

DR-7080C

SERVICE MANUAL

FIRST EDITION

Canon

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

PREFACE

This Service Manual describes necessary basic information for field service and maintenance for maintaining the product quality and functions of the DR-7080C.

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.

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CHAPTER 1

GENERAL DESCRIPTION

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I. FEATURES

- 1. Universal document scanner with ADF and flatbed (FB) for A3 size**
Support for black and white, grayscale, and color output
- 2. High speed scanning**
Using ADF, A4 simple: Max. 70 pages/minute, A4 duplex: Max. 36 images/minute
- 3. New functions**
Job function and MultiStream function by bundled software
- 4. Using the new product from Office Imaging Products Group of Canon Inc.**
Common ADF and Reader, and exclusive Controller

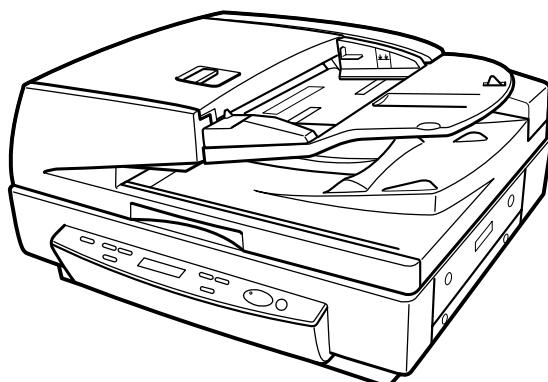


Figure 1-101

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

II. SPECIFICATIONS

1. Appearance/Installation

No.	Item	Specifications
1	Type	Desktop type flatbed scanner with ADF
2	Product models	1) for Japan: 100 VAC, 50/60 Hz 2) for American region: 120 VAC, 60 Hz 3) for European region: 220 to 240 VAC, 50/60 Hz 4) for others
3	Rating power consumption/current	1) 100 V model: 151 W 2) 120 V model: 1.23 A 3) 220 to 240 V model: 0.74 A Note: "EnergyStar" available.
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: 40 dB or less In operating mode: 78 dB or less (100 to 300 dpi) 75 dB or less (400 to 600 dpi) 2) Sound pressure level: Bystanders In standby mode: 40 dB or less In operating mode: 63 dB or less
6	Dimensions	575 (W) × 602 (D) × 300 (H) mm
7	Weight	Approx. 34 kg
8	Interface	1) SCSI-3 (Ultra SCSI compatible) 2) USB 2.0 (Hi-Speed compatible)
9	Expected product life	One of the following two items, whichever comes first. 1) 5 years 2) ADF mode: Sheets fed: 4,000,000 sheets (A4 size) 3) FB mode: 200,000 scans There are parts needed to replace.
10	Installation	By service technician
11	Option	1) Stamp unit 2) Network scanning adapter: NSA-01

Table 1-201

2. Document Reading

No.	Item	Specifications											
1	Method of scan	1) FB: Mirror moving 2) ADF: Sheet feeding (mirror fixing)											
2	Type of sensor	3-lines CCD											
3	Picture element	Density of element: 600 dpi, Effective elements: 7350											
4	Light source	Xenon tube											
5	Dropout color	Available (R/G/B)											
6	Color-emphasize mode	Available (R/G/B)											
7	Reading side	ADF: Simplex (front), Duplex FB: Simplex											
8	Reading size (typical)	1) L series: LDR / LGL / LTR / LTR-R 2) A series: A3 / A4 / A4R/ A5 / A5R 3) B series: B4 / B5 / B5R											
9	Reading size (atypical)	1) Available pixel unit setting 2) Main-scanning direction: Min. 139.7 mm, Max. 298 mm 3) Sub-scanning direction: Min.128 mm, Max. 432 mm											
10	Output mode	1) Binary (Black & White / Error diffusion Advanced text enhancement) 2) Grayscale (8 bit) 3) Color (24 bit)											
11	Output resolution	1) 100 × 100 dpi 2) 150 × 150 dpi 3) 200 × 200 dpi 4) 240 × 240 dpi 5) 300 × 300 dpi 6) 400 × 400 dpi 7) 600 × 600 dpi											
12	Scanning speed (ADF)	<table border="1"> <tr> <td colspan="2">A4 size</td></tr> <tr> <td colspan="2">Black & White</td></tr> <tr> <td colspan="2">Gray</td></tr> <tr> <td colspan="2">Color</td></tr> </table>				A4 size		Black & White		Gray		Color	
A4 size													
Black & White													
Gray													
Color													
	Simplex (pages/min.)	200 dpi	70 ppm	70 ppm	70 ppm								
		300 dpi	70 ppm	68 ppm	44 ppm								
		400 dpi	50 ppm	40 ppm	28 ppm								
		600 dpi	50 ppm	19 ppm	13 ppm								
	Duplex (images/min.)	200 dpi	36 ipm	36 ipm	36 ipm								
		300 dpi	36 ipm	36 ipm	36 ipm								
		400 dpi	32 ipm	32 ipm	28 ipm								
		600 dpi	32 ipm	19 ipm	13 ipm								
<p>Note: Grayscale and color mean JPEG in this case. It differs depending on the setting, computer performance, or other conditions.</p>													

Table 1-202

3. Documents Feed (ADF)

No.	Item	Specifications
1	Document size	<p>1) Width: 139.7 to 304.8 mm 2) Length: 128 to 432 mm</p> <p>Note: At Long document mode, Max. 630 mm length, added color and 600 dpi mode, Max. 540 mm length.</p>
2	Document weight (thickness)	<p>1) Simplex black & white document AB series: 42 to 128 g/m² (0.06 to 0.15 mm) L series: 50 to 128 g/m² (0.07 to 0.15 mm)</p> <p>2) Duplex black & white document 50 to 128 g/m² (0.07 to 0.15 mm)</p> <p>3) Color document 64 to 128 g/m² (0.08 to 0.15 mm)</p> <p>4) Black & white document at black & white and color mixed 50 to 128 g/m² (0.07 to 0.15 mm)</p> <p>Note: At Long document mode, 60 to 90 g/m².</p>
3	Document requirements	<p>1) Pressure-sensitive paper: Available (document weight: 50 to 128 g/m²)</p> <p>2) Carbon-backed document: None</p> <p>3) Perforated paper for binder: Only 2 / 3 / 4 holes can be fed.</p> <p>4) Folded paper File folded: Length 15 mm Max. / Height 10 mm Max. Staple folded: Length 20 mm Max. / Height 10 mm Max.</p> <p>5) Creased paper: Can be fed, but crease must be straightened.</p>
4	Pickup storage	<p>1) 100 pages Max. (at document weight 80 g/m²) Available adding in progress.</p> <p>2) 13mm Max. at height</p> <p>Note: At Long document mode, one sheet only.</p>
5	Delivery storage	100 pages Max. (at document weight 80 g/m ²)
6	Delivery face direction	Face down
7	Feeding speed	<p>1) 100/150/200/240/300 dpi: 468 mm/sec</p> <p>2) 400/600 dpi: 234 mm/sec</p>

Table 1-203

4. Image Processing/Others

No.	Item	Specifications
1	Image processing	1) Brightness adjustment: 255 levels 2) Contrast adjustment: 7 levels 3) Automatic brightness adjustment (AE): ABC processing 4) Shading correction: Standard white plate built in the scanner. 5) Smoothing: Available 6) Gamma correction: Standard / Custom 7) Edge emphasis: 5 steps 8) Image data compression: JPEG module built-in 9) MultiStream function: Available 10) Automatic size detection: Available 11) Skew correction: Available
2	Other function	1) Long document mode 2) Pre-scan 3) Count-only 4) Patch code 5) New file 6) Job function 7) Counter: stored in the memory 8) Self-diagnosis function
3	Bundled software	ISIS/TWAIN driver, CapturePerfect 2.0 Job registration tool

Table 1-204

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

III. PRECAUTIONS

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

1. Power OFF in Emergency

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

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

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

2. 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 reassembled, 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.

CAUTION LABEL

3. User Manual

Read the user manual thoroughly before using this machine.

4. Disposal

Following local regulations when disposing of the product and parts.

5. Movement

The machine weighs approximately 34 kg. Hold it firmly from both sides with two persons, and move the main body carefully. Do not try to lift it alone.

IV. NAME OF PARTS

1. Feeder

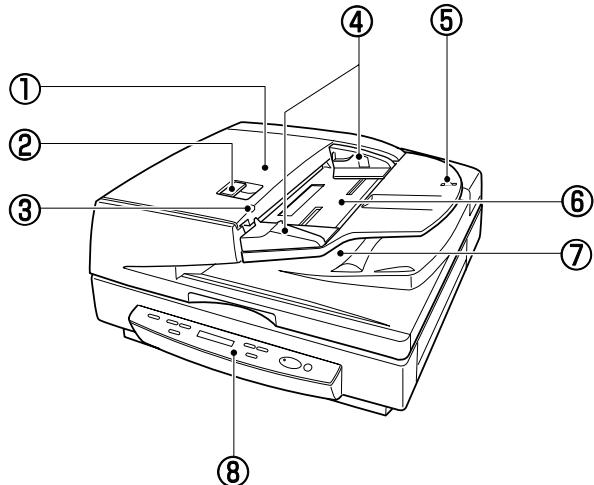


Figure 1-401

- ① Feeder cover
- ② Opening lever
- ③ Document set indicator
- ④ Slide guide (Document guide)
- ⑤ Large-size document detection sensor (LGL sensor)
- ⑥ Document feeder tray
- ⑦ Document delivery tray
- ⑧ Operation panel

2. Flatbed

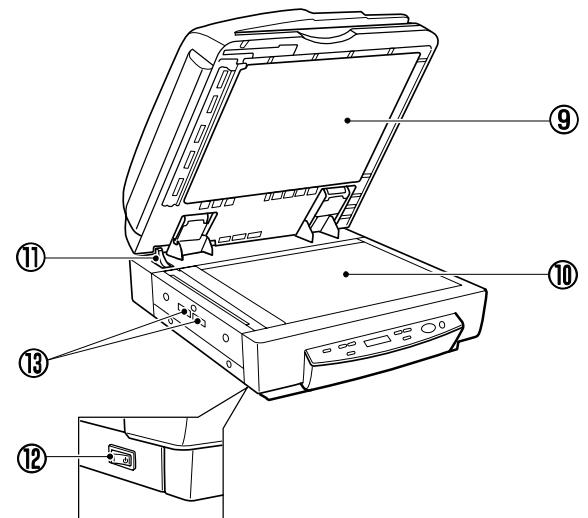


Figure 1-402

- ⑨ Pressure board (black)
- ⑩ Flatbed (Platen glass)
- ⑪ Opening sensor
- ⑫ Power switch
- ⑬ Air vents

3. Rear View

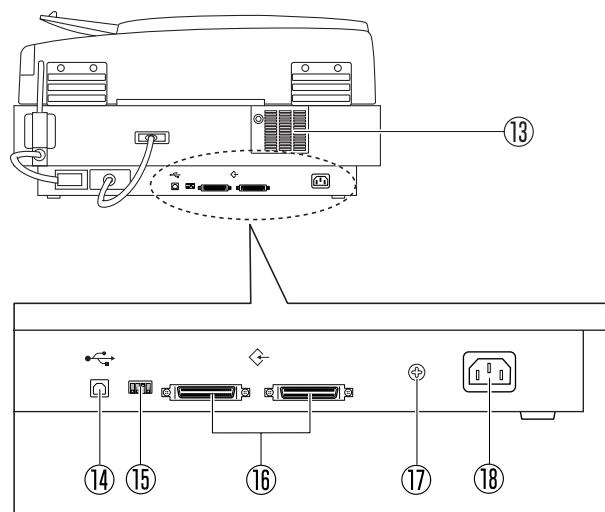


Figure 1-403

- (13) Air vents
- (14) USB connector
- (15) DIP switches
- (16) SCSI connectors
- (17) Grounding terminal
- (18) Power cord connector

Note: Take care to ensure that the vents never become blocked. Blocked vents can lead to heat build-up inside the scanner and create the risk of failure.

4. Operation Panel

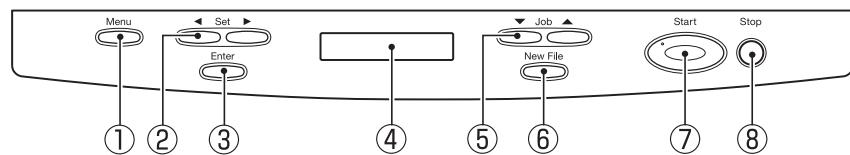


Figure 1-404

- ① Menu key
- ② Set keys
- ③ Enter key
- ④ Display panel
- ⑤ Job keys
- ⑥ New File key
- ⑦ Start key
- ⑧ Stop key

V. EXPLANATION OF OPERATION

For details, refer to user manuals of the DR-7080C and the software to be used.

1. Basic Operation

The basic operation for operating the DR-7080C is as follows.

- 1) Turn the DR-7080C 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 DR-7080C OFF.

2. Operation Screen

The basic operation screens are shown below for reference.

The bundled “CapturePerfect2.0” uses the “TWAIN” driver.

1) CapturePerfect2.0

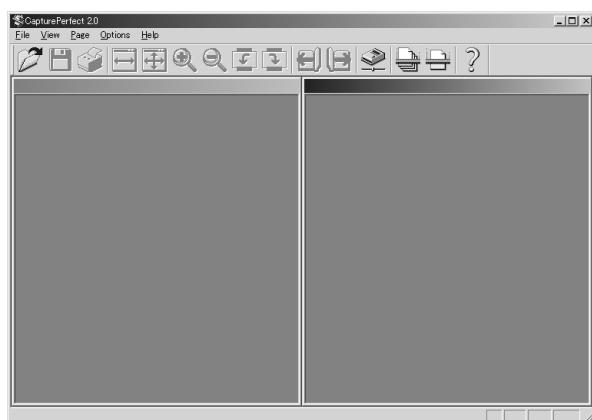


Figure 1-501

2) Scanner Setting

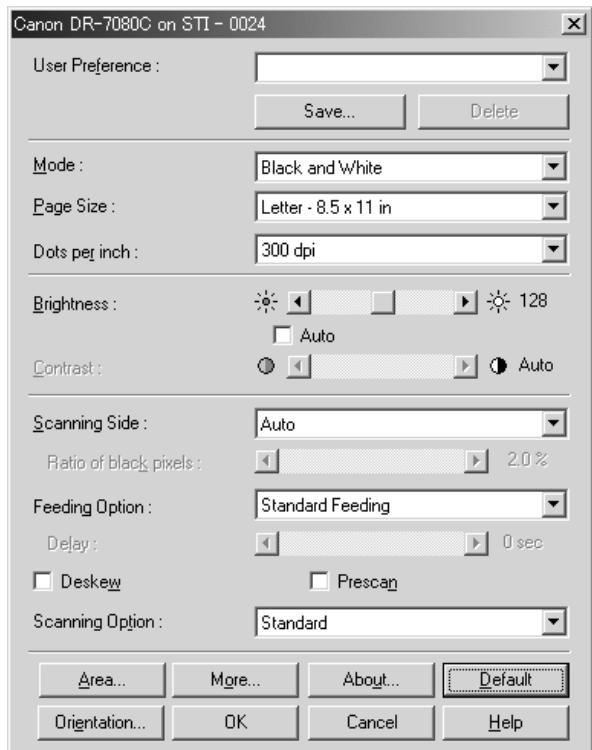


Figure 1-502

3) Advanced Settings

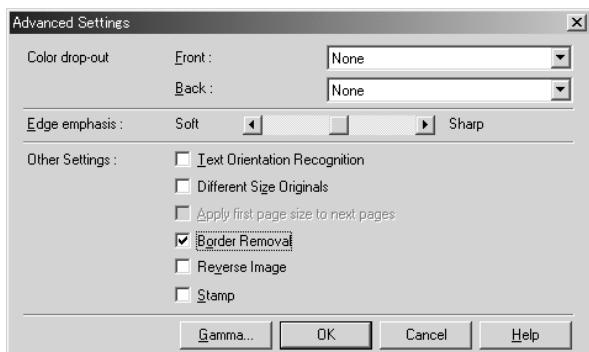


Figure 1-503

4) Job Registration

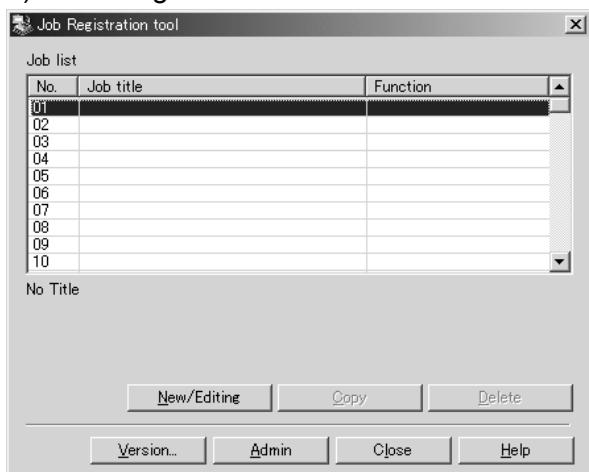


Figure 1-504

5) MultiStream

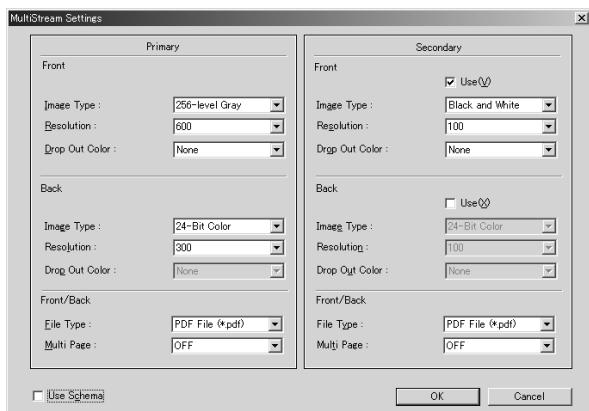


Figure 1-505

6) Version Indication



Figure 1-506

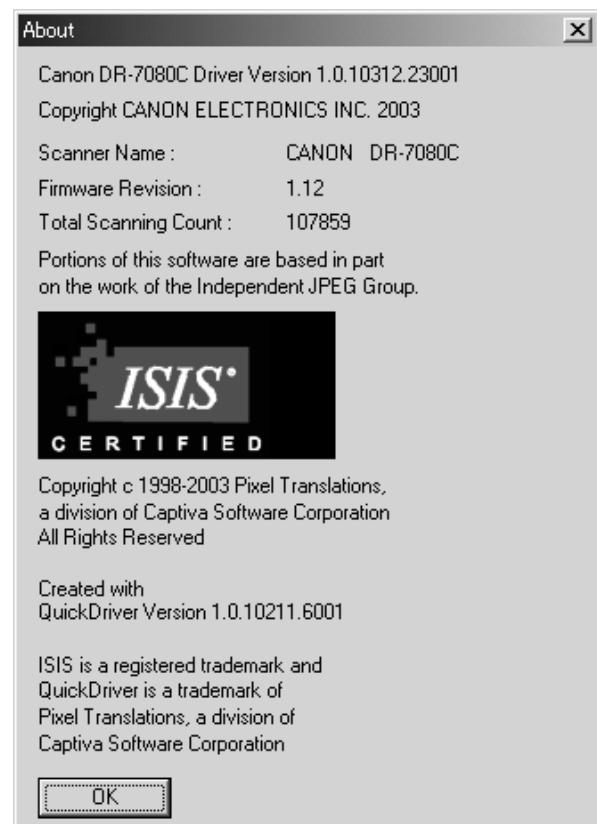


Figure 1-507

3. Jam Cleaning

- 1) Remove all document pages from the document feeder tray and the document delivery tray.
- 2) Open the feeder cover. Operate the opening lever, and then slowly raise the feeder cover it stops.

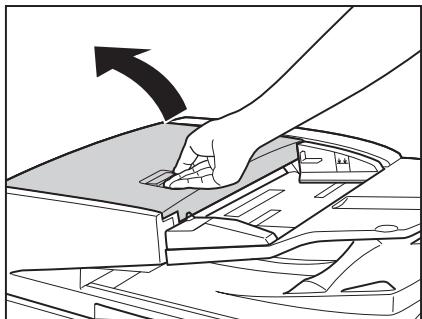


Figure 1-508

- 3) Remove the jammed document.

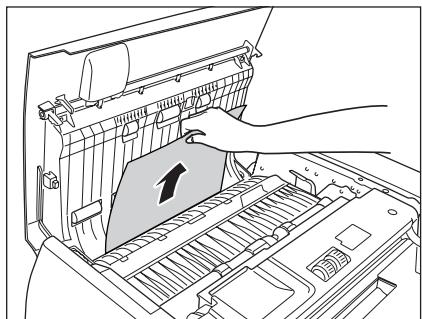


Figure 1-509

- 4) Grasping the tab inside the scanner, open the feeder guide.

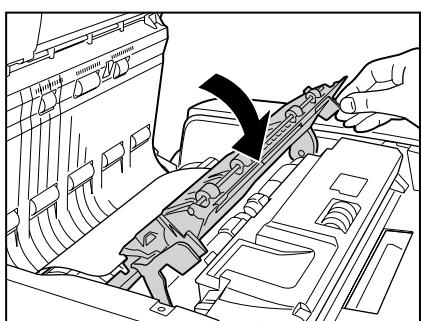


Figure 1-510

- 5) Rotate the dial on your side of the scanner to remove any document jammed inside the feeder.

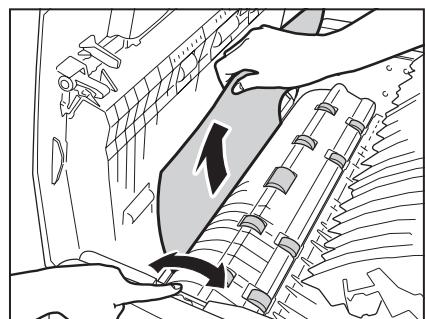


Figure 1-511

- 6) Close the feeder guide.

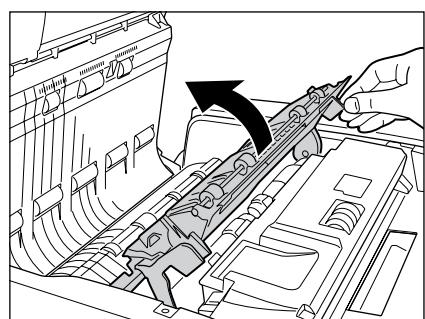


Figure 1-512

- 7) Close the feeder cover.

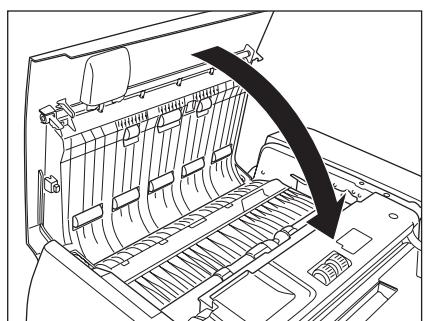


Figure 1-513

8) Open the feeder.

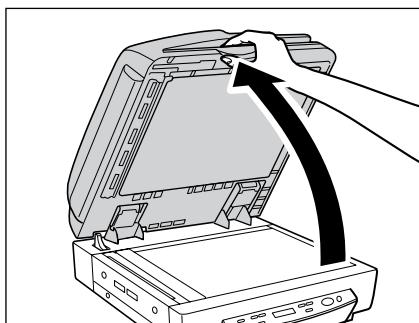


Figure 1-514

9) Remove the document jammed in the feeder.

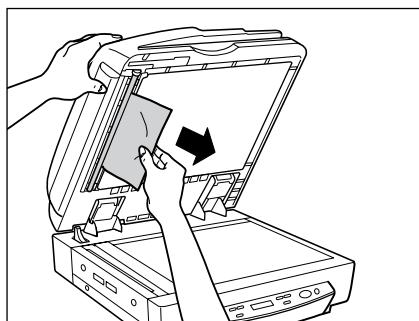


Figure 1-515

10) Close the feeder.

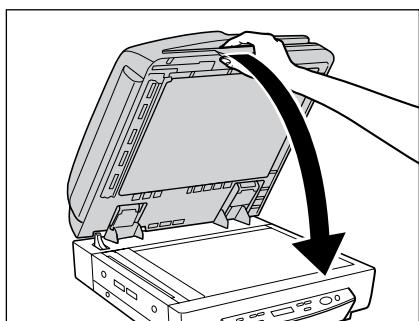


Figure 1-516

VI. REGULAR INSPECTION BY USERS

Instruct the user that the following locations must be cleared about once a week.

For the details, refer to the user manual.

1. Exterior

Wipe the covers with a cloth tightly wrung with water or neutral detergent soaked, and then wipe dry.

2. Glass, pressure board

Wipe the platen glass, ADF reading glass, and black pressure board with a cloth tightly wrung with water and then wipe dry.

3. Roller

Wipe the following rollers with a cloth tightly wrung with water and then wipe dry:

- 1) No. 1 registration roller
- 2) No. 2 registration roller
- 3) No. 1 registration roller follower
- 4) No. 2 registration roller follower
- 5) Reversal upper roller
- 6) Reversal lower roller
- 7) Platen roller

4. Power Cord

After the power code is plugged in to the outlet for a long period of time, dust will collect on the connected part and could cause a fire or electric shocks. To prevent this, clean it regularly.

CHAPTER 2

FUNCTIONS & OPERATION

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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 manual.

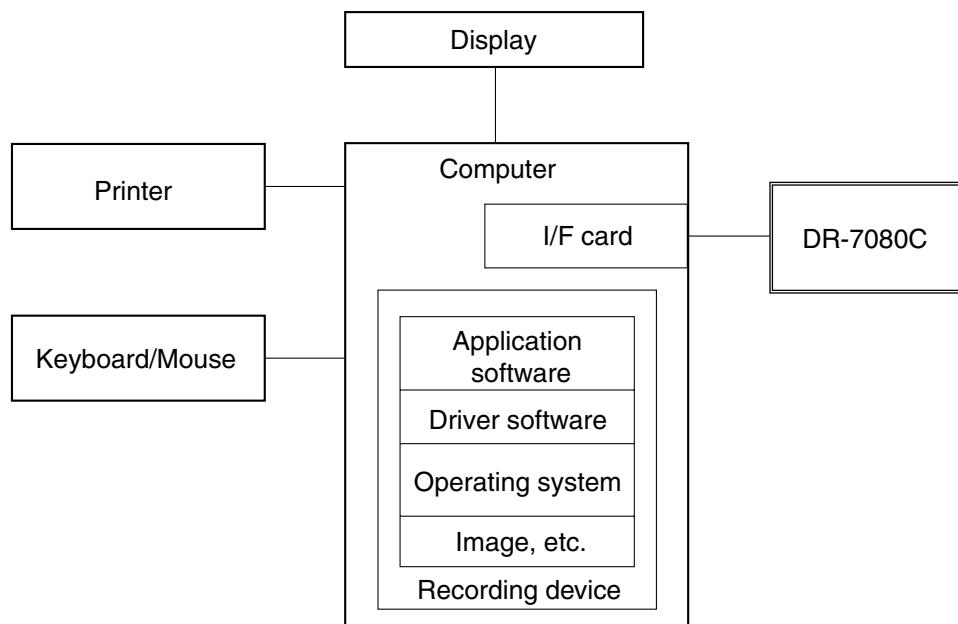


Figure 2-101

2. Overall Configuration

Figure 2-102 shows the overall configuration.

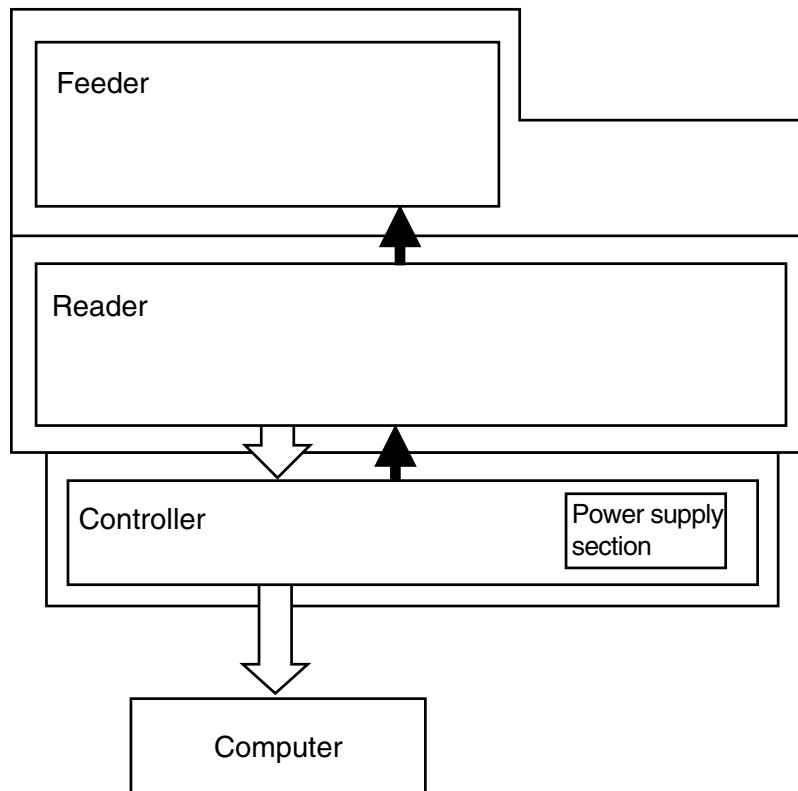


Figure 2-102

1) Feeder

The feeder picks up and delivers documents.

2) Reader

The reader scans image data with a CCD and controls the feeder.

3) Controller

The controller processes the image and performs the interface with the computer. However, image processing can also be performed from the computer. The controller is also provided with a power supply block.

3. Motor Drive

The reader of this machine includes a scanner motor (M501) for moving the mirror unit, a pickup motor (M1) for transporting documents in the feeder, a feed motor (M2), a delivery reversal motor (M3), and a pressure motor (M4) which presses the reader roller follower 1 to the read roller.

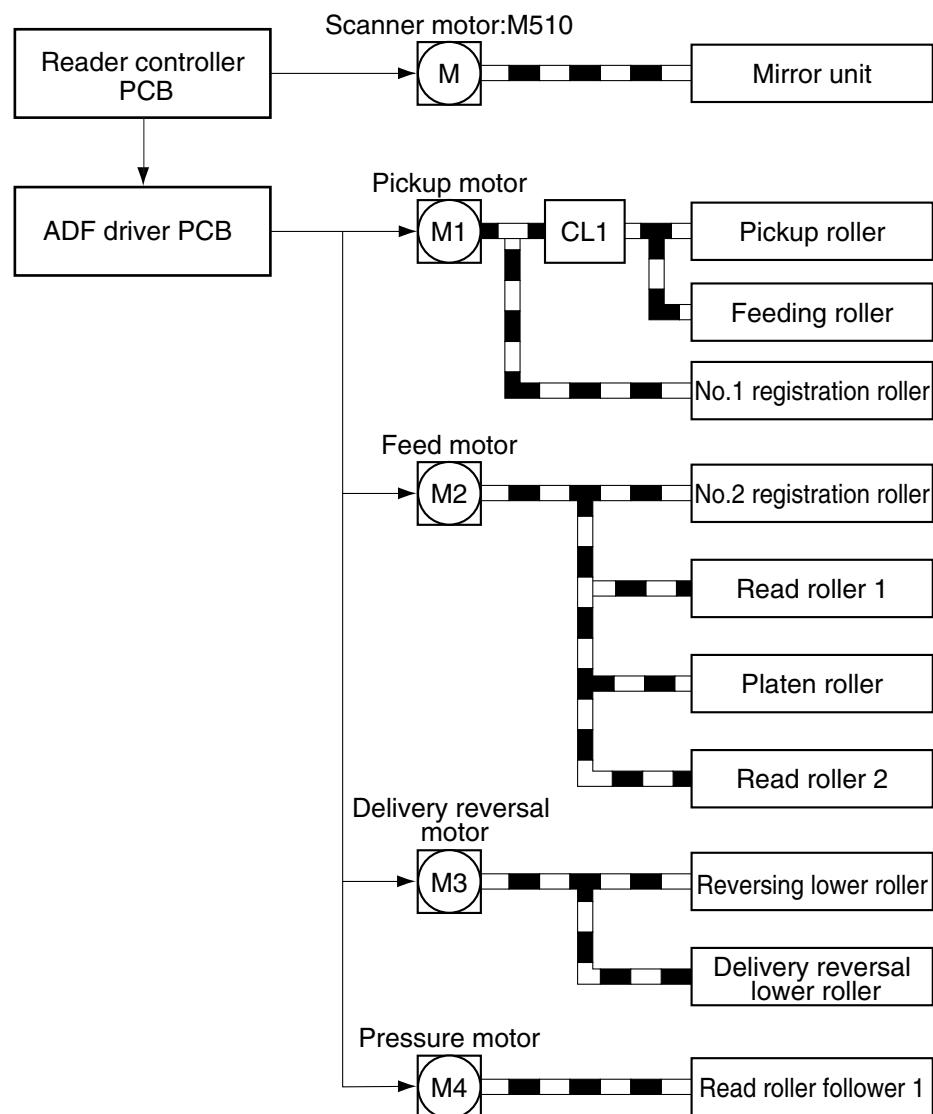


Figure 2-103

4. Electric Circuit

Figure 2-104 shows the electrical circuit block diagram

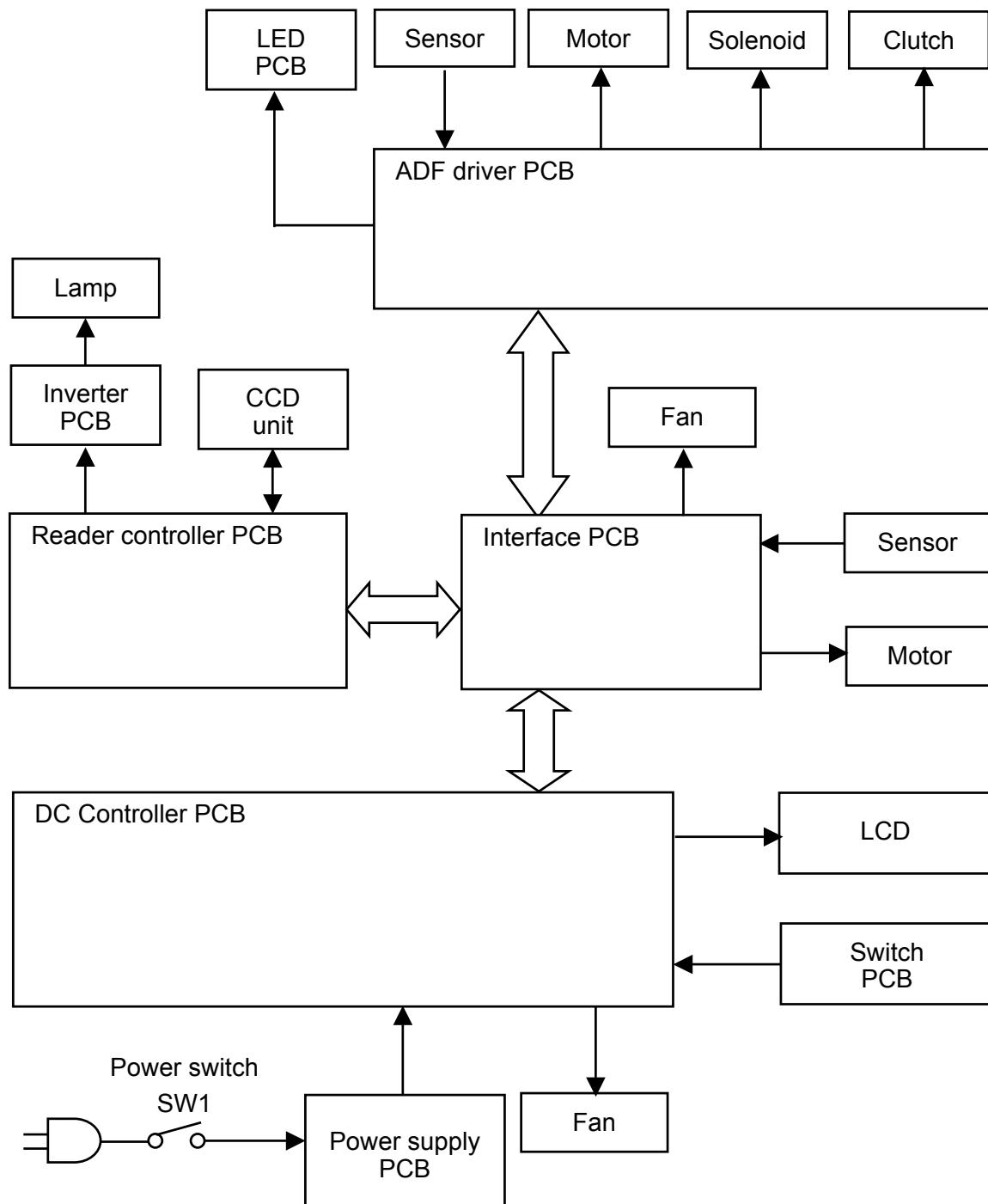


Figure 2-104

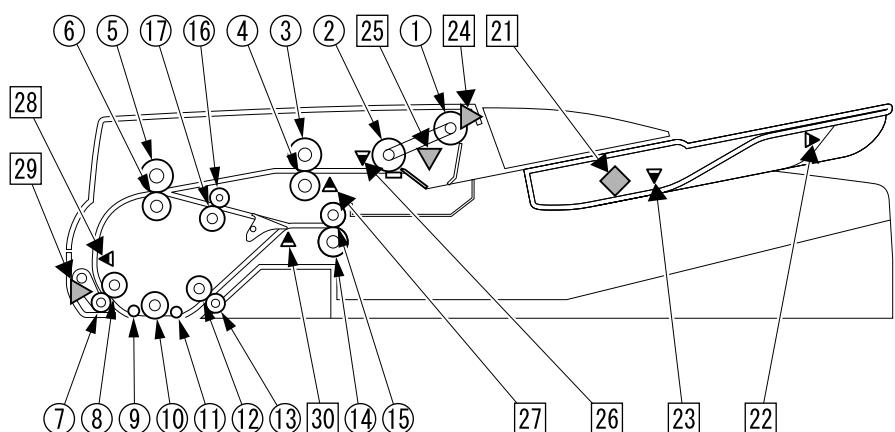
II. FEEDER

1. Basic Construction

1) Outline of the feeder system

Figure 2-201 shows the cross section of the feeder system.

The platen roller is black. The pressure board for the platen glass is also black. This color has been selected to facilitate image processing such as automatic size detection, which is described later.



① Pickup roller	⑯ Delivery reversal upper roller
② Feeding roller	⑯ Reversal upper roller
③ No. 1 registration roller follower	⑰ Reversal lower roller
④ No. 1 registration roller	⑯ Document width volume
⑤ No. 2 registration roller follower	⑯ LGL sensor
⑥ No. 2 registration roller	⑯ A4R/LTRR sensor
⑦ Read roller follower 1 (Pressure roller)	⑯ Feeder cover sensor
⑧ Read roller 1	⑯ Document set sensor
⑨ Platen roller follower 1	⑯ Post-separation sensor
⑩ Platen roller	⑯ Registration sensor
⑪ Platen roller follower 2	⑯ Read sensor
⑫ Read roller 2	⑯ Pressure HP sensor
⑬ Read roller follower 2	⑯ Delivery reversal sensor
⑭ Delivery reversal lower roller	

Figure 2-201

2) Outline of the electrical circuitry

The feeder is controlled by the reader controller PCB in the reader, which serves as a CPU (IC1).

The CPU interprets signals from sensors and the reader to generate signals used to drive DC loads (e.g., motor, solenoid) with the help of the CPU (IC9) of the ADF driver PCB.

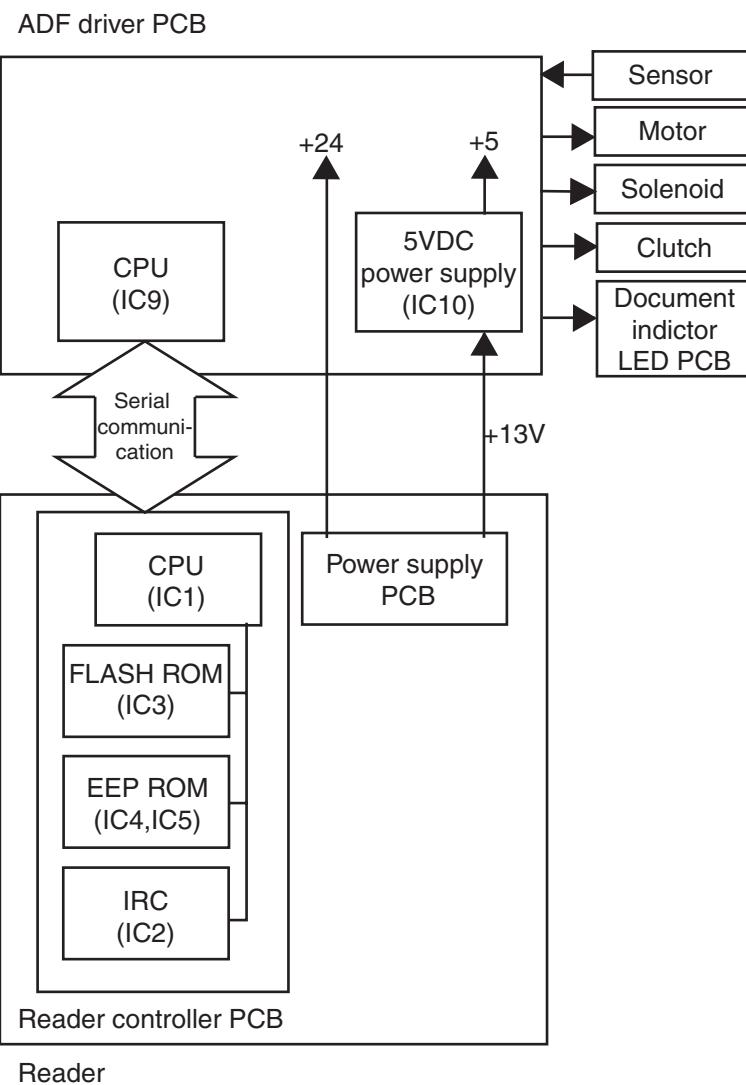


Figure 2-202

3) Inputs to the ADF driver PCB

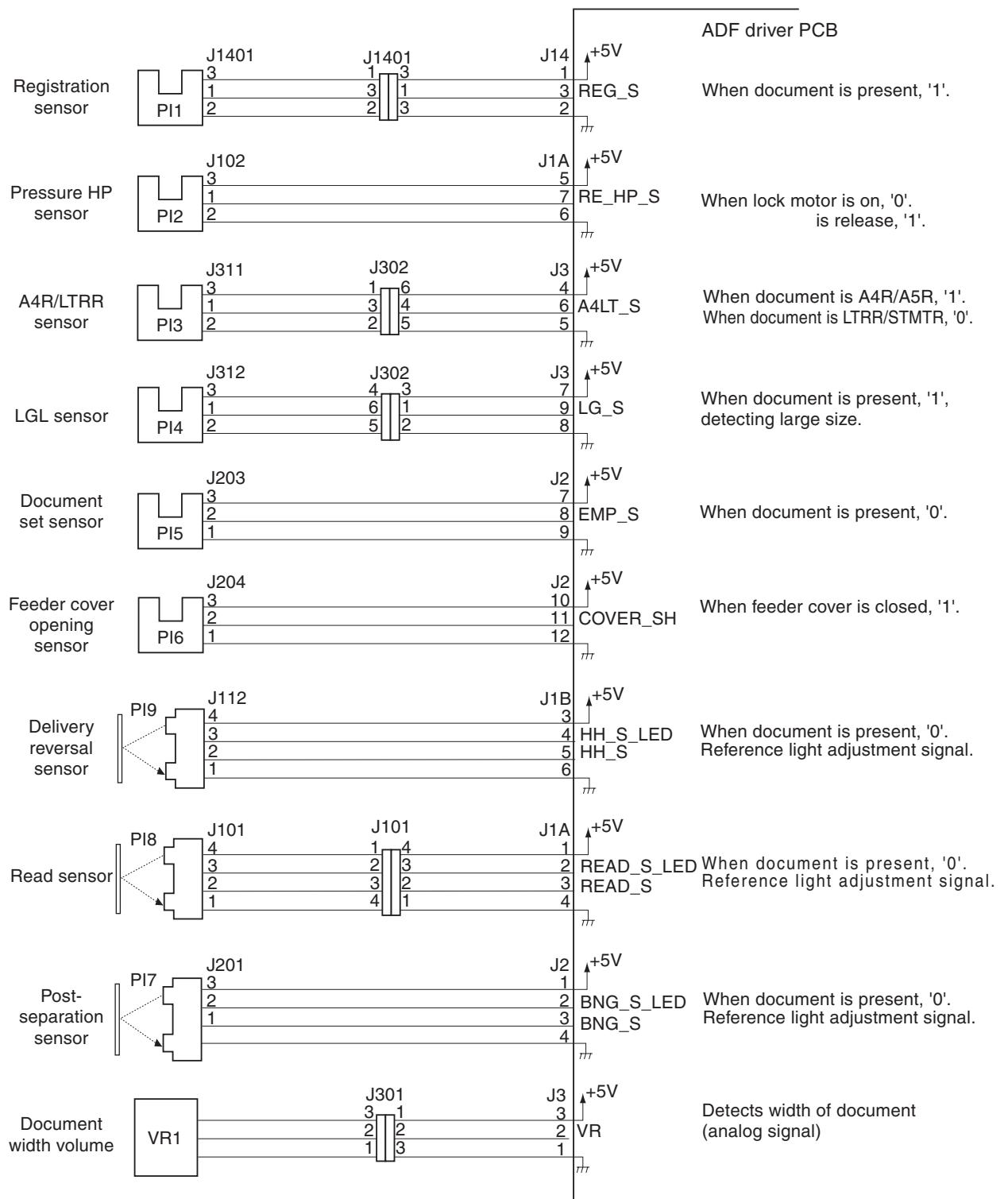


Figure 2-203

4) Outputs from the ADF driver PCB

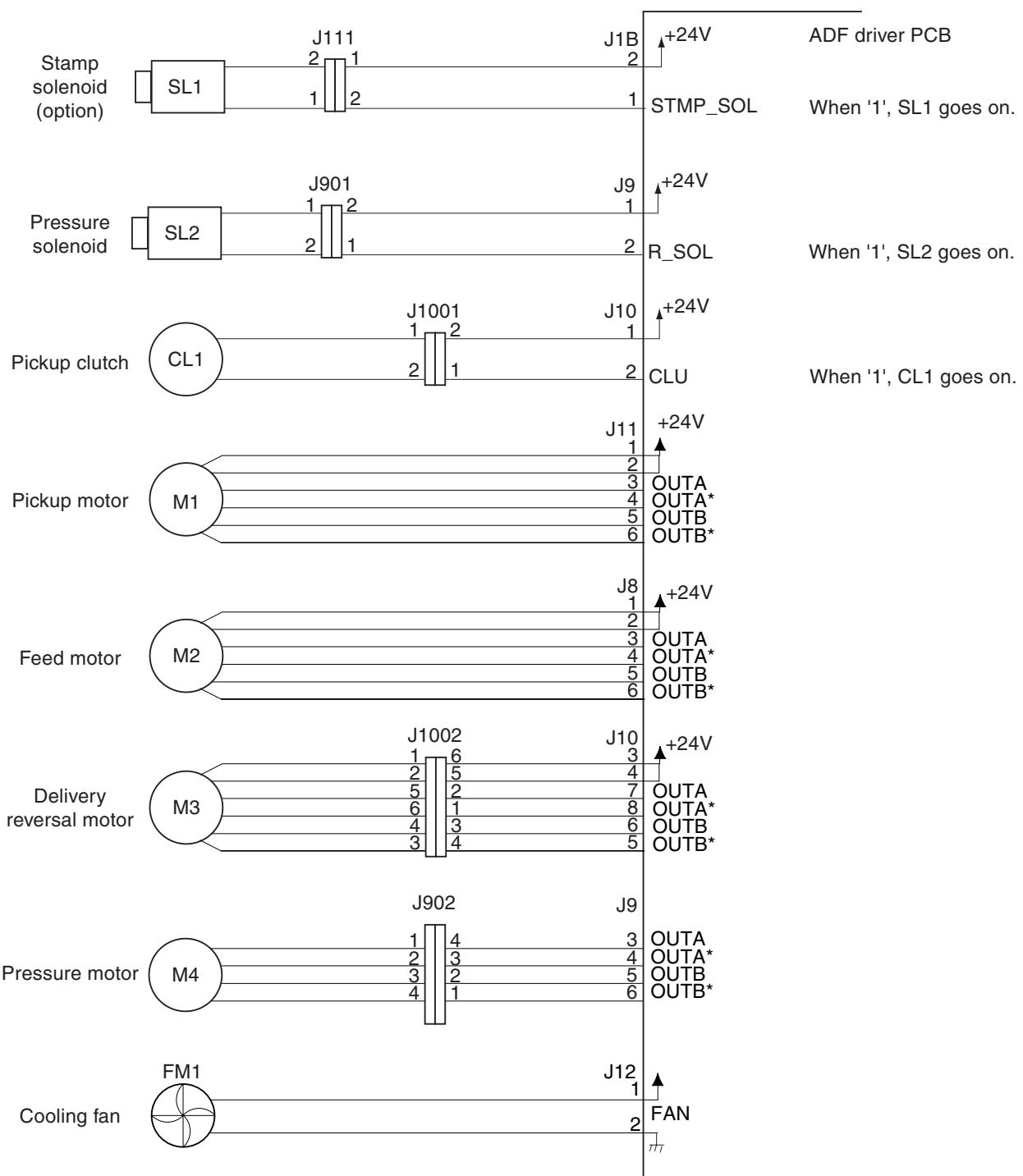


Figure 2-204

2. Basic Sequence of Operation

1) Routes of drive

The feeder uses 4 motors and 1 clutch to control the movement of documents.

Name	Symbol	Description
Pickup motor	M1	Picks up/feeds documents.
Feed motor	M2	Feeds documents.
Delivery reversal motor	M3	Delivers or reverses documents.
Pressure motor	M4	Pressures/separates the pressure roller
Pickup clutch	CL1	Cuts the drive from the pickup motor (M1) to the pickup roller and the feeding roller.

Table 2-201

The following is a diagram of the feeder routes of drive:

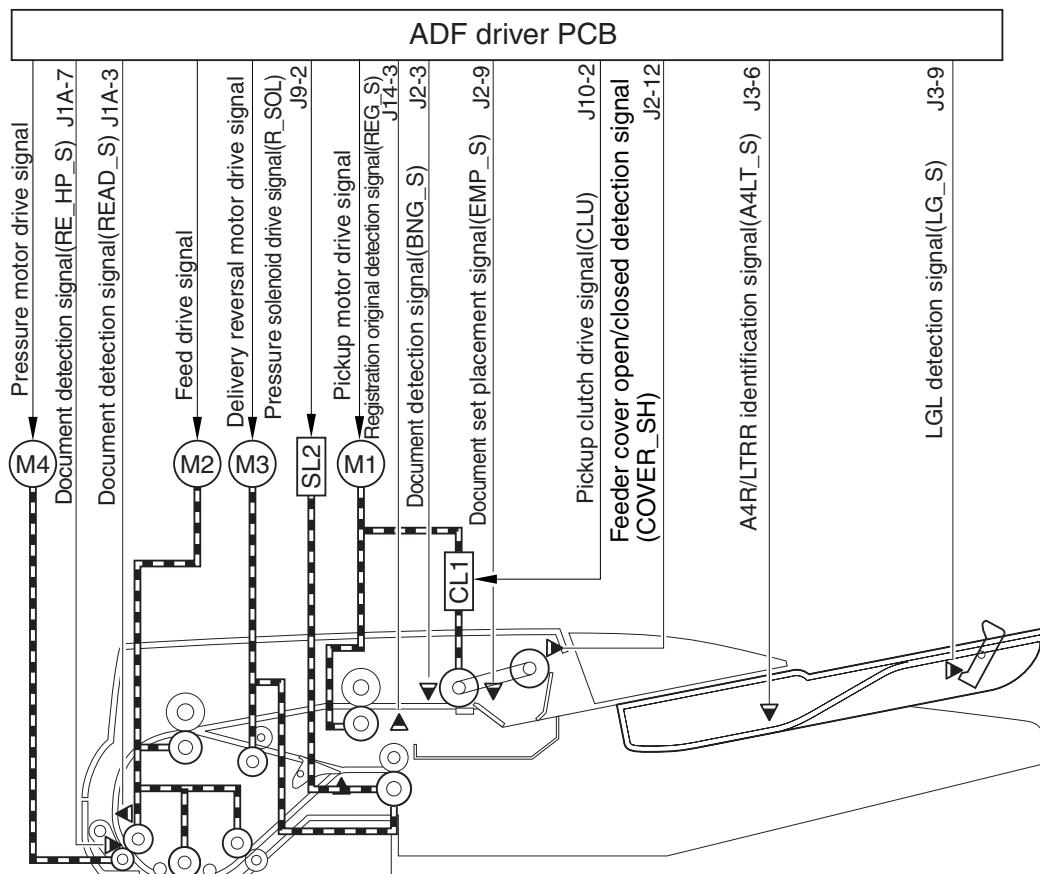


Figure 2-205

2) Overview of operation modes

The feeder executes the following 4 types of operation mode, executing individual modes according to the instructions from the host machine for reading.

The following table shows these operation modes, outlines of the modes, and corresponding reading modes:

No.	Operation mode	Outline of operation	Corresponding reading mode
①	Normal rotation pickup/ delivery • simplex mode	Picks up a document, and delivers it after it has been read	Simplex reading
②	Normal rotation pickup/ reversal delivery • low-speed duplex mode (small) • low-speed duplex mode (large) • high-speed duplex mode	Picks up a document, and reverses and delivers it after it has been read.	Duplex reading

Table 2-202

Document is identified as follows in terms of size:

- small-size: A5R, A5, A4, B5, LTR, STMT
- large-size: A4R, A3, B5R, B4, LTRR, LGL, LDR (11"×17")

3) Normal rotation pickup/delivery operation
(simplex mode)

The following shows the flow of documents:

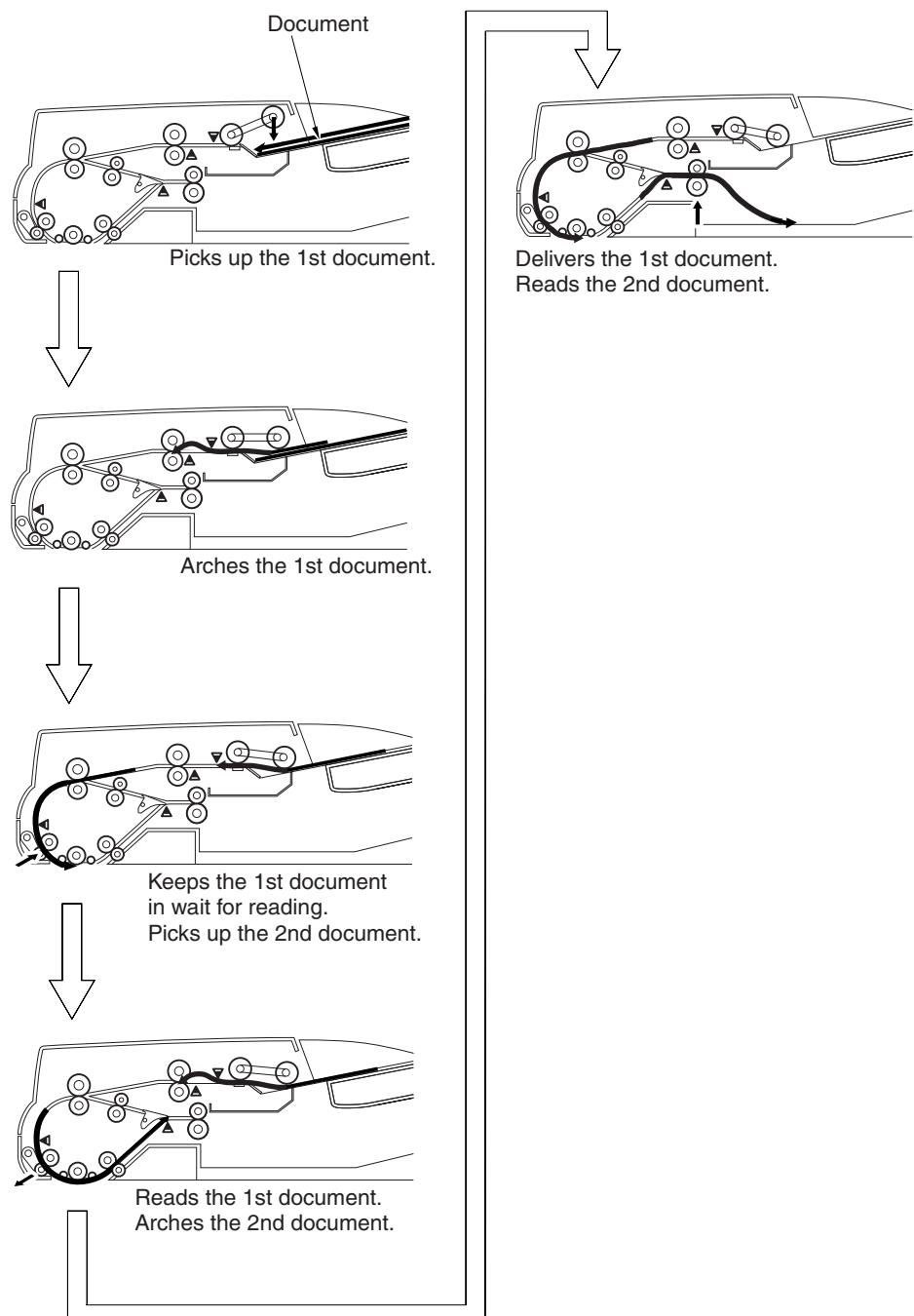


Figure 2-206

4) Normal rotation pickup/reversal delivery
(duplex mode)

The following shows the flow of documents:

a) Low-speed duplex mode

- Small-size

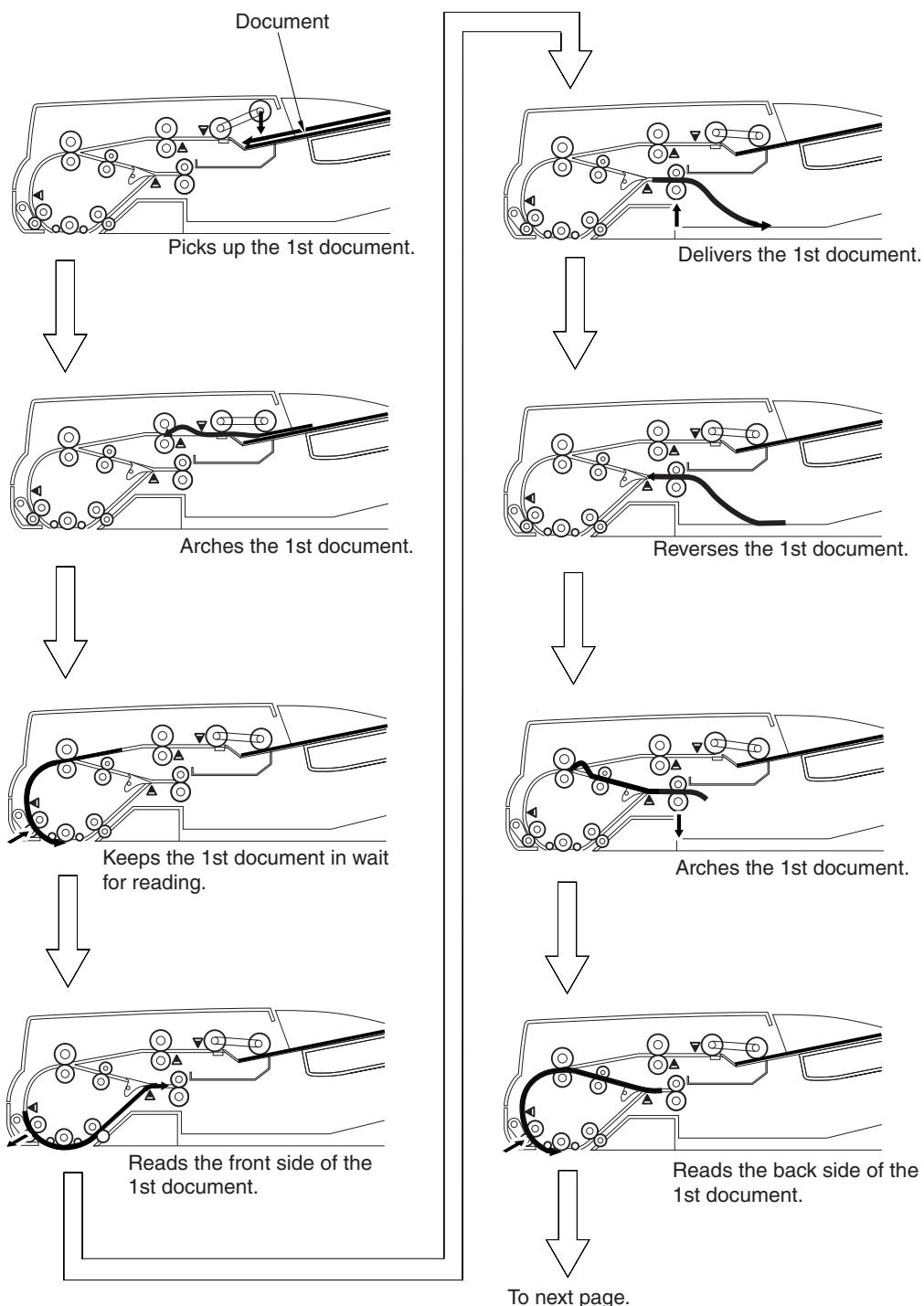


Figure 2-207

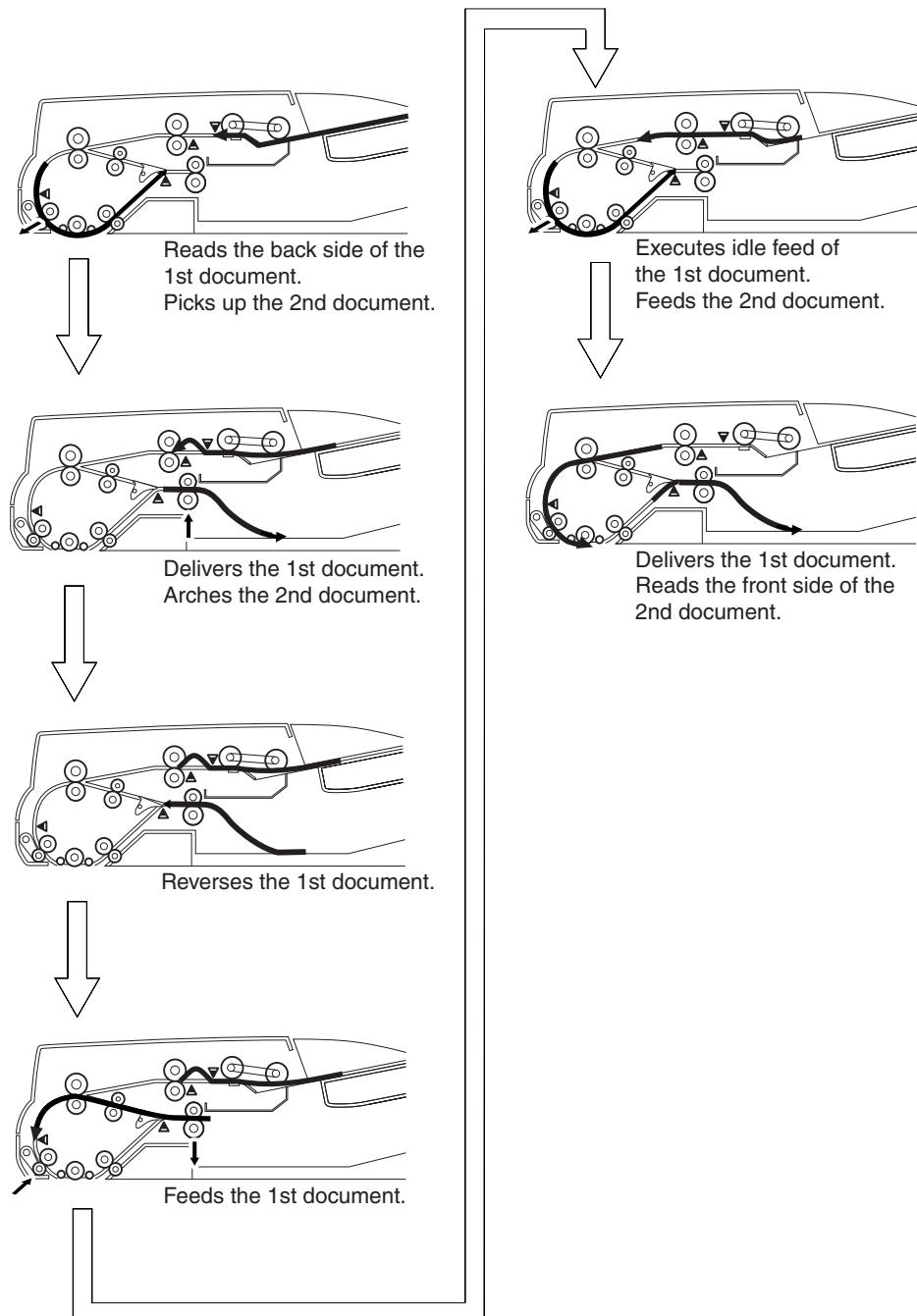


Figure 2-208

• Large-size

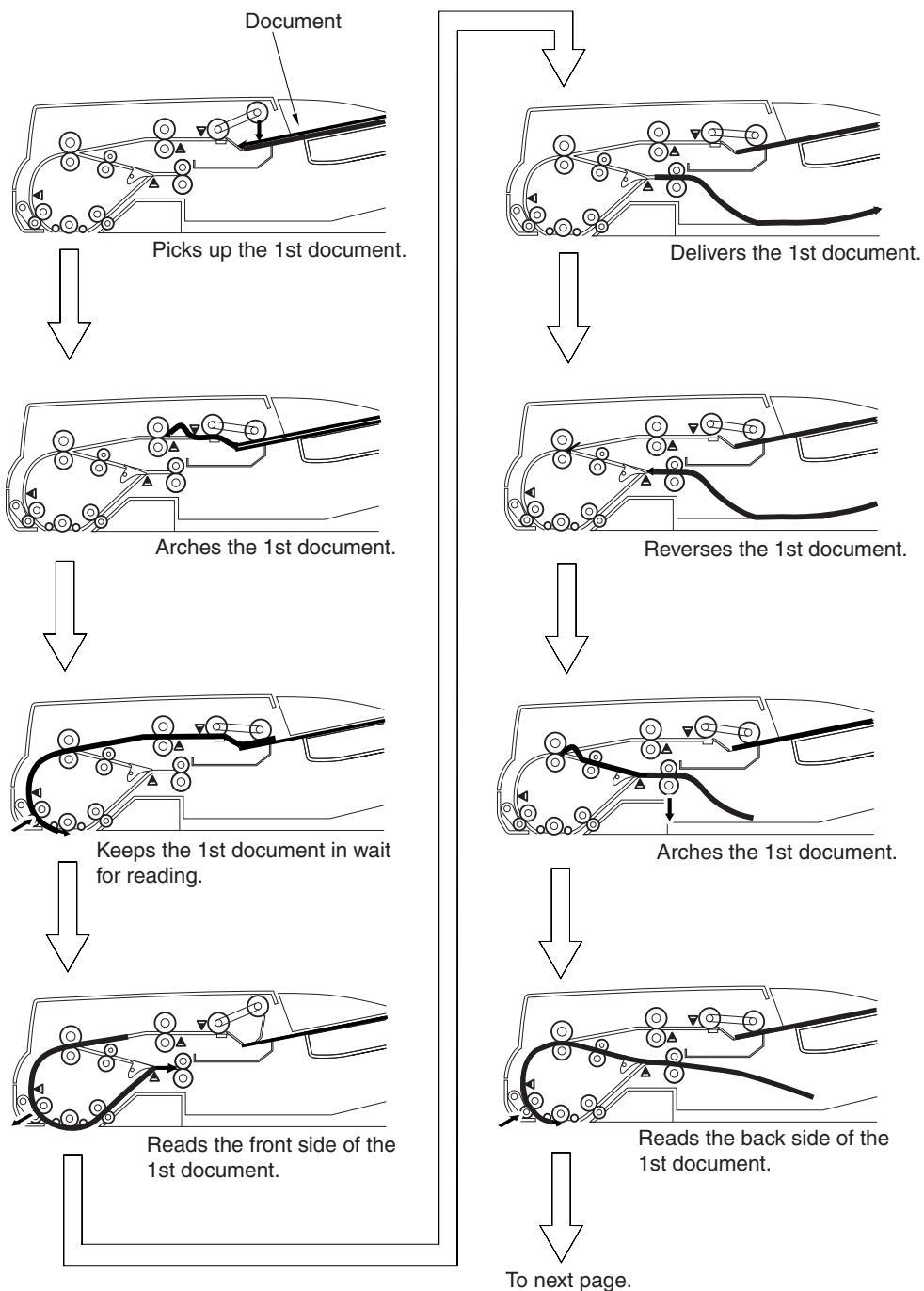


Figure 2-209

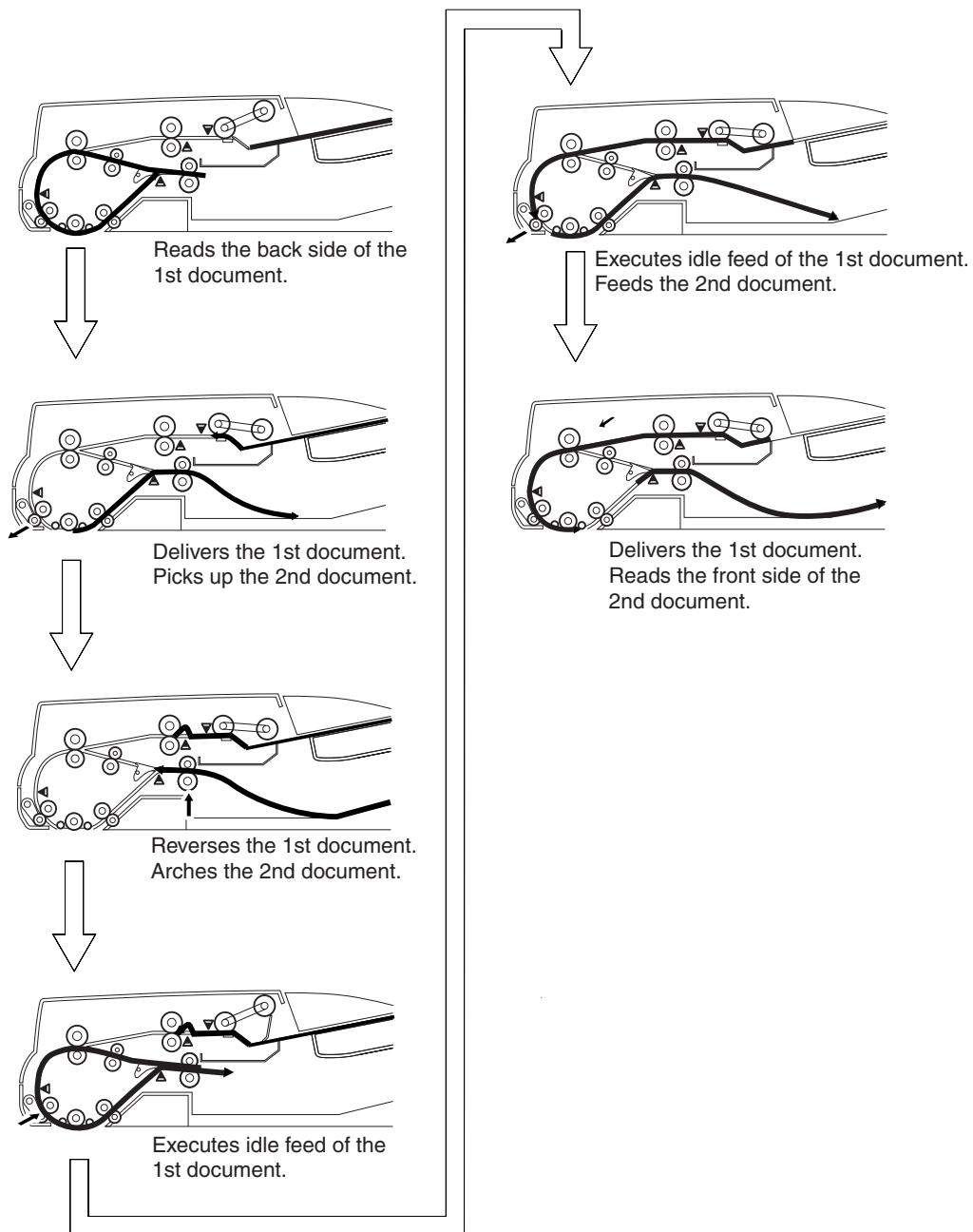


Figure 2-210

b) High-speed duplex mode (A4/LTR only)

The high-speed duplex mode may be enabled only when the document size is A4/LTR.

