

Service Manual

MF8100 Series

LaserBase MF8180C

Canon

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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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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Chapter 1 PRODUCT DESCRIPTION

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1.1 Product Specifications

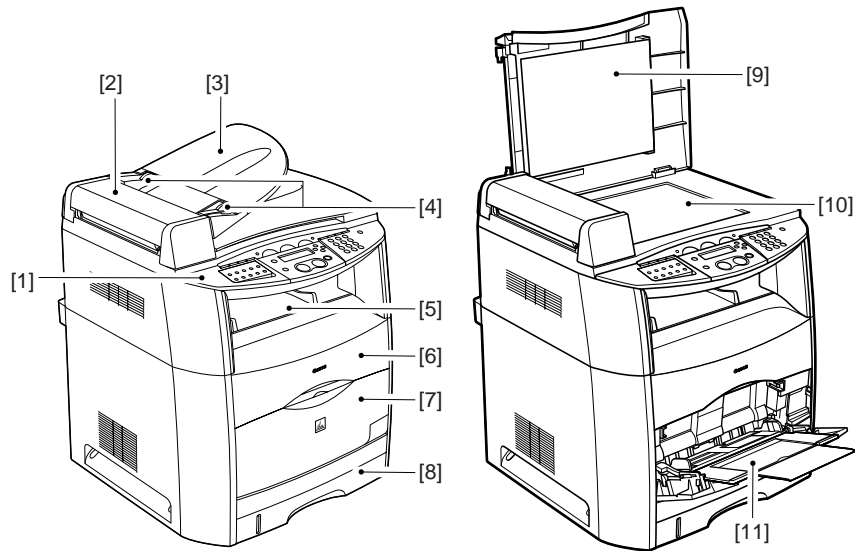
1.1.1 Product Specifications

Body installation method	desktop
Exposure Method	by semiconductor laser (2-beam laser)
Development Method	contact development
Transfer Method	primary transfer: by transfer belt secondary transfer: by transfer roller
Fixing method	on-demand
Delivery method	face-down/face-up
Toner level detection function	yes
Toner supply type	by toner cartridge (Toner Cartridge 701)
Document type	sheet, 3-D object (2 kg max.), plain paper, heavy paper, recycled paper, color paper, label sheet, transparency, envelope, postcard
Maximum document size	fixed: 216 mm x 297 mm ADF: 216 mm x 356 mm
Minimum document size	ADF: 148 mm x 105 mm
ADF capacity	30 sheets or a document height is 8 mm or less 50 sheets(80 g/m ² paper,stack height of 8 mm or less)
Scanning method	CCD reading method
Reproduction ratio	1:1 +/-1.0%; 1:2.000; 1:1.294; 1:0.786; 1:0.647; 1:0.500; zoom: 0.500 to 2.000 (in 1% increments)
Reduction for reception	Fixed reduction: 75%, 90%, 95%, 97% Auto reduction: 70 to 100%
Print area	Printing Paper types other than envelope: 5 mm and more inside from the paper edges Envelope: 10 mm and more inside from the paper edges Copying Inside from the following: Leading edge: 5 +/-3 mm, Right edge: 6 to 1 mm, Left edge: 3 +/-3 mm, Trailing edge:3 +/-3 mm (Print area for ADF reading is not specified.) Reception output: Inside from the following: Leading edge: 5 +/-3 mm, Right edge: 6 to 1 mm, Left edge: 3 +/-2 mm, Trailing edge: 12 to 1 mm
Reading resolution	ADF: 600x600 dpi copyboard glass: 1200x2400 dpi
Copying resolution	ADF: 600 x 600 dpi, copyboard glass: 600 x 600 dpi
Printing resolution	600 x 600 dpi
Print speed (A4)	if black-and-white, about 19 prints/min; if color, about 4 prints/min
Print speed(LTR)	if black-and-white, about 20 prints/min if color, about 4 prints/min
Warm-up Time	130 sec (approx.; at 65% humidity; until Standby screen appears after power is supplied; varies depending on machine condition and site condition)
First Copy Time	copyboard glass B/W: about 22 sec if BW color: about 46 sec if color ADF B/W: about 29 sec if BW color: about 53 sec if color
Cassette paper size	A4, A5, B5, LEGAL, LETTER, EXE
Multi-purpose paper size	A4, A5, B5, LEGAL, LETTER, EXE, envelope, postcard
Cassette paper type	plain paper (64 to 105 g/m ²), heavy paper (106 to 135 g/m ²)
Multi-purpose paper type	plain paper (64 to 105 g/m ²), heavy paper (106 to 135 g/m ²), transparency, label sheet,postcard
Cassette capacity	plain paper (64, 75, 80 g/m ²): about 250 sheets heavy paper (90, 105 g/m ²): about 150 sheets heavy paper (128g/m ²): about 100 sheets
Multi-purpose capacity	15 mm in height (if 64 g/m ² paper, about 125 sheets; if label sheet, 50 sheets; if transparency, 60 sheets if envelope/postcard, 10)
Energy save mode	yes
Operating environment (Temperature range)	10 to 30 deg C
Operating environment (Humidity range)	10 to 80% RH
Power supply rating	200-240V 50/60Hz
Power consumption (Maximum)	1100W
Dimensions	w/ tray: 510 mm x 512 mm x 641 mm w/o tray: 510 mm x 512 mm x 588 mm
Weight	36.0 kg (w/o cartridge)

Option	none
Applicable lines	Applicable line analog (1-line) subscriber line (PSTN)
Handset	none
Transmission method	half-duplex
Transmission control protocol	ITU-T T.30 binary
Modulation method	G3 image signal: ITU-T V.27ter (4.8k, 2.4k bps), ITU-T V.29 (9.6k, 7.2k bps), ITU-T V.17 (14.4k, 12.0k, TC9.6k, TC7.2k bps), ITU-T V.34 (33.6k, 31.2k, 28.8k, 26.4k, 24.0k, 21.6k, 19.2k, 16.8k, 14.4k, 12.0k, 9.6k, 7.2k, 4.8k, 2.4k bps) / G3 procedural signal : ITU-T V.21 (No.2) 300 bps, ITU-T V.8 300 bps, ITU-T V.34 1200 bps, 600 bps
Transmission speed	33.6k, 31.2k, 28.8k, 26.4k, 24k, 21.6k, 19.2k, 16.8k, 14.4k, 12k, TC9.6k, TC7.2k, 9.6k, 7.2k, 4.8k, 2.4k bps, w/ auto fallback function
Coding method	JBIG, MMR, MR, MH
Error correction method	ITU-T ECM
Transmission output level	about -11 dBm
Reception input level	V.17, V.27ter, V.29: -6 to -43 dBm V.34: -9 to -43 dBm
Modem	Conexant (FM336 Plus)
Half tone	256-gradation, error diffusion
Dialing	manual dialing: keypad auto dial (one-touch: 19; coded dial: 100; keypad: 1) group dial: 119 max.
Broadcast transmission	100 max.
Delayed transmission	no
Subaddress transmission	no
Confidential transmission	no
Relay broadcast originating transmission	no
Relay broadcast transmission	no
Polling transmission	no
Dual access	Number of jobs reserved for transmission: 20 max. Number of jobs stored for reception: 20 max. (when combined, 25 jobs max.)
FAX/TEL switching	yes
Answering machine connection	yes
Remote reception	yes (by remote ID tone from extension)
Confidential reception	no
Polling reception	yes (manual only)
Closed network communication	no
System data backup	Flash ROM: dial registration data, user data, service data, communication control report lithium battery: clock
Image data backup	backup particulars: memory reception, memory transmission, broadcast image data backup IC: 128 MB (SDARAM) Backup battery: rechargeable capacity backup length: about 40 min
Activity management	- User Report: communication control report (every 20 communications), one-touch dial list, abbreviation dial list, group dial list, user data list, transmission result report, reception result report - Service Report system data list, system dump list
Others	summer time function: yes telephone directory function: yes forced memory reception: no 2-on-1 reception: no LCD display: yes (20 characters x 2 lines) DONE stamp: no

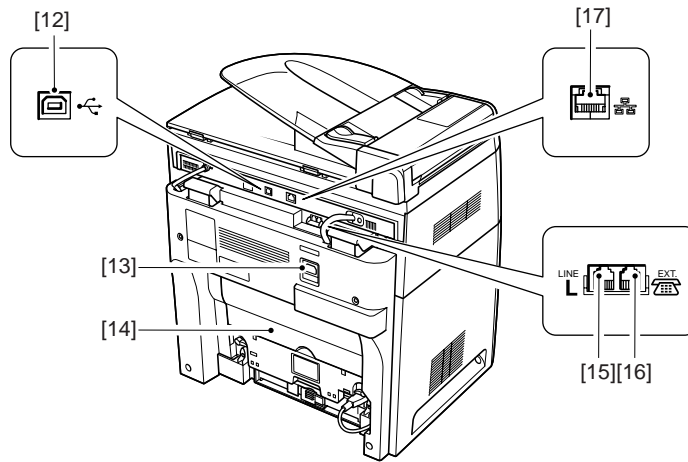
1.2 Names of Parts

1.2.1 External View



F-1-1

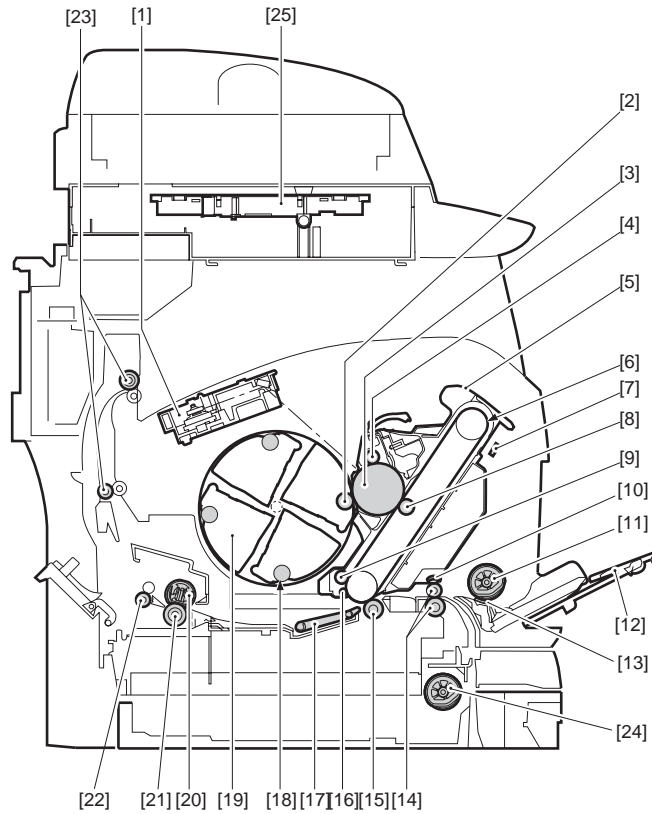
- | | | | |
|-----|----------------------------|------|--------------------|
| [1] | Operation panel | [7] | Front cover |
| [2] | ADF (Auto Document Feeder) | [8] | Cassette |
| [3] | Document feeder tray | [9] | Platen glass cover |
| [4] | Document guides | [10] | Platen glass |
| [5] | Output tray | [11] | Multi-purpose tray |
| [6] | Cartridge cover | | |



F-1-2

- | | | | |
|------|---------------|------|----------------------|
| [12] | USB port | [15] | Telephone line jack |
| [13] | Power socket | [16] | External device jack |
| [14] | Face up cover | [17] | Ethernet port |

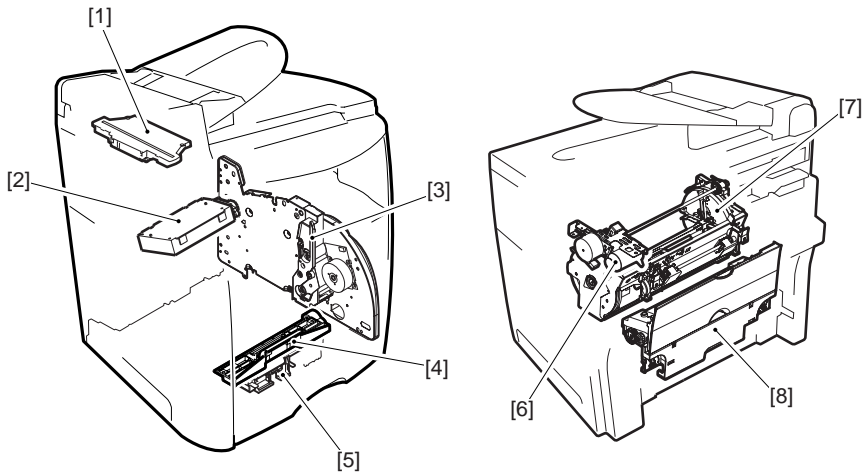
1.2.2 Cross Sectional View



F-1-3

- | | |
|-----------------------------|------------------------------------|
| [1] Laser/scanner unit | [14] Registration roller unit |
| [2] Developing cylinder | [15] Secondary transfer roller |
| [3] Photosensitive drum | [16] Auxiliary ITB cleaning roller |
| [4] Primary charging roller | [17] Feed belt |
| [5] Drum cartridge | [18] Developing rotary |
| [6] ITB | [19] Toner cartridge |
| [7] Density sensor | [20] Fixing film unit |
| [8] Primary transfer roller | [21] Pressure roller |
| [9] ITB cleaning roller | [22] Fixing delivery roller |
| [10] Registration shutter | [23] Facedown delivery roller |
| [11] Pick-up roller | [24] Cassette feeding roller |
| [12] Multi-purpose tray | [25] CCD unit |
| [13] Separation pad | |

1.2.3 Major Unit

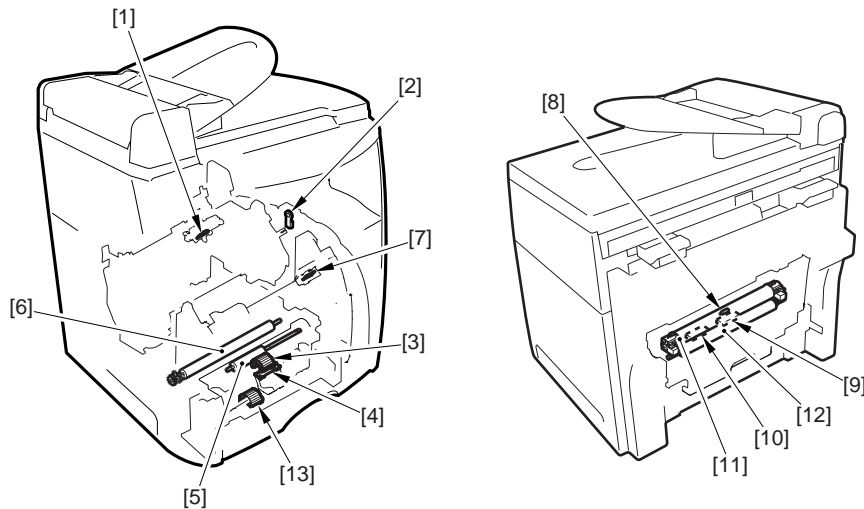


F-1-4

- | | |
|------------------------|----------------------------------|
| [1] CCD unit | [5] Registration roller assembly |
| [2] Laser/scanner unit | [6] Rotary drive assembly |

- | | |
|-----------------------------------|--------------------------------|
| [3] Main drive assembly | [7] Developing rotary assembly |
| [4] Registration shutter assembly | [8] Fixing assembly |

1.2.4 Major Component



F-1-5

- | | |
|---|-----------------------------|
| [1] Toner cartridge memory tag contact | [8] Thermal fuse |
| [2] Machine inside temperature thermistor | [9] Main thermistor |
| [3] Multifeeder pickup roller | [10] Sub thermistor |
| [4] Separation pad | [11] Fixing film assembly |
| [5] Registration roller | [12] Pressure roller |
| [6] Secondary toner roller | [13] Cassette pickup roller |
| [7] Drum cartridge memory tag contact | |

1.3 Safety

1.3.1 Safety of the Laser Light

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



F-1-6

1.3.2 Safety of Toner

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



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

Toner on the Skin or Clothes

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

1.3.3 Safety and Ozone

The cleaning charge roller used in the machine generates ozone gas (O₃) at time of corona discharge (only when the machine is in operation).

A set of rules exists under Underwriters' Laboratories (UL) standards for levels of ozone gas permitted, and the machine has been certified to comply with the rules at time of shipment from the factory.

1.3.4 Points to Note When Replacing/Disposing of the Lithium Battery

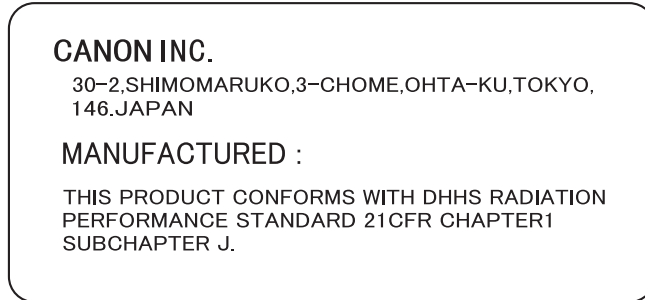


RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

1.3.5 CDRH Ordinances

The Center for Devices and Radiological Health (CDRH) of the US Food and Drug Administration put into force ordinances related to laser products on August 2, 1976. These ordinances apply to laser products manufactured on and after August 1, 1976, and sale of laser products is prohibited within the US unless they bear a certificate of compliance. The following is the label that indicates compliance with the CDRH ordinances, and it must be found on all laser products sold in the US.



F-1-7



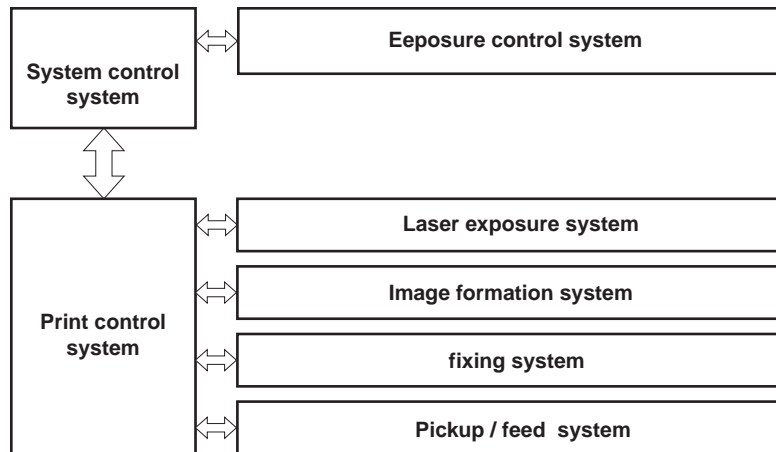
The description may vary from model to model.

1.4 Functional Configuration

1.4.1 Functional Construction

The machine may be divided into the following 6 functional blocks: system control block, reader control block, printer control block, laser/scanner block, image formation block, pickup/feeder block.

The following is a diagram showing these blocks:



F-1-8

1.5 Basic Sequence

1.5.1 Basic Operation Sequence

The operation sequences for the printer are controlled by the CPU in the DCNTboard in the engine control system. The table below indicates the purposes and engine operations of each period from when the power is turned on until a print operation is completed and each motor stops rotating. See the appendix for the timing chart.

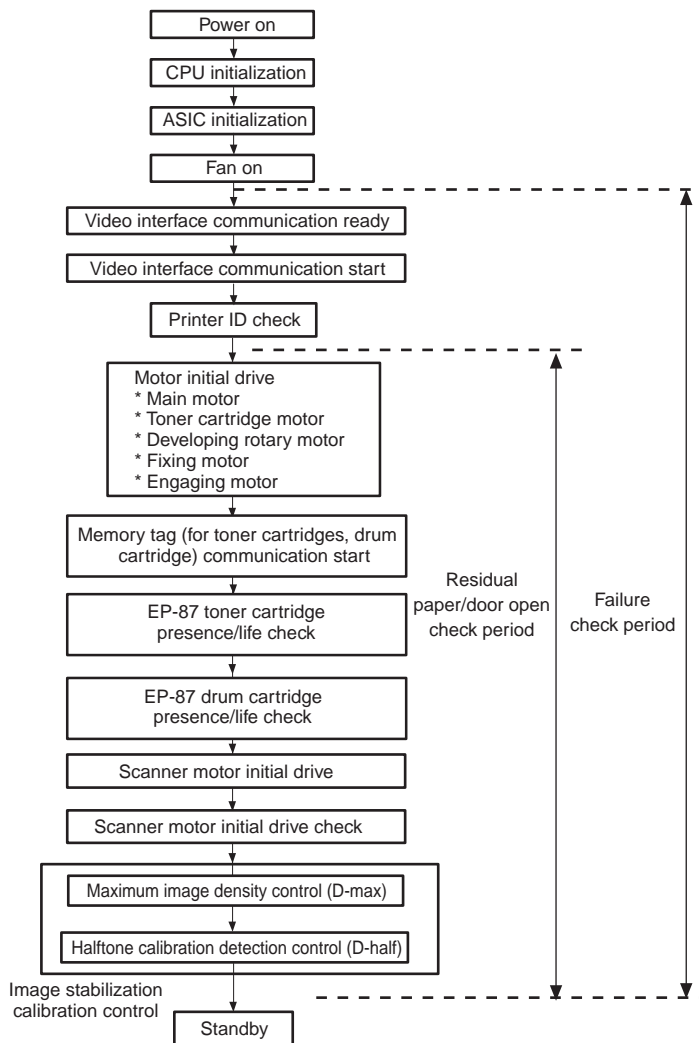
T-1-1

Period		Purpose	Remarks
WAIT (Wait)	From the power switch is turned on until ITB cleaning is completed.	To clear a potential on the drum surface and clean the ITB.	In this period, the printer executes residual paper detection, toner level detection, image density calibration control, etc.
STBY (Standby)	From the end of the WAIT or LSTR period until a print command is input from the interface controller or the power switch is turned off.	To keep the printer ready to print.	
INTR (Initial rotation)	After the input of a print command from the interface controller until the ITB HOME POSITION DETECTION (HP1) signal for the first color is detected.	To stabilize sensitivity of the photosensitive drum in preparation for printing.	

PRINT (Print)	From the end of the INTR period until the ITB home position for the secondary transfer is detected.	To form an image on the photosensitive drum based on the VIDEO signal input from the interface controller and transfer a toner image to the ITB.	
LSTR (Last rotation)	From the end of a print operation until the main motor stops its rotation.	To transfer secondarily a toner image on the ITB to a paper and then delivers outpaper with toner fixed on.	Instant a print command is input from the interface controller; the initial rotation starts.

1.5.2 Power-on Sequence

The power-on sequence is the first operation executed by loads based on the firmware previously stored in the printer. It is indicated in the flowchart below. The power-on sequence is executed from when the power is turned on until the printer enters the standby status.



F-1-9

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2.1 Document Feed and Exposure System

2.1.1 Overview/Configuration

2.1.1.1 Overview

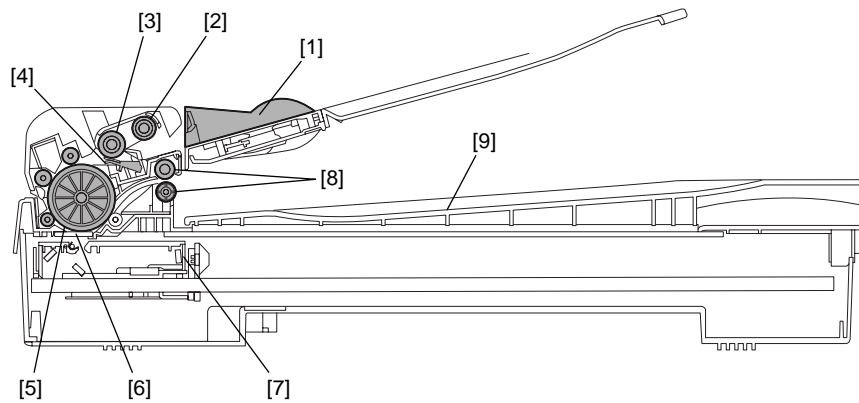
The following are the major specifications, control mechanisms, and functions associated with the original feed/exposure system:

T-2-1

Item	Function/method
Scanning lamp	cathode ray tube
Original scanning	in book mode: scanning by moving the CCD unit in ADF mode: scanning by moving the original
Reading resolution	1200(main scanning) x 2400 (sub scanning) dpi (ADF:600 x 600dpi)
Scanner position detection	by home position sensor
Reproduction ratio (zoom)	in copyboard mode: 100% in ADF mode: 100% (main scanning) image processing by SCNT board (sub scanning): image processing by SCNT board
CCD unit drive control	by flat bed motor
Scanning lamp	activation control by inverter circuit

2.1.1.2 Major Components

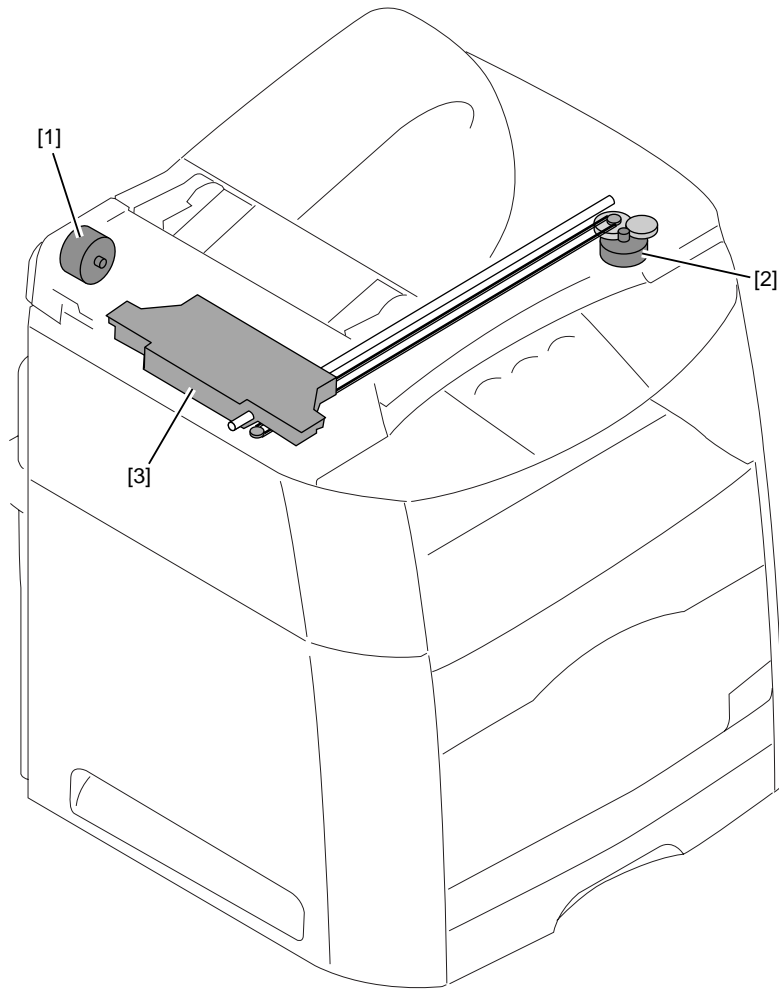
The Document feed / Exposure system consists of the following major components:



F-2-1

T-2-2

- | | |
|--------------------------------|------------------------------|
| [1] Slide guide | [6] Reading glass |
| [2] Document pick-up roller | [7] CCD unit |
| [3] Document separation roller | [8] Document delivery roller |
| [4] Separation guide | [9] Document output tray |
| [5] Document feed roller | |



F-2-2
T-2-3

- [1] Document feed motor
- [2] Flatbed motor
- [3] CCD unit

Reading from the ADF

To avoid skew feeding, documents loaded on the document tray are retained in the horizontal direction by the slide guide. Then, the documents are fed to the separation roller by the pickup roller, and separated one sheet each using differences in the coefficient of friction among the separation roller, documents, and separation guide.

After that, the feeder roller feeds the document onto the reading glass, and the CCD unit reads out image data of the document; then, the delivery roller delivers it to the output tray.

The document feed motor drives the various rollers of the ADF.

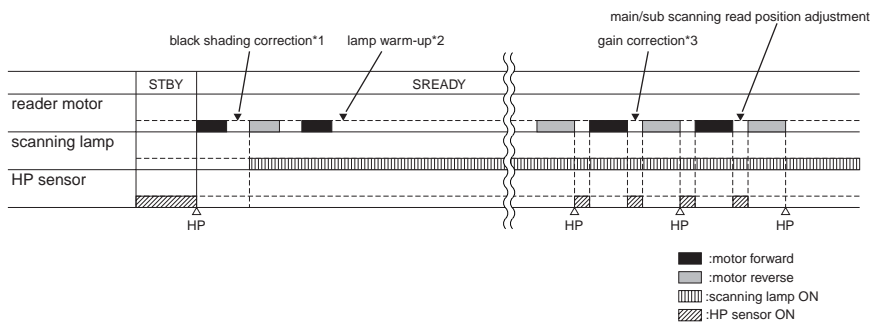
Reading from the platen glass

The CCD unit driven by the flatbed motor reads out image data of a document on the platen glass.

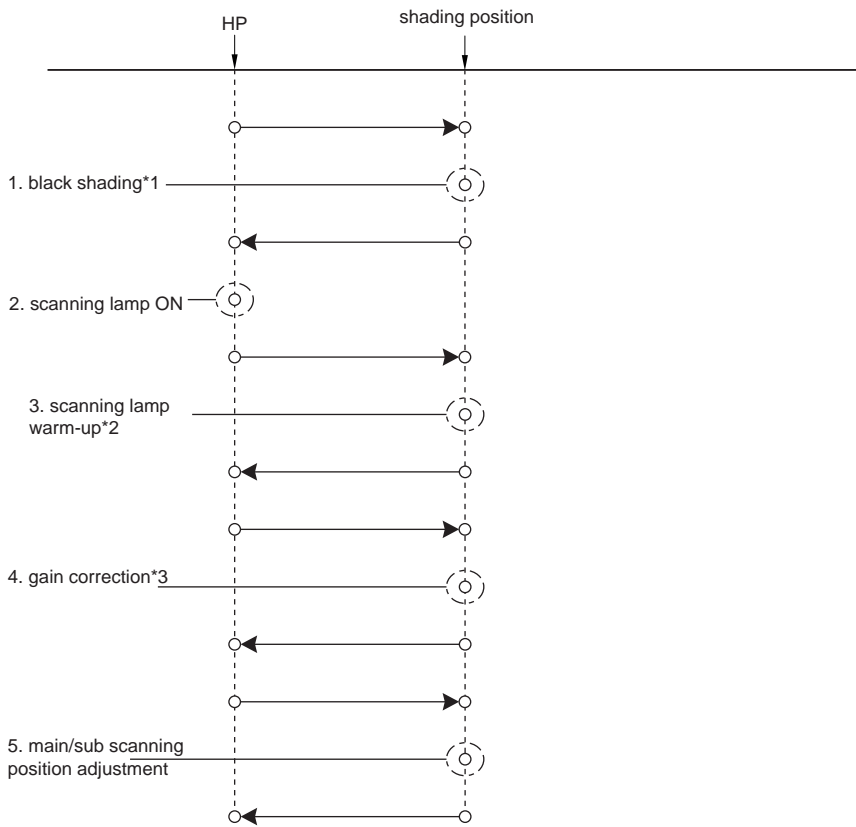
2.1.2 Basic Sequence

2.1.2.1 Basic Sequence of Operation at Power-on

Basic Sequence of Operation at Power-On



F-2-3



F-2-4

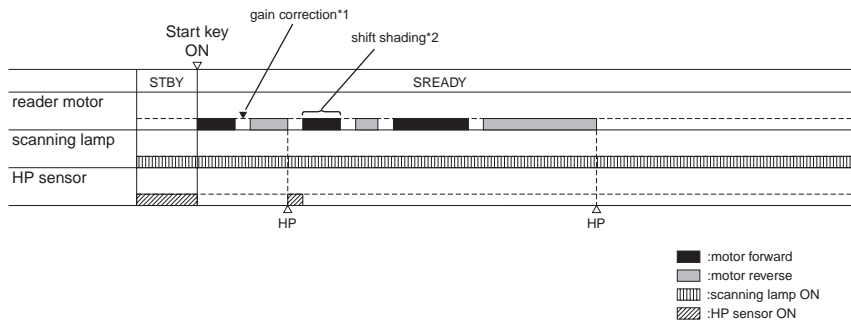
*1: black shading correction (the dark output analog level is adjusted so that the image density digital level is '0').

*2: scanning lamp warm-up (lasts until the temperature of the scanning lamp stabilizes).

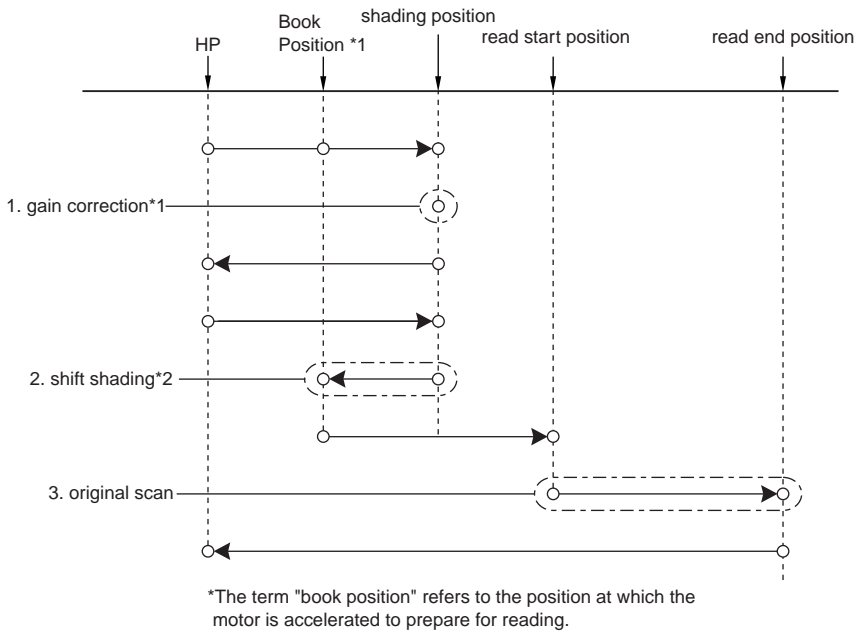
*3: gain correction (standardizes the rate of amplification of the analog video signals generated by the CCD; main/sub scanning point adjustment)

2.1.2.2 Basic Sequence of Operation in Response to a Press on the Start Key (book)

Basic Sequence of Operation in Response to a Press on the Start Key(BOOK)



F-2-5



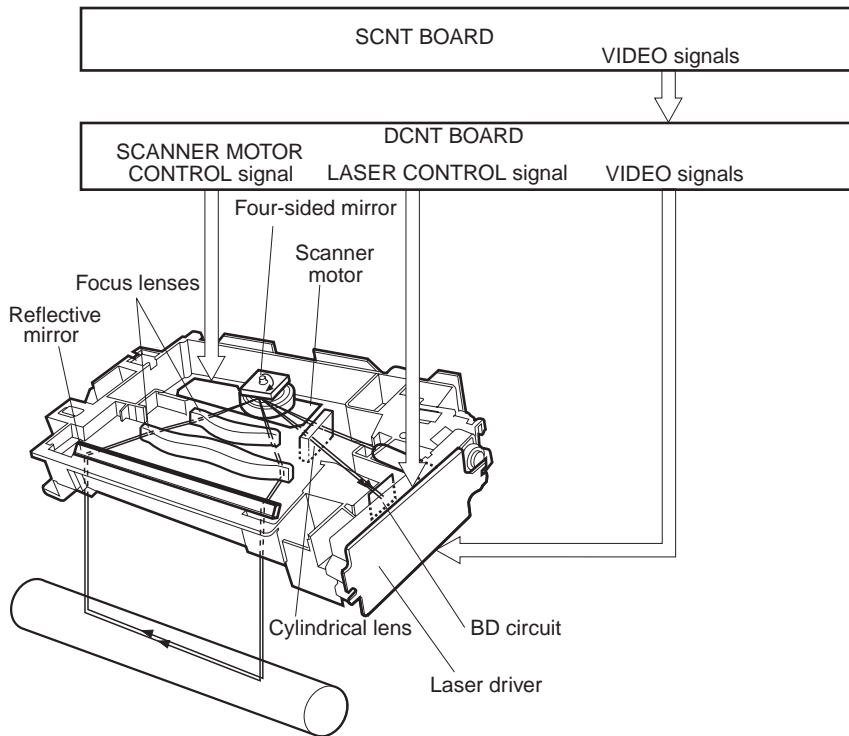
F-2-6

2.2 Laser Exposure

2.2.1 Overview/Configuration

2.2.1.1 Outline

The laser/scanner system forms a latent image on the photosensitive drum according to the VIDEO signals sent from the SCNT Board. This system consists of the laser driver circuit, scanner motor, etc. They are integrated into the laser/scanner unit and controlled by the DCNT Board. The laser scanner unit is illustrated in the figure below and the sequence is described in the following.



F-2-7

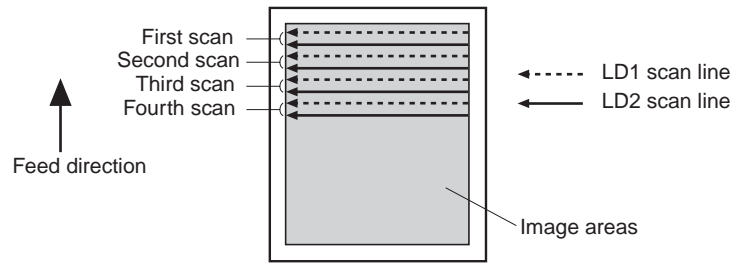
The laser/scanner unit adopted a "twin beam method" (Note) which scans two lines simultaneously with two laser diodes for high-speed laser scanning with the motor revs restrained. The operation sequence of the laser/scanner unit is discussed in the following:

- 1) The DCNT Board rotates the four-sided mirror when a print command is sent from the SCNT Board, and then rotates the scanner motor.
- 2) When the scanner motor starts to rotate, the DCNT Board emits light from the laser forcefully with the LASER CONTROL signal and then starts to control the rotation of the scanner motor.
- 3) The DCNT Board rotates the motor at a specified speed with the SCANNER MOTOR SPEED CONTROL signal.
- 4) The DCNT Board sends the VIDEO signals to the laser driver circuit after the rotational speed of the motor reaches its target value.
- 5) The laser driver PCB emits light from the two laser diodes according to these signals.
- 6) The two laser beams strike the four-sided mirror rotating at a specified speed through the collimator lens and cylindrical lens.
- 7) The laser beams reflected off the four-sided mirror focus on the photosensitive drum through the focus lens and reflective mirror located in front of the four-sided mirror.

- 8) When the four-sided mirror rotates at a constant speed, the laser beam striking the photosensitive drum scans on the drum at a constant speed.
 9) When the photosensitive drum rotates and the laser beam scans on the photosensitive drum, at each specified speed, a latent image is formed on the drum.

⚠ Twin beam method

Two laser diodes (LD1, LD2) are built into the laser unit. In one scanning operation, the laser unit emits light from the LD1 and LD2 and writes two lines simultaneously. This enables a two-fold printing at the same print speed.

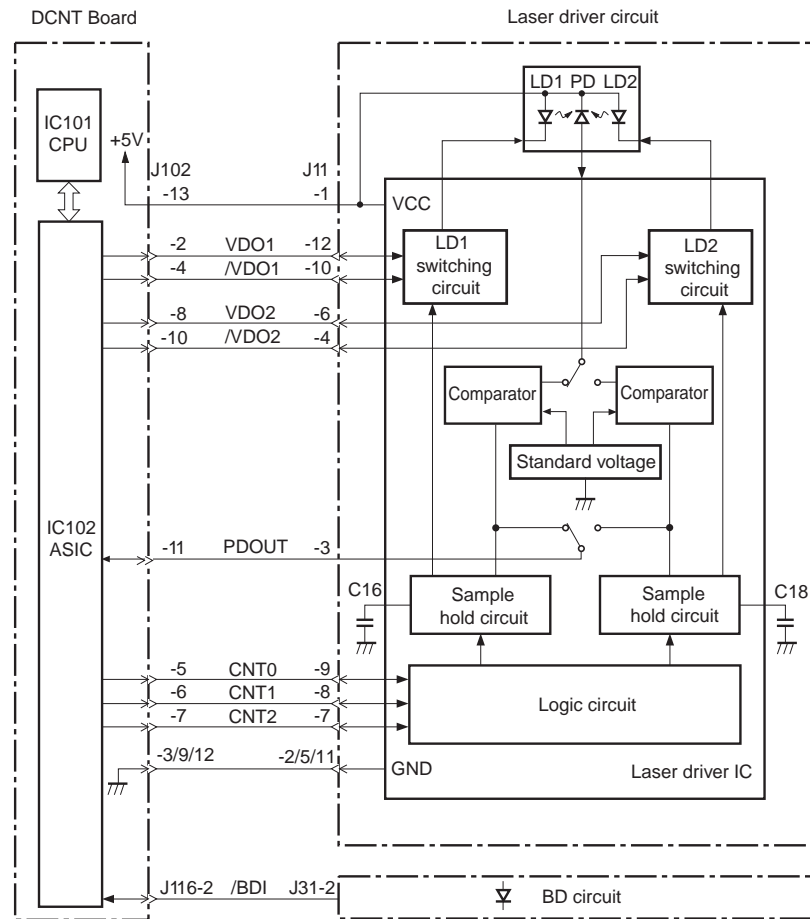


F-2-8

2.2.2 Controlling the Laser

2.2.2.1 Outline

This control is utilized to turn on/off the two laser diodes (LD1, LD2) based on the LASER CONTROL signal sent from the DCNT Board. The circuit diagram of the laser control is illustrated below.



