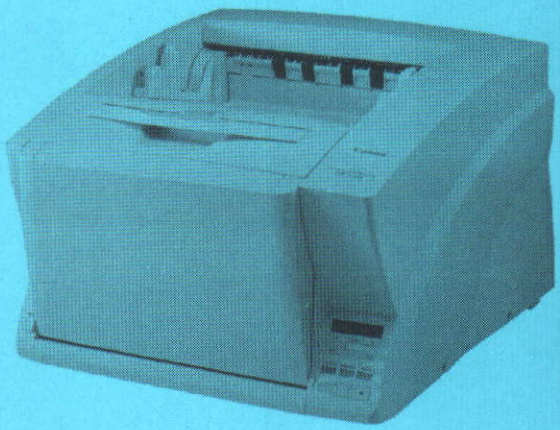
DR -X10C

SERVICE MANUAL



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PREFACE

This Service Manual describes necessary basic information for field service and maintenance for maintaining the product quality and functions of this machine.

Contents

Chapter 1: General description
Product 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
Error display and troubleshooting

Appendix: General diagram 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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III. USER OPERATION.....1-10

I. PRODUCT SPECIFICATIONS

1. Features

1) High-speed scanning
   Binary/Grayscale/Color, 200 dpi: Simplex 100 ppm, Duplex 200 ipm (A4 portrait)
   Color, 300 dpi: Simplex 100 ppm, Duplex 170 ipm (A4 portrait)

2) Dust prevention
   Blower: blowing the dust off
   Wiper: wiping on the reading glass
   Dust escape function: changing the reading position

3) Feed advancement
   Separation roller control
   Eject roller control
   Double feed retry function

4) Image treatment by high-speed IC

5) Many other functions
   Three ultrasonic sensors, Staple detection, Exchangeable background color, Moire reduction, etc.

6) High-durability
   Expected life: 18-million sheets (A4 portrait)

2. Specifications

1) Appearance/Installation

No.	Item	Specifications
1	Type	Desktop type sheet-fed scanner
2	Power supply rating	1) 100V model: 100 VAC, 50/60 Hz, 125 W 2) 120V model: 120 VAC, 60 Hz, 1.4 A 3) 200V model: 220-240 VAC, 50/60 Hz, 0.8 A
3	Power consumption	1) Operating: 125 W 2) Stand-by mode: 4.2 W (100 V/120 V), 4.5 W (200 V) 3) Power switch OFF: 0 W
4	Operating environment	10 to 32.5°C (50 to 90.5°F), 20 to 80%RH *No condensation allowed.
5	Noise	1) Standby: 40 dB max. 2) Operating: 72 dB max. *Sound power level
6	Dimensions * Details to be described later.	Tray closed: 528 (W) × 563(D) × 375 (H) mm Tray opened: 528 (W) × 861(D) × 432 (H) mm
7	Weight	39 kg (Main body only)
8	Output interface	1) USB 2.0 (Hi-speed) 2) SCSI-3 (Ultra) 3) KOFAX board interface *KOFAX board will be released after this machine.
9	Expected product life (In-house information)	One of the following two items, whichever comes first. 1) 5 years 2) Sheets fed: 18-millon sheets (A4 copy paper) *There are parts needed to replace.
10	Installation	By service technicians
11	Bundle software	ISIS/TWAIN driver, CapturePerfect 3.0, Job Tool
12	Consumable parts (commercial goods)	1) Exchange roller kit (Pickup/Feed/Retard rollers) *Expected life 500,000 sheets 2) Roller cleaning sheets 3) Ink cartridge *Ink cartridge is consumable parts for Imprinter (option).
13	Option	1) Pre-imprinter 2) Post-imprinter 3) Patchcode decoder 4) Barcode module (driver's option)

Table 1-101

* Dimensions (unit: mm)

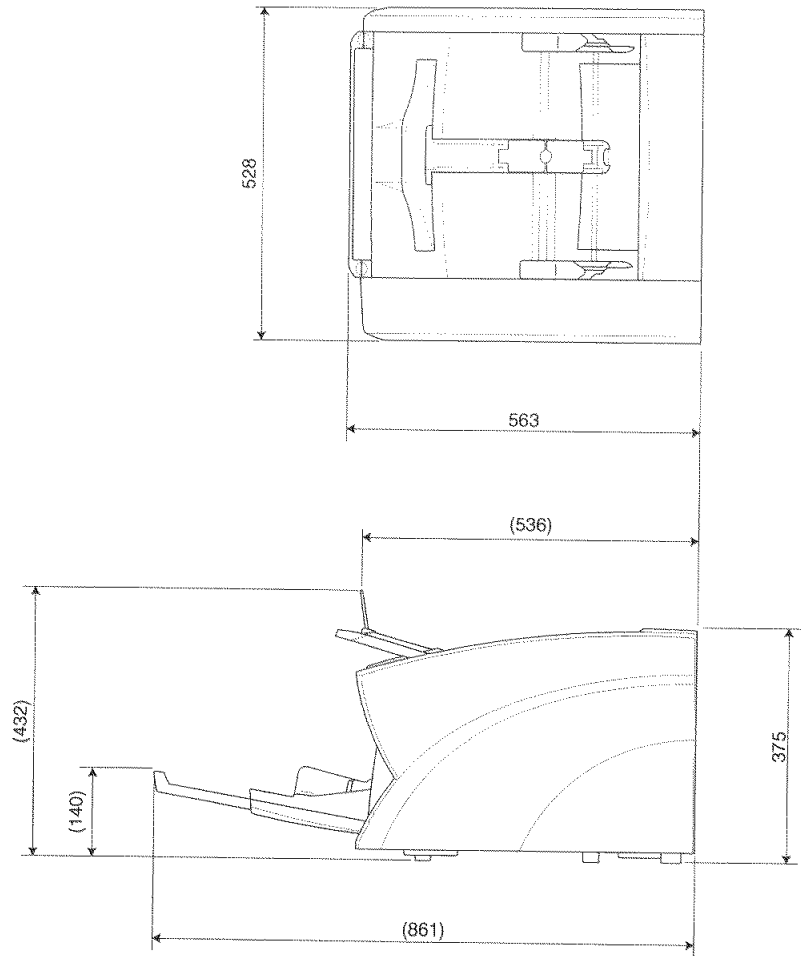


Figure 1-101

2) Document feed

No.	Item	Specifications	
1	Document feed path	U-turn path	
2	Document size	1) Width	50.8 to 305 mm *Less than 55 mm, no guarantee for skew.
		2) Length	70 to 432 mm *Excluded long document mode.
		3) Weight (thickness)	1) Separation pickup 52 to 128 g/m^2 (0.06 to 0.15 mm) 2) Non-separation pickup 42 to 255 g/m^2 (0.05 to 0.30 mm)
3	Document limitation	1) Pressure-sensitive paper: Can be fed with limitation of direction. 2) Carbon-backed paper: Cannot be fed. 3) Perforated paper for binder: Can be fed with limitation of holes. 4) Curled paper: Can be fed only if curl is 8 mm or less. 5) Creased paper: Can be fed, but crease must be straightened before being fed. *For the staple detection, curl is 3 mm or less, and no crease.	
4	Long document mode	Length: 1000 mm max. *Thickness is 0.2 mm or less. *Image data size is 384 MB × 80% or less. *Feeding function is not guaranteed. *If using the Folio together, A1-size scanning is available.	
5	Document storage	1) Pickup: 500 sheets max. or 48mm height max. (including curls) 2) Eject: 500 sheets max. or 50mm height max. (including curls)	
6	Feeding speed	Resolution	Binary, Grayscale, Color
		100/150/200/240/300 dpi	661.7 mm/sec
		400/600 dpi (speed priority)	
		400/600 dpi (image priority)	165.4 mm/sec
7	Double feed detection	1) Length detection (by registration sensor) 2) Ultrasonic double feed detection (3 positions) *Separation retry function is available, when it is detected.	
8	Dust prevent function	1) Blower: The fans are installed in the reading unit. 2) Wiper: The brush is attached on the platen roller.	
9	Other functions	1) Separation torque adjustment 2) Automatic eject speed control 3) Staple detection 4) Multiple document guides positioning 5) Pickup tray position adjustment	

Table 1-102

3) Document reading *using bundle software CapturePerfect 3.0

<table>
<tr><th>No.</th><th>Item</th><th>Specifications</th></tr>
<tr><td>1</td><td>Type of sensor</td><td>3-line Contact Image Sensor (CIS)</td></tr>
<tr><td>2</td><td>Sensor pixels</td><td>600 dpi, Effective pixels 7396 × 3 lines (313 mm)</td></tr>
<tr><td>3</td><td>Light source</td><td>3-color (RGB) LED, Double-side illumination</td></tr>
<tr><td>4</td><td>Background color</td><td>White or Black (User selection)</td></tr>
<tr><td>5</td><td>Image data memory size</td><td>384 MB (However, 20% of it is used for image rotation.)</td></tr>
<tr><td>6</td><td>Document frame sensor</td><td>Sensor: CIS (300 dpi), Light source: LED (penetrate type)
*To use the auto-size detection and deskew.</td></tr>
<tr><td>7</td><td>Reading side</td><td>Simplex/Duplex/Blank skip/Folio</td></tr>
<tr><td>8</td><td>Reading size</td><td>1) Typical: A3/A4/A4-R/A5/A5-R/A6/A6-R,
B4/B5/B5-R/B6/B6-R, LDR/LGL/LTR/LTR-R
2) Auto-size detection
3) Maximum size (305 × 432 mm)
4) User setting
5) Margin (±10 mm)</td></tr>
<tr><td>9</td><td>Output mode</td><td>1) Binary (Black and white/Error diffusion/ATE/ATE-II)
*ATE=Advanced Text Enhancement
*ATE-II is not available at 400/600 dpi.
2) Grayscale (8 bits)
3) Color (24 bits)
4) Auto image type detection</td></tr>
<tr><td>10</td><td>Output resolution</td><td>100 × 100 dpi, 150 × 150 dpi, 200 × 200 dpi, 240 × 240 dpi, 300 × 300 dpi, 400 × 400 dpi (speed priority), 600 × 600 dpi (speed priority), 400 × 400 dpi (image priority), 600 × 600 dpi (image priority)</td></tr>
<tr><td>11</td><td>Reading speed</td><td>*A4 portrait, JPEG transportation for grayscale and color modes.
<table>
<tr><th>Mode (file format)</th><th>Resolution</th><th>Simplex</th><th>Duplex</th></tr>
<tr><td rowspan="4">Black and white (TIFF)</td><td>200 dpi</td><td>100 ppm</td><td>200 ipm</td></tr>
<tr><td>300 dpi</td><td>100 ppm</td><td>200 ipm</td></tr>
<tr><td>600 dpi (speed priority)</td><td>82 ppm</td><td>82 ipm</td></tr>
<tr><td>600 dpi (image priority)</td><td>25 ppm</td><td>50 ipm</td></tr>
<tr><td rowspan="4">Grayscale (JPEG)</td><td>200 dpi</td><td>100 ppm</td><td>200 ipm</td></tr>
<tr><td>300 dpi</td><td>100 ppm</td><td>200 ipm</td></tr>
<tr><td>600 dpi (speed priority)</td><td>84 ppm</td><td>84 ipm</td></tr>
<tr><td>600 dpi (image priority)</td><td>25 ppm</td><td>50 ipm</td></tr>
<tr><td rowspan="4">Color (JPEG)</td><td>200 dpi</td><td>100 ppm</td><td>200 ipm</td></tr>
<tr><td>300 dpi</td><td>100 ppm</td><td>170 ipm</td></tr>
<tr><td>600 dpi (speed priority)</td><td>46 ppm</td><td>46 ipm</td></tr>
<tr><td>600 dpi (image priority)</td><td>25 ppm</td><td>18 ipm</td></tr>
</table>
*The numbers above may differ depending on the computer, the function settings and other conditions.</td></tr>
</table>

Table 1-103

4) Image processing/Other functions *using bundle software CapturePerfect 3.0

No.	Item	Specifications
1	Brightness adjustment	255 steps, back side individual setting, Auto for Black and white mode (ABC processing) *Not available for ATE/ATE-II
2	Contrast adjustment	7 steps, back side individual setting
3	Gamma correction	Front/back side each, R/B/G/grayscale
4	Edge emphasize	5 steps
5	Color dropout	Dropout/emphasize, R/G/B/custom, front/back side each
6	Moire reduction	None/Hi-speed/Hi-quality *Depend on the resolution, selectable items are different.
7	Other image processing	Dots erasing, Prevent bleed-through/Remove background, Text orientation recognition, Border removal, Punch hole removal, Add-on, Resampling (included MultiStream), Pre-scan, 3-D gamma (color correction), Image rotation
8	Other function	Skew detection, Rapid recovery scan, Continuous manual feed, Dust escape, Buzzer, Count only, Verify count, Automatic pickup tray opening, USB interlock power switch, Roller cleaning, Batch separation
9	Operation section	Keys (Start/Stop/Functions), Display LCD (16 characters × 2 lines) *Function of buttons can be invalided.
10	User modes	Setting by operation section of the main body.
11	Job function	Save as file
12	Counter	Sheets count for total scanning and replacing parts (memorized in EEPROM on the scanner main body)

Table 1-104

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

3. Precautions

This section describes items that require particular care, for example, regarding human safety.

These precautions must be observed. The user should be explained the items that relate to user safety and instructed to take appropriate actions.

1) Power OFF in emergency
If such abnormal conditions as extraordinary noise, smoke, heat and odor occur, immediately unplug the power cord.
Be careful not to get clothing (ties, long hair, etc.) caught in the machine as it may cause injury. Should this occur, immediately unplug the power cord. Do not insert fingers in the feed section while moving the rollers.

2) Power OFF on disassembling
When disassembling and assembling are performed, unplug the power cord.

3) Prohibition of modify
This machine must not arbitrarily be modified or remade. If it is, use may be forcibly suspended.
To change the specifications or disassemble and reassemble this machine, follow the instructions described in this manual and the service information.

4) Electromagnetic wave interference
This machine complies with some standards regarding electromagnetic wave interference, such as VCCI and FCC. However, the user may have to take countermeasures if the machine causes electromagnetic wave interference.

5) "User Manual"
Read each "User Manual" thoroughly prior to use of this machine.

6) Disposal
Follow local regulations when disposing of the product and parts. This product is subject to the WEEE Directive in Europe.

7) Movement
This machine weighs 39 kg. When lifting or moving this machine, 2 persons must hold it from both sides.

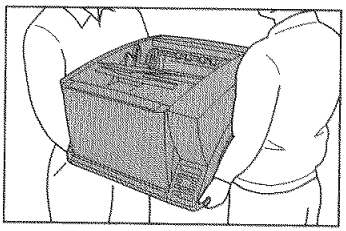


Figure 1-102

II. NAME OF PARTS

1. Front Side

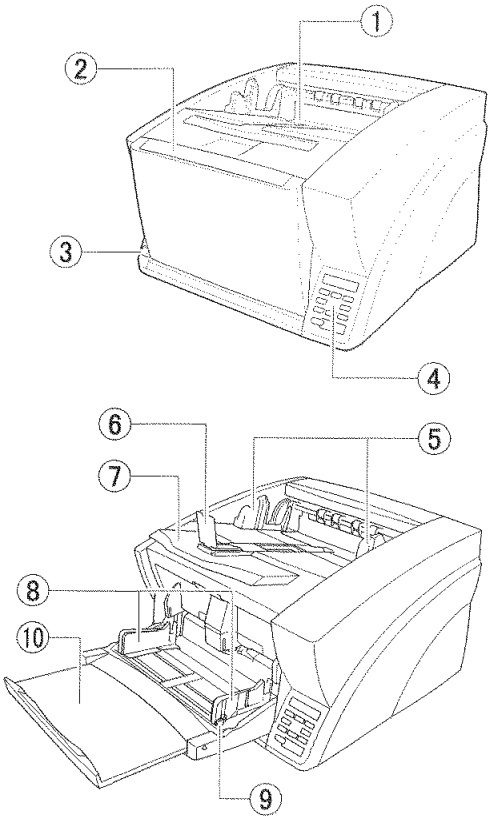


Figure 1-201

① Document eject tray
② Document feed tray (Pickup tray ＊)
③ Power switch
④ Operation panel
⑤ Document guide
⑥ Eject paper stoppers
⑦ Document eject tray extension
⑧ Document guide
⑨ Document guide lock lever
⑩ Document feed tray extension

Note: In this manual, the "Document feed tray" may also be mentioned as the "Pickup tray."

2. Rear Side

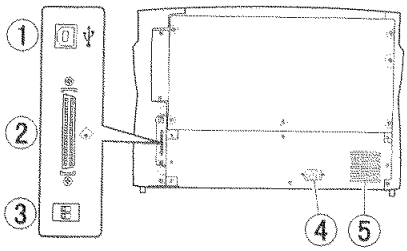


Figure 1-202

① USB connector (Type B)
② SCSI connector (Half pitch D-sub 50 pin)
③ DIP switches (SCSI ID)
④ Power connector
⑤ Ventilation holes (exhaust fan)

3. Control Panel ✳

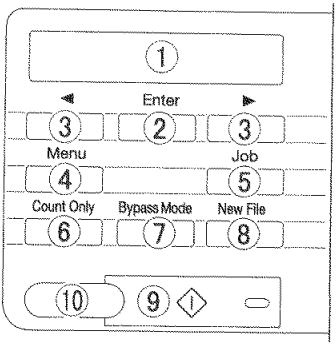


Figure 1-203

① Display panel
② Enter key
③ ◀ ▶ keys (allow keys)
④ Menu key
⑤ Job key
⑥ Count Only key
⑦ Bypass Mode key
⑧ New file key
⑨ START key
⑩ STOP key

Note: In this manual, the "Control panel" may also be mentioned as the "Operation panel."

III. USER OPERATION

This section presents an outline of the scan operations and document jam clearing.

Refer to the "User Manual" of this machine for details. This machine includes 2 printed manuals; the "Easy Start Guide" and the "Reference Guide." The CD-ROM disc contains the data of the "User Manual" in addition to these manuals.

The machine is installed by the service technician.

1. Preparation of Trays

Before scanning documents, prepare for the document feed tray and document eject tray according to the documents.

1) Document feed tray

When the power to the main body is turned ON, the document feed tray opens automatically and moves to the height of the set home position.

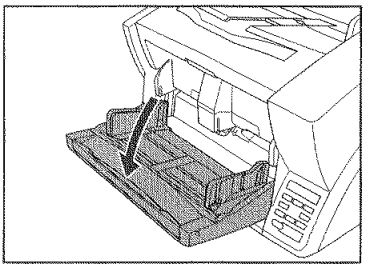


Figure 1-301

Push the document guides from both sides (①) and adjust their positions according to the document width (②).

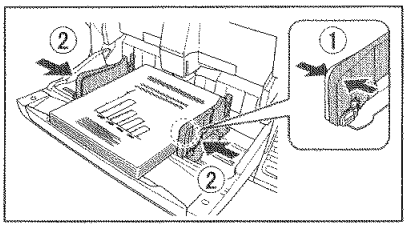


Figure 1-302

Note: The right and left positions can be changed by locking the document guides. Refer to the "User Manual" for the details.

Pull out the document feed tray extension according to the document length.

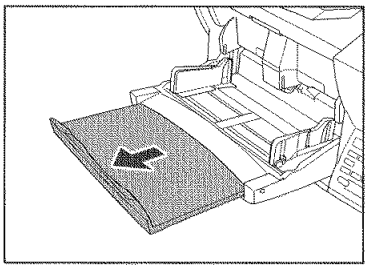


Figure 1-303

2) Document eject tray
Hold both document guides and adjust the positions according to the width of the document to be set.

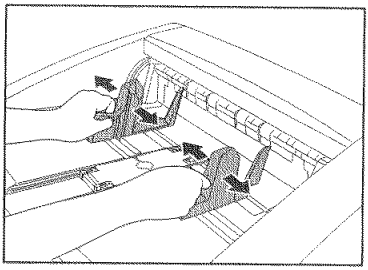


Figure 1-304

Note: The right and left positions can be changed by holding one document guide and moving the other document guide.

Pull out the document eject tray extension according to the document length.

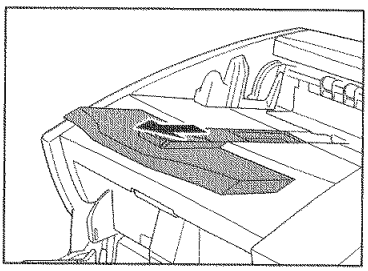


Figure 1-305

If a document jumps out of the document eject tray and drops, raise the eject paper stoppers to prevent the jumping of the document.

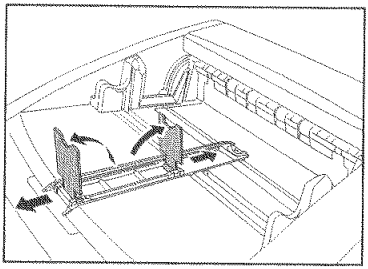


Figure 1-306

2. Feeding Methods

There are 2 document feeding methods: "continuous feeding" that continuously feeds documents set on the document feed tray with the pickup roller and "manual feeding" that stops the pickup roller and manually feeds one document at a time to the position where the document is fed with the feed roller. Continuous manual feeding mode is provided to scan a batch of documents that cannot be fed smoothly.

1) Continuous feeding

In continuous feeding, the documents that are drawn with the pickup roller are fed with the feed roller and separated with the retard roller one at a time to avoid double feeding.

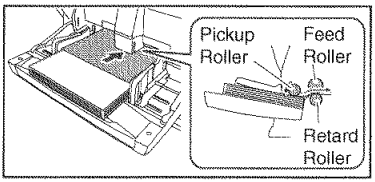


Figure 1-307

2) Manual feeding

The [Bypass Mode] key lights and the document feed tray lifts and one document is fed at a time.

Since the pickup roller stops during manual feeding, insert the document to the position where it is pulled in with the feed roller.

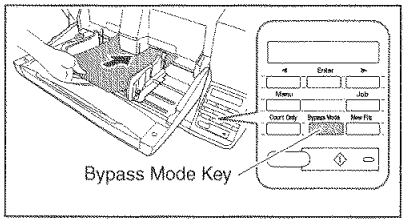


Figure 1-308

Note: During manual feeding, documents are not separated with the retard roller. When multiple documents are set, some of them may be fed together, causing a document jam.

To scan bound multi-page documents such as invoice booklets, face the bound side to the feed inlet and scan with "manual feeding".

Note: The [Bypass Mode] key is interlocked with [Manual Feeding] of "Feed Option" set with the ISIS/TWAIN driver.

When the [Bypass Mode] key on the control panel is pressed, or "Feed Option" is set to [Manual Feeding], the [Bypass Mode] key lights and the document feed tray lifts.

3) Continuous manual feeding mode

The continuous manual feeding mode is set in the user mode and is used to scan documents that cannot be separated correctly with continuous feeding. Set a batch of documents, but since the pickup roller stops, insert a document to the position where it is drawn with the feed roller. The retard roller is rotating in the direction of separation.

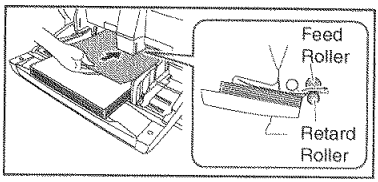


Figure 1-309

3. Job Function

The job registered with the job registration tool is performed with the following procedure.

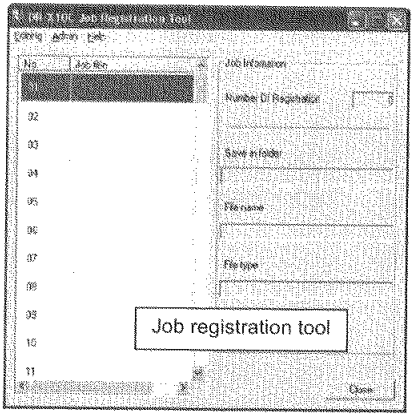


Figure 1-310

1) Press the [Job] key on the control panel.

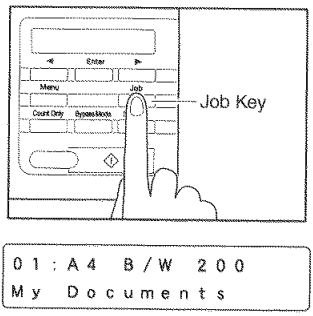


Figure 1-311

2) Select the job with [◀] [▶] keys.

3) Perform the job with the [Start] key.

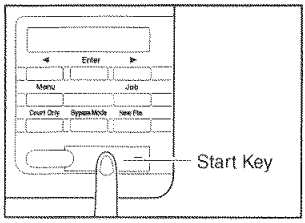


Figure 1-312

4) Open the specified folder and check the image file.

4. CapturePerfect3.0

This section describes the scan procedure with [Scan Batch to File] from the activation of CapturePerfect 3.0.

1) Start CapturePerfect3.0.

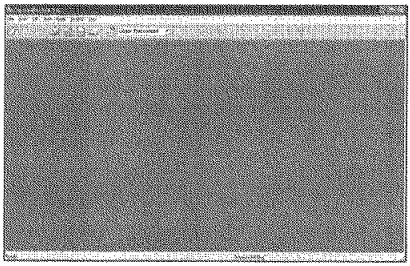


Figure 1-313

2) Select [Canon DR-X10C] from the [Select Scanner] screen.
3) Select [Scanner Settings] and open the ISIS driver setting dialog box.
First the [Basic] tab is selected.

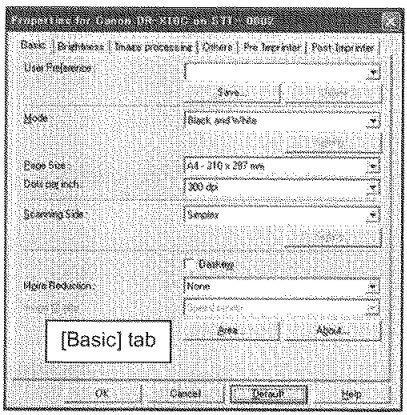


Figure 1-314

4) Set the reading conditions.
The dialog boxes other than the [Basic] tab are shown below.

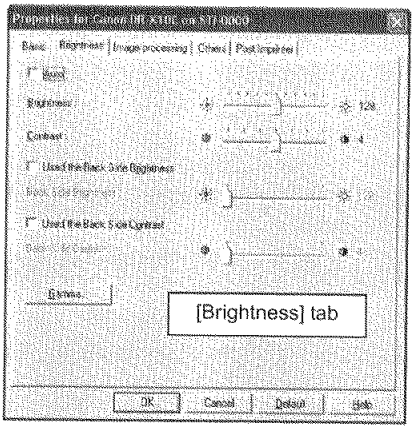


Figure 1-315

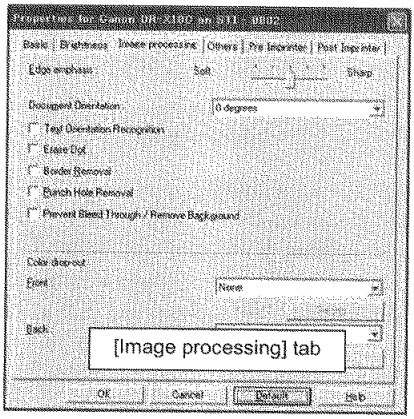


Figure 1-316

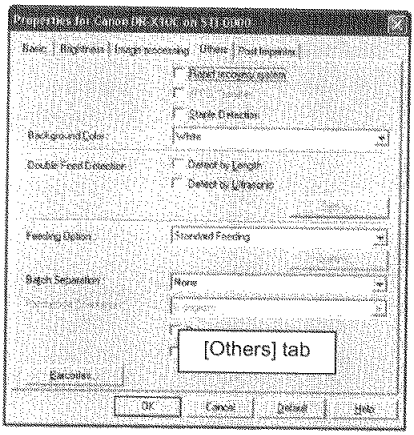


Figure 1-317

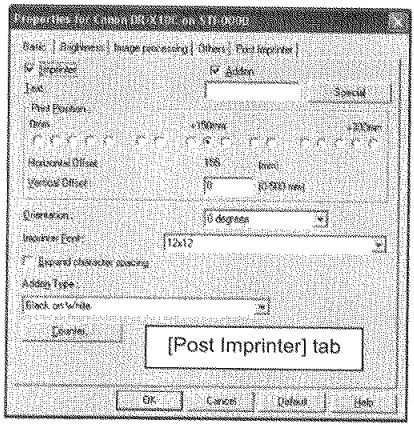


Figure 1-318

5) Select a scanning method.
Selecting "Scan Batch to File" opens the setting dialog.
6) Specify the location, file name and format for saving and then click "Save" to start scanning.

7) When the set documents ran out, the scan stops and the [Continue Scanning] dialog box is displayed. To continue the scan, add documents and click [Continue Scanning] and to end the scan, click [Stop Scanning].

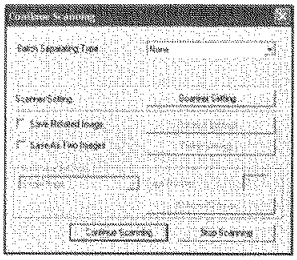


Figure 1-319

8) Close CapturePerfect 3.0 after scanning.

5. Document Jam Processing

If a document jam occurs during scanning, the following message is displayed on the display panel and feeding stops.

Figure 1-320

Note: The error code (Pxxx) changes according to the location of the jammed document.

1) Remove the document remaining on the document eject tray.
2) While pressing the open/close button, open the upper unit carefully until it stops.

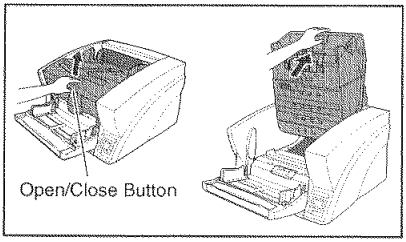


Figure 1-321

3) Remove a jammed document.
   If the document has stopped in the midst of ejecting to the document eject tray, open the upper unit slightly to remove it.
   If the document has stopped inside the main body, open the upper unit until it stops to remove it.

4) Carefully close the upper unit (①). Make sure the upper unit is closed securely by pushing on both edges of the upper unit. (②)

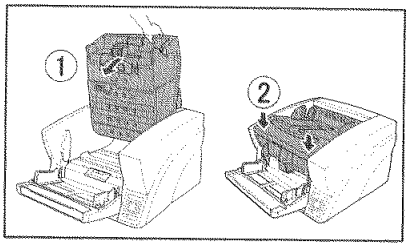


Figure 1-322

5) Check the last image that is saved and perform the scan again.

Note: If [Continuous Mode] is set, a message appears on the display panel after clearing document jams.

CHAPTER 2

FUNCTIONS & OPERATION

I. OUTLINE....2-1
II. READING SYSTEM....2-7
III. FEED SYSTEM....2-14
IV. CONTROL SYSTEM....2-20
V. POWER SUPPLY....2-25
VI. OPTION....2-27
VII. ELECTRICAL PARTS LAYOUT....2-29
VIII. PARTS LAYOUT ON EACH PCB....2-33

I. OUTLINE

1. Basic Configuration

Figure 2-101 shows the configuration of this machine.

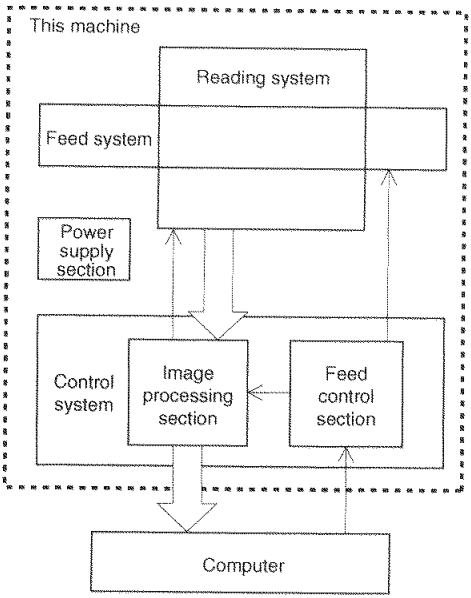


Figure 2-101

1) Reading system
This system reads document frame and image data from image sensors.

2) Feed system
This system performs from document pickup to document ejection.

3) Control system
This system is comprised of an image processing section, a feed control section and a system control section.
The image processing section controls the reading system and processes the read image data.
However, image data processing is also performed by the computer.
The feed control section controls the feed system.

4) Power supply section
This section converts the AC power supplied from external into the DC power and supplies it to the internal PCB.

2. Roller Arrangement

A sectional view of the feed section is shown below.

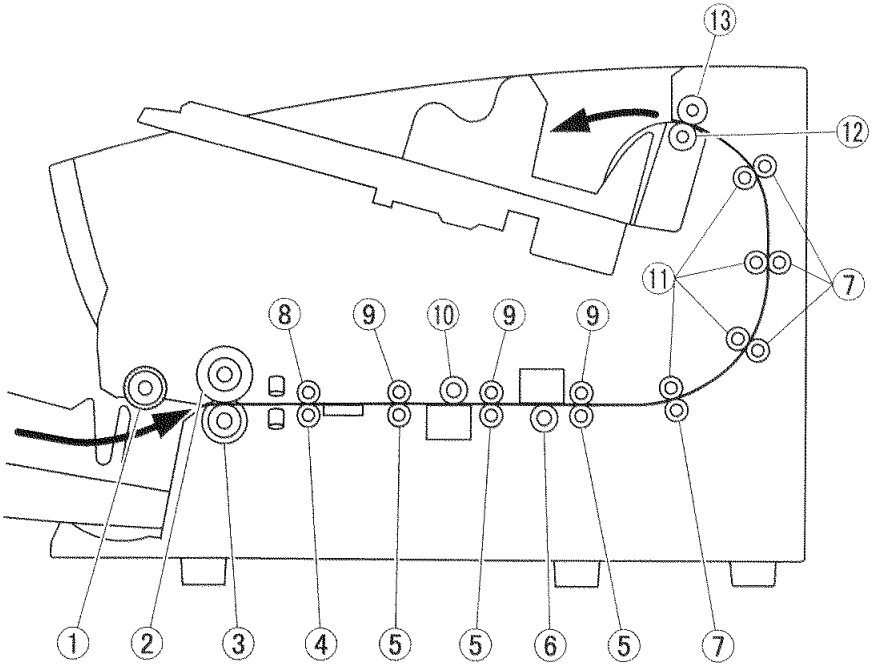


Figure 2-102

① Pickup roller
② Feed roller
③ Retard roller
④ Registration roller (lower)
⑤ Reading roller (drive): 3
⑥ Platen roller (lower)
⑦ U-turn roller (drive): 4
⑧ Registration roller (upper)
⑨ Reading roller (follower): 3
⑩ Platen roller (upper)
⑪ U-turn roller (follower): 4
⑫ Eject roller (follower)
⑬ Eject roller (drive)

3. Motor Drive

This machine has the following 12 motors. Additionally, it also has 2 magnet clutches, 4 blowers for reducing dust, and an exhaust fan.

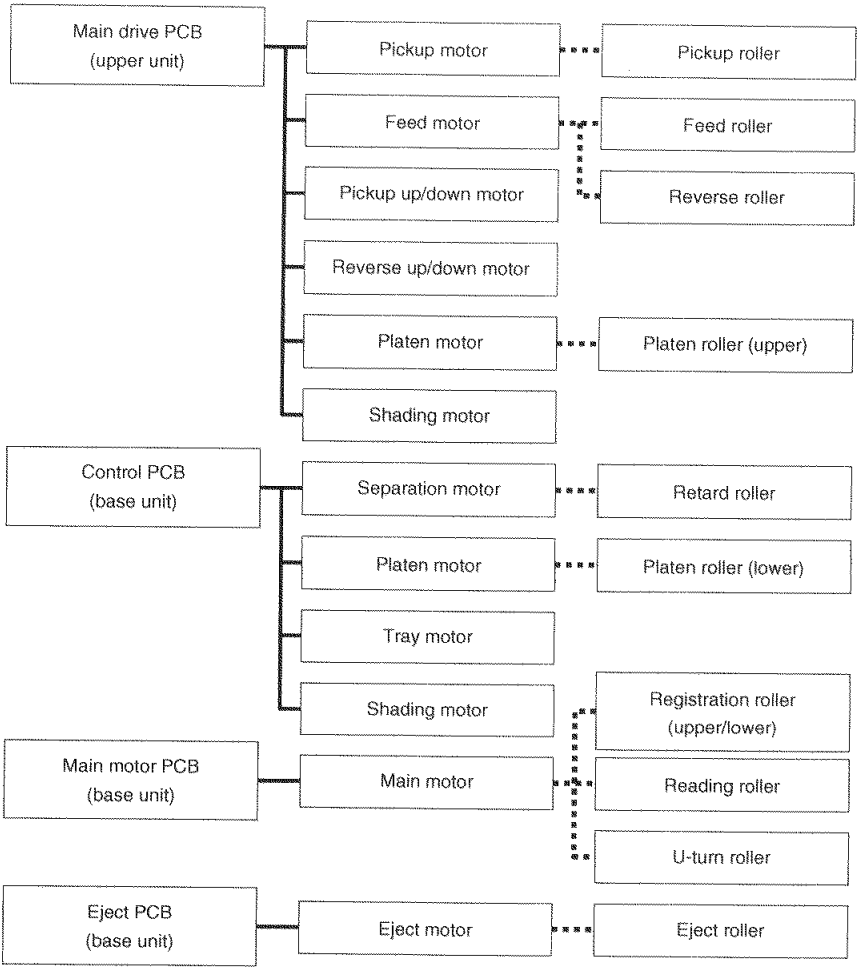


Figure 2-103

4. List of Sensors

This machine has the following main sensors. In addition, there are a power supply sensor that turns the power OFF and a document sensor for the ultrasonic sensor.

