# Service Manual

## LBP5000 Series
## **LBP5000**

Canon

Jan 19 2006

## Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

## Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

The following paragraph does not apply to any countries where such provisions are inconsistent with local law.

## Trademarks

The product names and company names used in this manual are the registered trademarks of the individual companies.

## Copyright



## Caution

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

# Symbols Used

This documentation uses the following symbols to indicate special information:

| Symbol | Description |
|---|---|
|  | Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning. |
|  | Indicates an item requiring care to avoid electric shocks. |
|  | Indicates an item requiring care to avoid combustion (fire). |
|  | Indicates an item prohibiting disassembly to avoid electric shocks or problems. |
|  | Indicates an item requiring disconnection of the power plug from the electric outlet. |
|  Memo | Indicates an item intended to provide notes assisting the understanding of the topic in question. |
|  REF. | Indicates an item of reference assisting the understanding of the topic in question. |
|  | Provides a description of a service mode. |
|  | Provides a description of the nature of an error indication. |

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.
   In the diagrams, ▭▮▮▮▭ represents the path of mechanical drive; where a signal name accompanies the symbol , the arrow ⟶ indicates the direction of the electric signal.
   The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.
2. In the digital circuits, '1'is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low".(The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.
   In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.
All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine."

# Contents

Chapter 3 DISASSEMBLY AND ASSEMBLY

# Chapter 1 PRODUCT DESCRIPTION

# Contents

# 1.1 Features

## 1.1.1 Feature

**1. Smallest Color LBP**
The machine has the smallest body of all Canon color LBPs.

**2. Electrostatic Transportation Belt (ETB)**
The machine uses an ETB for movement of media and transfer of images. The direct transfer of color images from the photosensitive drum to media has enable a significant increase in printing speed.

**3. Four consecutive drum method (Inline method)**
The machine uses a 4-drum construction, in which 4 toner cartridges are arranged in a straight line for one-shot transfer of 4 colors. Compared with the conventional rotary construction, it brings about a bigger reduction in transfer time and a bigger increase in printing speed (full color).

**4. Integrated Laser Scanner Unit**
The machine uses a 4-beam/2-mirror mechanism in which 2 laser beams (colors) are directed to each polygon mirror. Thanks to the elimination of the need for separate laser scanner units commonly found in a 4-drum construction, the machine is less subject to color displacement and has a smaller laser unit.

**5. On-Demand Fixing**
The machine uses an on-demand fixing method combined with a ceramic heater so far mostly used in a mono-color printer. The fact has led to a shorter warm-up period and lower energy consumption.

**6. Support of Various Media Types**
The machine permits the use of transparencies (mono-color prints only), label sheets, envelopes, and postcard-size sheets through both its cassette and manual feeder.
Moreover, it also permits the use of heavy paper (163 g/m2 max.) in its cassette.

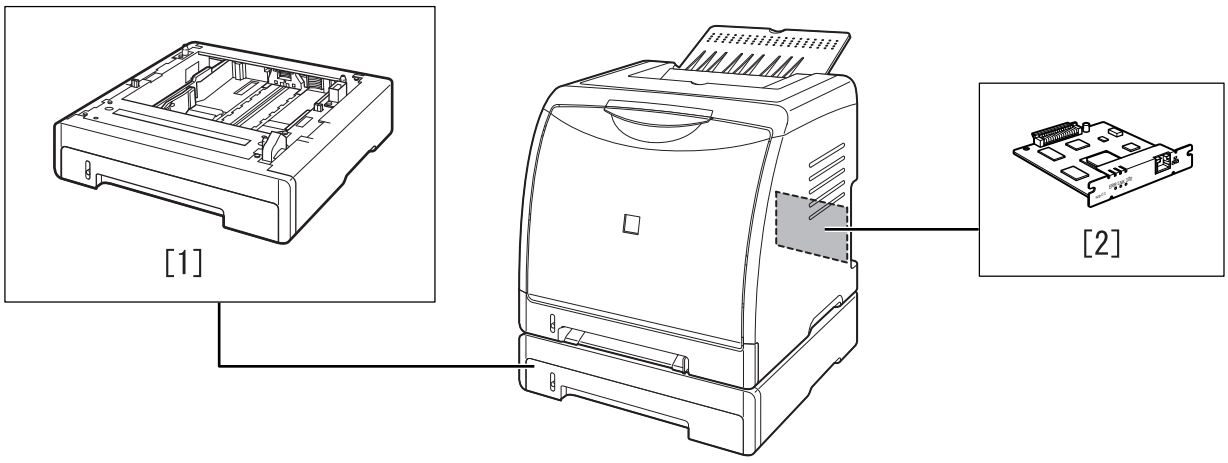
**7. High-Performance Printing System (CAPT)**
The machine draws on the latest developments in CAPT (Canon Advanced Printing Technology), which promises high performance in a Windows operating system. Thanks to the technology, data processing usually assigned to the printer is now fully undertaken by a PC to take full advantage of the use of a PC for higher printing speed. Its added benefits include the ability to process a large volume of data without adding memory to the printer.

**8. Ease of Maintenance**
The toner cartridges (cyan, magenta, yellow, black) each consist of a toner casing and a drum constructed as a single entity. This way, there is no need for toner replenishment or drum replacement, which could well soil the hands of the user or take up his/her time. Mere replacement of the appropriate toner cartridge is enough to keep the machine in good working condition.
The access cover is found at the front of the machine so that both cartridge replacement and jam removal are easy. In terms of printing processes, all (pickup, development, transfer, fixing) take place at the front of the machine, resulting in a highly simple paper path.

# 1.2 System construction

## 1.2.1 System Construction

The following shows the machine's system construction:

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[1] Paper Feeder PF-92
[2] Network Board NB-C1

# 1.3 Product Specifications

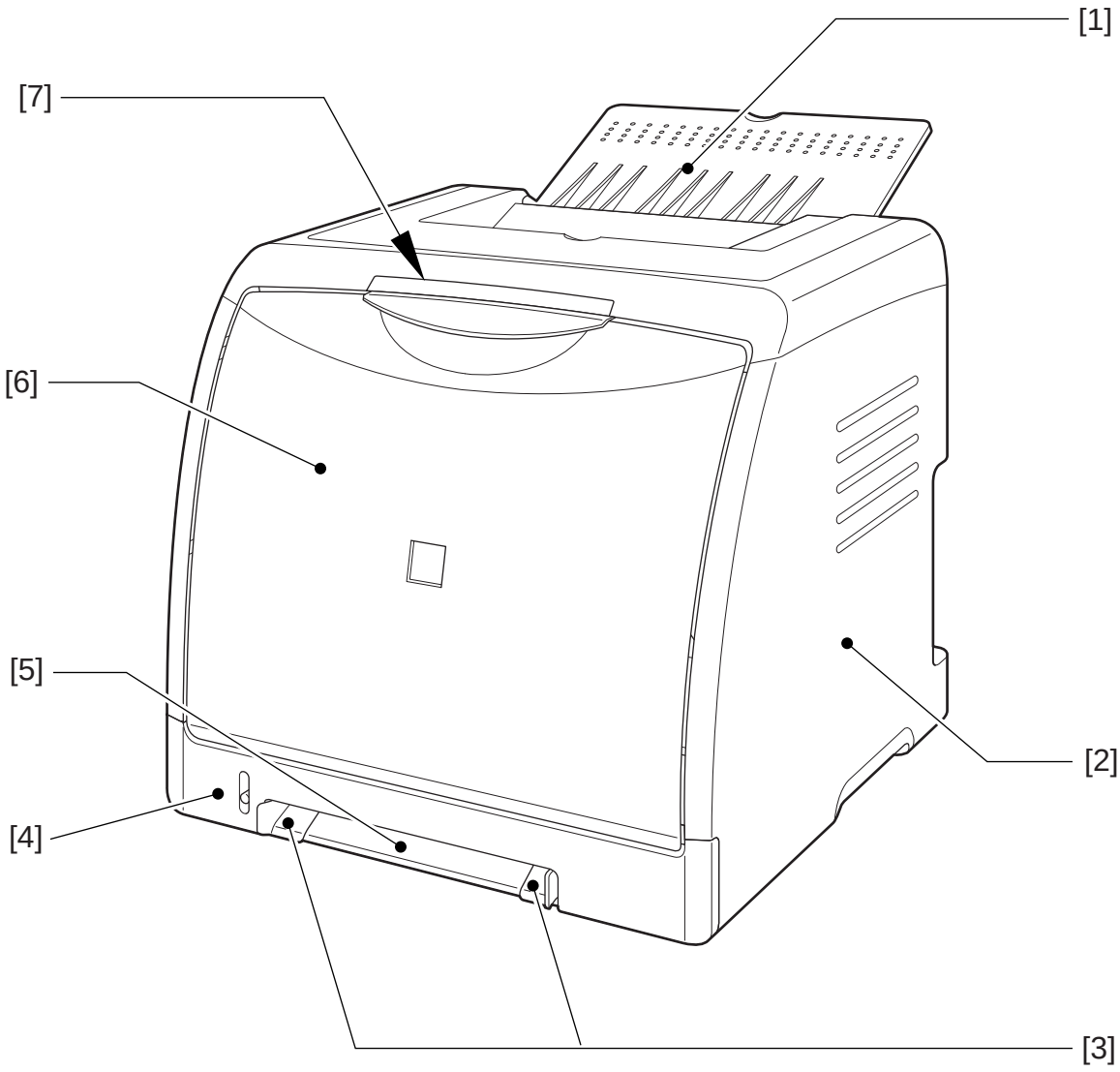
## 1.3.1 Product Specifications

| | |
|---|---|
| **Body installation method** | Desktop page printer |
| **Photosensitive medium** | OPC drum |
| **Charging method** | Roller charging |
| **Exposure method** | Laser scanning |
| **Development method** | Toner projection development |
| **Transfer method** | By Electrostatic Transportation Belt |
| **Separation method** | Curvature |
| **Pickup method** | By cassette/manual feeder |

| | |
|---|---|
| **Cassette pickup method** | By separation pad |
| **Drum cleaning method** | By blade |
| **Trasnsfer cleaning method** | Drum static collection |
| **Fixing method** | On-demand |
| **Delivery method** | Face-down |
| **Contrast adjustment function** | Auto |
| **Toner level detection function** | Available |
| **Toner type** | non-magnetic, 1-component dry toner |
| **Toner supply type** | By EP cartridge (for A4/LTR, about 2500 impressions of Bk; about 2000 impressions of M, C, and Y) |
| **Warm-up time** | 195 sec or less (approx.; at power-on, at 20 deg C) |
| **Image margin (Leading edge)** | 5.0+1.5/-1.5mm |
| **Image margin (Trailing edge)** | 5.0+1.5/-1.5mm |
| **Image margin (Left/right)** | 5.0+1.0/-1.0mm |
| **Number of gradations** | 16 gradations |
| **Printing resolution** | 600dpi×600dpi |
| **First print time** | 20 sec or less (approx.; both mono- and full-color) |
| **Print speed (A4)** | 8 impressions/min (approx.; both mono- and full color) |
| **Cassette paper size** | A4, B5, LGL, LTR, Executive, Index Card, envelope, user-defined sheet (762 to 215.9 mm in length, 127.0 to 355.6 mm in width) |
| **Multifeeder paper size** | Same as for cassette |
| **Cassette paper type** | Plain paper (60 to 90 g/m2), heavy paper (91 to 163 g/m2), envelope (Envelope DL, Envelope COM10, Envelope C5, Envelope Monarch, Envelope B5), label sheet, transparency ((Black and white printing only) |
| **Multifeeder tray paper type** | Same as for cassette |
| **Cassette capacity** | 250 sheets (64 g/m2) |
| **Multifeeder tray capacity** | 1 sheet |
| **Delivery tray stack** | 125 sheets (plain paper, 64 g/m2) |
| **Memory** | 8 MB (addition not possible) |
| **Auto gradation correction** | Available |
| **Operating environment (Temperature range)** | 10Å` 30Åé |
| **Operating environment (Humidity range)** | 10 Å` 80%RH |
| **Operating environment (Atmospheric pressure)** | l810.6 to 1013.3 hpa (0.8 to 1.0 atm) |
| **Noise** | 25 dB or less (standby); 50 dB or less (print) |
| **Power supply rating** | 110 - 127 V (±10 %) 50/60 Hz (±2 Hz)<br>220 - 240 V (±10 %) 50/60 Hz (±2 Hz) |
| **Power consumption (Maximum)** | ñÒ638W or less (approx.) |
| **Power consumption** | 18W or less (approx., operating; reference only); 220W or less (approx., operating; reference only) |
| **Dimensions** | 407mm(W) x 367mm(D) x 376mm(H) |
| **Weight** | 15.7 kg (approx.; excluding cartridges) |

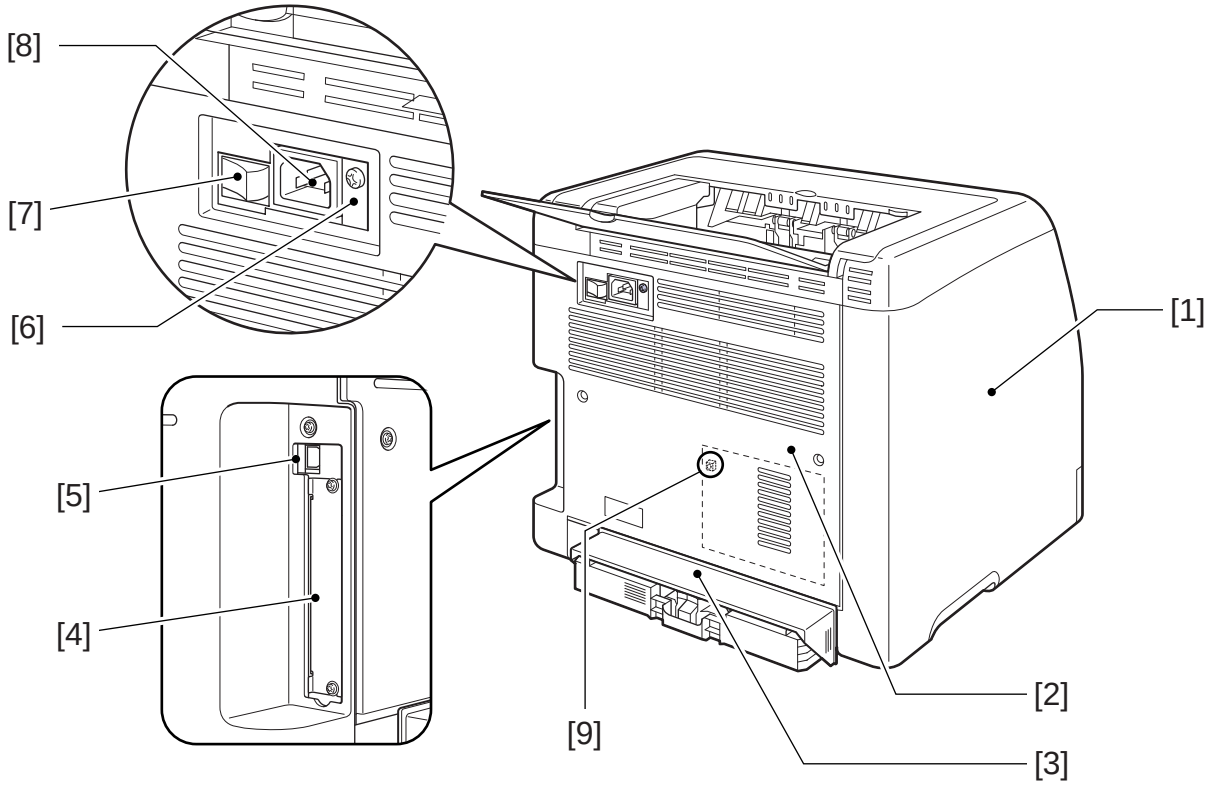
## 1.4 Name of Parts

### 1.4.1 External View




F-1-2

| | | | |
|---|---|---|---|
| [1] | Delivery tray | [2] | Right cover |
| [3] | Paper guide | [4] | Cassette |
| [5] | Manual feeder slot | [6] | Front cover |
| [7] | Lamp unit | | |

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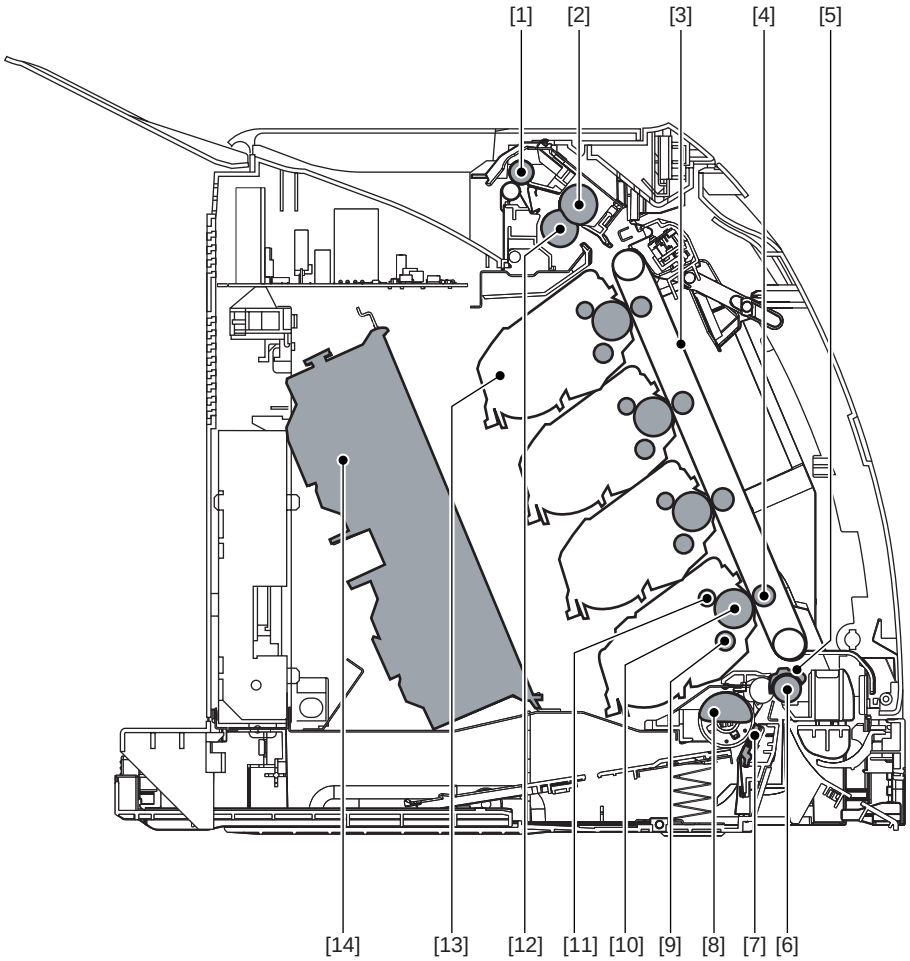
| | | | |
|---|---|---|---|
| [1] | Left cover | [2] | Rear cover |
| [3] | Cassette protective cover | [4] | Expansion board slot |
| [5] | USB port | [6] | Grounding wire terminal |
| [7] | Power supply switch | [8] | Power supply receptacle |
| [9] | Test Print Switch<br>(On the DC controller PCB) | | |

### 1.4.2 Cross Section View



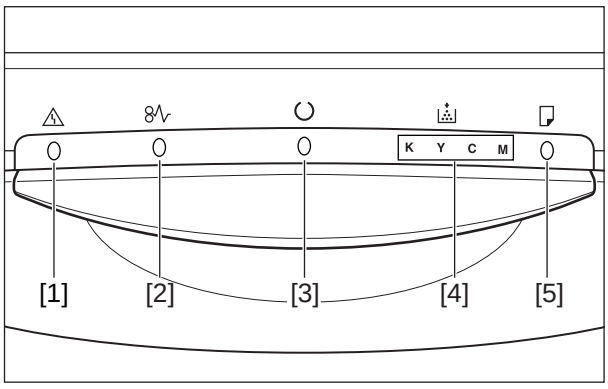

F-1-4

| | | | |
|---|---|---|---|
| [1] | Delivery roller | [2] | Fixing pressure roller |
| [3] | ETB | [4] | Transfer roller |
| [5] | Registration shutter | [6] | Registration roller |
| [7] | Separation pad | [8] | Pickup roller |
| [9] | Developing cylinder | [10] | Photosensitive roller |
| [11] | Primary charging roller | [12] | Fixing film unit |
| [13] | Toner cartridge | [14] | Laser/scanner block |

## 1.5 Using the Machine

### 1.5.1 Control Panel

The lamp unit used to indicate the state of the printer consists of multiple LEDs that go on or flash as follows:

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| LED | On/Flash | Description |
|---|---|---|
| Alarm Indicator [1] | on | Service call is occurring. |
| | flash | An error is occurring, disabling printing. |
| Paper Jam Indicator [2] | flash | A paper jam is occurring, disabling printing. |
| Ready Indicator [3] | on | The printer is in the sleep mode and ready to print. |
| | flash | engine in operation, printing The printer is busy performing some kind of processing or operation, such as printing, warming up, calibrating, or pausing a job. |
| Toner Indicator [4] | on | Toner cartridge replacement is required. |
| | flash | Cannot print because toner cartridge replacement is required or any toner cartridge is not installed properly.<br>Indicator of the color that requires toner cartridge replacement comes on or blinks. "K", "Y", "C", and "M" indicate black, yellow, cyan, and magenta respectively. |
| Load Paper Indicator [5] | on | There is no paper in any paper source. |
| | flash | No paper or paper of an inappropriate size is loaded. |

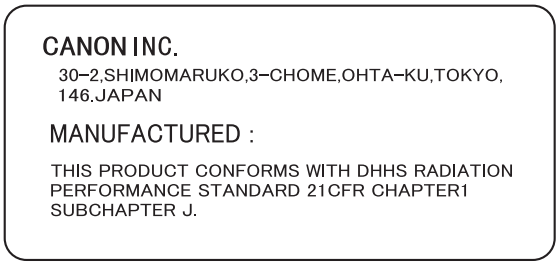
## 1.6 Safety

### 1.6.1 Safety of the Laser Light

Laser light can prove to be hazardous to the human body. The machine's laser unit is fully enclosed in a protective housing and external covers so that its light will not escape outside as long as the machine is used normally.

### 1.6.2 Regulations Under the Center for Devices and Radiological Health (CDRH)

The CDRH of the US Food and Drug Administration put into effect regulations governing the sale of laser products in the US on August 2, 1976. These regulations apply to all laser products produced on and after August 1, 1976, and a laser product cannot be sold unless it has been certified to comply with the regulations. The following is the label used to indicate that the product has been certified under the regulations, and all laser products sold in the US must bear the label.

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### 1.6.3 Handling the Laser Unit

The laser/scanner unit emits invisible laser beam. DO NOT disassemble the unit as the laser beam can possibly damage your eyes. The unit cannot be adjusted in the field. The following label is attached to the cover of the unit:


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### 1.6.4 Safety of Toner

The machine's toner is a non-toxic material composed of plastic, iron, and small amounts of dye.

⚠

Do not put the toner into fire. It may explode.

Toner on the Skin or Clothes
1. If your skin or clothes came into contact with toner, use dry tissue to remove the toner, and then wash with water.
2. Do not use warm or hot water, which will cause the toner to jell, permanently fusing it with the fibers of the clothes.
3. Do not bring toner into contact with vinyl material. They are likely to react with each other.

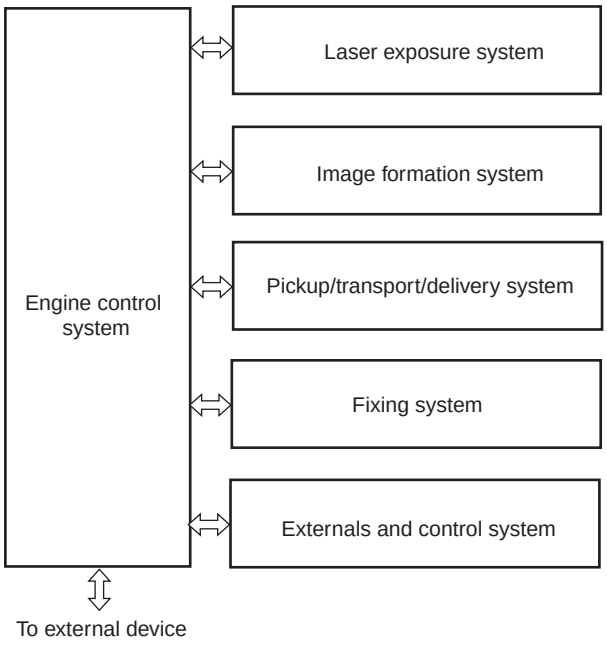
# Chapter 2 TECHNICAL REFERENCE

# Contents

# 2.1 Functional Configuration

## 2.1.1 Outline

The machine may be broadly divided into the following 6 functional blocks: engine control system, laser exposure system, image formation system, pickup/transport/delivery system, fixing system, and externals/auxiliary control system.

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# 2.2 Basic Sequense

## 2.2.1 Basic Sequence of Operation

The machine's sequence of operation is controlled by the CPU on its DC controller PCB. The following describes the machine's operation in respect of various intervals, from when the machine goes on until its main motor stops at the end of a print job:

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| Interval | | Description | Remarks |
|---|---|---|---|
| WAIT<br>(wait) | From when the power is turned on until the initial drive of the main motor stops. | To eliminate the drum surface potential, and to clean the ETB. | The machine checks the presence/ absence of cartridges during the interval. |
| STBY<br>(standby) | From when the wait period ends, or when last rotation ends, to when the video controller sends the print command; or, from when last rotation ends to when the power is turned off. | To make the machine ready for printing. | |
| INTR<br>(initial rotation) | From when the video controller sends the print command to when the pickup solenoid goes on. | To stabilize the sensitivity of the photosensitive drum in preparation for a print job. | |
| PRINT<br>(print) | From when initial rotation ends to when the developing high voltage goes off. | Forms a toner image on the photosensitive drum and transfers the image to print paper according to the video signal from the video controller. | |
| LSTR<br>(last rotation) | From when developing high voltage goes on to when the main motor stops. | To completely discharge the last print sheet. Also, to clean the ETB. | The machine starts initial rotation immediately in response to the print command for the video controller. |

## 2.2.2 Power-On Sequence

In power-on sequence, the machine resets itself to make sure that it is free of jams and faults. The machine goes through the following from when the power is turned on until it enters a standby state:

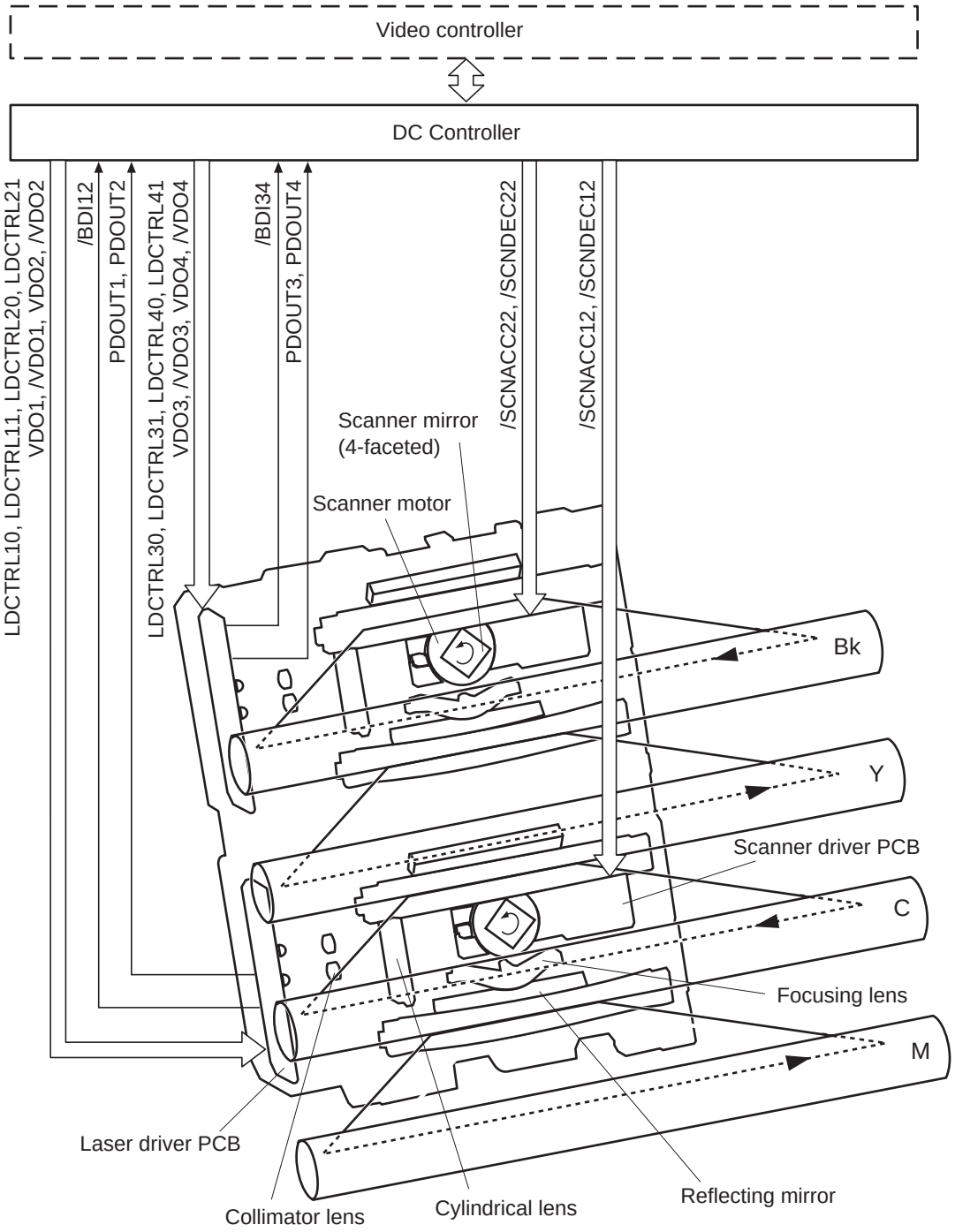
1) The power is turned on.
2) The CPU is initialized.
3) The ASIC is initialized.
4) The video interface communication is started.
5) Residual paper check by each sensor signaling paper presence.
6) Initial drive for main motor, pick-up motor, and fixing/delivery motor
7) Fixing heater initial drive by controlling fixing temperature targeting for 100 deg C.
8) Initial drive for scanner motor
9) Failure/Abnormality check
   Detect scanner failure, fixing unit failure, and door open during the above periods.
10) Communication with memory tag
11) Cartridge presence detection

# 2.3 LASER EXPOSURE SYSTEM

## 2.3.1 Overview/Configuration

### 2.3.1.1 Outline

The machine's laser/scanner system serves to form latent images on the photosensitive drum according to the video signals coming from the video controller PCB, and its principal components include the laser driver PCB and the scanner motor.
These components are grouped as a laser scanner unit, and are controlled by the DC controller PCB.

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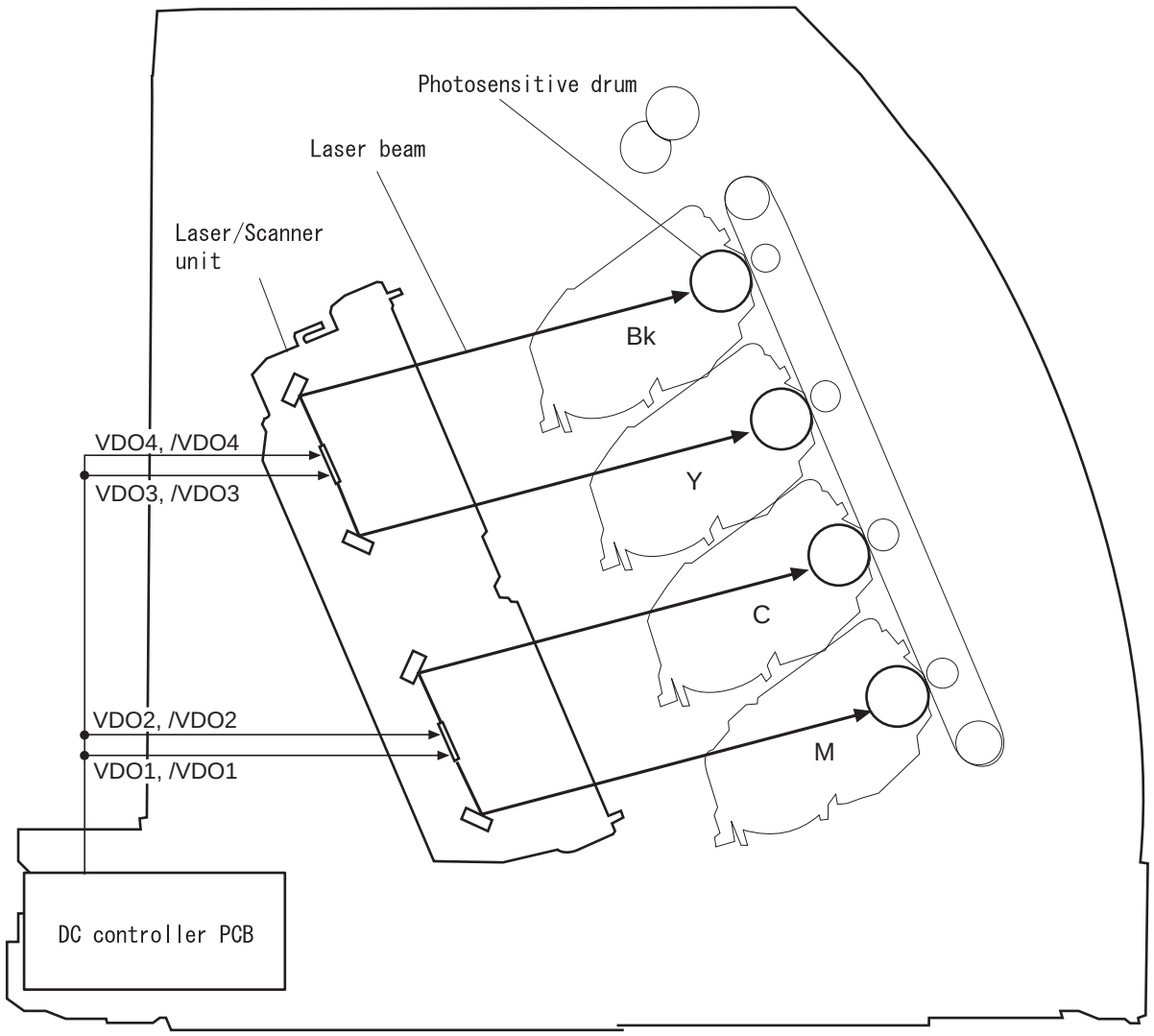
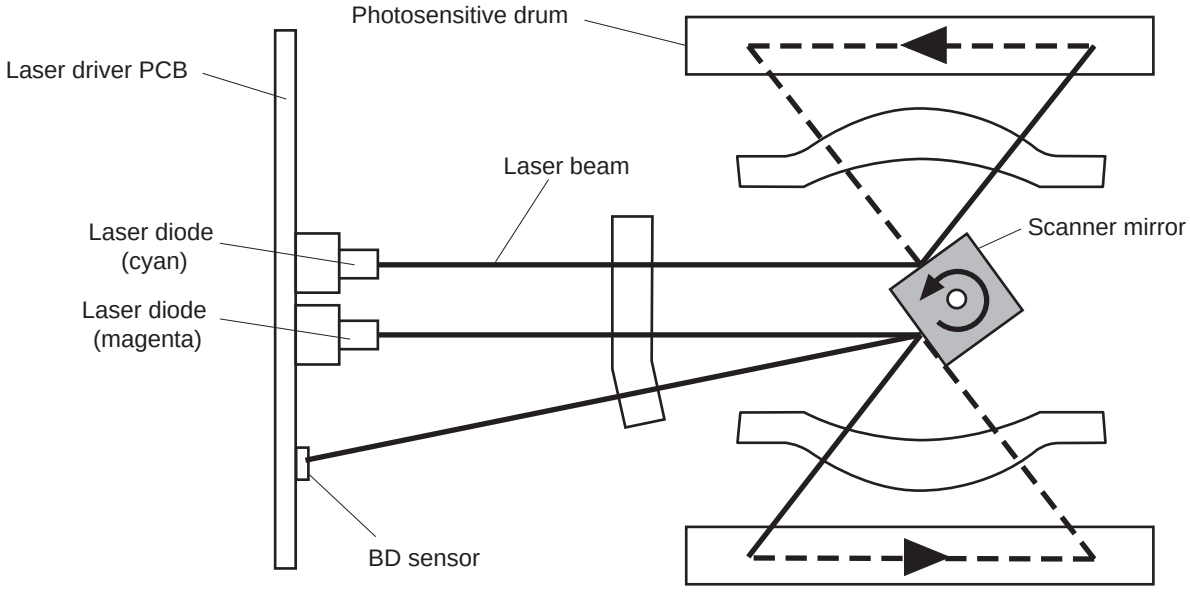



F-2-3

The machine's laser/scanner unit is designed in such a way that a single scanner mirror is used to guide 2 laser beams (colors) at the same time (4-laser/2-mirror method). Instead of the 4 scanner mirrors and scanner motors, the machine uses 2 mirrors and motors to perform the same mechanism, permitting the use of a smaller laser unit and, ultimately, a smaller machine size.
The machine uses 4 laser diodes, 2 each on the 2 laser driver PCBs. It uses 2 scanner motors with a single scanner mirror reflecting 2 laser beams (colors).

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The machine operates in the following sequence to execute a print job:
1) In response to the print command for the video controller PCB, the DC controller PCB rotates the scanner motor to turn the scanner mirror.
2) When the scanner motor starts to rotate, the DC controller PCB turns on the laser, and obtains /BD input signal from the BD sensor. The DC controller PCB finds out the speed of rotation of the scanner motor with reference to the timing of the /BD input signal to make sure that the motor rotates at a specific speed of rotation.
3) When the speed of the scanner motor has stabilized, the laser driver PCB turns on the laser diodes according to the video signal.

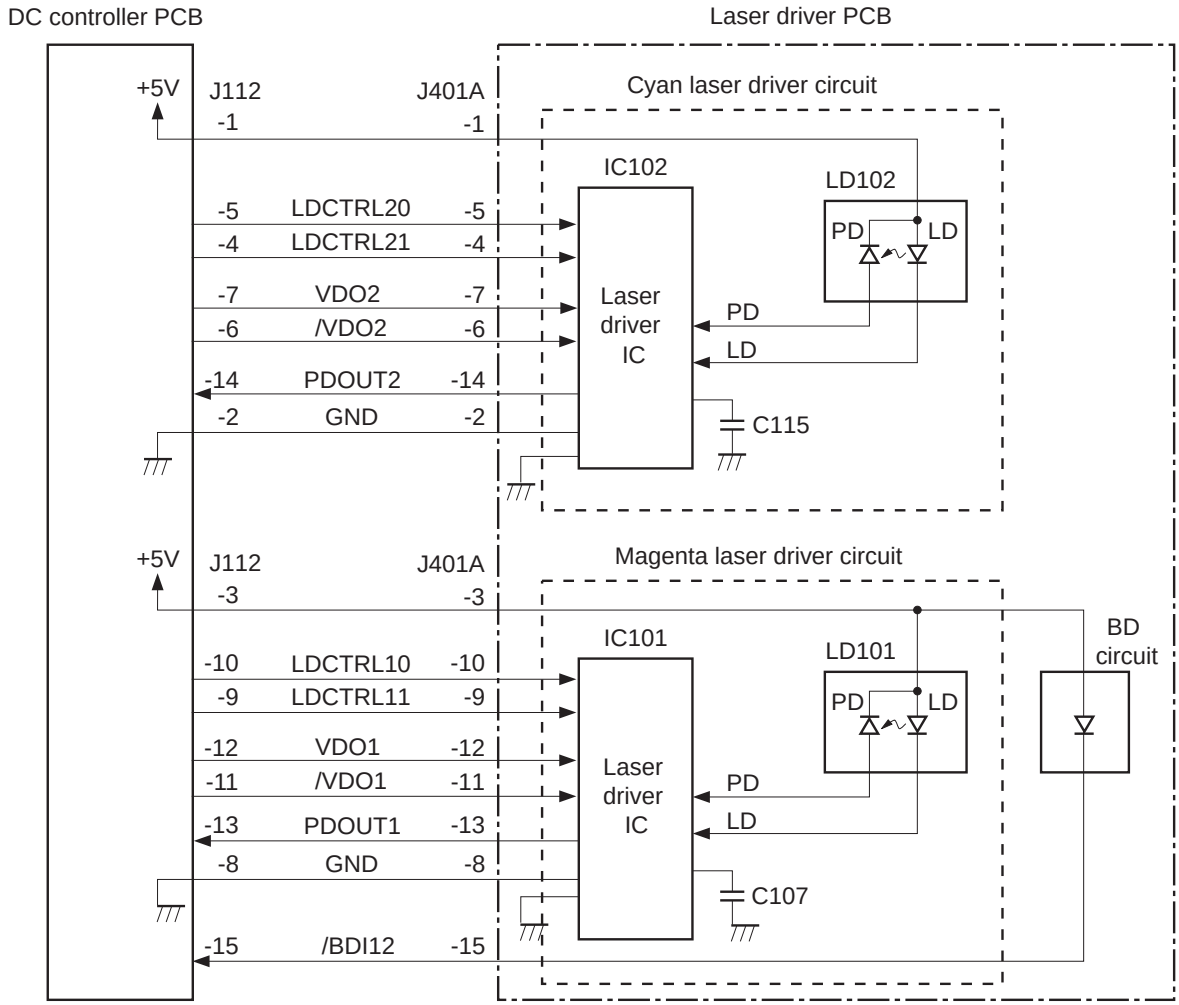
4) The scanner mirror reflects the laser beam while rotating at a specific speed so that the beam scans the surface of the photosensitive drum at a corresponding speed.
5) When the photosensitive drum rotates at a specific speed and, in addition, the laser beam scans the surface of the photosensitive drum at a corresponding speed, a latent image appears on the drum surface.

Note
1. Only one /BDI signal is generated to a scanner motor in this machine.
The /BDI signal to the scanner motor for M/C is generated by the reflection light from M laser, while the BDI signal to the scanner motor for Y/Bk is generated by the reflection light from Y laser. Based on the /BDI signal, the DC controller PCB generates BD signals for four colors and send them to the video controller PCB.
2. The machine uses a mechanism in which a single scanner mirror is used for 2 colors; in other words, the direction of scanning differs between colors. (In respect of the printed side of a print, M/Y starts at the right edge, while C/Bk starts at the left edge.)

### 2.3.2 Laser Control

#### 2.3.2.1 Outline

The machine's laser control consists in turning on and off the laser diode by the laser driver according to the laser control signal from the DC controller.
The machine's laser drive PCB is either for M/C or for Y/Bk; both PCBs are identical, and here, the descriptions are of the control mechanism associated with M/C.

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The DC controller sends video signals (VDO, /VDO, used to form images) and laser control signals (LDCTRL0, LDCTRL1, used to switch the operating mode of the laser driver circuit) to individual laser driver ICs, which control the laser activation based on the combination of laser control signals.
The machine controls its laser activation in the following 4 modes as dictated by the laser control signals:
1. laser activation control (turns on or off the laser diode according to the video signal)
2. auto photo current control (APC; makes sure that the intensity of the laser diode is at a specific level)
3. horizontal sync control (makes sure that the laser write start point in image horizontal direction is correct)
4. image mask control (makes sure that the laser beam will not be turned on in the non-image area outside the unblocking period)
The laser current output signal (PDOUT) is an analog signal that is the result of conversion of laser light into a corresponding level of current. The DC controller PCB sends the respective intensity information to the video controller, representing individual colors (laser beams), obtained from the PDOUT signal so that the video controller PCB may execute PWM adjustment to suit the selected gradation.

#### 2.3.2.2 Laser Emission Control

The machine turns on and off the laser diode (LD) according to video signals.
When the DC controller PCB switches the operating mode of the laser driver circuit to print mode, the machine turns on and off the laser diode (LD) at a specific intensity as dictated by the video signal (VDO, /VDO) coming from the video control.