F-2-9

The DCNT Board sends the VIDEO (VDO1, /VDO1, VDO2, /VDO2) signals for image formation and the LASER CONTROL (CNT0, CNT1, CNT2) signals for changing the operation mode of the laser, to the logic circuit in the laser driver IC. The laser driver performs the laser control responsive to a combination of the CNT0, CNT1, CNT2 signals.

T-2-4

Operation mode	CNT0	CNT1	CNT2	Details
Standby mode	L	L	L	Laser control off status
Print mode	H	H	H	Laser emission is executable according to the VIDEO signals.
LD1 force on mode	L	H	L	Turns on the LD1 forcefully
LD2 force on mode	H	L	L	Turns on LD2 forcefully
LD force off mode	H	H	L	Turns off the LD1 and LD2 forcefully

The following four controls are performed with the LASER CONTROL signals:

- 1) Laser emission control

- 2) Automatic power control (APC)
- 3) Horizontal synchronization control
- 4) Image mask control

2.2.2.2 Laser Emission Control

In this control, the laser diodes (LD1, LD2) are turned on/off based on the VIDEO signals.

When the laser drive IC goes into print mode, the laser driver PCB turns on the laser diodes with a specified amount of light or turns it off according to the VIDEO (VDO1, /VDO1, VDO2, /VDO2) signals sent from the SCNT Board.

2.2.2.3 Automatic Power Control (APC)

This control is utilized to maintain amount of light emitted from the laser diodes at a specified amount.

There are two kinds of the APC, initial APC (Note: 1) and between-lines APC (Note: 2). They perform in the same way. The control procedures are described below.

- 1) When the laser driver IC goes in to LD1 force on mode, the laser driver circuit emits light from the LD1 forcefully.
- 2) The light amount of the laser diode is detected by the photo diode (PD). Then it is converted to voltage level and compared with the reference voltage (voltage level equivalent to a target laser light amount) in the comparator.
- 3) The laser driver circuit controls the laser current until the voltage level of the LD1 laser light amount reaches the standard voltage.
- 4) Then, when the laser driver IC goes into LD force off mode, the LD1 is turned off forcefully. The laser driver circuit stores the adjusted laser light amount in the C16.
- 5) After the light amount adjustment of the LD1, the laser driver IC goes into LD2 force on mode and the laser driver circuit emits light from the LD2 forcefully. The laser light amount of the LD2 is adjusted in the same way the LD1 is done. The laser driver circuit stores the adjusted laser light amount of the LD2 in the C18.



Note 1. The APC performed at scanner motor start-up. It adjusts the laser light amount and detects a laser failure.

Note 2. The APC performed during the print period. It performs the laser light amount adjustment for one line before the first line starts to be written.

2.2.2.4 Horizontal Synchronous Control

This control is utilized to determine a starting position in the image horizontal direction.

The control procedures are described below.

- 1) The DCNT Board outputs the LASER CONTROL signals in a combination of which the laser drive IC goes into LD1 force-on mode or LD2 force-on mode during the unblanking period (Note) and emits light from the laser diodes (LD1, LD2) forcefully.
- 2) Each laser beam is sent to the BD PCB located on the scanning path of laser beams.
- 3) The BD circuit detects these laser beams and generates the BD INPUT (/BDI) signal. The signal is sent to the DCNT Board.
- 4) The DCNT Board generates the HORIZONTAL SYNCHRONOUS (/BDO) signal based on the /BDI signal and sends the /BDO signal to the SCNT Board.
- 5) The SCNT Board, after inputting the /BDO signal, outputs the VIDEO (VDI1, /VDI1, VDI2, /VDI2) signals to the DCNT Board so that the starting position in the image horizontal direction is determined.



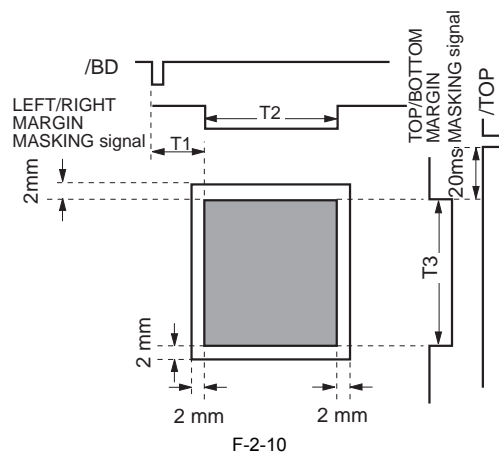
The unblanking period is a period while light is emitted from the laser diodes in non-image areas.

2.2.2.5 Image Mask Control

This control is utilized to avoid laser beam emission on the non-image areas during periods other than the unblanking period.

The DCNT Board let the laser driver IC go into LD force off mode to turn off the laser diodes (LD1, LD2) forcefully while the laser beam scans on non-image areas during periods other than the unblanking period. This status is called an image mask status, which the laser diodes (LD1, LD2) do not emit light even though the VIDEO (VDI1, /VDI1, VDI2, /VDI2) signals are input during this period. Control timing for the image masking is determined based on paper size information sent from the SCNT Board.

If the length of paper measured with the registration sensor (PS711) is longer than paper size information, the DCNT Board puts the image masking forcefully to avoid soiling the secondary transfer roller.



1. The shaded areas indicate areas in which an image can be written by the laser beams.
2. Times T1 to T3 vary according to a paper size.
3. When the multi-purpose tray is selected as a pick-up source, the paper width cannot be determined if a paper size specification command is not sent from the SCNT Board. In this case, values of T1 to T3 are set to be that of universal size.

2.2.2.6 Laser Failure Detection

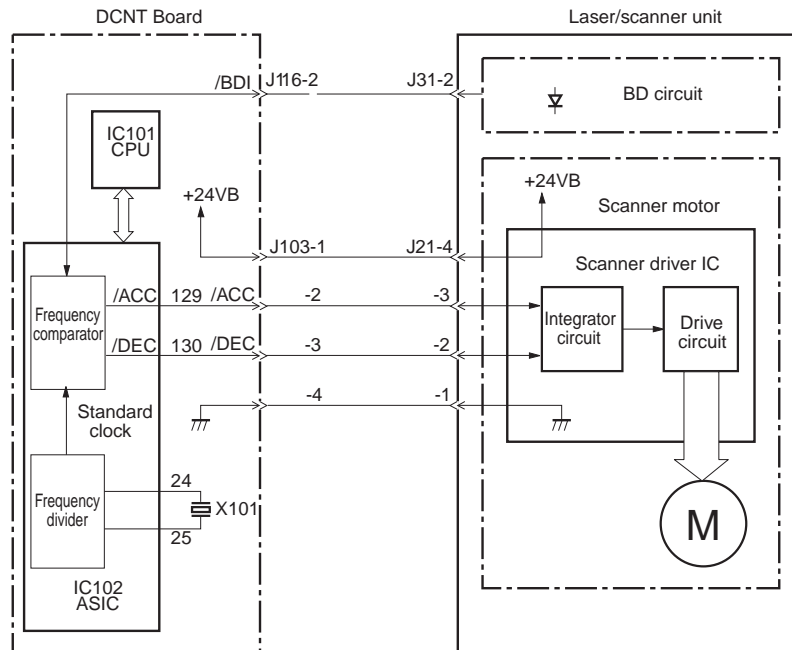
The DCNT Board detects a condition of the control in order for the laser control to be performed properly.

If the laser current monitor signal (PDOUT) cannot be detected when the scanner motor is started up or when APC is under way, the DCNT Board will assume the condition to indicate a fault in the scanner block and stop the printer engine; at the same time, it will communicate the fact to the SCNT Board.

2.2.3 Controlling the Laser Scanner Motor

2.2.3.1 Outline

The control is utilized to rotate the scanner motor in order to strike laser beams to a proper position on the photosensitive drum. The circuit diagram of the scanner motor control is illustrated below.



F-2-11

2.2.3.2 Scanner Motor Speed Control

This control is utilized to rotate the scanner motor at a constant speed by the DCNT Board controlling the scanner motor drive IC.

The scanner motor, which is integral with the scanner motor drive circuit, is a 3-phase, 12-pole DC brushless motor with a built-in Hall device.

The operations of the scanner motor control are described in the following.

After receiving a print command, the CPU in the DCNT Board sets the SCANNER MOTOR ACCELERATION (/ACC) signal "L" through the ASIC and then the scanner motor starts to rotate.

The /BDI signal is sent from the BD circuit as the CPU emits light from the laser forcefully during scanner motor rotation. The ASIC compares a period of the /BDI signal with the reference clock in the frequency comparator. Then it controls the scanner motor revs by controlling the /ACC signal and /DEC signal until the revs reach a specified value.

2.2.3.3 Scanner Motor Failure Detection

The DCNT Board determines whether the scanner motor rotates at specified revs by monitoring the /BDI signal sent from the BD circuit.

The DCNT Board determines an optical unit failure or BD error, stops the printer engine, and notifies the failure to the SCNT Board, under the following conditions:

1) Optical unit failure

If the detected period of the /BDI signal does not satisfy a specified range within 20 seconds at scanner motor start-up, or if the /BDI signal cannot be detected for 0.5 second after the detected period of the signal has satisfied a specified range, the DC controller determines an optical unit failure.

2) BD error

If the input period of the /BDI signal is not within the range of $\pm 1.7\%$ of the scanner motors specified revs during a print operation after the motor has reached its specified revs, the DC controller determines a BD error.

2.3 Image Formation

2.3.1 Overview/Configuration

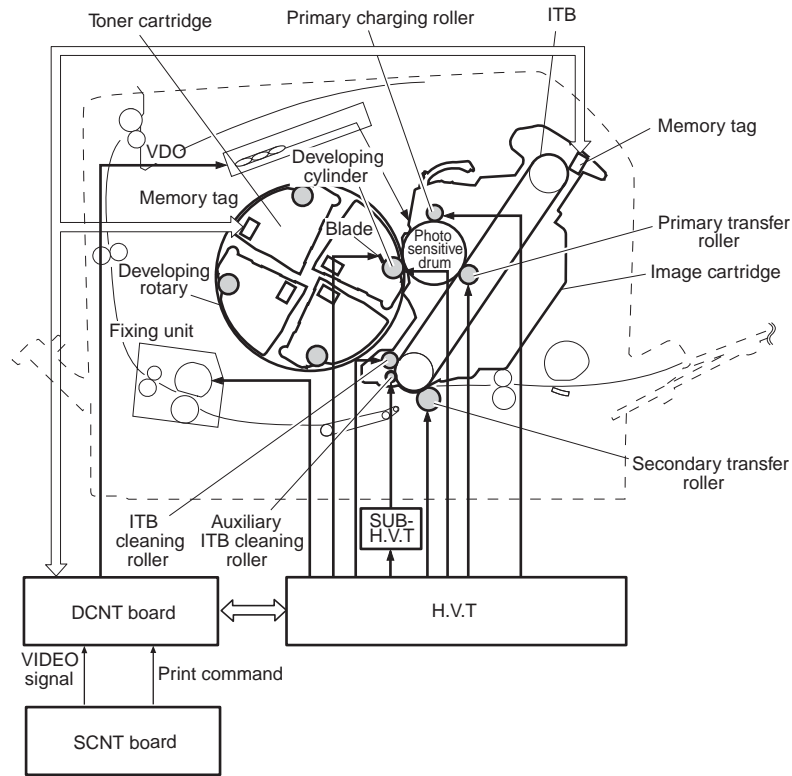
2.3.1.1 Outline

The image formation system, which serves as the nerve center of the printer, forms a toner image on paper.

It consists of a developing cylinder, four toner cartridges containing toner, a drum cartridge containing the ITB, photosensitive drum, etc., a developing rotary storing the toner cartridges, and a fixing unit, etc. These parts are controlled by the DCNT board.

After receiving a print command from the interface controller, the DCNT board the developing rotary, laser/scanner unit, high-voltage power supply circuit to form an image based on the VIDEO signals on paper.

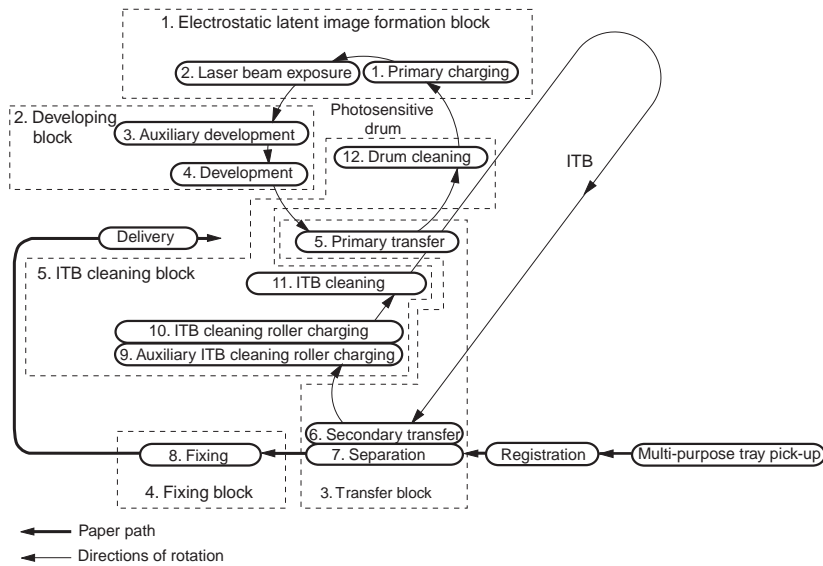
The toner cartridges and drum cartridge come with built-in memory tags that store cartridge usage condition information, etc. The DCNT board performs reading and writing.



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2.3.1.2 Image Formation Process

An image formation process is the basic procedures of operations for image formation. The process can be divided into 5 blocks and 12 steps. By performing steps in each block, a toner image is formed on paper. The following are the blocks and steps of the image formation process.



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1) Electrostatic latent image formation block

Forms an electrostatic latent image on the photosensitive drum.
 Step 1: Primary charging - A uniform negative charge is applied onto the surface of the drum.
 Step 2: Laser beam exposure - An electrostatic latent image is formed on the drum.

2) Developing block

Turns an electrostatic latent image on the drum to a visible image by applying the toner onto it.
 Step 3: Auxiliary development
 Step 4: Development

3) Transfer block

Transfers a toner image on the drum on paper.
 Step 5: Primary transfer - Toner on the drum is transferred to the ITB.
 Step 6: Secondary transfer - Toner on the ITB is transferred to paper.
 Step 7: Separation - Paper separates from the ITB.

4) Fixing block

Fuses a toner image onto paper.
 Step 8: Fixing

5) ITB cleaning block

Cleans residual toner on the photosensitive drum and ITB.

Step 9: Auxiliary ITB cleaning roller charging - Residual toner on the ITB is charged in order to be held on the ITB.

Step 10: ITB cleaning roller charging - Residual toner on the ITB is charged.

Step 11: ITB cleaning - Residual toner on the ITB is transferred onto the drum.

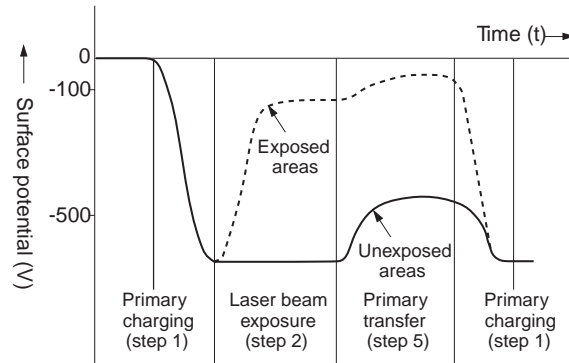
Step 12: Drum cleaning - Residual toner adhered to the drum is cleaned.

2.3.1.3 Electrostatic Latent Image Formation Block

This block comprises three steps, which form an electrostatic latent image on the photosensitive drum.

After the completion of the last step in this block, negative charges remain in areas on the drum surface exposed to laser beams. Negative charges are removed from areas exposed to the laser beams.

An image with negative charges on the drum is called an "electrostatic latent image" since it is invisible to the eye.

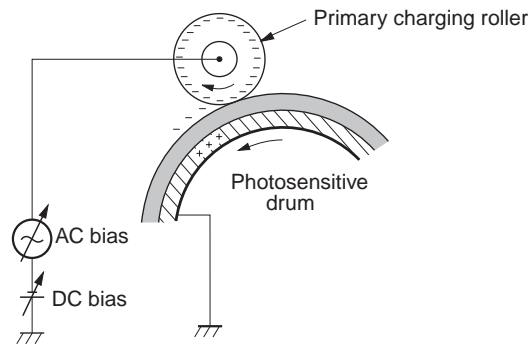


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Step 1: Primary charging

A uniform negative potential is applied to the drum surface in preparation for latent image formation, in this step.

The primary charging roller is made with conductive rubber. A DC bias is applied to the primary charging roller to keep the potential on the drum surface uniformly.

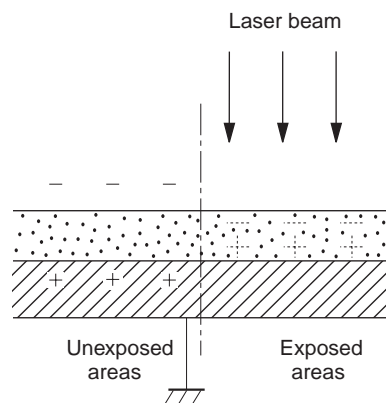


F-2-15

Step 2: Laser beam exposure

An electrostatic latent image is formed on the photosensitive drum in this step.

When the laser beams scan a negatively charged drum surface, it causes the charges in areas struck by the laser beams to be neutralized. An electrostatic latent image is formed in areas on the drum where the negative charges are eliminated.

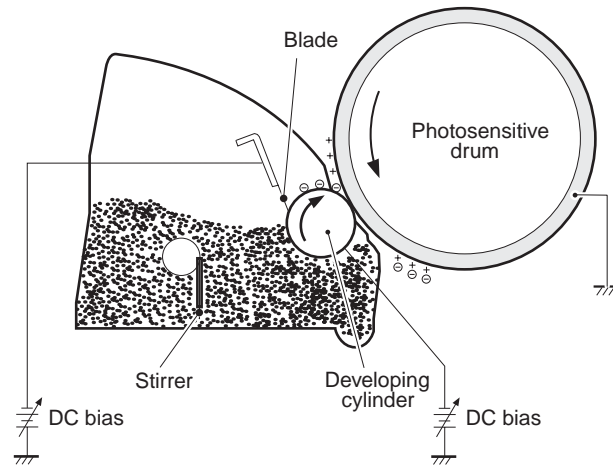


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2.3.1.4 Developing Block

This block is comprised of two steps (see Step 3 and Step 4). In this block, the image becomes visible by utilizing a developing method called contact development method, where the toner is transferred onto the electrostatic latent image on the drum surface. In this method, developing cylinder adheres closely to the photosensitive drum to push up the toner.

Toner (development agent) used in this printer is non-magnetic single-component toner, composed of resins, etc.



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Step 3: Auxiliary development

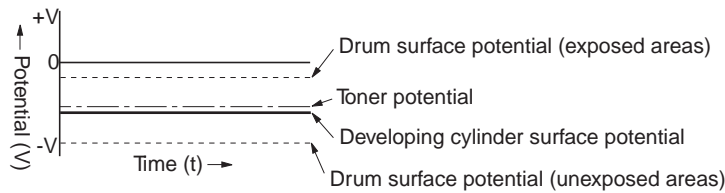
In this step, CPU applies DC bias onto the toner that was not charged by frictional electrification. Here, the toner becomes uniformed negative potential. The printer charges the uncharged toner by applying DC bias onto the blade inside the toner cartridge. The DC bias is also used as developing bias.

Step 4: Development

The toner is adhered onto an electrostatic latent image on the photosensitive drum in this step. The toner is insulators, and acquires a negative charge by friction due to the rotating cylinder and the blade. When the negatively charged toner makes contact with the drum, exposed areas on the drum are more positively charged than that on the cylinder. Then the toner charged about the same as the cylinder adheres onto the exposed areas on the drum. The latent image on the drum becomes visible.



Although the charges on the exposed area on the drum are shown as positive in follow, in actuality, they are negative. However, they are more positive than the charges on the cylinder.



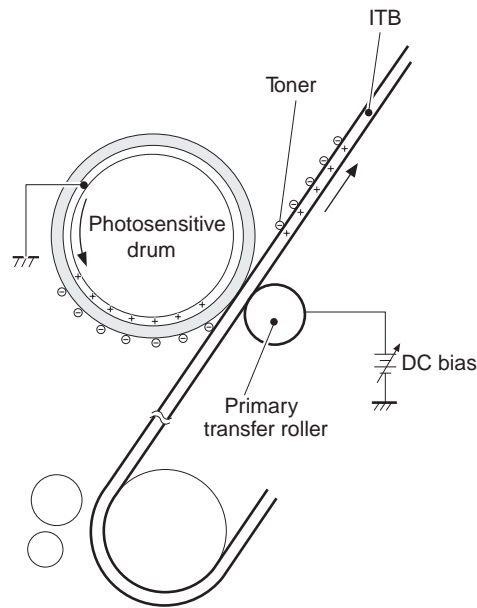
F-2-18

2.3.1.5 Transfer Block

This block comprises three steps, which transfers the toner image on the drum surface onto paper.

Step 5: Primary transfer

The toner on the drum is transferred onto the ITB in this step. A DC positive bias is applied to the primary transfer roller opposite to the drum in order to charge the ITB positively. Then the negatively charged toner on the drum is transferred onto the positively charged ITB. This procedure is repeated for each color (Y, M, C, Bk). In full-color printing, as toners in four colors are piled up on the ITB, the holding force of the toner weakens as the transfer process progresses for the 1st color, 2nd color... Therefore, after transferring the first color, the DC positive bias is increased for each color in order to supplement the holding force of the toner.

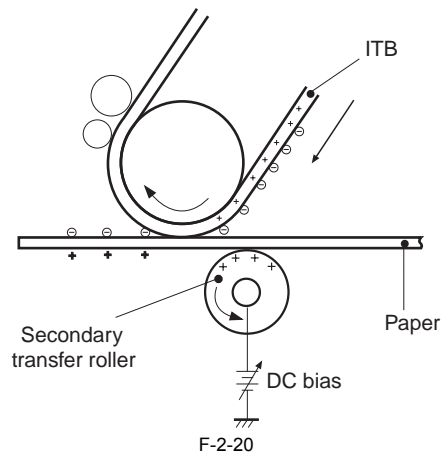


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Step 6: Secondary transfer

The toner on the ITB is transferred onto paper in this step.

A DC positive bias is applied to the secondary transfer roller to charge the back side of a fed paper. This allows the toner on the ITB to transfer onto paper positively. At the completion of secondary transfer, a DC negative bias is applied to the secondary transfer roller to avoid soiling the back of paper with the toner on the ITB.

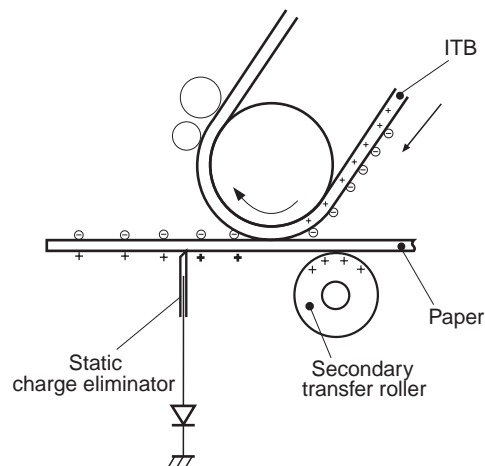


F-2-20

Step 7: Separation

The elasticity of paper causes the paper to separate from the ITB in the step.

This printer utilizes the static charge eliminator to reduce the charge on the back of paper, and weaken the electrostatic adhesion of the paper and facilitate separation. This makes a separation operation easier.



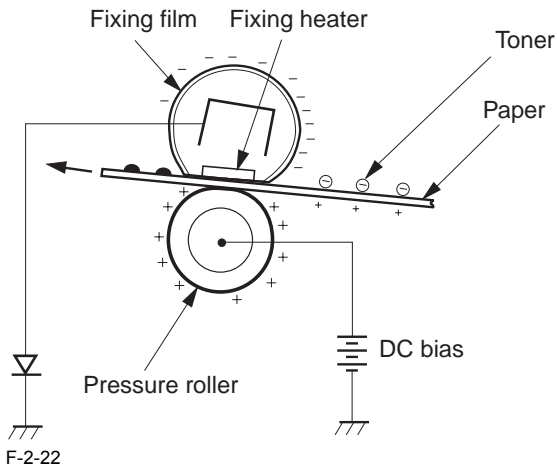
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2.3.1.6 Fixing Block

A toner image transferred onto paper in the transfer block can be smeared easily by hands since only the electrostatic attraction holds the image on paper. The toner on paper is melted and mixed by heat and pressure applied to it and then the image becomes permanent.

Step 8: Fixing

The machine uses an on-demand method, which requires a low thermal capacity. The method enables the machine to start up quickly and its heater to use little power while the machine is in a standby state. The machine may therefore be characterized by a short wait time and low energy consumption. The machine applies a positive DC bias to its pressure roller for the purpose of reinforcing the retention of toner on print paper, consequently preventing stray toner. Moreover, to prevent offset from the fixing film, the film surface is given a fluorine coating. The sleeve of the fixing film is made of rubber.



2.3.1.7 ITB Cleaning Block

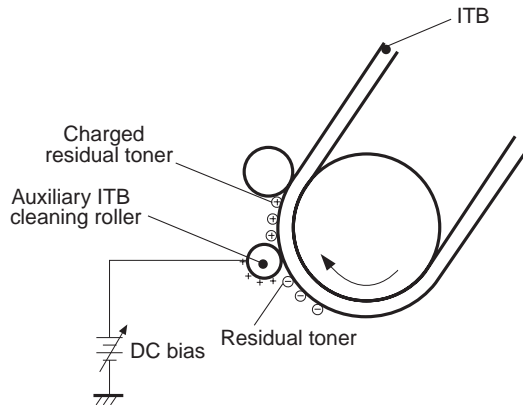
The ITB and drum are cleaned in this block by returning residual toner on the ITB into the waste toner case through the drum, as a preparation for the next print operation. This block comprises the following four steps:

Residual toner

In the secondary transfer step, not all the toner on the ITB is transferred onto paper. Some toner remains on the ITB. This toner is called the residual toner.

Step 9: Auxiliary ITB cleaning roller charging

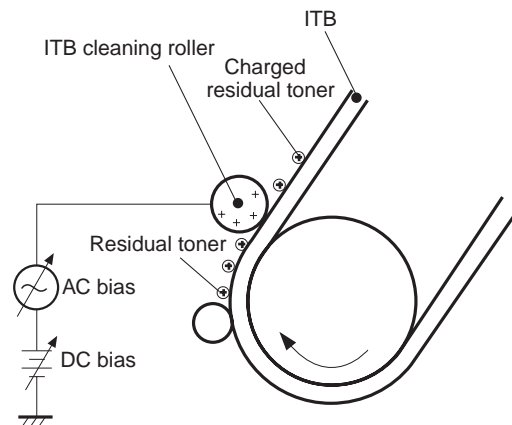
In this step, the holding force of the residual toner on the ITB is strengthened to prevent the toner from falling from the ITB and scattering in the printer. A DC positive bias is applied to the auxiliary ITB cleaning roller to charge the residual toner on the ITB positively. Then the residual toner is pressed to the ITB.



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Step 10: ITB cleaning roller charging

The residual toner on the ITB is charged uniformly positively in this step. A DC positive bias and AC bias are applied to the ITB cleaning roller in order to apply positive charges to the residual toner. This will make the next step, ITB cleaning, easier.

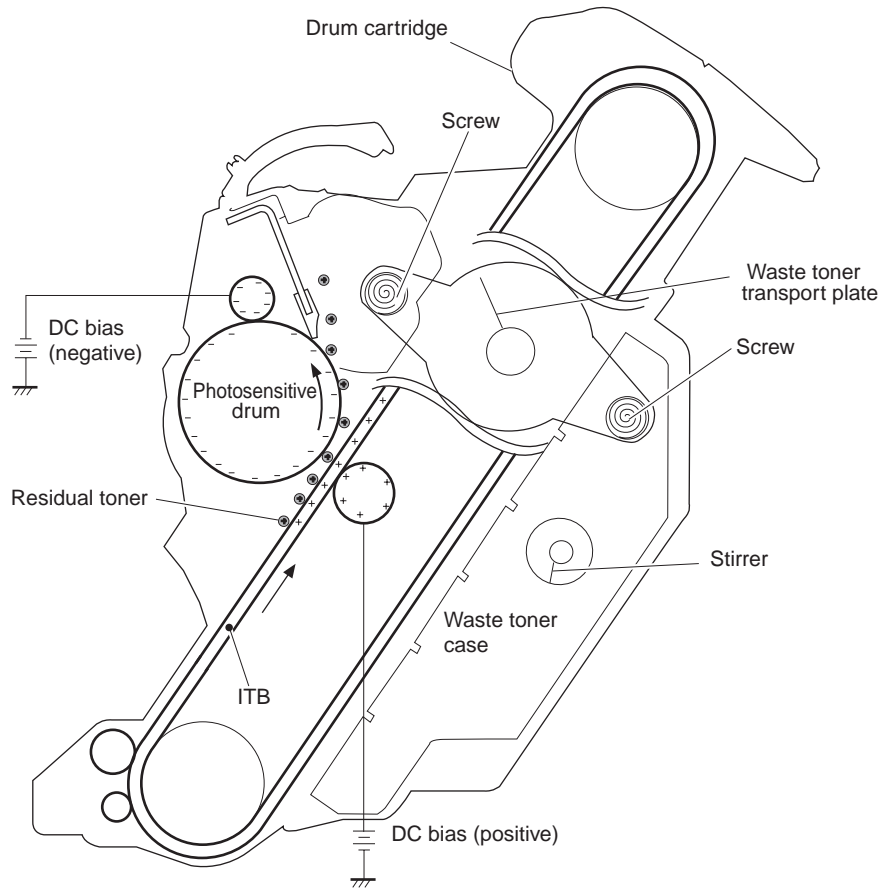


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Step 11: ITB cleaning

The positively charged residual toner on the ITB is returned to the drum in this step. A potential difference is produced between the drum and the ITB by applying

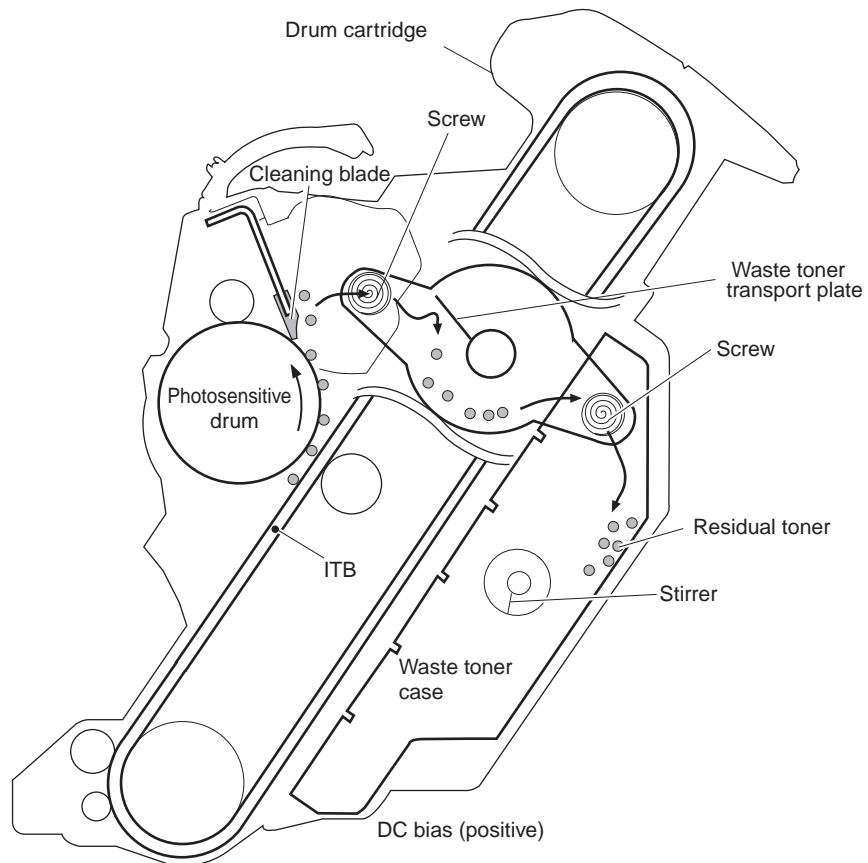
a DC positive bias onto the ITB and a DC negative bias onto the drum, to return the residual toner to the drum.



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Step 12: Drum cleaning

In this step, the residual toner is cleaned from the drum to prepare for the next print operation. The residual toner on the drum is scraped away with the cleaning blade. The removed toner is collected with the waste toner screws into the waste toner case. This allows the drum surface to be cleaned.



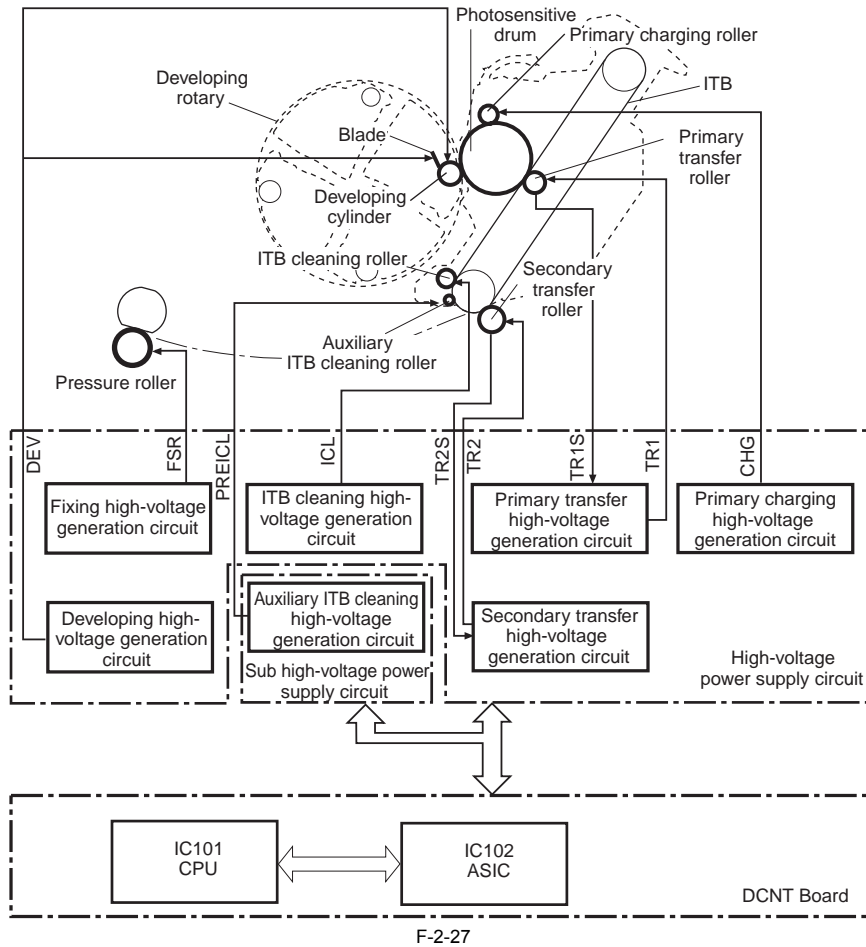
F-2-26

2.3.2 Driving and Controlling the High-Voltage System

2.3.2.1 Outline

In this circuit, biases are applied to the primary charging roller, developing cylinder, primary transfer roller, secondary transfer roller, auxiliary ITB cleaning roller, ITB cleaning roller, and fixing film. The CPU (IC101) in the DCNT Board controls the high-voltage power supply circuit and the sub high-voltage power supply circuit through the ASIC (IC102) to generate the biases.

The block diagram of this circuit is illustrated below.



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2.3.2.2 Primary Charging Bias Generation

The primary charging bias is output to apply uniformed negative potential to the photosensitive drum surface as a preparation for image formation. Two kinds of the biases, DC negative bias and AC bias, are generated in the primary charging high-voltage generation circuit in the high-voltage power supply circuit. These two biases are applied together to the primary charging roller in the drum cartridge with a specified timing. The values of the DC negative bias vary interlocked with the developing bias according to image density information sent from the SCNT Board.

Auxiliary developing bias is output to charge toner that was not charged by friction. The printer's auxiliary developing bias is DC minus bias generated at auxiliary developing bias generation circuit inside high-voltage printed circuit board. Auxiliary developing bias is applied onto the blade in the toner cartridge at a specified timing.

2.3.2.3 Developing Bias Generation

The developing bias is output to adhere toner to an electrostatic latent image formed on the photosensitive drum. This bias is a DC negative bias generated in the developing high-voltage generation circuit in the high-voltage power supply circuit. The bias is applied to the developing cylinder in the toner cartridge with specified timing. The values of the developing bias vary according to image density information sent from the SCNT Board. This allows the adjustment of image density. The developing bias is output to charge toner that was not charged by friction. This bias is applied onto the blade in the toner cartridge at a specified timing.

2.3.2.4 Primary Transfer Bias Generation

The primary transfer bias is output to transfer a toner image on the photosensitive drum to the ITB in the drum cartridge. Two kinds of the biases, DC positive bias and DC negative bias, are generated in the primary transfer high-voltage generation circuit in the high-voltage power supply circuit. The DC positive bias is output to the primary transfer roller in toner transfer. The DC negative bias is out-put to it in ITB cleaning. The high-voltage power supply circuit applies these primary transfer biases to the primary transfer roller according to a sequence.

The following are the biases applied at each sequence:

- Print bias (Note) (DC positive):

This bias is applied to the primary transfer roller to transfer a toner image on the photosensitive drum to the ITB in a print sequence.

- Cleaning bias (DC negative):

This bias is applied to the primary transfer roller to return residual toners adhered on the ITB to the photosensitive drum in a warm-up or last rotation sequence.

The values of the primary transfer bias vary according to the DCNT Board.

The DCNT Board changes the amperage of the primary transfer bias according to the PRIMARY TRANSFER CURRENT FEEDBACK (TR1S) signal sent from the primary transfer high-voltage generation circuit and performs rated current control.



In full-color printing, as four toner layers in each color are piled up on the ITB in primary transfer, the holding force of toner weakens as the transfer process progresses for the 1st color, 2nd color... Therefore, after transferring the first color, the primary transfer DC (positive) bias is increased for the toner in the rest of the colors to gain the holding force of the toner.

2.3.2.5 Secondary Transfer Bias Generation

The secondary transfer bias is output to transfer a toner image on the ITB onto paper.

Two kinds of the biases, DC positive bias and DC negative bias, are generated in the secondary transfer high-voltage generation circuit in the high-voltage power supply circuit. The DC positive bias is output to the secondary transfer roller in toner transfer. The DC negative bias is output to it in cleaning.

The high-voltage power supply circuit applies these secondary transfer biases to the secondary transfer roller according to a sequence.

The following are the biases applied at each sequence:

- Print bias (DC positive):

This bias is applied to the secondary transfer roller to transfer a toner image on the ITB onto paper in a print sequence.

- Cleaning bias (DC negative):

This bias is applied to the secondary transfer roller to return residual toners adhered on the secondary transfer roller to the ITB in a warm-up or last rotation sequence.

The values of the secondary transfer bias vary according to the DCNT Board.

The DCNT Board changes the amperage of the secondary transfer bias according to the SECONDARY TRANSFER CURRENT FEEDBACK (TR2S) signal sent from the secondary transfer high-voltage generation circuit and performs rated current control.

2.3.2.6 Auxiliary ITB Cleaning Bias Generation

The Auxiliary ITB cleaning bias is output to prevent residual toners on the ITB from falling on a paper path.

Two kinds of the biases, DC positive bias and DC negative bias, are generated in the auxiliary ITB cleaning high-voltage generation circuit in the sub high-voltage power supply circuit.

The DC positive bias is output to the auxiliary ITB cleaning roller to charge residual toners on the ITB positively. The DC negative bias is output to the auxiliary ITB cleaning roller to clean negatively charged residual toner on the roller.