No.	Name	Functions and features
1	Document sensor	Detects whether there is a document on the pickup tray. This sensor functions only when the pickup tray is in its home position. The light-receiving element also serves as a pickup tray sensor.
2	Pickup sensor	Detects whether a document is in the pickup position.
3	Registration front sensor (left/right)	Detects whether there is a document in front of the registration roller and double feed sensor.
4	Registration rear sensor (left/right)	Detects whether there is a document behind the registration roller.
5	Eject sensor (left/right)	Detects whether there is a document in front of the eject roller.
6	Skew sensor (left/right)	Detects whether the document extends beyond edges horizontally.
7	Double feed sensor (left/center/right)	Detects double feed of a document. 3 sets of ultrasonic sensors are mounted.
8	Door sensor	Detects whether the upper unit is open.
9	Imprinter door sensor	Detects whether the imprinter cover is open.
10	Platen roller sensor (left/right)	Detects the home position of the platen roller. In the detection state, the exposed surface is white.
11	CIS unit home sensor (upper/lower)	Detects the home position of the CIS unit for image reading. In the detection state, the CIS unit is in the image reading position.
12	Reverse roller sensor	Detects the home position of the reverse roller. In the detection state, the roller is positioned at the highest point. However, the sensor enters detection state slightly before the upper mechanical safety point.
13	Pickup roller sensor	Detects the home position of the pickup roller. In the detection state, the roller is positioned at the lowest point.
14	Tray home sensor (upper/center/lower)	Detects the home position of the pickup tray. The home position can be changed in the user mode, but the home position for the system is the lower position.
15	Staple sensor (left/right)	Detects buildup of documents bundled with staples. Consists of 4 LEDs and 1 light-receiving element. The 4 LEDs light in order and the light from them is detected by the light-receiving element on the opposite side.

Table 2-101

5. Electrical Circuits

An overview of the electrical circuits block diagram of this machine is shown below.

The control PCB, which is mounted on the right side of the main body, controls the entire electrical circuits. The main drive PCB is mounted in the upper unit.

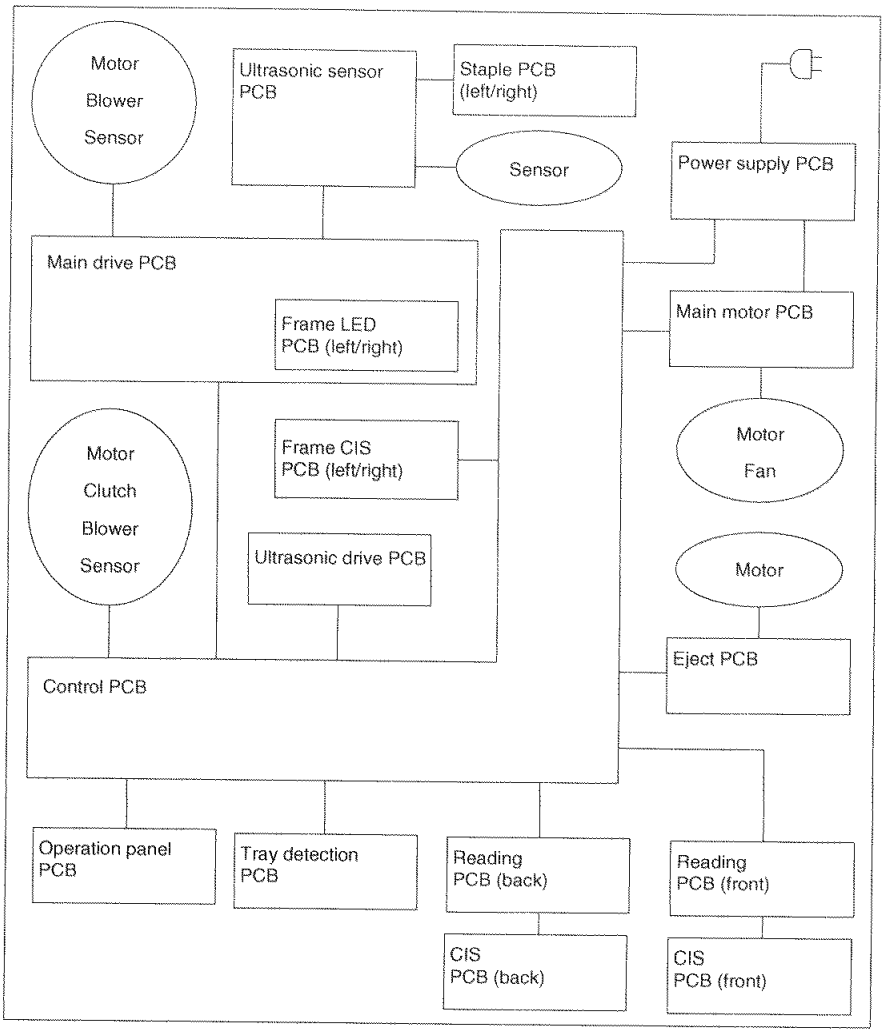
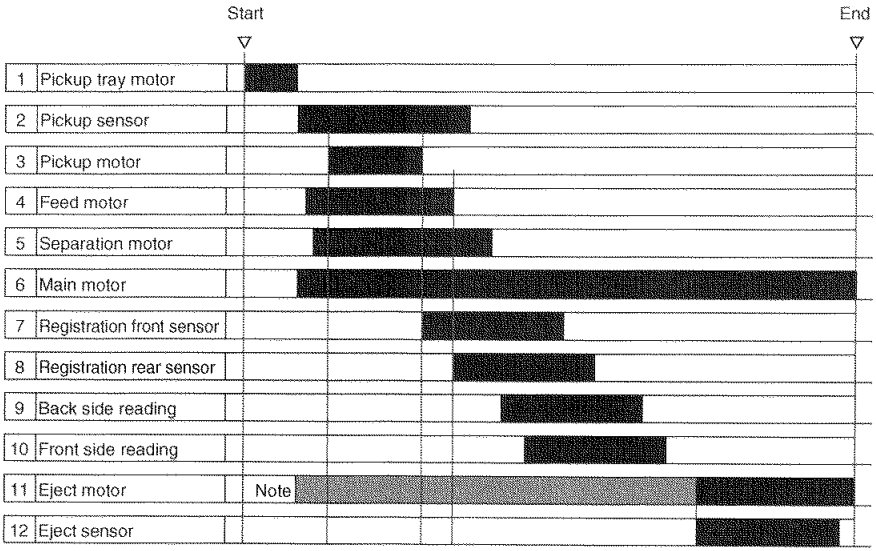


Figure 2-104

6. Timing Chart

Figure 2-105 shows the timing chart when 1 sheet of document is separately pickup. Once the machine starts scanning, the pickup tray lifts. Thereafter each motor starts rotating to feed the document.



Note: The gray part of the eject motor is ON for high-speed feeding and OFF for low-speed feeding.

Figure 2-105

II. READING SYSTEM

1. Outline

A sectional view of the image reading section is shown below.

The reading unit (upper) reads the front side of the documents and the reading unit (lower) reads the back side of the documents. This configuration enables the unit to read both the front and back sides of a document using a single scan.

The platen rollers are assembled as opposed by the reading units. A frame detection unit is assembled in front of the reading units to read the document frame data necessary for auto-size detection and skew correction.

The image data read are sent to the image processing section of the control PCB.

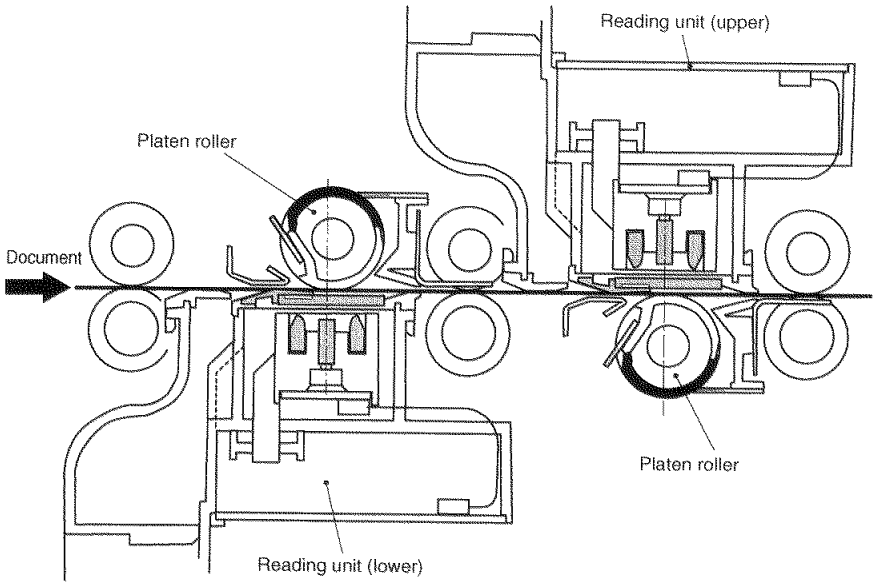


Figure 2-201

2. Image Reading

A sectional view of the image reading unit (lower) and the platen roller is shown below.

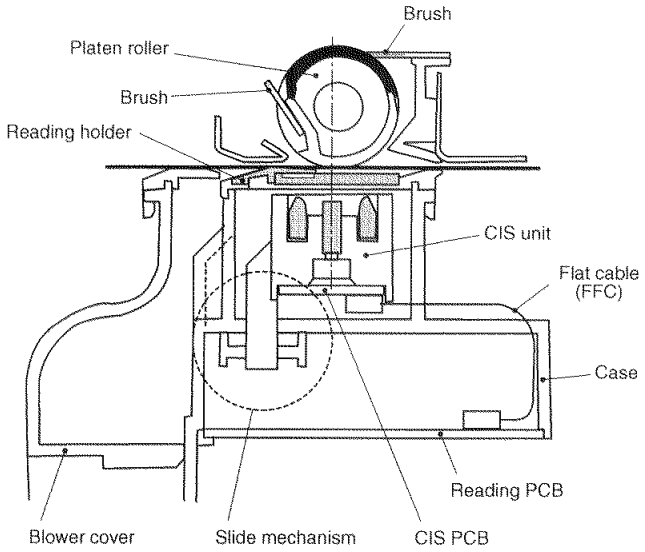


Figure 2-202

The reading unit consists of a CIS unit, a reading PCB, a reading holder, flat cables (FFC), a case and a slide mechanism.

The next section, "4. Dust-free Function", describes the blower.

The CIS PCB in the CIS (Contact Image Sensor) unit has a light-receiving element having an optical resolution of 600 dpi. This light-receiving element is a 3-line CMOS image sensor with color filters for R, G and B. The number of effective pixels of each color is 7396 and its reading width is 313 mm.

As a 3-line type light-receiving element, it can light on the LEDs of the 3 colors at the same time for image reading, thus reducing color shift. In addition, it can prevent slow-down in reading in the color mode.

The lights from the LEDs illuminate the document through the light guides and the reading glass. The lights reflected from the document enter the image sensors through the lens arrays. The image sensors convert the lights to analog signals.

The analog signals are sent to the reading PCB, processed and transformed into digital signals. And then, they are sent to the control PCB.

The platen rollers are assembled as opposed by the reading units.

The platen rollers have a function that presses a document against the reading side, a function that changes the background color between black and white, and a function that cleans the reading side and the surfaces of the rollers.

3. Shading

The CIS unit and its slide mechanism are assembled inside the reading unit. The CIS unit is positioned in the document reading position when the documents are read. Since the scanner needs to read white reference data when determining the shading correction value, it shifts the CIS unit. Figure 2-203 shows the position of the CIS unit when reading an image and white reference.

This slide plate is driven by the shading motor. Since the white reference is provided in the reading holder, the failures caused by the dirt and scratches of the white reference do not occur.

When the power is switched ON and when scanning starts, this machine slides the CIS unit and reads the white reference data to decide the shading correction value.

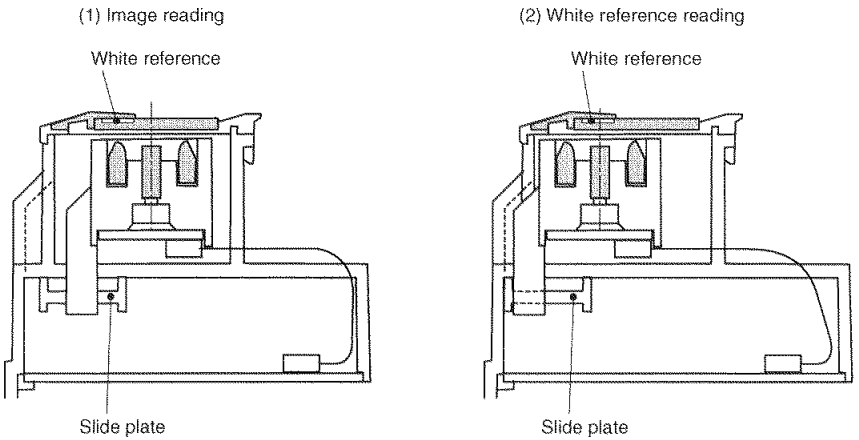


Figure 2-203

4. Dust-free Function

The machine has a dust-free function to prevent image failures caused by paper powder and other dust. The functions are described below.

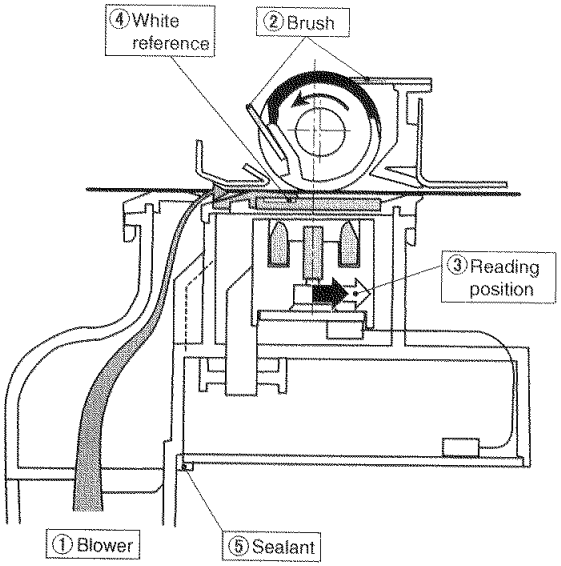


Figure 2-204

① Blower

Blow air to the reading glass surface to remove dust.

② Brush

A brush is assembled on the platen rollers. When the rollers turn one turn between sheets of documents, the reading glass surface and rollers are cleaned with the brush.

③ Reading position

If dust is detected in the normal reading position, the reading position is moved by using the slide function of the CIS unit. Details are set in the user mode.

④ White reference

As described in the previous section, the white reference used for shading is located in the reading holder, so it does not touch dust.

5. Frame Detection Unit

This machine has a dedicated frame detection unit detecting the document frame for auto-size detection and skew correction. The conventional machines detected document size or angle from image data from the reading unit to process images. By installing a sensor to read the document frame, high-speed scanning is realized and disappearance of an image can be prevented when there is a dark area at the periphery of a document.

A sectional view of the frame detection unit is shown below.

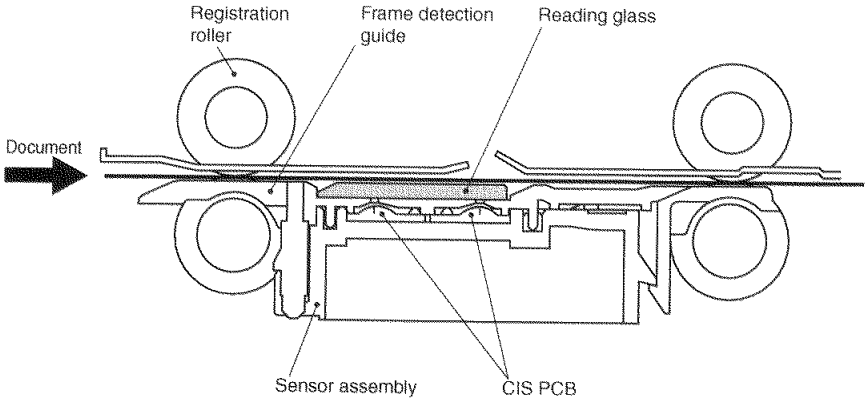


Figure 2-205

The frame detection unit consists of a sensor assembly including 2 CIS PCBs, a frame detection guide including a reading glass, and other parts (ink pad, light guide) not associated with the frame detection function.

The CIS PCB contains an A4/LTR 600dpi 1-line CMOS image sensor. The reading width of this machine is covered by assembling 2 CIS PCBs. The resolutions that are actually read are 300dpi for main-scanning direction and 50dpi for sub-scanning direction.

The light source is a yellow-green LED and is mounted on the frame LED PCB which is connected to the main drive PCB of the upper unit. Light from the LED passes through a slit and enters an image sensor. Reflected light is used to read images and transmitted light is used to detect the frame. Thus, the outer frame of the document can be detected correctly even if there is a dark area at the periphery of a document.

III. FEED SYSTEM

1. Outline

The drive rollers are driven by a motor and rotated by transmission of gears and timing belts. The motor is assembled for other purposes than rotation of the drive rollers. Sensors for feed control are also mounted.

The main characteristics of the feed system of this machine are shown below.

1) Pickup tray elevation
The elevation and the stop position of the pickup tray can be controlled. The standby position can be selected from 3 levels in the user mode and the pickup tray can be opened automatically when the power is turned ON.

2) Independent mechanism operation of the right and left document guides
The right and left document guides can be slid together and independently of each other. Thus, the reference position at which a document is loaded can be set arbitrarily.

3) Separation torque control
The number of revolutions and torque of the separation motor can be controlled. Thus, the separation force can be selected from 5 levels in the user mode according to the type of document.

4) Ultrasonic Sensor
This machine contains 3 sets of ultrasonic sensors. The double feeds of left- or right-justified documents can be detected by the sensors. An ultrasonic sensor to be enabled can be selected and a non-detection area in the feed direction can be set for each sensor by setting a driver.

5) Double feed retry
If a double feed is detected by the ultrasonic sensor, the doubly-fed document can be returned automatically to the pickup inlet without ejecting it and the document can be fed again and separation can be retried. Therefore, scanning can be continued. In the user mode, the number of repetitions can be selected and this function can be disabled.

6) Eject speed control
If documents are fed at a high speed and ejected at the same speed, alignment of the documents deteriorates. The speed when the trailing edge of the document is ejected is reduced and deterioration of alignment is prevented by controlling the number of revolutions of the eject motor.

7) Staple detection
Feeding of stapled documents can be stopped by installing a dedicated sensor at the pickup inlet.

2. Pickup Tray Elevation

The maximum loading capacity of this machine is 500 sheets of ordinary copy paper. If the standby position of the pickup tray is at the lower position suitable for the maximum loading capacity, waiting time until the pickup tray rises to the pickup position increases when a few documents are scanned.

A function that can set the standby position to 3 levels (up, middle, down) according to the number of documents to be scanned has been added.

An oblique perspective figure of the tray elevation drive section is shown below and this section describes the elevation operation. First, the drive shaft ② is rotated by the tray motor ①. When the drive shaft rotates, the right and left elevating guides ③ go up and down. Since the right and left elevating guides are mounted on the pickup tray ④, the pickup tray goes up and down.

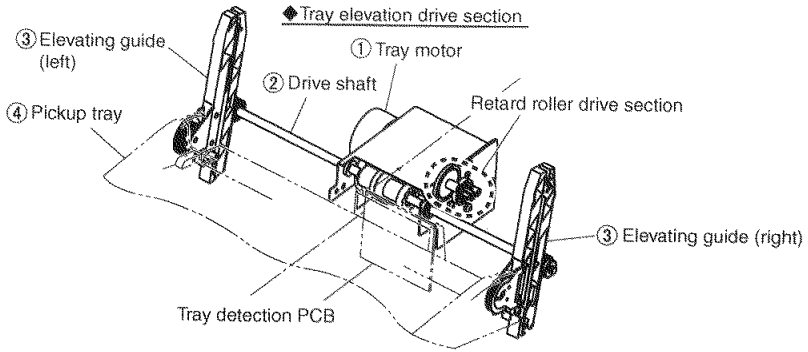


Figure 2-301

Then, an oblique perspective figure of the tray position detection section is shown below and this section describes how to set the standby position in 3 levels. One LED ② and 3 light-receiving elements ③ are mounted on the tray detection PCB ①. The light guide ⑤ that sends light from the LED to the light-receiving element is assembled on the pickup tray ④. The LED is at the same height as the lower light-receiving element. The lower light-receiving element is designed for detecting the tray position and documents, and others are designed for detecting documents.

When the pickup tray is at the lower position, light from the LED is detected by the lower light-receiving element through the light guide. This position is the home position of the pickup tray. The middle and upper positions are controlled with the number of input pulses of the tray motor based on the home position.

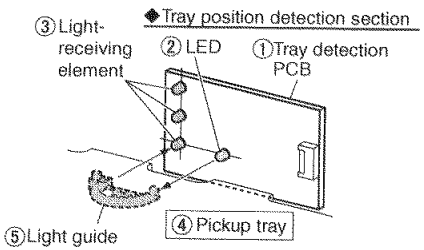


Figure 2-302

3. Pickup Unit

An oblique perspective figure of the pickup unit is shown below and this section describes its configuration and the "double feed retry" which is one of the characteristics of the feed system.

Four motors and 4 rollers are assembled in the pickup unit. The feed rollers and the right and left reverse rollers are rotated by a feed motor. The reverse rollers are used for double feed retry.

The sensors for controlling the upper and lower positions of the pickup and reverse rollers are mounted on the main drive PCB. A detection lever is assembled in this unit. In addition, a long light guide that sends light from the LED to the light-receiving element to detect a document on the pickup tray is assembled.

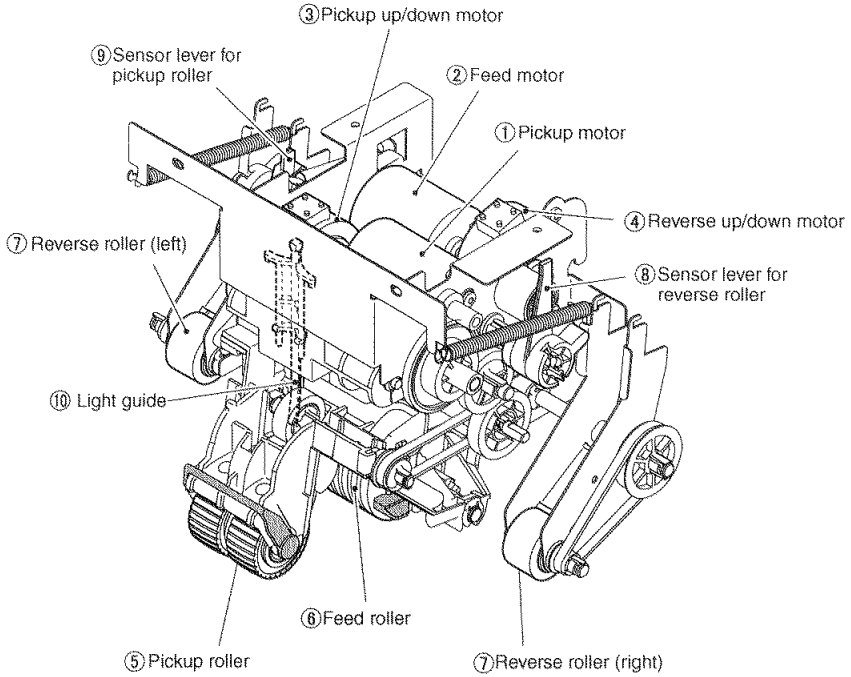


Figure 2-303

Then the double feed retry is described below. If the double feed retry function is not disabled, the feeding of the document stops when a double feed is detected by the ultrasonic sensor. The document is returned to the pickup inlet by rotating the rollers in the reverse direction. The motor that drives the rollers located where the document stops can be rotated in the reverse direction.

If there are no reverse rollers, the feeding force is not stable and the document may be skewed or jammed when it is returned. In case of ordinary feeding, the reverse roller is not necessary, so it is at the upper position, and does not touch the document. When returning the document, the reverse roller is moved downward.

However, if a double feed is detected after the document is fed backward 100 mm or more from the registration sensor (rear), the double feed retry is not carried out.

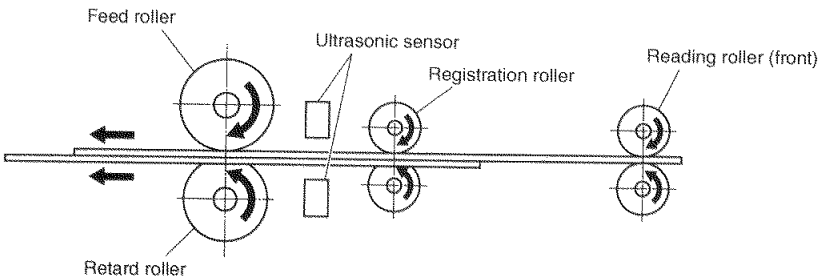


Figure 2-304

Then, a side view when the reverse roller moves upward and downward is shown below. When the reverse motor rotates, the sensor lever ① rotates. The sensor lever is integrated with the cam ②. Since this cam surface is in contact with the surface of the mounting plate ③ of the reverse roller, when the sensor lever rotates, the mounting plate rotates and the reverse roller ④ lowers.

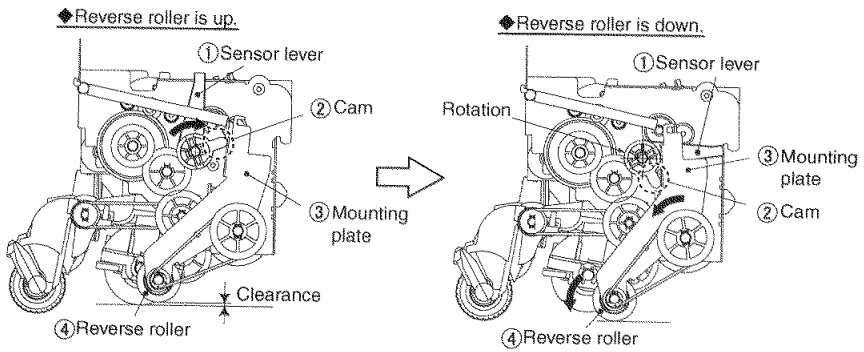


Figure 2-305

4. Staple Detection

The staple detection of this machine detects jumping of stapled documents. Like the conventional machine, DR-7580/9080C, this machine does not detect presence of staples. Therefore, the documents must be jumping. An example of a specific condition is shown below.

- The stapled position must be only one of 4 corners.
- The document size must be A5 or larger.
- Set the document based on the center.

An oblique perspective figure of the staple detection section is shown below. The staple PCB ① is mounted on the right and left sides of the pickup inlet and a rectangular light guide ② is assembled on the pickup roller cover at the center.

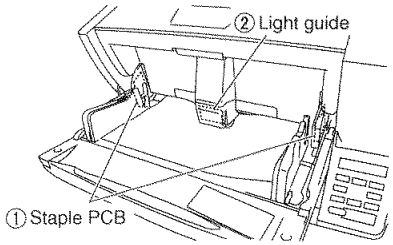


Figure 2-306

Four LEDs and 1 light-receiving element are mounted on the staple PCB. An illustration of light emission and reception is shown below.

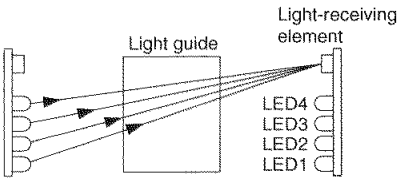


Figure 2-307

The LEDs light one by one from the bottom. If documents do not jump, light enters the opposite light-receiving element through the central light guide. Then, the opposite LED lights in the same way. This process is repeated. If the documents jump, the light path is blocked, so the light cannot be detected. This condition is judged as staple detection, the feeding of documents stops and the pickup tray is lowered to the standby position. An error message is displayed on the operation panel of this machine and the screen of the computer.

An actual figure during staple detection is shown below.

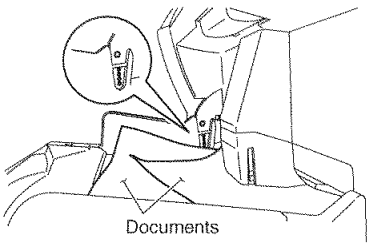


Figure 2-308

5. Ultrasonic Double Feed Detection

There are 2 double feed detection methods: the document length detection by the registration sensor and the document overlapping detection by the ultrasonic sensor.

This section describes the ultrasonic sensor.

This machine contains 3 pairs of ultrasonic sensors in front of the registration roller. A layout drawing is shown below.

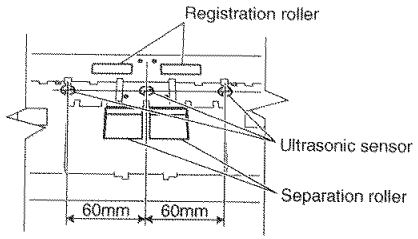


Figure 2-309

The ultrasonic drive sensor transmits the ultrasonic and the ultrasonic receive sensor receives the ultrasonic signal to gain a specific signal level. When overlapping documents are fed, the signal level is different from when properly feeding a single document. This machine interprets this difference as a "double feed". The double feed detection by ultrasonic may not work if the document overlapping width is 50 mm or less.

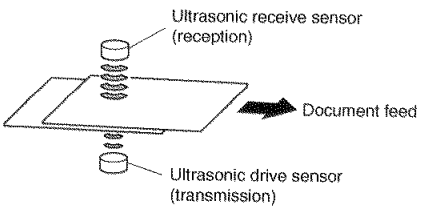


Figure 2-310

6. Jam Detection

Document jams are detected by the registration sensors (front and rear) and the eject sensor.

1) Pickup Delay Jam (Pickup Error)
The leading edge of the document was not detected by the registration sensor within the specified time after the machine starts pickup.

2) Early Reach Jam
The leading edge of the following document was detected after the trailing edge of the document was detected by the registration sensor before the document has been fed for a specified length.

3) Residual Jam
The trailing edge of the document was not detected even though the document has been fed for the maximum specified length after the leading edge of the document was detected by the registration sensor.

4) Fast Feed Jam
The trailing edge of the document was detected after the leading edge of the document was detected by the registration sensor before the document has been fed for the minimum specified length.

5) Eject Jam
A pickup delay jam and a residual jam were detected by the eject sensor.

6) Non-removal Jam
When the power was turned ON or the upper unit was opened or closed, the document was detected by the registration sensor.

IV. CONTROL SYSTEM

1. Control PCB

Control of this machine is performed by the control PCB. Figure 2-401 shows the block diagram associated with image, and Table 2-401 lists the main IC functions.

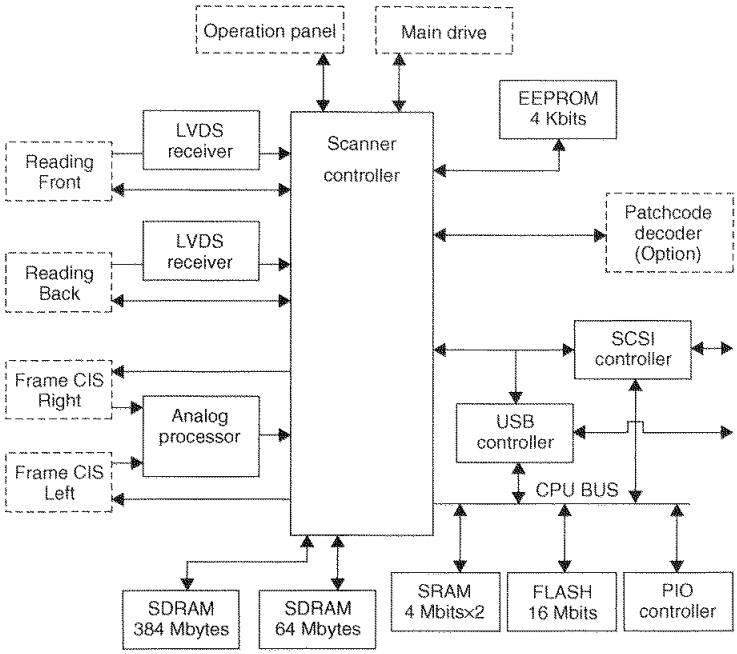


Figure 2-401

◆ Main IC functions

IC No.	Name	Function
IC108	Scanner controller	General scanner control
IC104	Analog processor	Frame detection CIS analog data adjustment and A/D conversion
IC109	EEPROM 4 Kbits	Storage of various setting data
IC110-111	SRAM 4 Mbits×2	For scanner controller work
IC144	FLASH 16 Mbits	Firmware storage
IC113-118	SDRAM 384 Mbytes	Temporary storage of image data, memory for image data processing
IC119	SDRAM 64 Mbytes	Memory for JPEG processing

Table 2-401

2. Drive System Block Diagram

Figure 2-402 shows the block diagram associated with motor control.

A control CPU is mounted on each PCB.

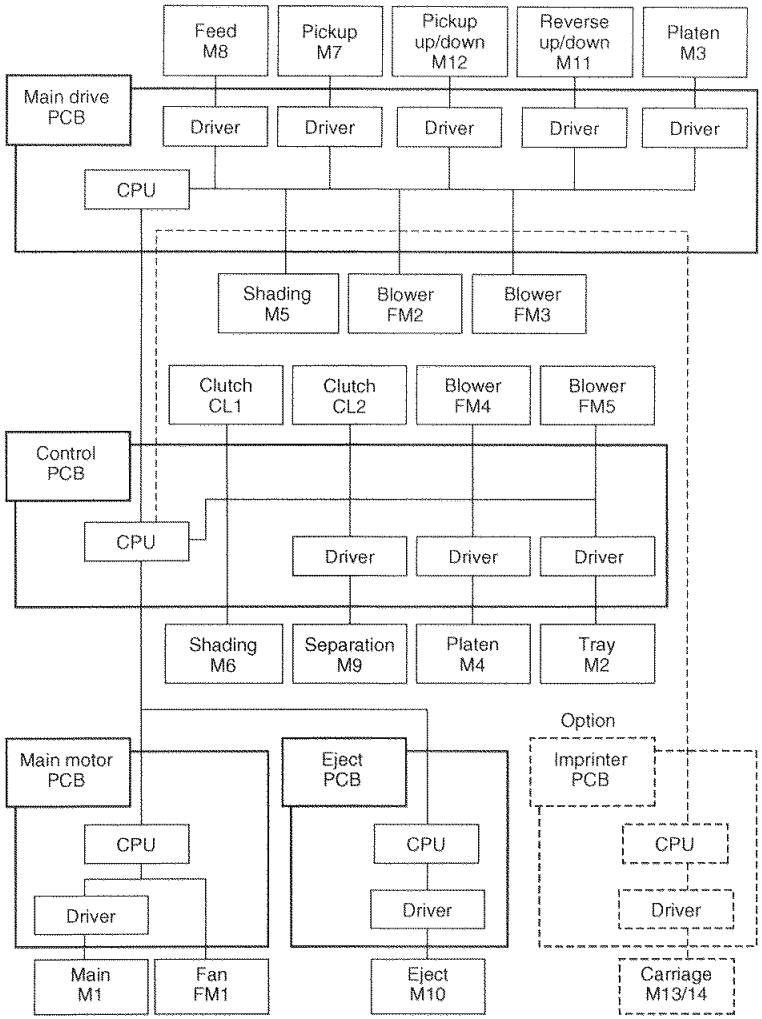


Figure 2-402

3. Image Processing Control

This machine performs main image processing using the hardware in the main body to speed up image processing.