#### 2.3.2.3 Automatic power control (APC)

The machine makes sure that the intensity of the laser diode (LD) remains at a specific level at all times.
The APC mechanism may be either initial APC or between-line APC, and both are controlled by the laser driver circuit as follows:
1) When the DC controller PCB switches the operating mode of the laser driver circuit to LD forced activation mode, the laser driver circuit forces the LD to go on.
2) A photodiode (PD) checks the intensity of the LD, and converts it into a voltage; it is then compared against the reference voltage (equivalent of the target laser

intensity) within the laser driver IC.
3) The laser driver circuit controls the laser current until the voltage of the laser is identical to the reference voltage.
4) Thereafter, the DC controller PCB switches the laser drive circuit to LD forced deactivation mode; in response, the LD is forced to go off. The laser driver circuit serves to retain the adjusted laser intensity using a capacitor (C107, C115).

**Initial APC**
The initial APC is executed when the scanner motor starts up, and is used to adjust the laser intensity.
**Between-Line APC**
The between-line APC is executed while printing is under way. The laser intensity is adjusted for each single line before drawing any line.

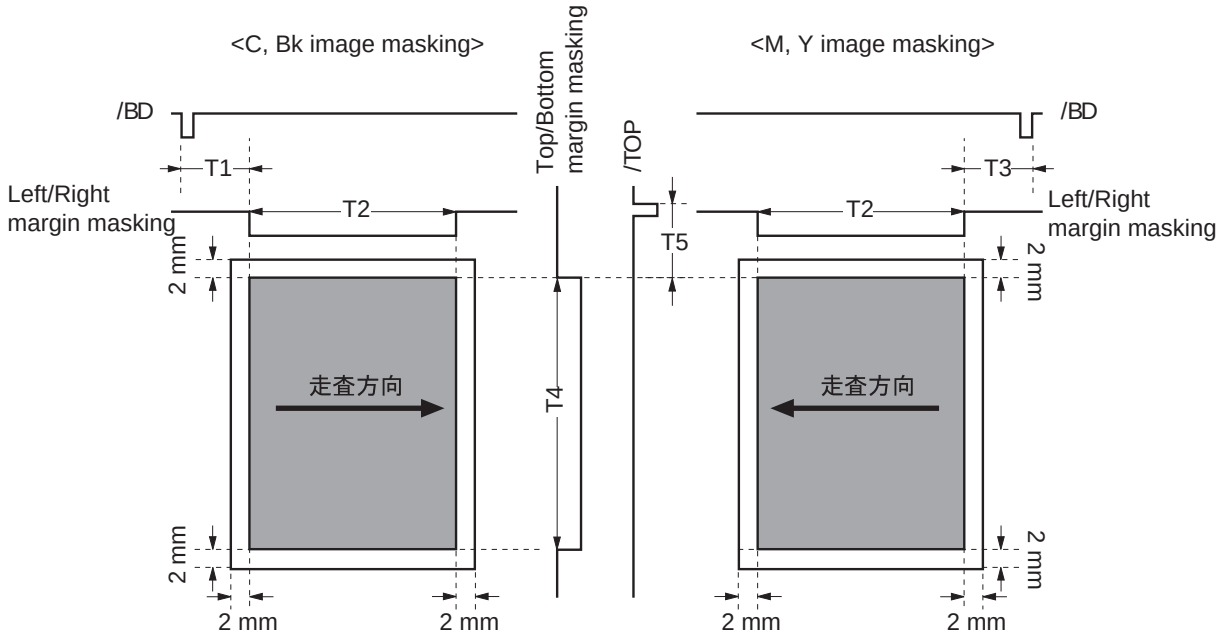
### 2.3.2.4 Horizontal synchronous control

The machine controls the laser write start print in horizontal direction as follows:
1) The DC controller PCB causes the laser driver circuit to execute LD forced activation mode in the course of an unblanking period, thereby forcing the laser diode (LD) to go on.
2) The point in the laser path at which the laser beam starts to scan is equipped with a small fixed mirror (BD mirror) used to reflect the laser beam, guiding it to the BD circuit inside the laser/scanner assembly.
3) The BD circuit detects the laser beam to generate the BD input signal (/BDI12) and sends it to the DC controller PCB.
4) The DC controller PCB generates the horizontal sync signal (M: /BD1; C: /BD2) based on /BDI12, and sends the result to the video controller PCB.
5) In response to the /BD1 and /BD2 signal, the video controller PCB sends video signals (VDO1, /VDO1, VDO2, /VDO2) to the DC controller PCB so that the image write position will be correct in horizontal direction.

1. The term "unblanking period" is used to refer to the period of time in which the laser diode is turned on in the non-image area.
2. The /BD1 signal is a timing signal like the /BDI12 signal. The /BD2 signal, however, is a signal that is newly generated based on the /BDI 2 signal.

### 2.3.2.5 Image Mask Control

The machine makes sure that the laser beam will not be emitted in a non-image area unless BD detection is under way.
While the laser beam scans a non-image area (except at the time of BD detection), the DC controller PCB causes the laser driver circuit to assume LD forced de-activation mode, thus forcing the laser diode to go off. The resulting state is referred to as an "image mask state," and the LD is not turned on in the presence of a video signal. The timing at which image mask control is executed is determined based on the paper size information coming from the video controller PCB. (The machine is not equipped with a mechanism used to identify the size of paper in the cassette.)

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1. The shaded area indicates that an image may be drawn using the laser beam.
2. The time intervals T1 through T4 vary depending on the selected paper size.
3. The time interval T5 varies according to individual colors.
4. If the paper size command from the video controller PCB does not specify the size of print paper in manual feed mode, the machine does not have a means to find out the width of paper; as such, the T1, T2, and T3 values will be based on LTR size, and the T4 value will be determined based on the length of paper detected by the registration paper sensor.

### 2.3.2.6 Fault Detection

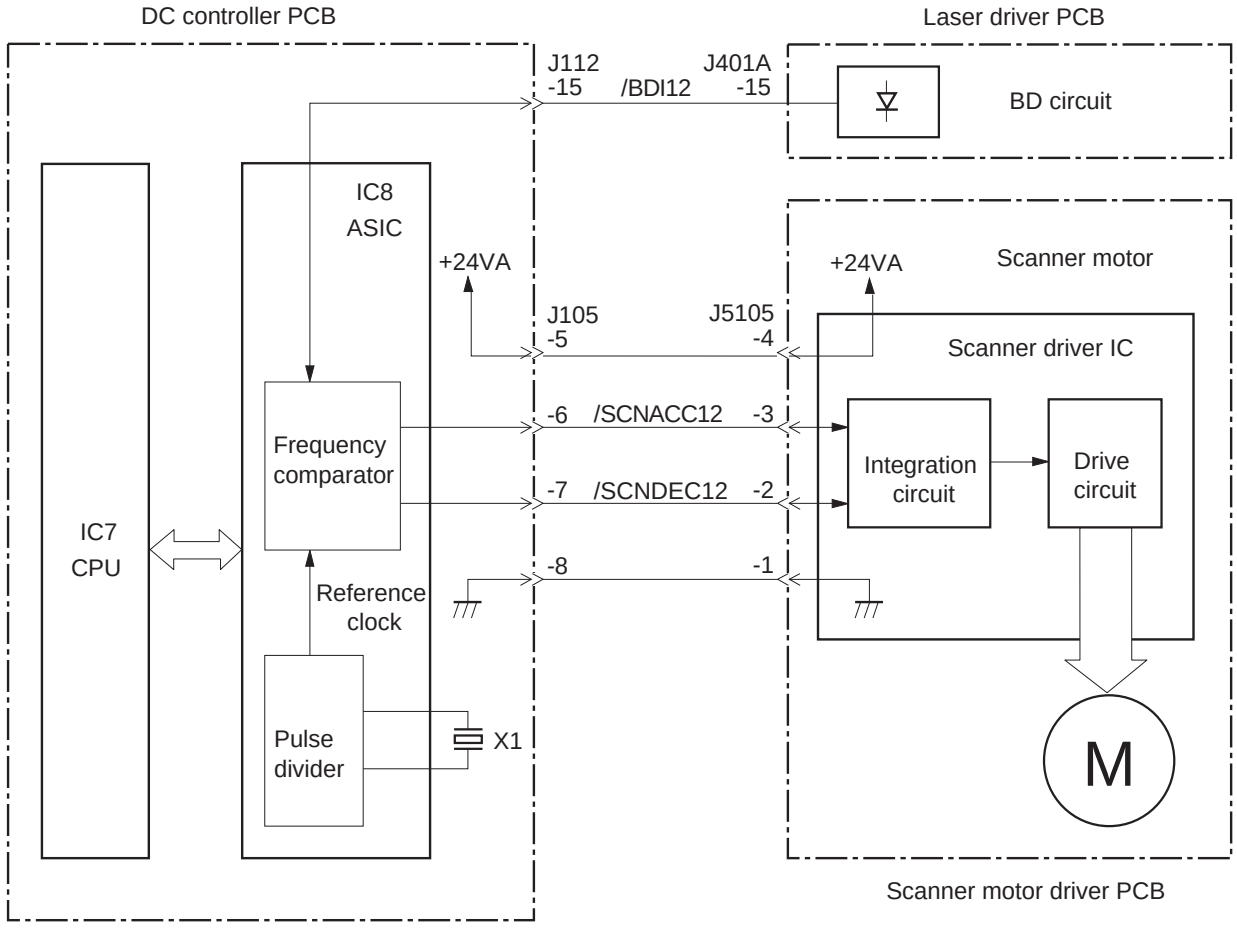
The machine possesses a mechanism used to check the laser diode for a fault.
In the course of initial APC, the laser IC converts the laser current of the laser diode into its corresponding level of voltage (PDOUT), and sends the result to the DC control PCB. If the voltage of the PDOUT signal is lower than a specific value, the DC controller PCB will identify the fact as the presence of a fault in the laser unit, stopping the printer engine and, at the same time, indicating 'E100' in the status window.

## 2.3.3 Laser Scanner Motor Control

### 2.3.3.1 Outline

The machine controls the rotation of the scanner motor so that the laser beam will correctly scan the surface of the photosensitive drum.

The scanner motor is a 3-phase, 8-pole DC brushless motor with a built-in Hall element. The drive circuit is part of the scanner motor, and its control circuitry is as shown in the following diagram:




F-2-7

The laser scanner motor control mechanism is initiated by the DC controller PCB. The DC controller PCB generates reference clock signals based on the oscillation frequency of an oscillator (X1). The frequency comparator compares the BD input signal (/BDI12) against the reference clock signal to monitor the rotation of the scanner motor. The DC controller PCB sends the scanner motor acceleration signal (/SCNACC12) and the scanner motor deceleration signal (/SCNDEC12) it has generated to suit the rotation of the motor to the scanner motor driver to control the speed of rotation.

1. speed control: used to rotate the scanner motor at a specific speed.
2. phase control: used to adjust the difference in phase between the 2 scanner mirrors occurring while the scanner motor is rotated at a specific speed, thereby eliminating the variation in rotation between lines and, ultimately, preventing displacement of color in sub scanning direction.

### 2.3.3.2 Speed Control

The machine controls the scanner motor so that it rotates at a specific speed as follows:

1) When the scanner motor starts up, the DC controller generates /SCNACC12 to force the scanner motor to increase its speed.
2) The DC controller PCB forces the laser to go on, and compares the interval of /BDI12 against that of the reference clock signal by way of monitoring the rotation of the scanner motor.
3) When the speed of the scanner motor reaches a specific value, the DC controller generates /SCNDEC12 to decrease the speed of the scanner motor. Thereafter, the DC controller generates /SCNACC12 or /SCNDEC12 to control the speed of the scanner motor.

### 2.3.3.3 Phase Control

The machine executes its phase control mechanism to correct the difference in phase between the 2 scanner mirrors while the scanner motor is rotating at a specific speed, thereby eliminating the variation between lines and, ultimately, preventing displacement of color in sub scanning direction.

1) When the scanner motor rotates at a specific speed in response to the phase control mechanism, the DC controller generates a phase reference clock signal based on the reference clock signal.
2) The DC controller compares the phase of /BDI12 against that of the reference clock signal using the frequency comparator to detect variation in rotation between lines.
3) If the phase of /BDI12 is behind that of the phase reference clock signal, the DC controller generates /SCNACC12; if ahead, it generates /SCNDEC12 to correct any variation in rotation between lines.

### 2.3.3.4 Fault Detection

The CPU monitors the frequency comparator of the ASIC to find out whether the scanner motor is rotating at a specific speed.
The CPU will identify any of the following conditions as the presence of a fault in the scanner motor, thus stopping the printer engine and, at the same time, indicating 'E100' in the status widow.

1. Scanner Motor Start-Up Error
   When the scanner motor is starting up, the machine does not detect a scanner ready state within 5 sec.
2. Scanner Rotation Error
   While the scanner motor is being rotated normally, the cumulative period of time during which the frequency of the /BDI signal deviates from a specific frequency range reaches a specific value (in terms of print distance, about 23 mm).
   If this condition occurs while image mask control is deactivated, the machine will identify it not as a fault but as a BD error.

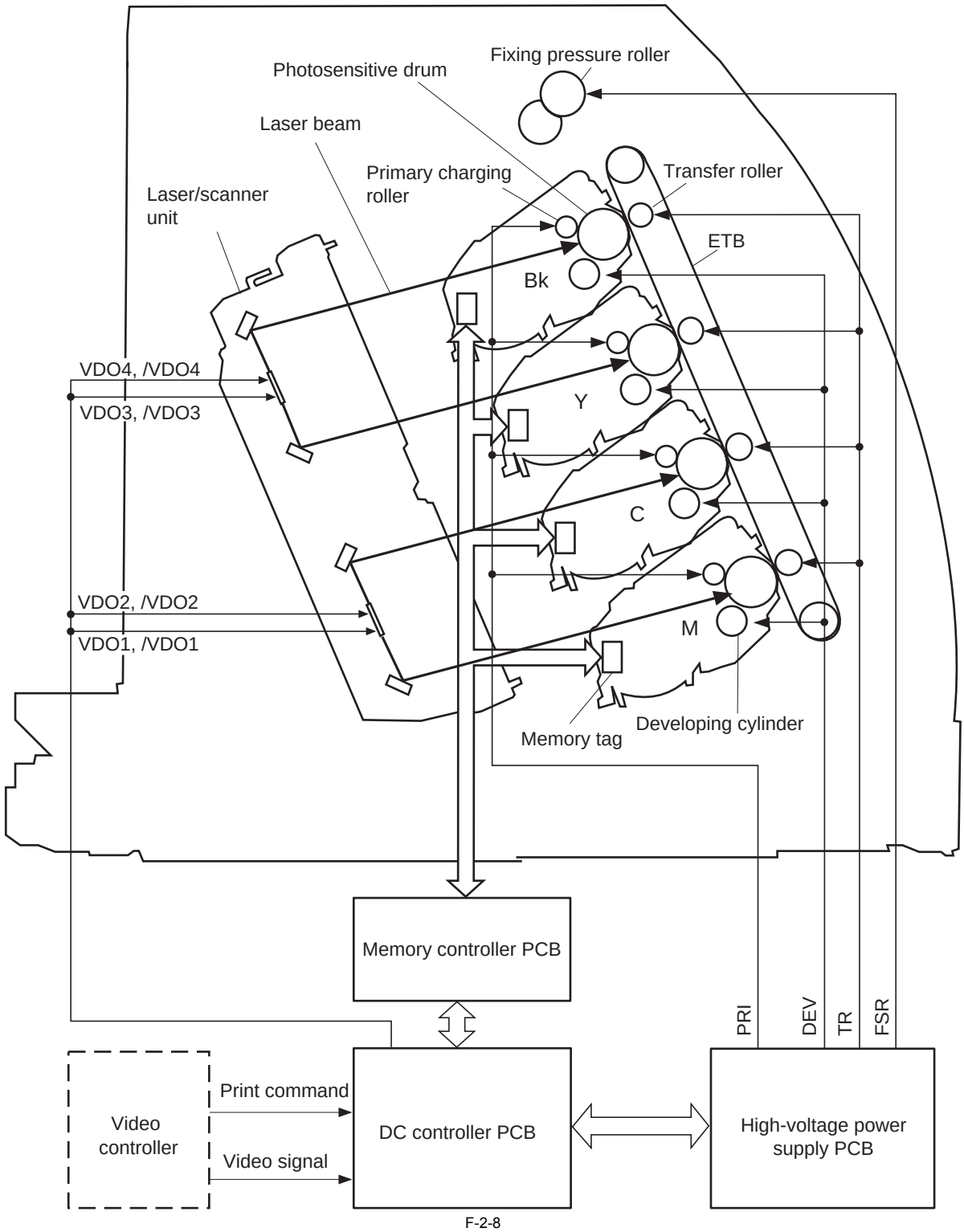
MEMO
While the scanner motor is rotating normally and image mask remains deactivated, the machine will identify a BD error if the frequency of the /BDI signal once deviates from a specific frequency range.

# 2.4 IMAGE FORMATION SYSTEM

## 2.4.1 Overview/Configuration

### 2.4.1.1 Outline

The image formation system is the core of the machine, in which toner images are formed and transferred to print paper.
The machine's image formation system is controlled by the DC controller PCB. When the print command arrives from the video controller PCB, the DC controller PCB controls the laser/scanner unit and the high-voltage power supply circuit to form a print image according to the video signal (VDO, /VDO).
The machine's cartridges are equipped with a memory tag that reads and writes data to suit instructions from the DC controller by way of the memory controller PCB.




F-2-8

### 2.4.1.2 Image Formation Process

The processes associated with the formation and printing of images are as follows:
The machine's printing processes may broadly be divided into the following 5 blocks (7 steps) during which a toner image is drawn on print paper as follows:

**1. Electrostatic latent image formation block**
Form an electrostatic latent image on the photosensitive drum.

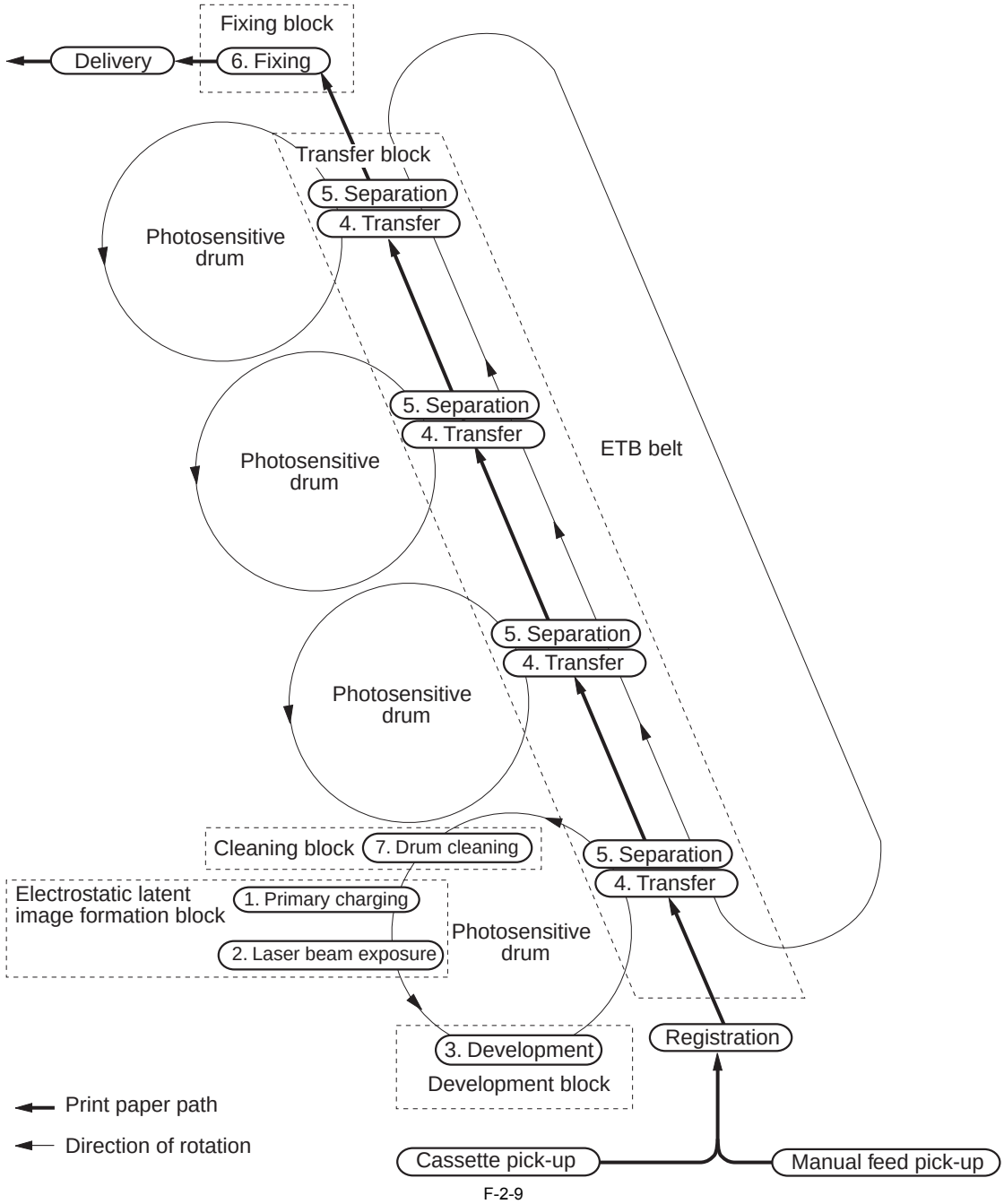
Step 1:Primary charging
Step 2:Laser beam exposure

**2. Developing block**
Make the electrostatic latent image on the photosensitive drum surface visible by applying toner.
Step 3:Development

**3. Transfer block**
Transfer a toner image on the photosensitive drum onto paper.
Step 4:Transfer
Step 5:Separation

**4. Fixing block**
Fix the toner image on paper
Step 6:Fixing

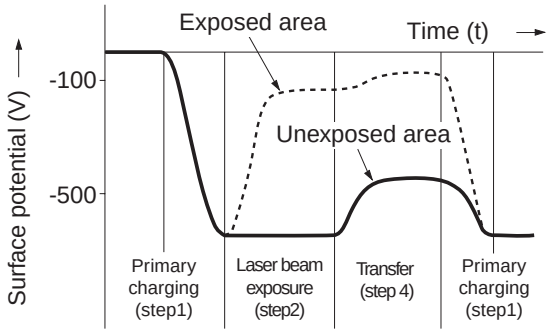
**5. Drum cleaning block**
Clean the residual toner on the photosensitive drum.
Step 7:Drum cleaning




F-2-9

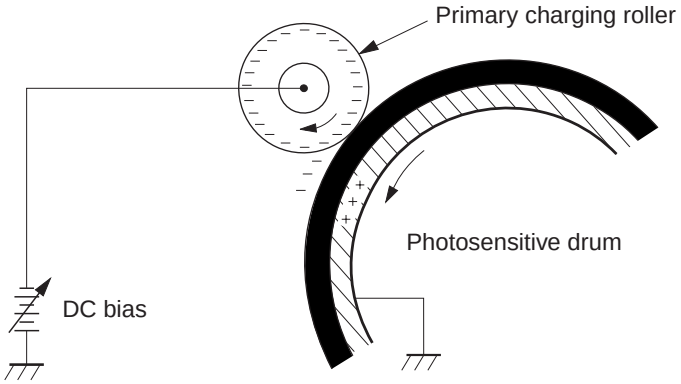
### 2.4.1.3 Electrostatic latent image formation block

This block consists of 2 steps during which a latent static image is formed on the surface of the photosensitive drum.
At the end of this block, the area of the drum that has not been exposed by the laser beam retains negative charges (dark area) while the area exposed by the laser beam is rid of negative charges. The resulting pattern is not visible to the human eye, thus the name "electrostatic latent image."



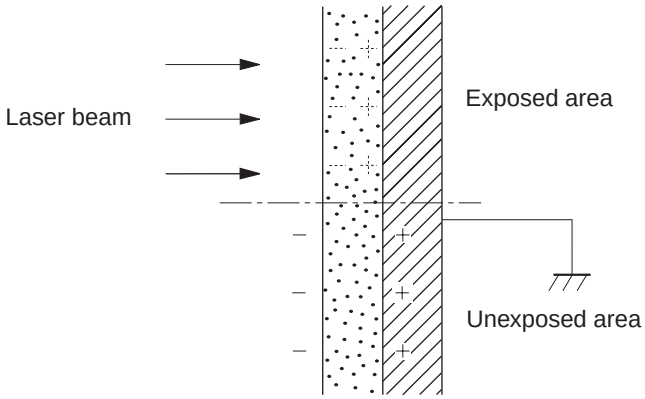

F-2-10

**Step 1: Primary charging**
To prepare for the formation of a latent image, the surface of the drum is charged to a uniform negative potential.
The primary charging roller operates in keeping with the photosensitive drum, and directly charges the surface of the drum. The roller is made of conducting rubber, and a DC bias is applied to charge the surface of the photopositive drum to a negative potential.




F-2-11

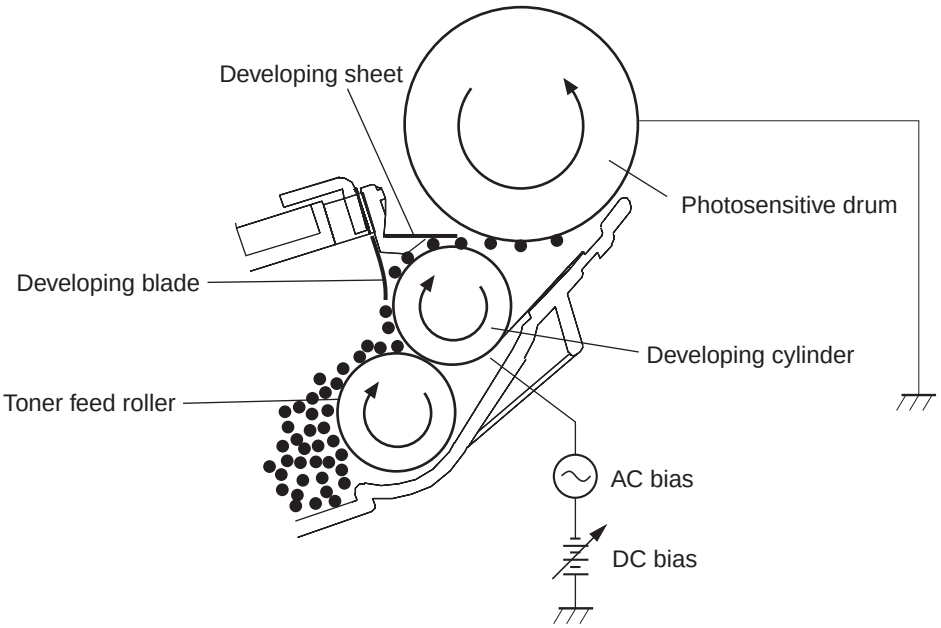
**Step 2: Laser beam exposure**
When the laser beam is scanned over the surface of the photosensitive drum, the charges in the light area are neutralized, forming a latent (static) image.




F-2-12

### 2.4.1.4 Developing block

In this block, toner is deposited over the latent (static) image on the surface of the photopositive drum, turning it into a visible image. The machine uses a toner projection method to develop images in combination with non-magnetic, 1-compeonet toner.
**Step 3: Developing**

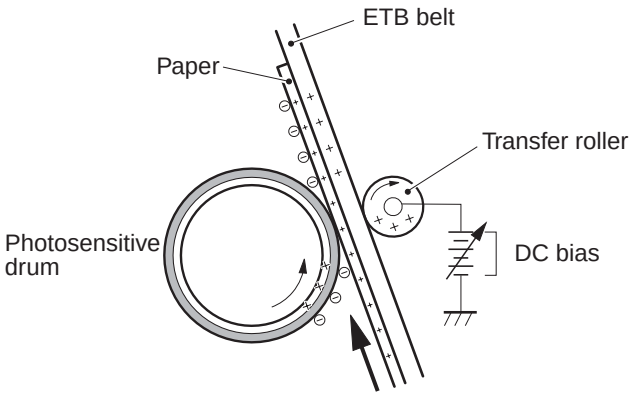



F-2-13

The toner (developer) used by the machine has insulating properties, and is charged to a negative potential as a result of friction against the surface of the developing cylinder and the developing blade.
The area of the surface of the photosensitive drum exposed by the laser beam has a higher potential than the negatively charged toner on the cylinder. When such an area moves close to the toner layer on the cylinder (possessing a negative potential), the difference in potential between the surface of the drum and that of the cylinder (i.e., the drum has a higher potential) causes the toner to jump to the drum surface. This phenomenon is referred to as "toner projection," and is used to turn the latent (static) image on the surface of the photosensitive drum into a visible image.
To facilitate the movement of toner to the surface of the photosensitive drum, and also to enhance the contrast of the output image, an AC bias is applied to the developing cylinder.
The machine changes the developing bias according to the image density information signal from the video controller to vary the difference in potential of the surface of the cylinder and that of the photosensitive drum, thus permitting the adjustment of the image density.
The development sheet is used to improve image quality while blocking stray toner.

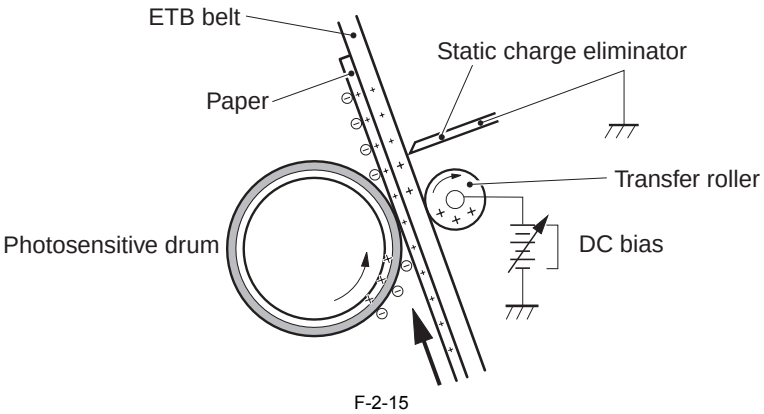
### 2.4.1.5 Transfer block

In this step, the toner image on the surface of the photosensitive drum is moved to print paper.
**Step 4: Transfer**




F-2-14

A positive charge is applied to the back of the print paper to attract the toner from the surface of the photosensitive drum to the paper. This process is repeated for M, C, Y, and Bk in sequence, thus forming a toner image consisting of 4 colored layers on the paper.
**Step 5: Separation**

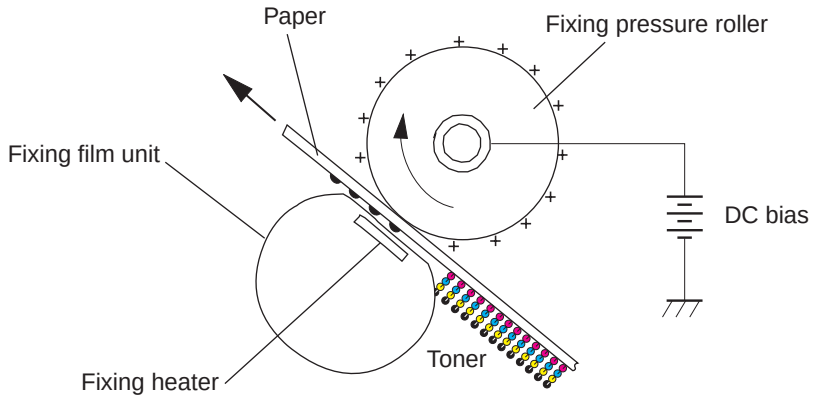



F-2-15

The rigidity of print paper is used to separate it from the drum. (curvature separation)
To prevent a toner splash in print images (in the form of dots, mostly occurring in a low temperature, low humidity environment), the machine is equipped with a static eliminator. The static eliminator is used after transfer to decrease the charge on the back of print paper, and also to help make sure of the proper movement of paper.

### 2.4.1.6 Fixing block

In this block, the toner image is permanently fused with the fibers of print paper.
Upon transfer to print paper in the transfer block, the toner image remains on the paper because of static bonding. It would, therefore, be disrupted if touched (e.g., by a hand). In this block, the toner and the print paper are subjected to mechanical pressure and heat so that the toner will melt and fuse with the fibers of the paper.
**Step 6: Fixing**

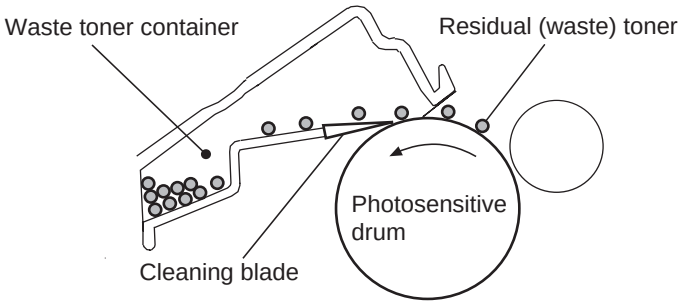



F-2-16

In this step, an on-demand fixing method is used to permanently fix the toner image on the print paper.
The machine uses a ceramic heater, which has a high heating efficiency; specifically, it starts up fast, and does not require power while the machine is in a standby state. Its wait time, moreover, is short, and is generally characterized by its high energy efficiency.
The machine applies a positive DC bias to the fixing pressure roller to increase the retention of negatively charged toner on print paper, thus conversely preventing the adhesion of unwanted toner on the fixing film (offset).

### 2.4.1.7 Drum cleaning block

In the transfer block, not all the toner on the surface of the photosensitive drum is moved to the print paper; in other words, there will always be residual toner remaining after transfer.
In the drum cleaning block, the surface of the photosensitive drum is "cleaned" in preparation for the upcoming print job, ensuring that the next image will also be reproduced as desired.
**Step 7: Drum cleaning**



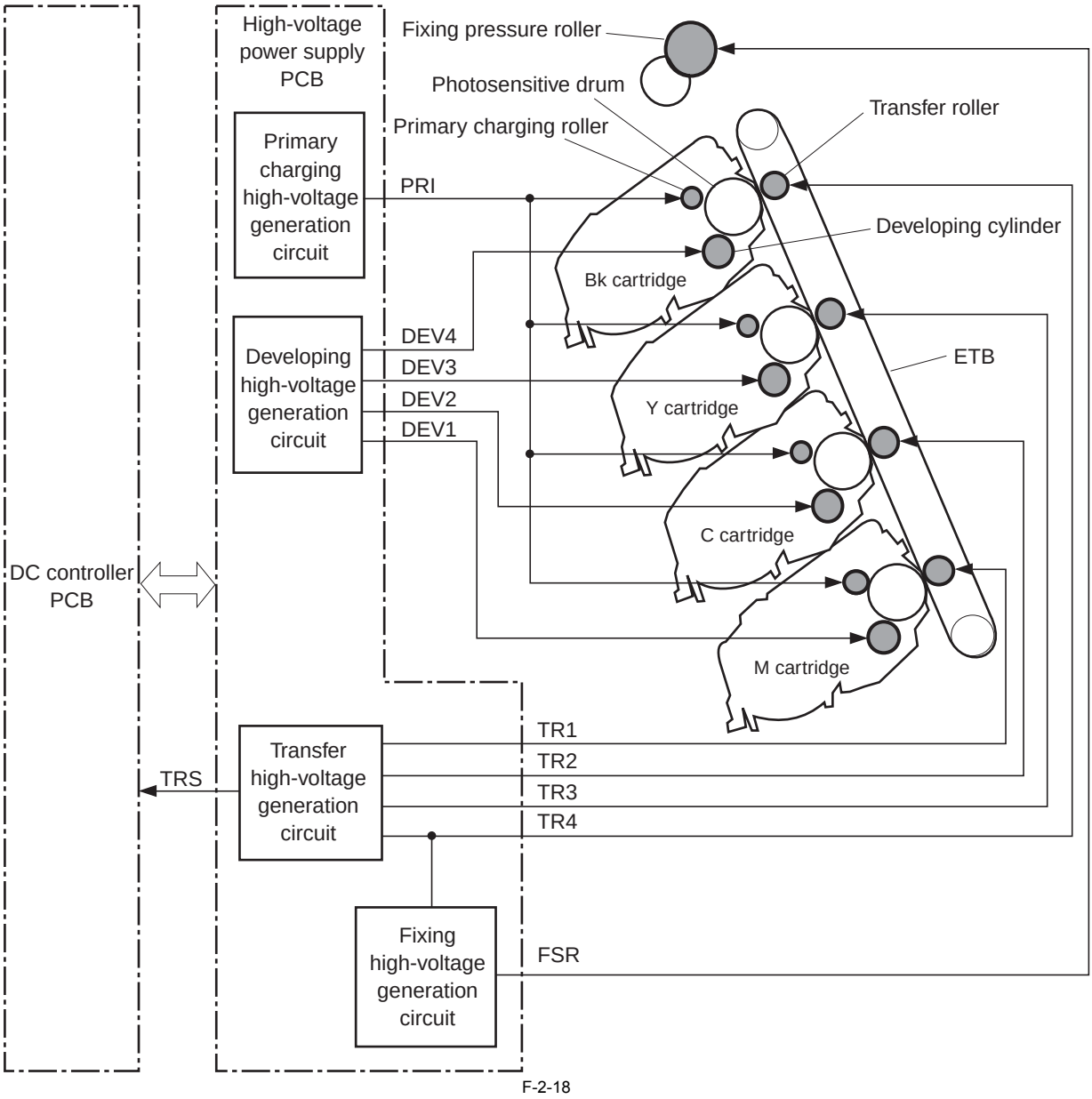

F-2-17

In preparation for the next print job, the machine uses the cleaning blade to scrape off the residual toner from the drum surface by way of "cleaning" the surface. The toner thus removed from the drum surface is collected inside the cleaner casing.

## 2.4.2 High-Voltage Control

### 2.4.2.1 Outline

A high-voltage circuit is used in conjunction with the application of various biases to the primary charging roller, developing cylinder, transfer roller, and fixing pressure roller. These high-voltage biases are generated by the DC controller PCB through control of the high-voltage power supply circuit.




F-2-18

### 2.4.2.2 Generation of the Primary Charging Bias

The primary charging bias (PRI) is used to charge the surface of the photosensitive drum to a uniform negative potential in preparation for image formation.
The machine's primary charging bias is a negative DC bias generated by the primary charging high voltage generation circuit found on the high-voltage power supply PCB. The high-voltage power supply PCB applies the primary charging bias it has generated to the primary charging roller of the individual cartridges at specific timing.
The level of the primary charging bias varies according to the instructions from the DC controller PCB.

### 2.4.2.3 Generation of the Developing Bias

The developing bias (DEV1, DEV2, DEV3, DEV4) is used to deposit toner over the latent (static) image formed on the surface of the photosensitive drum.
The developing bias is generated by the developing high-voltage generation circuit of the high-voltage power supply PCB, and may be a negative DC bias or AC bias. The high-voltage power supply PCB applies a combination of these 2 types of biases to the developing cylinder of the cartridge at specific timing.

The level of the developing bias varies according to the instructions from the DC controller PCB.

### 2.4.2.4 Generation of the Transfer Bias

The transfer bias (TR1, TR2, TR3, TR4) is used to move the toner image from the surface of the photosensitive drum to the print paper.
The transfer bias is generated by the transfer high-voltage generation circuit of the high-voltage power supply PCB, and may be a positive DC bias or negative DC bias. The high-voltage power supply PCB applies these 2 types of transfer biases to the transfer roller according to the selected printing sequence.
The machine applies these biases in keeping with the following printing sequence:

**- Print Bias (positive DC bias)**
While printing sequence is under way, the machine uses the print bias to transfer the toner from the surface of the photosensitive drum to print paper.

**- Sheet-to-Sheet Bias (positive DC bias)**
While continuous printing is under way, the machine uses the sheet-to-sheet bias to make sure that the residual toner on the photosensitive drum will not move to the surface of the ETB.

**- Cleaning Bias (negative DC bias)**
The machine uses the cleaning bias to move the toner sticking to the ITB back to the photosensitive drum.
The level of the transfer bias varies according to the instructions from the DC controller PCB.
The DC controller PCB adjusts the output of the transfer bias according to the transfer current feedback signal (TRS) from the transfer bias generation circuit to maintain a specific level of transfer efficiency (constant current control).

### 2.4.2.5 Generation of the Fixing Bias

The machine uses the fixing bias (FSR) to prevent the movement of toner from the print paper to the fixing film before fixing.
The fixing bias may be a positive DC bias or a negative DC bias generated by the fixing high-voltage generation circuit of the high-voltage power supply PCB. The machine applies the fixing bias to the fixing pressure roller at specific timing.

## 2.4.3 Image Stabilizaton Control

### 2.4.3.1 Overview of the Image Stabilization Control Mechanism

The machine uses its image stabilization control mechanism to prevent lowering of image quality (e.g., in the form of a faulty image) otherwise caused by changes in the environment or deterioration of the photosensitive drum or toner.
The machine's image stabilization control mechanism may be any of 4 types: Environment corrective control, Image density corrective control (D-max control), Image halftone corrective control (D-half control), Color Misregistration Corrective Control.

T-2-2

| Condition | Control item | | | | Remarks |
|---|---|---|---|---|---|
| | Environment corrective control | D-max control | D-half control | Color Misregistration Corrective Control | |
| When the power is turned on | Yes | Yes | Yes | Yes | |
| When a cartridge has been replaced | Yes | Yes | Yes | Yes | |
| When a specific number of prints have been made | | Yes | Yes | Yes | |
| When an appreciable change has occurred in the environment | Yes | Yes | Yes | | |
| A specific period of time after the end of printing | | Yes | Yes | Yes | Executed as set by the user; however, not enabled in a sleep state. (OFF by default) |
| When the user requests calibration | | Yes | Yes | Yes | |

### 2.4.3.2 Environment corrective control

The DC controller checks the site environment with reference to the temperature/humidity information from the environment sensor (SR12), and controls the various high-voltage biases so as to ensure the production of optimum images.

The machine executes environment control at the following timing:
- when the power is turned on
- when a cartridge has been replaced
- when there has been an appreciable change in the environment

### 2.4.3.3 Image density corrective control (D-max control)

The machine executes image density correction to stabilize the image density by controlling the printer engine.
When a specific condition exists, the DC controller executes D-max control in the following sequence:
1. It measures the density patterns of individual colors drawn on the ETB.
2. It controls the primary charging bias and the developing bias based on the measurements of the individual patterns to ensure optimum density.

The conditions used to execute the mechanism are the following:
- when the power is turned on.
- when a cartridge has been replaced.
- when an appreciable change has occurred in the environment.

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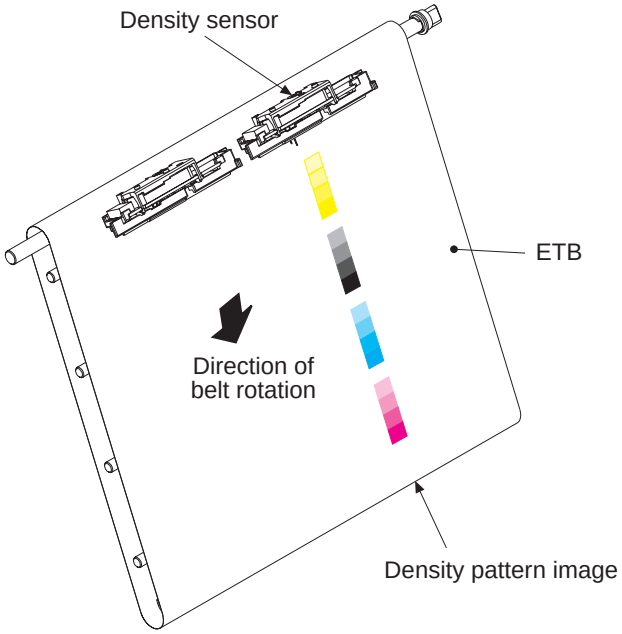
- when the user requests the execution of calibration.

### 2.4.3.4 Image halftone corrective control (D-half control)

The machine uses the video controller PCB to execute gradation control based on the measurements of the halftone density taken by the DC controller PCB.
When D-max control ends, the DC controller PCB and the video controller PCB executes D-half control in the following sequence:
1. The DC controller measures the density patterns of individual colors drawn on the ETB using the optimum primary charging bias and developing bias determined by D-max control, sending the result to the video controller PCB in the form of density data.
2. The video controller PCB executes gradation control based on the density data so that ideal halftone images may be obtained.