The Sub high-voltage power supply circuit applies these auxiliary ITB cleaning biases to the auxiliary ITB cleaning roller during the cleaning period with specified timing.

2.3.2.7 ITB Cleaning Bias Generation

The ITB cleaning bias is output to clean the ITB.

Three kinds of the biases, DC positive bias, DC negative bias, and AC bias, are generated in the ITB cleaning high-voltage generation circuit in the high-voltage power supply circuit.

The AC bias and DC positive bias are output to the ITB cleaning roller to clean positively charged residual toners on the ITB. The AC bias and DC negative bias are output to the ITB cleaning roller to clean negatively charged residual toners on the roller.

The high-voltage power supply circuit applies these ITB cleaning biases to the ITB cleaning roller during the cleaning period with specified timing.

2.3.2.8 Fixing Bias Generation

The fixing bias is generated and used to prevent adhesion to the fixing sleeve of toner that is on print paper before fixing takes place.

The fixing bias is a DC positive bias generated in the fixing height-voltage generation circuit of the high-voltage power supply PCB. It is applied to the pressure roller of the fixing assembly at such times as programmed in advance.

2.3.3 Image Stabilization Control

2.3.3.1 Outline

This printer performs image stabilization control using the image density detection function (see note) in order to reduce image density variations caused by changes in environments, deterioration of the drum or toner, etc.

Two kinds of the image stabilization controls, image density calibration (D-max) control and image halftone calibration (D-half) control, are executed as necessary.

Specified conditions to perform image stabilization calibration control are listed in the following:

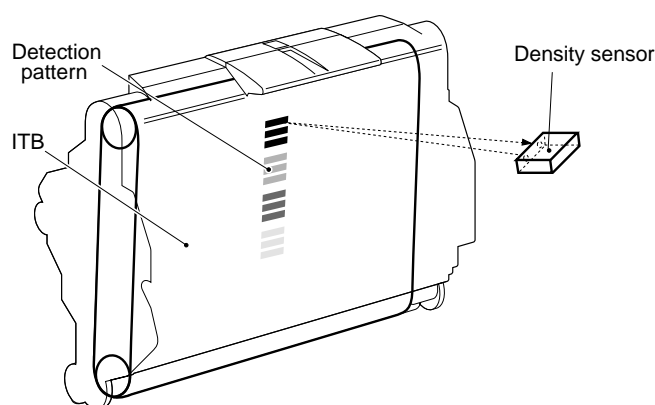
- Power is turned on.
- Cartridge is replaced.
- After printing 800 images or more (mono color: 800 pages, full color: 200 pages)
- After 12 hours in the absence of a print command
- In response to a command for execution from the SCNT Board.

Image density detection function

This printer has functions of striking light to image density patterns in each color formed on the ITB and measuring the density of the patterns from the amount of reflected light.

The DCNT Board emits light from the density sensor and strikes the light to each detection pattern. Then the reflected light off the patterns is received at a light receiver and returned to the DCNT Board as the IMAGE DENSITY signals.

The DCNT Board converts the input IMAGE DENSITY signals (analog values) to density values (digital values) and stores them.



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The DCNT board resets the image density to the default setting and starts the engine in the event of the following: at time of image density detection, the light-receiving segment does not receive light at all, or the level detected by the density sensor does not match a specific value.

2.3.3.2 Image Density Calibration (D-max) Control

This control is performed to stabilize the image density of the printer engine. The DCNT Board forms density patterns in each color on the ITB as varying the developing bias when specified conditions are met. Then the DCNT Board measures the density of the patterns with the density sensor and controls the developing bias to obtain a proper density based on the measured density.

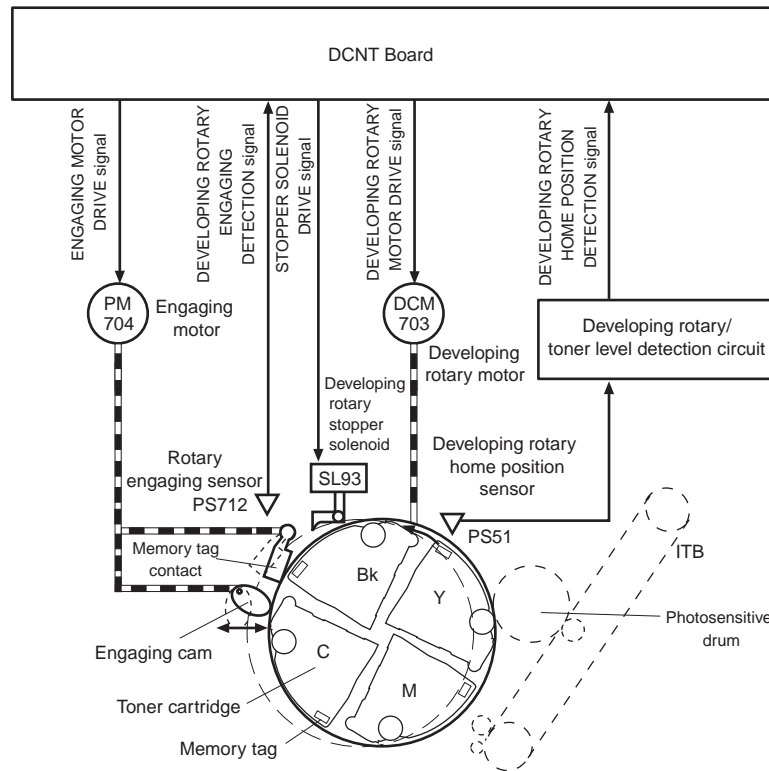
2.3.3.3 Image Halftone Calibration (D-half) Control

This control is utilized to measure a halftone density output from the SCNT Board in order for the SCNT Board to perform halftone calibration, and to return the measurement results to the SCNT Board. The DCNT Board forms image detection patterns for each color on the drum with a proper developing bias specified in the D-max control based on image data sent from the SCNT Board. Then the DCNT Board measures the patterns with the density sensor and returns image data to the SCNT Board. The SCNT Board performs the halftone calibration to obtain an ideal halftone image based on data.

2.3.4 Developing Rotary

2.3.4.1 Outline

The developing rotary has a function of moving a toner cartridge to a specified position. There are four toner cartridges (Y, M, C, Bk) stored in the rotary. The rotary is illustrated in the figure below.



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The developing rotary motor (DCM703) rotates the rotary so that the EP-87 toner cartridges in each-color face the drum one by one. As the rotary stops, the developing rotary stopper solenoid (SL93) is driven to lock the rotary.

The rotary performs engaging operations of the rotary and of the memory tag contacts, with the engaging motor (PM704). (See the memory tag engaging control on page 2-60 for details on an engaging operation of the memory tag contacts.)

There are two sensors for the rotary, which performs position detection and engaging detection.

The functions the rotary has are described next.

2.3.4.2 Developing Rotary Rotation Control

This control is utilized to rotate the rotary during a print or toner cartridge removal operation in order to move each toner cartridge to its specified position.

The DCNT Board moves the rotary by turning on/off the developing rotary motor (DCM703) as monitoring the position of the rotary with the developing rotary home position sensor (PS51). When the rotary stops, the DCNT Board drives the developing rotary stopper solenoid (SL93) to lock the rotary.

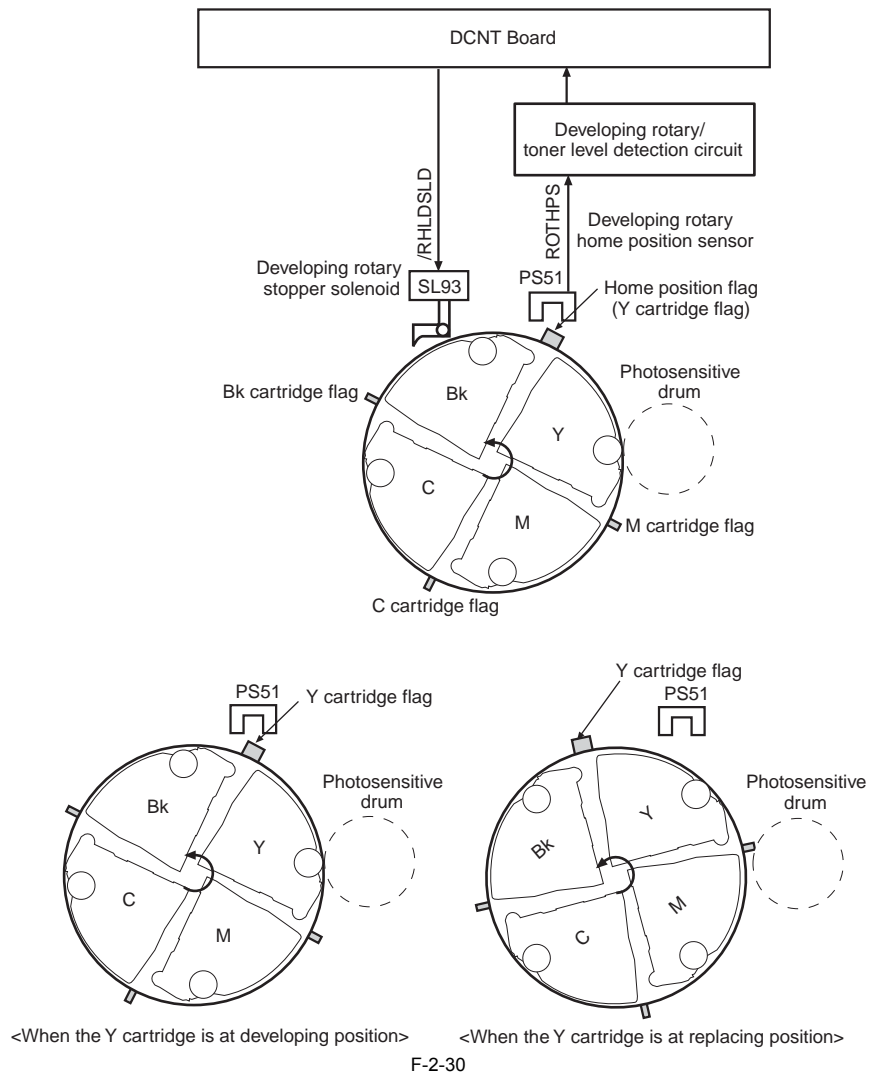
The DCNT Board monitors the PS51 to determine the stopping position of the rotary. It detects the position of the rotary from time for four cartridge flags located on the left side of the rotary to pass the PS51.

The four cartridge flags are for detecting the developing positions for each cartridge. The DCNT Board determines a cartridge developing position when these flags interrupt the PS51, and stops the rotation of the DCM703.

The flags are used for detecting the removing position for each cartridge also. The DCNT Board rotates the DCM703 for a specified period from the position at where each flag interrupts the PS51 and then stops it. This position will be a removing position for each cartridge.

The DCNT Board will assume any of the following conditions to be a fault in the developing rotary locking mechanism and will stop the printer engine and, at the same time, communicate the fact to the SCNT Board:

- 1) The home position detecting flag cannot be detected by PS51.
- 2) A fault exits during the period of detection between flags by PS51.



2.3.4.3 Developing Rotary Engaging Control

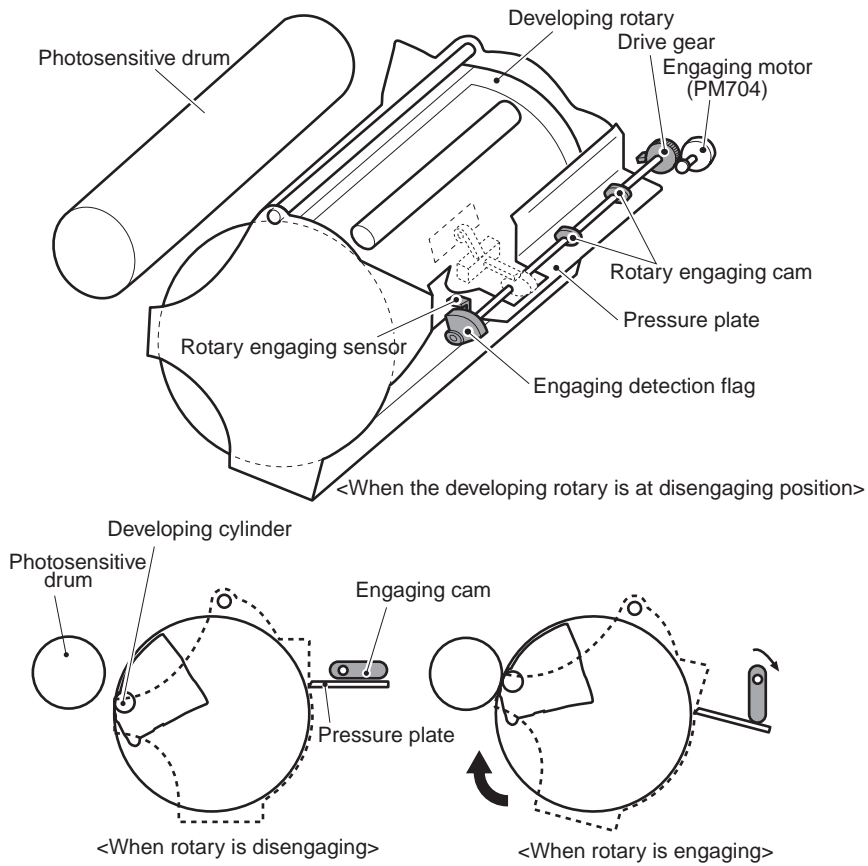
This control is utilized to engage a developing cylinder in the rotary to the drum in order to transfer the toner image on the drum onto the ITB. In rotary engaging control, the DCNT Board switches the rotational direction of the engaging motor (PM704) and moves the rotary to either of two positions, engaging position and disengaging position.

At the time of rotary engaging (travelling from a disengaging position to an engaging position), the DCNT Board rotates the engaging motor clockwise for a specified period. This allows the rotary engaging cam to rotate and then the engaging plate is pressed out. The developing cylinder is engaged to the drum.

At the time of rotary disengaging (travelling from an engaging position to a disengaging position), the DCNT Board rotates the engaging motor counterclockwise and instructs the reverse operation of rotary engaging. Then the developing cylinder is disengaged from the drum.

A mechanism used in this control is also used in a memory tag contact engaging operation.

Developing rotary position detection is performed by the DCNT Board monitoring the rotary engaging sensor (PS712).



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2.3.4.4 Developing Rotary Position Detection

This printer has a function of detecting the rotary engaging position between the rotary and drum determined in the developing rotary engaging control. This detection is performed by the DCNT Board monitoring the output of the engaging sensor (PS712). The DCNT Board determines either of three modes: print, initial, and memory tag communication, from whether the engaging detection flag located on the end of the drive gear shaft interrupts the PS712.

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Mode	Status			
	Developing rotary	Memory tag contact	Rotary engaging sensor (PS712)	Relationship between the rotational direction of the engaging motor and the position of the sensor flag
1. Print mode	Engaging	Disengaging		
2. Initial mode	Disengaging	Disengaging		
3. Memory tag communication mode	Disengaging	Engaging		

When the power is turned on or the top cover is closed, the DCNT Board executes as follows based on the output of the PS712. When the output of the PS712 is "H", the DCNT Board determines that the printer is in print mode (#1 in the table above) and rotates the engaging motor clockwise for a specified period to switch the mode to initial mode in order to prepare for the next operation. When the output is "L", the DCNT Board cannot determine whether the printer is in initial mode (#2 in the table above) or memory tag communication mode (#3 in the table above). In such a case, the DCNT Board rotates the engaging motor counterclockwise for a specified period to switch the mode to print mode. Then it rotates the motor clockwise for a specified period to switch the mode to initial mode. The DCNT Board detects mode the printer is actually in from the detection results of the PS712 and prepare for the next operation.

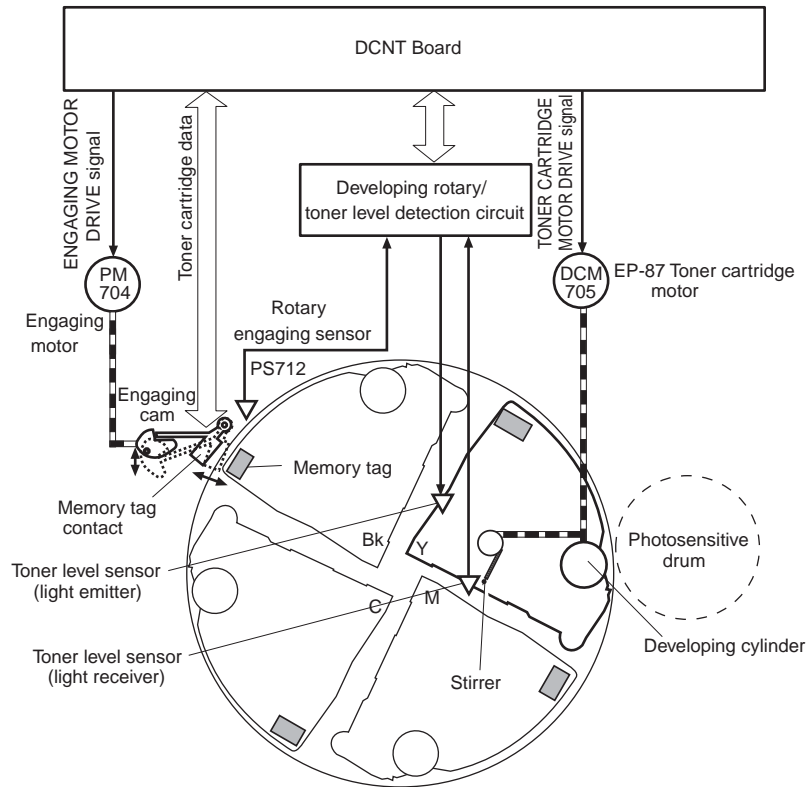
The DCNT Board determines a developing rotary engaging mechanism abnormality, stops the printer engine, and notifies it to the SCNT Board under the following conditions in engaging failure detection:

- 1) The PS712 does not output "L" even if the engaging motor rotates counter clockwise for a specified period (0.2 seconds) at developing rotary disengaging.
- 2) The PS712 does not output "H" even if the engaging motor rotates clockwise for a specified period (0.2 seconds) at developing rotary engaging.

2.3.5 Toner Cartridge

2.3.5.1 Outline

The toner cartridge has a function of forming a visible image on the drum with toner. There are four toner cartridges in Y, M, C, and Bk, which are the same in structure. The following indicates the configuration of the cartridges and loads.



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This toner cartridge is structured with a developing cylinder, and stirrer. The toner cartridge motor rotates these parts. The memory tag is installed in each cartridge. The engaging motor rotates as required to operate the memory tag contact cam. This allows the memory tag contact on the printer side and that on the cartridge side to contact each other, and enables the DC controller to communicate with each toner cartridge. Toner level detection is performed with an LED (light emitter) and a photodiode (light receiver) on the developing rotary/toner level detection circuit. The functions and controls that the cartridge have are described next.

2.3.5.2 Memory Tag

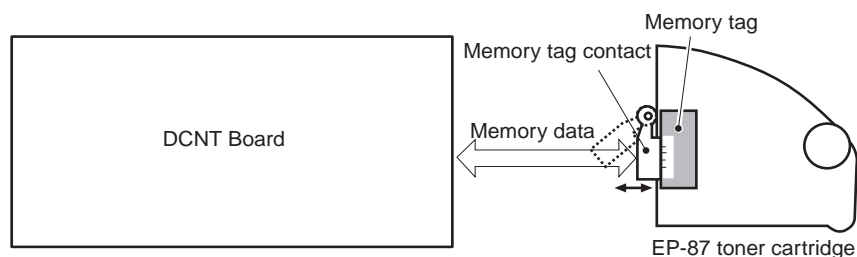
The memory tag is a non-volatile memory built into the toner cartridge. It stores cartridge usage condition data. The DCNT Board reads and writes memory data constantly to detect the usage conditions of each toner cartridge.

The DCNT Board reads and writes to the memory tag through the memory tag contacts.

The memory tag contacts are disengaged from the memory tag normally. However, when the DCNT Board reads and writes to the memory tags in each toner cartridge, it performs memory tag contact engaging control. The DCNT Board starts memory data communication as the toner cartridge contacts with the memory tag contact. After receiving memory data, the DCNT Board updates the information with specified timing and writes it to the memory tags for each cartridge.

The DCNT Board instructs the memory tag to read or write under the following conditions:

- <Read>
- Power is turned on.
- Top cover is closed.
- <Write>
- After 50 papers printing.
- When a Change Has Occurred to the Data on the Lives of Parts.



F-2-33

2.3.5.3 Memory Tag Contact Engaging Control

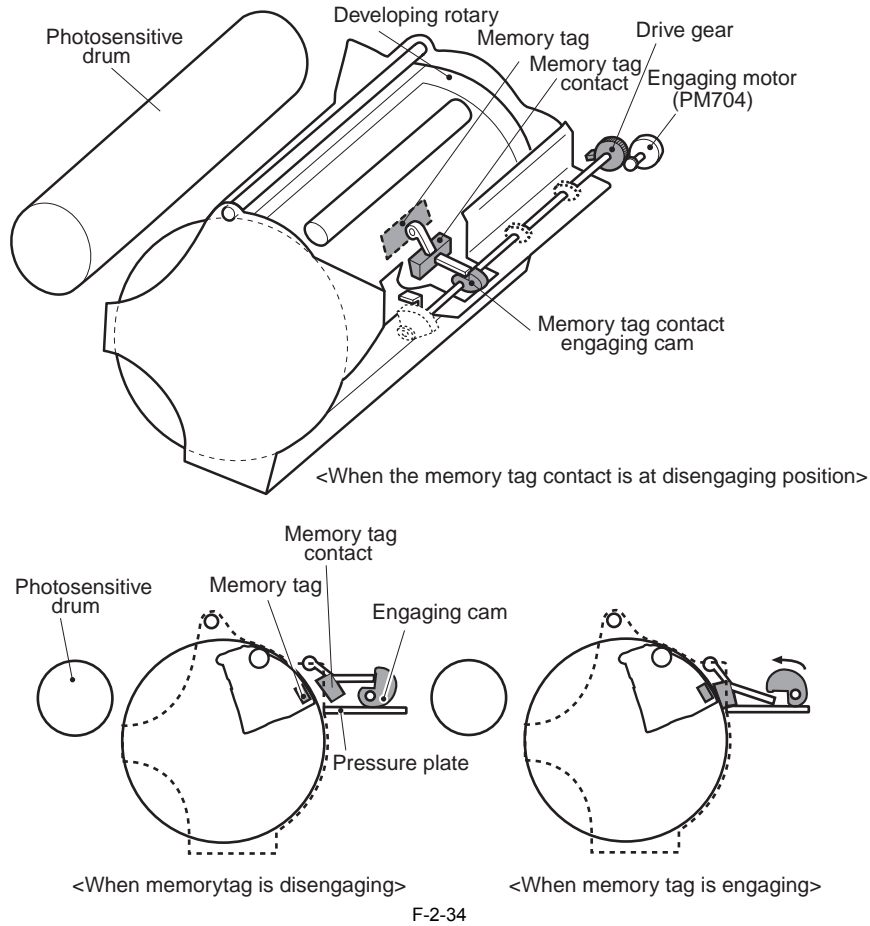
This control is utilized to contact memory tag contacts on the printer side with that on the toner cartridge side in order to enable communication between the memory tags in each toner cartridge and the printer.

The DCNT Board moves the memory tag contact to either of two positions, engaging position or disengaging position, by switching the rotational direction of the engaging motor (PM704).

At the time of memory tag contact engaging (travelling from a disengaging position to an engaging position), the DCNT Board rotates the engaging motor counterclockwise for a specified period. This allows the memory tag contact engaging cam to rotate. Then the contact is pressed out and engaged to the memory tag.

At the time of memory tag contact disengaging (travelling from an engaging position to a disengaging position), the DCNT Board rotates the engaging motor counterclockwise and instructs the reverse operation of the contact engaging. This allows the contact to be disengaged from the memory tag.

A mechanism used in this control is also used in a developing rotary engaging operation. The developing rotary position detection is also performed by the DCNT Board monitoring the rotary engaging sensor (PS712).



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2.3.5.4 Cartridge Presence Detection

This detection is utilized to detect the presence of the cartridge. When the power is turned on or the top cover is closed, the DCNT Board reads in data (cartridge ID) from the memory tags in each toner cartridge. When the DCNT Board successfully reads data, it determines a cartridge presence. If the DCNT Board determines a cartridge out, it notifies the error to the SCNT Board.

2.3.5.5 Toner Cartridge Life Detection

a. Outline

This detection is utilized to detect whether the toner cartridge has reached the end of its life. When the power is turned on or the top cover is closed, the DCNT Board monitors the following two items. It determines a toner cartridge end-of-life if either of the items reaches its specified value.

- a. Developing cylinder life (usage hour)
- b. Toner level

The life of the toner cartridge is indicated to the SCNT Board in 2 steps (warning, end of life); the printer engine will be stopped only when the end of life has been reached. The life of the developing cylinder and the level of remaining toner are checked as follows:

b. Developing cylinder life detection

The life of the developing cylinder is detected by the DCNT Board monitoring the cumulative usage hours of the developing cylinder, which stored in the memory tag.

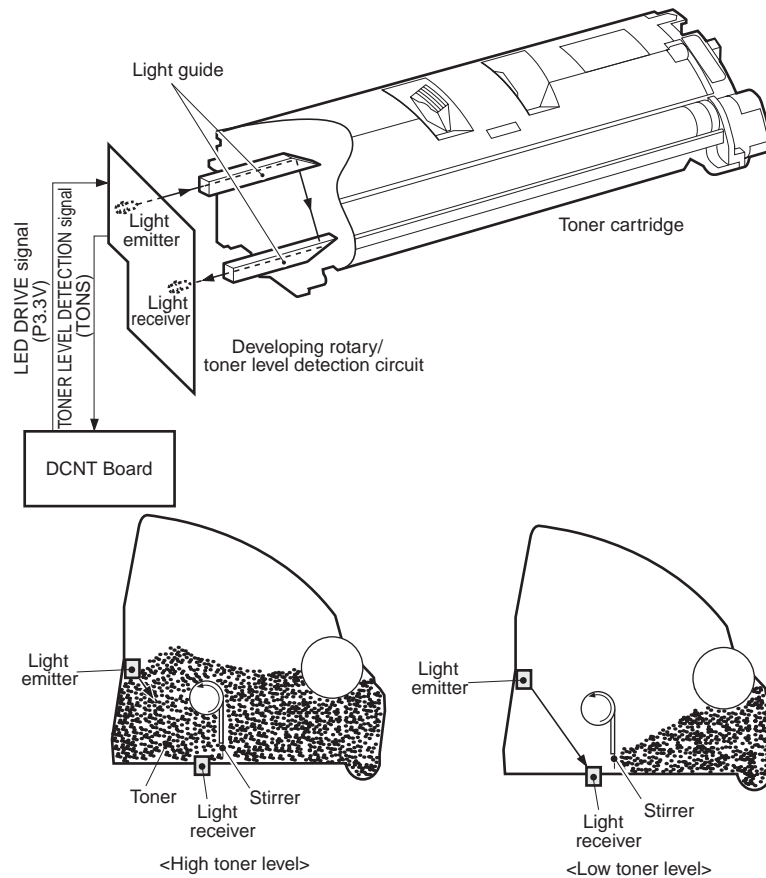
Developing cylinder usage hour (DC application time) data sent from the DCNT Board is written in the memory tag in the toner cartridge. The DCNT Board updates data with specified timing. If updated data, developing cylinder cumulative usage hours, reaches a specified value, the DCNT Board determines a developing cylinder end-of-life.

c. Toner level detection

This printer utilizes a through-beam sensor for toner level detection.

The toner level is detected by the DCNT Board monitoring the toner level detection unit structured with a light emitter (LED) and a light receiver (PD) (Note:1). After the start of a print operation, the DCNT Board emits light from the LED with the LED DRIVE (P3.3V) signal. The light emitted from the light emitter passes through the light guide in the cartridge and enters into the cartridge. The light passes through it and again the light guide. Then the light is detected at the light receiver and output as the TONER LEVEL DETECTION (TONS) signal to the DCNT Board. The DCNT Board detects the toner level from the cumulative detection time of the TONS signal during one rotation of the stirrer in the cartridge.

The DCNT Board determines that the toner level is low when the cumulative detection time of the TONS signal exceeds a specified value (Note:2).



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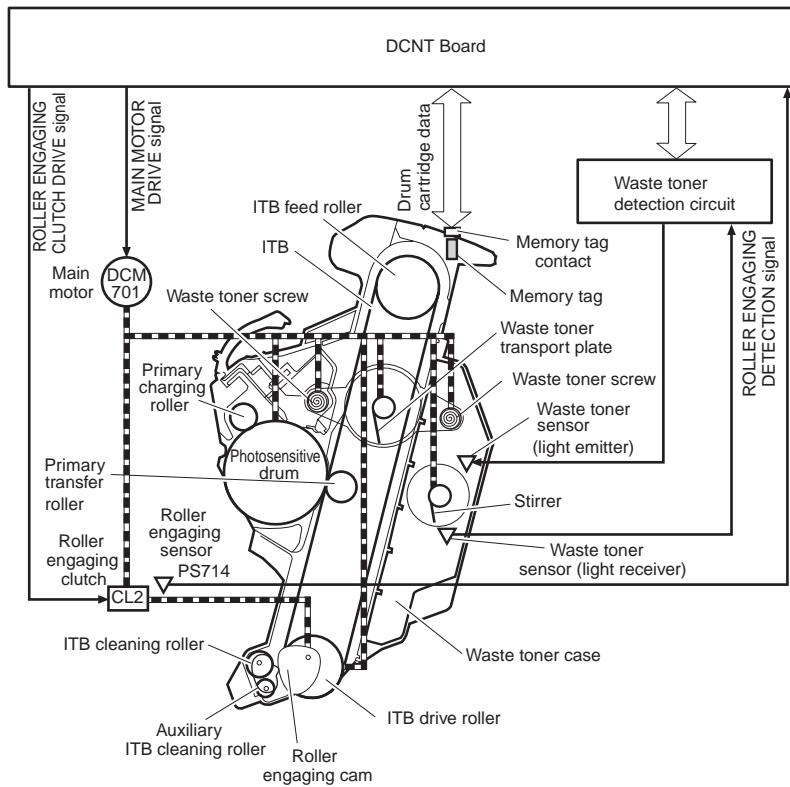
Note 1. In full-color printing, the detection is performed for the cartridges in each color. In monochrome printing, it is performed just for the Bk cartridge.
 Note 2. If the toner level written in the memory tag is lower than the detected toner level, data is not updated.

2.3.6 Drum Cartridge

2.3.6.1 Outline

The machine's drum cartridge is equipped with a mechanism that forms images on the ITB. The drum cartridge consists of a drum cartridge and an ITB unit constructed as a single entity.

The following shows the machine's cartridge and the arrangement of loads.



F-2-36

The cartridge consists of the photosensitive drum, primary charging roller, waste toner transport plate, etc. These parts are driven by the main motor (DCM701). This cartridge performs engaging operations for two rollers, the ITB cleaning roller and auxiliary ITB cleaning roller, with the DCM701. Position detection for these two rollers are performed with a common sensor.

A memory tag is installed into the drum cartridge. The memory tag contact makes contact with the memory tag in the cartridge constantly when the cartridge is installed in the printer.

The waste toner detection is performed by an LED (light emitter) and a photodiode (light receiver) on the waste toner detection circuit.

The functions and controls of the cartridge are discussed next.

2.3.6.2 Cleaning Roller Engaging Control

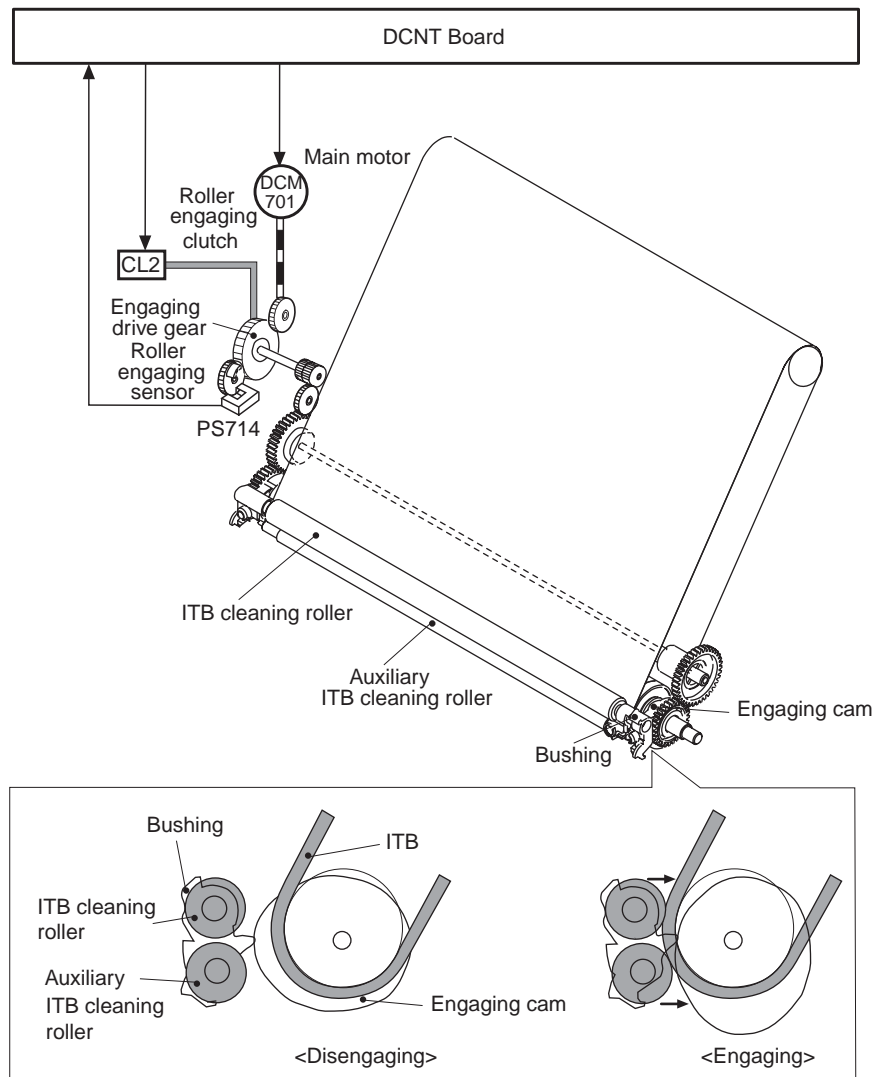
In this control, the two rollers, the ITB cleaning roller and auxiliary ITB cleaning roller, are engaged/disengaged from the ITB to clean residual toners on the ITB. The operations of this control are described in the following:

- 1) At printing, the DCNT Board checks that the two rollers, ITB cleaning roller and auxiliary ITB cleaning roller, are at their home positions (Note:1) in secondary transfer roller position detection.
 - 2) At the timing of the start of secondary transfer, the DCNT Board let out the roller engaging clutch (CL2). This transmits the drive of the main motor (DCM701) to the engaging cam.
- Then the roller bushing is pushed out and the two rollers start to engage to the ITB.
- 3) At this point, the DCNT Board is monitoring the output of the PS714, When the output becomes "L", it lets out the CL2. This allows the cam to stop and the two rollers to stop at each engaging position.
 - 4) After a print operation, the DCNT Board let in the CL2 again for 0.2 seconds. This disengages the two rollers from the ITB.
 - 5) The DCNT Board monitors the output of the PS 714, When the output becomes "L", it lets out the CL2. This allows the cam to stop and the two rollers to stop at each home position. Then, it is ready for the next print operation.



Note 1. The home positions of each roller are positions at where the rollers are disengaged from the ITB by the roller bushing.

Note 2. The operation of the engaging cam used in this control is also used in the secondary transfer roller engaging control.



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2.3.6.3 Memory Tag

The memory tag is a non-volatile memory built into the drum cartridge. It stores cartridge usage condition data. The DCNT Board detects drum cartridge usage conditions by reading and writing memory data.

A memory tag in the drum cartridge contacts with the memory tag contact constantly when the cartridge is installed in the printer.

After receiving memory data from the memory tag through the memory tag contact, the DCNT Board updates data with specified timing and rewrites it to the memory tag.

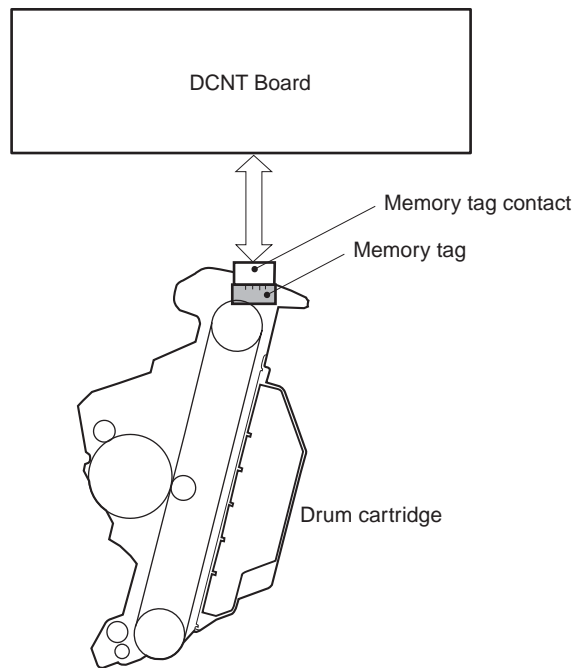
The DCNT Board instructs the memory tag to read or write under the following conditions:

<Read>

- Power is turned on.
- Top cover is closed.

<Write>

- After 50 papers printing.
- When a Change Has Occurred to the Data on the Lives of Parts.

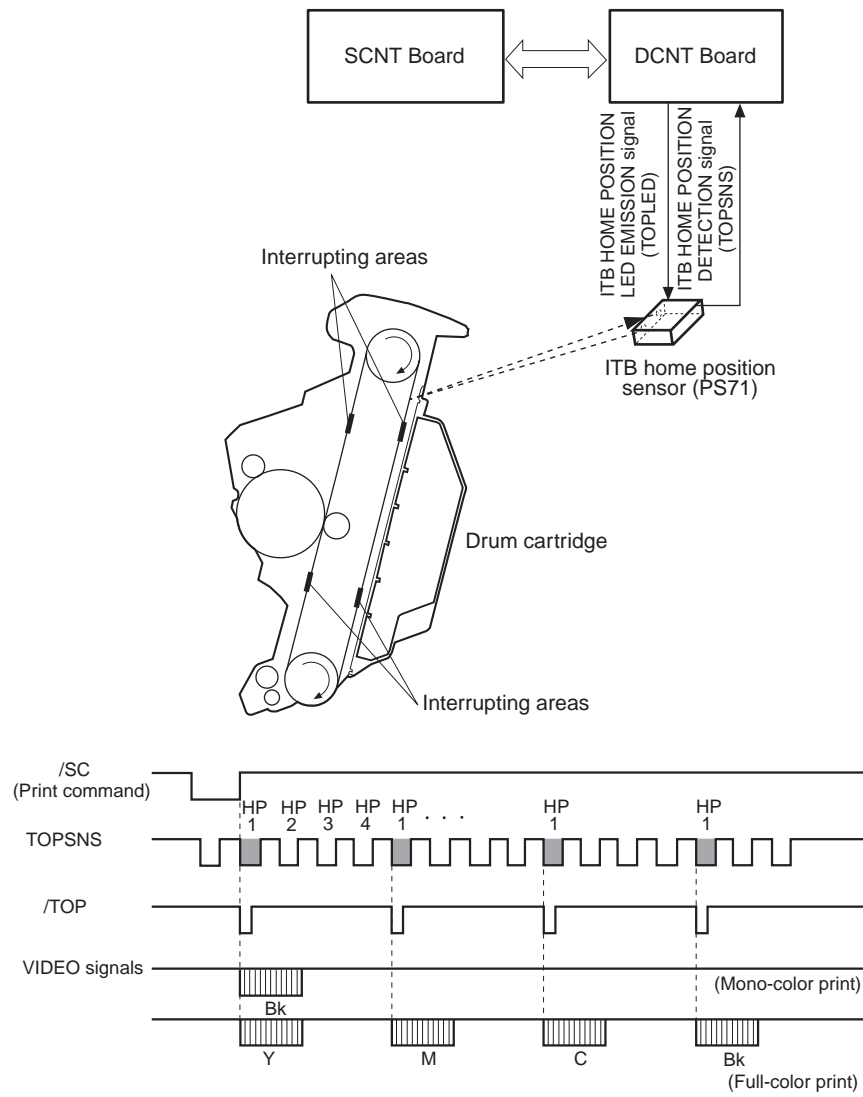


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2.3.6.4 Detecting the ITB Home Position

The machine checks the ITB home position to ensure the correct image write start position using the ITB home position sensor (PS71), which checks the position with reference to the home position detection faces (4 light-blocking faces) found on the edge of the ITB belt as follows:

- 1) When it receives the print command, the DCNT Board starts to rotate the ITB belt. When PS71 detects a light-blocking face, it sends TOPSNS to the DCNT Board.
- 2) The DCNT Board assumes the first TOPSNS signal to indicate the home position (HP1), and increases the count each time a new light-blocking face is detected (HP2, HP3, HP4).
- 3) In the case of full color operation, the DCNT Board uses these signals to generate the vertical sync signal (/TOP) 4 times, and sends them to the SCNT Board. Thereafter, the DCNT Board receives video data of each color from the SCNT Board 4 times, and draws images of individual colors on specific points on the ITB. The DCNT Board monitors the TOPSNS signal at all times, and will identify a fault in the ITB home position sensor in the event of the following condition; as a result, it will stop the printer engine and, at the same time, will communicate the nature of the fault to the SCNT Board.



