Service Manual

LBP5050 Series

Canon

Aug 13 2008

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.

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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.

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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."

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1.1 Features

1.1.1 Feature

LBP5050N / LBP5050

1. Small and low-cost printer
   The printer uses a flat in-line cartridge method for the first time in the small printer. This lowers the height and reduces the printer size. The printer uses the transfer pad and the separation roller to reduce the parts expenses.
2. Intermediate transfer method
   The intermediate transfer method transfers toner images to the Intermediate Transfer Belt (ITB) and transfers the images in four colors onto the print media at once. It realizes a stabilized color-print on various media without being affected by the primary transfer operation.
3. Improved usability
   The printer improves usability by using the pullout cartridge and the front side accessibility to the media. This small-sized printer is user-friendly on the space of the desktop.

1.2 Product Specifications

1.2.1 Product Specifications

LBP5050N / LBP5050

Body installation method	Desktop page printer
Photosensitive medium	OPC drum
Charging method	Roller charging
Exposure method	Laser scanning
Development method	Contact development
Transfer method	Intermediate Transfer Belt (ITB)
Separation method	Curvature
Pickup method	By cassette/manual feeder
Cassette pickup method	Separation pad
Drum cleaning method	Rubber blade
Transfer cleaning method	Contact charging roller, brush
Fixing method	On-demand fixing
Delivery method	Face-down
Contrast adjustment function	Auto
Toner level detection function	Available
Toner type	Non-magnetic single-component dry toner
Warm-up time	Instant warm-up (25 seconds or less after the printer is turned 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 x 600dpi
First print time	B/W: 22 sec or less Color: 28 sec or less (When printing A4 paper)
Print speed (A4)	Color: approx. 8 pages/min B/W: approx. 12 pages/min
Cassette paper size	Standard sizes: A4, B5, A5, Legal, Letter, Executive, Statement, Foolscap, 16K, Envelope DL, Envelope COM10, Envelope C5, Envelope B5, Envelope Monarch and Index Card Custom paper sizes: 76.2 to 215.9 mm wide and 127.0 to 355.6 mm long
Multifeeder paper size	Standard sizes: A4, B5, A5, Legal, Letter, Executive, Statement, Foolscap, 16K, Envelope DL, Envelope COM10, Envelope C5, Envelope B5, Envelope Monarch and Index Card Custom paper sizes: 76.2 to 215.9 mm wide and 127.0 to 355.6 mm long
Cassette paper type	Plain paper(75 to 90 g/m2), Thin paper (60 to 74 g/m2), Heavy paper (91 to 163 g/m2), Transparency, Coated paper, Glossy film, Label, Envelope Monarch , Envelope COM10, Envelope DL, Envelope C5, Envelope B5
Multifeeder tray paper type	Plain paper(75 to 90 g/m2), Thin paper (60 to 74 g/m2), Heavy paper (91 to 163 g/m2), Transparency, Coated paper, Glossy film, Label, Envelope Monarch , Envelope COM10, Envelope DL, Envelope C5, Envelope B5
Cassette capacity	Approx. 150 sheets (80 g/m2)
Multifeeder tray capacity	1 sheet
Delivery tray stack	Approx. 125 sheets (80 g/m2)
Duplex method	None
Memory	Standard: 16MB, option: none
Hard disk	Standard: none, option: none
Interface	LBP5050: USB2.0 LBP5050N: USB2.0,10Base-T/100Base-TX
Operating environment (Temperature range)	5 to 35 deg C

Operating environment (Humidity range)	10 to 80%RH
Operating environment (Atmospheric pressure)	l810.6 to 1013.3 hpa (0.8 to 1.0 atm)
Noise	During standby: Background noise level During operation: 48 dB (black and white)/47 dB (color)
Power supply rating	110-127 V (±10%), 50/60 Hz (±2 Hz), 220-240 V (±10%), 50/60 Hz (±2 Hz)
Power consumption (Maximum)	LBP5050: Approx. 615 W or less (110 - 127 V) / Approx. 665 W or less (220 - 240 V) LBP5050N: Approx. 625 W or less (110 - 127 V) / Approx. 980 W or less (220 - 240 V) (at 20 deg C)
Power consumption	LBP5050 Average during operation (110 - 127 V) Color printing: Approx. 200 W or less Black and white printing: Approx. 255 W or less Average during standby: Approx. 11 W or less Average during operation (220 - 240 V) Color printing: Approx. 207 W or less Black and white printing: Approx. 253 W or less Average during standby: Approx. 12 W or less LBP5050N Average during operation (110 - 127 V) Color printing: Approx. 210 W or less Black and white printing: Approx. 255 W or less Average during standby: Approx. 15 W or less Average during operation (220 - 240 V) Color printing: Approx. 210 W or less Black and white printing: Approx. 258 W or less Average during standby: Approx. 16 W or less (at 20 deg C)
Dimensions	399 x 452.5 x 262 mm
Weight	Approx. 16.0 kg (excluding toner cartridges)

1.3 Detailed Specifications

1.3.1 Print Speed

LBP5050N / LBP5050

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Paper type	Paper size	Color	B&W
Plain paper (60 to 90g/m2)	A4	8	12
	LTR	8.4	12.6
	LGL	6.8	10.2
	B5	8.4	7.9
	A5	8.4	7.9
	EXE	8.4	7.9
Hevey paper (91 to 163g/m2)	A4	6	6
	LTR	6.3	6.3
	LGL	5	5
	B5	6	6
	A5	6	6
	EXE	6	6
Post card	Post card	5.6	

1.4 Name of Parts

1.4.1 External View

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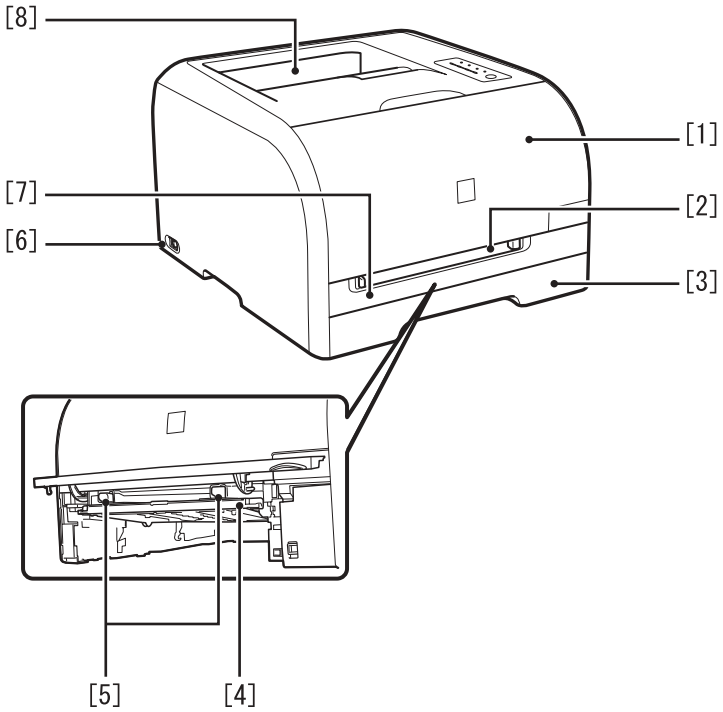
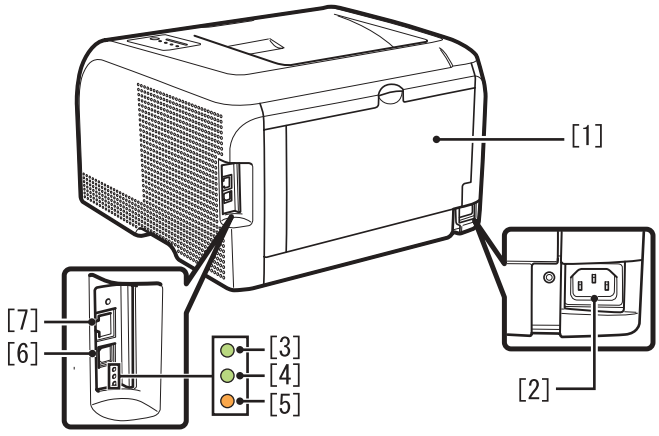


F-1-1

[1]	Front Cover	[5]	Paper Guides
[2]	Manual Feed Slot	[6]	Power Switch
[3]	Paper Cassette	[7]	Manual Feed Slot Cover
[4]	Manual Feed Guide	[8]	Output Tray



F-1-2

[1]	Rear Cover	[5]	ERR Indicator (Orange)
[2]	Power Socket	[6]	USB Port
[3]	100 Indicator (Green)	[7]	Ethernet Port
[4]	LNK Indicator (Green)		

1.4.2 Cross Sectional View

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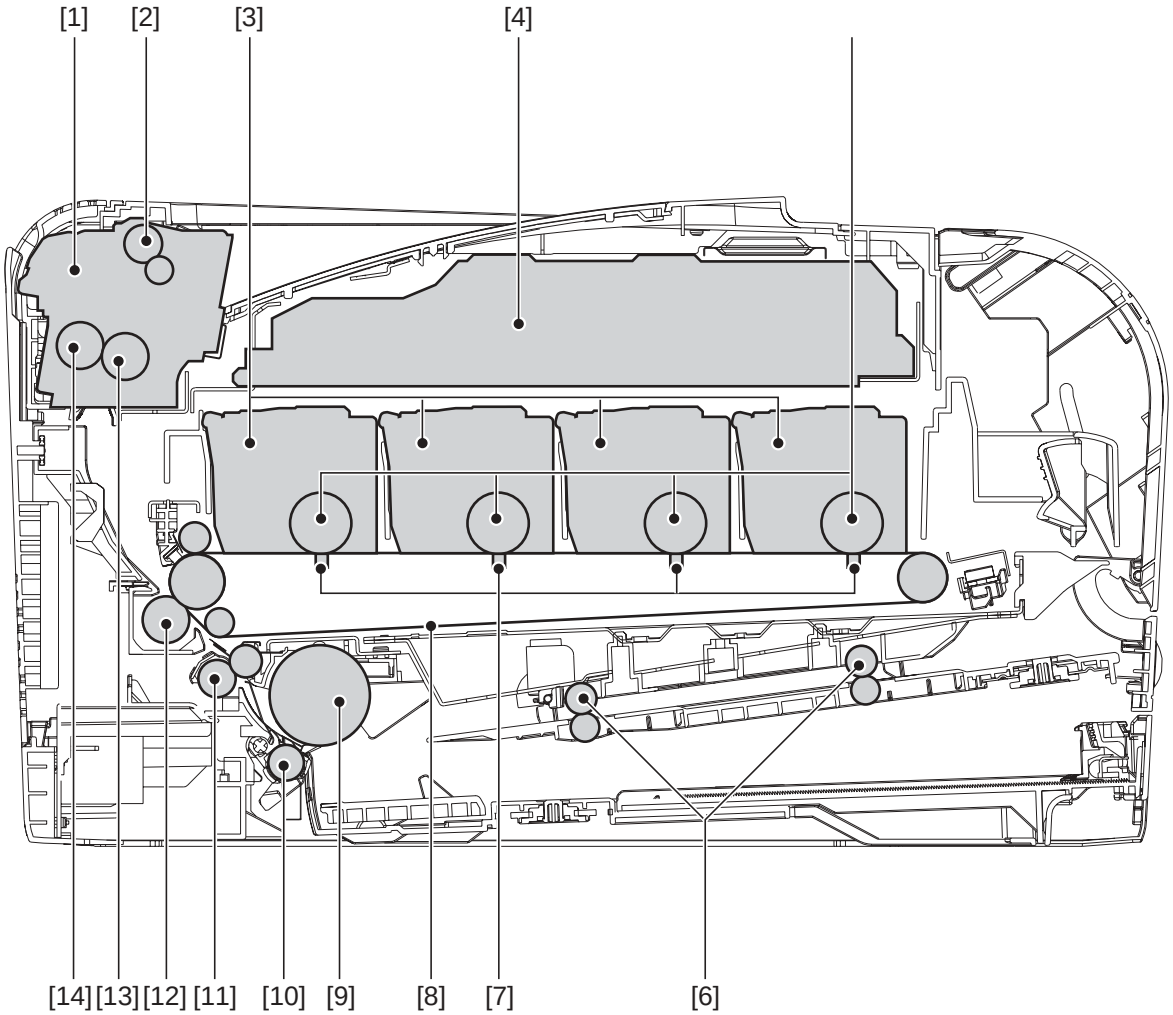

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T-1-2

[1] Fixing unit
[2] Delivery roller
[3] Cartridge
[4] Laser scanner unit
[5] Photosensitive drum
[6] Manual feed roller
[7] Primary transfer pad
[8] ITB unit
[9] Pickup roller
[10] Separation roller
[11] Registration roller
[12] Secondary transfer roller
[13] Fixing film
[14] Pressure roller

1.5 Using the Machine

1.5.1 Control Panel

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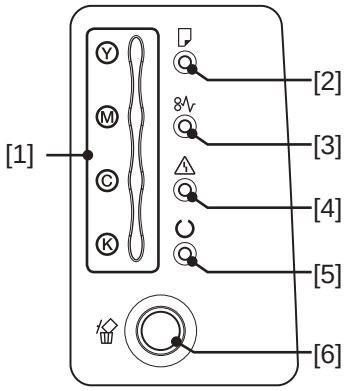

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Functions of the LEDs

T-1-3

Name	Status	Description
[1] Toner Indicator	Blinking	Printing cannot be performed because a toner cartridge needs to be replaced, or a toner cartridge is not installed properly.
	On	A toner cartridge needs to be replaced.
[2] Paper Source Indicator	Blinking	There is no paper or paper of the correct size is not loaded.
[3] Paper Jam Indicator	Blinking	A paper jam has occurred and printing cannot be performed.
[4] Alarm Indicator	Blinking	An error has occurred and printing cannot be performed.
	On	A service error has occurred.
[5] Ready Indicator	Blinking	The printer is busy printing, warming up, or cleaning.
	On	The printer is ready to print.
[6] Cancel Job Indicator	Blinking	A job is being canceled.
	On	The Cancel Job key has been pressed.

Functions of the Control Panel Keys

T-1-4

Name	Function
[6] Cancel Job Key	Press this key to cancel the job that is currently being printed or a job with an error.

1.6 Safety

1.6.1 Safety of the Laser Light

LBP5050N / LBP5050

Laser beam radiation may pose a danger to the human body. A laser scanner mounted on the machine is sealed with the protection housing and external cover to prevent the laser beam from leaking to the outside. The laser beam never leaks out of the scanner as far as users operate the machine normally

The following warnings are given to comply with Safety Principles (EN60950).
Laserstrahlen können für den menschlichen Körper gefährlich sein. Aus diesem Grund ist das optische Lasersystem mit einem Schutzgehäuse und einer Außenabdeckung dicht verschlossen und hat eine Struktur, die keine Laserstrahlen nach außen dringen lässt. Unter der Voraussetzung, dass der Benutzer dieses Gerät normal bedient, ist ein Austritt von Laserstrahlen daher ausgeschlossen.

1.6.2 CDRH Regulation

LBP5050N / LBP5050

The Center For Devices and Radiological Health (CDRH) of Food and Drug Administration in U.S. has implemented a regulation regarding laser products on August 2nd, 1976. This regulation is applied to all products manufactured since August 1st, 1976, and prohibits the sale of laser products without certification.
The following labels certify compliance with the CDRH regulations, and must be attached to all laser products that are sold in the US.

CANON INC.
30-2,SHIMOMARUKO,3-CHOME,OHTA-KU,TOKYO,
146.JAPAN

MANUFACTURED :

THIS PRODUCT CONFORMS WITH DHHS RADIATION
PERFORMANCE STANDARD 21CFR CHAPTER1
SUBCHAPTER J.

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1.6.3 Handling the Laser Unit

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When servicing the area around the laser assembly, be sure to turn off the main power.
If you must servicr while the power is turned on, be sure to keep the followings:
- Do not use a screwdriver or tools that have a high level of reflectance in the laser path.
- Remove watches and rings before starting the work. (They can reflect the laser beam, possibly hitting the eye.)
The machine's covers that can reflect laser light are identified by means of a warning label (Figure). If you must detach a cover showing the label, be sure to take extra caution during the work.

The following warnings are given to comply with Safety Principles (EN60950).

Handhabung des Laserteils

Bei Servicearbeiten am oder in der Nähe des Laserteils zuerst das Hauptgerät abschalten.

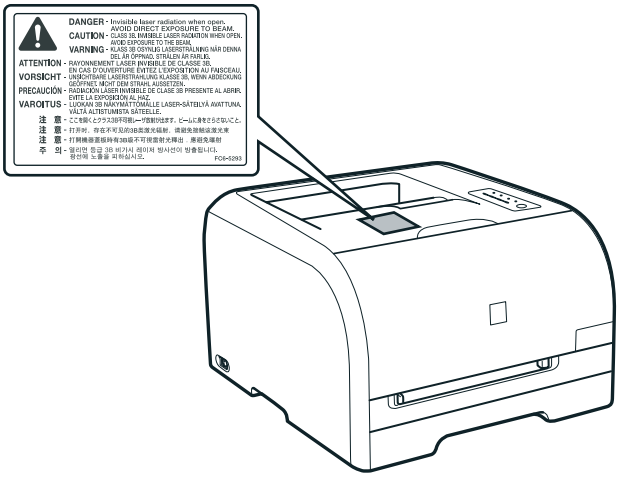
Bei Servicearbeiten, die unbedingt bei eingeschaltetem Gerät durchgeführt werden müssen, auf jeden Fall die folgenden Vorsichtsmaßnahmen beachten.

• Keine stark reflektierenden Schraubenzieher oder ähnliche Werkzeuge direkt in den Lichtpfad des Laserstrahls bringen.

• Vor Beginn der Arbeit Uhren, Ringe und ähnliche Gegenstände abnehmen. (Reflektierte Laserstrahlen könnten sonst in die Augen geraten.)

Abdeckungen, die möglicherweise Laserstrahlen reflektieren, haben in der auf dem Bild gezeigten Position einen Aufkleber. Bei Servicearbeiten auf der Innenseite von Abdeckungen mit Aufkleber ist besondere Vorsicht erforderlich.

F-1-6



F-1-7

1.6.4 Points to note at disassembly/installation procedure

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At disassembly/installation procedure, make sure to follow the instruction below to proceed.
1. Be sure to unplug the power code before disassembly/installation.
2. At installation, follow the procedure in the reverse order of disassembly unless otherwise instructed.
3. Be careful of the screw type (length, diameter) and corresponding part.
4. To check the electrical conductivity, washer equipped screw is used to attach the grounding wire and the varistor etc. When attaching them, be sure to use this screw.
5. In principle, do not operate the machine without any part.
6. Be sure not to unscrew the screw with painting at disassembly.

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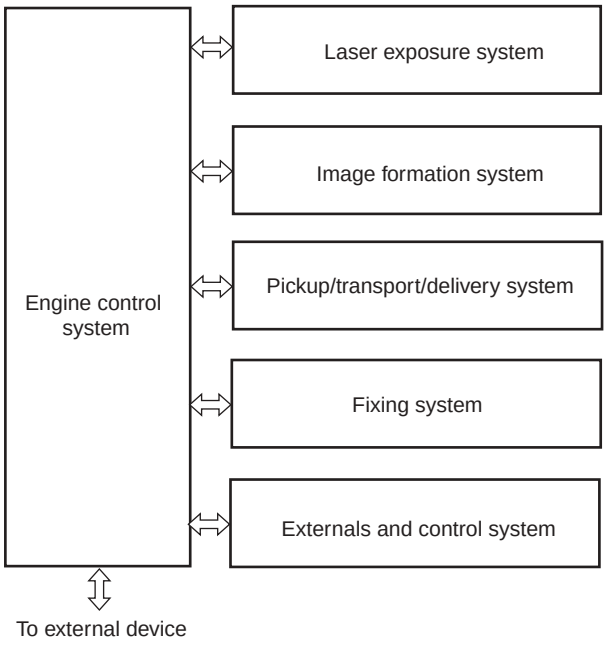
2.1 Functional Configuration

2.1.1 Outline

LBP5050N / LBP5050

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.



F-2-1

2.2 Basic Sequense

2.2.1 Basic Sequence of Operation

LBP5050N / LBP5050

The operational sequence of the printer is controlled by the DC controller in the engine control system.
Table describes periods, durations and operations for each period of a print operation from the printer is turned on until the motors stop rotating.

T-2-1

Period	Duration	Operation
WAIT	From the time the power switch is turned on, the door is closed or the Sleep mode is released until the printer gets ready for a print operation	Brings the printer to printable condition The printer performs the following during this period: - Detects the pressure roller pressurized status - Detects the presence of each cartridge and unit - Determines the homeposition of the development unit - Cleans the ITB - Completes any required calibration, such as color misregistration and image stabilization control
STBY (Standby)	From the end of WAIT or LSTR period until either the print command is received from the main controller or the power switch is turned off	Maintains the printer in printable condition The printer performs the following during this period: - Enters Sleep mode when the main controller sends a sleep command - Completes any required calibration, such as color misregistration control and image stabilization control, when the main controller sends a command
INTR (Initial rotation period)	From the time the print command is received from the main controller during STBY period until the temperature of the fixing unit reaches the targeted temperature	Starts up each high-voltage bias, laser scanner unit and fixing unit for preparing a print operation
PRINT	From the end of INTR period until the last media completes the fixing operation	Forms the image on the photosensitive drum based on the video signals from the main controller, transfers and fuses the toner image to the print media The printer performs color misregistration control and image stabilization control at a specified print interval after the printer is turned on
LSTR (Last rotation period)	From the end of PRINT period until the motors stop rotating	Moves the last printed sheet out of the printer and stops the laser scanner unit operation and high-voltage biases The printer enters INTR period as soon as the LSTR period is completed if another print command is received from the main controller

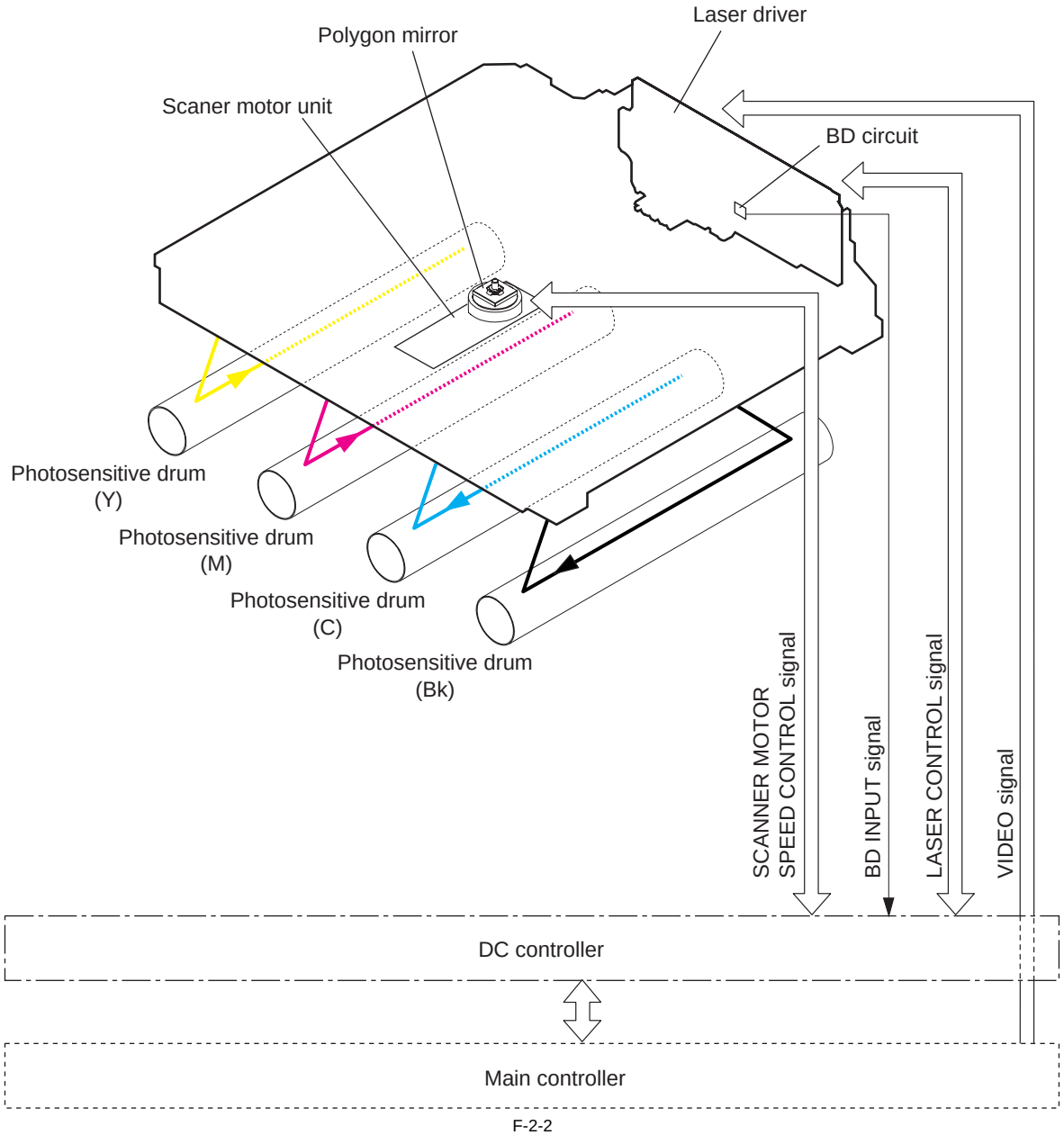
2.3 LASER EXPOSURE SYSTEM

2.3.1 Overview/Configuration

2.3.1.1 Outline

LBP5050N / LBP5050

The laser scanner system forms the latent image on the photosensitive drum according to the VIDEO signals sent from the main controller.
The main components of the laser scanner unit are the laser driver and the scanner motor unit and are controlled by the signals sent from the DC controller.



F-2-2

2.3.2 Laser Scanner Motor Control

2.3.2.1 Fault Detection

LBP5050N / LBP5050

1. Scanner motor failure
   - The scanner motor does not reach a specified rotation within a specified period after starting-up the laser scanner motor.
   - The rotation of the scanner motor is out of specified range for a specified period during scanner motor drive.
2. BD failure
   - The BD interval is detected at out of a specified value during a print operation.

2.4 IMAGE FORMATION SYSTEM

2.4.1 Overview/Configuration

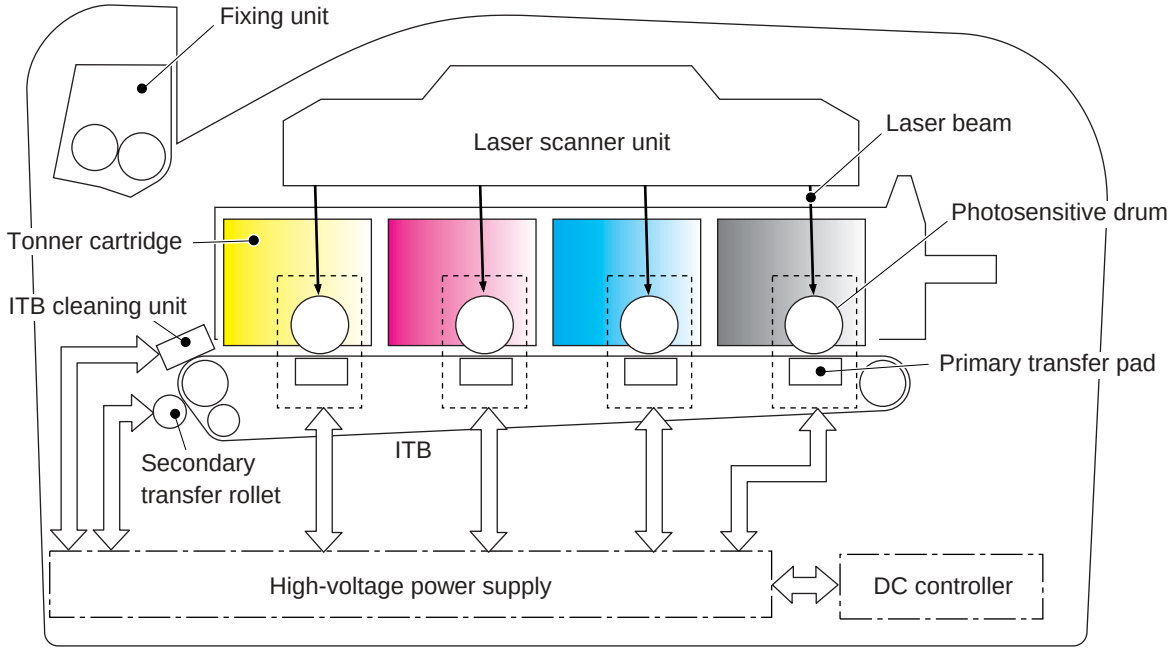
2.4.1.1 Outline

LBP5050N / LBP5050

The image-formation system is the central hub of the printer. It forms the toner image on the media.
The following are the main components of the image-formation system:

- Four toner cartridges
- ITB
- Laser scanner unit
- Fixing unit

The DC controller controls the laser scanner unit and high-voltage power supply to form the toner image on the photosensitive drums according to the VIDEO signals. The image is transferred to the print media through the ITB and fixed.

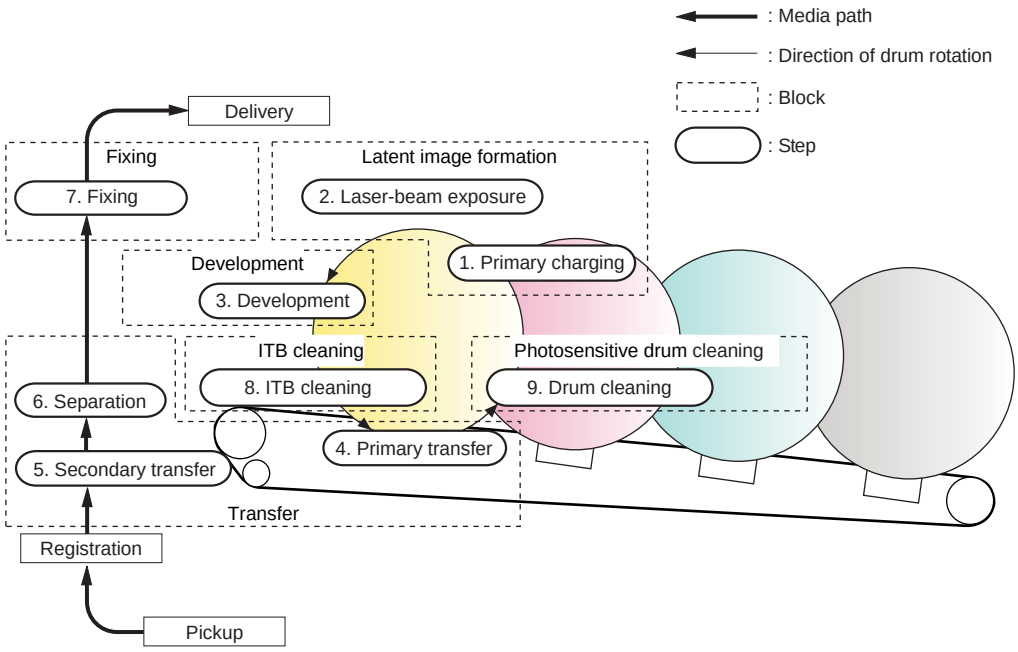


F-2-3

2.4.1.2 Image-formation Process

LBP5050N / LBP5050

The image-formation process consists of the following nine steps divided among six functional blocks:
Block 1: Latent image formation
  Step 1: Primary charging
  Step 2: Laser-beam exposure
Block 2: Development
  Step 3: Development
Block 3: Transfer
  Step 4: Primary transfer
  Step 5: Secondary transfer
  Step 6: Separation
Block 4: Fixing
  Step 7: Fixing
Block 5: ITB cleaning
  Step 8: ITB cleaning
Block 6: Photosensitive drum cleaning
  Step 9: Drum cleaning



F-2-4

2.4.1.3 Latent image formation block

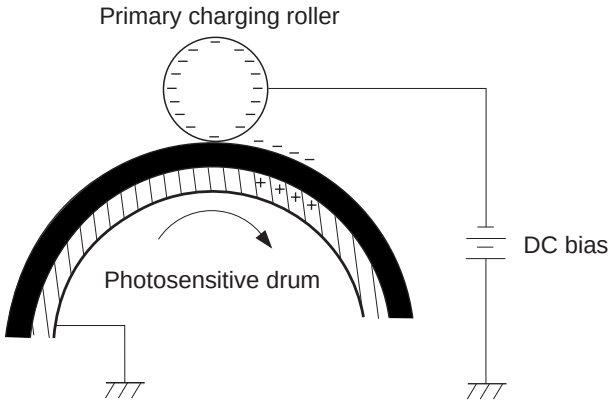
LBP5050N / LBP5050

During the two steps that comprise this block, an invisible latent image is formed on the photosensitive drum.