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

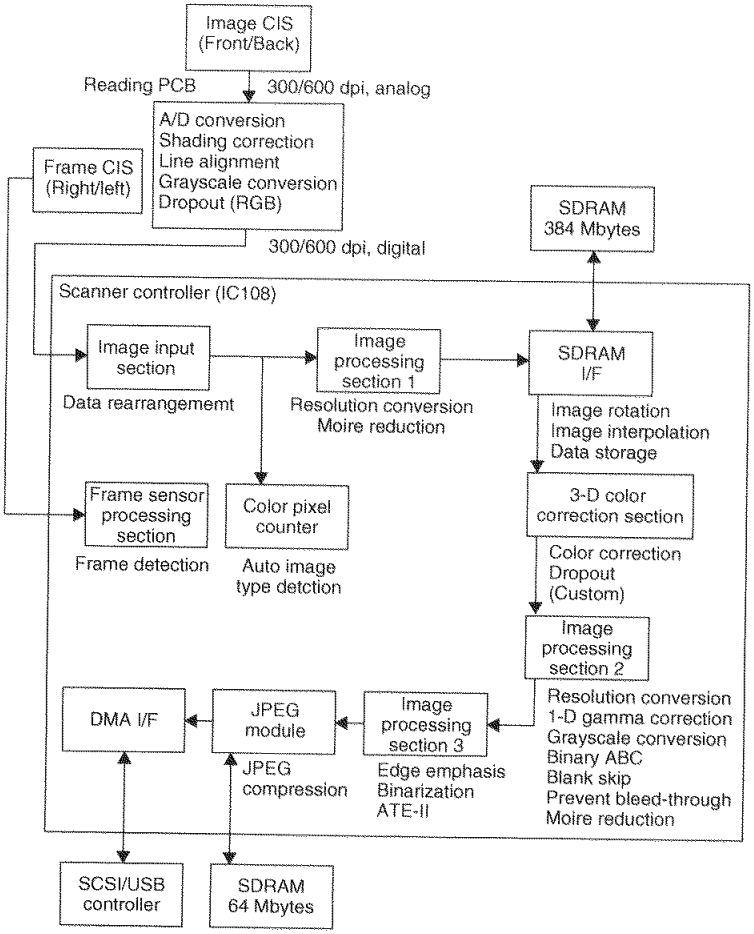


Figure 2-403

The analog signals output from the CIS unit are input to the reading PCB.

After those signals are converted into the digital signals in the reading PCB, the dedicated image processing IC performs the shading correction and rearranges the order of the data to align 3 lines.

According to the scanner settings, an optical resolution between 600 dpi and 300 dpi can be selected. In case that the resolution is set at 300 dpi or less, 300dpi data are output. The user selects either "Speed priority" or "Quality priority" for 400/600dpi. The machine processes the image by using the 300dpi data for "Speed priority" and the 600dpi data for "Quality priority. "

The image data output from the reading PCB are input to the control PCB and processed by the dedicated scanner controller (IC108).

First, the image data is rearranged in the image input section.

Image processing section 1 changes the resolution of the main-scanning direction in accordance with the scanner settings in order to convert the data into basic image data.

The basic image data are stored in the SDRAM through the SDRAM interface. SDRAM is 384 Megabytes in capacity and its 80% is used for storage.

And then, the 3-D color space processing section performs the 3-D gamma correction to improve the quality of colors.

Image processing section 2 changes the resolution, performs the gamma correction (adjustment of brightness and contrast, and custom gamma correction), the binary auto-brightness adjustment (ABC), and the grayscale conversion.

Image processing section 3 handles the edge emphasis, binarizing (simple binarizing, error diffusion, and high-speed text enhancement).

In the JPEG module, the grayscale and color data can be compressed in JPEG format. When JPEG is selected, the image data size is reduced by compression within this machine so that it can be transferred to the computer in less time. As a result, more documents can be read in a given time.

Finally, processed image data are sent from the DMA I/F to the computer either through the SCSI or USB interface.

Auto-size detection and skew correction are processed according to the results of the frame sensor processing section. Auto image type detection is processed according to the results of the pixel counter.

In case that the MultiStream is selected, the image data stored in the SDRAM are processed again in accordance with the secondary settings.

The following image processing is carried out inside the computer.

- Advanced text enhancement
- Folio processing
- Punch hole removal (if background is black)
- Border removal (if background is black)
- Text orientation recognition

V. POWER SUPPLY

1. Power Supply

The power supply PCB of this machine supports AC power supply input of 100 V to 240 V.

When the power switch (button) at the front of the main body is pressed, the power switch on the main motor PCB is turned ON. While it is ON, 24 VDC is supplied from the power supply PCB, the relay is turned ON, and DC power is provided continuously. When the power switch (button) is pressed again, the power supply sensor is turned ON, the relay is turned OFF and the power supply stops.

If the "Auto USB Power Switch Setting" is turned ON in the user mode and the USB cable is connected, the relay is turned ON/OFF in conjunction with the computer power ON/OFF.

The supplied AC power is converted by a rectifying bridge to unsmoothed power and converted to 24 VDC power.

This DC power is supplied to each PCB and is converted to a necessary DC voltage.

Figure 2-501 shows the block diagram of the power supply PCB and related blocks.

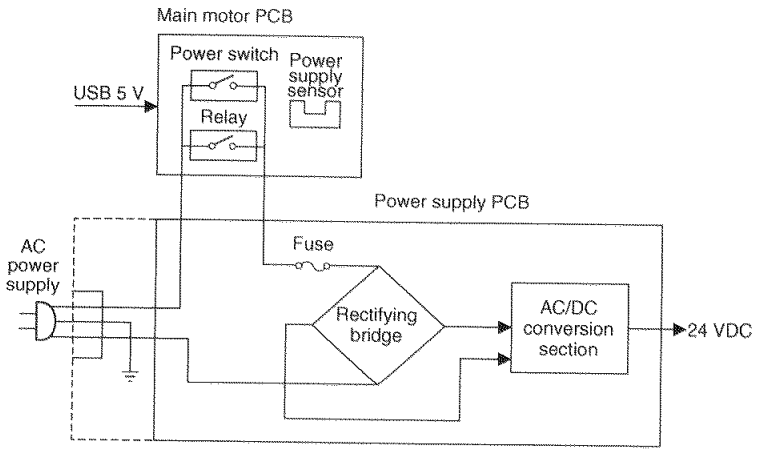


Figure 2-501

The power supply PCB contains a fuse, and if an excessive current flows, the fuse blows and the power supply stops. The motor driver has a protection function and if an excessive current flows, the power supply to the motor stops.

This machine will shift into the stand-by mode (Energy Star mode) if no key or no scan operation takes place after the power is turned ON. Select shifting time from 240/60/10 minutes according to the "Stand-by Mode Setting" in the user mode. It is set to "10 minutes" at the factory.

If communication is performed from a computer or a key on the operation panel is pressed, the machine resumes from the stand-by mode.

This machine conforms to the standards defined by the International Energy Star Program.

VI. OPTION

1. Imprinter

Characters can be printed on the front side of the document by installing the imprinter in the DR-X10C. There are 2 types of imprinters: a pre-imprinter that prints before reading the document and a post-imprinter that prints after reading the document.

Ink cartridges made by Hewlett Packard are used.

The imprinters are installed by the service technician. Refer to "Chapter 4, INSTALLATION & MAINTENANCE" for details.

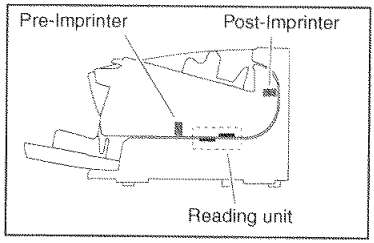


Figure 2-601

No.	Item	Description
1	Type	Pre-imprinter, Post-imprinter
2	Form	Built in the main body
3	Printing surface	Front
4	Head movement method	Electric
5	Printing density	12 nozzles/line, 96 dpi
6	Maximum number of characters	32 characters
7	Character font	Original (12 × 12 dots, 12 × 8 dots)
8	Character string	1) ASCII codes: 20H to 7FH (Alphanumeric characters, symbols) 2) Special: counter, time, date, arrow
9	Printing position	1) Horizontal: An example is shown below. 2) Vertical: 0 to 500 mm from the leading edge of the document
10	Printing orientation	0/90/180/270°
11	Consumable part	Ink cartridge

Table 2-601

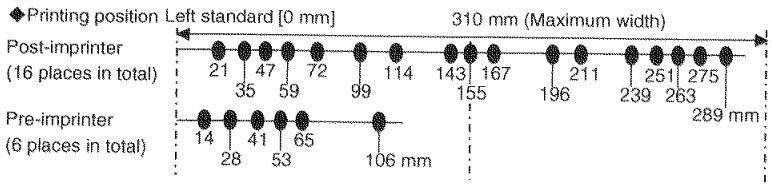


Figure 2-602

2. Patchcode Decoder

When the patchcode decoder is installed in the DR-X10C, the DR-X10C can recognize the patchcode printed on a patchcode sheet inserted within the documents and can perform batch separation.

The DR-X10C can recognize two types of patchcodes: "PATCH T" and "PATCH II".

The patchcode decoder is installed by the service technician. Refer to "Chapter 4, INSTALLATION & MAINTENANCE" for details.

◆ PATCH T (FILE A)

Figure 2-603

The scanner creates a separate file for the document that comes after the patchcode sheet. The image of this sheet can be saved or not, depending on the application's settings.

◆ PATCH II (FILE B)

Figure 2-604

The scanner creates a separate file starting from the patchcode sheet. The image of this sheet is saved, regardless of the application's settings.

3. Barcode Module

The barcode module is an add-on module that adds the barcode detection function to the ISIS/TWAIN driver. Barcodes can be read by installing the barcode module in the computer.

The barcode module is installed by the user.

The following table lists the barcode types that can be read.

Code	No. of digits	Checksum
EAN/JAN	8 or 13	Modulus 10, Weight 3
CODABAR	3 to 32 (including Start/Stop characters)	Modulus 16, 7 DR
CODE 39	3 to 32 (including Start/Stop characters) (Standard ASCII or Full ASCII)	Modulus 43
ITF	2 to 32 (Even number of digits only)	Modulus 10, Weight 3
CODE 128	1 to 32 (Valid data only)	Modulus 103
UPC-A	13	Modulus 10, Weight 3
UPC-E	8	Modulus 10, Weight 3

Table 2-602

VII. ELECTRICAL PARTS LAYOUT

1. Motor, Clutch, Fan

1) Upper unit

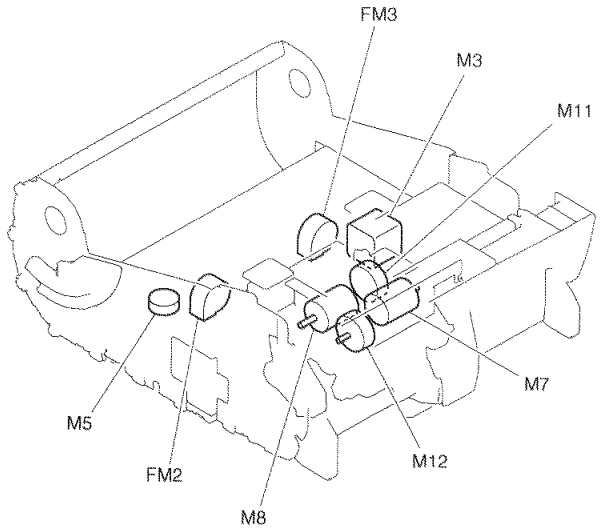


Figure 2-701

Category	Name	Symbol
Motor	Platen motor	M3
	Shading motor	M5
	Pickup motor	M7
	Feed motor	M8
	Reverse up/down motor	M11
	Pickup up/down motor	M12
Fan	Blower	FM2
	Blower	FM3

Table 2-701

2) Base unit

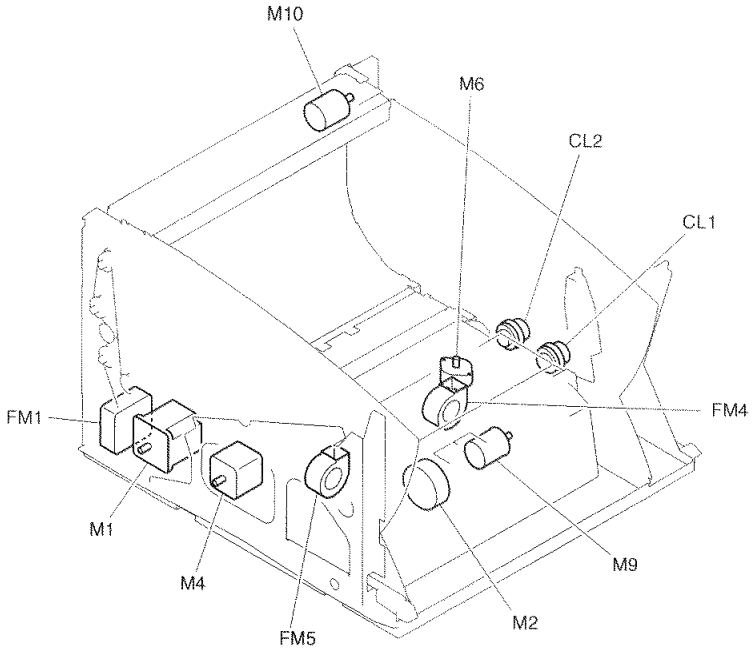


Figure 2-702

Category	Name	Symbol
Motor	Main motor	M1
	Tray motor	M2
	Platen motor	M4
	Shading motor	M6
	Separation motor	M9
	Eject motor	M10
Clutch	Clutch (registration)	CL1
	Clutch (reading front)	CL2
Fan	Exhaust fan	FM1
	Blower	FM4
	Blower	FM5

Table 2-702

2. PCB

1) Upper unit

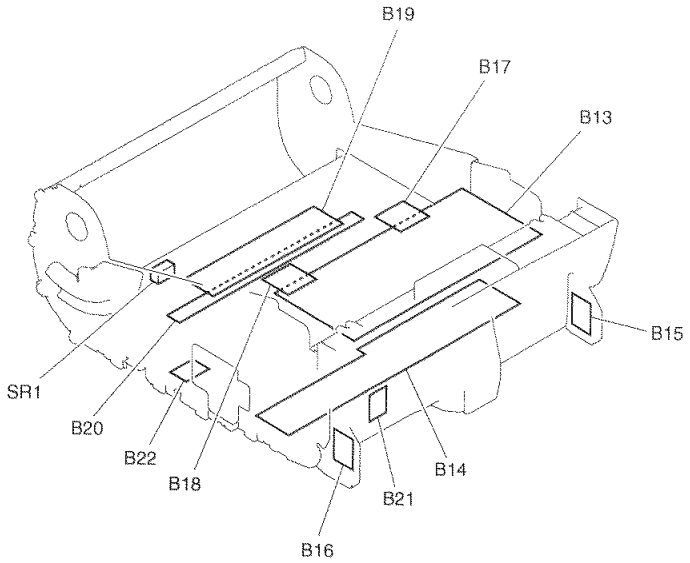


Figure 2-703

Name	Symbol	Description
Main drive PCB	B13	Door sensor Pickup roller sensor Reverse roller sensor
Ultrasonic sensor PCB	B14	Registration sensor (front/rear) Skew sensor Document sensor for ultrasonic sensor
Staple PCB (right)	B15	
Staple PCB (left)	B16	
Frame LED PCB (right)	B17	
Frame LED PCB (left)	B18	
Reading PCB	B19	Reading unit (upper)
CIS PCB	B20	Reading unit (upper)
Sensor PCB	B21	Pickup sensor
Sensor PCB	B22	Platen roller sensor upper
Sensor	SR1	Imprinter door sensor

Table 2-703

2) Base unit

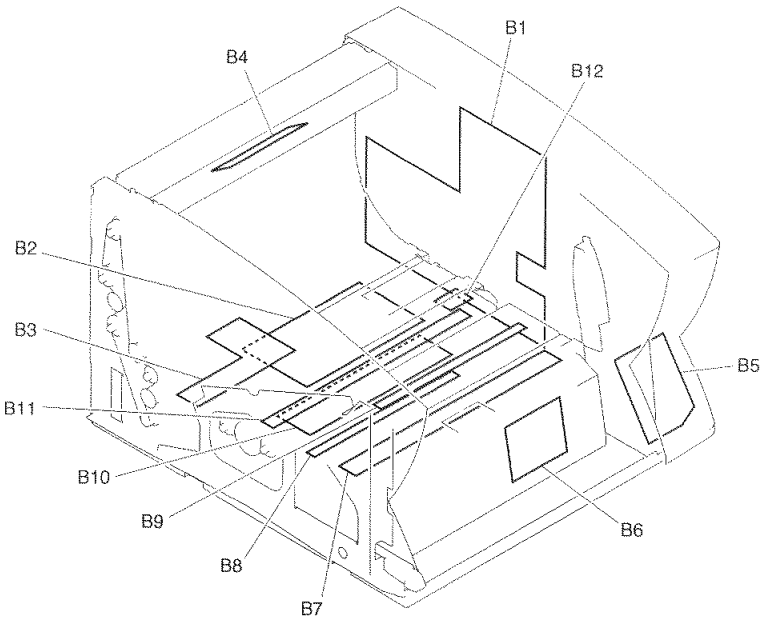


Figure 2-704

Name	Symbol	Description
Control PCB	B1	
Power supply PCB	B2	
Main motor PCB	B3	Power supply sensor
Eject PCB	B4	Eject sensor
Operation panel PCB	B5	
Tray detection PCB	B6	Document sensor
Ultrasonic drive PCB	B7	Registration sensor (front) Skew sensor Document sensor for ultrasonic sensor
Frame CIS PCB (right)	B8	Frame detection unit
Frame CIS PCB (left)	B9	Frame detection unit
Reading PCB	B10	Reading unit (lower)
CIS PCB	B11	Reading unit (lower)
Sensor PCB	B12	Platen roller sensor lower

Table 2-704

VIII. PARTS LAYOUT ON EACH PCB

1. Control PCB

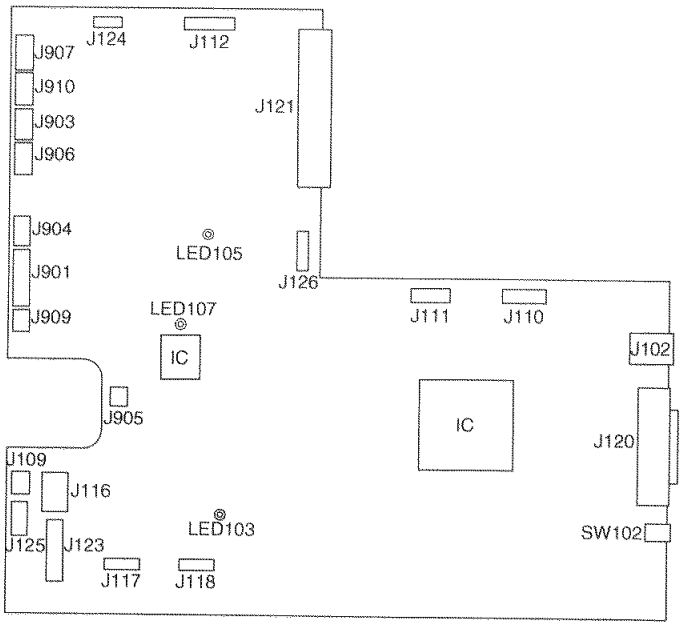


Figure 2-801

Connector		Description
J102	---	USB connector
J109	3P	Power supply PCB
J110	30P	Reading PCB (upper)
J111	30P	Reading PCB (lower)
J112	40P	Main drive PCB
J116	4P	Power supply PCB (24VDC)
J117	12P	Frame CIS PCB (left)
J118	12P	Frame CIS PCB (right)
J120	---	SCSI connector
J123	24P	Operation panel PCB
J124	6P	Eject PCB
J125	7P	Main motor PCB
J126	30P	Patchcode decoder (option)
J901	15P	Tray detection PCB, ultrasonic drive PCB
J903	6P	Platen motor
J904	4P	Tray motor
J905	2P	Clutch (reading)
J906	12P	Separation motor
J907	8P	Shading motor, platen roller sensor
J909	3P	Clutch (registration)
J910	7P	Blower, CIS unit home sensor

Table 2-801

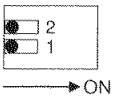
Symbol	Description
SW102	SCSI ID settings SW2 / SW1 ID2: OFF / OFF ID3: OFF / ON ID4: ON / OFF ID5: ON / ON Setting at shipping: ID2 
LED103	Lit: 2.5/3.3V good condition
LED105	Lit: 24V good condition
LED107	Flashing: CPU good condition

Table 2-802

2. Main Drive PCB

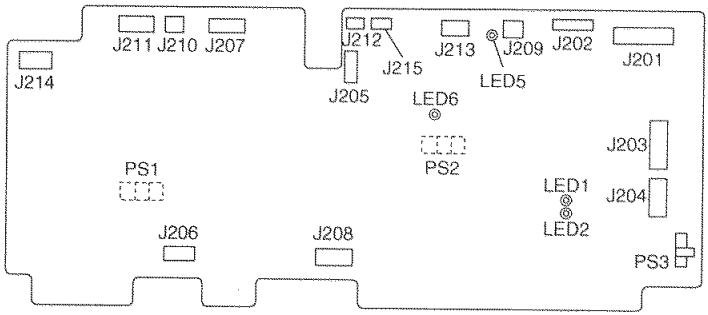


Figure 2-802

Connector		Description
J201	40P	Control PCB
J202	14P	Ultrasonic sensor PCB
J203	8P	CIS unit home sensor, shading motor
J204	6P	Platen motor
J205	4P	Reverse up/down motor
J206	4P	Pickup up/down motor
J207	12P	Feed motor
J208	12P	Pickup motor
J209	2P	Blower
J210	2P	Blower
J211	6P	Platen roller sensor, imprinter door sensor
J212	6P	Pre-imprinter (option)
J213	5P	Frame LED PCB (right)
J214	5P	Frame LED PCB (left)
J215	7P	Post-imprinter (option)

Table 2-803

Symbol	Description
LED1	Lit: CPU good condition
LED2	
LED5	Lit: 24V good condition
LED6	Lit: 5V good condition
PS1	Pickup up/down sensor
PS2	Reverse up/down sensor
PS3	Door sensor

Table 2-804

3. Main Motor PCB

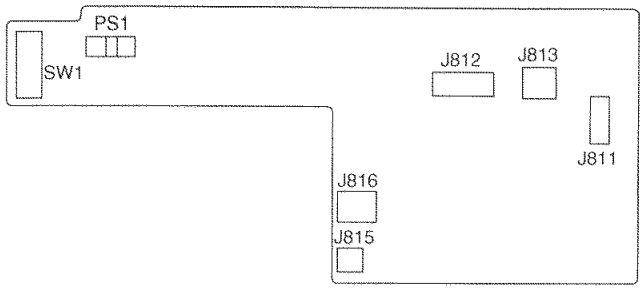


Figure 2-803

Connector		Description
J811	7P	Control PCB
J812	6P	Main motor
J813	2P	Power supply PCB (24V)
J815	3P	Exhaust fan
J816	3P	Power supply PCB (AC)

Table 2-805

Symbol	Description
SW1	Power switch
PS1	Power supply sensor

Table 2-806

4. Power Supply PCB

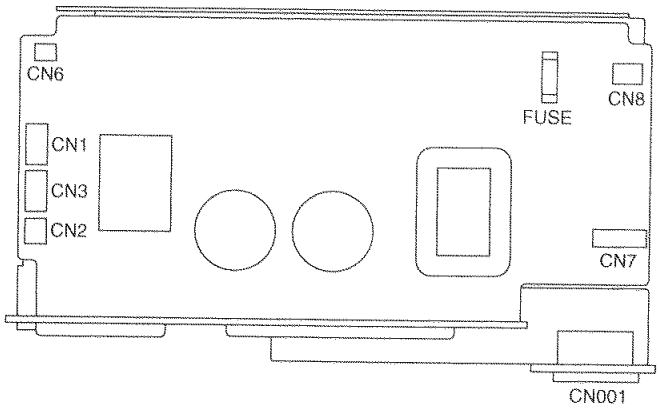


Figure 2-804

Connector		Description
CN001	3P	AC cable
CN1	4P	Control PCB (24V output)
CN2	2P	Main motor drive PCB (24V output)
CN3	4P	Control PCB (24V output, reserved)
CN6	3P	Control PCB (standby signal)
CN7	3P	AC input
CN8	3P	Main motor drive PCB (AC line)

Table 2-807

CHAPTER 3

DISASSEMBLY & REASSEMBLY

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I. REPLACED BY USERS

1. Pickup Roller

1) Hold the roller cover as shown below and turn it to the front.

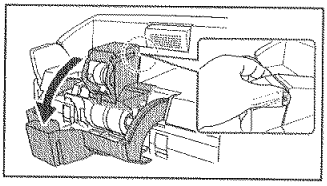


Figure 3-101

2) Flip up the lock lever of the pickup roller and remove the pickup roller.

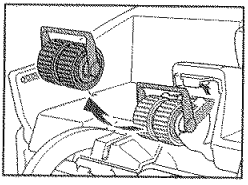


Figure 3-102

2. Feed Roller

1) Hold the roller cover as shown below and turn it to the front.

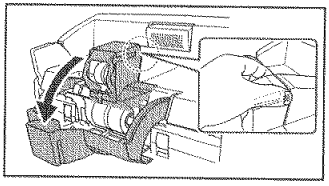


Figure 3-103

2) Remove the roller lock lever from the feed roller.

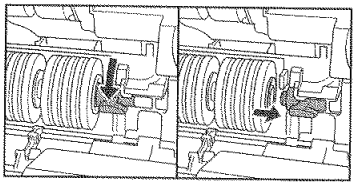


Figure 3-104

3) Remove the feed roller.

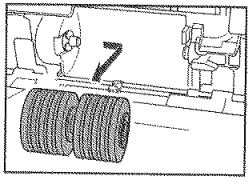


Figure 3-105

3. Retard Roller

1) Hold the roller cover with fingers and remove it.

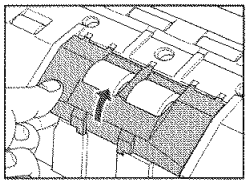


Figure 3-106

2) Remove the roller lock lever from the retard roller.

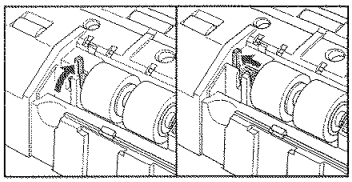


Figure 3-107

3) Remove the retard roller.

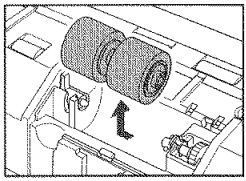


Figure 3-108

II. EXTERNAL COVERS

1. Rear Cover

1) Remove 5 screws ① (round tips), and while removing the upper hooks (2 places on the right and left sides), remove the rear cover ②.

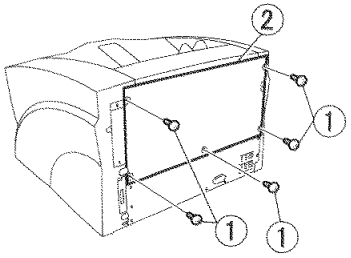


Figure 3-201

◆ General precaution

Place the main body on a flat, sturdy surface when disassembling and reassembling. If it is placed on an inclined table, the base or upper unit may be deformed when the external cover is removed.

2. Right Cover

1) Remove the rear cover.
2) Remove 4 screws ① (round tips) on the rear and the side.

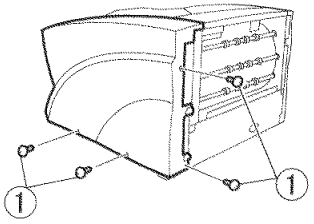


Figure 3-202

3) With the upper unit closed, remove 1 screw ① (self-tapping). With the upper unit open, remove 2 screws ② (self-tapping).

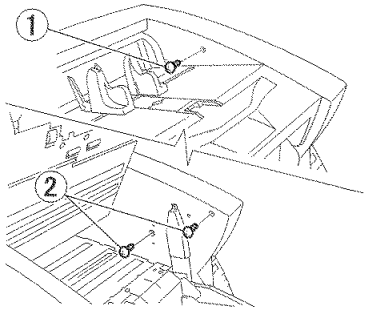


Figure 3-203

4) Move the pickup tray upward and remove the screw ① (round tip).

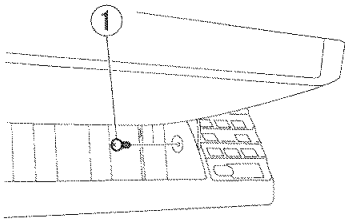


Figure 3-204

5) Unhook the rear fitting part ①, and while lifting the main body a little to raise the tip-resistant foot ②, remove the right cover ③ from the main body.

Note: Do not pull it excessively because a cable is connected to the back side.

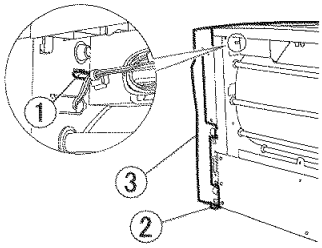


Figure 3-205

6) Remove the cable ① and remove the right cover ②.

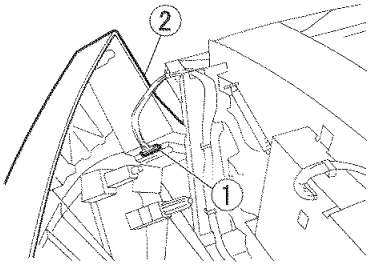


Figure 3-206

7) Remove the operation panel if necessary. (Page 3-12)

◆ **Notes on assembling**

To close the pickup tray, first move it downward and then close it.

The screw (for operation panel installation) in step 4 is not self-tapping screw, but normal type.

3. Left Cover

1) Remove the rear cover.
2) Remove 4 screws ① (round tips) on the rear and the side.

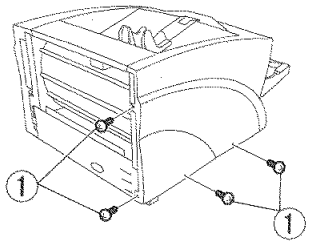


Figure 3-207

3) With the upper unit closed, remove 1 screw ① (self-tapping). With the upper unit open, remove 2 screws ② (self-tapping).

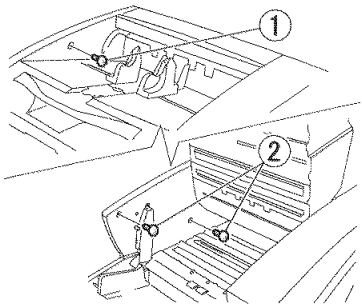


Figure 3-208

4) Move the pickup tray upward and remove the screw ① (self-tapping).

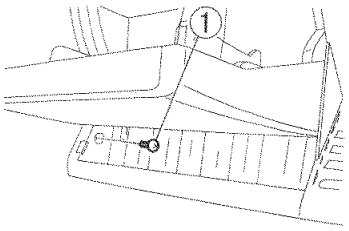


Figure 3-209

5) Unhook the rear fitting part ①, and while lifting the main body a little to raise the tip-resistant foot ②, remove the left cover ③.

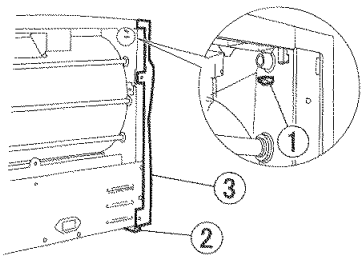


Figure 3-210

◆ **Notes on assembling**

To close the pickup tray, first move it downward and then close it.

4. Top Cover

1) Remove the right and left covers.
2) Remove screw ① (round tips), and while unhooking 2 pairs of the fitting parts ②, remove the top cover ③.

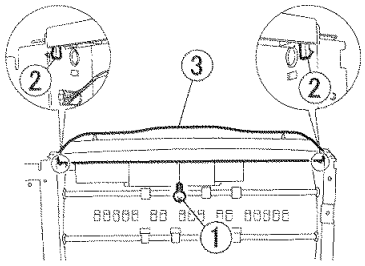


Figure 3-211

5. Pickup Tray Unit

1) Remove the right and left covers.
2) Remove the screw ① (TP head) and remove the lock shaft ②. Remove screw ③ (M3, round tips), and while unhooking 2 pairs of the fitting parts ④, remove the cover ⑤. In the same way, remove the lock shaft and the cover on the opposite side.

Note: A light guide for the sensor is built in the right cover.

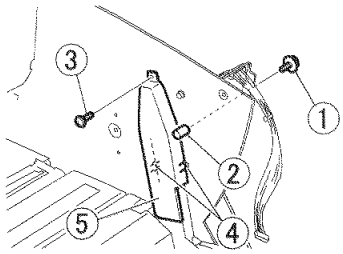


Figure 3-212

3) Lift and remove the pickup tray unit ① along the guide.

Note: When the coil spring ② is removed and the shaft ③ is removed, it is easier to remove the pickup tray unit. Refer to the "VI. 4. Entire Upper Unit" section.

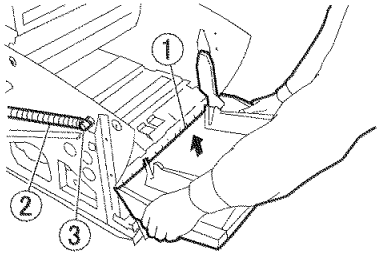


Figure 3-213

◆ **Notes on assembling**

When assembling the pickup tray unit in the main body, do not hit it against the inside of the right and left side plates to prevent damage to painted surfaces.

Since a damper is built in the raising and lowering drive unit for the pickup tray unit, put both hands on the top of the pickup tray unit and push it downward slowly and uniformly on the right and left sides.

When assembling the pickup tray unit, be careful not to tilt it to the right or left and ensure that it is not tilted to the right and left.

Install the lock shaft by aligning the D-cut shape of the end with the hole in the side plate.

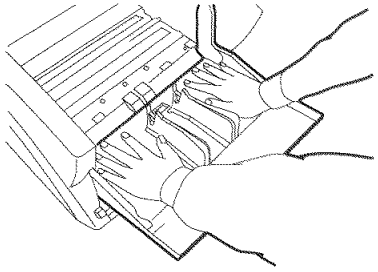


Figure 3-214

6. Pickup Document Guide

1) Remove the pickup tray unit.
(Page 3-6)
2) Remove 4 screws ① (M4, self-tapping) and remove the document guide unit ②.

Note: At this time, the pickup tray cover and pickup tray extension are also detached.

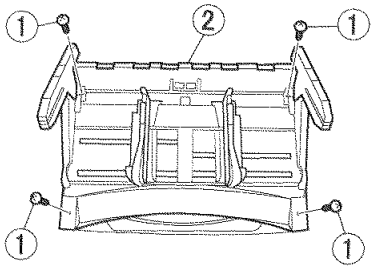


Figure 3-215

3) Remove 3 screws ① (M4, self-tapping) and remove the cover ②.

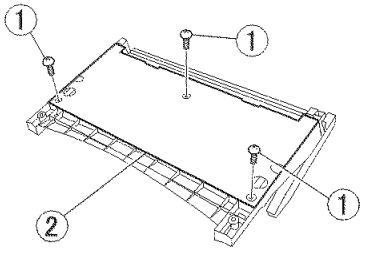


Figure 3-216

4) Remove 2 pulleys ①, belt ②, spring ③, and rack ④.

Note: The right document guide is shown here. Remove the left document guide by referring to the following procedure.

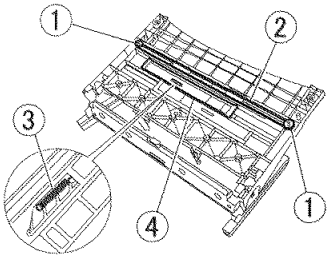


Figure 3-217

5) Remove the screw ① (M3, self-tapping) and remove the holder ②. Then, remove the shaft ③. When the shaft is removed, the lock lever on the rear side is detached.

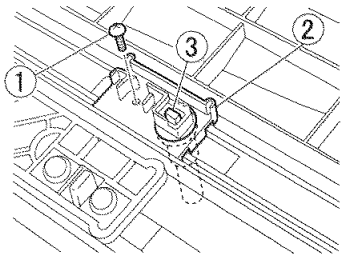


Figure 3-218

6) While holding the document guide, remove 2 screws ① (M3, self-tapping) and remove the document guide.

Note: The document guide consists of a total of 4 parts, including the lock lever.

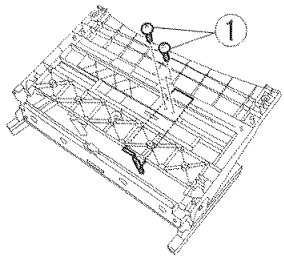


Figure 3-219

◆ Document guide components

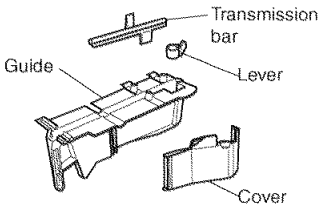


Figure 3-220

◆ **Notes on assembling**

After assembly, ensure that the document guide operates correctly.

7. Tray Guide

Note: The right tray guide is shown here. Remove the left tray guide by referring to the following procedure.

1) Remove the pickup tray unit. (Page 3-6)
2) Remove the screw ① (M3, round tip) and remove the leaf spring ②. Then, remove 3 screws ③ (M3, TP head, self-tapping) and remove the holder ④ and tray guide ⑤.

Note: When the holder is removed, the coil spring inside is detached.

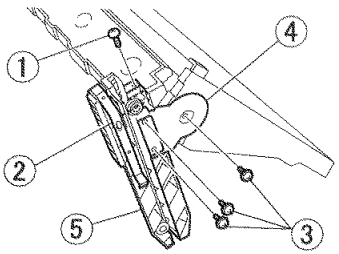


Figure 3-221

◆ **Notes on assembling**

When the coil spring ① is mounted in the holder, insert a tool with a thin and flat tip from the rear side of the hole ②, and clip the coil spring as shown in the figure below. Mount the holder with this condition and fix it with screws.