### 2.4.3.5 Image density detection control

The machine executes image density detection to enable D-max control and D-half control.
The machine shines light on the 4-color image density patterns formed on the ETB, and measures the intensity of the reflected light to identify the density of the patterns.
The density of an image is measured by the DC controller PCB using the reflection type/density sensor (SR10) mounted on the ETB.




F-2-19

If the light-receiving segment does not receive a sufficient amount of light at time of image density detection, the DC controller will indicate 'E020' in the status window. If the reading by the color displacement/density sensor (SR10) is outside a specific range, on the other hand, the DC controller sets the image density to the density control value used before the execution of the image density detection or the initial value, and indicate the presence of an "image measurement error" for the color in question.

### 2.4.3.6 Overview of Color Misregistration Corrective Control

The machine corrects displacement of color caused by the variation that may exist among individual laser/scanner units and cartridges. The types of displacement corrected by this mechanism are the following:
- main scanning direction write start position
- main scanning direction magnification
- sub scanning direction write start position

The color displacement correction mechanism is executed by the DC controller PCB through control of the color displacement/density sensor (SR10) and the color displacement sensor (SR11) for the following conditions:
- when the power is turned on or the door is closed after a cartridge has been replaced
- when a specific number of prints have been made (on a job basis)
- when the user requests the execution of calibration

The machine uses the following sequence when executing the mechanism:
1) The DC controller identifies the degree of displacement of individual colors based on the patterns drawn on the ETB, and sends the result to the video controller in the form of color displacement information.
2) In response, the video controller controls the video signals of the individual colors based on the color displacement information it has received to adjust the main scanning direction write start position, main scanning direction magnification, and sub scanning direction write start position.
   On the printer engine side, the DC controller PCB controls the speed of the scanner motor to correct any displacement of color in sub scanning direction.

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**Scanning Magnification**
The term "scanning magnification" refers to the size of an image in main scanning direction.
The machine's photosensitive drums are independent among individual colors, and the possible variation between drums leads to different optical paths. The fact in turn means variation in the imaging area in main scanning direction among colors, causing color displacement along the image edge if left unattended.

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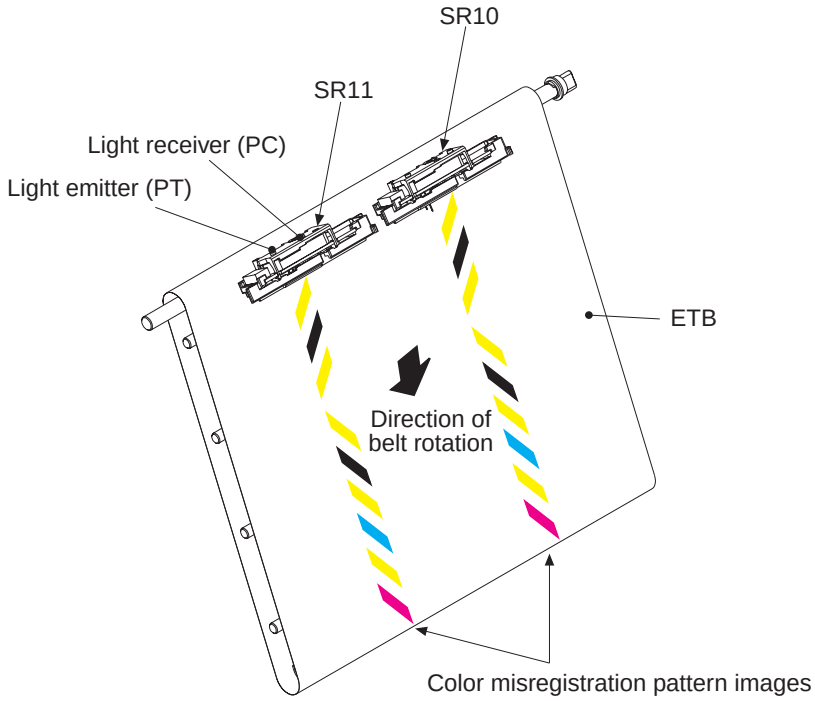
### 2.4.3.7 Color misregistration detection

The machine checks the position of the 4 color displacement patterns (colors) formed on the ETB.
When color displacement correction control is executed, the DC controller PCB controls the color displacement/density sensor (SR10) and the color displacement sensor (SR11). The color displacement/density sensor (SR10) and the color displacement sensor (SR11) are located on the ETB, and each consists of 2 segments (i.e., light-emitting LED and light-receiving phototransistor).
The machine uses the following sequence to execute color displacement detection:
1) The DC controller PCB turns on the LED, and checks the light reflected by the ETB. At this time, the intensity of the reflected light differs depending on the presence (color displacement pattern) and the absence (ETB) of toner.
2) The DC controlled PCB checks the location of the detection pattern with reference to the timing at which the intensity of reflected light changes.



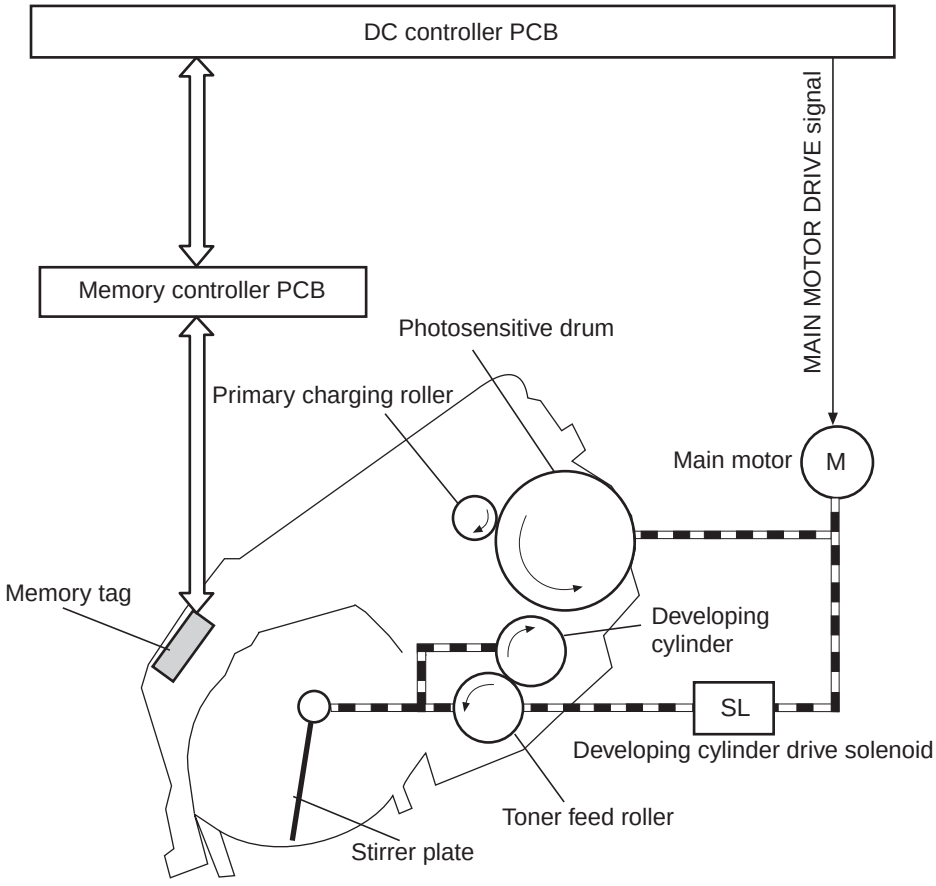

F-2-20

If any of the following errors occurs in the course of color displacement detection, the DC controller will indicate the fact in the status window. The presence of an error causes the use of the default value as the color displacement value:
- E194 (none of the patches of the color displacement pattern has been detected)
- CPR sensor detection error (the result of measurement is outside a specific range)

### 2.4.4 Toner Cartridge

#### 2.4.4.1 Outline

The cartridge is equipped with a mechanism used to form a visible image on the surface of the photosensitive drum using toner. Such an image may be any of 4 colors (magenta, cyan, yellow, black), and all of them have the same construction.




F-2-21

The cartridge consists of the following: photosensitive drum, primary charging roller, developing cylinder, toner feed roller, stirring plate, memory tag.
The developing cylinder, toner feed roller, stirring plate, and photosensitive drum are rotated by the main motor, and the primary charging roller operates in con-

junction with the photosensitive drum.
The drive to the developing cylinder, toner feed roller, and stirring plate is transmitted by way of the developing cylinder drive solenoid. The solenoid may be the Bk developing cylinder drive solenoid (SL3) or the MCY developing cylinder drive solenoid (SL2). When a Bk print is made, SL2 is left off so that the drive of the main motor will not reach the developing cylinder. When the ETB is being cleaned, both SL2 and SL3 are off, not permitting the drive of the main motor to reach any of the developing cylinders.

### 2.4.4.2 Memory Tag Control

The machine checks the usage of the cartridge with reference to the data retained in its memory tag. If it finds that a read/write operation has failed, it will indicate a message in the status window to prompt the user to check the connection of the toner cartridge.

### 2.4.4.3 Detection of Toner cartridge presence/absence

This machine detects if a toner cartridge is mounted on the printer.
The DC controller PCB recognizes that the toner cartridge is absent if the color displacement/density sensor cannot find any of the detection patterns written in the ETB.
Then, the PCB shows the message “Toner cartridge is absent.” on the status window.
If detecting an improper insertion of the cartridge, the PCB shows the message “Toner cartridge is not mounted on the correct position.” on the status window.

### 2.4.4.4 Detecting the End of Life of the Cartridge

The machine monitors the cartridges to see if any of them has reached the end of its life.
The DC controller checks the following 3 types of life data, and sends the result to the video controller PCB:
1) photosensitive drum life (in terms of cumulative use of the drum)
2) developing assembly life (in terms of cumulative use of the cylinder)
3) toner level (with reference to the time it takes for light to move through the cartridge while printing is under way)
If any of the 3 values is exceeded, the DC controller PCB will identify the condition as indicating the end of life of the cartridge in question, and will indicate a message to that effect in the status window.
The life of a cartridge is expressed in 2 sates, i.e., in terms of "alert" and "warning" in the status window.

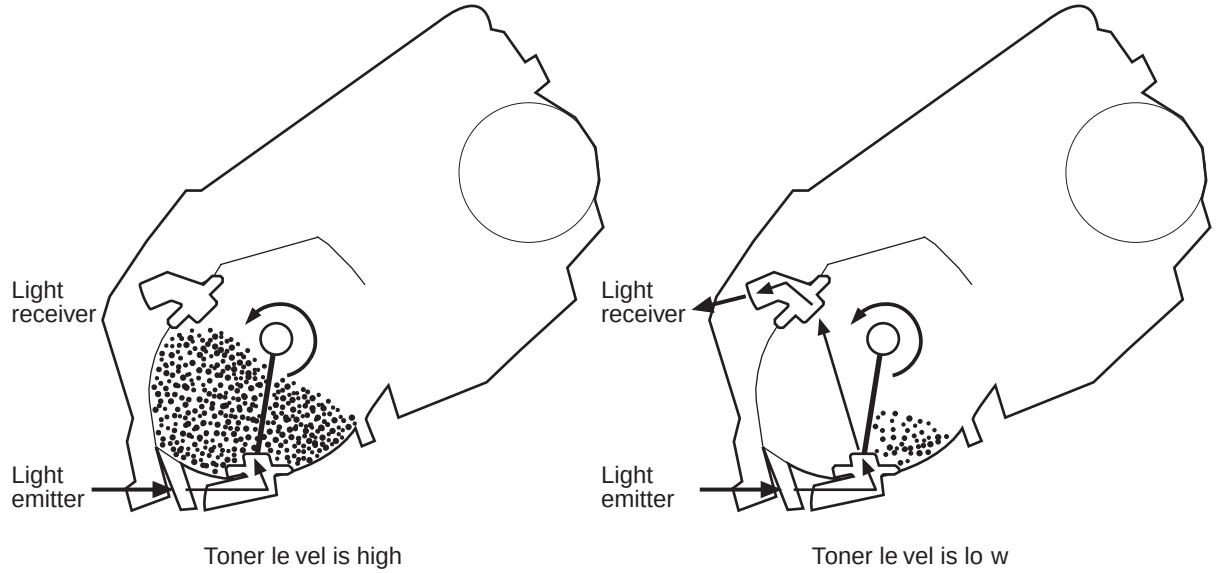
T-2-3

| Type | Warning | Alert | Remacks |
|---|---|---|---|
| Black | about 2500 impressions | 2250 impressions | A4 paper, 5% print ratio per side |
| Color | about 2000 impressions | 1750 impressions | A4 paper, 5% print ratio per side |

When the life of developing assembly or photosensitive drum is detected, a message “Check the toner cartridge” is shown on the status window. In this case, pressing the error reset button enables to continue printing.
If the toner absence is detected, a message “Toner cartridge needs replacing” appears on the status window.
If the Bk toner absence is detected, the machine will stop working.
If the color toner absence is detected, only monochrome print can be done.

### 2.4.4.5 Detecting the Level of Toner

The machine monitors the level of toner inside the cartridge.
To find out how much toner remains, the DC controller PCB refers to the time it takes for light to move through the cartridge while printing is under way.
The memory controller PCB is mounted to the back of the toner cartridge, equipped with a light-emitting segment (LED) and a light-receiving segment (photodiode). When printing starts, the DC controller turns on the LED. The light from the light-emitting segment moves along the light guide to move into the toner case, through the toner case, and along the opposite light guide to reach the light-receiving segment.




F-2-22

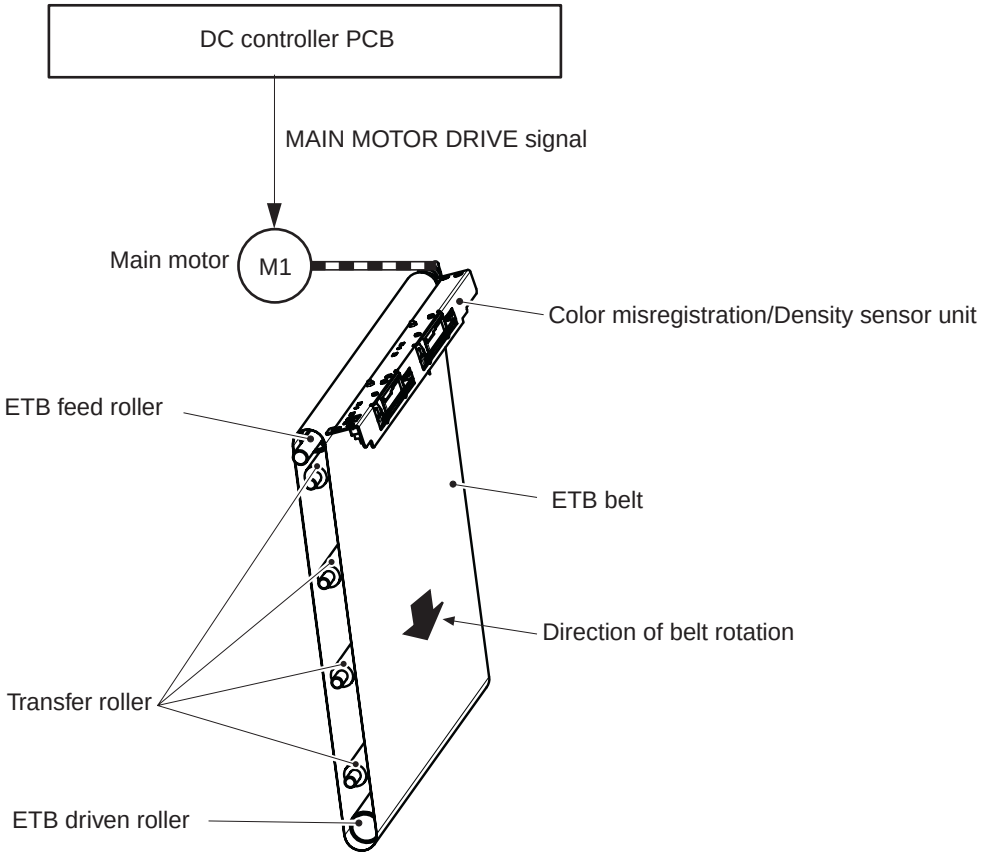
When there is much toner inside the toner case, the light is blocked by the toner, not reaching the light-receiving segment. On the other hand, when there is little toner, the light moves through to reach the light-receiving segment. The DC controller PCB identifies the level of toner remaining inside with reference to the period of time during which light hits the light-receiving segment while the stirring plate makes a single rotation.
The DC controller communicates the level of toner it has identified (as being sufficient, being insufficient, and being absent; 3 levels) to the video controller. If the light-receiving segment continuously receives light while the stirring plate rotates 5 times, the DC controller will identify the condition as indicating that the toner level sensor is out of order, thus stopping the printer engine and, at the same time, indicating 'E024' in the status window.

### 2.4.5 Transfer Unit

### 2.4.5.1 ETB Unit

The ETB unit serves to move print paper and also transfer toner to the print paper.

The following is an outline diagram of the ETB unit:



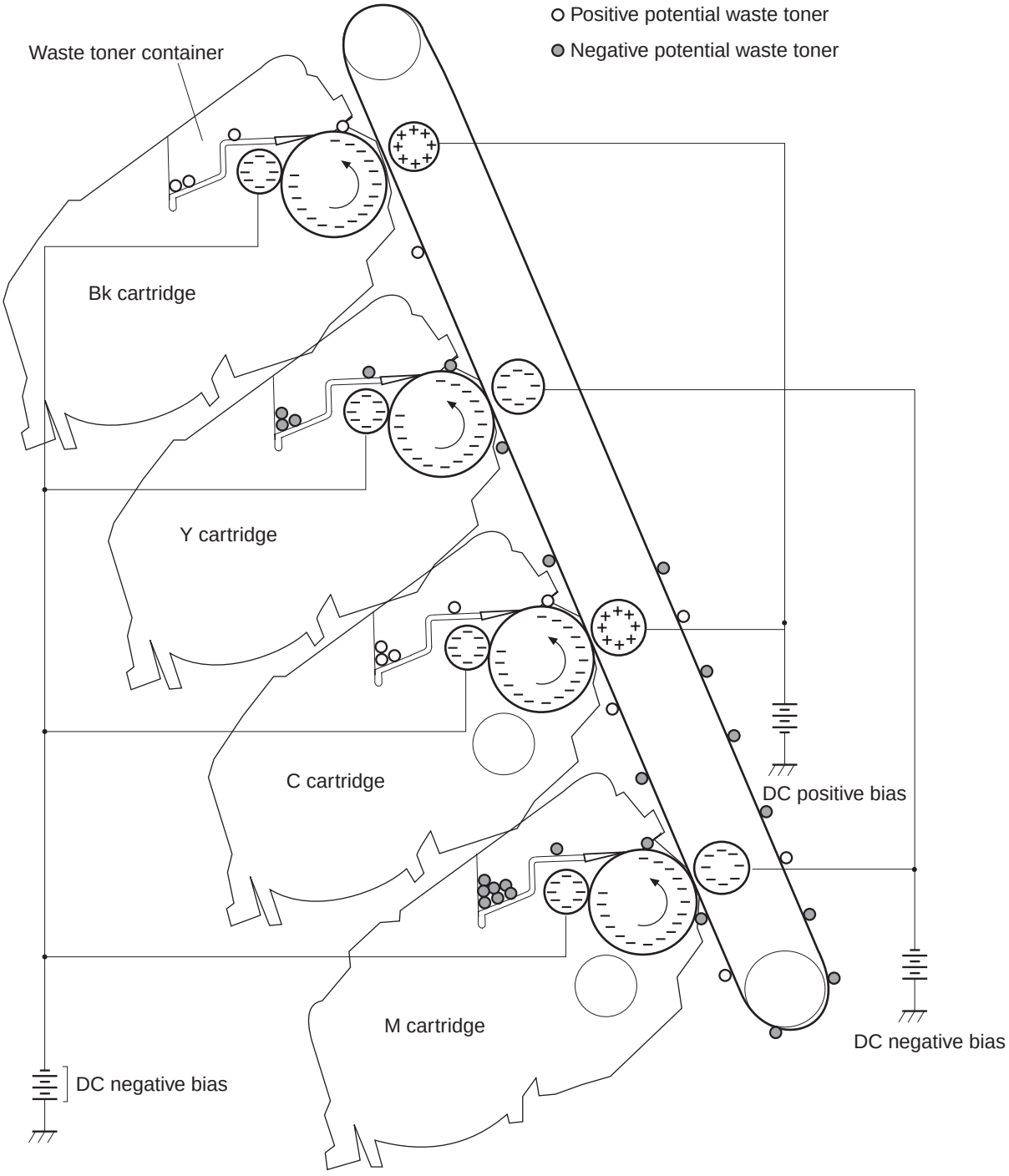

F-2-23

The ETB unit consists of the following: ETB, ETB feed roller, ETB slave roller, transfer roller, color displacement/density sensor.
The ETB is driven by the main motor through the ETB feed roller. The transfer roller and the ETB slave roller operate in keeping with the ETB.
While printing is under way, the print paper is moved between the ETB and the photosensitive drum, during which time it receives an image. The ETB is also used in relation to color displacement correction and image stabilization, during which a color displacement/image density detection pattern is drawn on the belt for reading by the color displacement/density sensor.
The following mechanism is controlled in relation to the ETB unit:
- ETB cleaning

### 2.4.5.2 ETB Cleaning

In ETB cleaning, the residual toner on the ETB is returned from the belt to the photosensitive drum to prevent soiling of the back of print paper.
The cleaning mechanism is executed by the DC controller for the following:
- when a jam has occurred
- when calibration has been suspended
- when a specific number of prints have been made
- when color displacement correction has been executed
- when image stabilization has been executed

When ETB cleaning starts the DC controller applies a negative bias to the photosensitive drum and negative and positive biases to the 4 transfer rollers (colors), causing a difference in potential between the drum and the belt and, thus, moving both negatively and positively charged toner particles from the ETB to the photosensitive drum at the same time.
While cleaning is under way, the developing cylinder remains still, thus preventing movement of toner from inside the toner case to the ETB.



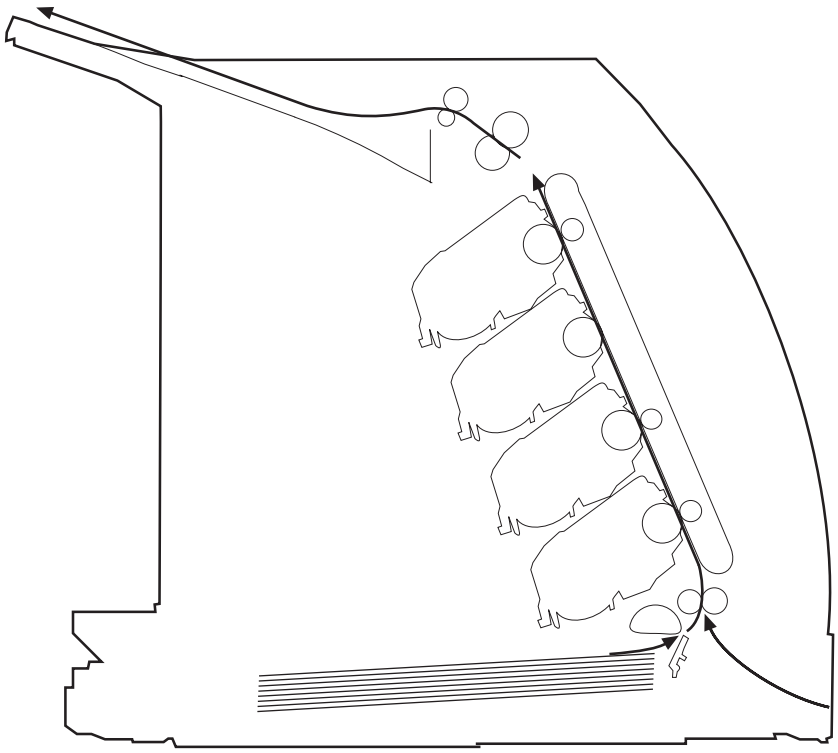

F-2-24

## 2.5 Pickup/Feeding/Delivery System

### 2.5.1 Overview/Configuration

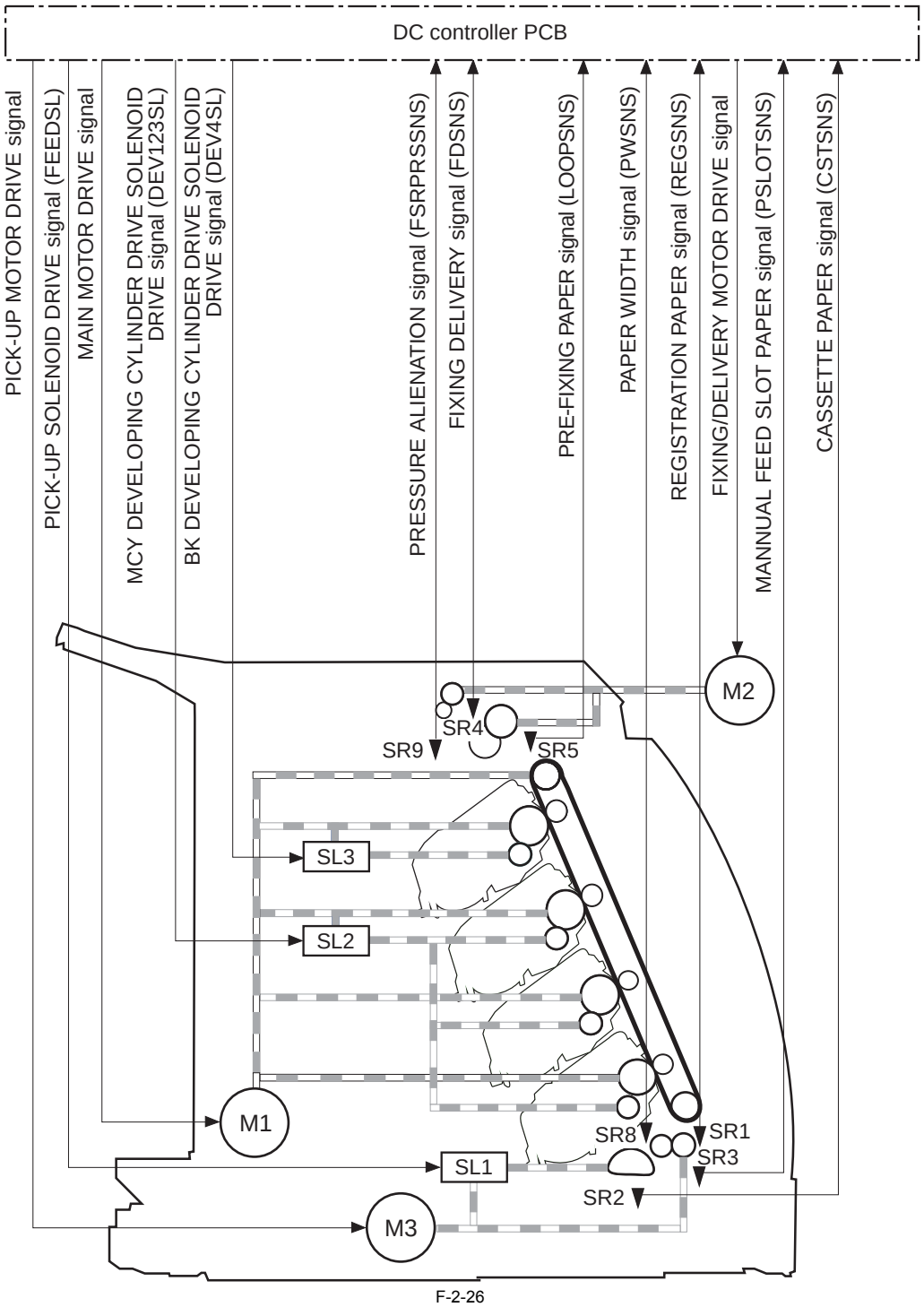
#### 2.5.1.1 Outline

The machine's pickup/transport system serves to pick up and move print paper, and includes various feed rollers.
The machine has 2 pickup slots: cassette and manual feeder. On the other hand, the face-down tray is its only delivery slot.



F-2-25

The presence of paper in the manual feeder slot is checked by the manual feeder paper sensor (SR3), and paper in the cassette is checked by the cassette paper sensor (SR2).
The machine's various feed rollers are controlled by the DC controller PCB through control of 3 motors (main motor M1, fixing/delivery motor M2, pickup motor M3) and 3 solenoids (SL1, SL2, SL3).
The paper path is equipped with 3 photointerrupters (SR1, SR4, SR5) to find out whether paper has reached or moved past a specific point of the path.
In addition to these sensors, 2 photointerrupters are used to check the locking/unlocking of the fixing assembly (SR9) and the width of print paper (SR8).
The following is a diagram showing the various motors, solenoids, and sensors:




F-2-26

| | | | |
|---|---|---|---|
| SR1 | Registration paper sensor | SR2 | Cassette paper sensor |
| SR3 | Manual feed slot paper sensor | SR4 | Fixing delivery paper sensor |
| SR5 | Pre-fixing paper sensor | SR8 | Paper width sensor |
| SR9 | Pressure alienation sensor | M1 | Main motor |
| M2 | Fixing/Delivery motor | M3 | Pick-up motor |
| SL1 | Cassette pick-up solenoid | SL2 | MCY developing cylinder drive solenoid |
| SL3 | Bk developing cylinder drive solenoid | | |

## 2.5.2 Other Control

### 2.5.2.1 outline

The machine's pickup/transport system makes sure that a single sheet of print paper is picked up from the cassette or the manual feeder and moved inside it to reach the fixing assembly.

The principal mechanisms involved in picking up paper from the cassette or the manual feeder and moving print paper inside the machine are as follows:

**Picking Up Print Paper from the Cassette**

The machine picks up sheets of paper from inside the cassette one by one. The machine uses the cassette paper sensor to check the presence/absence of paper inside the cassette.

**Picking Up Paper from the Manual Feeder**
The machine picks up the sheet of paper from the manual feeder. (Only one sheet of paper may be placed in the manual feeder at a time.) The machine uses the manual feeder paper sensor to check the presence/absence of paper in the manual feeder, and uses the registration roller to move the paper inside the machine.
**Moving the Print Paper**
After picking up the paper, the machine moves it all the way to the delivery assembly by way of the fixing assembly. The registration shutter makes sure that the paper does not move askew, and the paper width sensor in the path checks the paper to find out if it is of small size.
**Controlling the Speed of Movement**
The machine switches the speed at which the paper is moved according to the type of paper to prevent poor fixing.
**Paper loop control**
The machine keeps the print paper arching to a specific degree between the fixing pressure roller and the ETB to prevent image faults and transport faults.
**Automatic release of fixing pressure mechanism**
The machine is equipped with a mechanism to automatically release the engagement between the fixing assembly pressure roller and the fixing film to facilitate removal of a jam.

### 2.5.2.2 Picking Up Paper from the Cassette

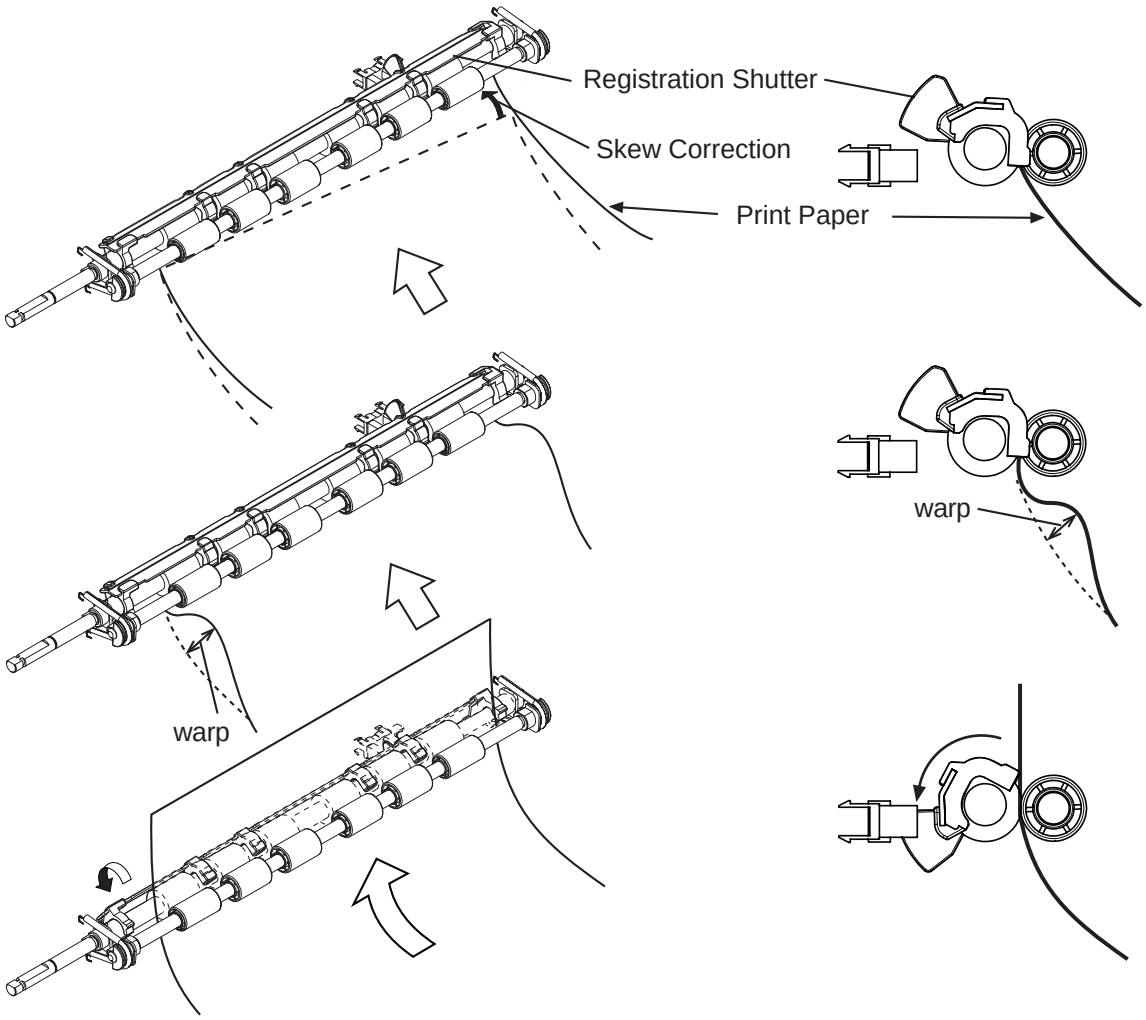
The machine makes sure no more than a single sheet of print paper is picked up from the cassette.
The presence/absence of paper inside the cassette is checked by the cassette paper sensor (SR2).
To prevent double feeding of print paper, the machine uses a slope separation/pad separation method.
1) When the print command arrives from the video controller, the DC controller turns on the pickup motor (M3).
2) The pickup solenoid (SL1) goes on, and the drive of the pickup motor arrives to rotate the pickup roller.
3) The holding plate is held up by the work of a spring, thus keeping the stack of sheets at a level that permits pickup. The pickup roller rotates to pick up a single sheet of paper, and moves it forward to the inside of the machine. At this time, the slope/pad separation mechanism makes sure no more than one sheet of paper is picked up.

### 2.5.2.3 Picking Up Paper from the Manual Feeder

The manual feeder accepts a single sheet of paper inserted into the manual feeder slot, and moves it into the machine.
The machine's manual feeder slot is not equipped with a pickup roller, and the registration roller functions as the pickup roller.
The printer paper that is placed in the manual feeder slot is checked by the manual feeder paper sensor (SR3).
The following is the sequence used to pick up paper from the manual feeder:
1) When a sheet of print paper is placed in the manual feeder slot while the machine is in a standby state, the manual feeder paper sensor (SR3) detects the presence of the paper.
2) As a result, the DC controller drives the pickup motor (M3; for a maximum of 5 sec), thus moving the paper about 5 mm so that it is held by the registration roller.
3) Thereafter, the print paper is moved farther inside the machine by the work of the registration roller.

### 2.5.2.4 Moving the Print Paper

The machine moves the single sheet of paper that has been picked up as far the fixing assembly.
The paper path of the fixing assembly is equipped with a paper width sensor to prevent overheating at ends of the drums by recognizing paper that is 190 mm or less in width.
The following is the sequence of operation used to move print paper:
1) When the paper is inside the machine, the registration shutter makes sure that the paper moves without any skew.
2) The print paper then receives the toner image from the photosensitive drum, and is moved to the fixing/delivery assembly.
3) The machine removes any warping from the paper using the drive of the fixing/delivery motor.
4) The print paper is moved between the fixing film an the fixing pressure roller so that the toner that has been deposited on it is permanently fused to its fibers. It is then discharged to the delivery tray.
**Removing the Skew by the Registration Shutter**
1) The print paper arriving in the registration roller assembly butts against the registration shutter so that its leading edge is aligned.
2) The registration shutter is held in place by the force of a spring, and will not open unless a certain degree of force is applied, thus causing the print paper to arch.
3) The arching print paper takes on extra body, enough to push up the registration shutter and be free of any skew.




F-2-27

### 2.5.2.5 Transport Speed Control

The machine is designed to switch the speed at which paper is moved according to type so as to prevent fixing faults.
Specifically, the DC controller switches the speed over 2 settings in response to the media selection command coming from the video control. The particulars of speed control are as follows:

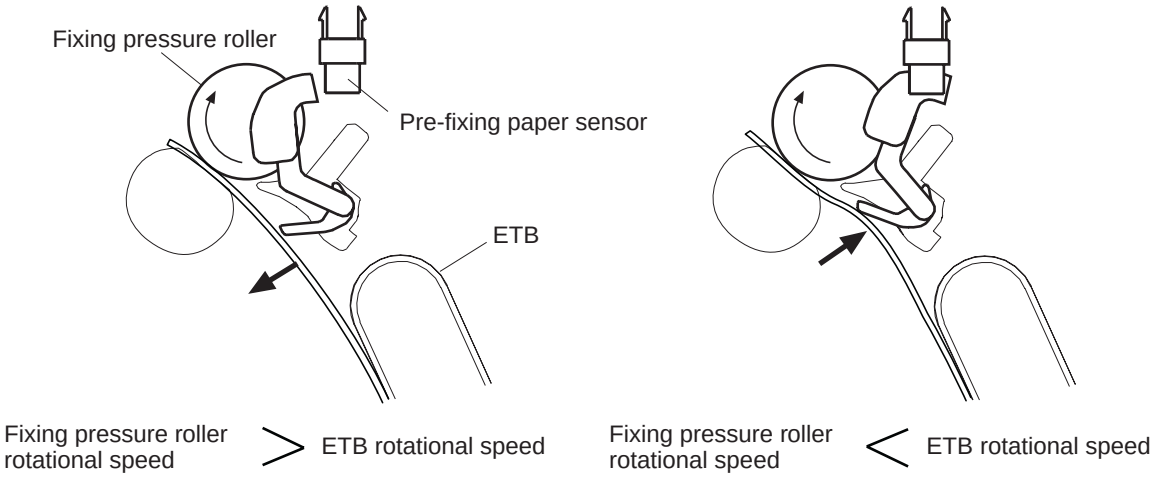
T-2-4

| Paper type | Weight | Paper type | Speed |
|---|---|---|---|
| Thin paper | 60-74g/m2 | Plain paper L | 1/1 |
| Plain paper | 74-90g/m2 | Plain paper | 1/1 |
| Heavy paper | 91-120g/m2 | Heavy paper 1 | 1/2 |
| Heavy paper | 121-163g/m2 | Heavy paper 2 | 1/2 |
| Label sheet | | Label sheet | 1/2 |
| Envelope | | Envelope | 1/2 |
| Transparency | | Transparency sheet | 1/2 |

### 2.5.2.6 Paper loop control

The machine has a mechanism to keep the arching of paper between the fixing pressure roller and the ETB to a specific degree to prevent image faults and feeding faults.
The arching is controlled to a specific degree by varying the speed of the fixing/delivery motor with reference to the output of the pre-fixing paper sensor (SR5) by the DC controller.

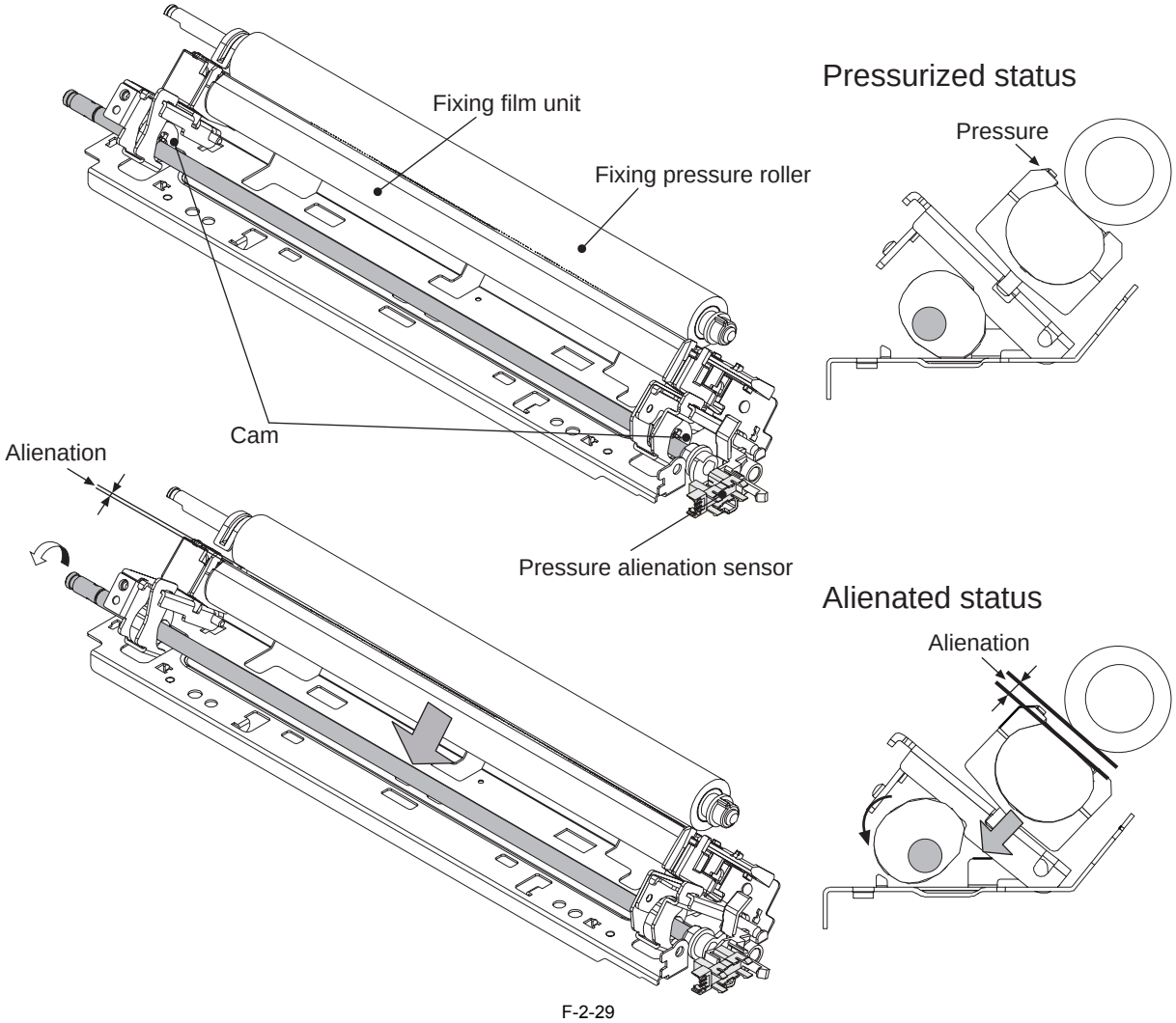
Normally, when print paper is moved to the fixing assembly, it is made to arch by the work of the fixing inlet guide as long as the speed of the fixing pressure roller and that of the ETB are identical.
If the speed of rotation of the fixing pressure roller is lower than that of the ETB, however, the arching will increase, resulting in a disruption in the image or wrinkling of the paper. The presence of a discrepancy in speed will cause the pre-fixing paper detection signal (LOOPSNS) to go Low; and, in response, the DC controller PCB increases the rotation speed of the fixing/delivery motor to decrease the arching of the print paper.
If the rotation speed of the fixing pressure roller is higher than that of the ETB, on the other hand, the print paper will not arch, and color displacement will be likely in sub scanning direction as the paper is pulled by the fixing pressure roller. At this time, the LOOPSNS signal will go High, and the DC controller will decrease the rotation speed of the fixing/delivery motor to cause the paper to arch.