The high-speed duplex mode may be enabled or disabled in service mode: FEEDER>OPTION>SL-DBL.

The default is set to ON (high-speed mode).

If the user tends to use documents not suited to high-speed duplex mode, be sure to select OFF (disabled).

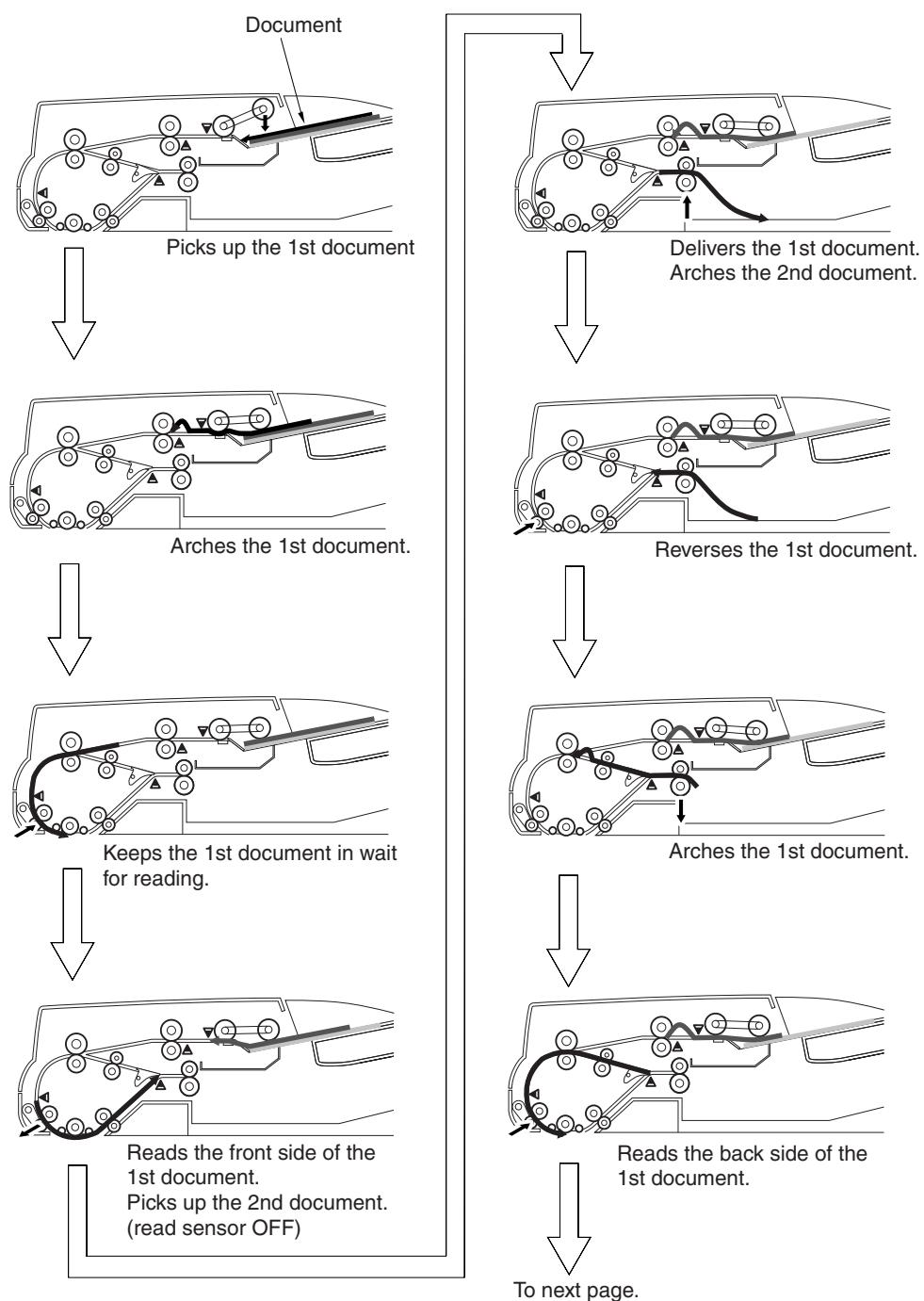


Figure 2-211

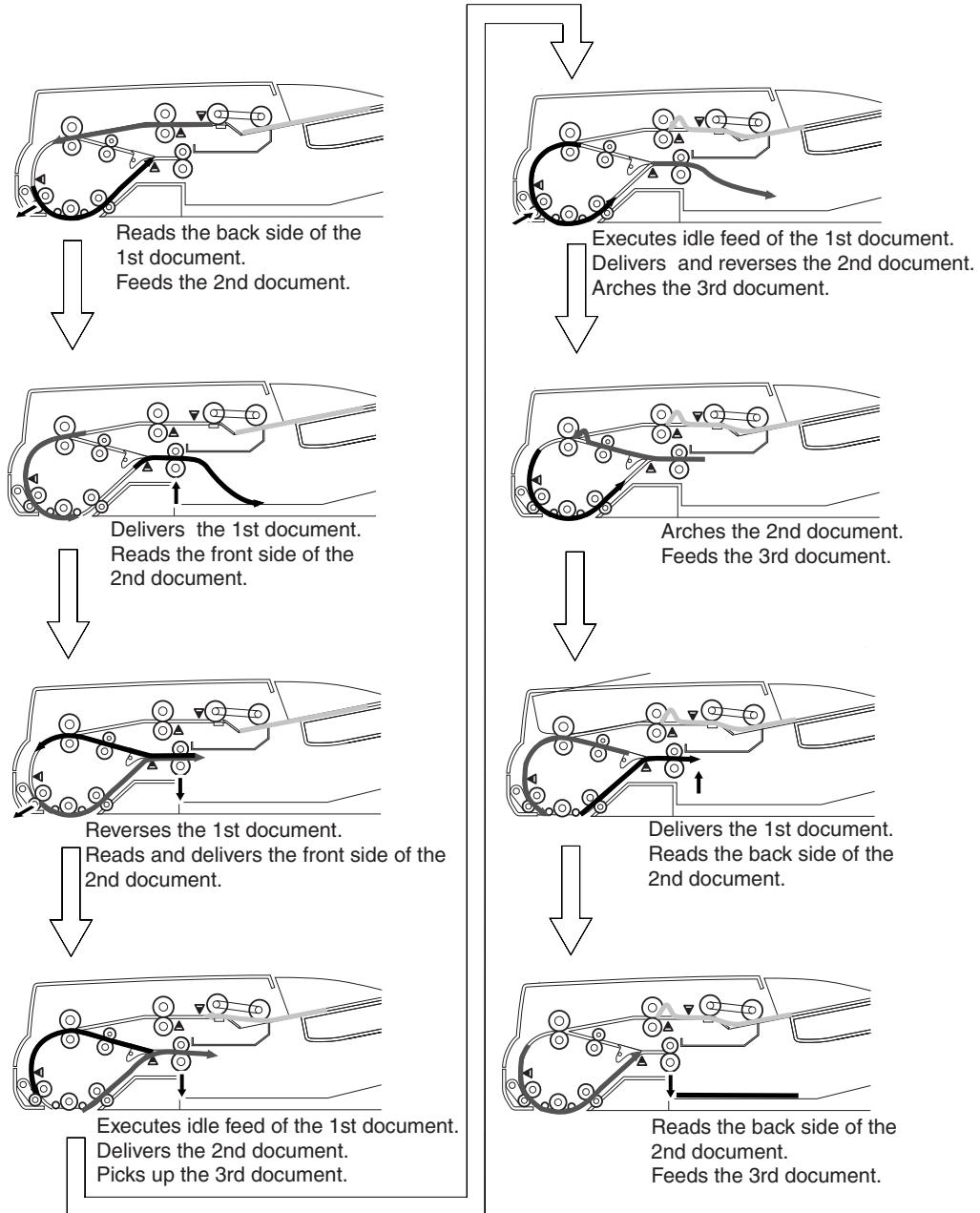


Figure 2-212

Note: The high-speed duplex mode is a feed operation mode whereby the scan speed (number of scanned images per minute) for the standard A4/LTR size using a resolution of 400/600 dpi is faster than that for the regular small size.

The following conditions are required to execute this mode.

- Pre-read scan: ON
- Long document mode: OFF
- Stamp: OFF
- Different size documents: OFF
- Specification of number of scan sheets: OFF

3. Detecting the Documents

1) Overview

The feeder provides presence/absence of document detection and document size detection functions. Their details and the sensors they use are listed in Table 2-203.

The document size detection during different size documents, automatic size detection, and long document mode is special. Refer to the relevant sections.

Item	Description	Sensor used (notation)
Presence/absence of document detection	Identifies the presence/absence of a document in the document pickup tray	Document set sensor (PI5)
Document size detection		
Feed direction	Identifies whether the length of documents placed in the document pickup tray is longer than LGL.	LGL sensor (PI4)
	Identifies the state of the post-separation sensor (ON/OFF) after the read sensor goes ON to identify the document as being small or large.	Post-separation sensor (PI7), read sensor (PI8)
	Detects the time from post-separation sensor OFF until read sensor ON (A4R/LTR identification).	
Width direction	Detects the width of the document placed in the document pickup tray	Document width volume (VR1)
	Identification between A4R and LTRR	A4R/LTRR sensor (PI3)

Table 2-203

2) Detecting the presence/absence of a document

The machine uses the document set sensor (PI5) to detect the presence/absence of a document in the document pickup tray.

When a document is placed on the tray, the detection lever operates in conjunction with the light-blocking plate, during which the light-blocking plate blocks the light of the photo interrupter.

As a result, the document set sensor (PI5) generates the document detection signal (EMP_S), which will cause the ADF driver PCB to turn on the document set indicator.

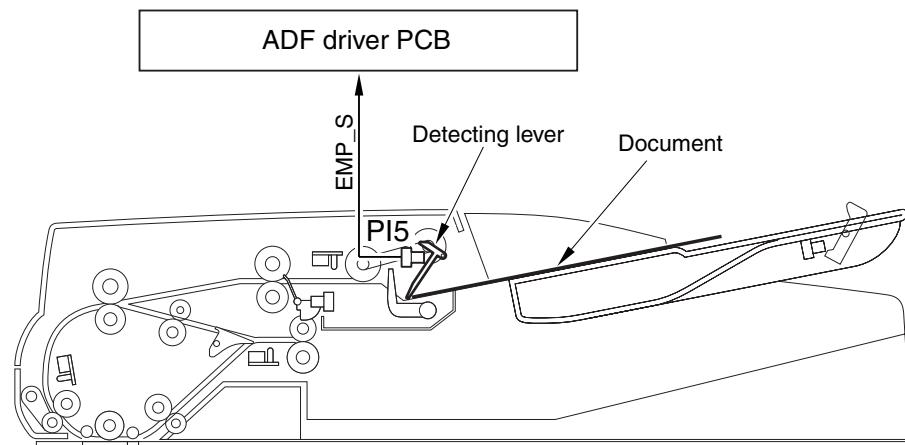


Figure 2-213

3) Document size detection

The document size is detected using the combination of size detection (width, length) in the document pickup tray and size detection (length) during feeding.

As a result, the size of the set document is

identified as large size, small size, or A4/LTR. The feed operation mode best suited to the size of the document is executed. Table 2-204 lists the various document sizes and the detection results.

Document	Dimensions (mm)		LGL sensor	Post-separation sensor	Guide position No.	Judgment
	Width	Feed				
LDR	279	432	ON	ON	2	Large
A3	297	420	ON	ON	1	Large
B4 (JIS)	257	364	ON	ON	3	Large
LGL	216	356	ON	ON	4	Large
A4R	210	297	OFF	ON	5	Large
LTRR	216	279	OFF	ON	4	Large
B5R	182	257	OFF	ON	6	Large
LTR	279	216	OFF	OFF	2	Small*
A5R	148	210	OFF	OFF	7	Small
A4	297	210	OFF	OFF	1	Small*
B5 (JIS)	257	182	OFF	OFF	3	Small
A5	210	148	OFF	OFF	5	Small
STMT	216	140	OFF	OFF	4	Small

Table 2-204

Note: "Post-separation sensor" indicates the status of the post-separation sensor when the read sensor is ON. "Guide position No." indicates the document guide position. "1" indicates that the deployed position of the guides.

a) Feed direction (length)

The size of the document in the feed direction is judged through LGL sensor ON/OFF detection, and post-separation sensor ON/OFF detection when the read sensor is ON, or the time from post-separation sensor OFF until read sensor ON.

However, if automatic size detection is selected, the length data calculated fro

read sensor ON/OFF is used.

For details, refer to the relevant sections. If the post-separation sensor is ON when the document is fed and the read sensor (PI8) detects the document, a large size is judged. If the post-separation sensor is OFF at this time, a small size is judged.

Refer to Figure 2-214.

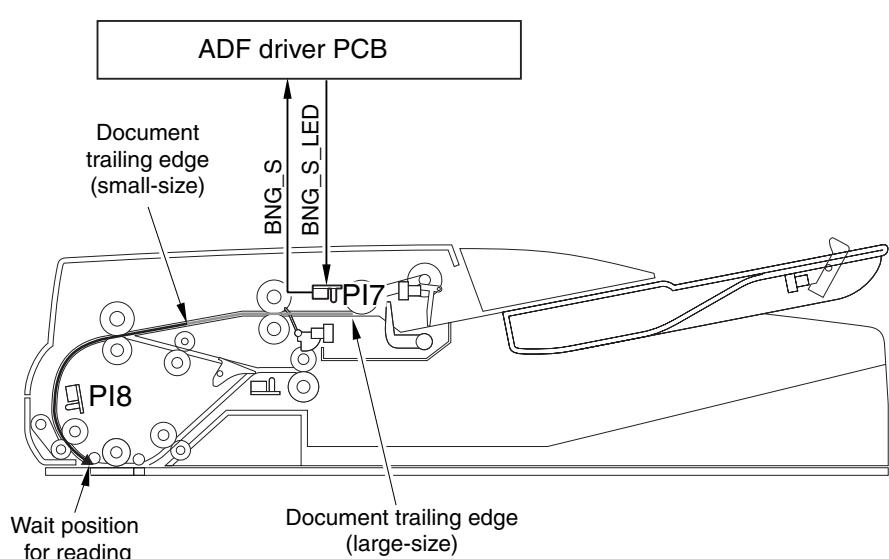


Figure 2-214

To execute the high-speed duplex mode for A4 or LTR, when the document guide is set to A4 or LTR, the machine measures the time from post-separation

sensor OFF until read sensor ON, and judges if the document size is A4 or LTR. Refer to Table 2-205.

Document	Sensor	Timing	Judgment
A3	Post-separation Read	Document detection 225mm	Large
A4	Post-separation Read	Measurement	Small* A4
A5	Post-separation Read	Measurement	Small

Table 2-205

When a document of LTR or larger size is placed in the document pickup tray, the LGL sensor detection lever actuates the light-blocking plate, and the light-blocking plate blocks off the light to

the photo interrupter. Thus the fact that the document is a large size can be detected before feeding starts. Refer to Figure 2-215.

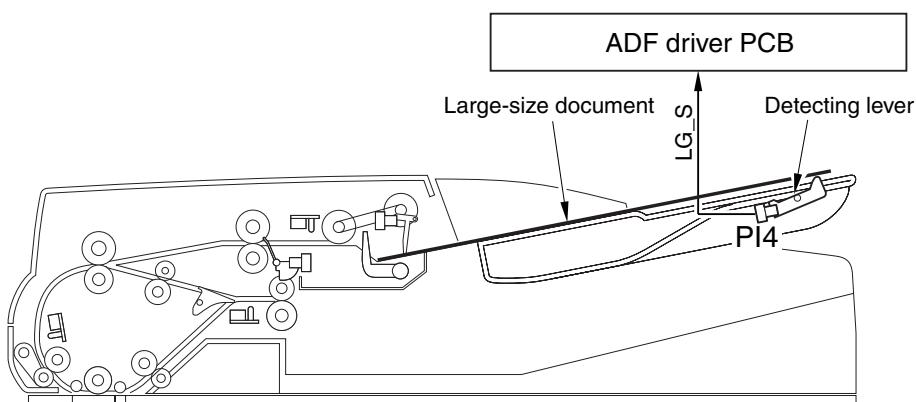


Figure 2-215

b) Width direction

The width direction of a document is detected using the document width detecting volume (VR1) found inside the document pickup tray. The volume operates in conjunction with the document guides, its resistance changing (analog) as the guides are moved. The ADF driver PCB reads these changes in resistance as the document size signal (WIDTH), and recognizes them as specific widths.

To make sure that the document width of A4R and LTRR can be correctly detected, a special A4R/LTRR sensor (PI3) is used inside the document pickup tray; the sensor goes '1' (A4R signal) when the width of the document is 197 mm or more and less than 214 mm. The A4R document width is 210 mm.

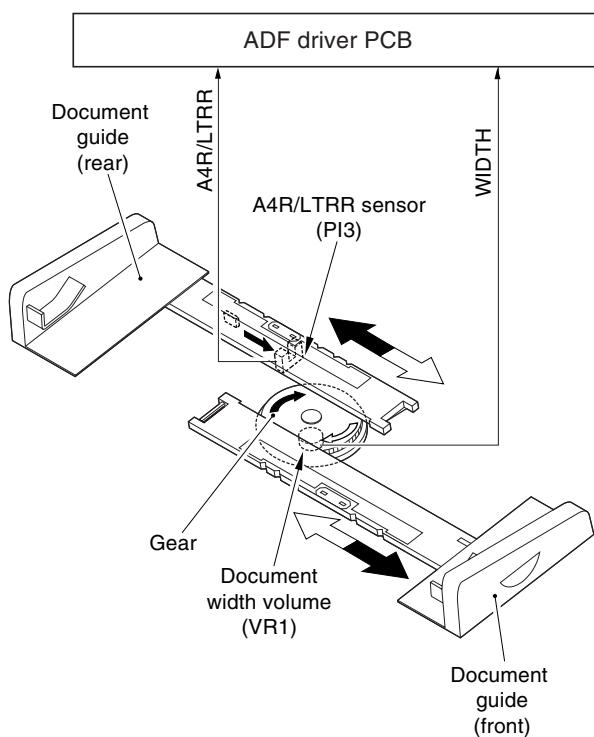


Figure 2-216

The track of the document guides is given a groove so that the guides may stop at specific default sizes. Some sizes, however, are extremely close to each other, possibly causing the document guides to stop at the wrong point. To make sure that the document slide stops at the correct stops, the document guides are provided with a positioning parts ①, which restricts the stops as follows:

The front marking is set to A4 and there are two grooves at the factory setting.

Marking on document guides positioning parts (front)	Document guide stop position	
	1 groove	2 grooves
A4R	A4R	A4R LTRR
INCH	LTRR	A4R LTRR

Table 2-204

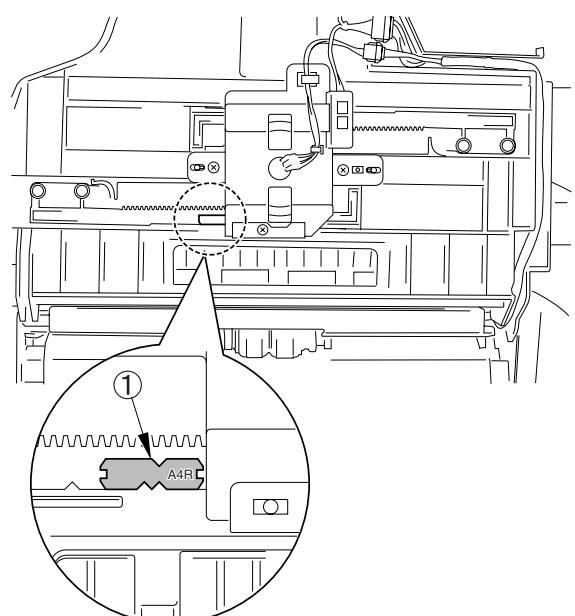


Figure 2-217

c) Long document mode, automatic size detection

To read document images that exceed 432 mm in length, it is necessary to set both the long document mode and automatic size detection to ON. In the case of automatic size detection, the document size in the feed direction is detected from read sensor ON until read sensor OFF, and the width direction is detected during image processing.

The platen roller is black to enable image processing in width direction so that the background of documents may be read as black. For details, refer to "IV. CONTROLLER".

When the long document mode or automatic size detection is ON, the feed operation does not switch to the high-speed duplex mode even when the document size is A4 or LTR.

d) Different size documents mode

When the different size documents mode is set to ON, A4 or LTR detection is not performed during feed direction size detection, and the feed operation mode does not switch to the high-speed duplex mode.

When this mode is OFF and the current conditions allow switching to the high-speed duplex mode, an error is judged and feeding is stopped when the first document of the batch is either A4 or LTR, but the 2nd and subsequent documents that are fed have a different size in the feed direction.

If the second or subsequent document size is longer than the first document, a different size document error is displayed, and if it is shorter, document jam is displayed.

4. Picking Up and Feeding

1) Basic operation

a) Picking up

When the pickup motor (M1) rotates in reverse and the pickup clutch (CL1) goes ON, the pickup roller unit moves

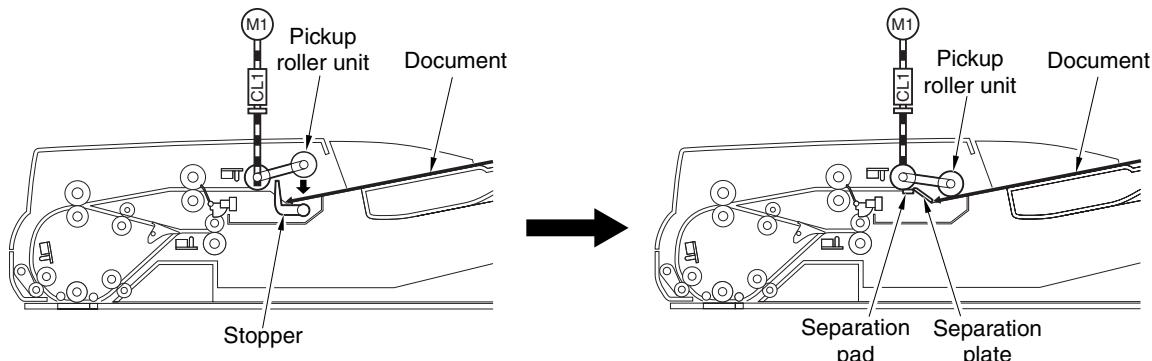


Figure 2-218

b) Aching

When the document has been moved for a specific number of pulses after the registration sensor has gone ON, the document is caused to arch at the No. 1 registration roller so that it becomes free of any skew.

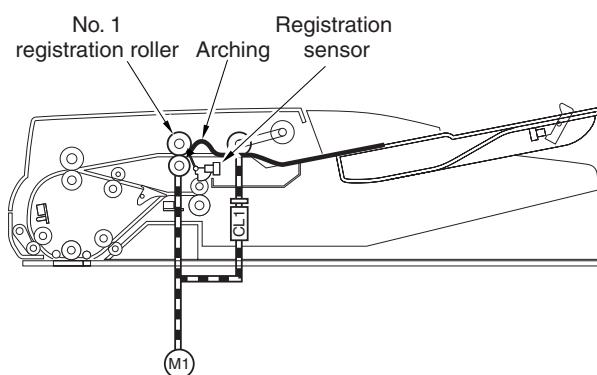
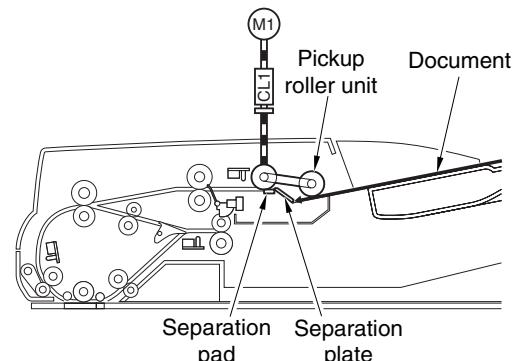


Figure 2-219

down to start pickup operation. The separation plate and the separation pad are used to prevent multiple feeding of documents. After the 2nd document, the pickup unit remains in down position.



c) Sheet-to-sheet distance

Set the pickup clutch to OFF, drive the pickup motor in normal rotation, and drive the feed motor (M2) to feed the document.

While the document is between the No. 1 registration roller and the No. 2 registration roller, its movement is accelerated so that there will be a sheet-to-sheet distance at the time it reaches the No. 2 registration roller for reading. The normal rotation maximum speed of the pickup motor is 750 mm/sec; it decelerates to reading speed at a point 23 mm in front of the No. 2 registration roller to move the document to the No. 2 registration roller.

(Refer to Figure 2-220)

d) Feeding

The document from the No.2 registration roller is fed by the feed motor (M2). The pressure motor (M4) is driven and pressed before the leading edge of the document reaches the reading roller 1. When the document reaches the point of deceleration before reading, the machine checks whether the READY signal is on, in which case it will feed the document ahead to the point of reading; if the signal is off, the machine keeps the document in wait for reading.

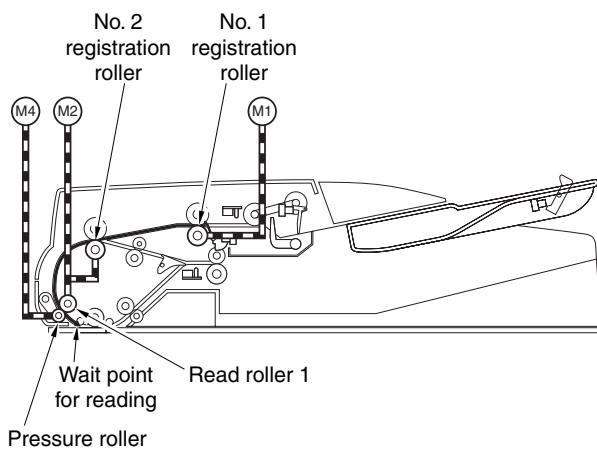


Figure 2-220

e) Start of reading

The machine identifies the document position with reference to the pulses generated by the feed motor after the read sensor goes ON. When the leading edge of the document reaches the point of reading, the machine sends the image leading signal to the reader so that the reader can start reading operation.

The reading is executed by fixing the scanner of the reader in place and moving the documents on the reading glass.

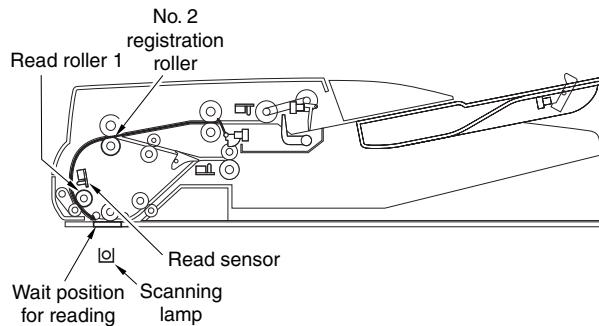


Figure 2-221

2) Pickup unit and the stopper

The pickup unit consists of a pickup roller and a feeding roller. When the document pickup signal arrives, the pickup clutch (CL1) goes ON, the pickup motor (M1) starts to rotate in reverse to move down the pickup unit, and the pickup roller and

the feeding roller start to rotate to pick up a document. The separation pad and the separation plate are used to make sure that no more than one document is picked up and fed at time of pickup.

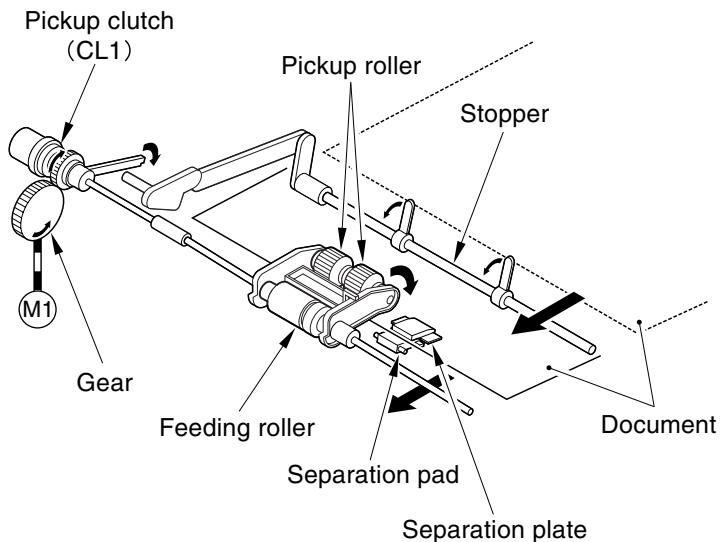


Figure 2-222

3) Sequence of operation

The figure shows sequence of pickup operation (small-size).

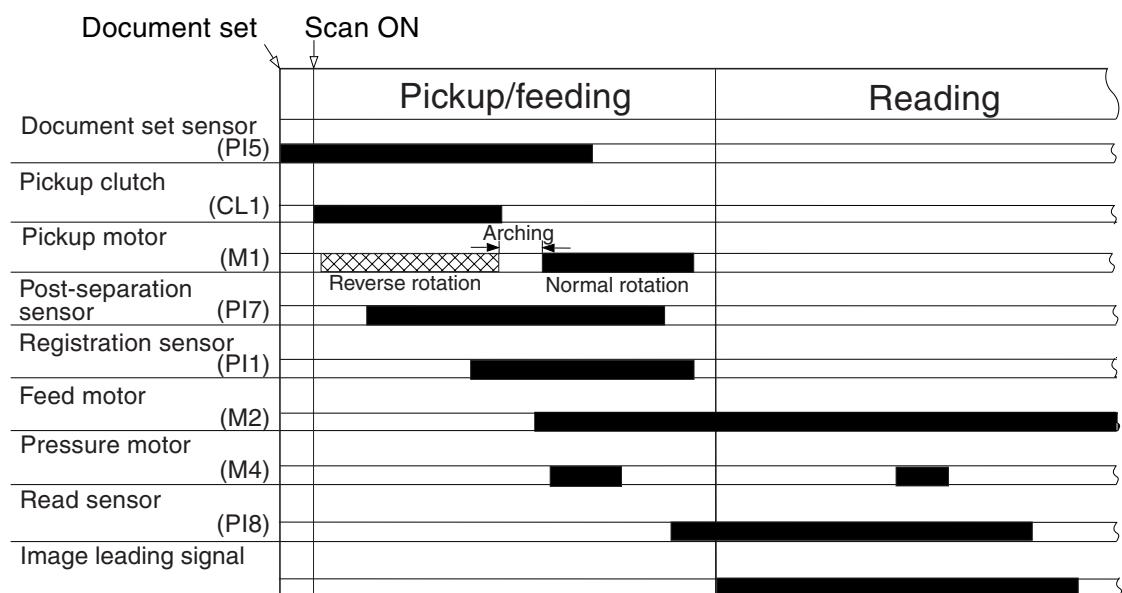


Figure 2-223

4) Controlling the pickup motor (M1)

The following is a diagram of the circuit used to control the pickup motor (M1). The pickup motor is a 4-phase stepping motor, and the circuit serves the following functions:

- Controlling the current values of the motor
- Controlling the rotation direction of the motor
- Controlling the rotation speed of the motor

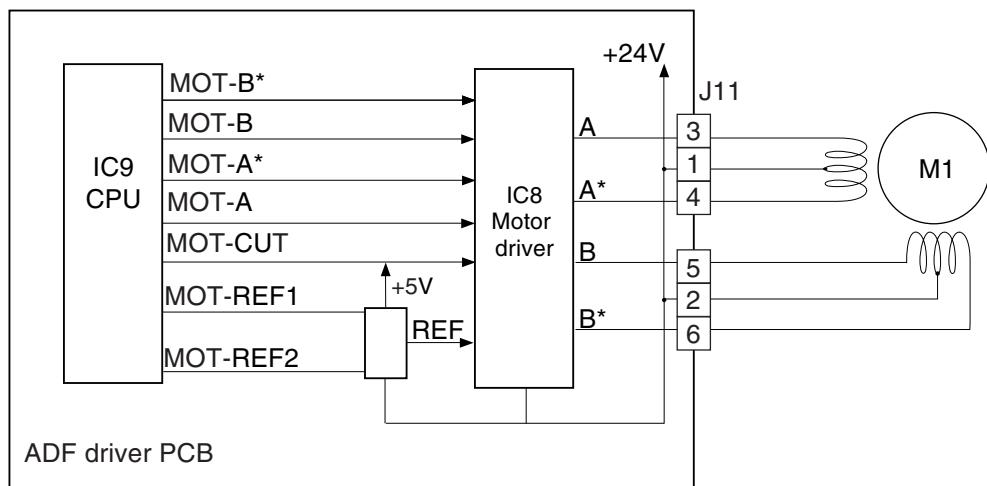


Figure 2-224

IC9 on the ADF driver PCB receives data (command) of the rotation direction and current values and drive pulses from the reader; in response, it generates drive pulses to drive the pickup motor (M1).

The pickup motor (M1) is a stepping motor, and its direction and speed of rotation are varied by changing the order and the frequency of drive pulses (A, A*, B, B*).

5) Controlling the feed motor (M2)

The following is a diagram of the circuit used to control the feed motor (M2). The feed motor (M2) is a 4-phase stepping motor, and the circuit has the following functions:

- Controlling the ON/OFF of the motor
- Controlling the rotation direction of the motor
- Controlling the rotation speed of the motor

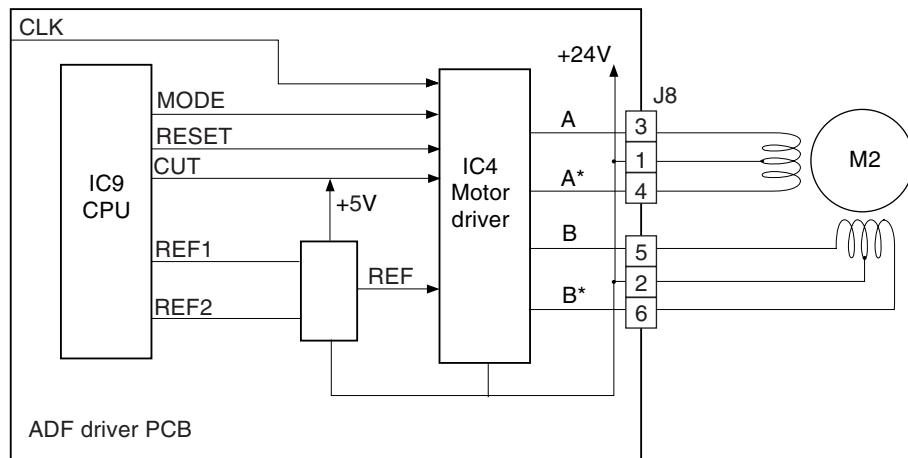


Figure 2-225

6) Controlling the pressure motor (M4)

The following is a diagram of the circuit used to control the pressure motor, and the circuit has the following function:

- Controlling the ON/OFF of the motor
- Controlling the rotation speed of the motor

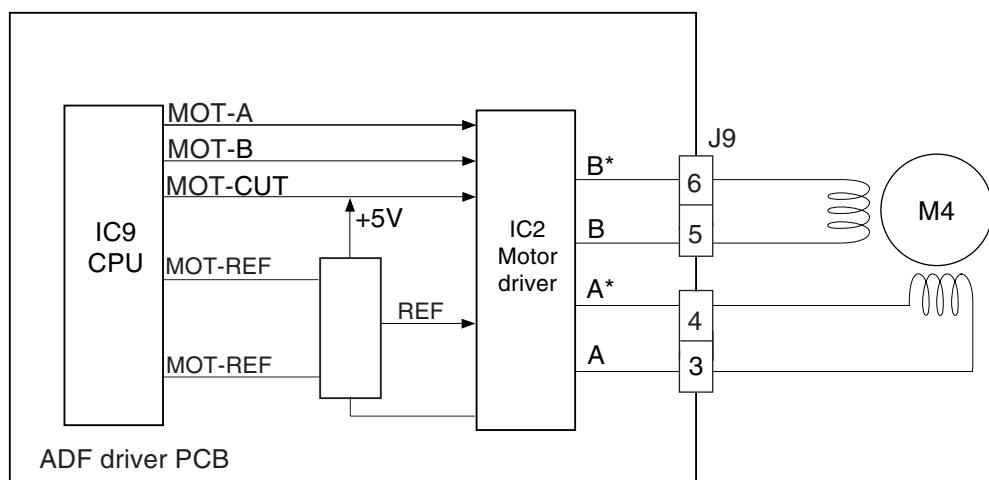


Figure 2-226

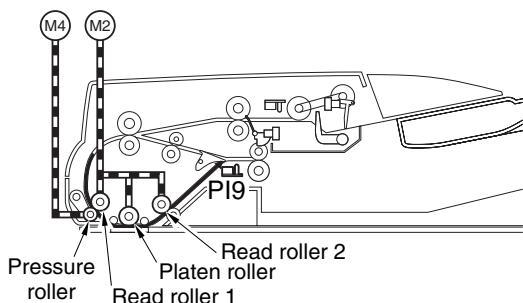
5. Reading/reversing

The document reversing is performed in case of the duplex reading mode.

1) Basic sequence of operation

a) Reading

The platen roller rotates using the drive from the feed motor (M2) for reading the document. The machine keeps count of pulses from the feed motor to monitor the movement of the document; and, before the trailing edge of the document leaves the read roller 1, the machine drives the pressure motor (M4) for a specific number of pulses to move the pressure roller away (i.e., to prevent the



impact otherwise occurring when the trailing edge of the document leaves the roller).

Moreover, the machine turns ON the delivery reversal sensor (PI9) to drive the delivery reversal motor (M3) and deliver the document. It also turns ON the pressure solenoid (SL2) to press the delivery reversal lower roller before the trailing edge of the document leaves the read roller 2. The machine accelerates the delivery reversal motor when the trailing edge of the document leaves the read roller 2.

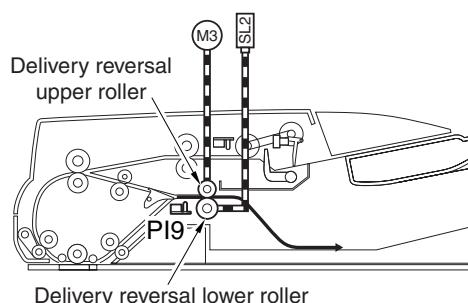


Figure 2-227

b) Reversing/feeding 1

The delivery reversal motor (M3) stops when the trailing edge of the document moves past the delivery reversal sensor (PI9); immediately thereafter, the delivery reversal motor starts to rotate in

reverse so that the document will arch against the No. 2 registration roller. At the same time, the pressure solenoid goes OFF to move the delivery reversal lower roller away.

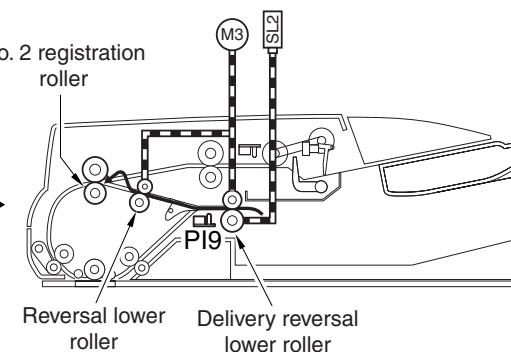
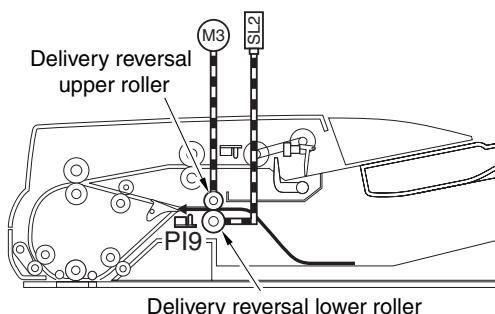


Figure 2-228

c) Reversing/feeding 2

The machine rotates the feed motor (M2) in normal direction and the delivery reversal motor (M3) in reverse to feed documents at the same time. The machine stops the delivery reversal

motor when the documents have fed a specific distance. The machine then drives the pressure motor for a specific number of pulses to press the pressure roller in place.

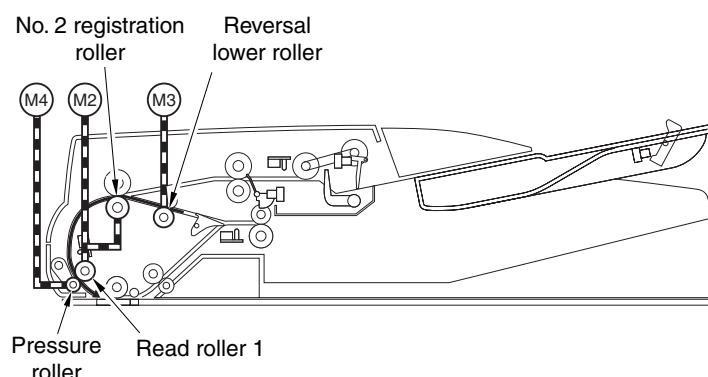


Figure 2-229

2) Sequence of operation

The figure shows sequence of operation (small-size, reversal).

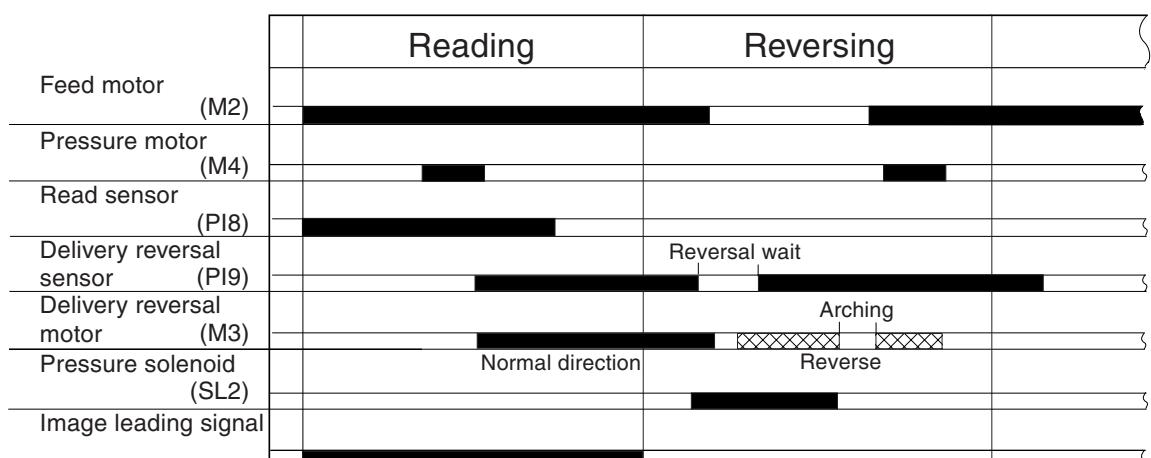


Figure 2-230

3) Controlling the delivery reversal motor (M3)

The following is a diagram of the circuit used to control the delivery reversal motor (M3). The delivery reversal motor is a 4-phase stepping motor, and the circuit

has the following functions:

- Controlling the ON/OFF of the motor
- Controlling the rotation direction of the motor
- Controlling the rotation speed of the motor

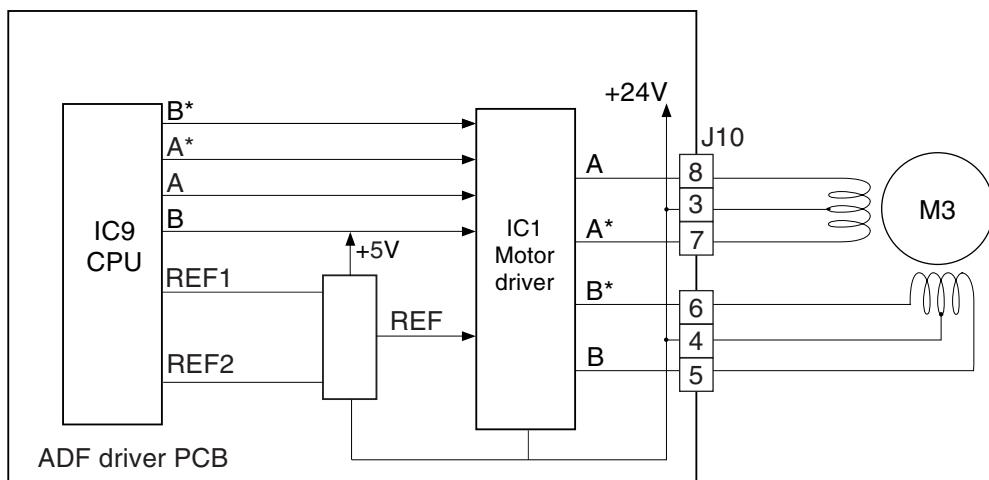


Figure 2-231

6. Moving and Delivering

1) Basic sequence of operation

The machine turns ON the pressure solenoid (SL2) before the trailing edge of the document leaves the read roller to

press the delivery reversal lower roller in place. It then accelerates the delivery reversal motor (M3) when the trailing edge of the document leaves the read roller for delivery.

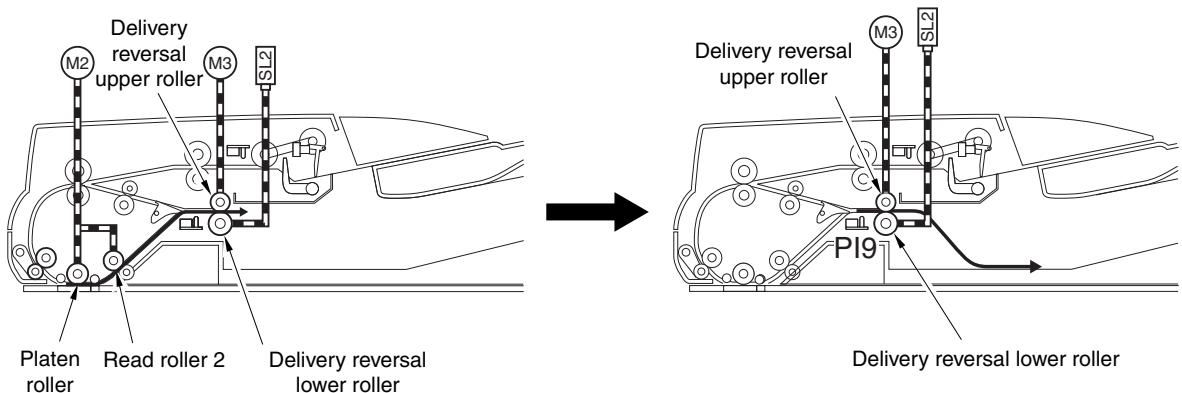


Figure 2-232

2) Sequence of operation

The figure shows sequence of operation (small-size, delivery).

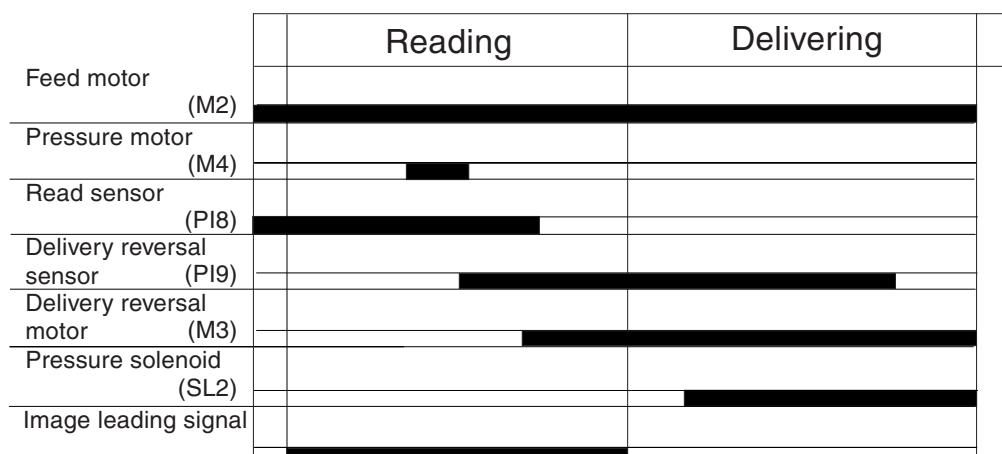


Figure 2-233

III. READER

1. Basic Construction

1) Major components

The reader consists of the following major components:

Item	Notation	Description
Scanning lamp	LA1	Xenon lamp: 77,500 lx
Scanner motor	M501	2-phase pulse motor: pulse control
Cooling fan	FM501	Cools the reader
Scanner HP sensor	PS501	Detects the home position of the scanner.
ADF opening sensor 1	PS502	Detects the state (open/closed) of the ADF using the ADF opening sensor (5 deg).
ADF opening sensor 2	PS503	Detects the size with the ADF at 25 deg (not used)
Mirror	---	No. 1, No. 2, No. 3 mirror

Table 2-301

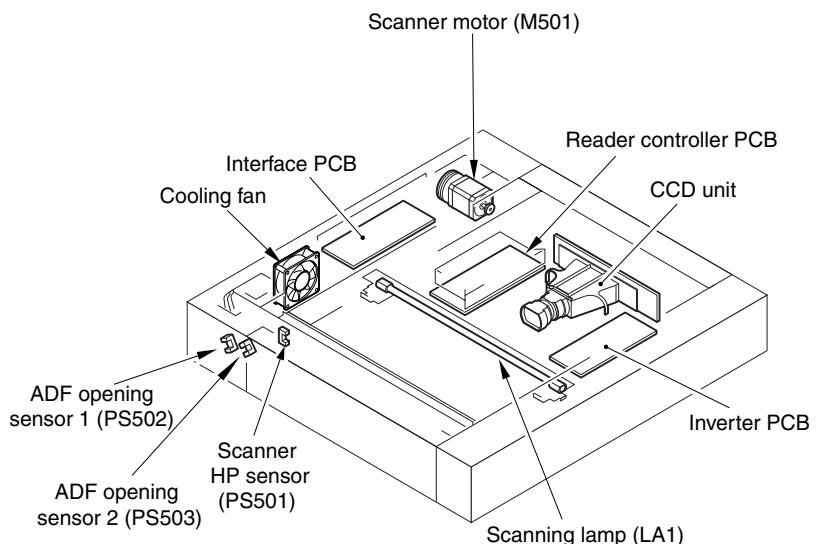


Figure 2-301

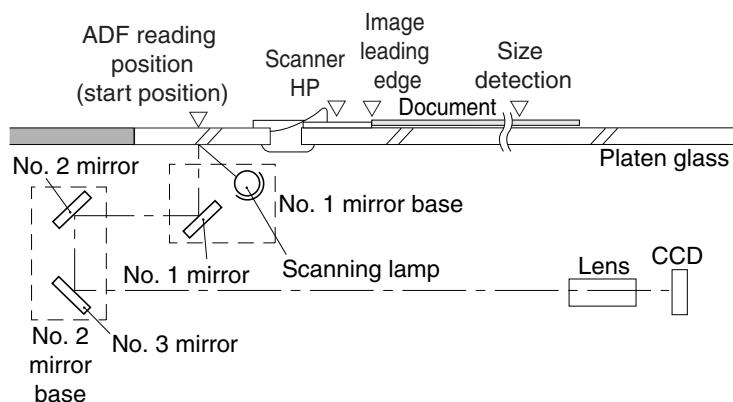


Figure 2-302

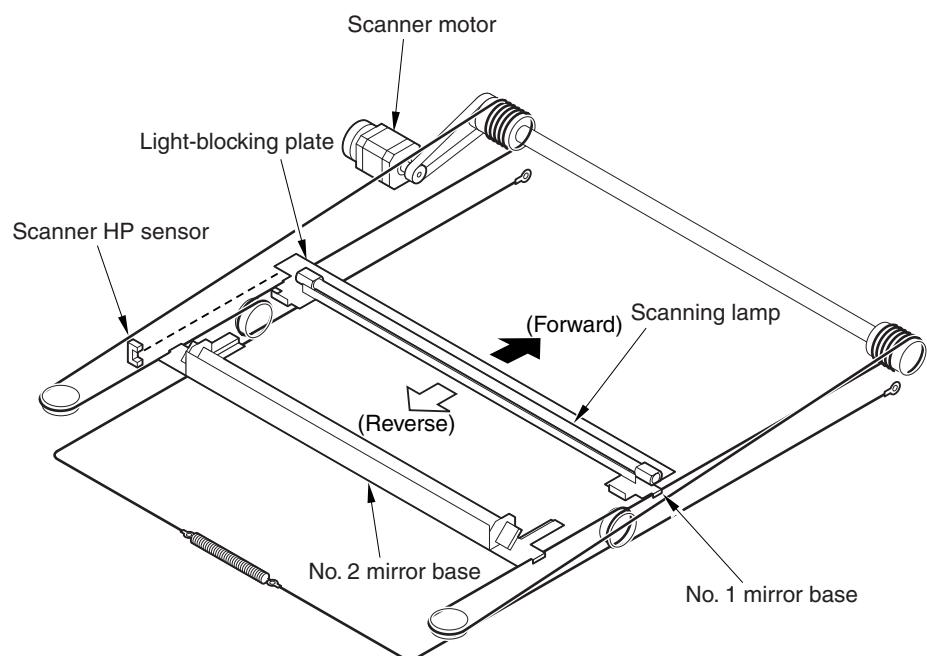


Figure 2-303

2) Construction of the control system

The following shows the construction of the control system of the reader:

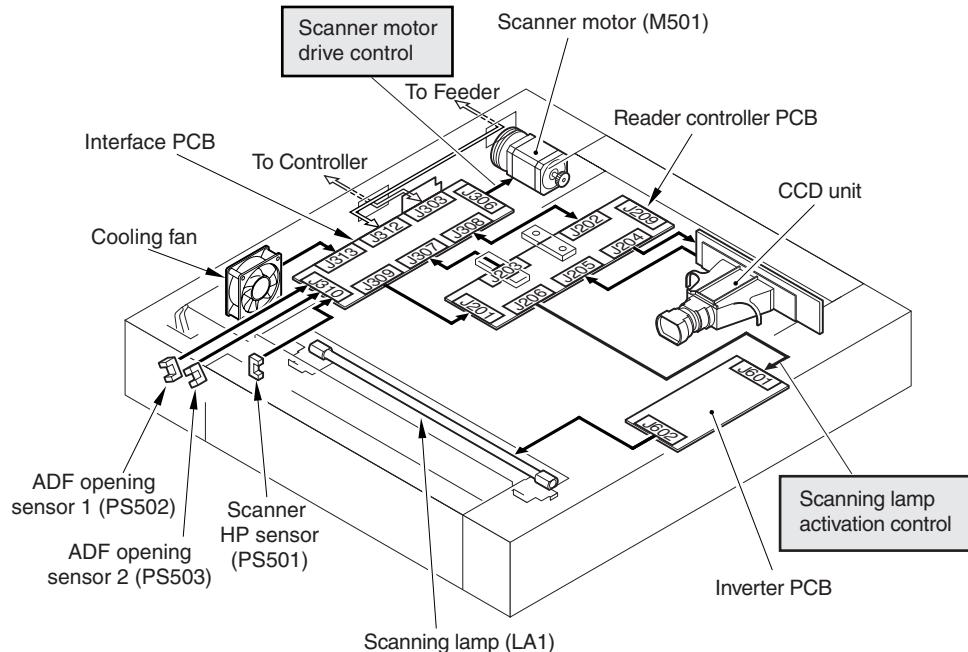


Figure 2-304

The following shows the functional construction of the reader controller PCB:

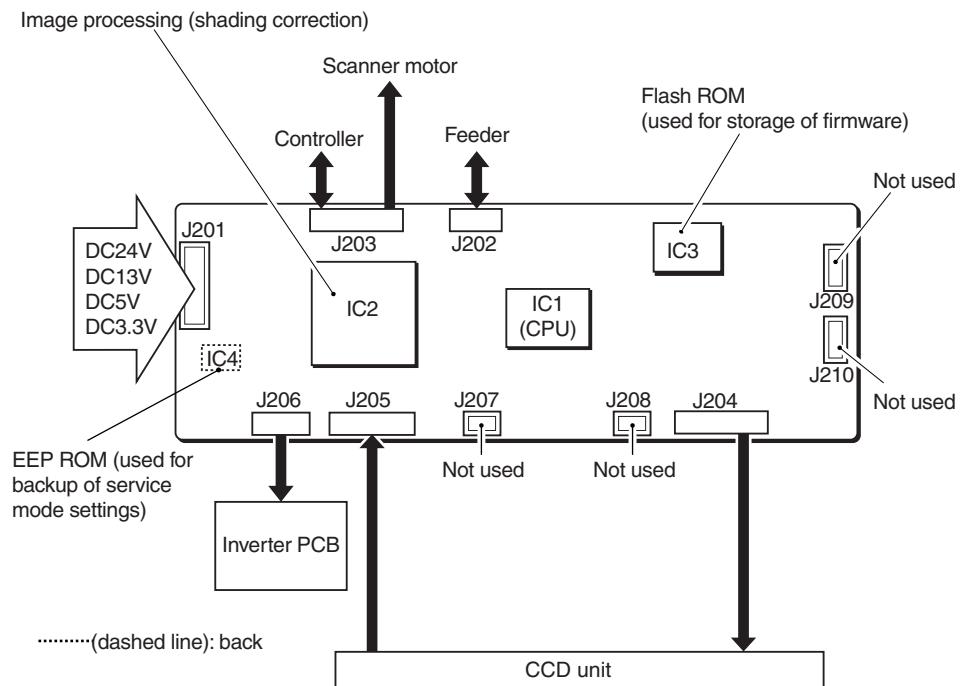


Figure 2-305

Jack No.	Description
J201	Used for the power from the controller
J202	Used for communications with the ADF
J203	Used for communications with the controller Used for connection with the scanner motor
J204	Used for connection with the CCD unit
J205	Used for connection with the CCD unit
J206	Used for connection with the inverter PCB

Table 2-302

IC No.	Description
IC1	CPU (holds boot program)
IC2	ASCI (built-in RAM)
IC3	Flash ROM (stores firmware)
IC4	EEPROM (backs up service mode settings)