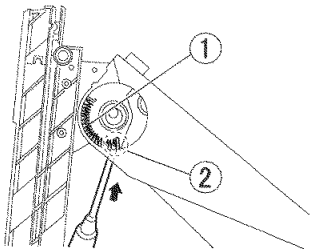


Figure 3-222

8. Lower Front Cover

1) Remove the pickup tray unit. (Page 3-6)
2) Remove 3 screws ① (TP head) and remove the lower front cover ②.

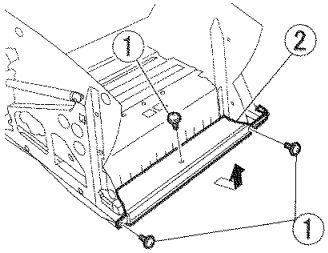


Figure 3-223

9. Eject Tray Unit

1) Open the upper unit and remove 3 screws ① (TP head). In the same way, remove 3 screws on the opposite side.

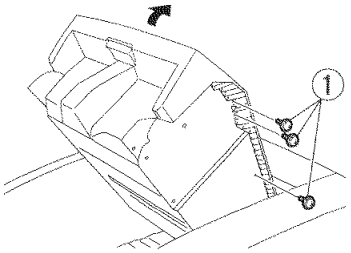


Figure 3-224

2) Close the upper unit, lift the front of the eject tray unit ① a little, and draw it to the front.

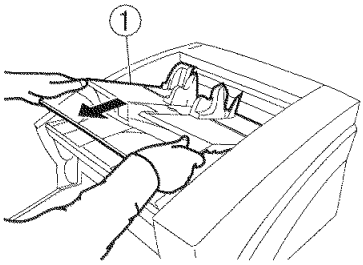


Figure 3-225

◆ **Notes on assembling**

When assembling the eject tray unit in the main body, do not hit it against the inside of the right and left side plates to prevent damage to painted surfaces.

10.Eject Document Guide

1) Remove the eject tray unit.
(Page 3-10)
2) Remove 6 screws ① (M3, self-tapping) and remove the guide plate ②.

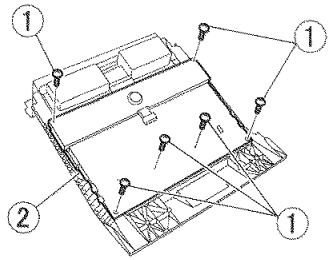


Figure 3-226

3) Remove 2 screws ① (M3, self-tapping) and remove the eject document guide on the rear side.

Note: The eject tray extension unit ② can be pulled out at this time.

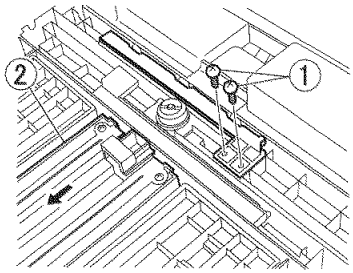


Figure 3-227

◆ **Notes on assembling**

Mount the pinion gear (left) ① and pinion gear (right) ② (with a torque limiter ③) as shown in the figure below.

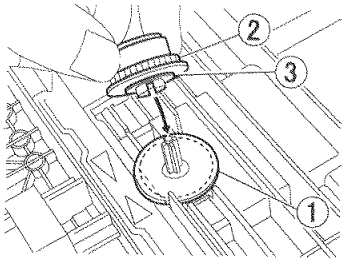


Figure 3-228

11. Operation Panel

1) Remove the right cover.
2) Remove 2 screws ① (M3, self-tapping) and 2 screws ② (M3×16, self-tapping) and remove the operation panel unit ③ (with a plate).

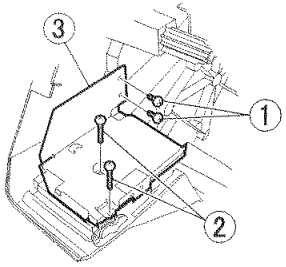


Figure 3-229

3) Remove 4 kinds of buttons ① and LED window ②.

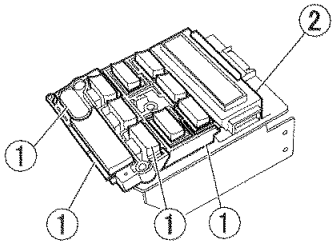


Figure 3-230

4) Remove the screw ① (M3, round tip) and remove the operation PCB ②.

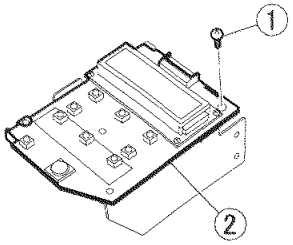


Figure 3-231

III. BASE UNIT-1 (ELECTRICAL SYSTEM)

1. Control PCB

1) Remove the right cover.
(Page 3-3)
2) Remove 5 screws ① (TP head) and remove the option PCB guide plate ①.

Note: Do not deform the ambient leaf spring.

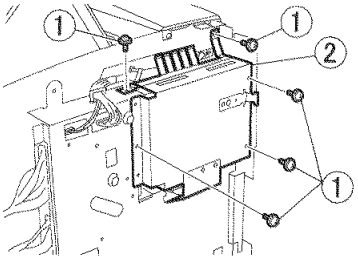


Figure 3-301

3) Remove the cable connected to the control PCB ① and 11 screws ② (TP head) and remove the control PCB (with a plate).

Note: The connector (for the reading unit (upper) and the DC power supply) marked with ✳ is one with a lock.

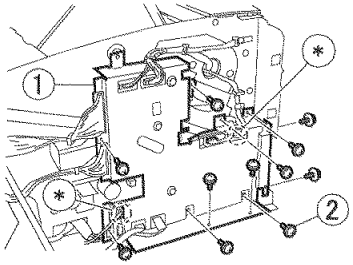


Figure 3-302

4) Remove 11 screws ① (M2.5×4) and screw ② (M3, round tip) for the USB connector and remove the control PCB ③.

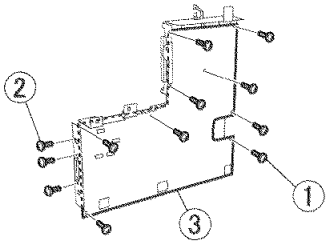


Figure 3-303

2. Power Supply PCB

1) Remove the rear cover.
(Page 3-3)
2) Remove 3 screws ① (with a tooth washer) and pull out the panel ②.

Note: Do not pull it excessively because a cable is connected to the back side.

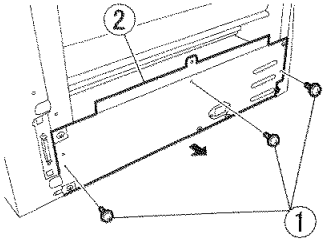


Figure 3-304

3) Remove 4 cables ① and remove the power supply PCB ② (with a panel).

Note: The connector marked with ✳ has a lock.

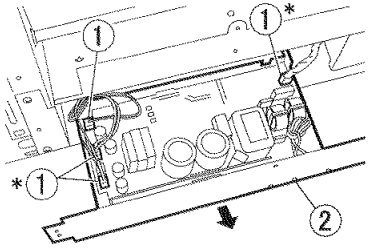


Figure 3-305

4) Remove 4 screws ① (round tip) and remove the power supply PCB ②.

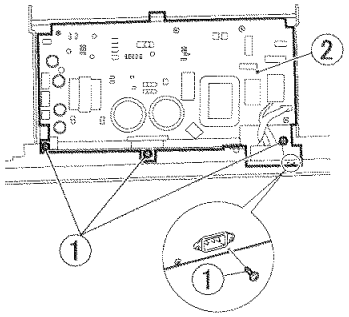


Figure 3-306

◆ **Notes on assembling**

There is no electrical problem if 4-pole connector of the DC power supply cable is connected to either of the 2 4-pole connectors (CN1, CN3) on the power supply PCB, but it must be connected to CN1.

When pushing the power supply PCB (with a panel) into the main body, align the lock screw hole positions roughly since there are 3 positioning guides in the main body.

3. Main Motor

1) Remove the left cover.
(Page 3-5)
2) Remove the power supply PCB (with a panel).
(Page 3-14)
3) Remove 2 screws ① (TP head) and remove the tension plate ②, tension spring ③ and belt ④.

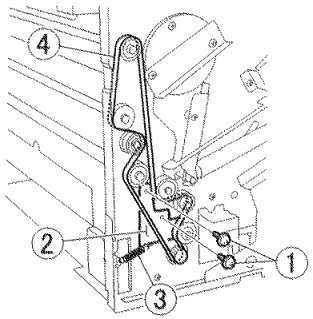


Figure 3-307

4) Remove 3 cable holders ① and remove the cable ② from the mounting plate. Remove 3 screws ③ (round tips), pull out the mounting plate ④ (with a motor), and turn it over while holding it with a hand.

Note: Do not pull it excessively because a cable is connected.

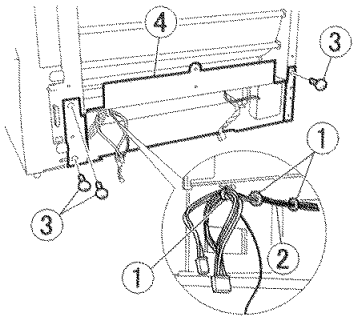


Figure 3-308

5) Remove the cable holder and connector of the cable ① and remove the main motor unit ② from the main body.

Note: The DC power supply connector for the cable has a lock.

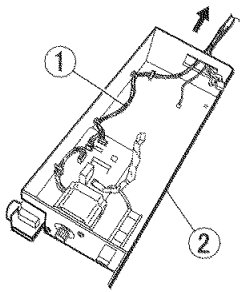


Figure 3-309

6) Remove the cable holder and connector of cable ①. Remove 2 screws ② (TP head) and remove the main motor ③.

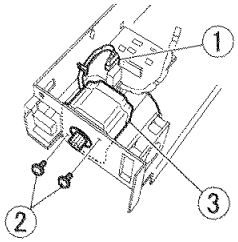


Figure 3-310

◆ **Notes on assembling**

When installing the main motor, the cable outlet must be on the connector side of the PCB.

4. Main Motor PCB

1) Remove the main motor unit.
(Page 3-15)
2) Remove 3 connected cables ① and screw ② (M3, round tip), unhook 4 pairs of the fitting parts ③ of the locking support and remove the main motor PCB ④.

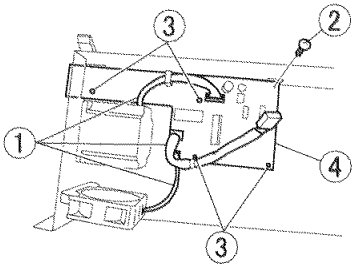


Figure 3-311

5. Exhaust Fan

1) Remove the main motor unit.
(Page 3-15)
2) Remove the connector ① and 2 screws ② (M4×25) and remove the exhaust fan ③.

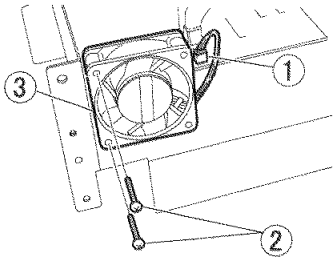


Figure 3-312

◆ **Notes on assembling**
Assemble the exhaust fan so that its display label faces outward.

6. Tray Detection PCB

1) Remove the entrance lower guide unit.
(Page 3-24)
2) Remove the cable ① and 2 screws ② (TP head) and remove the tray detection PCB ③ (with a mounting plate).

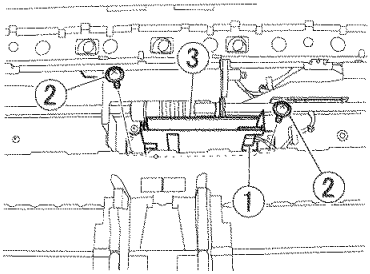


Figure 3-313

3) Remove 2 screws (M3, round tip) and remove the mounting plate.

7. Tray Drive Unit

1) Remove the pickup tray unit and tray detection PCB.
(Page 3-6), (Page 3-17)
2) Remove the registration roller.
(Page 3-25)
3) Remove 2 cables connected to the tray drive unit from the relay connector. Then, remove the screws ① (with washers). Then, remove the stop rings ② located outside both side plates and remove the bearing. Slide the gear ③ and remove the pin.

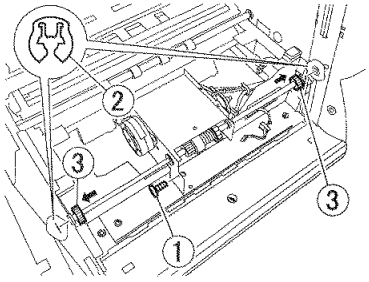


Figure 3-314

4) Rotate the tray drive unit ① and stand it on end. Remove the shaft ② from the side plate and remove the tray drive unit.

Note: After removal, remove 2 gears ③.

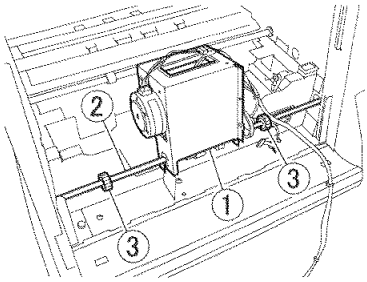


Figure 3-315

8. Pickup Tray Motor

1) Remove the tray drive unit.
(Page 3-18)
2) Remove 2 screws ① (M3, round tip) and remove the pickup tray motor ②.

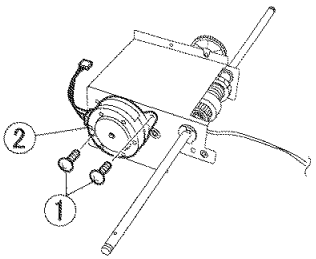


Figure 3-316

9. Separation Motor

1) Remove the tray drive unit.
(Page 3-18)
2) Remove 2 screws ① (M3, round tip) and remove the separation motor ②.

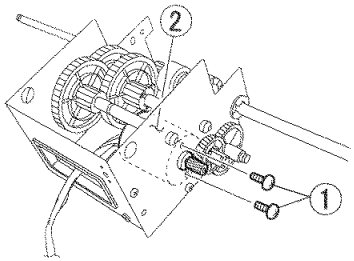


Figure 3-317

10.Ultrasonic Drive PCB

1) Remove the entrance lower guide unit. (Page 3-24)
2) Remove 2 screws ① (long stepped), lift the frame detection unit ② a little and shift it. Then, pull out the ultrasonic drive PCB unit ③.

Note: Do not pull it excessively because a cable is connected to the back side of both units.

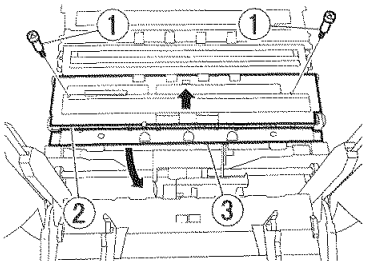


Figure 3-318

3) Remove the connector ① and remove the ultrasonic drive PCB unit ② from the main body.

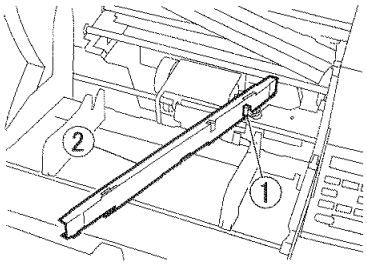


Figure 3-319

4) Remove the transparent guide plate ①.

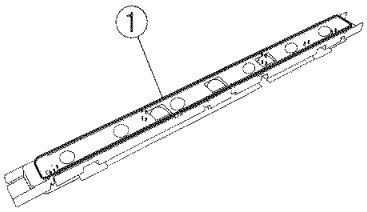


Figure 3-320

5) Remove 2 screws ① (M3, round tips), and while unhooking 3 pairs of the fitting parts ②, remove the ultrasonic drive PCB ③.

Note: Since the ultrasonic sensor and LED are mounted on the back side of the PCB, do not hit them against the mounting plate.

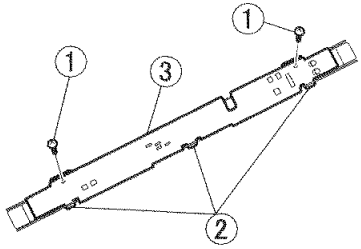


Figure 3-321

11. Eject Unit

1) Remove the top cover.
(Page 3-6)
2) Remove the cable ① and 4 screws ② (M4, round tip) and remove the eject unit ③.

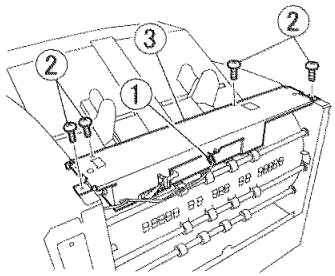


Figure 3-322

12. Eject Motor

1) Remove the eject unit.
(Page 3-21)
2) Remove the cable ① and 2 screws ② (M3, round tip) and remove the eject motor ③.

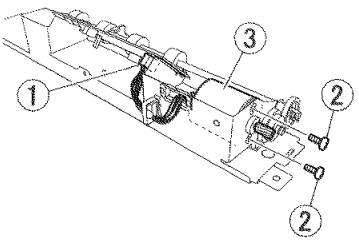


Figure 3-323

13.Eject PCB

1) Remove the eject unit.
(Page 3-21)
2) Remove the cable ① and 2 screws ② (M3, round tip) and remove the eject PCB ③ (with a leaf spring).

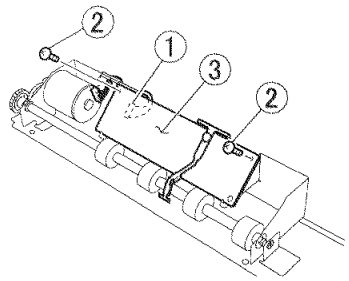


Figure 3-324

3) Grasp the head of the rivet ① and pull it out with a tool, such as nippers. Then, remove the base of the rivet and remove the leaf spring ②.

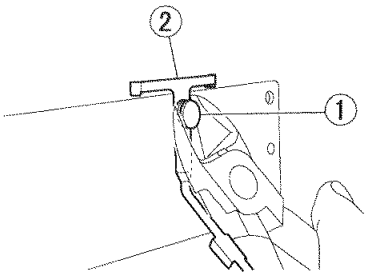


Figure 3-325

14.Platen Motor (Lower)

1) Remove the reading unit (lower).
(Page 3-32)
2) Remove 2 screws ① (M3, round tip) in the left side plate.

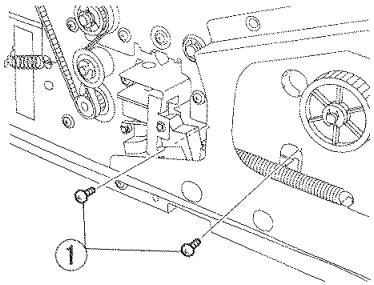


Figure 3-326

3) Take the motor unit ① out and remove the cable ②.

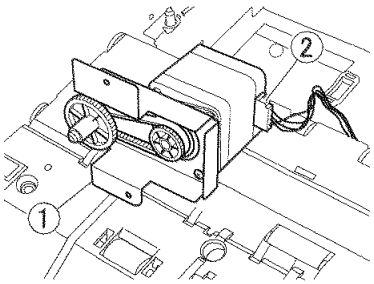


Figure 3-327

4) Remove the pulley ① and belt ②. Remove 2 screws ③ (M3, round tip) and remove the mounting plate ④.

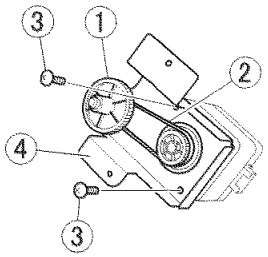


Figure 3-328

5) Remove 2 screws ① (M3, round tip) and remove the motor mount ③ from the platen motor ②.

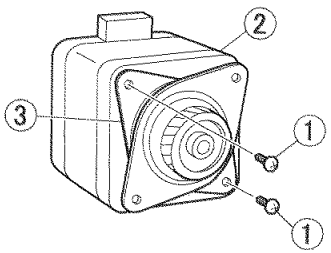


Figure 3-329

IV. BASE UNIT-2 (FEED SYSTEM)

1. Entrance Lower Guide Unit

1) Remove the retard roller.
(Page 3-2)
2) Remove screw ① (M3, round tips), and while unhooking 2 pairs of the fitting parts ②, remove the cover ③. In the same way, remove the cover on the opposite side.

Note: A light guide for the sensor is built in the right cover.

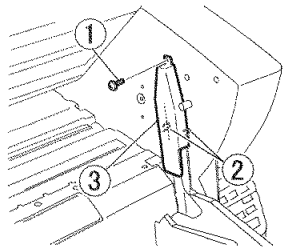


Figure 3-401

3) Remove 3 screws ① (short stepped) and remove the entrance lower guide unit ②.

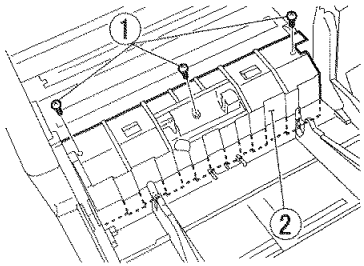


Figure 3-402

2. Platen Roller (Lower)

1) Remove 2 screws ① (M3, round tip) using a short screwdriver, lift the front of the guide plate ②, and while unhooking 2 pairs of the rear fitting parts ③, remove the guide plate.

Note: If no short screwdriver is available, remove the upper unit.

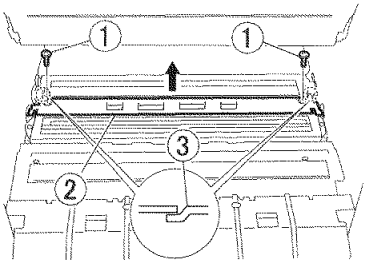


Figure 3-403

2) Lower the front of the platen roller ①, turn it, align the positions of both bearings ② and pull it out upward.

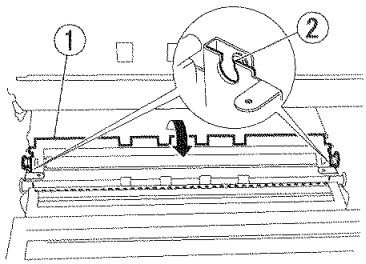


Figure 3-404

◆ **Notes on assembling**

Insert the fitting parts of the guide plate below the fitting parts of the platen roller.

3. Registration Roller

1) Remove the right and left covers.
(Page 3-3), (Page 3-5)
2) Remove the frame detection unit and ultrasonic drive PCB.
(Page 3-39), (Page 3-20)
3) Remove the control PCB.
(Page 3-13)

Note: Remove this PCB to adjust the tension of the belt during assembly.

4) Remove the stop ring ① and remove the magnetic clutch ② and belt ③.

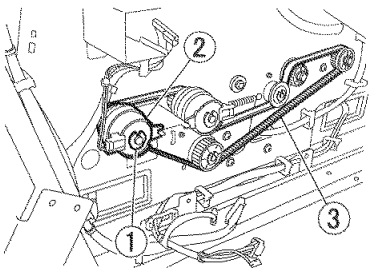


Figure 3-405

5) Remove the stop rings ① on both sides. Remove the bearings on both sides, escape the arm ② and remove the registration roller ③.

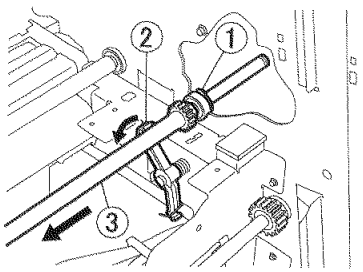


Figure 3-406

◆ **Notes on assembling**

Hang the arm in procedure 5) on the shaft and mount the registration roller.

When mounting the magnetic clutch, insert the rotation stopper.

4. Reading Roller (Front)

1) Remove the right and left covers.
(Page 3-3), (Page 3-5)
2) Remove the frame detection unit and ultrasonic drive PCB.
(Page 3-39), (Page 3-20)
3) Remove the control PCB.
(Page 3-13)

Note: Remove this PCB to adjust the tension of the belt during assembly.

4) Remove the stop ring ① and remove the magnetic clutch ② and belt ③.

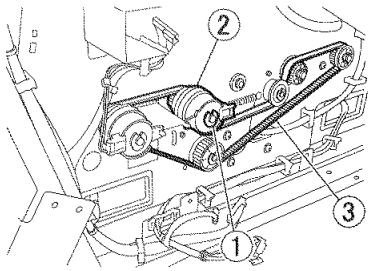


Figure 3-407

5) Remove the stop rings ① on both sides. Remove the bearings on both sides and remove the reading roller (front) ②.

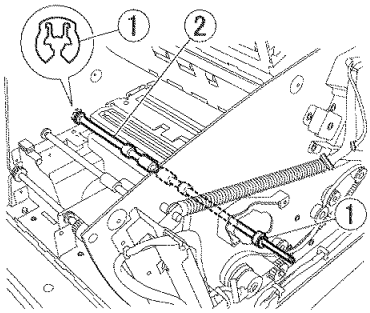


Figure 3-408

◆ **Notes on assembling**

When mounting the magnetic clutch, insert the rotation stopper.

5. Reading Roller (Center)

1) Remove the left covers.
(Page 3-5)
2) Remove 2 screws ① (M3, round tip) using a short screwdriver, lift the front of the guide plate ②, and while unhooking 2 pairs of the rear fitting parts ③, remove the guide. Unhook 2 pairs of the fitting parts ④ and remove the gear ⑤ and pin ⑥.

Note: Do not drop and lose the pin.
If a short screwdriver is not available, remove the upper unit.

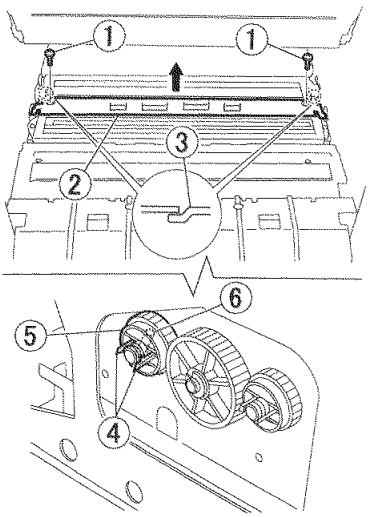


Figure 3-409

3) Remove the stop ring ①, and while removing the ball bearings ② on both sides, remove the reading roller (center) ③.

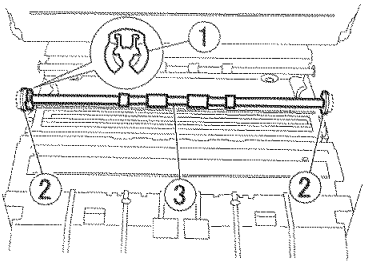


Figure 3-410

◆ **Notes on assembling**
There is only one stop ring at the left side. Insert the fitting parts of the guide plate below the fitting parts of the platen roller.

6. Reading Roller (Rear)

1) Remove the right and left covers. (Page 3-3), (Page 3-5)
2) Remove the platen roller (lower). (Page 3-24)
3) Remove the control PCB. (Page 3-13)
4) Remove the belt ①. Unhook 2 pairs of the fitting parts ② and remove the gear ③ and pin.

Note: Do not drop and lose the pin.

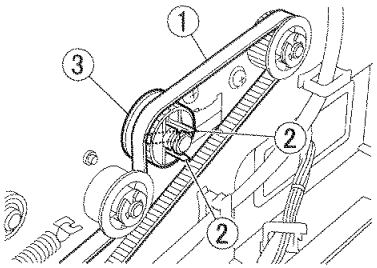


Figure 3-411

5) Remove the stop ring ①, and while removing the ball bearings ② on both sides, remove the reading roller (rear) ③.

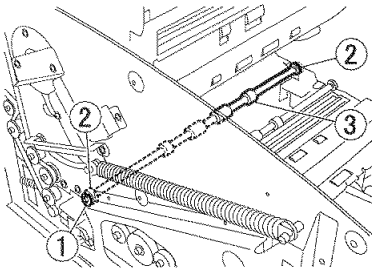


Figure 3-412

7. U-Turn Roller A

1) Remove the right and left covers. (Page 3-3), (Page 3-5)
2) Remove the control PCB. (Page 3-13)
3) Remove the belts ① on both sides. Unhook 2 pairs of the fitting parts ② and remove the gear ③, pin and bearing. Remove the parts on the opposite side in the same way, and remove the U-turn roller A ④ from the rear cover side.

Note: Do not drop and lose the pin.

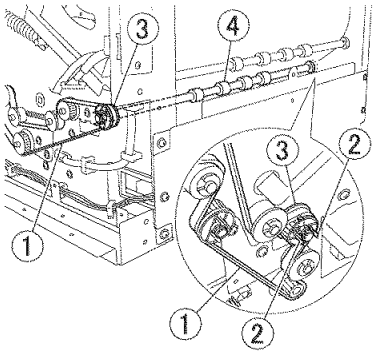


Figure 3-413

8. U-Turn Roller B

Note: There are 3 U-turn rollers B and they are same parts. However, the control PCB must be removed according to locations, or only the guide plate for the option PCB should be removed.

1) Remove the right and left covers.
(Page 3-3), (Page 3-5)
2) Remove the control PCB or the guide plate for the option PCB.
(Page 3-13)
3) Remove the belt ①. Unhook 2 pairs of the fitting parts ② and remove the gear ③ and pin ④.

Note: Do not drop and lose the pin.

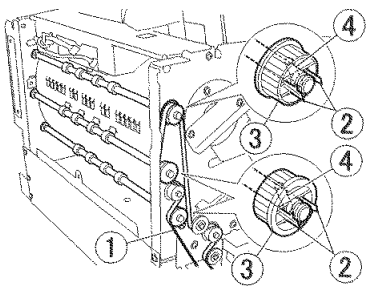


Figure 3-414

4) Remove the stop ring ①, and while removing the ball bearings ② on both sides, remove the U-turn roller B ③ from the rear cover side.

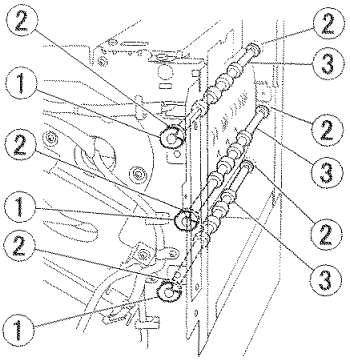


Figure 3-415

9. Eject Roller

1) Remove the eject unit.
(Page 3-21)
2) Remove the gear ① and stop ring ② and remove the eject roller ③.

Note: At this time, the pin and 2 bearings are detached. Do not lose them.

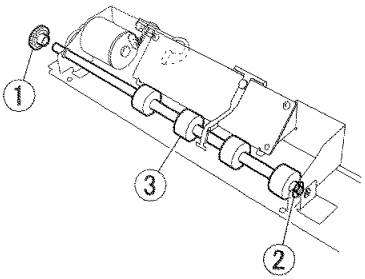


Figure 3-416

10. Belt (Right)

1) Remove the control PCB.
(Page 3-13)
2) Loosen the screw ① (TP head), loosen the tension of the belt (right) ② and remove the belt.

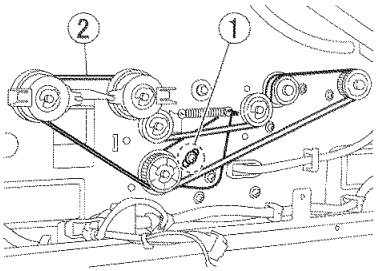


Figure 3-417

11. Belt (Left)

1) Remove the left cover.
(Page 3-5)
2) Loosen the screw ① (TP head), loosen the tension of the belt (left) ② and remove the belt.

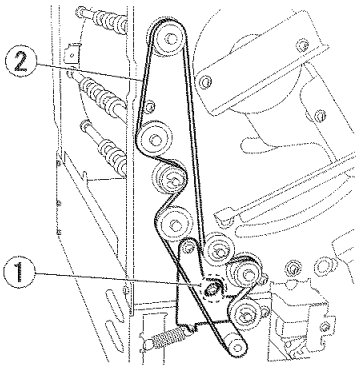


Figure 3-418

V. BASE UNIT-3 (READING SYSTEM)

Note: If the reading unit is disassembled further, be careful to prevent entry of dust. Do not touch the inner surfaces of glass and the surfaces of the lens array with fingers. If they are dirty, clean them with a clean dry cloth.
If the inside is not disassembled, replace the entire reading unit.

Note: The differences between the parts of the reading unit (upper) and the reading unit (lower) are the cable cover and flat cable. The wiring of some cables and the direction of assembly are different.

1. Reading Unit (Lower)

1) Remove the left cover.
(Page 3-5)
2) Remove the platen roller (lower).
(Page 3-24)
3) Unhook 2 pairs of the fitting parts ① and remove the gear ② and pin ③ for the reading roller (middle).

Note: Do not drop and lose the pin.

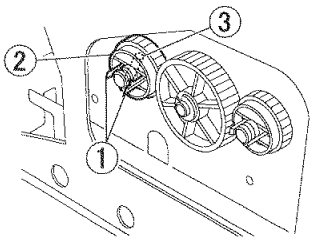


Figure 3-501

4) Remove the stop ring ① and while removing the ball bearings ② on both sides, remove the reading roller (middle) ③.

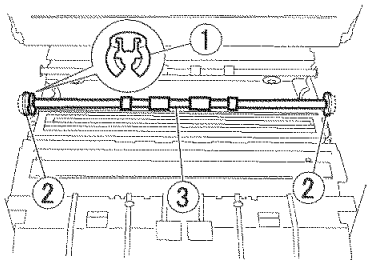


Figure 3-502

5) Remove the screw ① (M3, round tip) and remove the support plate ②. In the same way, remove the support plate on the opposite side.

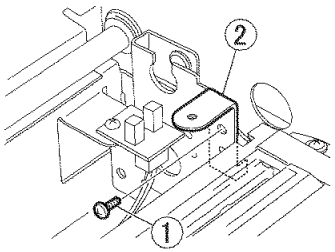


Figure 3-503

6) Remove the cable from cable guides on the bottom plate. Remove 2 screws ① (M3, TP head) on the both sides and pull out the reading unit (lower) ②.

Note: Do not pull it excessively because a cable is connected to it.
Coil springs are mounted in the lower part of the reading unit fixing part. Do not lose it.

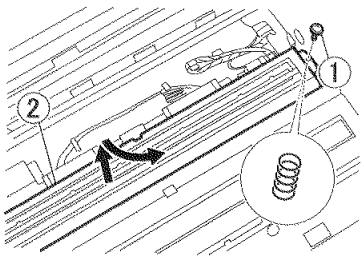


Figure 3-504

7) Remove 3 connectors ① and remove the reading unit (lower) ②.

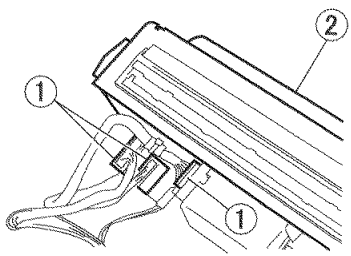


Figure 3-505

◆ **Notes on assembling**
Do not nip the cable. Insert the cable into the cable holder of the reading unit and the cable guide of the bottom plate.

2. Reading PCB

1) Remove the reading unit (lower). (Page 3-32)
2) Remove 3 connectors ① and remove the cable from the cable guides of the 2 cable covers ②.

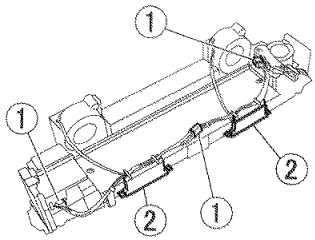


Figure 3-506

3) Unhook 2 pairs of the fitting parts ① and remove the cable cover ②. In the same way, remove the cable cover on the opposite side.

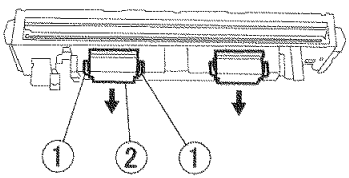


Figure 3-507

4) Remove 2 screws ① (M3, TP head, self-tapping) and turn the reading PCB ② over.

Note: Do not pull it excessively because the cables are connected to it.

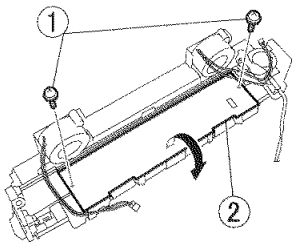


Figure 3-508

5) Pull out both ends of the lock plate of the connector ① using the clips ② and remove the flat cable ③. In the same way, remove the flat cable on the opposite side.

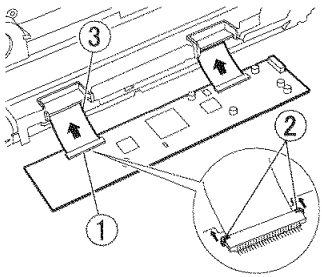


Figure 3-509

◆ **Notes on assembling**

When the lock plate of the connector is open, insert the flat cable into the connector until the contact surface of the flat cable is entirely covered and then close the lock plate.

When assembling the PCB in the case, align the end surface of the PCB with the end surface of the sponge of the case and press it. The PCB must not ride on the sponge.

3. Shading Motor

1) Remove the reading PCB.
(Page 3-33)

Note: When mounting the shading motor, the reading PCB must be removed.

2) Remove the connector ① and 2 screws ② (M3, self-tapping, black) and remove the shading motor ③ and cover ④.