F-2-28

### 2.5.2.7 Automatic release of fixing pressure mechanism

The machine is equipped with a mechanism that causes the fixing pressure roller and the fixing film to disengage for removal of jams.
When a jam occurs in the fixing assembly, the fixing film assembly is moved away from the fixing pressure roller. The state of engagement/disengagement is checked by the shift sensor.
If the shift sensor indicates the state of engagement during printing and then fails to indicate the state when a jam has occurred, the DC controller PCB will identify the condition as being a fault in the auto fixing assembly release mechanism and will indicate 'E840' in the status window.




F-2-29

### 2.5.3 Detecting Jams

### 2.5.3.1 Jam Detection Outline

#### 2.5.3.1.1 Outline

0010-6139

The machine is equipped with the following paper sensors used to check the presence/absence of paper and also the movement of paper if any.

1: registration paper sensor (SR1)
2: pre-fixing paper sensor (SR5)
3: fixing delivery sensor (SR4)
The machine checks for the presence/absence of paper at a specific sensor at such times as programmed in the CPU.
When the CPU identifies a jam, the machine will stop the ongoing printing and, at the same time, indicate a message in the status window.

### 2.5.3.2 Delay Jams

#### 2.5.3.2.1 Pick-up delay jam

*0010-6145*

The machine uses a mechanism called "retry control," in which pickup operation is executed multiple times (3 times) in consideration of pickup delay jams most often caused by minor deterioration of the pickup roller.
If the registration paper sensor (SR1) does not detect the leading edge of print paper within about 2.5 sec (in the case of the accessory cassette, 4.5 sec) after the pickup solenoid (SL1) has gone on, the CPU executes pickup operation for a second time (retry operation), repeating the sequence up to 3 times.

#### 2.5.3.2.2 Delivery delay jam

*0010-6146*

If the fixing delivery sensor (SR4) does not detect the leading edge of print paper about 6.5 sec after the registration paper sensor (SR1) has detected the leading edge of print paper, the CPU will identify the condition as indicating the presence of a delivery delay jam.

### 2.5.3.3 Stationary Jams

#### 2.5.3.3.1 Pickup Stationary Jam

*0010-6147*

If the registration paper sensor (SR1) does not detect the trailing edge of print paper about 8.6 sec after it has detected the leading edge of print paper, the CPU will identify the condition as indicating the presence of a pickup stationary jam.

#### 2.5.3.3.2 Delivery Stationary Jam

*0010-6148*

The CPU checks for a delivery stationary jam after it has made sure that the jam in question is not a wrap jam.
If the fixing delivery sensor (SR4) indicates the presence of paper after the machine has fed paper over a distance of +50 mm (as determined with reference to the length of paper detected by the registration paper sensor) following the detection of the leading edge of print paper (by SR4), the CPU will identify the condition as indicating the presence of a delivery stationary jam.

### 2.5.3.4 Other Jams

#### 2.5.3.4.1 Wrap Jam

*0010-6149*

The CPU checks for a wrap jam after it has made sure that the jam in condition is not a delivery delay jam.
If the fixing delivery paper sensor (SR4) detects the absence of paper after the machine has fed paper over a distance of -40 mm (as determined with reference to the length of paper detected by the registration paper sensor (SR1) following the detection of the leading edge of paper by SR4, the CPU will identify the condition as indicating the presence of a wrap jam.

#### 2.5.3.4.2 Start-Up Residual Paper Jam

*0010-6150*

If the pre-fixing paper sensor (SR5) or the fixing delivery sensor (SR4) detects print paper at the start of initial rotation, the CPU will identify the condition as a start-up residual jam.

#### 2.5.3.4.3 Door Open Jam

*0010-6151*

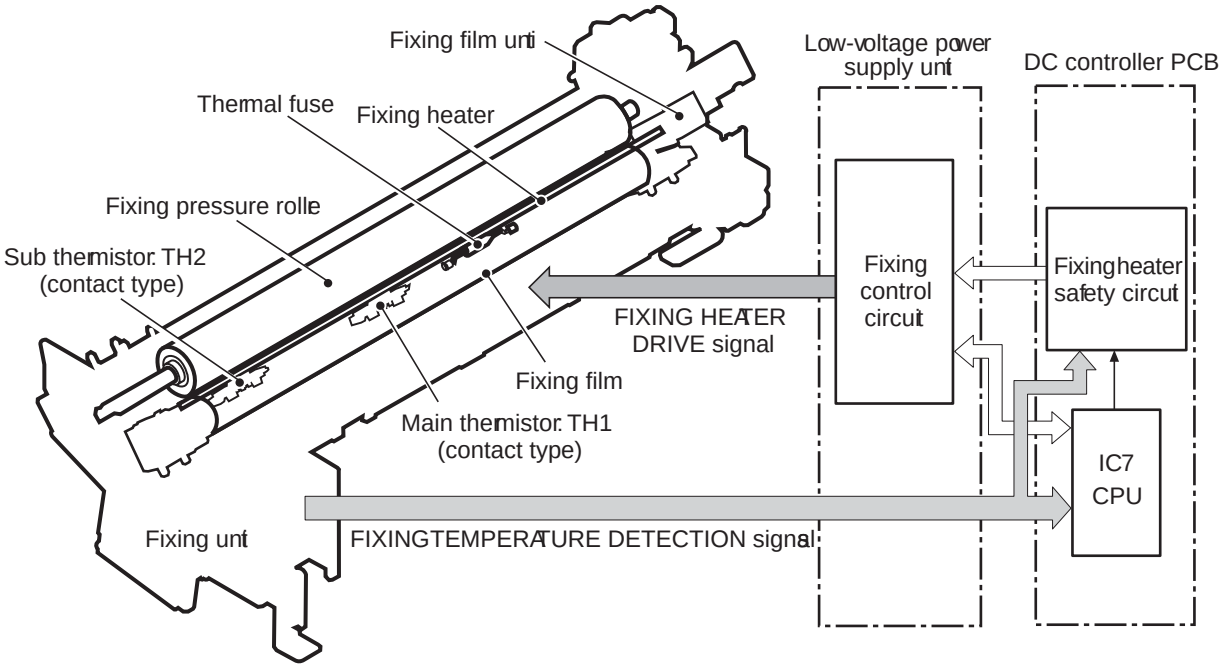
If the pre-fixing paper sensor (SR5) or the fixing delivery sensor (SR4) detects the presence of print paper while any of the machine's doors is identified as being open, the machine will identify the condition as a door open jam.

## 2.6 FIXING UNIT SYSTEM

### 2.6.1 Overview/Configuration

### 2.6.1.1 Outline

The following is a diagram of the circuit used to control the temperature of the fixing heater.
The machine uses an on-demand fixing method, and the fixing unit is constructed as follows:




F-2-30

**- Fixing Heater**
The fixing heater is a ceramic heater used to heat the fixing film. It has a single source of heat.
**- Thermistor (TH1, TH2)**
The thermistors are used to check the fixing temperature. The machine's fixing assembly uses 2 thermistors.
- Main thermistor (TH1): contact type thermistor
TH1 is in contact with an area of the fixing heater (around the middle), and is used to monitor the temperature of the heater.
- Sub thermistor (TH2): contact type thermistor
TH2 is in contact with the edge of the fixing heater, and is used to monitor the temperature of the edge of the fixing heater.
**- Thermal fuse**
The thermal fuse is used to prevent overheating of the fixing heater. The fuse is mounted around the middle of the fixing heater.
The temperature of the fixing assembly is controlled by the fixing control circuit and the fixing heater safety circuit using the foregoing items in response to the instructions from the CPU (IC7) on the DC controller PCB

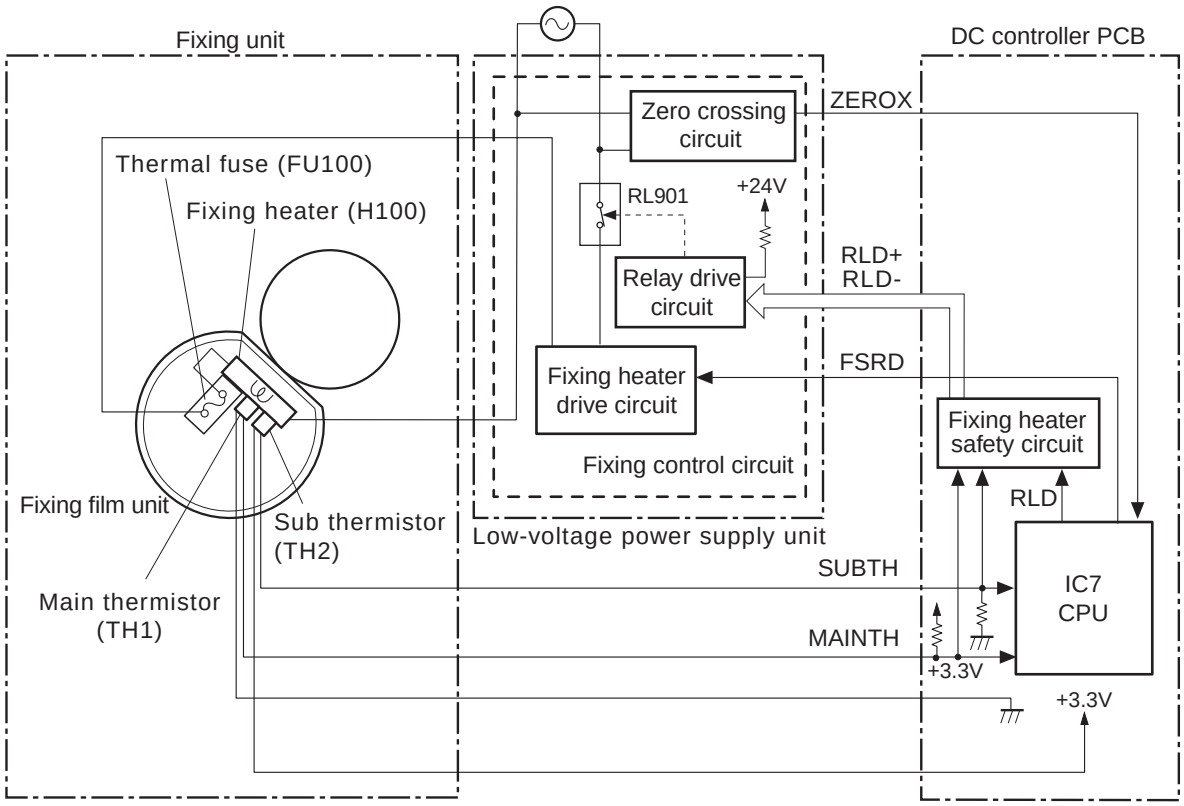
## 2.6.2 Various Control Mechanisms

### 2.6.2.1 Fixing Temperature Control

#### 2.6.2.1.1 Fixing Temperature Control

*0010-6160*

The machine monitors the surface temperature of the fixing heater, and controls the drive signal of the fixing heater so that the temperature will be identical to the target temperature.




F-2-31

The temperature of the fixing heater is checked by 2 thermistors: main thermistor (TH1), sub thermistor (TH2).
TH1 is used for printing temperature detection and sheet-to-sheet temperature control, while TH2 is used to check for edge overheating.
The CPU (IC7) on the DC controller PCB monitors the voltage of these 2 thermistors, and generates the fixing heater drive signal (FSRD) according to the level of the voltage.
The machine's fixing temperature control mechanism uses the following 5 sequences of operation:

1. Initial Multiple Rotation Temperature Control
   The machine executes initial multiple rotation temperature control to prevent tears in the fixing film by melting the grease on the inner side of the film at power-on for smoother belt movement.
   If the reading of the sub thermistor is lower than 55 deg C at power-on, the CPU turns on the fixing heater for a specific period of time before it starts the fixing/delivery motor.
2. Start-Up Temperature Control
   The machine executes start-up temperature control to determine the start-up temperature for the fixing heater to suit the reading of the main thermistor detected when turning on the heater. If the heater is turned on within 40 sec after the end of the previous print job, the previous printing temperature is used for the upcoming print job.
3. Printing Temperature Control
   The machine executes printing temperature control so that the temperature of the fixing heater will be identical to the target temperature during printing.
   In continuous printing mode, the machine changes the target temperature in stages according to the specified number of prints
4. Sheet-to-Sheet Temperature Control
   The machine executes sheet-to-sheet temperature control to prevent overheating of the fixing pressure roller between sheets in continuous mode (low-speed mode). The temperature of the fixing heater is lowered between sheets.
   The sheet-to-sheet temperature, further, is varied depending on the distance between sheets and the type of paper used.
5. Throughput Reduction Control
   The machine executes throughput reduction control to prevent overheating of the edges of the fixing heater during continuous printing on narrow paper.
   If the reading of the sub thermistor exceeds a specific level in continuous printing, if the paper width sensor does not detect paper, or if the width of paper is less than 195 mm, the machine will increase the distance between sheets to decrease throughput

T-2-5

| Mode | | Temperature control 1 | Temperature control 2 | Temperature control 3 | Temperature control 4 | Temperature control 5 |
|---|---|---|---|---|---|---|
| Plain paper | Number of sheets passed | 1-5 | 6-17 | 18-37 | 38-73 | 74- |
| | Initial rotation temperature | 199 | 179 | 167 | 161 | 154 |
| | Printing temperature | 194 | 189 | 182 | 176 | 169 |
| | Sheet-to-sheet temperature | 194 | 184 | 177 | 171 | 164 |
| Heavy paper 1 | Number of sheets passed | 1-2 | 3-6 | 7-13 | 14-25 | 26- |
| | Initial rotation temperature | 160 | 153 | 150 | 145 | 140 |
| | Printing temperature | 165 | 163 | 160 | 155 | 150 |
| | Sheet-to-sheet temperature | 155 | 153 | 150 | 145 | 140 |
| Heavy paper 2 | Number of sheets passed | 1-2 | 3-6 | 7-13 | 14-25 | 26- |
| | Initial rotation temperature | 165 | 158 | 155 | 150 | 145 |
| | Printing temperature | 170 | 168 | 165 | 160 | 155 |
| | Sheet-to-sheet temperature | 160 | 158 | 155 | 150 | 145 |
| Thin paper | Number of sheets passed | 1-5 | 6-17 | 18-37 | 38-73 | 74- |
| | Initial rotation temperature | 194 | 174 | 162 | 156 | 149 |
| | Printing temperature | 189 | 184 | 177 | 171 | 164 |
| | Sheet-to-sheet temperature | 189 | 179 | 172 | 166 | 159 |

| Mode | | Temperature control 1 | Temperature control 2 | Temperature control 3 | Temperature control 4 | Temperature control 5 |
|---|---|---|---|---|---|---|
| Envelope | Number of sheets passed | 1-2 | 3-6 | 7-13 | 14-25 | 26- |
| | Initial rotation temperature | 165 | 158 | 155 | 150 | 147 |
| | Printing temperature | 170 | 168 | 165 | 160 | 157 |
| | Sheet-to-sheet temperature | 160 | 158 | 155 | 150 | 147 |
| Transparency | Number of sheets passed | 1-2 | 3-6 | 7-13 | 14-25 | 26- |
| | Initial rotation temperature | 170 | 168 | 161 | 157 | 153 |
| | Printing temperature | 175 | 173 | 171 | 167 | 163 |
| | Sheet-to-sheet temperature | 170 | 168 | 161 | 157 | 153 |

### 2.6.3 Protective Functions

#### 2.6.3.1 Outline

The machine is equipped with the following 3 protective mechanisms to detect overheating of the fixing heater and cut power to the heater:

1. Protective Mechanism by the CPU
   The CPU monitors the output voltage (MINTH, SUBTH) of the main/sub thermistor. If the voltage of MAINTH is about 0.84 V or less (equivalent of 225 deg C or more), or if the voltage of SUBTH is about 2.12 V or more (equivalent of 245 deg C or more), the CPU will identify the condition as a fault in the fixing assembly and execute the following:
   1) The CPU stops the fixing heater drive signal (FSRD) to turn off the heater.
   2) The CPU stops the relay drive signal (RLD).
   3) The fixing heater safety circuit stops the main thermistor relay drive signal (RLD-).
   4) The relay drive circuit opens the contact of the relay (RL901) to cut off power to the heater.
   5) The machine stops printing operation, and indicates 'E001' in the status window.
2. Protective Mechanism by the Fixing Heater Safety Circuit
   The fixing heater safety circuit monitors the output voltage (MAINTH, SUBTH) of the main/sub thermistor. If the voltage of MAINTH is about 0.6 V or less (equivalent of 260 deg C or more), or if the voltage of SUBTH is about 2.8 V or more (equivalent of 270 deg C or more), the machine will identify the condition as a fault in the fixing assembly and execute the following:
   1) The fixing heater safety circuit stops the main thermistor relay drive signal (RLD-).
   2) The fixing heater safety circuit stops the sub thermistor relay drive signal (RLD+).
   3) The relay drive circuit turns off the relay (RL901) to cut off power to the heater.
3. Protective Mechanisms by the Thermal Fuse
   The inside of the thermal fuse will melt at about 220 deg C, thereby cutting the power to the fixing heater.

#### 2.6.3.2 Fault Detection

The CPU will assume the presence of a fault in the fixing assembly in response to any of the forgoing conditions, and will stop the printer engine and indicate 'E001' through 'E004' in the status window

1. Start-Up Fault (E002)
   If the reading of the main thermistor is not 5 deg C or more (if at power-on, 0 deg C) 1 sec after the heater is turned on, the CPU will identify the condition as a start-up fault.
2. Main Thermistor Error Temperature Low (E003-0000)
   If the reading of the main thermistor is100 deg C (equivalent of about 2.60 V) or less continuously for 0.5 sec or more, the CPU will identify the condition as an open circuit in the main thermistor.
3. Main Thermistor Error Temperature High (E001-000)
   If the reading of the main thermistor is 225 deg C (equivalent of about 0.84 V) or more continuously for 0.5 sec or more, the CPU will identify the condition as a main thermistor error temperature high.
4. Sub Thermistor Error Temperature Low (E001-0000)
   If the reading of the sub thermistor is less than 100 deg C (equivalent of about 0.38) continuously for 0.5 sec or more, the CPU will identify the condition as a sub thermistor error temperature low.
5. Sub Thermistor Error Temperature High (E001-0001)
   If the reading of the sub thermistor is 245 deg C (equivalent of about 2.12 V) or more continuously for 0.5 sec or more, the CPU will identify the condition as a sub thermistor error temperature high.
6. Drive Circuit Fault (E004)
   If the zero-cross signal (ZEROX) is not detected for a specific period of time or more, the CPU will identify the condition as a drive circuit error.

## 2.7 EXTERNAL AND CONTROLS SYSTEM

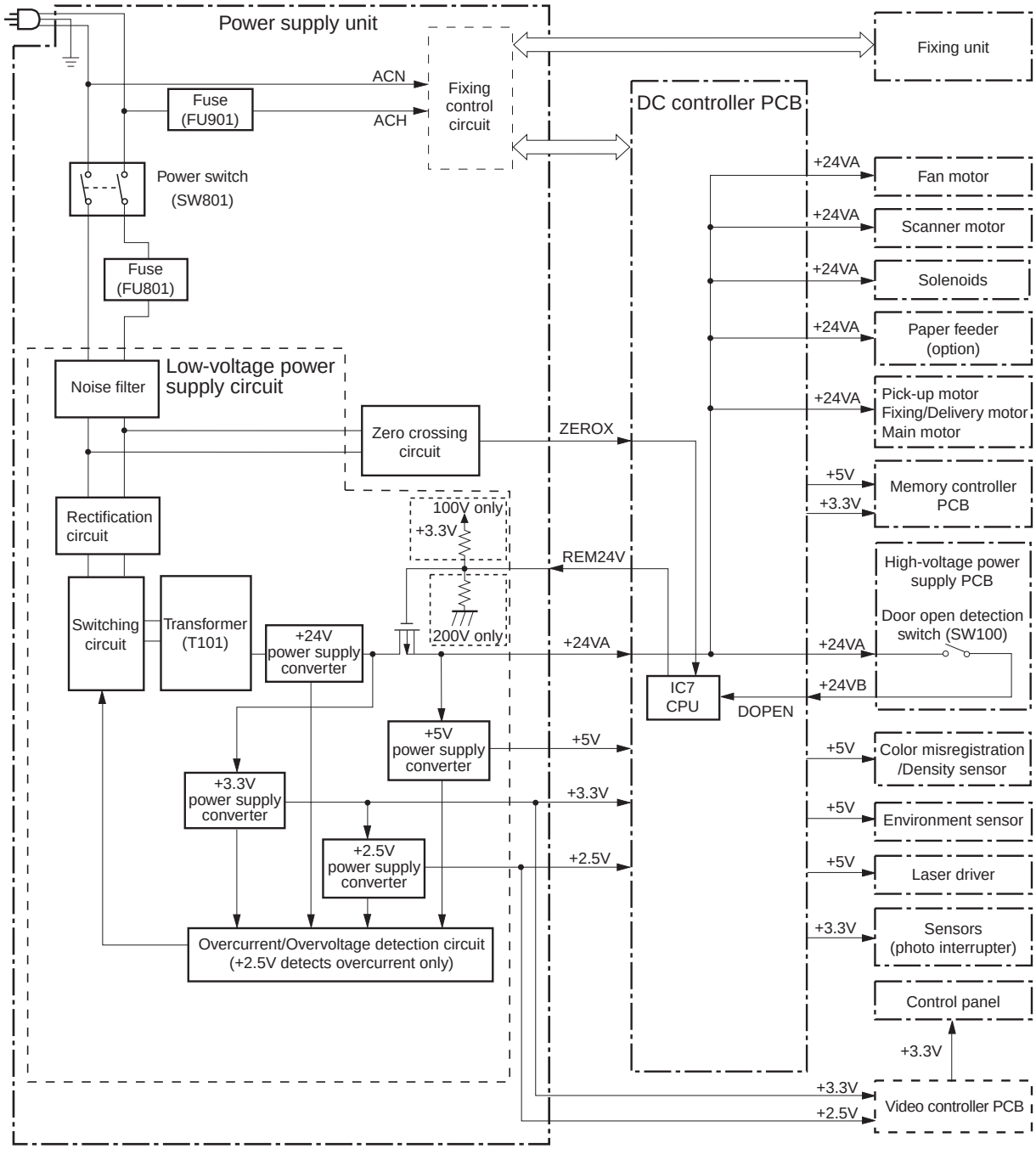
### 2.7.1 Power Supply

#### 2.7.1.1 Power Supply

##### 2.7.1.1.1 Low-Voltage Power Supply PCB

*0010-6165*

The low-voltage power supply circuit serves to convert the AC voltage coming from the power receptacle into DC power for provision to various loads. The following is a block diagram of the circuit:




F-2-32

The AC power is supplied to the low-voltage power supply circuit when the power switch (SW801) is turned on.
The AC power supply is then converted into +24V, +5V, +3.3V, and +2.5V, which are DC power used by the printer engine.
The following shows the major destinations of +24V, +5V, +3.3V, and +2.5V:
+24V: motors, solenoids, high-voltage power supply PCB, memory controller PCB, accessories
+5V: laser driver PCB, sensors other than photointerrupters
+3.3V: video controller, sensor (photointerrupters), control panel, DC controller PCB, memory controller PCB
+2.5V: ASIC, video controller

### 2.7.1.2 Other Function

#### 2.7.1.2.1 Protective Functions

*0010-6166*

The low-voltage power supply circuit is equipped with an over-current protective mechanism and an over-voltage protective mechanism used to automatically cut the output voltage in response to an over-current or over-voltage caused by a short circuit on the load side.
If the low-voltage power supply does not generate DC voltage, therefore, it is likely that the over-current protective mechanism or the over-voltage protective mechanism has gone on: turn off the power switch (SW801), remove the cause of the activation, and then turn the power switch back on.
In addition to these, the circuit is provided with 2 power fuses (FU801, FU901). In response to over-current in the AC line, these power fuses will blow to cut the power.

⚠
Once the protective mechanism has gone on, you must turn off the power (by turning off the power switch or disconnecting the power cord), leave the machine alone for 3 min or more and then turn it back on to reset the low-voltage power supply.

#### 2.7.1.2.2 Sleep function

0010-6168

The machine is equipped with a mechanism to limit the consumption of power by the printer engine, controlled as follows by the instructions from the DC controller PCB:

1) The DC controller receives the sleep command from the video controller PCB.
2) In response to the sleep command, the DC controller PCB stops the 24V output signal (REM24V, pulse signal) to the low-voltage power supply a specific period of time thereafter.
3) When the REM24V signal stops, the low-voltage power supply circuit stops the power to the 24V and 5V systems used to drive various loads so that the printer will assume the following state:
   - Fixing temperature control: STOP
   - Fan: STOP
   - Motors: STOP

The machine resets itself from sleep mode in response to any of the following:
   - when printing is started
   - when calibration (manual) is executed
   - when cleaning is executed

#### 2.7.1.2.3 Connection Power Supply Detection

0010-6169

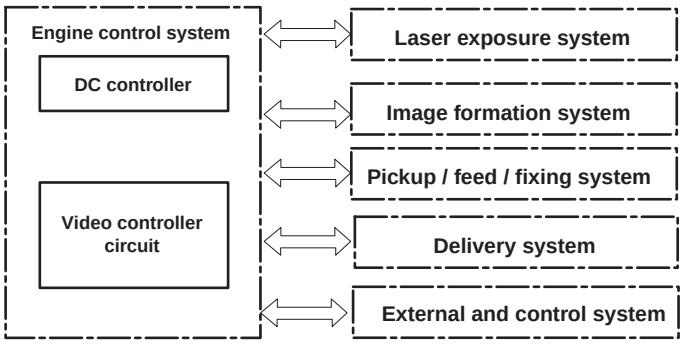
The machine is capable of identifying the type (100V system or 200V system) of the low-voltage power supply used by the printer engine. The identification is by the CPU with reference to REM24V: when a 100V power supply is connected to the printer engine, the REM24V signal will go High, while connection of a 200V power supply will cause the signal to go Low.

## 2.8 ENGINE CONTROL SYSTEM

### 2.8.1 Construction

#### 2.8.1.1 Outline

The engine control system is the "brain" of the machine, and has control over its laser exposure system, image formation system, pickup/delivery system, fixing system, and externals/auxiliary control system. The following is a block diagram of the engine control system, followed by descriptions of individual circuits:

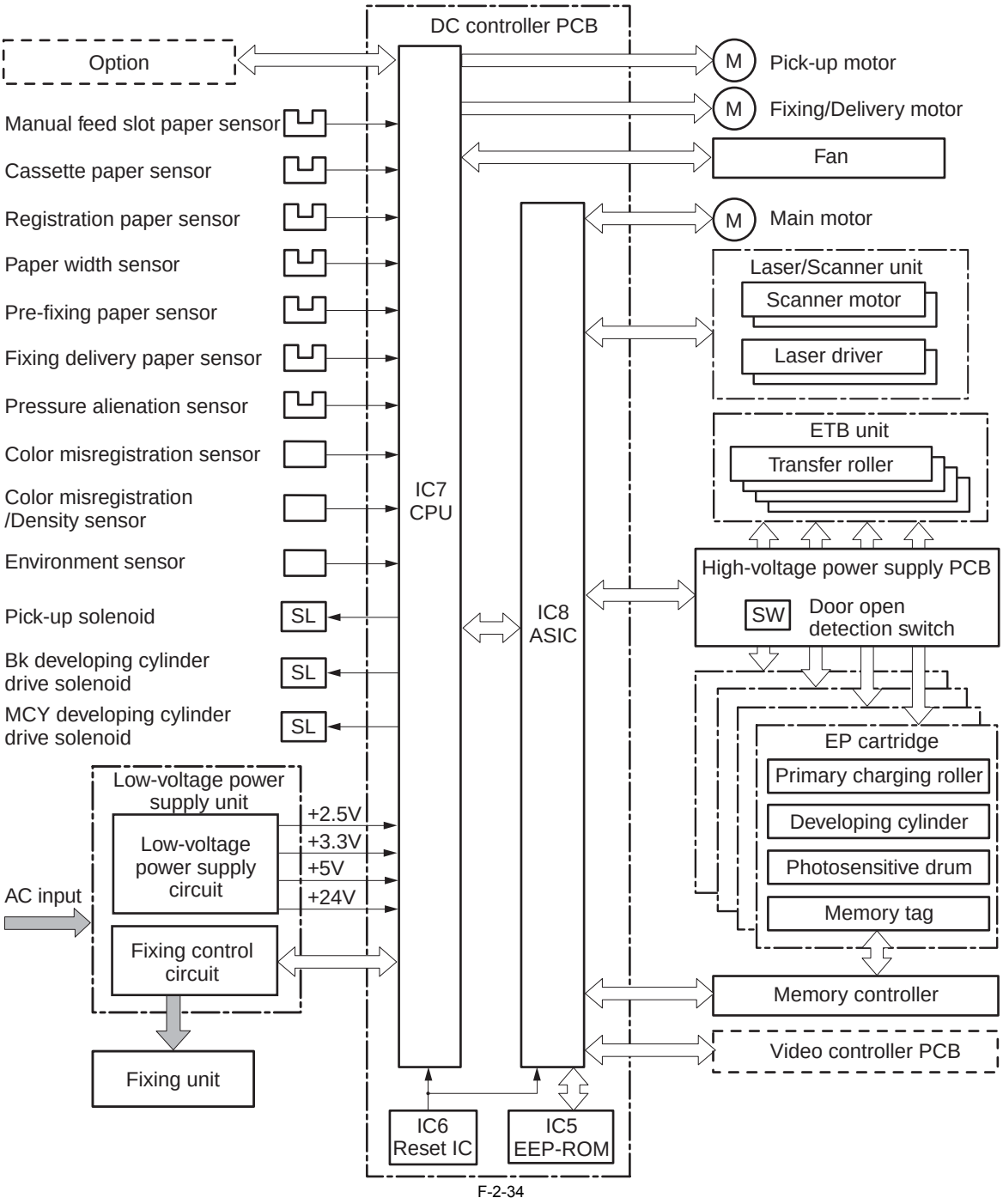



F-2-33

### 2.8.2 DC Controller

#### 2.8.2.1 Outline

The DC controller is a circuit that controls the machine's various operation sequences, and is in turn under the control of its CPU. The following is a block diagram of the circuit:




F-2-34

### 2.8.2.2 Operation of Individual Blocks

**a. CPU(IC7)**

The CPU is a 16-bit single chip microcomputer.
The CPU is a one-chip CPU with built-in ROM and RAM. The machine controls the following printer operation in keeping with the control programs stored in ROM:

1) printer engine sequence control
2) ASIC control
3) fixing control circuit control
4) fixing assembly control
5) pickup motor, fixing/delivery motor control
6) fan motor control
7) control of various solenoids
8) control of various sensors/switches
9) control of accessories

**b. ASIC (IC8)**

The ASIC (application-specific IC) is used for IC, memory, and external device interfaces, and is used to control the following printer operations in keeping with the instructions from the CPU:

1) control of laser/scanner block
2) communication with video control
3) control of high-voltage power supply PCB
4) control of main motor
5) write/read operation to and from EEPROM
6) control of memory controller

**c. Reset IC (IC6)**
The reset IC serves to reset the CPU and ASIC at power-on with reference to the +3.3V voltage.

**d. EEPROM(IC5)**
The EEPROM is used to store various backup data.

### 2.8.2.3 Fan/Motor Control

The DC controller PCB serves to control 4 motors.
The following shows the specifications of the various motors used in the machine:

T-2-6

| Name | | Function | Type | Direction of rotation | Fault detection |
|---|---|---|---|---|---|
| Motor | Main motor (M1) | Drives the ETB, photosensitive drum, and developing cylinder. | DC motor | Clockwise | Yes |
| | Fixing/delivery motor (M2) | Drives the pressure roller, delivery roller, and fixing assembly release mechanisms. | Stepping motor | Clockwise/ counterclockwise | No |
| | Pickup motor(M3) | Drives the pickup roller and registration roller | Stepping motor | Clockwise | No |
| | Fan (FM1) | Cools the area around the cartridges. | DC motor | - | Yes |

### 2.8.2.4 Main Motor Fault Detection

The CPU will identify any of the following conditions as the presence of a fault in the main motor, and will stop the printer engine and, at the same time, indicate 'E012' in the status window.
1) Main Motor Start-Up Fault (E012-0000)
The interval of the main motor speed detection signal (/MAINMFG) is not as specified 1000 msec after the start of the main motor drive.
2) Main Motor Rotation Fault (E012-0001)
The /MINMFG signal occurs at the specified intervals, but thereafter deviates continuously for 100 msec.

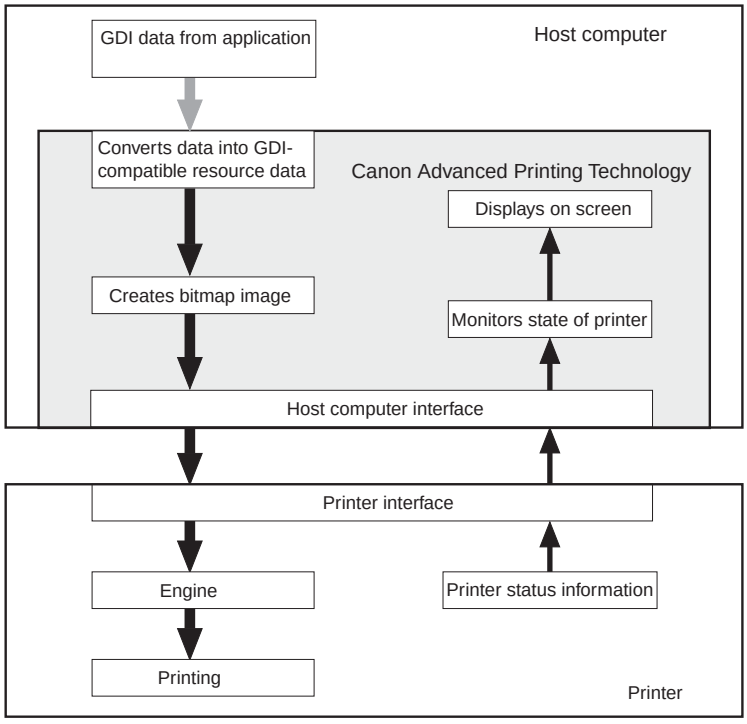
### 2.8.2.5 Fan Motor Fault Detection

The CPU will identify any of the following conditions as the presence of a fault in the main motor, and will stop the printer engine and, at the same time, indicate 'E806' in the status window.
1) While the fan motor is rotating, the fan lock detection signal (FANLCK) is continuously High for about 10 sec or more.

## 2.8.3 Video Controller PCB

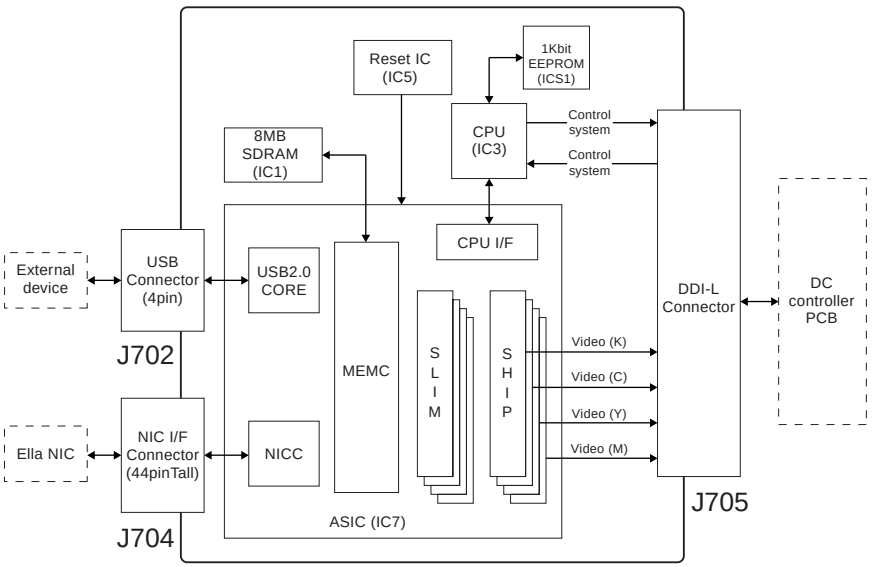
### 2.8.3.1 Outline

The video controller receives print information from external devices (e.g., host computer) by way of interface cables. The information contains a CAPT command used to communicate printer status and printer-specific characteristics and dot data, which is the result of conversion of print data by the host computer.
The data is sent to the DC controller circuit for control of laser diode activation.
If properly connected with a bi-directional interface, an external device may be used to check the printer status.
When printing is executed in a Microsoft Windows or Macintosh environment, CAPT (Canon Advanced Printing Technology) serves to reduce processing speed and enhance the ease of operation to provide a user-friendly printing environment. To that end, CPU is designed for the following:
- The print data from the application is turned into dot data and sent to the printer without conversion into the printer's page description language (PDL).
- The printing environment may be checked and set on the host computer display by responding to dialog boxes.
- The printer status is indicated on the host computer screen: print end time, print paper movement, error status.




F-2-35

### 2.8.3.2 Overview of the Block




F-2-36

T-2-7

| Notation | Name | Description |
|---|---|---|
| IC1 | SDRAM | Retains image data. |
| IC3 | CPU | Controls the board. |
| IC5 | Reset IC | Resets the board. |
| IC6 | SSCG | Performs clock modulation. Generates modulation clock signals used by the system clock. |
| IC7 | ASIC | Serves as an IC for USB device controller, memory controller, video controller, and NIC interface controller. |
| IC8 | PWM | Converts image data from the ASIC into data by pulse width modulation. |
| IC9 | | |
| IC10 | | |
| IC11 | | |
| IC12 | Logic IC | Converts voltage levels. |

# Chapter 3 DISASSEMBLY AND ASSEMBLY

# Contents

# 3.1 Before Parts Replacement

## 3.1.1 Outline

The pages that follow contain instructions on how to disassemble and assemble the machine. Be sure to follow the instructions whenever you have to replace parts to correct a fault or at the end of the part life.

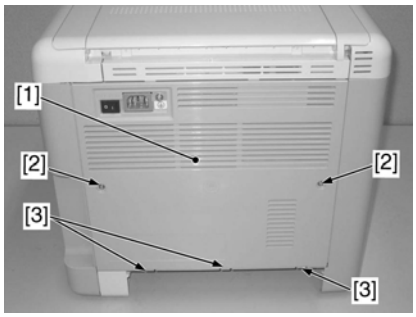
All work must be performed with the following in mind:
1. The instructions assume that the cassettes and cartridges have already been removed. Whenever you have removed a cartridge from the machine, make sure it is in a protective bag to limit its exposure to light (no matter how short it may be).
2. The power plug must be disconnected for safety before starting to disassemble or assemble the machine.
3. Unless otherwise indicated, assembly is the reverse of disassembly in terms of the sequence of steps to perform.
4. The screws and fixings must be identified correctly in terms of type (length, diameter) and location.
5. The machine must not be operated with any of its parts removed.
6. You must not touch any PCB without first discharging the build-up of static electricity from your body, as by touching a metal area of the machine.
7. You must not touch the following with bare hands: pickup roller, separation pad, ETB, photosensitive drum, fixing film, pressure roller.

## 3.2 EXTERNAL AND CONTROLS SYSTEM

### 3.2.1 Rear Cover

#### 3.2.1.1 Removing the Rear Cover

1) Remove the rear cover [1].
   - 2 screws [2]
   - 3 claws [3]

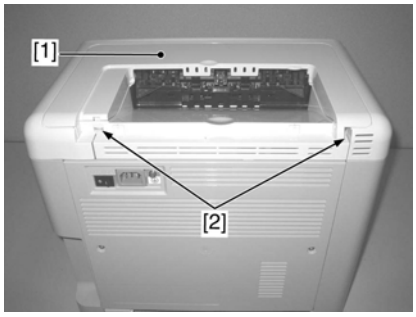



F-3-1

### 3.2.2 Right Cover

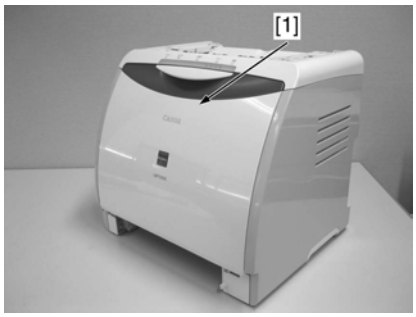
#### 3.2.2.1 Removing the Right Cover/Right Cassette Cover

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the top cover [1].
   - 2 claws [2]



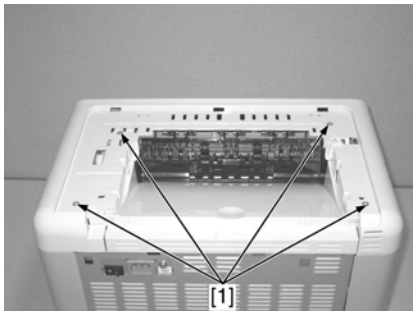

F-3-2

3) Open the front cover [1].



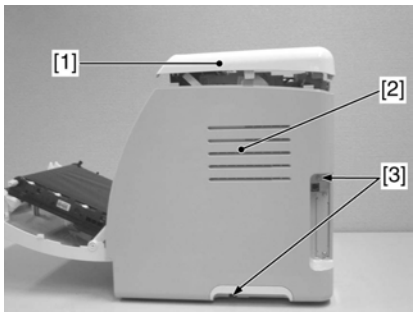

F-3-3

4) Remove the 4 screws [1].

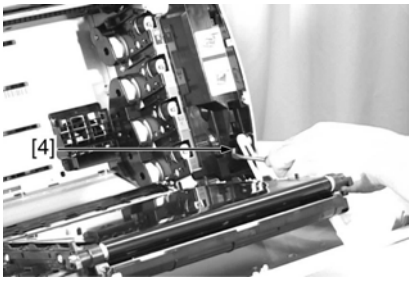



F-3-4

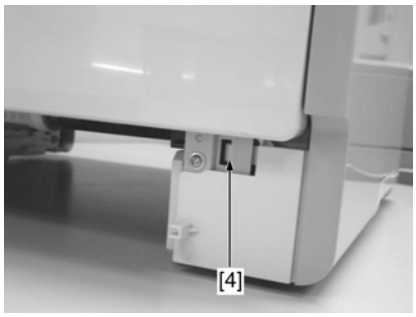
5) Lift the upper cover [1] slightly, and detach the right cover [2].
   - 2 screws [3]
   - 3 claws [4]



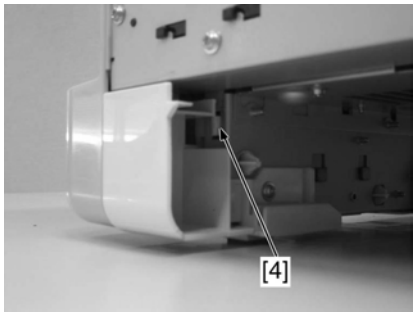

F-3-5




F-3-6



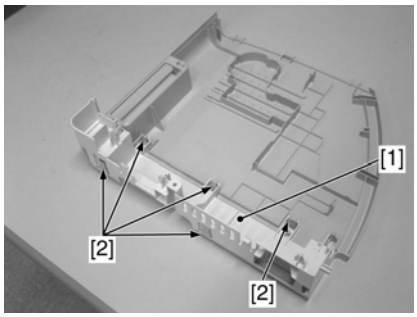

F-3-7




F-3-8

⚠
When detaching the right cover, take care not to lift the upper cover excessively; otherwise, the control panel flat cable connected to the cover may suffer damage.