Table 2-303

2. Basic Sequence of Operation

1) Basic sequence of operation at power-on

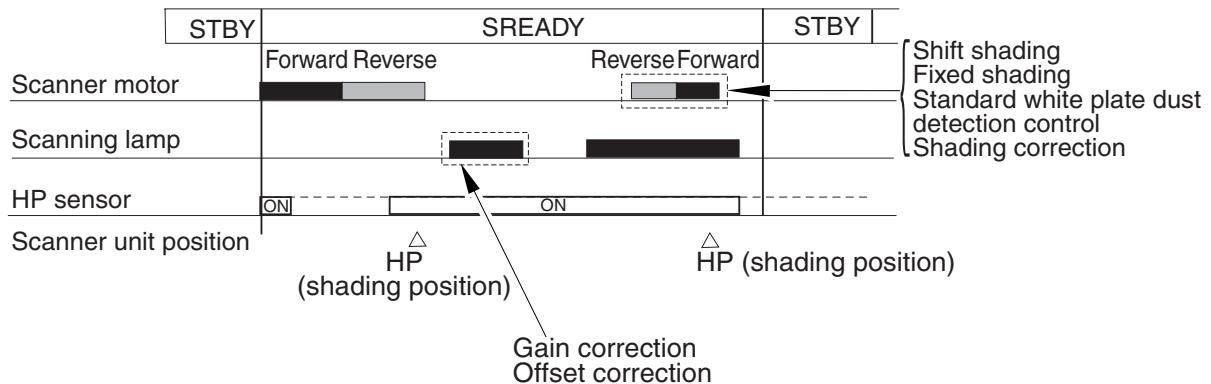


Figure 2-306

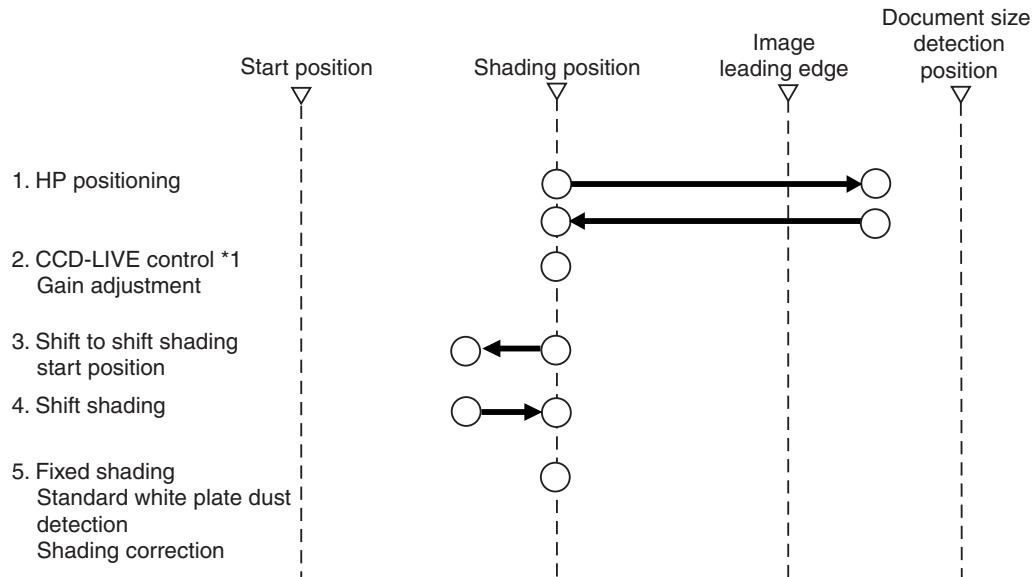


Figure 2-307

2) Basic sequence of scanning

- FB mode; 1 document

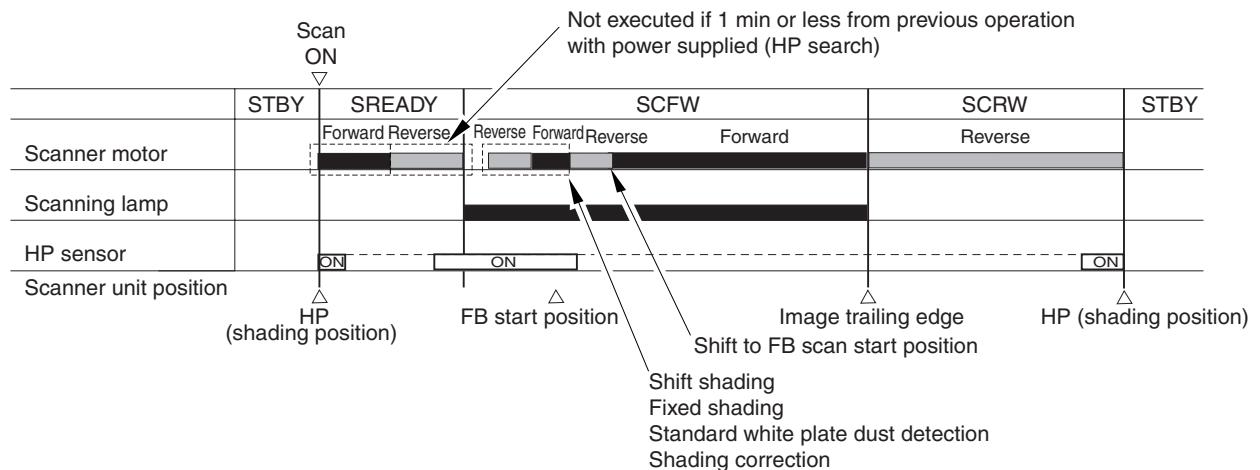


Figure 2-308

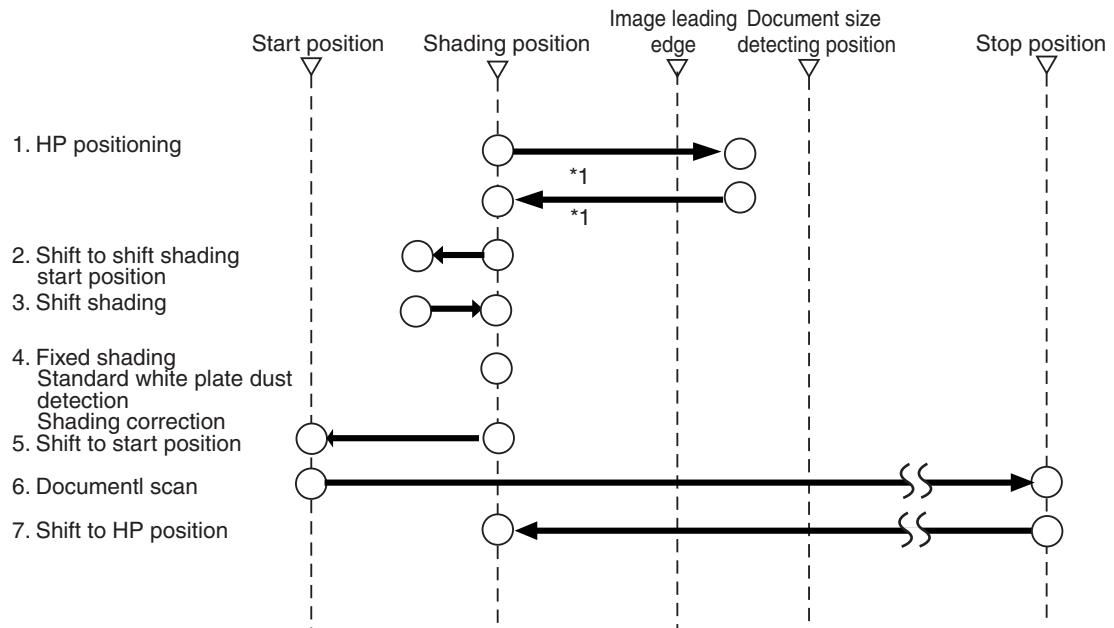


Figure 2-309

• ADF mode; 1 document

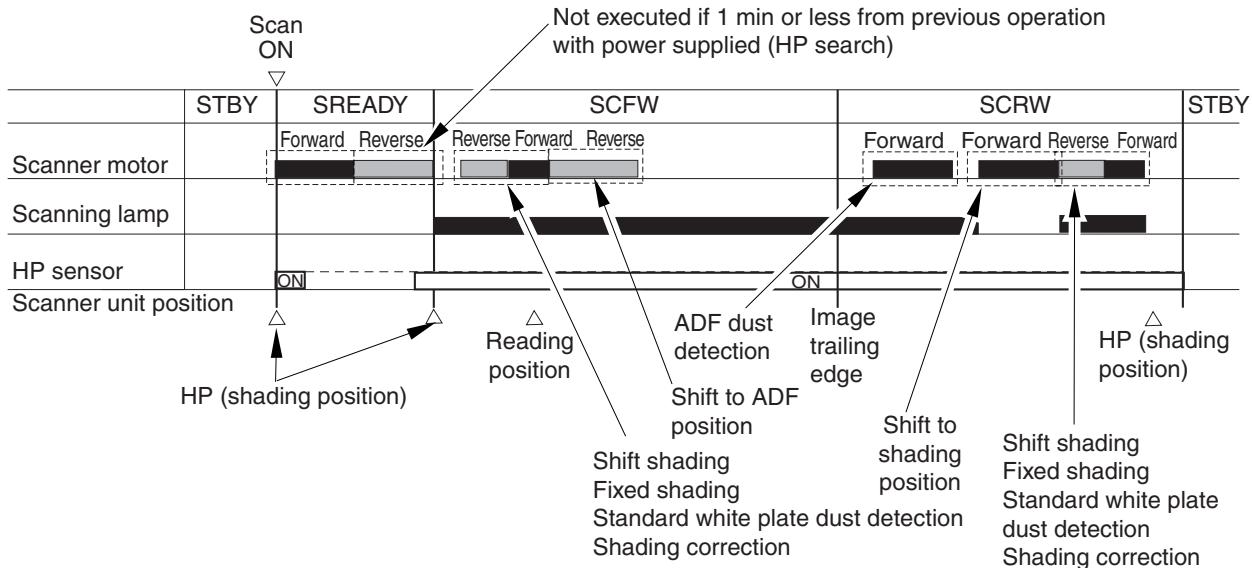


Figure 2-310

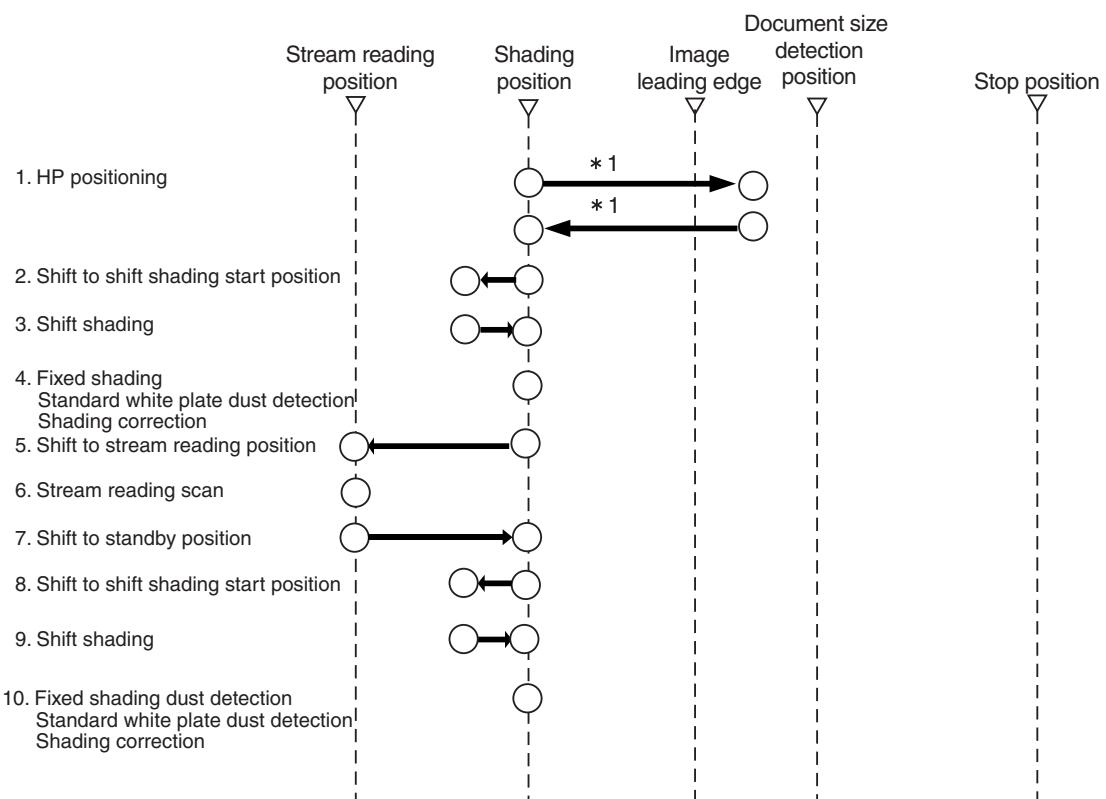


Figure 2-311

3. Drive of the Scanner

1) Overview

The following shows the arrangement of the components associated with the drive of the scanner:

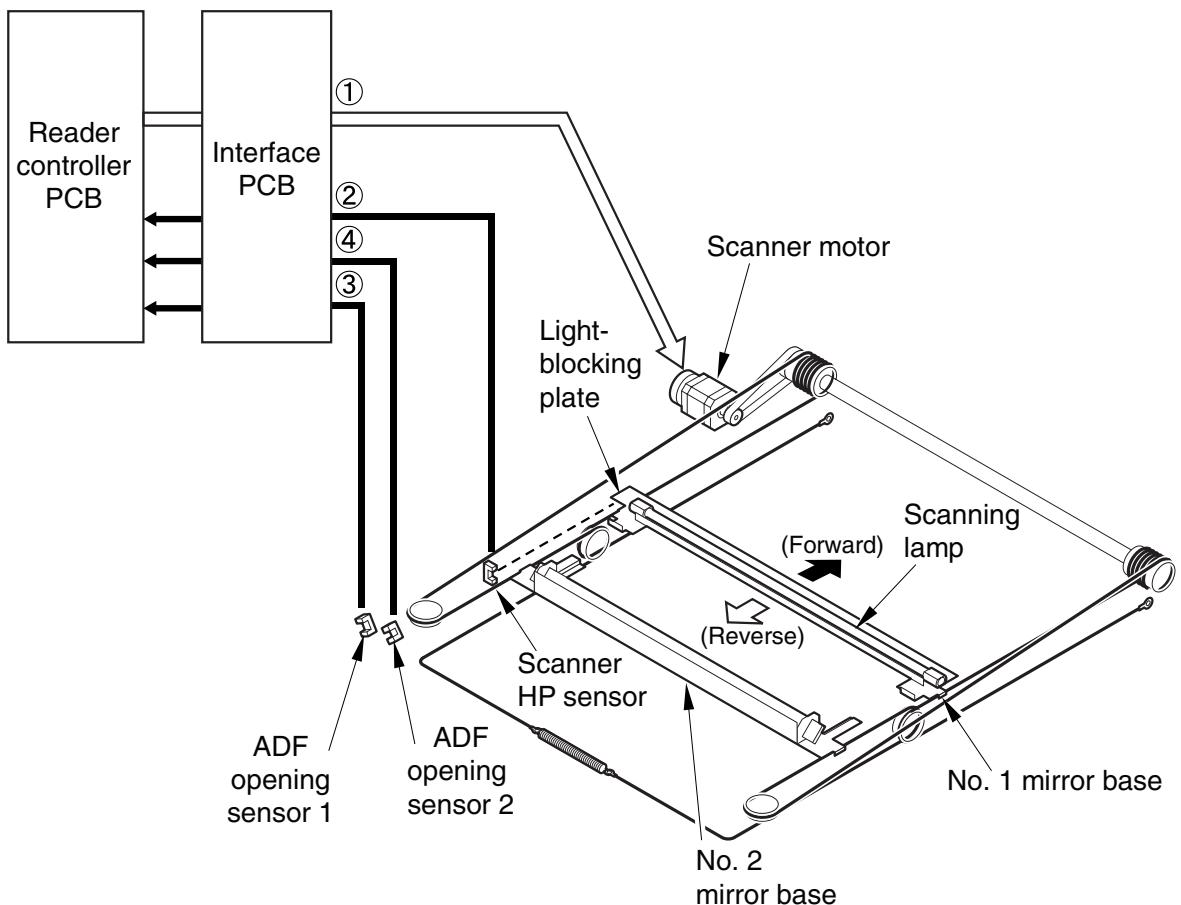


Figure 2-312

No.	Signal	Function
①	Scanner motor drive signal	Controls the activation/deactivation of the motor and the direction and speed of the motor.
②	Scanner HP sensor detection signal	Used in reference to the detection of the No. 1 mirror base at its home position.
③	ADF opening sensor 1 detection signal	Used in reference to the detection of the state (open/closed) of the ADF. (5 deg)
④	ADF opening sensor 2 detection signal	Used in reference to the detection of the state (open/closed) of the ADF. (25 deg)

Table 2-304

2) Controlling the scanner motor

The following shows the construction of the scanner motor control.

The motor driver on the interface PCB controls the rotation (activation/deactivation) of the scanner motor and its direction and speed of rotation according to the signals from the CPU.

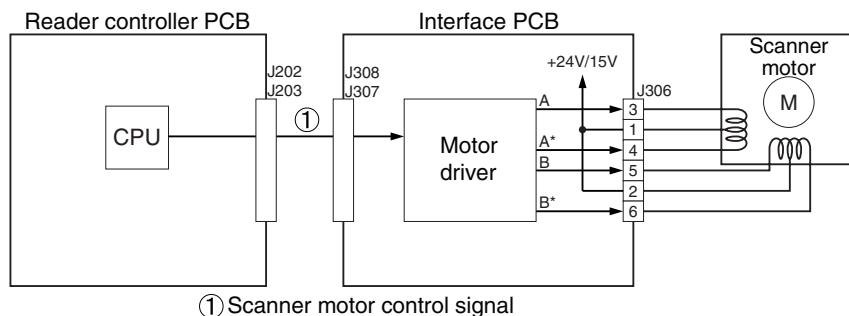
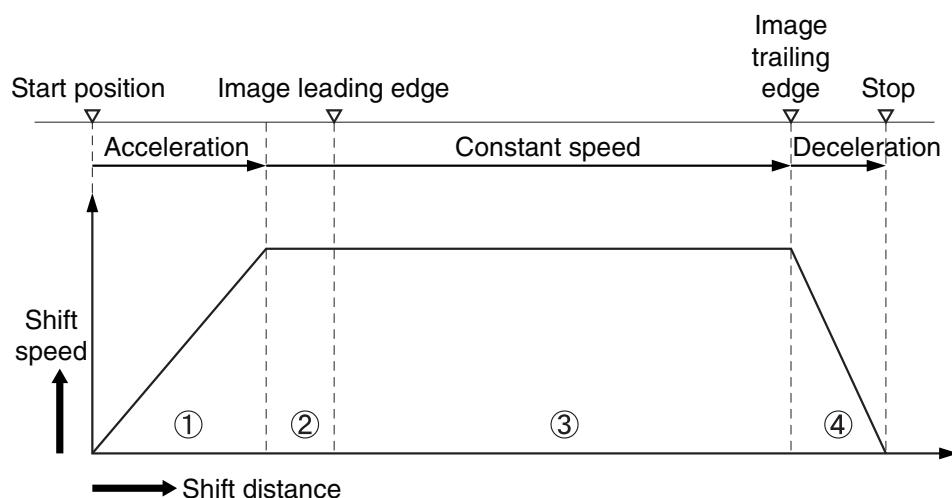


Figure 2-313

The forward operation of the No. 1 mirror base unit during scanning in the FB mode is shown below.

When the resolution is 300 dpi or lower, the scan speed is 468 mm/sec, and in the case of 400/600 dpi, it is 234 mm/sec.

After an image scan, the No. 1 mirror base is moved in reverse to shading position at 234 mm/sec regardless of the selected resolution.



- ① Acceleration Area : Accelerates the scanner to the speed corresponding to the resolution.
- ② Preparatory Area : Serves as a margin for speed stabilization.
- ③ Image Read Area: Reads the image at a specific speed.
- ④ Deceleration Area : Decelerates and stops as soon as reaching the original trailing edge.

Figure 2-314

4. Scanning Lamp

1) Overview

The controlled items and control system configuration related to the scanning lamp are indicated as follows:

a) Turning On and Off the Scanning Lamp

The scanning lamp is turned on or off by the drive signal (XE-ON) generated by the CPU of the reader controller PCB. When the signal is generated, the inverter PCB generates high-frequency high voltage using the activation control circuit from the drive voltage (+24V) supplied by the reader controller PCB, thus turning on the scanning lamp.

b) Detection Error Activation

The machine detects a fault in the intensity of the lamp as an activation error caused by a fault in the intensity of the lamp at time of initial activation (shading correction).

Error code: E2250001

- The reader controller PCB is faulty.
- The inverter PCB is faulty.
- The scanning lamp is faulty.
- The cable has poor contact.

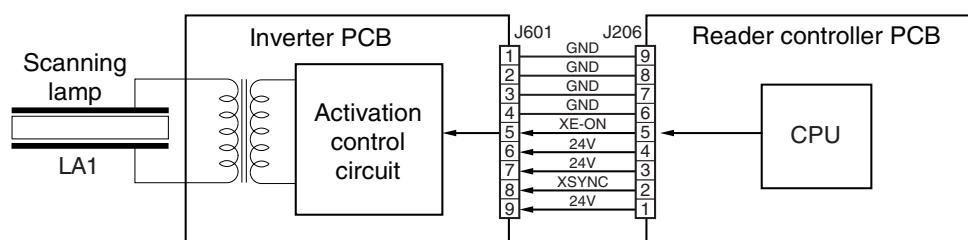


Figure 2-315

2) Scanning Lamp

The machine's scanning lamp is a xenon lamp, which uses xenon gas sealed inside. On the outside of the glass tube, 2 electrodes are arranged in parallel with the tube; the inside of the tube, on the other hand, is coated with fluorescent material. When a high-frequency high voltage is applied to the electrodes, the gas inside the tube starts to discharge, causing the fluorescent material to emit light.

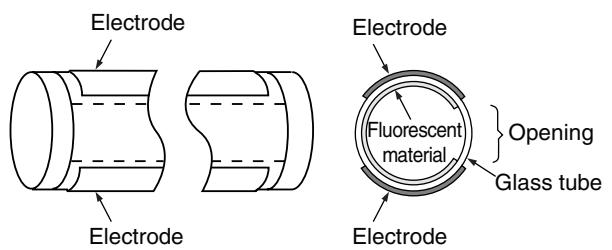


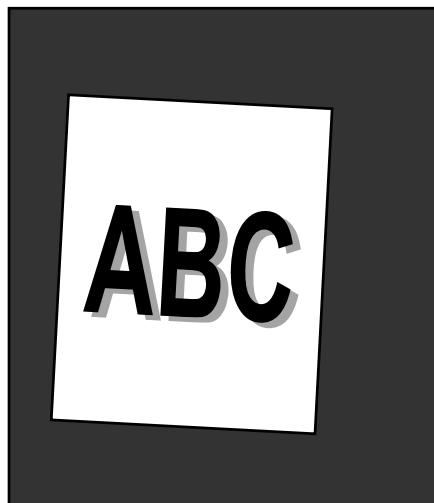
Figure 2-316

5. Document Size Detection

The scan area is selected by software. When either "Standard Size" or "Specify Area" is selected, regardless of the size and position of the set document, the software's selections are used.

When "Automatic Detection" is selected, the size of the document is detected by processing the scanned image data.

- In case the background is black



The pressure board and platen roller are black. Since the background of documents can be read as black, automatic detection by image processing is possible.

For details, refer to "IV. CONTROLLER".

- In case the background is white

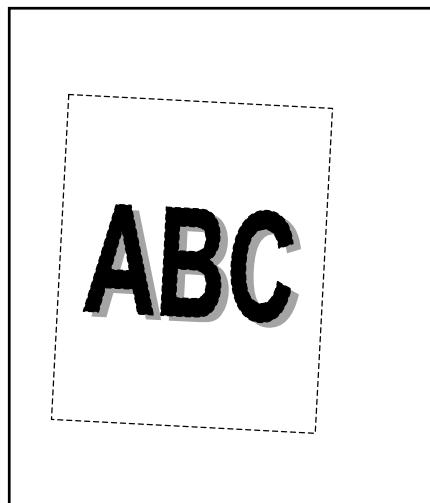


Figure 2-317

6. Standard white plate Dust Detection

1) Overview

The machine uses a fan to cool the inside of the reader unit to prevent overheating otherwise caused by the xenon lamp in the ADF mode. The fact, however, can cause stray dust inside the reader unit to collect on the standard white plate that is attached on the rear side of the platen glass, showing up as lines in output images.

2) Timing of control

The standard white plate dust detection and correction are performed when the power is ON and also at the beginning and end of scanning.

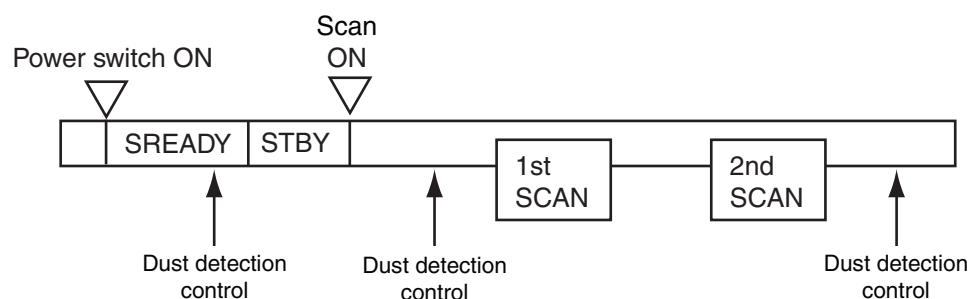


Figure 2-318

3) Particulars of control

• Standard white plate Dust Detection

The machine compares the shading coefficient obtained from shift shading and the shading coefficient obtained from fixed shading to identify the presence/absence of dust and, if any, coordinates and width of the area.

• Standard white plate Dust Correction

If the machine detects dust as a result of standard white plate dust detection, it corrects the shading coefficient of the area using the shading coefficient of both sides so as to decrease the effects of the presence of dust. It executes shading correction using the coefficient it obtains after correction.

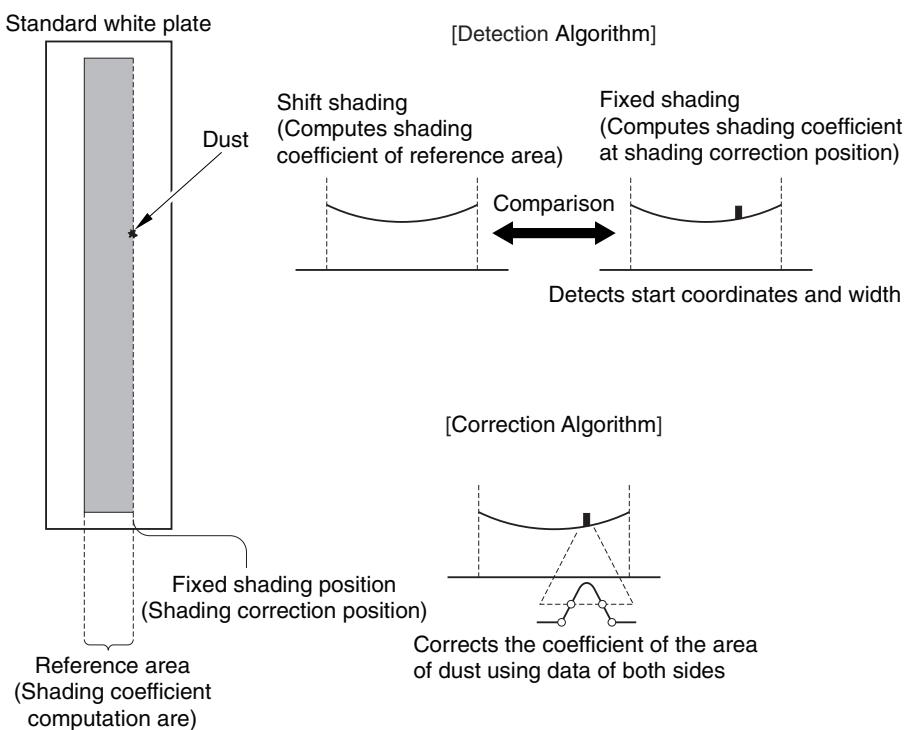


Figure 2-319

7. Reading

1) Outline

Reading by this machine is done using the CCD in the CCD unit.

The image data read with the CCD is subjected to a first stage of image data

processing using the CCD/AP PCB on which the CCD is mounted, and is then output to the reader controller circuit. After that, it is output to the controller.

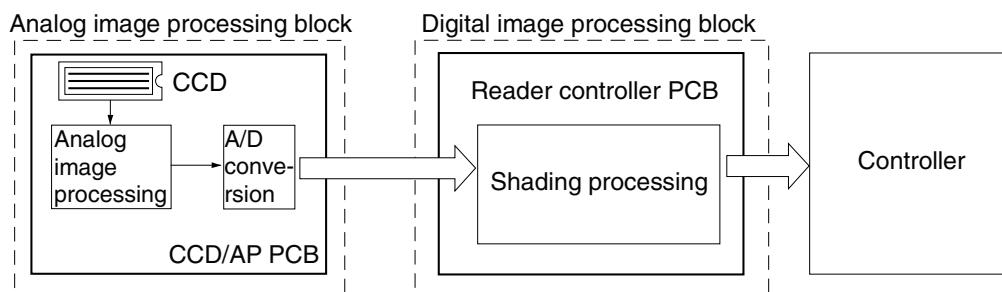


Figure 2-320

2) CCD

The machine's CCD is a linear image sensor consisting of 3 lines (R, G, B, 1 line each), each line composed of 7350 photo cells.

The signal that has been put through photo-conversion in the light-receiving segment is divided into 2 analog signals of 2 channels for output: even-numbered pixels (EVEN) and odd-numbered pixels (ODD).

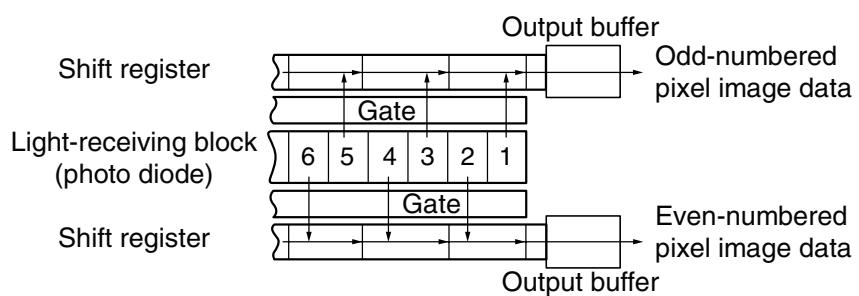


Figure 2-321

3) Image data processing

Following the execution of offset adjustment, gain adjustment, and A/D conversion by the CCD/AP PCB, shading correction is performed by the reader controller PCB.

Figure 2-322 shows the block diagram of the image processing performed by the CCD/AP PCB, and Figure 2-323 shows the block diagram of the image processing performed by the reader controller PCB.

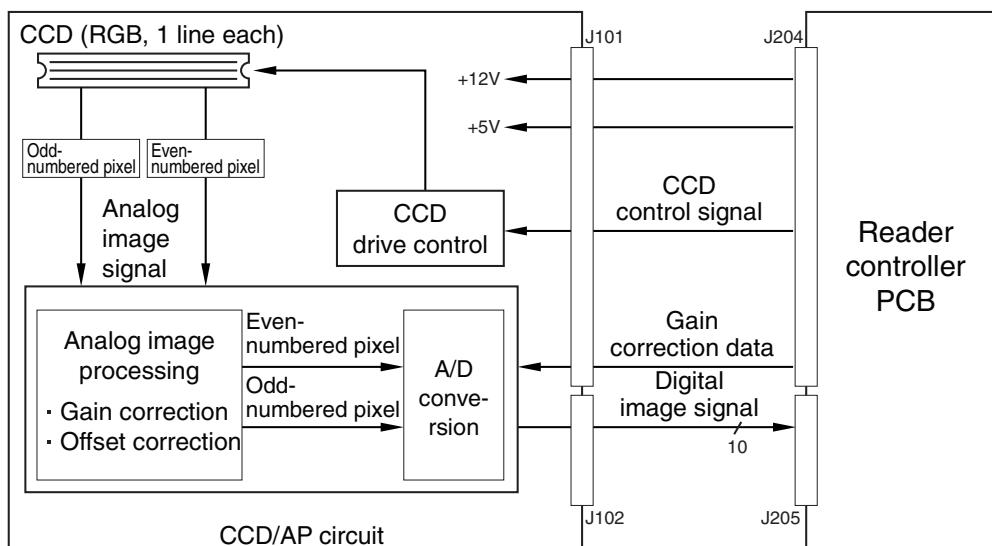


Figure 2-322

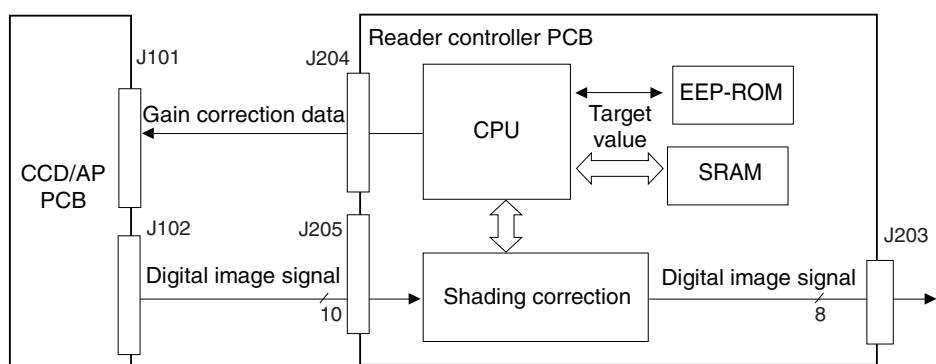


Figure 2-323

4) Shading correction

The CCD output is not constant even when the document density is the same, due to variations in the sensitivity of the CCD's pixels and the light intensity of the scanning lamp. The processing performed to compensate these aspects is called shading correction. Shading correction is performed for digital signals following A/D conversion. This processing is performed every time scanning is performed.

The target values used for shading correction are determined by measuring the density of the normal white paper and the standard white plate in the machine in the service mode. This is called "shading adjustment".

The machine directs the light from the scanning lamp against the standard white plate each time it scans a document, and converts the reflected light into a digital signal by the analog image processing block on the CCD/AP PCB. The result (i.e., a digital signal representing the intensity of the reflected light) is sent to the shading correction circuit of the reader controller PCB as a shading coefficient of the individual pixels of the CCD. The shading correction circuit in turn compares the coefficient against the target value it holds, and offers the difference as the shading correction value.

The machine uses the shading correction value to correct the variation that may exist among the individual pixels of the CCD, thereby keeping the image density to a specific level at all times.

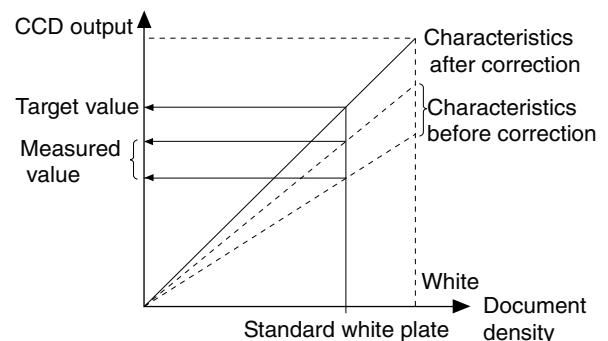


Figure 2-324

IV. CONTROLLER

1. Outline

The main functions of the controller are image processing and interfacing with the computer.

However, image processing can also be performed with the first-stage reader, or the computer following output.

Moreover, a power supply block is provided in the controller. This power supply block converts the AC power supply input from external and supplies the appropriate power to the reader and feeder.

Figure 2-401 shows the block diagram of the controller.

The feeder and reader used in the machine are the same as those employed in copiers, but the controller is a dedicated controller specifically designed for this machine.

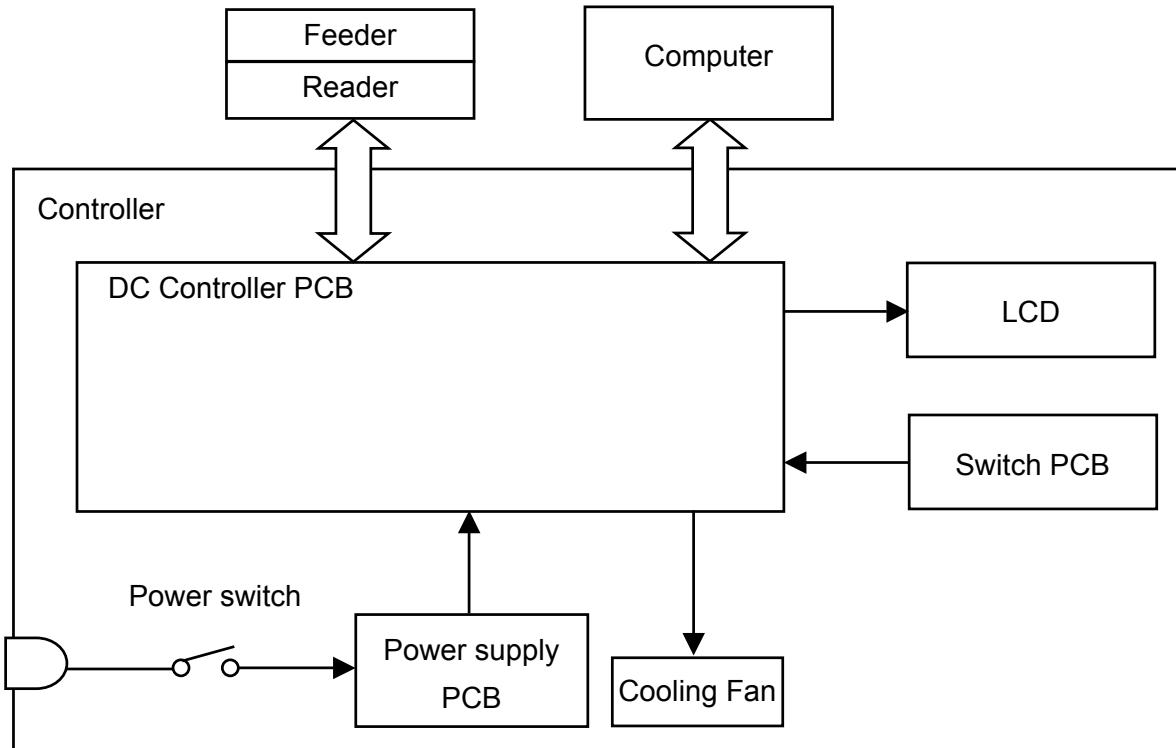


Figure 2-401

2. DC Controller PCB

Figure 2-402 shows the block diagram of the DC controller PCB, and Table 2-401 lists the functions of the ICs in the block diagram.

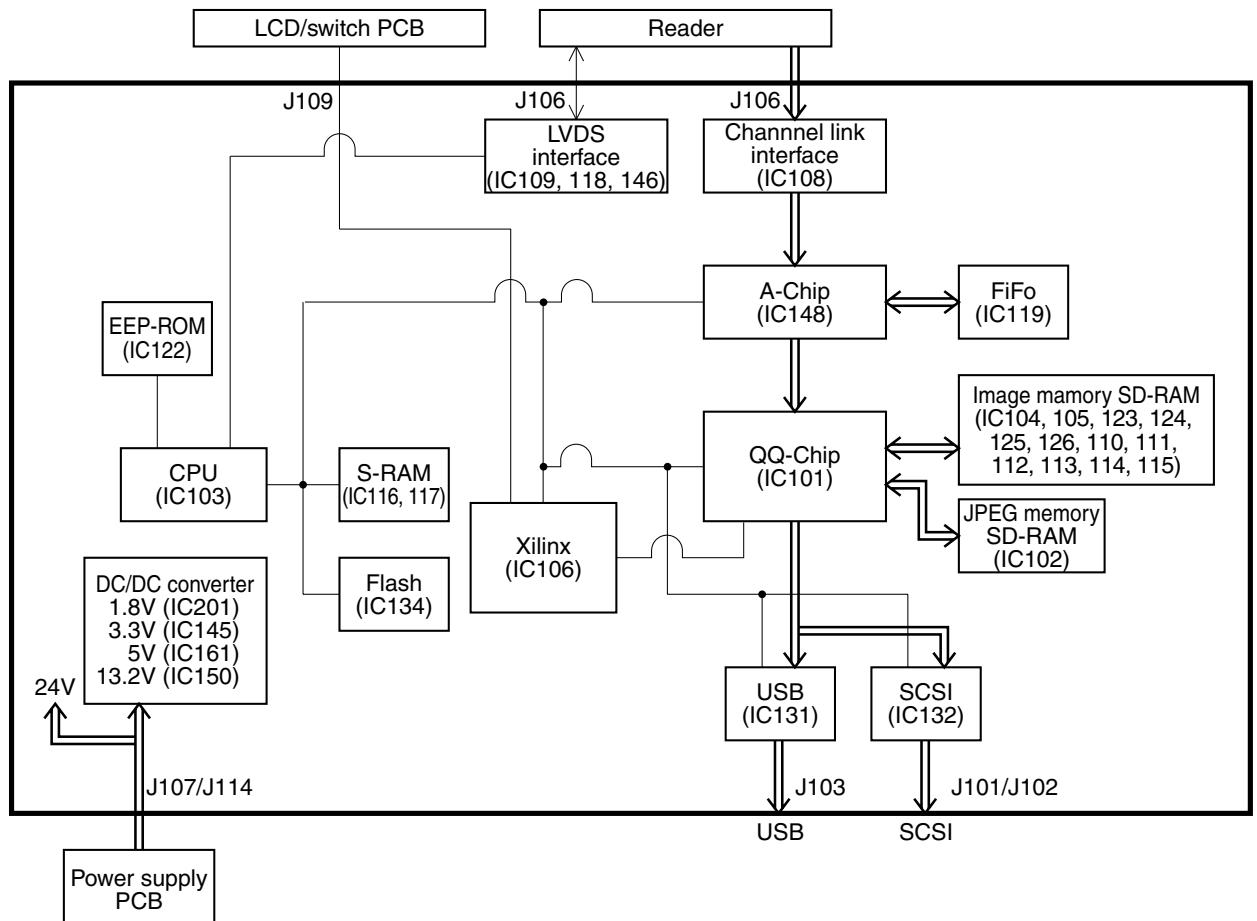


Figure 2-402

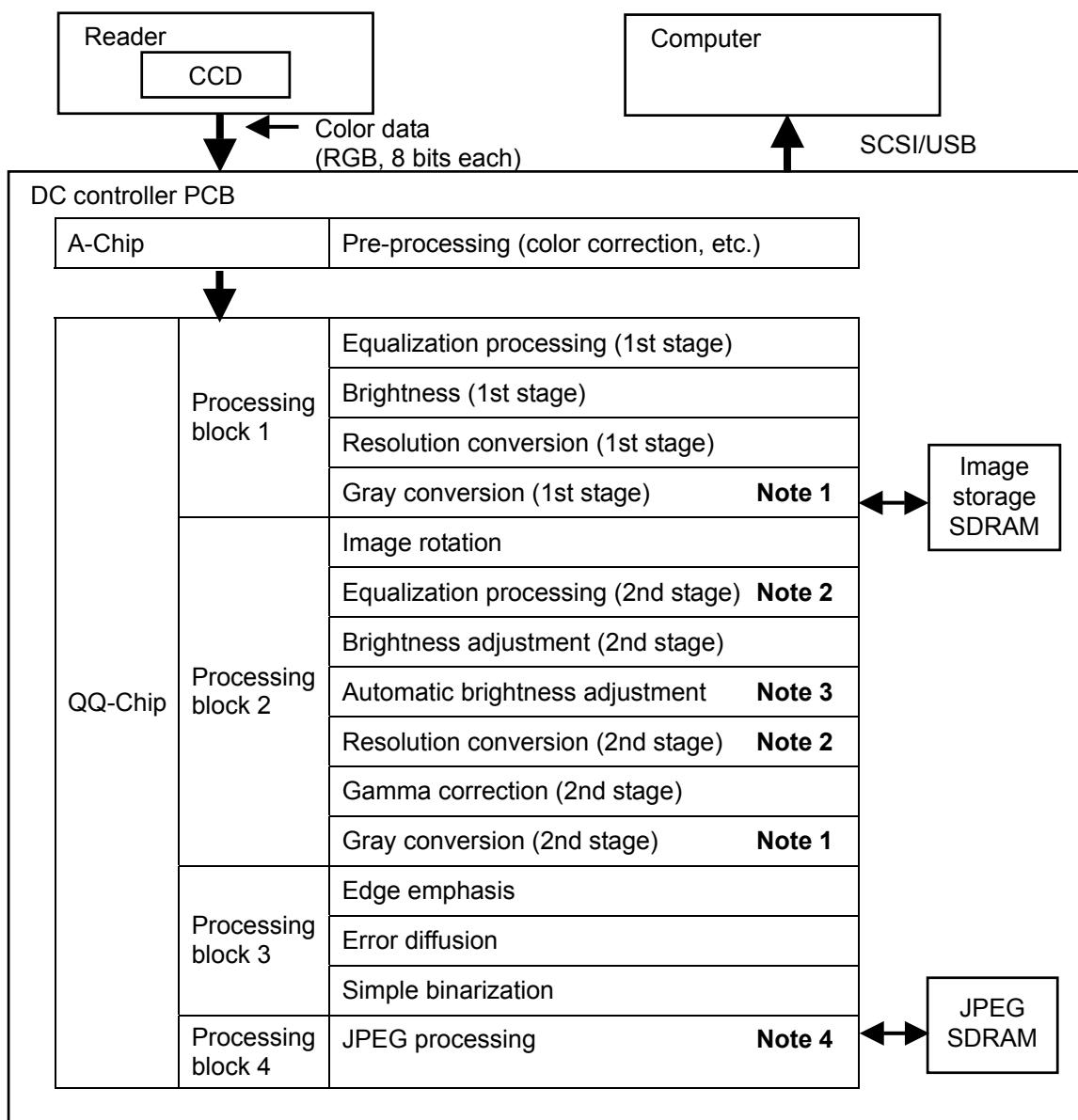
IC No.	Name	Function
IC101	QQ-Chip	Image processing, JPEG compression, DMA transfer
IC102	JPEG memory (SDRAM)	JPEG compression memory
IC103	CPU	Controller control
IC104	Image memory (SDRAM)	Image storage memory
IC105	Image memory (SDRAM)	Image storage memory
IC106	Xilinx	DMA control, etc.
IC108	Channel link interface	Image signal input
IC109	LVDS interface	Command/status
IC110	Image memory (SDRAM)	Image storage memory
IC111	Image memory (SDRAM)	Image storage memory
IC112	Image memory (SDRAM)	Image storage memory
IC113	Image memory (SDRAM)	Image storage memory
IC114	Image memory (SDRAM)	Image storage memory
IC115	Image memory (SDRAM)	Image storage memory
IC116	S-RAM	For CPU work
IC117	S-RAM	For CPU work
IC118	LVDS interface	Command/status
IC119	FiFo	Image processing FiFo memory
IC122	EEP-ROM	Log record parameters
IC123	Image memory (SDRAM)	Image storage memory
IC124	Image memory (SDRAM)	Image storage memory
IC125	Image memory (SDRAM)	Image storage memory
IC126	Image memory (SDRAM)	Image storage memory
IC131	USB	USB interface
IC132	SCSI	SCSI interface
IC134	Flash	Firmware
IC145	DC-DC converter	+3.3VDC generation
IC146	LVDS interface	Command/status
IC148	A-Chip	Image processing
IC150	DC-DC converter	+13.2VDC generation
IC161	DC-DC converter	+5VDC generation
IC201	DC-DC converter	+1.8VDC generation

Table 2-401

3. Image Processing

1) Outline

Figure 2-403 shows the block diagram of the image processing performed by the DC controller PCB.



Note 1: If the output mode is other than color, the color data is converted to the grayscale data.

Note 2: This processing is performed when resolution conversion is requested by the MultiStream function.

Note 3: This processing is performed when automatic brightness is selected for the simple binarization (black & white) output mode.

Note 4: This processing is performed when a JPEG format is requested at the color or grayscale mode.

Figure 2-403

The main image processing of the controller is performed by the IC101 (QQ-chip) on the DC controller PCB.

As described in the section covering the reader, the document is read by the CCD in the reader, and after the basic processing has been performed, the data is input to the DC controller PCB as main-scan 600 dpi color data (RGB, 8 bits each).

The image data is first input to the A-chip, and after undergoing basic adjustments such as color correction, it is input to the QQ-chip.

The QQ-chip supports the MultiStream function. MultiStream is a function for outputting data of two different modes at a single scan. Use of the MultiStream function requires application software that supports this function.

CapturePerfect 2.0, which is bundled in this machine, supports this function.

Therefore, two image processing blocks that can perform brightness adjustment and resolution conversion in the QQ-chip are provided to achieve higher processing speed.

Processing block 1, which is the first stage, performs processing using conditions involving a small data amount within the range covering the requested output conditions. For example, if the requested resolutions are 100 dpi and 300 dpi, the resolution is converted from 600 dpi to 300 dpi.

Averaging, which is the pre-processing done before resolution conversion, is also called "smoothing". It helps minimize the moire effect during conversion to a low resolution.

Averaging can be performed for all output modes (binary, grayscale, color).

The image data processed in processing block 1 is stored in image storage SDRAM.

Processing block 2 performs image processing according to the various requested output conditions based on the data stored in image processing SDRAM.

The data is then output to processing block 3.

Following edge emphasis, processing block 3 performs error diffusion or simple binarization according to the requested output mode. The data whose image processing has been completed is output to the computer via the SCSI or USB interface.

However, if the file format request is JPEG, the data is sent to processing block 4 following edge emphasis. Once JPEG processing has been performed in processing block 4, the data is sent to the computer via the SCSI or USB interface. When JPEG processing is performed in the machine, the data amount is reduced, so the time required for transfer to the computer is shorter, and thus a larger number of sheets can be scanned in a given time, compared to when JPEG processing is performed in the computer. Part of the image processing is also performed in the computer. In some cases, image processing is also performed in the controller in order to make the data suitable for image processing in the computer. For details, refer to the other relevant sections.

2) MultiStream

As described previously, MultiStream is a function that outputs data in two different modes at a single scan.

Figure 2-404 shows a screen where 600 dpi resolution for grayscale and 100 dpi for black & white have been set for CapturePerfect 2.0, and the resulting outputs.

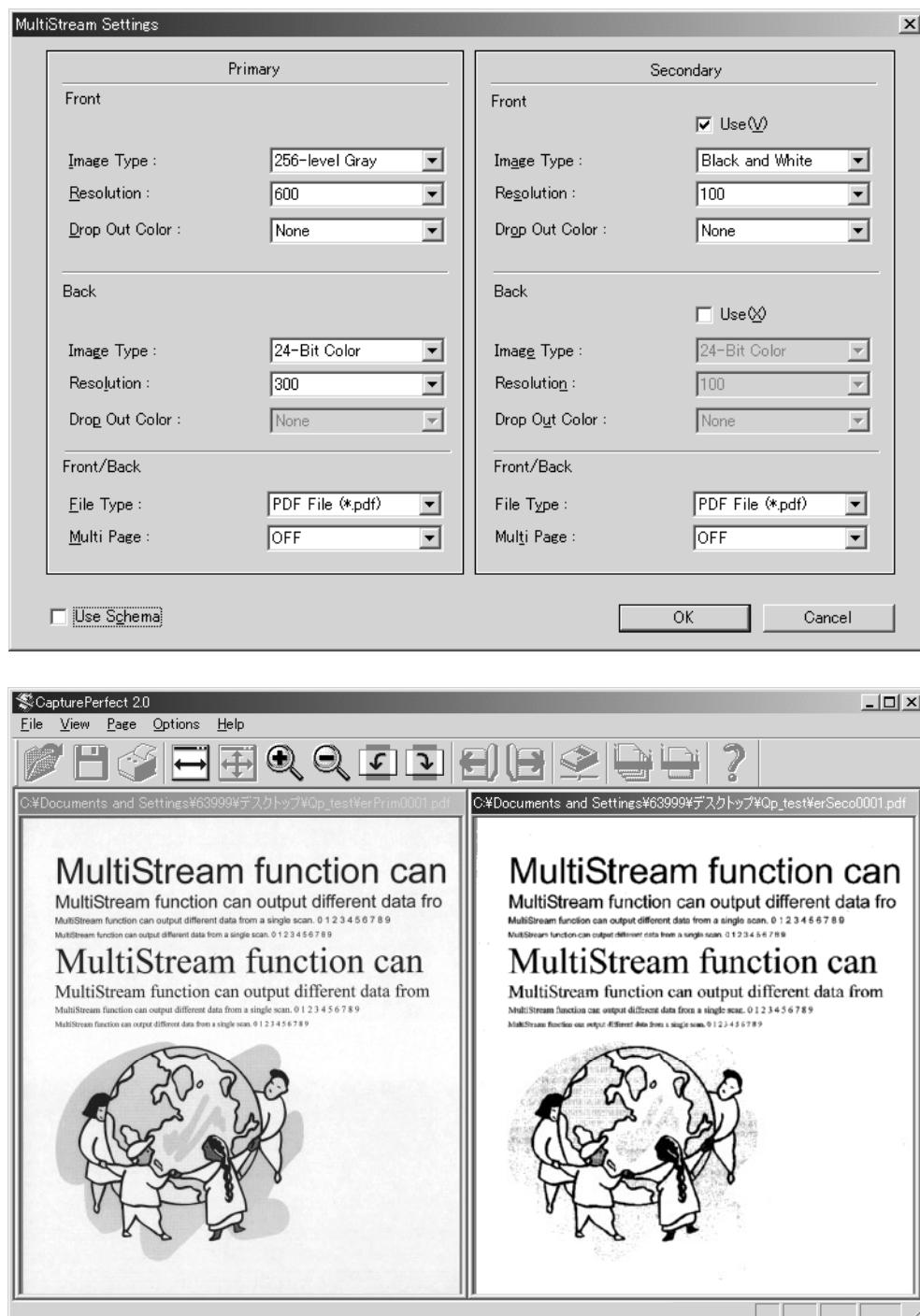


Figure 2-404

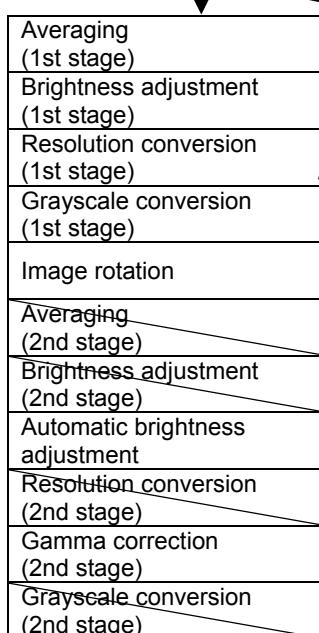
3) Resolution conversion/ averaging

Resolution conversion for the main-scan direction in the machine is done through pixel thinning, and resolution conversion in the sub-scan direction is done through pixel thinning and changing the feeding speed. However, pixel thinning results in a moire effect that lowers image quality. Equalization processing is done to prevent this effect.

The resolution in the main-scan direction for image data input to the controller from the reader is always 600 dpi. The sub-scan direction resolution varies according to the feed speed. It is 600 dpi (low-speed feed) and 300 dpi (high-speed feed).

The cases for 400 dpi resolution output only and both 300 dpi and 200 dpi resolution output using the MultiStream function are described below.

a) 400 dpi only



b) 300 dpi and 200 dpi

The resolution during controller input is $[600 \times 300 \text{ dpi}]$.

Since the data resolution is converted to $[300 \times 300 \text{ dpi}]$ during image processing in the 1st stage, averaging and resolution conversion are not performed during image processing of 300 dpi data during the 2nd stage.

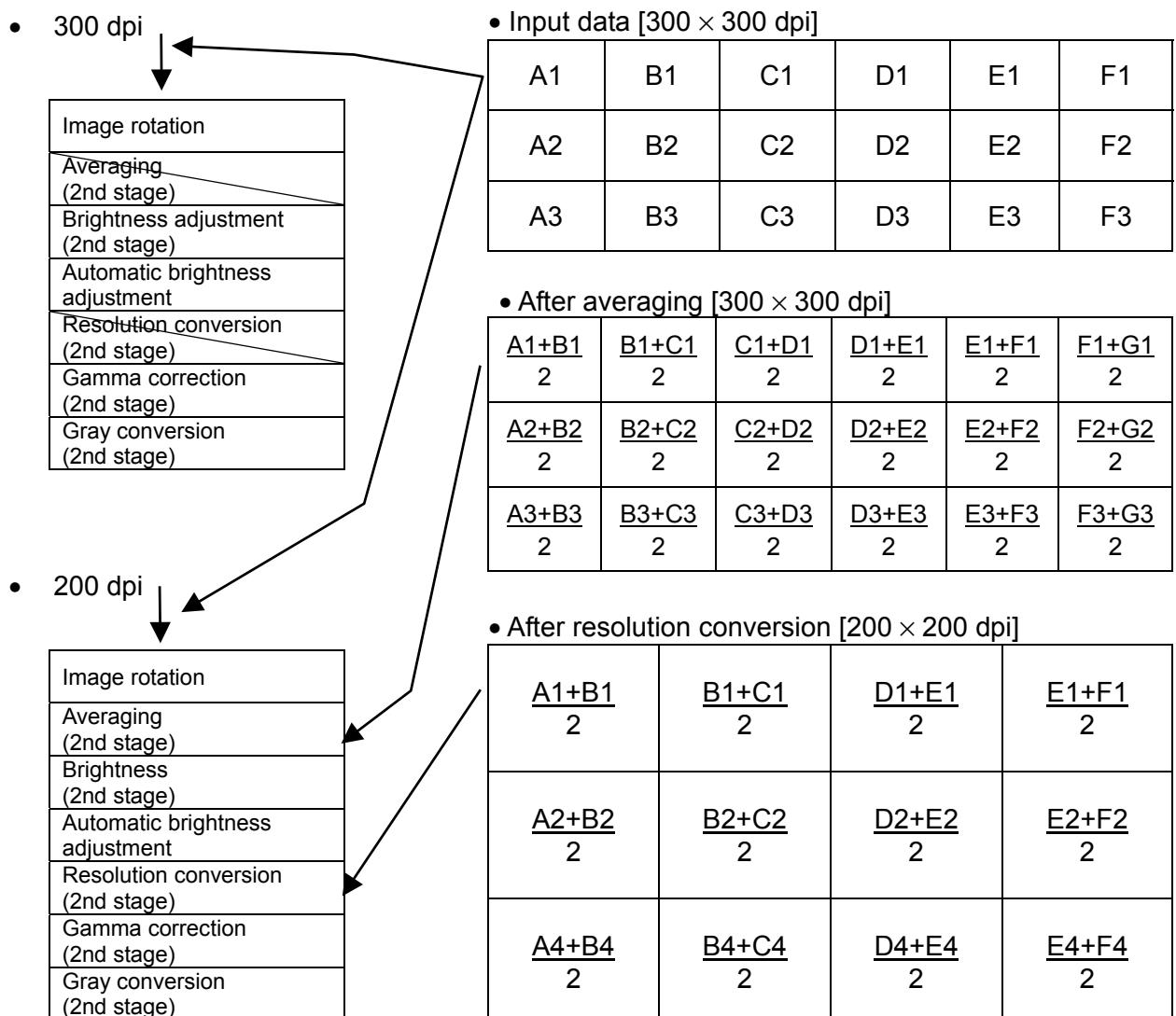


Figure 2-406

4) Data conversion

To improve the reproducibility of documents and modify the acquired image as required by the user, it is possible to convert the document image data using conversion tables. This machine provides various conversion tables adjusted for image mode and setting value.

However, there are several adjustment items not available for image mode and other conditions. For details, refer to the driver software "Help" function.

The conversion tables below are for fundamental items and may be different from actual items.

a) Brightness adjustment

This adjusts the overall brightness of the scanned image. The image brightness increases as the setting value becomes larger, and decreases as the value becomes smaller.

For automatic brightness adjustment in Black & White mode, refer to the "Binarizing" section.

b) Contrast adjustment

This adjusts the contrast of the scanned image. The image contrast increases as the setting value becomes larger, and decreases as the value becomes smaller.

In this machine, this processing is performed at the gamma correction location in the image processing block diagram.

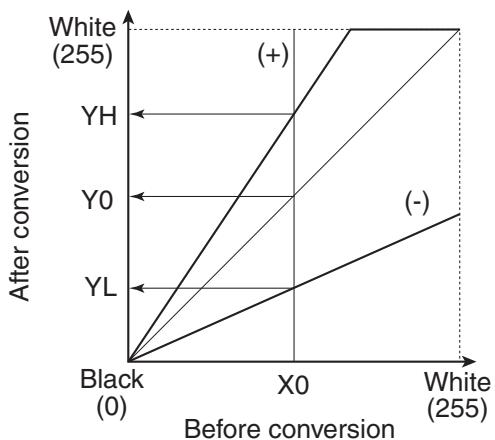


Figure 2-408

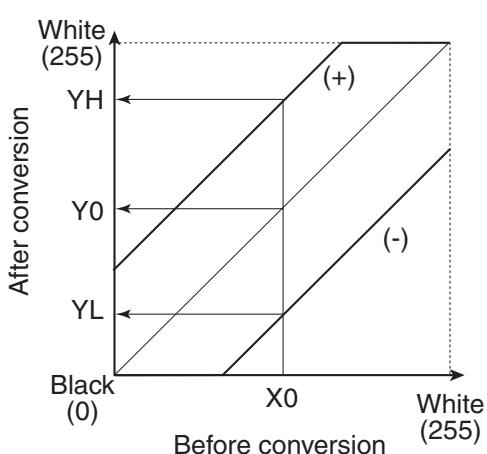


Figure 2-407

c) Gamma correction

This is used when data conversion other than brightness and contrast adjustments is required.

It is possible for the user to use a custom conversion table for converting the gamma curve to the document image data. In this case, the brightness and contrast adjustments become invalid.

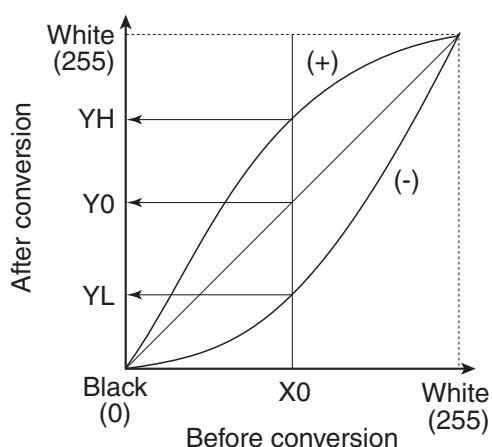


Figure 2-409

5) Edge emphasis

Edge emphasis is a kind of processing which emphasizes light and shade in order to make the image appear sharp.

(Figure 2-410)

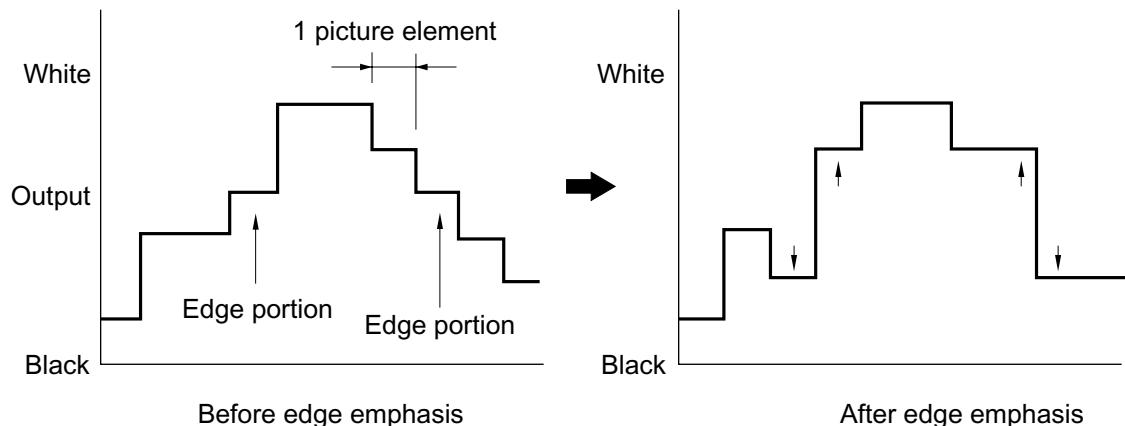


Figure 2-410

Density processing is performed by comparing the data in the conversion table provided for performing edge emphasis, with the target picture element. (Refer to Figure 2-411.)

The stages in edge emphasis can be changed by changing the conversion table and reproduction ratio (B) of the conversion table.

If the density of the target picture element is increased fourfold and the density of the other four points multiplied by -1, the overall density will remain unchanged.

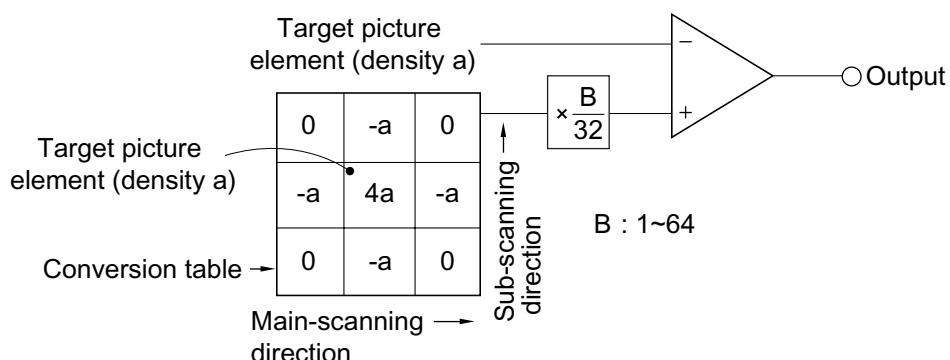


Figure 2-411

6) Binarizing

Image binarizing is described below. For the "Advanced text enhancement," refer to the section entitled "Image Processing in the Computer."

a) Simple Binarizing

Binary image data can only express picture elements as either "black" or "white."

In order to separate the picture elements into black and white, signals corresponding to the image density of the document must be cut off at a certain level, so that anything above that level is judged as "white" and anything below as "black." This is called simple binarizing. This is useful for text documents. Simple binarizing for this machine is called "Black and White" mode.

The level at which picture elements are to be divided into white or black is called the "slice level" (or threshold value).

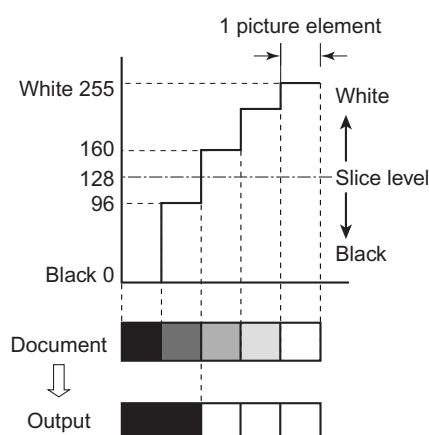


Figure 2-412

b) Error diffusion

Error diffusion processing is used to binarize documents containing gray levels, such as pictures and photos.

A sample case is shown below, where the output is set to 4 bits and the slice level is set to 8.

The value of 1 picture element of input image data is compared with the slice level. When it is smaller than the slice level, it is output as "0" and when it is

bigger than the slice level, it is output as "15". The difference between the values of the input and output picture elements is then added to the next picture element to be processed.

First, when processing the first row of Line 1, since the data "12" is larger than the slice level "8", the output data becomes "15", and the resultant error becomes $-3(=12-15)$. (Refer to Figure 2-413.)

First row of line 1

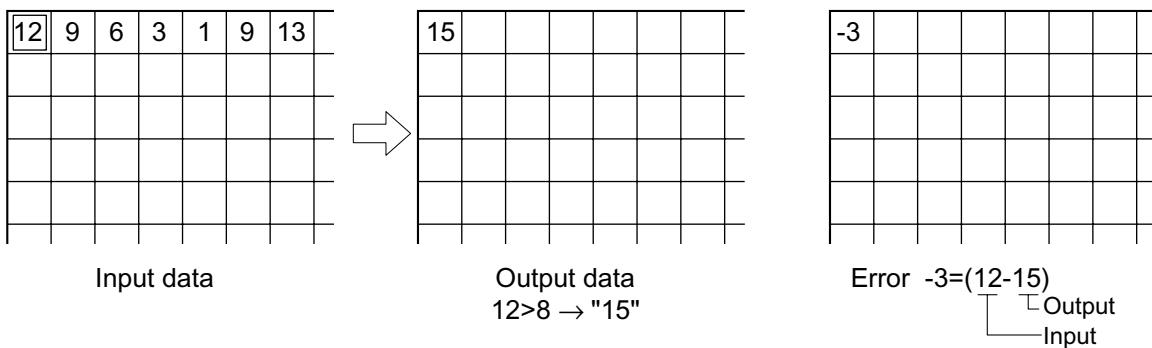


Figure 2-413

Next, when processing the second row of Line 1, since the error is diffused to the right, the data of the picture element of the second row of Line 1 becomes "6"(=9-3).

As this value is smaller than the slice level, the output data is "0" and the error becomes "+6"[=(9-3)-0]. (Refer to Figure 2-414.)

The third row of Line 1 and later are processed similarly.