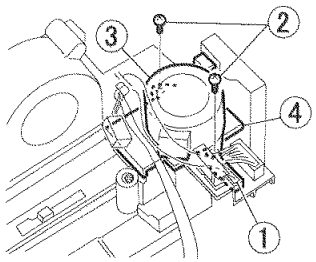


Figure 3-510

◆ Notes on assembling

1) Move the slide plate ① with hand, and align the position of the groove ② with 2 holes ③ for the motor.

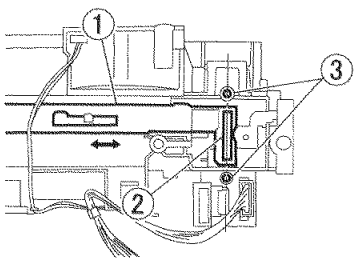


Figure 3-511

2) Align the motor rotating shaft ① with 2 holes ② for fixing.

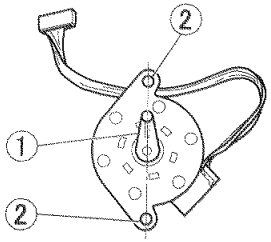


Figure 3-512

3) After assembling the cover ①, insert the rotating shaft into the hole in the cover so that it does not move, and mount the motor so that the cover aligns with the motor fixing holes.

Note: If each position is aligned, the end of the rotating shaft fits in the groove in the slide plate.

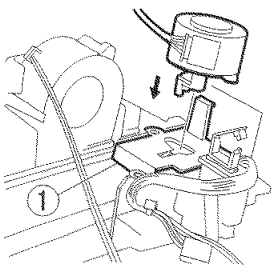


Figure 3-513

4) While holding the motor with hand, slide the slide plate slightly to the right and left. Verify that the end ① of the motor rotating shaft turns.

Note: To confirm rotation, a mark ② may be affixed to the end surface of the rotating shaft.

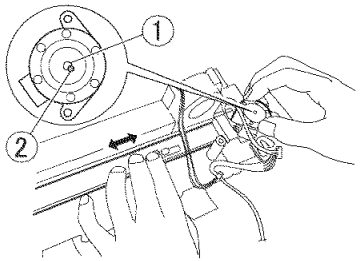


Figure 3-514

5) If it turns, the position is correct. In this condition, fix the motor with screws.

Note: If it does not turn, retry assembly.

4. CIS Unit

1) Remove the shading motor.
(Page 3-35)

2) Unhook 2 pairs of the fitting parts ① and remove the cover ②. Then, remove the slide plate ③ by aligning positions.

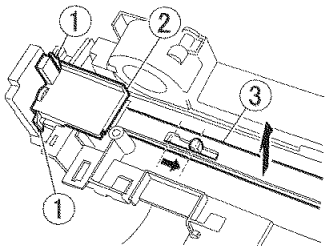


Figure 3-515

3) Remove the shaft guide ring ① with tweezers.

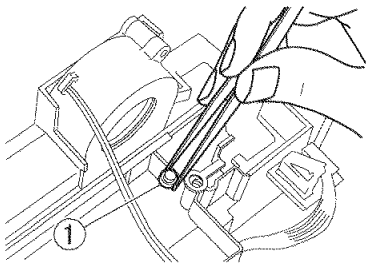


Figure 3-516

4) Place the reading holder ① upward, remove the screw ② (M3, self-tapping, black) and remove the side plate ③. In the same way, remove the side plate on the opposite side. Slide the reading holder, and while unhooking the fitting parts ④ (7 pairs), remove it.

Note: The right side plate differs from the left side plate in shape. The right side plate shown below has a stopper ⑤.

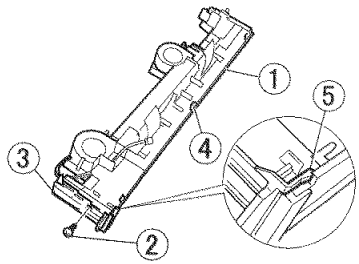


Figure 3-517

5) Lift the CIS unit ①, and while removing both flat cables ② from the slit, remove the unit.

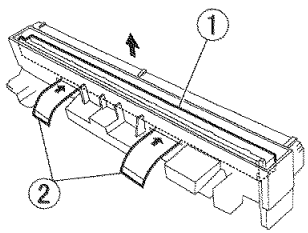


Figure 3-518

6) Remove 2 flat cables ① from the connectors. While unhooking the fitting parts, remove 2 grounding plates ②.

Note: The connector has a lock. Release the lock according to the previous section, "2. Reading PCB".

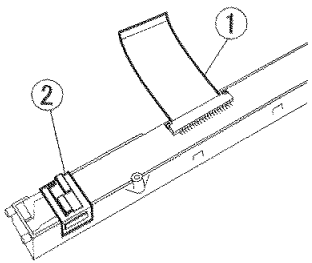


Figure 3-519

◆ **Notes on assembling**

The grounding plates are same, but assemble them by aligning vertical and horizontal directions with original positions. Do not forget to mount a guide ring on the shaft on the back side of the CIS unit.

5. Reading Holder

Note: A reading glass and a shading sheet are mounted in this reading holder. If it is removed, the CIS unit is exposed.

1) Open the upper unit.
2) Slide the reading holder to the left and remove it while pushing down the fitting parts ② on the rear left side of the reading holder ① with a tool with a thin tip.

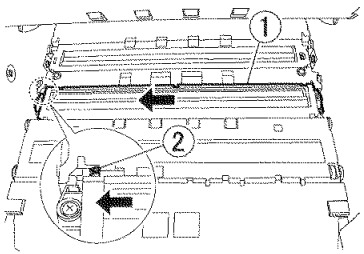


Figure 3-520

6. Blower

1) Remove the reading unit.
(Page 3-32)
2) While unhooking the fitting parts ①, tilt and remove the blower ③ so that the fitting parts ② are removed.

Note: If the fitting parts ① are bent excessively, they may be damaged.

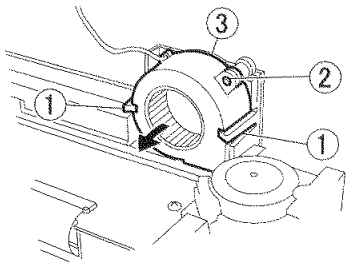


Figure 3-521

◆ **Notes on assembling**

Insert the blower discharge opening ① into the opening in the reading unit. While aligning 2 pairs of the fitting parts ②, push the blower in.

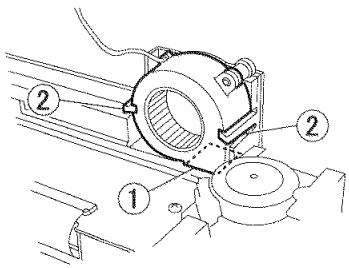


Figure 3-522

7. Frame Detection Unit

1) Remove the right cover.
(Page 3-3)
2) Remove 2 flat cables ① from the connectors and cable holders.

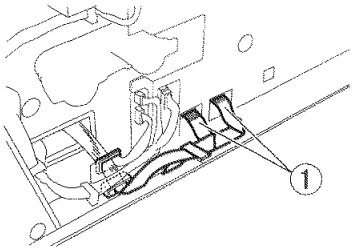


Figure 3-523

3) Remove 2 screws ① (long stepped) and remove the frame detection unit ②.

Note: Since the flat cables are connected to the back side, remove them being careful not to damage it.

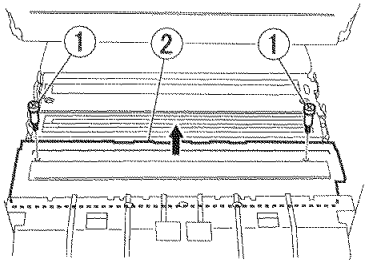


Figure 3-524

Note: If parts, such as a frame detection guide and ink drain pad are removed, perform the following procedure. However, be careful not to allow dust to enter the parts.

4) Unhook 7 pairs of the fitting parts ① and remove the frame detection guide ②.

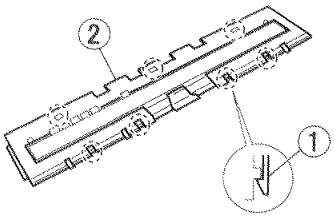


Figure 3-525

5) Remove the ink drain pad ① by inserting the thin tip of a tool.

Note: Do not stain the surface of the sensor ②. If ink is collected in the pad, provide paper and a storage bag to prevent soiling of your fingers or the periphery. Do not remove the sensor from the case.

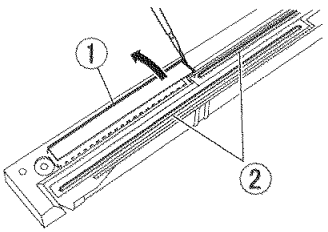


Figure 3-526

◆ **Notes on assembling**

Remove dust from the surfaces of the sensor with an air blower before assembling the frame detection guide.

Push all fitting parts until they snap on. There must be no lifts or gaps.

They must not nip the flat cable.

VI. UPPER UNIT-1 (EXTERNAL COVERS)

1. Entrance Upper Unit

1) Open the pickup roller cover.
2) Press the rear side ① (marked with ＊) of both arms and unhook the fitting parts inside. The pickup roller cover opens further.

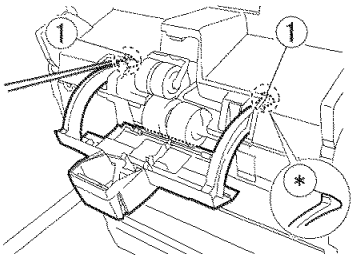


Figure 3-601

3) While holding the entrance upper guide plate ①, remove 9 screws ② (M3, round tip) and remove the entrance upper unit ③.

Note: The screws at the lower 2 places (marked with ＊) are hidden inside. Remove the screws with a magnetized screwdriver so that they do not drop inside.

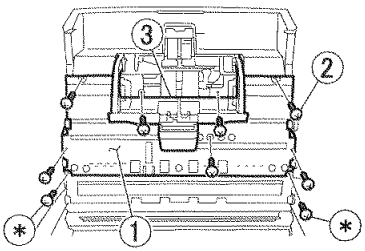


Figure 3-602

2. Pickup Roller Cover

1) Remove the entrance upper unit.
(Page 3-40)
2) While bending the stopper ①, push the end of the shaft ② with a tool with a thin tip and unhook the fitting parts. Then remove the shaft.
When the shaft is removed, the entrance upper guide plate ③ and pickup roller cover ④ are separated.

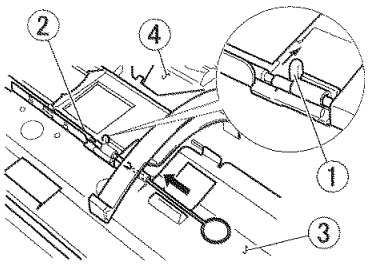


Figure 3-603

3. Upper Front Cover

1) Remove the eject tray unit.
2) Remove 2 screws ① (TP head).

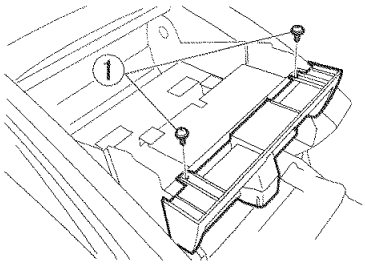


Figure 3-604

3) Open the pickup roller cover. Press the rear side ① (marked with ＊) of both arms and unhook the fitting parts inside. The pickup roller cover opens further.

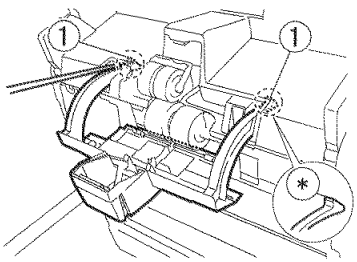


Figure 3-605

4) Remove 2 screws ① (TP head) and pull out the upper front cover ② to the front.

Note: Since the internal open/close button shaft unit is combined with a part of the upper front cover, there is some resistance when the cover is pulled out, but it can be removed easily by pulling it.

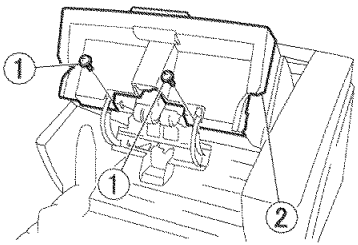


Figure 3-606

◆ **Notes on assembling**

When mounting the upper front cover, first insert the open/close button into the hole at the center of the upper front cover.

4. Entire Upper Unit

Note: When replacing the U-turn roller and U-turn guide plate, the entire upper unit must be removed.

1) Remove the right and left covers.
(Page 3-3), (Page 3-5)
2) Remove the top cover.
(Page 3-6)
3) Remove the pickup tray unit.
(Page 3-6)
4) Remove the eject tray unit.
(Page 3-10)

Note: When removing the upper unit, it is easier to perform work if the weight is reduced, so remove the eject tray unit.

5) Remove the control PCB.
(Page 3-13)
6) Remove the screws ① (M3, round tip). Remove the cable ② from the cable guide. Then, pass 2 cables from the upper unit through the hole ③ and insert them into the upper unit.

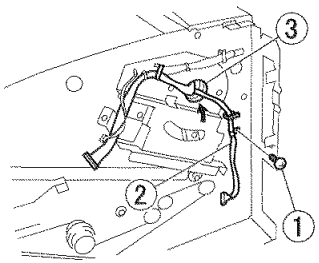


Figure 3-607

7) Open the upper unit and reduce the tension of the large coil spring ①. Then, while pulling the coil spring to the direction of arrows with one hand, hold the shaft ② with the other hand, remove the shaft groove from the side plate and remove the coil spring from the shaft. Also remove the shaft.

Note: The shaft at the rear side may also be detached.

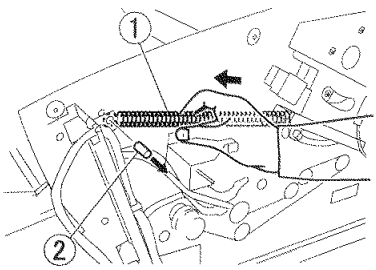


Figure 3-608

◆ **Shape of the shafts**

Since the front shaft that was removed in this process is similar in shape to the shaft that hooks the rear side of the spring which is removed in a subsequent process, their shapes are shown below. Assemble the rear shaft with the flat side facing down

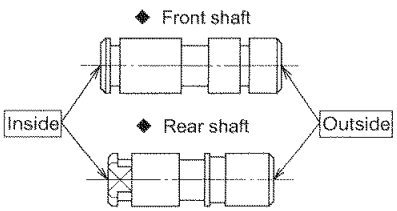


Figure 3-609

8) Remove the coil spring ① on the opposite side using the same procedure as above.

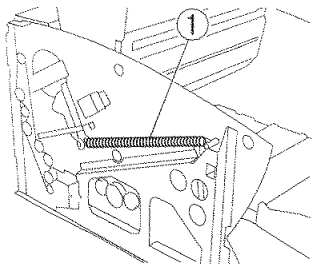


Figure 3-610

9) When both coil springs are removed from the front shaft, close the upper unit. To prevent collision with the feed surface, paper or a sheet should be placed between the upper unit and the base unit.

Note: If the damper is removed when the upper unit is open, the upper unit closes under their own weight, causing danger.

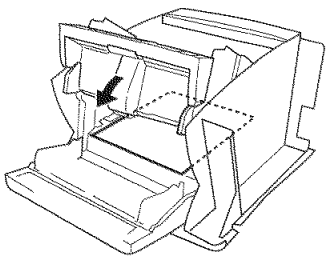


Figure 3-611

10) Remove 4 screws ① (TP head) and remove the holding plate (right) ②.
Then remove 3 screws ③ (TP head) and remove the hinge ④, arm ⑤ , shaft ⑥ and coil spring ⑦.
Remove 2 screws ⑧ (TP head) and remove the support plate ⑨ and shaft guide ⑩.

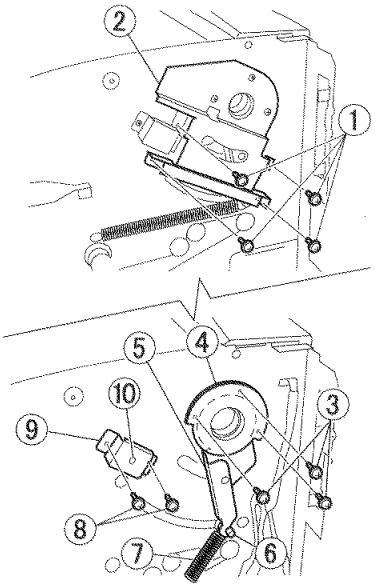


Figure 3-612

11) Remove 2 screws ① (TP head) and remove the holding plate (left) ②. Remove 2 screws ③ (TP head, black) and remove the reinforcing plate ④. Then, remove the screw ⑤ (TP head) and remove the hinge ⑥, arm ⑦, shaft ⑧ and coil spring ⑨.
Remove two screws ⑩ (TP head) and remove the support plate ⑪ and shaft guide ⑫.

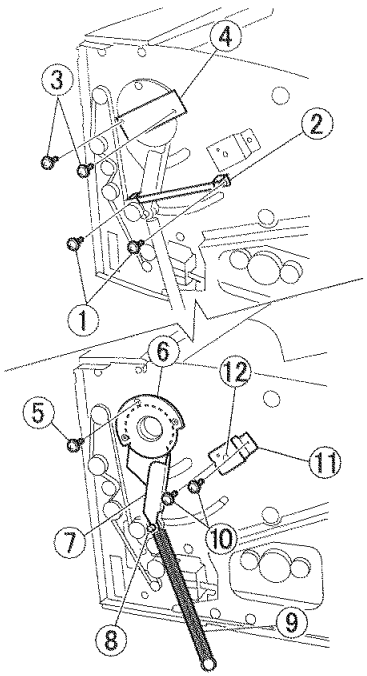


Figure 3-613

12) Verify that the upper unit is closed, remove 2 screws ① (M3, black) and remove the damper (right) ②.
In the same way, remove the damper (left).

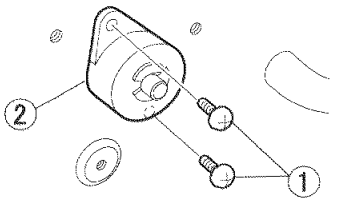


Figure 3-614

◆ **Dampers**

The right and left dampers are same in shape, but different in function. If they are mounted incorrectly, the damper function does not work correctly. The method of identifying the right and left dampers is shown below. The color of the end surface of the main body is different. The damper (left) is white and the damper (right) is black.

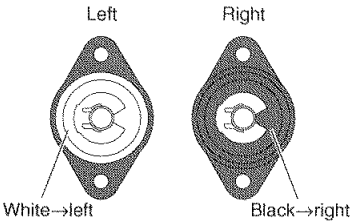


Figure 3-615

13) Reserve a space for placing the removed upper unit, lift the front of the upper unit slightly, put one hand under the bottom and hold it. While holding the rear side of the upper unit with the other hand, lift and rotate the front of the upper unit, and remove it so that the side of the upper unit does not hit and damage the side of the base unit.

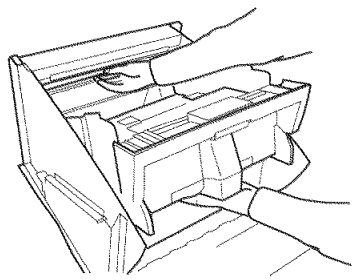


Figure 3-616

◆ **Notes on assembling**

1) After assembling the upper unit in the base unit, mount both arms first. Mount the arm so that the outer area of the arm shaft ① touches the contact area ② of the upper unit.

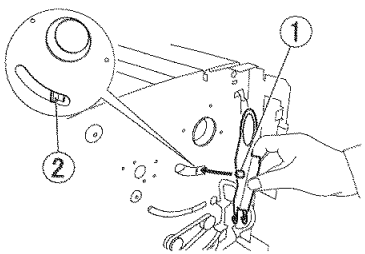


Figure 3-617

2) Then mount the hinge, verify that the right and left dampers are correct and mount them.

   Do not open the upper unit before mounting the dampers. It is dangerous because the dampers do not work when the upper unit is closed.

3) Install the coil spring when the upper unit is open. Since the spring has a strong tension, hold the spring firmly and install the front shaft on the side plate. Align the direction of the D-shape with the notch of the arm of the rear shaft.

   Verify that the grooves of the front and rear shafts fit into the side plate.

4) After assembly, ensure that the upper unit is opened and closed correctly.

VII. UPPER UNIT-2 (ELECTRICAL SYSTEM)

1. Main Drive PCB

1) Remove the eject tray unit.
(Page 3-10)
2) Remove the cables connected to the main drive PCB ①.
Then, remove 6 screws ② (M3, round tips), and while unhooking 3 pairs of the fitting parts ③, remove the main drive PCB (with the frame LED PCB).

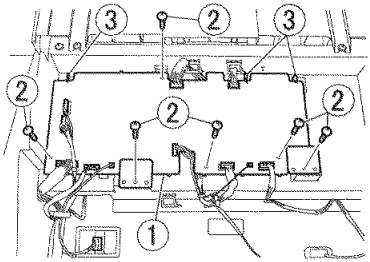


Figure 3-701

3) Remove 2 frame LED PCBs ② from the main drive PCB ①.

Note: Both frame LED PCBs are same parts.

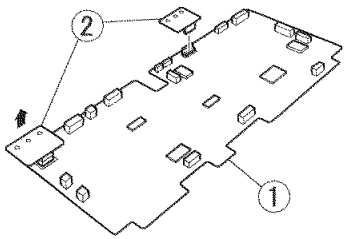


Figure 3-702

2. Staple PCB

Note: The right and left staple PCBs are symmetrical parts. Since the disassembling procedure is the same and the configuration is symmetrical, only the disassembling procedure of the left staple PCB is shown here. Disassemble the right staple PCB by referring to the disassembling procedure of the left staple PCB.

1) Remove the upper front cover. (Page 3-41)
2) Insert fingers into the clearance in the front and remove the cable holder ① from the bottom plate. Then, unhook the fitting parts ② and rotate the staple detection unit ③ to the front.

Note: Before unhooking the fitting parts, remove the cable holder so that the cable does not become stiff.

Note: If the space is too small to remove the cable holder, remove the main drive PCB and PCB mounting plate.

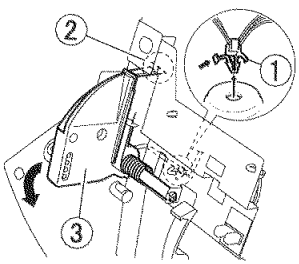


Figure 3-703

3) Align the ends of the right and left shafts with the notch ① of the mounting section, and remove the staple detection unit ②.

Note: Do not pull it excessively because a cable is connected to it. Since the coil spring ③ is detached, do not lose it.

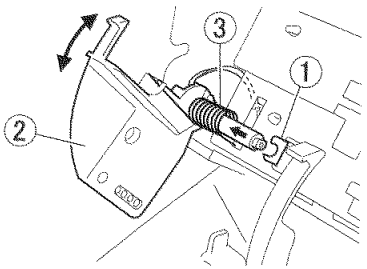


Figure 3-704

4) Remove the screw ① (M3, round tip) and remove the cover ②.

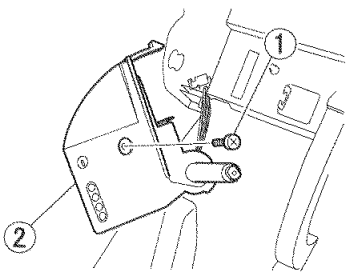


Figure 3-705

5) Remove the cable ① and screw ② (M3, round tip) and remove the staple PCB ③.

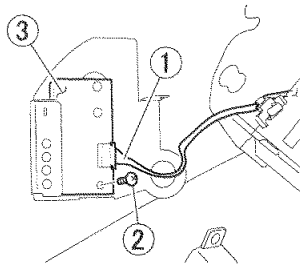


Figure 3-706

◆ **Notes on assembling**

Fit the cable ① into the groove ② in the cover. If the cable extrudes outside the groove, it is caught.

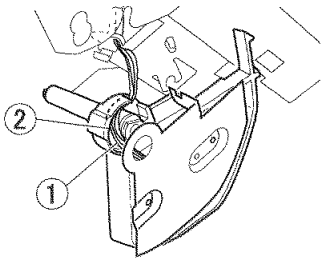


Figure 3-707

3. Ultrasonic Sensor PCB

1) Remove the upper front cover and entrance upper unit.
(Page 3-41), (Page 3-40)
2) Remove the main drive PCB.
(Page 3-46)

Note: To reserve work space for removing the cable connected to the ultrasonic sensor PCB, remove the PCB mounting plate in the next step in addition to these parts.

3) Remove 9 screws ① (TP head) and remove the PCB mounting plate ②.

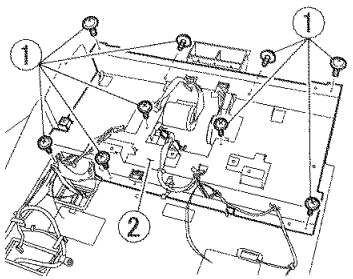


Figure 3-708

4) Remove 4 cables ① connected to the ultrasonic sensor PCB.

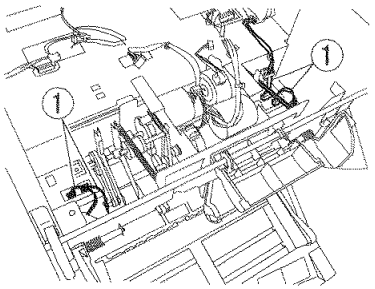


Figure 3-709

5) Remove the registration roller.
(Page 3-51)
6) Remove 3 screws ① (M3, round tip) and while unhooking 2 pairs of the fitting parts ②, remove the ultrasonic sensor PCB ③.

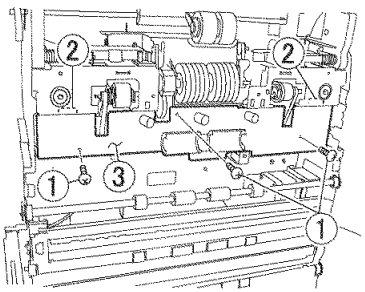


Figure 3-710

4. Pickup Unit Motor

1) Remove the pickup unit.
(Page 3-55)
2) Remove 2 screws ① (M3, round tip) and remove the pickup motor ②.
In the same way, remove the reverse up/down motor ③, feed motor ④, and pickup up/down motor ⑤.

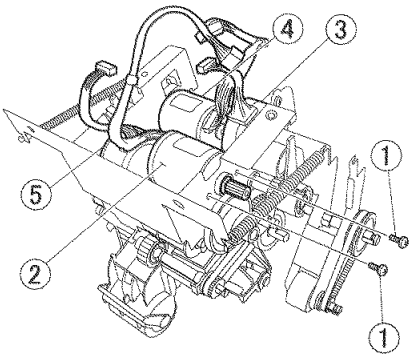


Figure 3-711

5. Platen Motor

1) Remove the eject tray unit.
(Page 3-10)
2) Remove the cable ① connected to the platen motor.

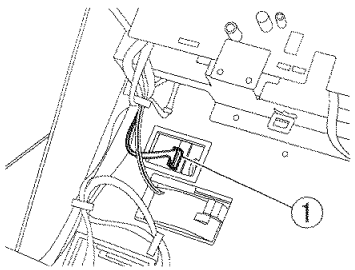


Figure 3-712

3) Remove the entrance upper unit.
(Page 3-40)
4) Remove the reading roller (front) and platen roller.
(Page 3-52), (Page 3-51)
5) Remove 2 screws ① (M3, round tip) and remove the motor unit ②.

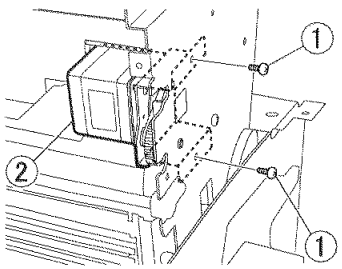


Figure 3-713

6) Remove the pulley ① and belt ②. Remove 2 screws ③ (M3, round tip) and remove the mounting plate ④.

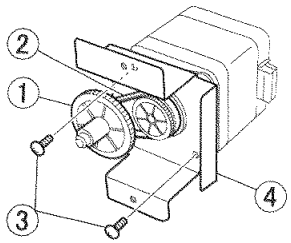


Figure 3-714

7) Remove 2 screws ① (M3, round tip) and remove the motor mount ③ from the platen motor ②.

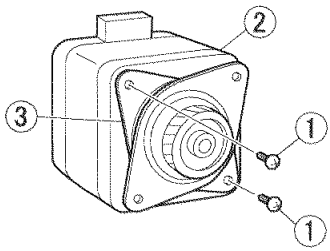


Figure 3-715

VIII. UPPER UNIT-3 (FEED SYSTEM)

1. Platen Roller

1) Remove the screws ① (stepped) on both sides. Then, rotate the platen roller ② in the direction of the arrow, align the bearing ③ with the side plate notch ④, and remove the platen roller.

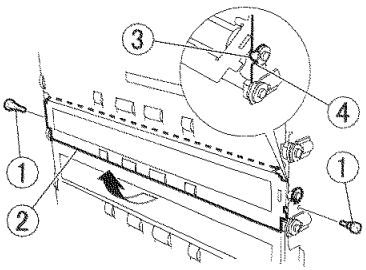


Figure 3-801

2. Registration Roller

1) Remove the entrance upper unit.
(Page 3-40)
2) Open the ends (marked with ∗) of both bearing holders ① and unhook the fitting parts and remove the registration roller unit ②.

Note: Since the coil spring in the registration roller unit may be detached, do not lose it.

Note: Since the entire registration roller unit and a single registration roller are set as service parts, select them as required.

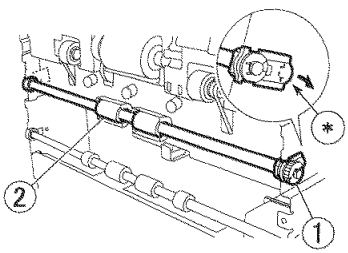


Figure 3-802

3) Remove both retaining rings ① and remove the gear, pin, 2 ball bearings, 2 bearing holders and 2 coil springs from the registration roller ②.

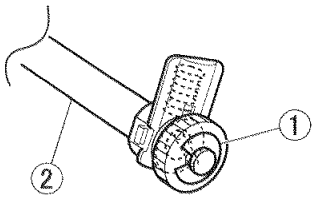


Figure 3-803

◆ **Notes on assembling**

When mounting the coil spring in the bearing holder, set the position of the spring bending section ① as follows. Insert the end of the bending section between the ball bearing flange ② and the bearing holder.

Since the end of the bending section touches the outer area of the ball bearing, static electricity on the roller is discharged to the side plate.

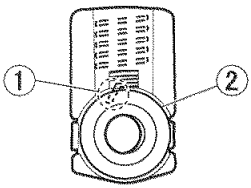


Figure 3-804

3. Reading Roller (Front)

1) Remove the entrance upper unit. (Page 3-40)

2) Open the end (marked with ＊) of both bearing holders ①, and while unhooking the fitting parts, remove the reading roller (front) unit ②.

Note: Since the coil spring in the reading roller (front) unit may be detached, so do not lose it.

Note: Since the entire reading roller unit and a single reading roller (front) are set as service parts, select them as required.

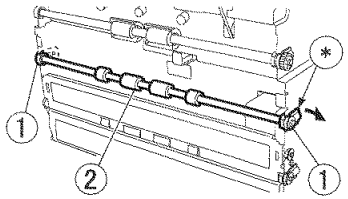


Figure 3-805

3) If a reading roller (front) is removed, refer to the "Registration Roller" section. However, the gear and pin are not installed. (Page 3-51)

◆ **Notes on assembling**

The three types of reading roller units (front, center and rear) are same parts.

4. Reading Roller (Center)

1) Remove the platen roller.
(Page 3-51)
2) Open the end (marked with ＊) of both bearing holders ①, and while unhooking the fitting parts, remove the reading roller (center) unit ②.

Note: For other precautions and subsequent procedures, refer to the "Reading Roller (Front)" section.

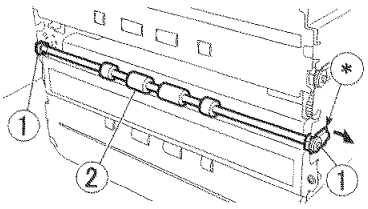


Figure 3-806

5. Reading Roller (Rear)

1) Remove 2 screws ① (M3, round tip) and remove the guide plate ②.

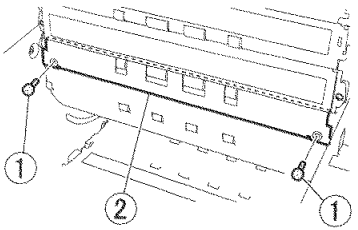


Figure 3-807

2) Insert a tool with a thin and flat tip into a clearance between the base side plate and the upper unit, open the end (marked with ＊) of both bearing holders ①, and while unhooking the fitting parts, remove the reading roller (rear) unit ②.

Note: For other precautions and subsequent procedures, refer to the "Reading Roller (Front)" section.

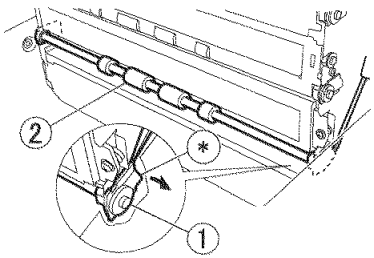


Figure 3-808

6. U-Turn Rollers

Note: There are 4 U-turn rollers. All of them are same parts and can be disassembled using the same disassembling procedure.

1) Remove the upper unit.
(Page 3-42)
2) Remove the screen plate for the post-imprinter. (3 M3 screws with round tips)
Refer to "CHAPTER 4, INSTALLATION & MAINTENANCE" for details.
(Page 4-12)
3) Remove 2 screws ① (M3, round tip) and remove the guide plate ②. Remove 6 screws ③ (TP head) on both sides and remove the U-turn guide plate ④.

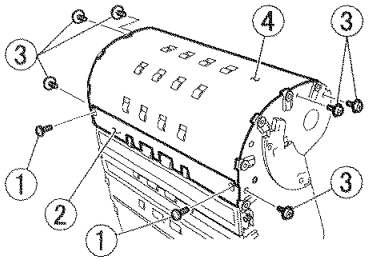


Figure 3-809

4) Open the end (marked with ＊) of both bearing holders ①, and while unhooking the fitting parts, remove the U-turn roller unit.

Note: For other precautions and subsequent procedures, refer to the "Reading Roller (Front)" section.

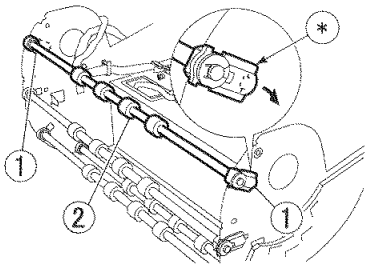


Figure 3-810

◆ **Notes on assembling**

The positioning of the guide plate and U-turn guide must match the positioning of the side plate correctly.

7. Eject Roller

1) Remove the eject tray unit.
(Page 3-10)
2) Remove 2 screws ① (M3, self-tapping) and remove 2 roller holding plates ② and eject roller ③.

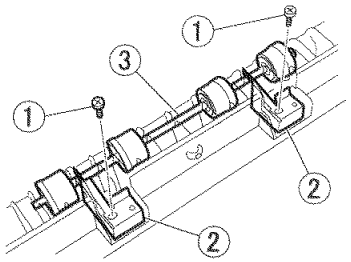


Figure 3-811

◆ **Notes on assembling**

Assemble the D-cut shape at the center of the roller shaft by aligning it with the guide.

8. Pickup Unit

1) Remove the upper front cover and main drive PCB.
(Page 3-41), (Page 3-46)
2) Remove 9 screws ① (TP head) and remove the PCB mounting plate ②.

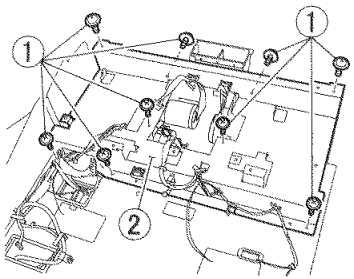


Figure 3-812

3) Remove 2 screws ① (TP head), lift the front of the pickup unit ②, unhooking the fitting parts, remove the pickup unit.

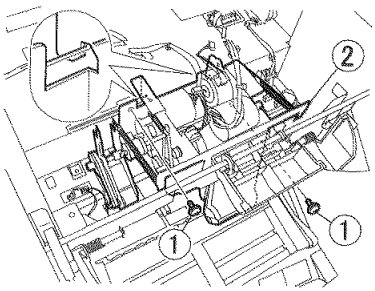


Figure 3-813

9. Reverse Roller

Note: The right and left reverse rollers are same parts. Since the disassembling procedure is the same and the configuration is symmetrical, only the disassembling procedure of the right reverse roller is shown here. Disassemble the left reverse roller by referring to the disassembling procedure of the right reverse roller.

1) Remove the pickup unit.
(Page 3-55)
2) Remove the belt ①. Unhook the fitting parts ② of the pulley and remove the pulley. Then, remove both shaft guides ③ from the mounting plate and remove the reverse roller ④.