6) Detach the right cassette cover [1] connected to the right cover.
   - 5 claws [2]




F-3-9

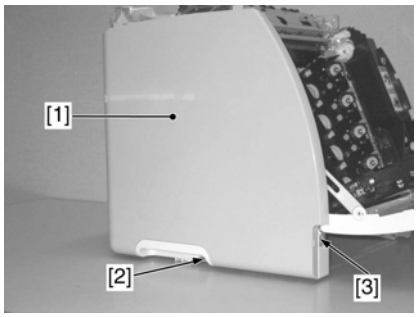
### 3.2.3 Left Cover

#### 3.2.3.1 The former procedure of removing the Left Cover/ Left Cassette Cover

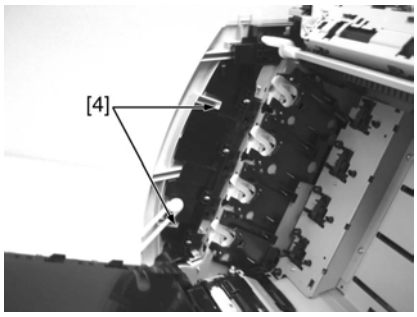
1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]

#### 3.2.3.2 Removing the Left Cover/Left Cassette Cover

1) Remove the left cover [1].
   - 1 screw [2]
   - 1 claw [3]
   - 2 hook [4]

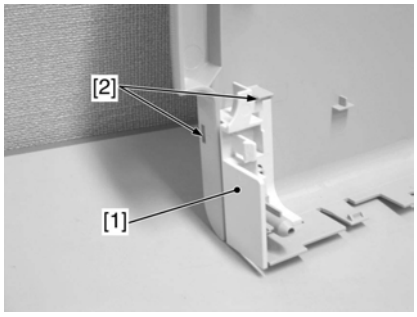



F-3-10



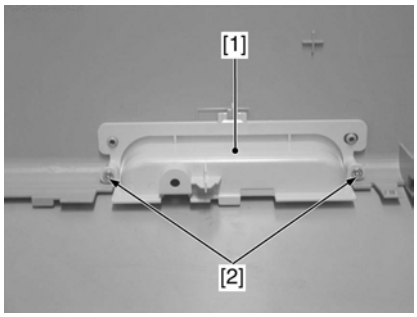

F-3-11

2) From the left cover, detach the left cassette cover [1].
   - 2 claws [2]




F-3-12

3) From the left cover, detach the left handle [1].
   - 2 screws [2]




F-3-13

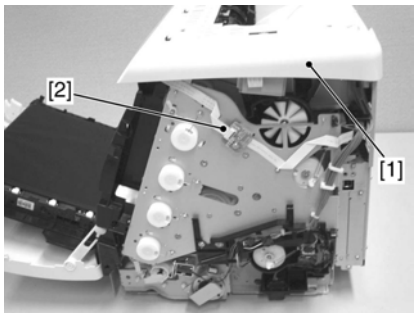
### 3.2.4 Upper Cover

#### 3.2.4.1 The former procedure of removing the Upper Cover

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

#### 3.2.4.2 Removing the Upper Cover

1) Remove the upper cover [1].
   - 1 connector [2]




F-3-14

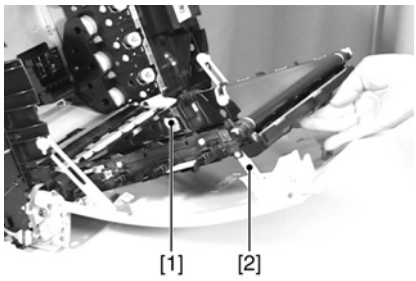
### 3.2.5 Front Cover

#### 3.2.5.1 The former procedure of removing the Front Cover

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]

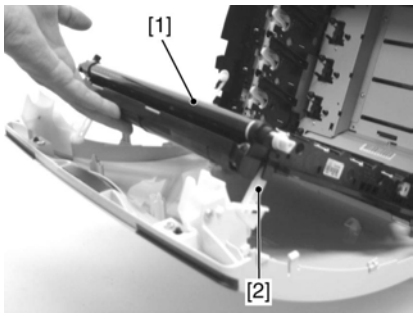
#### 3.2.5.2 Removing the Front Cover

1) Open the front cover.
2) Lift the ETB unit [1] slightly, and pick the link arm [2] to detach the shaft of the arm.



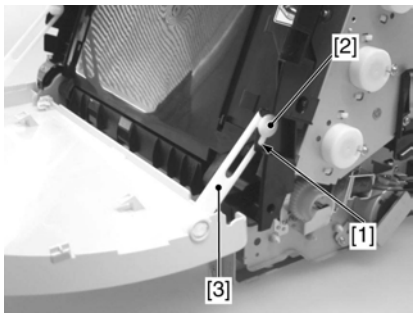

F-3-15

3) Lift the ETB unit [1] slightly, and pick the link arm [2] to detach the shaft of the arm.



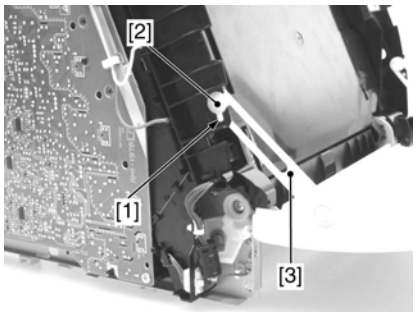

F-3-16

4) Put the ETB back into the machine.
5) Remove the boss [1], and rotate the bearing [2] to detach the bushing and the arm [3].



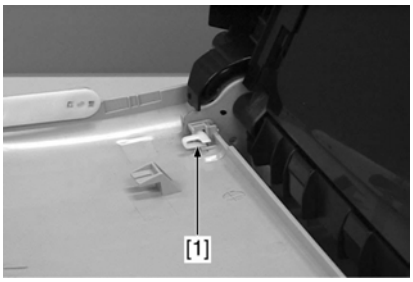

F-3-17

6) Remove the boss [1], and rotate the bearing [2] to detach the bearing and the arm [3].



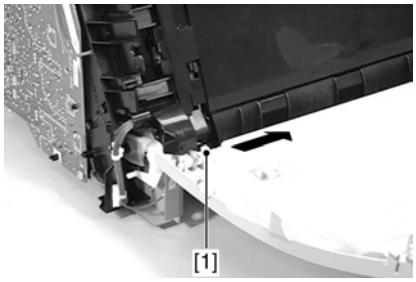

F-3-18

7) Remove the claw [1].



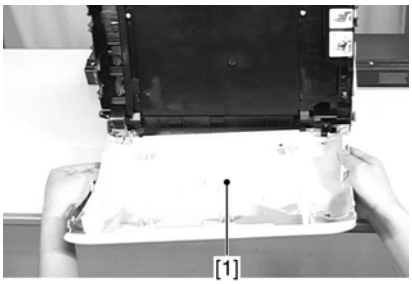

F-3-19

8) Slide the shaft [1] in the direction of the arrow to detach.




F-3-20

9) Remove the front cover [1].

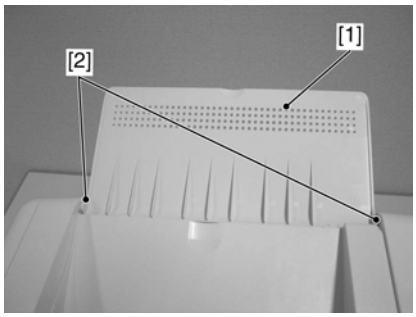



F-3-21

### 3.2.6 Delivery Tray

#### 3.2.6.1 Removing the Delivery Tray

1) Remove the shaft [2] of the delivery tray [1].




F-3-22

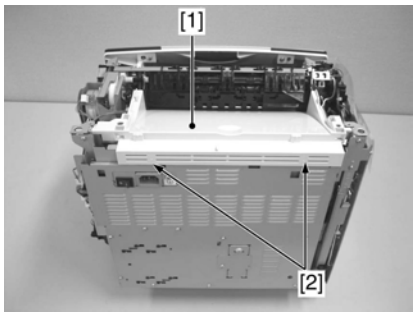
### 3.2.7 Face-down Cover

#### 3.2.7.1 The former procedure of removing the Face-Down Cover

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]

#### 3.2.7.2 Removing the Face-Down Cover

1) Remove the face-down cover [1].
- 2 claws [2]




F-3-23

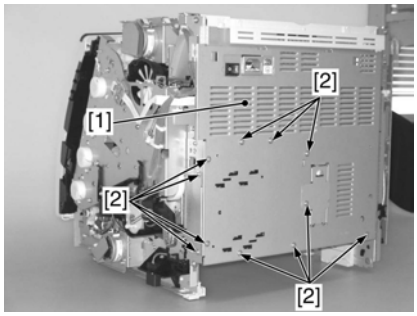
### 3.2.8 Main Drive Unit

#### 3.2.8.1 The former procedure of removing the Main Drive Assembly

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]

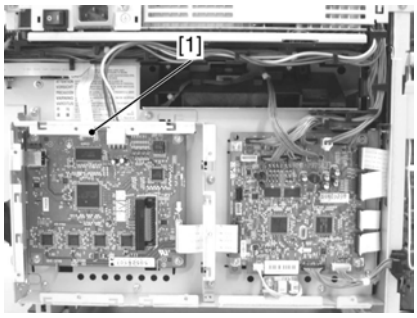
### 3.2.8.2 Removing the Main Drive Assembly

1) Remove the rear plate [1].
- 11 screws [2]



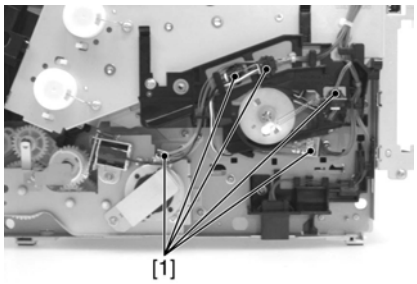

F-3-24

2) Remove the flat cable [1].

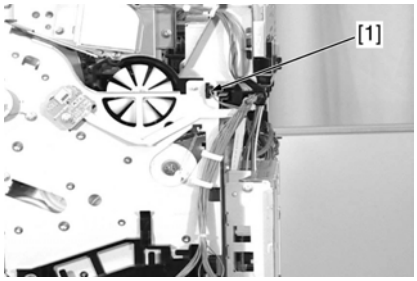



F-3-25

3) Disconnect the 6 connectors [1], and free the cable from the cable guide.

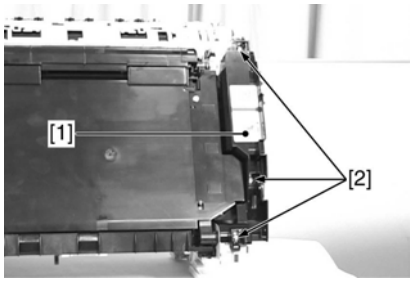



F-3-26




F-3-27

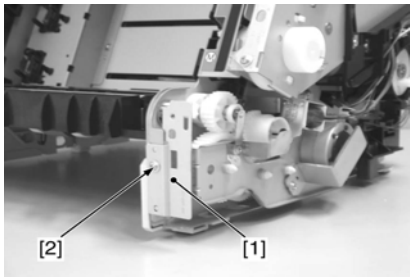
4) Open the ETB unit, and remove the right inner cover [1].
- 3 screws [2]




F-3-28

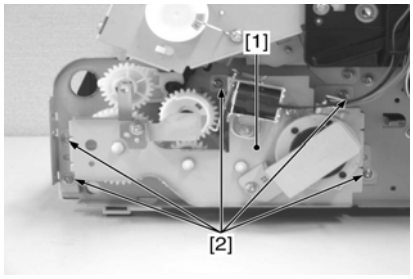
When removing the right inner cover, be sure to take care not to touch the surface of the ETB.

5) Remove the plate [1].
- 1 screw [2]



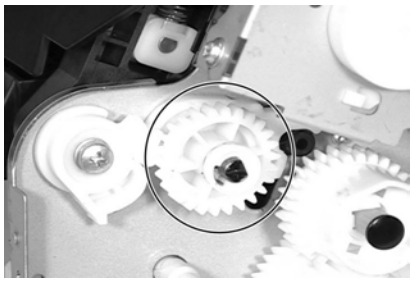

F-3-29

6) Remove the pickup motor plate [1].
- 5 screws [2]

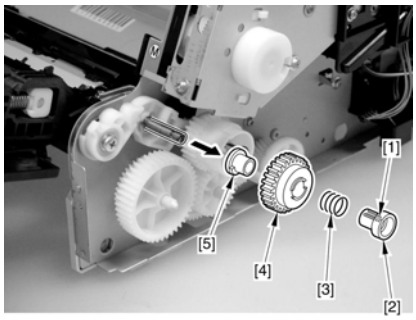



F-3-30

7) Remove the gears.
- 1 claw [1]
- 1 bearing [2]
- 1 spring [3]
- 1 gear [4]
- 1 bearing [5]

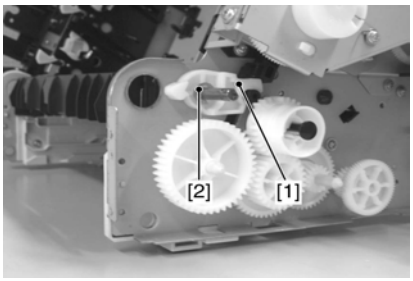


F-3-31



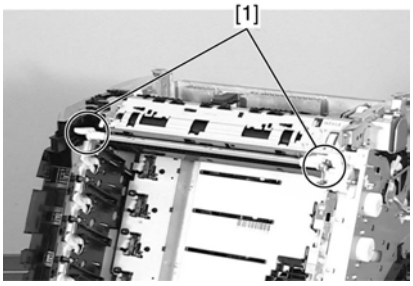

F-3-32

8) Remove the ETB drive cam [1].
- 1 E-ring [2]



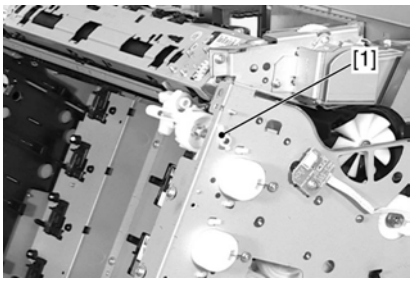

F-3-33

9) Lower the left/right ETB locking lever [1].



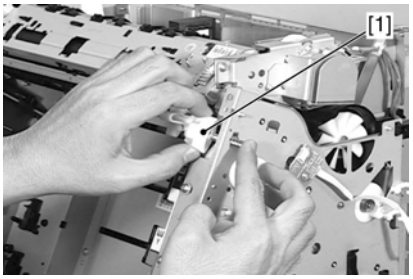

F-3-34

10) Remove the bearing [1].



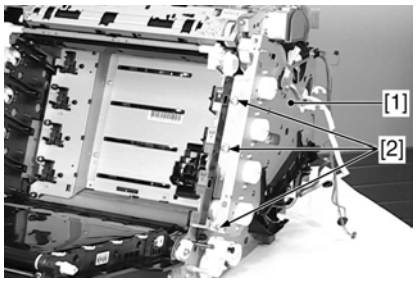

F-3-35

11) Remove the gear [1].

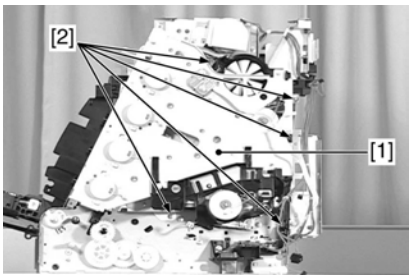



F-3-36

12) Remove the main drive assembly [1].
- 8 screws [2]



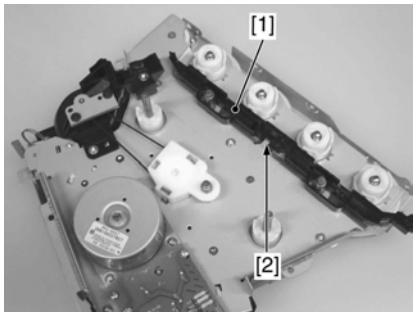

F-3-37




F-3-38

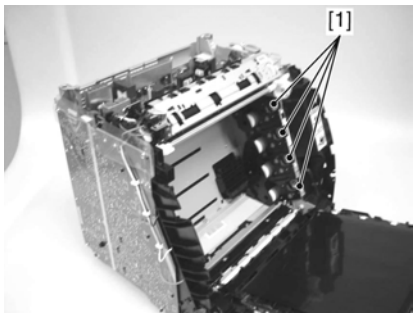
The main drive assembly requires adjustment after assembly. In other words, it must not be disassembled in the field

**Notes for installing the main drive assembly**
If the CRG coupling arm is disengaged at disassembly of the main drive assembly, be sure to mount the arm [1] under the protruding parts [2] on the sheet metal.




F-3-39

After installing the main drive unit, check if the coupling [1] of the cartridge works in conjunction with the open/close movement of the ETB unit. If not, remove the main drive assembly to check if the CRG coupling arm is mounted correctly, as there is a possibility it is not




F-3-40

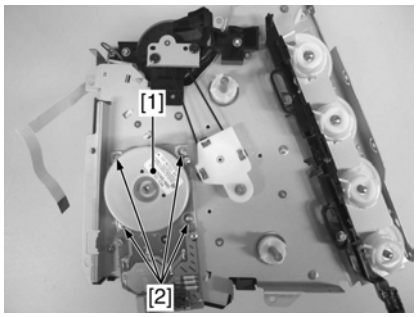
### 3.2.9 Main Motor

#### 3.2.9.1 The former procedure of removing the Main Motor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the main drive assembly. (page 3-5) Reference[Removing the Main Drive Assembly]

#### 3.2.9.2 Removing the Main Motor

1) Remove the main motor [1].
- 4 screws [2]




F-3-41

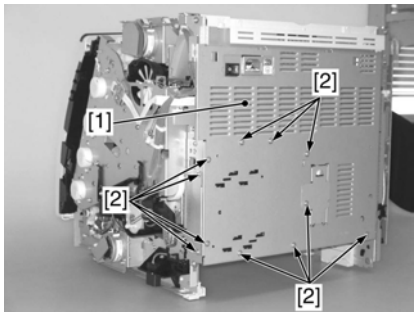
### 3.2.10 DC Controller PCB

#### 3.2.10.1 The former procedure of removing the DC Controller PCB

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

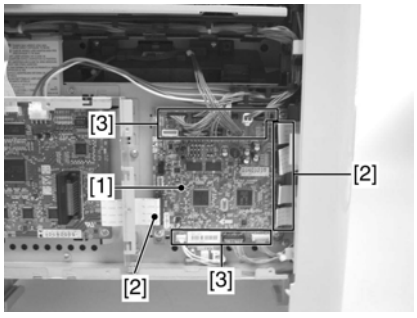
#### 3.2.10.2 Removing the DC Controller PCB

1) Remove the rear plate [1].
- 11 screws [2]

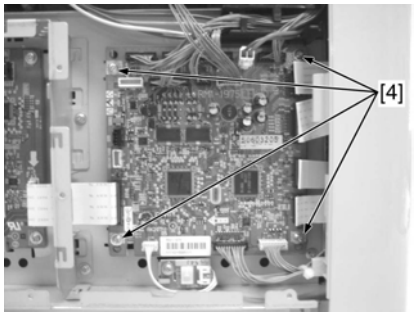



F-3-42

2) Remove the DC controller PCB [1].
- 4 flat cables [2]
- 11 connectors [3]
- 4 screws [4]




F-3-43




F-3-44

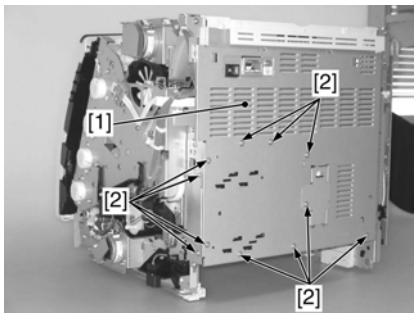
### 3.2.11 Video Controller PCB

#### 3.2.11.1 The former procedure of removing the Video Controller PCB

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

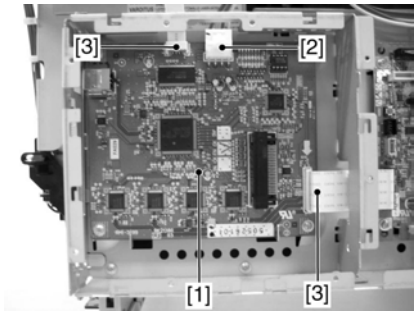
#### 3.2.11.2 Removing the Video Controller

1) Remove the rear plate [1].
- 11 screws [2]

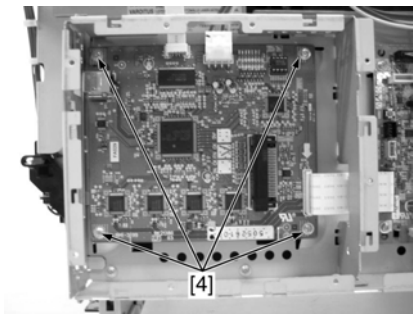



F-3-45

2) Remove the video controller PCB [1].
- 1 connector [2]
- 2 flat cables [3]
- 4 screws [4]

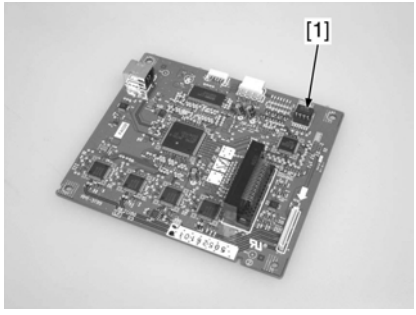



F-3-46

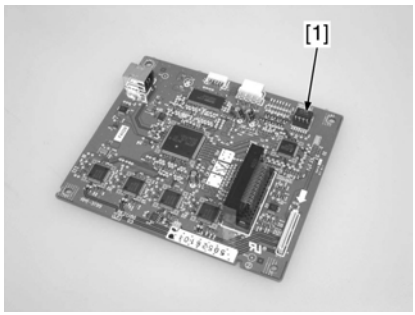



F-3-47

When replacing the video controller PCB, be sure to remove NVRAM (ICS1)[1] from the PCB and then mount it to the new one.




F-3-48




F-3-49

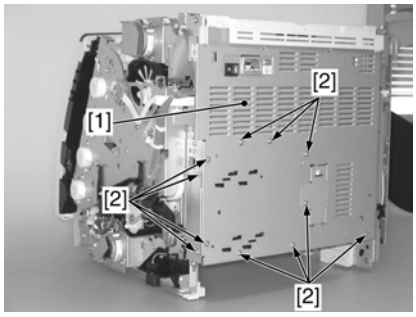
### 3.2.12 Memory Controller PCB

#### 3.2.12.1 The former procedure of Removing the Memory Controller PCB

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
5) Remove the high-voltage power supply PCB. (page 3-9) Reference[Removing the High-Voltage Power Supply PCB]

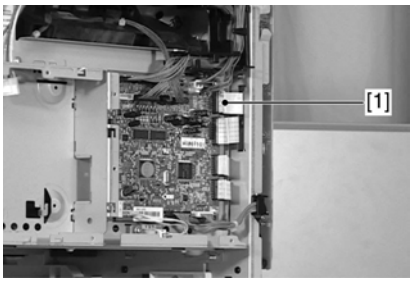
#### 3.2.12.2 Removing the Memory Controller PCB

1) Remove the high-voltage power supply PCB.
2) Remove the rear cover.
3) Remove the rear plate [1].
- 11 screws [2]



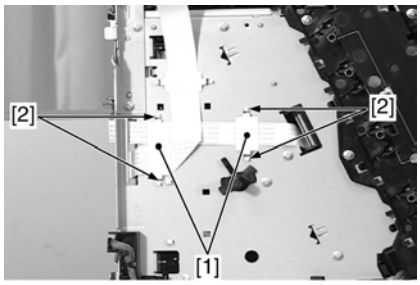

F-3-50

4) Remove the flat cable [1].



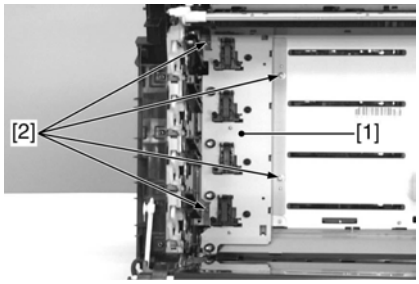

F-3-51

5) Remove the 2 FFC retainers [1].
- 4 claws [2]




F-3-52

6) Remove the memory controller PCB [1].
- 4 screws [2]




F-3-53

When removing the memory controller PCB, take care not to touch the surface of the ETB.

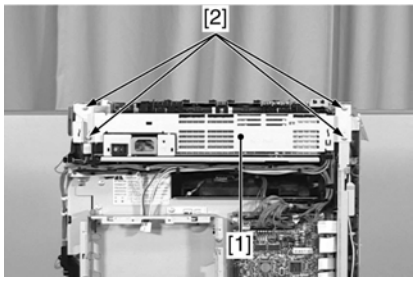
### 3.2.13 Low-Voltage Power Supply Assembly

#### 3.2.13.1 The former procedure of Removing the Low-Voltage Power Supply PCB

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
6) Remove the face-down cover. (page 3-4) Reference[Removing the Face-Down Cover]

#### 3.2.13.2 Removing the Low-Voltage Power Supply PCB

1) Remove the rear upper plate [1].
- 4 screws [2]

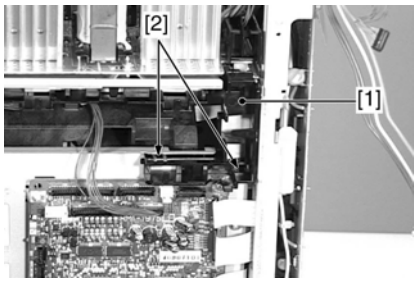



F-3-54

2) Remove the 9 connectors [1], and free the cable from the cable guide.

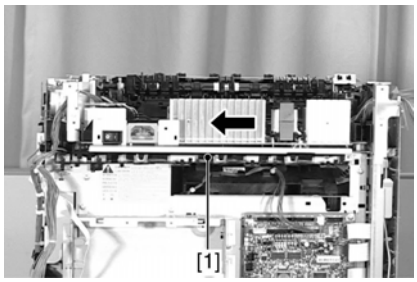

F-3-55

3) Remove the cable guide [1].
- 2 claws [2]



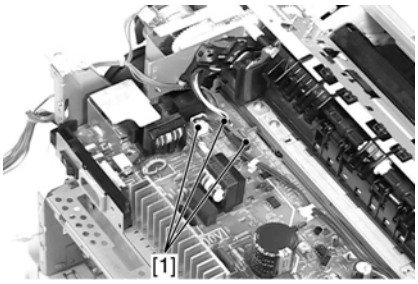

F-3-56

4) Slide the cable guide [1] to the left to detach.




F-3-57

5) Disconnect the 3 connectors [1].

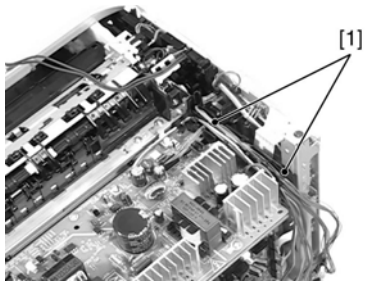



F-3-58

6) Remove the 3 harness retainers [1], and remove the cable.

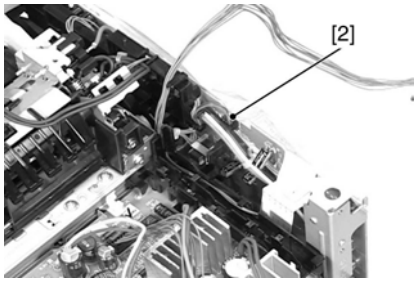

F-3-59

7) Free the cable from the cable guide [1].

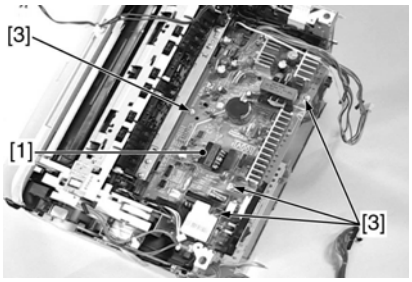



F-3-60

8) Remove the low-voltage power supply PCB [1].
- 1 connector [2]
- 4 screws [3]




F-3-61




F-3-62

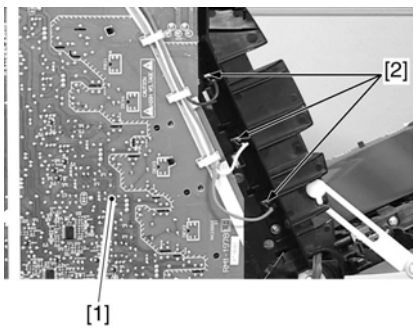
### 3.2.14 High-voltage PCB

#### 3.2.14.1 The former procedure of Removing the High-Voltage Power Supply PCB

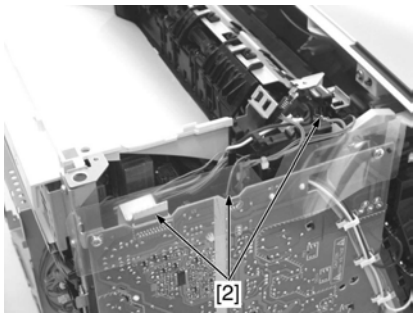
1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]

#### 3.2.14.2 Removing the High-Voltage Power Supply PCB

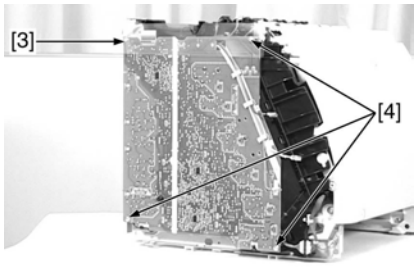
1) Remove the high-voltage power supply PCB [1].
- 6 connectors [2]
- 1 washer [3]
- 3 screws [4]
- 3 claws



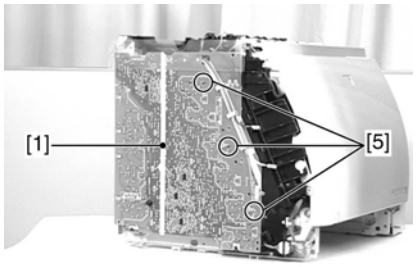

F-3-63




F-3-64

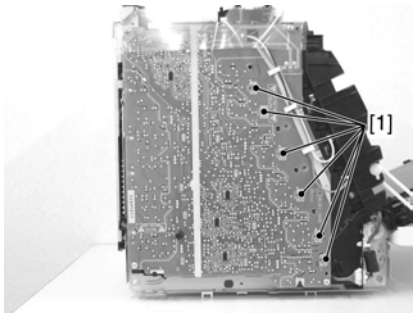



F-3-65

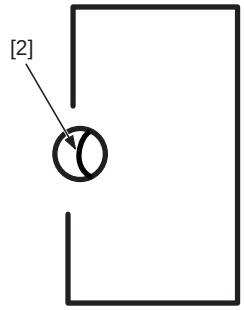



F-3-66

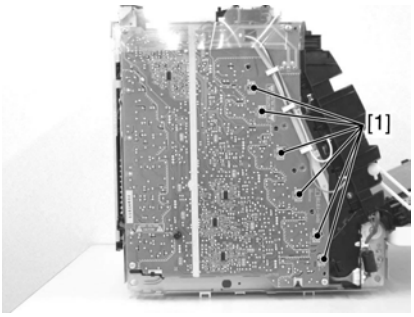
When mounting the high-voltage power PCB, check if the springs [2] can be seen through the peephole of spring contact point [1]. If not, be sure to install the PCB again so that the springs can be seen.



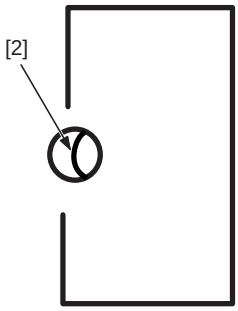

F-3-67




F-3-68




F-3-69




F-3-70

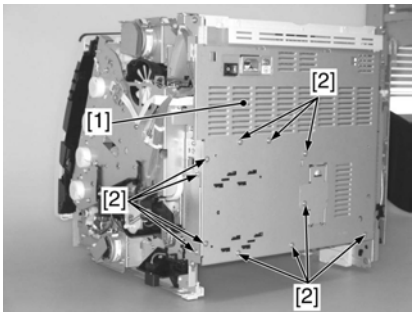
### 3.2.15 Machine Outside Environment Sensor

#### 3.2.15.1 The former procedure of removing the Site Environment Sensor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

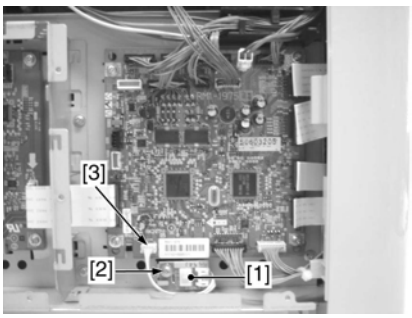
#### 3.2.15.2 Removing the Site Environment Sensor

1) Remove the rear plate [1].
   - 11 screws [2]




F-3-71

4) Remove the environment sensor [1].
   - 1 connector [2]
   - 1 screw [3]




F-3-72

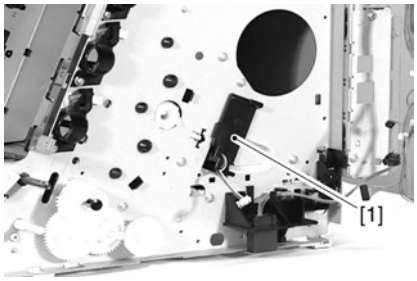
### 3.2.16 Cartridge Fan

#### 3.2.16.1 The former procedure of removing Removing the Cartridge Fan

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the main drive assembly. (page 3-5) Reference[Removing the Main Drive Assembly]

#### 3.2.16.2 Removing the Cartridge Fan

1) Slide out the cartridge fan [1].




F-3-73

## 3.3 LASER EXPOSURE SYSTEM

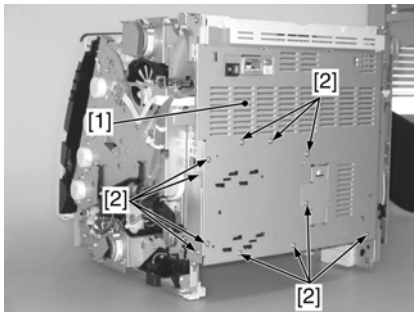
### 3.3.1 Laser Scanner Unit

#### 3.3.1.1 The former procedure of removing the Laser Scanner Unit

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]

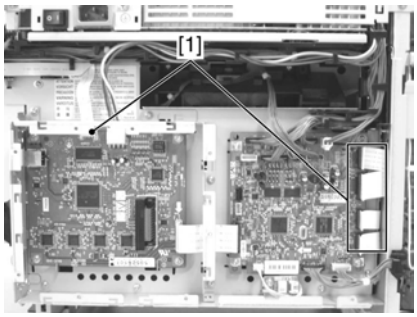
#### 3.3.1.2 Removing the Laser Scanner Unit

1) Remove the rear plate [1].
- 11 screws [2]



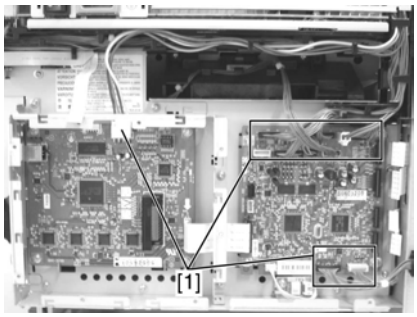

F-3-74

2) Remove the 5 flat cables [1].



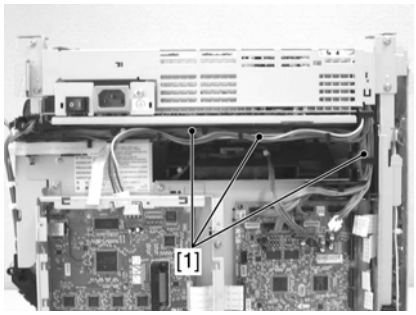

F-3-75

3) Disconnect the 11 connectors [1].



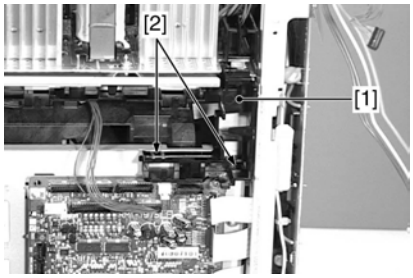

F-3-76

4) Free the cable from the cassette guide [1].



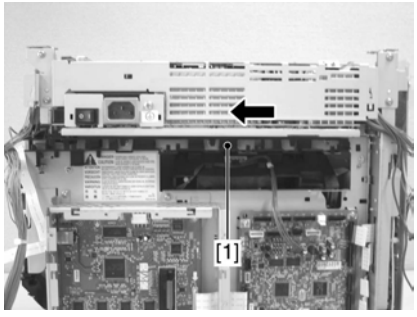

F-3-77

5) Remove the cable guide [1].
- 2 claws [2]



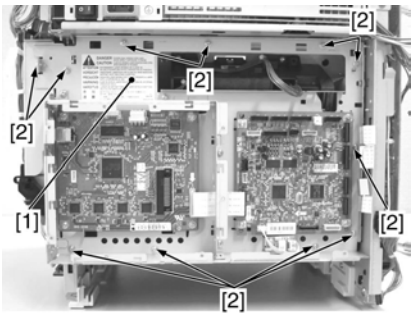

F-3-78

6) Slide the cable guide [1] to the left to remove.



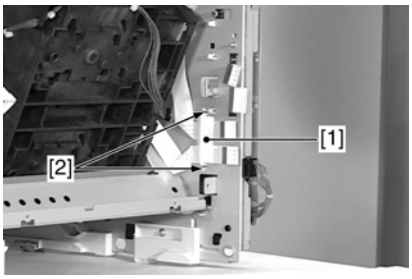

F-3-79

7) Remove the rear plate [1].
- 11 screws [2]



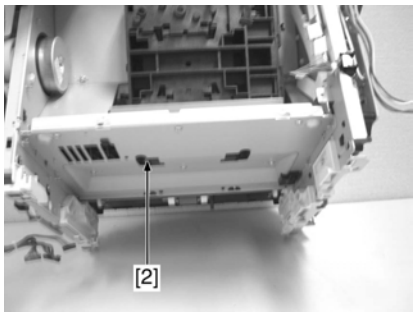

F-3-80

8) Remove the FFC stopper [1].
- 2 claws

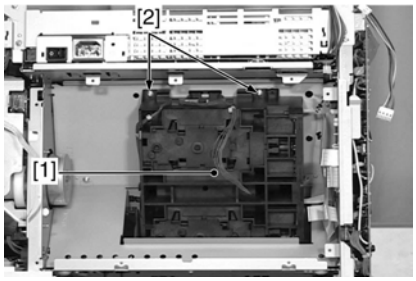



F-3-81

9) Remove the laser scanner unit [1].
- 3 screws [2]




F-3-82




F-3-83

The laser/scanner unit requires adjustment at the end of assembly work. Do not disassemble it in the field.

## 3.4 IMAGE FORMATION SYSTEM

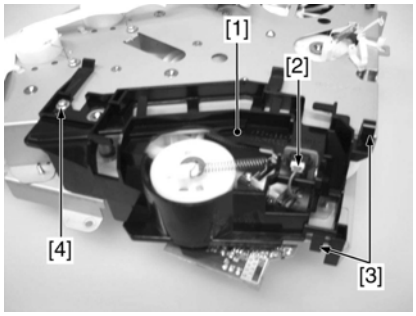
### 3.4.1 MCY Developing Cylinder Drive Solenoid

#### 3.4.1.1 The former procedure of removing the MCY Developing Cylinder Drive Solenoid

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the main drive assembly. (page 3-5) Reference[Removing the Main Drive Assembly]

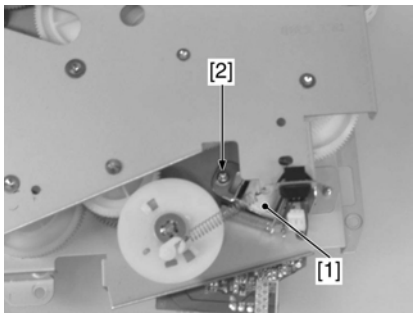
#### 3.4.1.2 Removing the MCY Developing Cylinder Drive Solenoid

1) Remove the cable guide [1].
- 1 connector [2]
- 2 claws [3]
- 1 screw [4]




F-3-84

2) Remove the MCY developing cylinder drive solenoid [1].
- 1 screw [2]




F-3-85

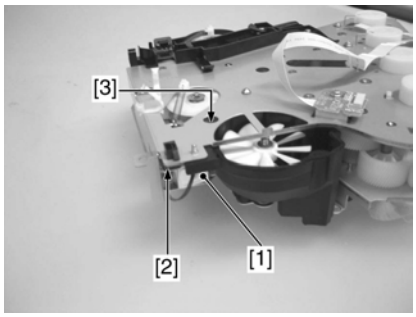
### 3.4.2 Bk Developing Cylinder Drive Solenoid

#### 3.4.2.1 The former procedure of removing the Bk Developing Cylinder Drive Solenoid

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the main drive assembly. (page 3-5) Reference[Removing the Main Drive Assembly]

#### 3.4.2.2 Removing the Bk Developing Cylinder Drive Solenoid

1) Remove the Bk developing cylinder drive solenoid [1].
- 1 connector [2]
- 1 screw [3]




F-3-86

### 3.4.3 ETB Unit

#### 3.4.3.1 The former procedure of removing the ETB Unit

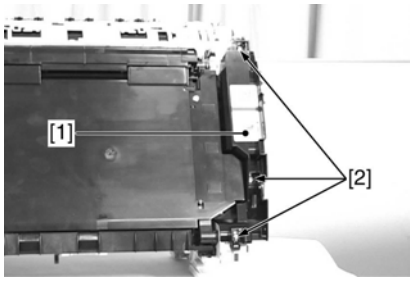
1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery

Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
6) Remove the front cover. (page 3-3) Reference[Removing the Front Cover]

### 3.4.3.2 Removing the ETB Unit

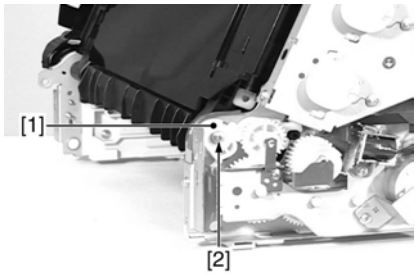
Assembly and Disassembly of ETB unit should be done with the ETB unit closed.

1) Remove the inner cover [1].
- 3 screws [2]



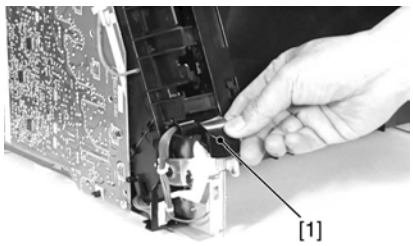

F-3-87

2) Remove the cam [1].
- 1 screw [2]



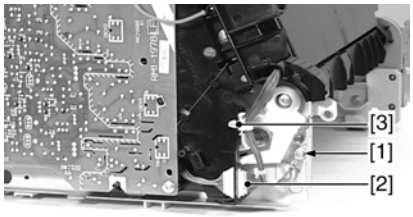

F-3-88

3) Remove the cable cover [1].



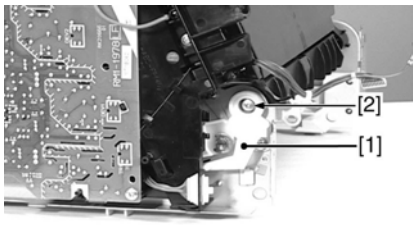

F-3-89

4) Remove the screw [1].
5) Disconnect the connector [2].
6) Remove the harness retainer [3].



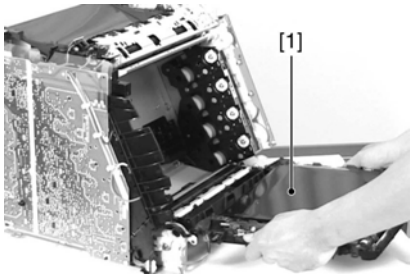

F-3-90

7) Remove the cam [1].
- 1 screw [2]




F-3-91

8) Remove the ETB unit [1].




F-3-92

When removing the ETB, take care not to touch the surface of the ETB.