F-2-39

2.3.6.5 Drum Cartridge Presence Detection

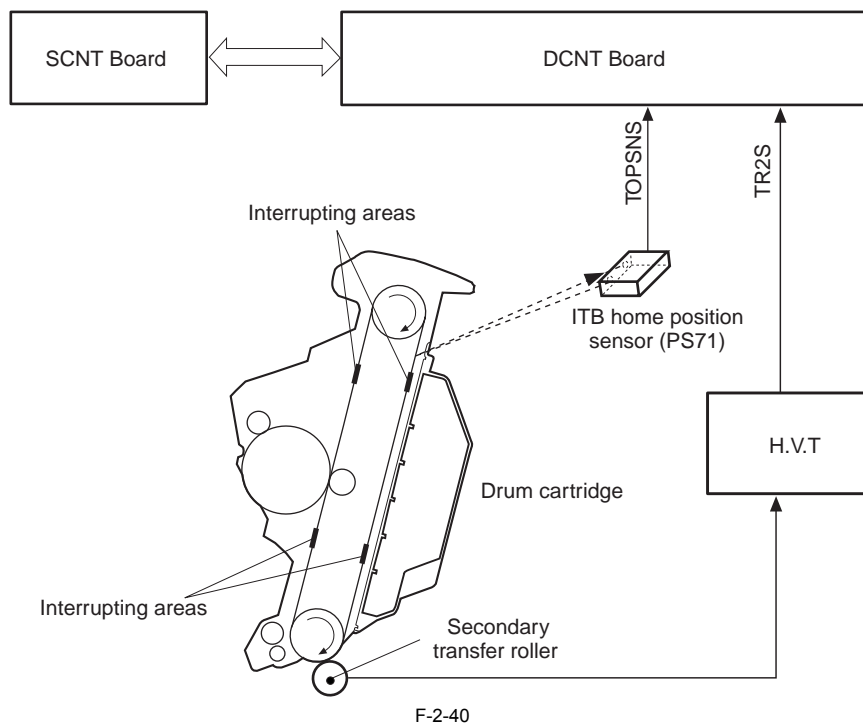
This detection is utilized to detect the presence of the drum cartridge.

When the power is turned on or the top cover is closed, the DCNT Board determines the presence or absence of the cartridge by monitoring the following two items:

- 1) PS71 (ITB HOME POSITION DETECTION signal) outputs "L" periodically.
- 2) Output results from the TR2 (FEED BACK signal for secondary transfer bias) exceed a specified value.

The DCNT Board determines a cartridge presence only when the three conditions above are satisfied.

When the DCNT Board determines a cartridge absence, it stops the printer engine and notifies a drum cartridge out to the SCNT Board.



2.3.6.6 Checking the Life of the Drum Cartridge

a. Outline

The machine uses the following mechanism to check the life of the drum cartridge.

When the power is turned on, the upper cover is closed, or a print job is over, the DCNT Board checks on the following 2 items, and will assume that the cartridge has reached the end of its life if any of them reaches a specific value:

- life of photosensitive drum (hours of use)
- amount of waste toner

The life of the drum cartridge is indicated to the SCNT Board in 2 steps (warning, end of life); the printer engine is stopped only when the end of life has been identified.

The following mechanisms are used to detect the end of life of the photosensitive drum and the level of waste toner:

b. End of Life of the Photosensitive Drum

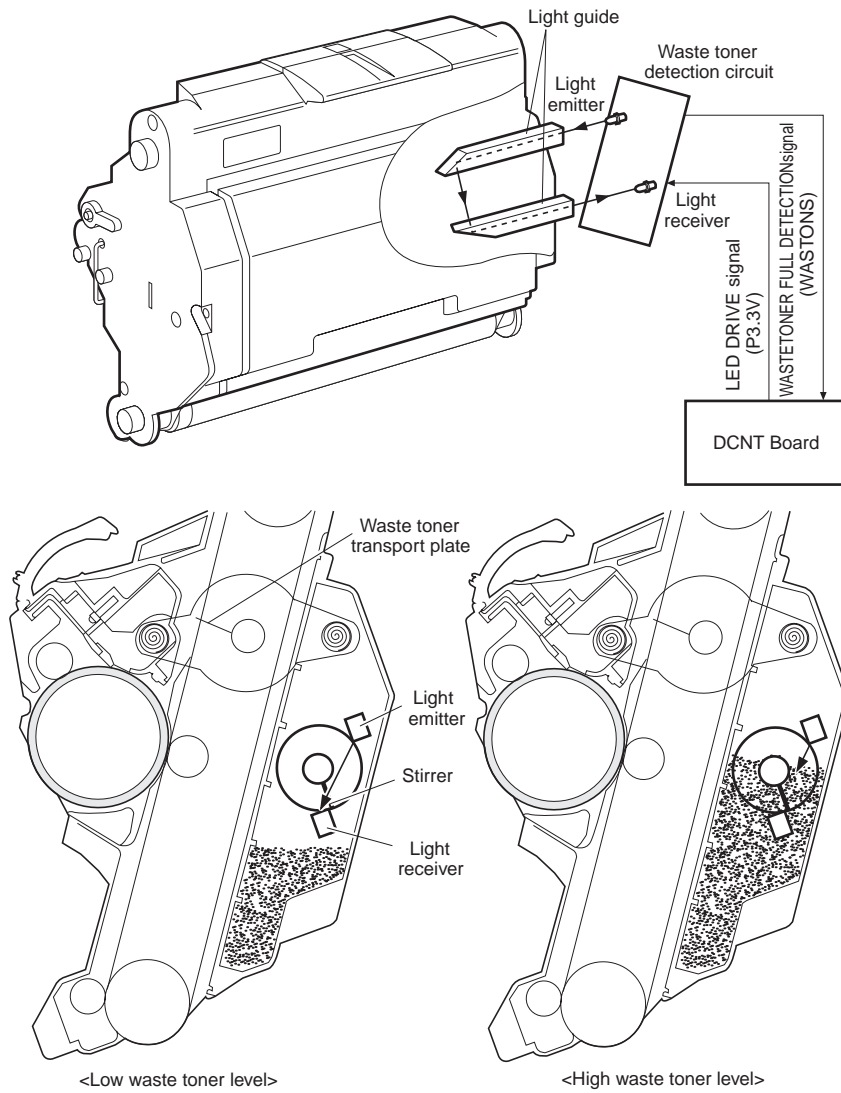
The end of life of the photosensitive drum is checked by the DCNT Board by monitoring how long the photosensitive drum has been used with reference to the data stored in the memory tag. The memory tag retains data on the period during which the photosensitive drum has been used (i.e., length of primary AC application + number of drum rotations) sent by the DCNT Board.

The DCNT Board updates the data each time the power is turned on, the upper cover is closed, or a print job is over; when the cumulative period of use reaches a specific level, it will identify the condition as indicating the need of replacement of the drum cartridge.

c. Waste Toner

The machine is equipped with a mechanism to find out when the cartridge becomes full of waste toner. The detection is undertaken by the DCNT Board by monitoring the output of the waste toner detection mechanism, which consists of a light-emitting member (LED) and a light-receiving member (PD) as well as a PCB. The DCNT Board causes the LED to emit light using the LED drive signal (P3.3V); the light from the light-emitting member reaches the cartridge along the light guide mounted to the cartridge. The light then moves through the cartridge, and is detected by the light-receiving member after passing along the light guide; the result is then sent to the DCNT Board in the form of the waste toner detection signal (WASTONS).

The DCNT Board checks the level of waste toner with reference to the cumulative period of WASTONS for each single rotation of the stirring plate inside the cartridge when the power is turned on, the upper cover is closed, or a print job is over, and will assume that the cartridge is full of waste toner if it finds that the level has reached a specific value.

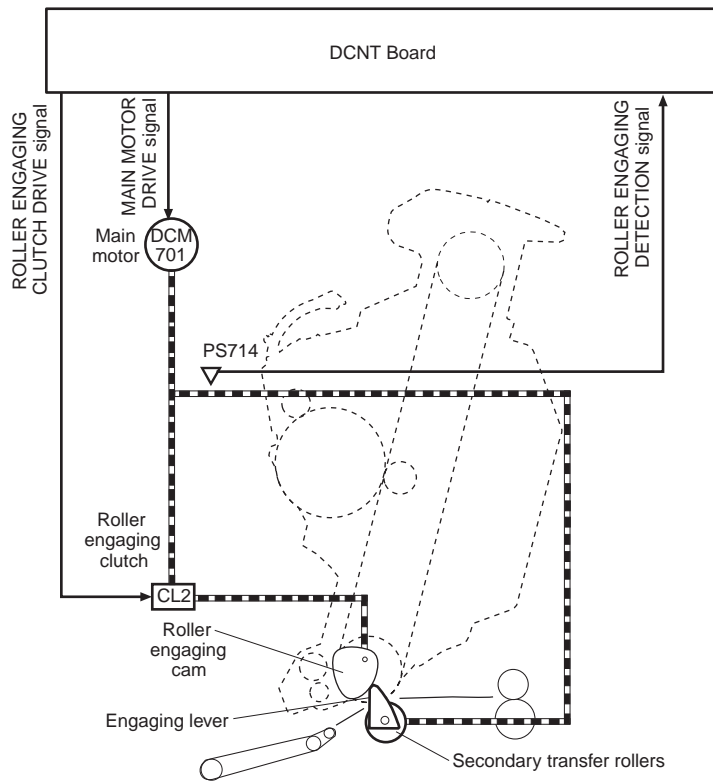


F-2-41

2.3.7 Secondary Transfer Mechanism

2.3.7.1 Outline

The transfer unit has a function of secondarily transferring the toner transferred primarily on the ITB onto paper. The unit is structured with the secondary transfer roller and engaging lever, which are operated by the main motor drive. The secondary transfer roller rotates by the motor drive. The engaging lever performs an engaging operation between the secondary transfer roller and ITB in roller engaging control.



F-2-42

2.3.7.2 Secondary Transfer Roller Engaging Control

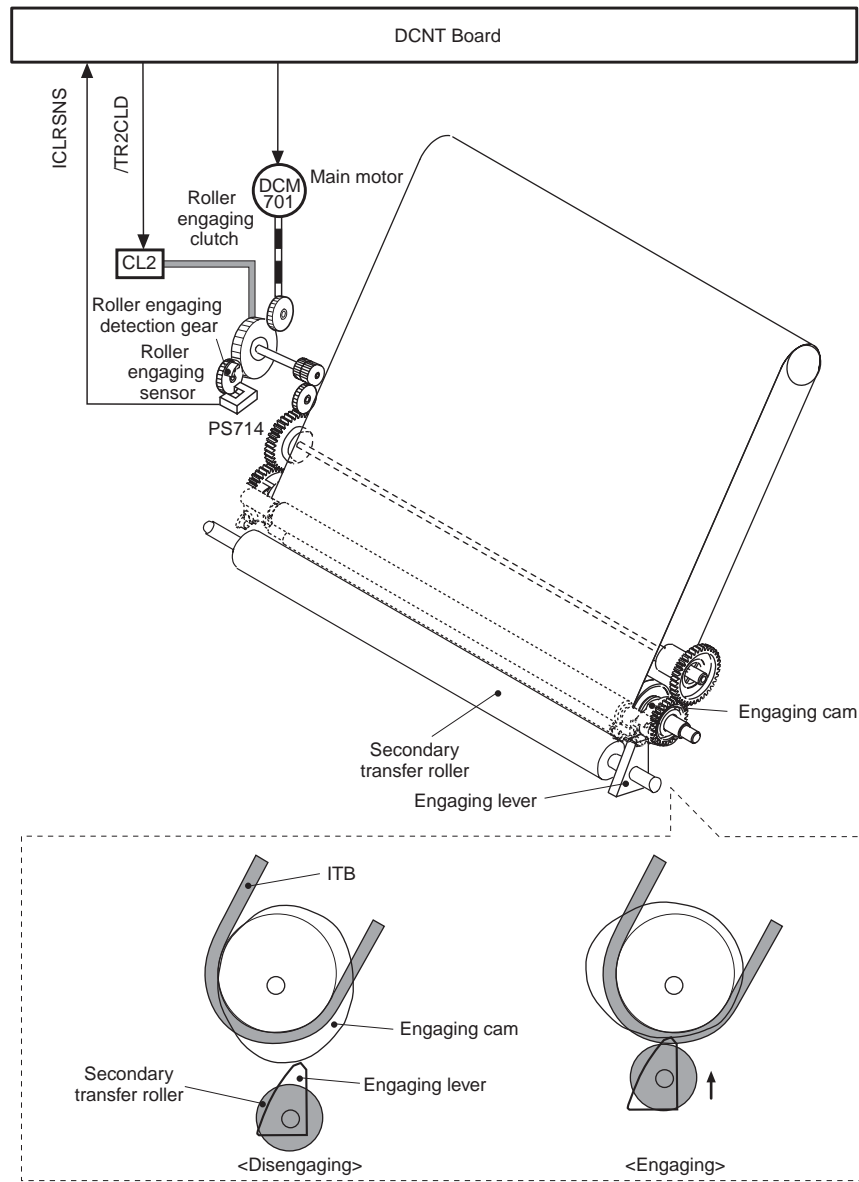
This control is utilized to perform an engaging/disengaging operation between the secondary transfer roller and ITB in order to transfer the toner on the ITB to paper. The operations of this control are described in the following:

- 1) At printing, the DCNT Board checks that the secondary transfer roller is at its home position (Note:1) in secondary transfer roller home position detection.
- 2) At the timing of the start of secondary transfer, the DCNT Board lets in the roller engaging clutch (CL2). This transmits the drive of the main motor (DCM701) to the engaging cam. Then the engaging lever is pushed out and the secondary transfer roller starts to engage to the ITB.
- 3) At this point, the DCNT Board is monitoring the output of the PS714. When the output becomes "L", it lets out the CL2. This allows the cam to stop and the secondary transfer roller to stop at its engaging position.
- 4) After a print operation, the DCNT Board lets in the CL2 again for 0.2 seconds. This disengages the secondary transfer roller from the ITB.
- 5) The DCNT Board monitors the output of the PS714. When the output becomes "L", it lets out the CL2. This allows the cam to stop and the secondary transfer roller to stop at its home position.



Note 1. The home position for the secondary transfer roller is the state in which it is disengaged from the ITB.

Note 2. The operation of the engaging cam used in this control is also used in the cleaning roller engaging control.



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2.3.7.3 Secondary Roller Position Detection

This printer has a function of detecting the engaging position of the secondary transfer roller between the roller and ITB. The home position of the roller is detected by the DCNT Board monitoring the roller engaging sensor (PS714) and FEEDBACK (TR2S) signal for the secondary bias.

The DCNT Board detects whether the roller is at its home position (Note) when the power is turned on or the top cover is closed. This detection is performed by a flag located at the end of the engaging detection gear interrupting the PS714. When the roller is at its home position, the PS714 outputs "L".

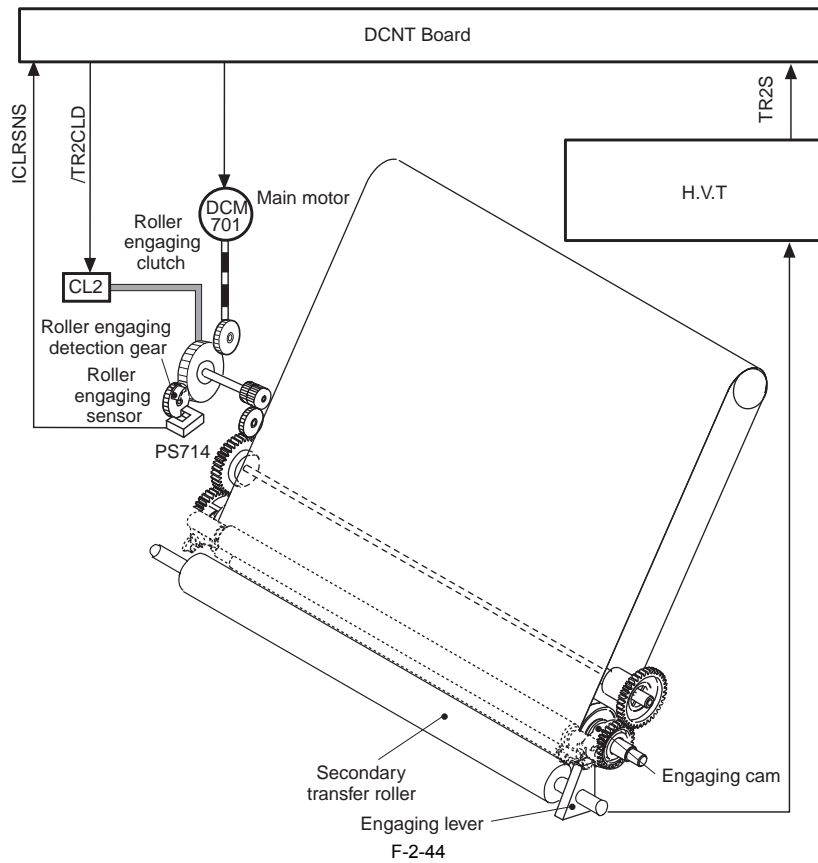
When the engaging detection gear is not at its home position; the PS714 is "H", the DCNT Board rotates the main motor and let in the roller engaging clutch (CL2) for a specified period to return the gear to its home position.

Then the DCNT Board detects the position of the secondary transfer roller, engaging and disengaging, by monitoring the FEEDBACK (TR2S) signal for the secondary transfer bias.

When the roller is at its engaging position, the resistance of the roller increases and the value of the TR2S signal decreases since the roller contacts with the ITB. When the roller is at a disengaging position, the resistance decreases and the value increases.

If the value of the TR2S signal does not vary when the CL2 is on, the DCNT Board stops the printer engine and notifies a secondary transfer roller engaging mechanism abnormality to the SCNT Board.

⚠ The home position for the secondary transfer roller is the state in which it is disengaged from the ITB.



2.4 Pickup and Feed System

2.4.1 Overview/Configuration

2.4.1.1 Overview

The pickup/feed system serves to pick up and move paper, and it consists of various feed rollers.

The machine possesses 2 inlet slots for paper (i.e., multifeder tray and paper feeder) and 2 outlet slots (face-up tray and face-down tray).

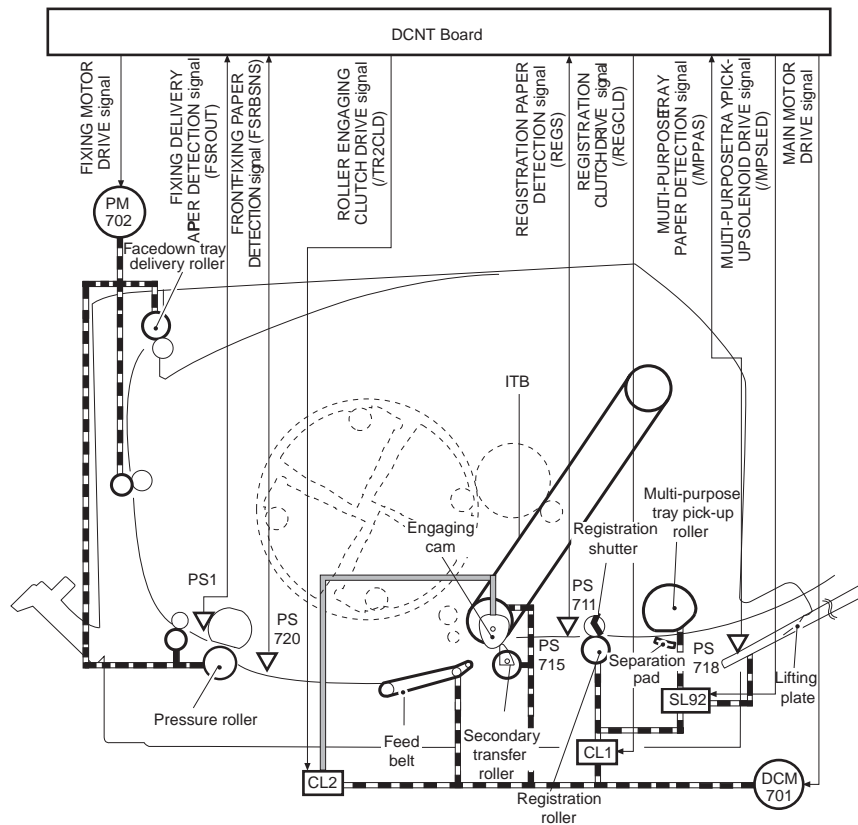
The presence/absence of paper is checked by the paper sensor (PS716, for the paper feeder) and by the multifeder paper sensor (PS718, for the multifeder tray).

The various feed rollers of the machine are controlled by the DCNT board, which governs 2 motors, 2 clutches, and 2 solenoids.

The paper path is equipped with 3 photointerrupters (PS1, PS711, PS717, PS720), checking to see whether paper has reached or moved past a specific sensor position.

If paper fails to reach or move past a specific sensor within a specific period of time, the CPU on the DCNT board will identify the condition as being a jam, and communicate the fact to the SCNT board.

The following is a diagram showing how the machine's motors, solenoids, and sensors are arranged:

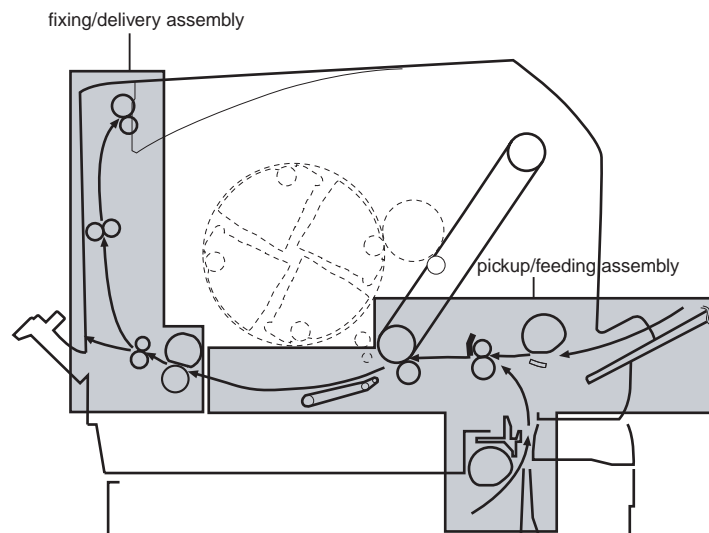


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PS1: Fixing delivery paper sensor
 PS711: Registration paper sensor
 PS718: Multi-purpose tray paper sensor
 PS720: Front fixing paper detection sensor
 DCM701: Main motor
 PM702: Fixing motor
 SL92: Multi-purpose tray pick-up solenoid
 CL1: Registration clutch
 CL2: Roller engaging clutch

The pickup/feed system can broadly be divided into the following 2 blocks:

- pickup/feeding assembly, i.e., between the pickup slot (multifeeder/feeder) and fixing assembly inlet
- fixing/delivery assembly, i.e., from fixing assembly to delivery slot



F-2-46

2.4.1.2 Pickup/Feeding Assembly

The pickup/feeding assembly consists of the following: the pickup assembly, which serves to pick up a single sheet of print paper from the cassette/multifeeder manual fee tray, and the feeding assembly, which serves to move the incoming paper as far as the fixing assembly. These 2 assemblies have the following functions:

- <Cassette>
1. picks up print paper from the cassette
- <Multifeeder>
1. picks up printed paper placed in the multifeeder tray
- <paper path>
1. corrects the movement of paper by removing skew
 2. controls the speed at which paper is moved to suit paper type

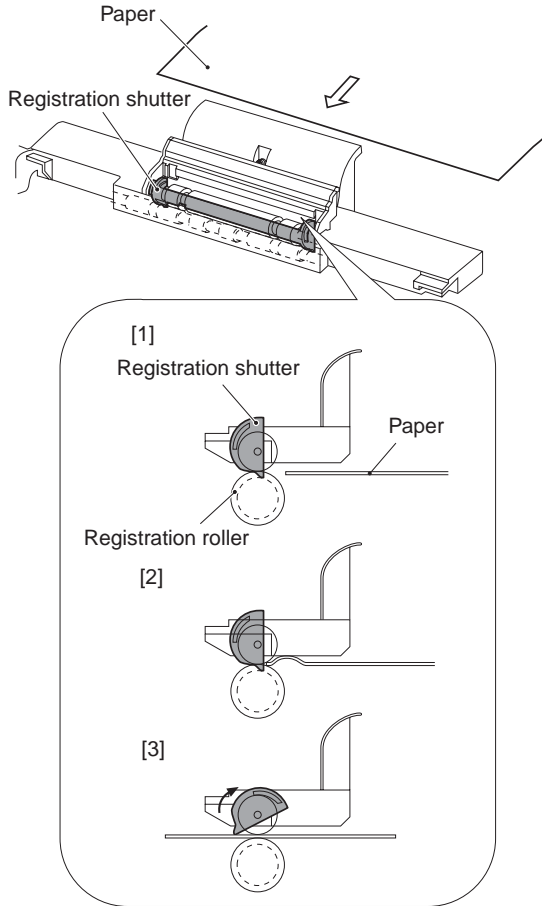
3. controls the speed at which paper is moved to suit the temperature inside the machine

2.4.2 Other Control

2.4.2.1 Skew Correction Function

This function is utilized to correct the skew of the paper to be fed, using the registration shutter method. The operations of this function are discussed below.

When paper is fed to the registration roller, the leading edge of paper is pushed against the registration shutter to correct a skew (1). Paper is warped as the feed roller keeps pushing it when it is pushed against the shutter (2). The shutter is lifted up by the stiffness of paper as paper warps, and paper passes through the shutter (3). It allows the skew of paper to be corrected.



F-2-47

2.4.2.2 Feed Speed Control

In this control, a feed speed is changed based on the types of the fed paper in order to prevent fixing defects. The DCNT Board changes a feed speed in two levels based on a paper type specification command sent from the SCNT Board. Types of paper and their feed speeds are indicated below.

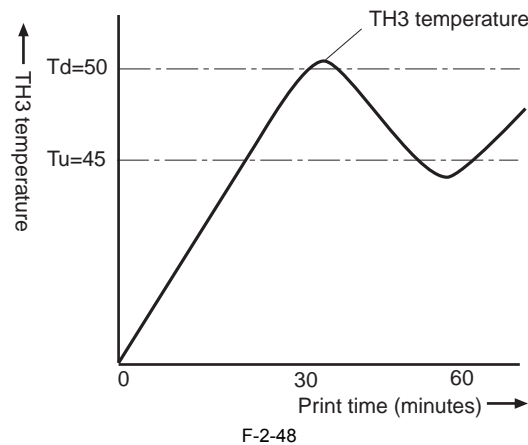
T-2-6

Media type	Print type	Feed speed	
Plain paper	Full-color	Normal speed	
	Mono-color		
Heavy paper	Full-color		
	Mono-color		
OHP sheet	-----		
	Mono-color		
Thick paper	Full-color		
	Mono-color		
Special paper	Full-color		Half speed
	Mono-color		
Envelope	Full-color		
	Mono-color		
Label	Full-color		
	Mono-color		

2.4.2.3 Detecting the Machine Inside Temperature

As a means to prevent overheating inside the machine, the machine is equipped with a thermistor (TH3) used to detect the temperature inside the machine (found near the toner cartridge motor).

If the STNT board finds that the machine inside temperature has exceeded an upper limit (Td) at time of continuous printing/copying, it will increase the distance between sheets to prevent overheating. If the temperature falls below a specific level (Tu), on the other hand, it changes the sheet-to-sheet distance to normal.



2.4.3 Detection Jams

2.4.3.1 Jam Detection Outline

2.4.3.1.1 Outline

0007-4990

To detect the presence of paper and whether paper has been correctly fed, the following paper sensors are provided:

- Registration sensor (PS711)
- Fixing delivery paper sensor (PS1)
- Fixing front paper sensor (PS720)
- paper feed sensor (PS717)

The CPU in the DCNT Board determines whether a paper jam has occurred by checking for the presence of paper at the sensor unit at the timing stored in the CPU. If the CPU determines a jam, it stops a print operation and notifies the jam occurrence to the SCNT Board.

Occurrence timings for each jam are listed below. A specified period is timed at a normal speed (1/1-speed).

2.4.3.2 Delay Jams

2.4.3.2.1 Pickup Delay Jam

0007-4991

If the leading edge of paper does not reach the registration sensor (PS711) within a specific period of time (T) after the start of pickup (i.e., the clutch or the solenoid at the inlet slot goes on), the CPU will identify the condition as being a pickup delay jam.

T = about 1.1 sec (multifeeder tray) or about 1.7 sec (250-sheet feeder)

2.4.3.2.2 Delivery Delay Jam

0007-4992

When the leading edge of paper does not reach the fixing delivery paper sensor (PS1) within a specified period (t) after the start of a re-pick-up operation (the registration clutch is on), the CPU determines a delivery delay jam.

t = Approx. 2.3 seconds.

2.4.3.3 Stationary Jams

2.4.3.3.1 Pick-up Stationary Jam

0007-4993

When the trailing edge of paper does not pass the registration sensor (PS711) within a specified period (t) after the start of a re-pick-up operation (the registration clutch is on), the CPU determines a pick-up stationary jam.

t = Approx. 3.4 seconds.

2.4.3.3.2 Delivery Stationary Jam

0007-4994

When the leading edge of paper does not pass the fixing delivery paper sensor (PS1) within a specified period (t) after it has passed the registration sensor (PS711), the CPU determines a delivery stationary jam.

t = Approx. 2.4 seconds.

2.4.3.4 Other Jams

2.4.3.4.1 Fixing Unit Wrapping Jam

0007-4995

CPU detects fixing unit wrapping jam, when there are any print papers inside the fixing front paper sensor when turning on the power or after closing the upper cover.

2.4.3.4.2 Door Open Jam

0007-4996

When the top cover is opened during a print operation, the main CPU determines a door open jam.

2.4.3.4.3 Residual Paper Jam

0007-4997

The CPU determines a residual paper jam under the following conditions:

- Power is turned on.
- Returned from the sleep status.
- Door is closed after a jam occurrence.
- Registration sensor (PS711) and fixing delivery sensor (PS1) detect paper.

2.4.4 Cassette Pickup Unit

2.4.4.1 Pickup from the Cassette

When the cassette is used as the source of paper, the machine operates as follows to make sure that a single sheet of paper is picked from the cassette:

1. When the SCNT board sends the pickup command, the DCNT board drives the main motor (DCM701) in response.
2. A specific period of time after the main motor (DCM701) starts to rotate, the cassette pickup solenoid (SL9) goes on.
3. The cassette pickup roller starts to rotate, thereby picking up paper and moving it to the inside of the machine.
4. The separation pad makes sure that no more than a single sheet of paper is picked up. The paper is then moved as far as the registration roller.
5. When the paper reaches the registration roller, the registration shutter makes sure that it is not askew. The paper is then moved at a speed suited to its type as instructed by the SCNT board.
6. Thereafter, the ITB home position detection mechanism goes on, and the DCNT board turns on the registration clutch (CL1). As a result, the drive of the motor (DCM701) reaches the registration roller, and the print paper is moved to the secondary transfer roller.
7. The DCNT board uses the secondary transfer roller shift mechanism to lock the secondary transfer roller to the ITB. At the same time, the roller shift clutch (CL2) goes on so that the drive of the motor (DCM701) reaches the secondary transfer roller. The toner image on the ITB is then transferred to the print paper, which thereafter is moved to the fixing/delivery assembly.

2.4.5 Manual Feed Pickup Unit

2.4.5.1 Multi-purpose Tray Pick-up

When printing from the multi-purpose tray, paper on it is fed into the printer one by one.

The following describes the multi-purpose tray pick-up operation:

- 1) When a print command is input from the SCNT Board, the DCNT Board drives the main motor (DCM701) to rotate the ITB.
- 2) Within a specified period after the start of the DCM701 rotation, the multi-purpose tray pick-up solenoid (SL92) goes on.
- 3) After a lifting plate for the multi-purpose tray has moved up, the multi-purpose tray pick-up roller starts to rotate. This allows paper on the tray to be fed into the printer.
- 4) After a multiple-fed paper is removed with the separation pad, paper is sent to the registration roller.
- 5) After the skew of paper is corrected with the registration shutter, a feed speed is changed based on a paper type specified from the SCNT Board in feed speed control.
- 6) Then, the SCNT Board lets in the registration clutch (CL1) within a specified period in ITB home position detection function. This allows the drive of the DCM701 to transmit to the registration roller and paper to be fed to the secondary transfer roller.
- 7) The SCNT Board presses the secondary transfer roller shift mechanism against the ITB in secondary transfer roller engaging control. Simultaneously, it lets in the roller-engaging clutch (CL2). This allows the drive of the DCM701 to transmit to the secondary transfer roller. Toner is transferred onto paper on the ITB and paper is fed to the fixing/delivery unit.

2.5 Fixing Unit

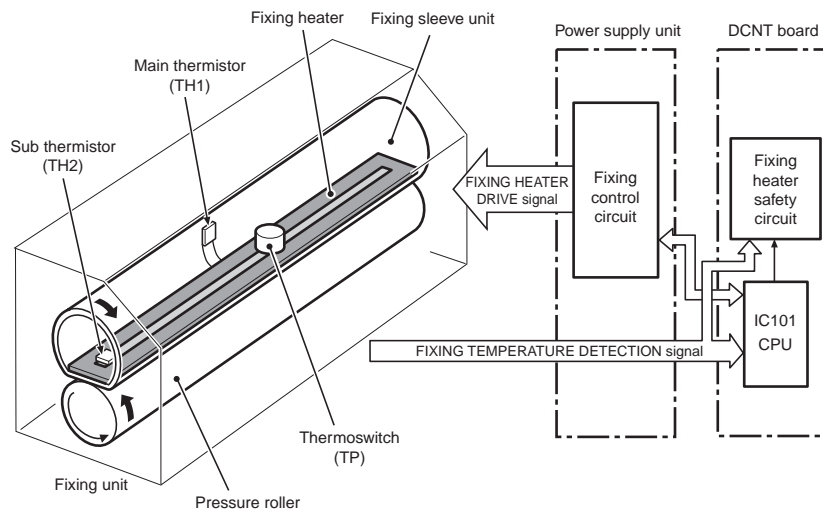
2.5.1 Overview/Configuration

2.5.1.1 Outline

This printer utilizes an on-demand fixing method which is configured as shown in the figure below.

T-2-7

- Heater:	
	One heater is utilized in the fixing unit. Fixing heater (H1): For fixing film heating (ceramic heater)
- Thermistors:	
	Two thermistors are utilized in the fixing unit. Main thermistor (TH1): For fixing heater temperature control (contact thermistor) Sub thermistor (TH2): For fixing heater temperature rise detection at its end (contact thermistor)
- Thermoswitch:	
	One thermoswitch is placed on top of the fixing heater (non contact type). When the fixing heater is abnormally overheated, the switch opens and cut off the power supply to the heater.



F-2-49

This control circuit has the following four controls and functions:

- Heater temperature control-Maintains the fixing heater at a specified temperature.
- Flicker prevention function-Prevents flicker caused by attaching lighting apparatuses to the power source to which the printer is connected.
- Protective function-Shuts off the power supply to the fixing heater when the heater is overheating.
- Failure detection-Monitors the abnormalities of the fixing unit and when an abnormality occurs, shuts off the heater and notifies it to the video controller.

The controls and functions in the fixing control circuit are described next.

2.5.2 Various Control Mechanisms

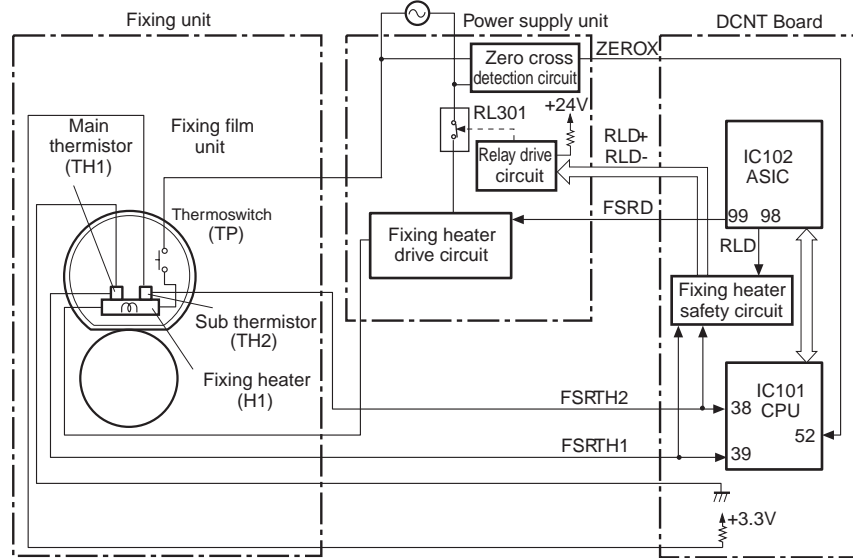
2.5.2.1 Controlling the Temperature of the Fixing Unit

2.5.2.1.1 Heater Temperature Control

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This function detects an abnormal temperature rise of the heater and shuts the heater off.

This printer utilizes three protective functions performed by the following parts, to prevent an abnormal temperature rise of the heater:



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The fixing heater temperature is monitored by two thermistors: the main thermistor (TH1) and the sub thermistor (TH2).

The TH1 is to control the print temperature and between-sheets temperature. It is placed contacting inside surface of the fixing sleeve and monitors the sleeve temperature. The TH2 is to control the start-up temperature. It is in contact with the fixing heater and detects the temperature rise at the end. As the surface temperature of the fixing heater rises, the resistances of both thermistors reduce and the voltage of the FIXING HEATER TEMPERATURE DETECTION signals (FSRTH1, FSRTH2) varies in analog form.

The CPU (IC101) in the DCNT board monitors the voltage of these two signals (FSRTH1, FSRTH2) and accordingly outputs the FIXING HEATER DRIVE signal (FSRD). Based on this signal the fixing heater drive circuit controls and maintains the fixing heater at the specified temperature.

This control system is divided into the following five fixing sequences.

1) Start-up temperature control

This control is to determine the start-up temperature of the fixing heater according to its temperature (detected by TH2) upon energization. If the heater is energized within 30 seconds after a print is completed, the start-up temperature is determined according to the last printing temperature.

The fixing heater on for a specified time before it drives the feed motor if the heater temperature is below 55 deg C at the start of fixing heater drive (detected by TH2). It drives the motor after the fixing heater is left on for the prescribed time period.

2) Print temperature control

This control is to maintain the fixing heater at the target temperature during printing. The CPU raises the target temperature in stages in one printing process to prevent the temperature fall of the fixing sleeve as the paper goes through. The target temperature varies in stages depending on the number of print if continuous printing and it differs depending on the color of print (monochrome or colors) and the media type.

3) Between-sheets temperature control

This control is to make the temperature of the fixing heater lower than the target temperature during continuous printing to prevent the temperature rise of the fixing sleeve between sheets. The between-sheets temperature varies depending on the distance between two sheets and media type.

4) Throughput control

This control is to prevent the overheating at both ends of fixing sleeve unit during continuous printing of a narrow paper. For a continuous printing, this CPU decreases the throughput by extending the paper pick-up intervals if the sub thermistor reads over 270 deg C and the paper width is narrower than 210mm, or the sub thermistor reads over 280 deg C independent of the paper width.

2.5.3 Protection Function

2.5.3.1 Flicker prevention function

This function is utilized to prevent flicker caused by attaching lighting apparatuses to the AC power source to which the printer is connected.

The heater drive circuit uses a triac to switch AC power. If the user connects lighting apparatuses to the power supply, to which the power connector is connected, the current flowing into the heater increases. This decreases the voltage level of the AC line and results in flicker.

To prevent flicker, the printer utilizes a zero cross circuit that monitors the AC line voltage. The CPU detects ZERO CROSS DETECTION (ZEROX) signal to optimize the timing to energize the heater.

2.5.3.2 Protective Function

This function detects an abnormal temperature rise of the heater and shuts the heater off.