Step 1: Primary charging

To prepare for latent image formation, the surface of the photosensitive drum is charged with a uniform negative potential.

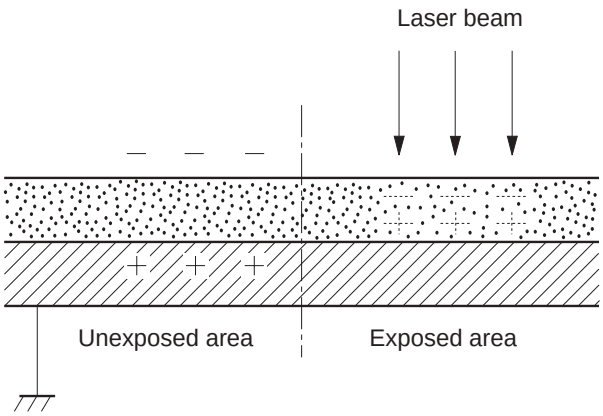
The primary charging roller charges the photosensitive drum directly. The DC negative bias is applied to the primary charging roller to keep a negative potential on the drum surface.



F-2-5

Step 2: Laser-beam exposure

The laser beam scans the photosensitive drum to neutralize the negative charge on portions of the drum surface. An electrostatic latent image forms where the negative charge was neutralized.



F-2-6

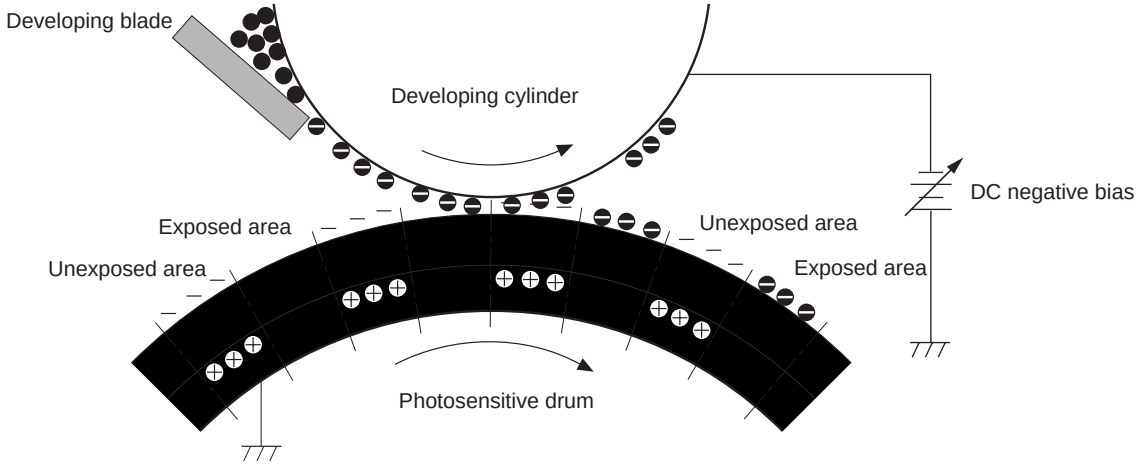
2.4.1.4 Development block

LBP5050N / LBP5050

Toner adheres to the electrostatic latent image on the photosensitive drum, which becomes visible.

Step 3: Development

Toner acquires a negative charge from the friction that occurs when the developing cylinder rotates against the developing blade. When the negatively charged toner comes in contact with the drum, it adheres to the latent image because the drum surface has a higher potential.



F-2-7

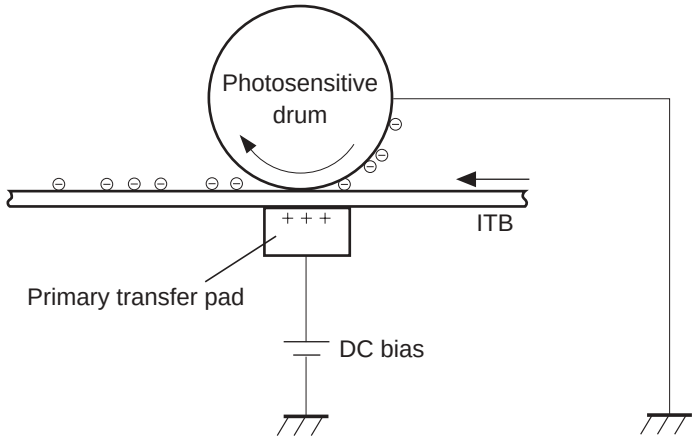
2.4.1.5 Transfer block

LBP5050N / LBP5050

During the three steps that comprise this block, a toner image on the photosensitive drum is transferred to the print media through the ITB.

Step 4: Primary transfer

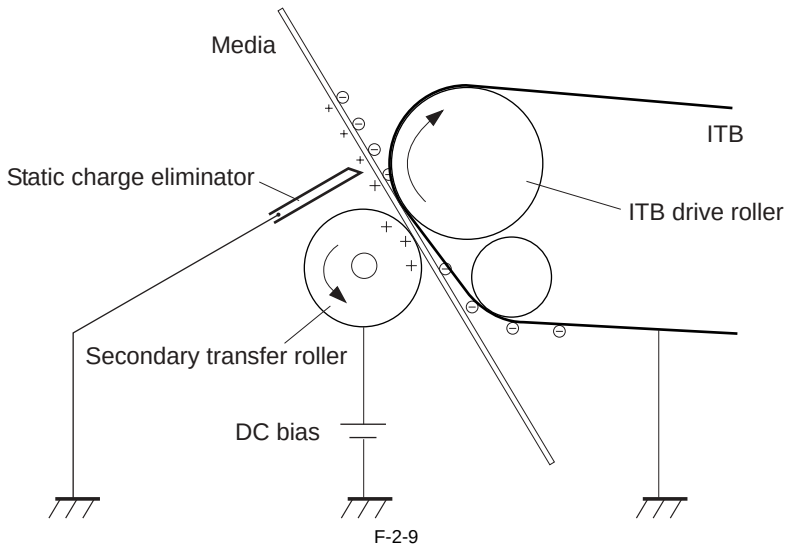
The toner image on the photosensitive drum is transferred to the ITB. The DC positive bias is applied to the primary transfer pad. The negatively charged toner transfers to the ITB from the drum surface.



F-2-8

Step 5: Secondary transfer

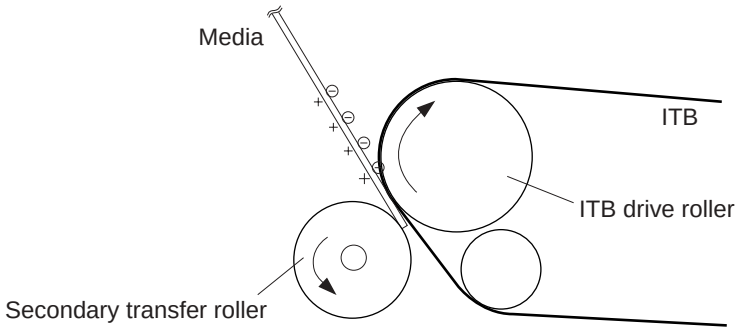
The toner image on the ITB is transferred to the print media. The DC positive bias is applied to the secondary transfer roller. As the media passes between the secondary transfer roller and the ITB, the toner image is transferred to the media.



F-2-9

Step 6: Separation

The elasticity of the print media and the curvature of the ITB drive roller cause the media to separate from the ITB.



F-2-10

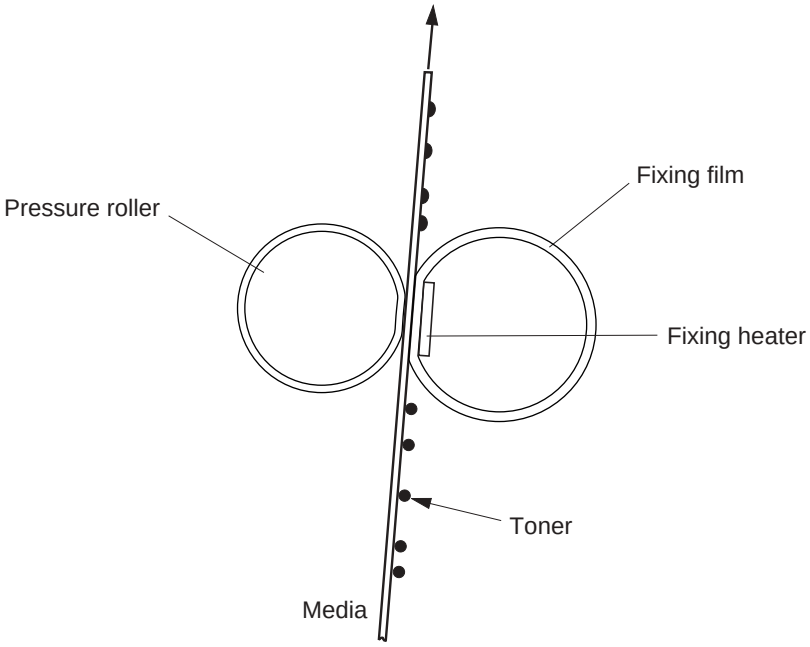
2.4.1.6 Fixing block

LBP5050N / LBP5050

The toner image is fixed onto the print media.

Step 7: Fixing

The printer uses an on-demand fixing method to fix the toner image onto the media. The toner image is permanently affixed to the print media by the heat and pressure.



F-2-11

2.4.1.7 ITB cleaning block

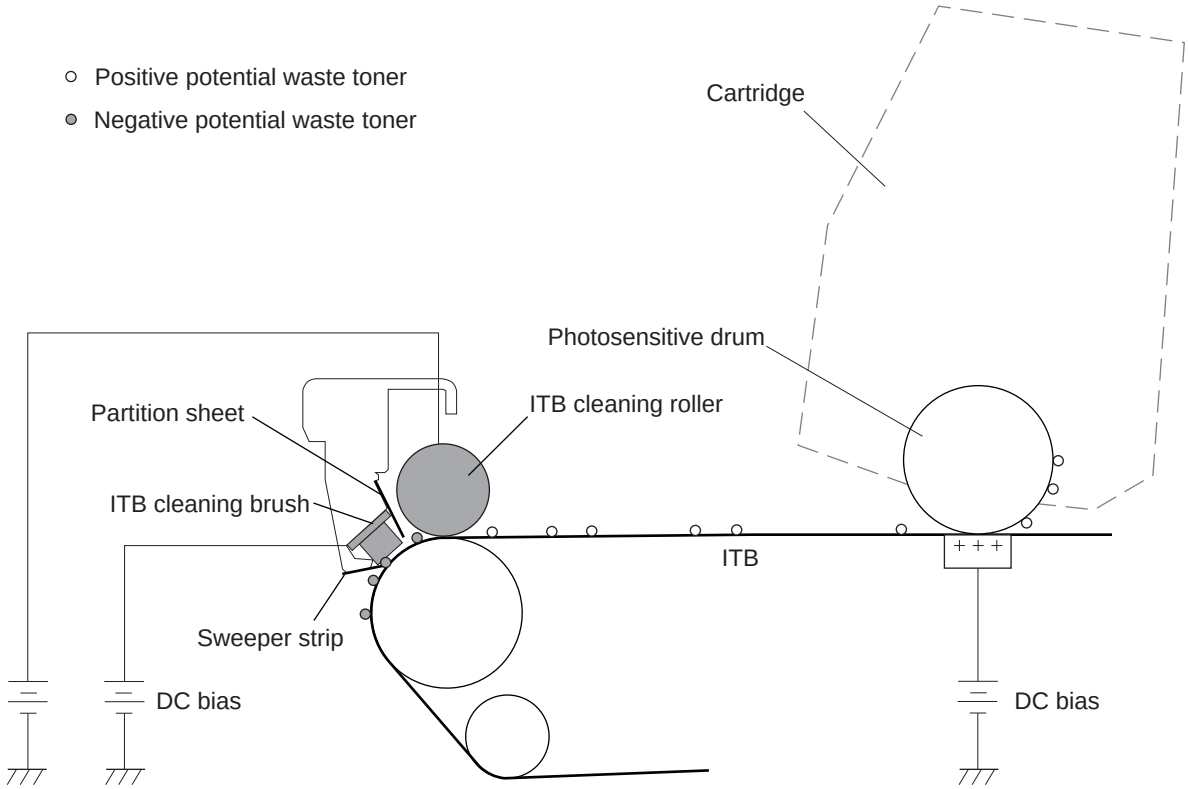
LBP5050N / LBP5050

The residual (waste) toner is cleared from the ITB surface.

Step 8: ITB cleaning

The ITB cleaning roller and the cleaning brush are applied with DC positive bias to charge the residual toner positive.

As the primary transfer pad is also applied with DC positive bias, the positively charged residual toner is reverse transferred to the photosensitive drum from the ITB surface.

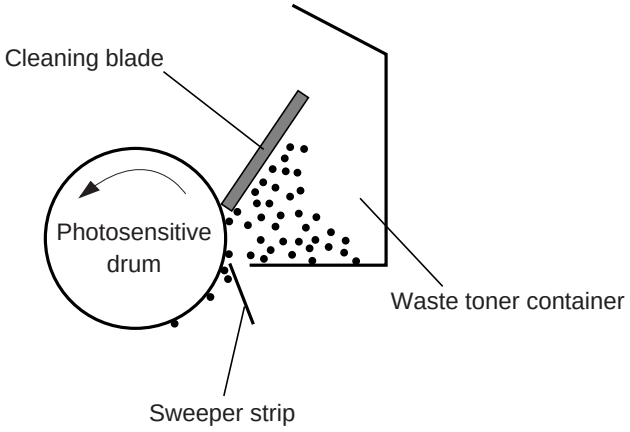


F-2-12

2.4.1.8 Photosensitive drum cleaning block

LBP5050N / LBP5050

The waste toner is cleared from the photosensitive drum surface.
Step 9: Drum cleaning
The cleaning blade scrapes the waste toner off the surface of the photosensitive drum. The waste toner is deposited in the waste toner container.



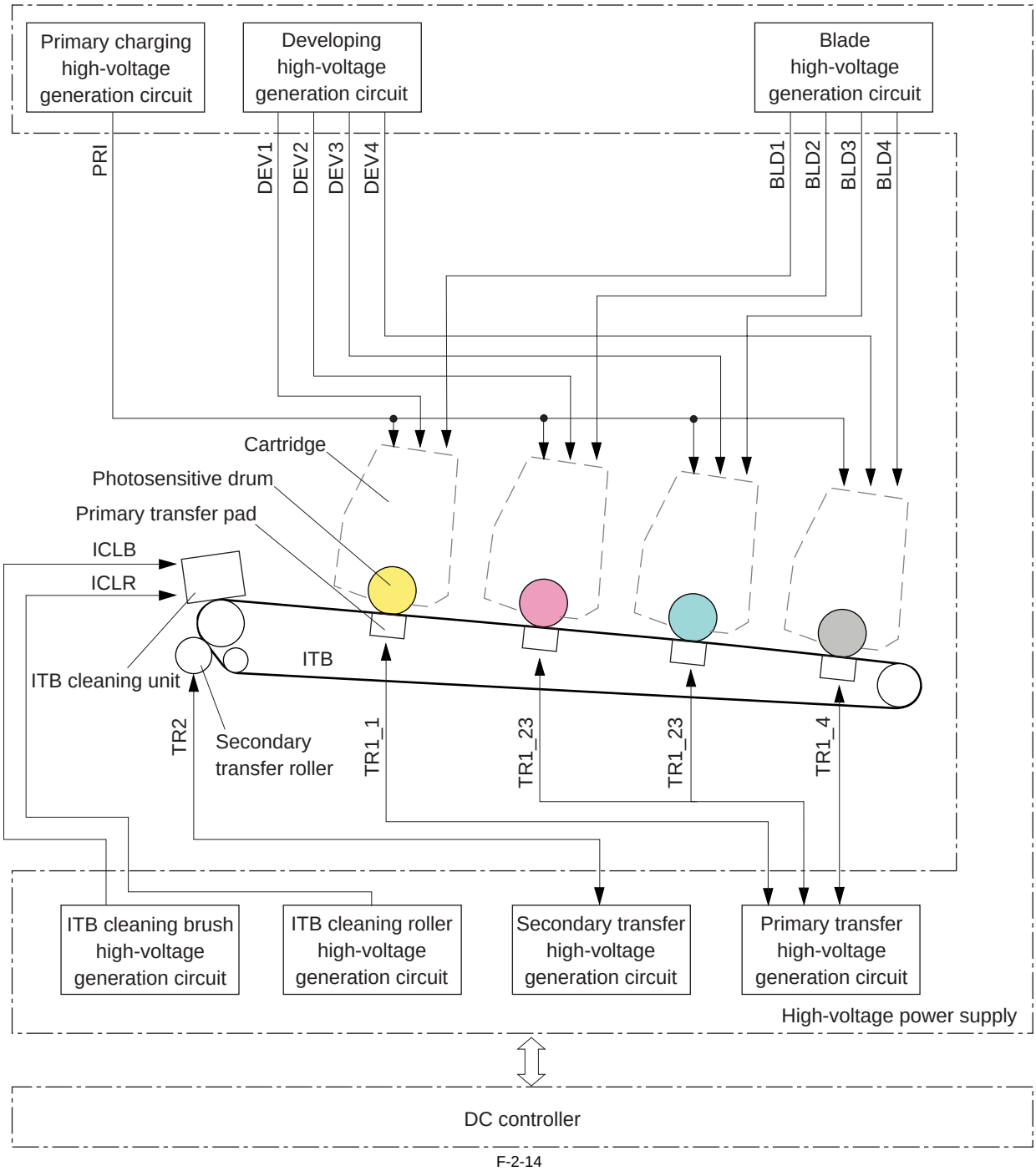
F-2-13

2.4.2 High-Voltage Control

2.4.2.1 Outline

LBP5050N / LBP5050

The high-voltage power supply generates the high-voltage biases that are applied to the primary charging roller, developing roller, primary transfer pad, secondary transfer roller and ITB cleaning unit. The DC controller controls the high-voltage power supply to generate high-voltage biases.



F-2-14

2.4.3 Image Stabilizaton Control

2.4.3.1 Overview of the Image Stabilization Control Mechanism

LBP5050N / LBP5050

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 3 types: Image density corrective control (D-max control), Image halftone corrective control (D-half control), Color Misregistration Corrective Control.

2.4.3.2 Image density correction control (D-max control)

LBP5050N / LBP5050

This control is to stabilize the image density of the printer engine.
If the prescribed condition is met, DC controller PCB performs D-max control in the following procedure.
1. Measure the each density detection pattern made on the ITB.
2. According to the measured density of each pattern, controls the primary charge bias and developing bias to get the appropriate density.
The following is the conditions that trigger the image density correction control
- When the power is ON
- When replacing the toner cartridge
- After replacing the toner cartridge, when the number of print exceeds the specified number (per 200 sheet)
- When the environment is changed drastically
- After printing, the specified time (300 min) elapses

- When a customer requests the calibration

MEMO:
- When the calibration is executed, sheet counter reading and elapsed time timer are cleared.
- Calibration is not executed in sleep mode.
- At power ON, calibration is suspended until the initial print process is completed and the machine is ready or until 15 min passes after the power ON. The time setting can be changed from option > Device settings > printer start setting in printer status window.

2.4.3.3 Image gradation correction control (D-half control)

LBP5050N / LBP5050

This is a control that main controller PCB executes the gradation correction based on result of the halftone density measurement that is executed by DC controller PCB.
After D-max control, DC controller PCB and main controller PCB execute the D-half control in the following procedure.
1. DC controller PCB measures the each color density detection pattern on ITB that is made by the appropriate primary charge bias that is determined at D-max control and developing bias, and sends the density data to main controller PCB.
2. Main controller PCB executes the gradation correction to realize the ideal halftone image based on the data.

2.4.3.4 Color displacement correction control

LBP5050N / LBP5050

This control is to correct the color displacement that appears due to the variation of laser scanner unit or toner cartridge.
The following objects are controlled by this color displacement correction.
- Write start position in main scanning direction
- Magnification in main scanning direction
- Write start position in sub scanning direction

When one of the following conditions is met, DC controller PCB controls the color displacement/density sensor and displacement sensor.
- At power ON
- When the door is closed after replacing the toner cartridge
- After printing, the specified time (100 min and 300 min) elapses
- After the previous color displacement correction control, when the number of print exceeds 100
- When a customer requests the calibration

MEMO:
- When the calibration is executed, sheet counter reading and elapsed time timer are cleared.
- Calibration is not executed in sleep mode.
- At power ON, calibration is suspended until the initial print process is completed and the machine is ready or until 15 min passes after the power ON. The time setting can be changed from option > Device settings > printer start setting in printer status window.

The following is the sequences of this control.
1) DC controller calculates the degree of each color displacement by the color displacement detection pattern made on ITB and sends the color displacement information to main controller.
2) Main controller controls the each color video signal according the color displacement data and adjusts the write start position in main scanning direction, the magnification in main scanning direction and the write start position in sub scanning direction.
   At printer engine side, DC controller PCB also controls the scanner motor speed to correct the color displacement in sub scanning direction.

T-2-2

Scanning magnification
This indicates the image size in the main scanning direction.
Since this machine is equipped with the independent photosensitive drum for each color, the photosensitive drum position differs due to the toner cartridge variation and that leads to the laser wave length difference. Thus, image range differs depending on a color in main scanning direction so that the color displacement occurs at the edge of the image.

2.4.4 Toner Cartridge

2.4.4.1 Developing roller engagement/disengagement control

LBP5050N / LBP5050

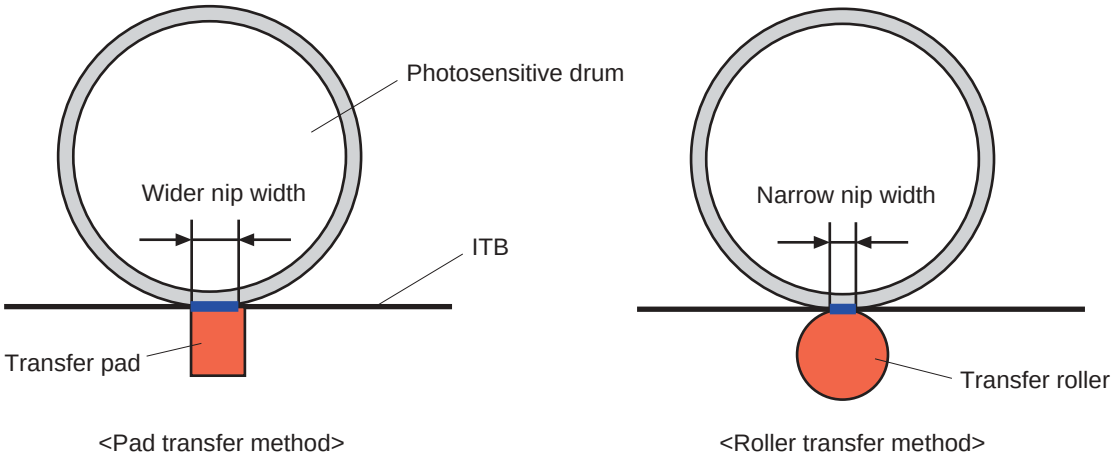
The developing roller engagement/disengagement control engages the required developing roller with the photosensitive drum according to the print mode, full-color mode or monochrome mode.
The necessary developing roller is engaged with the photosensitive drum only when required, preventing a deterioration of the drums and making maximum use of the life.
The engagement/disengagement of the developing roller is controlled by the DC controller rotating the main motor and changing the direction of the developing disengagement cam. The DC controller controls the developing roller state, whether engaged or disengaged, by counting the main motor rotation after it detects the signal from the developing homeposition sensor.
All four colors' developing rollers disengage from the photosensitive drums when the printer is turned on and when a print operation is completed. All four colors' developing rollers engage with the photosensitive drums when the full-color mode is designated. Only black's developing roller engages with the photosensitive drum when the monochrome mode is designated.
The DC controller determines an abnormality of the developing roller engagement/disengagement function and notifies the main controller when it does not sense the signal from the developing homeposition sensor for a specified period during the developing roller engagement/disengagement operation.

2.4.5 Transfer Unit

2.4.5.1 Pad transfer

LBP5050N / LBP5050

The printer has a pad transfer method for the primary transfer operation.
The pad transfer method stabilizes an image compared to the conventional separation roller method. The features for the pad transfer method are as follows:
The wider nip width between the transfer pad and the photosensitive drum improves the transfer performance.



<Pad transfer method> <Roller transfer method>

F-2-15

2.5 Pickup/Feeding/Delivery System

2.5.1 Overview/Configuration

2.5.1.1 Outline

LBP5050N / LBP5050

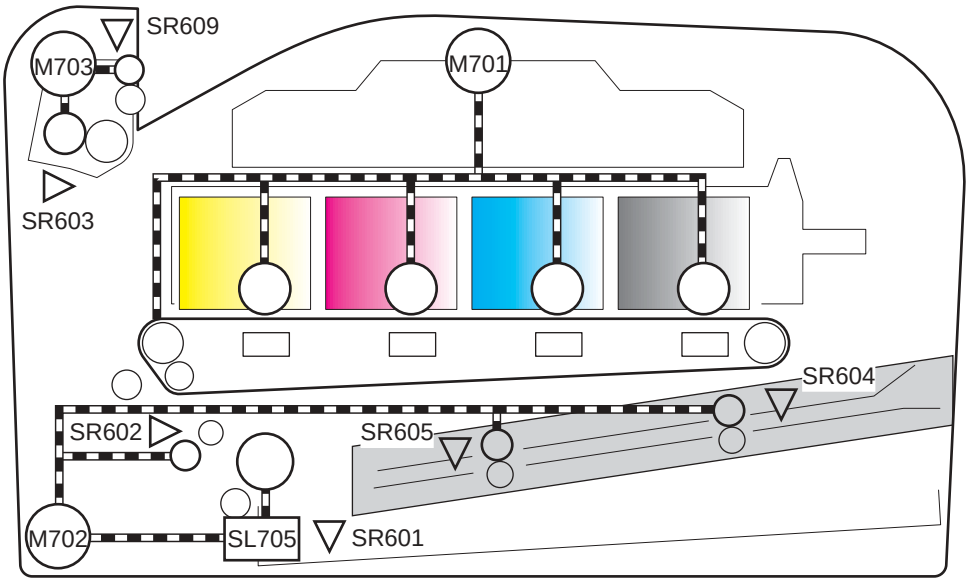
The pickup-and-feed system picks up and feeds the print media. It consists of several types of feed rollers.
The main components of the pickup-and-feed system are the following:
Pickup source:
- Cassette
- Manual feed slot

Delivery destination:
- Face-down tray

Motor:
- Main motor
- Pickup motor
- Fixing motor

Solenoid:
- Cassette pickup solenoid

Sensor:
- Cassette media presence sensor
- Top of page sensor
- Loop sensor
- Manual feed slot media presence sensor
- Manual feed slot top of page sensor
- Fixing delivery sensor



F-2-16

T-2-3

Description		Signal	Driver
Main motor	M701	MAIN MOTOR DRIVE signal	DC controller
Pickup motor	M702	PICKUP MOTOR DRIVE signal	DC controller
Fixing motor	M703	FIXING MOTOR DRIVE signal	DC controller

Description		Signal	Driver
Cassette pickup solenoid	SL705	CASSETTE PICKUP SOLENOID DRIVE signal	DC controller
Cassette media presence sensor	SR601	CASSETTE MEDIA PRESENCE signal	DC controller
Top of page sensor	SR602	TOP OF PAGE signal	DC controller
Loop sensor	SR603	LOOP DETECTION signal	DC controller
Manual feed slot media presence sensor	SR604	MANUAL FEED SLOT MEDIA PRESENCE signal	DC controller
Manual feed slot top of page sensor	SR605	MANUAL FEED SLOT TOP OF PAGE signal	DC controller
Fixing delivery sensor	SR609	FIXING DELIVERY signal	DC controller

2.5.2 Detecting Jams

2.5.2.1 Jam Detection Outline

2.5.2.1.1 Outline

LBP5050N / LBP5050

The printer uses the following sensors to detect the presence of media and to check whether media is being fed correctly or has jammed:
- Cassette media presence sensor
- Top of page sensor
- Loop sensor
- Priority slot media presence sensor
- Priority slot top of page sensor
- Fixing delivery sensor

The printer detects the following jams:
1. Pickup delay jam
2. Pickup stationary jam
3. Delivery delay jam
4. Delivery stationary jam
5. Fixing wrapping jam
6. Residual media jam
7. Door open jam

2.5.2.2 Delay Jams

2.5.2.2.1 Paper delay JAM

LBP5050N / LBP5050

In case that the paper edge sensor cannot detect the leading edge of paper by the time of re-pickup from the image formation start.

2.5.2.2.2 Fixing delay JAM

LBP5050N / LBP5050

In case that the fixing delivery sensor cannot detects the leading edge of paper within 3.9 sec from re-pickup start.

2.5.2.3 Stationary Jams

2.5.2.3.1 Pickup residual JAM

LBP5050N / LBP5050

In case that the paper edge sensor cannot detect the trailing edge of the paper within 8.4 sec from re-pickup start.

2.5.2.3.2 Fixing Stationary Jam

LBP5050N / LBP5050

The fixing delivery sensor cannot detect the trailing edge of paper within 4.5 sec after the paper leading edge sensor detects the trailing edge of paper.

2.5.2.4 Other Jams

2.5.2.4.1 Fixing winding JAM

LBP5050N / LBP5050

In case that the sensor turns OFF by the time that the fixing residual detection start after the fixing delivery sensor detects the leading edge of the paper.

2.5.2.4.2 In-body residual JAM

LBP5050N / LBP5050

If any of the following sensor detects the paper presence at power ON, door close or before/after printing; manual feed paper edge sensor, paper edge sensor, paper arch sensor and fixing delivery sensor.

2.5.2.4.3 Door open JAM

LBP5050N / LBP5050

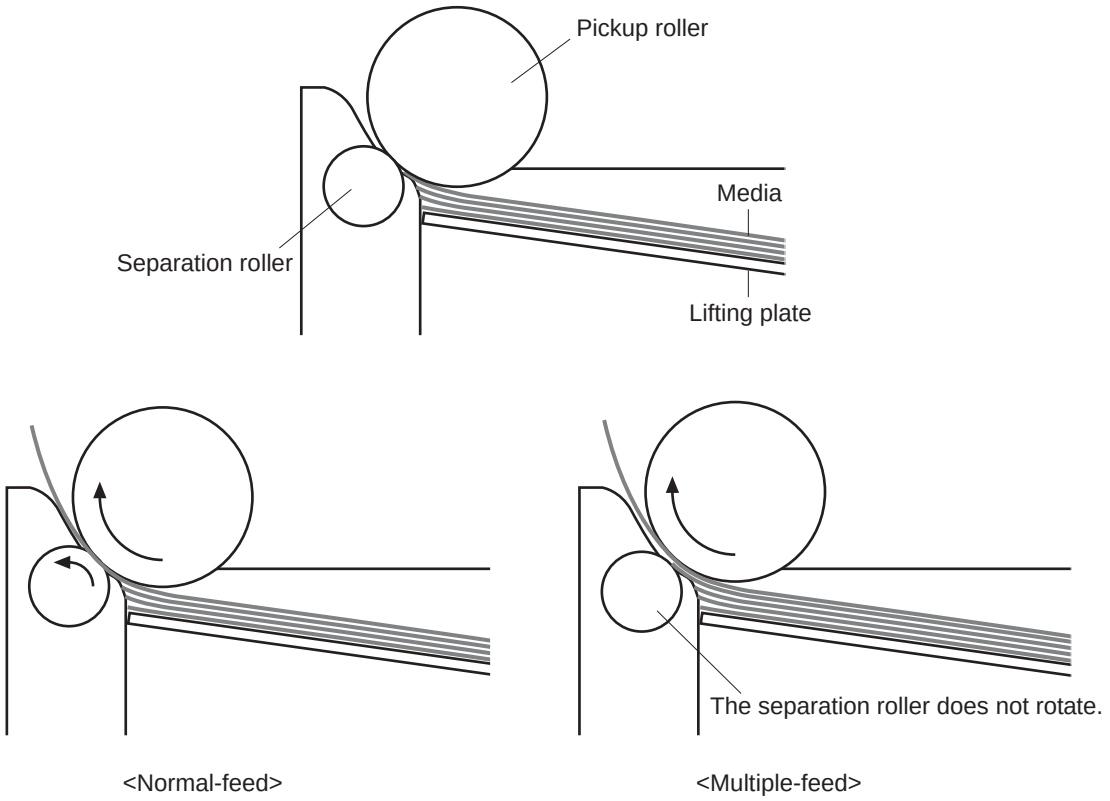
When door open is detected during printing, if the certain censor detects paper presence.