Second row of line 1

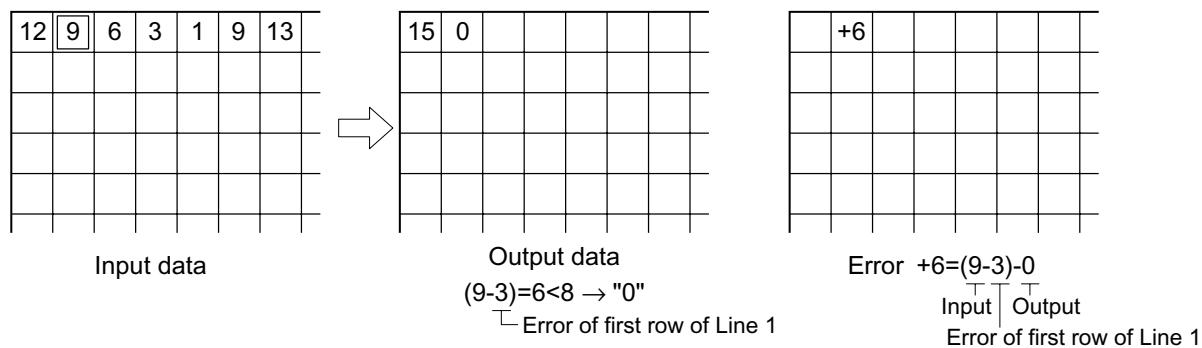
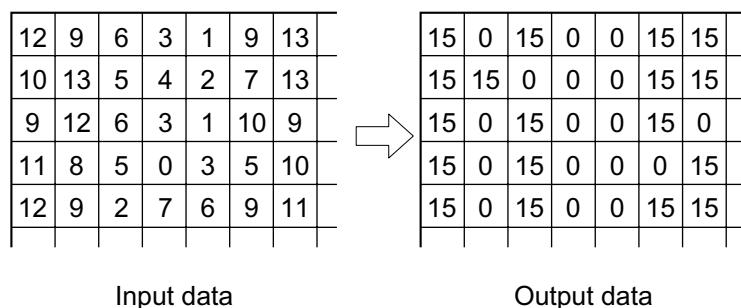


Figure 2-414

Line 2 is processed using the first row of Line 2 as a reference. If the rest is processed similarly, the data becomes as shown in Figure 2-415.



Input data

12	9	6	3	1	9	13	
10	13	5	4	2	7	13	
9	12	6	3	1	10	9	
11	8	5	0	3	5	10	
12	9	2	7	6	9	11	

Output data

15	0	15	0	0	15	15	
15	15	0	0	0	15	15	
15	0	15	0	0	15	0	
15	0	15	0	0	0	15	
15	0	15	0	0	15	15	

Figure 2-415

Figure 2-416 shows a comparison of binarizing with error diffusion processing, and binarizing without error diffusion processing (simple binarizing).

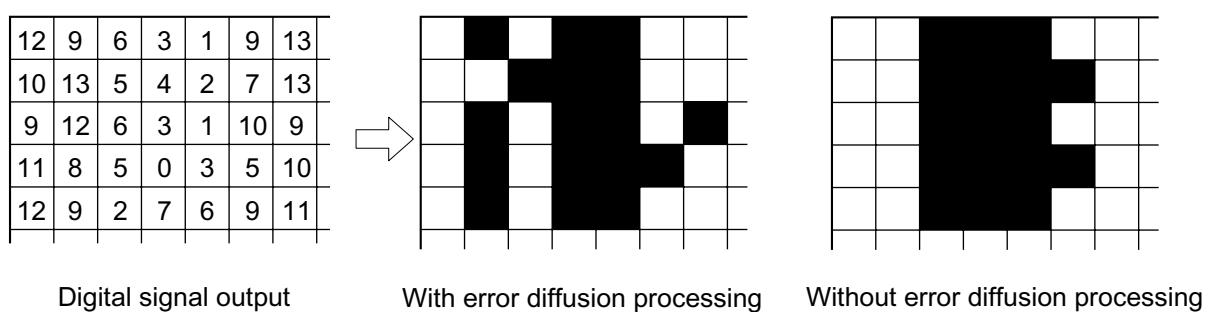


Figure 2-416

c) Automatic brightness adjustment

This adjustment automatically controls the brightness of the scanned image according to the density of the document's background in the simple binary mode.

The brightness is adjusted by assessing the brightness line by line, and adjusting the level for the next line to be scanned.

This process is known as ABC (Auto Back-ground Control).

When the number of pixels of specified brightness in a line exceeds the predetermined value for the document size, the brightest output is transformed gradually, line by line.

Figure 2-417 shows the difference in output when reading a text document with a colored background.

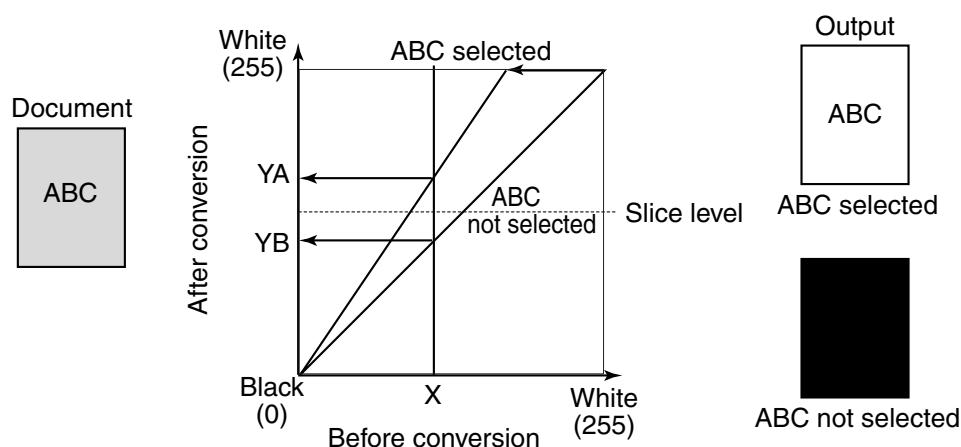


Figure 2-417

4. Image Processing in the Computer

Various types of image processing can be executed in the computer, in addition to the processing executed in this machine.

- Advanced text enhancement
- Automatic size detection
- Skew correction (deskew)
- Erase black border, etc.

The main types of image processing are described below. For others, refer to the driver software "Help".

1) Advanced text enhancement

In this mode, a histogram of brightness level for each block within the scanned data is calculated, and an optimum slice level is determined to binarize the pixels. Binarizing in this way removes the background, for example, from behind text printed on a background.

For example, as shown in the image in Figure. 2-418, a histogram for each block is calculated, and the optimum slice level is determined to binarize the pixels.

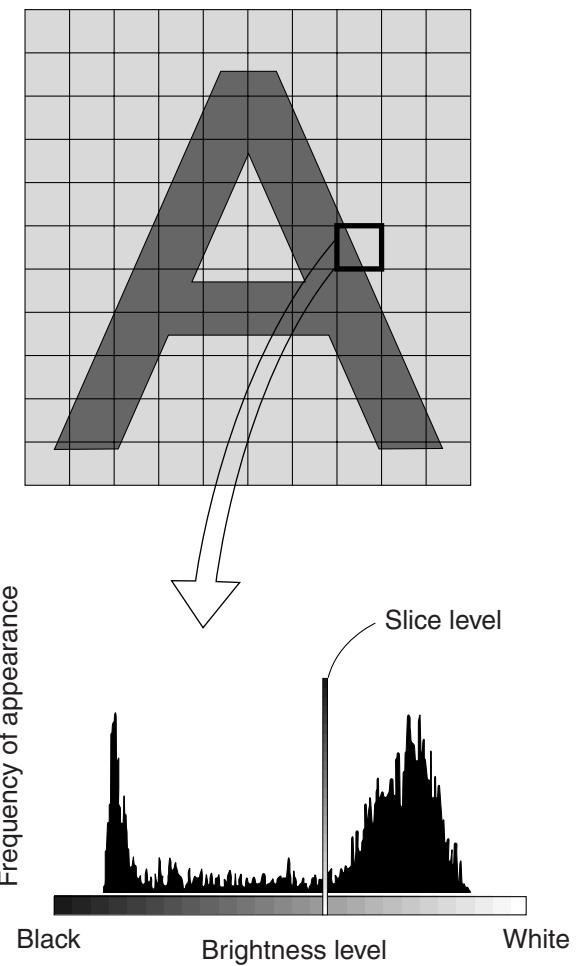


Figure 2-418

2) Automatic size detection

When automatic size detection is selected, images are scanned using the maximum size. Next, in processing block 2 of the QQ-chip in the controller in this machine (for 2nd stage), the image data is converted into 100 dpi black & white data to facilitate processing in the computer. This data is then processed in the computer and the maximum outer frame points of the image are calculated. The result is fed back to the controller, only the data corresponding to the square area formed by the maximum outer frame points is again image processed according to the user's selected conditions, and this data is then output to the computer.

However, since what is used are the maximum outer frame points, the square that is calculated includes any existing skew of the document.

Moreover, if the document is fed using the feeder, the size of the document in the sub-scan (length) direction is determined according to the data of the read sensor (PI8).

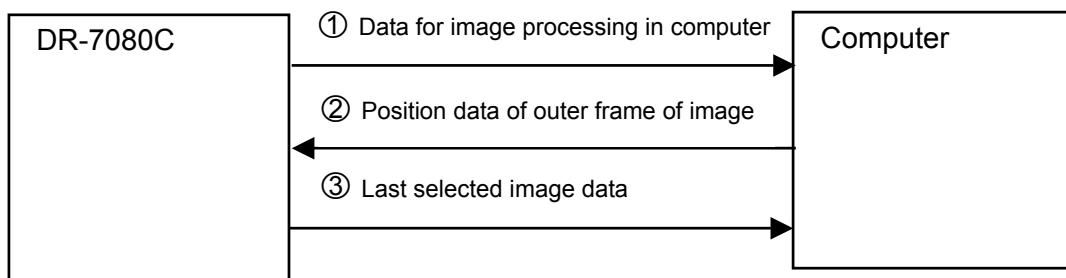
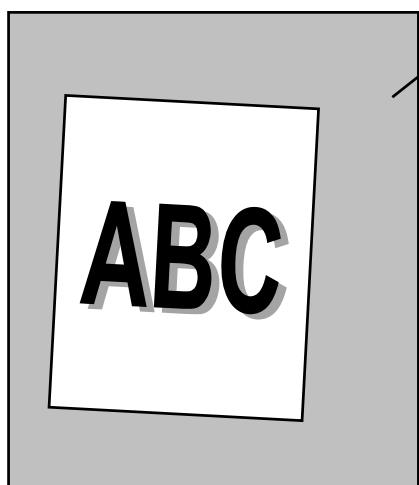


Figure 2-419

• Before processing



• After processing

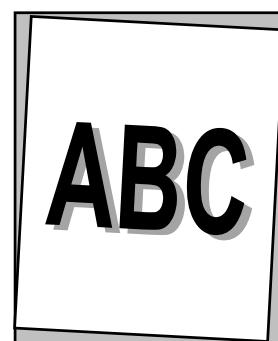
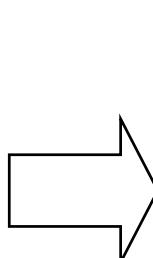


Figure 2-420

3) Skew correction (Deskew)

When image skew correction (deskew) is enabled, the driver detects the angle of skew from the black frame that is formed. Then image data is loaded at a size slightly larger than the user-specified paper size. The skew angle is corrected for, so that the image data is restored to the set image size.

However, skew correction may not work properly if the document has dark areas on its left and right edges or if the brightness setting is incorrect.

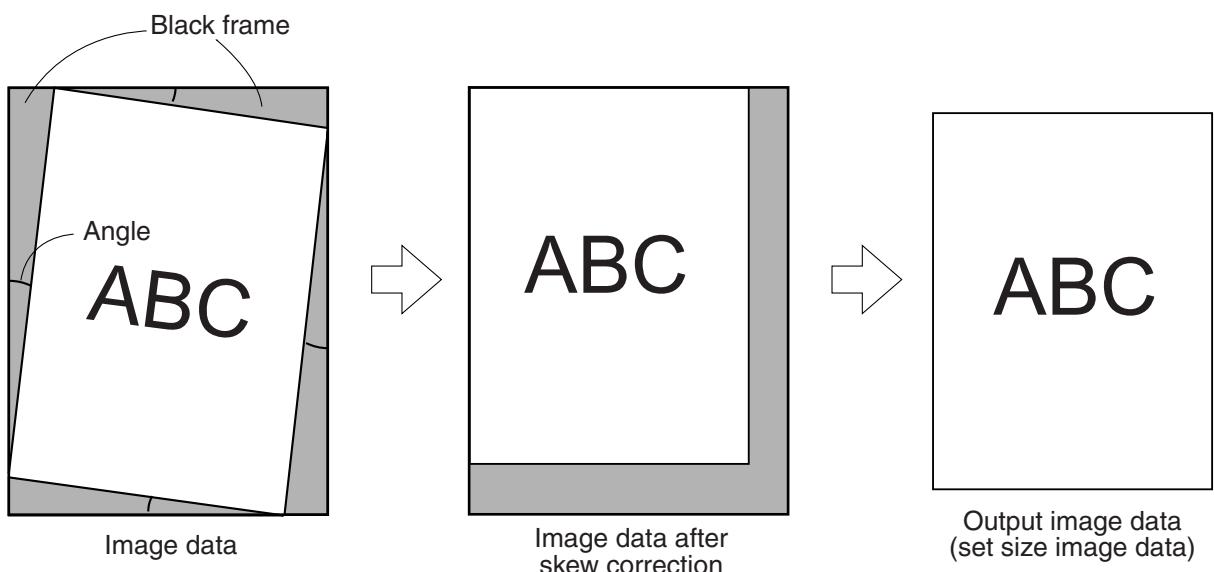


Figure 2-421

5. Power supply

1) Outline

The power supply PCB of this machine is capable of handling power input of 100 to 240 VAC.

Figure 2-422 shows a block diagram of the power supply PCB.

AC power is supplied to the power supply PCB by turning on the power switch.

The 100 to 240 VAC power is converted by a rectifying bridge to unsmoothed 100 to 240 VUN and sent to the booster assembly. At the booster assembly, the power is temporarily raised to 380VDC and then converted to 24VDC.

A fuse is used in the power supply PCB to protect against over-current situations. 24VDC is output from the power supply PCB to the DC controller PCB. The necessary voltage is generated by each regulator on the DC controller PCB. (Refer to Figure 2-423)

24V and 13V are supplied to the reader and feeder from a DC controller PCB. The required voltage is generated within the reader and feeder.

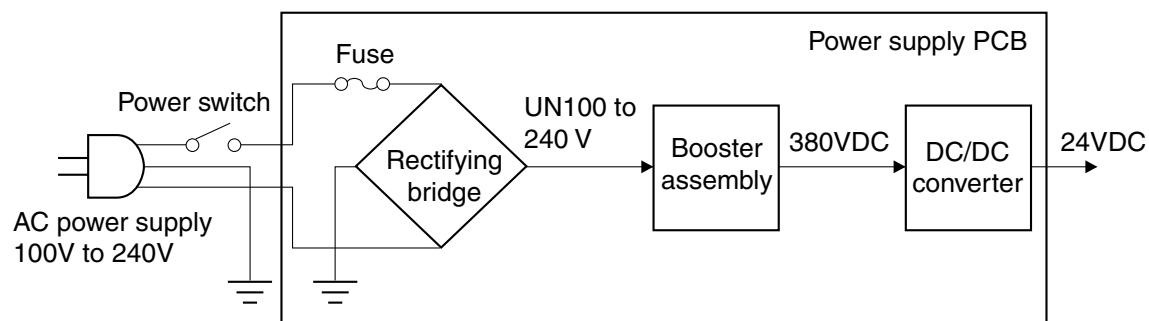


Figure 2-422

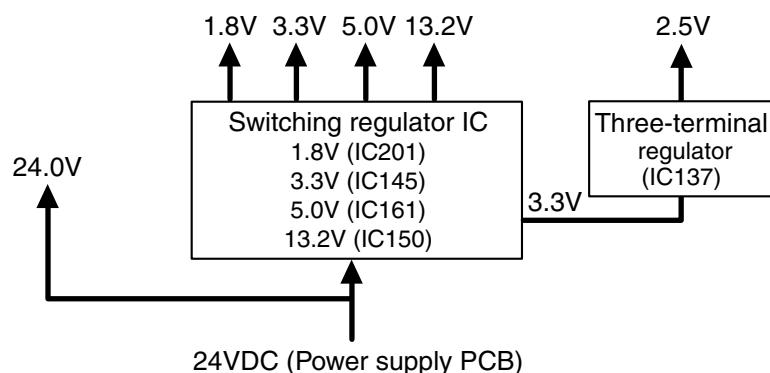


Figure 2-423

2) Protection function

The power supply PCB is a switching regulator type.

If the load is shorted and there is an over-current situation, the protection function is activated and the output is stopped.

Once the output stops, it can be automatically restored by turning the power switch off, eliminating the cause of the short circuit, discharging the capacitor (for about 10 minutes) and then turning on the power switch.

A fuse is used for protection on each PCB. If an excessive current flows into the DC/DC converter, the fuse blows and stops the power supply to the PCB.

Note, however, that this machine supplies power to each motor even when the feeder cover is open.

3) Power saving mode

This machine will shift into the power saving mode if no key or pickup operation takes place for 10 minutes or more, when the power is on. In the power saving mode, power consumption is minimized and the electrical circuits enter the "sleep" state. The CPUs, however, do not shift into power saving mode.

The machine shifts back to the ready mode when any communication is carried out on the computer side or when any key on the operation panel is pressed.

Setting the power saving mode is carried out in the user mode.

6. Interface

When sending data from this unit to a computer, the data is transmitted over an interface. This unit provides both SCSI-3 and USB 2.0 interfaces.

1) SCSI-3

SCSI-3 (Small Computer System Interface-3) is a Parallel Interface standard. This unit supports Ultra SCSI and the data transfer rate between the machine and the personal computer is up to 20 MB/sec.

Figure 2-424 shows the data input/output between the machine and the computer, when connected with SCSI-3. Table 2-402 gives the signal descriptions for the SCSI connector.

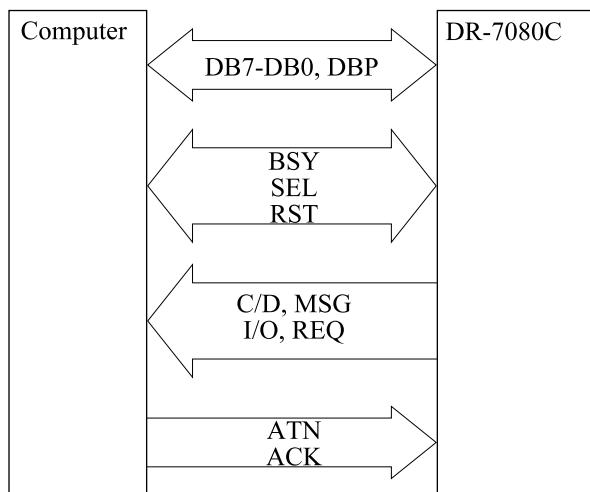


Figure. 2-424

Pin No.	Signal	Remarks
1-12	GND	(Ground)
13	OPEN	(Non-connection)
14-25	GND	(Ground)
26	DB0*	(Data Bit 0)
27	DB1*	(Data Bit 1)
28	DB2*	(Data Bit 2)
29	DB3*	(Data Bit 3)
30	DB4*	(Data Bit 4)
31	DB5*	(Data Bit 5)
32	DB6*	(Data Bit 6)
33	DB7*	(Data Bit 7)
34	DBP*	(Odd Parity Data Bit)
35-37	GND	(Ground)
38	TERMPWR	(Termination Power)
39-40	GND	(Ground)
41	ATN*	(Attention)
42	GND	(Ground)
43	BSY*	(Busy)
44	ACK*	(Acknowledge)
45	RST*	(Reset)
46	MSG*	(Message)
47	SEL*	(Select)
48	C/D*	(Control/Data)
49	REQ*	(Request)
50	I/O*	(Input/Output)

The asterisk "*" at the end of the signal name denotes the signal is low-active.

Table 2-402

The SCSI bus is made up of data signals (1 byte + parity bit = 9 signals) and control signals (9 signals) for a total of 18 lines.

2) USB 2.0

USB 2.0 (Universal Serial Bus 2.0) is a serial interface standard, and provides fast data transmission.

This machine supports Hi-Speed USB 2.0, and the data transfer rate between the unit and the computer is up to 480 Mbits/sec.

Figure 2-425 shows the data input/output between the machine and the computer when connected with USB. Table 2-403 gives the signal descriptions for the USB connector.

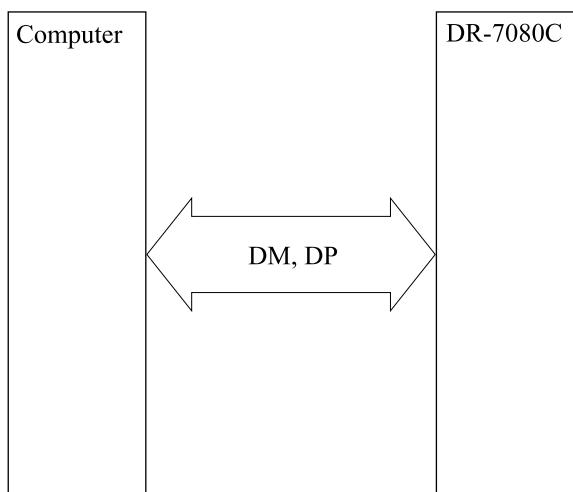


Figure. 2-425

Pin No.	Signal	Remarks
1	VBUS	Vcc (+5V)
2	DM	Differential signal (-)
3	DP	Differential signal (+)
4	GND	Ground

Table 2-403

USB is also referred to as a differential interface, and uses 2 signal lines for a single signal.

V. OPTION

1. Stamp

This option is used to stamp documents scanned with the feeder as "scanned". A stamper is provided at the tip of the stamp solenoid.

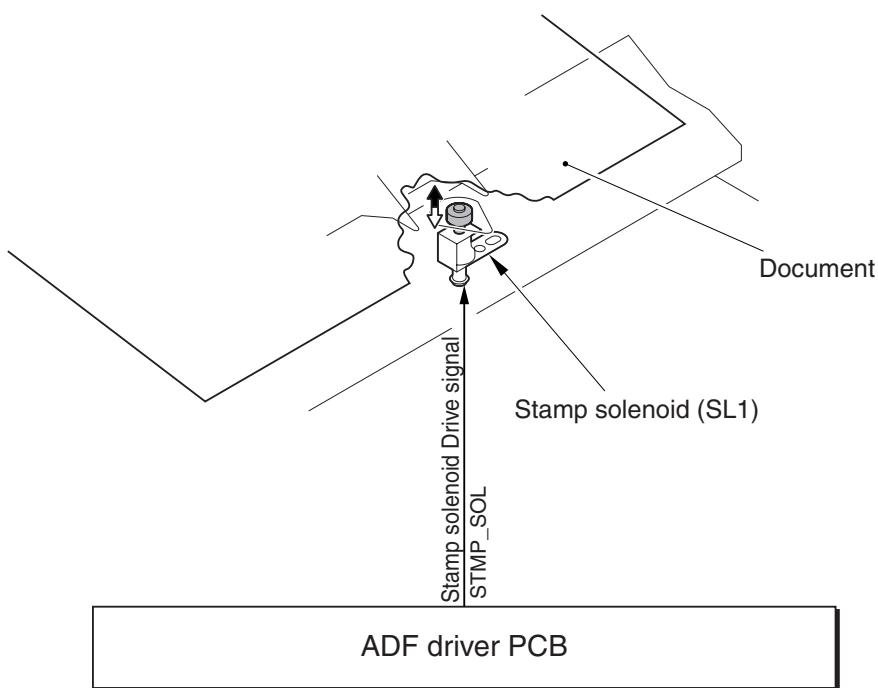


Figure 2-501

Feeding stops 100 ms after the trailing edge of the document clears the platen roller. During this time, the stamp solenoid (SL1) is switched ON and the document is stamped.

In the case of the duplex mode, both sides of the document are stamped. Figure 2-502 shows the stamping location.

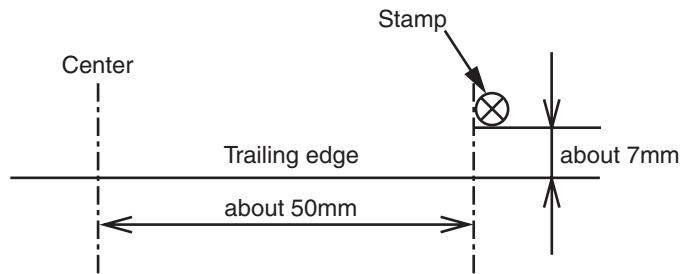


Figure 2-502

After the stamper is replaced with a new one, approximately 7,000 documents can be stamped.

When installing a stamp, be sure to valid Feeder > OPTION > STAMP-SW for the service mode, in order to make the machine recognize the stamp.

Refer to "CHAPTER 4 INSTALLATION & MAINTENANCE" for installation of the stamp solenoid.

2. Network Scanning Adapter: NSA-01

This option is a scanner control box for using the scanner as a network scanner. By connecting the NSA-01 to the DR-7080C, it is possible to send image data from a control computer to another computer, etc., use the document scanning network. For details, refer to the NSA-01 user manual and the Service Information. Note, however, that the NSA-01 must be a version that supports DR-7080C.



Figure 2-503

VI. ELECTRICAL PARTS LAYOUT

1. Feeder

1) Sensors

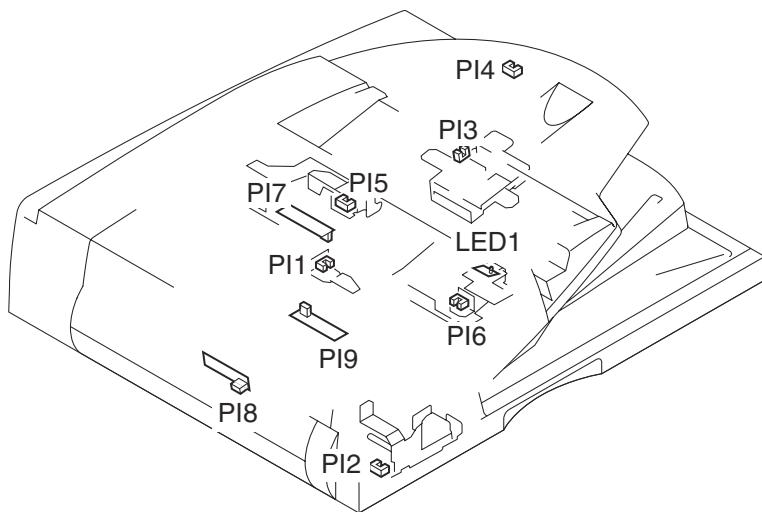


Figure 2-601

Category	Symbol	Name
Photo interrupter	PI1	Registration sensor
	PI2	Pressure HP sensor
	PI3	A4R/LTRR sensor
	PI4	LGL sensor
	PI5	Document set sensor
	PI6	Feeder cover opening sensor
Sensor PCB	PI7	Post-separation sensor
	PI8	Read sensor
	PI9	Delivery reversal sensor
LED	LED1	Document set display

Table 2-601

2) Motor, PCB, others

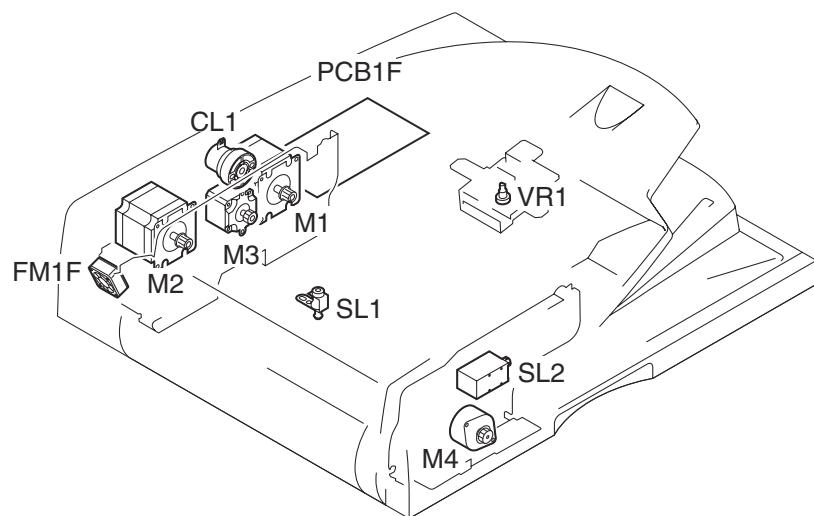


Figure 2-602

Category	Symbol	Name
Motor	M1	Pickup motor
	M2	Feed motor
	M3	Delivery reversal motor
	M4	Pressure motor
Clutch	CL1	Pickup clutch
Solenoid	SL1	Stamp solenoid (option)
	SL2	Pressure solenoid
Fan	FM1F	Cooling fan
PCB	PCB1F	ADF driver PCB
Volume	VR1	Document width volume

Table 2-602

2. READER

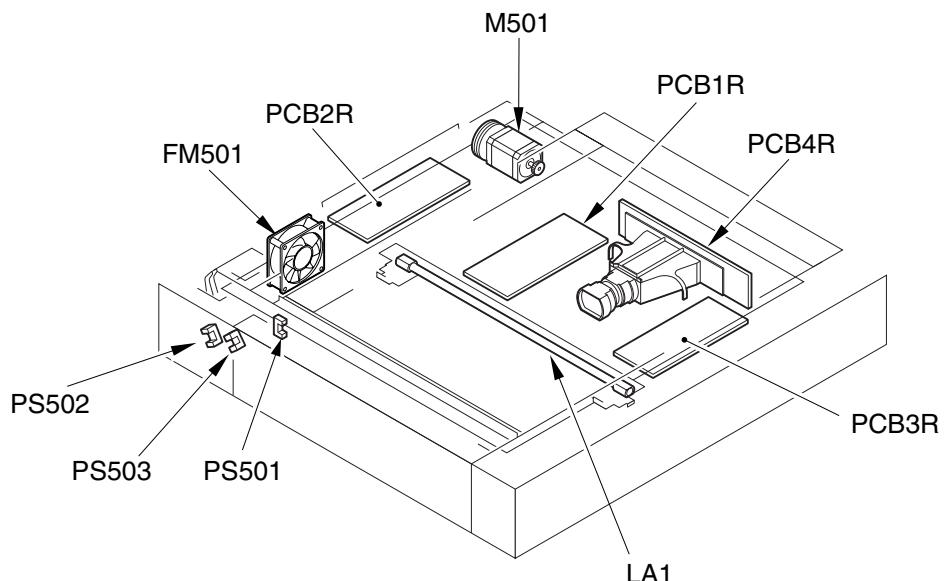


Figure 2-603

Category	Symbol	Name
Photo interrupter	PS501	Scanner HP sensor
	PS502	ADF opening sensor 1
	PS503	ADF opening sensor 2
Lamp	LA1	Scanning lamp
Motor	M501	Scanner motor
Fan	FM501	Cooling fan
PCB	PCB1R	Reader controller PCB
	PCB2R	Interface PCB
	PCB3R	Inverter PCB
	PCB4R	CCD/AP PCB

Table 2-603

3. CONTROLLER

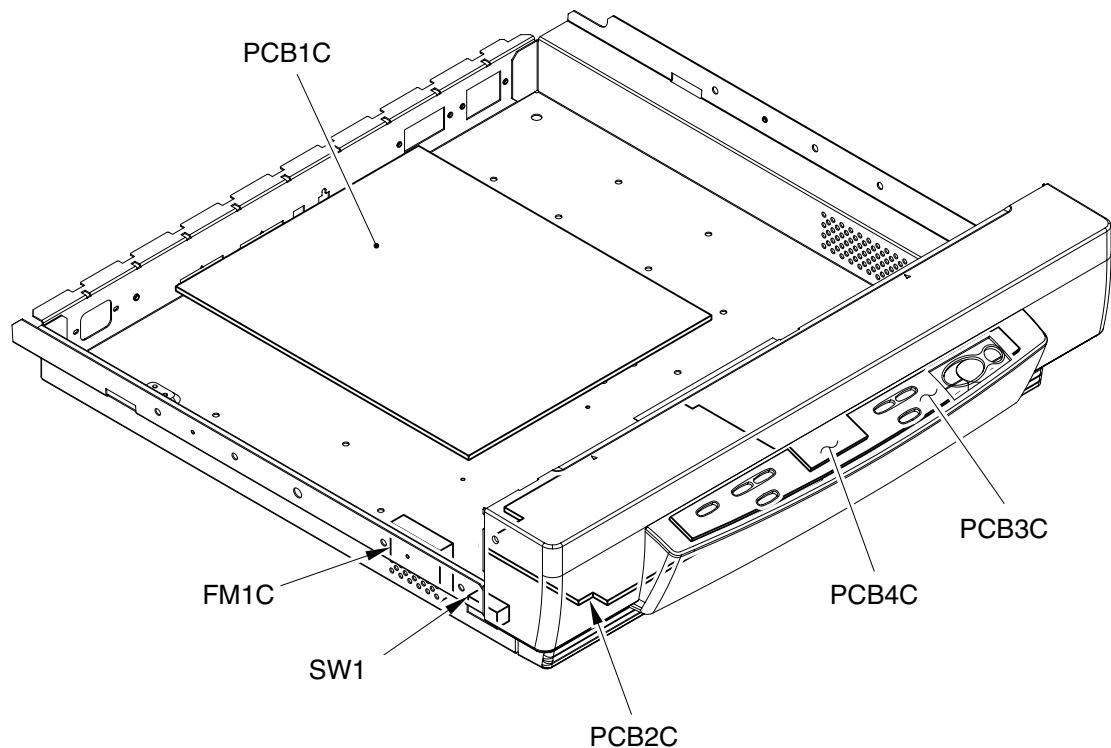


Figure 2-604

Category	Symbol	Name
Switch	SW1	Power switch
Fan	FM1C	Cooling fan
PCB	PCB1C	DC controller PCB
	PCB2C	Power supply PCB
	PCB3C	Switch PCB
	PCB4C	LCD

Table 2-604

VII. LISTS OF CONNECTORS/SW/LED OF EACH PCB

Items that are not listed in the lists and items that are specified as usage prohibited must not be procured in the market.

A. Controller

1. DC Controller PCB

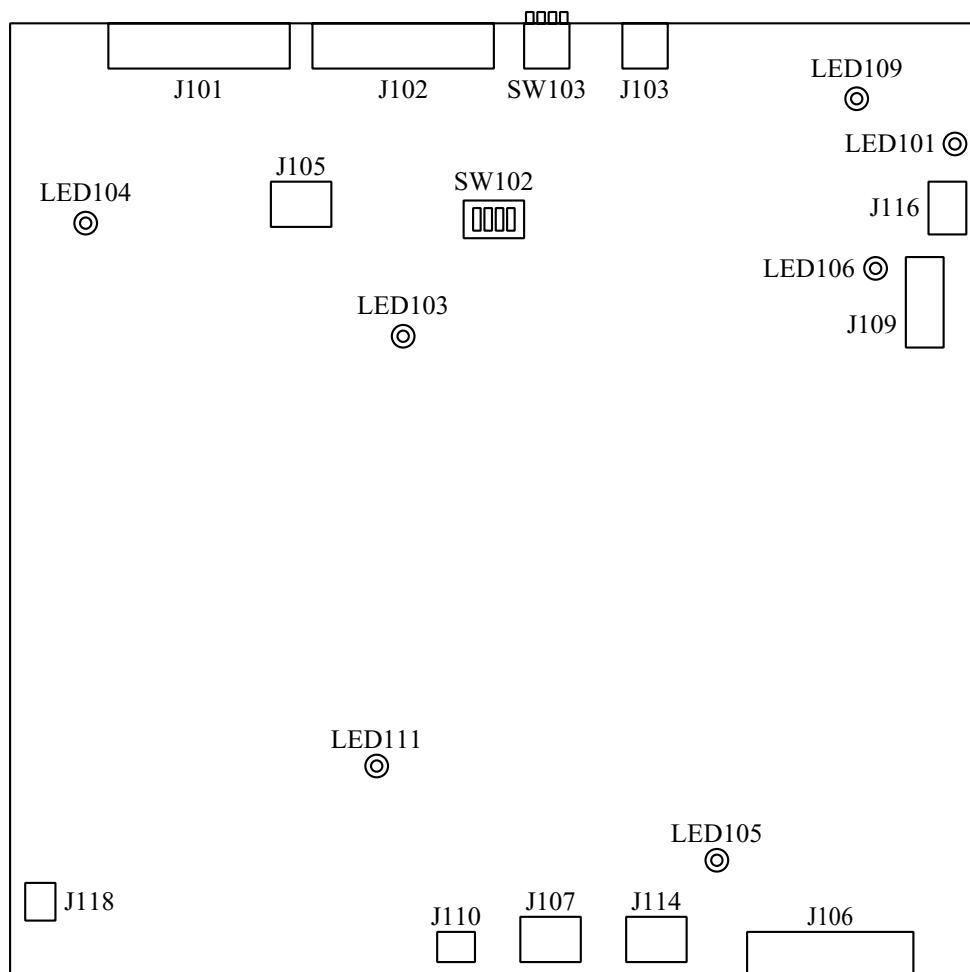


Figure 2-701

Connector	Description	
J101	50P	SCSI I/F
J102	50P	SCSI I/F
J103	4P	USB I/F
J105	4P	(For factory/design)
J106	36P	Image data
J107	4P	24VDC power supply input
J109	32P	Operation panel
J110	2P	Power supply standby signal
J114	4P	24VDC power supply input
J116	4P	DC power supply output
J118	3P	Cooling fan

Table 2-701

LED	Description
LED101	24VDC supply: Lit*
LED103	CPU (SH1) normal operation: Flashing
LED104	IC (XILINX) normal operation: Flashing
LED105	3.3VDC supply: Lit
LED106	13VDC supply: Lit*
LED109	5VDC supply: Lit
LED111	1.8VDC supply: Lit*

Note: LED101/106 are extinguished during sleep.
LED111 is dark.

Table 2-703

Switch	Description																																				
SW102	<ul style="list-style-type: none"> For factory/design Do not use in market. <p>Setting at shipping</p> <p>ON</p> <p>1 2 3 4</p>																																				
SW103	<ul style="list-style-type: none"> For SCSI setting 1 to 3: SCSI ID setting 4: Terminator setting <p>At shipping SCSI ID: 2 Terminator: ON</p> <table border="1"> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> </tr> <tr> <td>ID0</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>ID1</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>ID2</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>ID3</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>ID4</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>ID5</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>ID6</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>ID7</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> </table> <p>ON</p> <p>1 2 3 4</p>		1	2	3	ID0	OFF	OFF	OFF	ID1	ON	OFF	OFF	ID2	OFF	ON	OFF	ID3	ON	ON	OFF	ID4	OFF	OFF	ON	ID5	ON	OFF	ON	ID6	OFF	ON	ON	ID7	ON	ON	ON
	1	2	3																																		
ID0	OFF	OFF	OFF																																		
ID1	ON	OFF	OFF																																		
ID2	OFF	ON	OFF																																		
ID3	ON	ON	OFF																																		
ID4	OFF	OFF	ON																																		
ID5	ON	OFF	ON																																		
ID6	OFF	ON	ON																																		
ID7	ON	ON	ON																																		

Table 2-702

2. Power Supply PCB



Figure 2-702

Connector	Description	
CN1	4P	24DVC power supply output
CN3	4P	24DVC power supply output
CN6	3P	Power supply standby signal
CN7	3P	AC power supply input

Table 2-704

3. Switch PCB

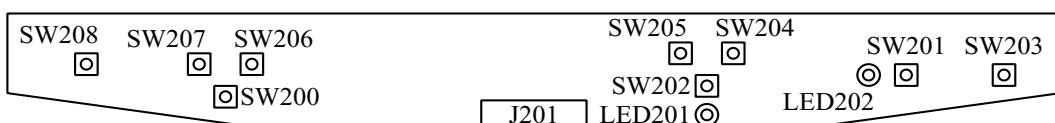


Figure 2-703

Connector	Description	
J201	14P	SW/LED signal

Table 2-705

Note: For details on the switches (SW200 to SW208), refer to "CHAPTER 1 GENERAL DESCRIPTION" or to the user manual.

LED	Description
LED201	For new file
LED202	For start

Table 2-706

B. READER

1. Reader Controller PCB

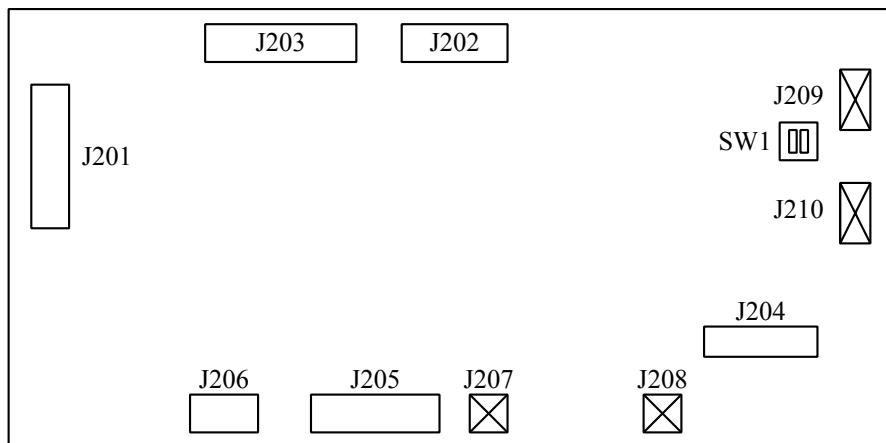


Figure 2-704

Connector	Description	
J201	8P	DC power supply input
J202	35P	Feeder system signal
J203	50P	Controller system signal, scanner motor signal
J204	50P	Communication with CCD
J205	40P	Communication with CCD
J206	9P	Connected to inverter PCB

Note: J207, 208, 209, and 210 are not used.

Table 2-707

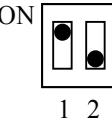
Switch	Description
SW1	<ul style="list-style-type: none"> For factory/design Do not use in market. <p>Setting at shipping</p> <p>ON </p>

Table 2-708

2. Interface PCB

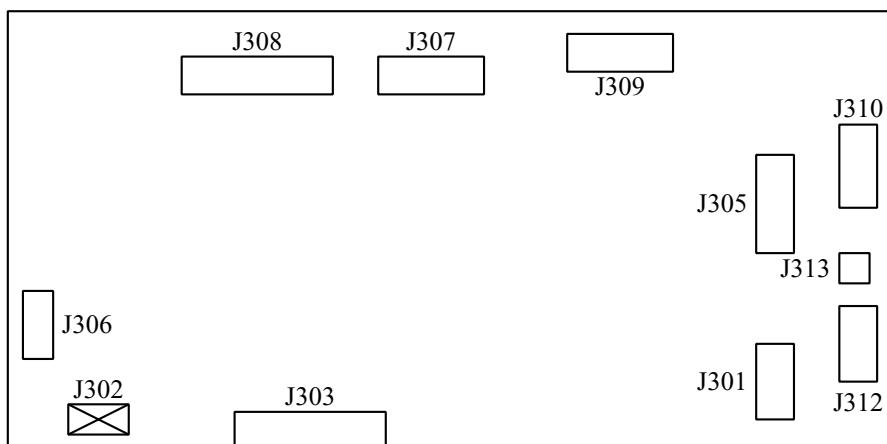


Figure 2-705

Connector	Description	
J301	4P	DC power supply input
J303	36P	Communication with controller
J305	14P	Communication with feeder
J306	6P	Scanner motor
J307	50P	Communication with reader controller PCB
J308	35P	Communication with reader controller PCB
J309	9P	DC power supply output to reader controller PCB
J310	9P	Sensor (3 pcs)
J312	2P	DC power supply output to ADF driver PCB
J313	3P	Cooling fan

Note: J302 is not used.

Figure 2-709

3. Inverter PCB

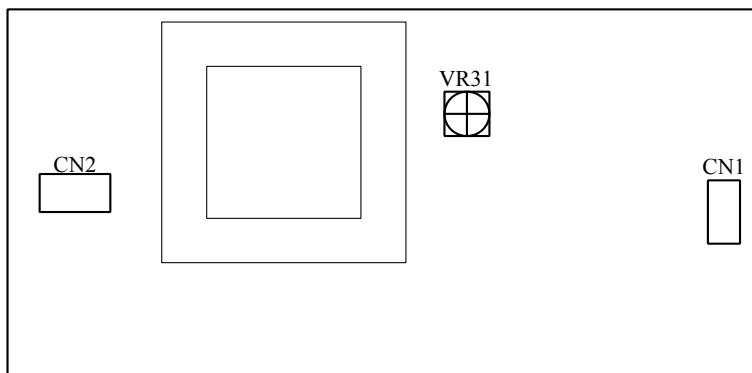


Figure 2-706

Connector		Description
CN1	9P	Connected to reader controller PCB
CN2	4P	Scanning lamp

Note: CN2 carries a high voltage and caution is therefore required.

Table 2-710

Note: In the market, do not touch the volume (VR31).

C. FEEDER

1. ADF Driver PCB

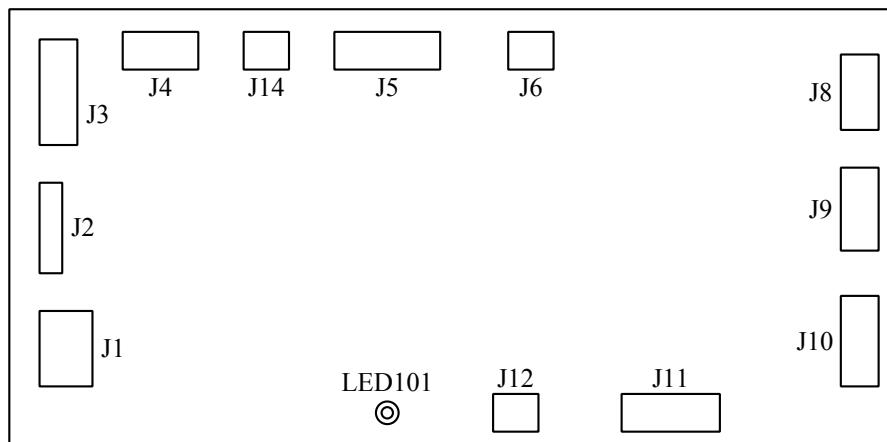


Figure 2-707

Connector		Description
J1	16P	Read sensor, pressure HP sensor, delivery reversal sensor, stamp solenoid
J2	12P	Post-separation sensor, document set sensor, feeder cover sensor, document set LED
J3	9P	Document width volume, A4R/LTRR sensor, LGL sensor
J4	7P	Communication with reader
J5	8P	Communication with reader
J6	2P	24VDC power supply input
J8	7P	Feed motor
J9	6P	Pressure solenoid, pressure motor
J10	8P	Pickup clutch, delivery reversal motor
J11	6P	Pickup motor
J12	3P	Cooling fan
J14	3P	Registration sensor

Table 2-711

LED	Description
LED101	24VDC supply: Lit*

Note: LED101/106 are extinguished during sleep.

Table 2-712

CHAPTER 3

DISASSEMBLY & REASSEMBLY

I. MAIN UNIT.....	3-1	III. READER.....	3-35
II. FEEDER.....	3-5	IV. CONTROLLER.....	3-52

I. MAIN UNIT

When disassembling the main unit a preparation should be made to determine locations of units after disassembly. Since each of the units is heavy, it should be handled carefully to prevent damage and accidents. The feeder weighs approximately 15 kg, the reader, approximately 14 kg, and the controller, approximately 5 kg.

1. Feeder

- 1) Remove the cable (with locks) ①. Flip open the rubber covers of the left and right hinge parts, remove the screws ② (2 each on the left and right), and remove the angle guide plate ③.
- Open the feeder to 90 degrees.

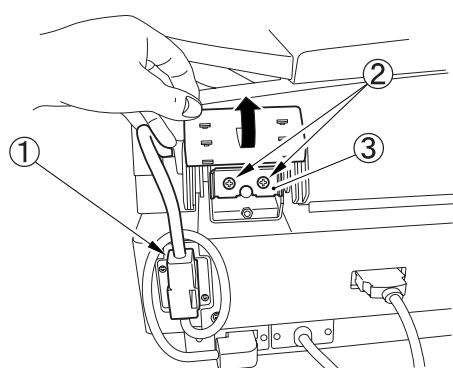


Figure 3-101

Note: When the feeder is opened to 90 degrees, the center of gravity moves backwards, so open it gently.

- 2) Remove the 3 knurling screws ① and slide the feeder ② toward the rear, releasing it from the stoppers ③, and lift it away.

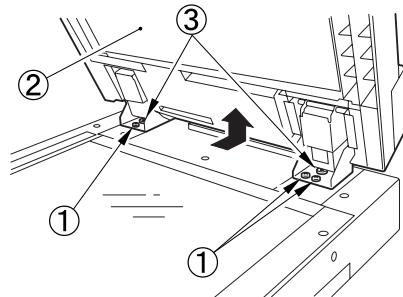


Figure 3-102

Note: The feeder weighs approximately 15 kg, so handle it with care when removing it and placing it back. If necessary, perform such work with the assistance of another person.

Note: If the failures such as the image right angle and so on occur after installing the feeder, adjust the position of feeder. Refer to the "CHAPTER 5 IV. FEEDER ADJUSTMENT" for details.

2. Reader/Controller

- 1) Remove the feeder.
- 2) Remove the 2 cables (with locks) ①.

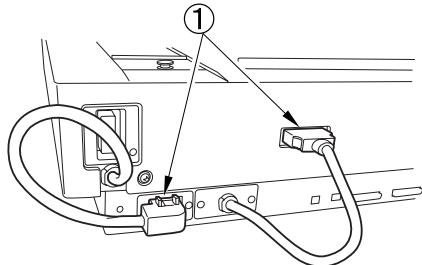


Figure 3-103

- 3) Remove the screws ② holding the operating panel assembly ① (1 each on the left and right).

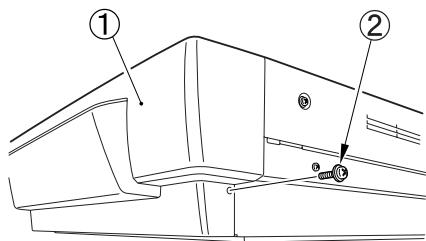


Figure 3-104

- 4) Remove the 2 fitting parts ① (marked with Δ) using a tool with a flat and thin tip, and detach the operation panel assembly ②.

Disconnect the connector that connects the operation panel assembly and controller.

Note: Take care to prevent damage to the platen glass.

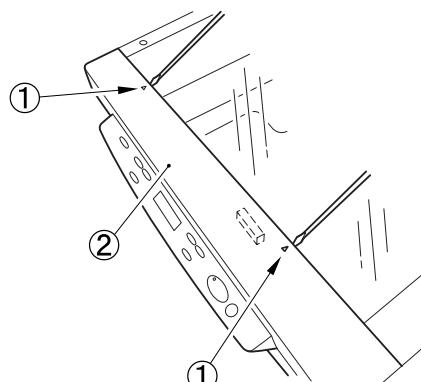


Figure 3-105

Note: When assembling the operation panel assembly, insert the pasted sheet ① under the platen glass.

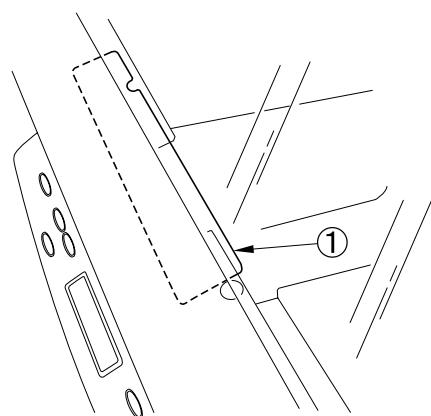


Figure 3-106

5) Remove the screws ① (2 each on the left and right), and remove the left and right bottom covers ②.

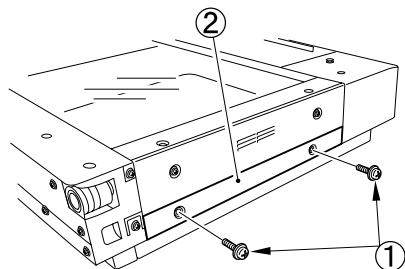


Figure 3-107

6) Remove the 12 screws ① (4 each on the left and right, 4 in front).

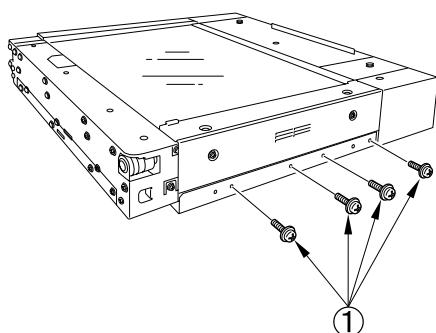


Figure 3-108

7) Remove the 5 screws ①, release the left and right hooks ②, and detach the reader rear cover ③.

Note: Take care to prevent damage the ADF opening sensor arm ④.

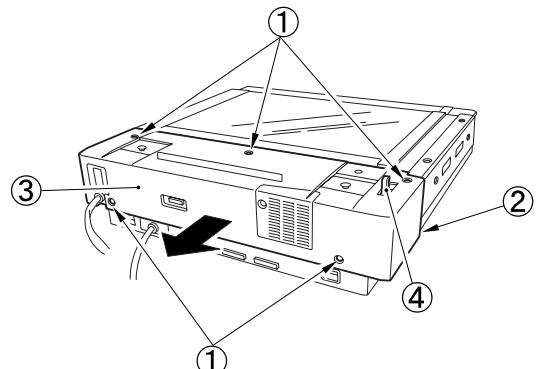
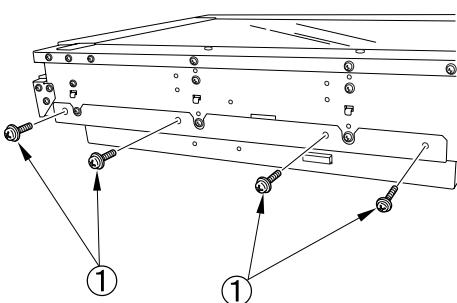


Figure 3-109

Note: When installing the reader rear cover, insert the pasted sheet under the platen glass. See the "Reader Rear Cover" Section for details.



8) Slide the reader ① slightly to the rear. It stops soon because there is an emboss ② on the left. Release the emboss through the opening in the side plate. Lift the rear of the reader slightly and slide it to the position where your hand can be put into the front side.

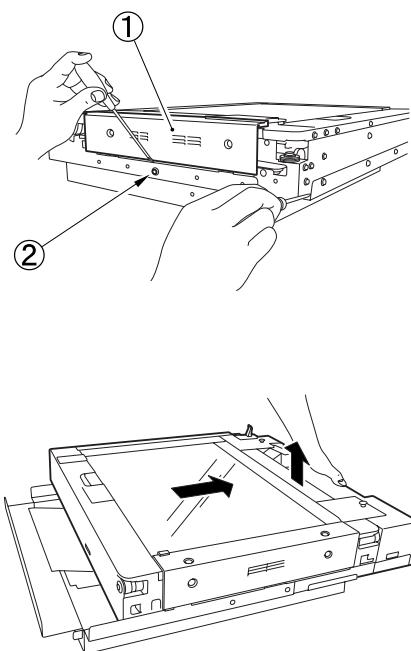


Figure 3-110

9) Hold tightly the reader and lift it up.

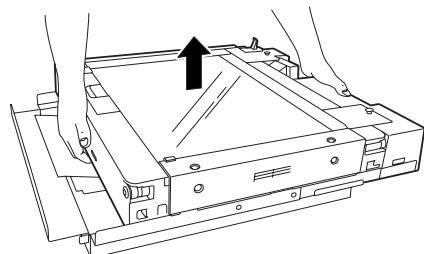


Figure 3-111

Note: The reader weighs approximately 14 kg and the controller approximately 5 kg, total 19 kg, so proceed with care when removing them and placing them back. In particular, be careful not to get your fingers pinched. If necessary, use the assistance of another person.

Reference: How to remove the reader without sliding

The reader can also be removed as follows in place of performing steps 7 to 9. However, it should be done with care because you hold less areas.

Hold diagonal corners of the reader ① from bottom and lift the reader.

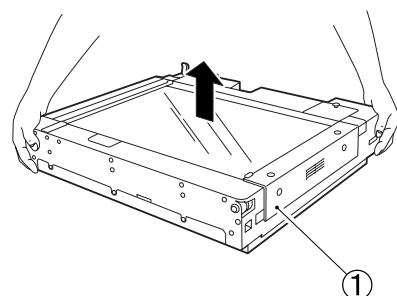


Figure 3-112

II. FEEDER

Take care not to damage the platen glass. It is recommended that you put a protective sheet on the platen glass. When the feeder is opened slightly, it is automatically and fully opened.

A. External Covers

1. Front Cover

- 1) Remove the 3 screws ①, and detach the front cover ② in the direction of the arrow.

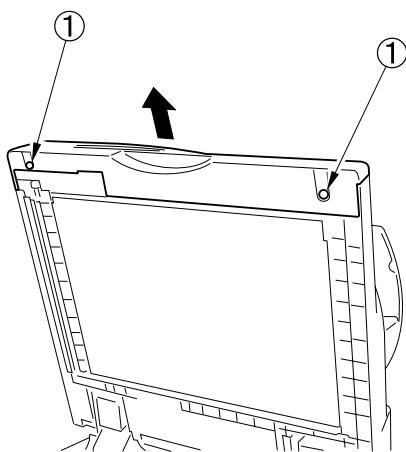
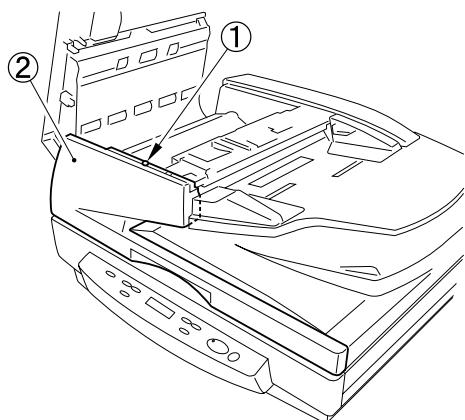


Figure 3-201

2. Rear Cover

- 1) Open the feeder cover ① and the document pickup tray ②; then, remove the 4 screws ③. Widen the right side slightly, release the hook ④ and detach the rear cover ⑤.

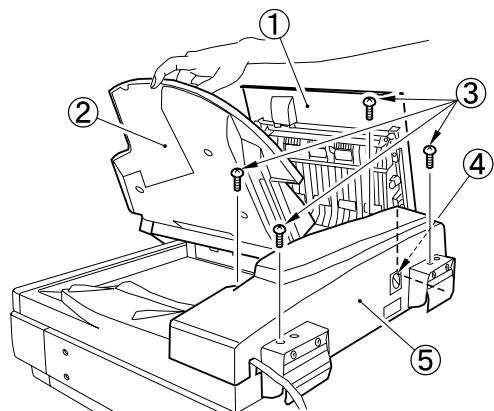


Figure 3-202

3. Lower Left Cover

- 1) Remove the front cover.
- 2) Remove the 2 screws ①, and detach the lower left cover ②.

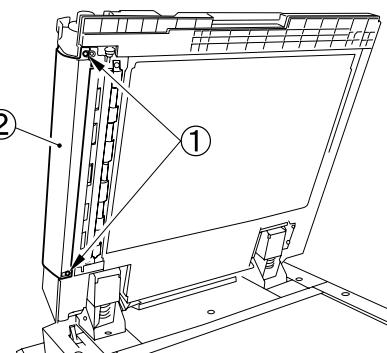
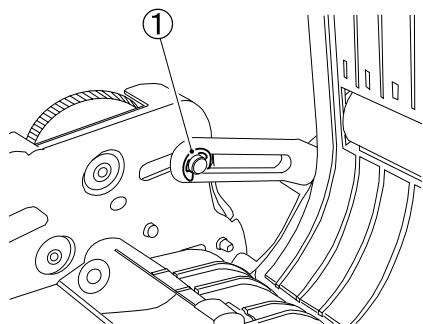


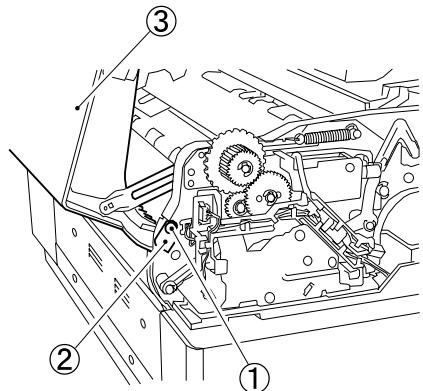
Figure 3-203

4. Feeder Cover

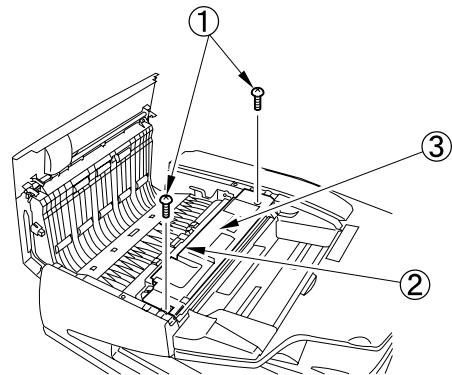
- 1) Remove the front cover.
- 2) Remove the E-ring ①.

**Figure 3-204**

- 3) Remove the screw ① and the positioning pin ② ; then, detach the feeder cover ③.

**Figure 3-205****5. Inside Cover**

- 1) Open the feeder cover, remove the 2 screws ①, and remove the fitting part ②; then, detach the inside cover ③.

**Figure 3-206**

B. Drive System

1. Pickup Motor

- 1) Remove the rear cover.
- 2) Disconnect the connector ①, and remove the 2 screws ②; then, detach the pickup motor ③.

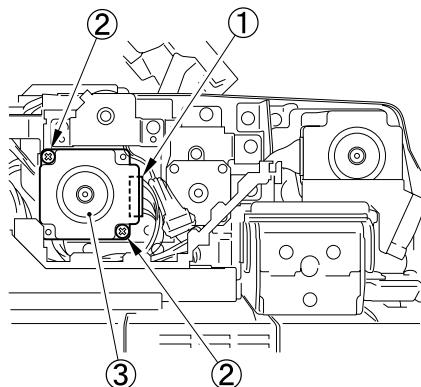


Figure 3-207

Note: When mounting it, be sure that the timing belt ① is securely fitted to the pulley. For this purpose, the pickup clutch or drive unit must be removed.

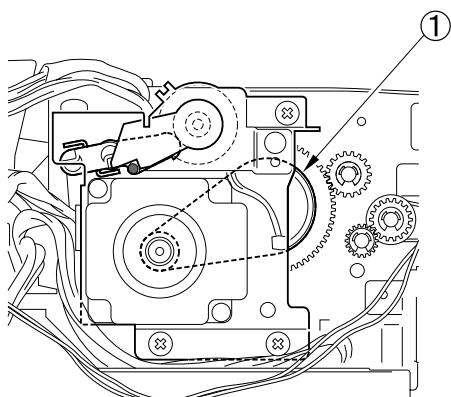


Figure 3-208

2. Feed Motor

- 1) Remove the rear cover.
- 2) Remove the screw ①, and free the cooling fan ②.

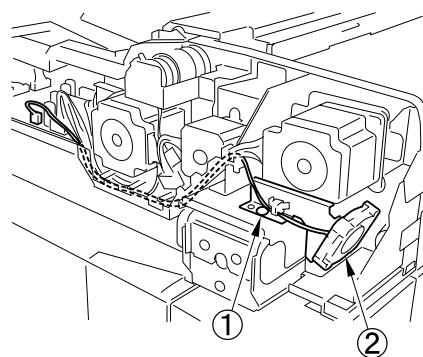


Figure 3-209

- 3) Loosen the 2 screws ①, move the feed motor ② downwards, and tighten the 2 screws ①.

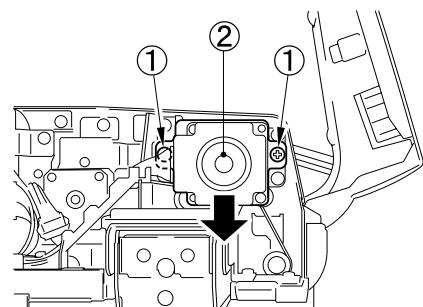


Figure 3-210

Note: When mounting it, loosen the screws and return the feed motor to its original position.

4) Disconnect the connector ① and remove the 2 screws ②; then, detach the feed motor ③.

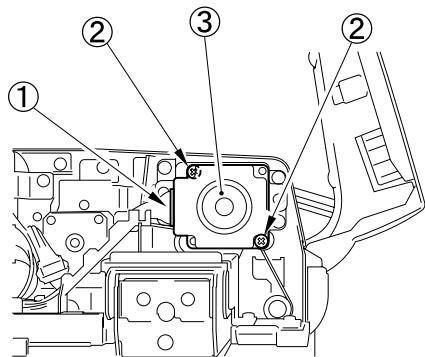


Figure 3-211

Note: When mounting it, be sure that the timing belt ① is securely fitted to the pulley.

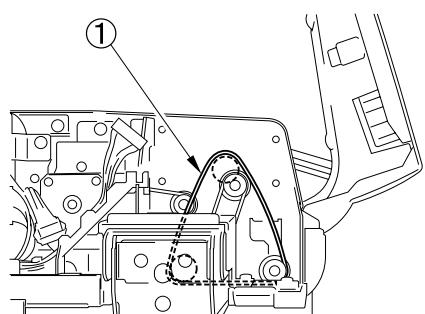


Figure 3-212

Note: The feed motor can be distinguished from the pickup motor by shaft length. The feed motor has a longer shaft than the pickup motor.

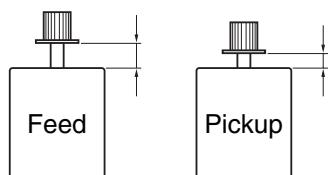


Figure 3-213

3. Delivery Reversal Motor

- 1) Remove the rear cover.
- 2) Remove the 2 screws ①, and disconnect the connector ②; then, detach the delivery reversal motor ③.

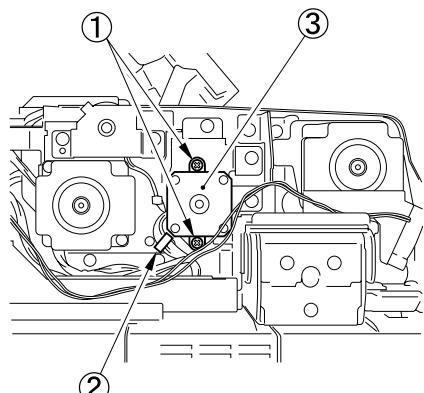


Figure 3-214

Note: If it is difficult to remove or tighten the lower screw holding the motor, remove the harness guide.

4. Pressure Motor

- 1) Remove the front cover.
- 2) Remove the screw ①, and disconnect the 2 connectors ②; then, free the harness guide ③.

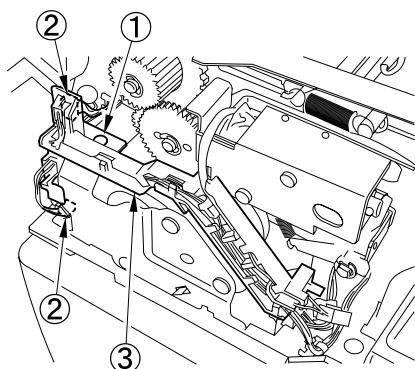


Figure 3-215

- 3) Remove the 3 screws ①, and disconnect the connector ②; then, detach the pressure motor drive unit ③.

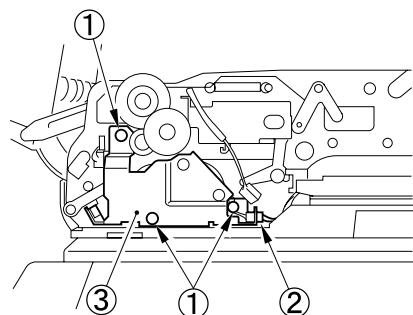


Figure 3-216

- 4) Remove the 2 screws ①, and the fitting part ②; then, free the pressure motor assembly.