This printer utilizes three protective functions performed by the following parts, to prevent an abnormal temperature rise of the heater:

- 1) CPU
- 2) Fixing heater safety circuit
- 3) Thermoswitch

Each protective function will be discussed in the following:

1) Protective function by the CPU

The CPU monitors the output voltages (FSRTH1, FSRTH2) of the main/sub thermistors. If the FSRTH1 is approx. 0.77 V or less (equivalent to 245 deg C or higher), or the FSRTH2 is approx 2.9 V or higher (equivalent to 290 deg C or higher), the CPU determines a fixing unit failure and executes the following:

1. Sets the FIXING HEATER DRIVE (FSRD) signal "L" through the ASIC and shuts off the heater.
2. Sets the RELAY DRIVE (RLD) signal "L" through the ASIC.
3. Sets the RELAY DRIVE (RLD-) signal "L" through the fixing heater safety circuit.
4. Turns off the relay (RL301) through the relay drive circuit and shuts off the heater.

2) Protective function by the fixing heater safety circuit

This circuit monitors the output voltages (FSRTH1, FSRTH2) of the main/sub thermistors.

When the FSRTH1 is approx. 0.5 V or less (equivalent to 280 deg C or higher), or the FSRTH2 is approx 3.0 V or higher (equivalent to 315 deg C or higher), the relay (RL301) is turned off and the heater is shut off.

3) Protective function by the thermoswitch

The thermoswitch (TP) gets disconnected to interrupt the current to the fixing heater when it reads the temperature of over 250 deg C (Note) due to an abnormal temperature rise of the fixing heater.



The thermoswitch is placed away from the fixing heater. The actual temperature of the fixing heater is higher than the thermoswitch reading.

2.5.3.3 Fixing Unit Failure Detection

The CPU determines fixing unit failures under the following conditions 1) - 3), turns off the relay (RL301), shuts off the heater, simultaneously notifies the failure to the SCNT board:

1) Abnormal high temperature

* Abnormal high temperature on the main thermistor

If the main thermistor continuously reads 245 deg C or higher for minimum 1 second, the CPU judges it abnormally high.

* Abnormal high temperature on the sub thermistor

If the sub thermistor continuously reads 290 deg C or higher for minimum 1.5 seconds, the CPU judges it abnormally high.

2) Abnormal low temperature

* Low temperature during temperature control

If the main thermistor continuously detects below 100 deg C for minimum 1 second during the print temperature control and between-sheets temperature control, the CPU judges it abnormal.

* Abnormal low temperature on the sub thermistor

If the sub thermistor continuously reads below 75 deg C for minimum 2 seconds after 20 seconds from when the heater is energized, the CPU judges it abnormal.

* Break during start-up in the sub thermistor

If the sub thermistor continuously reads below 40 deg C for minimum 1 second after the heater is energized, the CPU judges that the sub thermistor has a break.

* Break in the main thermistor

If the main thermistor continuously reads below 40 deg C for minimum 0.5 second after the start-up temperature control, the CPU judges that the main thermistor has a break.

* Break in the sub thermistor

If the sub thermistor continuously reads below 40 deg C for minimum 0.5 second after the start-up temperature control, the CPU judges that the sub thermistor has a break.

3) Start-up abnormality

* Start-up abnormality 1

If the main thermistor continuously reads below 120 deg C for minimum 1 second after 20 seconds from when the heater is energized, the CPU judges it abnormal.

* Start-up abnormality 2

If the main thermistor reading never exceeds 5 deg C below the target temperature of temperature control within 75 seconds from when the heater is energized, the CPU judges it abnormal.

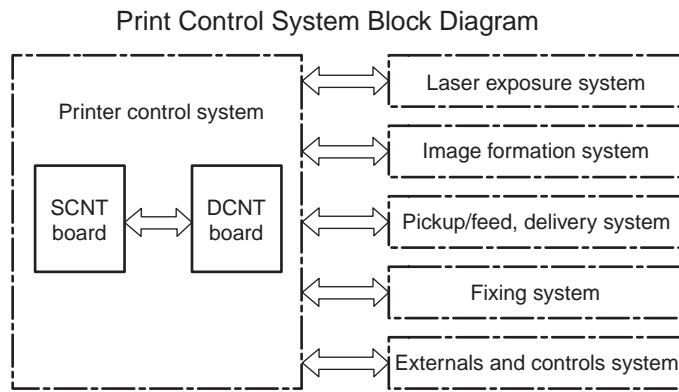
2.6 Engine Control System

2.6.1 Construction

2.6.1.1 Overview

The printer control system controls the laser exposure system, image formation system, pickup/feed system, delivery system, fixing system, and control system. The printer control system consists of 2 boards: DCNT board and SCNT board.

The following is a block diagram of the printer control system; a brief description of individual circuits follow:



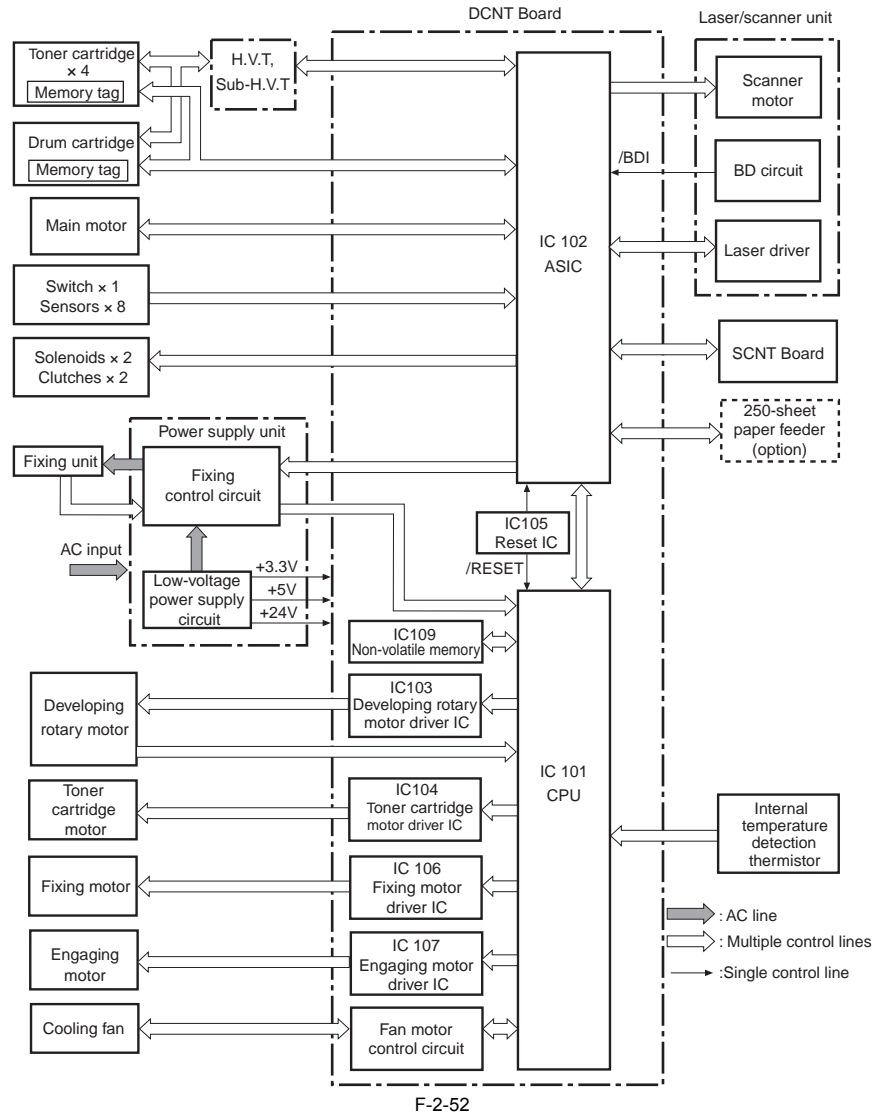
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2.6.2 DC Controller (DCNT)

2.6.2.1 Outline

The DCNT Board, which is controlled by the CPU in it, controls operation sequences for the printer.

When the power is turned on and DC power is supplied from the power supply unit to the DCNT Board PCB, the CPU starts to control the operations of the printer. Then, when the printer enters the standby status, the CPU drives loads such as the laser diodes, motors, solenoids, etc. based on a print command and image data input from the interface controller.



2.6.2.2 Operations

a. CPU (IC101)

A 16-bit single-chip microcomputer is used for a CPU. It has a built-in ROM and RAM. It controls the following operations according to a program stored in the ROM:

- 1) Printer engine sequence control
- 2) Drive controls for the developing rotary motor, toner cartridge motor, fixing motor, engaging motor
- 3) Drive control for the cooling fan
- 4) Internal temperature detection thermistor control
- 5) Reading/writing to the non-volatile memory

b. ASIC (IC102)

The ASIC (Application Specific IC) is an IC used for interface of IC, memory, external device, etc. It controls the following operations according to the CPU:

- 1) Laser/scanner control
- 2) Control of communications with the interface controller
- 3) Power supply unit (fixing control circuit, low-voltage power supply circuit) control
- 4) High-voltage power supply PCB control
- 5) Drive control for the main motor
- 6) Sensor/switch controls
- 7) Clutch/solenoid controls
- 8) Reading/writing to the memory tag
- 9) 250-sheet paper feeder (option) control

c. Reset IC (IC105)

It monitors +3.3 V and resets the CPU and ASIC when the power is turned on.

d. Non-volatile memory (IC109)

It stores backup data.

e. Developing rotary motor driver IC (IC103)
It controls the developing rotary motor.

f. Toner cartridge motor driver IC (IC104)
It controls the toner cartridge motor.

g. Fixing motor driver IC (IC106)
It controls the fixing motor.

h. Engaging motor driver IC (IC107)
It controls the engaging motor.

i. Fan motor control circuit
It controls the cooling fan motor.

2.6.2.3 Controlling the Motors and Fans

The machine uses several motors, consisting of 5 DC motors and 4 stepping motors. Of the DC motors, one is used in the reader system, one for the image formation system, and two for the image formation/paper feed system, with the remaining one used as a fan motor serving to cool the inside of the machine. As for the stepping motors, 2 are used in the reader system, another 2 are used in the image formation system.

The machine is designed to deposit toners of different colors on its intermediate transfer belt. It is important that all these deposits fall at exact points, and minute changes in the speed of motors can well cause displacement of resulting colors. The machine's DC motor used for image formation, for this reason, is controlled to an extremely high level of accuracy for its rotation speed.

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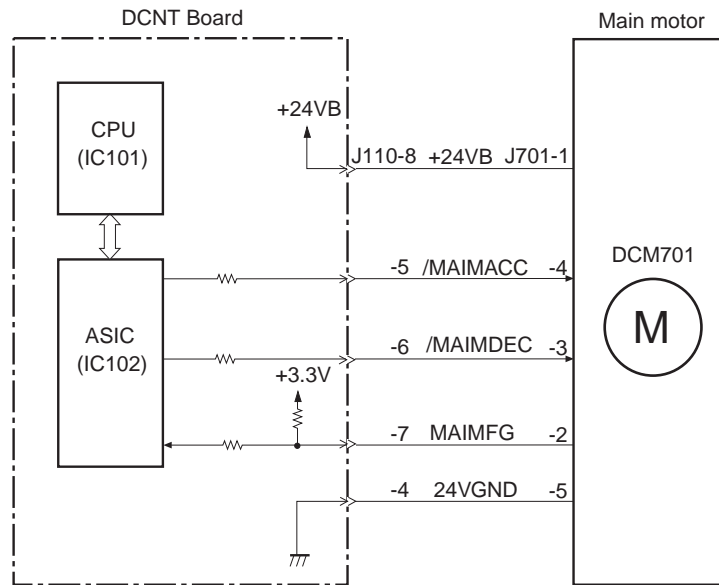
Name	Functions	Type	Direction of rotation	Speed	Fault detection
Main motor (DCM701)	drives the following: multifeed pickup roller, registration roller, photosensitive drum, secondary transfer roller, ITB, feed belt, holding plate, waste toner feedscrew	DC motor	normal	3-speed control full speed, 1/2 speed	yes
Developing rotary motor (DCM703)	drives the developing rotary	DC motor	normal	1-speed control	yes
Fixing motor (PM702)	drives the pressure roller, face-down delivery roller	DC motor	normal	3-speed control full speed, 1/2 speed	yes
Shift motor (PM704)	locks and unlocks the developing cylinder to and from the photosensitive drum; locks and unlocks the memory tag contact (toner cartridge) and the machine contact	stepping motor	normal/reverse	1-speed control	no
Toner cartridge motor (PM705)	drives the developing cylinder, toner stirring plate	stepping motor	normal	1-speed control	no
Cooling fan (FM721)	cools the areas near the fixing assembly, low-voltage power supply, high-voltage power supply, cartridge	DC motor	-	1-speed control	yes
Document feed motor (DCM706)	drives the various rollers of the ADF	stepping motor	normal	1-speed control	no
Flatbed motor (DCM707)	drives the CCD unit	stepping motor	normal/reverse	1-speed control	no
Reader Cooling fan (FM722)	serves as the reader unit cooling fan	DC motor	-	1-speed control	no

2.6.2.4 Main Motor Control

This control is utilized to drive the main motor (DCM701).

The DCM701, a three-phase, eight-pole DC motor with a built-in drive circuit, drives each roller used for paper feed and image formation. The DCNT Board drives the motor by controlling the MAIN MOTOR ACCELERATION (/MAIMACC) signal and MAIN MOTOR DECELERATION (/MAIMDEC) signal.

The illustration below shows the control circuit of the motor.



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The operations of the main motor are discussed next.

The CPU in the DCNT Board rotates the motor by setting the /MAIMACC signal "L" through the ASIC. The CPU monitors the MAIN MOTOR SPEED DETECTION (MAIMFG) signal. The CPU out-puts the /MAIMACC signal when the motor does not reach specified revs, and outputs the/MAIMDEC signal when it exceeds a specified rev. Then, the CPU controls these signals to adjust the motor revs to a specified value. The CPU determines a main motor failure, then stops the printer engine, and notifies the failure to the video controller, under the following conditions:

- 1) The period of the MAIMFG signal does not satisfy a specified period within 100 ms after the start of main motor drive.
- 2) The period of the MAIMFG signal goes out of a specified period continuously for more than 1 seconds after it once reaches the value.

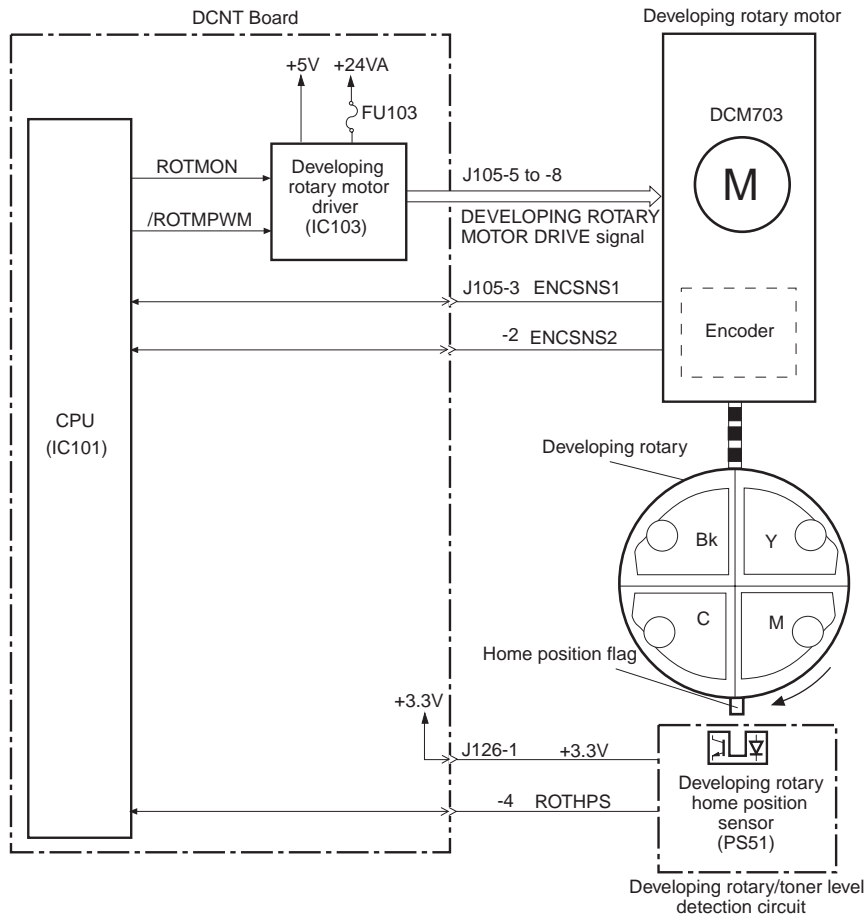
2.6.2.5 Developing Rotary Motor Control

This control is utilized to drive the developing rotary motor (DCM703).

The DCM703, a three-phase, eight-pole DC motor with a built-in encoder, drives the developing rotary.

The DCNT Board drives the motor by controlling the DEVELOPING ROTARY MOTOR ON (ROTMON) signal and DEVELOPING ROTARY SPEED CONTROL (/ROTMPWM) signal.

The illustration below shows the control circuit of the motor.



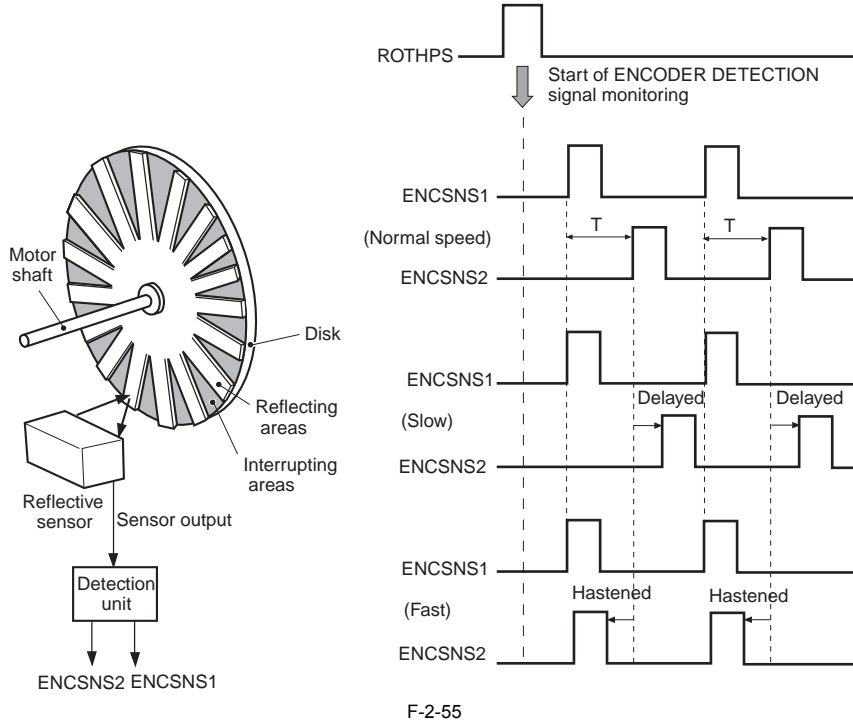
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- 1) When the CPU cannot detect ENCODER DETECTION signal within 5 seconds after the start of the developing rotary motor drive.

2) When the pulse count for ENCODER DETECTION signal does not fit in the prescribed range, (within +/- 200 of a targeted pulse count memorized by CPU) after a period of time from the start of the drive when the developing rotary motor becomes Ready.



The encoder used in this printer consists of a disk, reflective sensor, and detection unit. The disk is installed on the motor shaft. The disk rotates as the motor does. The disk has reflective areas and interrupting areas alternately located on its surface. The sensor strikes light to the rotating disk and sends the monitoring results of the reflected light to the detection unit. The detection unit monitors the results constantly. It generates the two ENCODER DETECTION (ENCSENS1, ENCSNS2) signals based on the timing of detecting the reflective and interrupting areas on the disk and sends the signals to the DC controller.



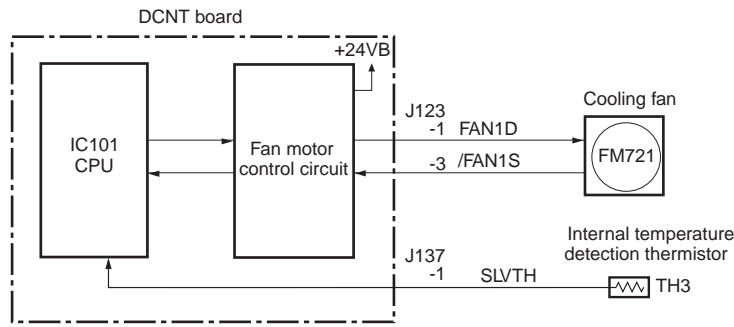
2.6.2.6 Cooling Fan

The Cooling fan, a DC brushless motor with a built-in Hall device, cools off around the fixing unit, power supply unit, high-voltage power supply PCB, and cartridge.

The CPU (IC101) controls the cooling fan.

The CPU outputs the FAN DRIVE (FAN1D) signal after receiving a print command from the interface controller and rotates the cooling fan. After the completion of a print operation, the CPU rotates the fan for a specified period based on internal temperature by monitoring the internal temperature detection thermistor (TH3). Then it stops the fan. (Refer to the table below)

The CPU monitors the FAN LOCK DETECTION (/FAN1S) signal while the cooling fan is rotating. If the signal remains "H" continuously for more than 10 seconds, the CPU determines a fan failure, then stops the printer engine, and notifies the failure to the interface controller.

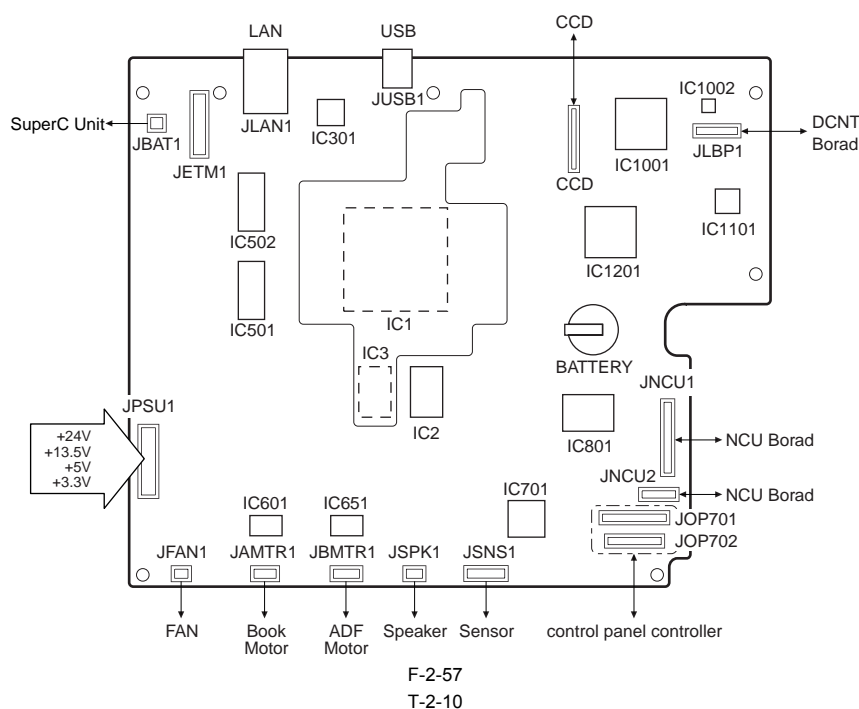


Thermistor detection temperature (deg C)	Fan rotation time (s)
44 or less	0
45 to 49	30
50 or more	300

2.6.3 System Controller (SCNT)

2.6.3.1 Outline

The following is the functional composition of the SCNT board:



IC	Function
IC1	CPU (ASIC) DRAM controller, image processing block, USB controller, LAN controller, reader unit control
IC2	FLASH ROM program control, data retention
IC3	FLASH ROM program control, data retention
IC301	LAN control
IC501	DDR memory
IC502	DDR memory
IC601	ADF motor driver
IC651	book mode motor driver
IC701	control panel controller
IC801	fax modem
IC1001	image processing controller
IC1002	flash ROM for image processing data storage
IC1101	ASIC for recording signal control
IC1201	clock IC communication block, recording signal processing block, image signal processing block

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Jack@No.	Function
JLBP1	DCNT board connector
JUSB1	USB terminal
JLAN1	LAN cable terminal
JETM1	not used
JBAT1	capacitor terminal
JPSU1	power board connection
JFAN1	fan connection
JAMTR1	CCD motor connection
JBMTR1	ADF, motor connection
JSPK1	speaker connection
JSNS1	power sensor/post-separation sensor
JOP701	control panel connection
JOP702	control panel connection
JNCU1	NCU board connection

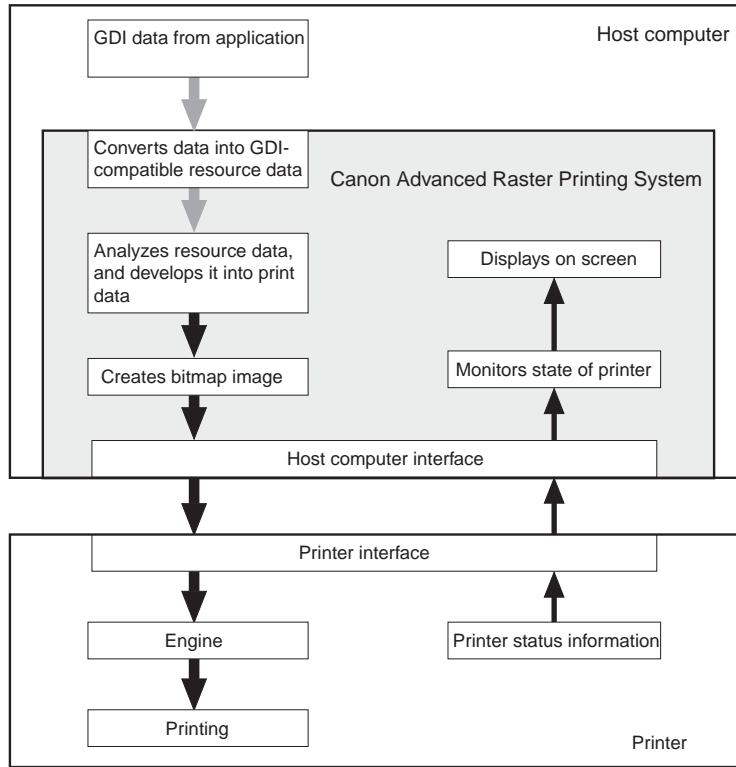
2.6.3.2 Canon Advanced Printing Technology@ (CARPS)

Canon Advanced Raster Printing System (hereafter (CARPS) refers to a system of processing data in which printing speed is reduced and operation is made easier for more user-friendly printing in a Microsoft Windows environment. In CARPS, the following takes place so as to generate output as fast and as easily as possible:

- Instead of converting the print data coming from the application into the printer's page description language (PDL), it turns it into resource data which is GDI-

compatible.

- It turns the resulting GDI-compatible source data into dot matrix data on the host computer and sends the result to the host computer.
- It allows making selections to set up a printing environment using dialog boxes on the host computer.



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- It indicates the status of the printer on the screen of the host computer, enabling a check on the end of printing, feed of print paper, and error status using the host computer screen.

! Graphics Device Interface (GDI)

It is a graphics drawing system of processing data that prints or displays images in a Windows environment (or an interface of a graphics system used in conjunction with an application).

CARPS is used after installing it to a Microsoft Windows 2000/XP or 98/Me environment. Use the CD-ROM that comes with the machine for installation. In CARPS, the paper size, original size, number of prints to make, and settings related to print quality are all specified on a computer screen. The way these settings are made differ between Microsoft Windows 2000/XP and 98/Me.

Chapter 3 DISASSEMBLY AND ASSEMBLY

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3.1 Cartridge Removal at Trouble Eruption Cartridge Removal at Trouble Eruption

3.1.1 Cartridge Removal at Trouble Eruption

If you removed the cartridge as you normally would in response to a fault in the machine, you could damage the machine. Be sure to observe the following removing the 2 types of cartridges (toner, drum) from the machine.

You will have to disconnect and connect the power cord as follows when removing these cartridges. Be sure not to ignore this step.

Turning On and Off the Power

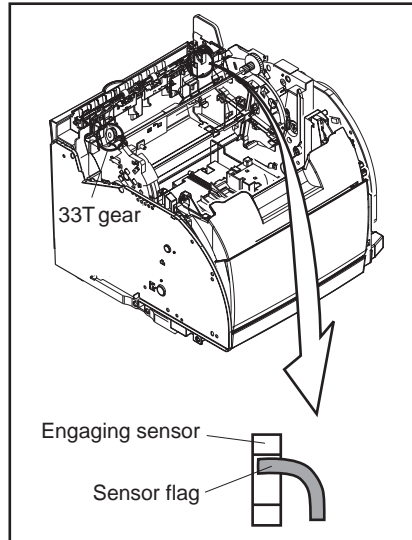
OFF -> ON (wait for 5 sec or more) -> OFF

3.1.2 Toner cartridge removal

1) Remove the reinforcement plate.

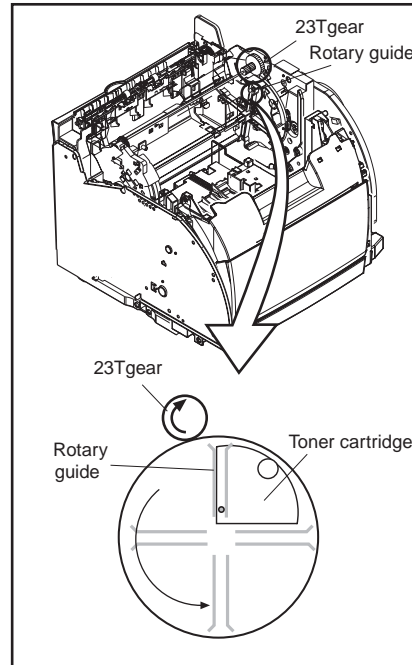
2) Be sure that the engaging sensor flag is at the position as shown in the following figure (in toner cartridges memory tag contact disengaging status).

If the sensor flag is not at the position in the following figure (in toner cartridges memory tag contact engaging status), rotate the 33T gear by hands so that it is at the position.



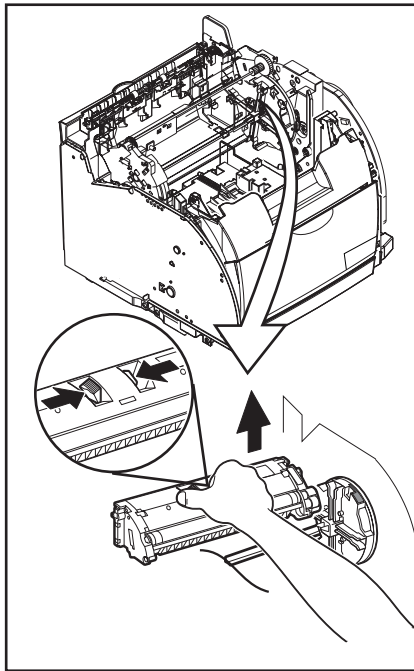
F-3-1

3) Rotate the 23T gear by hands in the direction of the arrow so that the rotary guide of the toner cartridge is at the top.



F-3-2

4) Grasp the finger holding on the toner cartridge and remove the cartridge in a horizontal position from the printer.



F-3-3

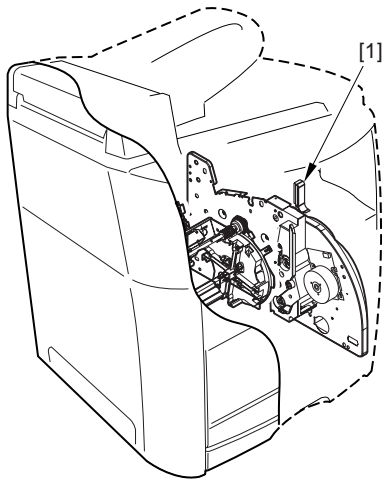
5) Repeat the steps 3) and 4) to remove the toner cartridges for each color.

3.1.3 Drum cartridge removal

1) Open the top cover unit and remove the drum cartridge.

⚠ When removing the drum cartridge with the top cover unit detached, be sure to pull up the drive release lever [1]. The drum cartridge cannot be removed otherwise.

2) Remove the drum cartridge from the printer.



F-3-4

3.2 EXTERNAL AND CONTROLS SYSTEM

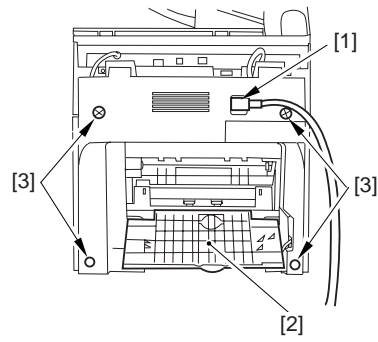
3.2.1 Front Cover

3.2.1.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

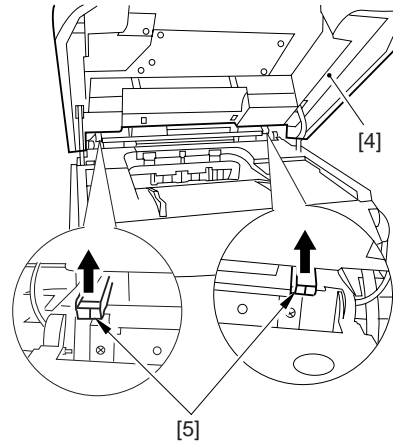
3.2.1.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



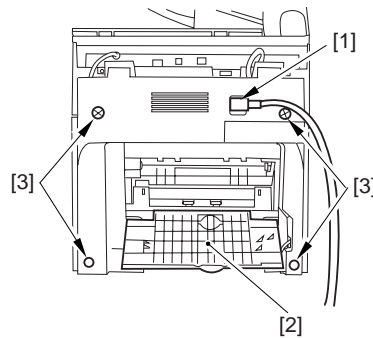
F-3-5

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-6

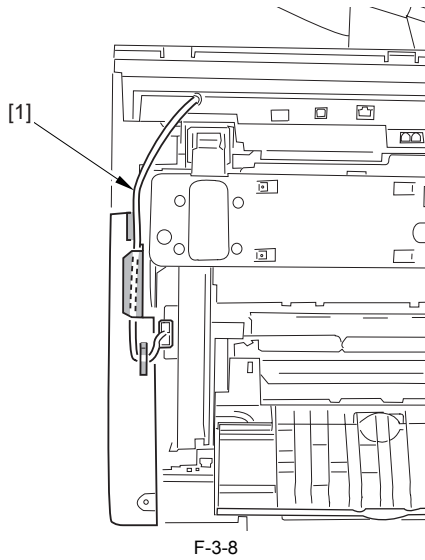
4) Close the reader assembly; then, detach the rear cover [1].



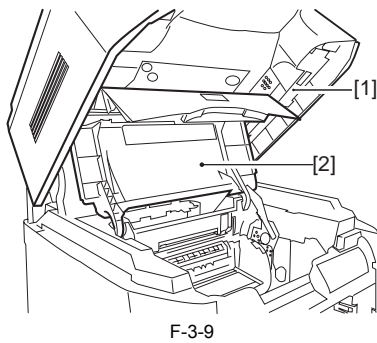
F-3-7

3.2.1.3 Removing the Right Cover (with the reader assembly intact)

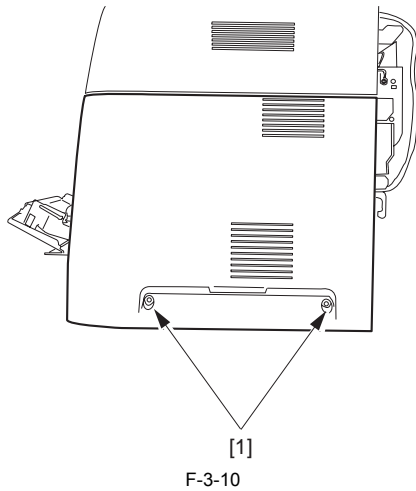
1) Free the cable [1] of the reader assembly.



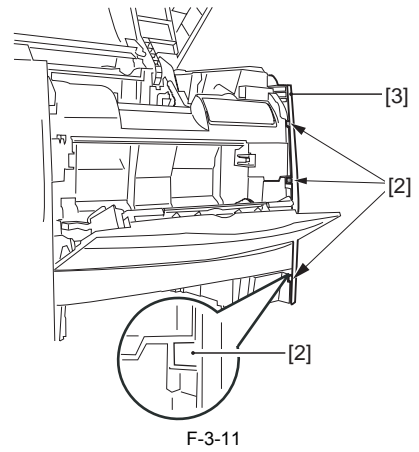
2) Open the reader assembly [1] and the top cover [2].



3) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].

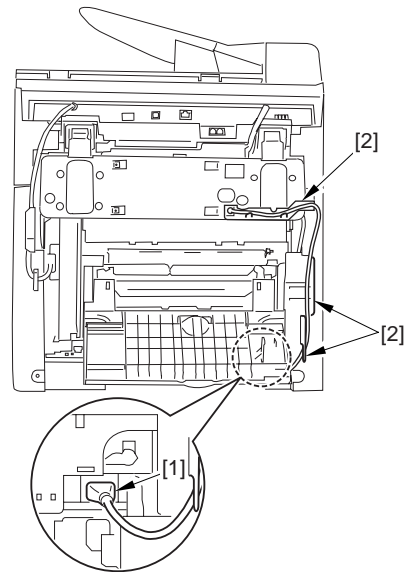


MEMO
It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.

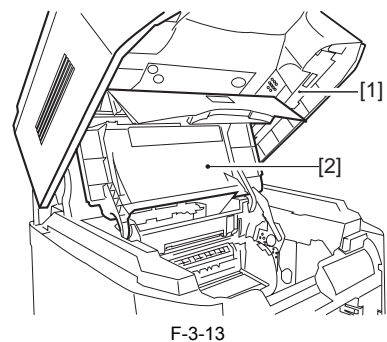


3.2.1.4 Removing the Left Cover (with the reader assembly intact)

1) Disconnect the plug [1], and free the cable [2] of the reader assembly from the guide.

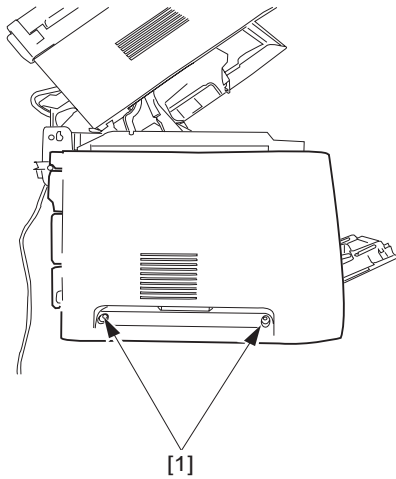


2) Open the reader assembly [1] and the top cover [2].

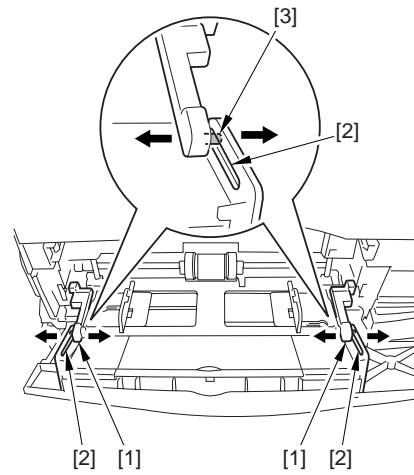


3) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the right cover [3].

MEMO
It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.

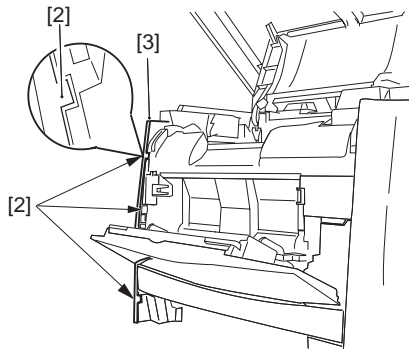


F-3-14



F-3-17

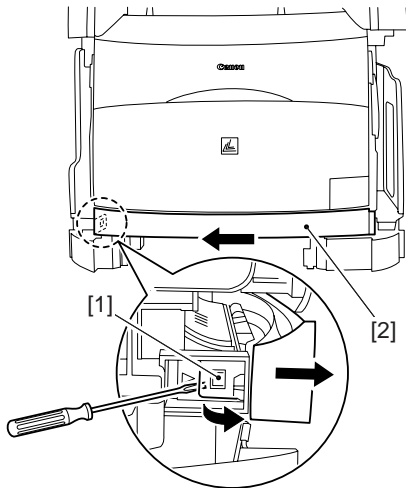
2) Slide the front cover [1] to the left to detach.