2.5.3 Cassette Pickup

2.5.3.1 Separation Roller Method

LBP5050N / LBP5050

The printer has a separation roller method to prevent multiple sheets of media from entering to the printer.
The paper separation roller follows the rotational direction of the pick-up roller because it does not have its own driving force.
- Normal-feed
  The separation roller is driven by the pickup roller through a sheet of print media. That is, the separation roller rotates in the media feed direction.
- Multiple-feed
  The low friction force between the sheets weakens the rotational force from the pickup roller. The separation roller is limited its rotational force and it does not rotate with such weak driving force from the pickup roller. As the separation roller does not rotate, the multiple sheets are not fed to the printer.



F-2-17

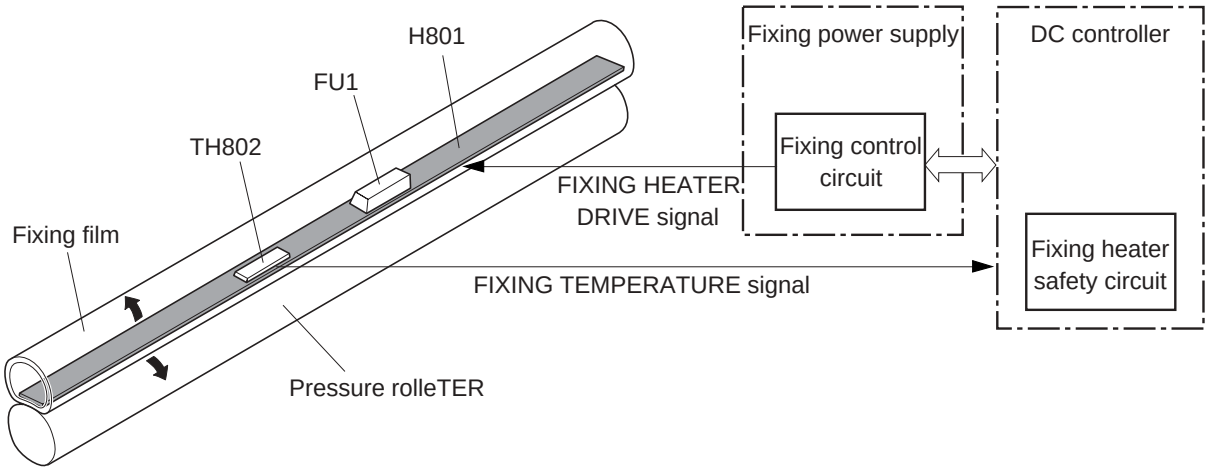
2.6 FIXING UNIT SYSTEM

2.6.1 Overview/Configuration

2.6.1.1 Outline

LBP5050N / LBP5050

The fixing power supply controls the temperature in the fixing unit. The printer uses an on-demand fixing method.



F-2-18

- Heater (H801): Heats the fixing film
- Thermistor (T802): Detects the fixing film temperature (Contact type)

- Thermal fuse (FU1): Prevents the fixing heater temperature from rising abnormally high
The thermal fuse is located at the center of the fixing heater.
If the temperature of the fixing heater rises abnormally high, the thermal fuse blows to interrupt power supply to the fixing heater.
These temperature controls in the fixing unit are performed by the fixing control circuit and the fixing heater safety circuit according to the commands from the DC controller.

2.6.2 Various Control Mechanisms

2.6.2.1 Controlling the Speed of the Fixing Unit

2.6.2.1.1 Speed control on small size paper (Throughput down control)

LBP5050N / LBP5050

This is the control to prevent the overheating at the edge of the fixing heater when continuously printing the smaller width paper than A4 size.
When continuously printing the smaller width paper than 210mm (A4 size), the machine slows down the throughput by extending the paper pickup interval according to the number of print.

T-2-4

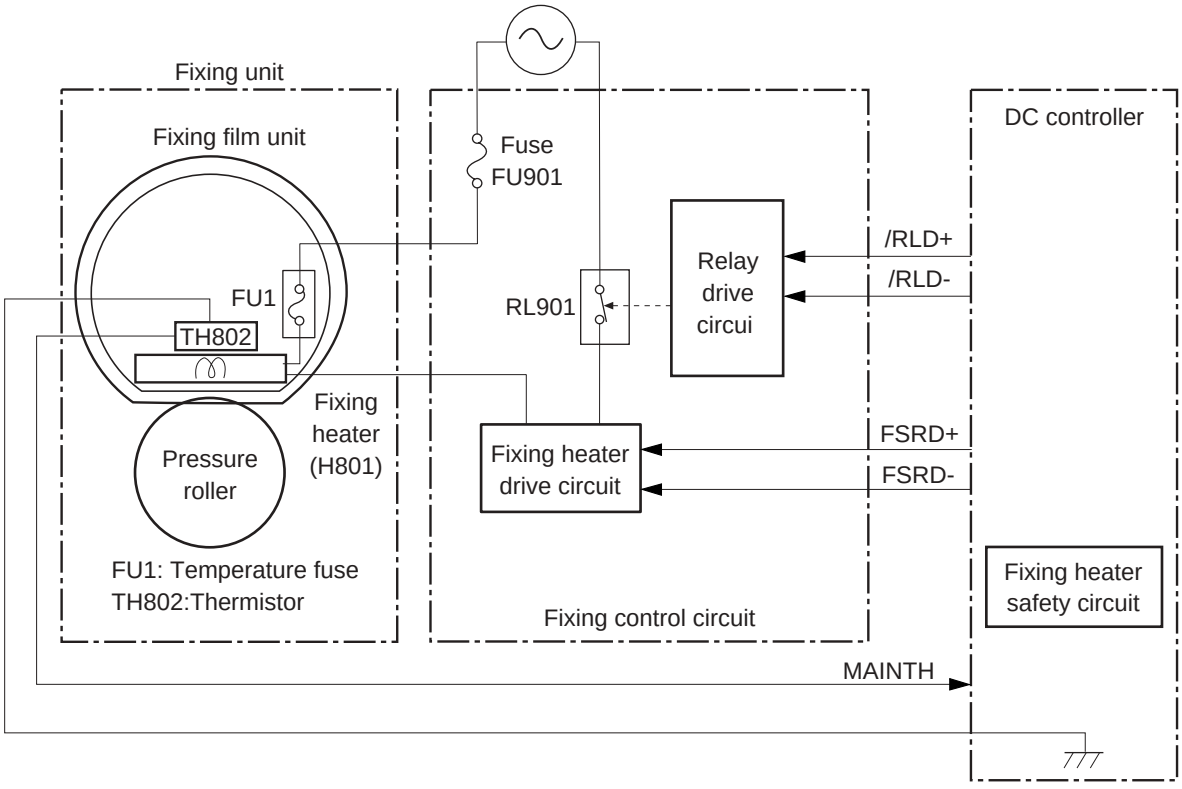
Paper type	Setting on driver	The number of print				
		1 to 5 sheet	6 to 10 sheet	11 to 20 sheet	21 to 50 sheet	Over 50 sheet
Plain paper (75 to 90 g/m2)	Plain paper	8	6	5.5	4	2
Thin paper (60 to 74 g/m2)	Plain paper L					
Thick paper (91 to 120 g/m2)	Think paper 1	6	5	5	2	2
Thick paper (121 to 163 g/m2)	Thick paper 2					

2.6.2.2 Fixing Temperature Control

2.6.2.2.1 Fixing temperature control

LBP5050N / LBP5050

The fixing control circuit brings the fixing heater temperature at the targeted temperature.



F-2-19

The DC controller monitors the FIXING HEATER TEMPERATURE (MAINTH) signal and sends the FIXING HEATER DRIVE (FSRD+, FSRD-) signals according to the detected temperature. The fixing heater drive circuit controls the fixing heater depending on the signals so that the heater remains at the targeted temperature.

1) Warm up temperature control
This control is to warm up the fixing heater until the fixing temperature reaches the required fixing temperature.
Warm up temperature differs depending on the elapsed time from the previous print, paper type or environment.
2) Print temperature control
This control is to keep the fixing sleeve temperature at a targeted temperature during printing.
CPU changes the target temperature corresponding to the number of print step-by-step. Target temperature differs depending on paper type.

T-2-5

Speed	Paper type	Setting on driver	1st temperature to 5th temperature
6/5 speed (monochrome)	Plain paper (75 to 90 g/m2)	Plain paper	183 to 175
	Thin paper (60 to 74 g/m2)	Plain paper L	164 to 130
1/1 speed (color)	Plain paper (75 to 90 g/m2)	Plain paper	168 to 156
	Thin paper (60 to 74 g/m2)	Plain paper L	168 to 150
3/4 speed	Thick paper (91 to 120 g/m2)	Thick paper 1	163 to 148
	Thick paper (121 to 163 g/m2)	Thick paper 2	168 to 159

3) Paper interval temperature control
This control is to bring the fixing heater temperature lower than the fixing temperature at paper interval to prevent the pressure roller from overheating during continuous printing in low speed mode at paper interval.
Temperature during paper interval is changed corresponding to the distance and paper type.

2.6.3 Protective Functions

2.6.3.1 Protective function

LBP5050N / LBP5050

The protective function detects an abnormal temperature rise of the fixing unit and interrupts power supply to the fixing heater.
The following three protective components prevent an abnormal temperature rise of the fixing heater:
- DC controller
- Fixing heater safety circuit
- Thermal fuse

1) DC controller
The DC controller monitors the detected temperature of the thermistor located at the center of the fixing heater. The DC controller sets the FIXING HEATER DRIVE (FSRD+, FSRD-) signals to inactive and releases the relay to interrupt power supply to the fixing heater under the following condition:
- Thermistor: 230 deg C or higher

2) Fixing heater safety circuit
The fixing heater safety circuit monitors the detected temperature of the thermistor located at the center of the fixing heater. The fixing heater safety circuit releases the relay to interrupt power supply to the fixing heater under the following condition:
- Thermistor: 240 deg C or higher

3) Thermal fuse
When the temperature of the fixing heater rises abnormally high and the detected temperature of the thermal fuse is the following condition, the fuse blows to interrupt power supply to the fixing heater:
- Thermal fuse: 226 deg C or higher

2.6.3.2 Fixing unit failure detection

LBP5050N / LBP5050

The DC controller determines a fixing unit failure, sets the FIXING HEATER DRIVE (FSRD+, FSRD-) signals to inactive, releases the relay to interrupt power supply to the fixing heater and notifies the main controller of a fixing unit failure when it encounters the following conditions:
1) Start-up failure
- If the detected temperature of the thermistor does not reach 40 deg C within a specified period from the heater energization during the wait period.
- If the detected temperature of the thermistor does not reach 70 deg C within a specified period after it once reaches 40 deg C after the heater energization during the wait period.
- If the detected temperature of the thermistor does not reach the targeted temperature within a specified period under the heater temperature control during the initial rotation period.

2) Abnormal low temperature
- If the detected temperature of the thermistor is kept 100 deg C or lower for a specified period under the heater temperature control during the print period.

3) Abnormal high temperature
- If the detected temperature of the thermistor is kept 230 deg C or higher for a specified period.

4) Fixing heater drive circuit failure
- If the specified count of the ZERO CROSSING signal is not detected within a specified period after the printer is turned on.
- If the ZERO CROSSING signal is not detected for a specified period during the print period after the signal is once detected after the printer is turned on.

2.7 EXTERNAL AND CONTROLS SYSTEM

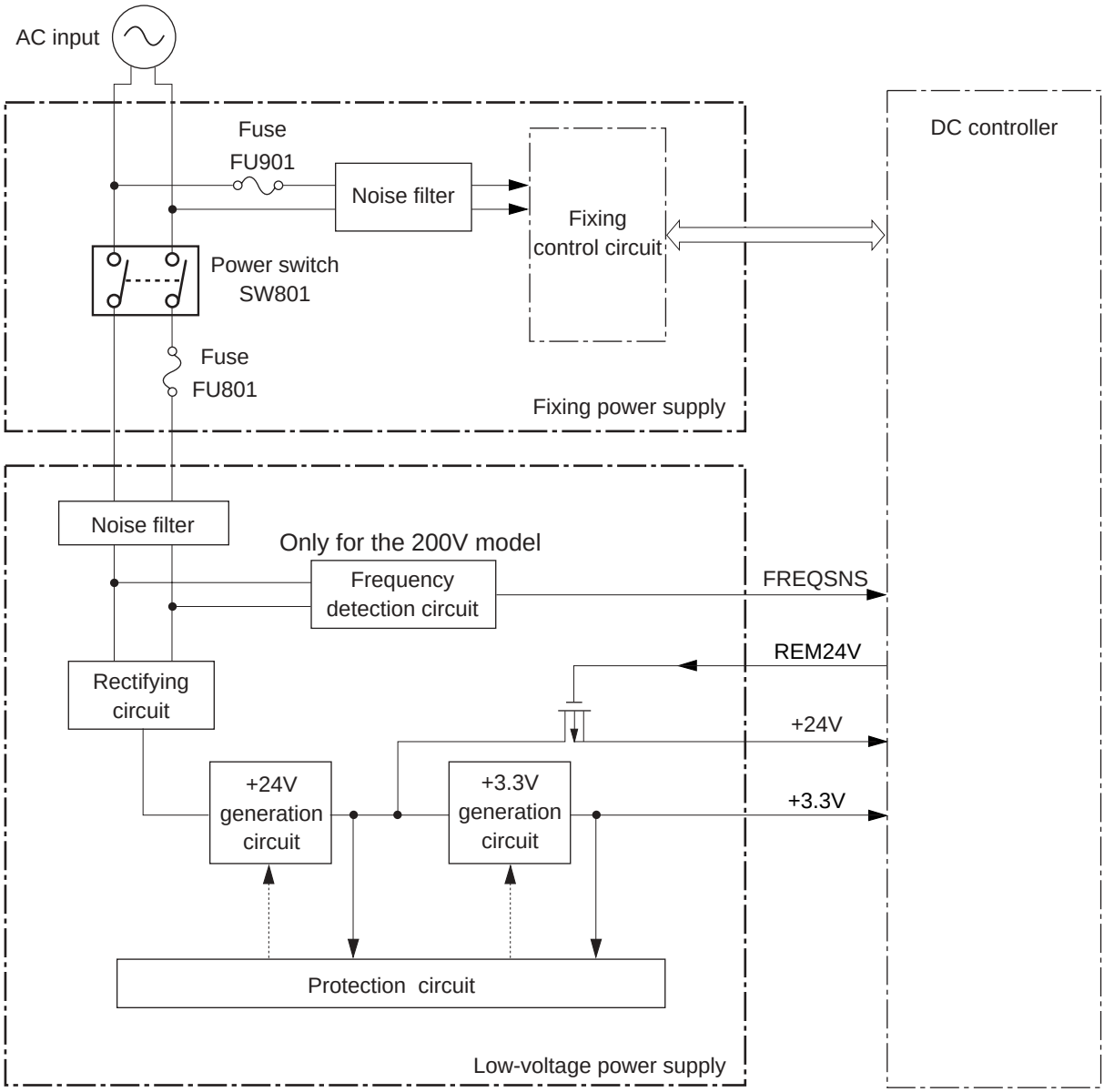
2.7.1 Power Supply

2.7.1.1 Power Supply

2.7.1.1.1 Low-voltage power supply

LBP5050N / LBP5050

The low-voltage power supply and the fixing power supply convert AC power from the power receptacle into DC power to cover the DC loads.
- Low-voltage power supply:
  Generates DC power required in the printer
- Fixing power supply:
  Supplies AC power to the low-voltage power supply
  Controls the fixing heater temperature in the fixing unit



F-2-20

The low-voltage power supply activates when the AC power is supplied through the fixing power supply by plugging in the AC power cord and turning on the power switch. The AC power is converted into +24V and +3.3V in the low-voltage power supply to serve the DC power load requirement.

2.7.1.2 Other Function

2.7.1.2.1 Protective function

LBP5050N / LBP5050

The low-voltage power supply has a protective function against overcurrent and overvoltage to prevent failures in the power supply circuit. If there flows an overcurrent or overvoltage, the low-voltage system automatically cuts off the output voltage.
If the DC voltage is not being supplied from the low-voltage power supply, turn off the power switch and unplug the AC power cord. Do not turn the power switch on again until the root cause is found.
In addition, two fuses in the fixing power supply protect against overcurrent. If overcurrent flows into the AC line, the fuses blow and cut off the AC power.

2.7.1.2.2 Power-save mode

LBP5050N / LBP5050

The power-save mode reduces power consumption of the printer.
When the low-voltage power supply receives the POWER SAVE (REM24V) signal from the DC controller, it stops the power supply from the +24V generation circuit.

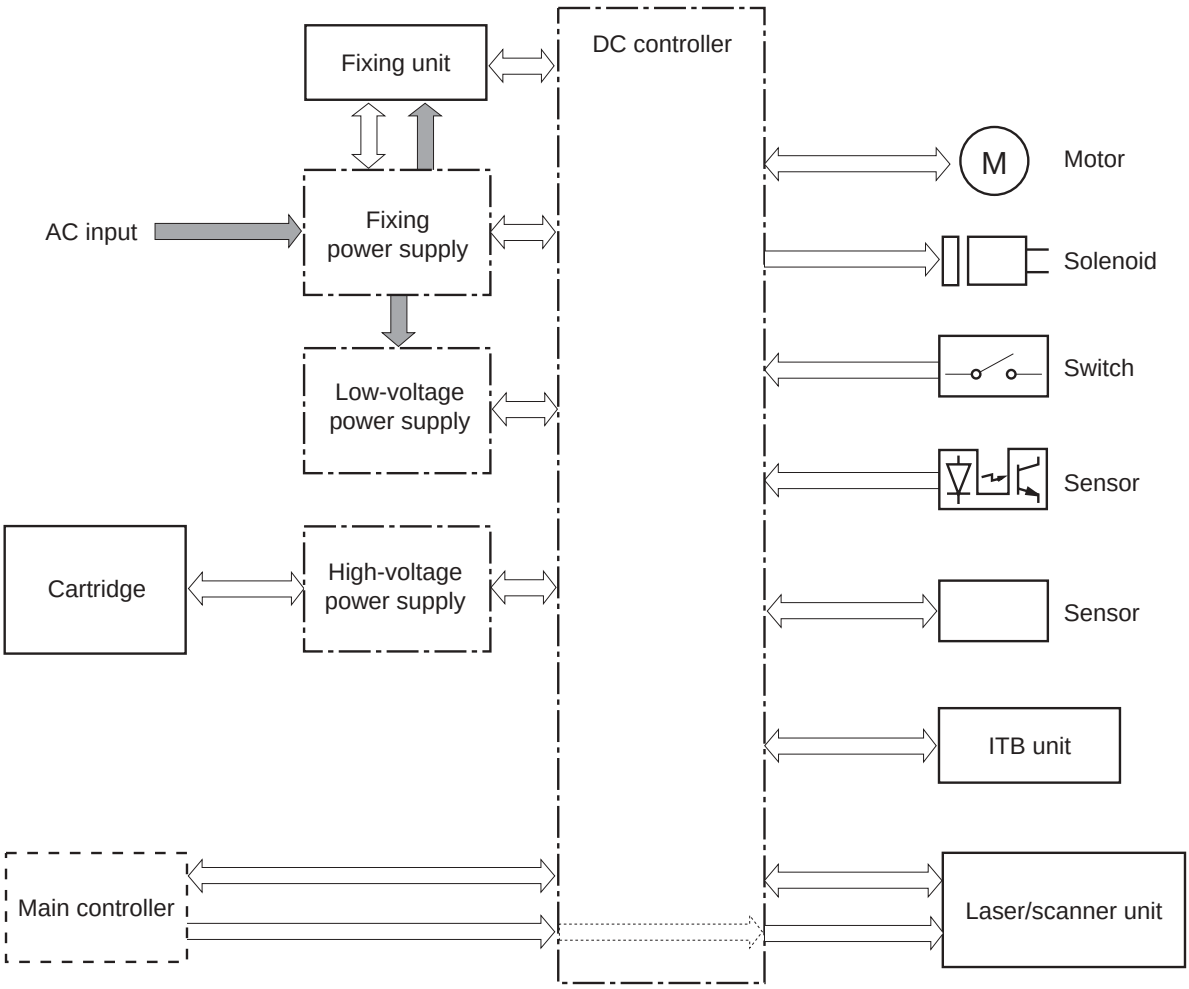
2.8 ENGINE CONTROL SYSTEM

2.8.1 DC Controller

2.8.1.1 Outline

LBP5050N / LBP5050

The DC controller controls the operational sequence of the printer.



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T-2-6

Symbol for component		Name
Motor	M701	Main motor
	M702	Pickup motor
	M703	Fixing motor
Solenoid	SL705	Cassette pickup solenoid
	SL706	Developing disengagement solenoid
Switch	SW801	Power switch
Sensor	SR601	Cassette media presence sensor
	SR602	Top of page sensor
	SR603	Loop sensor
	SR604	Manual feed slot media presence sensor
	SR605	Manual feed slot top of page sensor
	SR606	Developing homeposition sensor
	SR607	Media width sensor (R)
	SR608	Media width sensor (L)
	SR609	Fixing delivery sensor
	SR610	Fixing pressure release sensor
	SR612	Front door open detection sensor
	SR613	Rear door open detection sensor
	-	Environment sensor
	-	Color misregistration/toner density sensor
	-	Color misregistration/ITB perimeter sensor

2.8.1.2 Motor control

LBP5050N / LBP5050

The printer has three motors. The motors are used for the media feeding and image formation.

T-2-7

Description		Driving parts	Type	Failure detection
Main motor	M701	Photosensitive drum, developing cylinder, ITB	DC	Yes
Pickup motor	M702	Pickup roller, feed roller	SP	No
Fixing motor	M703	Pressure roller, delivery roller	SP	No

T-2-8

NOTE:
DC is an abbreviation of "DC motor" and SP is an abbreviation of "stepping motor".

2.8.1.3 Safety

LBP5050N / LBP5050

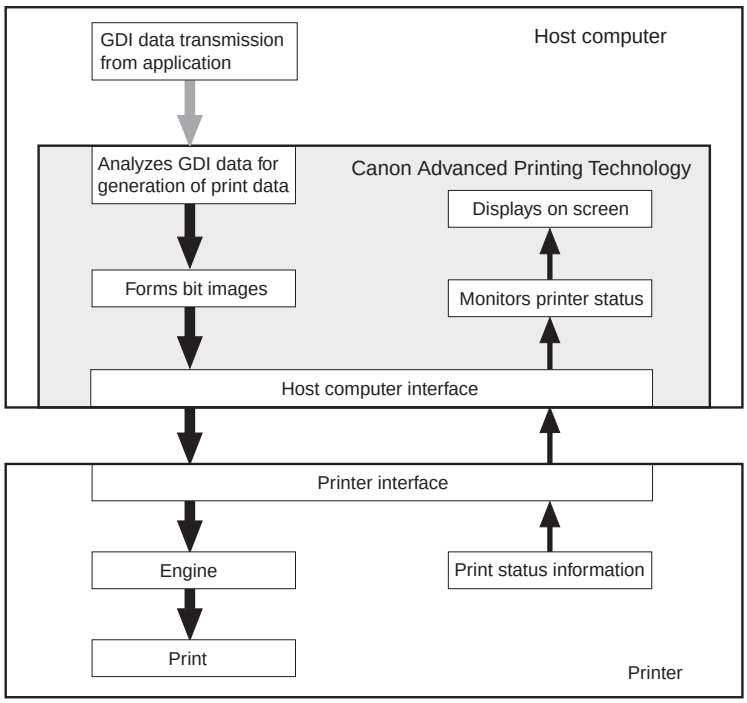
The printer detects the door open and close status by monitoring the door open detection sensors.
The DC controller stops driving the motors and solenoids if the sensor detects a door open.

2.8.2 Main Controller

2.8.2.1 Outline

LBP5050N / LBP5050

The main 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.



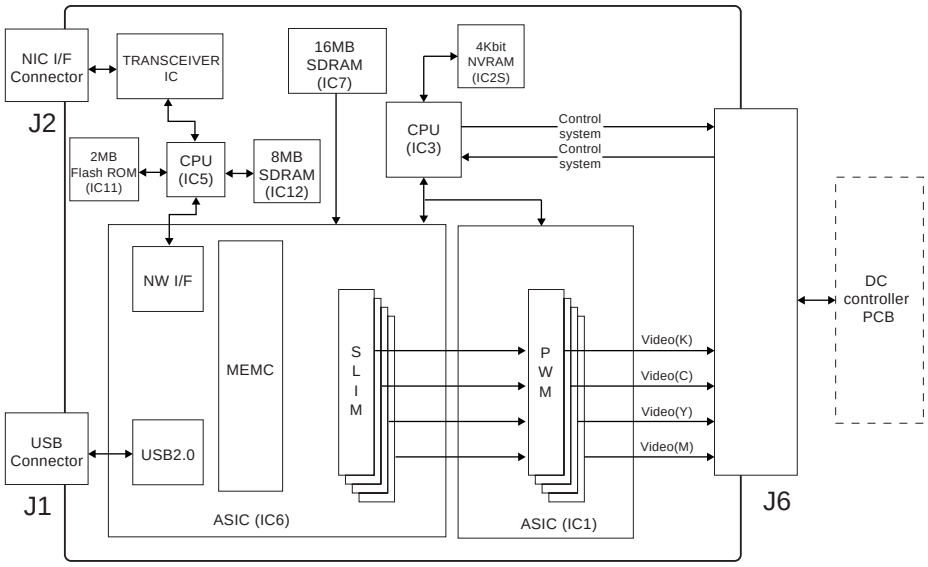
F-2-22

T-2-9

GDI (graphics device interface)
It is a graphical interface used in a Windows environment for printing and screen display (also for the application being in use).

2.8.2.2 Overview of the Block

LBP5050N / LBP5050



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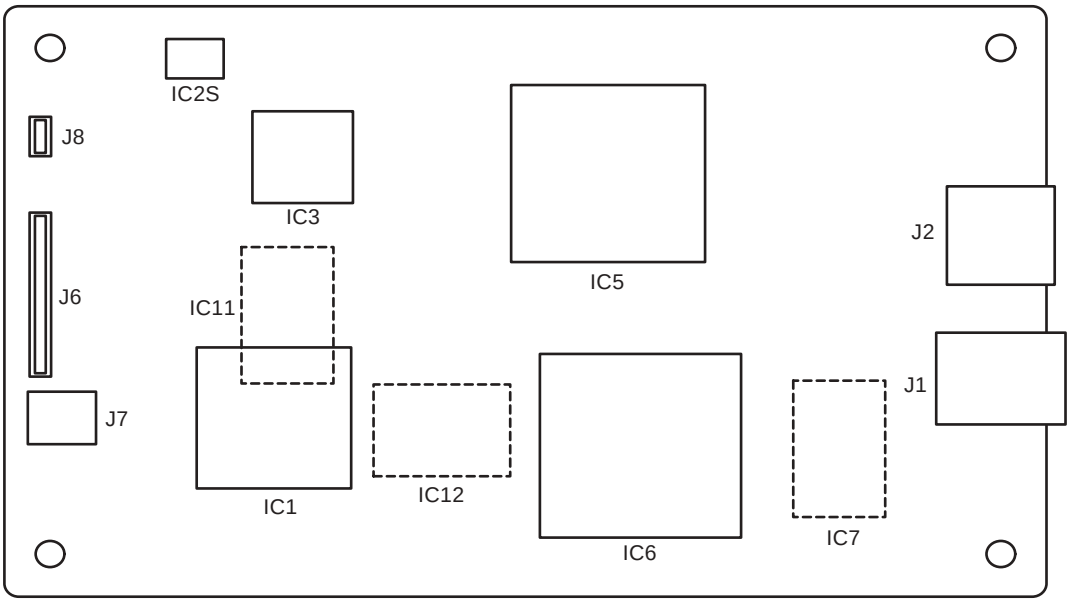
No.	Name	Description
IC1	ASIC	handle the image data
IC3	CPU	Controls the board.
IC5	CPU	Control the network
IC6	ASIC	Serves as an IC for USB device controller, memory controller, main controller, and NIC interface controller.
IC7	SDRAM	Retains image data.
IC11	Flash ROM	Network system order firmware storage
IC12	SDRAM	Retains image data.
IC2S	NVRAM	Serves to retain image data.



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3.1 EXTERNAL AND CONTROLS SYSTEM

3.1.1 Rear Cover

3.1.1.1 Before Removing the Rear Door

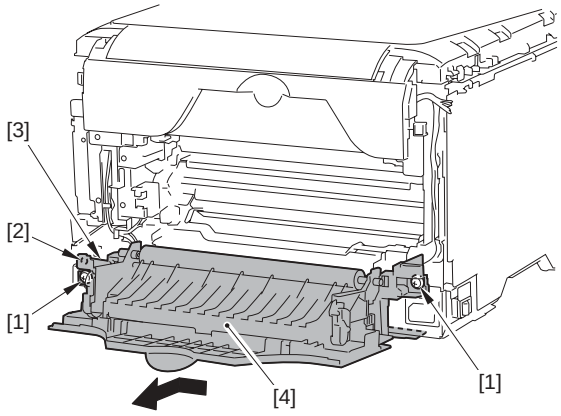
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]

3.1.1.2 Removing the Rear Door

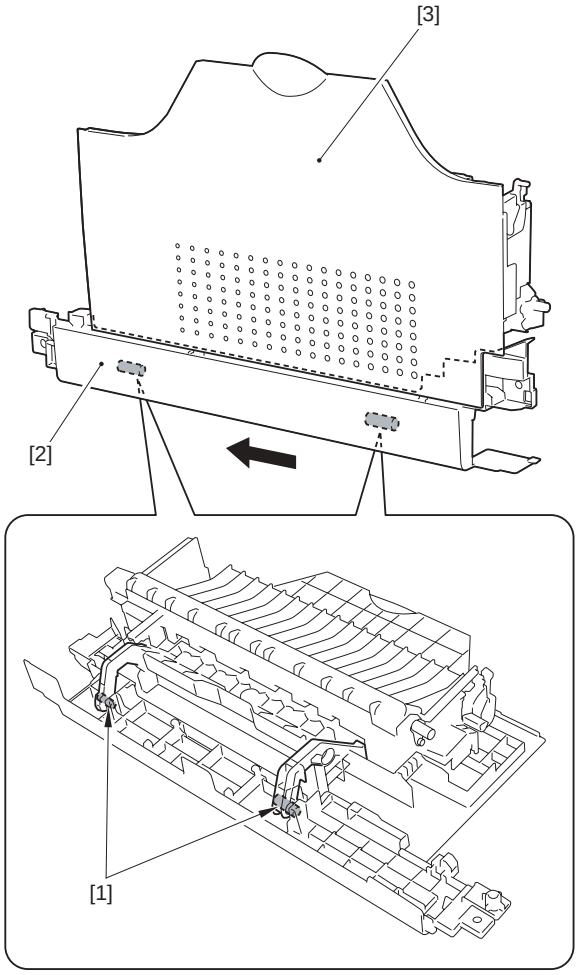
LBP5050N / LBP5050

1) Remove the 2 screws [1] and the boss [2], and remove the lower rear cover [3] and the rear door [4] as assembled.



F-3-1

2) Free the 2 connection shafts [1] of the lower rear cover and the rear door, and remove the lower rear cover [2] and the rear door [3].