## 3.5 PICKUP/FEEDING/DELIVERY SYSTEM

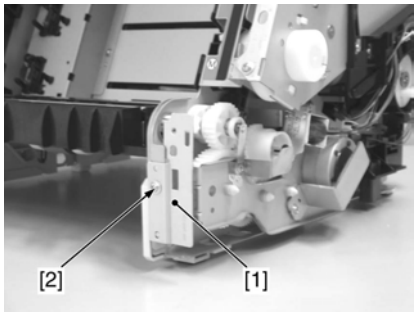
### 3.5.1 Paper Pick-up Feeder Unit

### 3.5.1.1 The former procedure of removing the Pickup/ Transport Assembly

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
6) Remove the front cover. (page 3-3) Reference[Removing the Front Cover]
7) Remove the ETB unit. (page 3-13) Reference[Removing the ETB Unit]
8) Remove the high-voltage power supply PCB. (page 3-9) Reference[Removing the High-Voltage Power Supply PCB]
9) Remove the memory controller PCB. (page 3-8) Reference[Removing the Memory Controller PCB]

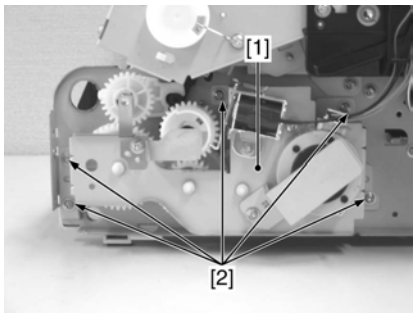
### 3.5.1.2 Removing the Pickup/Transport Assembly

1) Remove the plate [1].
- 1 screw [2]



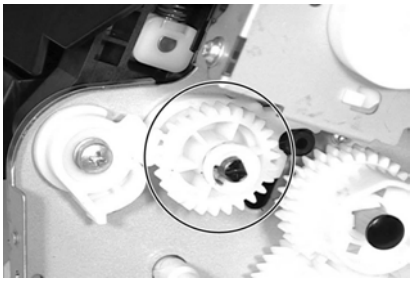

F-3-93

2) Remove the pickup motor plate [1].
- 5 screws [2]

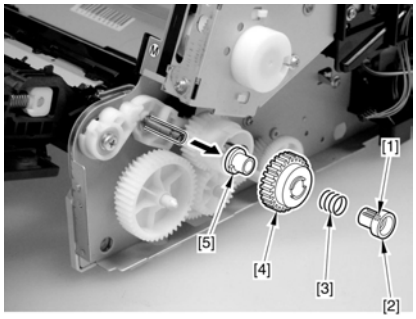



F-3-94

3) Remove the gears.
- 1 claw [1]
- 1 bushing [2]
- 1 spring [3]
- 1 gear [4
- 1 bearing [5]

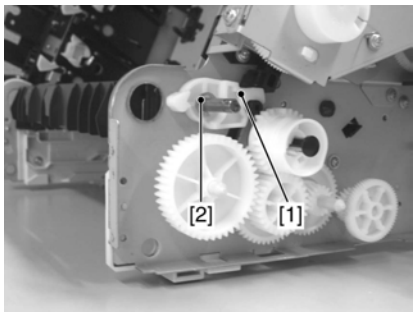


F-3-95



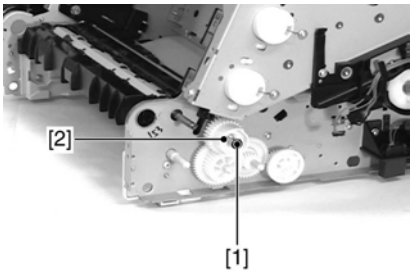

F-3-96

4) Remove the ETB drive cam [1].
- 1 E-ring [2]



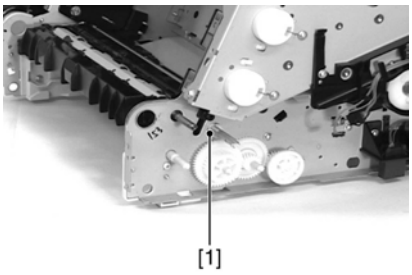

F-3-97

5) Remove the conducting cap [1] and the pickup gear [2].



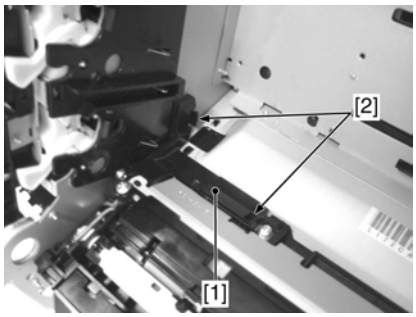

F-3-98

6) Remove the bearing [1].



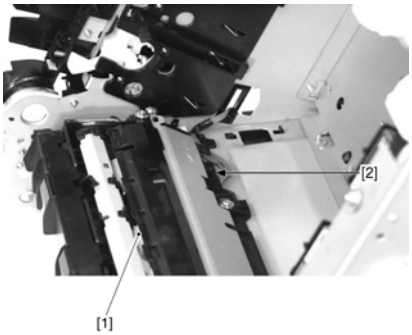

F-3-99

7) Detach the connector cover [1].
- 2 claws [2]

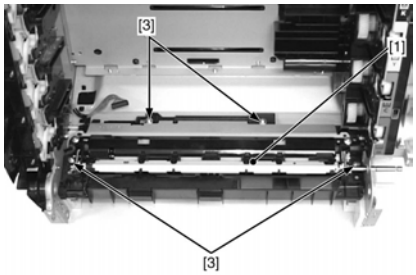



F-3-100

8) Remove the pickup/transport assembly [1].
- 1 connector [2]
- 4 screws [3]




F-3-101




F-3-102

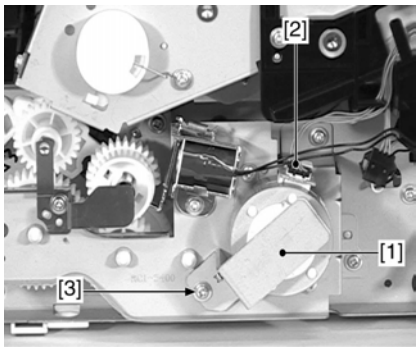
### 3.5.2 Pickup Motor

#### 3.5.2.1 The former procedure of removing the Pickup Motor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

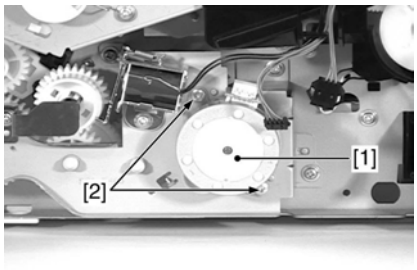
#### 3.5.2.2 Removing the Pickup Motor

1) Remove the plate [1].
- 1 connector [2]
- 1 screw [3]




F-3-103

2) Remove the pickup motor [1].
- 1 screw [2]

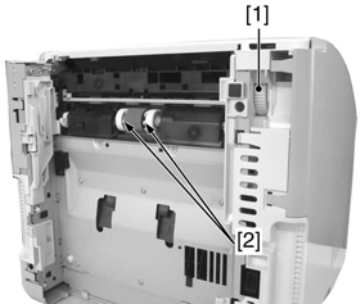



F-3-104

### 3.5.3 Cassette Pickup Roller

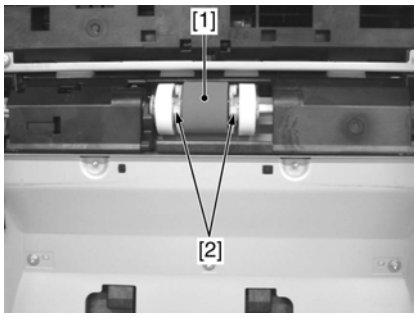
#### 3.5.3.1 Removing the Pickup Roller

1) Place the machine on its back
2) Turn the gear [1] in the direction indicated in the figure so that the claw [2] of the pickup roller is visible.




F-3-105

3) Remove the pickup roller [1].
- 2 claws [2]




F-3-106

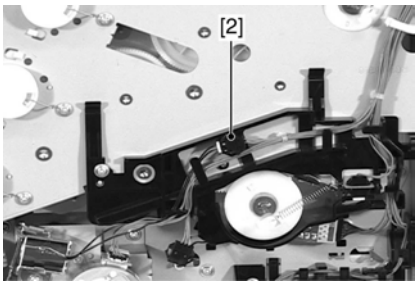
### 3.5.4 Cassette Pick-up Solenoid

#### 3.5.4.1 The former procedure of removing the Cassette Pickup Solenoid

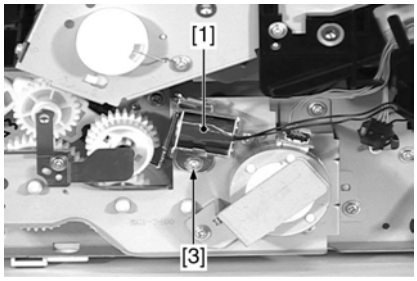
1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]

#### 3.5.4.2 Removing the Cassette Pickup Solenoid

1) Remove the pickup solenoid [1].
- 1 connector [2]
- 1 screw [3]




F-3-107

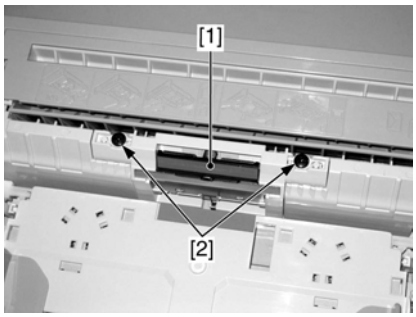



F-3-108

### 3.5.5 Cassette Separation Pad

#### 3.5.5.1 Removing the Separation Pad

1) Remove the separation pad [1].
- 2 screws [2]




F-3-109

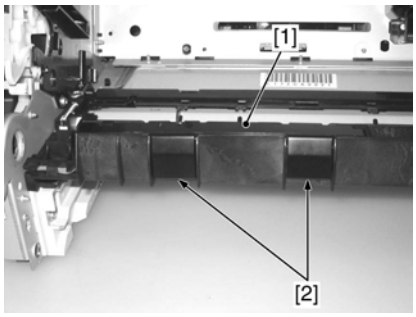
### 3.5.6 Manual Paper Sensor

#### 3.5.6.1 The former procedure of removing the Manual Feeder Paper Sensor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
6) Remove the front cover. (page 3-3) Reference[Removing the Front Cover]
7) Remove the ETB unit. (page 3-13) Reference[Removing the ETB Unit]

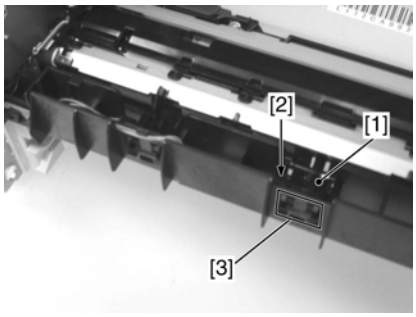
#### 3.5.6.2 Removing the Manual Feeder Paper Sensor

1) Remove the sensor cover [1].
- 2 claws [2]




F-3-110

2) Remove the manual feeder paper sensor [1].
- 1 connector [2]
- 2 claws [3]




F-3-111

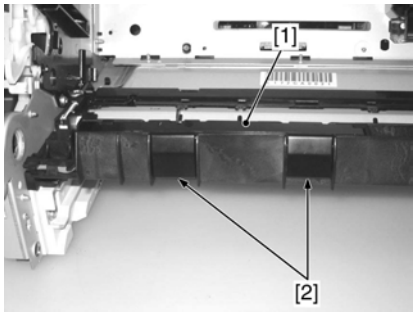
### 3.5.7 Registration Before Sensor

#### 3.5.7.1 The former procedure of removing the Registration Sensor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the rear cover. (page 3-2) Reference[Removing the Rear Cover]
3) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
4) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
5) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
6) Remove the front cover. (page 3-3) Reference[Removing the Front Cover]
7) Remove the ETB unit. (page 3-13) Reference[Removing the ETB Unit]

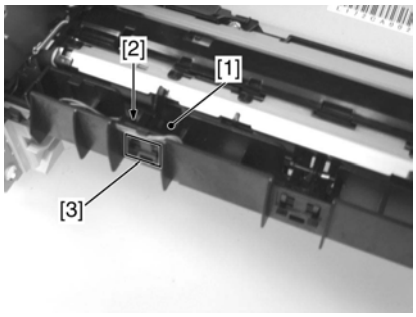
#### 3.5.7.2 Removing the Registration Sensor

1) Remove the sensor cover [1].
- 2 claws [2]




F-3-112

2) Remove the registration sensor [1].
- 1 connector [2]
- 2 claws [3]




F-3-113

## 3.6 FIXING SYSTEM

### 3.6.1 Fixing Assembly

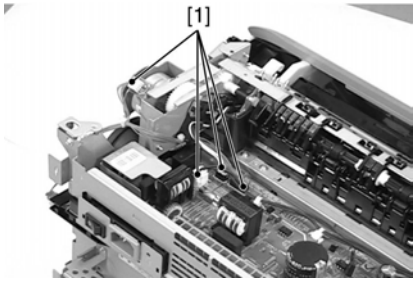
#### 3.6.1.1 The former procedure of removing the Fixing Assembly

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
5) Remove the face-down cover. (page 3-4) Reference[Removing the Face-Down Cover]

#### 3.6.1.2 Removing the Fixing Assembly

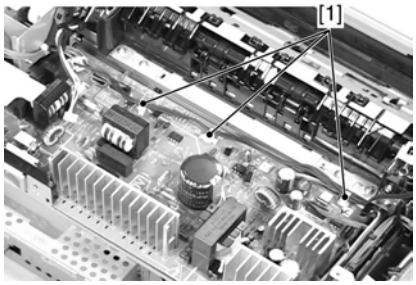
⚠
Before starting the work, be sure to turn off the power switch, and disconnect the power cord.
If the machine has been operating, it is most likely that the fixing assembly is extremely hot. Wait until the assembly has cooled enough before starting to remove it.

1) Disconnect the 4 connectors [1].



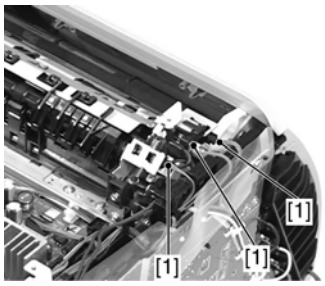

F-3-114

2) Free the cable from the harness retainer [1].



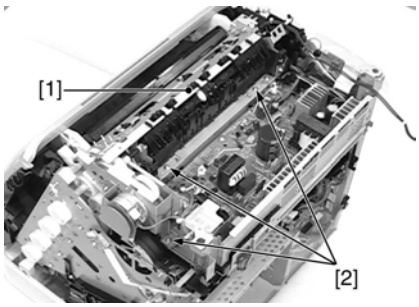

F-3-115

3) Remove the 3 connectors [1].




F-3-116

4) Remove the fixing assembly [1].
- 3 screws [2]




F-3-117

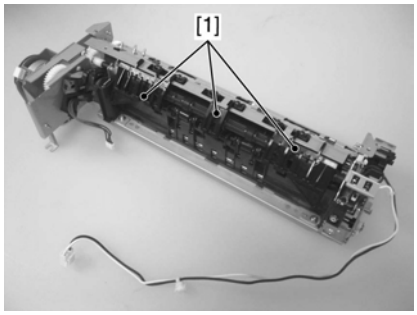
### 3.6.2 Fixing Film Unit

#### 3.6.2.1 The former procedure of removing the Fixing Film

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
5) Remove the face-down cover. (page 3-4) Reference[Removing the Face-Down Cover]
6) Remove the fixing assembly. (page 3-16) Reference[Removing the Fixing Assembly]

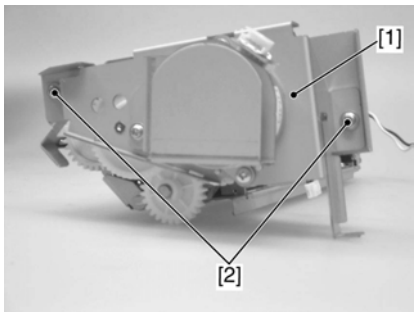
#### 3.6.2.2 Removing the Fixing Film

1) Remove the 3 flappers [1].



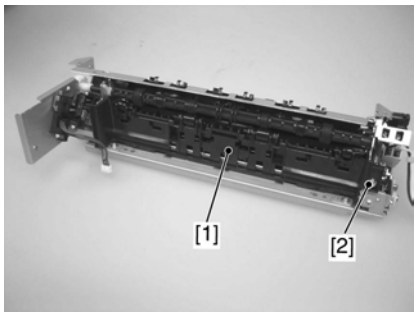

F-3-118

2) Remove the delivery drive unit [1].
- 2 screws [2]



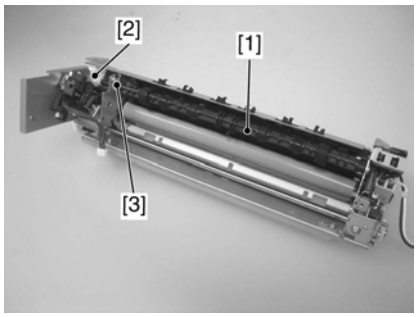

F-3-119

3) Remove the delivery lower guide [1].
- 1 screw [2]



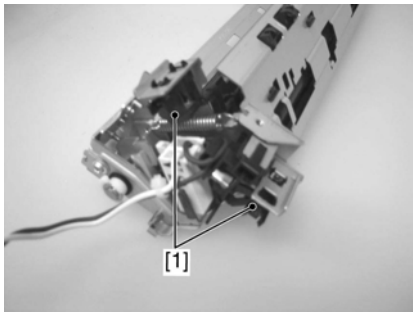

F-3-120

4) Remove the face-down roller [1].
- 1 gear [2]
- 1 bushing [3]



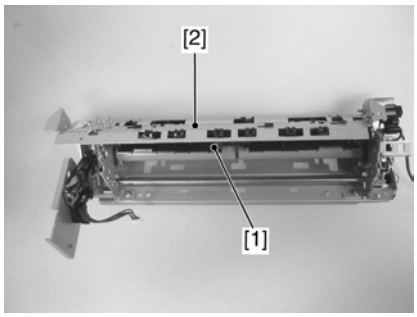

F-3-121

5) Remove the 2 photointerrupters [1].



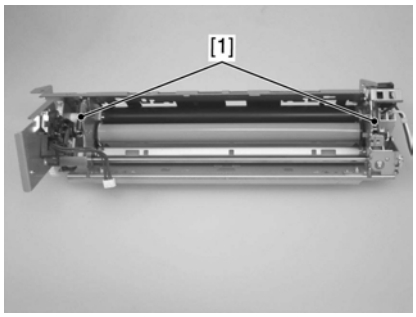

F-3-122

6) Remove the delivery upper guide [1].
- 1 claw [2]



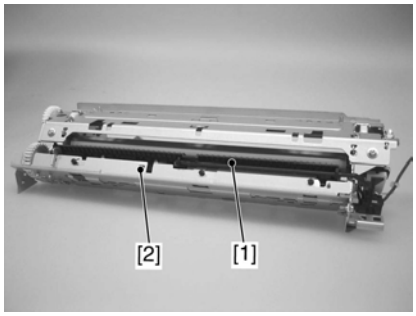

F-3-123

7) Remove the 2 fixing assembly pressure spring [1].



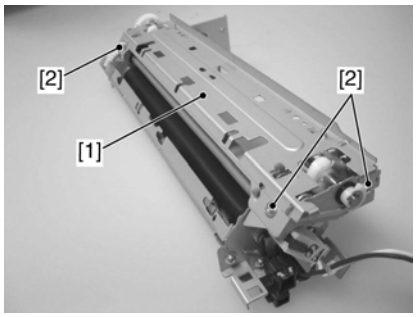

F-3-124

8) Remove the inlet guide [1].
- 1 claw [2]

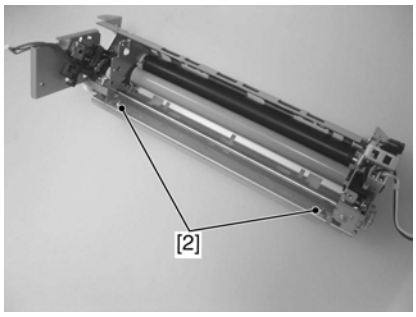



F-3-125

9) Remove the fixing base cover [1].
- 5 screws [2]

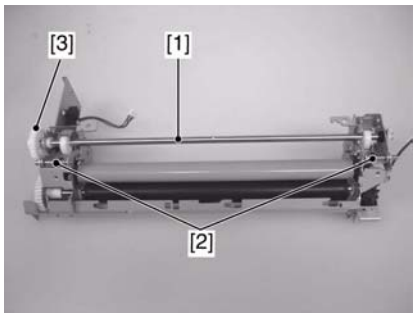



F-3-126

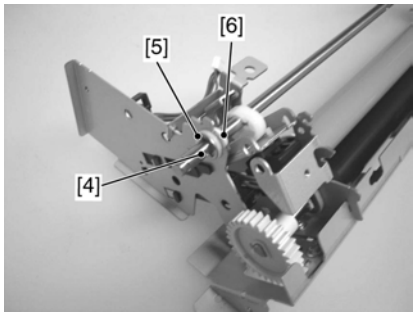



F-3-127

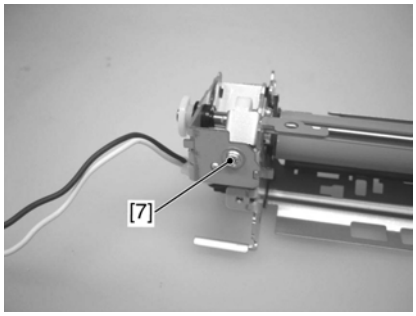
10) Remove the pressure plate cam [1].
- 2 pressure release shafts [2]
- 1 gear [3]
- 1 parallel pin [4]
- 1 E-ring [5]
- 1 bushing [6]
- 1 screw [7]




F-3-128

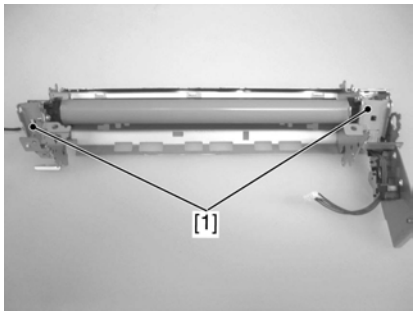



F-3-129



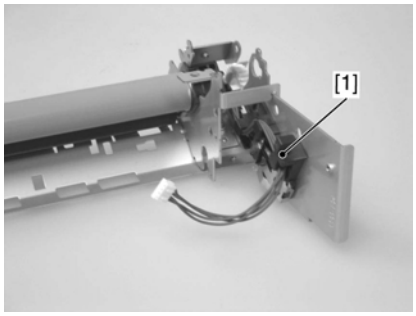

F-3-130

11) Remove the 2 pressure plates [1].

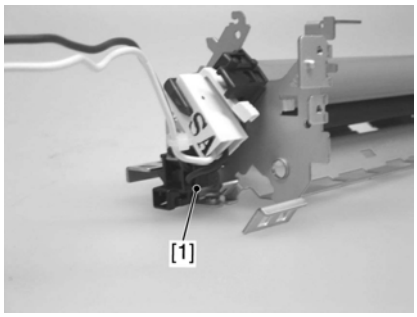



F-3-131

12) Free the cable from the cable guide [1].

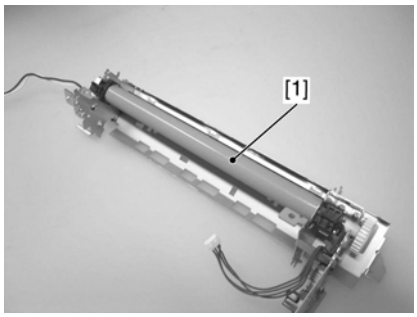



F-3-132




F-3-133

13) Remove the fixing film [1].




F-3-134

When removing the fixing film, take care not to touch the surface of the fixing film.

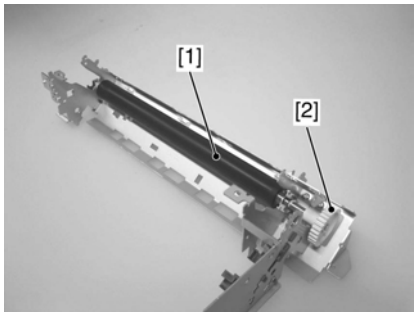
### 3.6.3 Fixing Pressure Roller

#### 3.6.3.1 The former procedure of removing the Fixing Pressure Roller

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
5) Remove the face-down cover. (page 3-4) Reference[Removing the Face-Down Cover]
6) Remove the fixing assembly. (page 3-16) Reference[Removing the Fixing Assembly]
7) Remove the fixing film. (page 3-17) Reference[Removing the Fixing Film]

#### 3.6.3.2 Removing the Fixing Pressure Roller

1) Remove the fixing pressure roller [1].
- 1 gear [2]




F-3-135

When removing the fixing pressure roller, take care not to touch the surface of the fixing film.

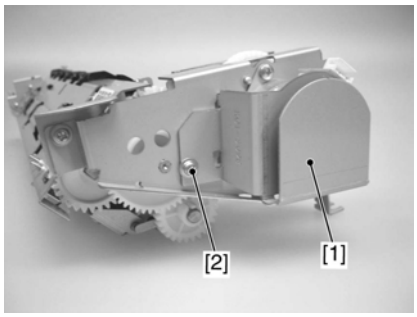
### 3.6.4 Fixing Motor

#### 3.6.4.1 The former procedure of removing the Fixing/ Delivery Motor

1) Remove the delivery tray. (page 3-4) Reference[Removing the Delivery Tray]
2) Remove the right cover/right cassette cover. (page 3-2) Reference[Removing the Right Cover/Right Cassette Cover]
3) Remove the upper cover. (page 3-3) Reference[Removing the Upper Cover]
4) Remove the left cover/left cassette cover. (page 3-3) Reference[Removing the Left Cover/Left Cassette Cover]
5) Remove the face-down cover. (page 3-4) Reference[Removing the Face-Down Cover]
6) Remove the fixing assembly. (page 3-16) Reference[Removing the Fixing Assembly]

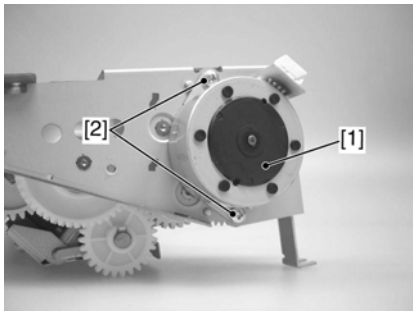
#### 3.6.4.2 Removing the Fixing/Delivery Motor

1) Remove the plate [1].
- 1 screw [2]




F-3-136

2) Remove the fixing/delivery motor [1].
- 2 screws [2]




F-3-137

# Chapter 4 MAINTENANCE AND INSPECTION

# Contents

# 4.1 Periodically Replaced Parts

## 4.1.1 Periodically Replaced Parts

The machine does not have parts that require periodical replacement.

# 4.2 Consumables

## 4.2.1 Durables Replaced by the User

The machine does not have durables that require replacement by the user.

## 4.2.2 Durables Replaced by the Service Person

The machine does not have parts that require replacement by the service person.

# 4.3 Periodical Service

## 4.3.1 Periodic Service

The printer has no parts that require periodic servicing.

# 4.4 Cleaning

## 4.4.1 Pickup Roller

Clean it with lint-free paper.

## 4.4.2 Separation Pad

Clean it with lint-free paper.

## 4.4.3 Registration Roller

Clean it with lint-free paper. If the soiling cannot be removed, use alcohol.

## 4.4.4 Registration Sub Roller

Clean it with lint-free paper. If the soiling cannot be removed, use alcohol.

## 4.4.5 Registration Shutter

Clean it with lint-free paper. If the soiling cannot be removed, use alcohol.

## 4.4.6 Transport Guide

Clean it with lint-free paper. If the soiling cannot be removed, use alcohol.

## 4.4.7 Delivery Roller

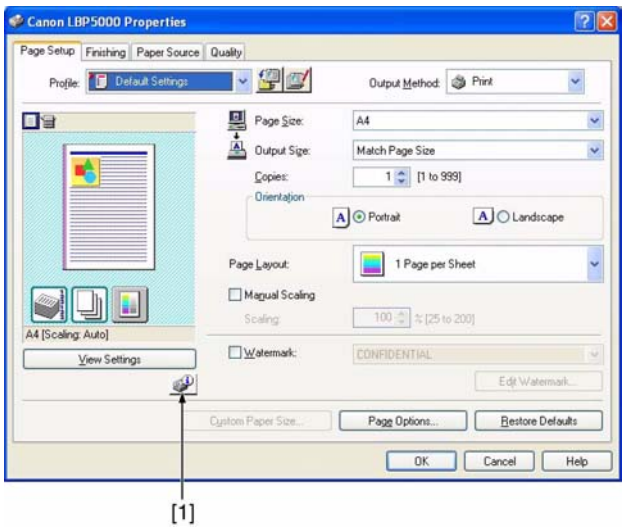
Clean it with lint-free paper. If the soiling cannot be removed, use alcohol.

## 4.4.8 Fixing Inlet Guide

Clean it using a cloth moistened with alcohol.

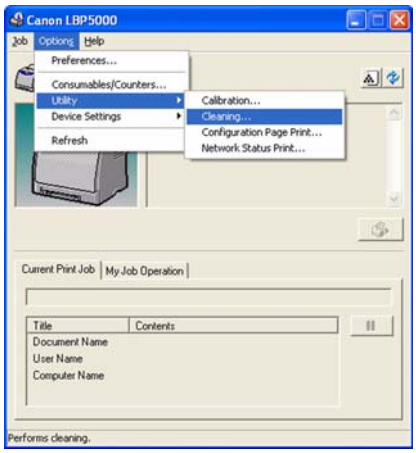
## 4.4.9 Fixing Pressure Roller

1) Start up the printer driver.
2) Click [printer status window icon] [1] found under [page setup] of [Printer Properties].



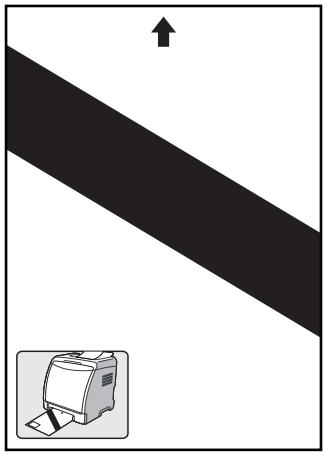

F-4-1

3) Make the following selections: option>utility>cleaning.




F-4-2

4) Click the OK button to print out the cleaning page.



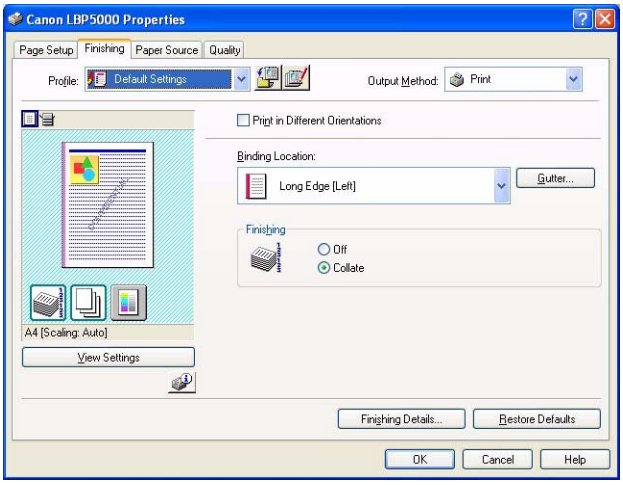
F-4-3

5) Place the printout with the printed side facing up. The printout will be fed into the machine, thereby cleaning the fixing pressure roller.

## 4.5 User Maintenance

### 4.5.1 Outline

When a copy image fault occurs, the image can be improved if the Special print processing is set in the printer driver.
Setting procedure of Special print processing
1. Press a button of 'Finishing detail' on the 'Finishing' page in the printer driver.




F-4-4

2. Press a button of 'Advanced Setting' on the screen of 'Finishing detail'
3. Change 'Special print Mode'.

## 4.5.2 List Of Special Print Mode

T-4-1

| Problem | Setting in Printer driver | Cause and Remedy |
|---|---|---|
| A printer is installed under high-humidity environment and the print density becomes lighter. | Special setting 1 | When using the printer under high-humidity environment or depending on the media used, the image of color letters or patterns with toners of two colors or more may become lighter. In that case, if setting to "Special setting 1", the print image may be able to be improved. |
| An envelope flap is sealed. | Special setting 2 | When using the printer under high-humidity environment or depending on the envelope types, the envelop flap may be sealed. In that case, if setting to "Special setting 2", the problem may be able to be improved. |
| A printer is installed under high-humidity environment and the print density of halftone becomes lighter or the displacement of letters occurs. | Special setting 3 | When using the printer under high-humidity environment or depending on the media used, the print density of thin line or fine halftone may become lighter. In that case, if setting to "Special setting 3", the print image may be able to be improved. |
| A printer is installed under low-humidity environment and the copy image fault occurs in paper with a high value of resistance. | Special setting 4 | When using the printer under low-humidity environment or depending on the media types, the marks like toner scatter around characters or patterns may be printed. In that case, if setting to "Special setting 4", the print image may be able to be improved. |
| The media with a rough texture is used. | Special setting 5 | When using the media with a rough texture, the density of image, especially the one with toners of two or more colors, may become lighter. In that case, if setting to "Special setting 5", the print image may be able to be improved. |
| Minus curling occurs. | Special setting 6 | When using the printer under high-humidity or depending on the media types, the printed sheet may curl to the non-printed side in some print patterns (especially the pattern with the low print ratio). In that case, if setting to "Special setting 6", the curling may be able to be improved. |
| Plus curling occurs. | Special setting 7 | When using the printer under low-humidity or depending on the media types, the printed sheet may curl to the printed side in some print patterns (especially the pattern with the high print ratio). In that case, if setting to "Special setting 7", the curling may be able to be improved. |
| The reproducibility in halftone decreases. | Special setting 8 | When not using the printer for a long period, the reproducibility in halftone may decrease or the inconsistencies in density may occur. In that case, if setting to "Special setting 8", the problem may be improved. In this mode, however, the lead time for printing becomes a bit longer. |
| Fogging occurs in the whole image. | Special setting 9 | When printing the image with a large blank area on the gloss paper, in some rare cases, the fogging may occur in the blank area. In that case, if setting to "Special setting 9", the problem may be improved. |
| The edge enhancement occurs. | Special setting 10 | When printing the image with a high-density area, the edge enhancement may occur in the area because the trailing edge of the area may be reproduced in high density. In that case, if setting to "Special setting 10", the edge enhancement may be improved. |

# Chapter 5 TROUBLESHOOTING

# Contents

# 5.1 Countermeasures

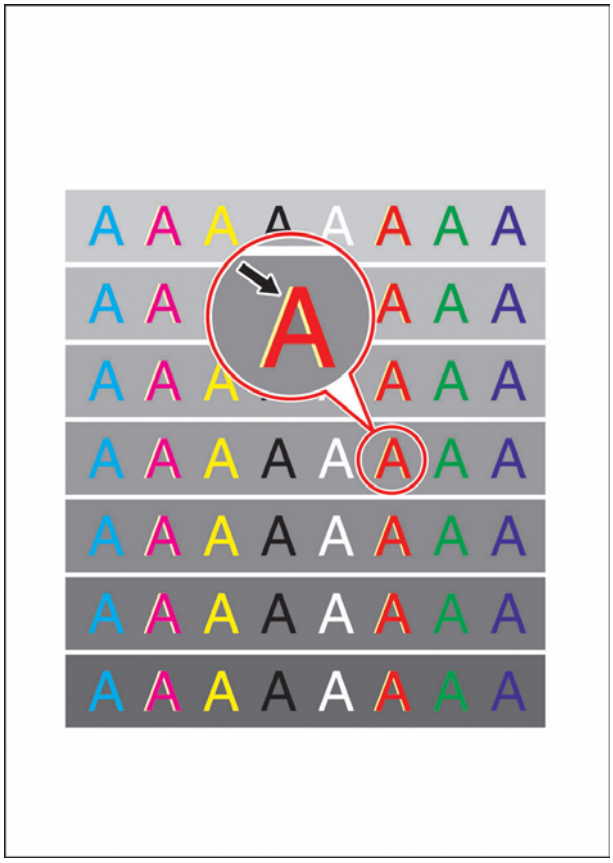
## 5.1.1 Image Faults

### 5.1.1.1 Out of Focus

#### 5.1.1.1.1 Color Misalignment

*0011-4188*

**Image Sample**



F-5-1

**Probable cause**
When the toner level is low or the photosensitive drum is deteriorated, a defective image “color misalignment” may occur.
**Servicing work**
In the printer driver, execute “calibration” and set “No” to gray correction, following the procedures mentioned below. When the color misalignment is not eliminated, clean the color misalignment sensor.
1. Calibration
1)Å@Activate the Status window from the printer driver.
2)Å@In the option menu in the Status window, select “Utility” and click “Calibration”.
3)Å@Press the OK button.
2. Use Pure Black
1) Select the "Quality" page in the printer driver.
2) In “Quality” in the page, click the “Settings” button.
3) Set “No” to Use Pure Black.
3. How to clean the color misalignment sensor
Wipe the sensor surface with a material such as lint-free paper dampened with alcohol.

Do not wipe the sensor surface with a dry cloth. If you do so, the sensor surface becomes charged and it causes stray toner.

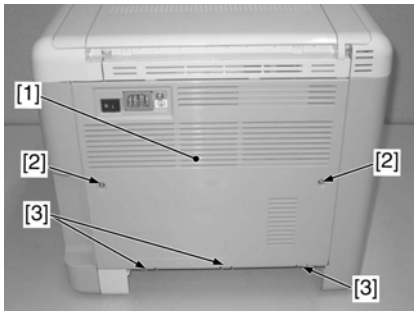
# 5.2 MEASUREMENT AND ADJUSTMENT

## 5.2.1 Test Print

### 5.2.1.1 Test Print

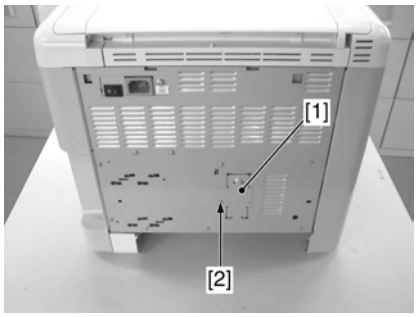
This test print is conducted in order to check if the printer engine works normally.
When the printer is in stand-by mode, a sheet with test pattern (horizontal lines) can be output if pressing the test print switch on the DC controller PCB at the back side of the printer.

Accessing the Test Print Switch
1) Remove the rear cover [1].
- 2 screws [2]
- 3 claws [3]

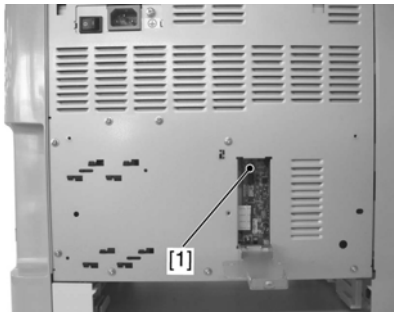



F-5-2

2) Remove the plate [1].
- 1 screw [2]

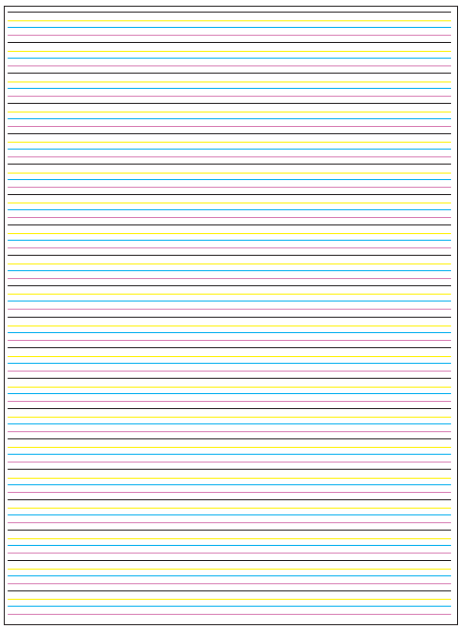



F-5-3




F-5-4

[1]: Test print switch



F-5-5

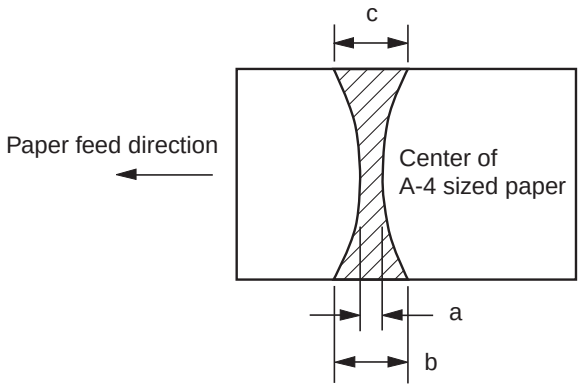
### 5.2.2 Adjustment of Fixing System

#### 5.2.2.1 Checking the Nip Width (fixing pressure roller)

⚠
Before removing the print paper, be sure to turn on the machine and see that the machine is in a jam state. Otherwise, the fixing film can suffer a tear.

The machine can start to show poor fixing when the nip of its fixing assembly is not correct. Check the nip of the fixing assembly first if poor fixing is noted. You will not be able to adjust the nip. If the nip is wrong, replace the assembly.

How to Check the Nip
1) Make a solid black print on A4/LTR paper, and take it to the user's.
2) Place the print in the machine's cassette with its printed side facing down.
3) Press the test print switch.
4) As soon as the leading edge of the print has appeared from the delivery slot, turn off the power, and wait for about 10 sec, leaving the machine alone.
5) Turn on the machine, and check to see that the machine is in a jam state. Thereafter, remove the print with care.
6) On the print, measure the width of the area with shiny toner to see if it is as indicated:
- middle (a): 6 +/-0.5 mm
- difference between left/right and middle (b - a, c - a): 0mm to 1mm
- difference between left and right (|b - c|): 0.8 mm or less



F-5-6

## 5.3 SERVICE TOOLS

### 5.3.1 Standard Tools

The table below lists the standard tools required for servicing the printer.