F-3-15

3.2.1.5 Removing the Lower Front Cover

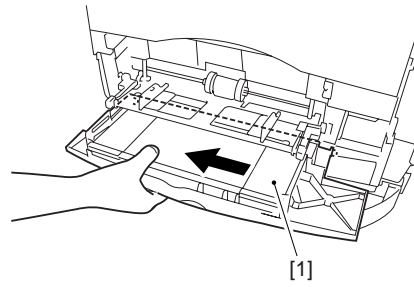
1) Free the claw [1] using a flat-blade screwdriver; then, slide the lower cover [2] to the left to detach.



F-3-16

3.2.1.6 Removing the Front Cover

1) Push the 2 bosses [1] used to hold the manual feed tray toward the inside while pushing the guide assembly [2] toward the outside to free the bosses.

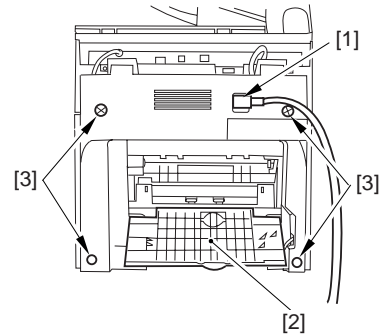


F-3-18

3.2.2 Rear Cover

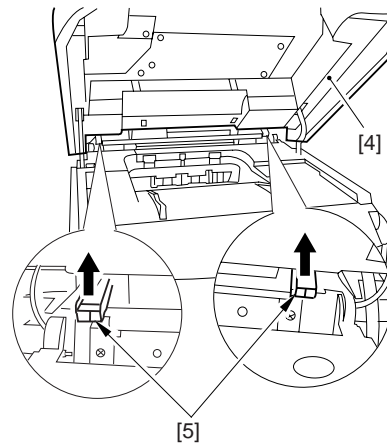
3.2.2.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



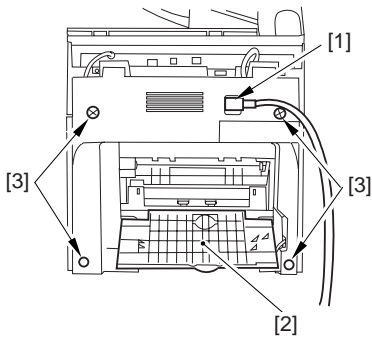
F-3-19

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-20

4) Close the reader assembly; then, detach the rear cover [1].



F-3-21

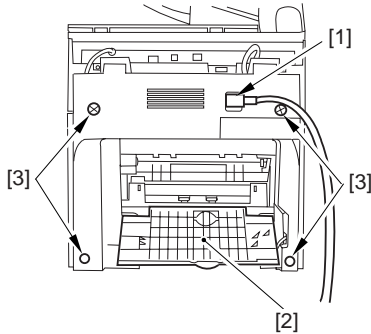
3.2.3 Top Cover

3.2.3.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

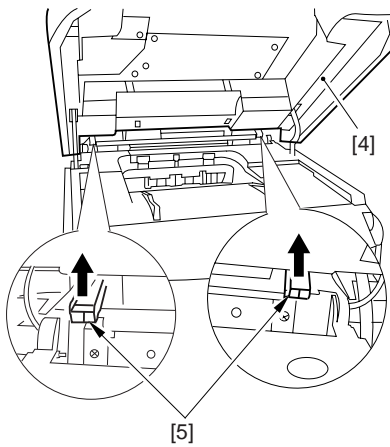
3.2.3.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



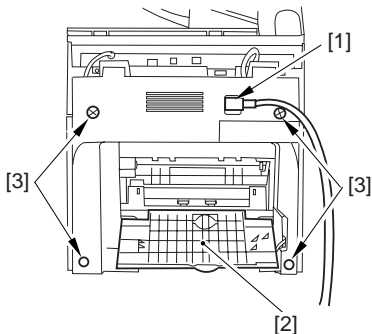
F-3-22

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-23

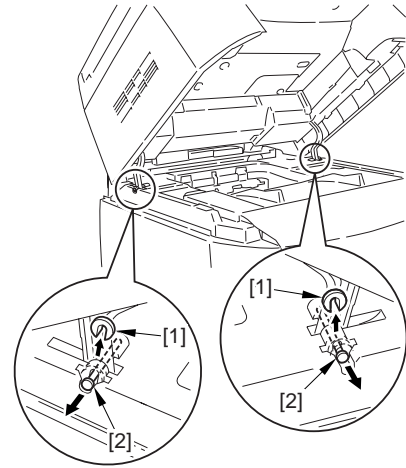
4) Close the reader assembly; then, detach the rear cover [1].



F-3-24

3.2.3.3 Removing the Reader Assembly

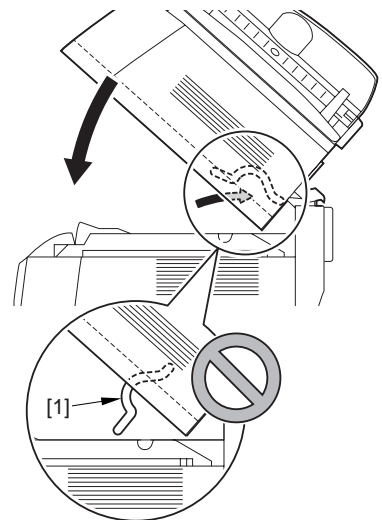
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-25

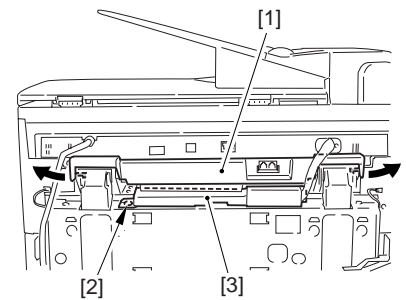


When closing the reader assembly, be sure to push in the arm [1] first.



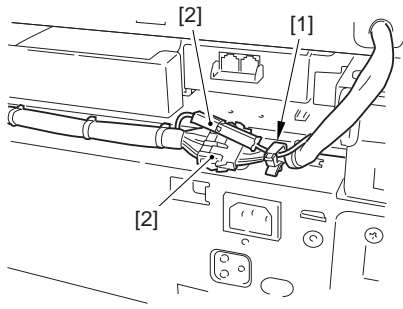
F-3-26

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



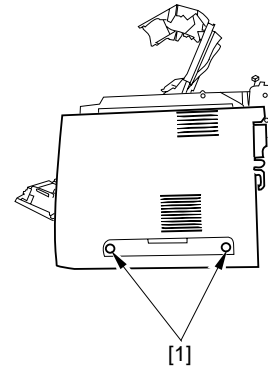
F-3-27

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

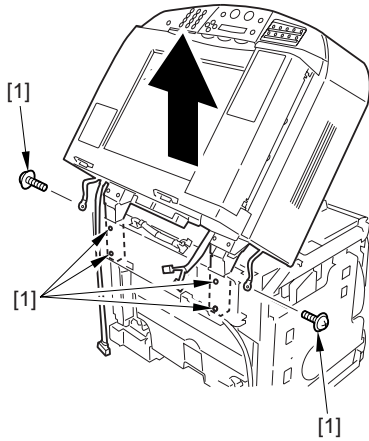


F-3-28

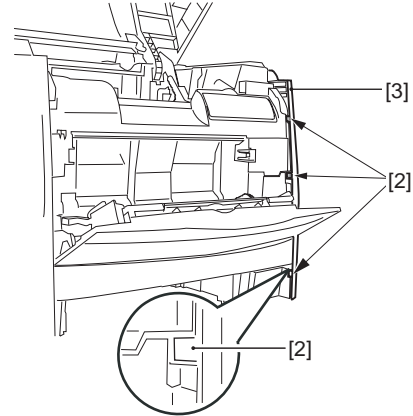
5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-32



F-3-29



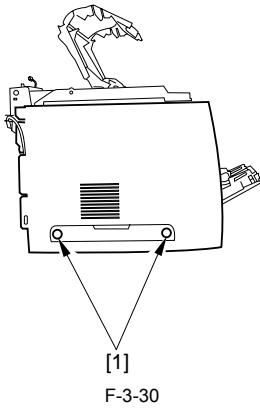
F-3-33

3.2.3.4 Removing the Right Cover

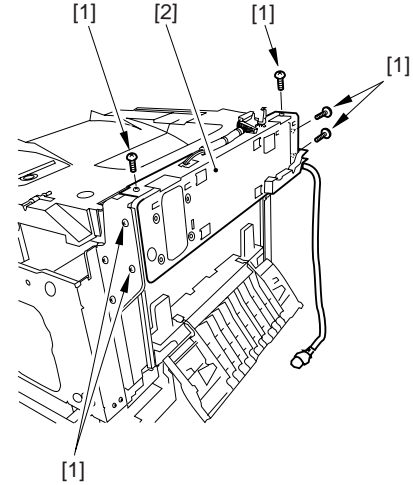
1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].

3.2.3.6 Removing the Power Supply Assembly

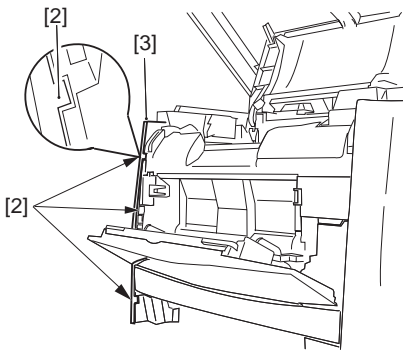
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-30



F-3-34



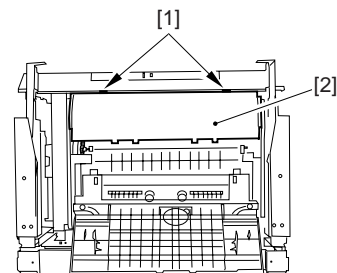
F-3-31

3.2.3.5 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].

3.2.3.7 Removing the Face-Down Cover

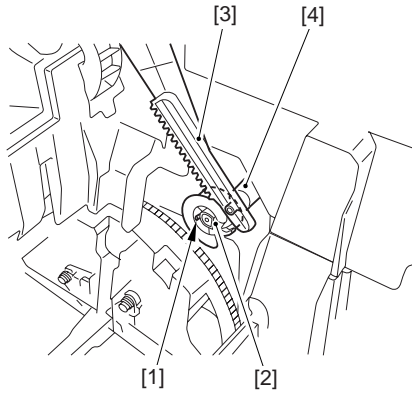
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-35

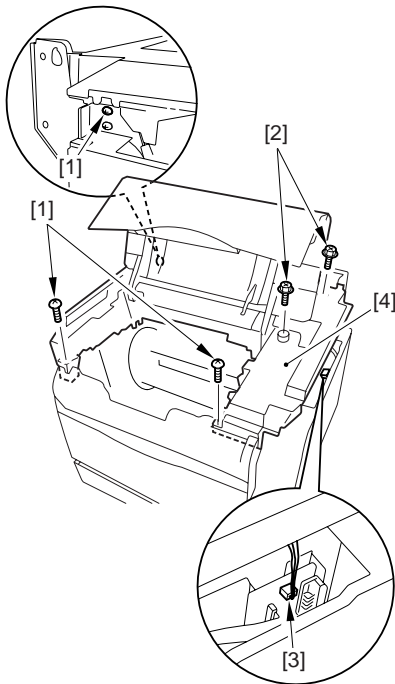
3.2.3.8 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



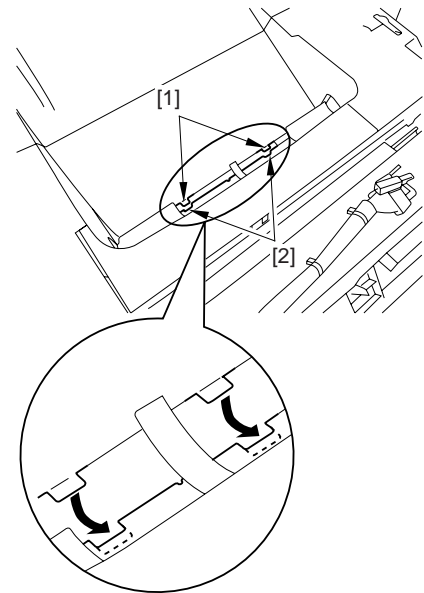
F-3-36

- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

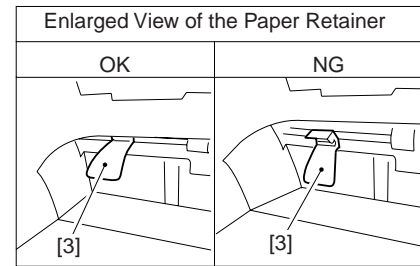


F-3-37

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

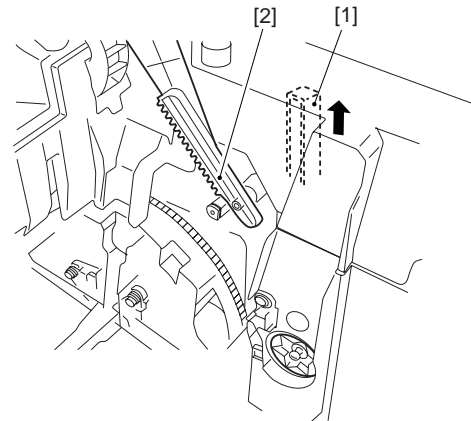


F-3-38



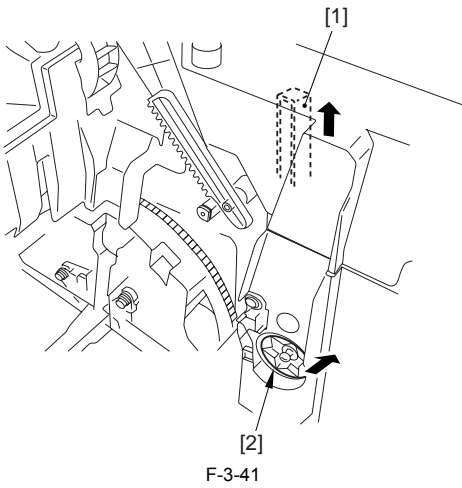
F-3-39

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-40

! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-41

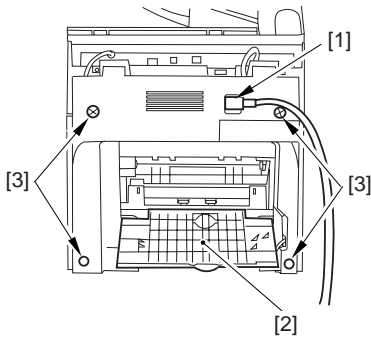
3.2.4 Right Cover

3.2.4.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

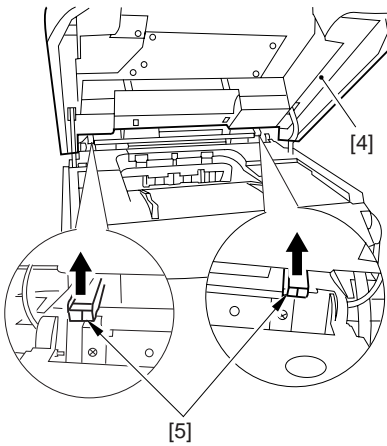
3.2.4.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



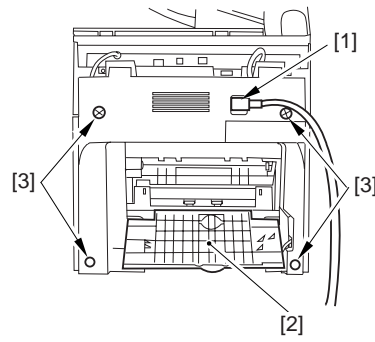
F-3-42

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-43

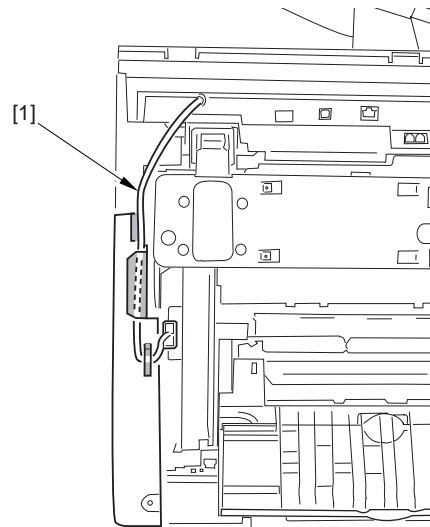
4) Close the reader assembly; then, detach the rear cover [1].



F-3-44

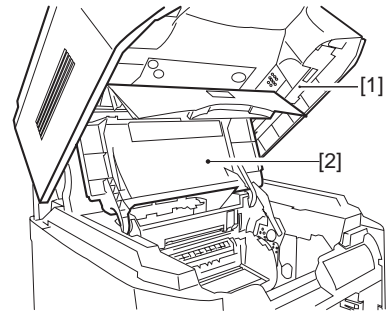
3.2.4.3 Removing the Right Cover (with the reader assembly intact)

1) Free the cable [1] of the reader assembly.



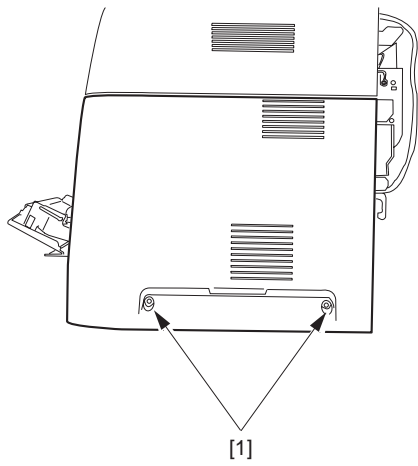
F-3-45

2) Open the reader assembly [1] and the top cover [2].



F-3-46

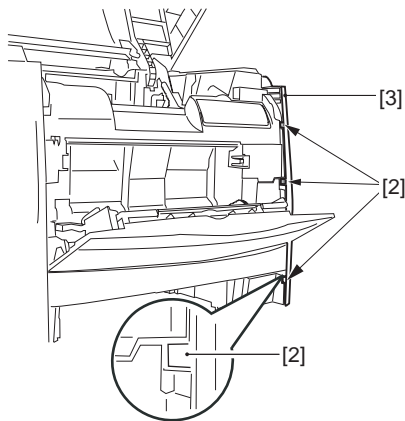
3) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



F-3-47

MEMO

It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.



F-3-48

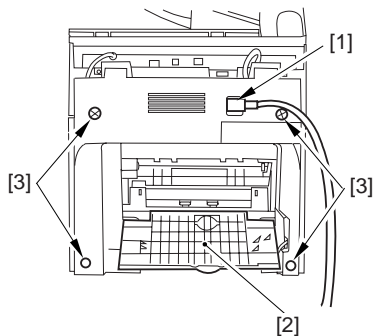
3.2.5 Left Cover

3.2.5.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

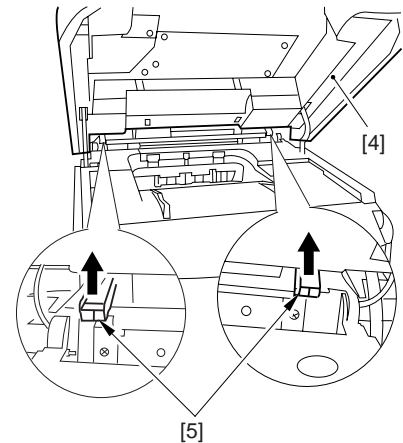
3.2.5.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



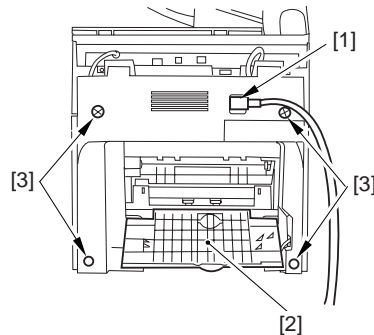
F-3-49

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-50

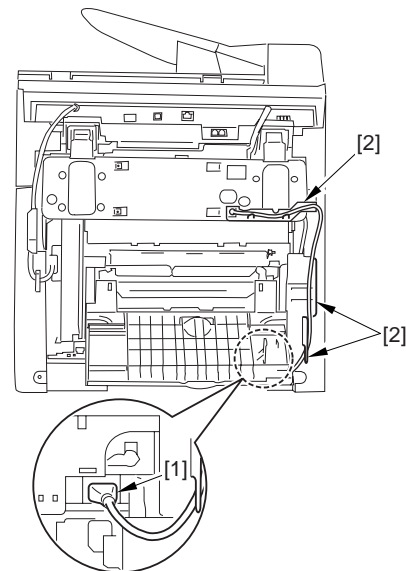
4) Close the reader assembly; then, detach the rear cover [1].



F-3-51

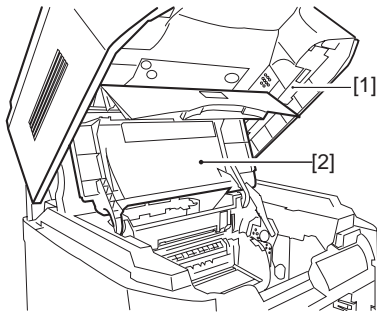
3.2.5.3 Removing the Left Cover (with the reader assembly intact)

1) Disconnect the plug [1], and free the cable [2] of the reader assembly from the guide.



F-3-52

2) Open the reader assembly [1] and the top cover [2].

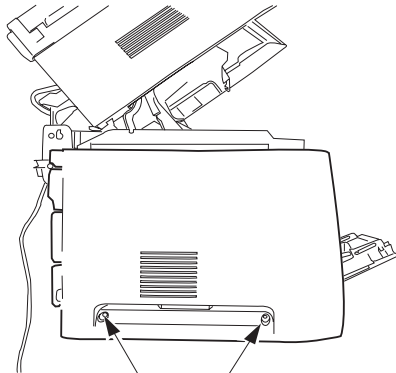


F-3-53

3) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the right cover [3].

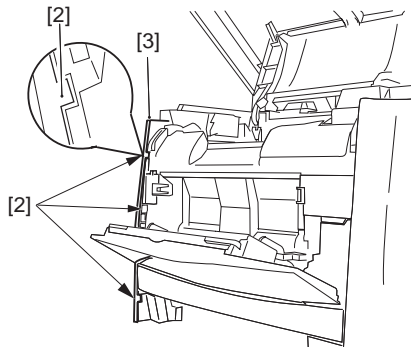
MEMO

It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.



[1]

F-3-54

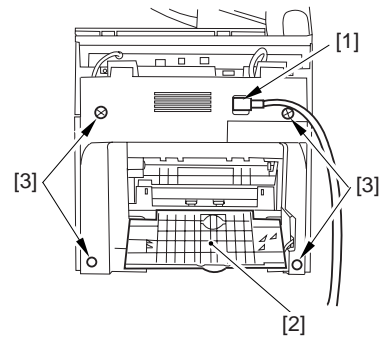


F-3-55

3.2.6 Upper Right Cover

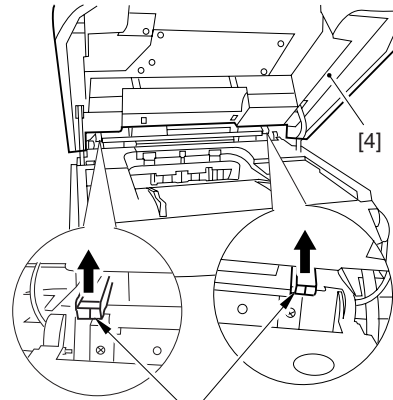
3.2.6.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-56

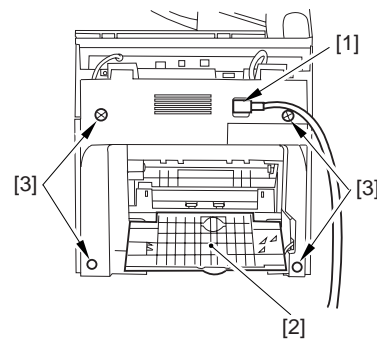
3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-57

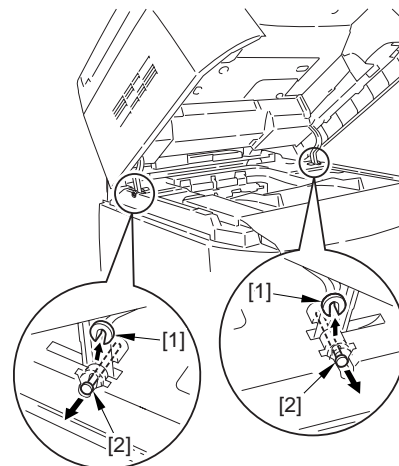
4) Close the reader assembly; then, detach the rear cover [1].



F-3-58

3.2.6.2 Removing the Reader Assembly

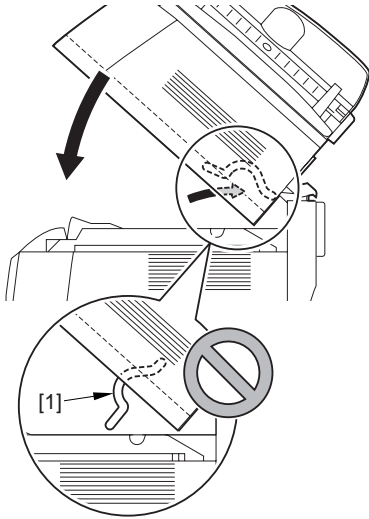
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-59

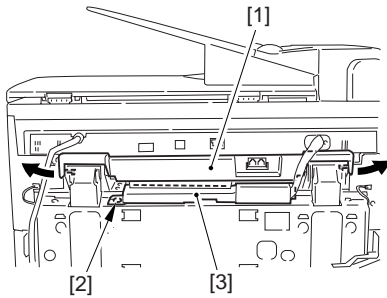


When closing the reader assembly, be sure to push in the arm [1] first.



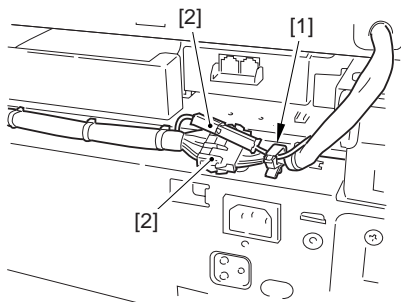
F-3-60

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



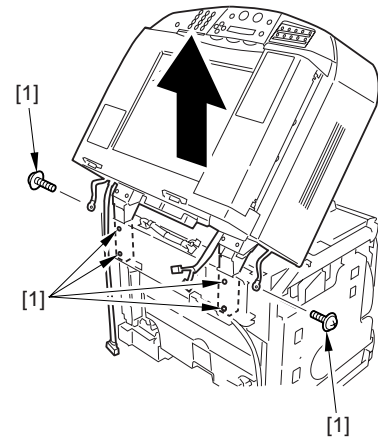
F-3-61

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-62

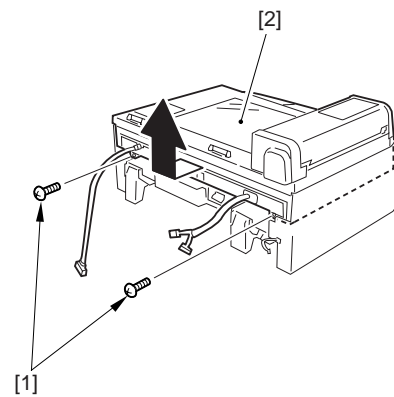
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-63

3.2.6.3 Removing the Scanner Unit

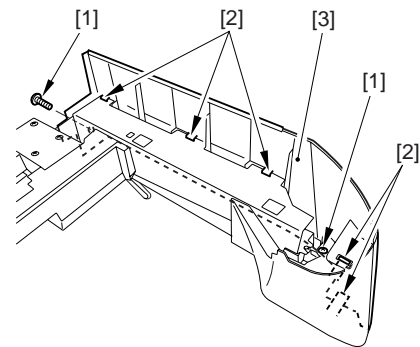
- 1) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-64

3.2.6.4 Removing the Upper Right Cover

- 1) Remove the 2 screws [1]; then, remove the 5 claws [2] to detach the upper right cover [3].

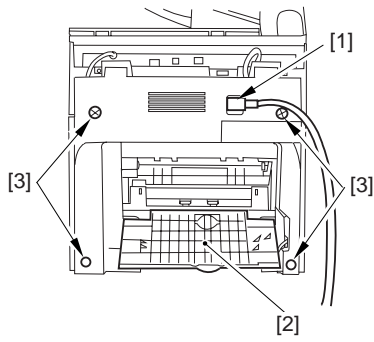


F-3-65

3.2.7 Upper Left Cover

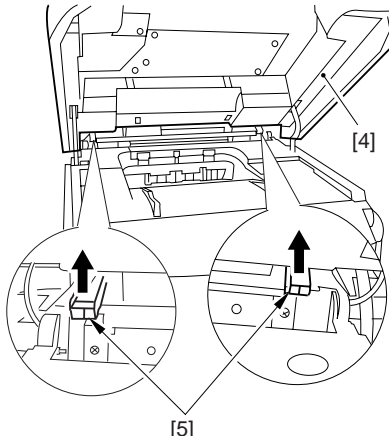
3.2.7.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



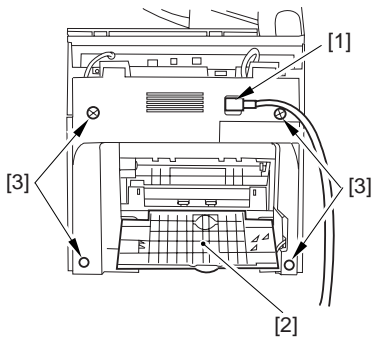
F-3-66

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-67

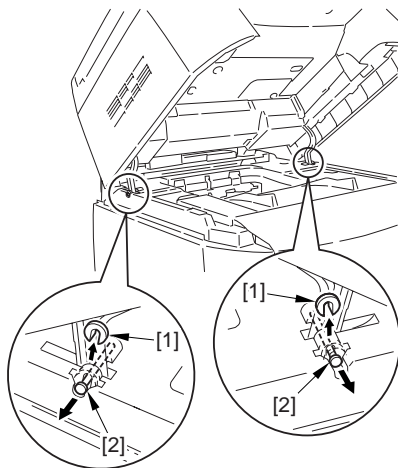
4) Close the reader assembly; then, detach the rear cover [1].



F-3-68

3.2.7.2 Removing the Reader Assembly

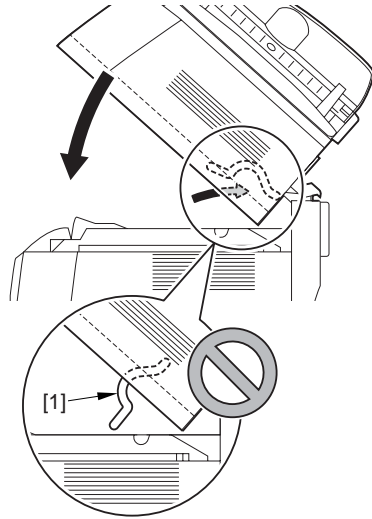
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-69

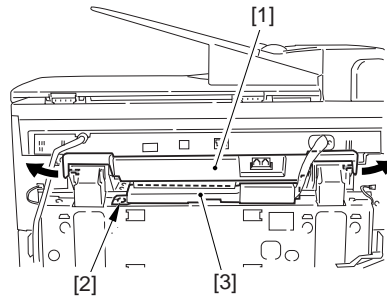


When closing the reader assembly, be sure to push in the arm [1] first.



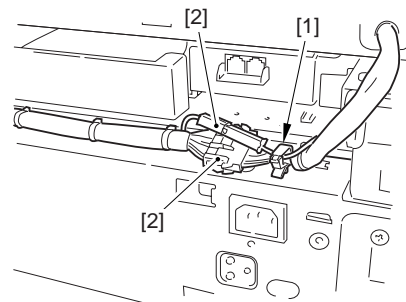
F-3-70

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



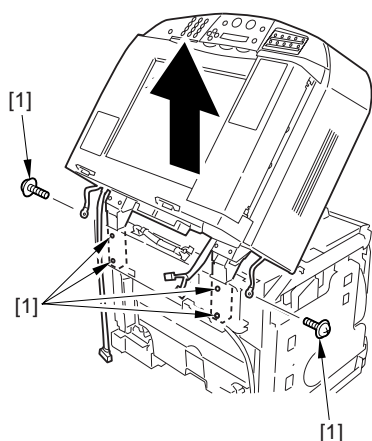
F-3-71

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-72

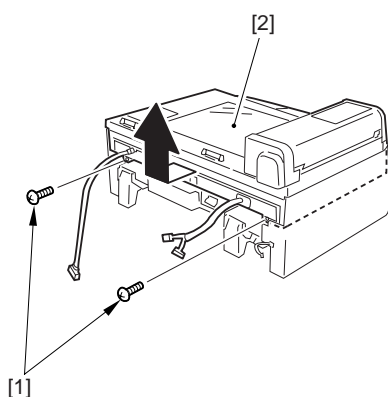
5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-73

3.2.7.3 Removing the Scanner Unit

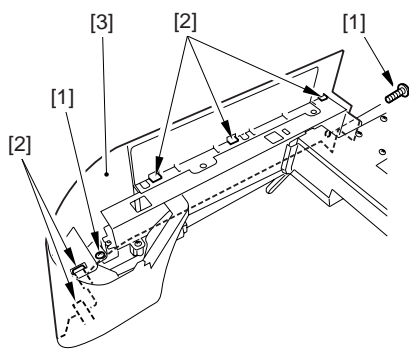
- 1) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-74

3.2.7.4 Removing the Upper Left Cover

- 1) Remove the 2 screws [1]; then, remove the 5 claws [2] to detach the upper left cover [3].



F-3-75

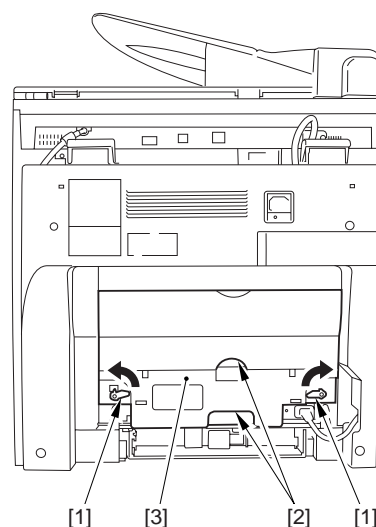
3.2.8 Face-up cover

3.2.8.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



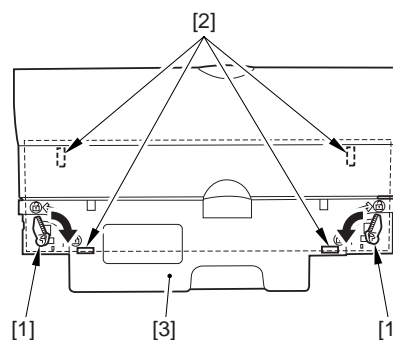
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-76

3.2.8.2 Removing the Face-Up Cover

- 1) Turn the fixing lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) Remove the 4 claws [2], and detach the face-up cover [3] from the fixing assembly.

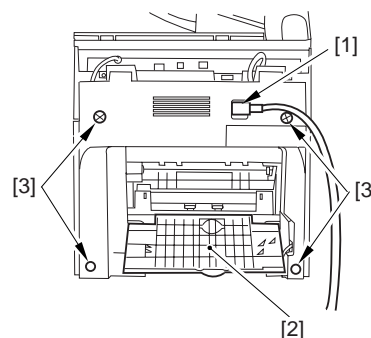


F-3-77

3.2.9 Main Drive Unit

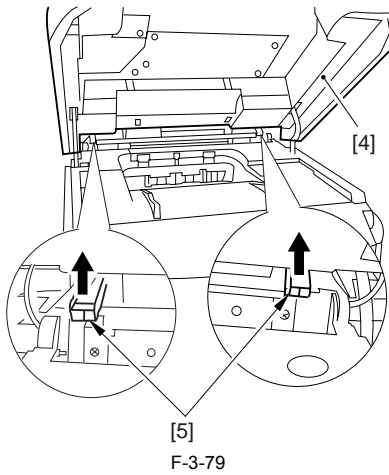
3.2.9.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



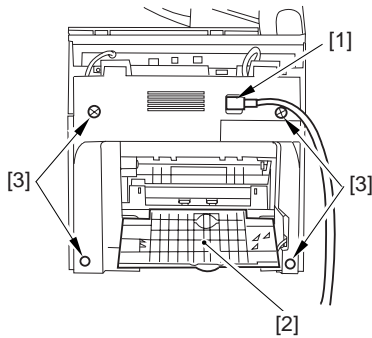
F-3-78

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-79

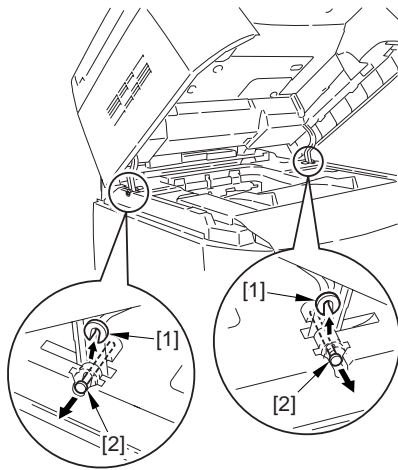
4) Close the reader assembly; then, detach the rear cover[1].



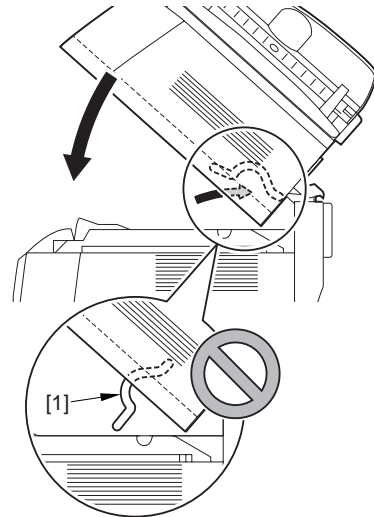
F-3-80

3.2.9.2 Removing the Reader Assembly

1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].

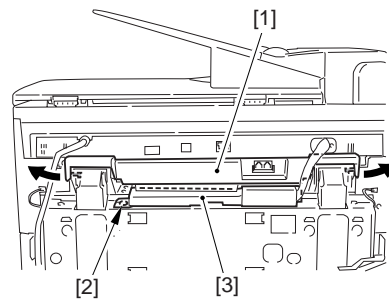


F-3-81



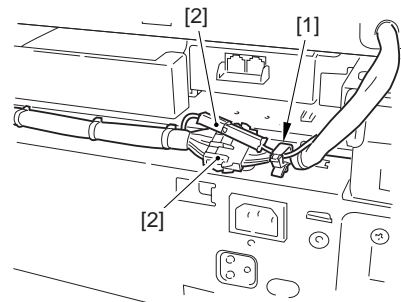
F-3-82

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



F-3-83

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

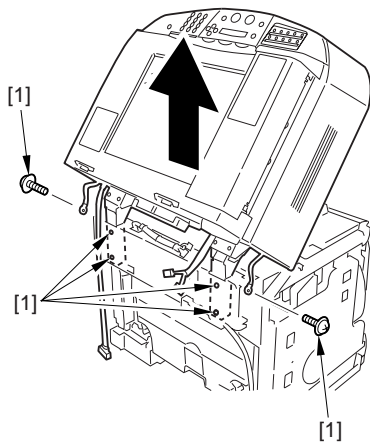


F-3-84

5) Remove the 6 screws [1], and lift the reader unit to detach.



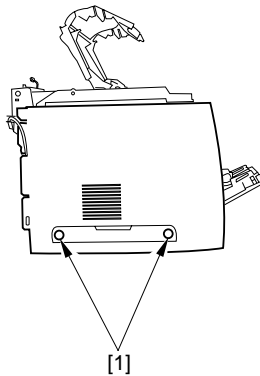
When closing the reader assembly, be sure to push in the arm [1] first.