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3.1.2 Rear Side Cover

3.1.2.1 Before Removing the Rear Side Cover

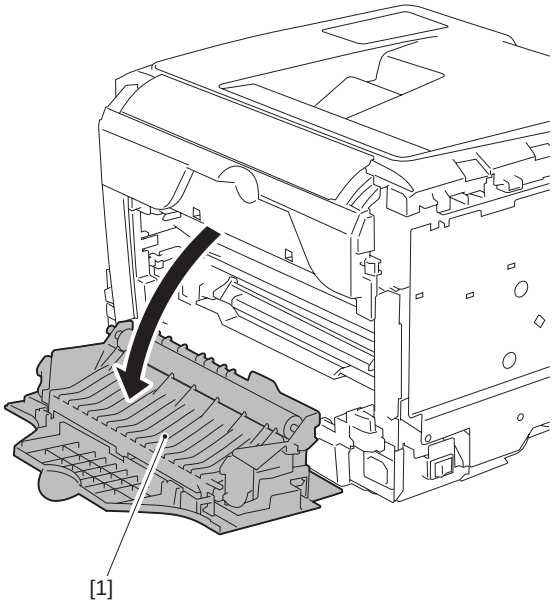
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]

3.1.2.2 Removing the Rear Side Cover

LBP5050N / LBP5050

1) Open the rear door [1].



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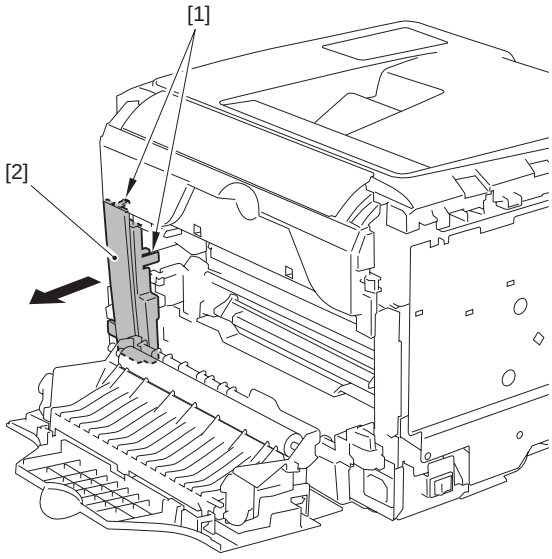
2) Free the 2 claws [1] and remove the rear side cover [2].



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3.1.3 Rear Upper Cover

3.1.3.1 Before Removing the Upper Rear Cover

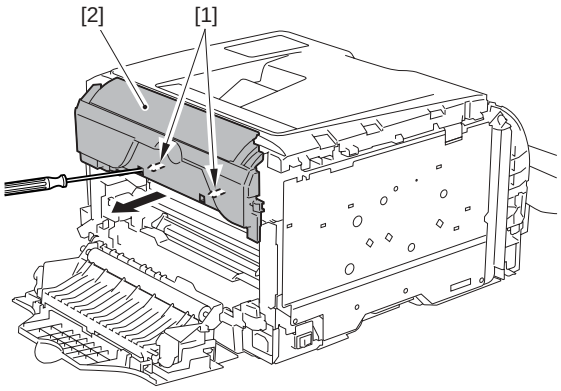
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]

3.1.3.2 Removing the Upper Rear Cover

LBP5050N / LBP5050

1) Free the 2 claws [1] and remove the upper rear cover [2].



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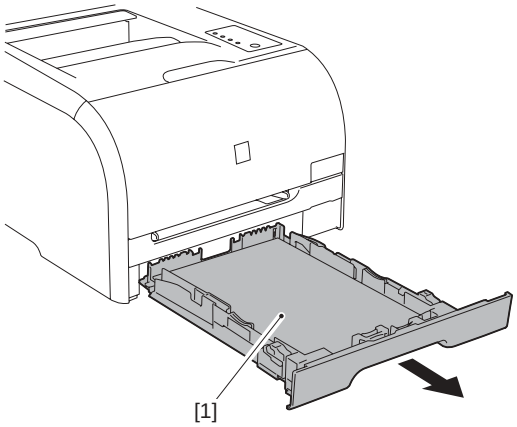
3.1.4 Right Cover

3.1.4.1 Removing the Right Cover

LBP5050N / LBP5050

1) Remove the cassette [1].



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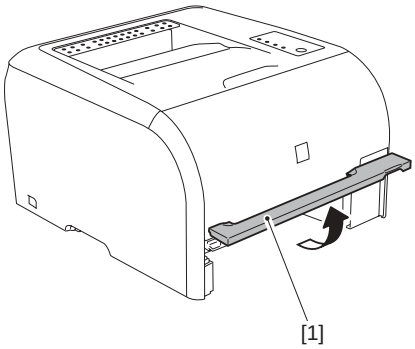
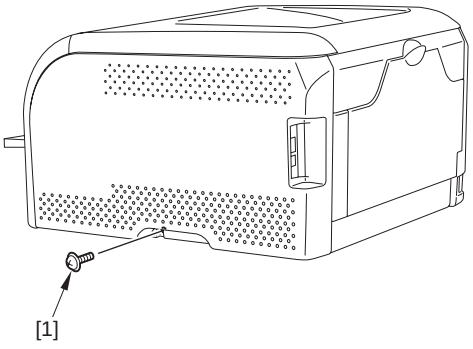
2) Open the manual pickup slot cover [1].



F-3-7

3) Remove the screw [1].



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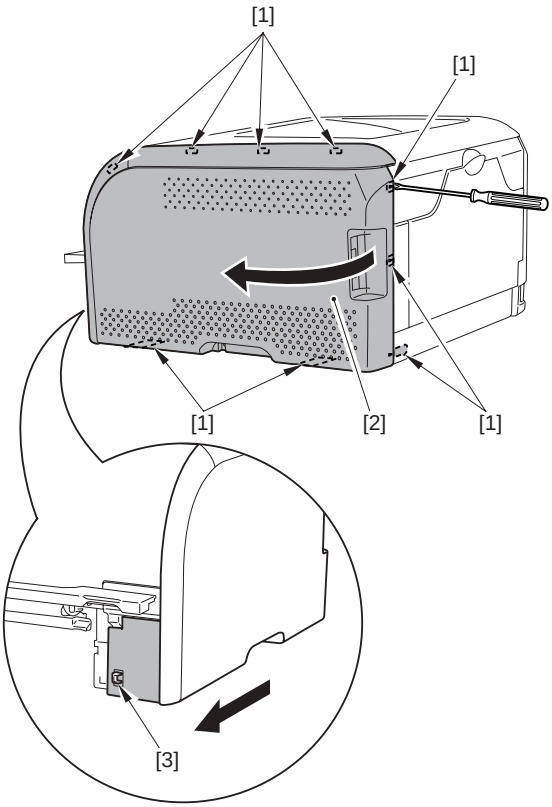
4) Free the 9 claws [1] and open the right cover [2] in the direction of the arrow.

5) Free the claw [3] and remove the right cover [2].



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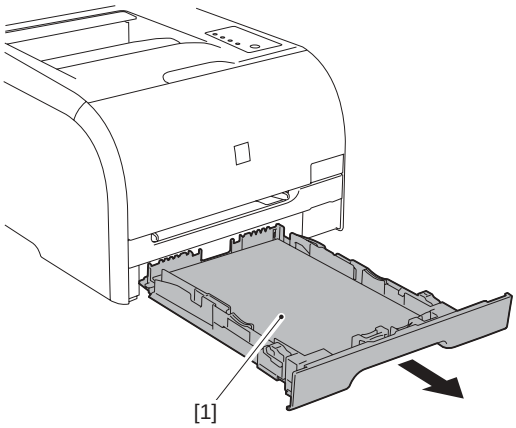
3.1.5 Left Cover

3.1.5.1 Removing the Left Cover

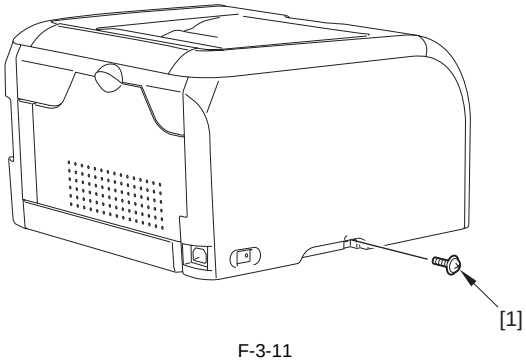
LBP5050N / LBP5050

1) Remove the cassette [1].



F-3-10

2) Remove the screw [1].



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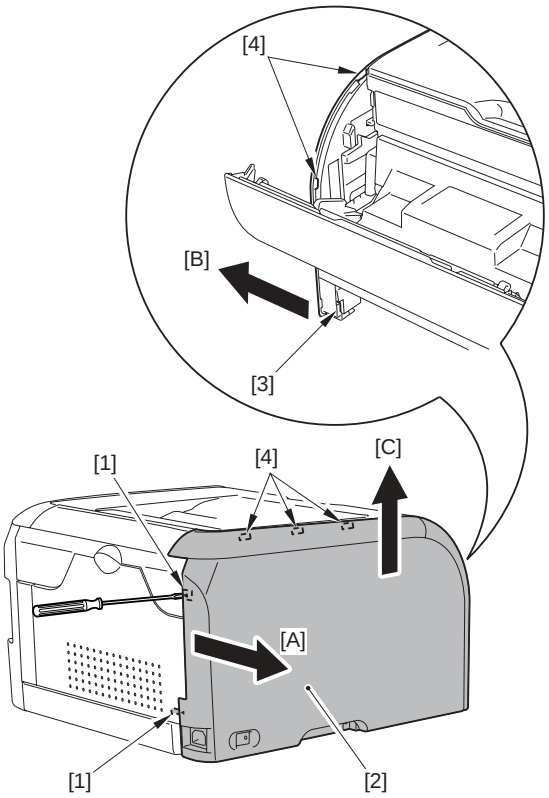
3) Free the 2 claws [1] and open the left cover [2] in the direction of the arrow [A].
4) Free the claw [3] and open the left cover [2] in the direction of the arrow [B].
5) Free the 5 claws [4] and remove the left cover [2] in the direction of the arrow [C].



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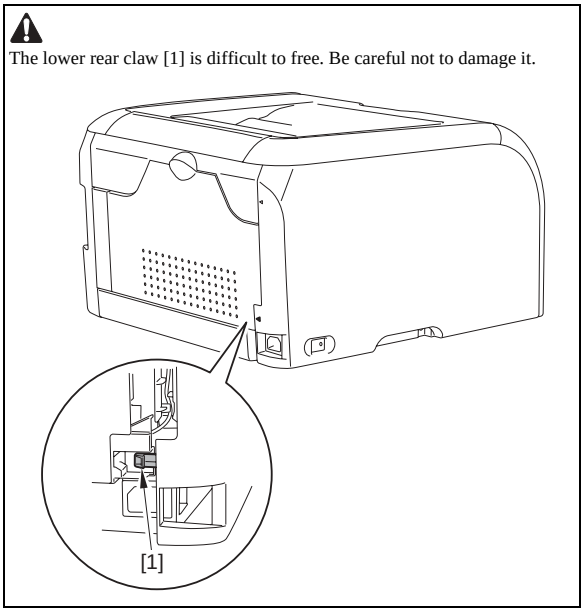


3.1.6 Upper Cover

3.1.6.1 Before Removing the Upper Cover Assembly

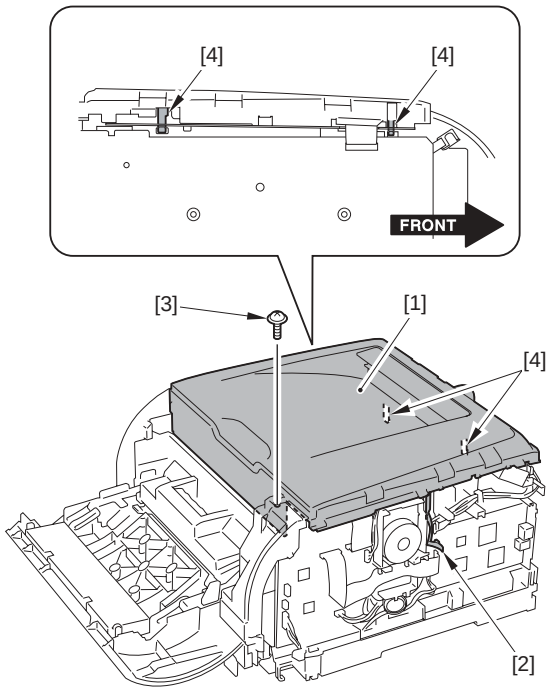
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]

3.1.6.2 Removing the Upper Cover Assembly

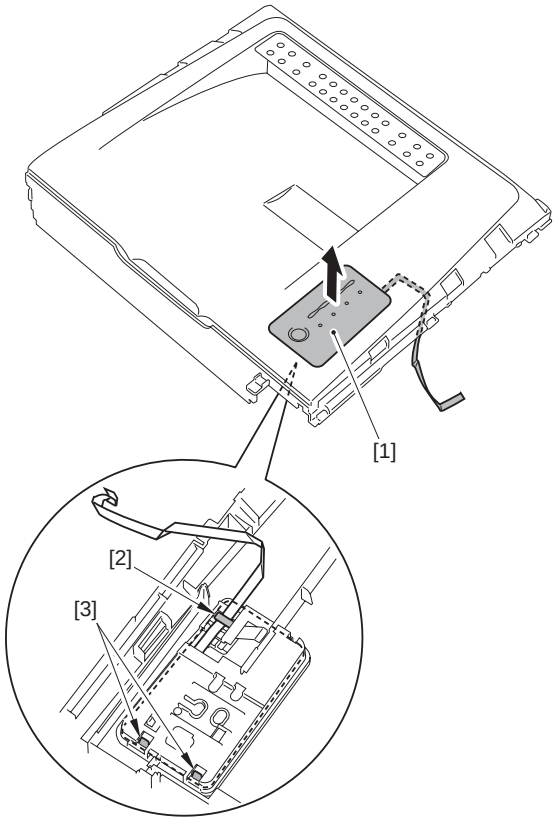
LBP5050N / LBP5050

1) Remove the upper cover assembly [1].
- 1 flat cable [2]
- 1 screw [3]
- 4 claws [4]



F-3-13

2) Remove the control panel [1] from the upper cover assembly.
- 1 harness guide [2]
- 2 claws [3]



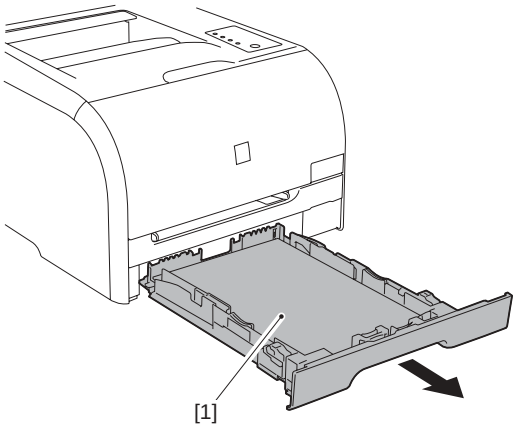
F-3-14

3.1.7 Front Cover

3.1.7.1 Removing the Front Door

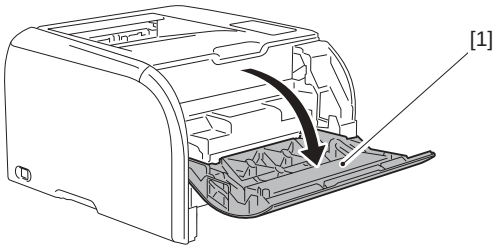
LBP5050N / LBP5050

1) Remove the cassette [1].



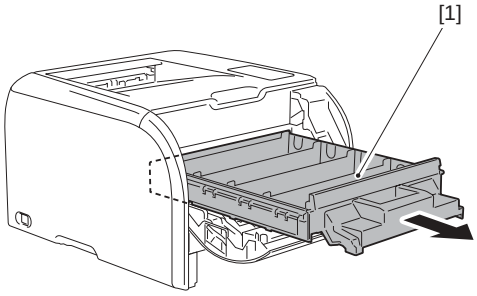
F-3-15

2) Open the front door [1].



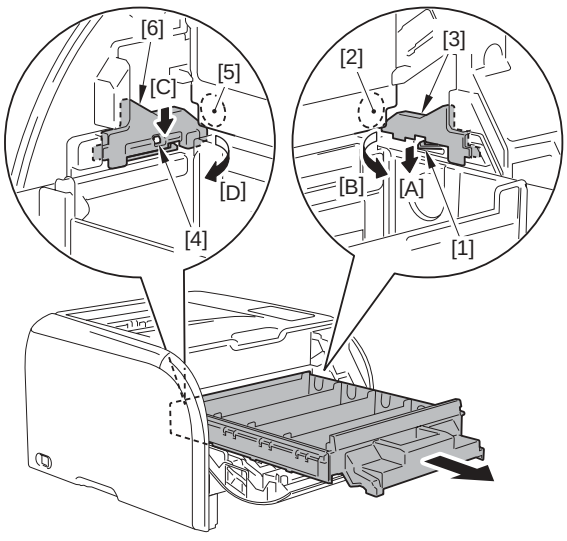
F-3-16

3) Pull out the cartridge tray [1].



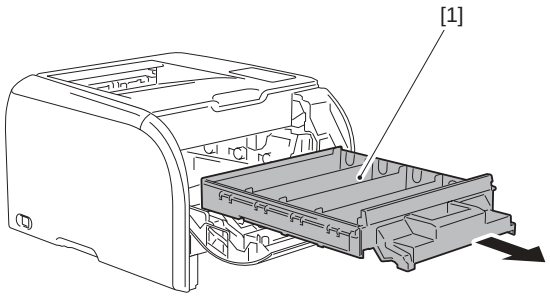
F-3-17

4) Push the claw [1] in the direction of the arrow [A], and remove the right stopper [3] in the direction of the arrow [B] while pushing the right corner [2] of the upper cover assembly.
5) Push the claw [4] in the direction of the arrow [C], and remove the left stopper [6] in the direction of the arrow [D] while pushing the left corner [5] of the upper cover assembly.



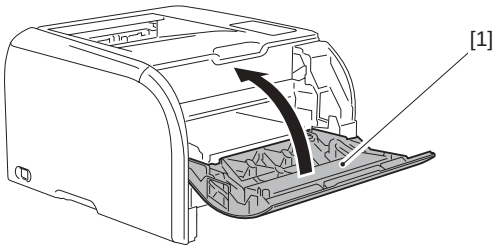
F-3-18

6) Remove the cartridge tray [1].



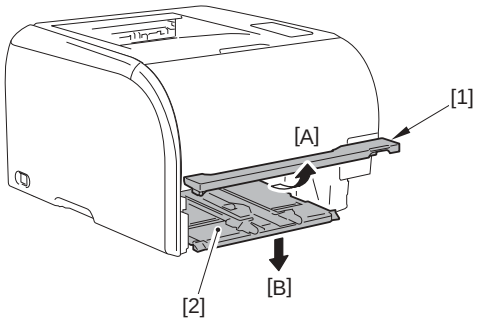
F-3-19

7) Close the front door [1].



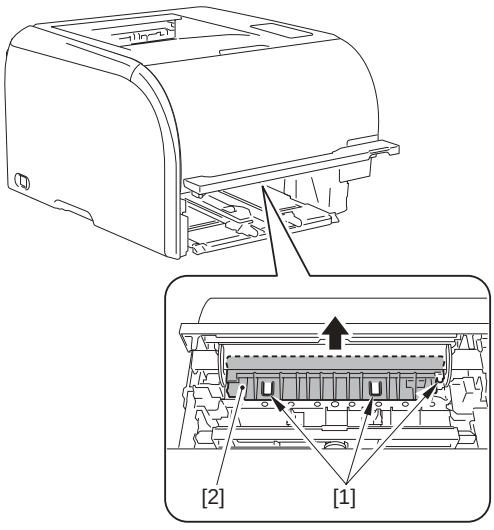
F-3-20

8) Open the manual pickup slot cover [1] in the direction of the arrow [A].
9) Open the manual pickup tray assembly [2] in the direction of the arrow [B].



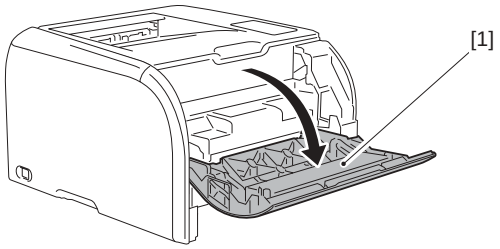
F-3-21

10) Free the 3 claws [1] and lift the paper pass guide [2] in the direction of the arrow.



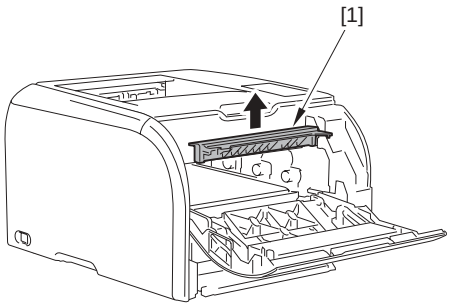
F-3-22

11) Open the front door [1].



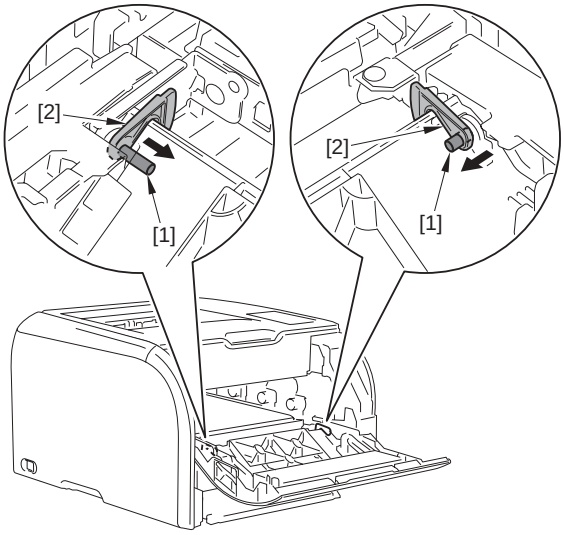
F-3-23

12) Remove the paper pass guide [1].



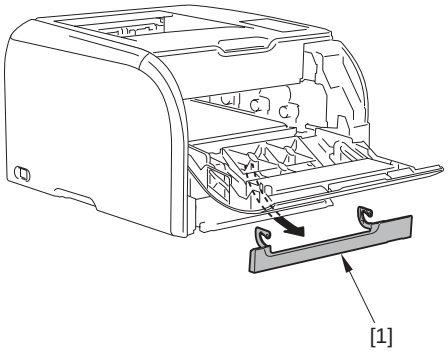
F-3-24

13) Remove the left and right arms [2] of the manual pickup slot cover assembly from the shaft [1] of the front door in the direction of the arrow.



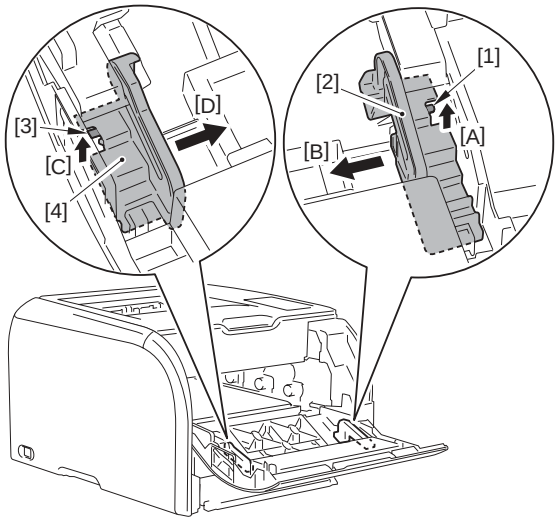
F-3-25

14) Remove the manual pickup slot cover assembly [1] in the direction of the arrow.



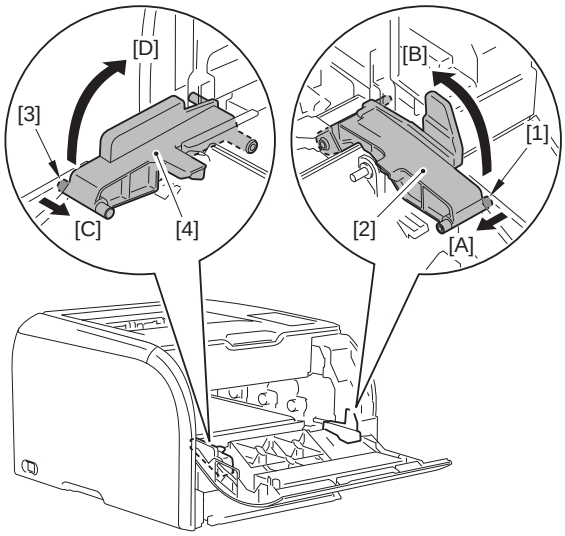
F-3-26

15) Lift the claw [1] in the direction of the arrow [A] and remove the right holder [2] in the direction of the arrow [B].
16) Lift the claw [3] in the direction of the arrow [C] and remove the left holder [4] in the direction of the arrow [D].



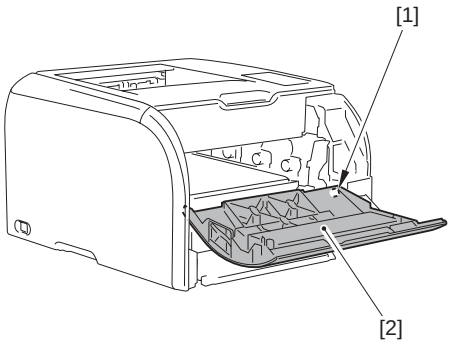
F-3-27

17) Remove the shaft [1] of the right arm in the direction of the arrow [A] and lift the right arm [2] in the direction of the arrow [B].
18) Remove the shaft [3] of the left arm in the direction of the arrow [C] and lift the left arm [4] in the direction of the arrow [D].



F-3-28

19) Remove the shaft [1] of the front door and remove the front door [2].



F-3-29

3.1.8 Main Drive Unit

3.1.8.1 Before Removing the Main Drive Assembly

LBP5050N / LBP5050

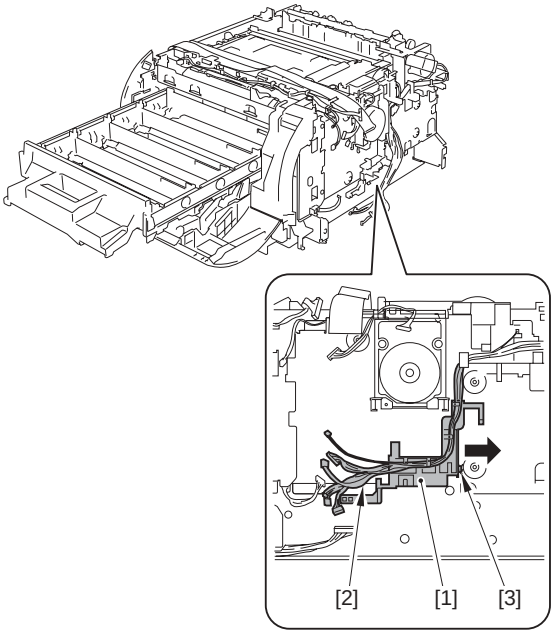
1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the rear door. (page 3-1)[Removing the Rear Door]

6) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]
7) Remove the main controller PCB. (page 3-11)[Removing the Main Controller PCB]
8) Remove the low-voltage power supply assembly. (page 3-11)[Removing the Low-Voltage Power Supply Assembly]
9) Remove the DC controller PCB. (page 3-10)[Removing the DC Controller PCB]

3.1.8.2 Removing the Main Drive Assembly

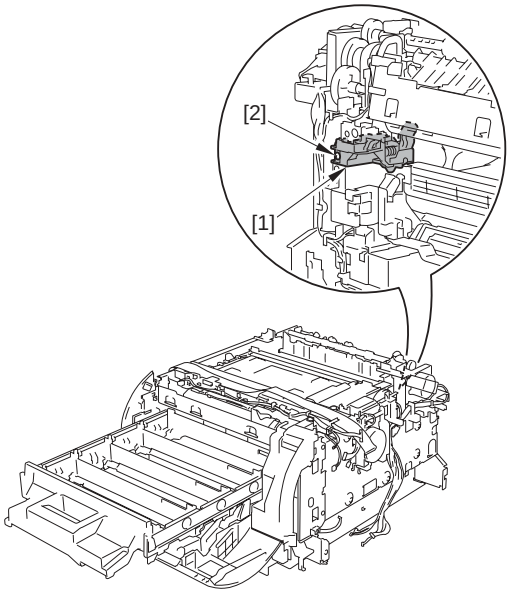
LBP5050N / LBP5050

1) Pull out the cartridge tray fully.
2) Remove the harness guide [1] in the direction of the arrow.
- Harness [2]
- 1 claw [3]



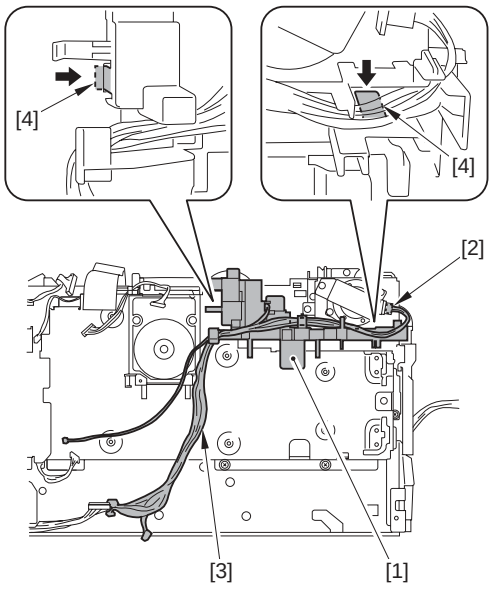
F-3-30

3) Remove the ITB fixing holder [1].
- 1 screw [2]



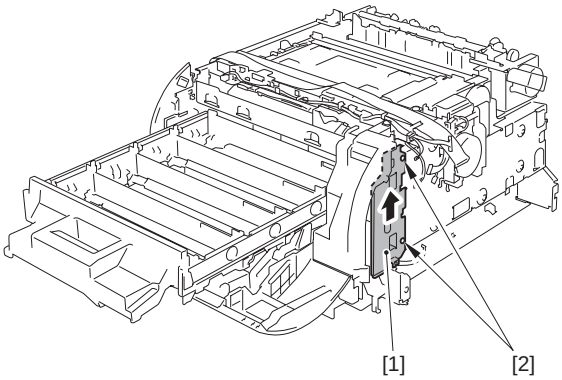
F-3-31

4) Remove the harness guide [1].
- 1 connector [2]
- Harness [3]
- 2 claws [4]



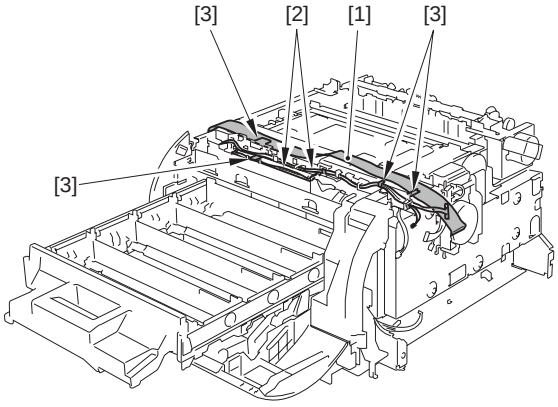
F-3-32

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



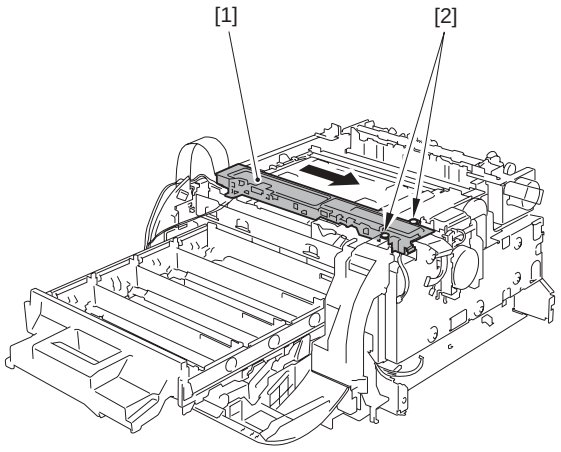
F-3-33

6) Free the flat cable [1] and the 2 harnesses [2] from the guide [3].