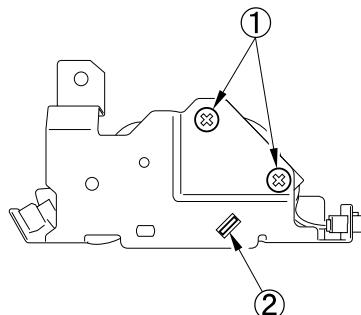


Figure 3-217

- 5) Remove the 2 screws ①, disconnect the connector ②, and remove the timing belt ③; then, detach the pressure motor ④.

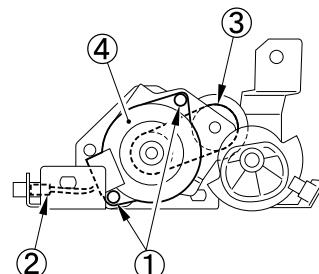


Figure 3-218

Note: When installing the pressure motor drive unit ①, place the pressure lever ② on the upper part of the driving cam.

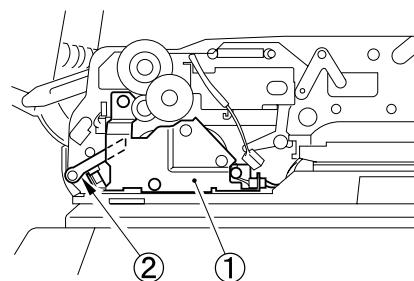


Figure 3-219

5. Drive Unit

- 1) Remove the rear cover.
- 2) Remove the inside cover.
- 3) Remove the screw ①, and disconnect the 4 connectors ②; then, detach the harness guide ③ from the harness.

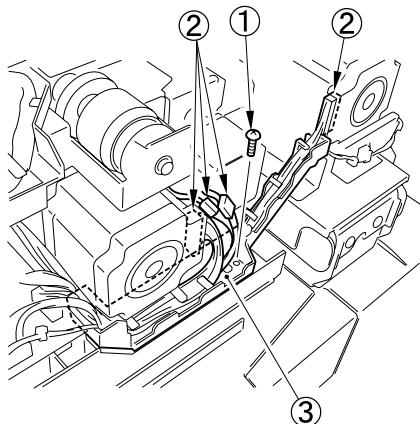


Figure 3-220

- 5) Remove the 2 screws ① and free the harness guide ②.

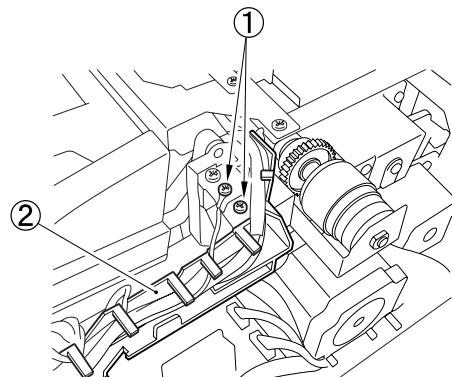


Figure 3-222

- 4) Remove the 3 screws ①, and detach the delivery reversal roller unit ②.

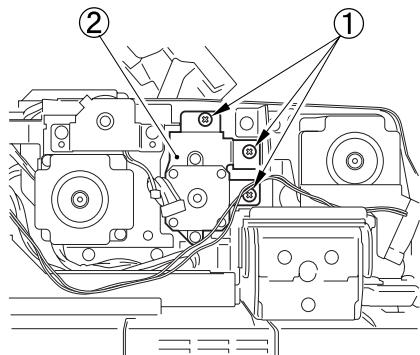


Figure 3-221

6) Remove the 4 screws ①, remove the hook of the connection guide ② and detach the drive unit ③.

Note: Be sure to free the harness from the wire saddle ④. Do not catch the cable that is located below the drive unit. Be careful not to lose the bearing of the pickup clutch shaft.

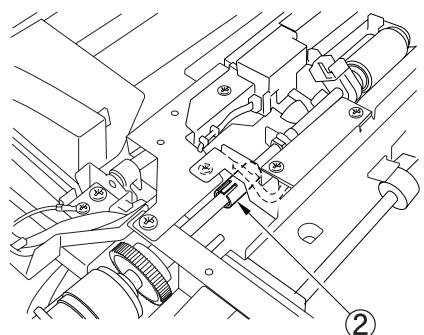
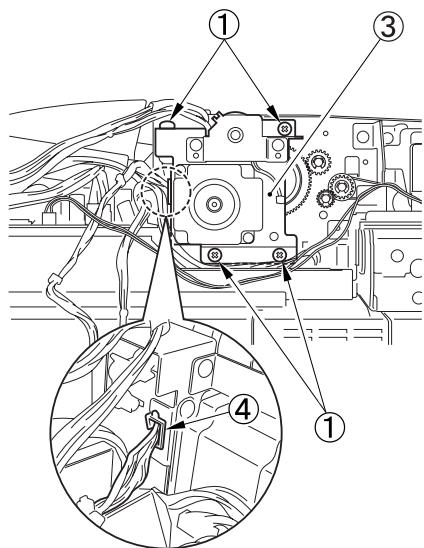


Figure 3-223

Precautions on assembly

- 1) Be careful not to get cables caught or pinched.
- 2) Install the connection guide for the pickup unit by aligning groove direction and shaft end shape. Align the flat part ① of the shaft and the hook position ② of the connection guide.

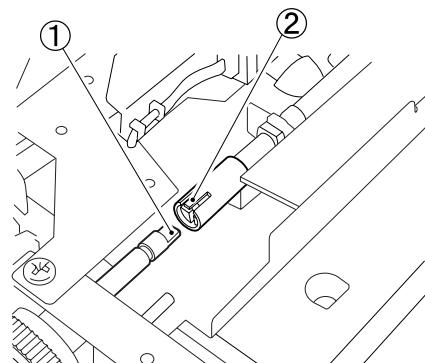


Figure 3-224

- 3) Make sure that the arm ① of the pickup clutch is above the pin ②. Be sure that the timing belt ③ is securely fitted to the pulley.

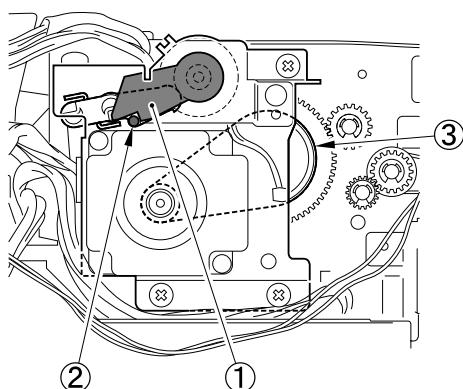


Figure 3-225

C. Feeding System

1. Pickup Roller Unit

- 1) Open the feeder cover and detach the inside cover.
- 2) Remove the 2 plastic E-rings ① and 2 bushings ②; then, detach the pickup roller unit ③.

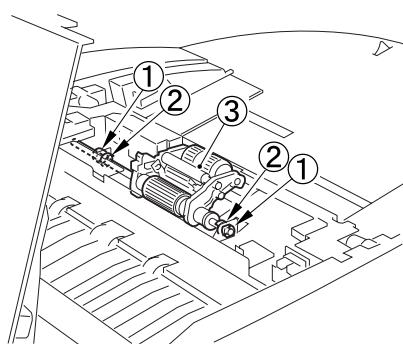


Figure 3-226

2. Pickup Roller/Feeding Roller

- 1) Remove the pickup roller unit.
- 2) Remove the 3 plastic E-rings ①, and detach the pickup roller support base ②.

Note: The pin ③ will come off upon detachment. Take care not to lose it.

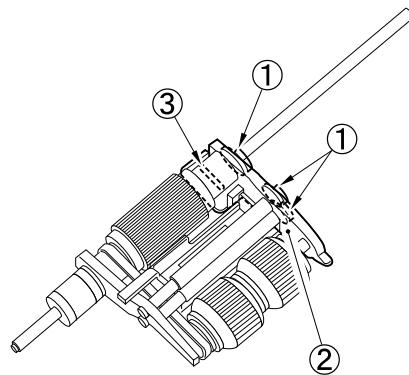


Figure 3-227

- 3) Remove the pin ① and detach the feeding roller ②. Then, remove the plastic E-ring ③ and the pickup roller ④.

Note: Pay attention to the installation direction of the pickup roller and the feeding roller. Install the pre-separation guide ⑤ at the fitting part for the roller support base by flexing it.

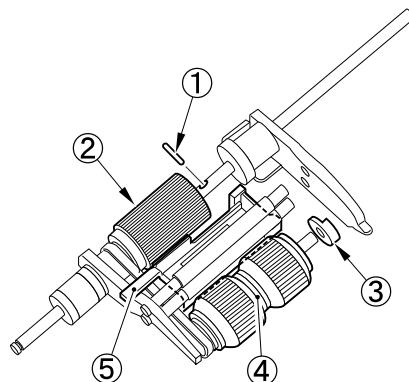


Figure 3-228

3. Separation Pad/ Separation Plate

- 1) Remove the inside cover
- 2) Remove the pickup roller unit.
- 3) Remove the 2 screws ①, push down the top of the separation pad assembly ②, release the fitting part, and remove the assembly.

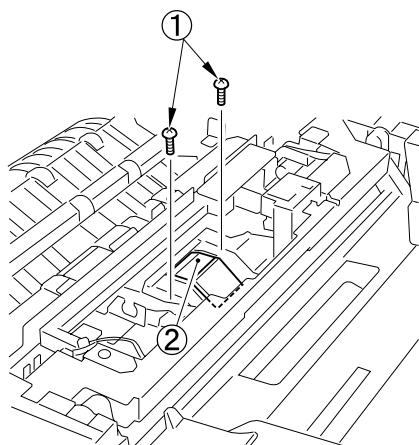


Figure 3-229

- 4) Remove the two springs ① and one pressure adjustment block ② on the back of the separation pad assembly.

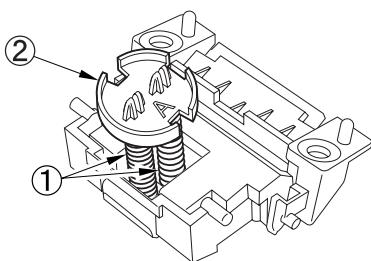


Figure 3-230

- 5) Push down the two hooks ② on the separation pad B ① and detach the separation pad B. At this time, the separation pad ③ and separation plate ④ will come off.

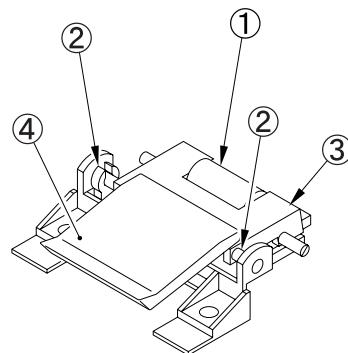


Figure 3-231

Notes on reassembly:

- 1) Before installing the separation pad B, install the separation pad on the separation plate.
- 2) Take care not to mistake the installation positions of the springs. Install the spring ① with a fold so that it is upstream to the feed direction.

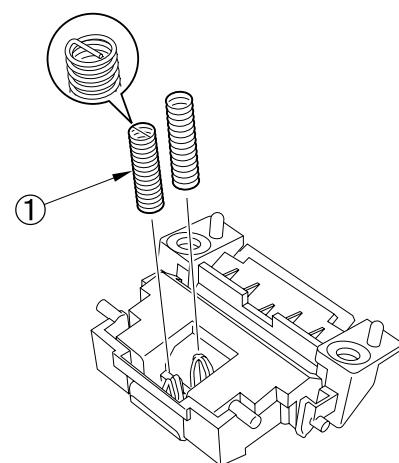


Figure 3-232

Reference: Separation pressure adjustment

This adjustment should be performed in case of the double feed. Normally, it is not required.

Pressure adjustment block	Separation pressure
Side A	Small
Side B	Large

Table 3-201

- 1) Turn the pressure adjustment block ① installed on the spring over, and install it. (From side A to side B)

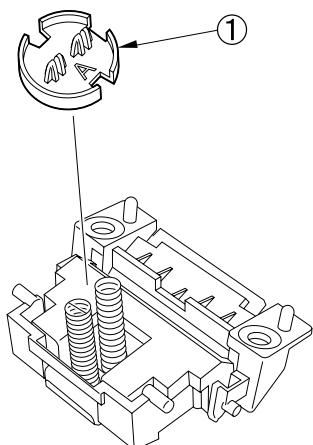


Figure 3-233

4. No. 1 Registration Roller Follower

- 1) Remove the front cover.
- 2) Remove the feeder cover.
- 3) Remove the 4 screws ① and detach the cover ②.

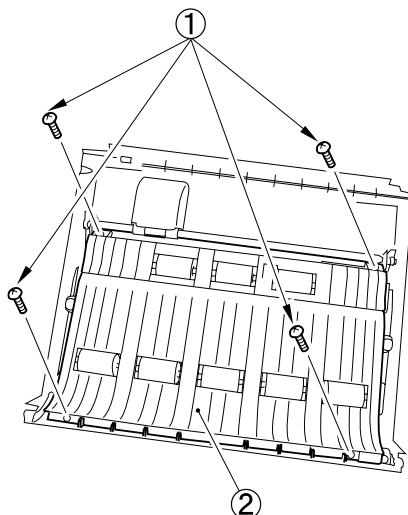


Figure 3-234

- 4) Remove the screw ①, and remove the support plate; then, detach the No. 1 registration roller follower ②.

Note: 4 coil springs may come off upon detachment. Be careful not to lose them.

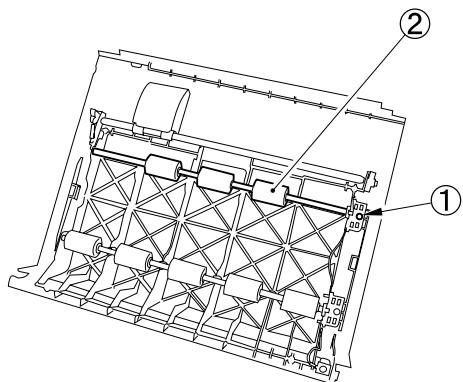


Figure 3-235

5. No. 1 Registration Roller

- 1) Remove the front cover.
- 2) Remove the rear cover.
- 3) Remove the screw ①, and disconnect the 2 connectors ②; then, free the harness guide ③.

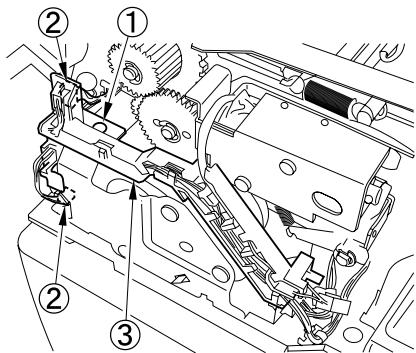


Figure 3-236

- 4) Remove the 2 screws ①, and remove the spring ②; then, detach the pressure solenoid unit ③.

Note: It may be difficult to remove the unit because a cushioning rubber sheet has been attached to the rear of the solenoid mounting plate.

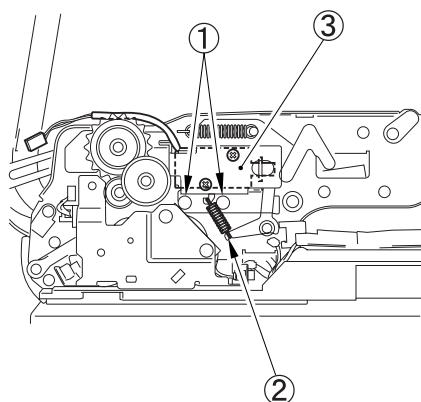


Figure 3-237

Note: Upon assembly, insert the solenoid plunger into the arm notch.

- 5) Remove the 3 screws ① and detach the delivery reversal roller unit ②.

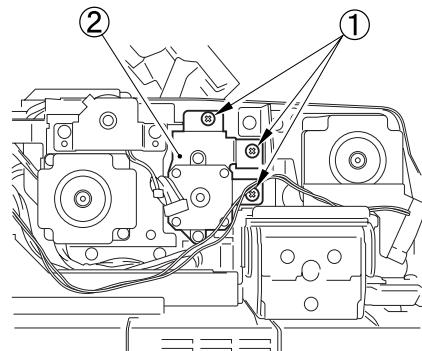


Figure 3-238

- 6) Remove the 2 screws ①, and detach the pre-registration guide ②.

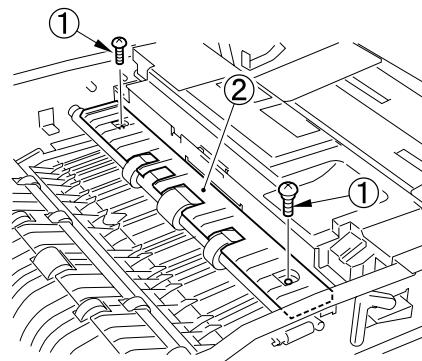


Figure 3-239

7) Remove the E-ring ① and bushing ② on the front side.

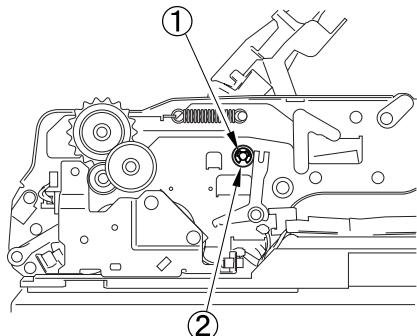


Figure 3-240

8) Remove the E-ring ①, gear ②, and bushing ③ on the rear side.

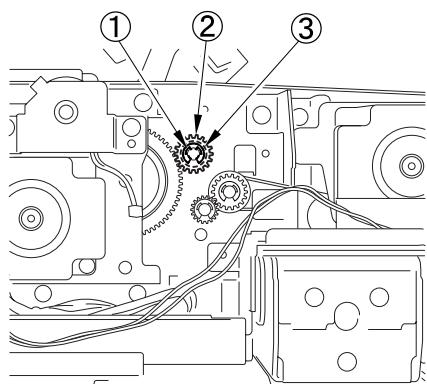


Figure 3-241

9) Remove the No. 1 registration roller ①.

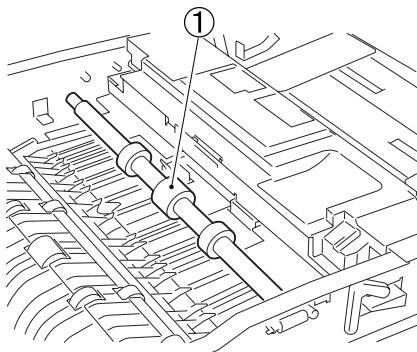


Figure 3-242

6. No. 2 Registration Roller Follower

- 1) Remove the front cover.
- 2) Remove the feeder cover.
- 3) Remove the 4 screws ① and remove the cover ②.

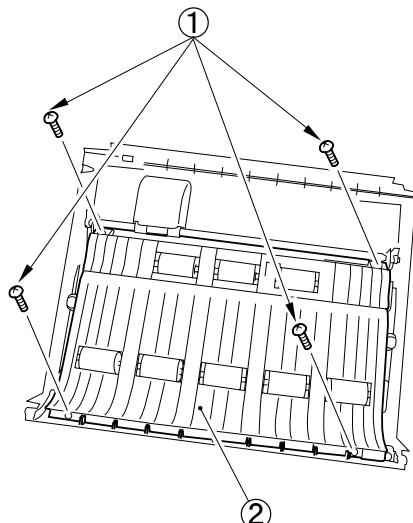


Figure 3-243

- 4) Remove the screw ①, and remove the support plate; then, detach the No. 2 registration roller follower ②.

Note: 4 coil springs may come off upon detachment. Be careful not to lose them.

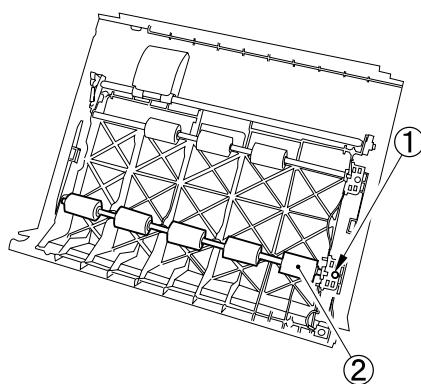


Figure 3-244

7. No. 2 Registration Roller

- 1) Remove the front cover.
- 2) Remove the rear cover.
- 3) Remove the screw ① and free the cooling fan ②.

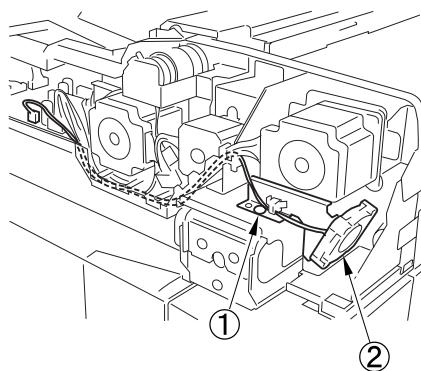


Figure 3-245

- 4) Loosen the 2 screws ①, move the feed motor ② downwards, and tighten the 2 screws ①.

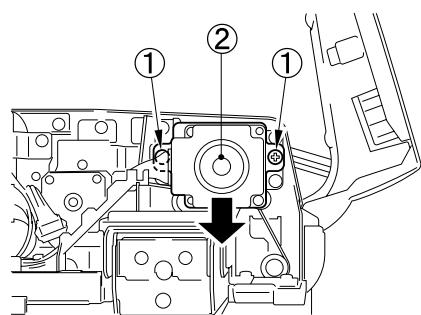


Figure 3-246

Note: When mounting it, loosen the screws and return the feed motor to its original position.

- 5) Remove the 4 screws ①, and disconnect the connector ②; then, detach the feed motor unit ③.

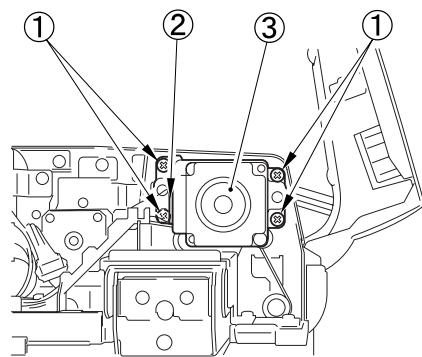


Figure 3-247

- 6) Remove the 3 E-rings ①, the 3 gears ②, and the 2 bushings ③; then, open the roller cover ④ and detach the No. 2 registration roller ⑤.

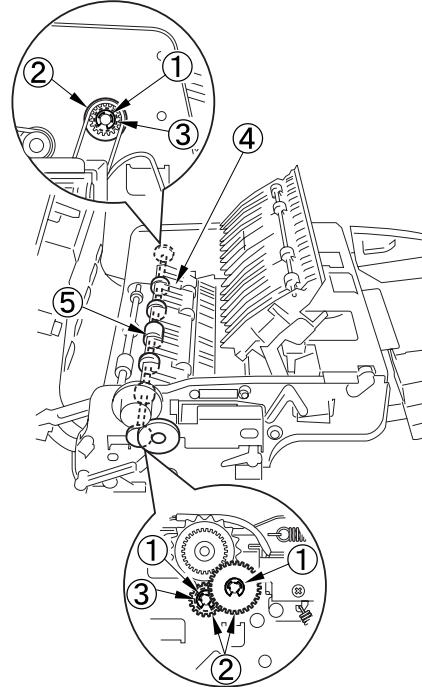


Figure 3-248

Note: Upon installation, install the timing belt on the feed roller side at its original position.

8. Delivery Reversal Upper Roller

- 1) Remove the front cover.
- 2) Remove the rear cover.
- 3) Remove the 3 screws ①, and detach the delivery reversal roller unit ②.

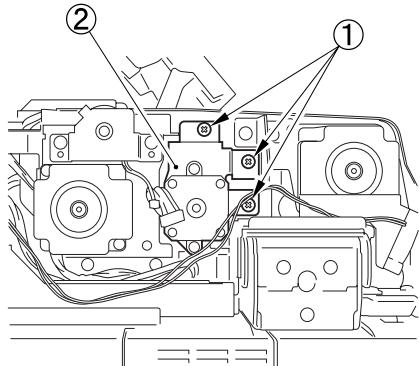


Figure 3-249

- 4) Remove the 4 screws ① and detach the drive unit ②.

Note: Be sure to free the harness from the wire saddle ③. When mounting it, be sure to route the harness through the wire saddle.

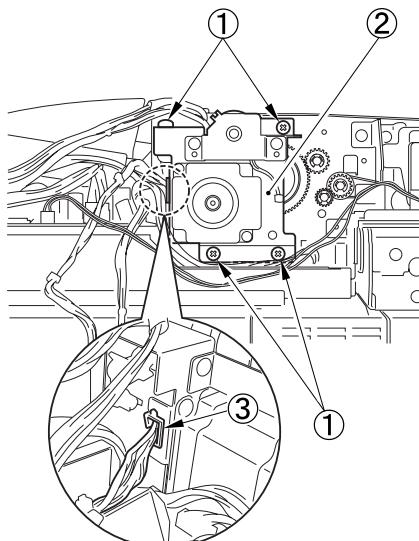


Figure 3-250

Note: For precautions on drive unit installation, see the "B. Drive System, 5. Drive Unit".

- 5) Remove the E-ring ① and the bushing ② on the front side.

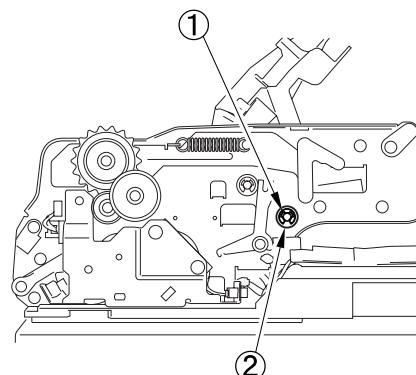


Figure 3-251

- 6) Remove the E-ring ①, gear ②, and bushing ③ on the rear side.

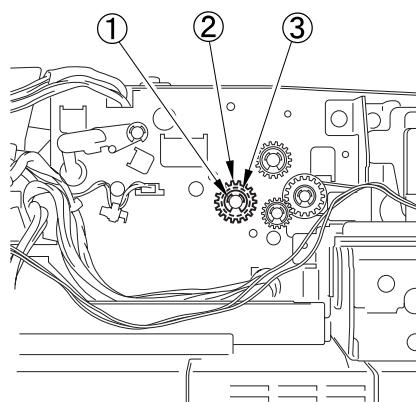


Figure 3-252

7) Remove the delivery reversal upper roller ①.

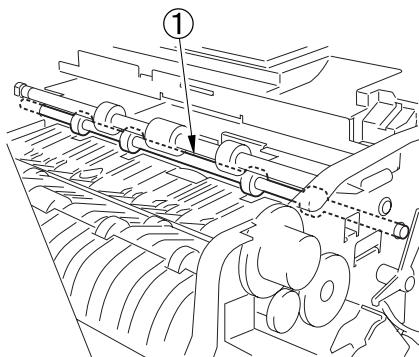


Figure 3-253

9. Read Roller 1

- 1) Remove the front cover.
- 2) Remove the rear cover.
- 3) Remove the feeder cover.
- 4) Remove the screw ①, and disconnect the 2 connectors ②; then, detach the harness guide ③.

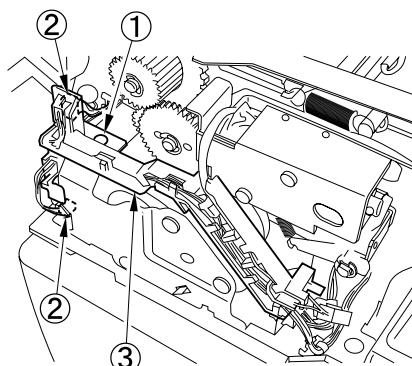


Figure 3-254

- 5) Remove the 3 screws ①, and disconnect the connector ②; then, detach the pressure motor drive unit ③.

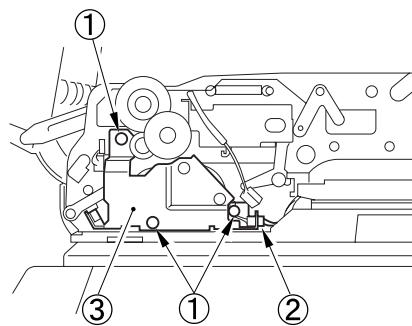


Figure 3-255

6) Remove the screw ①, and disconnect the connector ②; then detach the cooling fan ③.

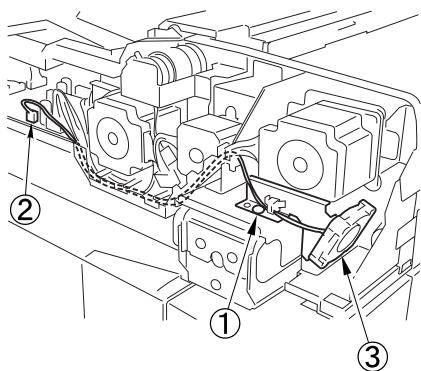


Figure 3-256

7) Loosen the 2 screws ①, move the feed motor ② downwards, and tighten the 2 screws ①.

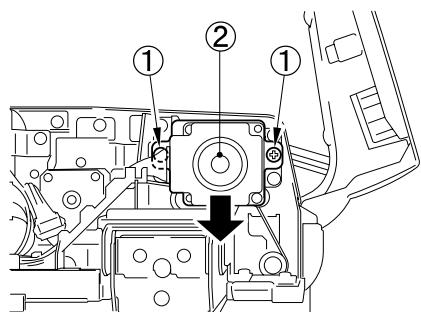


Figure 3-257

Note: When mounting it, loosen the screws and return the feed motor to its original position.

8) Remove the 4 screws ①, and disconnect the connector ②; then, detach the feed motor unit ③.

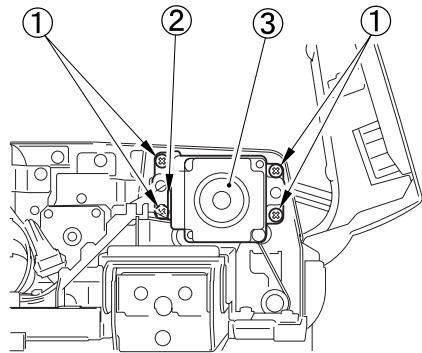


Figure 3-258

Note: When mounting it, be sure that the timing belt ① is securely fitted to the pulley.

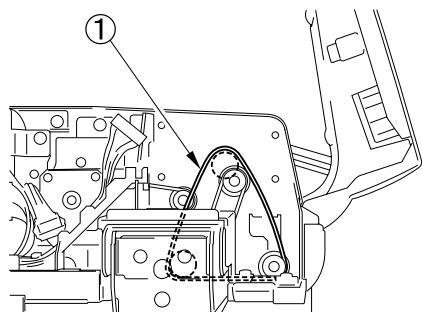


Figure 3-259

8) Remove the platen roller. See the "Platen Roller" Section for details.

9) Open the opening guide ①, remove the two screws ②, and remove the feed guide ③ by freeing its bottom slightly from the read roller.

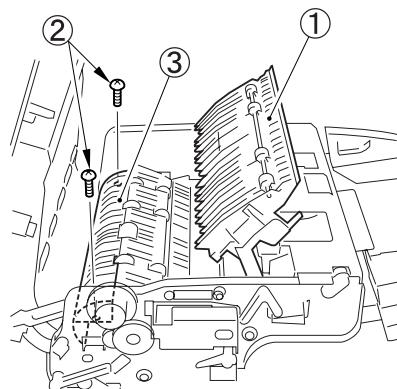


Figure 3-260

Note: When installing the feed guide, secure it so that (both) projections ① touch the metal plate ② to keep the clearance for document feeding constant.

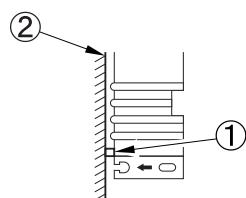


Figure 3-261

10) Remove the E-ring ①, gear ②, and bushing ③ on the front side.

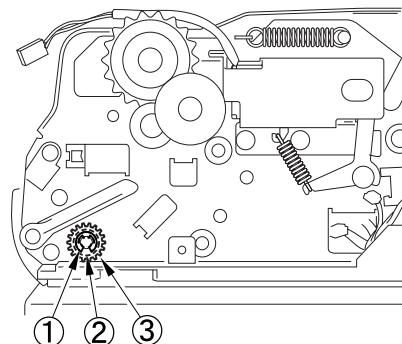


Figure 3-262

11) Remove the E-ring ①, gear ②, and bearing ③ on the rear side.

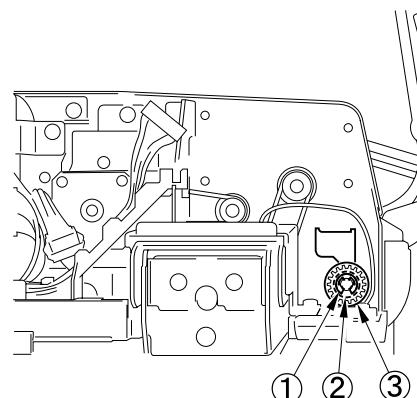


Figure 3-263

12) Release the pressure spring ①.

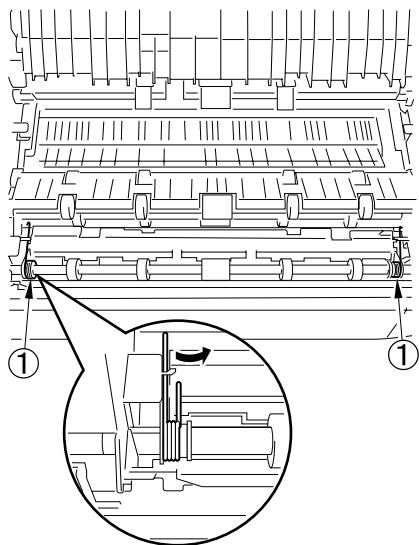


Figure 3-264

Note: When installing the pressure spring, install it at its correct position so that both ends of it do not project to the outside.

13) Remove the 2 E-rings ①.

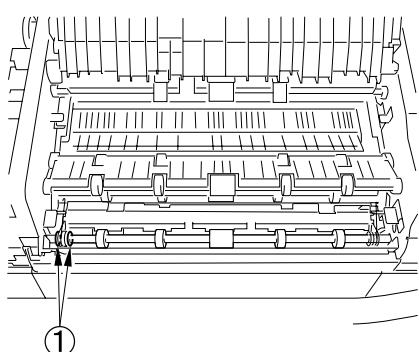


Figure 3-265

14) Slide the bushing ① (equipped with a plate) to the rear to detach the platen roller follower 1 unit ②.

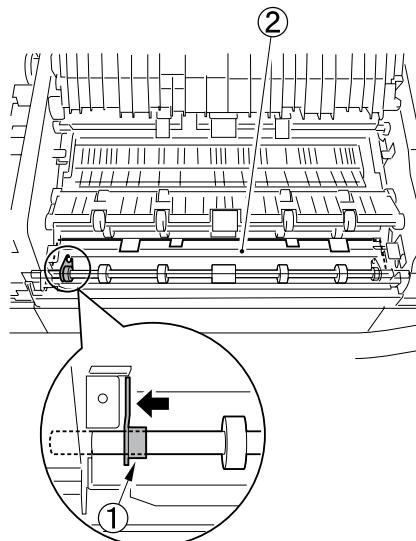


Figure 3-266

Note: When the roller shaft of the unit is removed, the platen roller follower 1 unit falls. Be careful not to lose it. When reinstalling it, insert both ends of the roller shaft into the holes in the bushings with a plate.

15) Open the feeder, and push down the read roller 1 unit ①, and remove it.

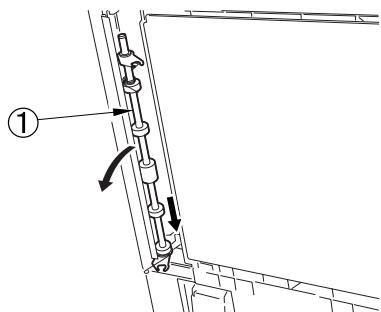


Figure 3-267

16) Remove the 2 E-rings ①, the 2 pressure springs ②, and the 2 bushings ③ with a plate; then, detach the read roller 1 ④.

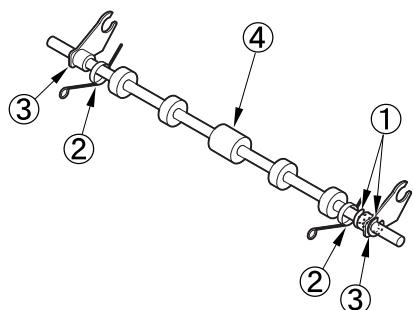


Figure 3-268

10. Platen Roller

1) Remove the screw (self-tapping) ①, slide the platen roller follower 2 unit ② upwards, and remove the fitting part ③. Then, remove the platen roller downstream.

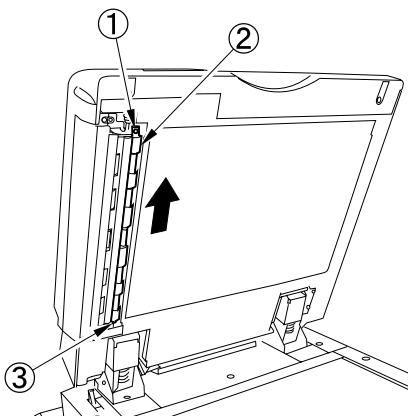


Figure 3-269

Note: Upon installation, push in the platen roller follower 2 unit.

2) Detach the belt ①, and remove the 2 plastic E-rings ②, and the 2 bushings ③; then, detach the platen roller ④.

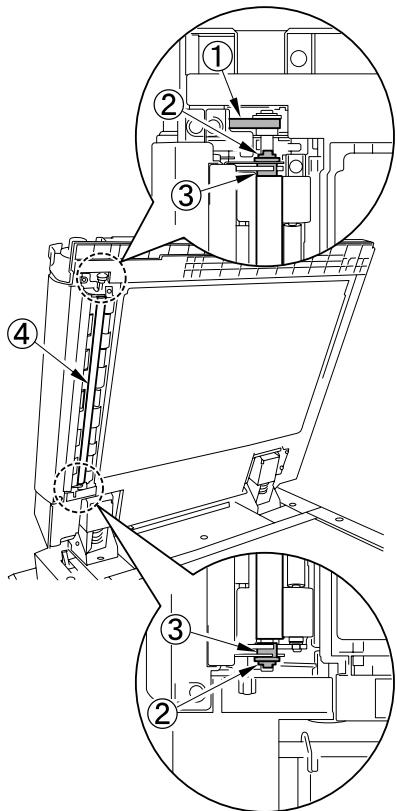


Figure 3-270

Note: Upon installation, align the metal and plastic bushing insertion position with the bushing notch position to install the bushing.

11. Delivery Reversal Lower Roller

- 1) Open the feeder cover, and detach the inside cover.
- 2) Open the opening guide ① slightly and remove the section A, open it widely and slide it, remove the opposite fitting part.

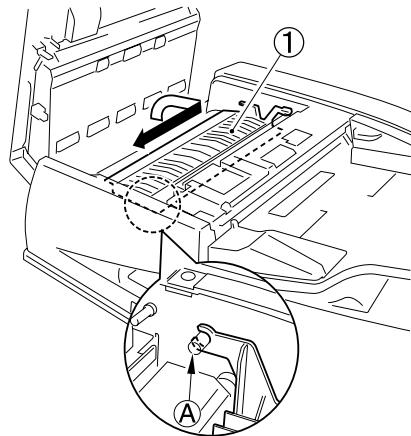


Figure 3-271

- 3) Remove the 2 screws ①, and detach the reversal guide ②.

Note: Cables are connected to the rear of the reversal guide.

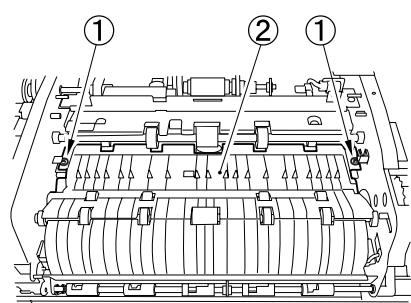


Figure 3-272

4) Push down the roller guide ①, and push down and detach the delivery reversal lower roller ②.

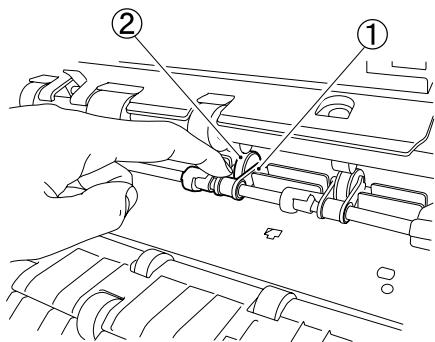


Figure 3-273

Note: When installing the delivery reversal lower roller, align the roller shaft with the roller guide groove, then turn the roller.

12. Reversal Upper Roller

- 1) Remove the opening guide.
- 2) Remove the E-ring ①, and remove the shaft ②; then, detach the reversal upper roller ③.

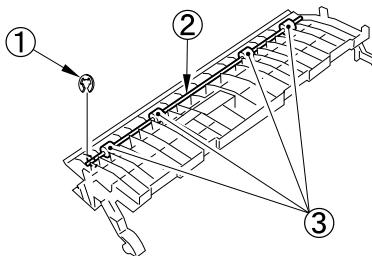


Figure 3-274

Note: 2 coil springs will come off. Be careful not to lose them.

13. Reversal Lower Roller

- 1) Remove the front cover.
- 2) Remove the rear cover.
- 3) Remove the screw ①, and disconnect the 2 connectors ②; then, free the harness guide ③.

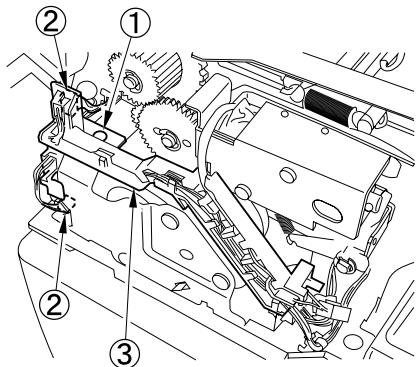


Figure 3-275

- 4) Remove the 3 screws ①, and disconnect the connector ②; then, detach the pressure motor drive unit ③.

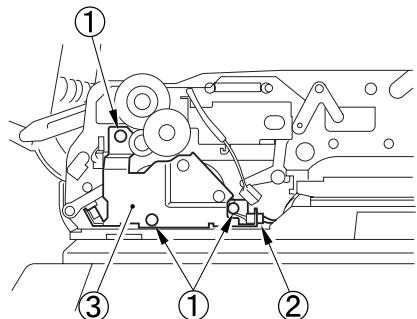


Figure 3-276

- 5) Remove the screw ①, and free the cooling fan ②.

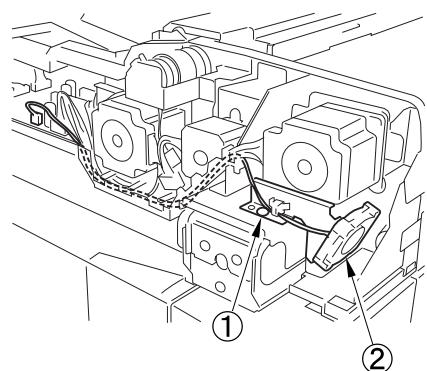


Figure 3-277

- 6) Loosen the 2 screws ①, move the feed motor ② downwards, and tighten the 2 screws ①.

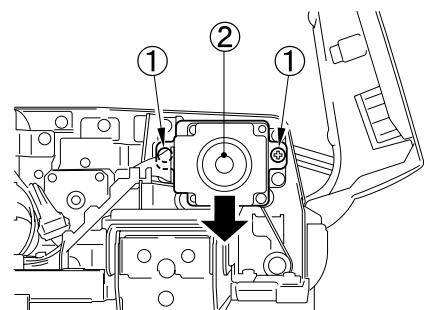


Figure 3-278

Note: When mounting it, loosen the screws and return the feed motor to its original position.

7) Remove the 4 screws ①, and disconnect the connector ②; then, detach the feed motor unit ③.

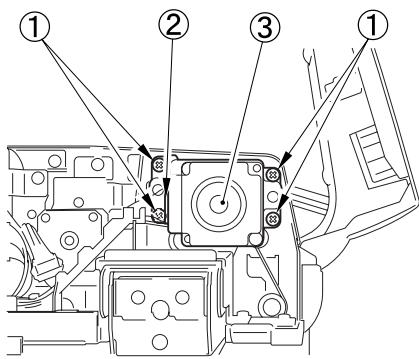


Figure 3-279

8) Remove the 2 E-rings ①, gear ②, and 2 bushings ③; then, detach the reversal lower roller ④.

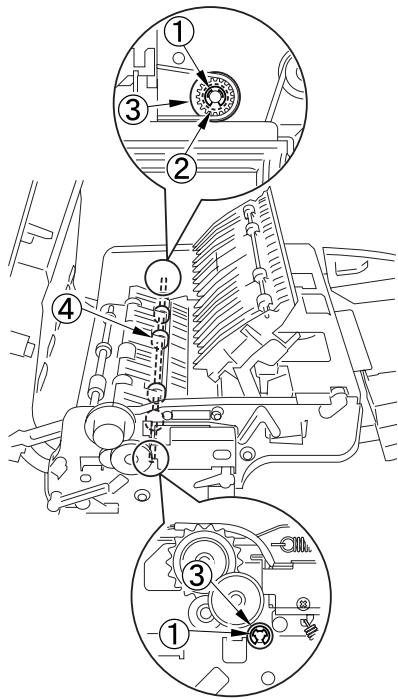


Figure 3-280

14. Dust-Collecting Tape

1) Remove the dust-collecting tapes Ⓐ, Ⓑ, Ⓒ, Ⓓ, and Ⓔ; then, attach new dust-collecting tapes over the same locations Ⓐ, Ⓑ, Ⓒ, Ⓓ, and Ⓔ.

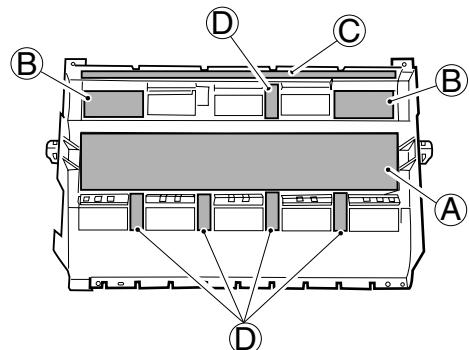


Figure 3-281

D. Control System

1. ADF Driver PCB

- 1) Remove the rear cover.
- 2) Remove the 3 screws ①, and disconnect the 7 connectors ②; then, detach the harness guide ③.

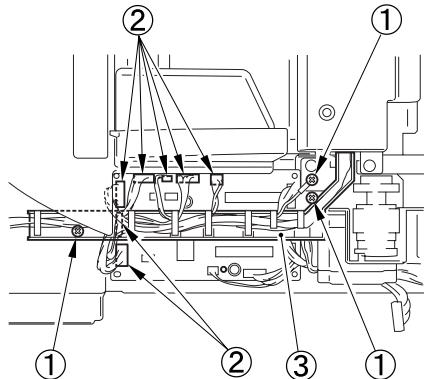


Figure 3-282

- 3) Disconnect the 5 connectors ①, and remove the 2 screws ②; then, detach the ADF driver PCB ③.

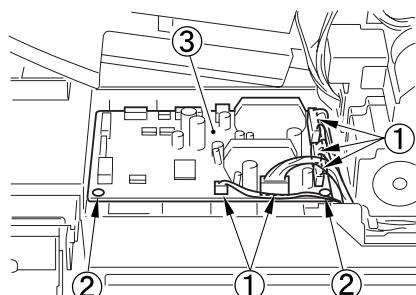


Figure 3-283

2. Document Width Volume

- 1) Open the feeder cover and detach the inside cover.
- 2) Shift up the document pickup tray; then, remove the 3 screws ①, and detach the document pickup tray cover ②.

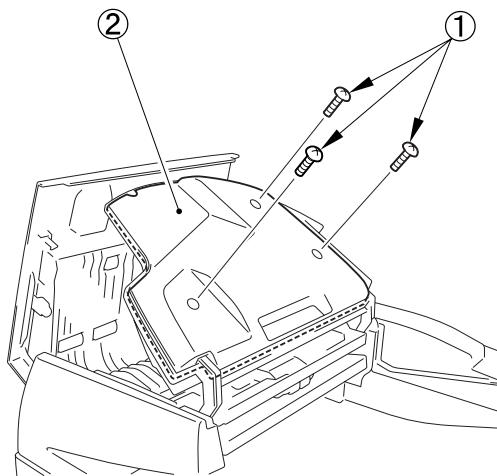


Figure 3-284

- 3) Disconnect the 3 connectors ①, and remove the 2 screws ②; then, detach the document width volume ③.

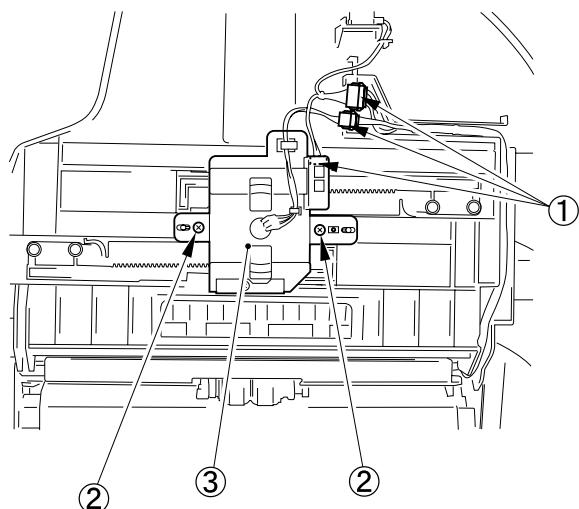
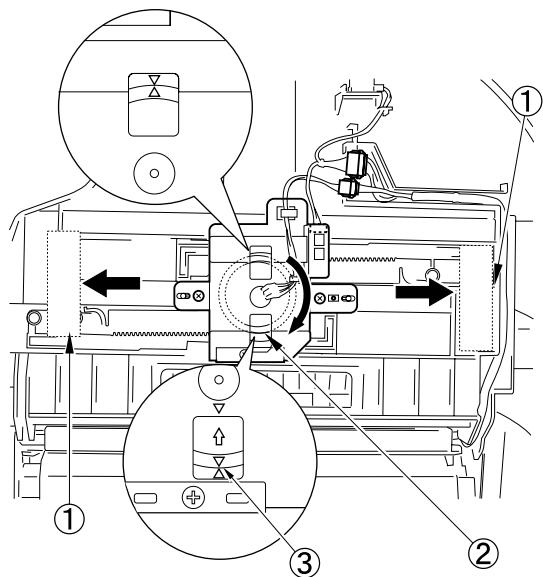


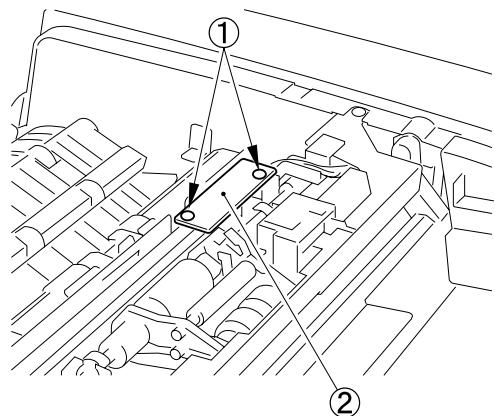
Figure 3-285

Note: Mounting

Widen the document guide ① to its maximum width. Next, fully rotate the gear ② counterclockwise so that the arrows ③ meet up.

**Figure 3-286****3. Post-Separation Sensor**

- 1) Open the feeder cover and remove the inside cover.
- 2) Remove the two screws ①, and disconnect the connector on the back; then, detach the post-separation sensor ②.

**Figure 3-287**

Note: After sensor replacement, sensor adjustment must be performed. See the "AFTER REPLACING PARTS" section for details.

4. Read Sensor

- 1) Remove the front cover.
- 2) Open the opening guide ①, remove the two screws ② and connector ③, and remove the feed guide ④ by freeing its bottom slightly from the read roller.

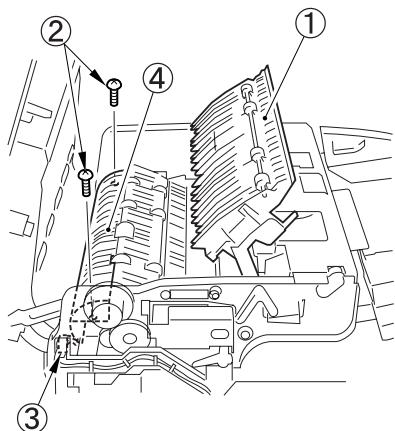


Figure 3-288

Note: When installing the feed guide, secure it so that (both) projections ① touch the metal plate ② to keep the clearance for document feeding constant.

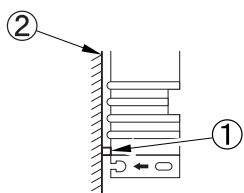


Figure 3-289

- 3) Remove the 2 screws ①, and disconnect the connector ②; then, detach the read sensor ③.

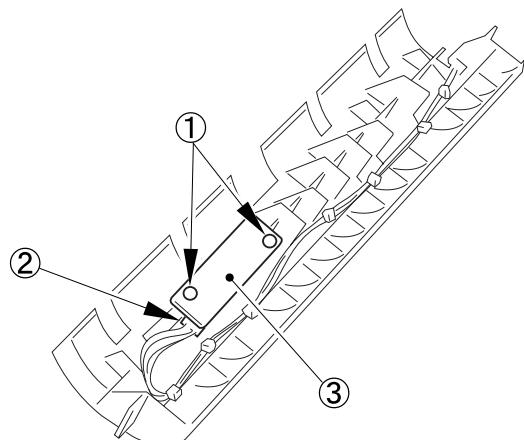


Figure 3-290

Note: After sensor replacement, sensor adjustment must be performed. See the "AFTER REPLACING PARTS" section for details.

5. Delivery Reversal Sensor

- 1) Open the opening guide ① slightly and remove the section A, open it widely and slide it, remove the opposite fitting part, and remove the opening guide.

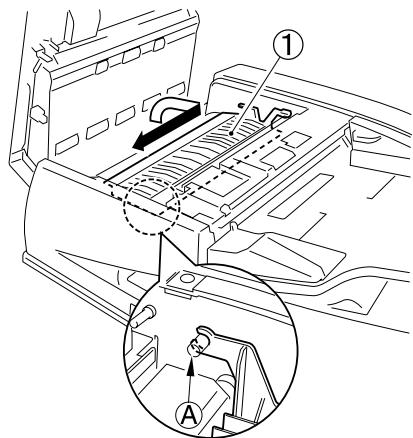


Figure 3-291

- 3) Remove the 2 screws ①, and disconnect the connector ②; then, detach the delivery reversal sensor ③.

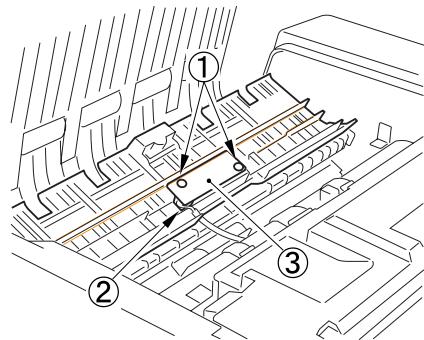


Figure 3-293

Note: After sensor replacement, sensor adjustment must be performed. See the "AFTER REPLACING PARTS" section for details.

- 2) Remove the 2 screws ①, and turn the delivery guide ② over.

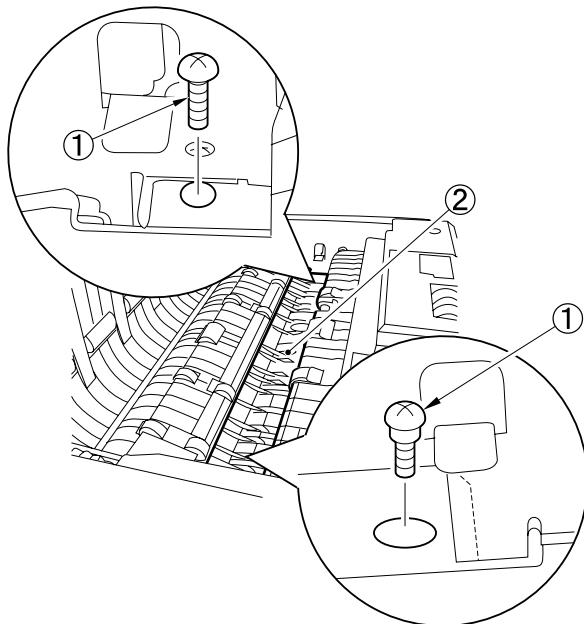


Figure 3-292

6. Pressure Solenoid

- 1) Remove the front cover.
- 2) Remove the screw ①, and disconnect the 2 connectors ②; then, free the harness guide ③.

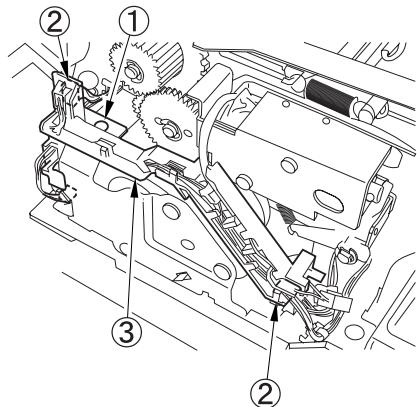


Figure 3-294

- 4) Remove the 2 screws ①, and detach the pressure solenoid ②.

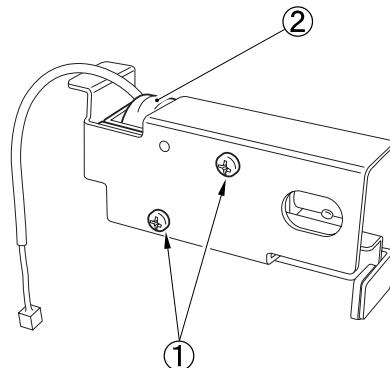


Figure 3-296

- 3) Remove the 2 screws ①, and remove the spring ②; then, detach the pressure solenoid unit ③.

Note: It may be difficult to remove the unit because a cushioning rubber sheet has been attached to the rear of the solenoid mounting plate.

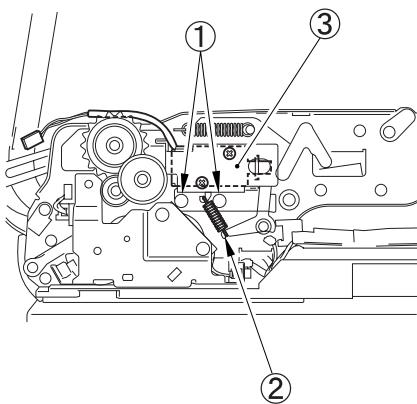


Figure 3-295

Note: Upon assembly, insert the solenoid plunger into the arm notch.

7. Pickup Clutch Unit

- 1) Remove the 2 screws ①, disconnect the connector ②, and detach the mounting plate ③.

Note: The bushing attached to the mounting plate will also come off. Be careful not to lose it.

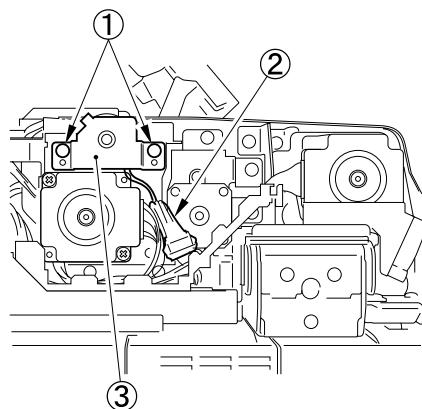


Figure 3-297

- 2) Slide the pickup clutch unit ① slightly toward you, and release the hook ② of the connection guide. Detach the pickup clutch unit while moving it so that the clutch arm ③ does not strike any other parts.

Note: The bushing attached to the clutch shaft will also come off. Be careful not to lose it.

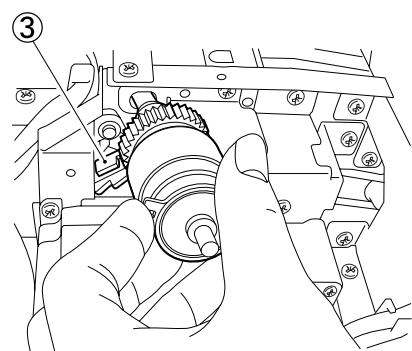
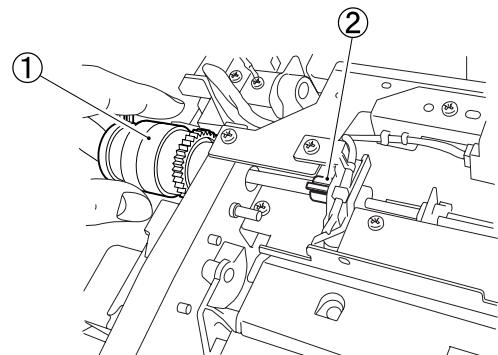
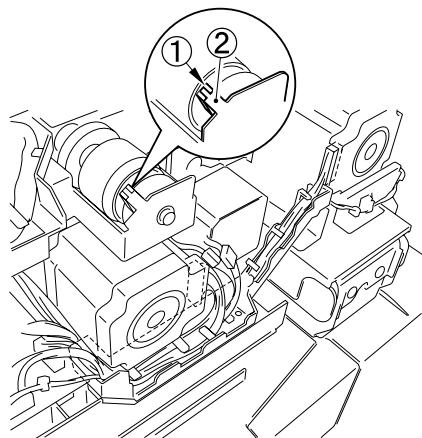


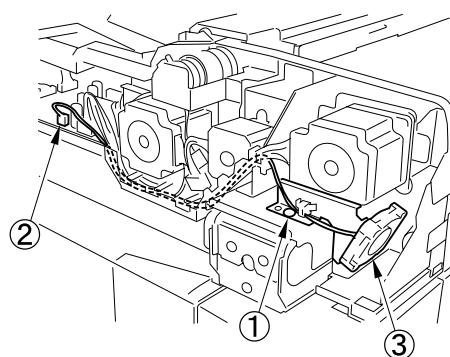
Figure 3-298

Precautions on assembly

- 1) Align the connection guide position with the clutch shaft position for assembly. Pay attention to the clutch arm position. See the "Drive Unit" section for details.
- 2) Insert the projection ② on the mounting plate into the groove ① for clutch positioning.

**Figure 3-299****8. Cooling Fan**

- 1) Remove the rear cover.
- 2) Remove the screws ①, and disconnect the connector ② ; then, detach the cooling fan ③.

**Figure 3-300**

III. READER

A. Exterior

1. Platen Glass

- 1) Remove the 2 screws ①, and detach the right glass retainer ②; then, detach the platen glass ③.

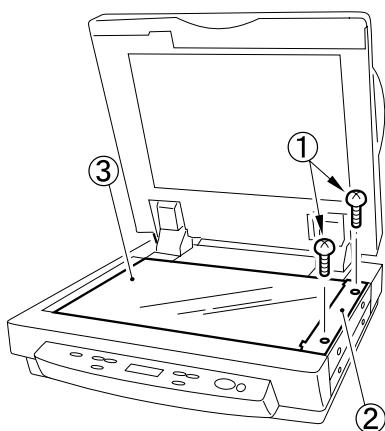


Figure 3-301

Note: When detaching the platen glass, take care not to touch the standard white plate attached to its back. If soiled, clean it.

2. ADF Reading Glass

- 1) Remove the 2 screws ①, and detach the glass retainer ②.

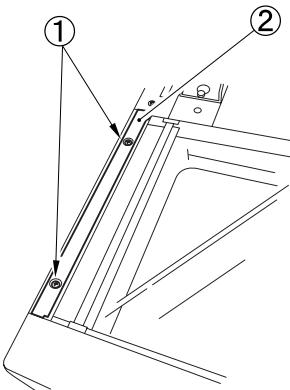


Figure 3-302

- 2) Pull out the ADF reading glass ①.

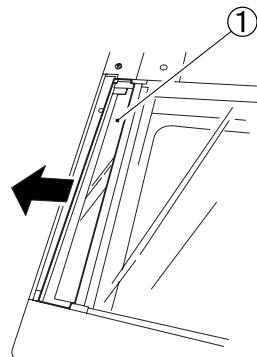


Figure 3-303

3. Operation Panel Assembly

- 1) Remove the 2 screws ① (1 each on the left and right).

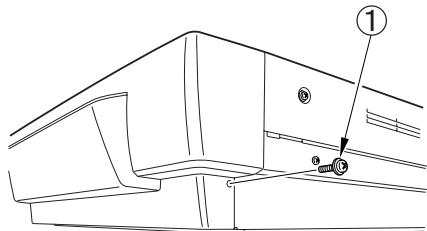


Figure 3-304

- 2) Remove the 2 fitting parts ① (marked with \triangle) using a tool with a flat and thin tip, and detach the operation panel assembly ②.

Disconnect the connector that connects the operation panel assembly and controller.

Note: Take care to prevent damage to the platen glass.

Note: When assembling the operation panel assembly, insert the pasted sheet ① under the platen glass.

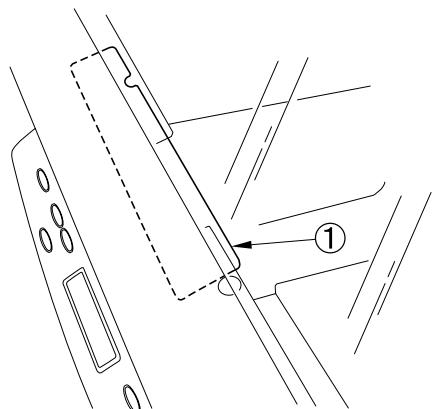


Figure 3-306

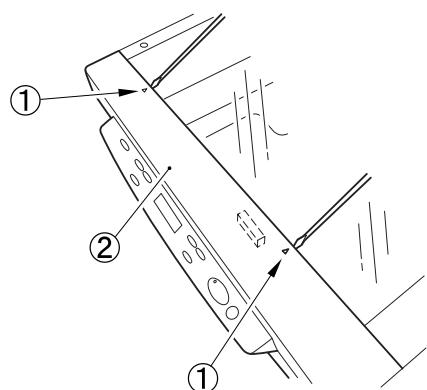
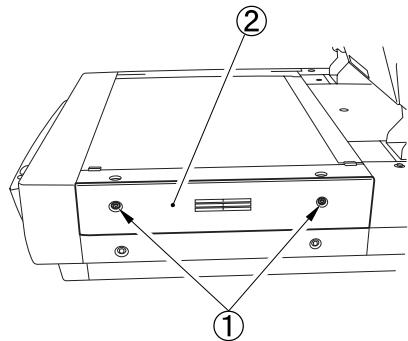


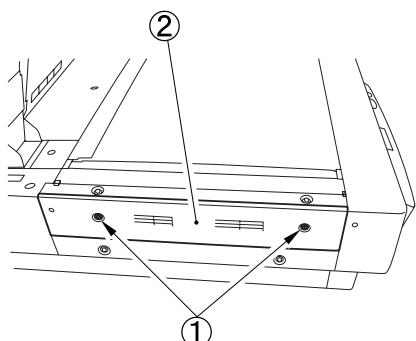
Figure 3-305

4. Reader Left/Right Covers

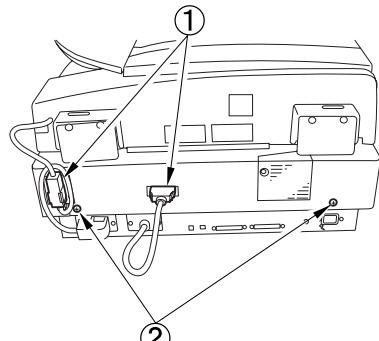
- 1) Remove the 2 screws ①, and detach the reader right cover ②.