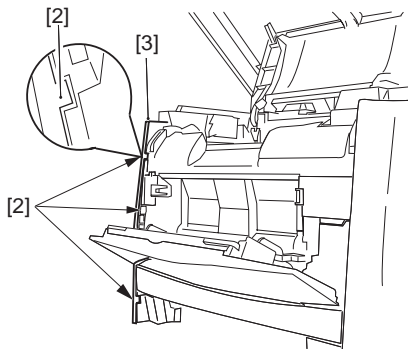
F-3-85

3.2.9.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



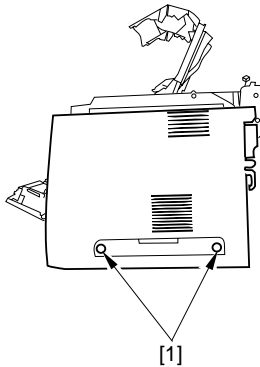
F-3-86



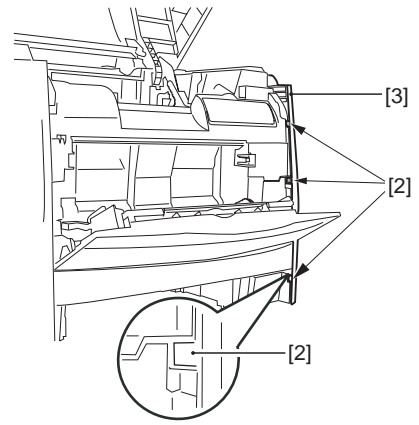
F-3-87

3.2.9.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



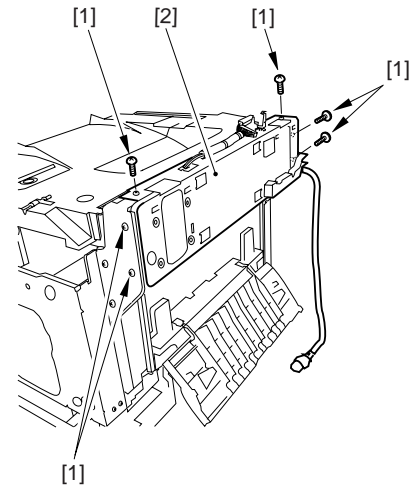
F-3-88



F-3-89

3.2.9.5 Removing the Power Supply Assembly

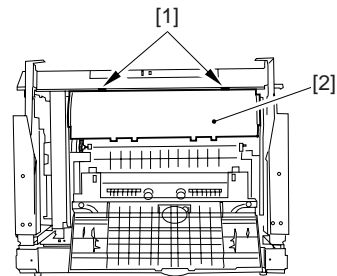
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-90

3.2.9.6 Removing the Face-Down Cover

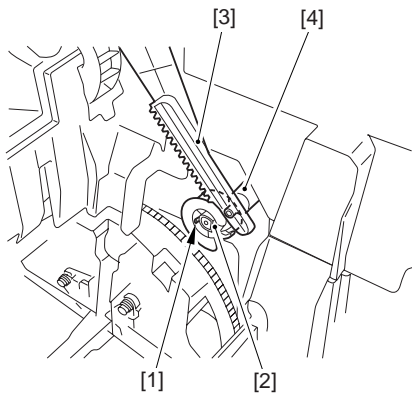
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-91

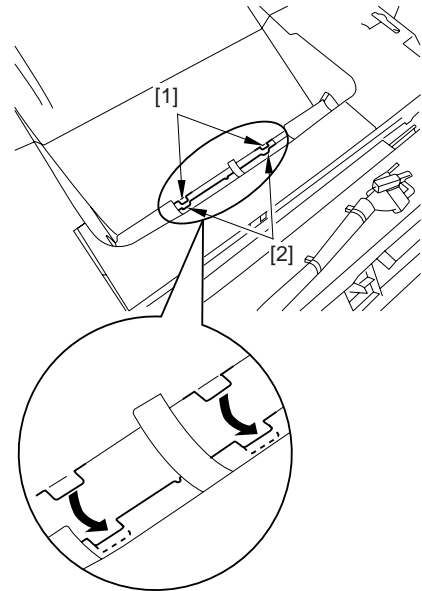
3.2.9.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

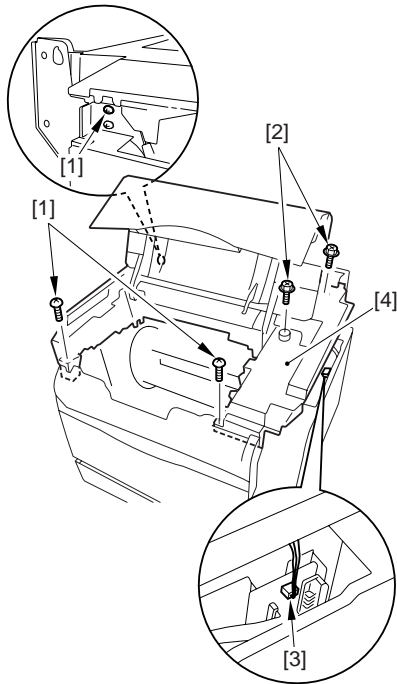


F-3-92

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

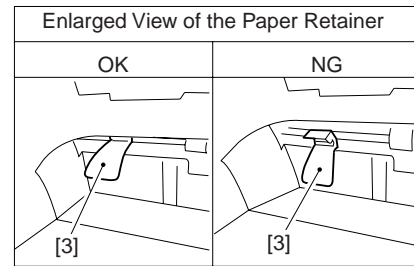


F-3-94



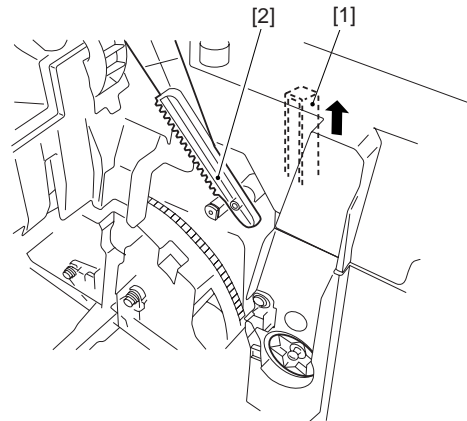
F-3-93

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



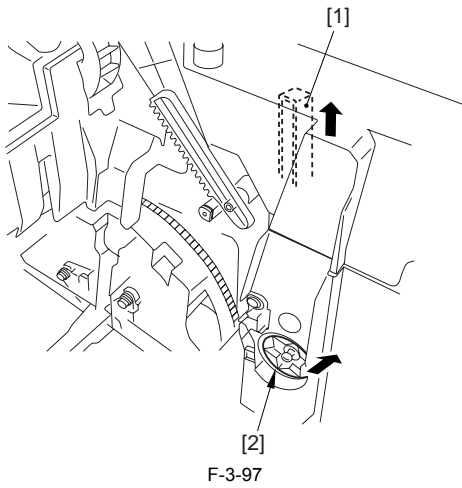
F-3-95

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-96

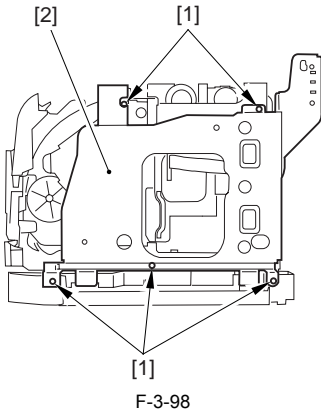
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-97

3.2.9.8 Removing the Right Frame

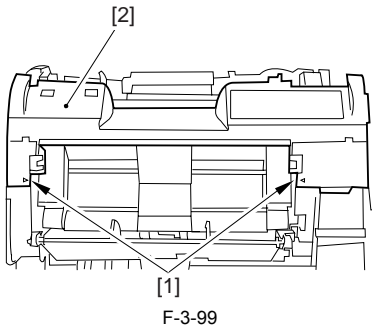
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-98

3.2.9.9 Removing the Inside Cover

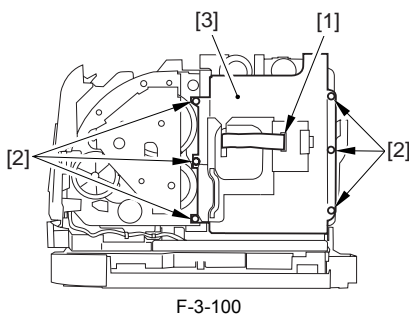
- 1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-99

3.2.9.10 Removing the Shield Plate

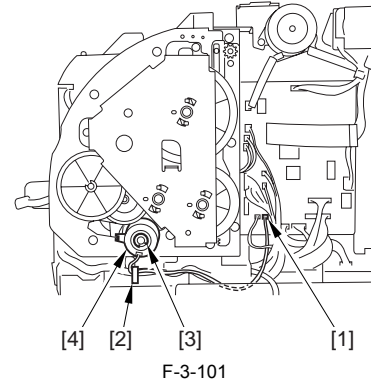
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-100

3.2.9.11 Removing the Registration Clutch

- 1) Disconnect the connector [1], and open the harness band [2].
- 2) Remove the E-ring [3], and detach the registration clutch [4].



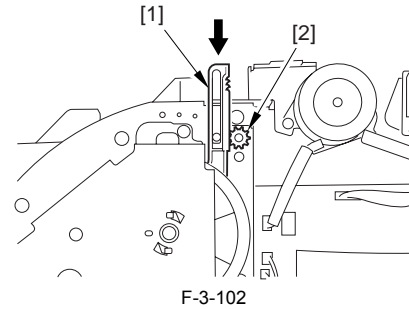
F-3-101



The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

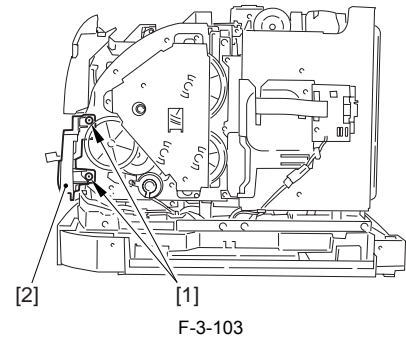
3.2.9.12 Removing the Main Drive Assembly

- 1) Shift down the drive release lever [1], and remove the gear [2].



F-3-102

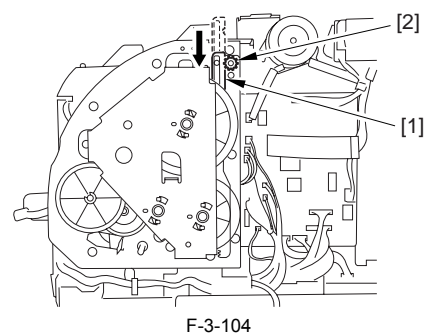
- 2) Remove the 2 screws [1], and detach the front sub cover [2].



F-3-103

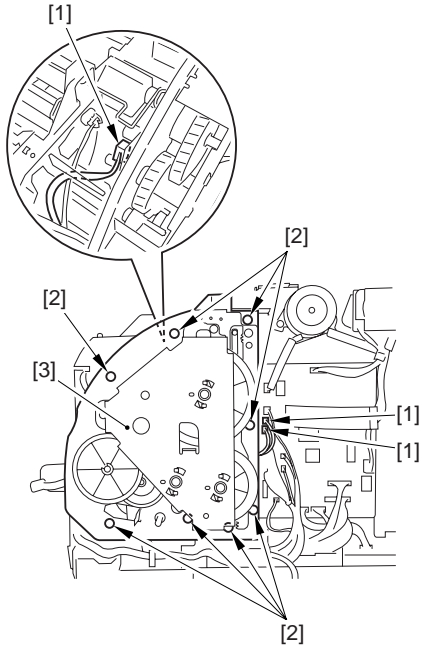


When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



F-3-104

3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].

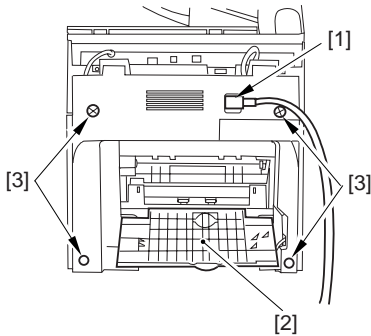


F-3-105

3.2.10 Operation Panel Unit

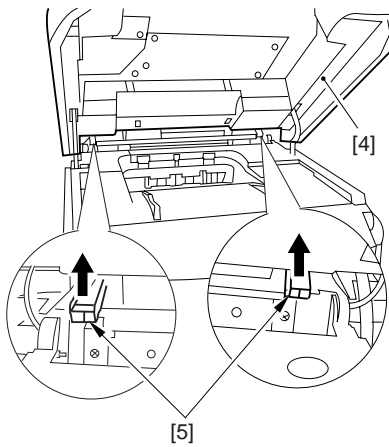
3.2.10.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



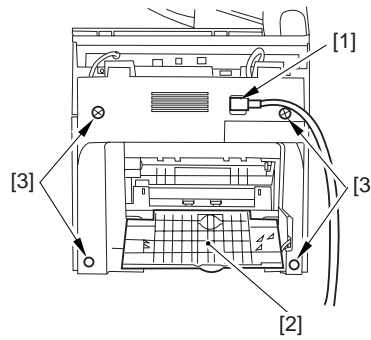
F-3-106

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-107

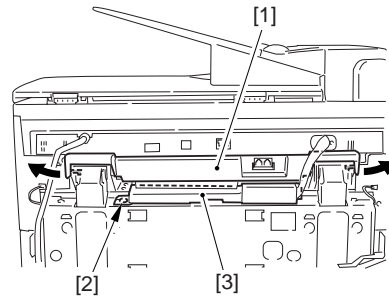
4) Close the reader assembly; then, detach the rear cover [1].



F-3-108

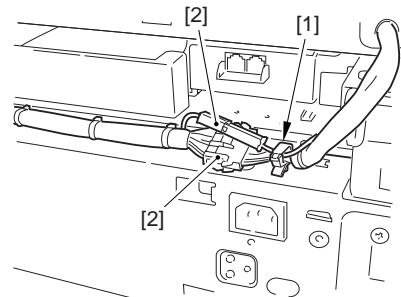
3.2.10.2 Removing the Scanner Unit

1) Remove the platen glass cover.
2) While removing the left and right claws, detach the hinge cover [1].
3) Remove the screw [2], and detach the cable guide [3].



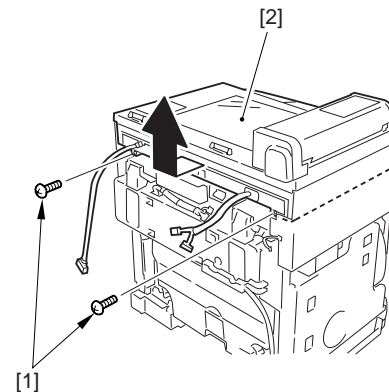
F-3-109

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-110

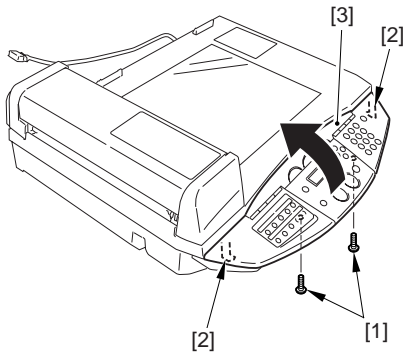
5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-111

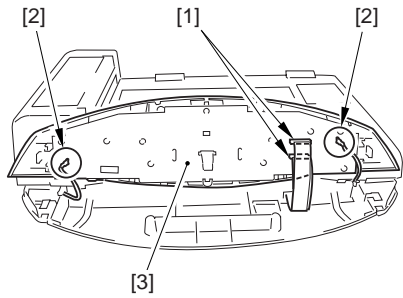
3.2.10.3 Removing the operation Panel

1) Remove the 2 screws [1], and free the 2 claws [2] (left/right) to open the operation panel [3].



F-3-112

- 2) Disconnect the 2 flat cables [1], and remove the 2 fastons [2]; then, detach the operation panel [3].

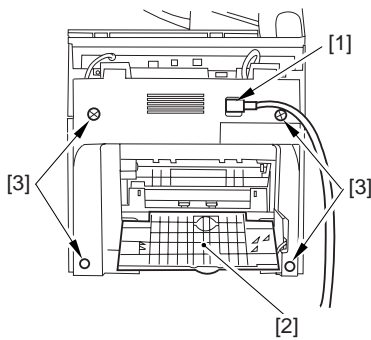


F-3-113

3.2.11 SCNT Board

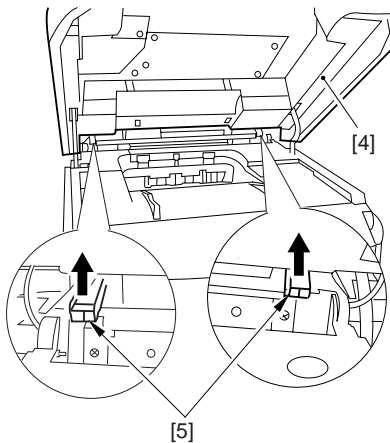
3.2.11.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



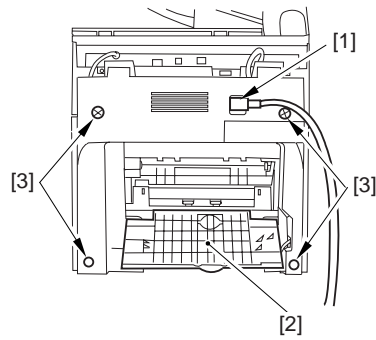
F-3-114

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-115

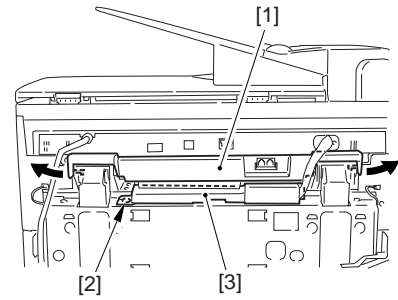
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-116

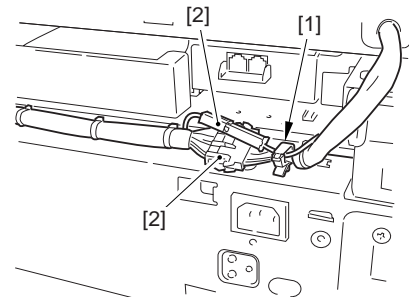
3.2.11.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



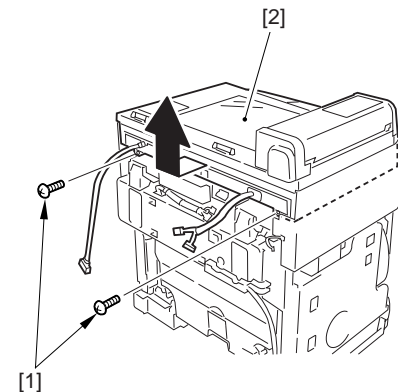
F-3-117

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-118

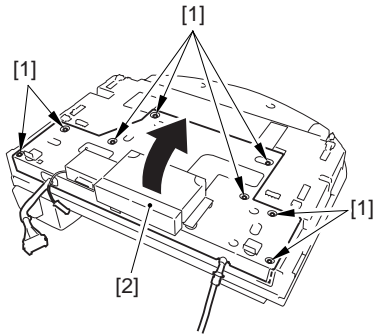
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-119

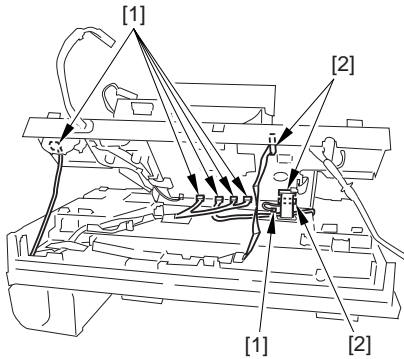
3.2.11.3 Removing the Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the board unit [2].



F-3-120

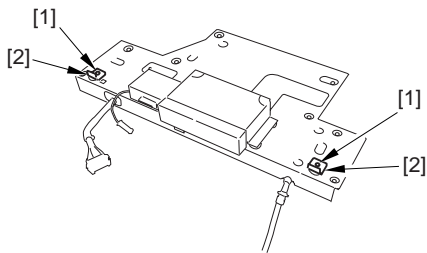
2) Open the board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-121

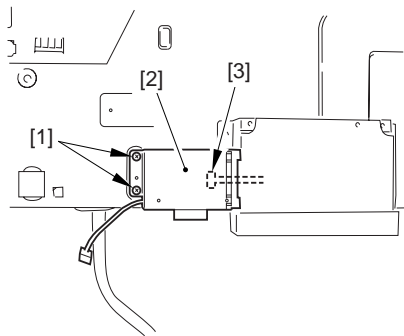
3.2.11.4 Removing the SCNT Unit

1) Remove the two screws [1], and detach the support plate [2].



F-3-122

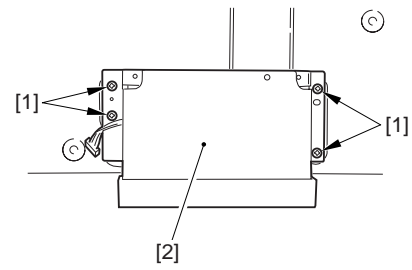
2) Remove the 2 screws [1], and detach the modular board cover [2].



F-3-123

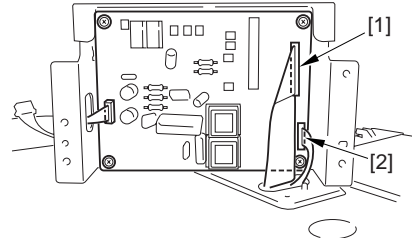
MEMO:
Pay attention to the harness [3], as it is connected to the cover..

3) Remove the 4 screws [1], and open the NCU unit [2].



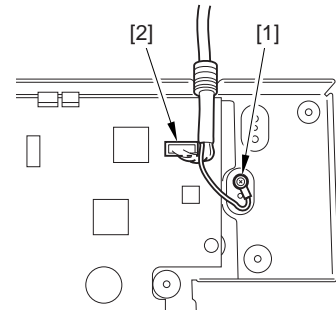
F-3-124

4) Disconnect the flat cable [1] and the connector [2].



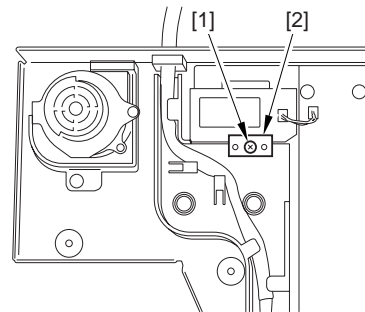
F-3-125

5) Remove the screw [1], and disconnect the connector [2].



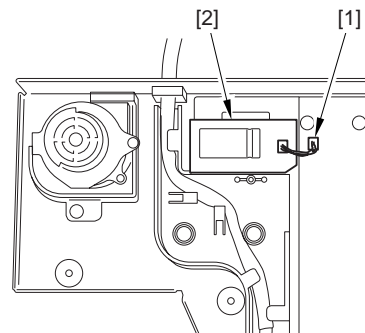
F-3-126

6) Remove the screw [1], and detach the retainer [2].



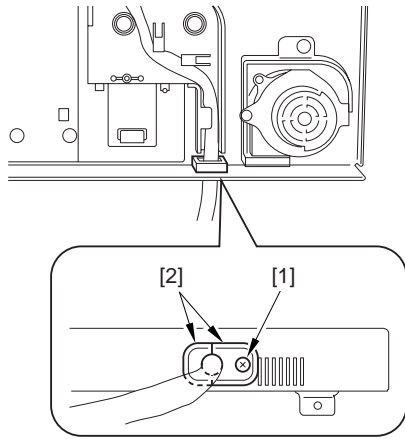
F-3-127

7) Disconnect the connector [1] and remove the lithium board [2].



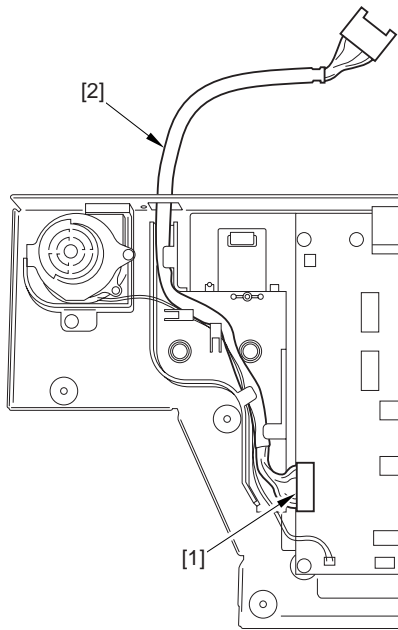
F-3-128

8) Remove the screw [1], and detach the two cable retainers [2].



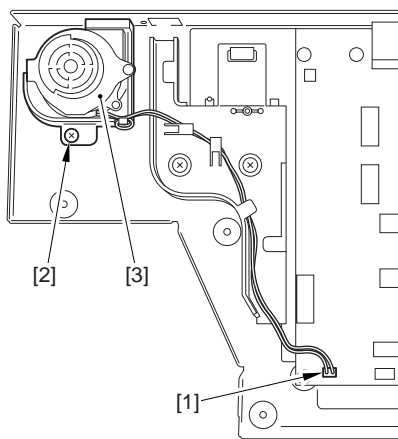
F-3-129

9) Disconnect the connector [1] and the cable [2].



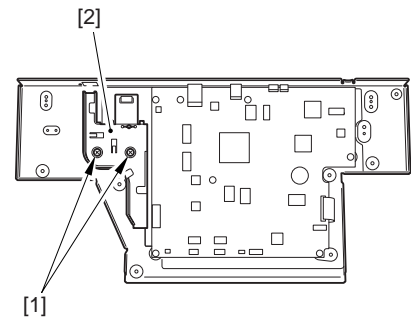
F-3-130

10) Disconnect the connector, remove the screw [2], and detach the fan [3] together with cover.



F-3-131

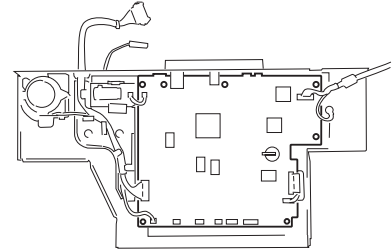
11) Remove the two screws [1], and detach the cable guide [2].



F-3-132



Never remove the SCNT board.

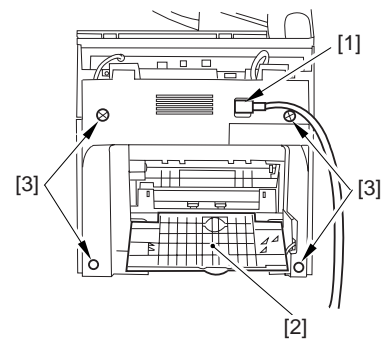


F-3-133

3.2.12 DCNT Board

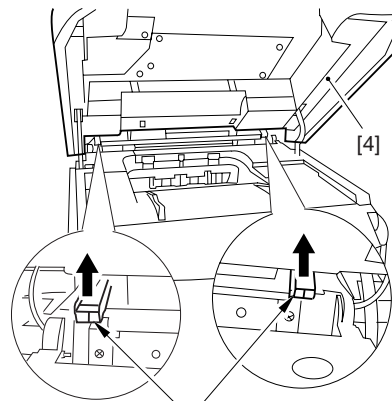
3.2.12.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



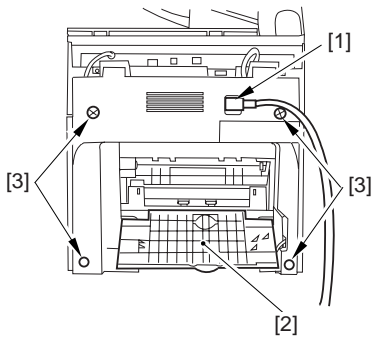
F-3-134

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-135

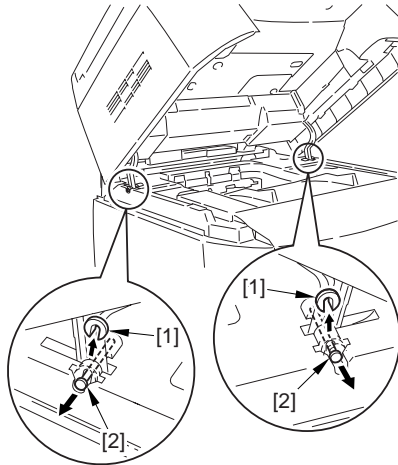
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-136

3.2.12.2 Removing the Reader Assembly

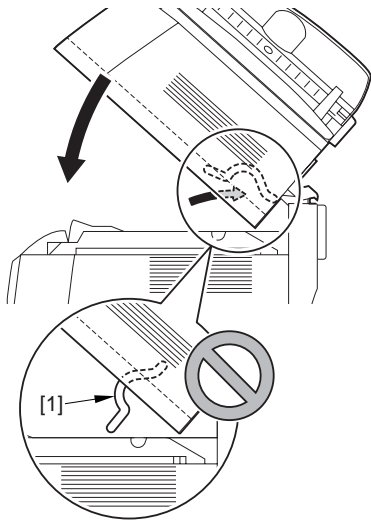
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-137

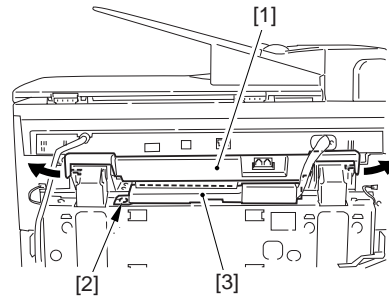


When closing the reader assembly, be sure to push in the arm [1] first.



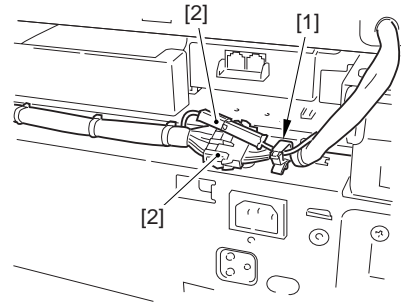
F-3-138

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



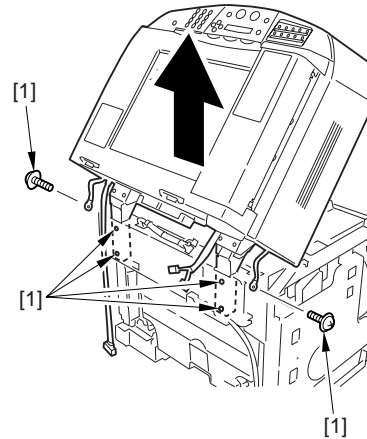
F-3-139

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-140

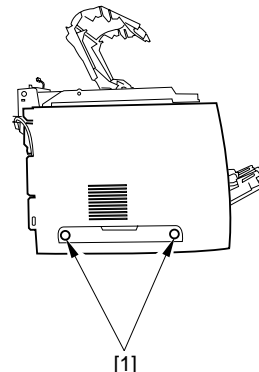
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



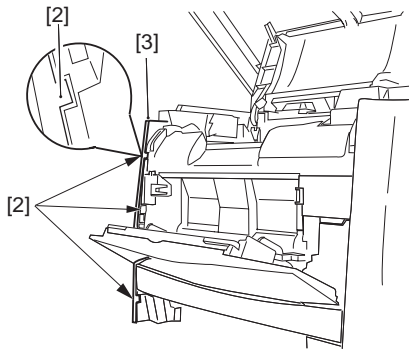
F-3-141

3.2.12.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



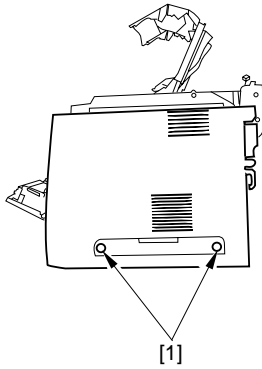
F-3-142



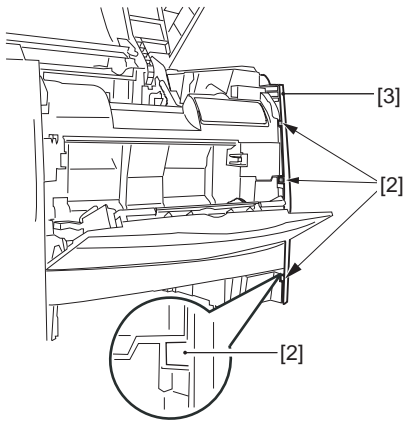
F-3-143

3.2.12.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



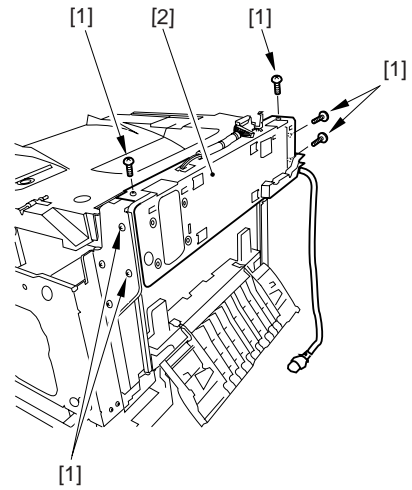
F-3-144



F-3-145

3.2.12.5 Removing the Power Supply Assembly

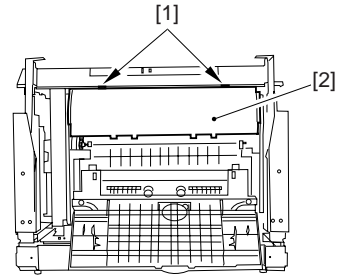
- 1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-146

3.2.12.6 Removing the Face-Down Cover

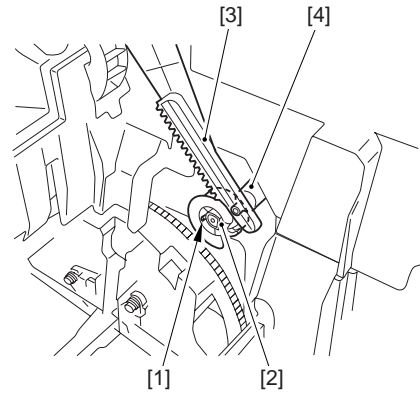
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-147

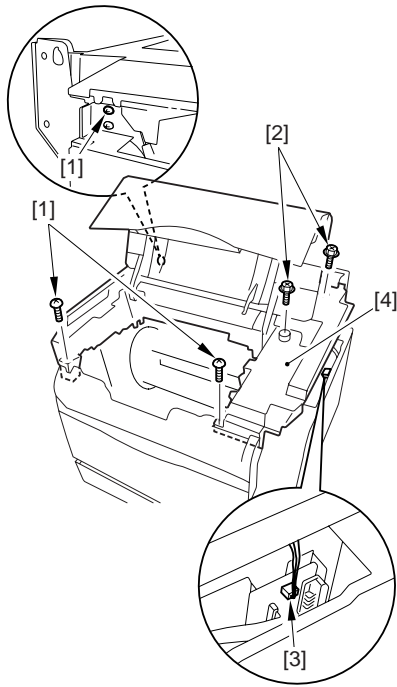
3.2.12.7 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-148

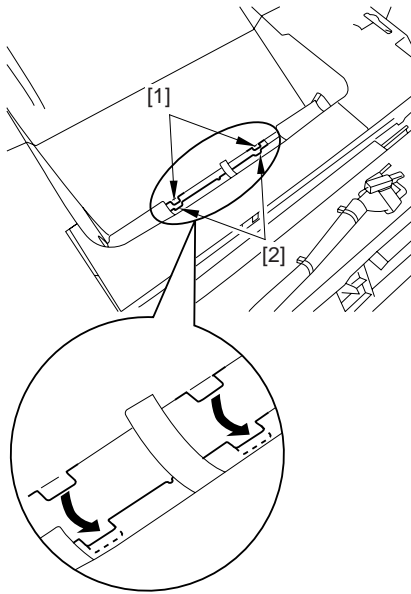
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



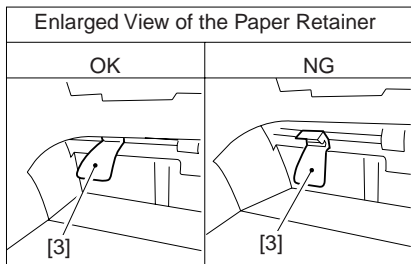
F-3-149



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



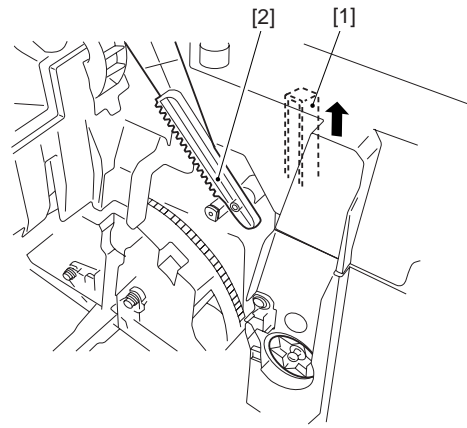
F-3-150



F-3-151



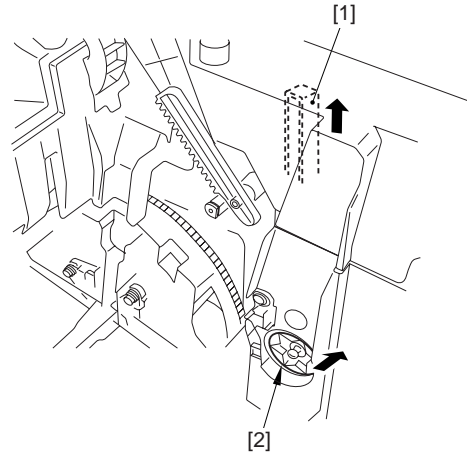
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-152



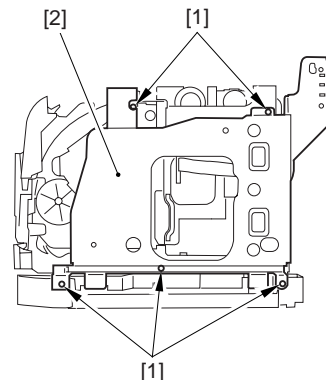
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-153

3.2.12.8 Removing the Right Frame

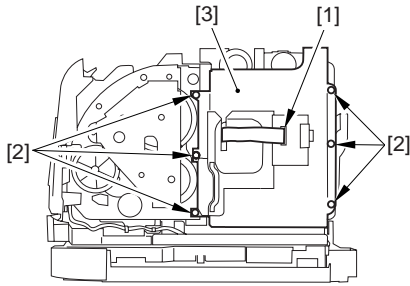
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-154

3.2.12.9 Removing the Shield Plate

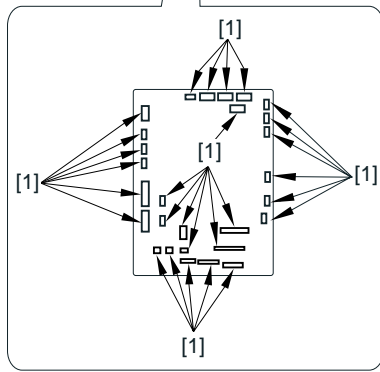
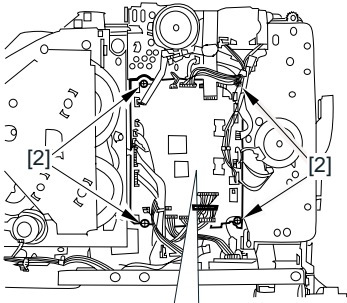
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-155

3.2.12.10 Removing the DCNT Board

- 1) Disconnect the connector [1] connected to the DC controller, and remove the 4 screws [2]; then, detach the DCNT board.

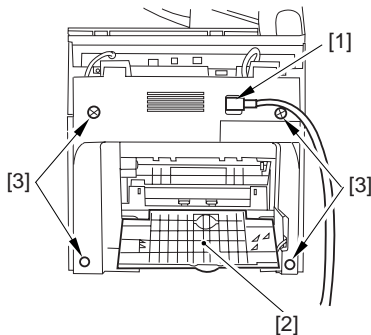


F-3-156

3.2.13 NCU Board

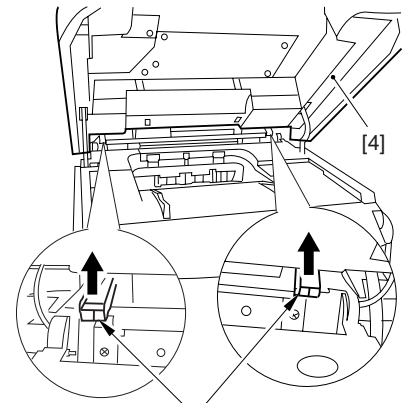
3.2.13.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-157

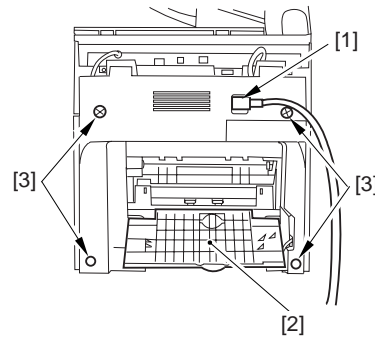
- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-158

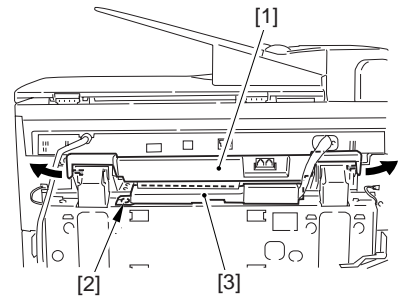
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-159

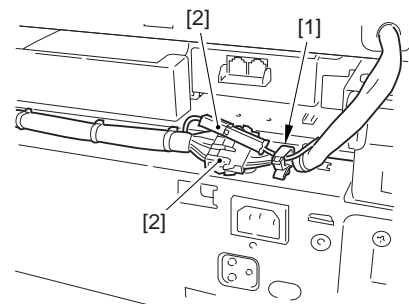
3.2.13.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



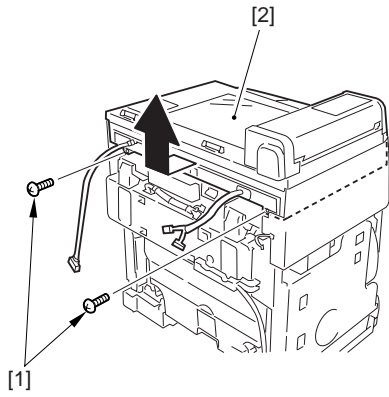
F-3-160

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-161

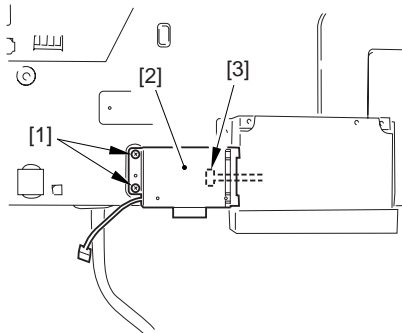
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-162

3.2.13.3 Removing the Modular Board Cover

1) Remove the 2 screws [1], and detach the modular board cover [2].