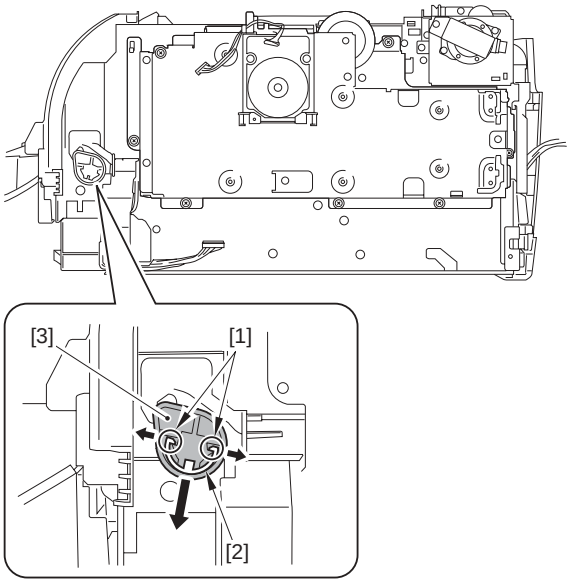
F-3-34

7) Remove the harness support plate [1] in the direction of the arrow.
- 2 screws [2]



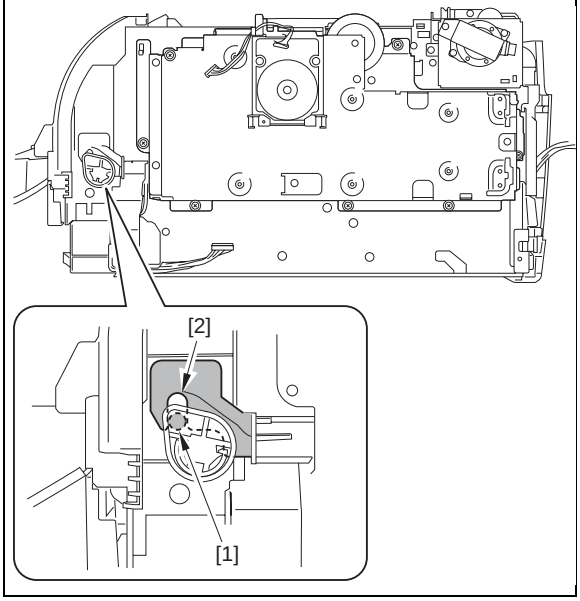
F-3-35

8) Free the 2 claws [1] in the direction of the arrow, remove the link shaft stopper [2] in the direction of the arrow and remove the link shaft [3].

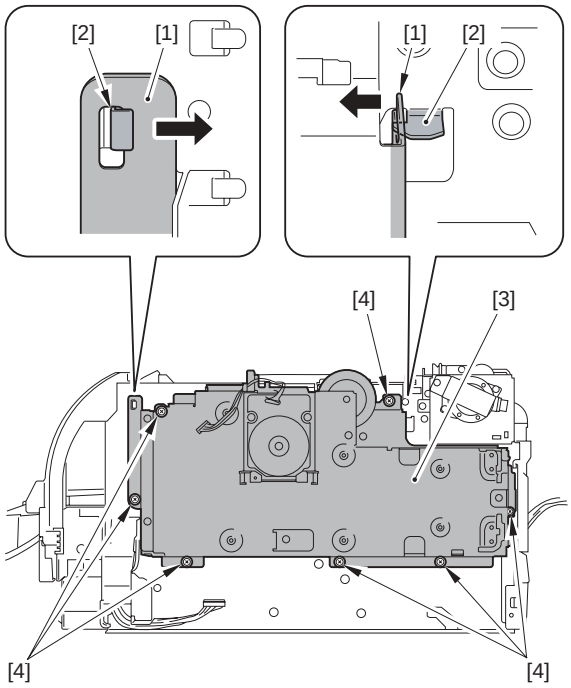


F-3-36

Points to Note at Installation
When installing the link shaft, be sure to fit the boss [1] of the link shaft into the groove [2] of the arm of the main drive assembly and install it.

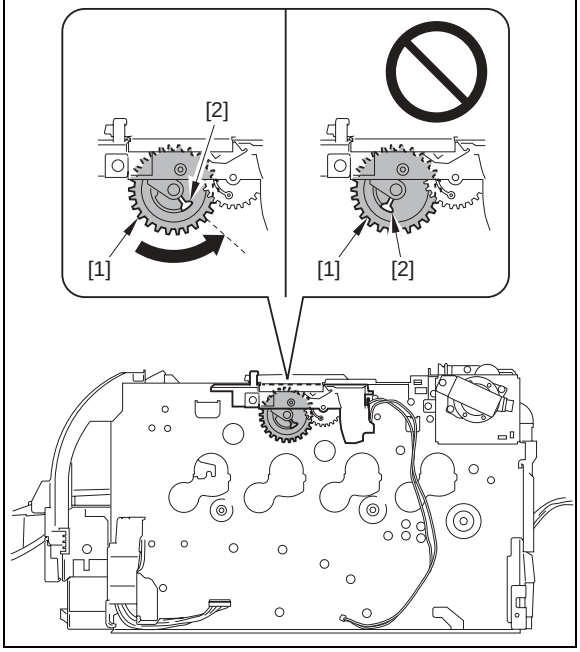


9) Free the 2 hooks [1] of the main drive assembly from the claws [2] in the direction of the arrow and remove the main drive assembly [3].
- 7 screws [4]



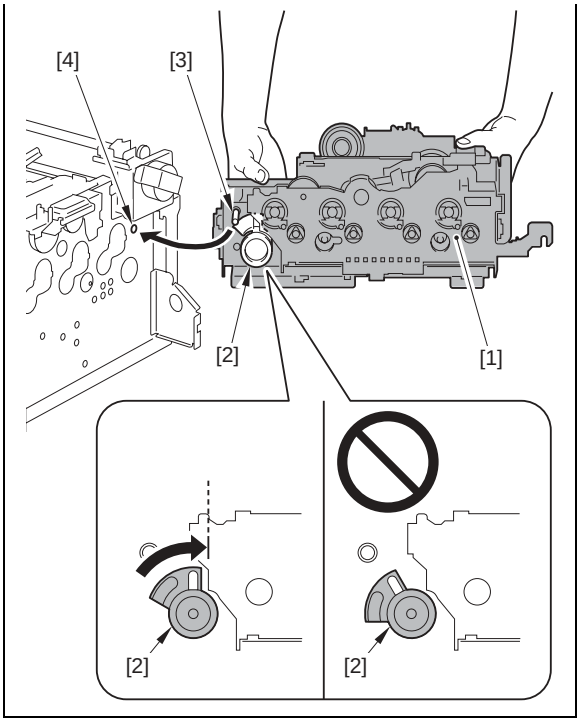
F-3-37

Points to Note at Installation
Check to see that hook [2] of the gear [1] of the sub drive assembly is situated at the correct position as shown in the following figure.
If it is not situated at the correct position, rotate the gear [1] in the direction of the arrow to adjust the hook [2] to the correct position.



Check to see that the ITB link assembly [2] of the main drive assembly [1] is set to the correct position as shown in the following figure.
If it is not set at the correct position, rotate the ITB link assembly [2] in the direction of the arrow to adjust it to the correct position.

Be sure to fit the shaft [3] of the main drive assembly into the hole [4] of the end plate and attach it.



3.1.9 Sub Driver Unit

3.1.9.1 Before Removing the Sub Drive Assembly

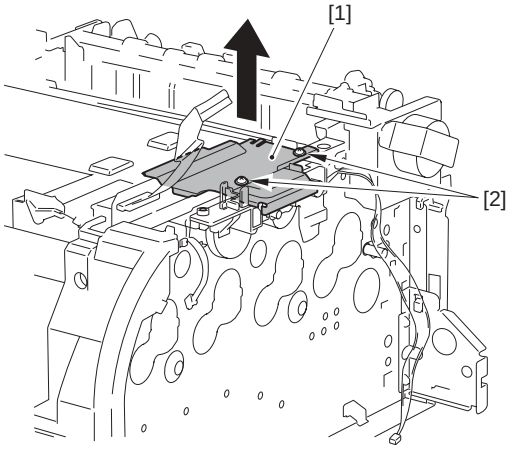
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the rear door. (page 3-1)[Removing the Rear Door]
6) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]
7) Remove the main controller PCB. (page 3-11)[Removing the Main Controller PCB]
8) Remove the low-voltage power supply assembly. (page 3-11)[Removing the Low-Voltage Power Supply Assembly]
9) Remove the DC controller PCB. (page 3-10)[Removing the DC Controller PCB]
10) Remove the main drive assembly. (page 3-6)[Removing the Main Drive Assembly]

3.1.9.2 Removing the Sub Drive Assembly

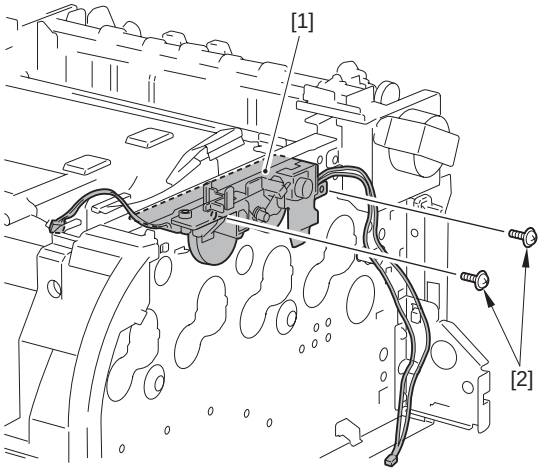
LBP5050N / LBP5050

1) Remove the sub drive assembly cover [1].
- 2 screws [2]



F-3-38

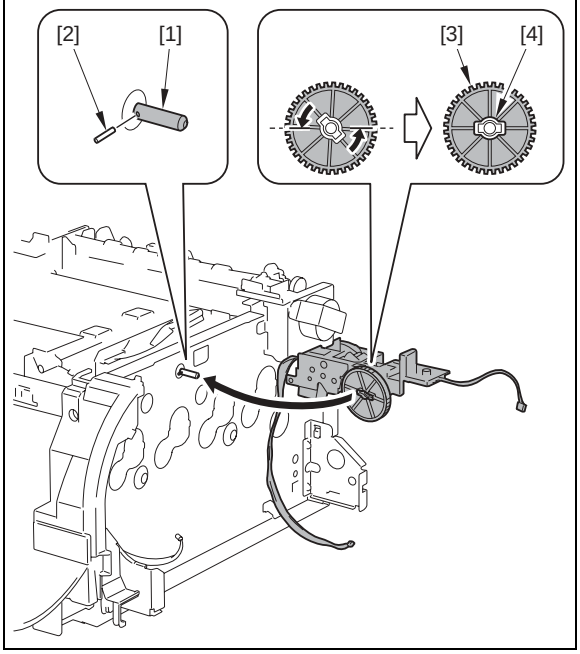
2) Remove the sub drive assembly [1].
- 2 screws [2]



F-3-39

Points to Note At Parts Replacement
The dowel pin may come off in certain directions of the shaft [1]. Be careful not to drop or lose the dowel pin [2].

When installing the sub drive assembly, be sure to fix the dowel pin [2] to the shaft [1], rotate the shaft [1] and the gear [3], fit the dowel pin [2] into the pin holder [4] of the gear horizontally and then install the assembly.



3.1.10 Main Motor

3.1.10.1 Before Removing the Main Motor

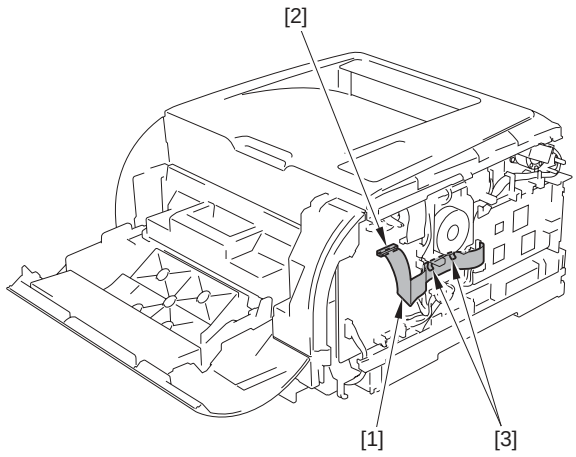
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]

3.1.10.2 Removing the Main Motor

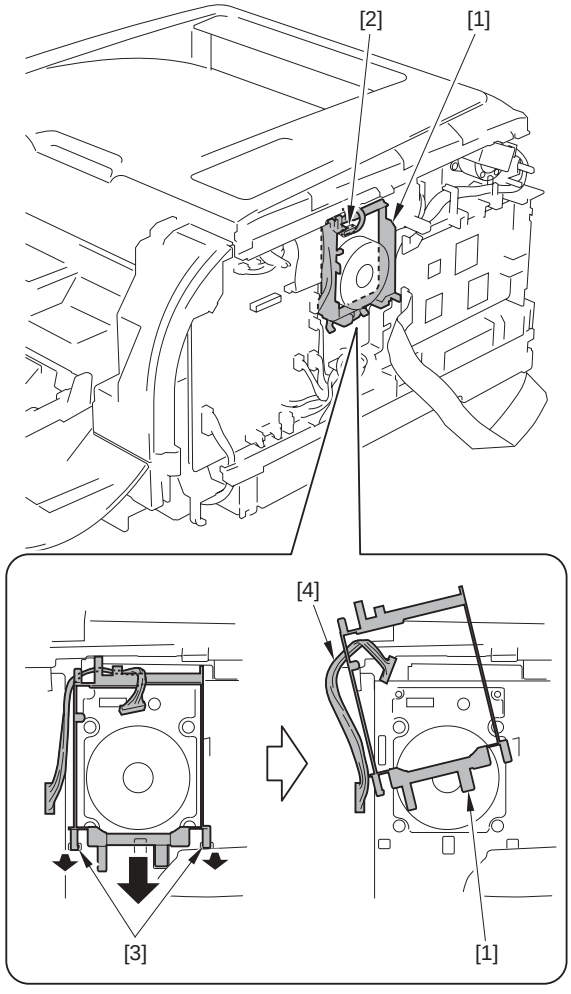
LBP5050N / LBP5050

1) Remove the flat cable [1].
- 1 connector [2]
- 2 guides [3]



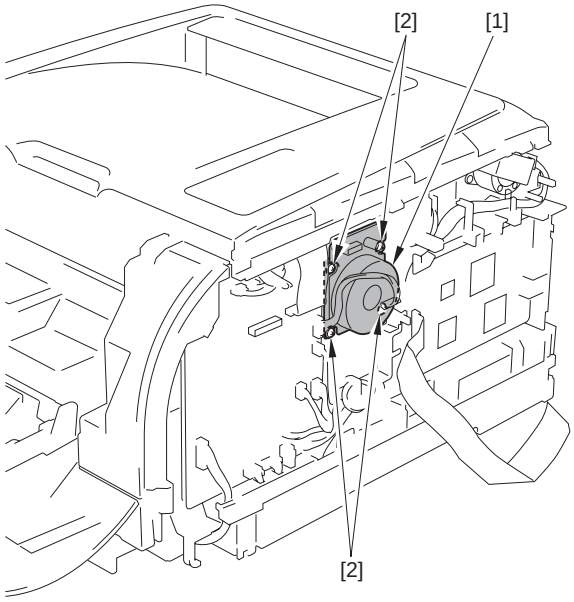
F-3-40

2) Slide the motor cover [1] downward and remove it.
   - 1 connector [2]
   - 2 claws [3]
3) Remove the motor cover [1] from the harness [4].



F-3-41

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



F-3-42

3.1.11 Operation Panel Unit

3.1.11.1 Before Removing the Control Panel

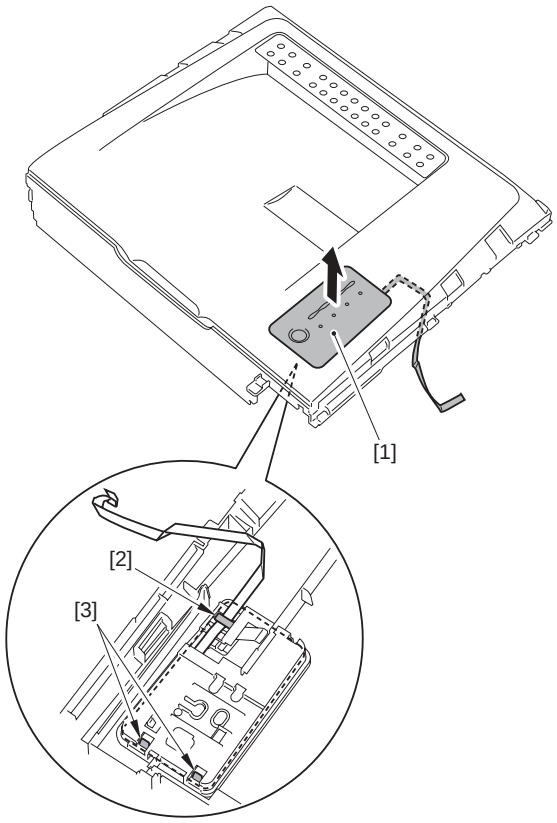
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]

3.1.11.2 Removing the Control Panel

LBP5050N / LBP5050

1) Remove the control panel [1] form the upper cover assembly.
   - 1 harness guide [2]
   - 2 claws [3]



F-3-43

3.1.12 DC Controller PCB

3.1.12.1 Before Removing the DC Controller PCB

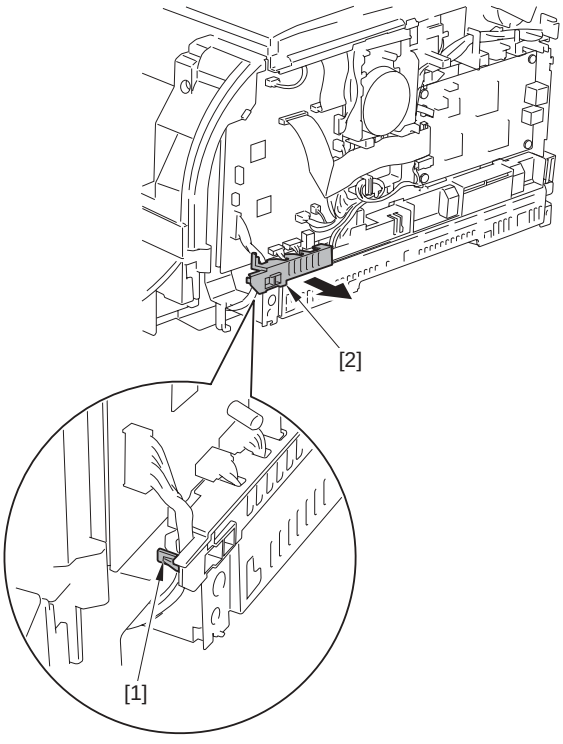
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]

3.1.12.2 Removing the DC Controller PCB

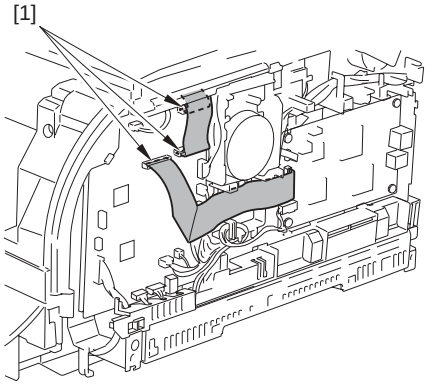
LBP5050N / LBP5050

1) Free the claw [1] and remove the guide [2] in the direction of the arrow.



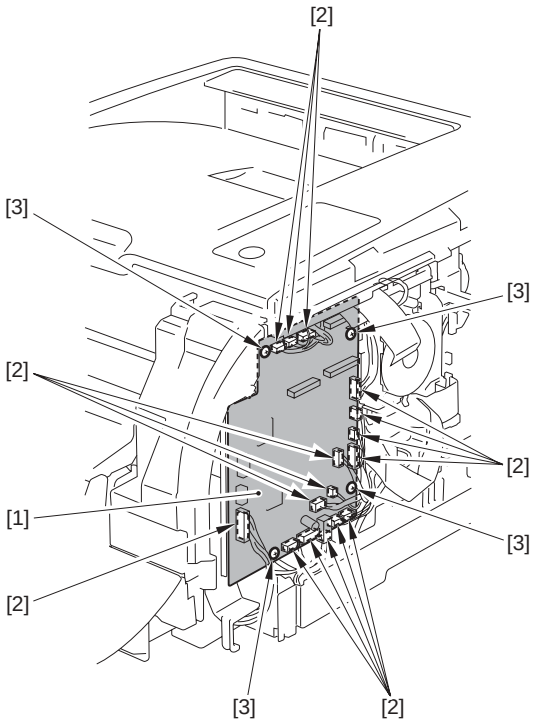
F-3-44

2) Remove the 3 flat cables [1].



F-3-45

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



F-3-46

3.1.12.3 After Replacing the DC controller PCB

LBP5050N / LBP5050

The information in the NVRAM on the DC controller PCB is saved as back-up data in the NVRAM on the main controller PCB.
Executing Printer Setting Restoration in service mode recovers the backup data in the NVRAM on the DC controller PCB.
When replacing the DC controller PCB, execute recovery of backup data, color displacement correction, and calibration in service mode.
1) Execute Option Menu > Service Mode > Printer Information settings > Printer Setting Restoration.

T-3-1

> ⚠
> After executing the printer recovery setting, wait completion of the processing for approx. 15 sec.

2) Turn off/on the power supply of the host machine.
3) Start the Status window.
4) Execute Option Menu > Utility > Out-of-Register Colors Correction.
5) Execute Option Menu > Utility > Calibration.

3.1.13 Main Controller PCB

3.1.13.1 Before Removing the Main Controller PCB

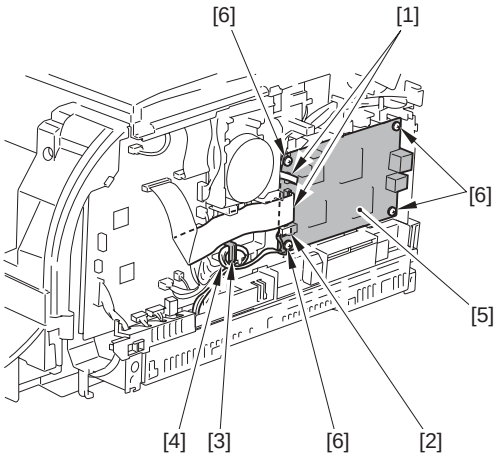
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]

3.1.13.2 Removing the Main Controller PCB

LBP5050N / LBP5050

1) Remove the 2 flat cables [1] and disconnect the connector [2].
2) Free the harness [4] from the guide [3].
3) Remove the main controller PCB [5].
   - 4 screws [6]



F-3-47

3.1.13.3 After Replacing the Main Controller PCB

LBP5050N / LBP5050

The settings and management data of host machine is saved in the NVRAM (IC2S) of the main controller PCB. When replacing the main controller PCB, be sure to move the NVRAM from the old PCB and to the new PCB.
After moving the NVRAM, execute color displacement correction and calibration.
1) Turn on the power supply of the host machine.
2) Start the Status window.
3) Execute Option Menu > Utility > Out-of-Register Colors Correction in the status window.
4) Execute Option Menu > Utility > Calibration in the status window.

T-3-2

> The information in the NVRAM on the DC controller PCB is saved in the
> NVRAM (IC2S) as backup data.
> When replacing the NVRAM, perform the same operation as replacing the
> main controller PCB and execute the following item; Option Menu > Service Mode > Printer Information settings > DCON data back up.

3.1.14 Low-Voltage Power Supply Assembly

3.1.14.1 Before Removing the Low-Voltage Power Supply Assembly

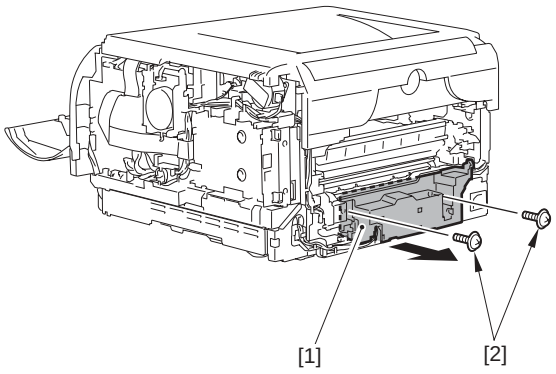
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
3) Remove the rear door. (page 3-1)[Removing the Rear Door]
4) Remove the main controller PCB. (page 3-11)[Removing the Main Controller PCB]

3.1.14.2 Removing the Low-Voltage Power Supply Assembly

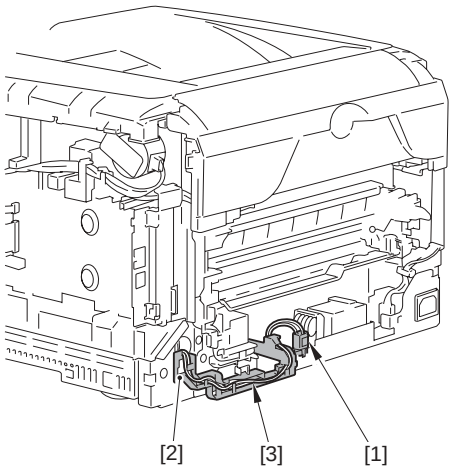
LBP5050N / LBP5050

1) Remove the fixing power supply cover [1].
   - 2 screws [2]



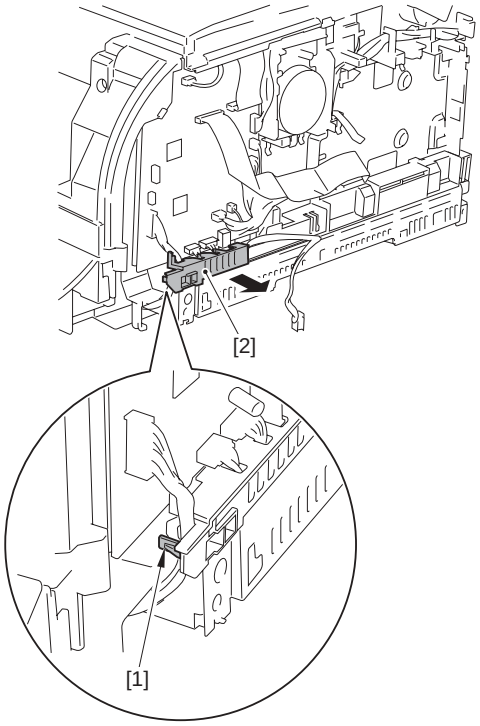
F-3-48

2) Disconnect the connector [1] and free the harness [3] from the guide [2].



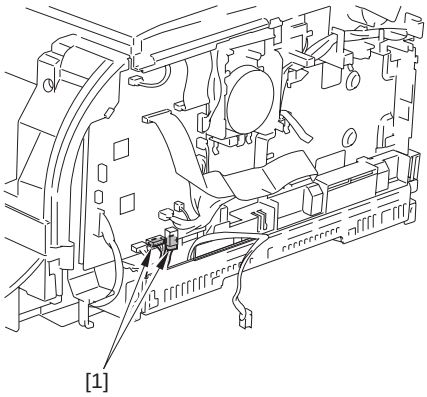
F-3-49

3) Free the claw [1] and remove the guide [2] in the direction of the arrow.



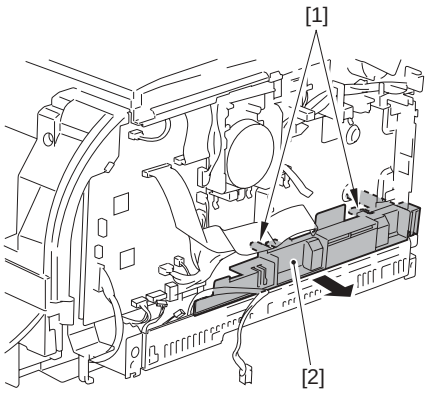
F-3-50

4) Disconnect the 2 connectors [1].



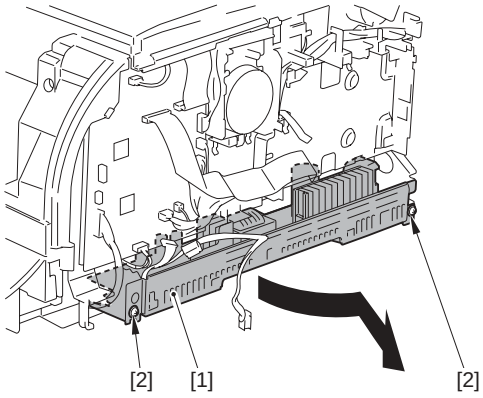
F-3-51

5) Free the 2 claws [1] and remove the guide [2] in the direction of the arrow.



F-3-52

6) Remove the low-voltage power supply PCB [1].
- 2 screws [2]



F-3-53

3.1.15 Fixing Power Supply Assembly

3.1.15.1 Before Removing the Fixing Power Supply Assembly

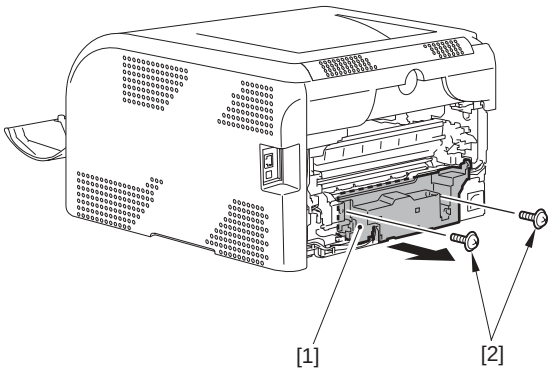
LBP5050N / LBP5050

1) Remove the left cover. (page 3-2)[Removing the Left Cover]
2) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
3) Remove the rear door. (page 3-1)[Removing the Rear Door]

3.1.15.2 Removing the Fixing Power Supply Assembly

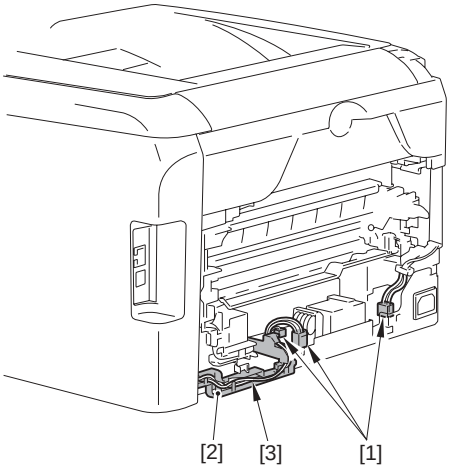
LBP5050N / LBP5050

1) Remove the fixing power supply cover [1].
- 2 screws [2]



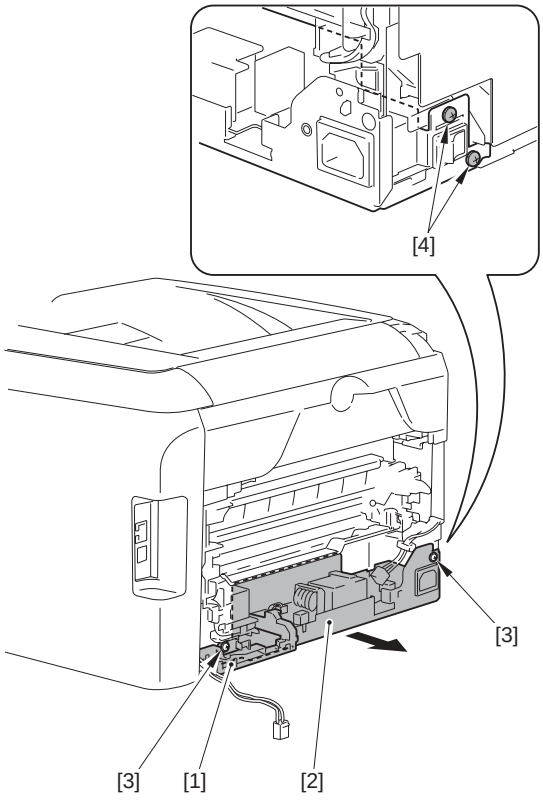
F-3-54

2) Disconnect the 3 connectors [1] and free the harness [3] from the guide [2].