**Figure 3-307**

- 2) Remove the 2 screws ①, and detach the reader left cover ②.

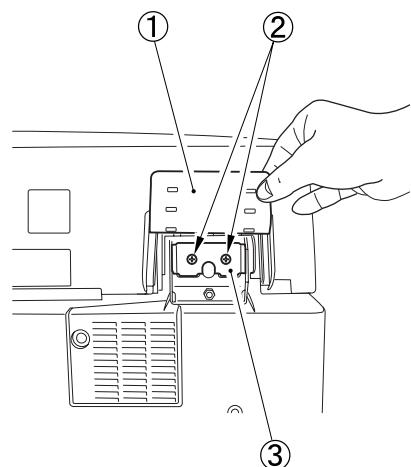
**Figure 3-308****5. Reader Rear Cover**

- 1) Disconnect the 2 connectors ① (with locks) and remove the 2 screws ②.

**Figure 3-309**

- 2) Flip open the rubber covers ① of the left and right hinge parts, remove the screws ② (2 each on the left and right), and detach the 2 angle control plates ③.

Note: This work is performed to easily remove screws in step 3 below.

**Figure 3-310**

3) Remove the 3 screws ①, and slide the reader rear cover ② toward the rear to detach.

Note:Take care not to damage the ADF opening sensor arm ③.

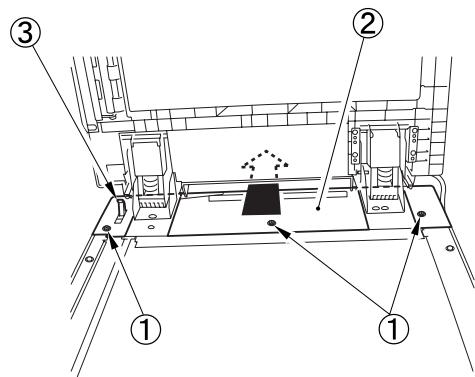


Figure 3-311

Note:When installing the reader rear cover, insert the sheet ① pasted to the cover under the platen glass.

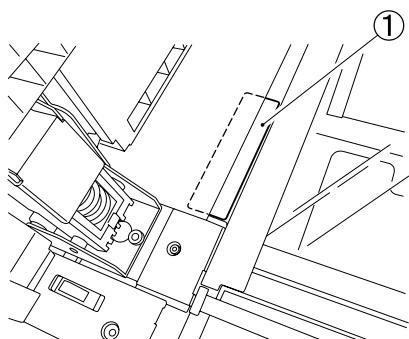


Figure 3-312

B. Drive/Control System

1. CCD Unit Cover

- 1) Detach the platen glass, reader right cover.
- 2) Remove the 9 screws ①, release the 2 hooks ②, and detach the CCD unit cover ③.

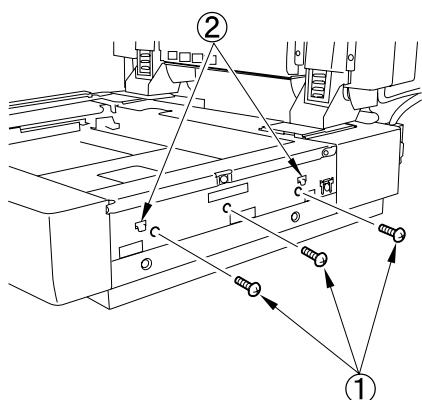
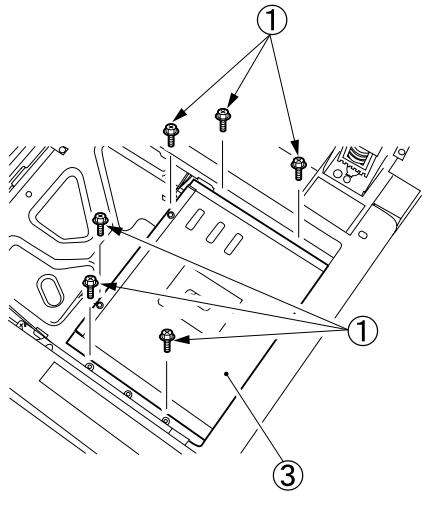


Figure 3-313

2. Scanning Lamp

- 1) Remove the platen glass and other external covers.
- 2) Detach the CCD unit cover.
- 3) Disconnect the connector ①, release the hook of cable stopper ②, and free the cable ③ from the cable guide ④.

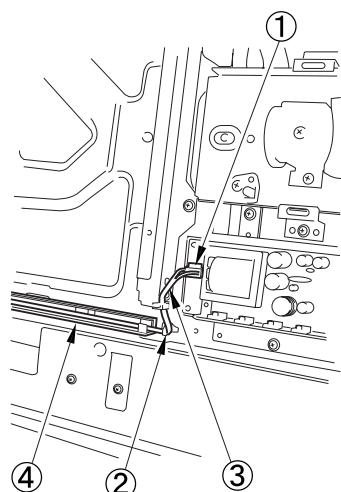


Figure 3-314

- 4) Slide the No. 1 mirror base ① to the right to match it against the cut-off ② of the frame.

Note: When sliding the No. 1 mirror base, be sure to hold it by the cut-up tab ④ of the mirror stay.

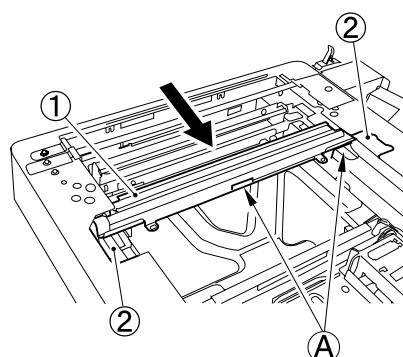


Figure 3-315

5) Remove the 2 screws ①, and detach the scanning lamp ②.

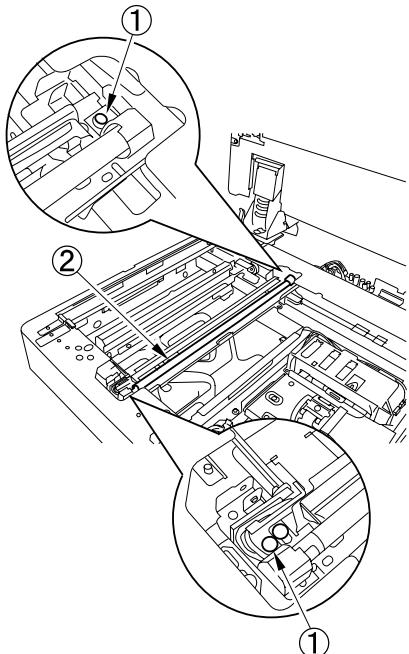


Figure 3-316

3. Reader Controller PCB

- 1) Remove the platen glass and reader right cover.
- 2) Detach the CCD unit cover.
- 3) Disconnect the 5 flat cables ① and the connector ② then, remove the 4 screws ③, and detach the reader controller PCB ④.

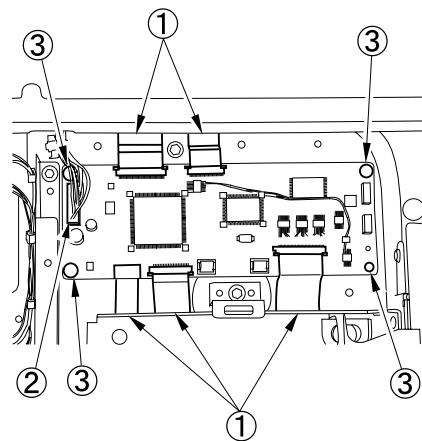


Figure 3-317

Note: Disconnecting the flat cable

Slide the locking lever ① to the direction of the arrow; then, disconnect the flat cable ②.

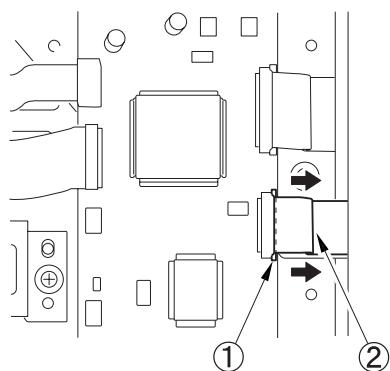


Figure 3-318

Note: For a measure to be taken after replacing the reader controller PCB, see the "AFTER REPLACING PARTS" section.

4. Interface PCB

- 1) Remove the reader rear cover.
- 2) Remove the 4 RS tightening screws ①, and remove the 2 binding screws ②; then, detach the interface PCB cover ③.

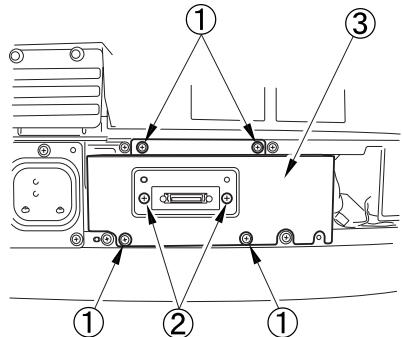


Figure 3-319

- 4) Remove the 9 screws ①, and detach the interface PCB ②.

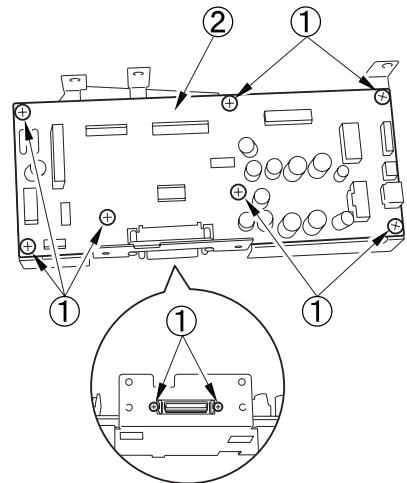


Figure 3-321

- 3) Disconnect the 7 connectors ①, detach the 2 flat cables ②, and remove the 5 screws ③; then, detach the interface PCB unit ④.

Note: The connectors for the flat cables have the locking lever.

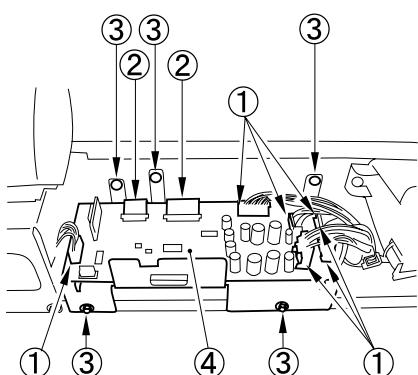


Figure 3-320

Note: When installing the interface PCB, place the tie-wrap ① closer to the PCB than to the wire guide ② so that the harness does not touch the scanner motor.

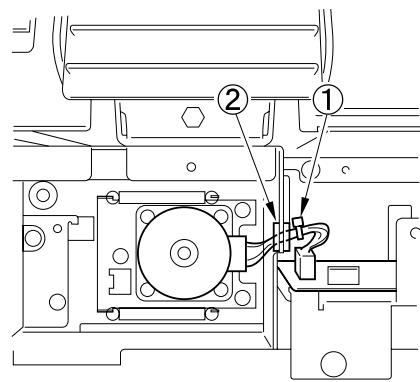


Figure 3-322

5. Inverter PCB

- 1) Remove the platen glass and reader right cover.
- 2) Detach the CCD unit cover.
- 3) Disconnect the connector ① and the flat cable ②; then, remove a screw ③, free the 2 PCB supports ④, and detach the inverter PCB ⑤.

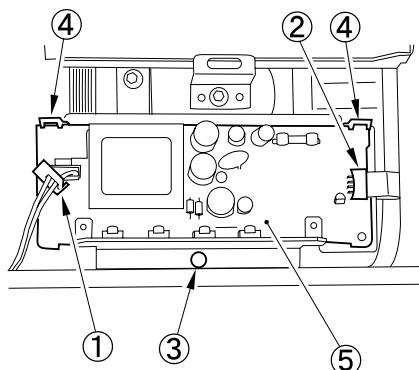


Figure 3-323

Note: For a measure to be taken after replacing the inverter PCB, see the "AFTER REPLACING PARTS" section.

6. CCD Unit

- 1) Remove the platen glass and reader right cover.
- 2) Detach the CCD unit cover.
- 3) Disconnect the 2 flat cables ① from the reader controller PCB; then, remove the 2 screws ②, detach the 2 leaf springs ③, and detach the CCD unit ④.

Note: The connectors for the flat cables have the locking lever.

Note: Do not lose the other screws for positioning the CCD unit.

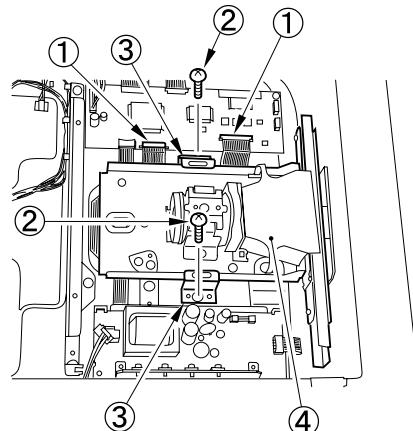


Figure 3-324

Note: For a measure to be taken after replacing the CCD unit PCB, see the "AFTER REPLACING PARTS" section.

7. Scanner Motor

- 1) Remove the reader rear cover.
- 2) Remove the 4 screws ①, and detach the cover ②.

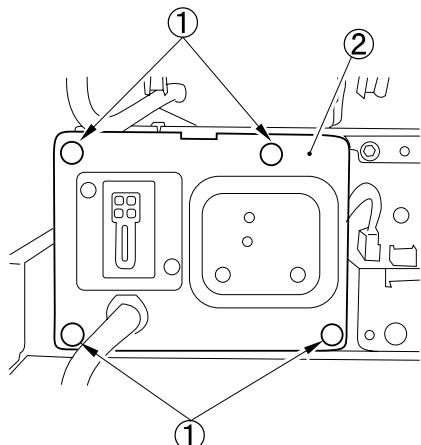


Figure 3-325

- 3) Release the 2 hooks of the cable stoppers ①, and free the cover ②.

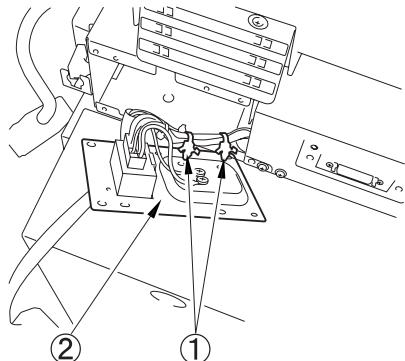


Figure 3-326

- 4) Remove the 3 screws ① and the 2 springs ②, and slide the scanner motor ③ toward the arrow.

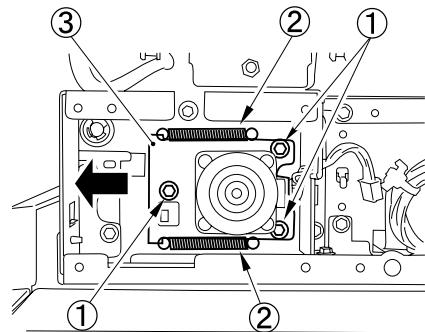


Figure 3-327

- 5) Disconnect the connector ①, and detach the scanner motor ②.

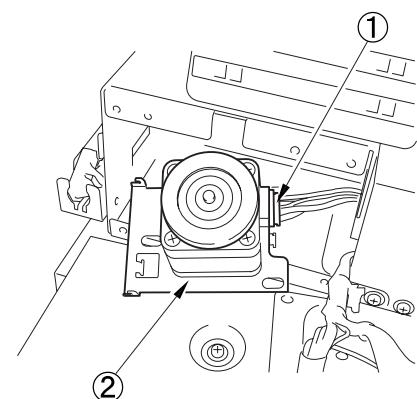


Figure 3-328

Note: When mounting the scanner motor, be sure that the timing belt ③ is securely attached to the scanner pulley ① and the motor shaft ②. Since the tension of the timing belt is adjusted with the force of 2 springs, install the springs, then secure the screws.

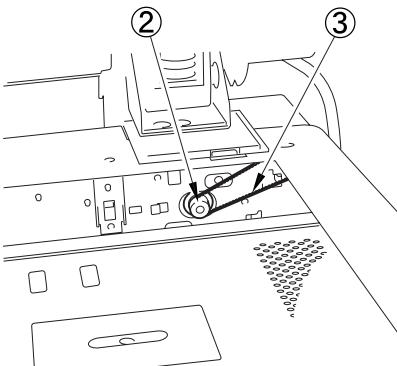
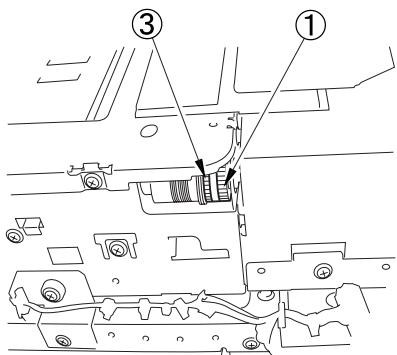


Figure 3-329

Note: When installing the scanner motor, place the tie-wrap ① closer to the interface PCB than to the wire guide ② so that the harness does not touch the scanner motor.

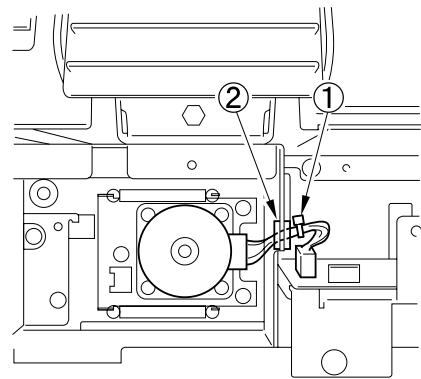
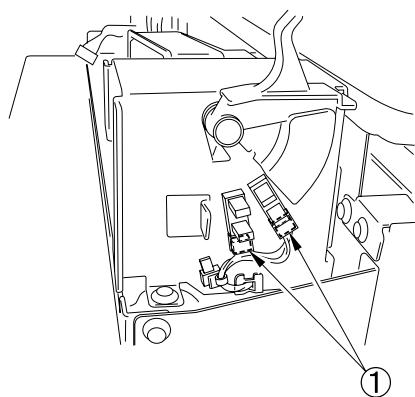


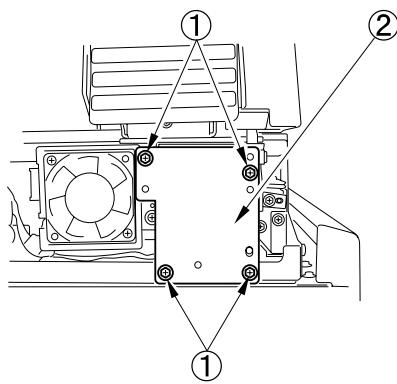
Figure 3-330

8. ADF Opening Sensor

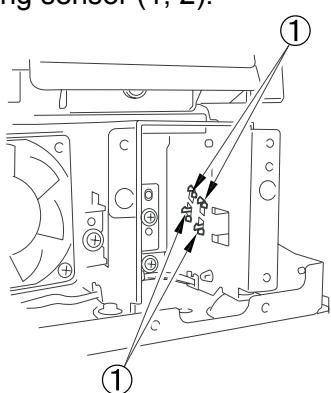
- 1) Remove the reader rear cover.
- 2) Remove the 2 connectors ①.

**Figure 3-331**

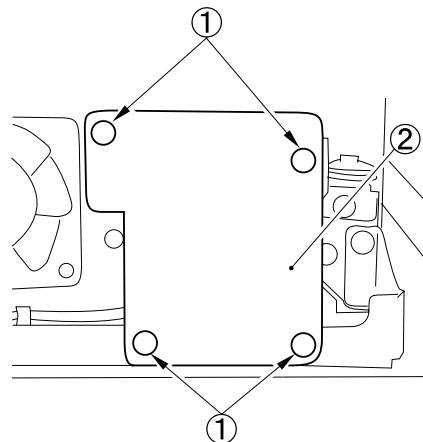
- 3) Remove the 4 screws ①, and detach the reinforcing plate ②.

**Figure 3-332**

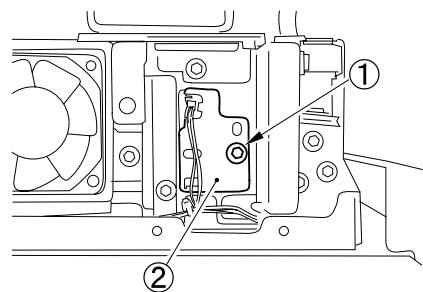
- 4) Free the hook ①, and detach the ADF opening sensor (1, 2).

**Figure 3-333****9. Scanner HP Sensor**

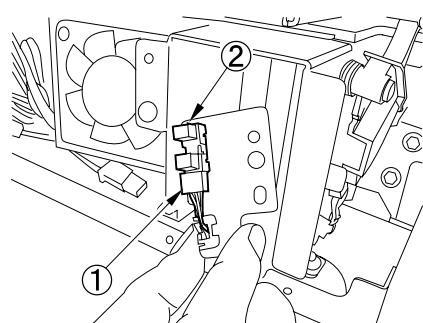
- 1) Remove the reader rear cover.
- 2) Remove the 4 screws ①, and detach the cover ②.

**Figure 3-334**

- 3) Remove the screw ①, and detach the sensor mounting plate ②.

**Figure 3-335**

- 4) Remove the screw ①, and detach the scanner HP sensor ②.

**Figure 3-336**

10. Cooling Fan

- 1) Remove the reader rear cover.
- 2) Remove the screw ① and 2 screws ②, and detach the cooling fan ③.

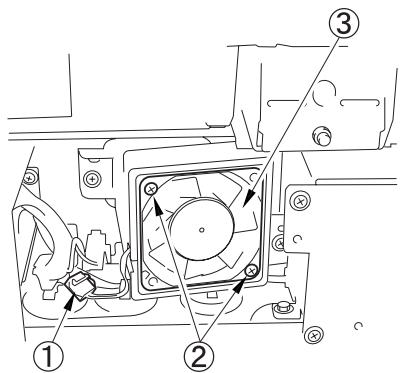


Figure 3-337

11. Scanner Drive Cable

Note: Since this is a complicated disassembly, do it only when required. Special tools are required for assembly. Prepare for the following tools before disassembly:

- Mirror positioning tool (front, rear)
FY9-3009-040

- 1) Remove the feeder.
- 2) Remove the platen glass.
- 3) Remove the other external covers.
- 4) After removing the 2 screws ① and detaching the ADF glass retainer ②, remove the ADF reading glass ③. And remove the 2 screws ④, and detach the left glass retainer ⑤.

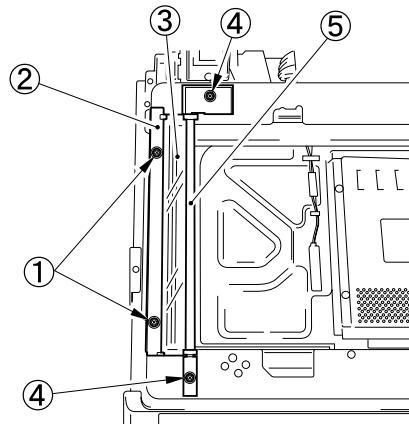


Figure 3-338

5) Remove the screw ①, and detach the ADF right screw cover ②.

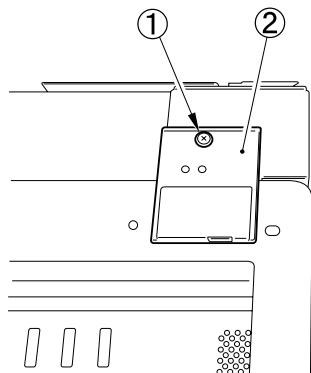


Figure 3-339

8) Disconnect the 9 connectors ①, and remove the 5 screws ②; then, detach the interface PCB ③ together with its base.

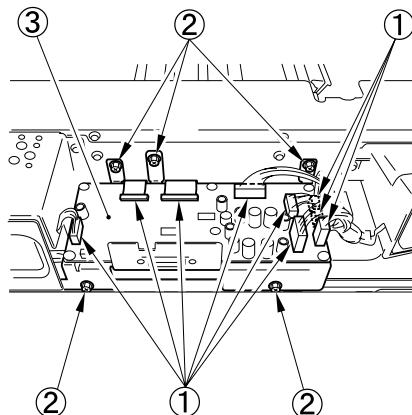


Figure 3-342

6) Remove the screw ①, and detach the ADF left screw cover ②.

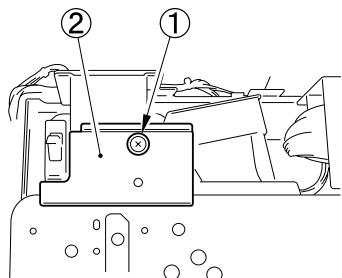


Figure 3-340

9) Disconnect the connector ①, and open the 3 wire saddles ②. And remove the 4 screws ③, and detach the motor cover ④ together with the harness.

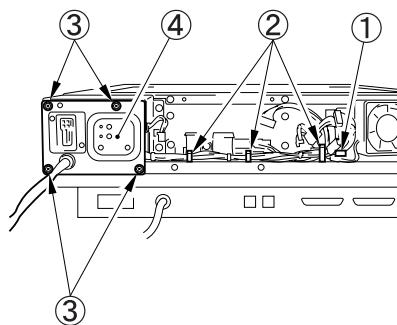


Figure 3-343

7) Remove the 6 screws ①, and detach the interface PCB cover ②.

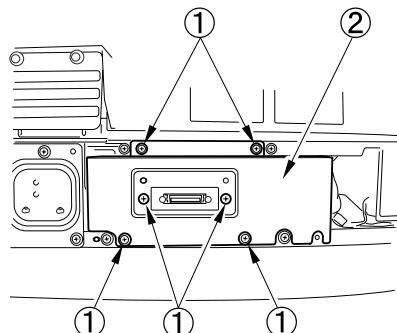


Figure 3-341

10) Free the harness from the wire saddle ①, and remove the 6 screws ②; then, detach the motor frame ③.

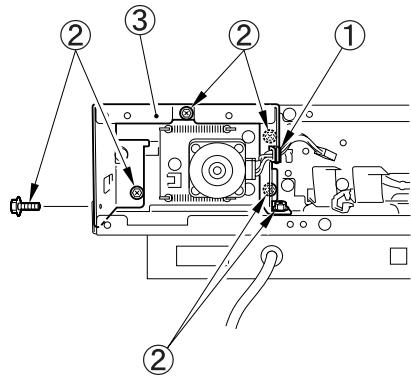


Figure 3-344

11) Remove the 4 screws ①, and detach the ADF opening sensor cover ②.

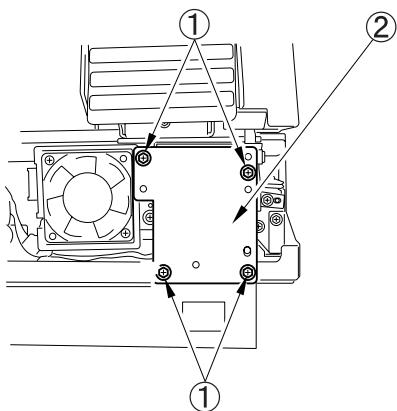


Figure 3-345

12) Disconnect the 2 connectors ①, and detach the snap-open band ②; then, free the harness from the wire saddle ③.

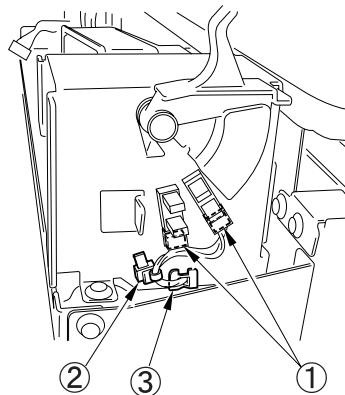


Figure 3-346

13) Free the harness from the wire saddle ①, and remove the 6 screws ②; then, detach the ADF opening sensor base ③.

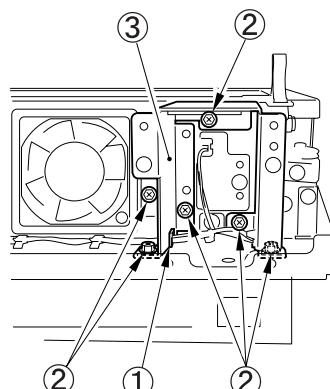


Figure 3-347

14) Remove the 24 screws ①, and detach the reader upper frame ②.

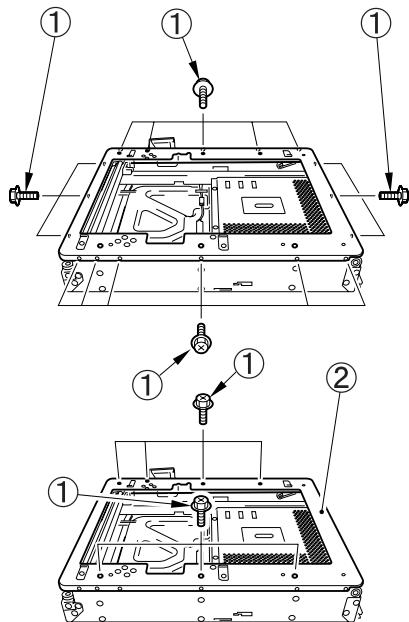


Figure 3-348

15) Remove the 2 cable fixing screws ② of the No. 1 mirror base ①. Remove the spring ③ used to hold the cable in place. Free the 2 hooks ④ of the cable from the right side of the reader frame. Then, free the cable from the pulleys.

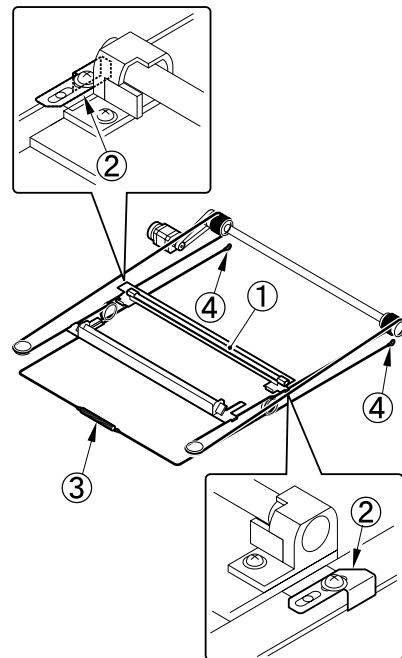


Figure 3-349

Note: Mounting

- 1) Fit the ball of the cable in the hole of the drive pulley ①, and wind the cable (4 times inside, 5 times outside); then, fix it in place using tape or the like. At this time, be sure that the cable fixing ② is on the inside. Next, engage the cable on the pulleys; then, engage one end of the cable on the hook ③ of the left side and the other end on the hook ④ of the right side. And temporarily fix the cable fixing plate ⑤ in place to the No. 1 mirror base ⑤. After that, mount the reader upper frame.

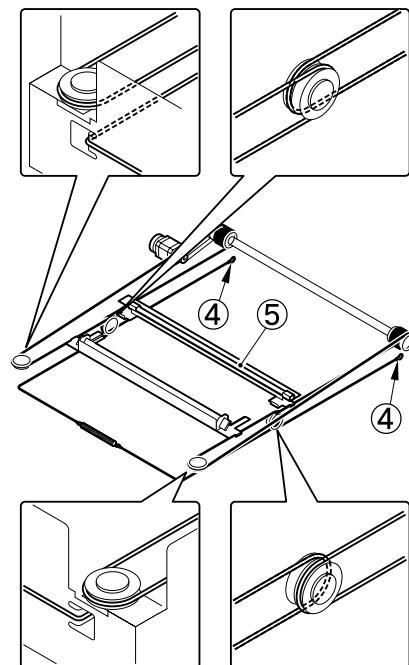
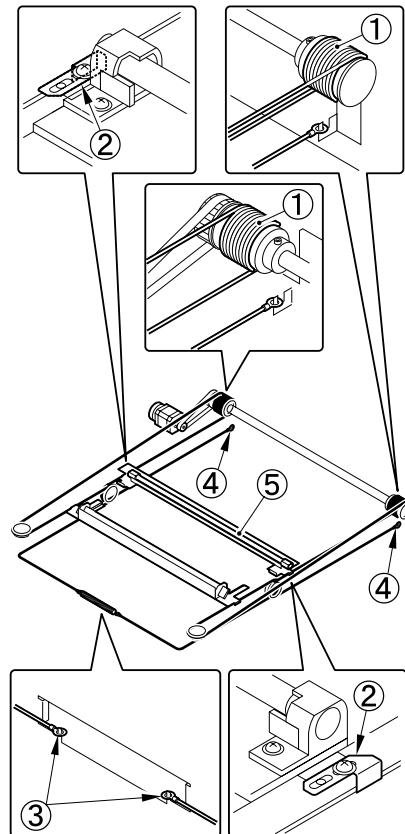


Figure 3-350

2) Set the pins at the rear of the mirror positioning tool (FY9-3009-040) in such a way so that the tool may be used for the machine.

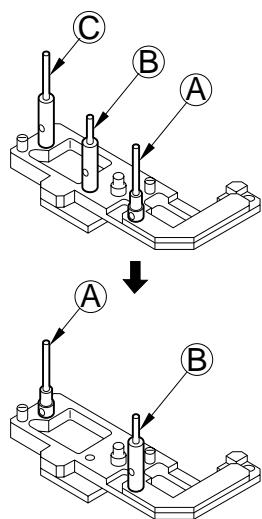


Figure 3-351

3) Set the pins at the front of the mirror positioning tool in such a way so that the tool may be used for the machine.

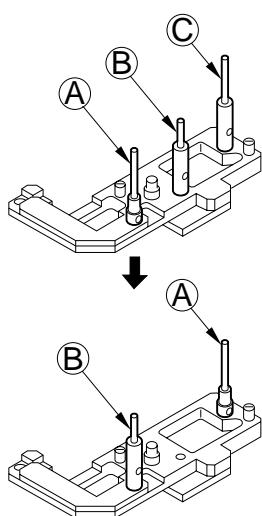


Figure 3-352

4) Fit the pins of the mirror positioning tool (front ② ; rear ③) of the mirror positioning tool into the holes ① of the No. 1 mirror base, No. 2 mirror base, and rail.

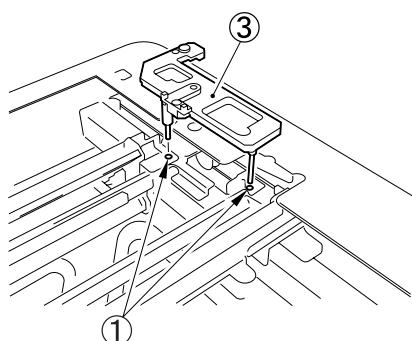
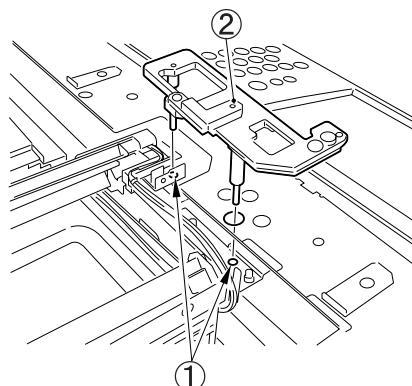


Figure 3-353

5) Fully secure the ends of the cable (you have temporarily fixed to the hooks of the reader frame previously).
 6) Tighten the screws for cable fixing plates.
 7) Detach the mirror positioning tool (front, rear).
 8) Put back the parts by reversing the steps used to detach them.

IV. CONTROLLER

1. DC Controller PCB

- 1) Remove the controller.
- 2) Remove all the connectors connected to the DC controller PCB ①.

Remove the 12 screws ②, the 4 screws (M2.5) ③, and then remove the DC controller PCB.

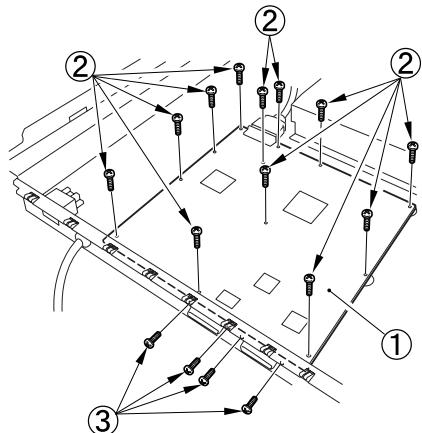


Figure 3-401

Note: Be careful not to get any screws caught between the PCB and the base plate.

2. Power Supply PCB

- 1) Remove the controller.
- 2) Remove the 2 screws (M3 x 5) ① and flip away the protection sheet ②.

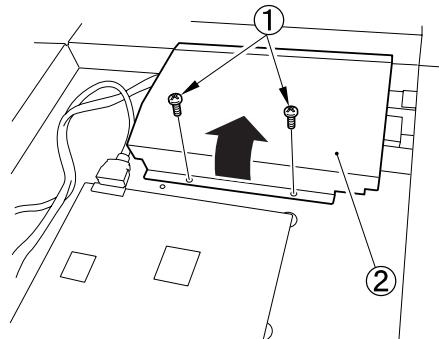


Figure 3-402

- 3) Remove all the connectors connected to the power supply PCB ①.

Remove the 6 screws ② and then remove the power supply PCB.

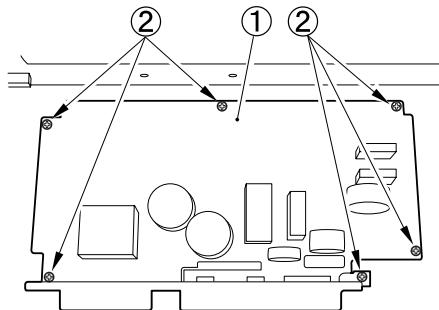
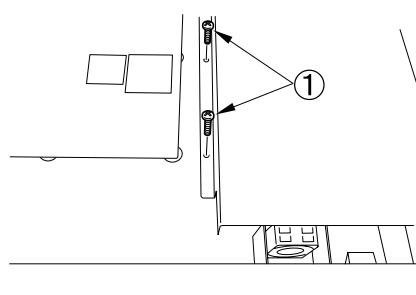


Figure 3-403

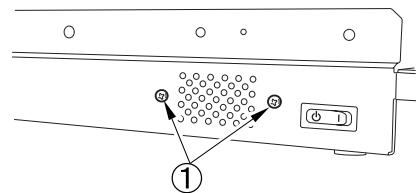
Note: Be careful not to get any screws caught between the PCB and the base plate.

3. Cooling Fan

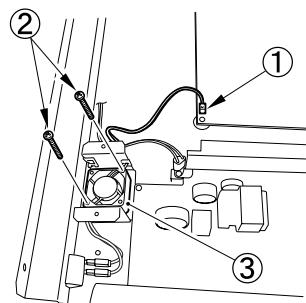
- 1) Remove the controller.
- 2) Remove the 2 screws ① for the protection sheet.

**Figure 3-404**

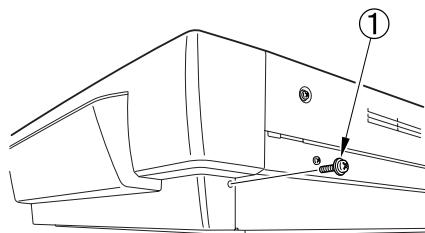
- 3) Remove the 2 screws ① and then remove the cooling fan (with mounting plate).

**Figure 3-405**

- 4) Remove the connector ① and the 2 screws ②, then remove the cooling fan ③.

**Figure 3-406****4. Operation Panel Assembly**

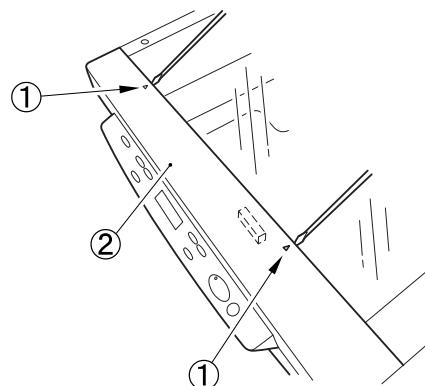
- 1) Remove the 2 screws ① (1 each on the left and right).

**Figure 3-407**

- 3) Remove the 2 fitting parts ① (marked with △) using a tool with a flat and thin tip, and detach the operation panel assembly ②.

Disconnect the connector that connects the operation panel assembly and controller.

Note: Take care to prevent damage to the platen glass.

**Figure 3-408**

Note: When assembling the operation panel assembly, insert the pasted sheet ① under the platen glass.

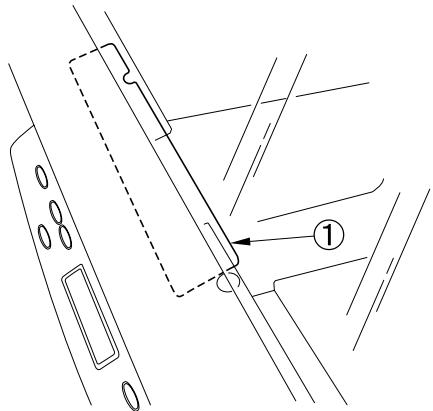


Figure 3-409

5. Operation Panel Cover/Panel Case Unit

- 1) Remove the operation panel assembly.
- 2) Remove the 5 screws ① (self-tapping screws), and then separate the operation panel cover ② and the panel case unit ③.

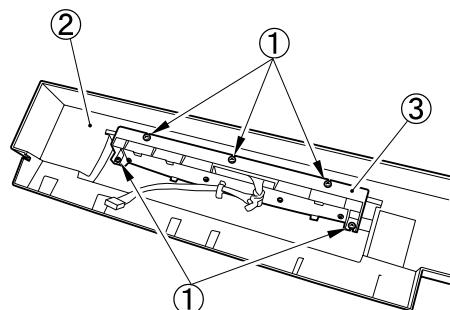


Figure 3-410

6. Switch PCB/LCD Unit

- 1) Remove the operation panel assembly.
- 2) Remove the panel case unit.
- 3) Remove the 4 screws ① (self-tapping screws), and then remove the assembly part ③ while pulling away the 2 hooks ②.

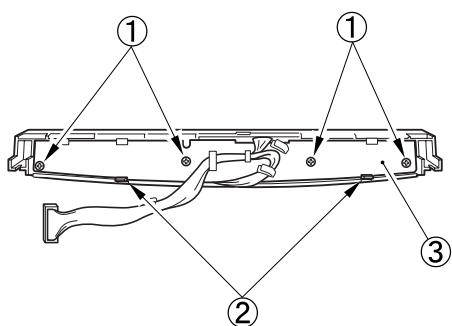


Figure 3-411

- 4) Remove the connector ① and separate the switch PCB ② and LCD unit ③.

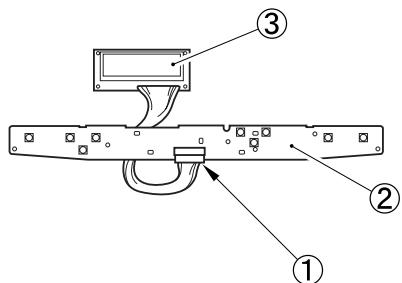


Figure 3-412

Note: Be careful not to lose the key tops embedded in the panel case.

CHAPTER 4

INSTALLATION & MAINTENANCE

I. SELECTION OF LOCATION.....	4-1	IV. PERIODICALLY REPLACED PARTS	4-8
II. UNPACKING AND INSTALLATION	4-2	V. CONSUMABLE PARTS AND	
III. STAMP UNIT INSTALLATION PROCEDURE	4-6	CONSUMABLES	4-9
		VI. PERIODIC SERVICING	4-11

I. SELECTION OF LOCATION

The installation location of DR-7080C should meet the following requirements.

The service technician must personally inspect the user's premises before installing the DR-7080C.

■ The power supply should be connected to an outlet capable of supplying the voltage shown on the rating plate plus or minus 5%. A grounding plug must be used.

Ground Items

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

■ Do not install DR-7080C on a weak table, a tilted or unstable surface. The main body weighs approx. 34 kg.

■ The theoretical temperature is between 15 to 30°C, and theoretical relative humidity between 25 to 80% RH. However, the temperature should be between 15 to 27.5°C, and relative humidity between 25 to 75% RH to guarantee performance.

In particular, do not install the machine near water faucets, humidifiers, hot water heaters, and refrigerators.

■ DR-7080C 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 DR-7080C.

* At the places where installation of DR-7080C in the direct sunlight is unavoidable, a heavy curtain should be installed on the windows to protect DR-7080C.

■ Maintain sufficient space around DR-7080C 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.

* There must be a sufficient space on both sides of DR-7080C so that it can be held with hands when it is moved.

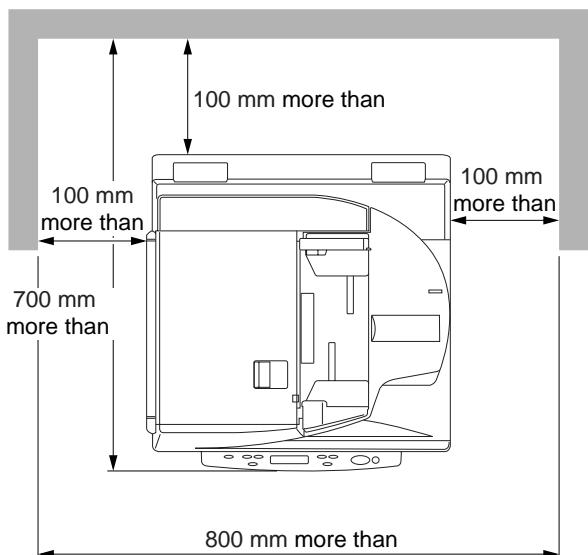
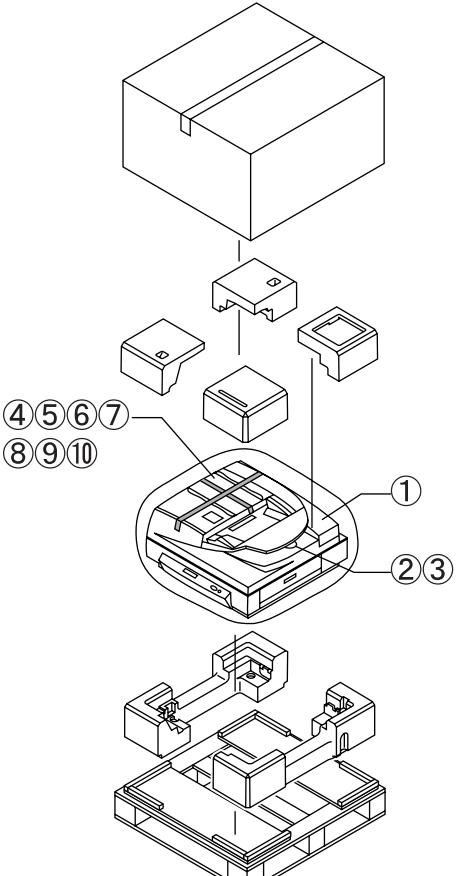


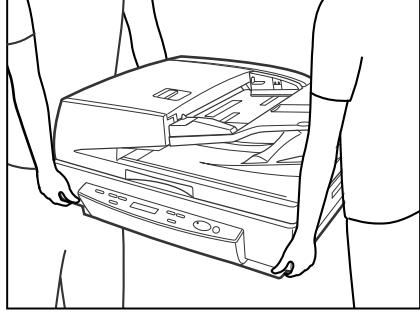
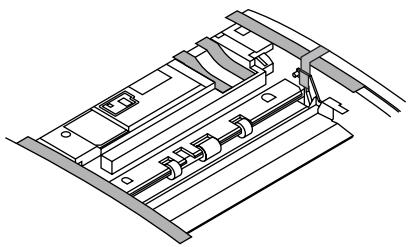
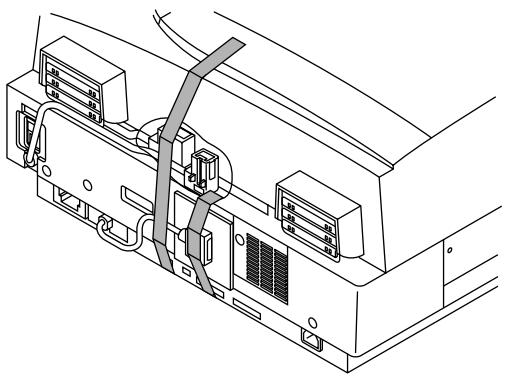
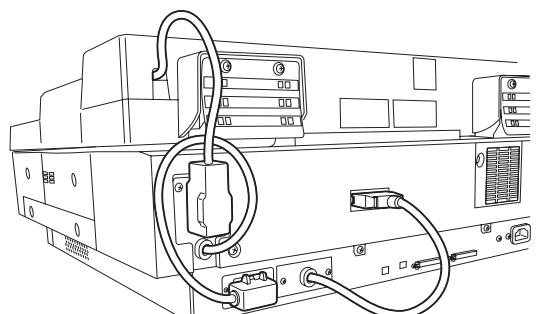
Figure 4-101

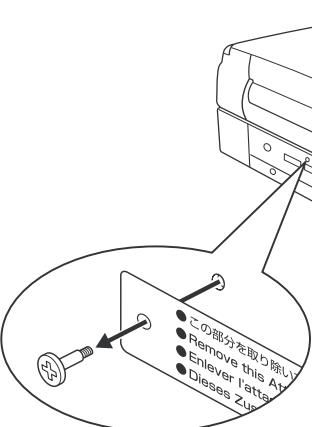
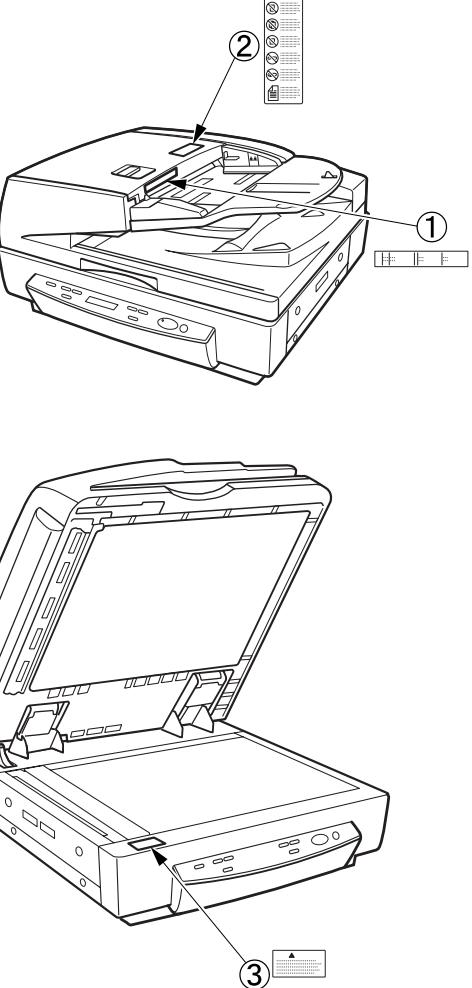
II. UNPACKING AND INSTALLATION

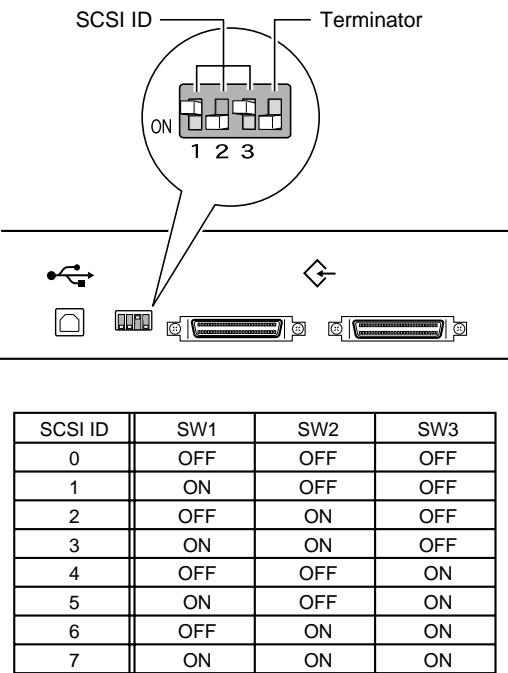
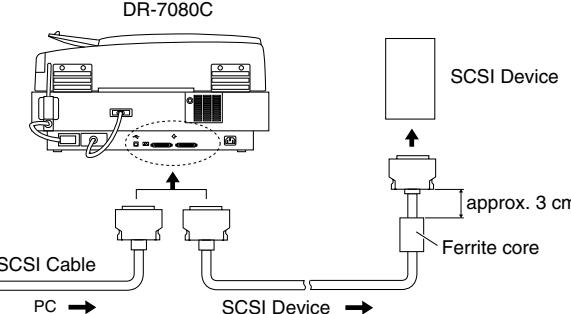
Water droplets sometimes form on the surface of metal parts when the machine is brought into a warm place from a cold place. This phenomenon is called "condensation." Using DR-7080C when condensation has occurred might cause machine trouble.

At least one hour should be allowed for DR-7080C 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.

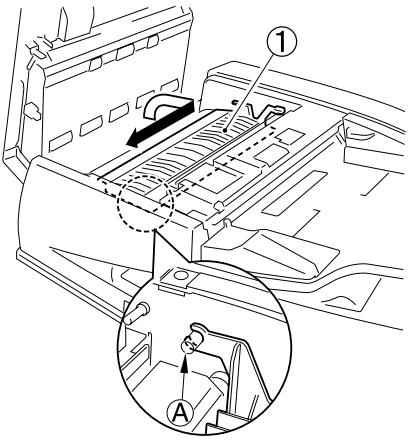
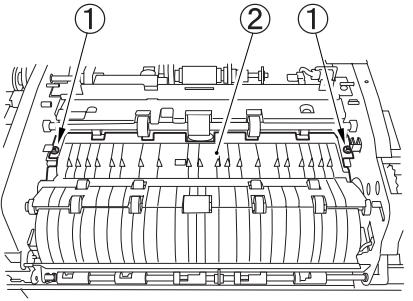
No.	Procedure	Check Items/Remarks
1	<p>Open the outer packaging box and take out the main body and other items packed with it. Two persons are required to take out the main body. Check that there are no missing items. The packed weight is approx. 47 kg, and the external dimensions are approx. 740 (W) × 780 (D) × 600 (H) mm.</p> <p>① Main body ② Power cord ③ Grounding cord (only for 100 V model) ④ Document size label ⑤ Cleaning caution label (only for 120 V model and 220-240 V models) ⑥ Ferrite core (only for 220-240 V models) ⑦ Quick reference guide ⑧ Setup disk (CD-ROM) ⑨ User manual ⑩ Warranty card (only for 100 V and 120 V models)</p> <p>Note: The main body weighs approx. 34 kg. Hold it firmly from both sides with two persons. See the figure in step 2.</p>	

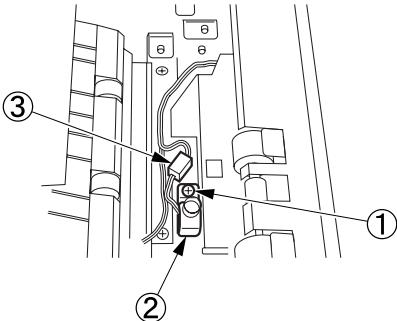
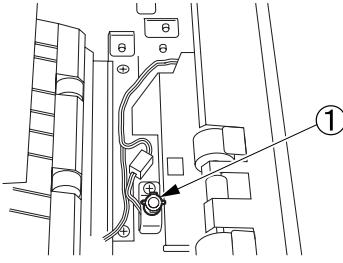
No.	Procedure	Check Items/Remarks
2	<p>Move the main body to the desired installation location.</p> <p>Note: When moving the main body, hold it firmly from both sides with two persons. A moveable cart may be used. The main body weighs approx. 34 kg.</p>	
3	<p>Peel off all the protective tapes securing the various parts.</p> <p>Remove the protective sheet of the platen glass.</p> <p>Check the covers for damage during shipping.</p>	<ul style="list-style-type: none"> • Inside the feeder  <ul style="list-style-type: none"> • Cable 
4	Connect the units of the machine with cables.	

No.	Procedure	Check Items/Remarks
5	<p>Remove the screw for transportation.</p> <p>Note: If the power is turned ON without removing this screw, "Please wait..." is kept displaying on the operation panel. Turn the power OFF, then remove the screw.</p> <p>When transporting DR-7080C, be sure to fix the mirror unit with the screw for transportation. Refer to the "SERVICE MODE" section for details.</p>	
6	<p>Attach labels as required.</p> <p>① Document size label Attach a label to the front as well so that a person in a wheelchair can adjust document size position easily. Select the best one of four types of labels.</p> <p>② Cleaning caution label (only 120 V model and 220-240 V models) Caution labels associated with glass staining in ADF mode. There are six kinds of labels. Select the one on which the language appropriate for the region is displayed.</p>	
7	<p>Connect the power cord.</p> <p>In the case of the 100 V model, connect also the grounding cord.</p>	

No.	Procedure	Check Items/Remarks																																				
8	<p>Connect the computer to DR-7080C using an SCSI cable or a USB cable. If the computer is connected to DR-7080C using an SCSI cable, change the SCSI ID and terminator settings as necessary. If DR-7080C is connected to the end of the daisy chain, turn the terminator ON.</p>	 <table border="1" data-bbox="928 752 1436 1021"> <thead> <tr> <th>SCSI ID</th><th>SW1</th><th>SW2</th><th>SW3</th></tr> </thead> <tbody> <tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td></tr> <tr><td>1</td><td>ON</td><td>OFF</td><td>OFF</td></tr> <tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td></tr> <tr><td>3</td><td>ON</td><td>ON</td><td>OFF</td></tr> <tr><td>4</td><td>OFF</td><td>OFF</td><td>ON</td></tr> <tr><td>5</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr><td>6</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr><td>7</td><td>ON</td><td>ON</td><td>ON</td></tr> </tbody> </table>	SCSI ID	SW1	SW2	SW3	0	OFF	OFF	OFF	1	ON	OFF	OFF	2	OFF	ON	OFF	3	ON	ON	OFF	4	OFF	OFF	ON	5	ON	OFF	ON	6	OFF	ON	ON	7	ON	ON	ON
SCSI ID	SW1	SW2	SW3																																			
0	OFF	OFF	OFF																																			
1	ON	OFF	OFF																																			
2	OFF	ON	OFF																																			
3	ON	ON	OFF																																			
4	OFF	OFF	ON																																			
5	ON	OFF	ON																																			
6	OFF	ON	ON																																			
7	ON	ON	ON																																			
9	<p>For 220-240 V models, if a SCSI device is connected to DR-7080C, attach a ferrite core to the cable on the SCSI device side.</p> <p>Note: This is to satisfy radio interference requirements for 220-240 V models.</p>																																					
10	<p>After turning DR-7080C ON, turn the computer ON.</p> <p>Note: Confirm that "Ready" is displayed on DR-7080C operation panel before the computer is turned ON.</p>																																					
11	Install the driver and application software in the computer. Refer to the user manual for details.																																					
12	Check if DR-7080C operates normally. Refer to the user manual for details.																																					

III. STAMP UNIT INSTALLATION PROCEDURE

No.	Procedure	Check Items/Remarks
1	<p>Open the package, take out the contents, and check if there are any missing parts.</p> <p>① Stamp solenoid ② Ink cartridge ③ Screw (BH, M3×6) ④ Installation procedure</p> <p>Note: The packed "Installation procedure" is a Japanese version for copiers. Follow the procedure instructions in this service manual for installation.</p>	
2	Open the feeder cover.	
3	Open the opening guide ① slightly, remove part A, open the guide widely and slide it, remove the opposite fitting part and take out the guide.	
4	<p>Remove the 2 screws ① and remove the reversal guide ②.</p> <p>Note: A cable is connected to the back of the reversal guide.</p>	

No.	Procedure	Check Items/Remarks
5	Install the solenoid ② with the screw ① supplied and connect the connector ③.	
6	Insert the cartridge ① into the end of the solenoid. Note: Push the cartridge until it clicks.	
7	Return the reversal guide and the opening guide to their original positions and close the feeder cover.	
8	Enter the service mode and enable "Feeder>OPTION>STAMP-SW".	
9	Set the appropriate paper on the feeder and check operation.	

IV. PERIODICALLY REPLACED PARTS

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

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

1. 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. 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. Consumables are the parts which are assigned as commercially available products and shall be replaced (usually by users) when becoming no good.

V. CONSUMABLE PARTS AND CONSUMABLES

Consumable parts and consumables are listed below.

Have a service technician perform replacements of all parts except "stamp cartridge".

No.	Part Name	Part No.	Q'ty	Replacement Cycle	Remark
1	Pickup roller	MA2-7046	1	400,000 sheets	Unique parts, Note 2
2	Feeding roller	MA2-7047	1	400,000 sheets	Unique parts, Note 2
3	Pre-separation base	MF1-4291	1	400,000 sheets	Unique parts, Note 2
4	Separation pad holder	MF1-4292	1	400,000 sheets	Unique parts, Note 2
5	Separation pad holder B	MF1-4293	1	400,000 sheets	Unique parts, Note 2
6	Dust-collecting tape A	MA2-7048	1	400,000 sheets	Unique parts, Note 2
7	Dust-collecting tape B	MA2-7049	1	400,000 sheets	Unique parts, Note 2
8	Dust-collecting tape C	MA2-7050	1	400,000 sheets	Unique parts, Note 2
9	Dust-collecting tape D	MA2-7051	2	400,000 sheets	Unique parts, Note 2
10	Dust-collecting tape E	MA2-7052	5	400,000 sheets	Unique parts, Note 2
11	No. 1 registration roller	FC5-2994	1	1,000,000 sheets	
12	No. 2 registration roller	FC5-2995	1	1,000,000 sheets	
13	Read roller 1	FC5-2997	1	2,000,000 sheets	
14	Read roller 2	FC5-2998	1	2,000,000 sheets	
15	Platen roller	FC5-3027	1	2,000,000 sheets	Unique parts
16	Reversal lower roller	FC5-3010	1	2,000,000 sheets	
17	Delivery reversal upper roller	FC5-2996	1	2,000,000 sheets	
18	Pickup clutch	FK2-0209	1	2,000,000 sheets	
19	Pressure solenoid	FK2-0210	1	2,000,000 sheets	
20	Scanning lamp	FK2-0224	1	2,000,000 sheets	500 hours lit
21	Stamp solenoid	Note 3	1	300,000 stamps	Option
22	Stamp ink cartridge	Note 4	1	7,000 stamps	Option

Table 4-501

Note 1: The values on this list are approximations and may be changed according to empirical data.

Note 2: For the parts No. 1 to 10 with replacement cycles of 400,000 documents, "Exchange Kit" are also available instead of service parts. Their product code is "9664A002AA".

Note 3: The product name is "Stamp unit A1".

The code for Japan is "9011A001BA",
and the code for other regions is
"9664A001AA". It has a stamp ink
cartridge.

Note 4: The product name is "Stamp ink
cartridge B1". The code is
"6776001AA".

VI. PERIODIC SERVICING

1. Periodic Servicing List

Table 4-601 gives a periodic servicing list. The maintenance intervals are replacement cycles of consumable parts.

If paper dust or dirt attach to rollers or scrapers, black lines may appear on images. Therefore, clean rollers and scrapers carefully.

Note: Use only specified solvents/oils.

[\triangle : Cleaning, \bullet : Replace, \star : Lubricate, \square : Adjust, \circ : Check]

Unit name	Location/Parts	Intervals			Remarks
		0.4 million	one million	two millions	
Feeder	Pickup roller	\bullet			If replacement is unnecessary, clean as follows: wipe with cloth slightly moistened with water, then wipe dry. Wipe with cloth slightly moistened with water, then wipe dry.
	Feeding roller	\bullet			
	Separation pad assembly (3 parts)	\bullet			
	Dust-collecting tape	\bullet			
	No. 1 registration roller	\triangle	\bullet		
	No. 2 registration roller	\triangle	\bullet		
	Read roller 1	\triangle		\bullet	
	Platen roller	\triangle		\bullet	
	Read roller 2	\triangle		\bullet	
	Reversal lower roller	\triangle		\bullet	
	Delivery reversal lower roller	\triangle		\bullet	
	Delivery reversal upper roller	\triangle			
	No. 1 registration roller follower	\triangle			
	No. 2 registration roller follower	\triangle			
	Read roller follower 1	\triangle			
	Platen roller follower 1	\triangle			
	Platen roller follower 2	\triangle			

Figure 4-601a

Unit name	Location/Parts	Intervals			Remarks
		0.4 million	one million	two millions	
Feeder	Read roller follower 2	△			Wipe with cloth slightly moistened with water, then wipe dry.
	Reversal upper roller	△			
	Document pass parts of feed guide, etc.	△			
	Scraper of feed guide, etc.	△			
	Black pressure board	△			
	White sheet of platen parts	△			
	Post-separation sensor	△			
	Read sensor	△			
	Delivery reversal sensor	△			
	Pickup clutch			●	
Reader	Pressure solenoid			●	
	Feeder height	□			See the "Chapter 5 IV. FEEDER ADJUSTMENT" for details.
	Platen glass (Clean the back side as required.)	△			Wipe with cloth slightly moistened with water, then wipe dry.
ADF	ADF reading glass (Clean the back side as required.)	△			Apply silicon oil to the "ADF reading glass" as required. See the other section for details.
	Scanning lamp			●	

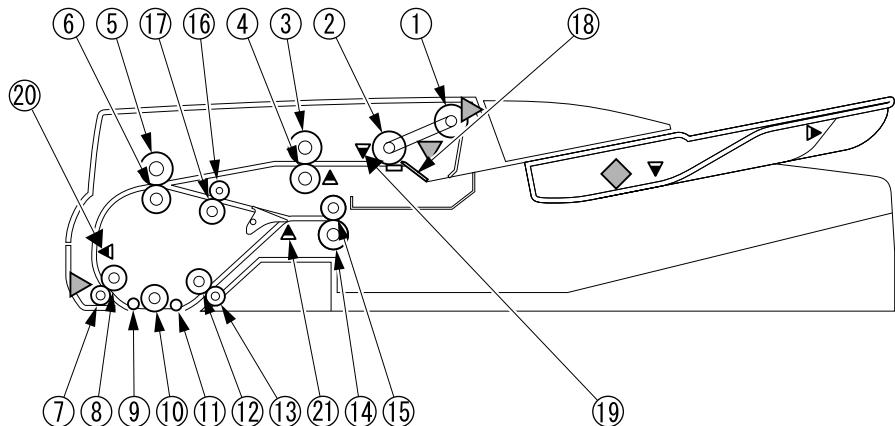
Figure 4-601b

Note 1: If stain is not removed, alcohol may be used.

Note 2: If parts are very dirty, "customer maintenance" should be instructed.