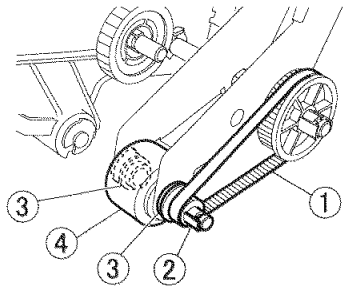


Figure 3-814

◆ **Notes on assembling**

Match the fitting shapes of the shaft guide and mounting plate. Assemble the shaft, roller and pulley by aligning the direction of the D-shapes of the shaft, roller and pulley.

10. Roller Holder

1) Remove the pickup unit.
(Page 3-55)
2) Remove the pickup roller and feed roller.
3) Remove the spring ①, belt ② and pulley ③ (1 each) on both sides of the reverse roller unit.

Note: A pin is mounted on the pulley. Do not lose it.

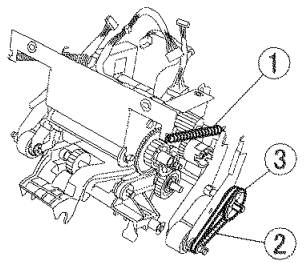


Figure 3-815

4) Remove the reverse roller unit ① and gear ② on both sides. Remove 2 stop rings ③ and pull out the shaft ④. Remove 2 shaft supports ⑤.

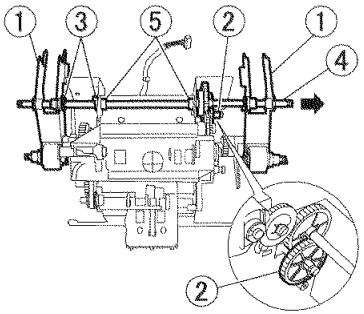


Figure 3-816

5) Unhook 2 pairs of the fitting parts ① and remove the feed roller holder ②.

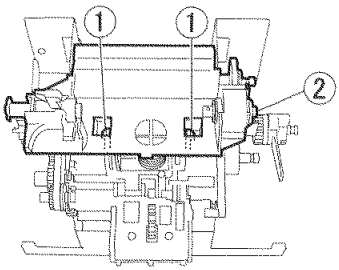


Figure 3-817

6) Remove the spring ①, 2 springs ② and arm ③. After removing the stop ring ④, rotate the shaft ⑤, align the D-shape of the shaft with the notch ⑥ in the side plate, and while unhooking 2 pairs of the fitting parts ⑦, remove the pickup roller holder ⑧.

Note: There are two springs, but the spring with marked with * has a weaker tension.

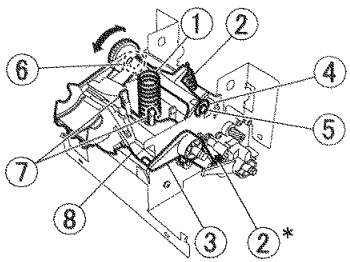


Figure 3-818

7) While pushing the fitting parts ① on both sides, rotate and remove the holder base ②.

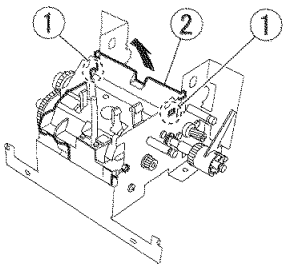


Figure 3-819

IX. UPPER UNIT-4 (READING SYSTEM)

Note: If the reading unit is disassembled further, be careful to prevent entry of dust. Do not touch the inner surfaces of glass and the surfaces of the lens array with fingers. If they are dirty, clean them with a clean dry cloth.
If the inside is not disassembled, replace the entire reading unit.

Note: The differences between the parts of the reading unit (upper) and the reading unit (lower) are the cable cover and flat cable. The wiring of some cables and the direction of assembly are different.

1. Reading Unit

1) Remove the eject tray unit.
(Page 3-10)
2) Remove 2 cables ① (for the blower) from the main drive PCB.

Note: If the cable is connected, the reading unit cannot be removed.

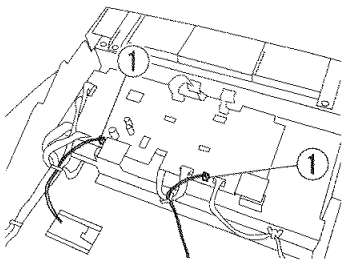


Figure 3-901

3) Remove the platen roller.
(Page 3-51)
4) Remove the reading rollers (center and rear).
(Page 3-53), (Page 3-53)
5) Remove 2 screws ① (M3, TP head) and remove the reading unit ②.

Note: Do not pull it excessively because a cable is connected to it.
Coil springs are mounted on the bottom side of the reading unit fixing part. Do not lose it.

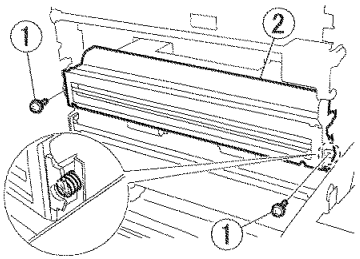


Figure 3-902

6) Remove 3 cables ① from the reading unit ② and remove the reading unit.

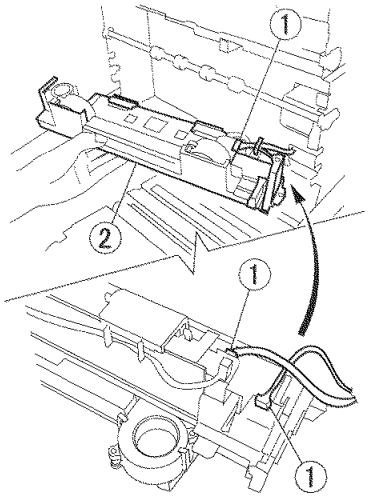


Figure 3-903

2. Reading PCB

1) Remove the reading unit (upper). (Page 3-58)
2) Remove the connector ① and remove cables from the cable guides of 2 cable covers ②.

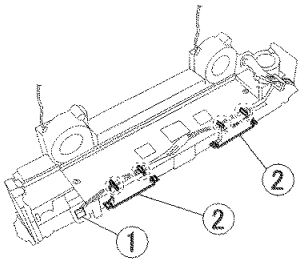


Figure 3-904

3) Unhook 2 pairs of the fitting parts ① and remove the cable cover ②. In the same way, remove the cable cover on the opposite side.

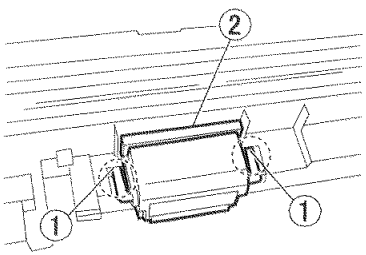


Figure 3-905

4) Pull out both ends of the lock plate of the connector ① using the clips and remove the flat cable ②. In the same way, remove the flat cable on the opposite side.
Then, remove 2 screws ③ (M3, TP head, self-tapping) and turn the reading PCB ④ over.

Note: Do not pull it excessively because the cables are connected to it.

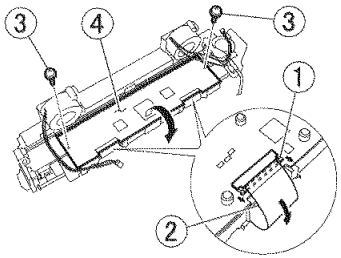


Figure 3-906

◆ **Notes on assembling**

When the lock plate of the connector is open, insert the flat cable into the connector until the contact surface of the flat cable is entirely covered and then close the lock plate.

When mounting the PCB in the case, align the end surface of the PCB with the end surface of the sponge of the case and press it. The PCB must not ride on the sponge.

3. Blower

1) Remove the reading unit.
(Page 3-58)
2) While unhooking the fitting parts ①, tilt and remove the blower ③ so that the fitting parts ② are removed.

Note: If the fitting parts ① are bent excessively, they may be damaged.

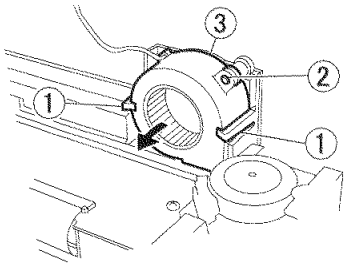


Figure 3-907

◆ **Notes on assembling**

Insert the blower discharge opening ① into the opening in the reading unit. While aligning 2 pairs of the fitting parts ②, push the blower in.

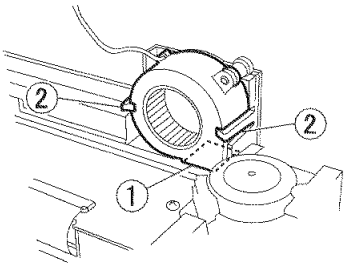


Figure 3-908

4. Reading Holder

Note: A reading glass and a shading sheet are mounted in this reading holder. If it is removed, the CIS unit is exposed.

1) Open the upper unit.
2) Slide the reading holder to the right and remove it while pushing down the fitting parts ② on the lower right side of the reading holder ① with a tool with a thin tip.

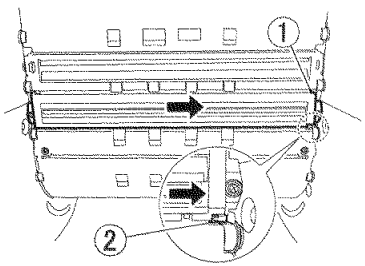


Figure 3-909

◆ **Note:** Other parts

For disassembly and assembly of reading unit components, refer to "V. BASE UNIT-3 (READING SYSTEM)".

◆ Differences between flat cables

The differences between the flat cables (FFC) of the reading unit (upper) and the reading unit (lower) are shown below.

The contact surface of the flat cable for the reading unit (upper) is in the reverse direction and the one of the flat cable for the reading unit (lower) is in the same direction.

The flat cable for the upper unit is longer than the one for the lower unit.

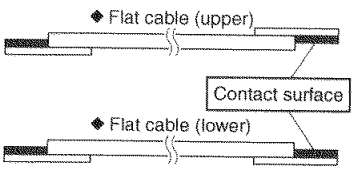


Figure 3-910

X. OPTION

Note: This section describes the pre-imprinter and post-imprinter. Since the patchcode decoder consists of a PCB and a few of parts only, the entire product must be replaced.

1. Post-Imprinter

1) Remove the eject tray unit.
(Page 3-10)
2) Remove the cable ① and screw ② (M3, round tip) and remove the post-imprinter from the main body.

Note: Remove the ink cartridge beforehand.

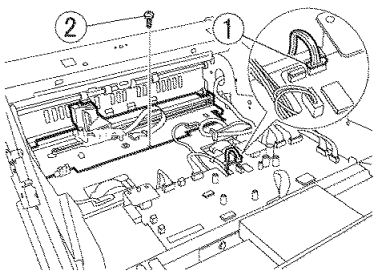


Figure 3-1001

3) Remove the screw ① (M3, round tip) and remove the guide shaft ② from the cartridge holder ③. Pull out the belt mounted on the rear side of the cartridge holder.

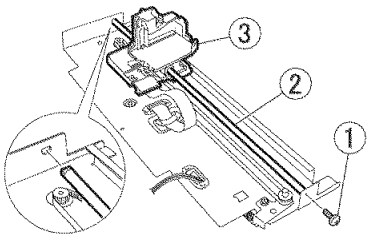


Figure 3-1002

4) Remove the cable ① of the cable holder and connector and remove the cartridge holder ②.

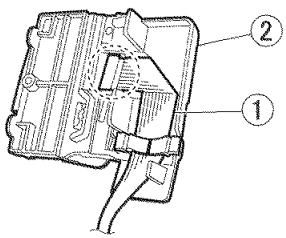


Figure 3-1003

5) Remove the cable and screw (M3 round tip) and remove the PCB ① and motor ②.

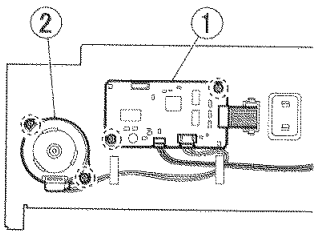


Figure 3-1004

1) Remove the ink drain pad unit after removing the rear cover. Remove 2 screws ① (M3, round tip) and remove the ink drain pad unit ②.

Note: If ink is collected in the pad, provide paper and a storage bag to prevent soiling of your fingers or the periphery.

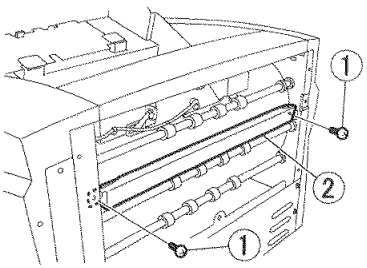


Figure 3-1005

◆ **Notes on assembling**

Fit the belt ② into the fitting parts ① of the cartridge holder.

Insert the projection of the end surface (the opposite side of the end surface of the D-shape) of the guide shaft into the hole in the mounting plate.

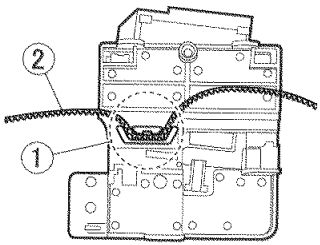


Figure 3-1006

2. Pre-Imprinter

2) Remove the eject tray unit.
(Page 3-10)
3) Remove the cable ① for the pre-imprinter.

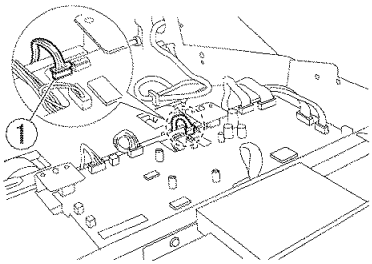


Figure 3-1007

4) Remove the entrance upper unit.
(Page 3-40)
5) Remove the reading roller (front).
(Page 3-52)
6) Remove 3 screws ① (M3, round tip) and remove the pre-imprinter ② from the main body.

Note: Remove the ink cartridge beforehand.

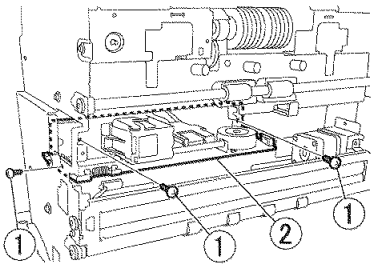


Figure 3-1008

7) Remove the stop ring ① and remove the guide shaft ② from the cartridge holder ③. Pull out the belt mounted on the rear side of the cartridge holder.

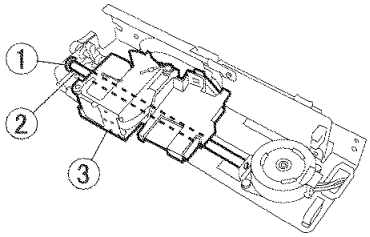


Figure 3-1009

8) Remove the cable ① from the cable holder and connector and remove the cartridge holder ②.

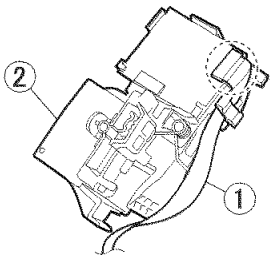


Figure 3-1010

9) Remove the cable and 2 screws ① (M3, round tip) and remove the motor ②.

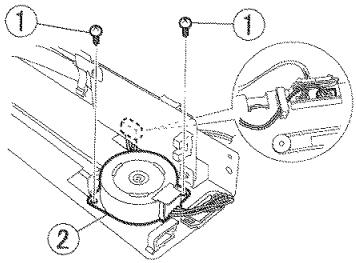


Figure 3-1011

10) Remove the cable and 2 screws ① (M3, round tip) and remove the PCB ②.

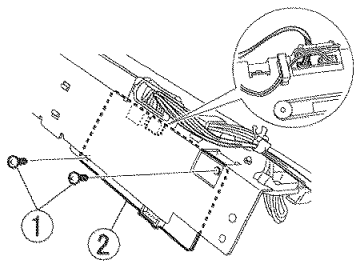


Figure 3-1012

◆ **Absorbing pad**

The ink drain pad for the pre-imprinter is located in the frame detection unit. Refer to the "Frame Detection Unit" section for the details.

(Page 3-39)

◆ **Notes on assembling**

Fit the belt ② into the fitting parts ① of the cartridge holder.

Insert the projection of the end surface (the opposite side of the end surface of the D-shape) of the guide shaft into the hole in the mounting plate.

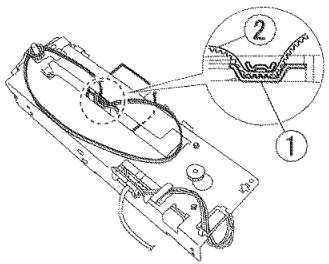


Figure 3-1013

CHAPTER 4

INSTALLATION & MAINTENANCE

I. INSTALLATION 4-1
II. PARTS REPLACEMENT.....4-17
III. MAINTENANCE 4-21

I. INSTALLATION

1. Choosing Location

The following requirements should be met when installing this machine. The service technician should inspect the planned location before delivery.

■ The power supply must be able to be connected separately from a reference voltage outlet

∗ If a ground wire must be connected, connect it to the correct location shown below.

1) Ground terminal of the outlet
2) Ground wire for which grounding work for office equipment is performed

■ Do not install this machine on a weak table or an inclined or unstable location. The weight of the main body is approx. 39 kg.

■ The temperature should be between 10°C and 32.5°C and the relative humidity should be between 20% and 80%. However, since the performance is guaranteed at a temperature between 15°C and 27.5°C and a relative humidity between 25% and 75%, this machine should be installed in this range. This machine should not be installed near water faucets, boilers, humidifiers, refrigerators, etc. and should not be put in a location where the temperature or humidity changes abruptly.

■ This machine should not be exposed to open flames, dust, ammonia fumes, direct sunlight, vibration, or electromagnetic wave.

∗ If it has to be placed in a sunny place, the windows should be curtained to avoid direct sunlight.

■ There should be an enough space around this machine for operation, maintenance and ventilation.

∗ Since there are a ventilation hole and a power cord on the rear side, do not push this machine against the wall.

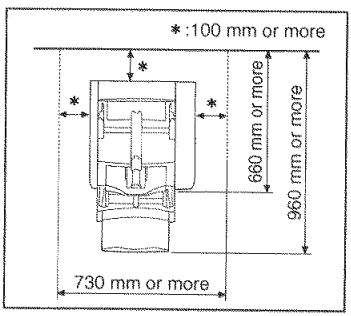
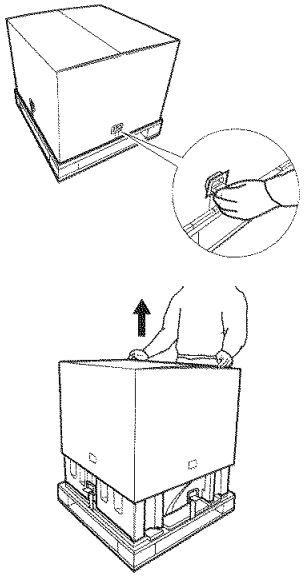


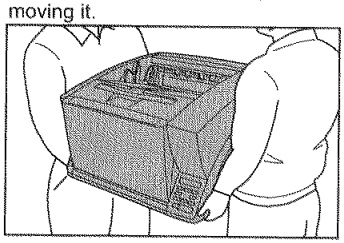
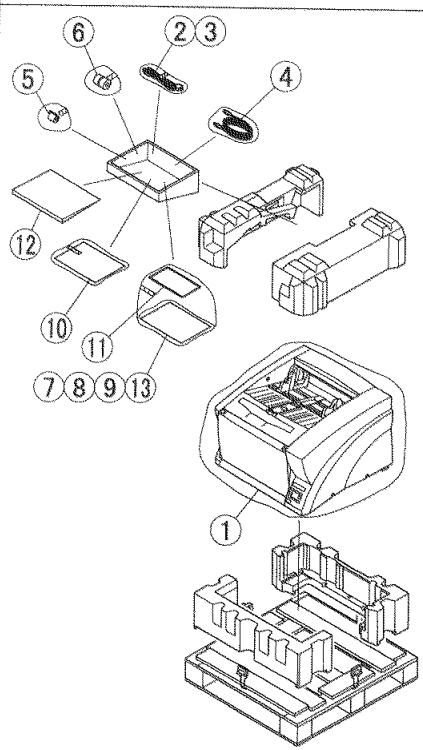
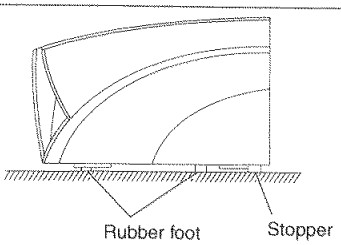
Figure 4-101

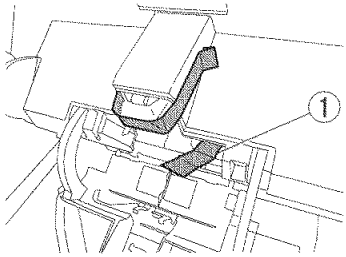
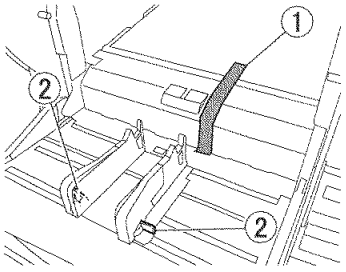
■ Ensure to provide a carry-in route and a means of transporting this machine in the packing condition. The packing weight is approx. 53 kg, and the dimensions are approx. 730 (W) × 700 (D) × 600 (H) mm.

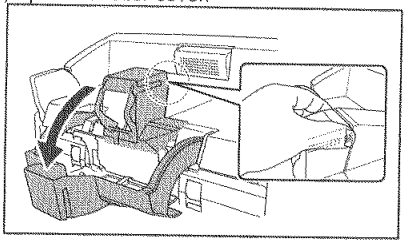
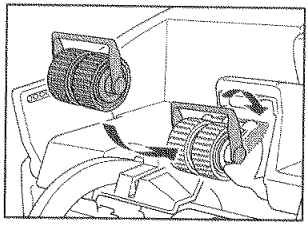
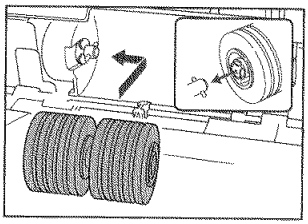
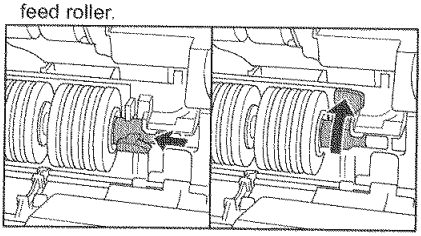
2. Unpacking And Installation

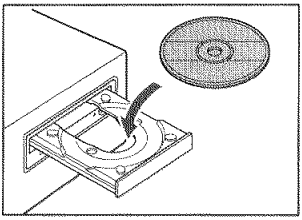
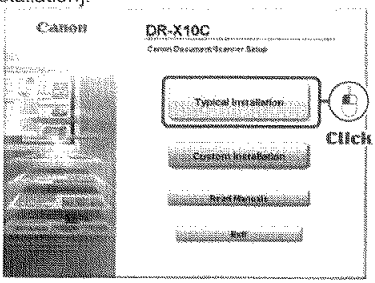
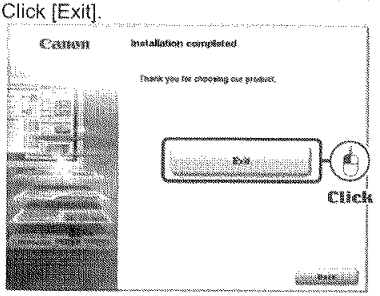
When metallic objects are brought from a cold room into a warm room, small drops of water may be formed on the surfaces. This phenomenon is called condensation and if the machine with condensation is used, various problems may take place. Therefore, allow this machine at least one hour to adjust to room temperature before moving the machine from a cold room into a warm room and installing it.

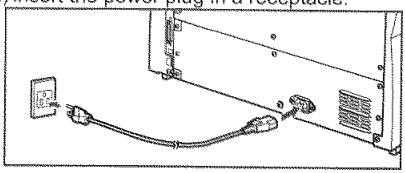
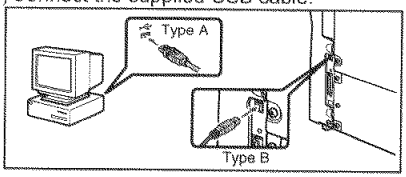
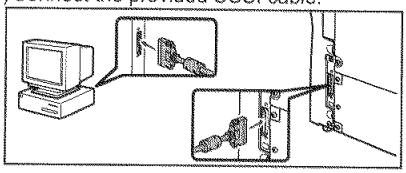
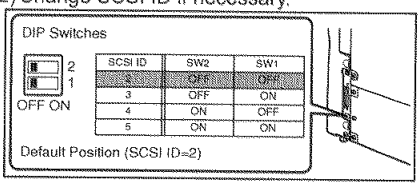
No.	Step	Details/Remarks
1	Remove the box joints (4) and lift and remove the cardboard box. The packing weight is approx. 53 kg and the dimensions are approx. 730 (L) × 700 (W) × 600 (H) mm. **Note:** 1) Do not open the top of the cardboard box, but remove the entire cardboard box. 2) The cardboard box may not be able to be removed if it contains accessories. Check the inside.	

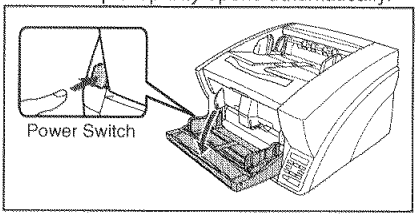
No.	Step	Details/Remarks
2	Take out the main body and accessories and move the main body to the installation location. Check that the accessories are present. ① Main body ② Power cord ③ Ground cord (100V model only) ④ USB cable ⑤ Pickup roller ⑥ Feed roller ⑦ Easy Start Guide ⑧ Reference Guide ⑨ DR-X10C Setup Disc ⑩ Roller cleaning sheet ⑪ Cleaning cloth ⑫ Binder (200V model only) ⑬ Warranty card (depending on models) **Note**: 1) The weight of the main body is approx. 39 kg. When taking the main body out or moving it, 2 persons must hold it from both sides. Use a cart, etc. when moving it. 	
3	Place the main body at the installation location. Note: 1) Since it is heavy, place it on a flat, sturdy surface. 2) Place the rubber feet (4 places) on the bottom and the stoppers (2 places) of the right and left covers for tip resistance on the same flat surface.	

No.	Step	Details/Remarks
4	Remove all tapes securing components. Remove the pad inside the roller cover. Remove the protection sheet from the reading section. Release the lock of the document guide.	* Inside the roller cover When the tape ① is pulled, the pad is detached.  * Reading section and document guide section The tape ① securing the protection sheet of the reading section also secures the separation roller cover. Since the document guides are locked, rotate both levers ② and release them. 

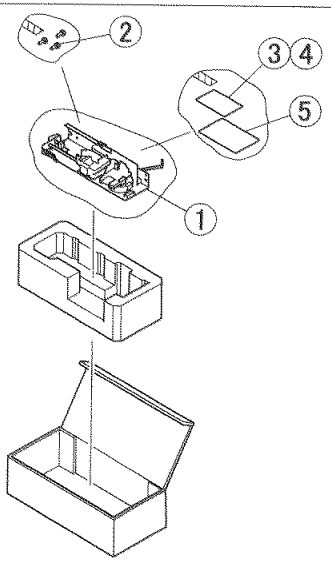
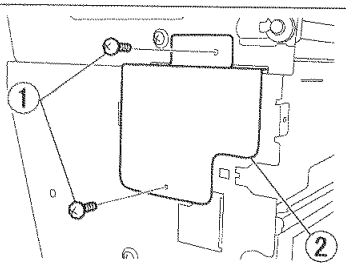
No.	Step	Details/Remarks
5	Install the pickup roller and feed roller. **Note:** 1) The "Easy Start Guide" for users describes the procedure that can be performed by the user. The service technician should also refer to it. The procedure is shown below. Step 1: Checking the Package Contents. Step 2: Installing the Rollers Step 3: Installing the Software Step 4: Connecting the Scanner to the Computer Step 5: Turning the Power ON Step 6: Selecting the Scanner	1) Open the roller cover.  2) Set the pickup roller, turn the lock lever to the back and lock it.  3) Align the notch on the feed roller with the shaft on the main body and set the feed roller.  4) Move the roller lock lever and secure the feed roller.  5) Close the roller cover.

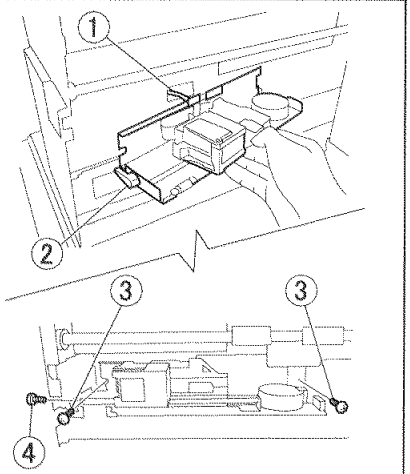
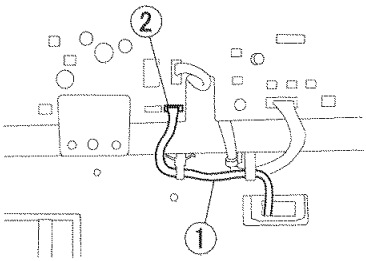
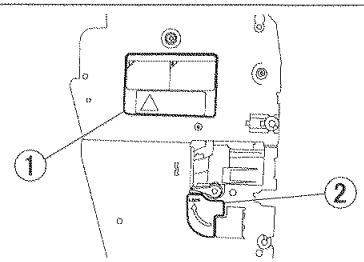
No.	Step	Details/Remarks
6	Install software in the computer used for operation check as required. ◆ If it has already been installed in the computer for servicing, it does not need to be installed during installation. ◆ If the service technician installs it in the user's computer, obtain the user's approval beforehand. ◆ If the user installs it, ask the user to install it according to the "Easy Start Guide". **Note:** 1) Ensure that the type of the operating system of the computer is correct. 2) Do not connect the scanner to the computer before installing software. 3) Be sure to log on with administrator privileges.	1) Insert the DR-X10C Setup Disc into the CD drive.  2) The setup menu starts. Click [Typical Installation] or [Custom Installation].  3) Later on, perform operation according screen instructions. 4) When all installation is completed, the installation completion screen is displayed. Click [Exit]. 

No.	Step	Details/Remarks
7	Connect the power cord and interface cable. **Note:** 1) Do not connect a USB cable and a SCSI cable at the same time. 2) This machine does not include a SCSI cable. Provide a SCSI cable that matches the connector type of this machine and SCSI card beforehand. The connector type of the scanner is "D-sub, half pitch, 50 pins". 3) If the SCSI cable is connected, turn the computer OFF.	◆Power cord 1) Connect the supplied power code to the power connector on the rear side of the main body. 2) Insert the power plug in a receptacle.  ◆USB cable 1) Connect the supplied USB cable.  ◆SCSI cable 1) Connect the provided SCSI cable.  2) Change SCSI ID if necessary. 

No.	Step	Details/Remarks
8	Turn the power ON and make the computer recognize the scanner. **Note:** 1) If the "Auto USB Power Switch Setting" is turned [ON] in the user mode, the scanner is turned ON automatically when the computer is turned ON with the USB cable connected. The "Auto USB Power Switch Setting" is set to [OFF] at the factory.	1) Press the power switch to turn this machine ON. The pickup tray opens automatically.  2) Turn the computer power ON. 3) Windows recognizes this machine as a new hardware and installs it automatically.
9	Ensure that it operates correctly by using the supplied "CapturePerfect 3.0" or "Job Function". Refer to the "User Manual" for the details. "CHAPTER 1, GENERAL DESCRIPTION, III. User Operation" of this manual provides its overview.	

3. Pre-imprinter Installation Procedure

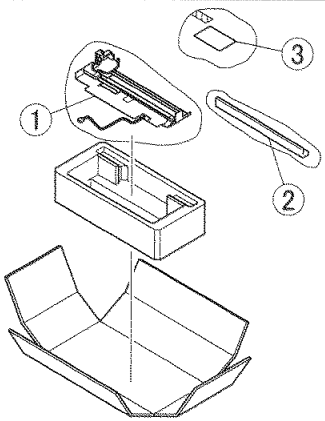
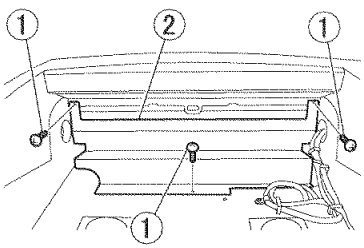
No.	Step	Details/Remarks
1	Take out the main body and accessories from the box and check that the accessories are present. ◆Bundled items ① Main body ② Screws (stepped) ③ Operation label ④ Lever operation label ⑤ Precautions for the user **Note:** 1) Provide an ink cartridge for operation check. The ink cartridge is separately sold. 2) The ink pad for the pre-imprinter is built in the frame detection unit of the scanner main body.	
2	Remove the eject tray unit, entrance upper unit and upper reading roller (front). Refer to "CHAPTER 3, DISASSEMBLY & REASSEMBLY" for details.	
3	Open the upper unit and remove 2 screws ① (M3, round tip) and remove the screen plate ②. **Note:** 1) Use the removed screws (2) in the next procedure.	

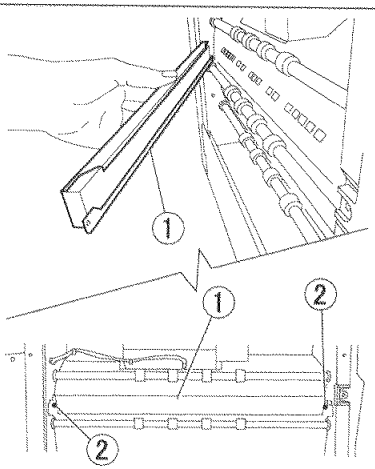
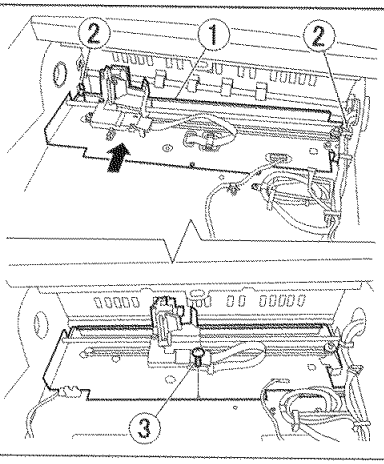
No.	Step	Details/Remarks
4	After taking the cable ① out through the hole, align the lever ② and positioning of the main body, and secure the main body with 2 screws ③ (which were removed in the previous step) and screw ④ (accessories, M3, stepped).	
5	Connect the pre-imprinter cable ① to the connector ② (J212) of the main drive PCB.	
6	Attach the operation label ① and lever operation label ② to given positions.	
7	Reinstall the removed parts.	

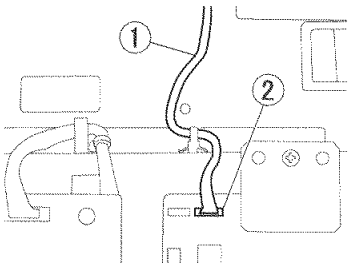
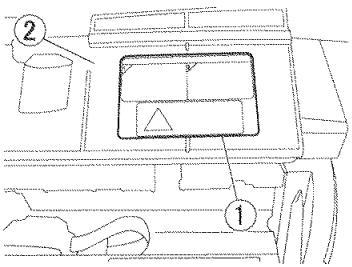
No.	Step	Details/Remarks
8	Set the provided ink cartridge and verify that it operates correctly. Use the "Imprinter Test" in the user mode. Refer to the "User Manual" for the details.	
9	Explain to the user the contents of the bundled sheet, "Precautions for the user", and give it to the user. It describes some precautions on double feed retry. * Details to be given below.	

Note: If the pre-imprinter is used when the double feed retry is effective, care must be taken. If a double feed is detected, the document is printed on repeatedly.

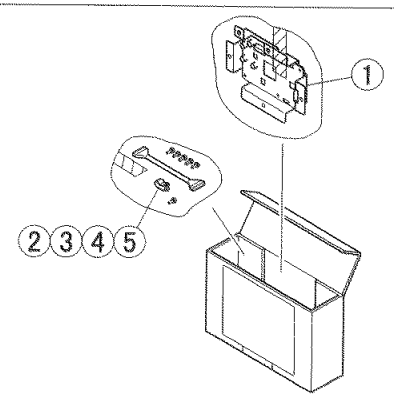
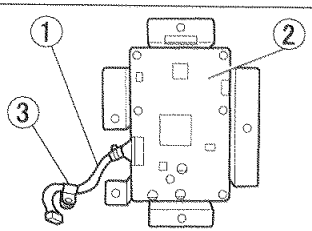
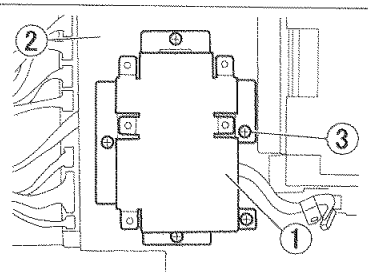
4. Post-imprinter Installation Procedure

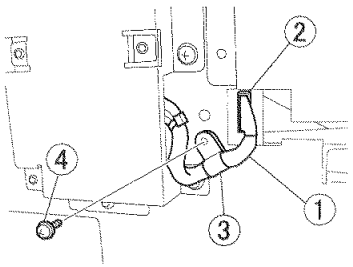
No.	Step	Details/Remarks
1	Take out the main body and accessories from the box and check that the accessories are present. ◆Bundled items ① Main body ② Ink pad unit ③ Operation label **Note:** 1) Provide an ink cartridge for operation check. The ink cartridge is separately sold.	
2	Remove the rear cover and eject tray unit. Refer to "CHAPTER 3, DISASSEMBLY & REASSEMBLY" for details.	
3	Remove 3 screws ① (M3, round tip) in the upper unit and remove the screen plate ②. **Note:** 1) Use the removed screws (3) in the next procedure.	