F-3-55

3) Remove the harness guide [1].
4) Remove the fixing power supply assembly [2].
- 2 screws (TP) [3]
- 2 screws (w/spring) [4]



F-3-56

3.1.16 High-voltage PCB

3.1.16.1 Before Removing the High-Voltage Power Supply PCB

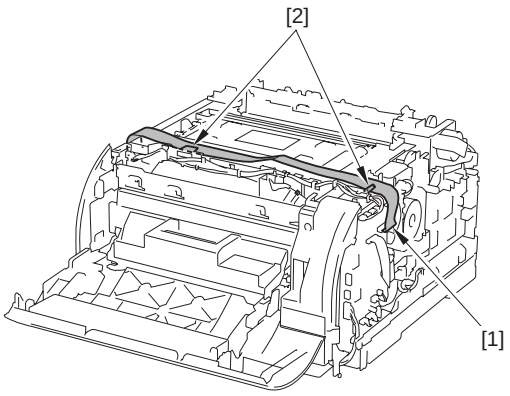
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]

3.1.16.2 Removing the High-Voltage Power Supply PCB

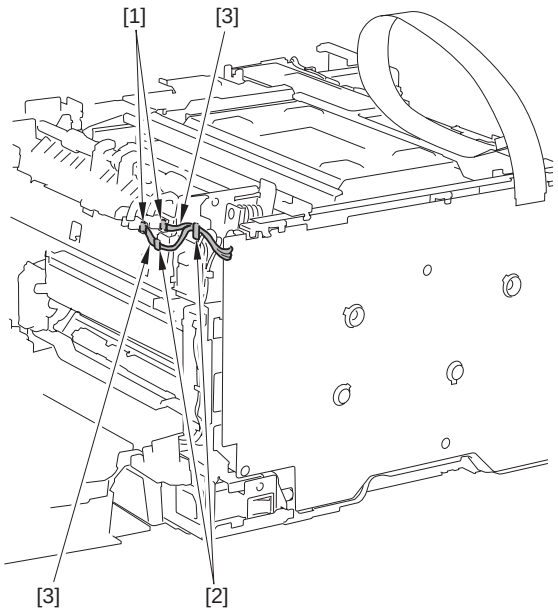
LBP5050N / LBP5050

1) Remove the flat cable [1] from the 2 guides [2].



F-3-57

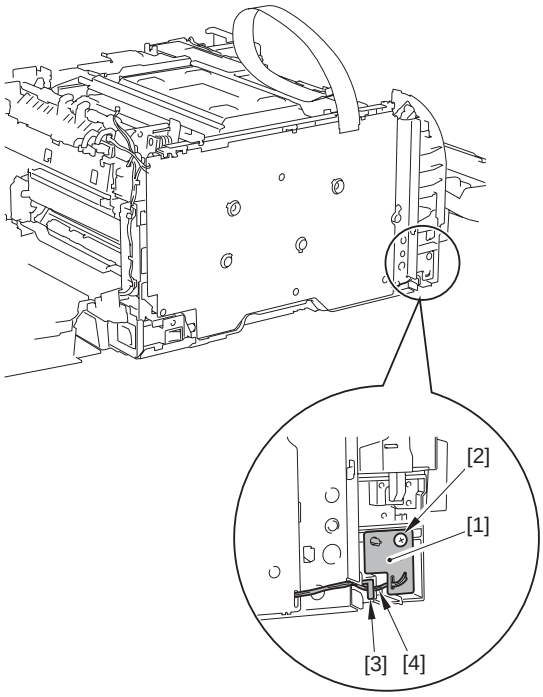
2) Disconnect the 2 connectors [1] and free the harness [3] from the 2 guides [2].



F-3-58

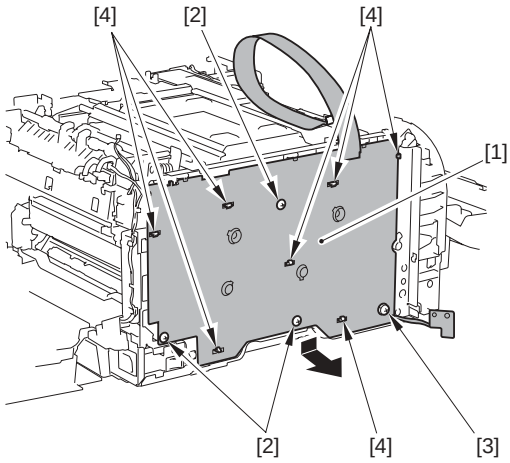
3) Remove the sub PCB [1].
- 1 screw [2]

4) Free the harness [4] from the guide [3].



F-3-59

5) Remove the high-voltage power supply PCB [1].
- 3 screws (binding) [2]
- 1 screw (w/spring) [3]
- 7 claws [4]



F-3-60

3.2 LASER EXPOSURE SYSTEM

3.2.1 Laser Scanner Unit

3.2.1.1 Before Removing the Laser Scanner Unit

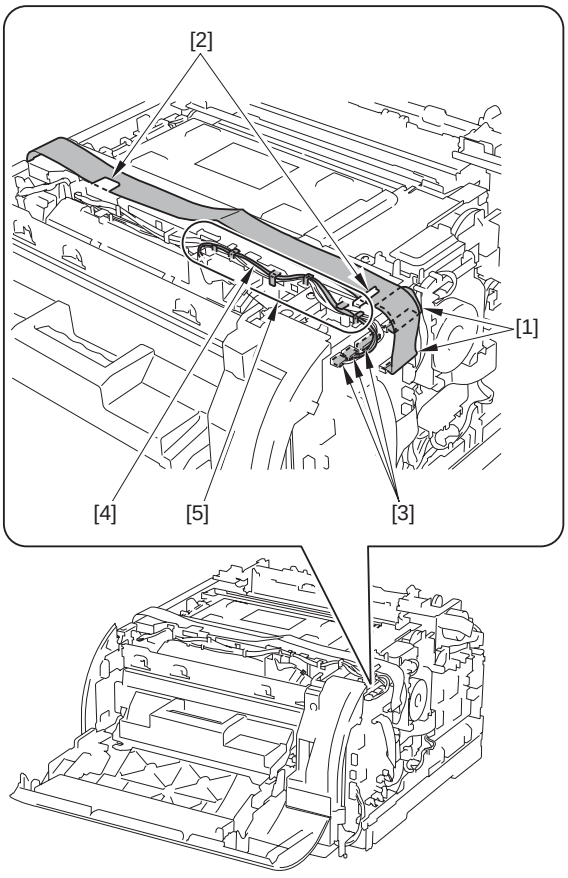
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]

3.2.1.2 Removing the Laser Scanner Unit

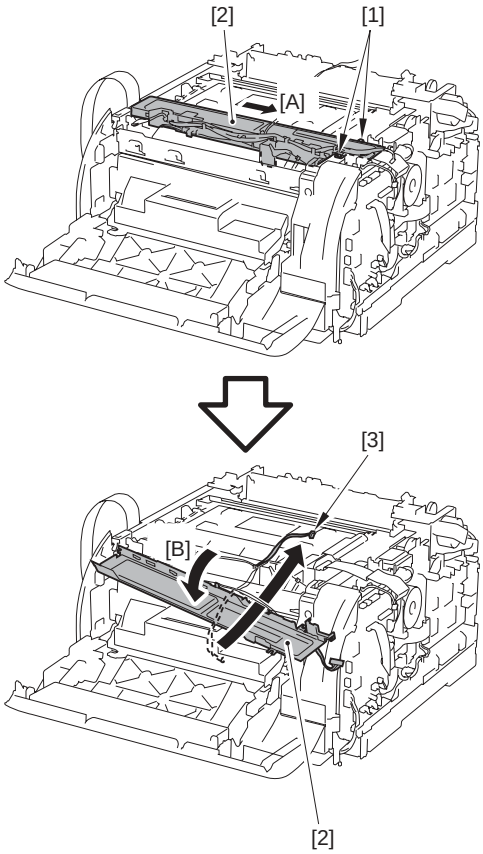
LBP5050N / LBP5050

1) Remove the 2 flat cables [1] from the 2 guides [2].
2) Disconnect the 3 connectors [3].
3) Free the purple harness [4] from the guide [5].



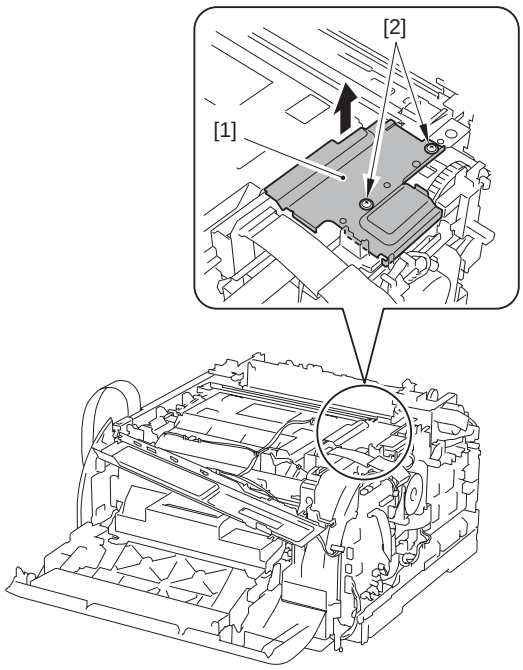
F-3-61

4) Remove the 2 screws [1] and remove the harness support plate [2] in the direction of the arrow [A].
5) Move the harness support plate [2] in the direction of the arrow [B] and free the purple harness [3] from the guide.



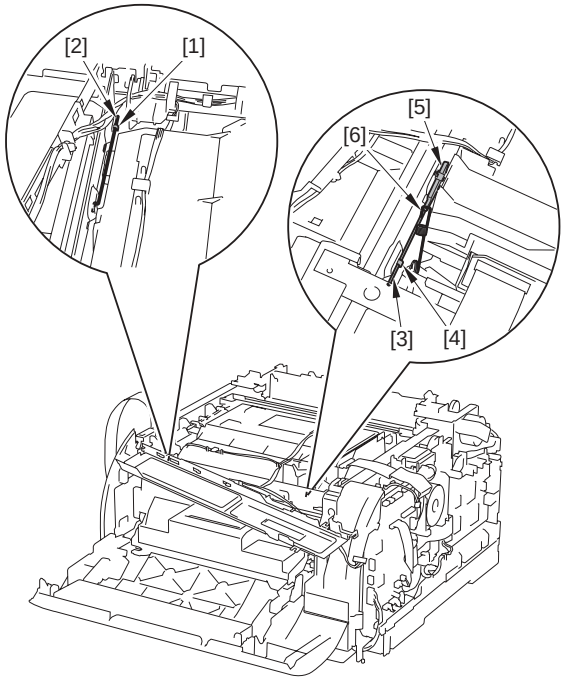
F-3-62

6) Remove the sub drive assembly cover [1].
- 2 screws [2]



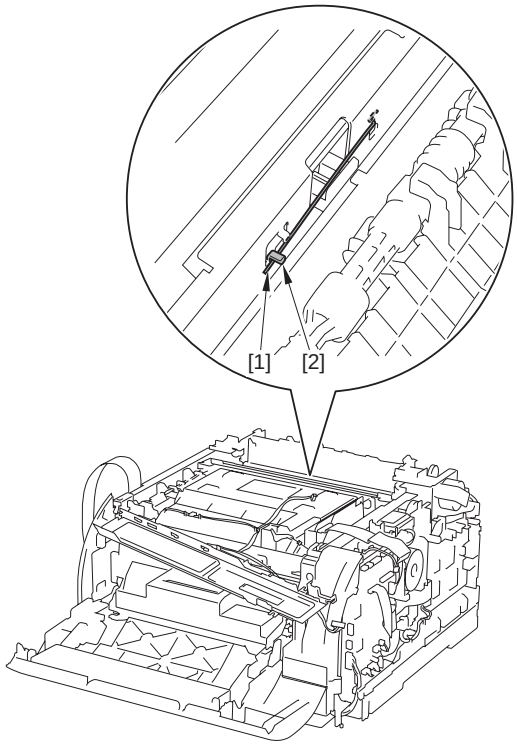
F-3-63

7) Free the left scanner fixing spring [1] from the hook [2].
8) Free the right scanner fixing spring [3] from the hook [4].
9) Remove the spring [6] from the sensor arm [5].



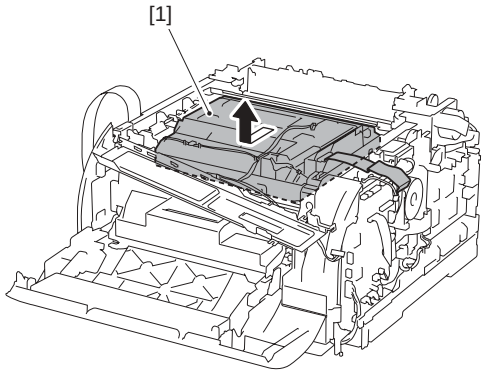
F-3-64

10) Free the rear scanner fixing spring [1] from the hook [2].



F-3-65

11) Remove the laser scanner unit [1].

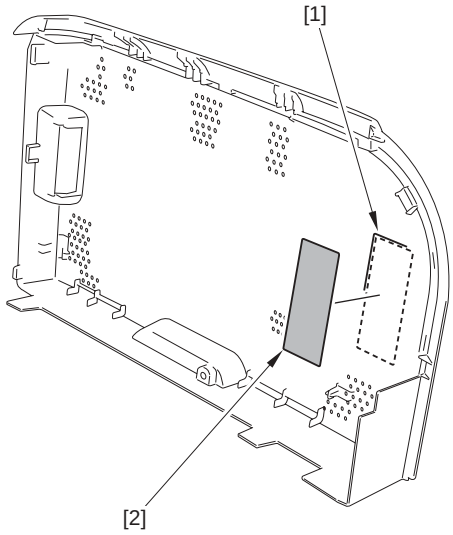


F-3-66

3.2.1.3 After Replacing the laser scanner unit

LBP5050N / LBP5050

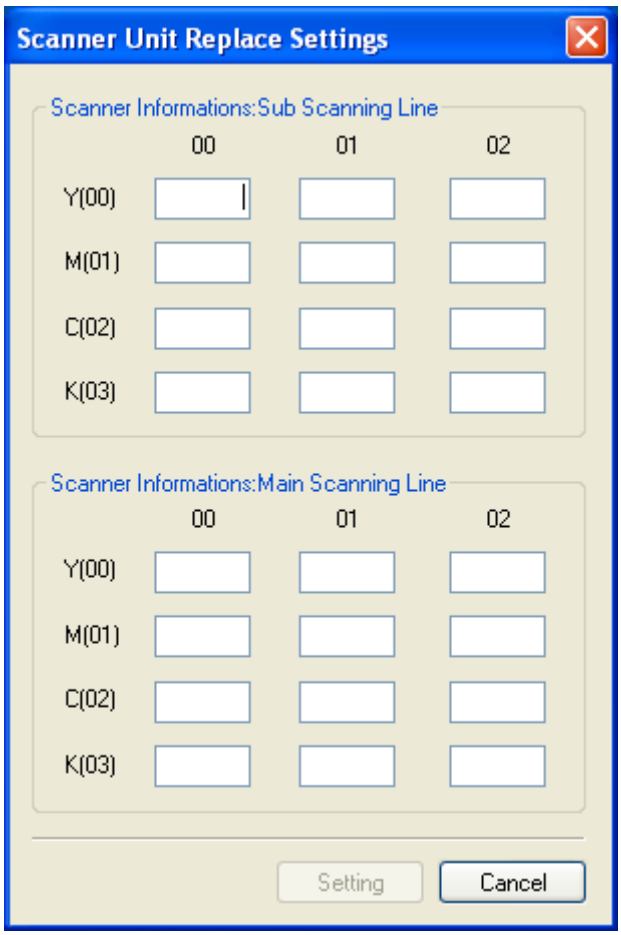
When replacing the laser unit, enter the value described on the label included in the scanner unit into the following service mode.
After entry, put the label [2] inside the right cover [1].



F-3-67

How to transit to the service mode

1. After the power ON, display the printer driver screen.
2. Change the display from the driver screen to status window.
3. Enter the password “*28*” with keyboards.
4. Select: Option menu > Service mode > Service parts replacement > Scanner unit replace settings from the status window.



F-3-68

3.3 IMAGE FORMATION SYSTEM

3.3.1 Intermediate Transfer Unit

3.3.1.1 Before Removing the ITB Unit

LBP5050N / LBP5050

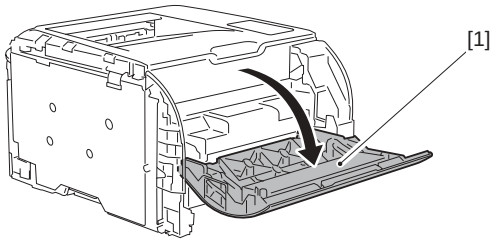
1) Remove the right cover. (page 3-2)[Removing the Right Cover]

2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]

3.3.1.2 Removing the ITB Unit

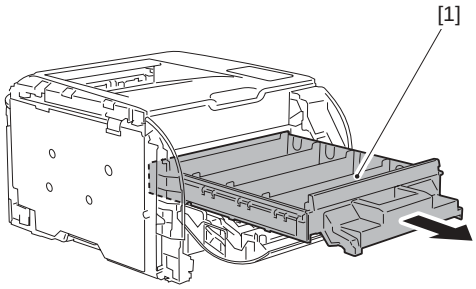
LBP5050N / LBP5050

1) Open the front door [1].



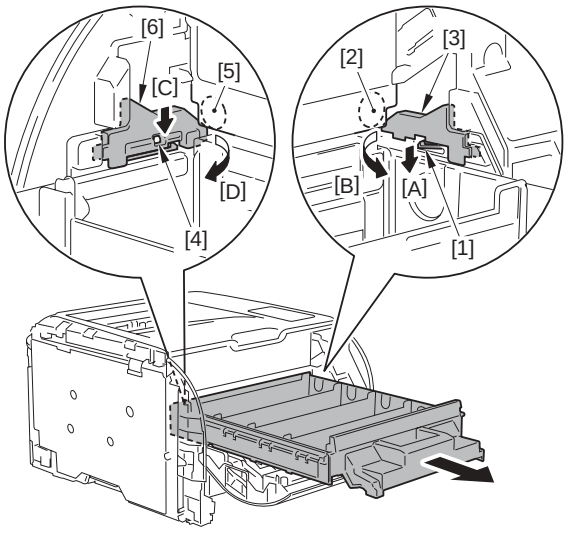
F-3-69

2) Pull out the cartridge tray [1].



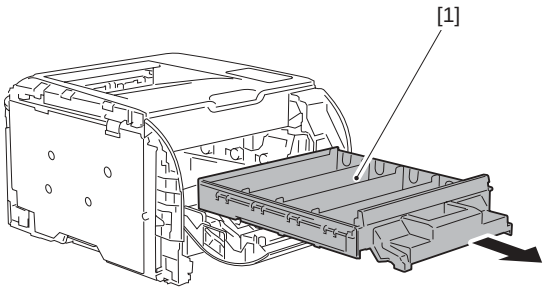
F-3-70

3) Push the claw [1] in the direction of the arrow [A], and remove the right stopper [3] in the direction of the arrow [B] while pushing the right corner [2] of the upper cover assembly.
4) Push the claw [4] in the direction of the arrow [C], and remove the left stopper [6] in the direction of the arrow [D] while pushing the left corner [5] of the upper cover assembly.



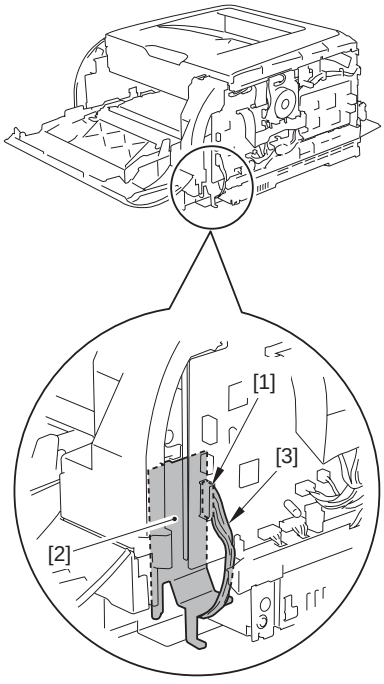
F-3-71

5) Remove the cartridge tray [1].



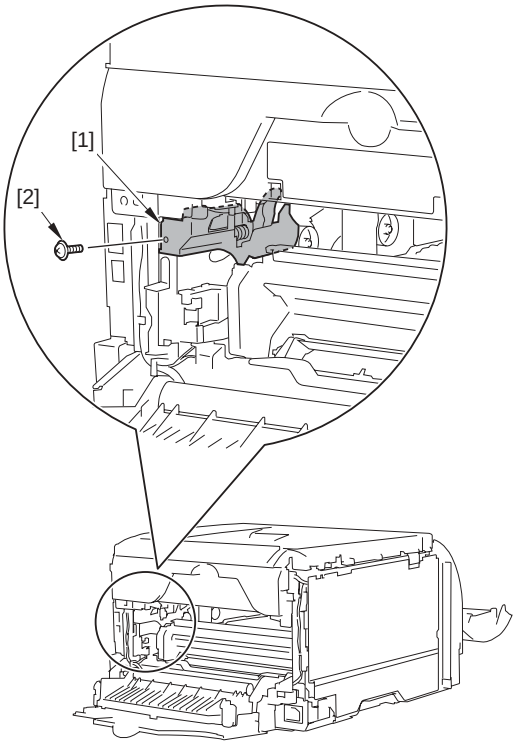
F-3-72

6) Disconnect the connector [1] and free the harness [3] from the harness guide [2].



F-3-73

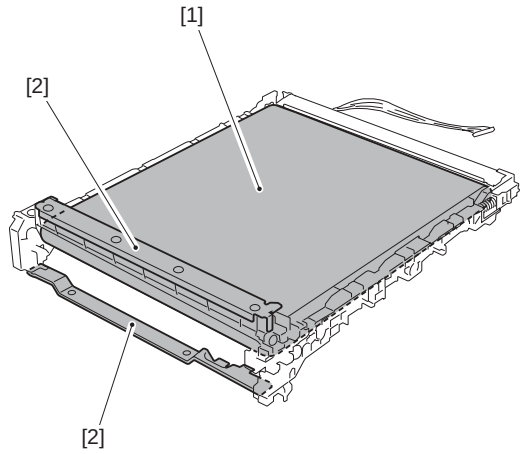
7) Remove the ITB fixing holder [1].
- 1 screw [2]



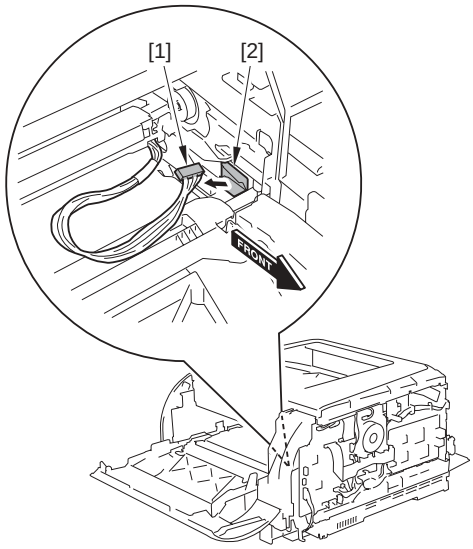
F-3-74

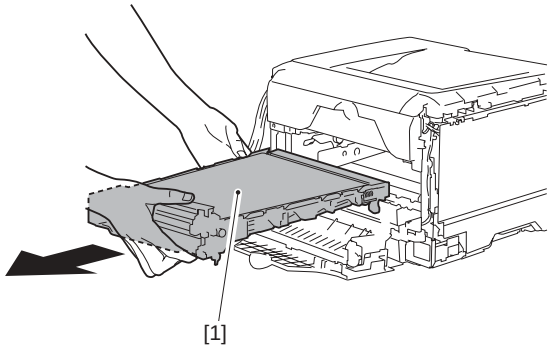
8) Hold the ITB unit [1] as shown in the following figure and remove it in the direction of the arrow.

- Be sure not to touch the ITB [1].
- Be sure to hold the plate [2] pull it out forward.
- Be sure not to deform the plate [2].



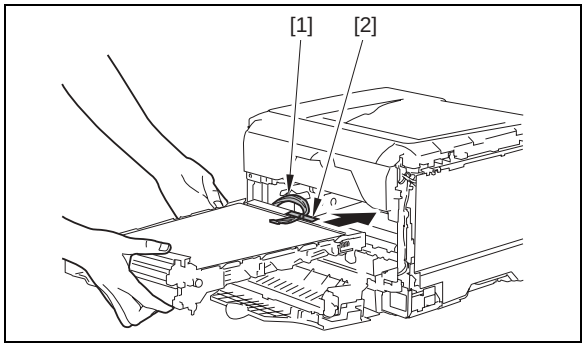
When removing the ITB unit, make sure that the connector [1] disconnected in step 6 not be caught in the mouth [2] of the connector guide.



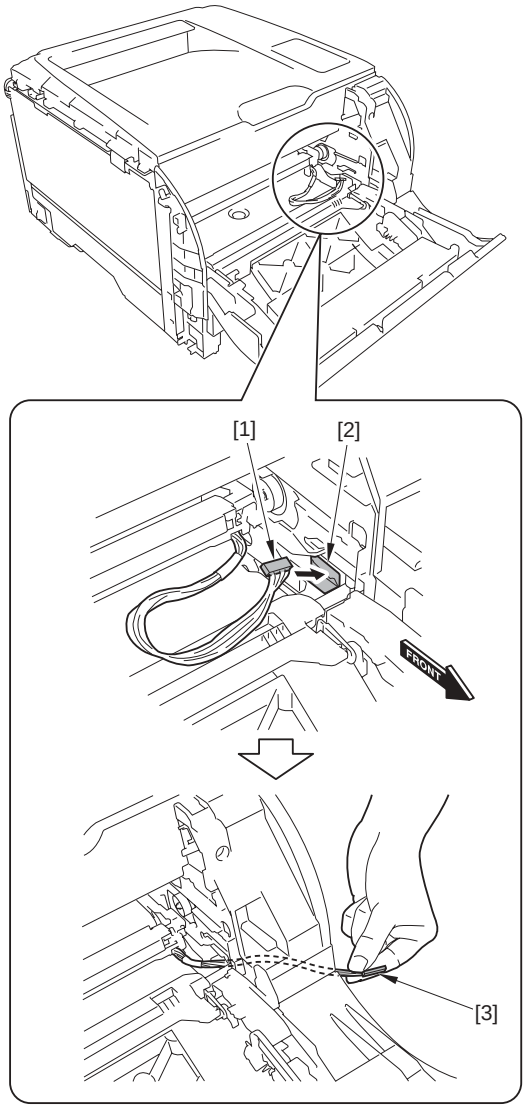


F-3-75

The ITB harness [1] may be caught inside of the host machine at the time of mounting the ITB unit. Be sure to fix the ITB harness with a tape [2] as shown in the following figure and mount the ITB unit.



When mounting the ITB unit, be sure to route the ITB harness [1] through the mouth [2] of the guide and pull out the ITB connector [3].



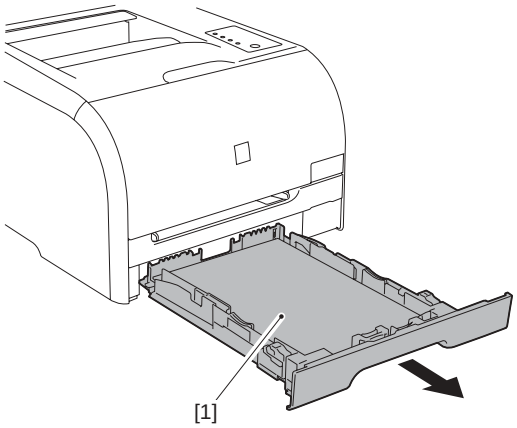
3.4 PICKUP/FEEDING/DELIVERY SYSTEM

3.4.1 Cassette Pickup Roller

3.4.1.1 Removing the Pickup Roller

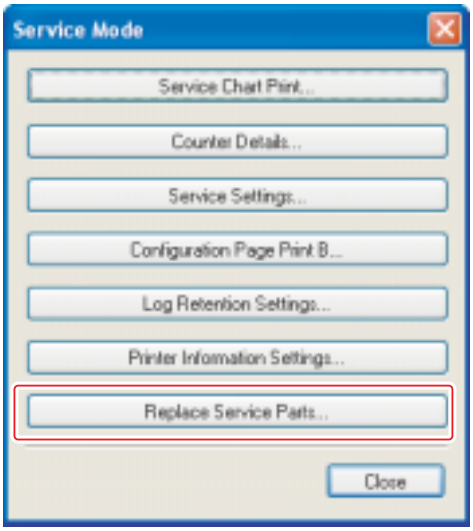
LBP5050N / LBP5050

1) Remove the cassette [1].



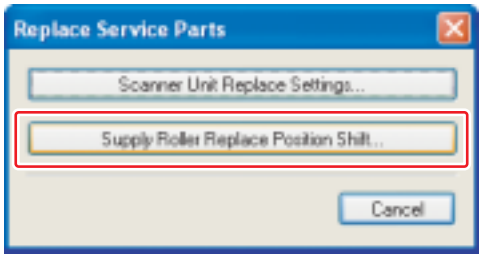
F-3-76

2) Click 'Replace Service Parts...' in service mode.



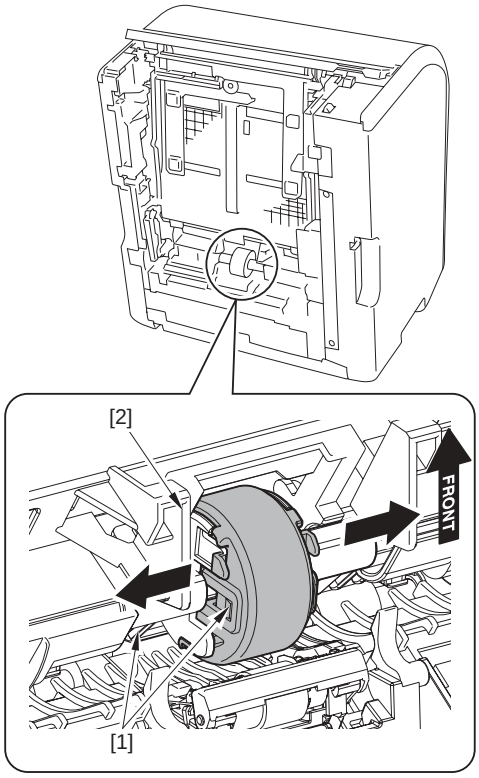
F-3-77

3) Click 'Supply Roller Replace Position Shift...' to rotate the pickup roller to the replacement position.



F-3-78

4) Turn off the power and disconnect the power outlet.
5) Stand the host machine with its rear side facing down.
6) Open the 2 protrusions [1] of the holder in the direction of the arrow and remove the pickup roller assembly [2].



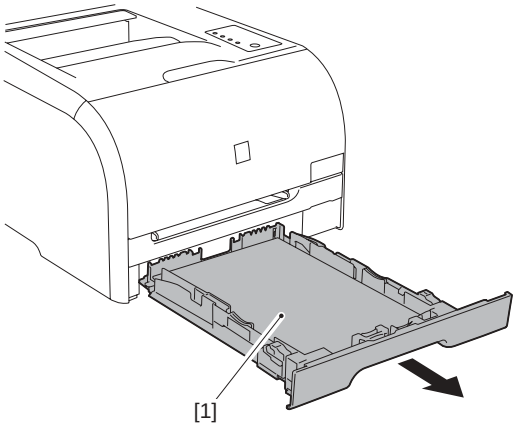
F-3-79

3.4.2 Cassette Separation Roller

3.4.2.1 Removing the Separation Roller

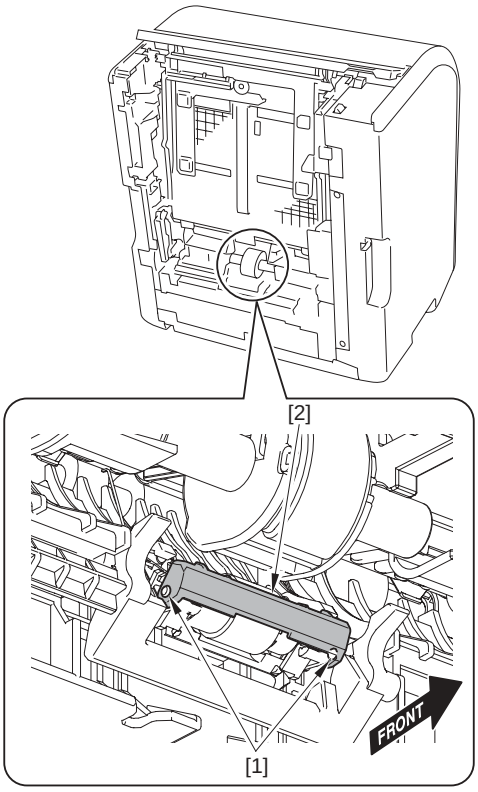
LBP5050N / LBP5050

1) Remove the cassette [1].