T-5-1

| No. | Tool name | Tool No. | Remark |
|---|---|---|---|
| 1 | Tool case | TKN-0001 | With a clip |
| 2 | Jumper wire | TKN-0069 | 0.02 to 0.3 mm |
| 3 | Clearance gauge | CK-0057 | 0 to 600 g for checking the cassette spring pressure |
| 4 | Compression spring scale | CK-0058 | |
| | | | M4, M5 Length : 363 mm |
| 5 | Phillips screwdriver | CK-0101 | |
| 6 | Phillips screwdriver | CK-0104 | M3, M4 Length: 155 mm |
| 7 | Phillips screwdriver | CK-0105 | M4, M5 Length: 191 mm |
| 8 | Phillips screwdriver | CK-0106 | M4, M5 Length: 85 mm |
| 9 | Flat-blade screwdriver | CK-0111 | |
| 10 | Precision flat-blade screwdriver set | CK-0114 | 6-piece set |
| 11 | Allen wrench set | CK-0151 | 5-piece set |
| 12 | File, fine | CK-0161 | |
| 13 | Allen (hex) screwdriver | CK-0170 | M4 Length: 107 mm |
| 14 | Diagonal cutting pliers | CK-0201 | |
| 15 | Needle-nose pliers | CK-0202 | |
| 16 | Pliers | CK-0203 | Applied to the axis ring |
| 17 | Retaining ring pliers | CK-0205 | |
| 18 | Crimper | CK-0218 | |
| 19 | Tweezers | CK-0302 | Employed to measure 150 mm |
| 20 | Ruler | CK-0303 | |
| 21 | Mallet, plastic head | CK-0314 | |
| 22 | Brush | CK-0315 | |
| 23 | Penlight | CK-0327 | 100cc |
| 24 | Plastic bottle | CK-0327 | 500SH/PKG |
| 25 | Lint-free paper | CK-0336 | |
| 26 | Oiler | CK-0349 | 30cc |
| 27 | Plastic jar | CK-0351 | 30cc |
| 28 | Digital multi-measure | FY9-2032 | |

### 5.3.2 Solvent/Oil List

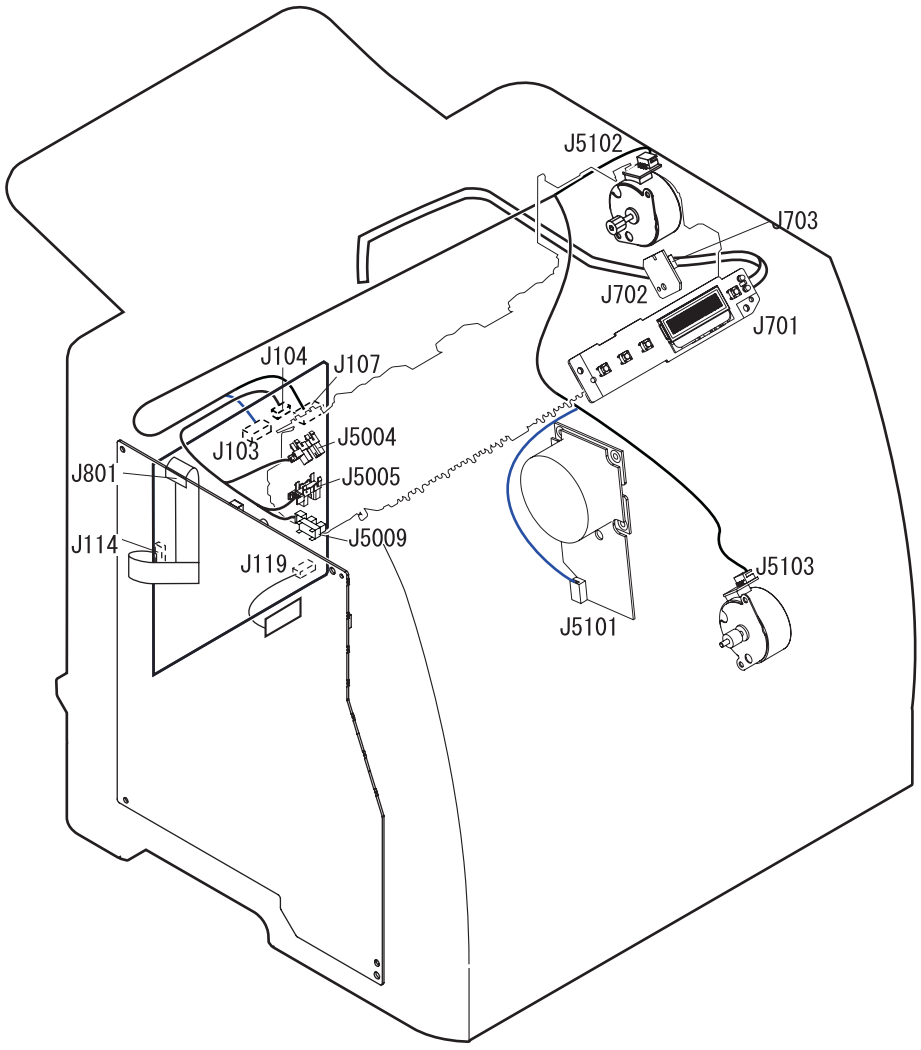
T-5-2

| No. | Name | Uses | Remarks |
|---|---|---|---|
| 1 | Ethyl alcohol | cleaning; e.g.,<br>oil, toner stain on metal area | - Do not bring close to fire.<br>- Procure locally. |
| 2 | Lubricant | - gear<br>- between shaft and bearing | - tool No.: HY9-0007 |
| 3 | Lubricant | - between shaft of pressure roller and grounding plate | - tool No.: CK-8007 |

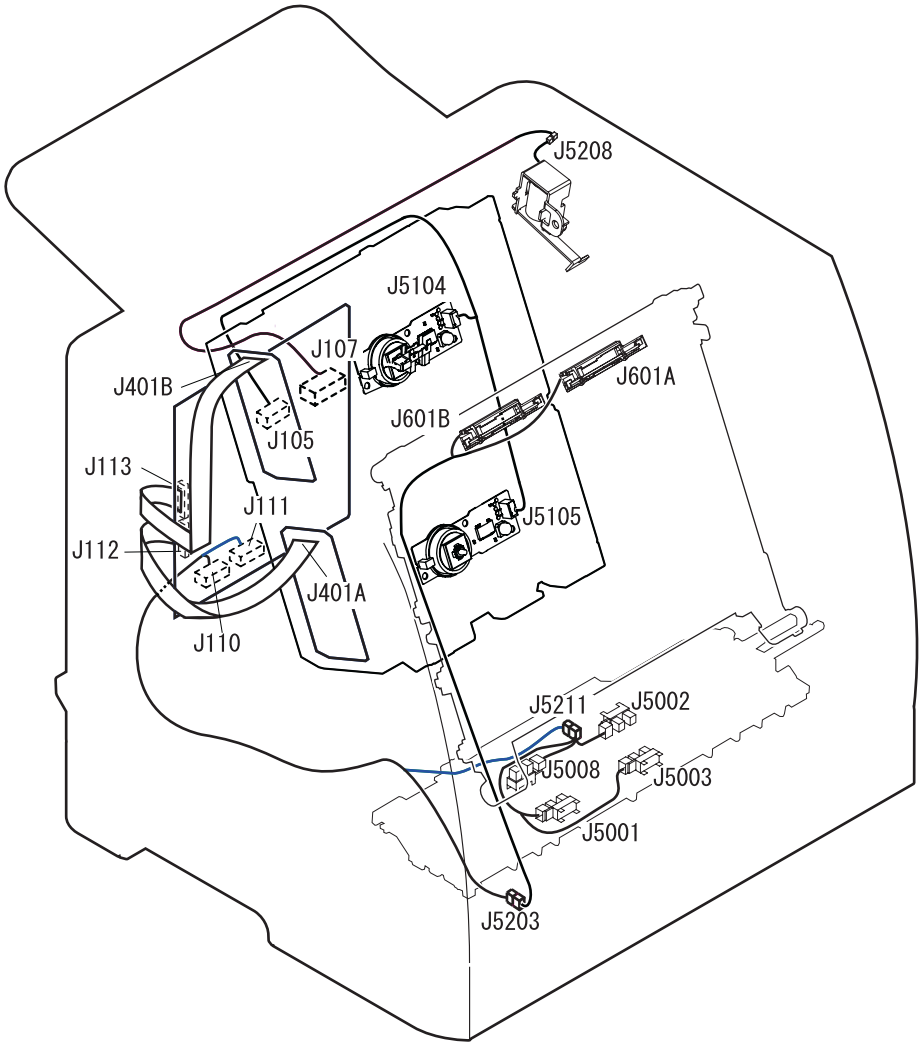
⚠
Do not use alcohol to wipe external covers. Use a moist cloth (well wrung) to clean them.

## 5.4 Location of Convectors

### 5.4.1 Connectors




F-5-7


J5208
J5104
J107
J401B
J601A
J105
J601B
J113
J111
J5105
J112
J401A
J110
J5211
J5002
J5008
J5003
J5001
J5203

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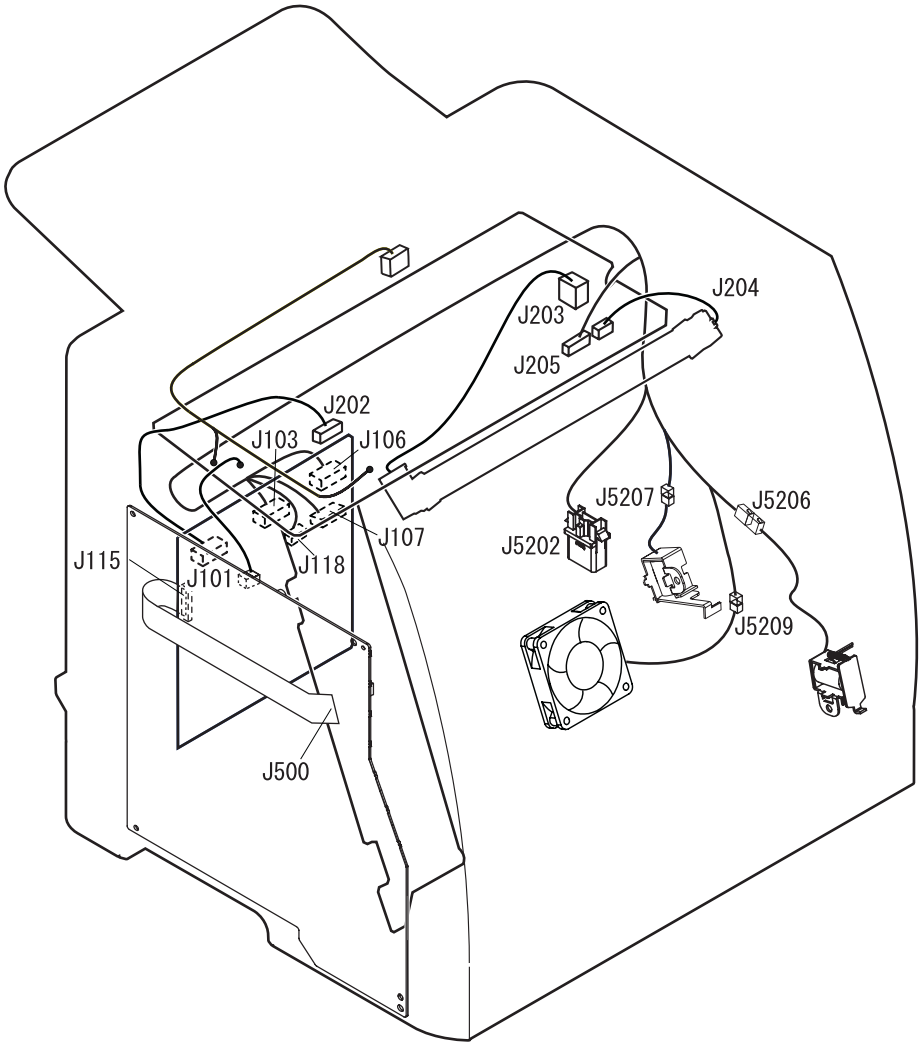


F-5-9

## 5.5 ERROR CODE

### 5.5.1 Error Code

T-5-3

| Code | | Description | Remedial action |
|---|---|---|---|
| E001 | | The fixing assembly is overheating. | |
| | 0000 | Particulars<br>The reading of the main thermistor is 225 deg C (equivalent of 0.84 V) or more for 0.5 sec or more.<br>Cause<br>The main thermistor is faulty. The DC controller PCB is faulty. | - Check the connector of the low-voltage power supply PCB.<br>- Replace the fixing film unit.<br>- Replace the DC controller PCB. |
| | 0001 | Particulars<br>The reading of the sub thermistor is 245 deg C (equivalent of 2.12 V) or more for 0.5 sec or more.<br>Cause<br>The sub thermistor is faulty. The DC controller PCB is faulty. | |
| E002 | | The warm-up of the fixing assembly is faulty. | |
| | | Particulars<br>The reading of the main thermistor fails to reach 5 deg C (0 deg C if at power-on) or more within 1 sec after the heater is supplied with power.<br>Cause<br>The main thermistor has an open circuit. The fixing heater has an open circuit. The DC controller PCB is faulty. | - Check the connector of the low-voltage power supply PCB.<br>- Replace the fixing film unit.<br>- Replace the DC controller PCB. |
| E003 | | The temperature of the fixing assembly is abnormally low. | |

| Code | | Description | Remedial action |
|---|---|---|---|
| | 0000 | Particulars<br>The reading of the main thermistor is 100 deg C (equivalent of 2.60 V) or less for 0.5 sec or more.<br>Cause<br>The low-voltage power supply PCB is faulty. The main thermistor has an open circuit. The DC controller PCB is faulty. | - Replace the low-voltage power supply PCB.<br>- Replace the fixing film unit.<br>- Replace the DC controller PCB. |
| | 0001 | Particulars<br>The reading of the sub thermistor is less than 100 deg C (equivalent of 0.38 V) for 0.5 sec or more after the heater is supplied with power.<br>Cause<br>The sub thermistor is faulty. The DC controller is faulty. | - Check the connector of the low-power supply PCB.<br>- Replace the fixing film unit.<br>- Replace the DC controller PCB. |
| E004 | | The fixing power supply drive circuit is faulty. | |
| | | Particulars<br>A zero-cross signal cannot be detected for a specific period of time.<br>Cause<br>The fixing control circuit is faulty. | - Replace the low-voltage power supply PCB. |
| E012 | | The main motor is faulty. | |
| | 0000 | Particulars<br>The revolution of the main motor fails to reach a specific value within 100 msec after the main motor is started.<br>Cause<br>The main motor is faulty. The DC controller PCB is faulty. | - Replace the main motor.<br>- Replace the DC controller. |
| | 0001 | Particulars<br>The revolution of the main motor reached a specific value, but thereafter has deviated continuously for 100 msec or more.<br>Cause<br>The main motor is faulty. The DC controller is faulty. | |
| E020 | | The density sensor is faulty. | |
| | | Particulars<br>The amount of light fails to reach a specific value when the density of the image is being checked.<br>Cause<br>The density sensor is soiled. The density sensor is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | - Replace the ETB unit.<br>- Suspect a high-voltage contact is faulty. (Check the contacts between the high-voltage contact of each color to the high-voltage PCB.)<br>- Replace the DC controller PCB.<br>- Replace the toner cartridge. |
| E024 | | The toner level sensor is faulty. | |
| | 0000 | Particulars<br>The light-receiving segment continues to receive light while the stirring plate of yellow cartridge rotates 5 times.<br>Cause<br>The memory controller PCB is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | - Replace the toner cartridge.<br>- Replace the memory controller PCB.<br>- Replace the DC controller PCB. |
| | 0001 | Particulars<br>The light-receiving segment continues to receive light while the stirring plate of mazenta rotates 5 times.<br>Cause<br>The memory controller PCB is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | |
| | 0002 | Particulars<br>The light-receiving segment continues to receive light while the stirring plate of cyan cartridge rotates 5 times.<br>Cause<br>The memory controller PCB is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | |
| | 0003 | Particulars<br>The light-receiving segment continues to receive light while the stirring plate of black cartridge rotates 5 times.<br>Cause<br>The memory controller PCB is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | |
| E066 | | The environment sensor is faulty. | |
| | | Particulars<br>The output of the environment sensor is faulty.<br>Cause<br>The environment sensor is faulty. The DC controller PCB is faulty. | - Replace the environment sensor.<br>- Replace the DC controller PCB. |
| E100 | | The scanner motor is faulty. The laser unit is faulty. The beam detector is faulty. | |
| | 0000 | Particulars<br>The yellow scanner mechanism is faulty.<br>Cause<br>The laser scanner unit is faulty. The DC controller PCB is faulty. | - Replace the laser scanner unit.<br>- Replace the DC controller PCB. |
| | 0001 | Particulars<br>The magenta scanner mechanism is faulty. The DC controller PCB is faulty. | |
| | 0002 | Particulars<br>The cyan scanner mechanism is faulty.<br>The laser scanner unit is faulty. The DC controller PCB is faulty. | |
| | 0003 | Particulars<br>The black scanner mechanism is faulty.<br>Cause<br>The laser scanner mechanism is faulty. The DC controller PCB is faulty. | |
| E194 | | The CPR sensor is faulty. | |

| Code | Description | Remedial action |
|---|---|---|
| | Particulars<br>The color displacement detection pattern is not recognized. The result of measurement is outside a specific range.<br>Cause<br>The color displacement sensor is soiled. The color displacement sensor is faulty. The DC controller PCB is faulty. The toner cartridge is faulty. | - Replace the ETB unit.<br>- Suspect that a high-voltage contact is faulty. (Check the contacts from the high-voltage contact of each color to the high-voltage PCB.)<br>- Replace the DC controller.<br>- Replace the toner cartridge. |
| E197 | An error has occurred in engine communication | |
| | An error has occurred in engine communication | Replace the DC controller PCB. |
| E198 | The DC controller memory is faulty. | |
| | Particulars<br>The DC controller has gone out of order.<br>Cause<br>The DC controller PCB is faulty. | - Replace the DC controller PCB. |
| E747 | An EEPROM error has occurred. | |
| | Particulars<br>An EEPROM error has occurred.<br>Cause<br>The video controller PCB is faulty. | - Replace the video controller PCB. |
| E806 | The fan motor is out of order. | |
| | Particulars<br>The fan lock detection signal (FANLCK) is continuously High for 10 sec or more while the fan motor is rotating.<br>Cause<br>The fan motor is faulty. The DC controller PCB is faulty. | - Replace the cartridge fan.<br>- Replace the DC controller PCB. |
| E840 | The unlocking mechanism is faulty. | |
| | Particulars<br>The unlocking mechanism of the fixing assembly is faulty.<br>Cause<br>The shift sensor is faulty. The shift sensor lever is damaged. The fixing drive assembly is faulty. The fixing/delivery motor is faulty. The DC controller PCB is faulty. | - Replace the shift sensor.<br>- Replace the shift sensor lever.<br>- Replace the fixing drive assembly.<br>- Replace the DC controller PCB. |

# 5.6 Sevice Mode

## 5.6.1 Outline

### 5.6.1.1 Outline

The machine is equipped with service mode to enable the service person to check its condition. On a PC, enter the appropriate ID from the keyboard to add a special menu to the Printer Status Window screen.

**Starting Service Mode**
1. Turn on the power so that the Printer Driver screen appears.
2. On the Drive screen, bring up the Status window [1].
3. Enter the appropriate password (*28*) from the keyboard.
4. See that service mode [2] has appeared on the Option menu of the Status Window screen.

## 5.6.2 Service Mode Table

### 5.6.2.1 Service Mode Items

T-5-4

| Group | | Description | Settings |
|---|---|---|---|
| Service Chart Print | | Service Chart Print 1 | |
| Service Chart Print | | Service Chart Print 2 | |
| Counter Details | | Use it to check the number of printed pages using respective toner cartridges. | |
| Service Settings | Fixing Temparature | Use it to set the fixing temperature. | -1 to 1 |
| Service Settings | Transfer Bias | Use it to set the offset value for the transfer bias. | -1 to 1 |
| configuration page print B | | configuration page print B | |

# Chapter 6 APPENDIX

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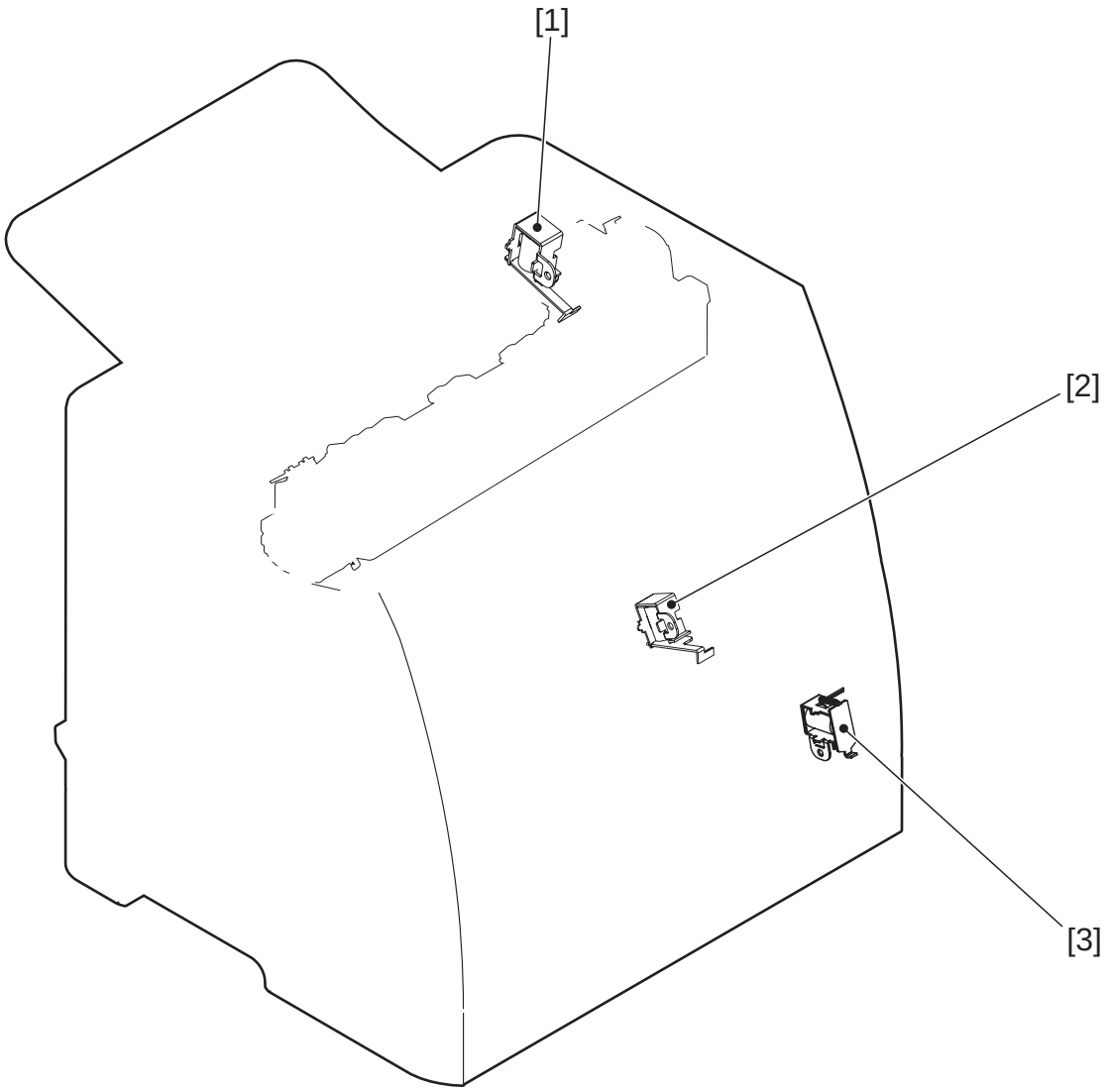
# 6.1 OUTLINE OF ELECTRICAL COMPONENTS

### 6.1.1 Clutch/Solenoid

#### 6.1.1.1 Solenoids

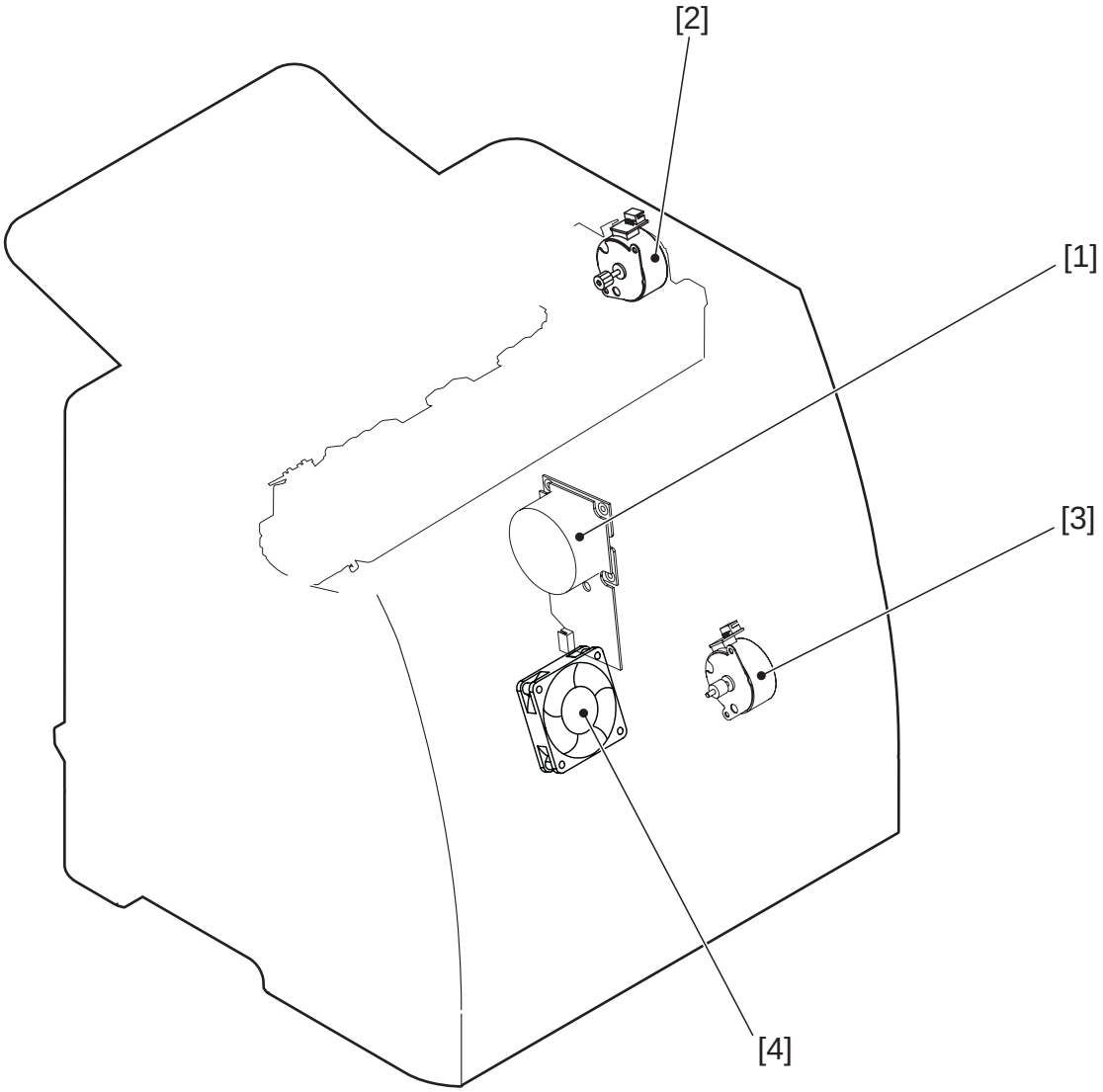



F-6-1

| Ref. | Notation | Name |
|---|---|---|
| [1] | SL1 | Pickup solenoid |
| [2] | SL2 | MCY developing cylinder drive solenoid |
| [3] | SL3 | Bk developing cylinder drive solenoid |

### 6.1.2 Motor/Fan

#### 6.1.2.1 Motors and Fans

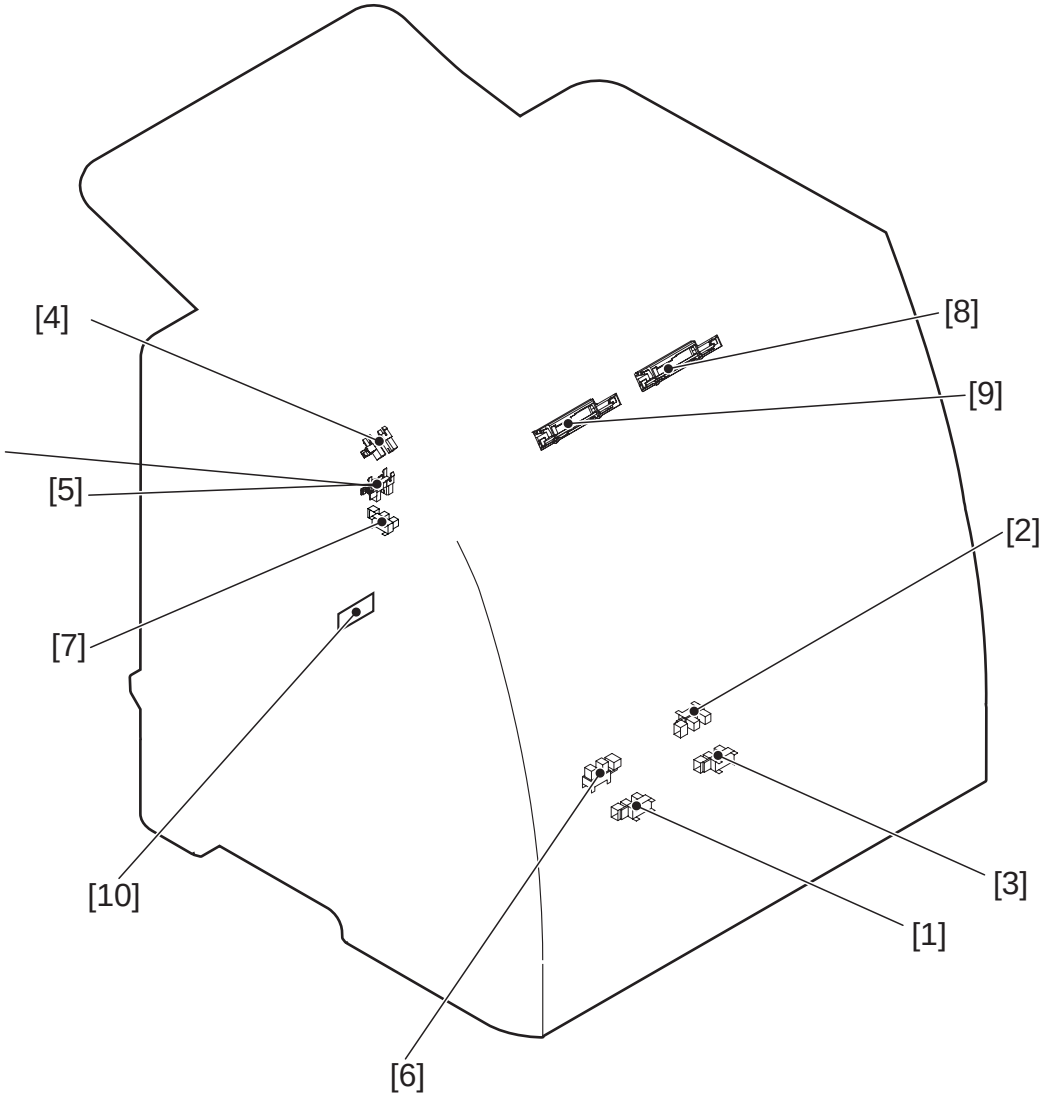



F-6-2

| Ref. | Notation | Name |
|---|---|---|
| [1] | M1 | Main motor |
| [2] | M2 | Fixing/delivery motor |
| [3] | M3 | Pickup motor |
| [4] | FM1 | Cartridge fan |

### 6.1.3 Sensor

#### 6.1.3.1 Sensors

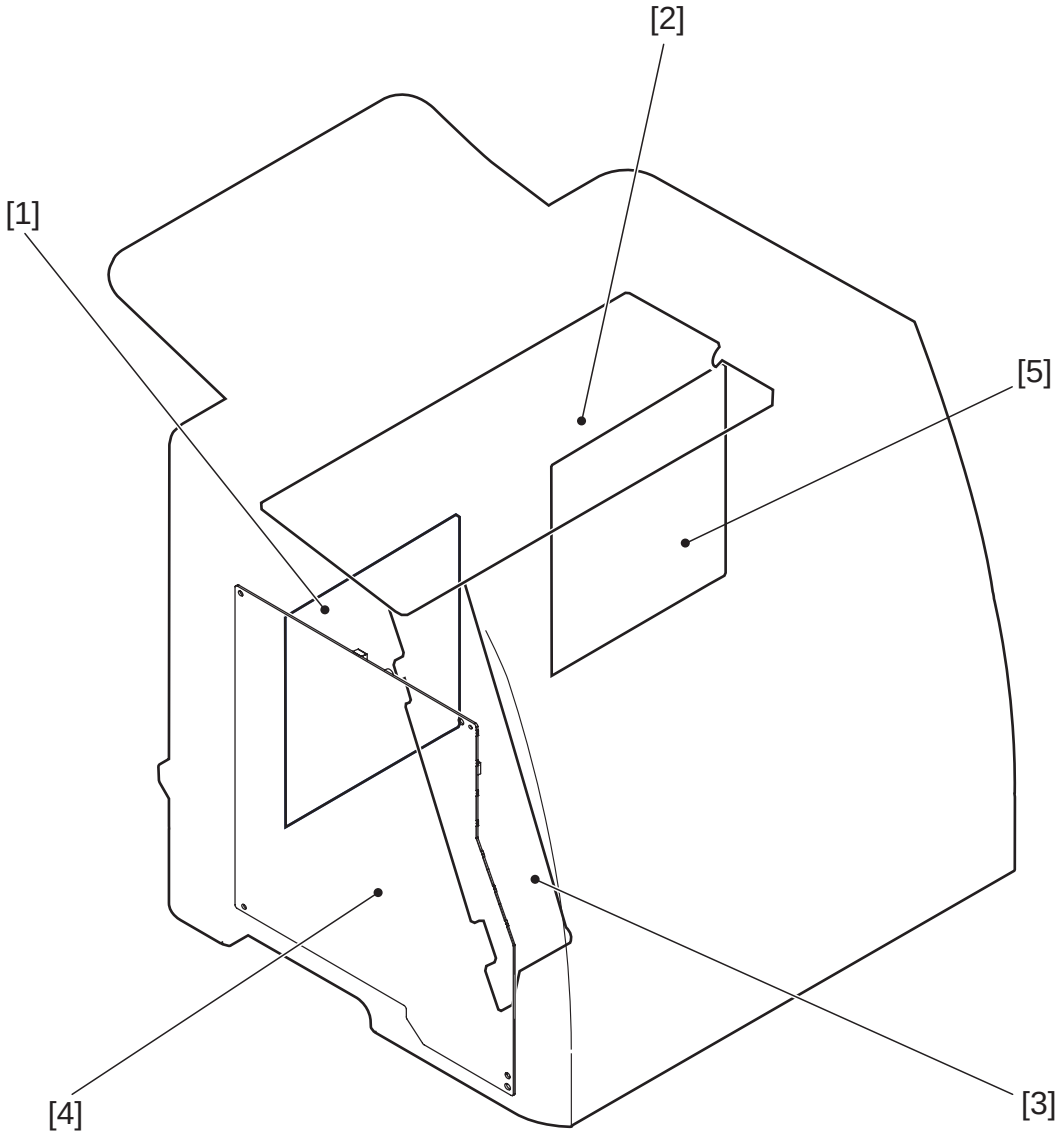



F-6-3

| Ref. | Notation | Name |
|---|---|---|
| [1] | SR1 | Registration paper sensor |
| [2] | SR2 | Cassette paper sensor |
| [3] | SR3 | Manual feeder paper sensor |
| [4] | SR4 | Fixing delivery paper sensor |
| [5] | SR5 | Pre-fixing paper sensor |
| [6] | SR8 | Paper width sensor |
| [7] | SR9 | Pressure alienation sensor |
| [8] | -- | Color misregistration/Density sensor |
| [9] | -- | Color misregistration sensor |
| [10] | -- | Environment sensor |

### 6.1.4 PCBs

#### 6.1.4.1 PCBs




F-6-4

| Ref. | Name |
|---|---|
| [1] | DC controller PCB |
| [2] | Low-voltage power supply PCB |
| [3] | High-voltage paper supply PCB |
| [4] | Memory controller PCB |
| [5] | Video controller PCB |

Jan 19 2006

Canon

# PARTS CATALOG

## LBP5000

Canon

Jan 20 2006

# PREFACE

This Parts Catalog contains listings of parts used

Diagrams are provided with the listings to aid the service technician in identifying clearly, the item to be orderd.
Whenever ordering parts, consult this Parts Catalog for all of the information pertaining to each item. Be sure to include, in the Parts Request, the full item description, the item part number, and the quantity.

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| NPN | 100 - | RC1-5197-000 | 102 - 9 | RC1-5415-000 | 310 - 6 |
| NPN | 101 - | RC1-5200-000 | 100 - 9 | RC1-5419-000 | 310 - 7 |
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| RK2-1310-000 | 103 - 35 | RU5-0440-000 | 810 - 44 | XB4-7401-005 | 100 - 502 |
| RK2-1386-000 | 001 - 1 | RU5-0441-000 | 810 - 45 | XB4-7401-005 | 102 - 501 |
| RK2-1473-000 | 001 - 1 | RU5-0455-020 | 101 - 12 | XB4-7401-005 | 103 - 36 |
| RL1-0659-000 | 810 - 35 | RU5-0467-000 | 101 - 23 | XB4-7401-005 | 310 - 501 |
| RL1-0660-000 | 810 - 32 | RU5-0471-000 | 101 - 24 | XD9-0134-000 | 101 - 26 |
| RL1-0664-000 | 810 - 4 | RU5-0472-000 | 101 - 25 | XD9-0232-010 | 810 - 30 |
| RL1-0746-000 | 101 - 21 | RU5-0481-000 | 102 - 28 | XD9-0233-010 | 102 - 35 |
| RL1-0747-000 | 102 - 10 | RU5-0482-000 | 102 - 29 | XD9-0233-010 | 810 - 29 |
| RL1-0748-000 | 310 - 22 | RU5-0483-000 | 102 - 30 | XD9-0238-000 | 810 - 21 |
| RL1-0749-030 | 102 - 27 | RU5-0484-000 | 102 - 31 | | |
| RM1-1820-000 | 810 - | RU5-0487-000 | 102 - 32 | | |
| RM1-1821-000 | 810 - | RU5-2440-000 | 810 - 46 | | |
| RM1-1822-000 | 810 - 8 | RU5-2442-000 | 810 - 47 | | |
| RM1-1823-000 | 810 - 8 | RU5-2448-000 | 101 - 33 | | |
| RM1-1844-000 | 101 - 34 | RU5-2450-000 | 101 - 13 | | |
| RM1-1845-000 | 101 - 15 | RU5-2455-000 | 101 - 14 | | |
| RM1-1895-120 | 250 - | RU5-2465-000 | 300 - 17 | | |
| RM1-1918-000 | 300 - 23 | RU5-2466-000 | 300 - 18 | | |
| RM1-1919-000 | 300 - 24 | RU5-2467-000 | 300 - 19 | | |
| RM1-1920-000 | 300 - 29 | RU5-2468-000 | 300 - 20 | | |
| RM1-1921-000 | 300 - 30 | RU5-2473-000 | 300 - 21 | | |
| RM1-1922-000 | 300 - 25 | RU5-2474-000 | 300 - 22 | | |
| RM1-1928-000 | 310 - | RU5-2477-000 | 310 - 23 | | |
| RM1-1929-020 | 310 - 25 | RU5-2479-000 | 102 - 33 | | |
| RM1-1970-000 | 103 - 15 | VR7-8850-206 | 810 - 48 | | |
| RM1-1975-050 | 103 - 16 | VS1-7177-002 | 103 - 28 | | |
| RM1-1976-000 | 103 - 17 | VS1-7177-003 | 103 - 29 | | |
| RM1-1977-000 | 103 - 17 | VS1-7258-007 | 103 - 12 | | |
| RM1-1978-000 | 103 - 18 | VS1-7584-011 | 101 - 29 | | |
| RM1-1991-000 | 103 - 20 | WG8-5696-000 | 310 - 24 | | |
| RM1-1993-000 | 103 - 22 | WG8-5696-000 | 810 - 49 | | |

# LBP5000

LBP5000

| | | |
|---|---|---|
| **100V** | **R96-2184-000** | **LPQA000001** |
| **120V** | **R96-2194-000** | **LQAA000001** |
| **220V EUR** | **R96-2198-000** | **LPRA000001** |
| **220V UK** | **R96-2198-000** | **LPSA000001** |
| **220V AU** | **R96-2198-000** | **LPXA000001** |
| **220V ASIA** | **R96-2298-000** | **LPTA000001** |
| **220V CN** | **R96-2308-000** | **LPYA000001** |

# Contents

# FIGURE A
# ASSEMBLY LOCATION DIAGRAM

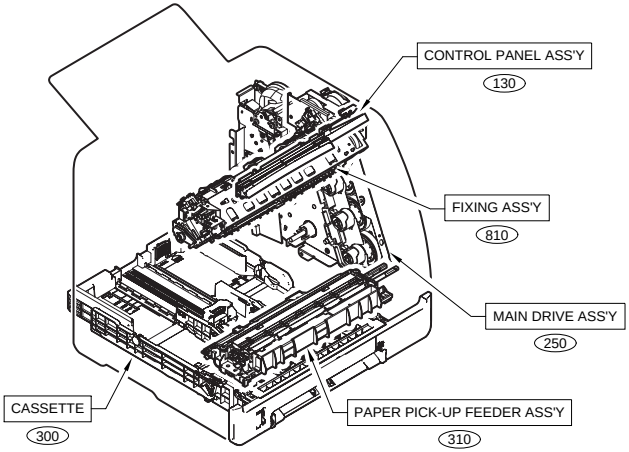
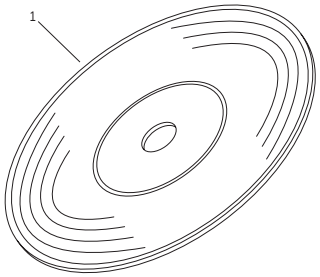
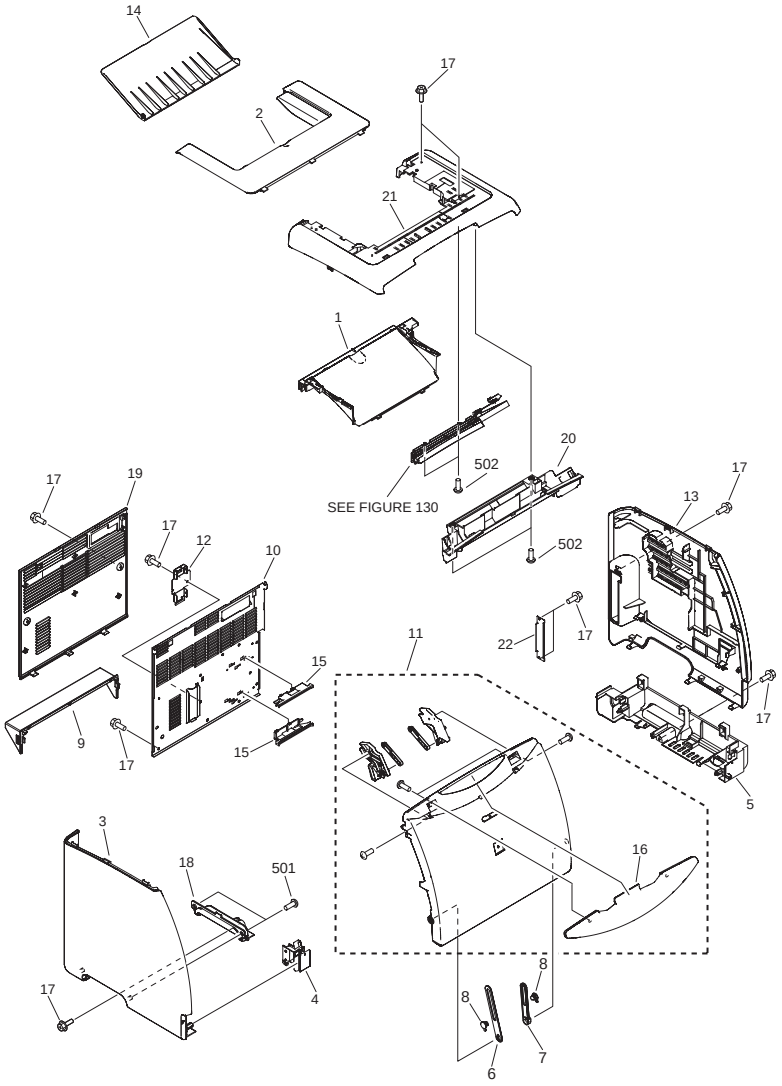