2. Layout Plan

1) Rollers and sensors related



① Pickup roller

② Feeding roller

③ No. 1 registration roller follower

④ No. 1 registration roller

⑤ No. 2 registration roller follower

⑥ No. 2 registration roller

⑦ Read roller 1 follower

⑧ Read roller 1

⑨ Platen roller follower 1

⑩ Platen roller

⑪ Platen roller follower 2

⑫ Read roller 2

⑬ Read roller 2 follower

⑭ Delivery reversal lower roller

⑮ Delivery reversal upper roller

⑯ Reversal upper roller

⑰ Reversal lower roller

⑱ Separation pad assembly (3 parts)

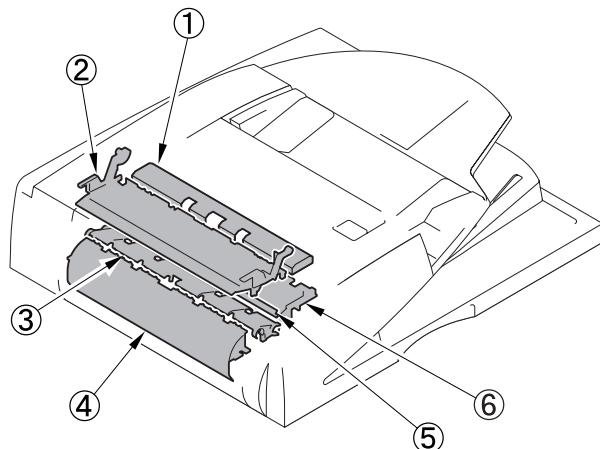
⑲ Post-separation sensor

⑳ Read sensor

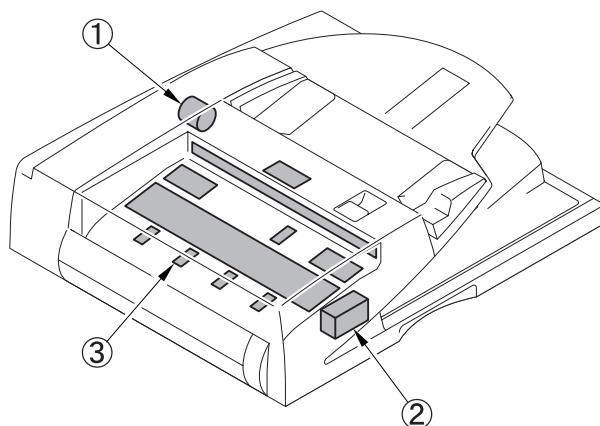
㉑ Delivery reversal sensor

Figure 4-601

2) Feed guide related



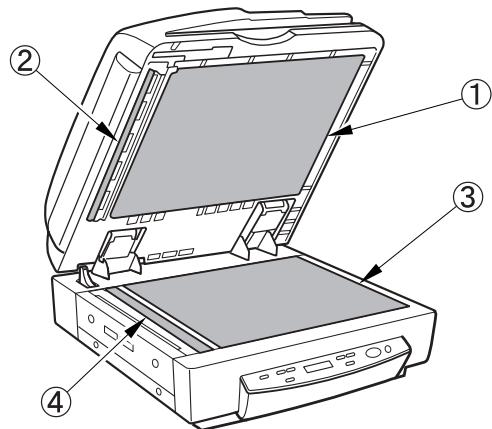
① Pre-registration guide	④ Feed guide
② Opening guide	⑤ Reversal flapper
③ Reversal guide	⑥ Delivery guide

Figure 4-6023) Dust-collection tape, clutch, solenoid
Dust-collection tape is located inside the
feeder cover.

① Pickup clutch
② Lock solenoid
③ Dust-collecting tape (Total 10 sheets)

Figure 4-603

4) Black pressure board, platen glass, etc.



- ① Black pressure board
- ② White sheet
- ③ Platen glass
- ④ ADF reading glass

Figure 4-604

3. Silicon Oil Application

If the document does not move smoothly on the ADF reading glass, apply silicon oil to the ADF reading glass.

* Items to Prepare

- Silicone oil

(Tool number: FY9-6013-000)



Figure 4-605

- Cleaning tissue

(Tool number: FC5-4430-000)

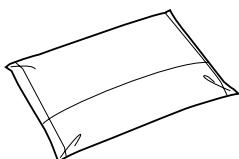


Figure 4-606

* Procedure

- 1) Wipe the ADF reading glass ① using cleaning tissue.

Note: Here, do not use silicone oil on the cleaning tissue.

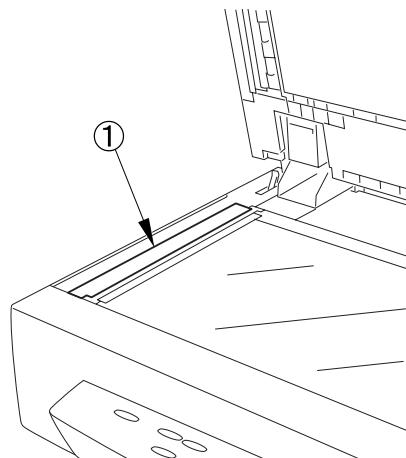


Figure 4-607

- 2) Squeeze the bottle ① of silicone oil 2 to 3 times to moisten cleaning tissue ② with silicone oil.

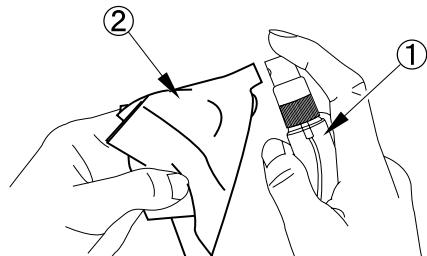


Figure 4-608

- 3) Apply the silicone oil on the reading glass with the cleaning tissue.
- 4) Dry wipe the reading glass with cleaning tissue (so as to even out the oil).

CHAPTER 5

TROUBLESHOOTING

I. ERROR DISPLAY AND REMEDY	5-1	V. AFTER REPLACING PARTS	5-46
II. SERVICE MODE.....	5-4	VI. OPERATION TROUBLESHOOTING	5-50
III. USER MODES	5-34	VII. IMAGE TROUBLESHOOTING.....	5-54
IV. FEEDER ADJUSTMENT.....	5-35		

I. ERROR DISPLAY AND REMEDY

1. Feeder

If a document jam occurs, the document set display of the feeder flashes. In this case, remove the jammed document.

2. DR-7080C Operation Panel

When an error occurs in the DR-7080C, an error message is displayed in the operation panel display. Refer to Table 5-101.

Users are to implement actions for all error messages other than service calls. However, if a user implemented action does not handle the problem, a service technician is to service the DR-7080C.

No.	Display	Cause → Action																																													
1	<table border="1" data-bbox="366 835 820 878"> <tr><td>C</td><td>o</td><td>v</td><td>e</td><td>r</td><td>O</td><td>p</td><td>e</td><td>n</td><td> </td><td> </td><td> </td><td> </td><td>0</td><td>1</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	C	o	v	e	r	O	p	e	n					0	1																															The feeder cover is open. → Close the feeder cover.
C	o	v	e	r	O	p	e	n					0	1																																	
2	<table border="1" data-bbox="366 878 820 920"> <tr><td>C</td><td>o</td><td>v</td><td>e</td><td>r</td><td>O</td><td>p</td><td>e</td><td>n</td><td> </td><td> </td><td> </td><td> </td><td>0</td><td>2</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	C	o	v	e	r	O	p	e	n					0	2																															The feeder is open. → Close the feeder.
C	o	v	e	r	O	p	e	n					0	2																																	
3	<table border="1" data-bbox="366 920 820 963"> <tr><td>F</td><td>e</td><td>e</td><td>d</td><td>i</td><td>n</td><td>g</td><td> </td><td>M</td><td>i</td><td>s</td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	F	e	e	d	i	n	g		M	i	s																																			Pickup error → Check the document and try again. If the document does not go through the ADF, scan it using the FB.
F	e	e	d	i	n	g		M	i	s																																					
4	<table border="1" data-bbox="366 963 820 1006"> <tr><td>J</td><td>a</td><td>m</td><td> </td><td> </td><td> </td><td> </td><td> </td><td>x</td><td>x</td><td>x</td><td>x</td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	J	a	m						x	x	x	x																																		Jam → Handle the jam and remove the document. Note: "XXXX" indicates the type of jam. For details, refer to Table 5-102.
J	a	m						x	x	x	x																																				
5	<table border="1" data-bbox="366 1006 820 1048"> <tr><td>S</td><td>e</td><td>n</td><td>d</td><td> </td><td>f</td><td>a</td><td>i</td><td>l</td><td>l</td><td>e</td><td>d</td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	S	e	n	d		f	a	i	l	l	e	d																																		Transmission error in job function → Check the settings with a job registration tool and try again.
S	e	n	d		f	a	i	l	l	e	d																																				
6	<table border="1" data-bbox="366 1048 820 1089"> <tr><td>D</td><td>e</td><td>t</td><td>e</td><td>c</td><td>t</td><td> </td><td>M</td><td>i</td><td>x</td><td> </td><td>D</td><td>o</td><td>c</td><td>.</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	D	e	t	e	c	t		M	i	x		D	o	c	.																															Different size documents have been detected. → After checking the front and back sides of the delivered document, set the different size documents mode to ON and perform the operation again.
D	e	t	e	c	t		M	i	x		D	o	c	.																																	
7	<table border="1" data-bbox="366 1089 820 1131"> <tr><td>E</td><td>r</td><td>r</td><td>o</td><td>r</td><td> </td><td> </td><td>E</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	E	r	r	o	r			E	x	x	x	x	x	x	x																															An anomaly occurred inside the main unit (service call). → Reset the machine. If the error is still displayed, switch the power OFF. → A service technician should take measures. For details, refer to Table 5-103.
E	r	r	o	r			E	x	x	x	x	x	x	x																																	
8	<table border="1" data-bbox="366 1131 820 1174"> <tr><td>W</td><td>a</td><td>i</td><td>t</td><td>.</td><td>.</td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table> <p>Display does not change from above message to "Ready".</p>	W	a	i	t	.	.																																								An anomaly occurred inside the main unit. → Same action as the above service call.
W	a	i	t	.	.																																										

Table 5-101

Code	Cause	Code	Cause
JAM 0001	Document is not reached to post-separation sensor	JAM 0067	1st document is not reached to registration sensor
JAM 0002	Document is stagnated in post-separation sensor	JAM 0068	1st document is stagnated in registration sensor
JAM 0003	Document is not reached to registration sensor	JAM 0069	1st document is not reached to read sensor
JAM 0004	Document is stagnated in registration sensor	JAM 0070	1st document is stagnated in read sensor
JAM 0005	Document is not reached to read sensor	JAM 0071	1st document is not reached to delivery reversal sensor
JAM 0006	Document is stagnated in read sensor	JAM 0072	1st document is stagnated in delivery reversal sensor
JAM 0007	Document is not reached to delivery reversal sensor	JAM 0113	Timing anomaly
JAM 0008	Document is stagnated in delivery reversal sensor	JAM 0115	Pressure sensor anomaly
JAM 0066	1st document is stagnated in post-separation sensor	JAM 0144	Feeder open
		JAM 0146	Feeder cover open
		JAM 0148	Initial stagnation
		JAM 0149	Pickup error

Table 5-102

Code	Cause	Problem location
Error E2020001	Scanner HP sensor detects positioning forward error	Scanner motor, scanner HP sensor related
Error E2020002	Scanner HP sensor detects positioning backward error	
Error E2250001	Light intensity at power ON below reference level	Scanning lamp related
Error E2270001	24V port OFF at power ON	24 VDC power supply related
Error E2270002	24V port OFF at job start	
Error E2270003	24V port OFF at job end	
Error E2270004	24V port OFF during load driving	
Error E2480001	Error at EEPROM power ON	Reader controller PCB related
Error E2480002	Error during EEPROM write	
Error E2480003	Error during EEPROM read	
Error E4000001	Feeder communication check-sum error	Feeder and reader connection related, ADF driver PCB related
Error E4000002	Feeder communication status error	
Error E4000003	Feeder communication receive interrupt error	
Error E4130001	Feeder pressure motor HP sensor open error	Pressure motor, pressure HP sensor related
Error E4130002	Feeder pressure motor HP sensor close error	
Error E7430000	Reader communication error	Reader and controller connection related
Error E3000000	Controller cooling fan error	Cooling fan related

Table 5-103

3. Computer

Error messages are displayed to the display connected to the computer. The content of these messages vary according to the software that is used.

The majority of error messages are related to user operation errors or document jams. Moreover, they may duplicate error messages displayed to the operation panel.

The user is to implement handling actions as directed in the error message. However, if the problem is not resolved as the result of user handling, it must be handled by a service technician.

Figure 5-101 shows the main error messages displayed when using "CapturePerfect 2.0."

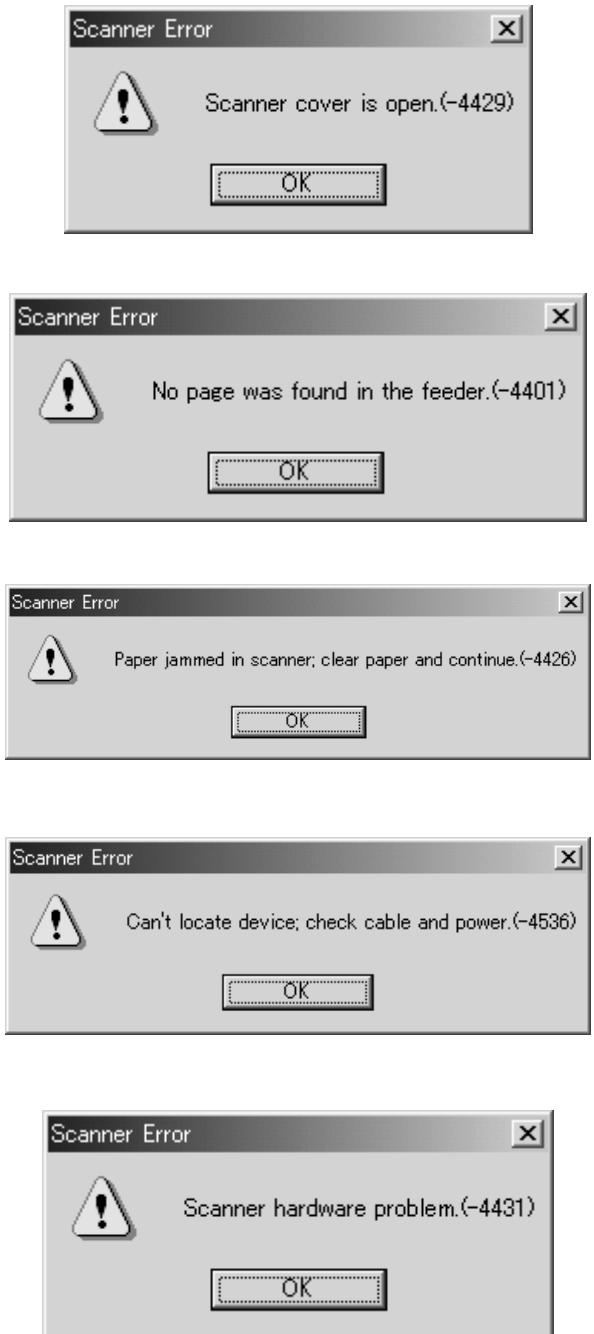


Figure 5-101

II. SERVICE MODE

1. Outline

The service mode of the DR-7080C can be executed by installing the service mode software on the computer for service. The service mode software is located in the setup disk provided with the DR-7080C.

The system conditions for the computer to be used are the same as those described in the user 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.

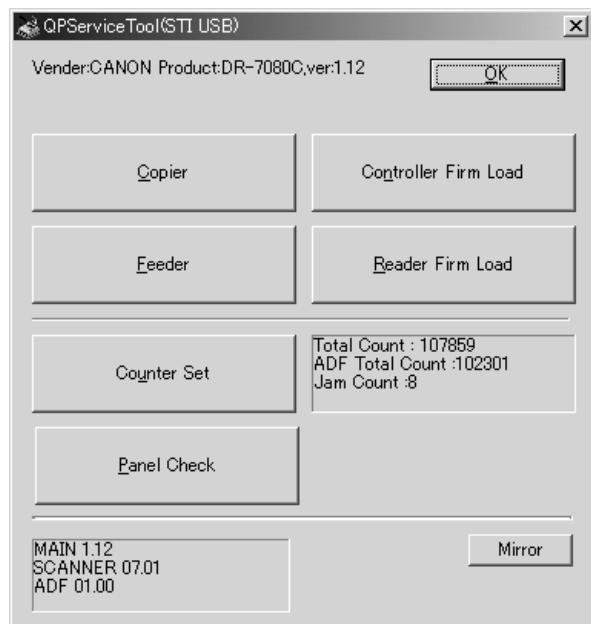


Figure 5-201

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

- 1) Copier
Service mode related to reader
- 2) Feeder
Service mode related to feeder
- 3) Counter Set
Counter change
- 4) Panel Check
Operation panel check
- 5) Controller Firm Load
Controller firmware change
- 6) Reader Firm Load
Reader and feeder firmware change
- 7) Mirror
To move the mirror unit to a fixed position for transport.

In addition to the above buttons, counters and the version information are also displayed.

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 computer for service and start up the OS (Windows).
- 2) Set the setup disk supplied with the DR-7080C.
- 3) Copy the "\Driver\Tools" folder in the setup disk to one of the drives of the computer for service.

Note: To check the operation of the DR-7080C with the service computer, the required software must be installed.

For how to install the software provided with the DR-7080C, refer to the user 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 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 DR-7080C using a SCSI cable or a USB cable.
- 2) After powering ON the DR-7080C, power ON the computer.
- 3) Check if the operation panel of the DR-7080C has changed to "Ready".
- 4) Open the installed "Tools" folder and start up the "QPTool.exe" file. (See Figure 5-202.)
- 5) The password screen is displayed, so after inputting "qp", select [OK]. (See Figure 5-203.)
- 6) The service screen is displayed.

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



Figure 5-202

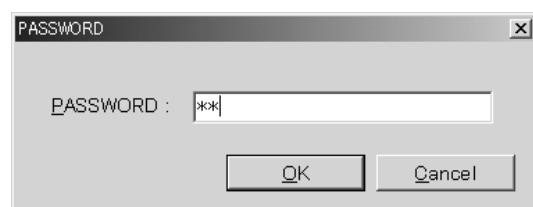


Figure 5-203

Note: After the DR-7080C 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 DR-7080C has been installed, perform the actions indicated in the user manual.

Note: Before starting the service mode file: "QPTool.exe", quit all scanner applications, such as "CapturePerfect". Also, start QPTool.exe only after checking that the operation panel of the DR-7080C displays "Ready". If scanning is attempted before "Ready" or while "Stand-by Mode" is displayed, software hangup will occur.

Note: To execute the service mode with the user's computer, start up "\Driver\Tools\QPTool.exe" on the setup disk supplied with the DR-7080C. Do not copy this program to the user's computer. Do not let the user know the folder name and password to be used.

Note: The version screen is displayed by right-clicking the title bar of the service screen and selecting "About Service Tool". Alternatively, the version can also be displayed in "QPTool.exe" properties.

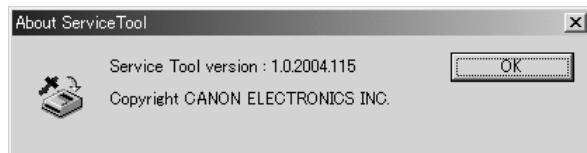


Figure 5-204

4. Service Mode List

There is a large number of service mode items related to the reader and feeder, as listed below.

For more details about the contents, operation method, etc., refer to the relevant sections.

Configuration/Name	Description	
Copier	Service mode related to reader	
	Display	Control display mode
	CCD	Display of measurement values related to CCD
	TARGET-B	BLUE shading target value (4-digit display in decimal)
	TARGET-G	GREEN shading target value (4-digit display in decimal)
	TARGET-R	RED shading target value (4-digit display in decimal)
	GAIN-OB	Gain level value of blue odd bits of CCD (for color)
	GAIN-OG	Gain level value of green odd bits of CCD (for color)
	GAIN-OR	Gain level value of red odd bits of CCD (for color)
	GAIN-EB	Gain level value of blue even bits of CCD (for color)
	GAIN-EG	Gain level value of green even bits of CCD (for color)
	GAIN-ER	Gain level value of red even bits of CCD (for color)
I/O	PCB I/O port display mode	
	R-CON	I/O port of reader controller PCB
	Port1	Port 1, 8 bits
	Port2	Port 2, 8 bits
	Port3	Port 3, 8 bits
	Port4	Port 4, 8 bits
	Port5	Port 5, 8 bits
	Port6	Port 6, 8 bits
	Port7	Port 7, 8 bits
	Port8	Port 8, 8 bits
	Port9	Port 9, 8 bits
	FEEDER	I/O port of ADF driver PCB
	Port1	Port 1, 8 bits
	Port2	Port 2, 8 bits
	Port3	Port 3, 8 bits
	Port4	Port 4, 8 bits
	Port5	Port 5, 8 bits
	Port6	Port 6, 8 bits
	Port7	Port 7, 8 bits
	Port8	Port 8, 8 bits
	Port9	Port 9, 8 bits
	Port10	Port 10, 8 bits
	Port11	Port 11, 8 bits

Table 5-201a

Configuration/Name		Description
Adjust	ADJ-XY	Adjustment mode (Changes are enabled by power RESET of machine.) Image scanning start position adjustment
	ADJ-X	Image scanning start position adjustment (X = sub-scan direction) during the FB mode. Adjustment range: 1 to 100 (Default: 20), 0.1 mm displacement when value is changed by 1.
	ADJ-Y	Image scanning start position adjustment (Y = main-scan direction) during the FB mode. Adjustment range: 47 to 131 (Default: 90), 0.1 mm displacement when value is changed by 1.
	ADJ-S	Shading position manual adjustment Note: No adjustment in market required. Used during manual adjustment when white lines or black lines caused by dust on the white plate occur, regardless of automatic adjustment. Adjustment range: 20 to 200 (Default: 50), 0.1 mm displacement when value is changed by 1.
	ADJ-Y-DF	Image scanning start position adjustment (Y = main-scan direction) during the ADF mode. Adjustment range: 21 to 106 (Default: 53), 0.1 mm displacement when value is changed by 1.
	STRD-POS	Image scanning start position adjustment (X = sub-scan direction) during the ADF mode. Adjustment range: 1 to 200 (Default: 100), 0.1 mm displacement when value is changed by 1.
	CCD	CCD, shading related adjustment
	W-PLT-X	X signal data of white plate. Perform setting again after replacing platen glass, reader controller PCB. Setting range: 1 to 9999 (Default: 8271)
	W-PLT-Y	Y signal data of white plate. Perform setting again after replacing platen glass, reader controller PCB. Setting range: 1 to 9999 (Default: 8735)
	W-PLT-Z	Z signal data of white plate. Perform setting again after replacing platen glass, reader controller PCB. Setting range: 1 to 9999 (Default: 9418)
	CCDU-RG	Color shift correction value in sub-scan direction between CCD unit dependent RG. Also set when replacing the CCD unit, the reader controller PCB. Setting range: -9 to 9 (Default: 0)
	CCDU-GB	Color shift correction value in sub-scan direction between CCD unit dependent GB. Also set when replacing the CCD unit, the reader controller PCB. Setting range: -9 to 9 (Default: 0)

Table 5-201b

Configuration/Name		Description
	FCCDU-RG	<p>Color shift correction value in sub-scan direction between CCD unit dependent RG at plant shipment.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: No adjustment in market required.</p> <p>Adjustment range: -9 to 9 (Default: 0)</p>
	FCCDU-GB	<p>Color shift correction value in sub-scan direction between CCD unit dependent GB at plant shipment.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: No adjustment in market required.</p> <p>Adjustment range: -9 to 9 (Default: 0)</p>
	50-RG	<p>Color shift (R-G) offset value display during FB mode/50% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	50-GB	<p>Color shift (G-B) offset value display during FB mode/50% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	50DF-RG	<p>Color shift (R-G) offset value display during ADF mode/50% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	50DF-GB	<p>Color shift (G-B) offset value display during ADF mode/50% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	100-RG	<p>Color shift (R-G) offset value display during FB mode/100% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	100-GB	<p>Color shift (G-B) offset value display during FB mode/100% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	100DF-RG	<p>Color shift (R-G) offset value display during ADF mode/100% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	100DF-GB	<p>Color shift (G-B) offset value display during ADF mode/100% scanning</p> <p>Setting range: -256 to 256 (Default: 0)</p>
	DFTAR-R	<p>Red shading target value display during the ADF mode</p> <p>Setting range: 1 to 2047 (Default: 1159)</p>
	DFTAR-G	<p>Green shading target value display during the ADF mode</p> <p>Setting range: 1 to 2047 (Default: 1189)</p>
	DFTAR-B	<p>Blue shading target value display during the ADF mode</p> <p>Setting range: 1 to 2047 (Default: 1209)</p>

Table 5-201c

Configuration/Name		Description
	PASCAL	Automatic gradation correction control adjustment
	OFST-P-Y	<p>Setting of high-density parts and Y target value during automatic gradation correction.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: Adjustments other than above resetting not required in market.</p> <p>Adjustment range: -128 to 128 (Default: 0)</p>
	OFST-P-M	<p>Setting of high-density parts and M target value during automatic gradation correction.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: Adjustments other than above resetting not required in market.</p> <p>Adjustment range: -128 to 128 (Default: 0)</p>
	OFST-P-C	<p>Setting of high-density parts and C target value during automatic gradation correction.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: Adjustments other than above resetting not required in market.</p> <p>Adjustment range: -128 to 128 (Default: 0)</p>
	OFST-P-K	<p>Setting of high-density parts and K target value during automatic gradation correction.</p> <p>Perform setting again after replacing reader controller PCB.</p> <p>Note: Adjustments other than above resetting not required in market.</p> <p>Adjustment range: -128 to 128 (Default: 0)</p>
Function		Operation/inspection mode
	CCD	CCD/shading related automatic adjustment
	DF-WLVL1	<p>White level adjustment during the FB mode.</p> <p>Scan white paper on the platen glass and adjust white level.</p> <p>Execute after replacing reader controller PCB.</p>
	DF-WLVL2	<p>White level adjustment during the ADF mode</p> <p>Scan white paper set on the document pickup tray and adjust white level.</p> <p>Execute after replacing reader controller PCB.</p>
CLEAR		Clears RAM/OPTION
	R-CON	<p>Clears RAM of reader controller PCB.</p> <p>Execute after replacing reader controller PCB.</p>
	OPTION	<p>Clears option backup data.</p> <p>Note: This function need not be executed for DR-7080C.</p>
MISC-R		Service mode related to other readers
	SCANLAMP	<p>Scanning lamp lighting check</p> <p>When this function is executed, the scanning lamp lights for 3 seconds.</p>

Table 5-201d

Configuration/Name		Description
Option	BODY	Settings related to selection of specifications related to machine
	SENS-CNF	Selection of location of document detection sensor Note: No change required in DR-7080C. AB system/Inch system (Default: AB system)
	MODELSZ2	Global support through document detection during FB mode (AB/INCH mixed detection) Note: No change required in DR-7080C. None/Detect (Default: None)
	SZDT-SW	Switching from CCD detection to photo size detection during document size detection in the FB mode. Note: No change required in DR-7080C. None/Detect (Default: None)
	SPECK-SW	Dust detection timing switch Switch the method of setting value for detecting white plate dust at each job, in order to prevent image degradation (lines) due to dust that adheres to the white plate following startup. Note: No change required in DR-7080C. None/Detect (Default: None)
	DFDST-L1	Adjustment of dust detection level when using ADF (sheet-to-sheet correction) 0: Switches OFF this mode. Note: No adjustment in market required. Setting range: 0 to 255 (Default: 0)
	DFDST-L2	Adjustment of dust detection level when using ADF (detection after job) 0: Switches OFF this mode. Note: No adjustment in market required. Setting range: 0 to 255 (Default: 0)
	USER	Selection of main unit related specifications related to the user mode
	SIZE-DET	Selects the document size detection function during the FB mode. Note: No execution required in DR-7080C. None/Detect (Default: None)

Table 5-201e

Configuration/Name		Description
Feeder		Service mode related to feeder
DISPLAY		Control display mode
	TRY-WIDE	Amount of document guide opening (Unit: 0.1 mm) Displays the distance between slides detecting the document width of the document pickup tray (distance between 2 points)
	SPSN-LMN	Post-separation sensor light intensity Displays the light emission voltage of the post-separation sensor.
	SPSN-RCV	Post-separation sensor light receiving intensity Displays the light receiving voltage of the post-separation sensor.
	RDSN-LMN	Read sensor light emission intensity Displays the light emission voltage for the read sensor.
	RDSN-RCV	Read sensor light receiving intensity Displays the light receiving intensity of the read sensor.
	DRSN-LMN	Delivery reversal sensor light emission intensity Displays the light emission voltage of the delivery reversal sensor.
	DRSN-RCV	Delivery reversal sensor light reception intensity Displays the light reception voltage of the delivery reversal sensor.
ADJUST		Adjustment mode
	DOCST	Document stop position adjustment during the ADF mode (leading edge registration adjustment) The image reading timing is delayed when a larger value is set. Perform setting again after replacing reader controller PCB. Note: Adjustments other than above resetting not required in market. Adjustment range: -50 to 50 (Unit: 0.1 mm)
	LA-SPEED	Document feed speed adjustment during the ADF mode (magnification adjustment) The speed slows down when a larger value is set. (The image becomes smaller.) Perform setting again after replacing reader controller PCB. Note: Adjustments other than above resetting not required in market. Adjustment range: -30 to 30 (Unit: 0.1%)
FUNCTION		Various automatic adjustments, operation check, cleaning mode
	SENS-INT	Adjustment of sensitivity of various feeder sensors (post-separation, read, delivery reversal sensors) Execute after replacing various sensors, and reader controller PCB.
	MTR-ON	Motor operation check Operates the selected motor. Motor selection is done with [MTR-CHK].
	MTR-CHK	Motor selection 0: Pickup motor 1: Feed motor 2: Delivery reversal motor 3: Pressure motor
	SL-ON	Solenoid operation check Operates the selected solenoid. Solenoid selection is done with [SL-CHK].
	SL-CHK	Solenoid selection 0: Pressure solenoid 1: Stamp solenoid

Table 5-201f

Configuration/Name		Description
	FEED-ON	Feed operation check Executes the selected feed mode. Feed mode selection is done with [FEED-CHK].
	FEED-CHK	Feed mode selection 0: Simplex feed 1: Duplex feed 2: Simplex feed with stamp 3: Duplex feed with stamp
	FAN-ON	Fan operation check Operates the selected fan. Fan selection is done with [FAN-CHK].
	FAN-CHK	Fan selection 0: Cooling fan of feeder
	CL-ON	Clutch operation check Operates the selected clutch. Clutch selection is done with [CL-CHK].
	CL-CHK	Clutch selection 0: Pickup clutch
	TRY-A4	Automatic adjustment of paper width detection reference point 1 in document pickup tray (A4) Records a value when A4 paper is set in document pickup tray. Then, following execution of this item, execute TRY-A5R. Execute after replacing reader controller PCB.
	TRY-A5R	Automatic adjustment of paper width detection reference point 2 in document pickup tray (A5R) Records a value when A5R paper is set in document pickup tray. Execute after replacing reader controller PCB.
	TRY-LTR	Automatic adjustment of paper width detection reference point 1 in document pickup tray (LTR) Records a value when LTR paper is set in document pickup tray. Then, following execution of this item, execute TRY-LTRR. Execute after replacing reader controller PCB.
	TRY-LTRR	Automatic adjustment of paper width detection reference point 2 in document pickup tray (LTRR) Records a value when LTRR paper is set in document pickup tray. Execute after replacing reader controller PCB.
	ROLL-CLN	Roller cleaning mode This mode automatically drives the drive rollers with motors. When cleaning the rollers, use this mode instead of turning the rollers by hand. However, the pickup, feed, and reversal rollers are not rotated in this mode.
OPTION		Specification setting using feeder function
	LS-DBL	ON/OFF switch for high-speed duplex mode The OFF mode is provided to support users who use a document not suitable for the high-speed duplex mode. ON/OFF (Default: ON)
	STAMP-SW	Stamp option installation setting Set when stamp solenoid is attached as option. None/Stamp (Default: None)

Table 5-201g

5. Copier

1) Screen

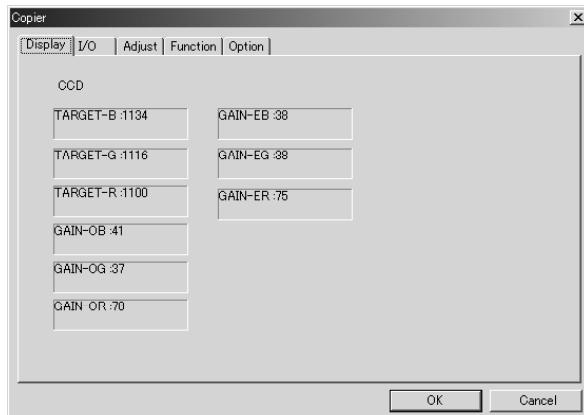


Figure 5-205a

Setting	Value	Setting	Value		
W-PLT-X	8250	1 - 9999	50DF-RG	0	-256 - 256
W-PLT-Y	8687	1 - 9999	50DF-GB	-40	-256 - 256
W-PLT-Z	9364	1 - 9999	100-RG	71	-256 - 256
CCDU-RG	0	-9 - 9	100-GB	86	-256 - 256
CCDU-GB	0	-9 - 9	100DF-RG	-4	-256 - 256
FCCDU-RG	0	-9 - 9	100DF-GB	-68	-256 - 256
FCCDU-GB	0	-9 - 9	DFTAR-R	1131	1 - 2047
50-RG	60	-256 - 256	DFTAR-G	1158	1 - 2047
50-GB	49	-256 - 256	DFTAR-B	1218	1 - 2047

Figure 5-205d

Setting	Value	Setting	Value
R-CON	FEEDER		
Port01	0000000000000010	Port01	0000000000001100
Port02	0000000000001100	Port02	0000000000001111
Port03	0000000011011111	Port03	0000000011111101
Port04	0000000000001111	Port04	0000000011001111
Port05	0000000011101111	Port05	0000000011001111
Port06	0000000011110011	Port06	0000000011000000
Port07	0000000000000000	Port07	0000000010001000
Port08	0000000000111100	Port08	0000000010111110
Port09	0000000011100000	Port09	0000000010110001
Port10	00000000001010010	Port10	00000000001010010
Port11	00000000001100110		

Figure 5-205b

Setting	Value	Setting	Value
OFST-P-Y	4	-128 - 128	
OFST-P-M	4	-128 - 128	
OFST-P-C	2	-128 - 128	
OFST-P-K	1	-128 - 128	

Figure 5-205e

Setting	Value	Setting	Value
ADJ-XY	22	01 - 100	
ADJ-X	92	47 - 131	
ADJ-Y	50	20 - 200	
ADJ-Y-DF	87	21 - 106	
STRD-POS	102	01 - 200	

Figure 5-205c

Setting	Value	Setting	Value
DF-WLVL1	START		
DF-WLVL2	START		
CLEAR			
R-CON	CLEAR		
OPTION	CLEAR		
MISC-R			
SCANLAMP	START		

Figure 5-205f

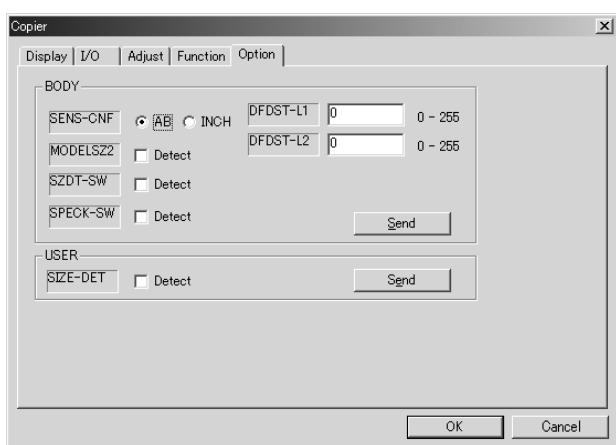


Figure 5-205g

2) Copier>I/O

This operation indicates the I/O port statuses of the reader controller PCB and ADF driver PCB.

Basically, this mode is for factory/design, but since the sensor operation status, etc., of the ADF driver PCB marked [FEEDER] is known, these contents are indicated.

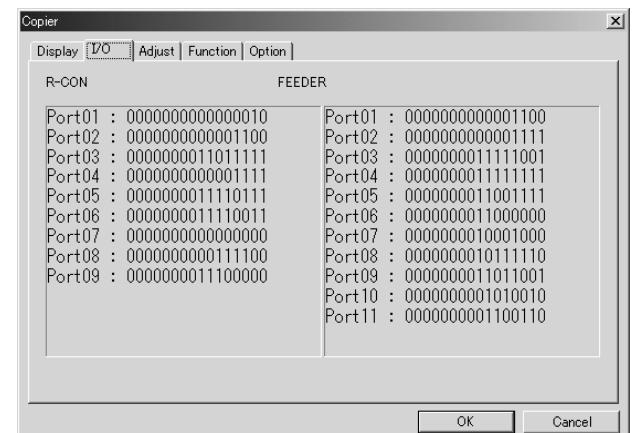
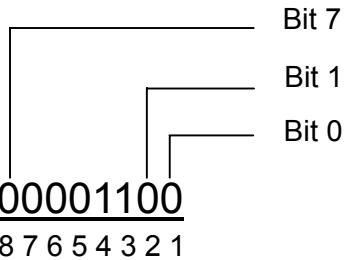


Figure 5-206

* Bit display



Port	Bit	Name	Remarks
P1	0	Read sensor	0: Document supplied
	1	Registration senor	0: Document supplied
	2	Delivery reversal sensor	0: Document supplied
	3	ADF opening sensor	0: Opened
	4	Unused	
	5	Unused	
	6	Unused	
	7	Unused	
P2	0	Delivery reversal motor current 1	
	1	Delivery reversal motor current 2	
	2	Pressure motor current setting 1	
	3	Pressure motor current setting 2	
	4	Stamp solenoid drive	1:ON
	5	Clutch drive	1:ON
	6	Document detection LED	1:ON
	7	Cooling fan drive	1:ON
P3	0	Pickup motor current cut	
	1	Read motor current cut	
	2	Pressure motor current setting	
	3	Read motor mode setting	
	4	Read motor current setting 1	
	5	Read motor current setting 2	
	6	Pickup motor current setting 1	
	7	Pickup motor current setting 2	

Port	Bit	Name	Remarks
P4	0	Feeder cover sensor	0:Opened
	1	Unused	
	2	Unused	
	3	Unused	
	4	Unused	
	5	Unused	
	6	Unused	
	7	Stamp	1:Supplied
P5	0	Unused	
	1	Pressure HP sensor	1:Released
	2	Delivery reversal sensor	0: Document supplied
	3	Post-separation sensor	0: Document supplied
	4	LGL sensor	1: Document supplied
	5	A4R/LTRR sensor	1:AB system
	6	Unused	
	7	Document set sensor	0: Document supplied
P6	0-7	For design	
P7	0-7	For design	
P8	0-7	For design	
P9	0-7	For design	
P10	0-7	For design	
P11	0-7	For design	

Table 5-202

3) Copier>Adjust>ADJ-XY

This mode adjusts the image read start position. The DR-7080C having been adjusted at factory, it can basically be used as is in the market, but if the reader controller PCB is replaced, the DR-7080C must be reset to the factory setting values. Moreover, this adjustment is used if for some reason, such as following disassembly and assembly, read images have defects, or if fine adjustments are required.

However, keep the value of "ADJ-S: Manual adjustment of shading position" the same as the factory setting value and do not adjust it in the market.



Figure 5-207

- ADJ-X: Adjustment of sub-scan direction start position in FB mode (X direction)
- ADJ-Y: Adjustment of main scan direction start position in FB mode (Y direction)
- ADJ-Y-DF: Adjustment of main scan direction start position in ADF mode (Y direction)
- STRD-POS: Adjustment of sub-scan direction start position in ADF mode (X direction)

• Operation Procedure

- Change the value according to the image. Changing the value by 1 results in movement of 0.1 mm.
- Click the [Send] button.
- When transmission of the input data has been completed, the [Success] screen is displayed. Click the [OK] button.

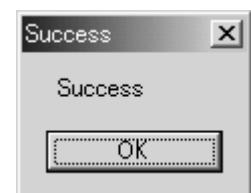


Figure 5-208

- End the service mode.
- Execute power supply reset. If power supply reset is not executed, some items will not be enabled.
- Check the image after changes have been made.

- Direction in FB mode

Document set status → Read image

Left rear of platen glass = origin

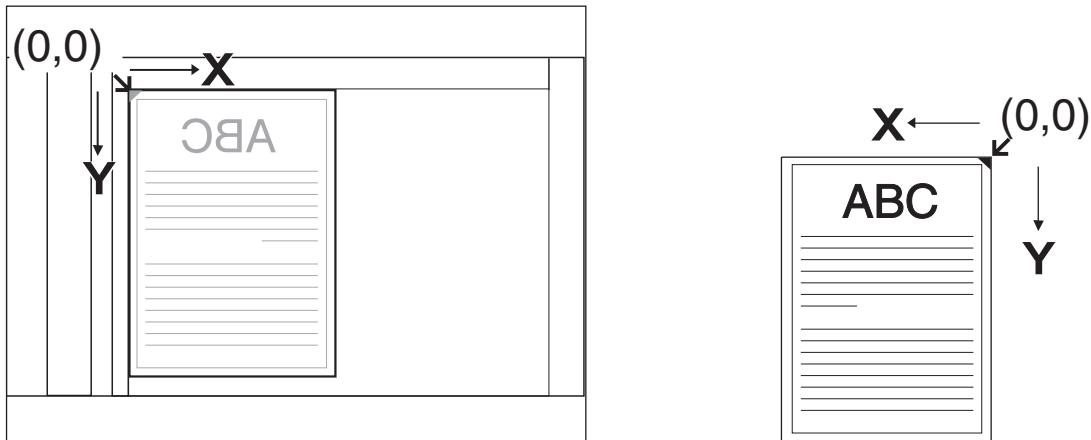


Figure 5-209

When the [ADJ-X] value is reduced, the read start position in the X direction enters the minus side, and when the [ADJ-X] value is increased, it enters the plus side.

In the example shown below, the right side of the read image was cut off, so the [ADJ-X] value was reduced to improve the image.

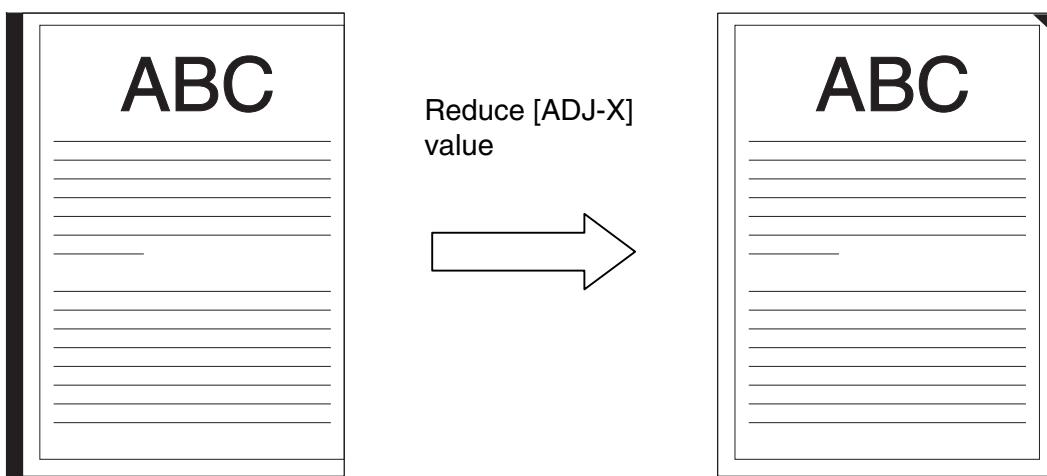


Figure 5-210

When the [ADJ-Y] value is reduced, the read start position in the Y direction enters the minus side, and when the [ADJ-Y] value is increased, it enters the plus side.

In the example shown below, the top side of the read image was cut off, so the [ADJ-Y] value was reduced to improve the image.

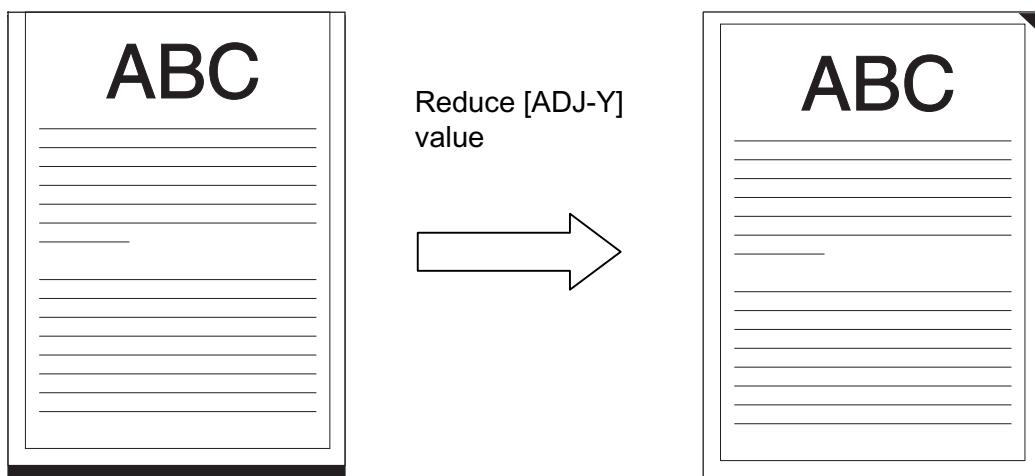


Figure 5-211

- Direction in ADF mode

Document read status → Read image
Center rear of ADF reading glass = origin

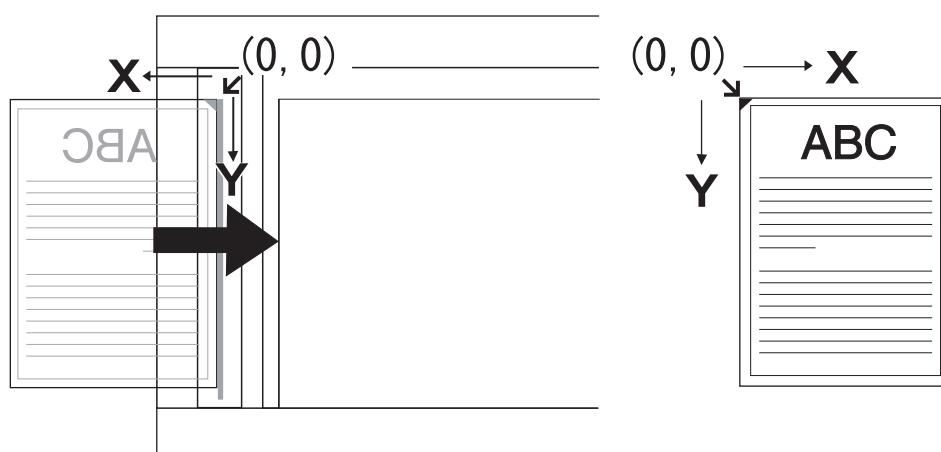
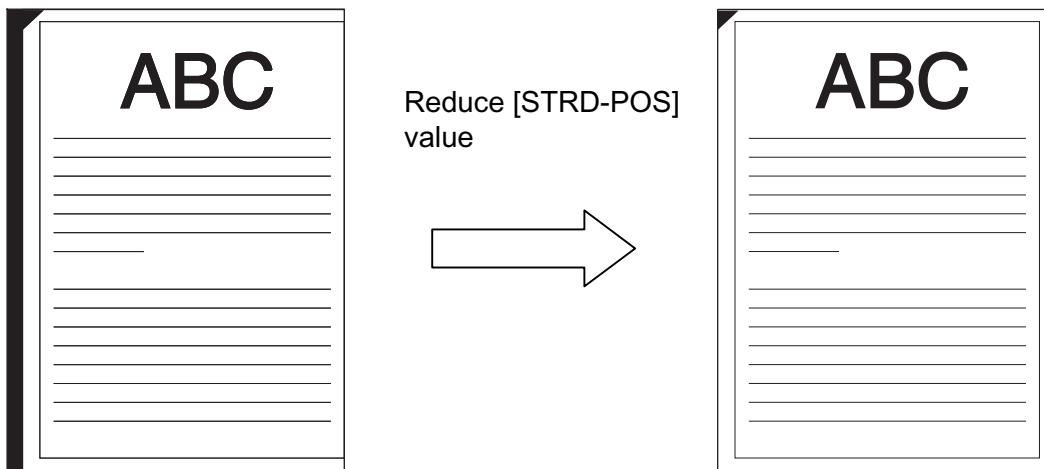


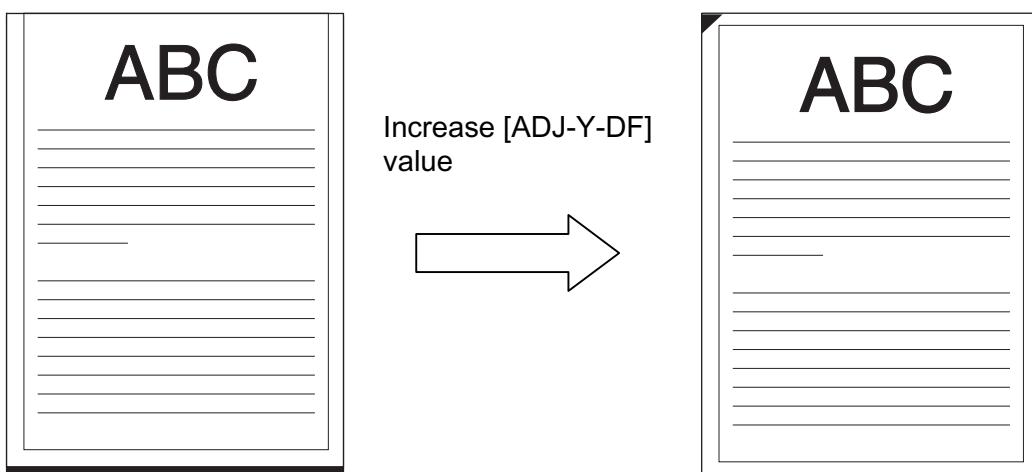
Figure 5-212

When the [STRD-POS] value is reduced, the read start position in the X direction enters the plus side, and then the [STRD-POS] value is increased, it enters the minus side.



In the example shown below, the right side of the read image was cut off, so the [STRD-POS] value was reduced to improve the image.

When the [ADJ-Y-DF] value is reduced, the read start position in the Y direction enters the plus side, and when the [ADJ-Y-DF] value is increased, it enters the minus side.



In the example shown below, the top side of the read image was cut off, so the [ADJ-Y-DF] value was increased to improve the image.

4) Copier>Adjust>CCD

This mode adjusts the CCD and shading-related data values. However, except for the [DFTAR-R], [DFTAR-G], and [DFTAR-B] values, all the values should remain the factory setting values, and if related parts are replaced in the market, the values should be adjusted again to the factory setting values. For details, refer to "AFTER REPLACING PARTS".

Note: The results of executing [Copier>Function>CCD] are displayed for the [DFTAR-R], [DFTAR-G], and [DFTAR-B] values.

If image anomalies occur for these values, set the factory setting values. For details, refer to [Copier>Function>CCD].

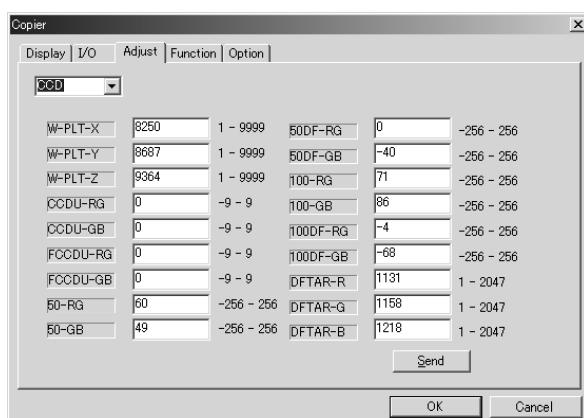


Figure 5-215

• Operation Procedure

- Input the factory setting value.
- Click the [Send] button.
- When transmission of the input data has been completed, the [Success] screen is displayed. Click the [OK] button.



Figure 5-216

- End the service mode.
- Execute power supply reset.
- If power supply reset is not executed, some items will not be enabled.
- Check the image after changes have been made.

5) Copier>Adjust>PASCAL

This mode adjusts the data values related to automatic gradation correction. However, leave all the values at their factory setting, and if the reader controller PCB is replaced in the market, set the values back to the factory setting values. For details, refer to "AFTER REPLACING PARTS".

The operation procedure is the same as [Copier>Adjust>CCD].

6) Copier>Function>CCD

This mode automatically adjusts the CCD's white level.

Execute this mode after replacing the reader controller PCB.

Both [DF-WLVL1] and [DF-WLVL2] must be executed.

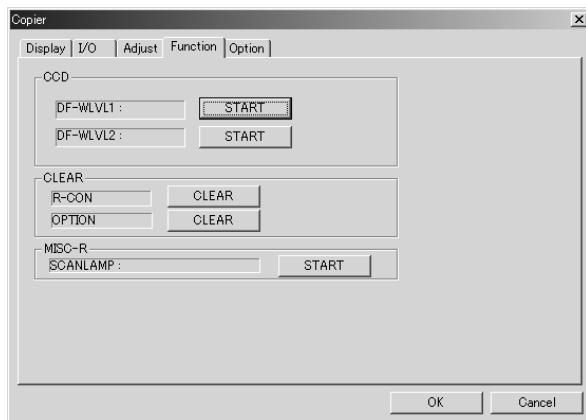


Figure 5-217

- Operation Procedure

- Clean the platen glass and the rollers.
- Set a blank A4 or LTR sized sheet of copy paper on the platen glass and click the [START] button of [DF-WLVL1].

Note: Execute [DF-WLVL1] first.

- Scanning is automatically performed. When completed, the [Success] screen is displayed, so click the [OK] button.

- Set the same copy paper in the document pickup tray and click the [START] button of [DF-WLVL2].
- Duplex scanning is automatically executed. When completed, the [Success] screen is displayed. Click the [OK] button.
- End the service mode and check the image.

By executing this mode, the target value for white level is calculated at the actual read position taking into consideration the transparency of the glass. The calculated value is displayed in [DFTAR-R], [DFTAR-G], and [DFTAR-B] of [Copier>Adjust>CCD].

If the copy paper that is used is soiled, anomalies such as streaks and color irregularities may occur in the image after this mode is executed. In this case, after cleaning the DR-7080C, execute this mode again using clean copy paper. If the problem persists, input the factory setting values in [DFTAR-R], [DFTAR-G], and [DFTAR-B].

The standard white plate data that serves as the reference for white level adjustment is measured for every platen glass and is input to [W-PLT-X], [W-PLT-Y], and [W-PLT-Z] of [Copier>Adjust>CCD]. This value is described on the platen glass and service label.



Figure 5-218

7) Copier>Function>CLEAR

[R-CON] performs RAM clear for the reader controller PCB. Execute this mode in the market after replacing the reader controller PCB. Since related items need to be reset after this mode is executed, be careful not to perform this mode by mistake. For details, refer to "AFTER REPLACING PARTS".

[OPTION] performs option-related data clear. However, this mode need not be performed for the DR-7080C.

- Operation Procedure

- Click the [CLEAR] button.
- The [Confirm] screen is displayed, so click the [Yes] button.

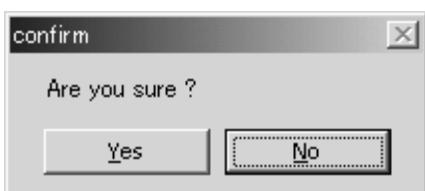


Figure 5-219

- When RAM clear is completed, the [Success] screen is displayed. Click the [OK] button.



Figure 5-220

- End the service mode.
- Execute power supply reset.
- Enter the service mode again and set again related items.

8) Copier>Function>MISC-R

[SCANLAMP] lights the scanning lamp. The scanning lamp lights approx. 3 seconds after [SCANLAMP] is executed. [SCANLAMP] is not used only to check lighting, but also during feeder height adjustment.

- Operation Procedure

- Click the [START] button. The lamp lights.
- While the lamp is lit, the [Wait] screen is displayed.



Figure 5-221

- The lamp goes out after approx. 3 seconds, and the [Success] screen is displayed. Click the [OK] button.



Figure 5-222

- End the service mode.

6. Feeder

1) Operation screen

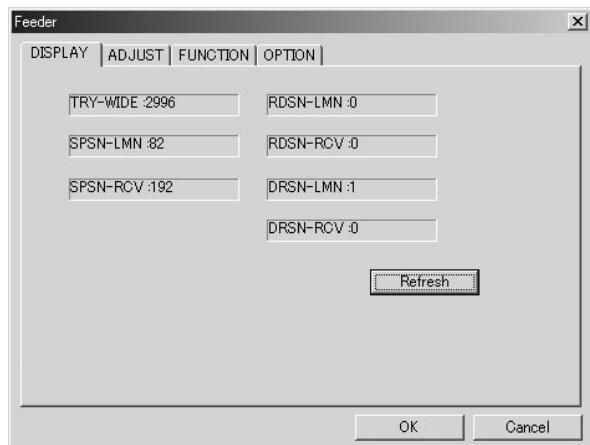


Figure 5-223a

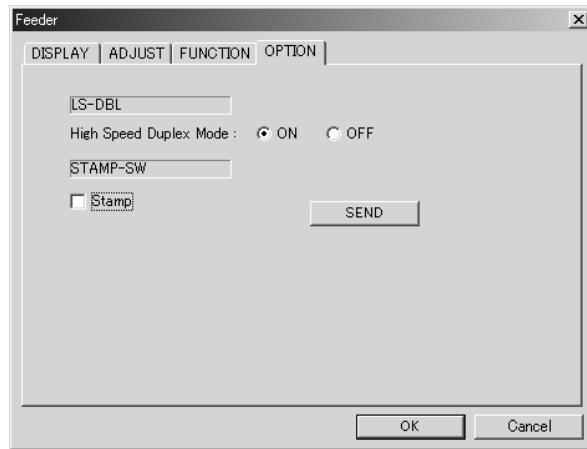


Figure 5-223d

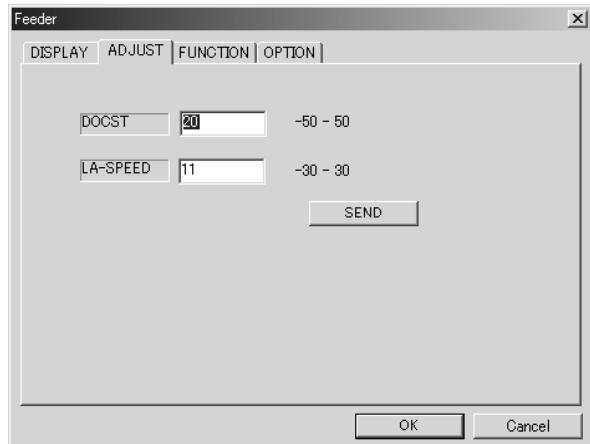


Figure 5-223b

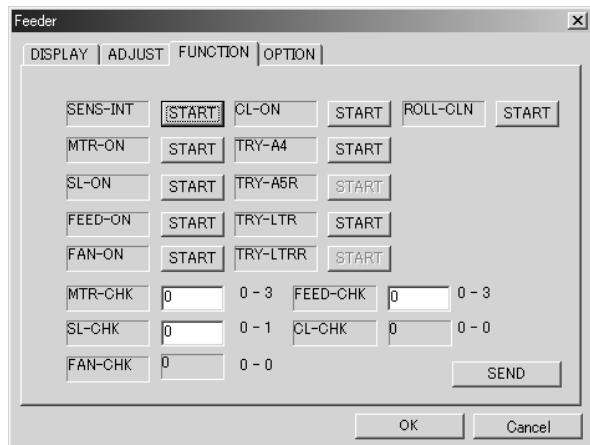


Figure 5-223c

2) Feeder>DISPLAY

This mode displays the document guide and sensors (post-separation, read, delivery reversal) status. Each status is displayed when [Feeder] is selected. Also, each status is displayed when the [Refresh] button is clicked. When the [Refresh] button is clicked after the amount of opening of the document guide is changed or the relevant sensor detection status is changed, that change can be checked with data.

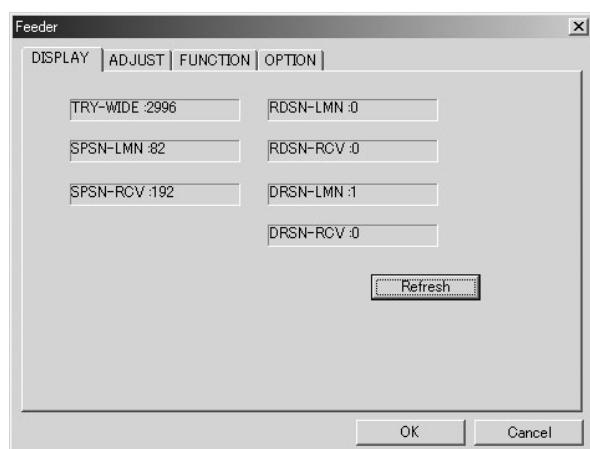


Figure 5-224

- TRY-WIDE: Document guide opening amount (Unit: 0.1 mm)
- SPSN-LMN: Post-separation sensor light-emission voltage
- SPSN-RCV: Post-separation sensor light-reception voltage
- RDSN-LMN: Read sensor light-emission voltage
- RDSN-RCV: Read sensor light-reception voltage
- DRSN-LMN: Delivery reversal sensor light-emission voltage
- DRSN-RCV: Delivery reversal sensor light-reception voltage

3) Feeder>ADJUST

This mode performs adjustments related to document feeding. The DR-7080C having been adjusted at factory, it can basically be used as is in the market, but if the reader controller PCB is replaced, the DR-7080C must be reset to the factory setting values.

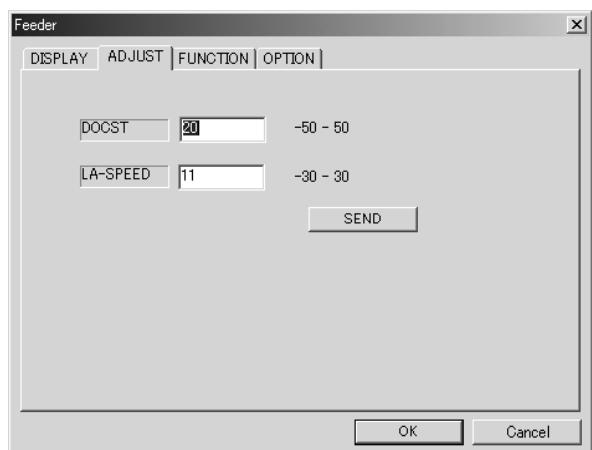


Figure 5-225

- DOCST: Adjustment of document stop position in ADF mode (leading edge registration adjustment)
- LA-SPEED: Adjustment of document feed speed in ADF mode (magnification adjustment)

- Operation Procedure
 - Input the value.
 - Click the [Send] button.
 - When transmission of the input data has been completed, the [Success] screen is displayed. Click the [OK] button.

5) Feeder>FUNCTION>SENS-INT

This mode adjusts the sensitivity of sensors (post-separation, read, delivery reversal). Execute this mode after replacing sensors and the reader controller PCB.

- Operation Procedure
 - When the [START] button is clicked, the mode is automatically executed.
 - Note:** Be sure to close the feeder cover.
 - When execution of the mode is completed, the [Success] screen is displayed. Click the [OK] button.



Figure 5-226

- End the service mode.

4) Feeder>FUNCTION

This mode automatically adjusts the document guide and sensors (post-separation, read, delivery reversal), checks the operation of the motor, etc., and executes the roller cleaning mode. For the respective details, refer to the relevant sections.

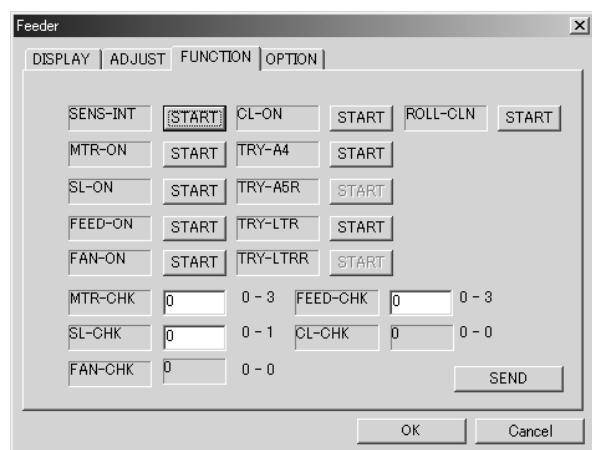


Figure 5-227



Figure 5-228

- End the service mode.

6) Feeder>FUNCTION>MTR-ON

How to check the various operations, including those of the motor and other driving parts, is explained here.

The following table lists the mode names and the targets they cover.

No.	Mode Name	Target
1	MTR-ON MTR-CHK	0: Pickup motor 1: Feed motor 2: Delivery reversal motor 3: Pressure motor
2	SL-ON SL-CHK	0: Pressure solenoid 1: Stamp solenoid
3	FEED-ON FEED-CHK	0: Simplex feed 1: Duplex feed 2: Simplex feed, stamp 3: Duplex feed, stamp
4	FAN-ON FAN-CHK	0: Cooling fan of feeder
5	CL-ON CL-CHK	0: Pickup clutch

Table 5-203

Each mode is used by setting [ON] and [CHK] for that mode.

The motor operation procedures are indicated below. Refer to these procedures for the solenoid, fan, and clutch operation procedures.

- Motor Operation Procedure
 - Input the target number in [MTR-CHK] and then click the [SEND] button.
 - When transmission of the input data has been completed, the [Success] screen is displayed. Click the [OK] button.

c) When the [START] button to the right of [MTR-ON] is clicked, the corresponding motor operates. At the same time, the button display changes to [STOP].

d) When the [STOP] button is clicked, the operation stops. At the same time, the button display changes to [START].

Note: The operation stops automatically approx. 5 seconds after the [START] button is selected. In this case, the button display remains [STOP].

e) End the service mode.

- Feed Operation Procedure

a) Set the documents to be fed in the document pickup tray.

b) Input the target number in [FEED-CHK] and then click the [SEND] button.

c) When transmission of the input data has been completed, the [Success] screen is displayed. Click the [OK] button.

d) Click the [START] button to the right of [FEED-ON] to start the targeted feed operation.

e) The feed operation ends when no more of the set documents are left.

f) End the service mode.

Note: Even if [Feeder>OPTION>STAMP-SW] is OFF, the stamp operation is executed as long as the stamp solenoid is attached.

7) Feeder>FUNCTION>TRY-A4

This section describes automatic adjustment of the document guide including [TRY-A4].

Execute automatic adjustment of the document guide after replacing the reader controller PCB. At this time, either the combination of [TRY-A4] and [TRY-A5R], or [TRY-LTR] and [TRY-LTRR], can be executed.

The operation procedure for the [TRY-A4] and [TRY-A5R] combination is described below. Use this as reference for the operation procedure for the [TRY-LTR] and [TRY-LTRR] combination.

- Operation Procedure

- Adjust the document guide to A4 size.
- When the [START] button to the right of [TRY-A4] is clicked, the opening amount data for the document guide is transmitted.

Note: Execute [TRY-A4] first.

- When transmission has been completed, the [Success] screen is displayed. Click the [OK] button.



Figure 5-229

- Adjust the document guide to A5R size.

- When the [START] button to the right of [TRY-A5R] is clicked, the opening amount data for the document guide is transmitted.