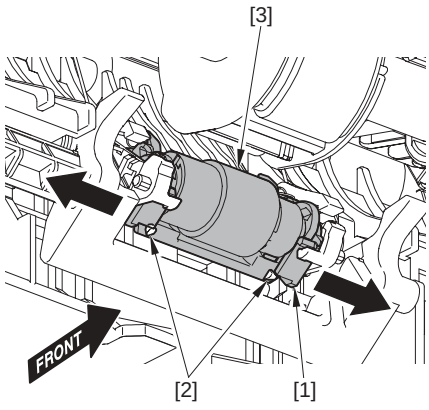
F-3-80

2) Stand the host machine with its rear side facing down.
3) Remove the 2 protrusions [1] and remove the cover [2].



F-3-81

4) Open the holder [1] in the direction of the arrow to release the protrusions [2] of the separation roller assembly and remove the separation roller assembly [3].



F-3-82

3.5 FIXING SYSTEM

3.5.1 Fixing Assembly

3.5.1.1 Before Removing the Fixing Assembly

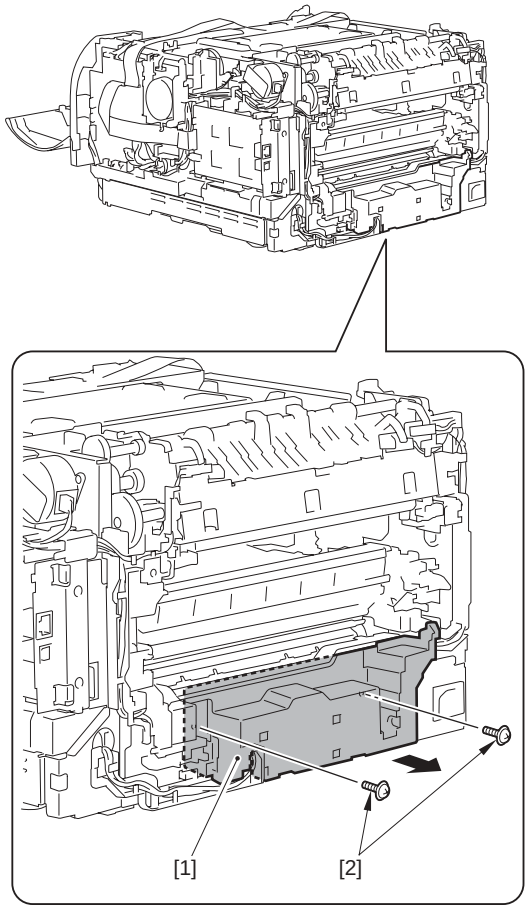
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]
6) Remove the Rear Door. (page 3-1)[Removing the Rear Door]

3.5.1.2 Removing the Fixing Assembly

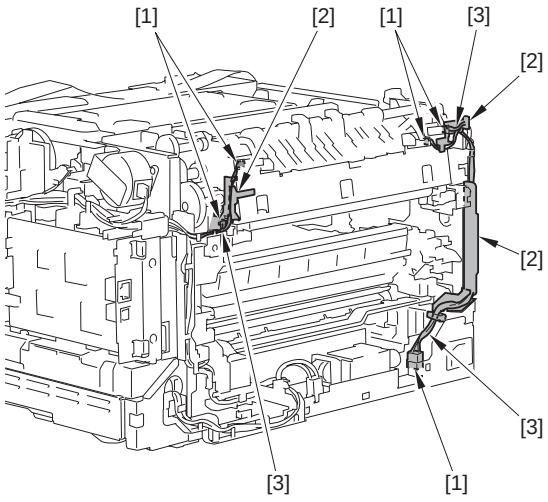
LBP5050N / LBP5050

1) Remove the high-voltage cover [1].
- 2 screws [2]



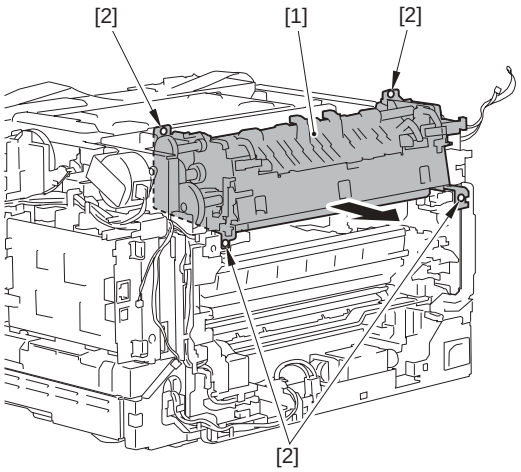
F-3-83

2) Disconnect the 5 connectors [1] and free the harness [3] from the 3 harness guides [2].



F-3-84

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



F-3-85

3.5.2 Fixing Film Unit

3.5.2.1 Before Removing the Fixing Film Unit

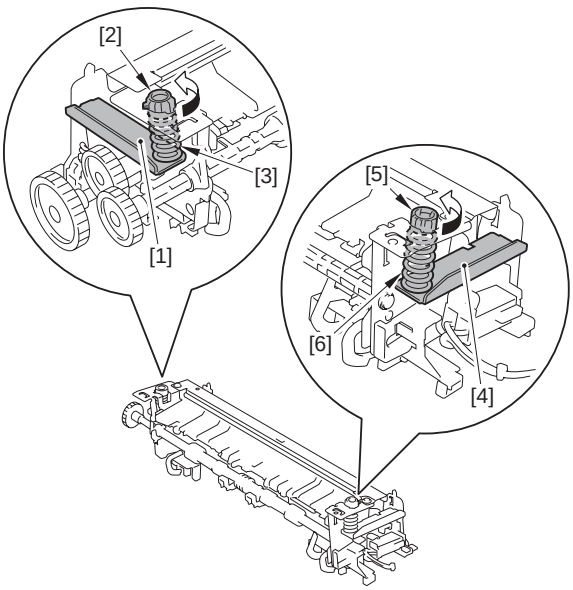
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]
6) Remove the Rear Door. (page 3-1)[Removing the Rear Door]
7) Removing the Fixing Assembly. (page 3-19)[Removing the Fixing Assembly]

3.5.2.2 Removing the Fixing Film Unit

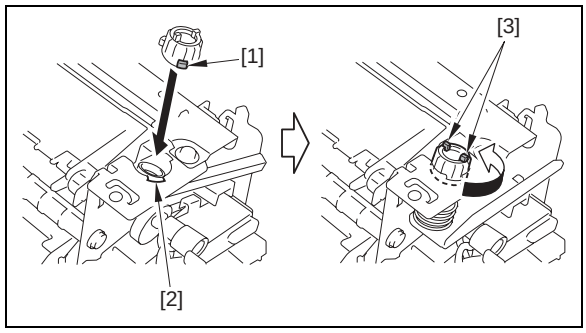
LBP5050N / LBP5050

1) Remove the right fixing pressure plate [1].
   - 1 spring retainer holder [2]
   - 1 spring [3]
2) Remove the left fixing pressure plate [4].
   - 1 spring retainer holder [5]
   - 1 spring [6]

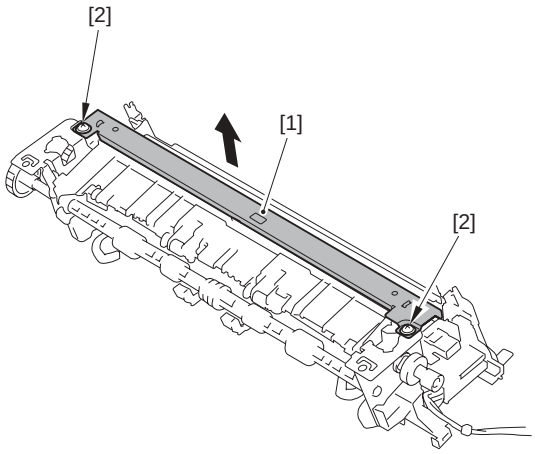


F-3-86

Be sure to fit the protrusion [1] of the spring retainer holder into the cut-off [2] of the fixing frame, rotate the spring retainer holder in the direction of the arrow to set the projections [3] in the direction shown in the following figure and install the spring retainer holder.

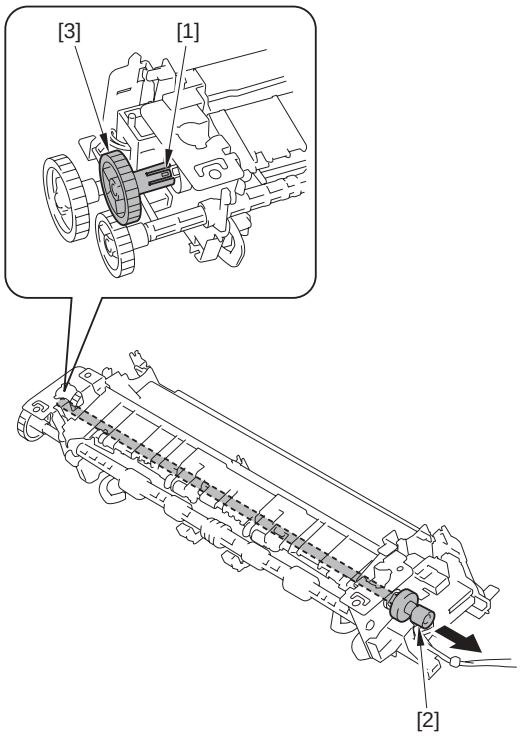


3) Remove the guide retaining plate [1].
   - 2 screws [2]



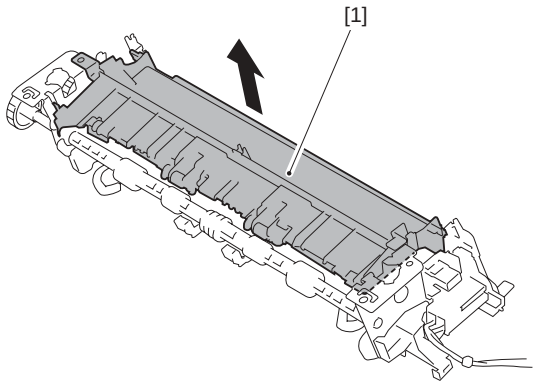
F-3-87

4) Remove the claw [1] of the gear, pull out the shaft unit [2] in the direction of the arrow and remove the gear [3].



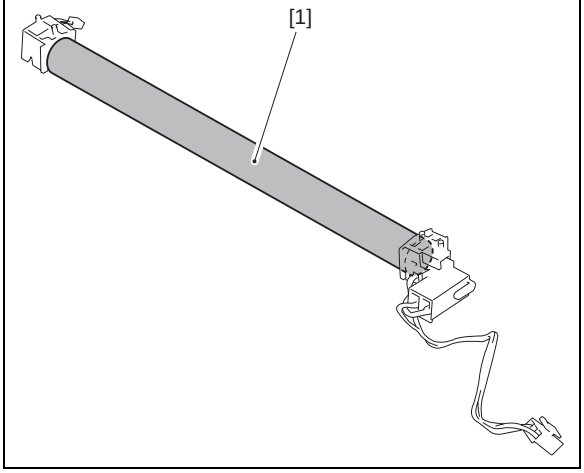
F-3-88

5) Remove the fixing guide (upper) [1].

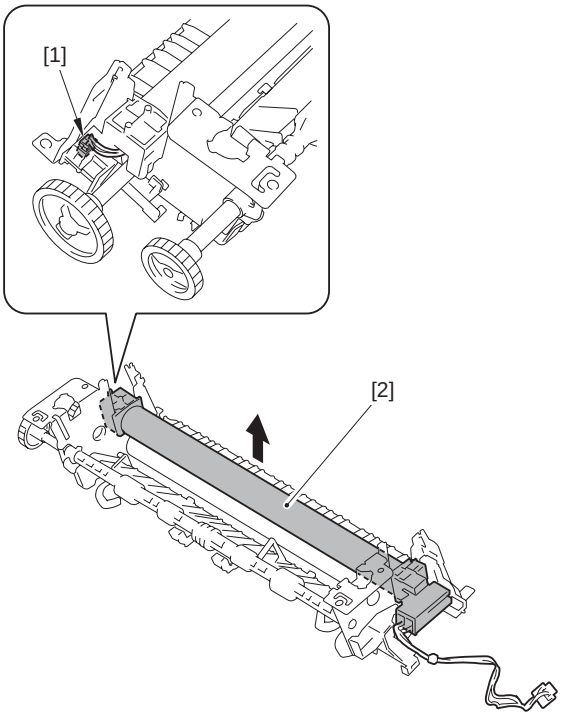


F-3-89

When removing and installing the fixing film unit, be sure not to touch or damage the fixing film [1].



6) Disconnect the connector [1] and remove the fixing film unit [2] in the direction of the arrow.



F-3-90

3.5.3 Fixing Pressure Roller

3.5.3.1 Before Removing the Fixing Pressure Roller

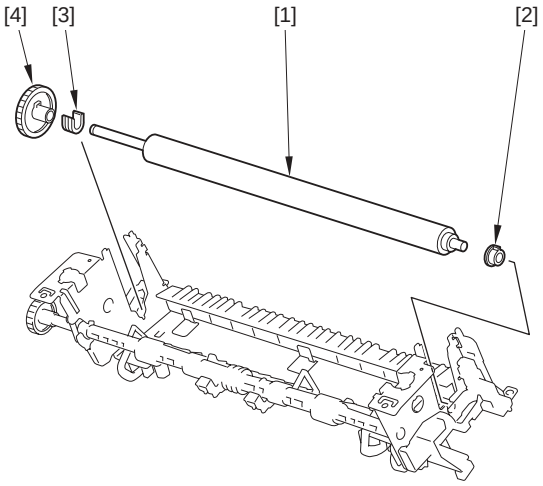
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]
2) Remove the left cover. (page 3-2)[Removing the Left Cover]
3) Remove the rear side cover. (page 3-1)[Removing the Rear Side Cover]
4) Remove the upper rear cover. (page 3-1)[Removing the Upper Rear Cover]
5) Remove the upper cover assembly. (page 3-3)[Removing the Upper Cover Assembly]
6) Remove the Rear Door. (page 3-1)[Removing the Rear Door]
7) Remove the Fixing Assembly. (page 3-19)[Removing the Fixing Assembly]
8) Remove the Fixing Film Unit. (page 3-20)[Removing the Fixing Film Unit]

3.5.3.2 Removing the Fixing Pressure Roller

LBP5050N / LBP5050

1) Remove the fixing pressure roller [1].
   - 1 bushing [2]
   - 1 bushing [3]
   - 1 gear [4]



F-3-91

3.5.4 Fixing Motor

3.5.4.1 Before Removing the Fixing Motor

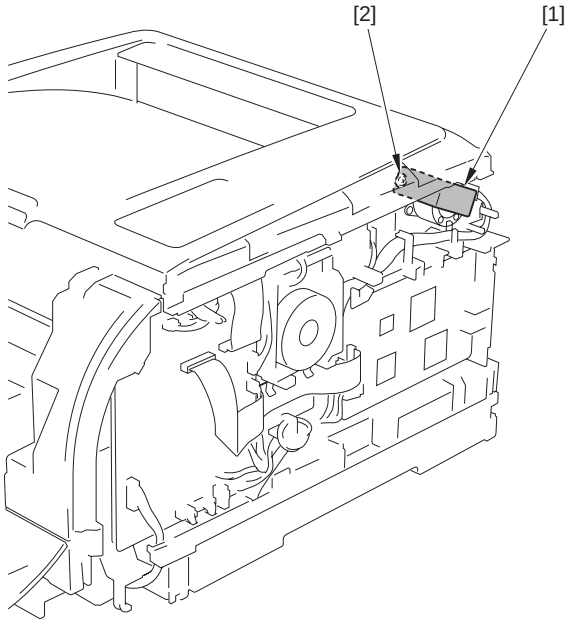
LBP5050N / LBP5050

1) Remove the right cover. (page 3-2)[Removing the Right Cover]

3.5.4.2 Removing the Fixing Motor

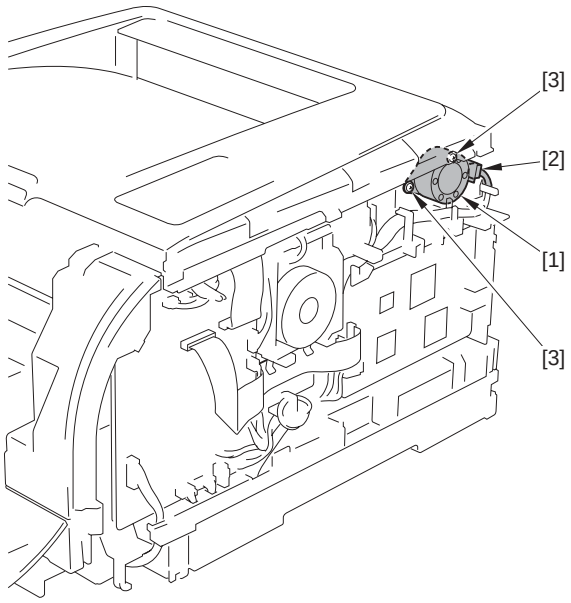
LBP5050N / LBP5050

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



F-3-92

2) Remove the fixing motor [1].
- 1 connector [2]
- 2 screws [3]



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Chapter 4 MAINTENANCE AND INSPECTION

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4.1 Periodically Replaced Parts

4.1.1 Periodically Replaced Parts

LBP5050N / LBP5050

The machine does not have parts that require periodical replacement.

4.2 Consumables

4.2.1 Life Expectancy of Consumable Parts

LBP5050N / LBP5050

No consumable parts are required in this printer.

4.3 Periodical Service

4.3.1 Periodic Service

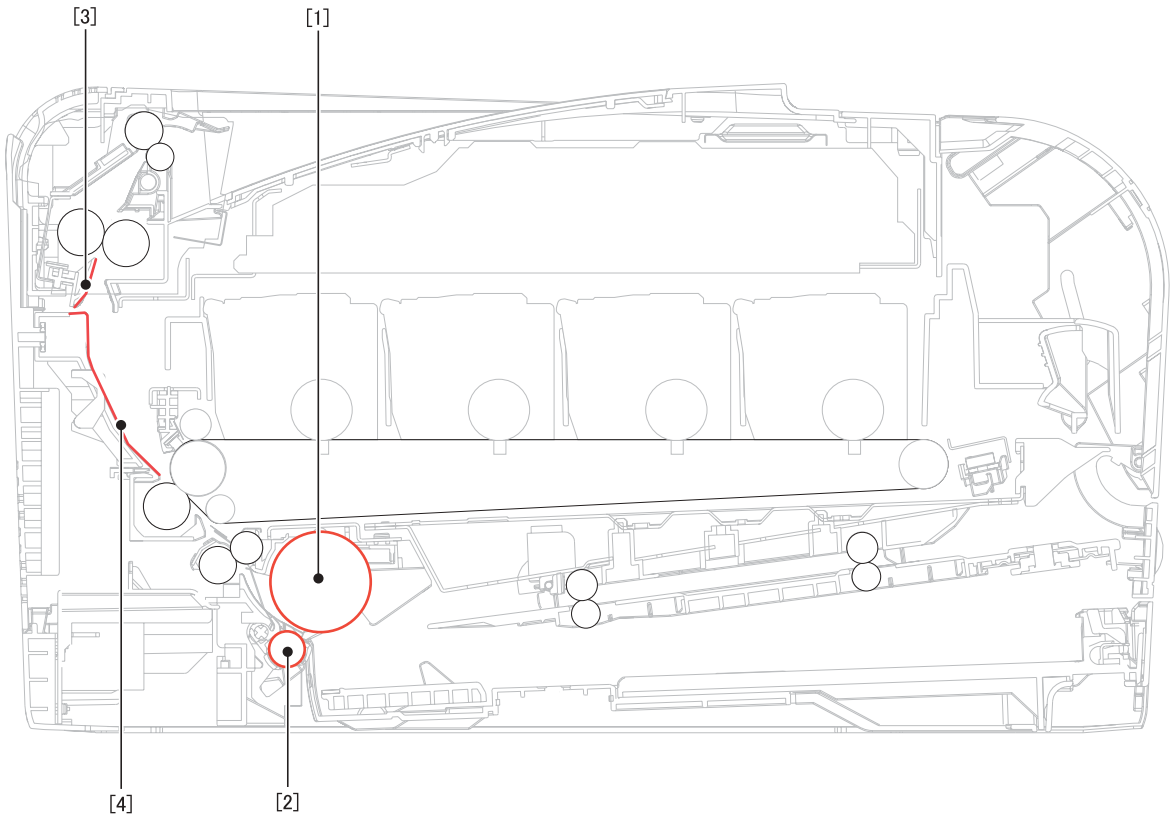
LBP5050N / LBP5050

The printer has no parts that require periodic servicing.

4.4 Cleaning

4.4.1 Cleaning Point

LBP5050N / LBP5050



F-4-1

[1] Pickup roller
[2] Separation roller
[3] Front fixing guide
[4] Feed guide

4.4.2 Pickup Roller

LBP5050N / LBP5050

Wipe with a lint-free cloth. If dirt cannot be removed, dampen the lint-free cloth with alcohol.

4.4.3 Separation Roller

LBP5050N / LBP5050

Wipe with a lint-free cloth. If dirt cannot be removed, dampen the lint-free cloth with alcohol.

4.4.4 Front Fixing Guide

LBP5050N / LBP5050

Wipe with a lint-free cloth. If dirt cannot be removed, dampen the lint-free cloth with alcohol.

4.4.5 Feed Guide

LBP5050N / LBP5050

Wipe with a lint-free cloth. If dirt cannot be removed, dampen the lint-free cloth with alcohol.

Chapter 5 TROUBLESHOOTING

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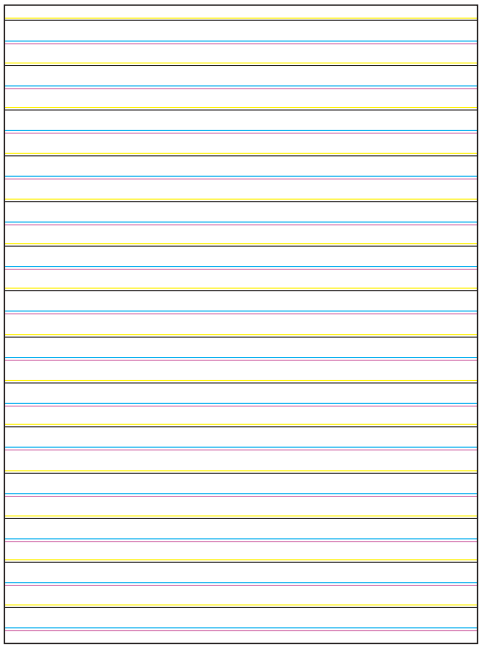
5.1 MEASUREMENT AND ADJUSTMENT

5.1.1 Test Print

5.1.1.1 Test Pages

LBP5050N / LBP5050

Printing test pages helps determine if the printer engine and main contoroller are functioning.
There are two types of test pages: engine-test page and main contoroller-test page. Print a test page to make sure theprinter engine or the main controller is functioning.
1) Open the front door and the rear cover unit and then turn the printer on.
2) Close the front door and the rear cover unit within 10 seconds.
3) The engine-test page should have a series of horizontal lines as shown below.



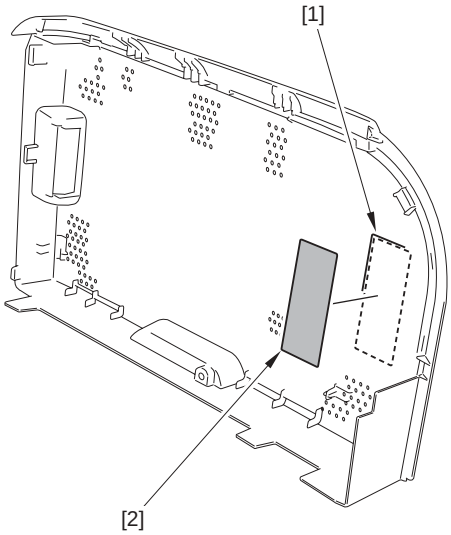
F-5-1

5.1.2 Adjustment of Laser Exposure System

5.1.2.1 After Replacing the laser scanner unit

LBP5050N / LBP5050

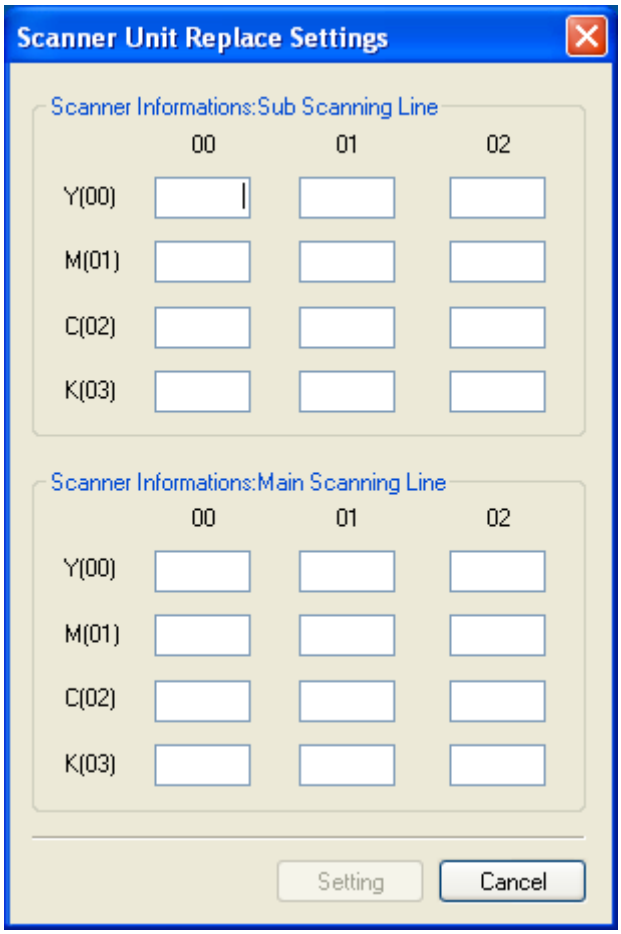
When replacing the laser unit, enter the value described on the label included in the scanner unit into the following service mode.
After entry, put the label [2] inside the right cover [1].



F-5-2

How to transit to the service mode

1. After the power ON, display the printer driver screen.
2. Change the display from the driver screen to status window.
3. Enter the password “*28*” with keyboards.
4. Select: Option menu > Service mode > Service parts replacement > Scanner unit replace settings from the status window.



F-5-3

5.1.3 Adjustment of Electrical Components

5.1.3.1 After Replacing the DC controller PCB

LBP5050N / LBP5050

The information in the NVRAM on the DC controller PCB is saved as back-up data in the NVRAM on the main controller PCB.
Executing Printer Setting Restoration in service mode recovers the backup data in the NVRAM on the DC controller PCB.
When replacing the DC controller PCB, execute recovery of backup data, color displacement correction, and calibration in service mode.
1) Execute Option Menu > Service Mode > Printer Information settings > Printer Setting Restoration.

T-5-1

> ⚠ After executing the printer recovery setting, wait completion of the processing for approx. 15 sec.

2) Turn off/on the power supply of the host machine.
3) Start the Status window.
4) Execute Option Menu > Utility > Out-of-Register Colors Correction.
5) Execute Option Menu > Utility > Calibration.

5.1.3.2 After Replacing the Main Controller PCB

LBP5050N / LBP5050

The settings and management data of host machine is saved in the NVRAM (IC2S) of the main controller PCB. When replacing the main controller PCB, be sure to move the NVRAM from the old PCB and to the new PCB.
After moving the NVRAM, execute color displacement correction and calibration.
1) Turn on the power supply of the host machine.
2) Start the Status window.
3) Execute Option Menu > Utility > Out-of-Register Colors Correction in the status window.
4) Execute Option Menu > Utility > Calibration in the status window.

T-5-2

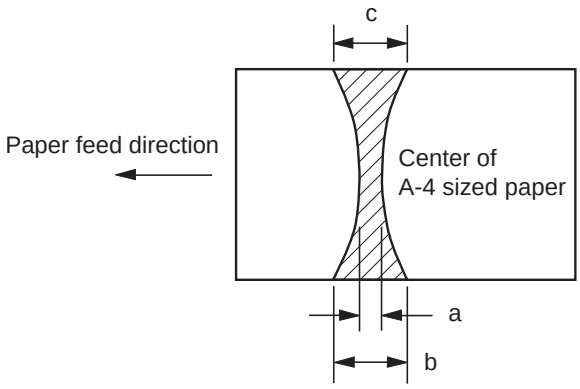
The information in the NVRAM on the DC controller PCB is saved in the
NVRAM (IC2S) as backup data.
When replacing the NVRAM, perform the same operation as replacing the
main controller PCB and execute the following item; Option Menu > Service Mode > Printer Information settings > DCON data back up.

5.1.4 Adjustment of Fixing System

5.1.4.1 Nip-width specifications

LBP5050N / LBP5050

The nip-width of the fixing unit is not adjustable in this printer, however the improper nip-width may causethe poor fixing.
Follow the procedures below to check the nip width.
1) Prepare an all-black print of A4 size that is printed with the same type of cartridge for the printer before visiting the user.
2) Load the printed sheet facing DOWN in the cassette.
3) Print a blank page from an external device.
4) Open the front door after 25 seconds. Wait for over 10 seconds and remove the paper from the printer.
5) Measure the width of the glossy band across the paper and check if it meets the requirements below:
   - Center (a): 6.0 ±1mm
   - Side (b), (c): 5.0 to 7.5mm
   - Right-Left asymmetry (|b-c|): 1.0mm or less



F-5-4

5.2 SERVICE TOOLS

5.2.1 Standard Tools

LBP5050N / LBP5050

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

T-5-3

No.	Tool name	Tool No.	Remark
1	Tool case	TKN-0001	
2	Jumper wire	TKN-0069	With a clip
3	Clearance gauge	CK-0057	0.02 to 0.3 mm
4	Compression spring scale	CK-0058	0 to 600 g for checking the cassette spring pressure
5	Phillips screwdriver	CK-0101	M4, M5 Length : 363 mm
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	
17	Retaining ring pliers	CK-0205	Applied to the axis ring
18	Crimper	CK-0218	
19	Tweezers	CK-0302	
20	Ruler	CK-0303	Employed to measure 150 mm
21	Mallet, plastic head	CK-0314	
22	Brush	CK-0315	
23	Penlight	CK-0327	
24	Plastic bottle	CK-0327	100cc
25	Lint-free paper	CK-0336	500SH/PKG
26	Oiler	CK-0349	30cc
27	Plastic jar	CK-0351	30cc
28	Digital multi-measure	FY9-2032	

5.2.2 Solvents and Oils

LBP5050N / LBP5050

T-5-4

No.	Type	Purpose	Remark
1	Alcohol	Cleaning: Plastic Rubber Metal part Oil stain Toner stain	- Keep away from flame - Purchase locally
2	Grease	Apply between gear and shaft	- SHELL TELLUS 68 (Showa Shell Sekiyu K.K.) - Tool No. CK-8003
3	Lubricant	Apply to gear	- MOLYKOTE® EM-50L (Dow Corning Corporation) - Tool No. HY9-0007

T-5-5

⚠
To clean the external covers, use a cloth moistened with water (well wrung).