FIGURE 001
PACKAGE COMPONENTS



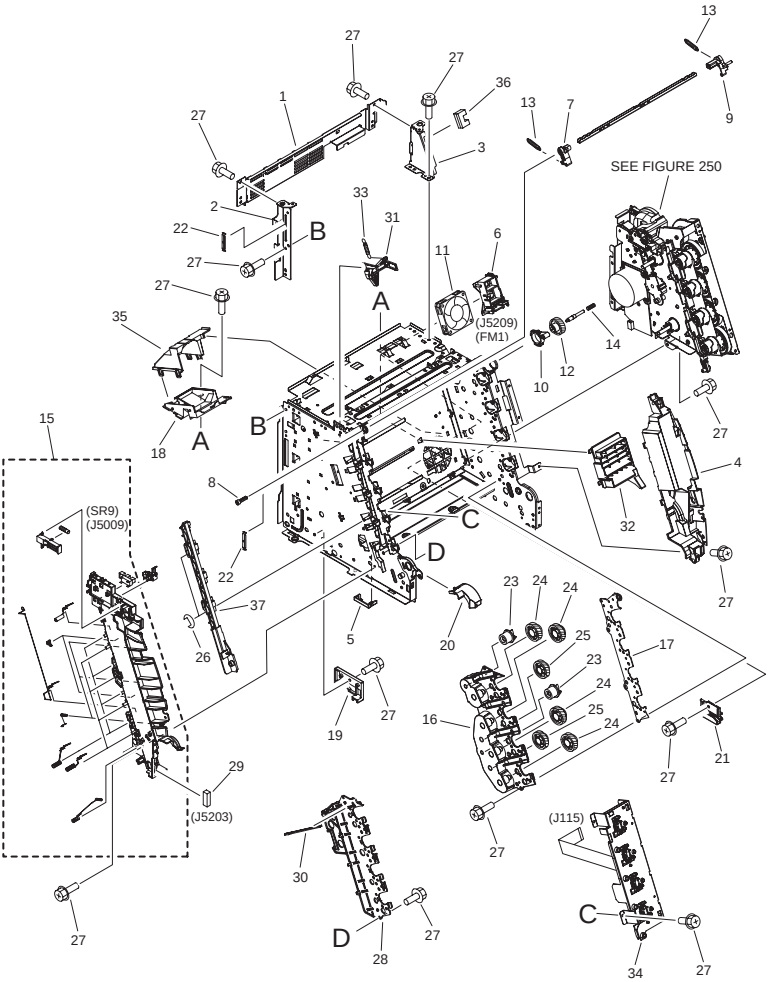
| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.001 | NPN | | RF | PACKAGE COMPONENTS | | |
| 1 | RK2-1473-000 | | 1 | CD-ROM, DRIVER SOFTWARE | 120V English,French,Italian,German,Spanish,Russian | |
| 1 | RK2-1386-000 | | 1 | CD-ROM, DRIVER SOFTWARE | Simplified Chinese,Traditional Chinese, Korean,English,Spanish,Portuguese | |

# FIGURE 100
# EXTERNAL PANELS, COVER, ETC.



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.100 | NPN | | RF | EXTERNAL PANELS, COVER, ETC. | | |
| 1 | RC2-0066-000 | | 1 | COVER, FACE-DOWN | | |
| 2 | RC2-0067-000 | | 1 | COVER, UPPER FACE, S | | |
| 3 | RC2-0075-000 | | 1 | COVER, LEFT | | |
| 4 | RC2-0076-000 | | 1 | COVER, CASSETTE, LEFT | | |
| 5 | RC2-0079-000 | | 1 | COVER, CASSETTE, RIGHT | | |
| 6 | RC1-5192-000 | | 1 | ARM, FRONT DOOR, LEFT | | |
| 7 | RC1-5193-000 | | 1 | ARM, FRONT DOOR, RIGHT | | |
| 8 | RC1-5194-000 | | 2 | SHAFT, FRONT DOOR ARM | | |
| 9 | RC1-5200-000 | | 1 | COVER, CASSETTE DUST | | |
| 10 | RC2-0087-000 | | 1 | PLATE, BACK | | |
| 11 | RM1-3183-000 | | 1 | FRONT DOOR ASS'Y | | |
| 12 | RC1-5229-000 | | 1 | LID, CONTROLLER | | |
| 13 | RC2-0078-000 | | 1 | RIGHT COVER ASS'Y | | |
| 14 | RC2-0065-000 | | 1 | TRAY, FACE-DOWN | | |
| 15 | RC2-0089-000 | | 2 | RAIL, N IC | | |
| 16 | RC2-0081-000 | | 1 | COVER, DOOR, FRONT | | |
| 17 | XA9-1500-010 | | 22 | SCREW, S, M3X8 | | |
| 18 | RC2-0077-000 | | 1 | HANDLE, LEFT | | |
| 19 | RC2-0088-000 | | 1 | PANEL, REAR | | |
| 20 | RC2-0074-000 | | 1 | COVER, INSIDE, UPPER | | |
| 21 | RC2-0068-000 | | 1 | COVER, UPPER | 100V | |
| 21 | RC2-0105-000 | | 1 | COVER, UPPER | 120V,EUR,GB,AU | |
| 21 | RC2-0108-000 | | 1 | COVER, UPPER | ASIA | |
| 21 | RC2-0109-000 | | 1 | COVER, UPPER | CN | |
| 22 | RC2-0090-000 | | 1 | PANEL, N IC | | |
| 501 | XB4-7300-809 | | 2 | SCREW, TAP, BINDING HEAD, M3X8 | | |
| 502 | XB4-7401-005 | | 4 | SCREW,TAPPING,TRUSS HEAD,M4X10 | | |

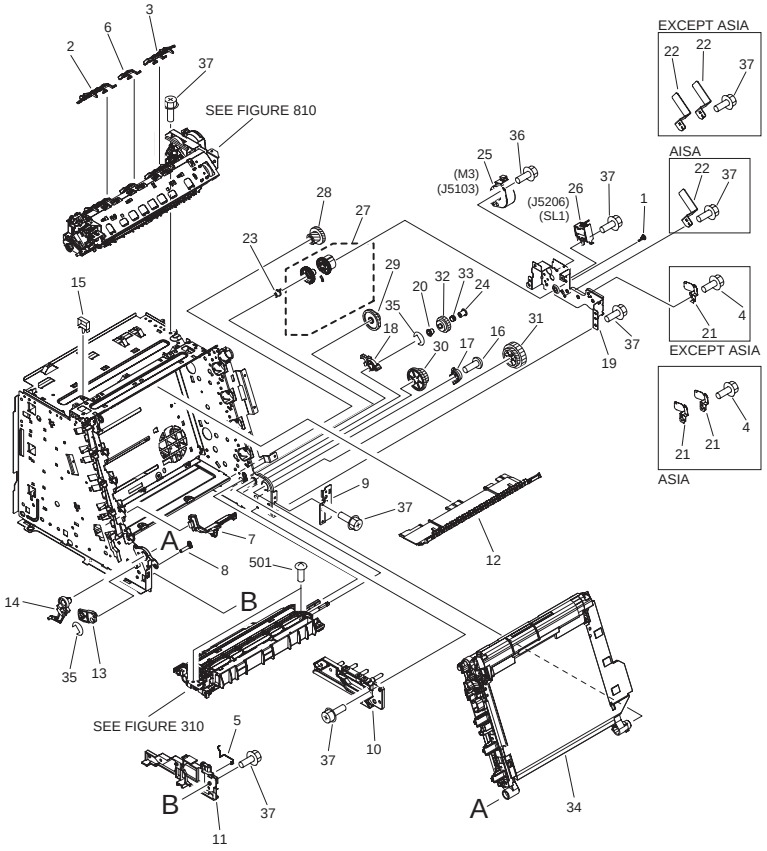
# FIGURE 101
# INTERNAL COMPONENTS 1



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.101 | NPN | | RF | INTERNAL COMPONENTS 1 | | |
| 1 | RC1-5180-000 | N | 1 | CROSSMEMBER, TOP COVER | | |
| 2 | RC1-5181-000 | | 1 | BRACKET, LEFT REAR | | |
| 3 | RC1-5182-000 | | 1 | BRACKET, RIGHT REAR | | |
| 4 | RC1-5189-000 | | 1 | COVER, INSIDE, RIGHT | | |
| 5 | RC1-5234-000 | | 1 | HOLDER, MEMORY CONTROLLER | | |
| 6 | RC1-5253-020 | | 1 | HOLDER, FAN RETAINER | | |
| 7 | RC1-5273-000 | | 1 | LATCH, LEFT | | |
| 8 | RC1-5274-000 | | 1 | BUSHING | | |
| 9 | RC1-5275-000 | | 1 | LATCH, RIGHT | | |
| 10 | RC1-5290-020 | | 1 | LEVER, ETB RELEASE | | |
| 11 | RK2-0673-000 | | 1 | FAN | FM1 J5209 | |
| 12 | RU5-0455-020 | | 1 | GEAR, 54T | | |
| 13 | RU5-2450-000 | | 2 | SPRING, TENSION | | |
| 14 | RU5-2455-000 | | 1 | SPRING, COMPRESSION | | |
| 15 | RM1-1845-000 | | 1 | LEFT INTERNAL COVER ASS'Y | | |
| 16 | RC1-5145-000 | | 1 | GUIDE, CARTRIDGE, RIGHT | | |
| 17 | RC1-5146-000 | | 1 | HOLDER, DRUM | | |
| 18 | RC1-5232-000 | | 1 | DUCT, FAN, LOWER | | |
| 19 | RC1-5397-000 | | 1 | GUIDE, CASSETTE, REAR LEFT | | |
| 20 | RC1-5147-000 | | 1 | COVER, CABLE, UNIT | | |
| 21 | RL1-0746-000 | | 1 | GUIDE, CASSETTE, REAR RIGHT | | |
| 22 | WT2-5912-000 | | 2 | CLAMP, FFC | | |
| 23 | RU5-0467-000 | | 2 | GEAR, 20T | | |
| 24 | RU5-0471-000 | | 4 | GEAR, 36T | | |
| 25 | RU5-0472-000 | | 2 | GEAR, 36T | | |
| 26 | XD9-0134-000 | | 2 | RING, E | | |
| 27 | XA9-1500-010 | | 33 | SCREW, S, M3X8 | | |
| 28 | RC1-5144-000 | | 1 | GUIDE, CARTRIDGE, LEFT | | |
| 29 | VS1-7584-011 | | 1 | CONNECTOR, SNAP TIGHT, BK | J5203 | |
| 30 | RC1-5155-000 | | 1 | LINK, SHUTTER | | |
| 31 | RC1-5158-000 | | 1 | ARM, LASER SHUTTER | | |

| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| 32 | RC1-5233-000 | | 1 | DUCT, FAN | | |
| 33 | RU5-2448-000 | | 1 | SPRING, TENSION | | |
| 34 | RM1-1844-000 | | 1 | MEMORY CONTROLLER PCB ASS'Y | J115 | |
| 35 | RC1-5231-000 | | 1 | DUCT, FAN, UPPER | | |
| 36 | WT2-5056-000 | | 1 | CLIP, CORD | | |
| 37 | RC1-5247-000 | | 1 | ROD, LEFT | | |

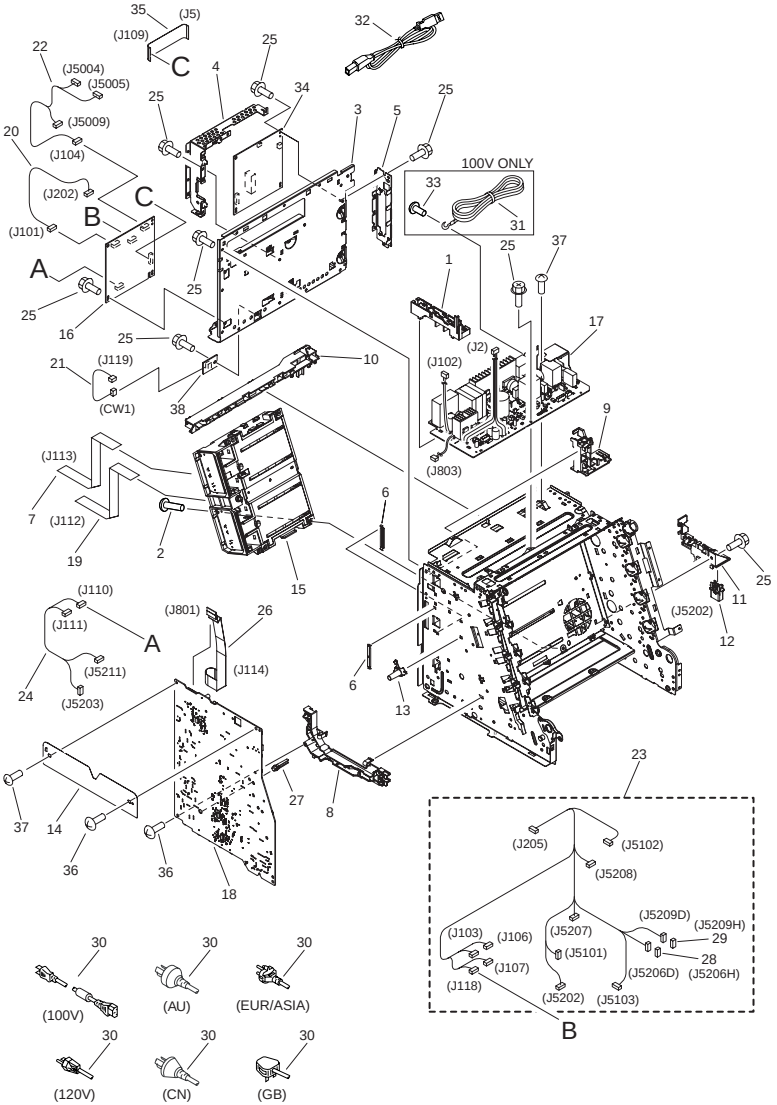
# FIGURE 102
# INTERNAL COMPONENTS 2



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.102 | NPN | | RF | INTERNAL COMPONENTS 2 | | |
| 1 | RA0-1068-000 | | 1 | CAP, CONTINUITY | | |
| 2 | RC1-5096-000 | | 1 | ARM, PAPER RETAINER, LEFT | | |
| 3 | RC1-5097-000 | | 1 | ARM, PAPER RETAINER, RIGHT | | |
| 4 | XA9-1499-000 | | 1 | SCREW, RS, M3X6 | | |
| 5 | RC1-5386-000 | | 1 | SPRING, GROUNDING | | |
| 6 | RC1-5062-000 | | 1 | RETAINER, PAPER | | |
| 7 | RC1-5161-000 | | 1 | COVER, PICK-UP FEED CABLE | | |
| 8 | RC1-5195-000 | | 1 | SHAFT, FRONT DOOR | | |
| 9 | RC1-5197-000 | | 1 | PLATE, PANEL FIX, RIGHT FRONT | | |
| 10 | RL1-0747-000 | | 1 | GUIDE, CASSETTE, FRONT RIGHT | | |
| 11 | RC1-5396-000 | | 1 | GUIDE, CASSETTE, FRONT LEFT | | |
| 12 | RC1-5235-000 | | 1 | PLATE, HEAT INSULATING | | |
| 13 | RC1-5248-000 | | 1 | LEVER, CONNECTING, LEFT | | |
| 14 | RC1-5249-000 | | 1 | CAM, LEFT | | |
| 15 | WT2-5694-000 | | 1 | CLIP CLAMP, WIRE | | |
| 16 | XA9-1647-000 | | 2 | SCREW, W/WASHER, M4X18 | | |
| 17 | RC1-5311-000 | | 1 | CAM, HINGE, RIGHT | | |
| 18 | RC1-5312-000 | | 1 | LEVER, CONNECTING, RIGHT | | |
| 19 | RC1-5400-000 | N | 1 | BASE, MOTOR | | |
| 20 | RC1-5401-000 | | 1 | CLUTCH, MECHANICAL | | |
| 21 | RC1-5402-000 | | 2 | SPRING, LEAF | ASIA | |
| 21 | RC1-5402-000 | | 1 | SPRING, LEAF | EXCEPT ASIA | |
| 22 | RC1-5403-000 | | 1 | PLATE | ASIA | |
| 22 | RC1-5403-000 | | 2 | PLATE | EXCEPT ASIA | |
| 23 | RC1-5439-000 | | 1 | BUSHING | | |
| 24 | RC1-5468-000 | | 1 | STOP, CLUTCH | | |
| 25 | RK2-0668-000 | | 1 | MOTOR, STEPPING, DC | M3 J5103 | |
| 26 | RK2-0670-000 | | 1 | SOLENOID | SL1 J5206 | |
| 27 | RL1-0749-030 | | 1 | PICK-UP GEAR ASS'Y | | |
| 28 | RU5-0481-000 | | 1 | GEAR, 57T/20T | | |
| 29 | RU5-0482-000 | | 1 | GEAR, 43T/16T | | |

| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| 30 | RU5-0483-000 | | 1 | GEAR, 47T/26T | | |
| 31 | RU5-0484-000 | | 1 | GEAR, 40T/43T | | |
| 32 | RU5-0487-000 | | 1 | CAM/GEAR, 26T | | |
| 33 | RU5-2479-000 | | 1 | SPRING, COMPRESSION | | |
| 34 | RM1-3190-000 | | 1 | ELECT.TRANSPORT BELT ASS'Y | | |
| 35 | XD9-0233-010 | | 2 | RING, E | | |
| 36 | XA9-1561-000 | | 2 | SCREW, RS, M3X6 | | |
| 37 | XA9-1500-010 | | 19 | SCREW, S, M3X8 | | |
| 501 | XB4-7401-005 | | 2 | SCREW,TAPPING,TRUSS HEAD,M4X10 | | |

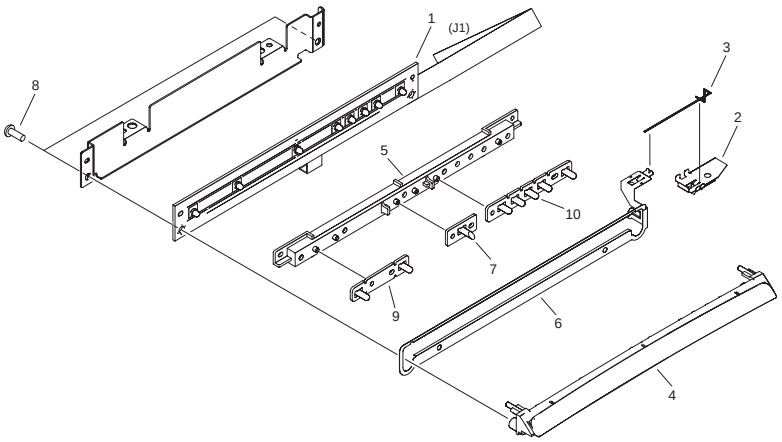
# FIGURE 103
# INTERNAL COMPONENTS 3



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.103 | NPN | | RF | INTERNAL COMPONENTS 3 | | |
| 1 | RC1-5153-000 | | 1 | GUIDE, CABLE, UPPER | | |
| 2 | XA9-1672-000 | | 3 | SCREW, RS W/WASHER, M3X12 | | |
| 3 | RC2-0084-000 | | 1 | PLATE, SHIELD | | |
| 4 | RC2-0085-000 | | 1 | PLATE, SHIELD, FRONT | | |
| 5 | RC2-0086-000 | | 1 | PLATE, CONNECTOR | | |
| 6 | WT2-5913-000 | | 2 | CLAMP, FFC | | |
| 7 | RK2-0688-000 | | 1 | CABLE, FLAT | | |
| 8 | RC1-5236-000 | | 1 | HOLDER, CABLE, LEFT | | |
| 9 | RC1-5237-000 | | 1 | HOLDER, DC CABLE | | |
| 10 | RC2-0091-000 | | 1 | HOLDER, CABLE, UPPER | | |
| 11 | RC1-5239-000 | | 1 | HOLDER, DRAWER | | |
| 12 | VS1-7258-007 | | 1 | CONNECTOR, DRAWER | J5202 | |
| 13 | RC1-5165-000 | | 1 | SUPPORT, BOARD | | |
| 14 | RC1-5203-000 | | 1 | SHEET, LEFT PANEL, UPPER | | |
| 15 | RM1-1970-000 | | 1 | SCANNER ASS'Y | | |
| 16 | RM1-1975-050 | | 1 | DC CONTROLLER PCB ASS'Y | | |
| 17 | RM1-1976-000 | | 1 | POWER SUPPLY PCB ASS'Y | 100V,120V J2,102,803 | |
| 17 | RM1-1977-000 | | 1 | POWER SUPPLY PCB ASS'Y | 220V J2,102,803 | |
| 18 | RM1-1978-000 | | 1 | HIGH-VOLTAGE PCB ASS'Y | | |
| 19 | RK2-0677-000 | | 1 | CABLE, FLAT | | |
| 20 | RM1-1991-000 | | 1 | POWER CABLE | J101,202 | |
| 21 | RM1-2009-000 | | 1 | CABLE, ENVIRONMENT | CW1 J119 | |
| 22 | RM1-1993-000 | | 1 | FIXING SENSOR CABLE | J104,5004,5005,5009 | |
| 23 | RM1-1994-000 | | 1 | DRIVE CABLE | J103,106,107,118,205,5102,5208,5207,5101,5202,5103,5209D,5206D | |
| 24 | RM1-1995-000 | | 1 | CABLE, CPR | J110,111,5203,5211 | |
| 25 | XA9-1500-010 | | 30 | SCREW, S, M3X8 | | |
| 26 | RK2-0690-000 | | 1 | CABLE, FLAT | J114,801 | |
| 27 | RC1-5157-000 | | 1 | ROD, BEARING SUPPORT | | |
| 28 | VS1-7177-002 | | 1 | CONNECTOR, SNAP TIGHT, BK | J5206H | |
| 29 | VS1-7177-003 | | 1 | CONNECTOR, SNAP TIGHT, BK | J5209H | |

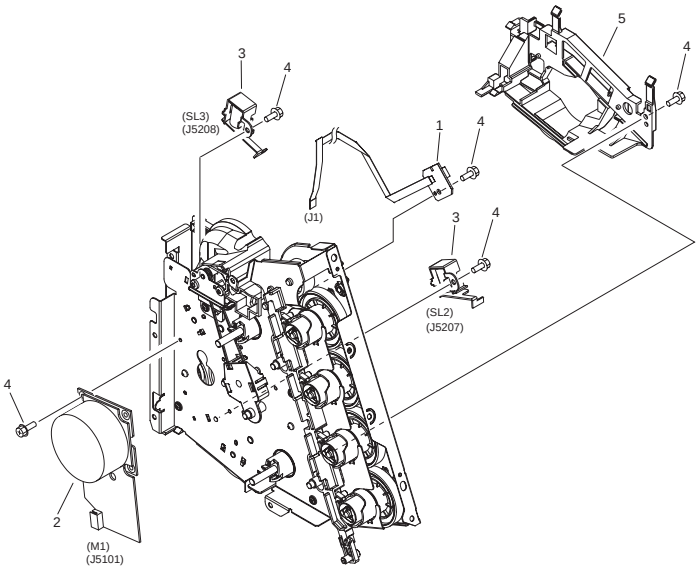
| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| 30 | RG5-7437-000 | | 1 | POWER CORD, 100V | 100V | |
| 30 | FH2-7120-000 | | 1 | CORD, POWER | 120V | |
| 30 | FH2-7082-000 | | 1 | CORD, POWER | AU | |
| 30 | RH2-5610-000 | | 1 | CORD, POWER | CN | |
| 30 | RH2-5116-000 | | 1 | POWER CORD, 220V | EUR,ASIA | |
| 30 | RH2-5230-000 | | 1 | CORD, POWER | GB | |
| 31 | RH9-1171-000 | | 1 | WIRE, GROUNDING | 100V ONLY | |
| 32 | RK2-1302-000 | | 1 | CABLE, USB HOST POWER SUPPLY | ASIA,CN | |
| 33 | FA9-2568-000 | | 1 | SCREW, MACH., TRUSS HEAD | 100V ONLY | |
| 34 | RM1-3443-000 | | 1 | VIDEO CONTROLLER PCB ASS'Y | 100V | |
| 34 | RM1-3515-000 | | 1 | VIDEO CONTROLLER PCB ASS'Y | 120V,220V | |
| 35 | RK2-1310-000 | | 1 | CABLE, VIDEO FOR FLAT | J5,109 | |
| 36 | XB4-7401-005 | | 3 | SCREW,TAPPING,TRUSS HEAD,M4X10 | | |
| 37 | XA9-1420-000 | | 4 | SCREW, W/WASHER, M3X8 | | |
| 38 | WP2-5187-000 | | 1 | SENSOR UNIT, HUMIDITY | | |

FIGURE 130
CONTROL PANEL ASS'Y



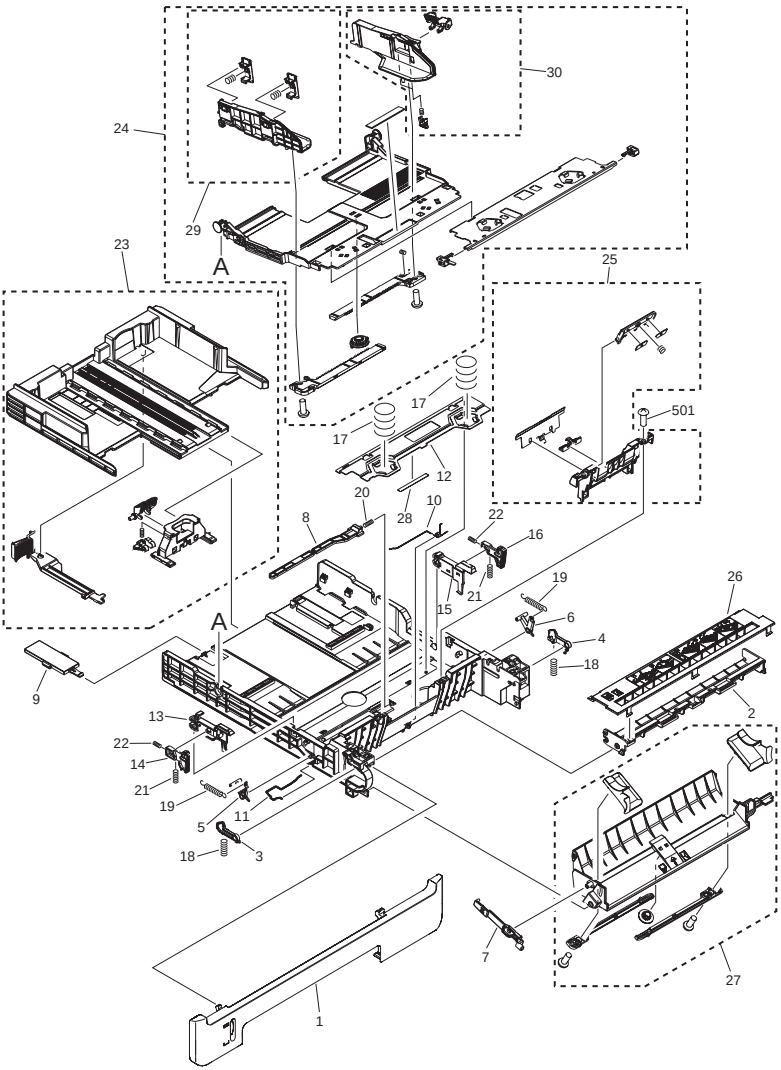
| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.130 | NPN | | RF | CONTROL PANEL ASS'Y | | |
| 1 | RM1-3200-000 | | 1 | CONTROL PANEL ASS'Y | J1 | |
| 2 | RC2-0103-000 | | 1 | PPLATE, GROUNDING | | |
| 3 | RC2-0104-000 | | 1 | NEEDLE, GROUNDING | | |
| 4 | RC2-0069-000 | | 1 | COVER, LED | | |
| 5 | RC2-0070-000 | | 1 | PLATE, LED LIGHT-BLOCKING | | |
| 6 | RC2-0071-000 | | 1 | PLATE, GROUNDING | | |
| 7 | RC2-0073-000 | | 1 | GUIDE, LED LIGHT, 1 | | |
| 8 | XA9-1500-010 | | 2 | SCREW, S, M3X8 | | |
| 9 | RC2-0106-000 | | 1 | GUIDE, LED LIGHT, 2 | | |
| 10 | RC2-0107-000 | | 1 | GUIDE, LED LIGHT, 3 | | |

# FIGURE 250
# MAIN DRIVE ASS'Y



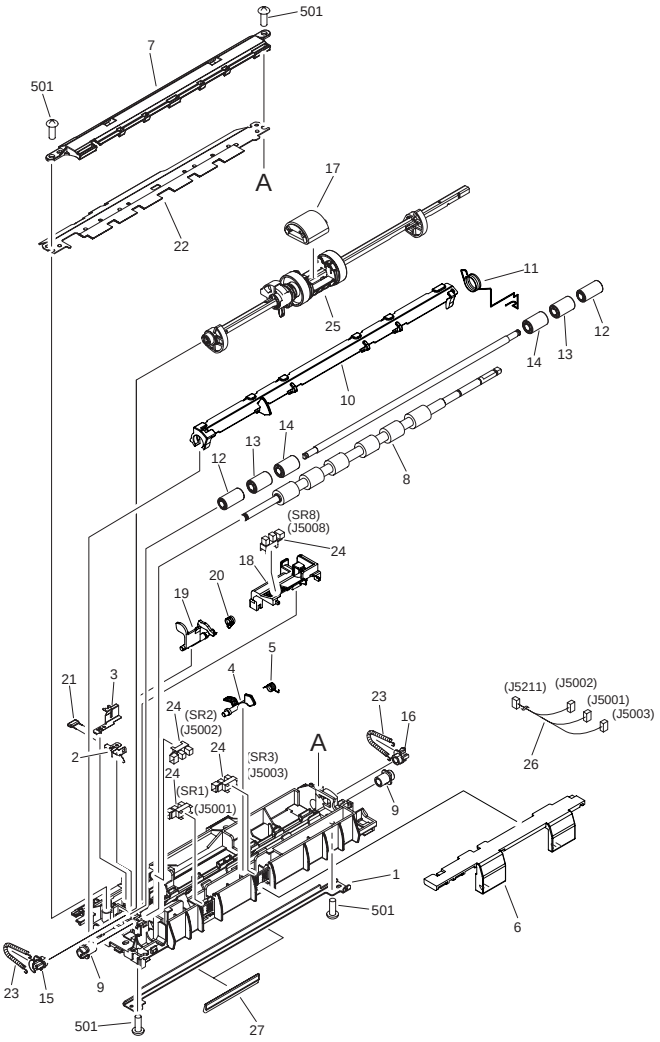
| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.250 | RM1-1895-120 | | 1 | MAIN DRIVE ASS'Y | | |
| 1 | RM1-3201-000 | | 1 | F.F.C. CONNECT PCB ASS'Y | J1 | |
| 2 | RK2-0667-000 | | 1 | MOTOR, DC | M1 J5101 | |
| 3 | RK2-0669-000 | | 2 | SOLENOID | SL2,3 J5207,5208 | |
| 4 | XA9-1500-010 | | 7 | SCREW, S, M3X8 | | |
| 5 | RC1-5327-000 | | 1 | GUIDE, DRIVE CABLE | | |

FIGURE 300
CASSETTE



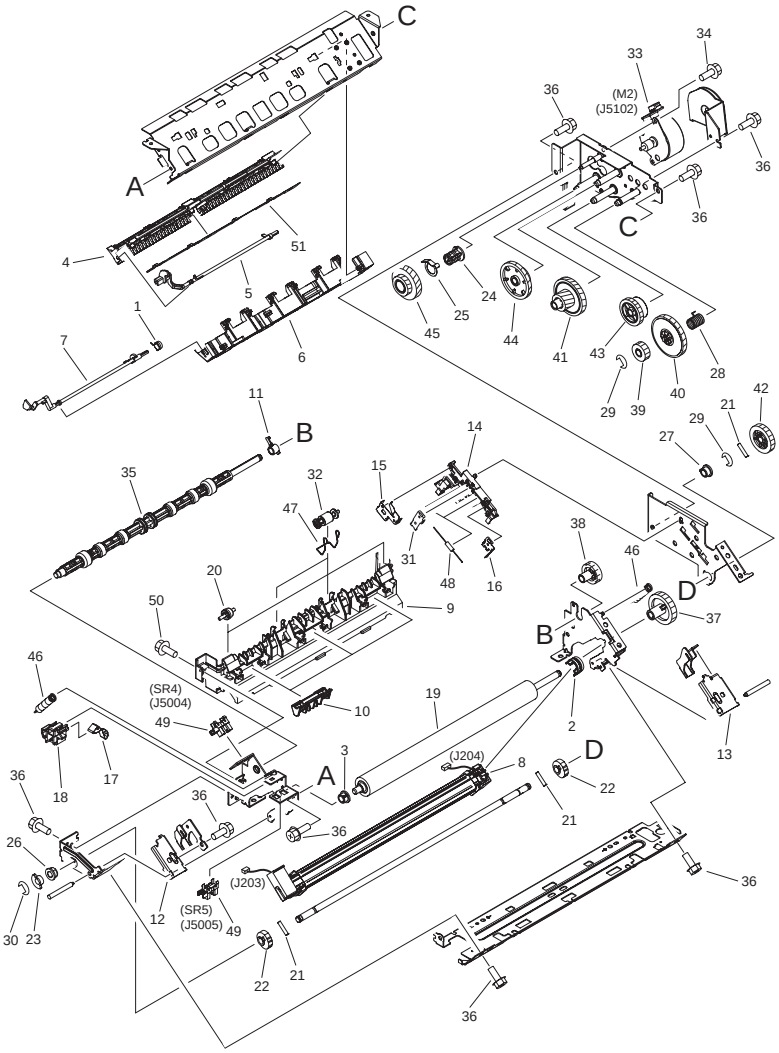
| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.300 | RM1-3179-000 | | 1 | CASSETTE | | |
| 1 | RC1-0092-000 | | 1 | PANEL, FRONT | | |
| 2 | RC1-5350-000 | | 1 | GUIDE, CASSETTE DUPLEX, LOWER | | |
| 3 | RC1-5348-000 | | 1 | STOPPER, CASSETTE, LEFT | | |
| 4 | RC1-5349-000 | | 1 | STOPPER, CASSETTE, RIGHT | | |
| 5 | RC1-5352-000 | | 1 | ARM, CLAW RELEASE, LEFT | | |
| 6 | RC1-5353-000 | | 1 | ARM, CLAW RELEASE, RIGHT | | |
| 7 | RC2-0097-000 | | 1 | ARM, REMNANT INDICAION | | |
| 8 | RC1-5355-000 | | 1 | ARM, PLATE LOCK RELEASE, MD. | | |
| 9 | RC1-5359-000 | | 1 | SIZE PLATE, PAPER | | |
| 10 | RC1-5360-000 | | 1 | SPRING, GROUNDING | | |
| 11 | RC1-5361-000 | | 1 | SPRING, GROUNDING | | |
| 12 | RC1-5362-000 | | 1 | PLATE, CASSETTE REINFORCEMENT | | |
| 13 | RC1-5382-000 | | 1 | ARM, MD. PLATE RELEASE, LEFT | | |
| 14 | RC1-5383-000 | | 1 | CLAW, MD. PLATE RELEASE, LEFT | | |
| 15 | RC1-5384-000 | | 1 | ARM, MD. PLATE RELEASE, RIGHT | | |
| 16 | RC1-5385-000 | | 1 | CLAW, MD. PLATE RELEASE, RIGHT | | |
| 17 | RU5-2465-000 | | 2 | SPRING, COMPRESSION | | |
| 18 | RU5-2466-000 | | 2 | SPRING, COMPRESSION | | |
| 19 | RU5-2467-000 | | 2 | SPRING, TENSION | | |
| 20 | RU5-2468-000 | | 1 | SPRING, COMPRESSION | | |
| 21 | RU5-2473-000 | | 2 | SPRING, COMPRESSION | | |
| 22 | RU5-2474-000 | | 2 | SPRING, COMPRESSION | | |
| 23 | RM1-1918-000 | | 1 | BACK END LIMIT PLATE ASS'Y | | |
| 24 | RM1-1919-000 | | 1 | MIDDLE PLATE ASS'Y | | |
| 25 | RM1-1922-000 | | 1 | SEPARATION ASS'Y | | |
| 26 | RC2-0096-000 | | 1 | GUIDE, CASSETTE DUPLEX, UPPER | | |
| 27 | RM1-3180-000 | | 1 | FEED ASS'Y | | |
| 28 | RC1-5390-000 | | 1 | SHEET, RESISTOR | | |
| 29 | RM1-1920-000 | | 1 | LEFT PAPER SIDE END ASS'Y | | |
| 30 | RM1-1921-000 | | 1 | RIGHT PAPER SIDE END ASS'Y | | |
| 501 | XB4-7400-809 | | 2 | SCREW,TAPPING,TRUISS HEAD,M4X8 | | |

# FIGURE 310
# PAPER PICK-UP FEEDER ASS'Y



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.310 | RM1-1928-000 | | 1 | PAPER PICK-UP FEEDER ASS'Y | | |
| 1 | RC1-5410-000 | | 1 | GUIDE, REGISTRATION | | |
| 2 | RC1-5411-000 | | 1 | PLATE, REG. GROUNDING, 1 | | |
| 3 | RC1-5412-000 | | 1 | PLATE, REG. GROUNDING, 2 | | |
| 4 | RC1-5413-000 | | 1 | FLAG, SENSOR | | |
| 5 | RC1-5414-000 | | 1 | SPRING, TORSION | | |
| 6 | RC1-5415-000 | | 1 | COVER, SENSOR, TOP | | |
| 7 | RC1-5419-000 | | 1 | GUIDE, PRE-TRANSFER | | |
| 8 | RC1-5420-000 | | 1 | ROLLER, REGISTRATION DRIVE | | |
| 9 | RC1-5421-000 | | 2 | BUSHING | | |
| 10 | RC1-5422-000 | | 1 | SHUTTER, REGISTRATION | | |
| 11 | RC1-5423-000 | | 1 | SPRING, TORSION | | |
| 12 | RC1-5425-000 | | 2 | ROLLER, REGISTRATION, A | | |
| 13 | RC1-5426-000 | | 2 | ROLLER, REGISTRATION, B | | |
| 14 | RC1-5427-000 | | 2 | ROLLER, REGISTRATION, C | | |
| 15 | RC1-5428-000 | | 1 | BUSHING | | |
| 16 | RC1-5429-000 | | 1 | BUSHING | | |
| 17 | RC1-5440-000 | | 1 | ROLLER, PAPER PICK-UP | | |
| 18 | RC1-5441-000 | | 1 | HOLDER, PAPER WIDTH SENSOR | | |
| 19 | RC1-5442-000 | | 1 | FLAG, PAPER WIDTH SENSOR | | |
| 20 | RC1-5443-000 | | 1 | SPRING, TORSION | | |
| 21 | RK2-0720-000 | N | 1 | RESISTOR, FILM, 330MOHM | | |
| 22 | RL1-0748-000 | | 1 | COVER, PICK-UP FEED FRAME | | |
| 23 | RU5-2477-000 | | 2 | SPRING, TENSION | | |
| 24 | WG8-5696-000 | | 4 | PHOTO INTERRUPTER, TLP1243 | SR1,2,3,8<br>J5001,5002,5003,5008 | |
| 25 | RM1-1929-020 | | 1 | PAPER PICK-UP DRIVE ASS'Y | | |
| 26 | RM1-1998-000 | | 1 | FEEDER UNIT CABLE | J5001,5002,5003,5211 | |
| 27 | RC1-5445-000 | | 2 | RIB, REG. GUIDE | | |
| 501 | XB4-7401-005 | | 4 | SCREW,TAPPING,TRUSS HEAD,M4X10 | | |

# FIGURE 810
# FIXING ASS'Y



| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| Fig.810 | RM1-3185-000 | | 1 | FIXING ASS'Y | 100V | |
| Fig.810 | RM1-1820-000 | | 1 | FIXING ASS'Y | 120V | |
| Fig.810 | RM1-1821-000 | | 1 | FIXING ASS'Y | 220V | |
| 1 | RA0-1099-000 | | 1 | SPRING, TORSION | | |
| 2 | RB3-1026-000 | | 1 | BUSHING | | |
| 3 | RB3-1027-000 | | 1 | BUSHING | | |
| 4 | RL1-0664-000 | | 1 | GUIDE, ENTRANCE | | |
| 5 | RC1-5059-000 | | 1 | FLAG, INLET | | |
| 6 | RC1-5060-000 | | 1 | GUIDE, PAPER DELIVERY UPPER | | |
| 7 | RC1-5061-000 | | 1 | FLAG, PAPER DELIVERY | | |
| 8 | RM1-3186-000 | | 1 | FILM GUIDE ASS'Y | 100V J203,204 | |
| 8 | RM1-1822-000 | | 1 | FILM GUIDE ASS'Y | 120V J203,204 | |
| 8 | RM1-1823-000 | | 1 | FILM GUIDE ASS'Y | 220V J203,204 | |
| 9 | RC1-5063-000 | | 1 | GUIDE, PAPER DELIVERY LOWER | | |
| 10 | RC1-5064-000 | | 3 | FLAG, INTERTWINE PREVENTION | | |
| 11 | RC1-5065-000 | | 1 | BUSHING | | |
| 12 | RC1-5067-000 | | 1 | PLATE, PRESSURE, LEFT | | |
| 13 | RC1-5068-000 | | 1 | PLATE, PRESSURE, RIGHT | | |
| 14 | RC1-5070-000 | | 1 | HOLDER, RESISTOR | | |
| 15 | RC1-5071-000 | | 1 | SPRING, GROUNDING | | |
| 16 | RC1-5072-000 | | 1 | SPRING, GROUNDING | | |
| 17 | RC1-5073-000 | | 1 | SPRING, GROUNDING | | |
| 18 | RC1-5074-000 | | 1 | GUIDE, CONTACT/SENSOR SUPPORT | | |
| 19 | RC1-5075-000 | | 1 | ROLLER, PRESSURE | | |
| 20 | RC1-5485-000 | | 2 | ROLLER, FACE-DOWN BENDING | | |
| 21 | XD9-0238-000 | | 3 | PIN,DOWEL | | |
| 22 | RC1-5086-000 | | 2 | CAM, PRESSURE RELEASE | | |
| 23 | RC1-5087-000 | | 1 | FLAG, PRESSURE RELEASE | | |
| 24 | RC1-5089-000 | | 1 | HOLDER, PRESSURE RELEASE GEAR | | |
| 25 | RC1-5091-000 | | 1 | SPRING, LEAF | | |
| 26 | RC1-5092-000 | | 1 | BUSHING | | |
| 27 | RC1-5093-000 | | 1 | BUSHING | | |

| FIGURE & KEY NO. | PARTS NUMBER | RANK | Q'TY | DESCRIPTION | SERIAL NUMBER/ REMARKS | SVC |
|---|---|---|---|---|---|---|
| 28 | RC1-5094-000 | | 1 | SPRING, COMPRESSION | | |
| 29 | XD9-0233-010 | | 2 | RING, E | | |
| 30 | XD9-0232-010 | | 1 | RING, E | | |
| 31 | RC1-5475-000 | | 1 | SPRING, GROUNDING | | |
| 32 | RL1-0660-000 | | 2 | ROLLER, DELIVERY | | |
| 33 | RK2-0668-000 | | 1 | MOTOR, STEPPING, DC | M2 J5102 | |
| 34 | XA9-1561-000 | | 2 | SCREW, RS, M3X6 | | |
| 35 | RL1-0659-000 | | 1 | SHAFT, FACE-DOWN ROLLER | | |
| 36 | XA9-1500-010 | | 17 | SCREW, S, M3X8 | | |
| 37 | RU5-0433-000 | | 1 | GEAR, 30T | | |
| 38 | RU5-0434-000 | | 1 | GEAR, 19T | | |
| 39 | RU5-0435-000 | | 1 | GEAR, 16T | | |
| 40 | RU5-0436-000 | | 1 | GEAR, 49T | | |
| 41 | RU5-0437-000 | | 1 | GEAR, 19T/71T | | |
| 42 | RU5-0438-000 | | 1 | GEAR, 27T | | |
| 43 | RU5-0439-000 | | 1 | GEAR, 26T | | |
| 44 | RU5-0440-000 | | 1 | GEAR, 20T/44T | | |
| 45 | RU5-0441-000 | | 1 | GEAR, 22T/38T | | |
| 46 | RU5-2440-000 | | 2 | SPRING, TENSION | | |
| 47 | RU5-2442-000 | | 2 | SPRING, TORSION | | |
| 48 | VR7-8850-206 | N | 2 | SOLID RESISTOR, 20MOHM, 1/4W | | |
| 49 | WG8-5696-000 | | 2 | PHOTO INTERRUPTER, TLP1243 | SR4,5 J5004,5005 | |
| 50 | XA9-1449-000 | | 1 | SCREW, RS, M3X8 | | |
| 51 | RC1-5489-000 | | 1 | PLATE, GROUNDING | | |

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