No.	Step	Details/Remarks
4	Set the ink pad unit ① on the back of the scanner main body and secure it with 2 screws ② (which were removed in the previous step).	
5	Tilt the post-imprinter main body ① slightly and while avoiding the right cable and left sensor, place the main body on the right and left supports ②, set it behind the upper unit, and secure it with 1 screw ③ (which were removed in the previous step).	

No.	Step	Details/Remarks
6	Connect the post-imprinter cable ① to the connector ② (J215) of the main drive PCB.	
7	Attach the operation label ① to the back side of the imprinter cover ②.	
8	Reinstall the removed parts.	
9	Set the provided ink cartridge and verify that it operates correctly. Use the "Imprinter Test" in the user mode. Refer to the "User Manual" for the details.	

5. Patchcode Decoder Installation Procedure

No.	Step	Details/Remarks
1	Take out the main body and accessories from the box and check that the accessories are present. ◆Bundled items ① Main body ② Cable ③ Cable holder ④ 5 screws (M4) ⑤ 1 screw (M3) **Note:** 1) Provide a patchcode sheet for operation check. Its PDF data is saved in the computer when the driver is installed.	
2	Remove the right cover. Refer to "CHAPTER 3, DISASSEMBLY & REASSEMBLY" for details.	
3	Connect the cable ① to the PCB ②. Install the cable holder ③ on the cable.	
4	Secure the patchcode decoder main body ① to the mounting plate ② of the control PCB with 5 screws ③ (accessories, M4).	

No.	Step	Details/Remarks
5	Connect the cable ① to the connector ② (J126) of the control PCB. Then secure the cable holder ③ with 1 screw ④ (accessory, M3).	
6	Reinstall the removed parts.	
7	Set the provided patchcode sheet and verify that it operates correctly. Use the "Patchcode" in the service mode. Refer to the "User Manual" for the details.	

II. PARTS REPLACEMENT

1. Periodically Replaced Parts

This machine does not have any periodically replaced parts.

2. Consumable Parts (Commercial Goods)

The list below shows the consumable parts specified as commercial goods. The user replaces them.

No.	Parts name	Parts number	Expected life	Remarks
1	Exchange roller kit ┌ Pickup roller Feed roller └ Retard roller	2418B001	500,000 sheets	Because of the worn rollers, it is necessary to replace them when the pickup failures or the document jams occur after the roller cleaning.
2	Roller cleaning sheet (30 sheets)	2418B002	None	Replace if the cleaning surface is dirty and cannot be cleaned.
3	Ink cartridge: blue	3693A002	1,750,000 characters	For pre/post-imprinters. Replace if ink runs out. The condition of expected life is 8×12 font, 32 characters/sheet, 100 sheets/batch, including preliminary application.
4	Ink cartridge: red	3693A003		
5	Ink cartridge: green	3693A004		

Note: The ink cartridges are Hewlett Packard part number C6602B/R/G.

Table 4-201

3. Consumable Parts (For User)

The list below shows the consumable parts that are specified as service parts and can be replaced by the user.

No.	Parts name	Parts number	Expected life	Remarks
1	Pickup roller	MF1-4503	500,000 sheets	Because of the worn rollers, it is necessary to replace them when the pickup failures or the document jams occur after the roller cleaning.
2	Feed roller	MA2-8111		
3	Retard roller	MG1-4072		

Note: The parts above are assigned as service parts and an exchange roller kit is assigned as commercially available products for a set.

Table 4-202

4. Consumable Parts (For servicing)

The list below shows the consumable parts that are specified as service parts and must be replaced by the service technician.

No.	Parts name	Parts number	Q'ty	Expected life	Remarks
1	Platen roller unit	MG1-4040	2	3,000,000 sheets	Replace if the surface wears and image failure occurs.
2	Registration roller (lower) Bearing	MF1-4495 XG9-0679	1 2	6,000,000 sheets	Because of the worn rollers, it is necessary to replace them when the pickup failures or the document jams occur after the roller cleaning. **Note:** 1) Because of expected life of electrical conductivity, replace the bearing at the same time. 2) Since the roller on the upper unit side is specified as a service part regardless of whether it is a single part or a unit including a bearing, the roller unit may be replaced.
3	Reading roller (front) Bearing	MA2-8045 XG9-0679	1 2	6,000,000 sheets	
4	Reading roller (center) Bearing	MA2-8046 XG9-0679	1 2	6,000,000 sheets	
5	Reading roller (rear) Bearing	MA2-8294 XG9-0679	1 2	6,000,000 sheets	
6	U-turn roller 1 Bearing	MA2-8039 XG9-0679	1 2	6,000,000 sheets	
7	U-turn roller Bearing	MA2-8038 XG9-0679	3 6	6,000,000 sheets	
8	Eject drive roller Bearing	MA2-8144 XG9-0616	1 2	6,000,000 sheets	
9	Registration roller unit (upper) ┌Registration roller (upper) └Bearing	MG1-4049 MA2-8074 XG9-0678	1 (1) (2)	6,000,000 sheets	
10	Reading follower roller unit ┌Reading follower roller └Bearing	MG1-4112 MA2-8293 XG9-0678	3 (3) (6)	6,000,000 sheets	
11	U-turn follower roller unit ┌U-turn follower roller └Bearing	MG1-4050 MA2-8073 XG9-0678	4 (4) (8)	6,000,000 sheets	
12	Eject follower roller	MG1-4086	1	6,000,000 sheets	
13	Magnetic clutch	MH7-5058	2	6,000,000 sheets	Replace if the registration roller (upper)/reading roller (front) malfunctions.
14	Clutch gear (one-way gear) Pickup drive shaft	MF1-4502 MA2-8153	1 1	6,000,000 sheets	Replace if the pickup roller/feed roller malfunctions.
15	One-way gear Feed drive shaft	MF1-4515 MF1-4498	1 1	6,000,000 sheets	
16	CIS unit	MH7-7055	2	8,000,000 sheets	Corresponds to LED life of 1000 hours. Replace if image failure occurs.
17	Frame LED PCB	MG1-4057	2	8,000,000 sheets	
18	Ink drain pad (pre)	MA2-8063	1	6,000,000 sheets	When using an imprinter. Replace if ink is not absorbed and the document gets dirty.
19	Ink drain pad unit (post)	MG1-4125	1	6,000,000 sheets	

Table 4-203

The figure below shows the mounting positions of the consumable parts replaced by the service technician. The numbers in the figure are the numbers shown in the above table.

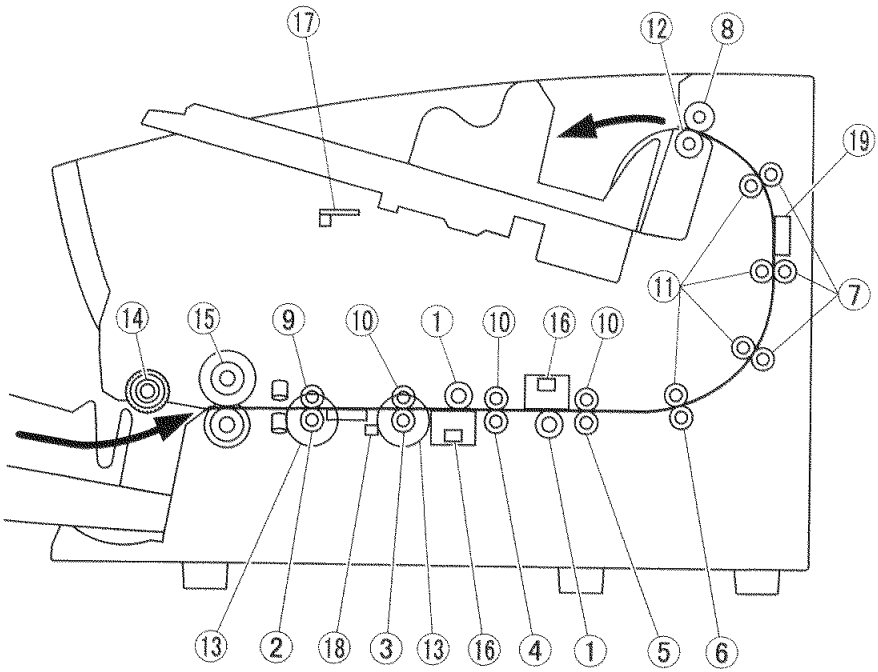


Figure 4-201

5. Main Parts

The list below shows the main electrical parts/units and reading glass, except consumable parts.

No.	Parts name	Parts number	Q'ty	Remarks
1	Control PCB	MG1-4074	1	
2	Power supply PCB	MH3-2070	1	
3	Main drive PCB	MG1-4056	1	
4	Main motor PCB	MG1-4058	1	
5	Ultrasonic sensor PCB	MG1-4055	1	
6	Ultrasonic drive PCB	MG1-4054	1	
7	Tray detection PCB	MG1-4077	1	
8	Operation panel PCB	MG1-4083	1	
9	Eject PCB	MG1-4059	1	
10	Reading unit (upper)	MG1-8287	1	Entire reading unit (upper)
11	Reading unit (lower)	MG1-8286	1	Entire reading unit (lower)
12	Reading sensor cover	MF1-4518	2	Including the reading glass.
13	Reading PCB	MG1-4079	2	
14	Frame detection unit	MG1-8283	1	Entire frame detection unit
15	Frame detection guide	MF1-4497	1	Including the frame reading glass.
16	Stepping motor	MH7-1157	1	Main motor
17	Reading sensor motor	MF1-4488	2	Shading motor
18	Platen roller motor	MF1-4492	2	Platen motor
19	DC brushless motor	MF1-4500	4	Pickup/feed/separation/eject motor
20	Stepping motor	RH7-1262	1	Tray up/down motor
21	Stepping motor	RH7-1278	2	Reverse up/down / pickup up/down motor

Table 4-204

III. MAINTENANCE

1. User Maintenance

A list is shown below. Refer to the "User Manual" for the details.

[△: Cleaning, ●: Replace]

No.	Location/parts	Intervals		Details
		As required	500,000 sheets	
1	Main body	△		Wipe the main body with a cloth dipped into water and wrung tightly, then wipe dry.
2	Pickup inlet/feed path	△		Using a blower, etc., remove remained dust and paper powder.
3	Pickup roller Feed roller Retard roller	△	●	Wipe the rollers with a cloth dipped into water and wrung tightly, then wipe dry. The expected life is 500,000 sheets. Refer to Note 3.
4	Platen roller	△		Press the [Stop] key on the operation panel, and while rotating it gradually, clean the black and white background section in the same way as for the above roller. Remove the brush section with a cotton swab, etc.
5	Other rollers	△		Clean in the same way as for the above roller.
6	Reading glass	△		Wipe the reading glass with a cloth dipped into water and wrung tightly, then wipe dry. Refer to Note 4.
7	Ink cartridge	△ ●		Clean the discharge outlet of the ink head with soft cloth or paper or a cotton swab. Refer to Note 5 for replacement time.
8	Parts to which ink is attached (Pre-imprinter)	△		Wipe these parts with a cloth dipped into water and wrung tightly, then wipe dry. Refer to Note 6.

Table 4-301

Note 1: The supplied cleaning cloth is used to clean the reading glass and rollers.
Note 2: Clean with the supplied roller cleaning sheet in the user mode.
Note 3: If the number of sheets fed with the roller exceeds 500,000 sheets, a replacement message is displayed on the operation panel LCD and computer screen.
Note 4: When the [Start] key on the operation panel is pressed, the LED on the reading unit lights and stains on the reading glass can be confirmed.
Note 5: The expected life of the ink cartridges is not shown on the "User Manual".
Note 6: Since post-imprinter parts are not easily available, they are not described in the "User Manual".

2. Service Maintenance

A list is shown below. For details of replacement parts, refer to the above section, "II. PARTS REPLACEMENT".

[Δ: Cleaning, □: Adjust, ●: Replace]

No.	Location/parts	Intervals			Remarks
		3,000,000 sheets	6,000,000 sheets	8,000,000 sheets	
1	Platen roller	●			
2	Other rollers Bearing		●		
3	Magnetic clutch		●		
4	One-way gear Shaft		●		
5	CIS unit			●	
6	Frame LED PCB			●	
7	Ink drain pad		●		If much paper powder occurs, the intervals shorten.
8	Parts to which ink is attached (Post-imprinter)	Δ: During above replacement			Fully open the upper unit and clean the rear feed path. Do not get your hand caught.

Table 4-302

Note 1: If rollers or feed paths are very dirty, the user should be advised to perform "user maintenance".

Note 2: If necessary, make a request to replace the roller of the exchange roller kit.

Note 3: If the power cord connection gathers dust, it may result in electrical leak. Clean it as required.

CHAPTER 5

TROUBLESHOOTING

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I. ERROR DISPLAY

1. Main Body

"Status" and "error messages" appear on the display panel of the main body. The table below lists error messages.

◆ Display example

Figure 5-101

◆ Errors associated with user operations

No.	Message	Code	Failure
1	Cover Open	C001	The upper unit is open.
2		C009	The imprinter cover is open.
3	Double Feed	D002	A double feed was detected by the document length.
4		D004	A double feed was detected ultrasonically.
5	Check Imprinter * Refer to the service call.	H001	An ink cartridge is not installed in the post-imprinter.
6		H008	An ink cartridge is not installed or fixed in the pre-imprinter.
7	Staple Detected	J001	A stapled document has been detected.
8	Skew Detected	J018	A skewed document was detected.
9	Dust Detected	J050	Dust detected on the reading glass could not be avoided.
10	Jam	P001	A document has jammed before entering the registration front sensor.
11		P002	A document has jammed before exiting from the registration front sensor.
12		P004	A document has jammed at the eject sensor.
13		P006	A document has jammed before entering the registration rear sensor.
14		P007	A document has jammed before exiting from the registration rear sensor.
15		P050	Feeding stopped due to other document jams.
16	Count Mismatch	U001	The specified number of sheets was exceeded before the scan ended.
17		U002	The scan ended with a number of sheets less than the setting.
18	Tray Error * Refer to the service call.	E021	Pickup tray operation error. The user moves the pickup tray position manually.
19	Error occurred. See PC.	(None)	This message may appear depending on applications being used. Since no message corresponding to this error is provided by the main body, its description is displayed on the computer.

Table 5-101

◆ Service calls

If a communication error occurs between the motor and PCB, an error message appears. If it appears, reset the main body and computer power. If the same error message/code still appears, check the connection of the related part, and if it is faulty, correct it. If there is no problem with connections, replace the related part. For motors, check the assembly of connected drive transmission parts as well.

Note: The table below lists errors that show messages other than "Call for Service" and are caused by defective parts.

No.	Message	Code	Symptom/parts
1	Check Imprinter * Refer to the messages associated with user operations.	H001	Post-imprinter carriage motor failure or ink cartridge installation failure
2		H008	Pre-imprinter carriage motor failure or ink cartridge installation failure
3	Tray Error * Refer to the messages associated with user operations.	E021	Tray motor operation failure or the user moved the pickup tray position manually.
4	Call for Service	E015	Post-imprinter PCB failure
5		E017	Pre-imprinter PCB failure
6		E021	Main motor failure
7		E022	Separation motor failure
8		E024	Eject motor failure
9		E025	Pickup up/down motor failure
10		E033	Shading motor failure
11		E037	Reverse up/down motor failure
12		E038	Platen motor
13		E040	Control PCB Sub-CPU communication failure
14		E041	Main drive PCB CPU communication failure (Judged by the CPU on the main drive PCB)
15		E042	Post-imprinter PCB CPU communication failure
16		E043	Pre-imprinter PCB CPU communication failure
17		E044	Ultrasonic drive PCB CPU communication failure
18		E046	Main drive PCB CPU communication failure (Judged by the CPU on the control PCB)
19		E047	Patchcode PCB CPU communication failure
20		E050	Patchcode decoder operation failure
21		E054	Reading sensor (upper) connection failure
22		E055	Reading sensor (lower) connection failure

Table 5-102

2. Computer

The display connected to the computer shows error messages. Their contents differ depending on the software being used.

Most errors are associated with users, such as user operation mistakes and document jams. The user must take appropriate actions according to error messages.

The figure below shows several examples of error messages when using "CapturePerfect 3.0".

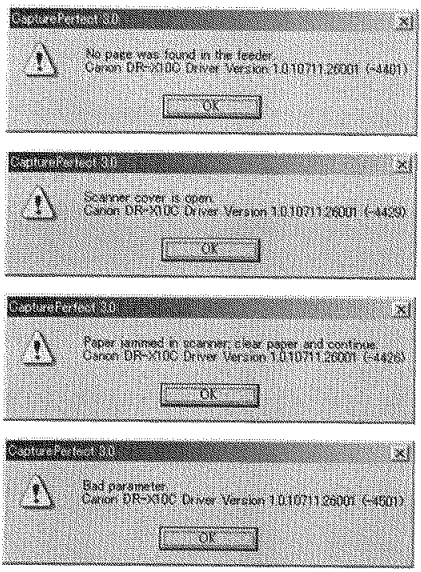


Figure 5-102

II. USER MODE

1. Operations and Items

Refer to the "User Manual" for the details.

1) When the [Menu] key on the operation panel is pressed, the user mode is entered. The items in the user mode are displayed.

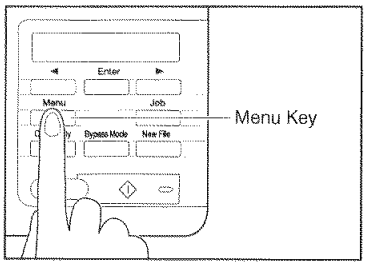


Figure 5-201

2) Press the arrow keys and select the user mode.

Note: For details on "Items and display order" of the user mode, refer to the next page.

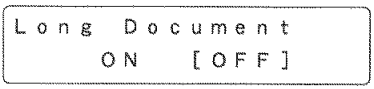
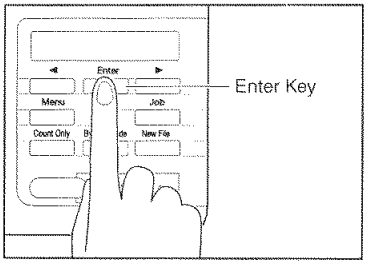


Figure 5-202

3) When the [Enter] key is pressed, the setting mode of the selected user mode is entered.



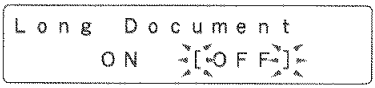


Figure 5-203

4) Select the mode with the arrow keys and press the [Enter] key to determine it.

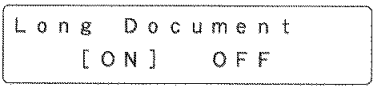


Figure 5-204

◆ Items and display order

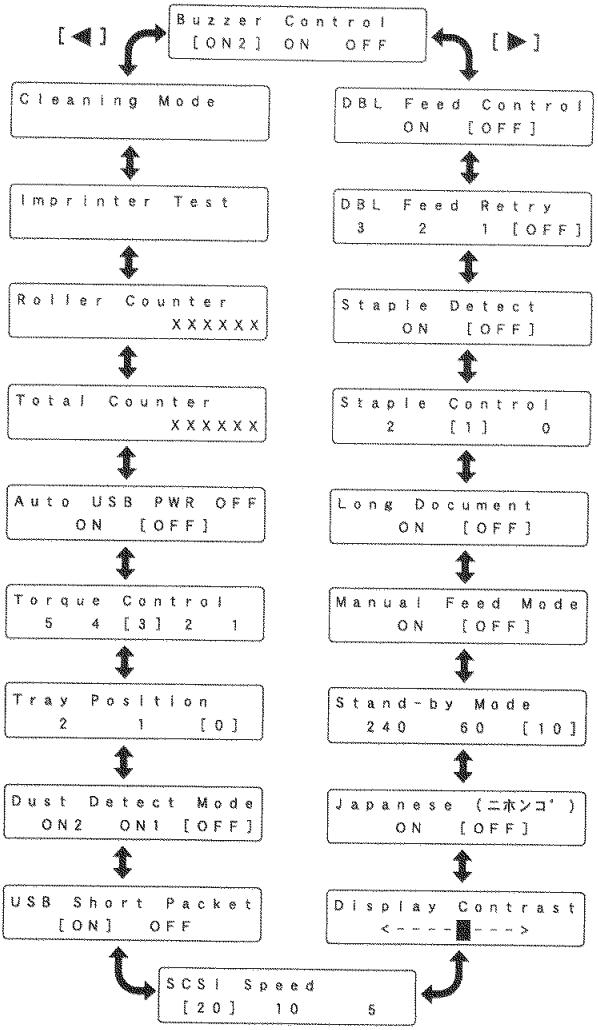


Figure 5-205

III. SERVICE MODE

1. Outline

The service mode of this machine can be executed by installing on the computer for servicing the service mode software (service tool) located in the setup disc bundled with this machine.

This software is based on the software for DR-4010C/5010C and can be used with this machine. The software offers screens suitable to each of these products.

The system requirements 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.

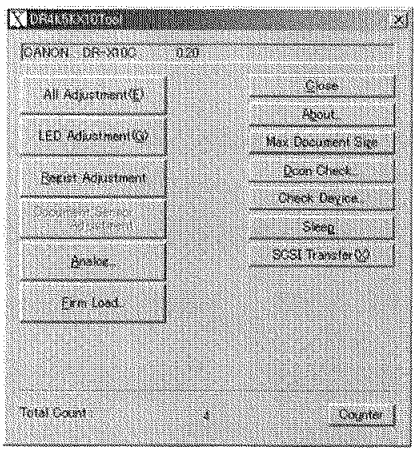


Figure 5-301

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

Table 5-301 shows the list of the service modes.

No.	Button name	Functions	Usage
1	All Adjustment	Perform all adjustments related to image reading. (CIS adjustment and registration adjustment)	Adjustment after replacement of the control PCB and the reading unit.
2	LED Adjustment	Perform the CIS adjustments.	Measures against image failures.
3	Regist Adjustment	Perform the registration adjustments. Perform the reading position adjustments of the frame sensor.	Measures against leading edge failures. Adjustment after replacement of the frame detection unit.
4	Analog	Display the analog value of each sensor.	Checking operation of the ultrasonic sensor.
5	Firm Load	Change the firmware.	Updating the firmware version.
6	About	Display this service tool version.	Checking the detailed version of this service tool.
7	Max. Document Size	Set the long document mode.	Using the long document mode. (Also available in the user mode.)
8	Dcon Check	Check the operation of the hardware such as operation keys, sensors, motors, CIS unit LED, etc.	Checking the operation of the hardware in case of feeding faults and image faults.
9	Check Device	Display the version of the firmware such as the main body and the internal devices.	Checking the version of the firmware such as the main body and the ultrasonic sensor.
10	Sleep	Set the sleep mode.	Changing the sleep mode settings. (Also available in the user mode.)
11	SCSI Transfer	Set the SCSI transfer speed.	Changing the SCSI transfer speed. (Also available in the user mode.)
12	Counter	Display and change the total scanning count, the number of document jams, and the replacement counter.	Checking the total scanning count, the number of document jams, and the replacement counter. Adjustment after replacement of the control PCB.

Table 5-301

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 servicing and start up the OS (Windows).
2) Set the setup disc that is bundled with this machine.
3) An installation screen for the user appears but ignore it. Right click on the [Start] button on the computer and select [Explorer].
4) Copy the "¥Driver¥Tools" folder in the setup disc to a desired drive of the computer for servicing.

Note: Make sure to also install the driver for this machine in the computer for servicing. This is required as the service tool does not have a function for detecting with the computer.
For how to install a software for the user bundled with this machine, refer to the "User Manual."
However, for the specifications, such as the reading speed, refer to the computer system requirements described in the "User Manual."

Note: Do not let the user know the folder name and password to be used.

3. Starting Up and Exiting Service Mode

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

1) Connect the computer for servicing with this machine using a USB or SCSI interface cable.
2) Power ON this machine.
3) Open the installed "Tools" folder and start up the "DR4K5KX10Tool.exe" file. (See Figure 5-302.)
4) The password screen is displayed, so after inputting the 6 characters "market," select [OK]. (See Figure 5-303.)
5) The service screen is displayed.

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

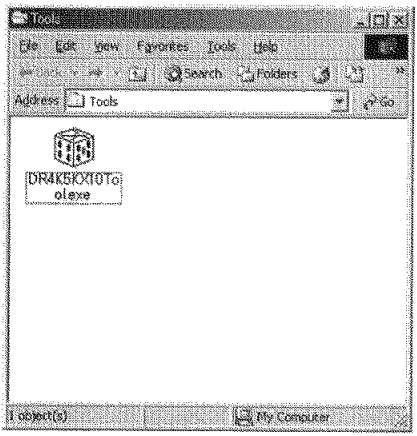


Figure 5-302

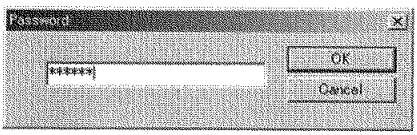


Figure 5-303

4. All Adjustment

This mode is used to adjust all image reading adjustments at the same time. Be sure to execute this mode after the control PCB or the reading unit has been replaced.

This mode consists of 2 individual adjustment items: "LED Adjustment," "Regist Adjustment."

◆ Operation Procedure

1) Clean the feed path, rollers, and reading glasses.
2) Set the document guide at the central position.
3) Set a piece of regular white copy paper (A4 or LTR) in portrait mode. Set the document guide position to the paper.
4) Select [All Adjustment] on the service screen.

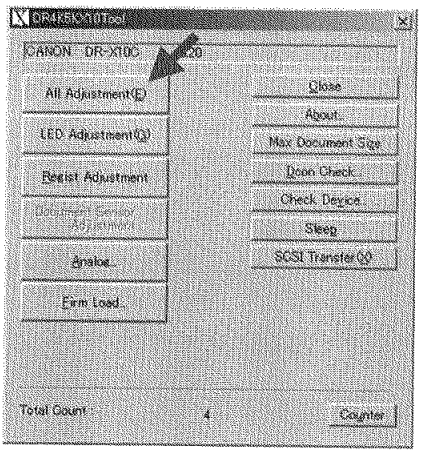


Figure 5-304

5) The adjustment starts automatically. The progress screen appears on the display. After "LED Adjustment" is performed, the paper is fed and "Regist Adjustment" is performed.

The display examples are shown below.

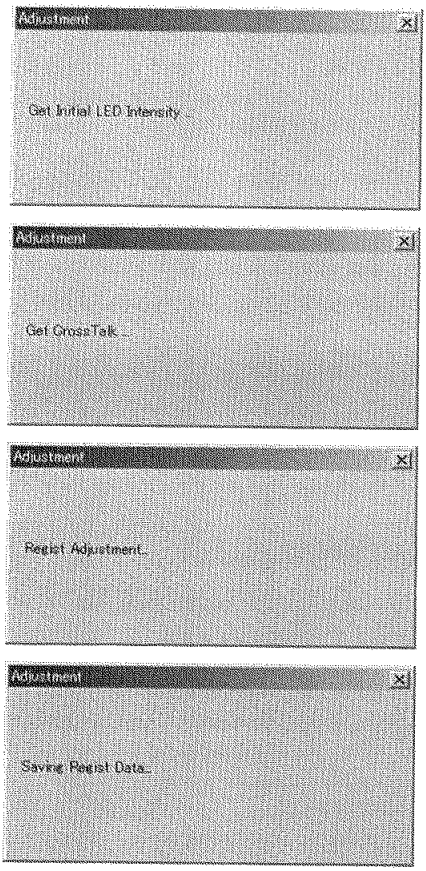


Figure 5-305

6) When the adjustment is finished, the progress screen disappears and the service screen appears.
It takes approx. 1 minute to finish.

◆ Errors

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

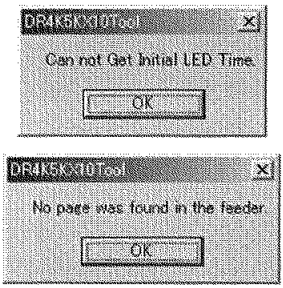


Figure 5-306

If the computer gets uncontrollable during use of the service mode including this mode, reset both the scanner and the computer.

5. Individual Adjustments

This section describes the following individual adjustment items. If all the 2 adjustments are performed, use [All Adjustment] described in the previous section.

- [LED Adjustment]
- [Regist Adjustment]

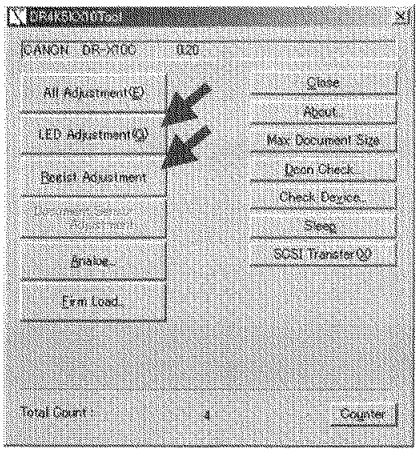


Figure 5-307

a. LED Adjustment

In this mode, 3-color LED intensity adjustment and 3-line sensor data output correction of the CIS unit are performed. Execute this mode when the quality of the read image is faulty.

◆ Operation Procedure

1) Clean the feed path, rollers, and reading glasses.
2) Select [LED Adjustment] on the service screen.
3) The adjustment starts automatically. The progress screen appears on the display.
4) When the adjustment is finished, the progress screen disappears and the service screen appears.

b. Regist Adjustment

The reading position is adjusted in this mode. Execute this mode if the leading edge of a read image is faulty. Or execute it after the replacement of the document frame detection unit.

◆ Operation Procedure

1) Set the document guide at the central position.
2) Set a piece of regular white copy paper (A4 or LTR) in portrait mode. Set the document guide position to the paper.
3) Select [Regist Adjustment] on the service screen.
4) The adjustment starts automatically. The progress screen appears on the display.
5) When the adjustment is finished, the progress screen disappears and the service screen appears.

6. Analog

This mode is used to check analog data for sensors. However, the operation check of normal sensors is performed in the [Dcon Check].

Selection of sensors is performed from the pull-down box. When a sensor enters detection state, a "red circle" on the left side lights.

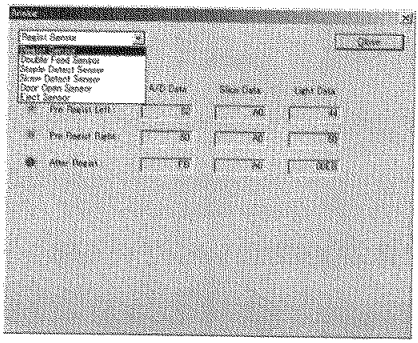


Figure 5-308

7. Firm Load

This mode is used to change the firmware of this machine. For details, refer to the service information issued during firmware changes.

◆ Operation Procedure Outline

1) Select [Firm Load] on the service screen.
2) The screen for selecting the file, where the firmware has been saved is displayed.
3) Select and open the file.
4) The progress screen appears and the firmware is loaded automatically into this machine.

Note: Do not turn the power OFF or perform other operations during loading.

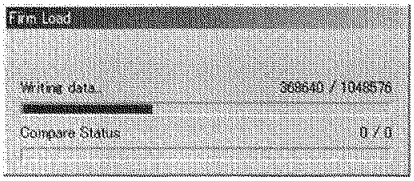


Figure 5-309

5) When the loading is finished, the progress screen disappears.
6) Exit the service mode.
7) Reset the power of this machine.
8) In the [Check Device] in the service mode, ensure that it is the new version.

8. About

This mode is used to check the detailed version of the software for this service mode.

When [About] is selected on the service screen, the version screen is displayed.

Figure 5-310

9. Max Document Size

This mode is used to set the long document mode. It is set to the standard mode at the factory setting. Changes can also be performed in the user mode.

When the long document mode is set, the document length is 1000 mm at the maximum, but there are restrictions shown below:

- Document size: "Auto-detection" only
- Document thickness: 0.2 mm or less
- Image size: 384 MB×80% or less
- Feed: Feed a sheet of paper. Performance of paper pickup/eject is not guaranteed.

When [Max Document Size] is selected on the service screen, the setting screen is displayed. To set the long document mode, change the setting to [1000.0(mm)] and press the [OK] button.

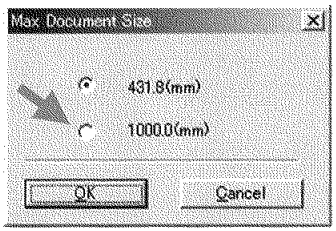


Figure 5-311

10.Dcon Check

This mode is used when checking the operation of the hardware controlled with this machine.

◆ Operation screen

When [Dcon Check] is selected on the service screen, the operation screen is displayed.

If options are not installed, 2 tabs are displayed on the upper left side of the screen. If options are installed, up to 4 tabs are displayed. If a tab is selected, a corresponding screen is displayed. [Dcon Check] is selected at first.

The tab names and the check items are listed below.

◆ List of items

Tab name	Item
Dcon Check	Sensor
	Operation button
	CIS LED
	Motor
	Feed test
ImgFrame	Frame detection unit
Imprinter	Imprinter (option)
Patchcode	Patchcode decoder (option)

Table 5-302

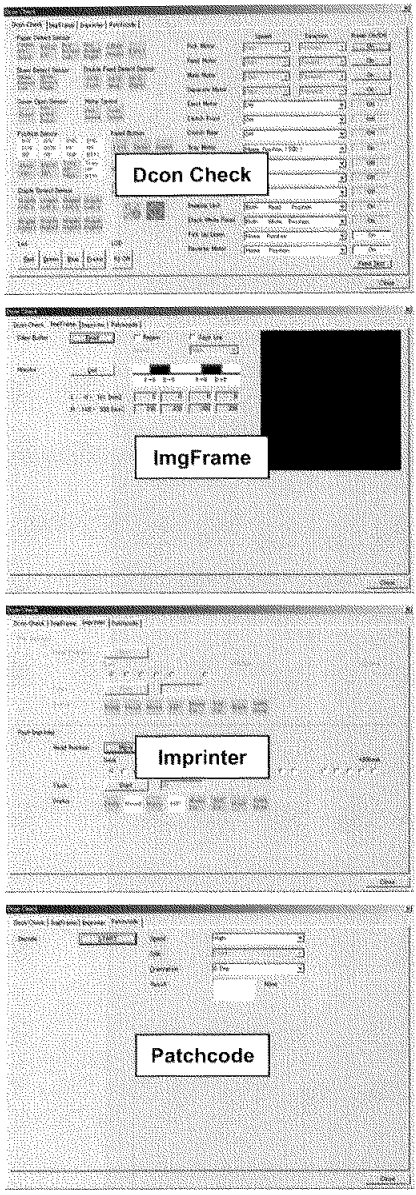


Figure 5-312

a. Sensors

When each sensor enters the detection state, the corresponding mark lights. Since there are many sensors, they are divided into groups. The figure below shows the standard initial lighting state.

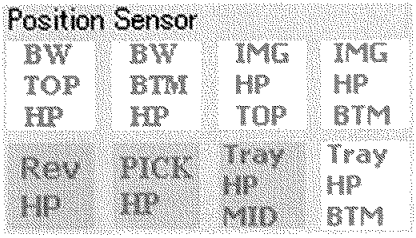


Figure 5-313

1) Paper Detect Sensors

These sensors are a group of sensors that detect documents.

Mark	Sensor name
Paper DTC Tray	Document sensor * See Note.
PICK UP	Pickup sensor
Pre Regist Left	Registration front sensor (left)
Pre Regist Right	Registration front sensor (right)
After regist	Registration rear sensor (right/left)
Eject	Eject sensor (right/left)

Table 5-303

Note: The document sensor is not displayed correctly if the upper unit is opened. Close the upper unit, confirm the operation of the "tray motor" shown in the next section, and make a retry.

2) Skew Detect Sensors

These sensors are a group of sensors that detect skew.

Mark	Sensor name
Skew Detect Left	Skew sensor (left)
Skew Detect Right	Skew sensor (right)

Table 5-304

3) Double Feed Detect Sensors

These sensors are a group of sensors that detect double feeds using ultrasonic.

Mark	Sensor name
DFS Left	Double feed sensor (left)
DFS Mid	Double feed sensor (center)
DFS Right	Double feed sensor (right)

Table 5-305

4) Cover Open Sensors

These sensors are a group of sensors that detect that the cover is open.