5.3 ERROR CODE

5.3.1 Error code

LBP5050N / LBP5050

T-5-6

Code	Detection details	Treatment
E000	Fixing unit startup defect	

Code		Detection details	Treatment
		Description: The detected temperature of the main thermistor does not rise after the heater is energised. Cause: Main thermistor broken wire, fixer heater broken wire, DC controller PCB defect	- Check the connector of the fixing unit, DC controller PCB, fixing power supply unit. - Replace the fixing film unit. - Replace the fixing power supply unit. - Replace the DC controller PCB.
E001		Abnormally high temperature in fixing unit	
	0000	Description: The detected temperature of the main thermistor is abnormally high. Cause: Main thermistor defect, DC controller PCB defect	- Check the connector of the fixing unit, DC controller PCB, fixing power supply unit. - Replace the fixing film unit. - Replace the fixing power supply unit. - Replace the DC controller PCB.
E003		Abnormally low temperature in fixing unit	
	0000	Description: The detected temperature of the main thermistor becomes lower than the specified one. Cause: Fixing power supply unit defect, main thermistor broken wire, DC controller PCB defect	- Check the connector of the fixing unit, DC controller PCB, fixing power supply unit. - Replace the fixing film unit. - Replace the fixing power supply unit. - Replace the DC controller PCB.
E004		Abnormality in fixing unit power supply drive circuitry	
		Description: Zero cross signal could not be detected within specified time limit. Cause: Fixing control circuitry defect	- Check the connector of the fixing power supply unit, DC controller PCB, fixing power supply unit. - Replace the low-voltage power supply PCB.
E012		Motor startup abnormality	
	0000	Description: ITB motor speed detection signal frequency does not reach specified frequency after starting to drive the ITB motor. Cause: ITB motor defect, DC controller PCB defect	- Check the connector of the ITB motor, DC controller PCB. - Replace ITB motor - Replace DC controller PCB
	0001	Description: ITB motor speed detection signal frequency reaches the specified frequency but is then out of synch after 2 sec. or longer of operation. Cause: ITB motor defect, DC controller PCB defect	
E015		Developing roller release operation defect	
	0001	Description: After the specified time from rotating the main motor for the developing roller depress/release, the output of the developing home position sensor does not change. Cause: Developing home position sensor defect, Main motor defect, DC controller PCB defect	- Check the connector of the developer home position sensor, main motor, DC controller PCB - Replace the developer home position sensor - Replace the main motor - Replace the DC controller PCB
E020		Density sensor abnormality	
		Description: Not enough light received upon image density detection. Cause: Soiled density detection sensor, density detection sensor defect, DC controller PCB defect, toner cartridge defect	- Check the connector of the DC controller PCB. - Replace ITB unit - Replace DC controller PCB - Replace toner cartridge
E024		Toner remaining detection sensor abnormality	

Code		Detection details	Treatment
	0000	Description: Abnormal output from toner remaining detection sensor (Yellow) Cause: Memory controller PCB defect, DC controller PCB defect, toner cartridge defect	- Check the connector of the DC controller PCB. - Replace toner cartridge - Replace DC controller PCB
	0001	Description: Abnormal output from toner remaining detection sensor (Magenta) Cause: Memory controller PCB defect, DC controller PCB defect, toner cartridge defect	
	0002	Description: Abnormal output from toner remaining detection sensor (Cyan) Cause: Memory controller PCB defect, DC controller PCB defect, toner cartridge defect	
	0003	Description: Abnormal output from toner remaining detection sensor (Black) Cause: Memory controller PCB defect, DC controller PCB defect, toner cartridge defect	
E066		Environment sensor abnormality	
		Description: Environment sensor abnormality Cause: Environment sensor defect, DC controller PCB defect	- Check the connector of the environment sensor, DC controller PCB. - Replace environment sensor - Replace DC controller PCB
E100		ITB/TOP sensor failed	
		Description: ITB/TOP sensor failed. Cause: ITB/TOP sensor defect, DC controller PCB defect	- Check the connector of the ITB unit, DC controller PCB. - Replace ITB unit - Replace DC controller PCB
E100		Scanner unit, laser unit, BD abnormality	
	0000	Description: Yellow optical assembly failure. Cause: Laser scanner defect, DC controller PCB defect	- Check the connector of the laser scanner unit, DC controller PCB. - Replace laser scanner unit - Replace DC controller PCB
	0001	Description: Magenta optical assembly failure. Cause: Laser scanner defect, DC controller PCB defect	
	0002	Description: Cyan optical assembly failure. Cause: Laser scanner defect, DC controller PCB defect	
	0003	Description: Black optical assembly failure. Cause: Laser scanner defect, DC controller PCB defect	
E110		BD correction control failure	
		Description: The machine does not change to the scanner ready status, after starting BD control. Cause: Laser scanner unit defect, DC controller PCB defect	- Replace the laser scanner unit - Replace DC controller PCB
E196		DCON ROM abnormality	
		DC controller PCB ROM update failed.	- Replace DC controller PCB
E197		Engine communication error	
	0000	Internal communication error	- Replace DC controller PCB - Replace main controller PCB
E198		DC controller memory failure	
		Description: DC controller memory failure. Cause: DC controller PCB defect	- Replace DC controller PCB
E747		EEPROM error	

Code		Detection details	Treatment
		Description: EEPROM error. Cause: Main controller PCB defect	- Replace main controller PCB
E840		Release mechanism abnormality	
		Description: Mechanism does not reach home position (engaged) after home position control begins. Cause: Fixing drive assembly defect, fixing release cam defect	- Replace fixing drive assembly - Replace fixing release cam

5.4 Version Up

5.4.1 Outline

5.4.1.1 Overview of Version Upgrading

LBP5050N / LBP5050

This equipment does not correspond to version upgrading using SST (service support tool).
Replace the PCB in the case of version upgrading of firmware for the DC controller PCB and the main controller PCB.

5.5 Service Mode

5.5.1 Outline

5.5.1.1 Outline

LBP5050N / LBP5050

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.

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F-5-7

5.5.2 Service Mode Table

5.5.2.1 Service Mode Items

LBP5050N / LBP5050

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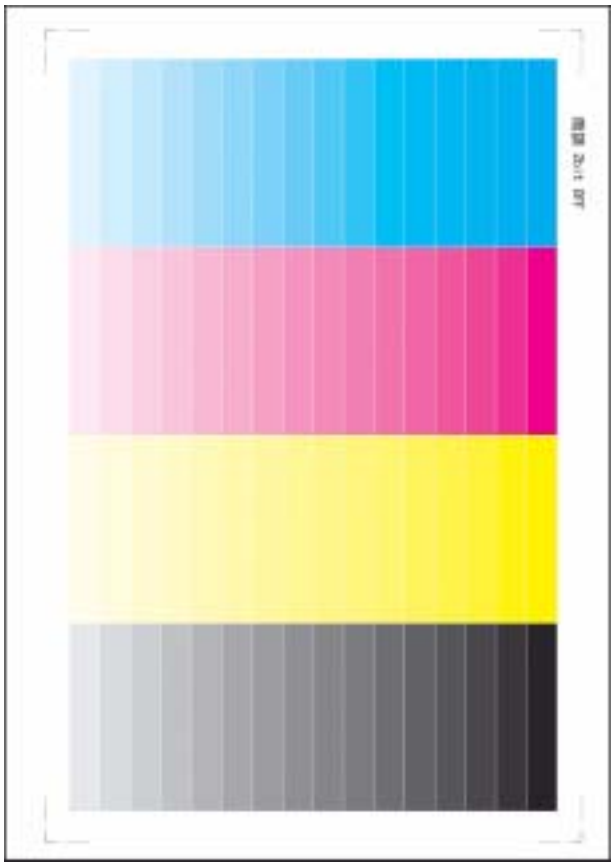
Group		Description	Settings
Service Chart Print		Print of Service Chart Print 1	
		Print of Service Chart Print 2	
Counter Details		Use it to check the number of printed pages using respective toner cartridges.	
Service Settings	Primary transfer bias	Use this to specify the offset value for primary transfer bias. -Decreasing the setting value: Effective for images with negative ghost image (reverse of the previous image).	-5 to +5(0*)
	Secondary transfer bias	Use this to specify the offset value for secondary transfer bias. - Increasing the setting value: Effective for images with toner spatter/water droplets. - Decreasing the setting value: Effective for images with white marks, white blotches, rough-textured half-tones.	front side: -5 to +5(0*) back side: -5 to +5(0*)
	Developing bias	Use this to specify the offset value for developing bias. - Increasing the setting value: Effective for images with foggy image. - Decreasing the setting value: Effective for images with light density.	-5 to +5(0*)
	ICL bias	Use this to specify the offset value for ITB cleaning bias. Cleaning trouble is alleviated when the setting is increased.	-5 to +5(0*)
	Fixing temperature	Use this to set the fixing temperature. sets the offset value of the fixing temperature control for improvement of fixing.	-2 to +2(0*)
Configuration Page Print B		Print of configuration page print B	
Log Retention Settings		Output of Log file	

Group		Description	Settings
Printer Information settings	Printer settings restoration	When replacing the DC controller PCB, use this to overwrite NVRAM with the backup data.	
	DCON data back up	When replacing DC controller PCB, use this to backup the NVRAN value of to NVRAM of main controller manually.	
	EEPROM CPR Information reset	When replacing DC controller PCB, use this to clear the registration value for horizontal scanning direction stored in NVRAM.	
Replace service parts	Scanner unit replacement settings	When replacing the laser scanner, use this to enter the setting value into NVRAM of DC controller PCB.	
	HP setting for pickup roller replacement	When replacing the pickup roller, use this to move the pickup roller to the appropriate position for replacement.	

5.5.2.2 Service Chart Print 1

LBP5050N / LBP5050

Use Service Chart Print 1 to check image density and color tint.



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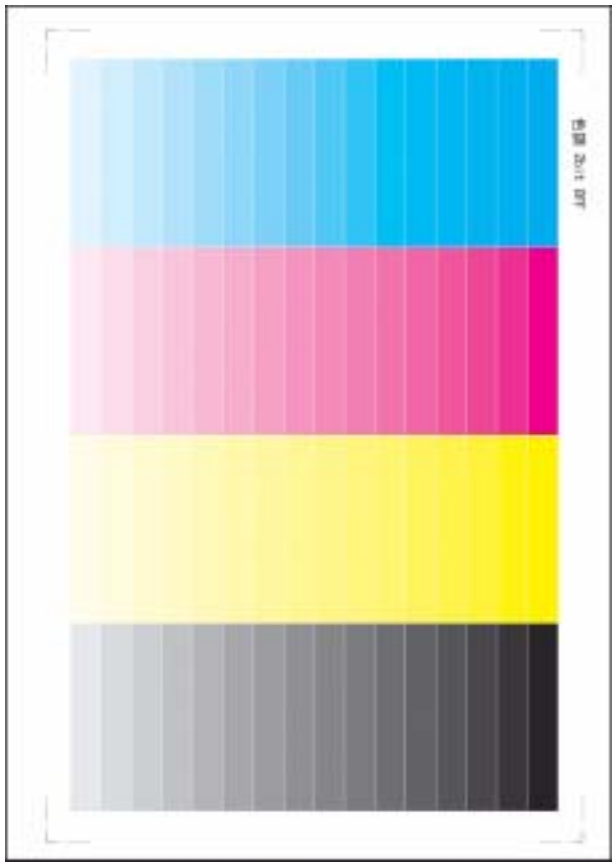
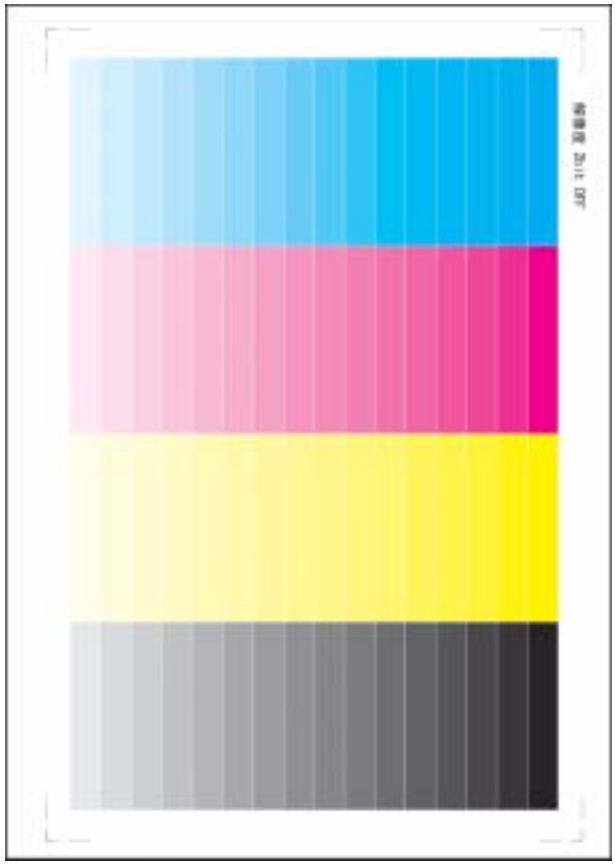


F-5-9



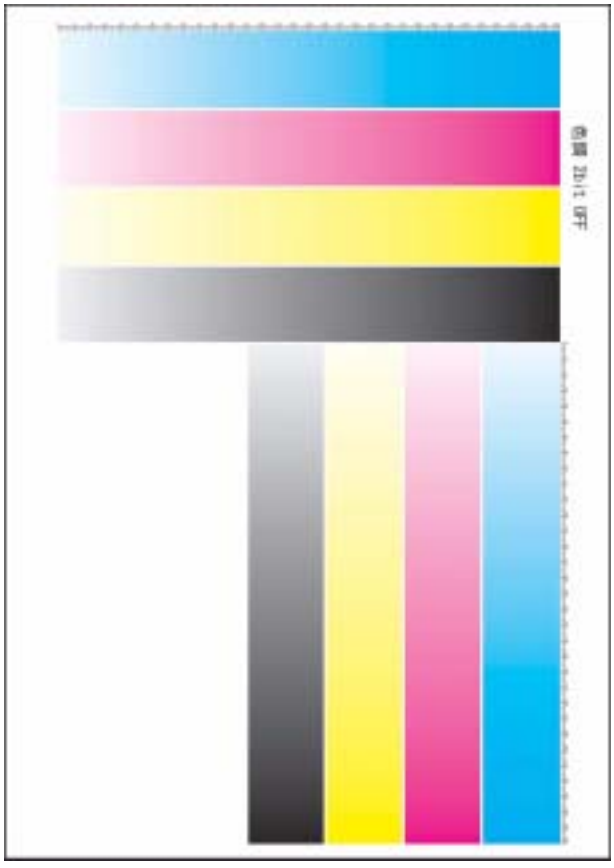
F-5-10

5.5.2.3 Service Chart Print 2

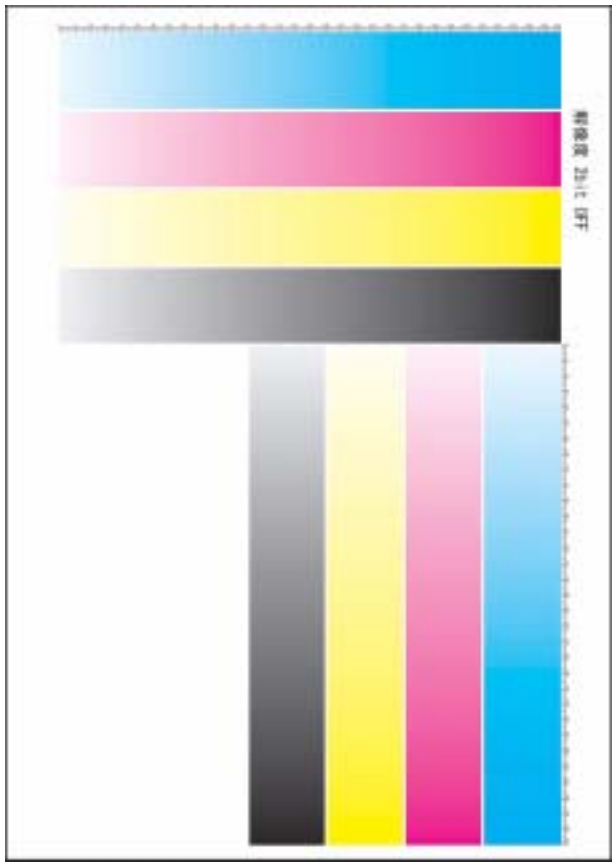
LBP5050N / LBP5050

Use Service Chart Print 2 to check image density and color tint.

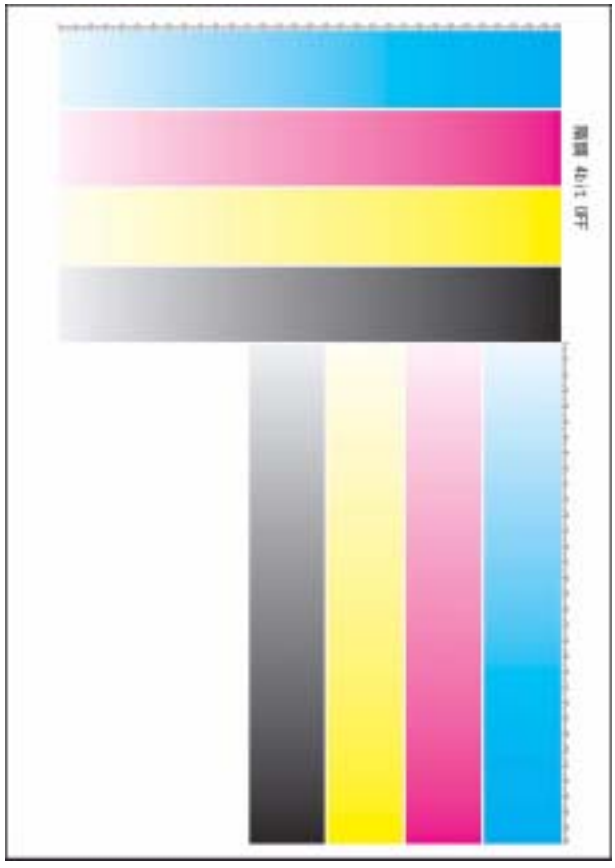
F-5-11



F-5-12



F-5-13



F-5-14

F-5-15

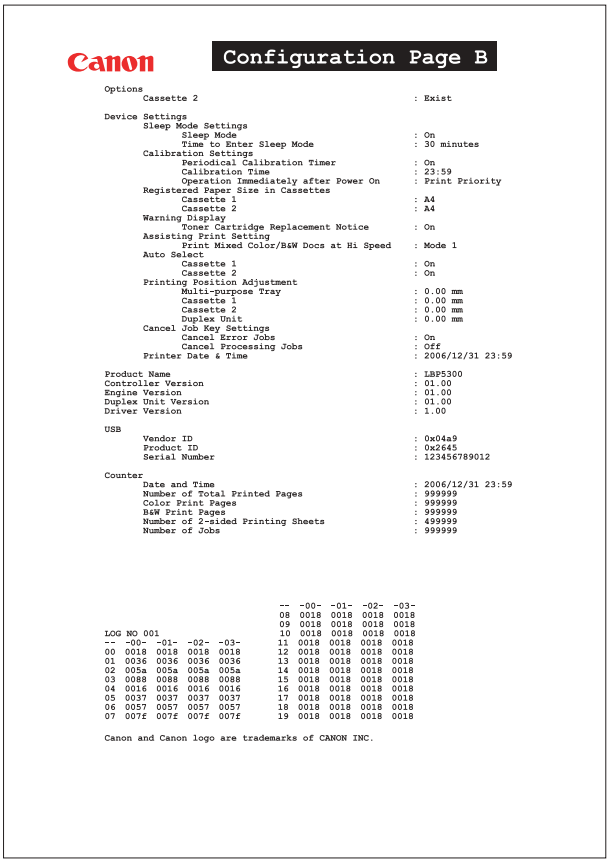
F-5-16

5.5.2.4 Status Print B

LBP5050N / LBP5050

In Status Print B, calibration logs are provided with the Status Print of the "Utility" menu in the Status window.

00: Cyan
01: Magenta
02: Yellow
03: black



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Configuration Page B

```
Options
       Cassette 2                                        : Exist

Device Settings
       Sleep Mode Settings
              Sleep Mode                                 : On
              Time to Enter Sleep Mode                   : 30 minutes
       Calibration Settings
              Periodical Calibration Timer               : On
              Calibration Time                           : 23:59
              Operation Immediately after Power On       : Print Priority
       Registered Paper Size in Cassettes
              Cassette 1                                 : A4
              Cassette 2                                 : A4
       Warning Display
              Toner Cartridge Replacement Notice         : On
       Assisting Print Setting
              Print Mixed Color/B&W Docs at Hi Speed     : Mode 1
       Auto Select
              Cassette 1                                 : On
              Cassette 2                                 : On
       Printing Position Adjustment
              Multi-purpose Tray                         : 0.00 mm
              Cassette 1                                 : 0.00 mm
              Cassette 2                                 : 0.00 mm
              Duplex Unit                                : 0.00 mm
       Cancel Job Key Settings
              Cancel Error Jobs                          : On
              Cancel Processing Jobs                     : Off
       Printer Date & Time                               : 2006/12/31 23:59

Product Name                                             : LBP5300
Controller Version                                       : 01.00
Engine Version                                           : 01.00
Duplex Unit Version                                      : 01.00
Driver Version                                           : 1.00

USB
       Vendor ID                                         : 0x04a9
       Product ID                                        : 0x2645
       Serial Number                                     : 123456789012

Counter
       Date and Time                                     : 2006/12/31 23:59
       Number of Total Printed Pages                     : 999999
       Color Print Pages                                 : 999999
       B&W Print Pages                                   : 999999
       Number of 2-sided Printing Sheets                 : 499999
       Number of Jobs                                    : 999999
```

```
                                --  -00-  -01-  -02-  -03-
                                08  0018  0018  0018  0018
                                09  0018  0018  0018  0018
LOG NO 001                      10  0018  0018  0018  0018
--  -00-  -01-  -02-  -03-      11  0018  0018  0018  0018
00  0018  0018  0018  0018      12  0018  0018  0018  0018
01  0036  0036  0036  0036      13  0018  0018  0018  0018
02  005a  005a  005a  005a      14  0018  0018  0018  0018
03  0088  0088  0088  0088      15  0018  0018  0018  0018
04  0016  0016  0016  0016      16  0018  0018  0018  0018
05  0037  0037  0037  0037      17  0018  0018  0018  0018
06  0057  0057  0057  0057      18  0018  0018  0018  0018
07  007f  007f  007f  007f      19  0018  0018  0018  0018
```

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Chapter 6 APPENDIX

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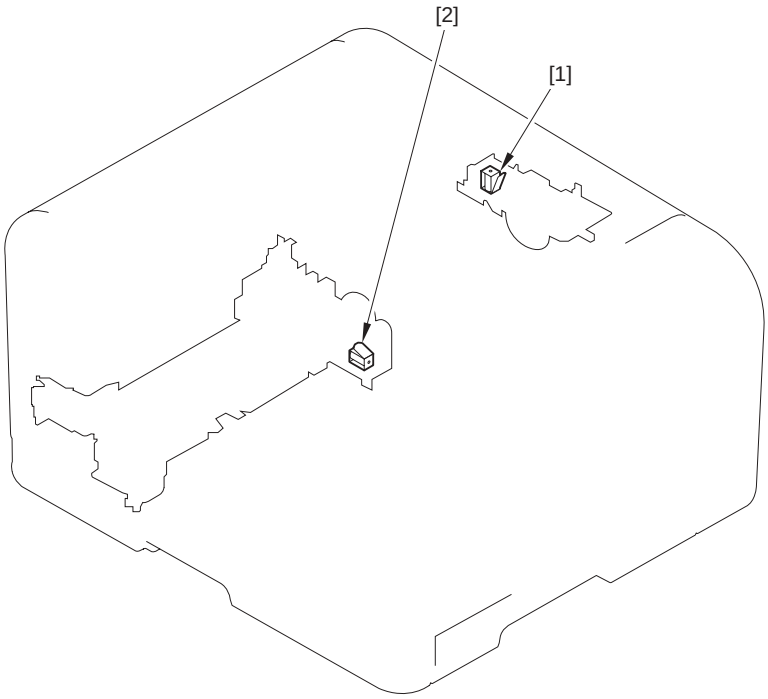
6.1 OUTLINE OF ELECTRICAL COMPONENTS

6.1.1 Clutch/Solenoid

6.1.1.1 Solenoid

LBP5050N / LBP5050



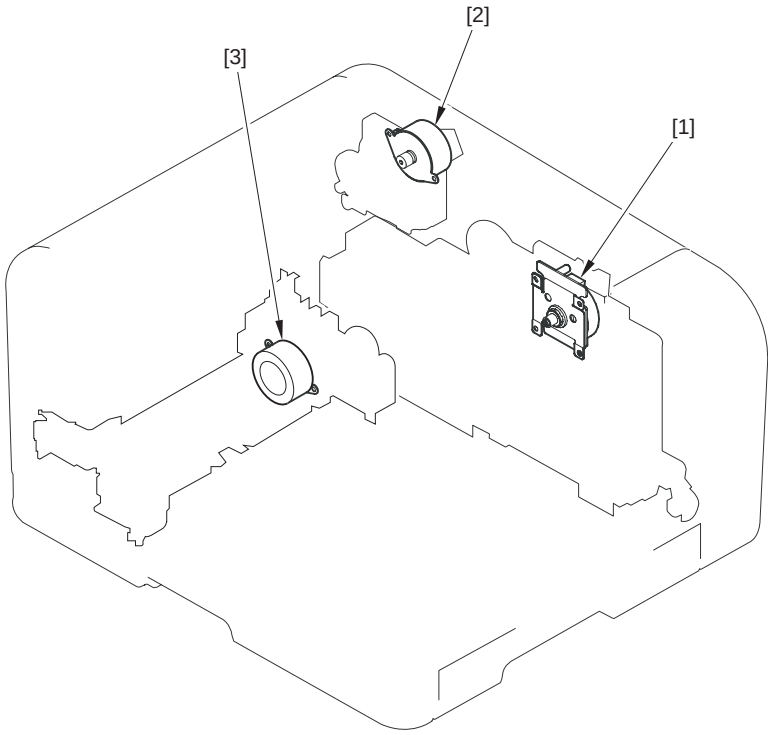
F-6-1

Ref.	Notation	Name
[1]	SL706	Developing disengagement solenoid
[2]	SL705	Cassette pickup solenoid

6.1.2 Motor

6.1.2.1 Motor

LBP5050N / LBP5050



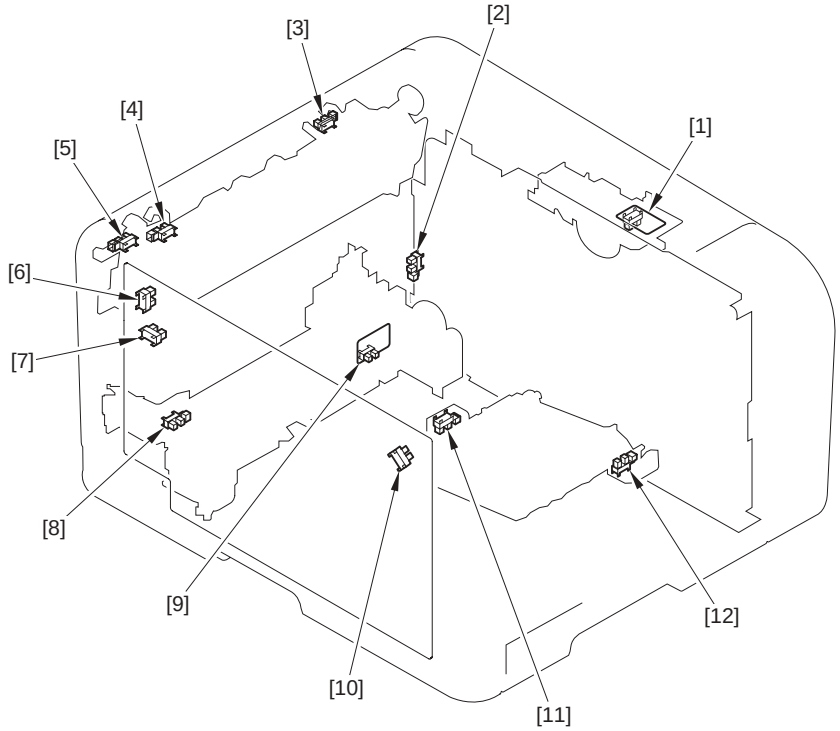
F-6-2

Ref.	Notation	Name
[1]	M701	Main motor
[2]	M703	Fixing motor
[3]	M702	Pickup motor

6.1.3 Sensor

6.1.3.1 Sensor

LBP5050N / LBP5050



F-6-3

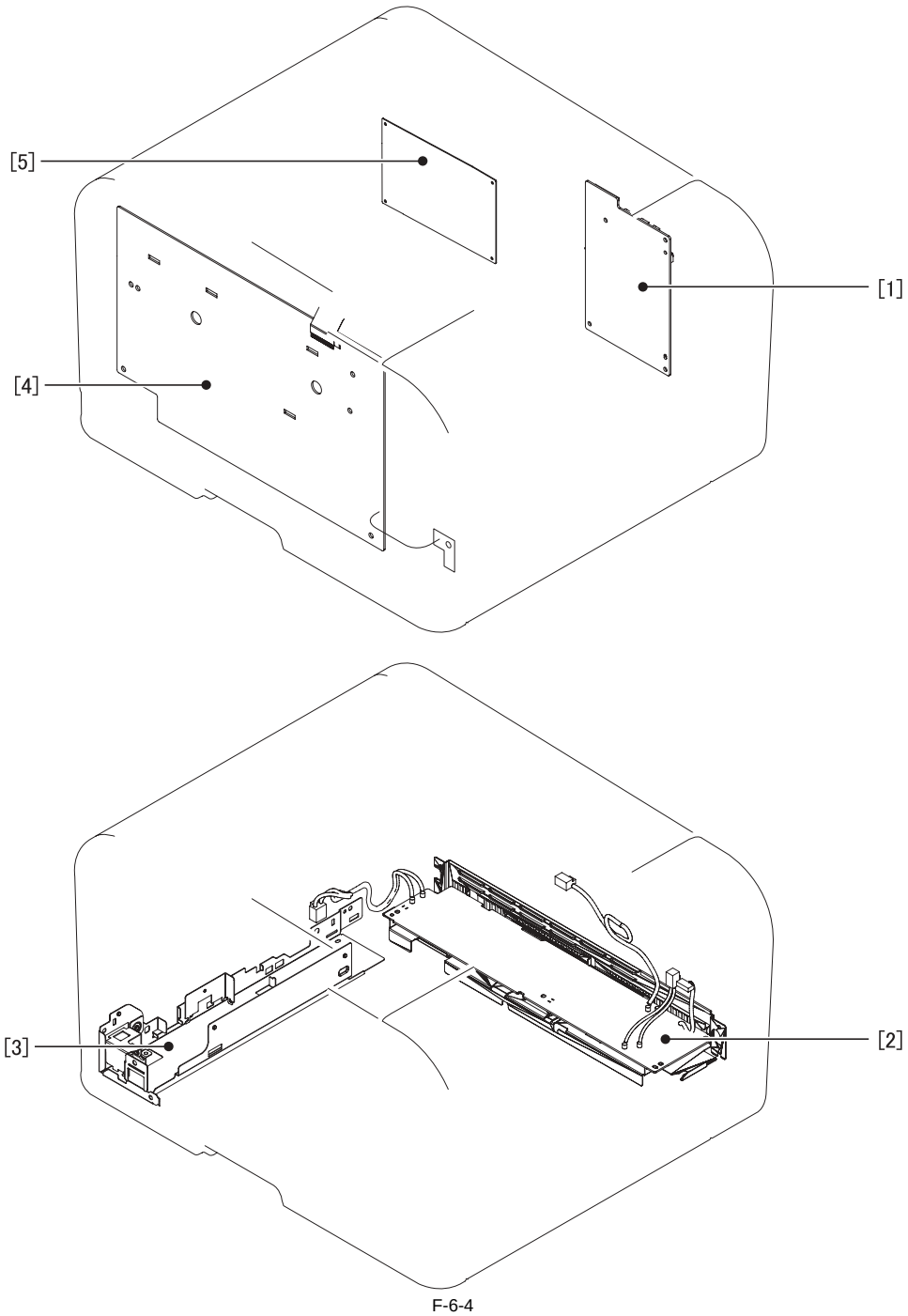
Ref.	Notation	Name	Ref.	Notation	Name
[1]	SR606	Developing homeposition sensor	[2]	SR603	Loop sensor

Ref.	Notation	Name	Ref.	Notation	Name
[3]	SR607	Media width sensor (R)	[4]	SR608	Media width sensor (L)
[5]	SR609	Fixing delivery sensor	[6]	SR610	Fixing pressure release sensor
[7]	SR613	Rear door open detection sensor	[8]	SR602	Top of page sensor
[9]	SR601	Cassette paper presence sensor	[10]	SR612	Front door open detection sensor
[11]	SR605	Manual feed top of page sensor	[12]	SR604	Manual feed paper presence sensor

6.1.4 PCBs

6.1.4.1 PCBs

LBP5050N / LBP5050



F-6-4

Ref.	Name
[1]	DC controller PCB
[2]	low-voltage power supply PCB
[3]	Fixing Power Supply
[4]	High-voltage power supply PCB
[5]	Main controller PCB

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