- When transmission has been completed, the [Success] screen is displayed. Click the [OK] button.

- Check the opening amount value for the document guide in [Feeder>DISPLAY>TRY-WIDE].

- End the service mode.

8) Feeder>FUNCTION>ROLL-CLN

This is a convenient mode for cleaning rollers. Executing this mode causes the rollers to rotate.

However, the pickup, feed, and reversal rollers do not rotate due to the structure of the transmission system and to avoid pinching of hands.

- Operation Procedure

- When the [START] button to the right of [ROLL-CLN] is clicked, the drive rollers rotate. At the same time, the button display changes to [STOP].
- Clean the rollers while they are rotating.
- Click the [STOP] button to stop the rollers.

Note: The rollers also stop rotating when the feeder cover is opened or closed, and upon feeder open/close detection.

- End the service mode.

9) Feeder>OPTION

This mode executes the high-speed duplex mode and stamp settings.

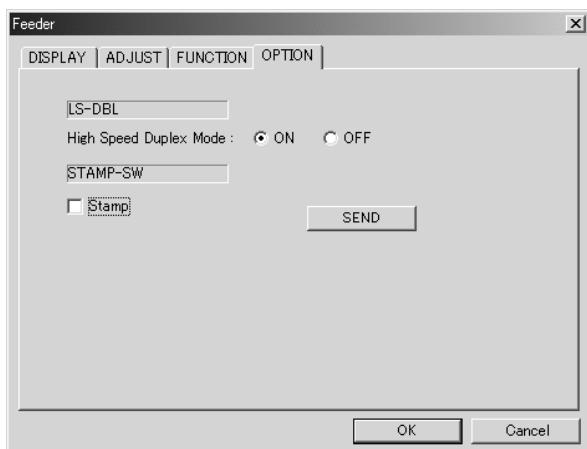


Figure 5-230

- [LS-DBL]:Setting of high-speed duplex mode
This setting is [ON] at factory.
Normally the [ON] setting is good, but when using documents for which feed problems often occur in the high-speed duplex mode, select the [OFF] setting.
- [STAMP-SW]: Setting of stamp
This setting is [OFF] at factory. Set this setting to [ON] after the optional stamp solenoid has been installed.

- High-Speed Duplex Mode Operation Procedure

- Click the radio buttons corresponding to the desired settings.
"ON" : ON OFF
"OFF": ON OFF
- Click the [Send] button.
- When transmission of the data has completed, the [Success] screen is displayed. Click the [OK] button.
- End the service mode.

- Stamp Operation Procedure

- To change the setting, click the checkbox to the left of [Stamp].
"ON" : Stamp
"OFF": Stamp
- Click the [Send] button.
- When transmission of the data has been completed, the [Success] screen is displayed. Click the [OK] button.
- End the service mode.
- Execute power supply reset.

Note: If power supply reset is not executed, the settings will not be enabled.

- Check that the operation is performed as set.

7. Counter Set

1) Outline

Counter Set is used to change the values of the various counters. These values are used for counter display such as the service mode screen.

These data are saved to the DC controller PCB. Therefore, as these values are changed when the DC controller PCB is replaced, it is necessary to restore the pre-replacement values following DC controller PCB replacement. However, if the pre-replacement values are not known, estimated values can be used.

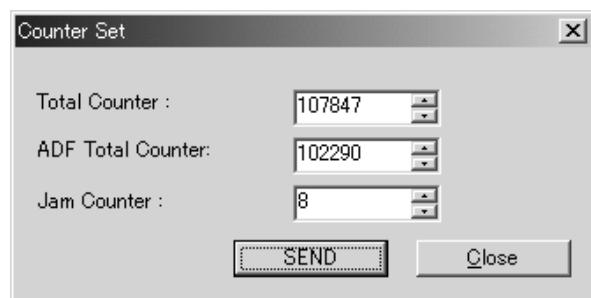


Figure 5-231

- Total Counter

Total number of scanned sheets for both ADF and FB

- ADF Total Counter

Total number of scanned (= fed) sheets for ADF

- Jam Counter

Total number of document jam error occurrences

However, since the [ADF Total Counter] value is expressed as number of sheets, in the case of duplex scan, the counter is incremented by "1" each time both the front and back sides of a sheet are scanned. The first document scan (front side in the case of duplex scan) at the time of pickup and feed is not added to the [Jam Counter] value.

Moreover, the [Total Counter] and [ADF Total Counter] values are saved in the temporary memory of the DC controller PCB for an increase of up to 10 sheets, and to regular ROM if the increase exceeds 10 sheets. Therefore, when the power supply of this machine is switched off when the increase is 10 or fewer sheets, the increase portion gets deleted. However, regarding [Jam Counter], the count value is written to the regular ROM each time it is incremented.

2) Usage Method

The operation procedure is as follows.

- Input the new value in the box to the right of the desired item.
- When input of all the items has been completed, click the [SEND] button.
- When transmission of the data has been completed, the [Success] screen is displayed. Click the [OK] button.
- End the service mode.

8. Panel Check

1) Outline

Panel Check is used to check the operation panel keys, LEDs, and the LCD panel operation.

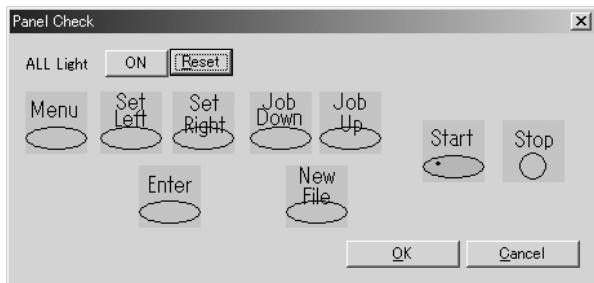


Figure 5-232

2) Usage Method

• Keys

When an operation panel key is pressed, the corresponding mark lights.

• LED, LCD

When the [ON] button at the right side of [ALL Lights] is clicked, all the LEDs and LCDs lights up. LEDs are provided for the Start key and New File key. When the [ON] button is clicked, the button display changes to [OFF]. When the [OFF] button is clicked, all the LEDs go out. When the [Reset] button is clicked, normal display is returned.

9. Firm Load

"Controller Firm Load" and "Scanner Firm Load" are used when changing the respective firmware.

For details, refer to the service information issued when changing the firmware. Do not use this mode by mistake.

- Outline of operation procedure
 - 1) Select the [Firm Load] to be changed.
 - 2) The screen for selecting the file where the firmware is saved is displayed.
 - 3) Specify and open the file.
 - 4) The firmware is loaded to the DR-7080C.

Note: If the firmware has been changed, write the number on the [ROM Version] label attached to the left of the DR-7080C.

10. Mirror

This mode is used to move the mirror unit to a fixed position for transport.

The mirror unit must be fixed with a special screw if the DR-7080C needs to be transported (by car, plane, etc.) after it has been installed. For this screw, refer to "CHAPTER 4, II. UNPACKING AND INSTALLATION".

- Operation Procedure

- 1) Click the [Mirror] button.
- 2) After the mirror unit has been fixed, the [Success] screen is displayed. Click the [OK] button.



Figure 5-233

- 3) End the service mode.
- 4) Fix the mirror unit with a special screw.
- 5) Switch OFF the power supply.

Note: The DR-7080C cannot function when the mirror unit is in a fixed position. After executing this mode, remove a screw and execute power supply reset before using the DR-7080C.

11. Service Label

In order to allow re-input the required adjustment values after replacing a part, a "service label" containing the factory setting values is pasted on the rear side of the document pickup tray.

Figure 5-234 shows this service label.

The various items of the service label indicate the service mode item names. The corresponding factory setting values are indicated in the "Factory" column.

When parts (platen glass, CCD unit, etc.) are replaced in the market, change the corresponding value.

COPIER > ADJUST		Factory	1	2	COPIER > ADJUST		Factory	1	2	COPIER > ADJUST		Factory	1	2
ADJ-XY	ADJ-X	20			CCD	CCDU-RG	3			PASCAL	OFST-P-Y	1		
	ADJ-Y	91				CCDU-GB	1				OFST-P-M	3		
	ADJ-S	50				FCCDU-RG	0				OFST-P-C	-2		
	STRD-POS	118				FCCDU-GB	1				OFST-P-K	1		
	ADJ-Y-DF	72				100_RG	77			FEEDER > ADJUST				
CCD	W-PLT-X	8198				100_GB	38			LA-SPEED		10		
	W-PLT-Y	8658				100DF-RG	-13			DOCST		4		
	W-PLT-Z	9352				100DF-GB	-12							
	DFTAR-R	1180				50-RG	55							
	DFTAR-G	1228				50-GB	18							
	DFTAR-B	1296				50DF-RG	3							
No. xxxxxx Date. yy/mm/dd		FC5-0829				50DF-GB	-10							

Figure 5-234

III. USER MODES

Table 5-301 lists the various user modes. For details, refer to the user manual.

No.	Item	Factory Setting
1	Count Only Mode	OFF
2	Long Document Mode	OFF
3	Stand-by Mode	ON
4	Display Language Mode	100 V: Japanese Other: English
5	Display Contrast Mode	Center
6	Setting SCSI Transfer Mode	20 MB/sec

Table 5-301

- **Operation Procedure**

- 1) Press the [Menu] key on the operation panel to display the user mode screen.
- 2) Press the [Menu] key to change the item.
- 3) Press the [Set] key to change the setting.
- 4) Press the [Enter] key.
- 5) Press the [Stop] key.

Note: If the SCSI transfer speed has been changed, also execute power supply reset. If power supply reset is executed in the Count Only Mode, the setting returns to the [OFF] at factory setting.

IV. FEEDER ADJUSTMENT

1. Outline

The feeder adjustment procedure must be performed after removing and reinstalling the feeder, after replacing the feeder, or when a feed problem or image problem has occurred.

The adjustment consists of the sequence described below. Items that are not a problem can be skipped.

Regarding items that use the service mode, refer to "SERVICE MODE". Moreover, if the factory setting values printed on the service label are changed at the time of adjustment, write down the new values on the label.

- ① Opening angle (90°)
- ② Tray width adjustment*1
- ③ Sensor output*1
- ④ Tilt correction
- ⑤ Height adjustment
- ⑥ Right angle adjustment
(skew adjustment)
- ⑦ Opening angle (70°)
- ⑧ Magnification adjustment*1
- ⑨ Horizontal registration adjustment*1
- ⑩ Leading edge registration adjustment*1
- ⑪ White level adjustment*1

*1: Service mode is used for these adjustments.

Note: Be sure to clean the rollers, glasses, etc. before the image adjustments are preformed.

2. Opening Angle (90°)

Set the feeder opening angle to 90° before performing the following adjustments.

- 1) Flip over the rubber cover ①, remove the 2 mounting screws ②, and detach the angle guide plate ③.

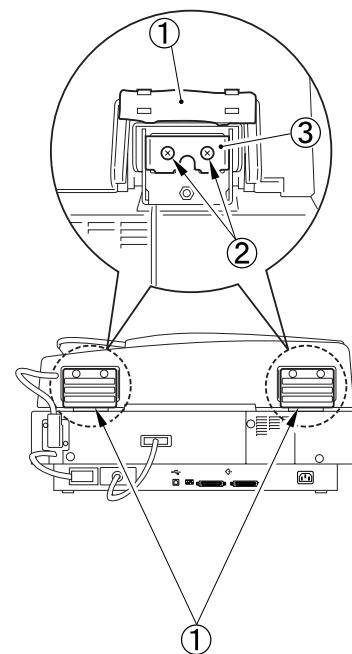


Figure 5-401

3. Tray Width Adjustment

Adjust the tray width if there are feed mode related problems.

In the DR-7080C, the document guide opening amount data is used to determine the feed mode, but it is not used to determine the size of scanned images.

For example, in the case of a document size of A4 or LTR, and scanning performed under conditions that enable the high-speed duplex mode, the tray width adjustment must be performed if performing feed in the low-speed duplex mode.

Execute the service mode [Feeder>FUNCTION>TRY-A4, TRY-A5R] or [Feeder>FUNCTION>TRY-LTR, TRY-LTRR].

4. Sensor Output Adjustment

Perform this adjustment after replacing the post-separation sensors, read sensors, and delivery reversal sensors.

Note: Also perform this adjustment after replacing the reader controller PCB of the reader.

- Adjustment Procedure
 - 1) Clean the sensors and the corresponding prisms.
 - 2) Check that there is no document inside the feeder.
 - 3) Execute the service mode [Feeder>FUNCTION>SENS-INT].

5. Tilt Correction

- 1) Loosen the nut ① behind the left hinge, turn the hex socket head bolt ②, moving the fixing member ③ until the line marking ④.
- Rotate bolt clockwise to move member forward.
- Rotate bolt counterclockwise to move member backward.
- Then, tighten the nut and fix it.

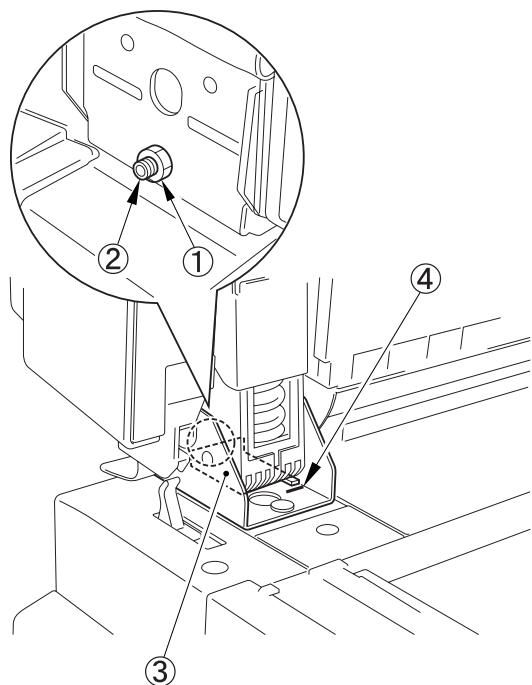


Figure 5-402

6. Height Adjustment

- 1) Check if the height adjusting blocks ① at the front left and rear are in contact with the reading glass ② when the feeder is closed.

Note: Contact check is done either by performing actual scanning, or by lighting the scanning lamp with service mode [Copier>FUNCTION>MISC-R>SCANLANP].

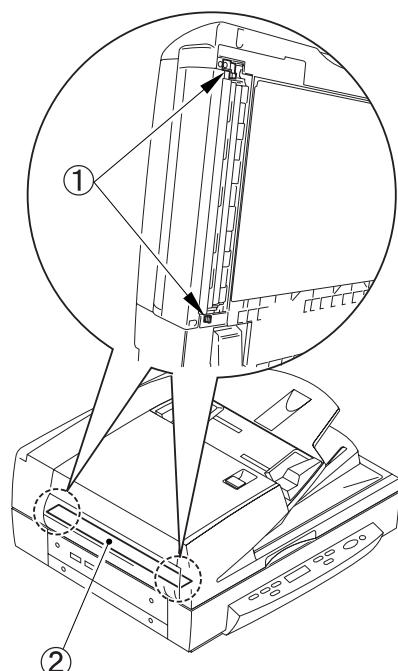


Figure 5-403

[When not contacted]

If the height adjusting blocks at the front left and rear are not in contact with the reading glass, adjust them by turning the fixing screw ① at the top of the left hinge.

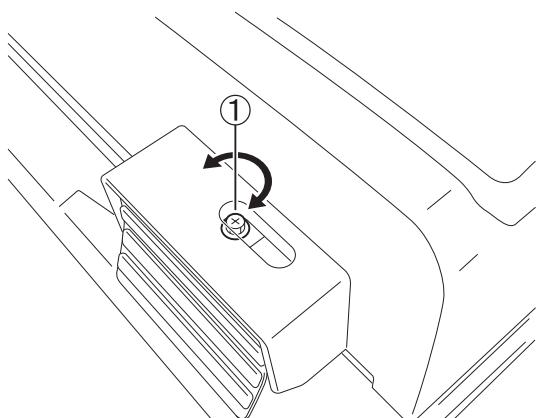


Figure 5-404

7. Right Angle Adjustment (Skew Adjustment)

This adjustment is performed to adjust the right angle of the scanner system of the reader and the feeder's document feed direction.

The skew adjustment is also described.

If the feeder is installed in a slanted position in relation to the reader, the read images will not be exactly at a right angle. Figure 5-405 shows an extreme example.

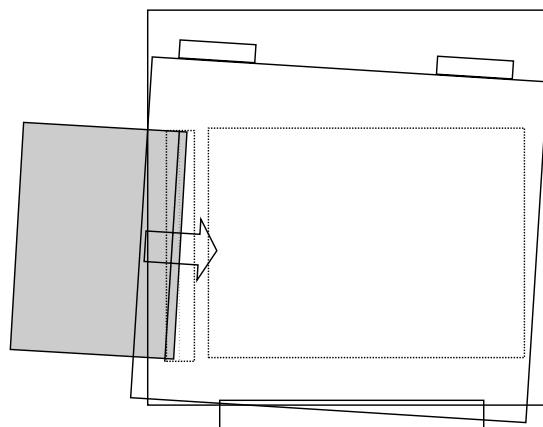
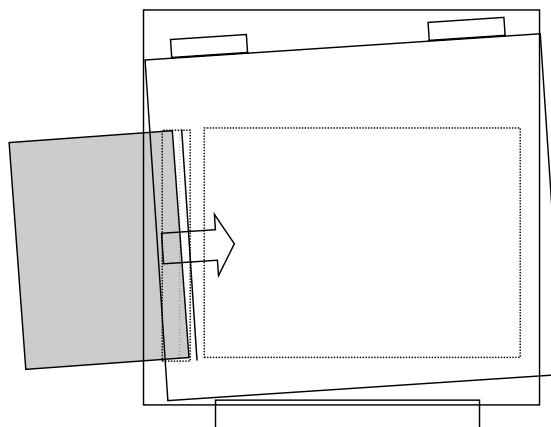


Figure 5-405

- 1) Set the test chart on the document pickup tray and read the image. Correctly adjust the document guide.
- 2) Check the right angle of leading edge A of the image. If adjustments are necessary, perform adjustments from step 3.

Note: Use a test chart with an A4 or LTR size frame as the test chart. No settings are provided for service tools, so create your own.

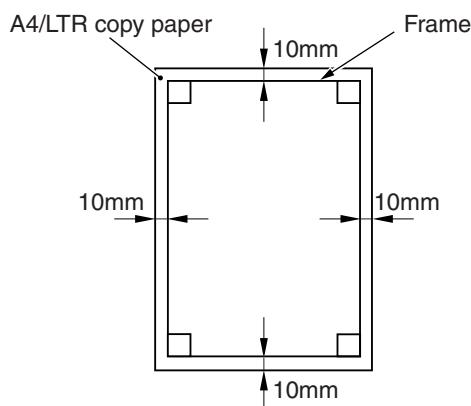


Figure 5-406

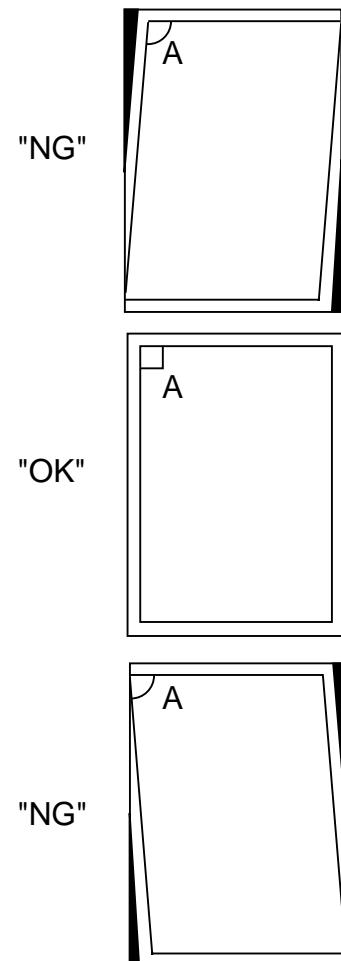


Figure 5-407

3) Loosen the 2 knurling screws ① at the front of the right hinge unit. Next, flip over the rubber cover ② at the rear of the right hinge unit and loosen the fixing nut ③, then turn the hex socket head bolt ④ to make adjustment. If $A > 90^\circ$, turn counterclockwise. If $A < 90^\circ$, turn clockwise.

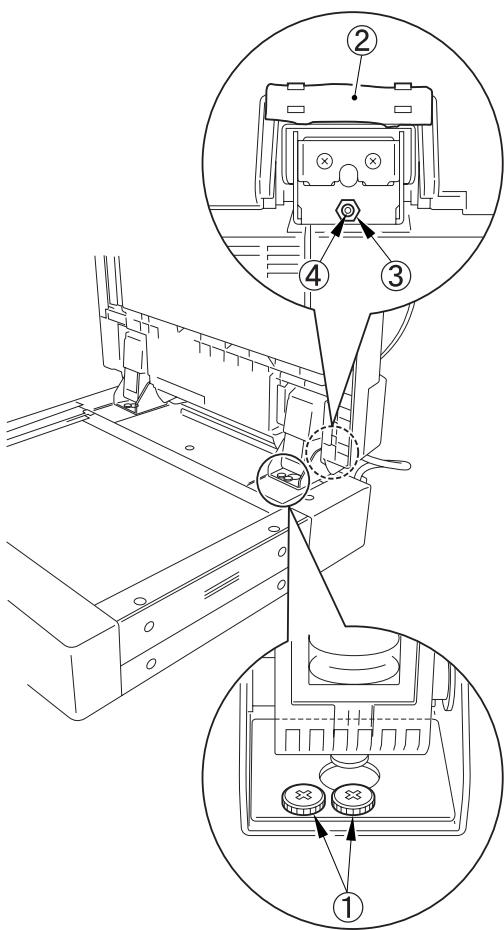


Figure 5-408

4) After performing the adjustment, fix the hex socket head bolt by tightening the fixing nut. Then tighten the two knurling screws.
 5) Scan again the test chart and check that part A is at a right angle. If not, do the same actions from the step 3.

* Skew adjustment

If the image is skewed as shown below even when right angle adjustment is performed, perform skew adjustment. And if the skewed image is caused by the skew failure not right angle failure, make a skew adjustment.

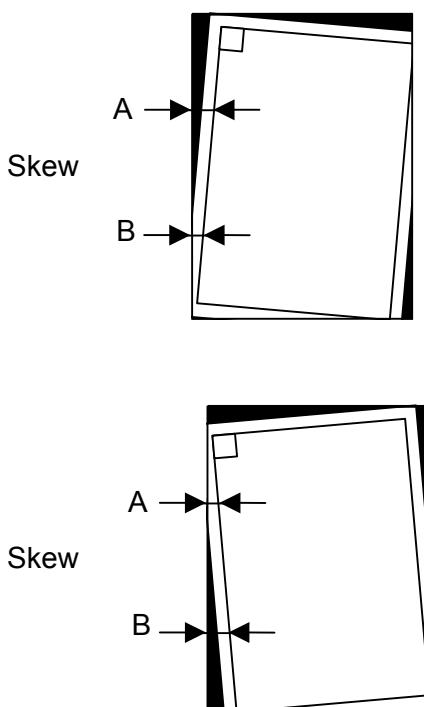


Figure 5-409

- Adjustment Procedure
 - 1) Open the feeder cover.
 - 2) Remove the screw ① of the No. 1 registration roller follower from the positioning hole, and gently tighten the screw through the adjustment slotted hole so that the stopper plate ③ can move along the adjustment slotted hole ②.

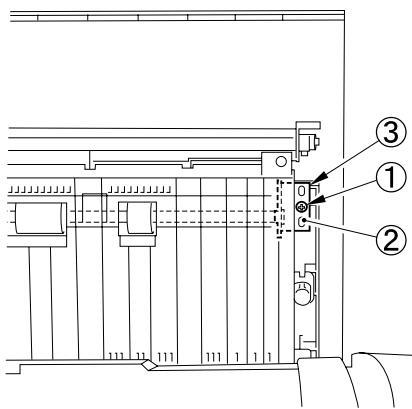


Figure 5-410

- 3) If $A > B$, move the stopper plate downward and then tighten the screw. If $A < B$, move the stopper plate upward and then tighten the screw.

Note: Be careful not to move the stopper plate too far so that the rollers come against the edge of the cover opening, as this will prevent the rollers from turning freely.

- 4) Scan again the test chart and check that the adjustment has been properly made.

Note: Properly adjust the document guide.

8. Opening Angle (70°)

Set the feeder opening angle to 70° before performing the following adjustments.

- 1) Flip over the rubber cover ① and attach the angle guide plate ③ with the two screws ②.

Note: Check that the feeder opening angle is approximately 70°.

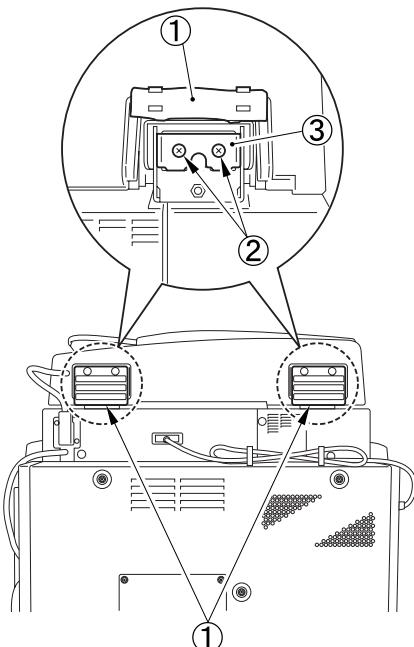


Figure 5-411

9. Magnification Adjustment

- 1) Prepare a test chart.
- 2) Set the test chart on the platen glass and scan the image. Use this image as the FB image.
- 3) Correctly set the same test chart on the document pickup tray and scan the image. Use this image as the ADF image.
- 4) Compare the lengths in the feed direction of the FB image and the ADF image, and if dimension A is approximately 1 mm or more, proceed to step 5.

Note: The rated value for the magnification error is 0.75% or less.

- 5) Select service mode [Feeder>ADJUST>LA-SPEED] and perform adjustment by changing the value.
If ADF image is too short → Decrease the value (slows the feed speed).
If ADF image is too long → Increase the value (speeds the feed speed).
[Unit: 0.1%]
<<Adjustment range: -30 to 30: -3 to +3%>>
- 6) Scan the test chart again and check that the image has been properly adjusted.

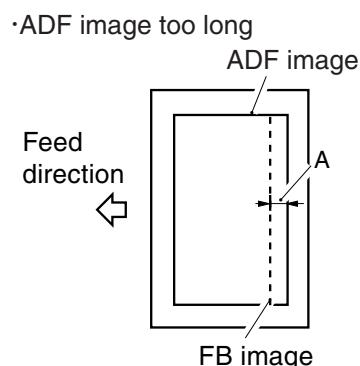
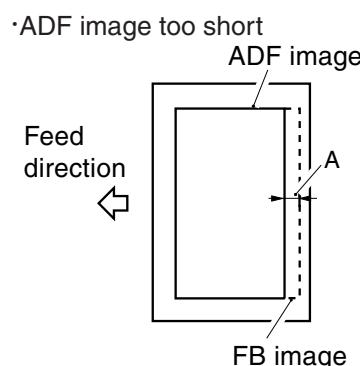


Figure 5-412

10. Horizontal Registration Adjustment

This adjustment adjusts the position of the document guide when adjustments have been performed in the service mode but were unsuccessful.

- Adjustment Using Service Mode

- 1) Prepare a test chart.
- 2) Correctly set the test chart on the document pickup tray and scan it.
- 3) Check the position of top side of the image obtained in step 2. If dimension [A] differs from the test chart dimension by more than approximately 1.5 mm, proceed to step 4 to make an adjustment.

Note: The rated value for horizontal registration is 1.8 mm or less for each side.

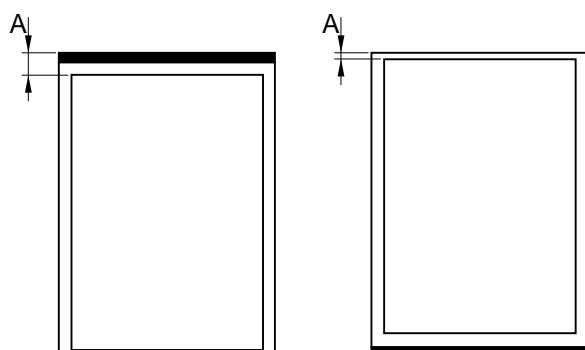


Figure 5-413

- 4) Select service mode [Copier>ADJUST >ADJ-XY>ADY-Y-DF] and perform adjustment by changing the value. Increasing the value increases dimension [A].
[Unit: 0.1 mm]
<<Adjustment range: 21 to 106>>
- 5) Scan the test chart again and check that the image has been properly adjusted.

- Document guide position adjustment

- 1) Open the feeder cover and remove the internal cover.
- 2) Remove the three fixing screws ① and remove the cover ②.

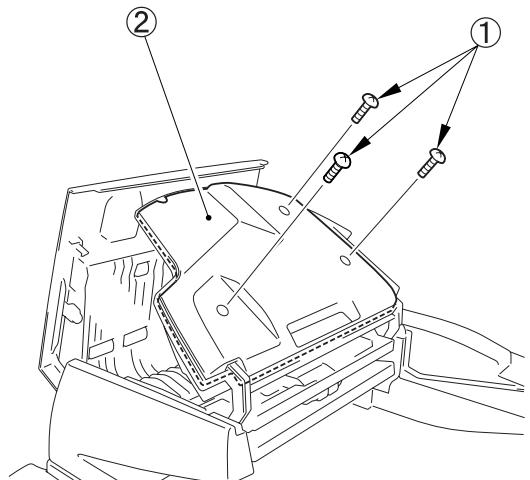


Figure 5-414

- 3) Loosen the screw ①, remove the screws ② from the positioning hole ③, and gently tighten the screw through the adjustment slotted hole so that the volume unit ④ can move along the adjustment slotted hole.

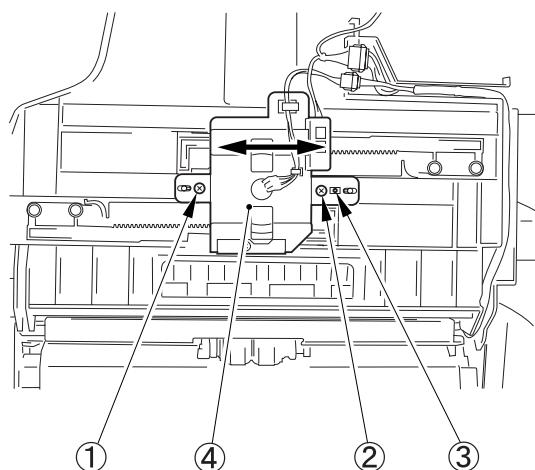


Figure 5-415

- 4) If image dimension [A] is too large, move the volume unit to the left. If it is too small, move it to the right.
- 5) Tighten the loosened screw ① and the screw ② attached to the adjustment slotted hole ③.
- 6) Return the removed cover to its original position.
- 7) Scan the test chart again and check that the image has been properly adjusted.

11. Leading Edge Registration Adjustment

- 1) Prepare a test chart.
- 2) Correctly set the test chart in the document pickup tray and scan it.
- 3) Check the position of the left side of the image obtained in step 2. If Dimension [A] differs from the test chart dimension by more than approximately 1.5 mm, proceed to step 4 to make an adjustment.

Note: The rated value for horizontal registration is 1.8 mm or less for each side.

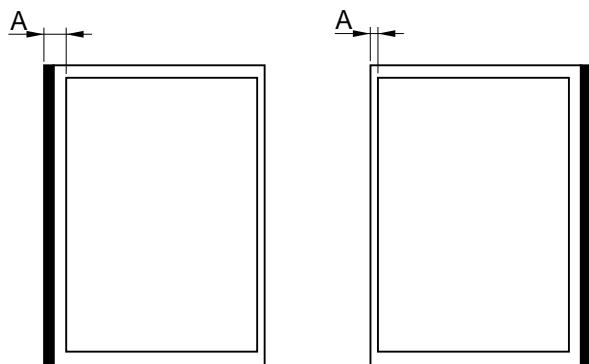


Figure 5-416

- 4) Select service mode [Feeder>ADJUST>DOCST] and perform adjustment by changing the value.
Increasing the value reduces the margin of dimension [A].
[Unit: 0.1 mm]
<<Adjustment range: -50 to +50; -5 to +5 mm>>
- 5) Scan the test chart again and check that the image has been properly adjusted.

12. White Level Adjustment

Perform this adjustment if you perform any of the adjustments described above.

Execute service mode [Copier>Function>CCD]. For details, refer to the section on service mode [Copier>Function>CCD].

Note: Execute [DF-WLVL1] for FB first.

13. Hinge Pressure Adjustment

This adjustment is executed in case of a change request from the user regarding closing (position and speed) of the feeder under its own weight.

The feeder is designed to slowly close under its own weight between 10 and 20 cm as shown in the following figure. However, the closing performance of the feeder will change over time. This adjustment adjusts the closing performance of the feeder by adjusting the hinge pressure as needed.

- * To lower the closing start position or reduce the closing speed, turn clockwise with an hex wrench.
- * To increase the closing start position or increase the closing speed, turn counterclockwise with an hex wrench.

Note: Use an hex wrench with face-to-face dimensions of 8 mm. If a commercially available hex wrench cannot be procured, purchase service tool CK-0540.

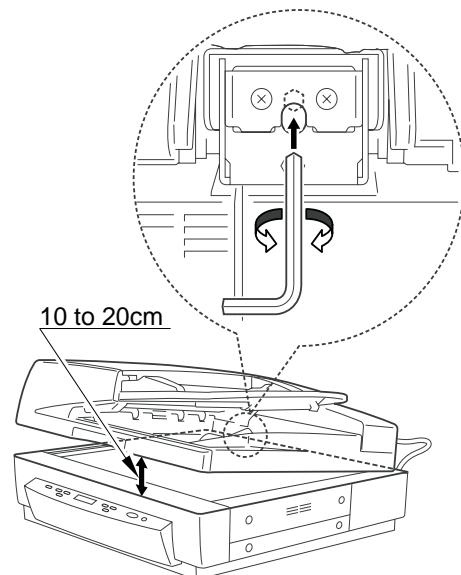


Figure 5-417

V. AFTER REPLACING PARTS

1. Outline

Feed and image checks must be performed after replacing parts.

The parts used in the DR-7080C include parts that require the execution of adjustments and settings following replacement. Table 5-501 lists these parts.

If the entire feeder is replaced, refer to "FEEDER ADJUSTMENTS" section.

For position adjustments following replacement of the scanner drive cable, refer to "CHAPTER 3 DISSASSEMBLY AND REASSEMBLY".

Item	Part	Reader Controller PCB	DC Controller PCB	CCD unit	Sensors (3 types)	Document width volume	Platen glass
1	RAM clear	Clear	—	—	—	—	—
2	Standard white plate data	Input (label)	—	—	—	—	Input (label)
3	FB read start position	Input (label)	—	—	—	—	—
4	FB shading position	Input (label)	—	—	—	—	—
5	ADF horizontal registration	Input (label)	—	—	—	—	—
6	ADF read position	Input (label)	—	—	—	—	—
7	CCD unit color shift	Input (label)	—	Input (label)	—	—	—
8	CCD unit factory setting color shift	Input (label)	—	—	—	—	—
9	Automatic gradation correction	Input (label)	—	—	—	—	—
10	ADF leading edge registration	Input (label)	—	—	—	—	—
11	ADF magnification	Input (label)	—	—	—	—	—
12	Sensor output	Automatic adjustment	—	—	Automatic adjustment	—	—
13	Tray width	Automatic adjustment	—	—	—	Automatic adjustment	—
14	White level	Automatic adjustment	—	—	—	—	—
15	SCSI setting	—	Manual setting	—	—	—	—
16	Counter	—	Input	—	—	—	—
17	User mode	—	Manual setting	—	—	—	—

Table 5-501

2. Reader Controller PCB

1) Version upgrade

First, check the reader firmware version in the service screen.

Look at the location where [SCANNER] is displayed.

If necessary, replace the firmware with the latest firmware corresponding to the unit. Use service mode [Reader Firm Load] to perform this change. For details, refer to the related service information.

3) Adjustment value re-input

Input the values indicated on the service label for the following items in the service mode.

- Standard white plate data
Copier>Adjust>CCD>W-PLT-X, Y, Z
- FB read start position
Copier>Adjust>ADJ-XY>ADJ-X, Y
- FB shading position
Copier>Adjust>ADJ-XY>ADJ-S
- ADF horizontal registration (Main scan position)
Copier>Adjust>ADJ-XY>ADJ-Y-DF
- ADF read position
Copier>Adjust>ADJ-XY>STRD-POS
- CCD unit color shift
Copier>Adjust>CCD>CCDU>RG, GB
- CCD unit factory setting color shift
Copier>Adjust>CCD>FCCDU>RG, GB
- Automatic gradation correction
Copier>Adjust>PASCAL>OFSET-P-Y, M, C, K
- ADF leading edge registration (stop position)
Feeder>ADJUST>DOCST
- ADF magnification (feed speed)
Feeder>ADJUST>LA-SPEED

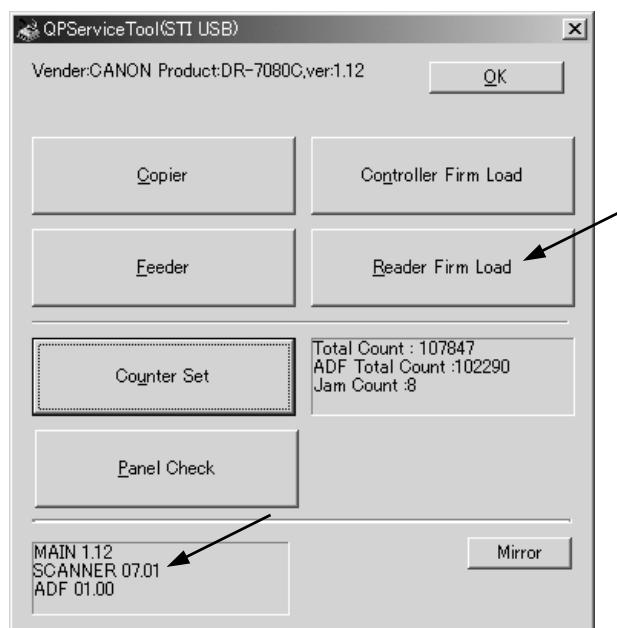


Figure 5-501

2) RAM clear

Execute service mode [Copier>Function>CLEAR>R-CON].

Upon completion, execute power supply reset.

4) Re-adjustments

Re-adjust the following items in the service mode.

- Sensor output
Feeder>FUNCTION>SENS-INT
- Tray width
Feeder>FUNCTION>TRY-A4, A5R
Feeder>FUNCTION>TRY-LTR, LTR-R
- White level
Copier>Function>CCD>DF-WLVL1, WLVL2

3. DC Controller PCB**1) Version upgrade**

First, check the controller firmware version in the service screen.

Look at the location where [MAIN] is displayed.

If necessary, replace the firmware with the latest firmware corresponding to the unit. Use service mode [Controller Firm Load] to perform this change. For details, refer to the related service information.

If the version number indicated on the [ROM Version] label pasted on the left side of the unit is different, correct the version number information on the label.

2) SCSI setting

Make the setting of the SCSI setting switch (SW103) on the DC controller PCB the same as the setting prior to replacement. If the pre-replacement setting is not known, ask to the user.

3) Counter

Re-input the counter value in service mode [Counter Set].

4) User mode

Make the user mode settings on the operation panel of the unit the same as the settings prior to replacement. If the pre-replacement settings are not known, ask to the user.

4. Other Parts

1) CCD unit

Input the values indicated on the labels attached to the CCD unit in service mode [Copier>Adjust>CCD>CCDU>RG, GB]. Be sure to also change the service label values.

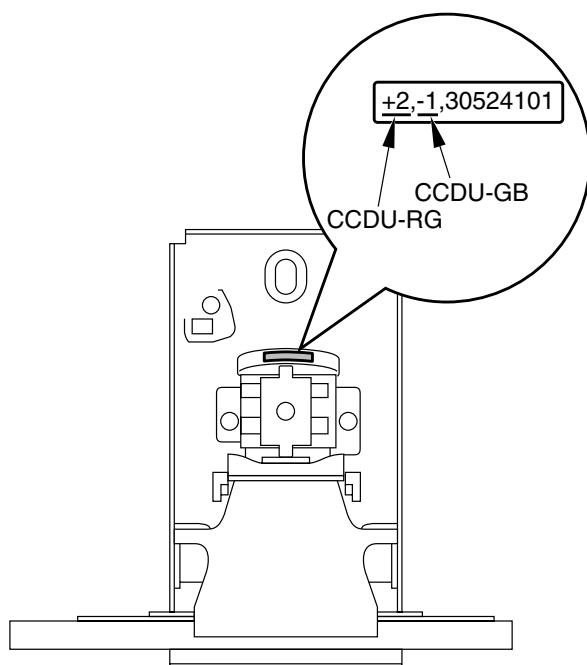


Figure 5-502

4) Platen glass

Input the values indicated on the label attached to the platen glass in service mode [Copier>Adjust>CCD>W-PLT-X, Y, Z]. Be sure to also change the service label values.

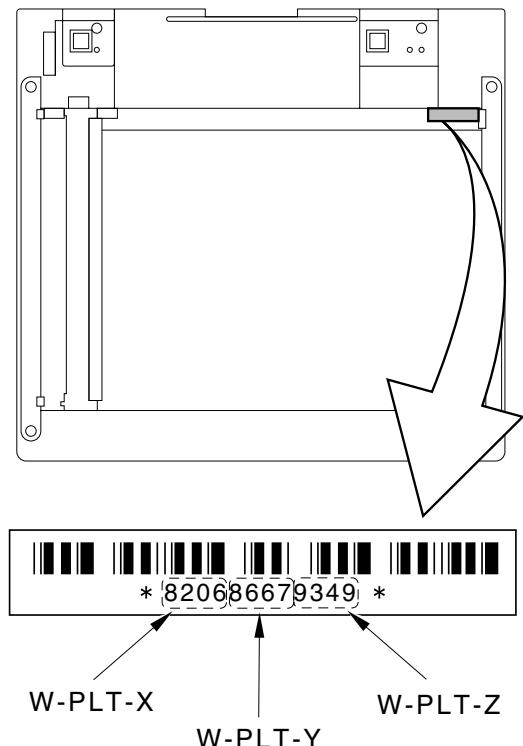


Figure 5-503

2) Sensors

After replacing the post-separation sensors, read sensors, or delivery reversal sensors, execute service mode [Feeder>FUNCTION>SENS-INT].

3) Document width volume

Execute service mode [Feeder>FUNCTION>SENS-INT].

VI. OPERATION TROUBLESHOOTING

Note 1: If a problem occurs, check the operation panel display of the DR-7080C and the screen display of the computer.

1	AC power does not come on
---	----------------------------------

Nothing is displayed on the operation panel of the DR-7080C.

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.
Connector connection (Operation panel)	3	Is connector on operation panel properly connected?	NO	Properly connect connector.
AC power supply voltage	4	Is the proper voltage supplied to the outlet?	NO	Explain to user that a problem is not with DR-7080C.
Connector connection (DC power supply)	5	Is connector on PCB properly connected?	NO	Properly connect connector.
Power supply PCB	6	Does LED light on DC controller PCB?	NO	Replace power supply PCB.
DC controller PCB	7	Is problem solved when DC controller PCB replaced?	YES	End.

Table 5-601

2	Computer does not detect DR-7080C
---	--

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

Cause/Fault Location	Step	Check Item	Result	Action
I/F cable connection	1	Is I/F cable correctly connected?	NO	Connect I/F cable correctly.
Power supply	2	Is DR-7080C powered on? Is the order of turning power ON correct?	NO	Power ON again DR-7080C and computer, starting with DR-7080C.
I/F card	3	Are specifications of I/F card suitable?	NO	Use I/F card with suitable specifications.
	4	Is the I/F card installed correctly? Is the I/F card recognized by the computer?	NO	Install the I/F card correctly.
SCSI ID (In case of SCSI connection)	5	Is SCSI ID setting appropriate?	NO	Perform correct setting.

Table 5-602

3 Scanning does not occur, no documents are fed. (Hardware failure)

Check the error code that is displayed on the operation panel.

See "ERROR DISPLAY AND REMEDY" for details.

Cause/Fault Location	Step	Check Item	Result	Action
DC power supply	1	Does LED101 light on ADF driver PCB?	NO	Check connector connection from ADF driver PCB to DC controller PCB.
Connector connection (Motors)	2	Are connectors of motors, solenoids and clutches connected correctly?	NO	Connect connectors correctly.
Drive transmission system	3	Is motor transmission system connected correctly?	NO	Connect motor transmission system correctly.
	4	Are gears, belt and other parts normal?	NO	Replace defective parts.
Scanner motor	5	Is problem solved when scanner motor is replaced?	NO	Check scanner HP sensor operation.
Feed related motor	6	Is problem solved when feed related motor is replaced?	NO	Check feed related sensor operation.
Scanning lamp	7	Is connector connected correctly?	NO	Connect connector correctly.
	8	Is problem solved when scanning lamp is replaced?	YES	End.
Reader controller PCB	9	Is problem solved when reader controller PCB is replaced?	YES	End.
DC controller PCB	10	Is problem solved when DC controller PCB is replaced?	YES	End.

Table 5-603

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 or scan in FB mode.
Rollers	2	Are rollers clean? (Stain, wear)	NO	Clean or replace rollers.
Separation pad	3	Is separation pad clean? (Stain, wear)	NO	Clean or replace separation pad.
Scraper	4	Is scraper clean? (Dirt, deformation)	NO	Clean or replace scraper.
Feed guide	5	Is feed guide installed correctly?	NO	Install feed guide correctly.
	6	Is the surface that touches documents clean?	NO	Clean or replace feed guide.
Drive transmission system	7	Turning smoothly? Are gears broken or belt loose?	YES	Perform assembly adjustment or replace defective parts.

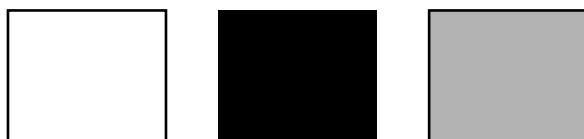
Table 5-604

VII. 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 DR-7080C.

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

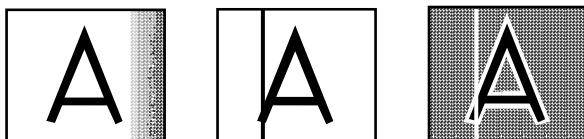
1 **Image is not output (completely white, completely black, all gray)**



Cause/Fault Location	Step	Check Item	Result	Action
Reading surface setting (Completely black)	1	Are documents set on document pickup tray and is reading side set to "flat bed"?	YES	Change the setting.
"Brightness" setting	2	Is "Brightness" setting good?	NO	Change the setting. Also change the "Contrast" setting if necessary.
Connector connection (Images)	3	Are reader and controller connected correctly?	NO	Connect reader and controller correctly
Platen glass (Standard white plate)	4	Is standard white plate on the back of the platen glass clean?	NO	Clean standard white plate. Take special care after disassembly or parts replacement.
CCD unit connection	5	Is flat cable correctly connected?	NO	Correctly connect cable.
CCD adjustment value	6	Is [Copier>Adjust>CCD]-related setting the same as the service label value?	NO	Change it to the service label value.
CCD unit	7	Is problem solved when CCD unit is replaced?	YES	End.
Reader controller PCB	8	Is problem solved when reader controller PCB is replaced?	YES	End.
DC controller PCB	9	Is problem solved when DC controller PCB is replaced?	YES	End.

Table 5-701

2 Uneven density, streak (main scanning direction)



Cause/Fault Location	Step	Check Item	Result	Action
Platen glass (FB mode)	1	Is platen glass clean? (Stain, damage)	NO	Clean or replace platen glass. Also clean the back if necessary.
ADF reading glass (ADF mode)	2	Is ADF reading glass clean? (Stain, damage)	NO	Clean or replace ADF reading glass. Apply "silicon oil" if necessary.
Roller	3	Is roller clean? (Stain, wear)	NO	Clean or replace roller.
Drive transmission system	4	Turning smoothly? Are gears broken or belt loose?	NO	Perform assembly adjustment or replace defective parts.
Feed related motor	5	Is problem solved when feed related motor is replaced?	YES	End.

Table 5-702

3 Uneven density, streak (sub scanning direction)



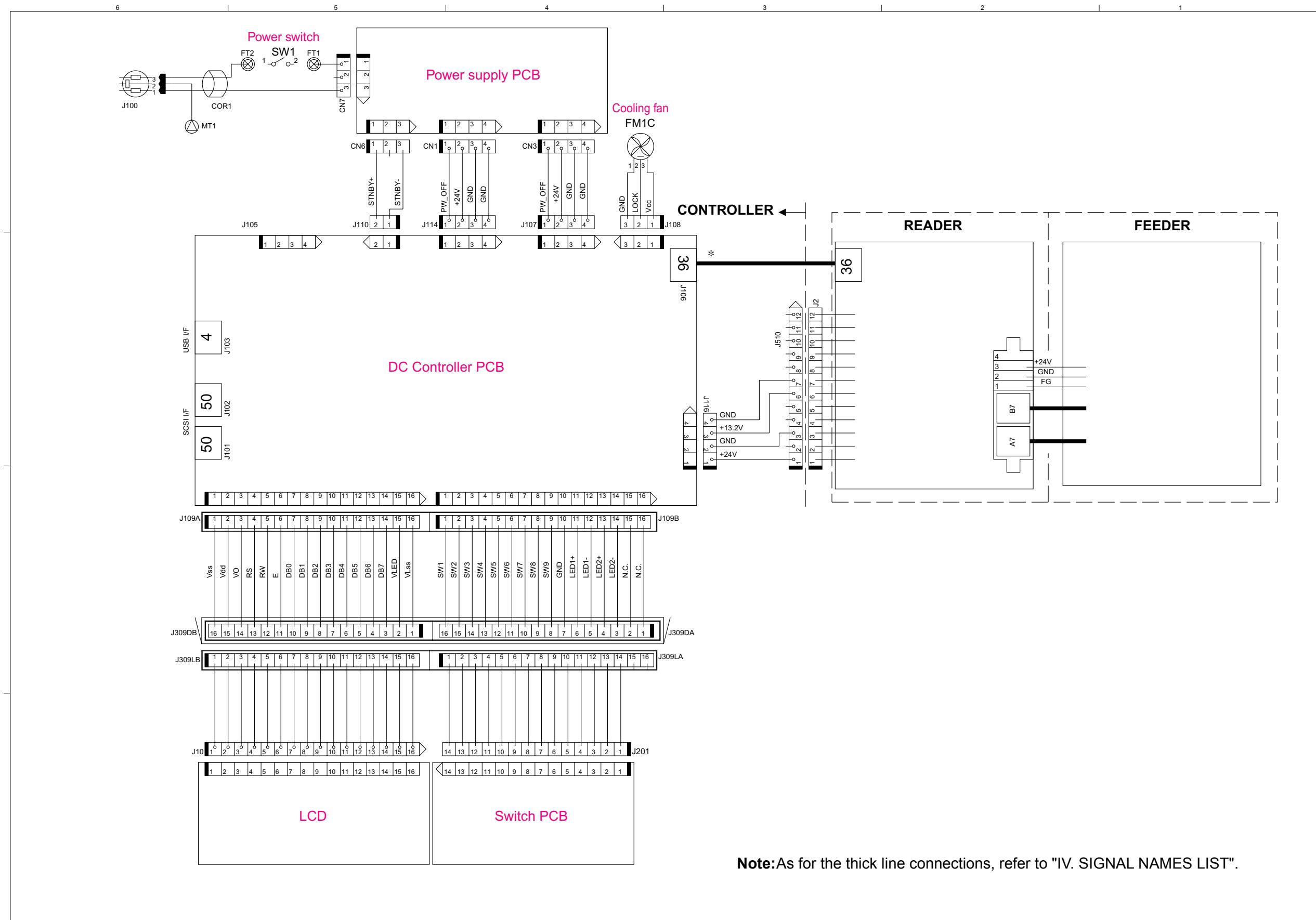
Cause/Fault Location	Step	Check Item	Result	Action
Platen glass	1	Is platen glass clean? (Stain, damage)	NO	Clean or replace platen glass. Also clean the back if necessary. (Including standard white board)
ADF reading glass (ADF mode)	2	Is ADF reading glass clean? (Stain, damage)	NO	Clean or replace reading glass. Also clean the back if necessary.
White level adjustment	3	Is problem solved when service mode is executed? Copier>Function>CCD> DF-WLVL1,DF-WLVL2	YES	End. See the "Service Mode" section for details.
CCD unit	4	Is problem solved when CCD unit is replaced?	YES	End.

Table 5-703

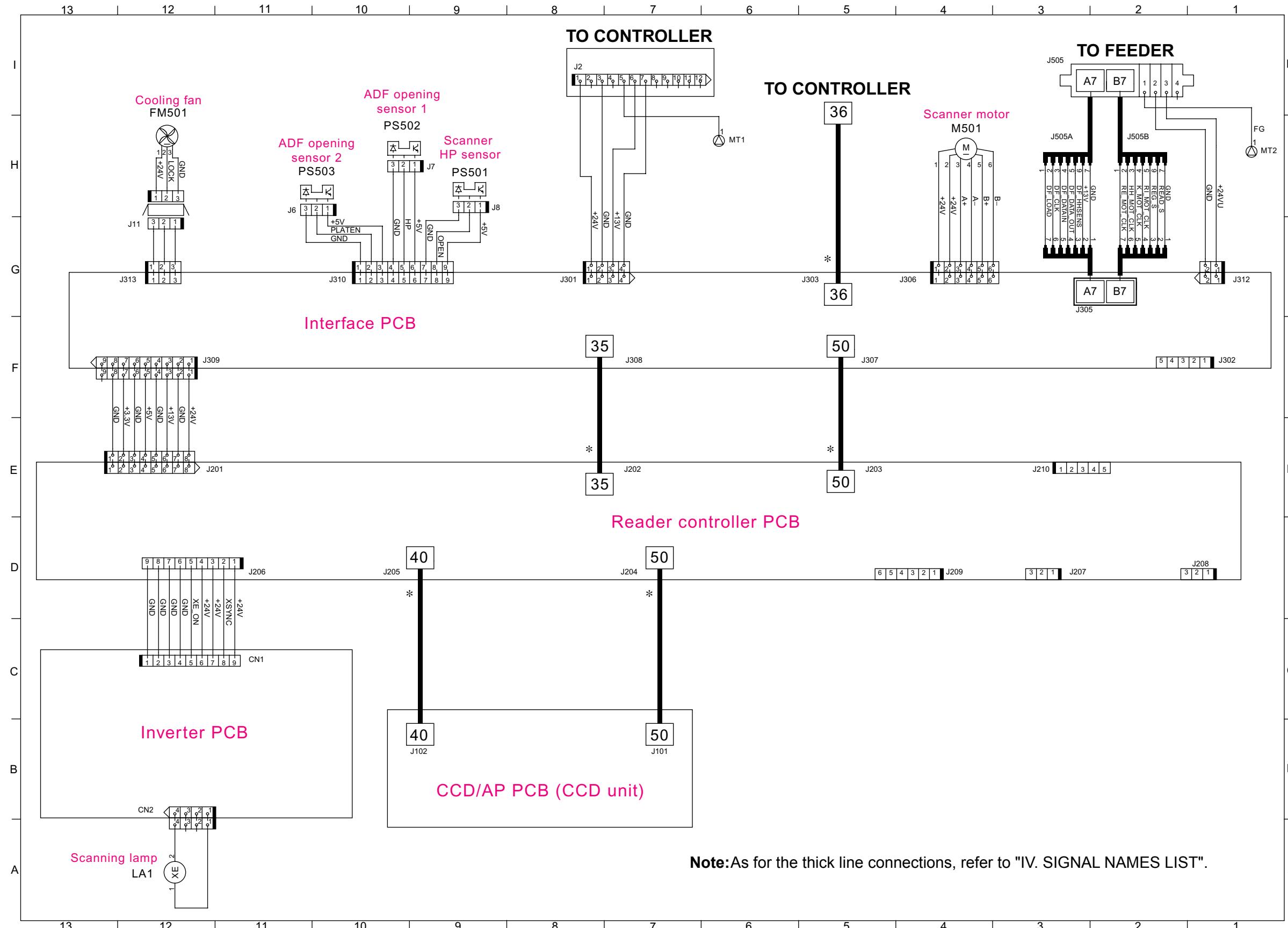
APPENDIX

I. GENERAL DIAGRAM	A-1	IV. SIGNAL NAMES LIST	A-7
II. READER DIAGRAM	A-3	V. SPECIAL TOOLS LIST	A-10
III. FEEDER DIAGRAM	A-5		

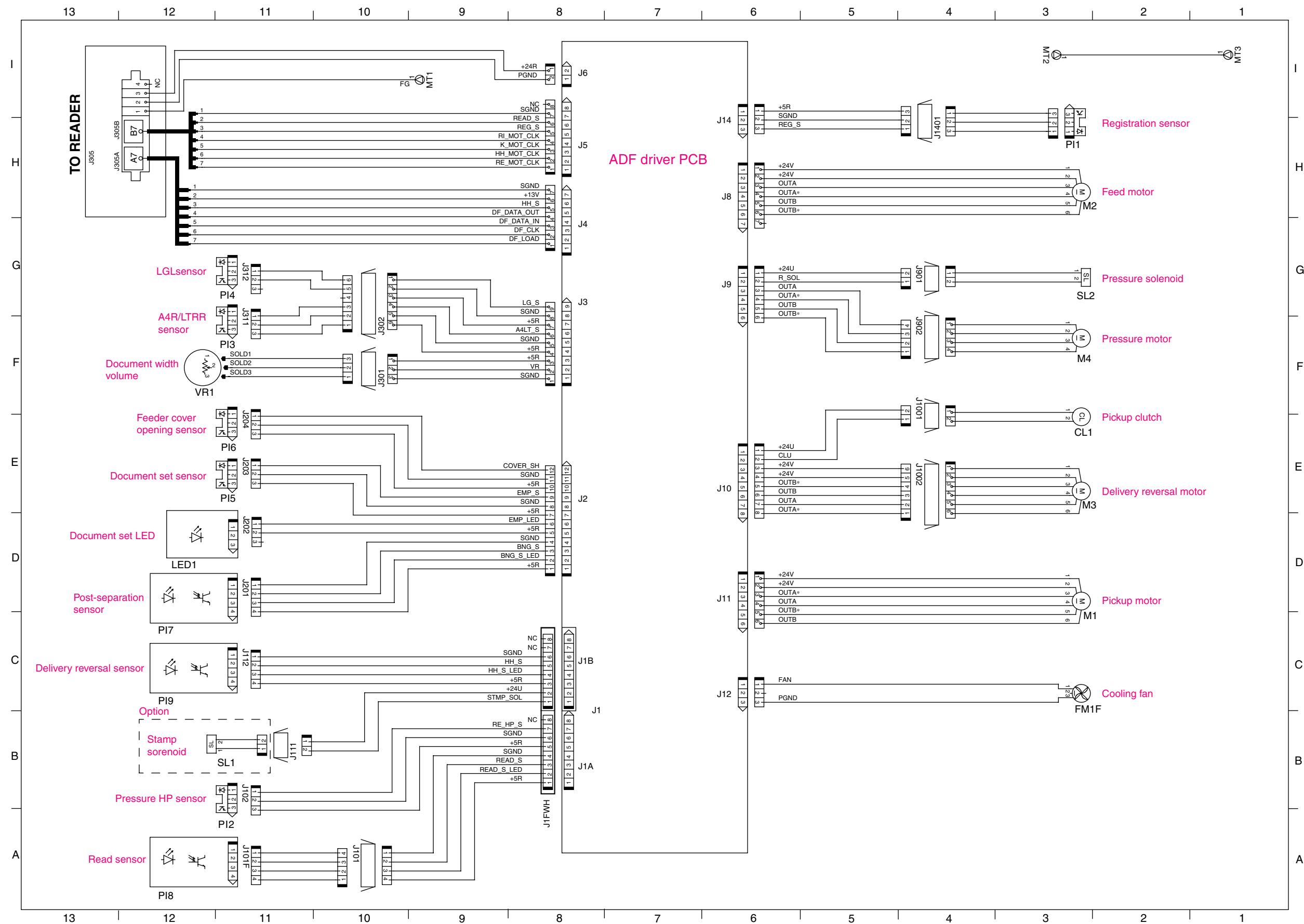
I. GENERAL DIAGRAM



II. READER DIAGRAM



III. FEEDER DIAGRAM



IV. SIGNAL NAMES LIST

The list of signal names that could not be included in the circuit diagram is shown below.

• Table 1

DC Controller PCB	Signal Name	Interface PCB
J106	36 *SPOWER	1
	35 SCMD+	2
	34 SCMD-	3
	33 *SSCNST+	4
	32 *SSCNST-	5
	31 GND	6
	30 TxOUT1-	7
	29 TxOUT1+	8
	28 GND	9
	27 TxCLKOUT-	10
	26 TxCLKOUT+	11
	25 GND	12
	24 *SPRTST-	13
	23 *SPRTST+	14
	22 SCTS-	15
	21 SCTS+	16
	20 SPO1+	17
	19 SPO1-	18
	18 *SPBD-	19
	17 *SPBD+	20
	16 SRTS-	21
	15 SRTS+	22
	14 TxOUT0-	23
	13 TxOUT0+	24
	12 GND	25
	11 TxOUT2-	26
	10 TxOUT2+	27
	9 GND	28
	8 TxOUT3-	29
	7 TxOUT3+	30
	6 *SPRDY	31
	5 SSTS+	32
	4 SSTS-	33
	3 *SLIVEWAKE	34
	2 *SDOWNLOAD	35
	1 *SCPRDY	36

• Table 2

Interface PCB	Signal Name	Reader Controller PCB
J308	35 GND	1
	34 STM_VREF	2
	33 GND	3
	32 PC_RxD	4
	31 PC_TxD	5
	30 GND	6
	29 SCPRDY	7
	28 SPO_1	8
	27 SDOWNLOAD (SPO_0+)	9
	26 SLIVEWAKE (SPO_-)	10
	25 GND	11
	24 SCTS*	12
	23 SSTS*	13
	22 GND	14
	21 SPRDY	15
	20 GND	16
	19 SRTS	17
	18 SCMD	18
	17 GND	19
	16 DF_LOAD	20
	15 DF_DATA_IN	21
	14 DF_DATA_OUT	22
	13 GND	23
	12 DF_CLK	24
	11 GND	25
	10 DF_HHMCK	26
	9 DF_KSMCK	27
	8 DF_RDMCK	28
	7 DF_RKMCK	29
	6 GND	30
	5 FAN_ON	31
	4 FAN_LOCK	32
	3 HP	33
	2 PLATEN	34
	1 GND	35

• Table 3

Interface PCB	Signal Name	Reader Controller PCB
J307	50 GND	1
	49 STM_CLOCK	2
	48 GND	3
	47 STM_STROBE	4
	46 STM_DATAAA	5
	45 STM_DATAAB	6
	44 GND	7
	43 SVSYNC	8
	42 GND	9
	41 SVCLK*	10
	40 GND	11
	39 SHSYNC	12
	38 GND	13
	37 SVDO16	14
	36 SVDO17	15
	35 SVDO18	16
	34 SVDO19	17
	33 GND	18
	32 SVDO20	19
	31 SVDO21	20
	30 SVDO22	21
	29 SVDO23	22
	28 GND	23
	27 SVDO8	24
	26 SVDO9	25
	25 SVDO10	26
	24 SVDO11	27
	23 GND	28
	22 SVDO12	29
	21 SVDO13	30
	20 SVDO14	31
	19 SVDO15	32
	18 GND	33
	17 SVDO0	34
	16 SVDO1	35
	15 SVDO2	36
	14 SVDO3	37
	13 GND	38
	12 SVDO4	39
	11 SVDO5	40
	10 SVDO6	41
	9 SVDO7	42
	8 GND	43
	7 GMKFLAG (SPI_0)	44
	6 SPI_1	45
	5 DF_RDSENS	46
	4 DF_RMAESENS	47
	3 DF_HHSENS	48
	2 DF_OPEN	49
	1 GND	50

• Table 4

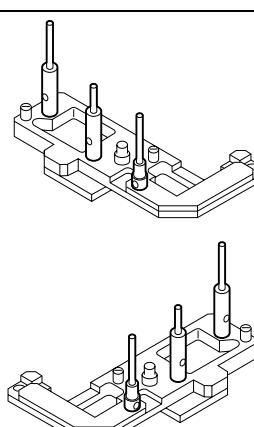
Reader Controller PCB	Signal Name	CCD/AP PCB
J204	50 GND	1
	49 GND	2
	48 AP_SCLK*	3
	47 AP_SDATA*	4
	46 AP_SLOAD	5
	45 GND	6
	44 AP_ACLP*	7
	43 GND	8
	42 AP_MCLK	9
	41 GND	10
	40 FCP	11
	39 SG	12
	38 GND	13
	37 FRS	14
	36 GND	15
	35 CK1*	16
	34 GND	17
	33 CK2*	18
	32 GND	19
	31 GND	20
	30 SW3*	21
	29 SW2*	22
	28 SW1*	23
	27 GND	24
	26 ST4*	25
	25 ST3*	26
	24 ST2*	27
	23 ST1*	28
	22 GND	29
	21 TG4*	30
	20 TG3*	31
	19 TG2*	32
	18 TG1*	33
	17 GND	34
	16 SH3*	35
	15 SH2*	36
	14 SH1*	37
	13 CLR*	38
	12 SG	39
	11 GND	40
	10 GND	41
	9 +12V	42
	8 N.C.	43
	7 +5V	44
	6 +5V	45
	5 +5V	46
	4 N.C.	47
	3 GND	48
	2 GND	49
	1 GND	50

• Table 5

Reader Controller PCB		Signal Name	CCD/AP PCB
J205	40	GND	1
	39	CCD1	2
	38	CCD2	3
	37	CCD3	4
	36	GND	5
	35	CCD4	6
	34	CCD5	7
	33	CCD6	8
	32	CCD7	9
	31	GND	10
	30	CCD8	11
	29	CCD9	12
	28	CCD10	13
	27	GND	14
	26	CCD11	15
	25	CCD12	16
	24	CCD13	17
	23	GND	18
	22	CCD14	19
	21	CCD15	20
	20	CCD16	21
	19	CCD17	22
	18	GND	23
	17	CCD18	24
	16	CCD19	25
	15	CCD20	26
	14	GND	27
	13	CCD21	28
	12	CCD22	29
	11	CCD23	30
	10	GND	31
	9	CCD24	32
	8	CCD25	33
	7	CCD26	34
	6	CCD27	35
	5	GND	36
	4	CCD28	37
	3	CCD29	38
	2	CCD30	39
	1	GND	40

V. SPECIAL TOOLS LIST

The special tools required for performing the services of this machine are listed below.

No.	Tool Name	Tool No.	Shape	Rank	Use/Remark
1	Mirror positioning tool	FY9-3009-040		C	Attachment of scanner drive cable

References: Rank symbols

A = Tool one of which is owned by each service technician

B = Tool one of which can be owned by a group of approx. 5 persons

C = Tool one of which can be owned by each workshop

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