Mark	Sensor name
Door	Door sensor * Detect opening of the upper unit.
Im-print Door	Imprinter door sensor * Detect opening of the imprinter cover on the eject tray.

Table 5-306

5) Motor Speed

These sensors are a group of sensors that detect that the motor reaches the specified speed. However, elements called sensors are not mounted and the speed is judged by the signal from the motor.

Mark	Sensor name
Pick Speed	Pickup motor speed sensor
Feed Speed	Feed motor speed sensor

Table 5-307

6) Position Sensors

These sensors are a group of sensors that detect the home position of important parts.

Mark	Sensor name/lighting state
BW TOP HP	Platen roller sensor (upper) * Detection of background color. Lights when it is white.
BW BTM HP	Platen roller sensor (lower) * Detection of background color. Lights when it is white.
IMG HP TOP	CIS unit home sensor (upper) * Lights when the CIS unit is at the document reading position.
IMG HP BTM	CIS unit home sensor (lower) * Lights when the CIS unit is at the document reading position.
Rev HP	Reverse roller sensor * Lights when the reverse roller is at the highest position. (Refer to Note.)
PICK HP	Pickup roller sensor * Lights when the pickup roller is at the lowest position.
Tray HP MID	Tray home sensor * Lights when the pickup tray is at the center (300)/upper (100) position.
Tray HP BTM	Tray home sensor * Lights when the pickup tray is at the lower (500) position.

Table 5-308

Note: Since the home position of the reverse roller sensor is detected at the highest position, but the mechanical upper stable point is slightly different from the highest point, the mark is off even if the roller is at the upper position immediately after the power is turned ON. When the reverse motor runs, the mark flashes.

7) Staple Detect Sensors

These sensors are the staple sensors.

Mark	Sensor name/lighting state
Staple Left1 Staple Left2 Staple Left3 Staple Left4	Staple sensor (left) * When the light-emitting part of the left LED1 is blocked, the [Left 1] mark lights. In the same way, when the light-emitting part of each LED is blocked, the corresponding mark lights. When the lighting-receiving part of the left light-receiving element is blocked, all the 4 marks light.
Staple Right1 Staple Right2 Staple Right3 Staple Right4	Staple sensor (right) * When the light-emitting part of the right LED1 is blocked, the [Right 1] mark lights. In the same way, when the light-emitting part of each LED is blocked, the corresponding mark lights. When the light-receiving part of the right light-receiving element is blocked, all the 4 marks light.

Table 5-309

4 LEDs and 1 light-receiving element are mounted on the staple PCB and the LEDs light sequentially one at a time. Each operation can be checked in this mode.

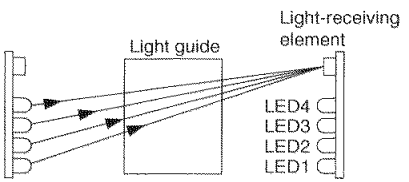


Figure 5-314

b. Keys

When a key on the operation panel is pressed, the corresponding mark lights. The figure below shows the lighting state when the "arrow key (left)", "stop key", and "start key" are pressed.

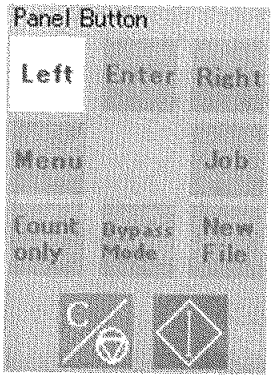


Figure 5-315

c. Led

Verify that LEDs of the reading unit and frame detection unit light. When the corresponding button is selected, the LED lights. When the button is pressed again, the LED turns off.

Button	LED that lights
Red	Red LED on the reading unit
Green	Green LED on the reading unit
Blue	Blue LED on the reading unit
Frame	LED (green) of the frame detection unit

Table 5-310

d. LCD

Check the lighting of the display panel (LCD) in the operation panel. When starting "Dcon Check", all display dots of 16 characters × 2 lines light. When the [All Off] button is selected, all the dots turn OFF. When the button is selected again, all the dots light.

e. Motor, clutch

Check the operation of the motor and clutch. The list below shows target parts.

Display	Target name
Pick Motor	Pickup motor
Feed Motor	Feed motor * Feed roller * Reverse roller
Separate Motor	Separation motor
Eject Motor	Eject motor
Clutch Front	Magnetic clutch (front) * Registration roller
Clutch Rear	Magnetic clutch (rear) * Reading roller (front)
Tray Motor	Tray motor * Pickup tray up/down
Blower Top	Blower of the reading unit (upper)
Blower Bottom	Blower of the reading unit (lower)
Fan	Exhaust fan
Image Unit	Shading motor * CIS unit position
Black White	Platen motor * Background
Panel	Pickup up/down motor
Pick Up Down	Reverse up/down motor

Table 5-311

The following describes the operation method and selection items by type.

1) Pick/Feed/Main/Separate Motor

When the [On] button on the right side is selected first, and then conditions are selected from the [Speed] and [Direction] pulldown boxes, the motor runs accordingly.

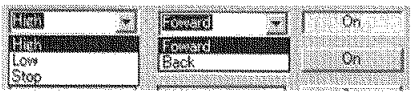
However, conditions that do not match each motor are not displayed.

When [Stop] on the pulldown box is selected or the [On] button is selected again, the motor stops.

The figure below shows each selection screen.

◆ Pick Motor

◆ Feed Motor



◆ Main Motor

◆ Separate Motor

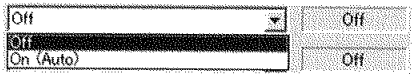
Figure 5-316

2) Others

When conditions are selected from the pulldown box, the motor or clutch is driven accordingly.

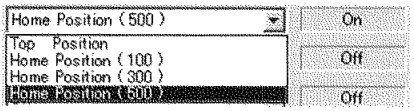
The figure below shows each selection screen.

◆ Eject Motor Refer to Note.

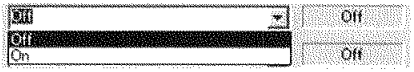


◆ Clutch Front/Rear

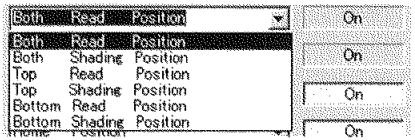
◆ Tray Motor



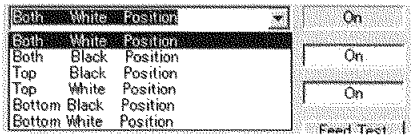
◆ Blower Top/Bottom and Fan



◆ Imaging Unit



◆ Black White Panel



◆ Pick Up Down

◆ Reverse Motor

Figure 5-317

Note: When [On (Auto)] is selected for the Eject Motor, the eject motor runs and stops immediately. The eject motor continues running only when the eject sensor is in the detection state.

f. Feed Test

Paper can be actually fed in this mode among service modes. However, a sheet of paper can be fed manually and other conditions cannot be selected, but the operation of sensors during feeding can be checked.

The operation procedure is shown below.

1) Select the [Feed Test] button on the lower right of the screen.
2) The pickup tray lifts and each roller rotates.
3) Insert a sheet of paper at a time into the pickup inlet.
4) The paper is fed and ejected onto the eject tray.
5) When the [Feed Test] button is selected again, the test stops.

An example of the sensor display section during feeding is shown below.

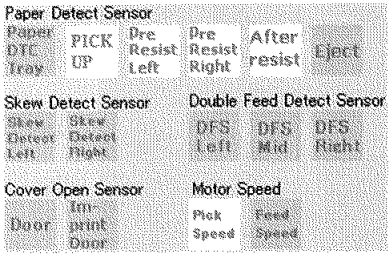


Figure 5-318

g. ImgFrame

The operation check of the frame detection unit is performed in this mode. When the [ImgFrame] tab is selected, a screen is displayed.

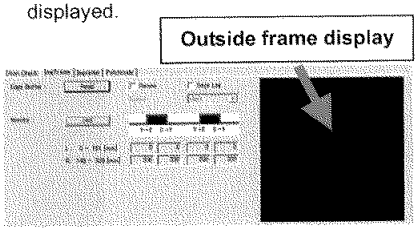


Figure 5-319

1) Edge Buffer

Paper is actually fed and data of its outside frame is obtained in this mode and the shape is displayed in the display section.

The operation procedure is shown below.

◆ Operation Procedure

i) When [Renew] is selected, [Speed] becomes effective, so select [High] or [Low].

Figure 5-320

ii) Set a sheet of paper on the pickup tray and select the [Read] button.

iii) The paper is automatically fed and ejected onto the eject tray.

iv) Data of the outside frame of the paper is memorized and displayed in the display section. The area enclosed by a red line and a blue line shows the outside frame of the paper. One scale is 10 mm.

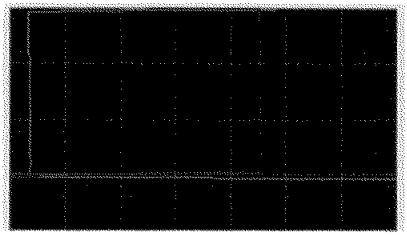


Figure 5-321

Note: When [Renew] is not selected, but the [Read] button is selected, the outside frame that was previously recorded is displayed.

Note: When [Save Log] is selected, outside frame data can be saved in the computer for servicing, which has been connected. It is not normally used, but is used only if an instruction for analysis is given.

2) Monitor

If a finger or a sheet of paper is placed on the frame detection section, detected data is displayed. Even when the upper unit is open, data is displayed due to outside daylight. If the upper unit is closed, select the [Led] button and light the LED.

◆ Frame detection section

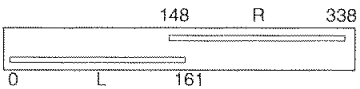


Figure 5-322

Examples of display are shown below.

i) Put 2 fingers on the left detection section.

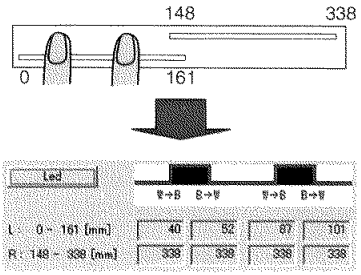


Figure 5-323

ii) Place a sheet of paper (A4 size) at the center.

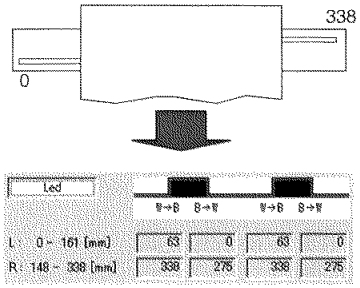


Figure 5-324

h. Imprinter

The operation check of the imprinter is performed in this mode. When the [Imprinter] tab is selected, a screen is displayed. The screen on the imprinter side that is not connected is grayed out.

The figure below shows the post-imprinter screen.

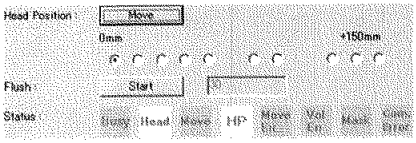


Figure 5-325

1) Head Position

The cartridge unit is moved in this mode. When the stop position is selected and then the [Move] button is pressed, the cartridge unit is moved.

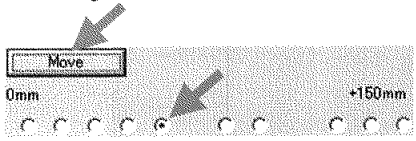


Figure 5-326

Note: If actual operation is checked visually, remove the eject tray unit and set the imprinter door sensor in the detection state using paper, etc.

2) Flush

The ink is ejected in this mode. If a sheet of paper is set in the machine to check the ejection of ink, a paper jam error occurs or the paper is ejected automatically. If the ejection is checked, set the paper so that it does not touch the roller or sensor.

The operation procedure is shown below.

◆ Operation Procedure

i) Set the cartridge unit position at the left end (0mm) or the second position.

ii) Set a sheet of paper with a width (approx. 100 mm) which does not touch the roller at the left end so that the paper is positioned at the ink ejection position.

iii) Close the upper unit and select the [Start] button.

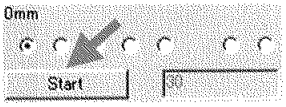


Figure 5-327

iv) Visually check whether ink is ejected.

Note: The value shown on the right side of the [Start] button is the number of ejections and cannot be changed.

3) Status

Check the state of the imprinter. The mark of each item lights according to its state.

Mark	Sensor name/lighting state
Busy	Busy Lights during normal operation. However, it does not light in service mode.
Head	Head Lights when the ink cartridge is installed.
Move	Move Lights when the cartridge unit is moved during opening or closing the cover.
HP	Home Lights when the machine is normal.
Move Err	Move error Lights when a motor or sensor error occurs.
Vol Err	Voltage error Lights when the applied voltage is abnormal.
Mask	Mask Lights when the cartridge is in the non-printing area.
Com. Error	Communication error Lights when a data communication error occurs or the PCB failure is defective.

Table 5-312

i. Patchcode

The operation check of the patchcode decoder is performed in this mode. When the [Patchcode] tab is selected, a screen is displayed.

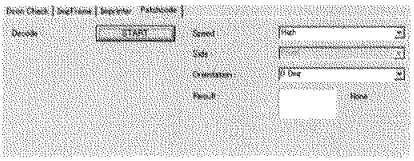


Figure 5-328

◆ Operation Procedure

1) Set a sheet of paper on which a patchcode is printed on the pickup tray. The patchcode should be on the top surface.
2) Select setting items of [Speed] and [Orientation] from the pulldown boxes.

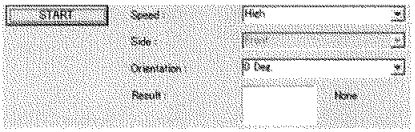


Figure 5-329

3) Select the [START] button. The pickup tray lifts and the paper is fed and ejected onto the eject tray.
4) The results are displayed.

Figure 5-330

11. Check Device

This mode is used to check the versions of the main body firmware and the internal devices of this machine.

When [Check Device] is selected on the service screen, the version screen is displayed.

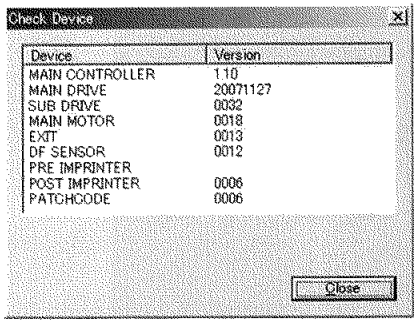


Figure 5-331

12. Sleep

This mode is used to check and change the time until the machine enters the sleep mode. It is set to "after 10 minutes" at the factory setting. It can also be changed in the user mode.

When [Sleep] is selected on the service screen, a setting screen is displayed. Change the setting as required and press the [OK] button.

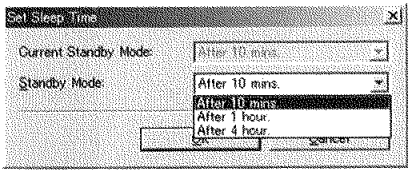


Figure 5-332

13.SCSI Transfer

This mode is used to change the maximum value of the synchronizing transfer speed of the SCSI interface.

However, there is normally no problem with the factory setting (20 MB/sec), so the setting should be changed only if the machine does not work properly. It can also be changed in the user mode.

When [SCSI Transfer] is selected on the service screen, a setting screen is displayed. Change the setting as required and press the [OK] button.

Then, a confirmation screen is displayed, so select the [OK] button again.

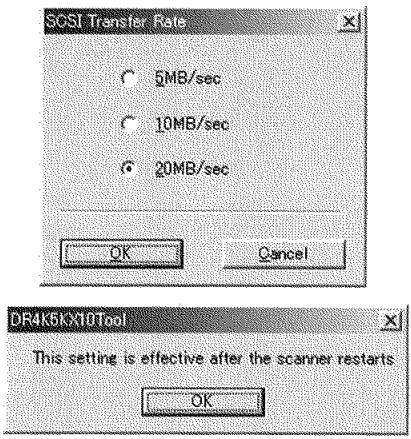


Figure 5-333

14.Counter

This mode is used to confirm the number of sheets fed and document jams and record the number of sheets fed when replacing consumable parts. These values can be changed.

When the [Counter] button is selected on the service screen, the [Change Counter] screen is displayed. The figure below shows a list of items on each screen and the [Change Counter] screen.

The [Total Count] value is displayed at the lower part of the service screen.

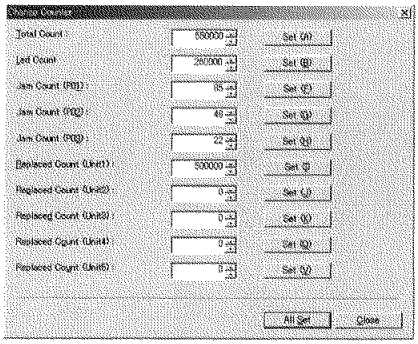


Figure 5-334

Display	Details
Total Count	Total scanning count
Led Count	Total lighting time of the LEDs used on the reading unit (upper/lower) and frame detection unit. However, the unit is "second". 1000 hours = 3,600,000 seconds
Jam Count (P01)	Number of documents jams in the pickup section. Error code P001
Jam Count (P02)	Number of documents jams in the registration section. Error code P002/006/007
Jam Count (P03)	Number of documents jams in the eject section. Error code P004
Replaced Count (Unit1)	Number of sheets fed when replacing parts replaced by users (expected life 500,000 sheets). Total scanning count when it is reset in the user mode is displayed.
Replaced Count (Unit2)	When parts with an expected life of 3,000,000 sheets is replaced, enter total scanning count.
Replaced Count (Unit3)	When parts with an expected life of 6,000,000 sheets is replaced, enter total scanning count.
Replaced Count (Unit4)	When parts with a reading LED are replaced, enter the total scanning count.
Replaced Count (Unit5)	Reserved (This may be used if necessary.)

Note: For Replaced Count (Unit2) to (Unit5), enter total scanning count when the service technician replaces parts as a guide for the next replacement time.

Table 5-313

When the [Set] button on the right or the [All Set] button on the lower right of the screen is selected after the value is changed, the changed value is determined.

To close the screen, select the [Close] button.

These values might be changed if the control PCB is replaced. Therefore, inputting the values again is required after the replacement. If the values before the replacement are not clear, it is better to input the recommended values.

The count of [Roller Counter] in the user mode is also changed when the control PCB is replaced or the [Total Count] is changed. When the user switches the machine power ON for the next time, the "Roller Replacement" message may appear or the count of [Roller Counter] may indicate an abnormal count. After exiting from the service mode, therefore, be sure to check the count of [Roller Counter] and reset it if the values are abnormal.

Note: The count of [Roller Counter] is calculated by subtracting the total scanning count on the previous reset from the total scanning count at that time.

Note: Since the number of writes of [Total Count] and [Led Count] values into memory is limited, new values are not written into memory if the number of sheets fed is 10 sheets or less. However, if an abnormality, such as a document jam, occurs, they are written into memory regardless of the number of sheets fed.

IV. LIST OF FAILURES

The lists below give the major failures conditions and their causes. Refer to the next section for details of the causes and the measures to be taken.

1. Operation Failures

Note: Major causes of each failure are marked "**X**."

No.	Failure \ Cause	System/ Software	Hard-ware	Connec-tion	Dirt	Docu-ment	Setting
1	No power is supplied		X	X			
2	Scanner is not rec-ognized	X		X			
3	Scanning does not start	X	X	X			X
4	Documents are not fed properly		X		X	X	
5	Scanning speed is low	X					X

Table 5-401

2. Images Failures

Note: Major causes of each failure are marked "**X**."

No.	Failure \ Cause	System/ Software	Hard-ware	Connec-tion	Dirt	Docu-ment	Setting
1	Completely black, completely white, all streaks		X		X		X
2	Too dark, too light				X		X
3	Wrong image size					X	X
4	Image skews					X	X
5	Streaks on image		X		X		
6	Text invisible					X	X
7	Moire on image					X	X

Table 5-402

V. OPERATION TROUBLESHOOTING

When an operation failure occurs, first check for an "Error Messages" displayed on this machine and computer. In addition, check the operation of the various sensors, motors using the "Service Modes."

1. No Power Is Supplied

This machine display panel does not light.

Cause/faulty location	Step	Check item	Result	Action
Connection of power cord	1	Is the power cord connected?	NO	Connect it properly.
AC power supply voltage	2	Is the specified voltage being supplied at the outlet?	NO	Explain to the user that the trouble is not with this machine.
Power cord	3	Is the problem solved when the power code is replaced?	NO	End.
DC power supply	4	Dose the LED on the control PCB light when the power switch is turned ON?	YES	The power is supplied. Check the operation PCB.
Operation panel PCB	5	Is the cable connected to the PCB?	NO	Connect it properly.
Power switch mechanical section	6	Dose the power switch of the main motor PCB operate when the power switch button is pressed on the front?	NO	Attach the parts properly.
Main motor PCB Power supply PCB Control PCB	7	Are the cables properly connected to the PCB?	NO	Connect it properly.
	8	Is the problem solved when these PCBs are replaced?	YES	End.
Auto USB power switch (user mode setting)	9	Is the setting "ON"?	NO	Set it "ON".
	10	Is this machine connected to the computer with a USB cable?	NO	Connect it to the computer with a USB cable.

Table 5-501

2. Scanner Is Not Recognized

Note: Install the driver in the computer before connecting the scanner.

Cause/faulty location	Step	Check item	Result	Action
Power supply	1	Is the power supplied to this machine?	NO	Perform the actions in section 1: "No power is supplied".
Connection of IF interface cable	2	Is the IF interface cable properly connected?	NO	Connect it properly.
Power-on sequence (SCSI connection)	3	Was the power to this machine turned ON before the computer was turned ON in the case of the SCSI connection?	NO	Follow the proper power-on sequence.
SCSI ID settings	4	Is the SCSI ID set properly?	NO	Set them properly.
Computer, I/F card	5	Are the computer and I/F card set properly?	NO	Use them properly.

Table 5-502

3. Scanning Does Not Start

Note: Scanning may not start when a "cover open" or "no document" error messsage is displayed due to a sensor problem.

Cause/faulty location	Step	Check item	Result	Action
System	1	Is the problem solved when the scanner power is reset and the computer is restarted?	YES	End.
Software	2	Is the problem solved when the scanner driver and the application are reinstalled?	YES	End.
Connector connection	3	Are the motor and sensor connectors connected properly?	NO	Connect them properly.
Drive transmission system	4	Is the transmission system driven by the motor normal? Are such parts as gears and belts normal?	NO	Attach the parts properly. Replace needed parts.
Motor, clutch	5	Is the operation normal when checking the operation in the service mode?	NO	Check the cable connections. Replace needed parts.
Sensor	6	Is the operation normal when checking the operation in the service mode?	NO	Check the attachment of the sensor, light guide and lever. Check the cable connections for the sensor.
Main drive PCB Control PCB	7	Is the problem solved when these PCBs are replaced?	YES	End.

Table 5-503

4. Documents Are Not Fed Properly

Note: If a sensor failure occurs an error message such as "paper jam" or "double feed" may be shown.

Cause/faulty location	Step	Check item	Result	Action
Document	1	Is the document within the specifications (thickness, dimensions, fold, curl, etc.)?	NO	Ask the user to use documents within the specifications.
Document setting	2	Are the documents stuck together?	YES	Fan the stack of documents well.
	3	Are the document guides adjust properly?	NO	Adjust them in a correct position.
Roller	4	Is the roller properly mounted?	NO	Mount it properly.
	5	Is it dirty or deformed?	NO	Clean or replace it.
Parts in feed path	6	Are all parts that the documents contact properly mounted (not loose or tilted)?	NO	Mount them properly.
	7	Is the surface in contact with the document smooth (not scratched, no burrs)?	NO	Replace faulty parts.
Drive transmission system	8	Is any abnormal noise emitted when feeding documents? Are any gears broken or is the belt loose?	YES	Mount the parts properly. Replace faulty parts.
Motor, clutch	9	Is the operation normal when an operation check is performed with the service mode?	NO	Check the cable connections. Replace needed parts.
Sensor	10	Is the operation normal when an operation check is performed with the service mode?	NO	Check the attachment of the sensor, light guide and lever. Check the cable connections for the sensor.
Main drive PCB Eject PCB Control PCB	11	Is the problem solved when these PCBs are replaced?	YES	End.

Table 5-504

5. Scanning Speed Is Slow

The basic scanning speed of this machine is 100 ppm in simplex mode and 200 ipm in duplex mode (A4/200 dpi).

Selecting higher resolutions, color setting and/or special functions further makes the scanning speed slower.

Should the scanning speed be too slow after taking all of these considerations, the possible causes are as listed below.

Cause/Faulty location	Step	Check item	Result	Action
Insufficient memory capacity in computer	1	Is memory capacity sufficient?	NO	Add the memory capacity.
	2	Is any other application started up?	YES	Close other applications.
	3	Is any resident application started up such as a virus protection application?	YES	Close resident applications.
	4	Is the hard disk short of empty capacity?	YES	Increase empty capacity of the hard disk.
Hi-Speed USB2.0 is not supported (when USB is used)	5	Is the USB port supported?	NO	Use a supported computer.
	6	Is the USB cable supported?	NO	Use a included USB cable.
	7	Is the USB hub supported?	NO	Use a supported USB hub.
SCSI-3 is not supported (when SCSI is used)	8	Is the SCSI card supported?	NO	Use a supported SCSI card.
	9	Is the SCSI cable supported?	NO	Use a supported SCSI cable.

Table 5-505

VI. IMAGE TROUBLESHOOTING

◆ Image Samples

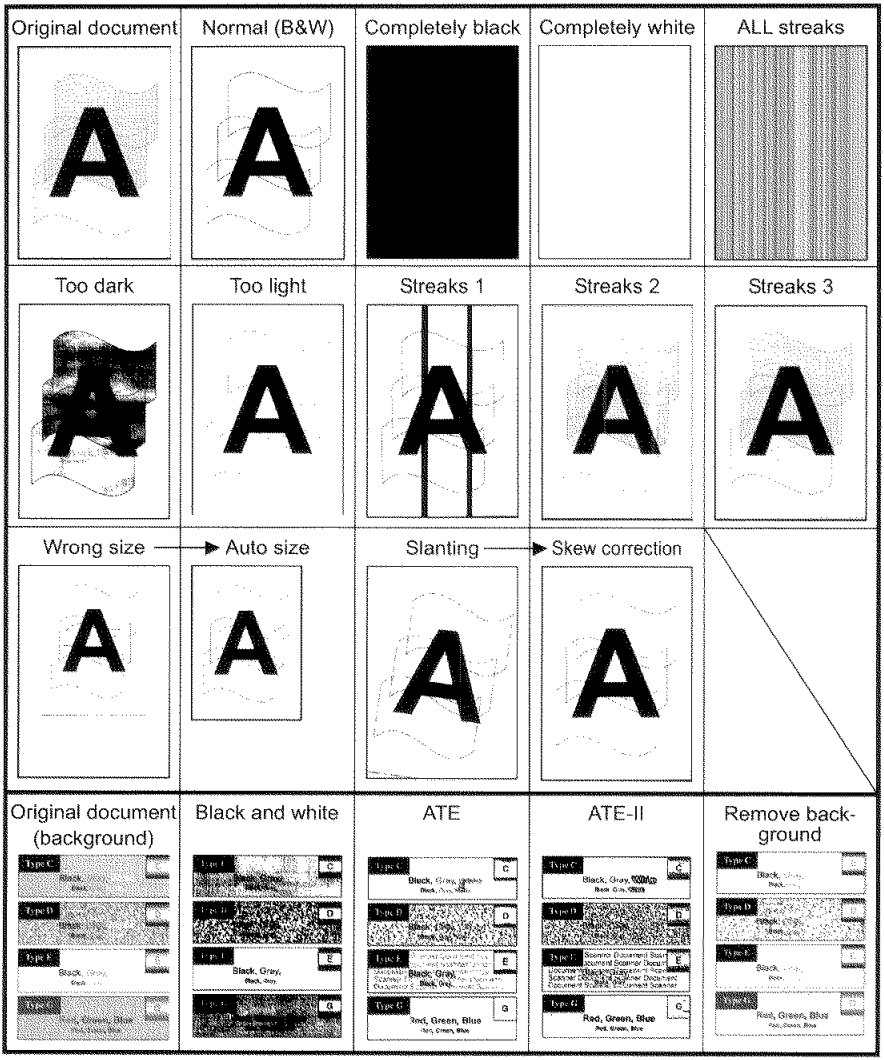


Figure 5-601

Note: There are times when, depending on the type of image and settings, document reproducibility becomes poor. In such case, the image may be improved by changing the settings.

1. Completely Black, Completely White, All Streaks

Completely Black, Completely White, or All Streaks are output.

Cause/faulty location	Step	Check item	Result	Action
Document setting	1	Was the document set with the surface facing down? If not, the back side will be scanned.	NO	Properly set the document.
"Brightness" setting	2	Is the "Brightness" setting appropriate?	NO	Change the setting. Also change "Contrast" if necessary.
System	3	Is the problem solved when the scanner power is reset and the computer is restarted?	YES	End.
Reading unit	4	Are the reading related cables connected proparly ?	NO	Connect properly.
	5	Is the problem solved when the reading glass is replaced?	YES	End.
Control PCB	6	Is the problem solved when the control PCB is replaced?	YES	End.

Table 5-602

2. Too Dark, Too Light

Image does not look appropriate due to improper brightness.

Cause/faulty location	Step	Check item	Result	Action
"Brightness" setting	1	Is the "Brightness" properly set? The brightness should be set to "128" in normal case but may be required to change according to the type of document.	NO	Change the setting.
"Contrast" setting	2	Is the "Contrast" properly set? The default setting is "4".	NO	Change the setting.

Table 5-603

3. Wrong Image Size

There are borders around the image, or some of the image is missing.

Note: Set the document size to "Auto-detection" when scanning stack of different size documents.

Cause/faulty location	Step	Check item	Result	Action
"Page Size" setting	1	Is the "Page Size" properly set?	NO	Change the setting.
Document setting	2	Is the document set at the correct position?	NO	Set at the correct position.
Setting of "Auto-detection"	3	Is "Auto-detection" set?	NO	Set it.
Reading glass of frame detection unit	4	Are the reading glasses clean?	NO	Clean the reading glasses.

Table 5-604

4. Image Skews

If the document skews when fed, the scanned image also skews.

Cause/faulty location	Step	Check item	Result	Action
Document setting	1	Is the document properly set?	NO	Properly set the document.
	2	Are the document guides adjusted to fit the document width?	NO	Adjust them in a correct position.
"Deskew" setting	3	Is the "Deskew" set?	NO	Set it. Slant can be corrected by image processing.
Document feeding	4	Is the document fed straight?	NO	Carry out check items listed in "Documents Are Not Fed Properly".

Table 5-605

5. Streaks on Image

If the reading glass surface is dirty, streaks appear on the scanned images in the feed direction. Dirt on the rollers may also be transferred to the documents.

On the other hand, white streaks appearing on the scanned images are caused by the execution of the shading correction while the reading unit inside is dirty.

Cause/faulty location	Step	Check item	Result	Action
Reading glasses	1	Are the reading glasses clean?	NO	Clean the reading glasses. Replace the reading sensor cover if scratches are found.
Roller	2	Are the surfaces clean?	NO	Clean or replace the roller.
Feed unit	3	Is the feed path clean?	NO	Clean the feed path.
Reading unit inside	4	Is the reading unit inside clean?	NO	Clean or replace the reading sensor cover or CIS unit.

Table 5-606

6. Text Invisible

When the background includes colors or patterns, text may be hidden by the background when scanning in black and white mode. A special mode called "Advanced Text Enhancement" exists to solve this problem.

Note: The problem may not be fixed, depending on the type of document.

Cause/faulty location	Step	Check item	Result	Action
"Mode" setting	1	Is the problem solved when the "Color" or "Grayscale" setting is changed?	YES	End.
	2	Is the problem solved when the setting of a special mode such as the "Advanced Text Enhancement" is changed?	YES	End.
"Brightness" setting	3	Is the problem solved when the "Brightness" setting is changed?	YES	End.

Table 5-607

7. Moire (A Shimmering Wavy Pattern) on Image

Moire is likely to appear when a photograph is color scanned with a low resolution from a magazine or a catalog.

Cause/faulty location	Step	Check item	Result	Action
"Moire Reduction" setting	1	Is the "Moire Reduction" set?	NO	Set.
			YES	Heighten the resolution. Set to "High Quality Moire Reduction".

Table 5-608

VII. AFTER REPLACING PARTS

Some of the parts used in this machine require adjustments and settings after being replaced or disassembled/reassembled. The replacement parts are shown below.

Check document feed and images after the replacement or disassembly/reassembly of the parts.

1) Control PCB
   i) Perform "All Adjustment" of the service mode.
   ii) Change the value by the "Counter" of the service mode.

2) Reading unit
   Perform "All Adjustment" in the service mode.

3) Frame detection unit
   Perform "Regist Adjustment" in the service mode.

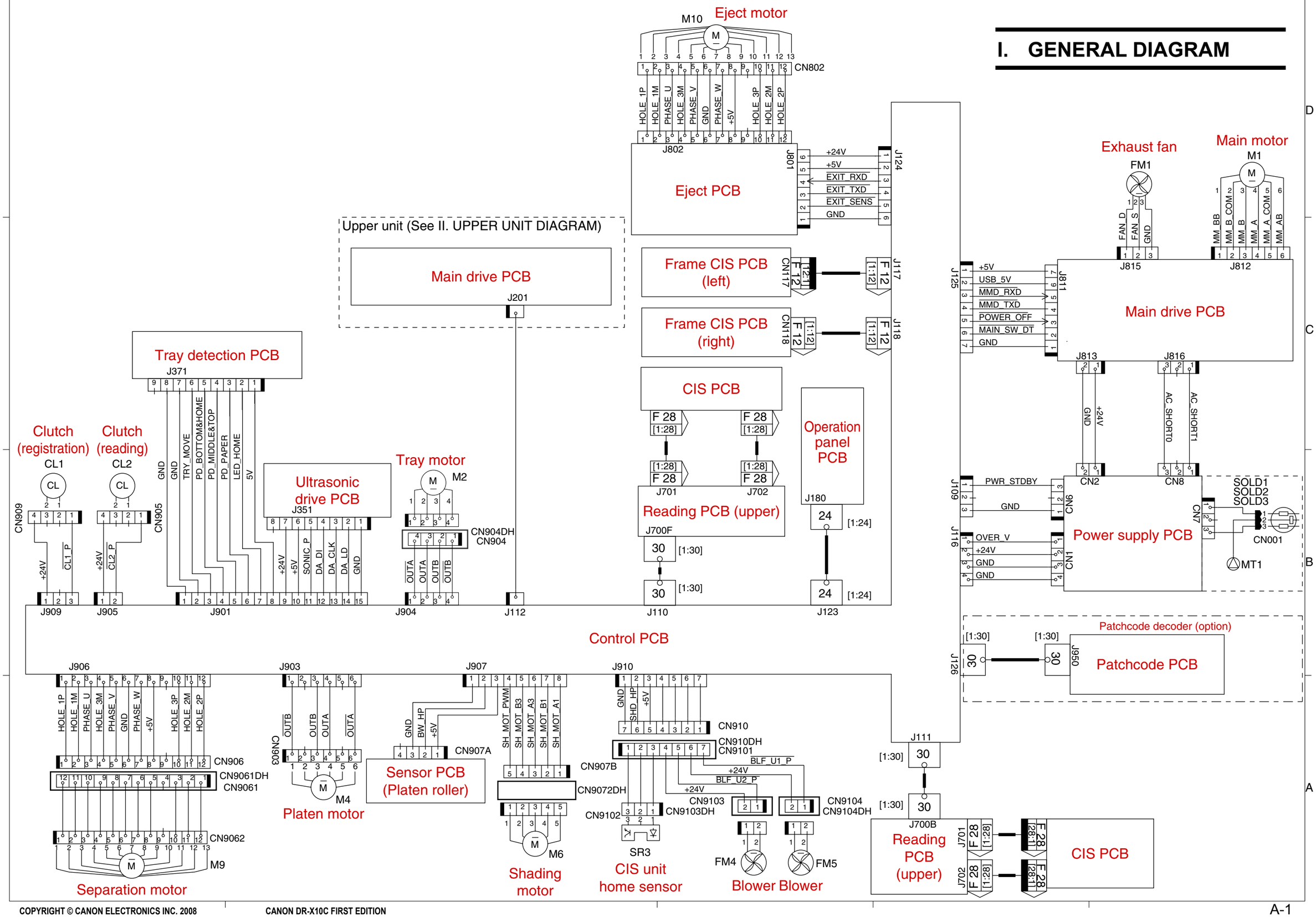
4) Registration-related parts
   When replacing or reassembling the ultrasonic sensor PCB and ultrasonic drive PCB on which a registration sensor is built, perform "Regist Adjustment" in the service mode.

5) Consumable parts (service parts)
   When consumable parts, such as platen rollers, which are replaced by the service technician, are replaced, set the number of sheets fed during replacement by the "Counter" of the service mode.

APPENDIX

I. GENERAL DIAGRAM ..... A-1 | II. UPPER UNIT DIAGRAM A-2

I. GENERAL DIAGRAM



II. UPPER UNIT DIAGRAM