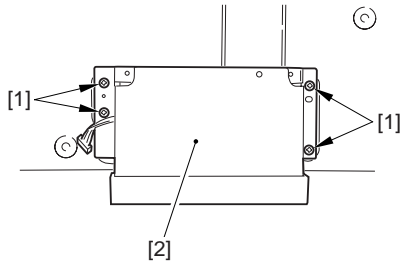


F-3-163

Pay attention to the harness [3].

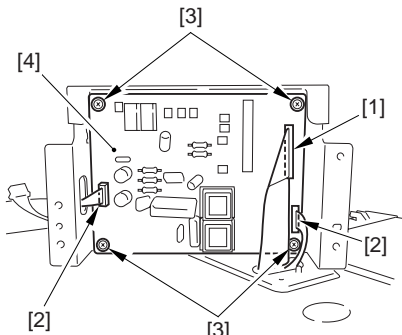
3.2.13.4 Removing the NCU Board

1) Remove the 4 screws [1], and open the NCU unit [2].



F-3-164

2) Disconnect the flat cable [1] and the 2 connectors [2]; then, remove the 4 screws [3], and detach the NCU board [4].

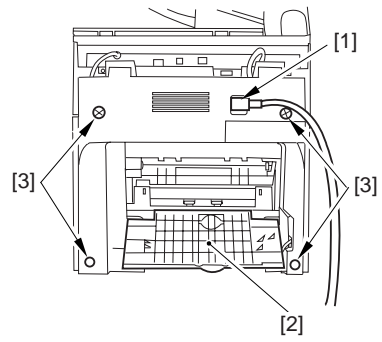


F-3-165

3.2.14 Modular Board

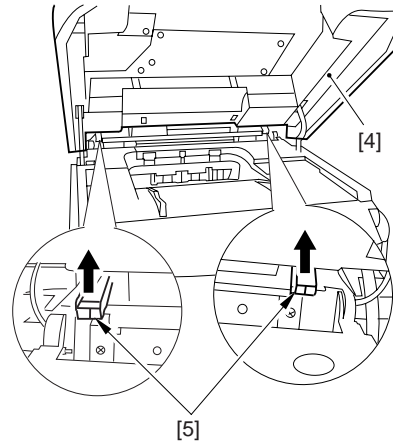
3.2.14.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



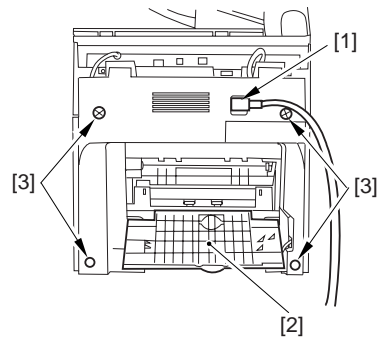
F-3-166

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-167

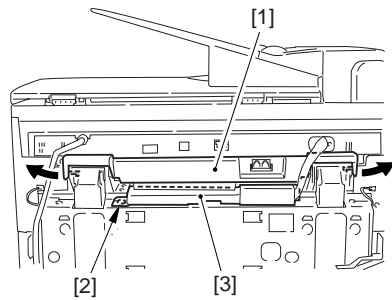
4) Close the reader assembly; then, detach the rear cover [1].



F-3-168

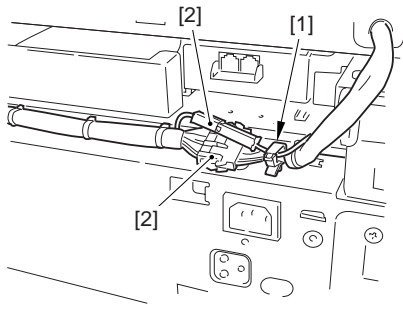
3.2.14.2 Removing the Scanner Unit

1) Remove the platen glass cover.
2) While removing the left and right claws, detach the hinge cover [1].
3) Remove the screw [2], and detach the cable guide [3].



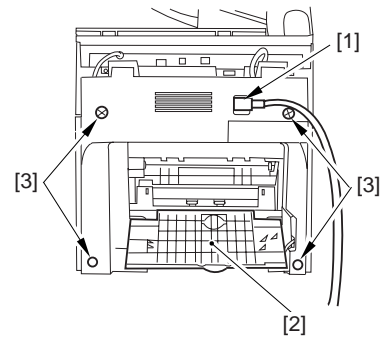
F-3-169

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



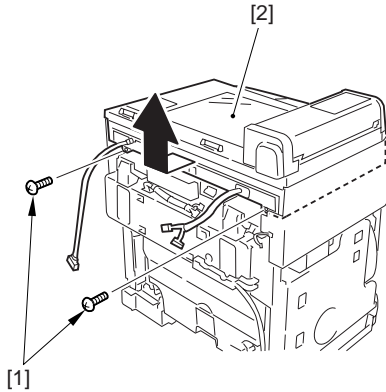
F-3-170

5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-174

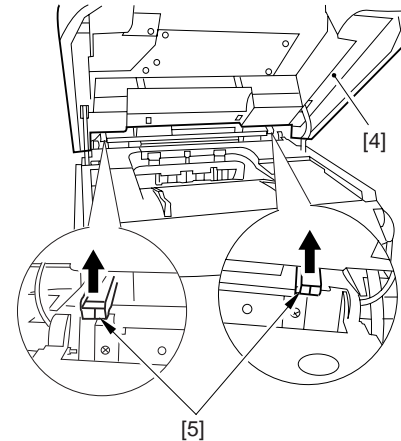
3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-171

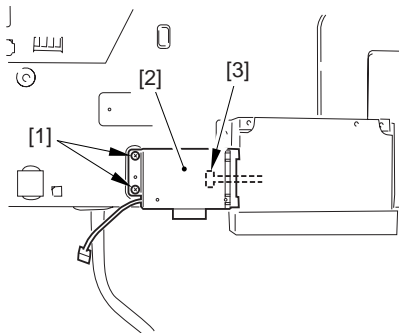
3.2.14.3 Removing the Modular Board Cover

1) Remove the 2 screws [1], and detach the modular board cover [2].



F-3-175

4) Close the reader assembly; then, detach the rear cover [1].

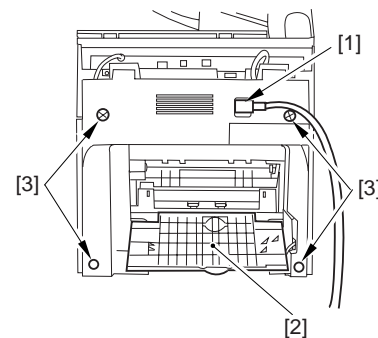


F-3-172

Pay attention to the harness [3].

3.2.14.4 Removing the Modular PCB

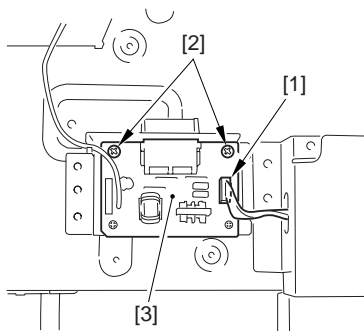
1) Disconnect the cable [1], and remove the 2 screws [2]; then, detach the modular board [3].



F-3-176

3.2.15.2 Removing the Reader Assembly

1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].

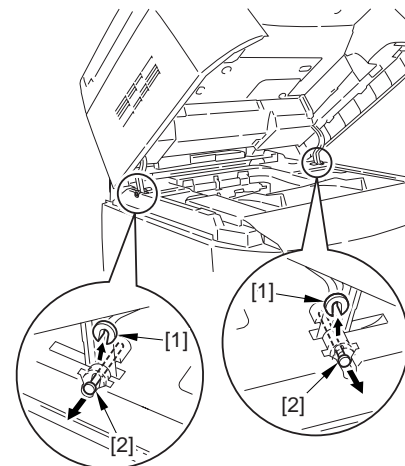


F-3-173

3.2.15 Power Supply PCB

3.2.15.1 Removing the Rear Cover

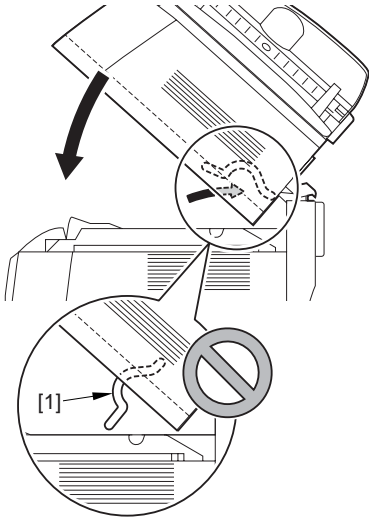
1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-177

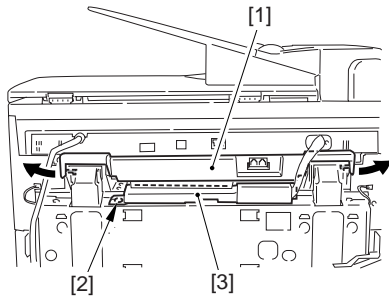


When closing the reader assembly, be sure to push in the arm [1] first.



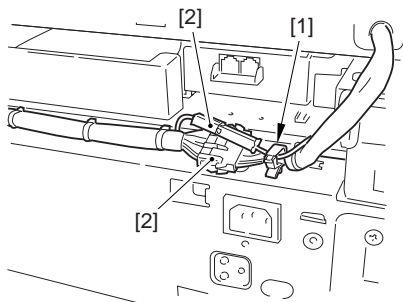
F-3-178

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



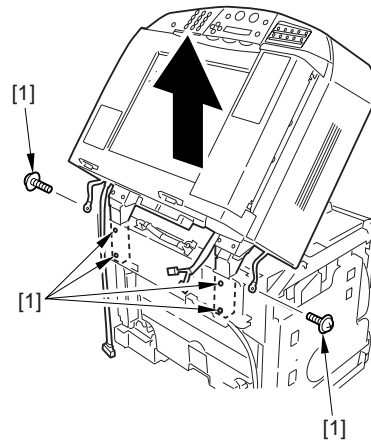
F-3-179

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-180

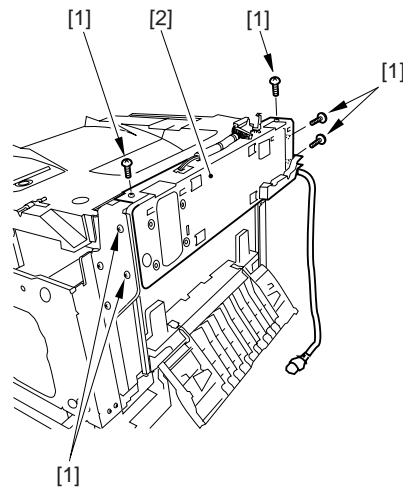
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-181

3.2.15.3 Removing the Power Supply Assembly

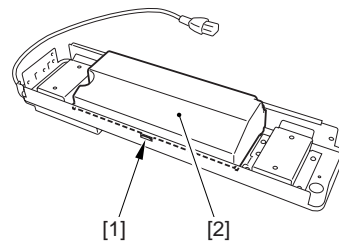
- 1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-182

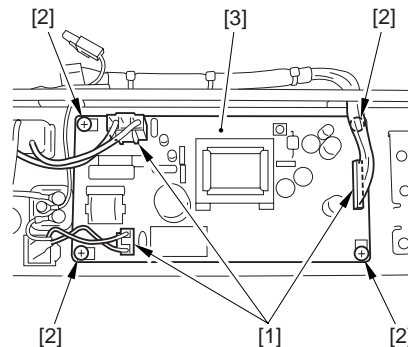
3.2.15.4 Removing the Power Supply PCB

- 1) Remove the claw [1], and detach the cover [2].



F-3-183

- 2) Disconnect the 3 connectors [1], and remove the 4 screws [2]; then, detach the power supply PCB [3].



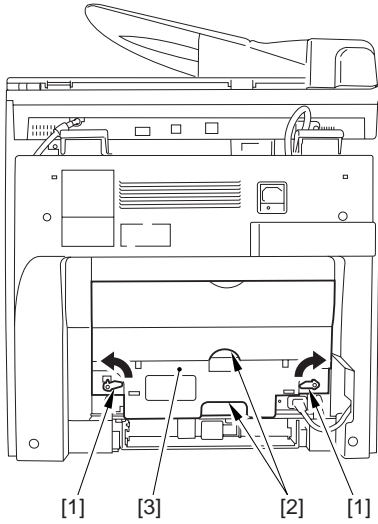
F-3-184

3.2.16 Print Power Supply PCB

3.2.16.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.

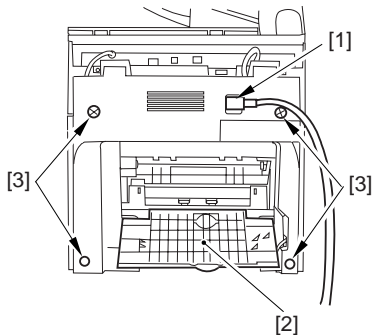
⚠ Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-185

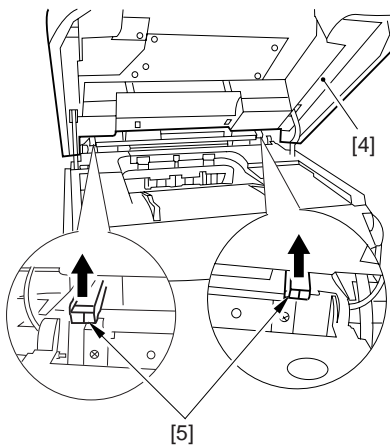
3.2.16.2 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



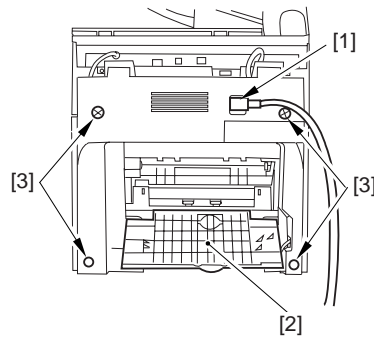
F-3-186

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-187

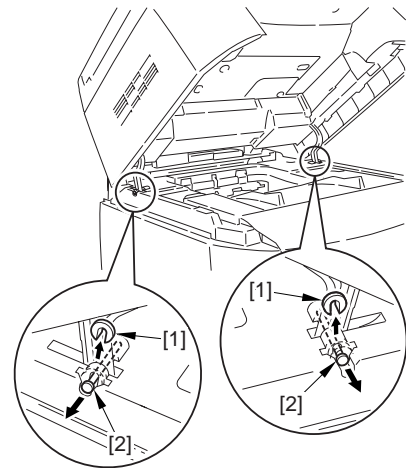
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-188

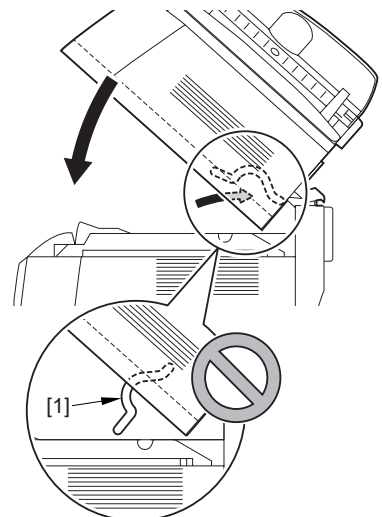
3.2.16.3 Removing the Reader Assembly

- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



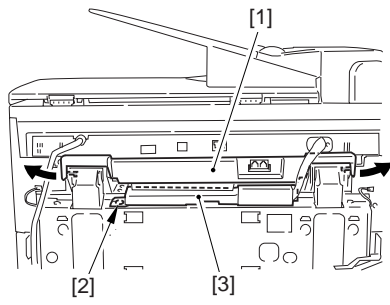
F-3-189

⚠ When closing the reader assembly, be sure to push in the arm [1] first.



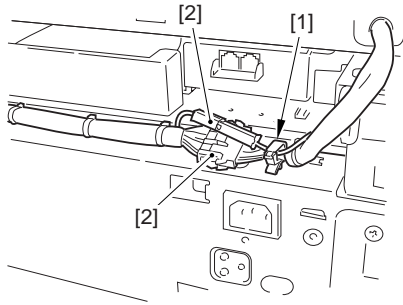
F-3-190

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



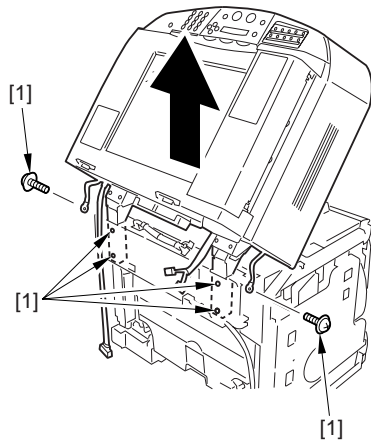
F-3-191

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-192

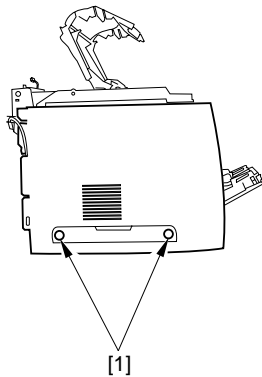
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



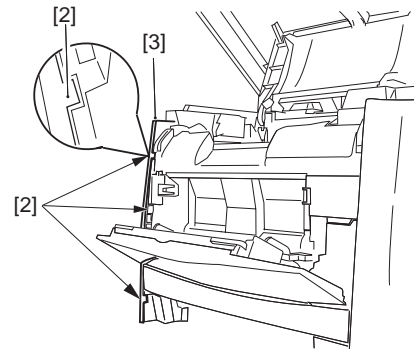
F-3-193

3.2.16.4 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



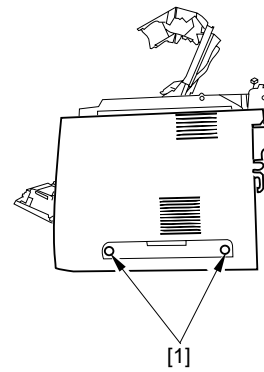
F-3-194



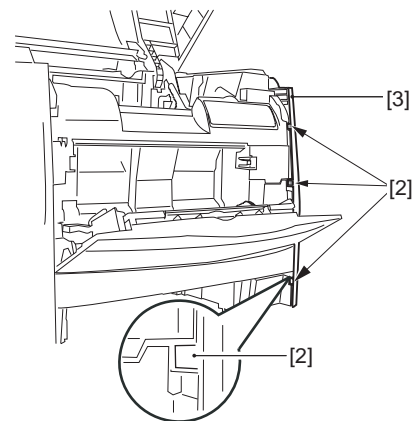
F-3-195

3.2.16.5 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



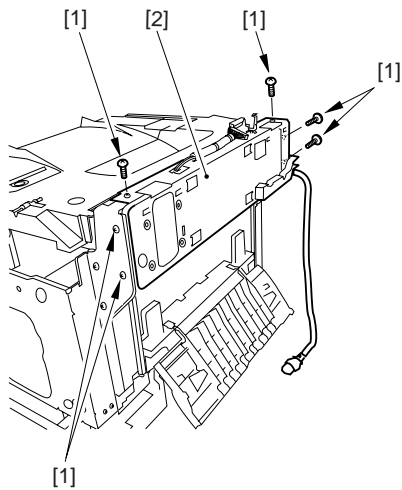
F-3-196



F-3-197

3.2.16.6 Removing the Power Supply Assembly

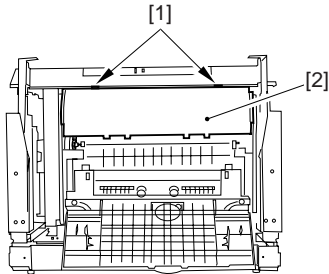
- 1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-198

3.2.16.7 Removing the Face-Down Cover

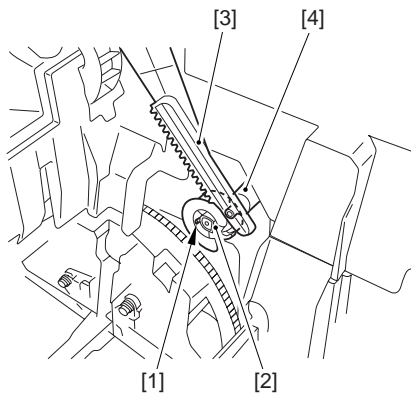
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-199

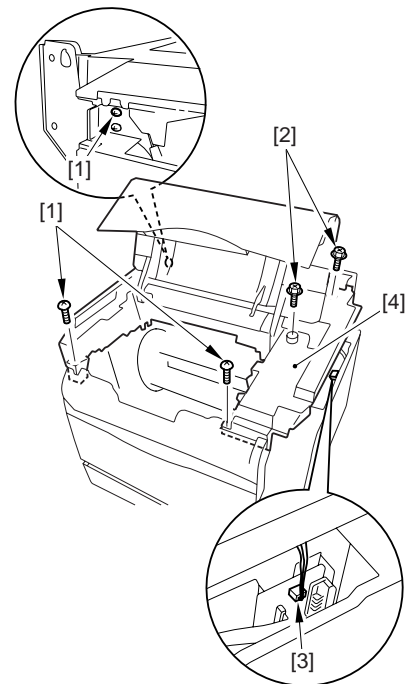
3.2.16.8 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-200

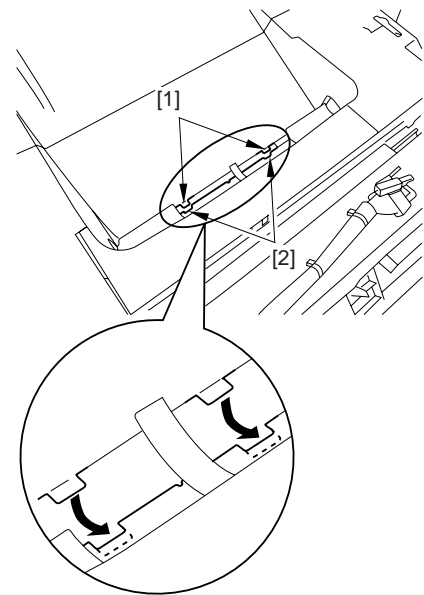
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



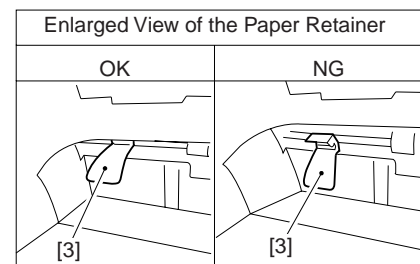
F-3-201



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



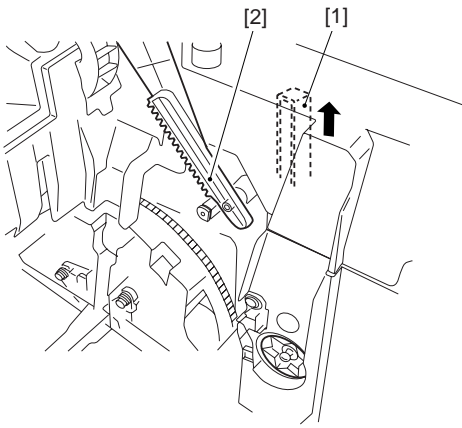
F-3-202



F-3-203



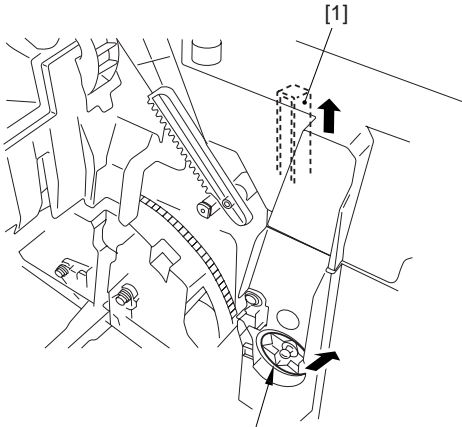
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-204



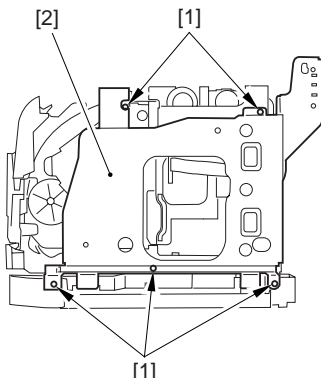
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-205

3.2.16.9 Removing the Right Frame

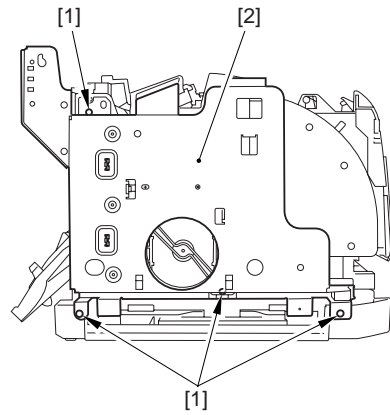
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-206

3.2.16.10 Removing the Left Frame

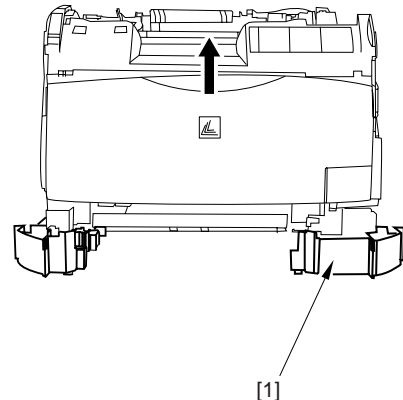
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-207

3.2.16.11 Removing the Cassette Feeder

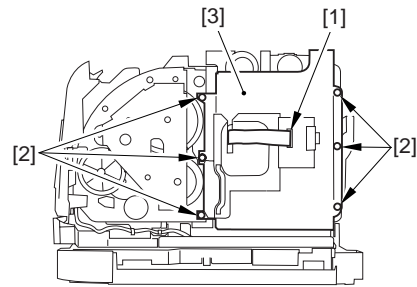
1) Lift the machine, and detach the cassette feeder [1].



F-3-208

3.2.16.12 Removing the Shield Plate

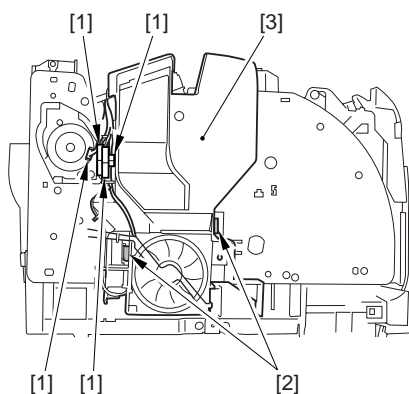
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-209

3.2.16.13 Removing the Fan Duct

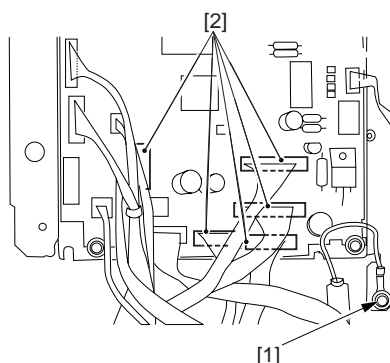
1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
2) Slide the fan duct [3] in upward direction to detach.



F-3-210

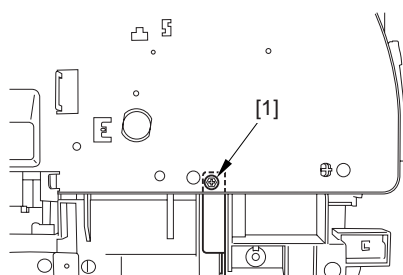
3.2.16.14 Removing the Lower Case Assembly

- 1) Remove the screw [1], and disconnect the 5 connectors [2].



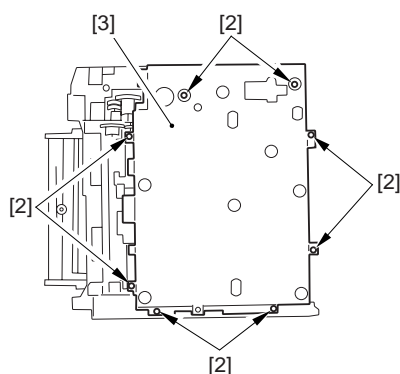
F-3-211

- 2) Remove the screw [1] from the left side of the machine.



F-3-212

- 3) With care, shift down the machine to the left; then, remove the 8 screws [2] from the bottom, and detach the lower case assembly [3].



F-3-213



When you shift down the machine, be sure to take care to avoid injury by the edge of the side plate. Also, be sure to hold it by its grip segment. Be sure to place a cushioning material (g., towel) on the work table to protect the protrusions of the machine from damage. Moreover, be sure to tape the opening of the laser scanner assembly to prevent intrusion of toner in the optical path of the assembly before shifting

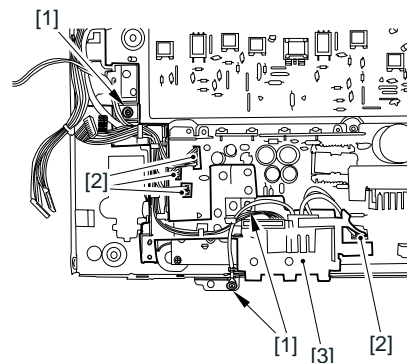
down the machine.



If you must detach the lower case assembly, base user to hold it by its bottom so as to avoid injury by the edge of its side plate.

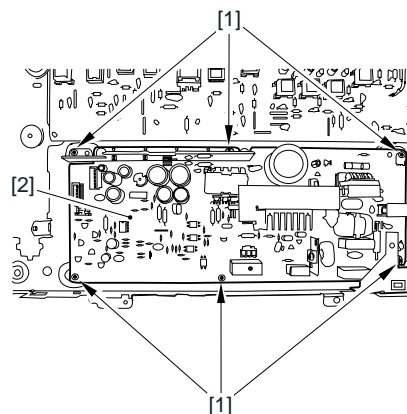
3.2.16.15 Removing the Printer Power Supply PCB

- 1) Remove the 3 screws [1], and disconnect the 4 connectors [2]; then, detach the cable guide [3].



F-3-214

- 2) Remove the 6 screws [1], and detach the printer power supply PCB [2].



F-3-215

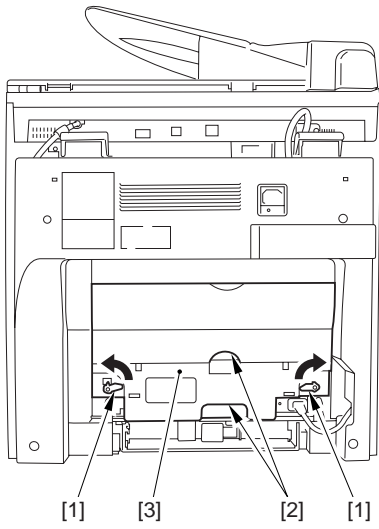
3.2.17 High-voltage Power Supply PCB

3.2.17.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



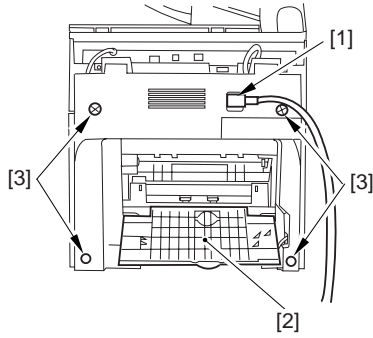
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-216

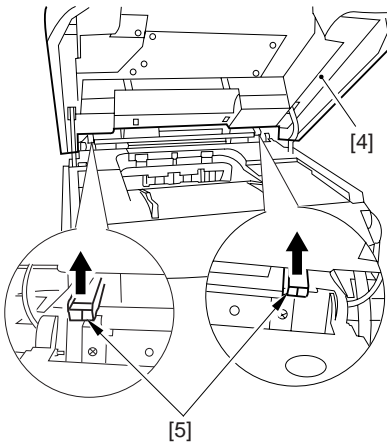
3.2.17.2 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



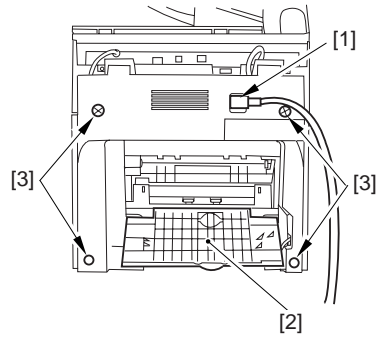
F-3-217

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-218

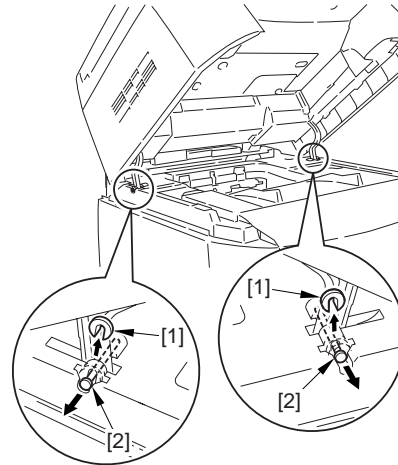
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-219

3.2.17.3 Removing the Reader Assembly

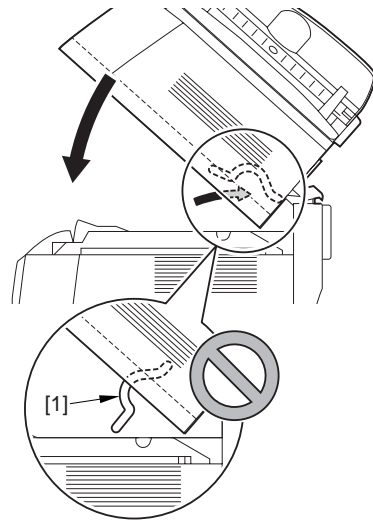
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-220

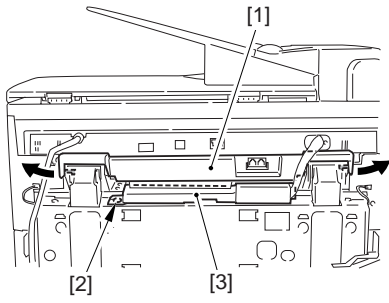


When closing the reader assembly, be sure to push in the arm [1] first.



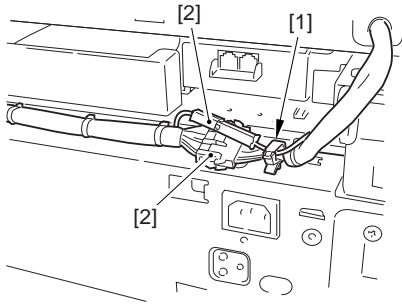
F-3-221

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



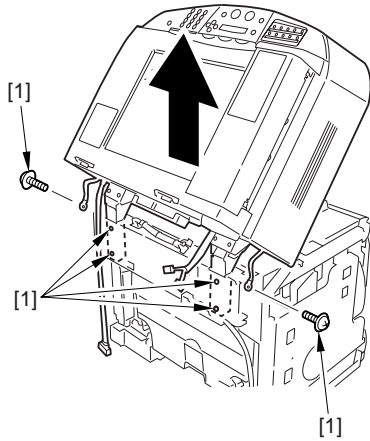
F-3-222

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-223

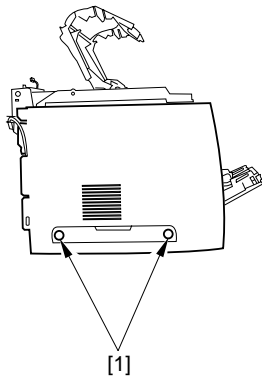
5) Remove the 6 screws [1], and lift the reader unit to detach.



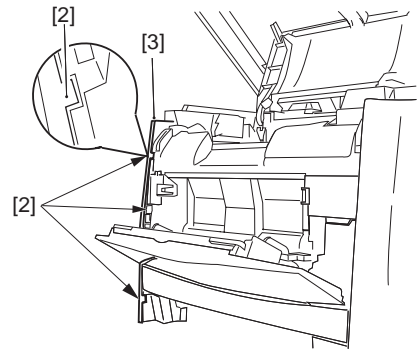
F-3-224

3.2.17.4 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



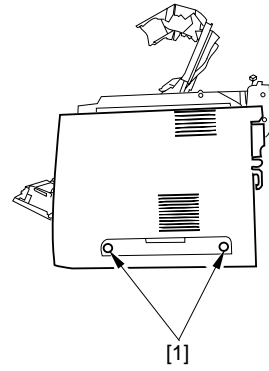
F-3-225



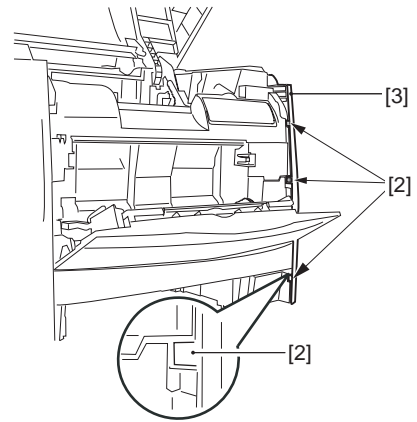
F-3-226

3.2.17.5 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



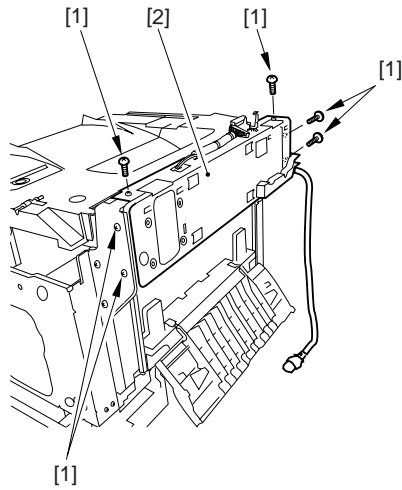
F-3-227



F-3-228

3.2.17.6 Removing the Power Supply Assembly

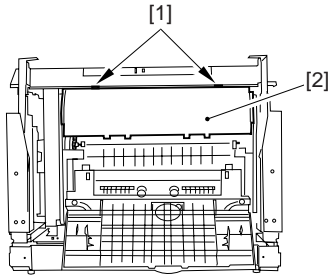
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-229

3.2.17.7 Removing the Face-Down Cover

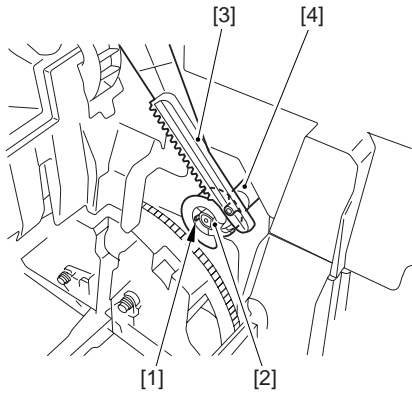
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-230

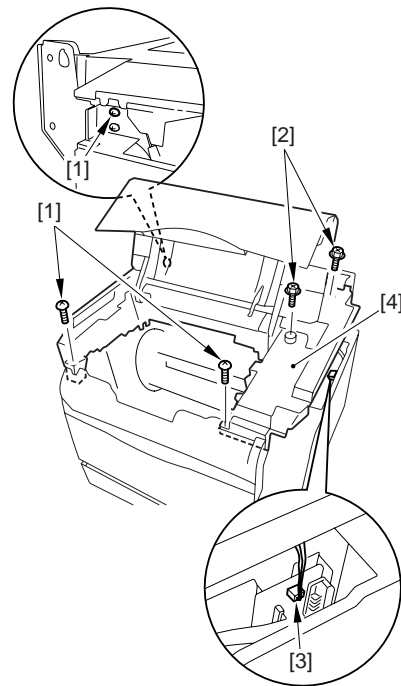
3.2.17.8 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-231

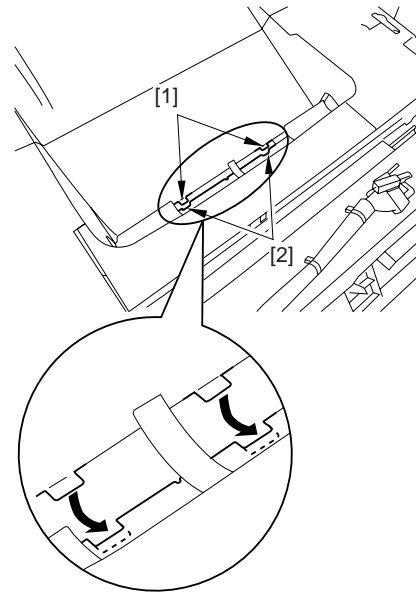
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



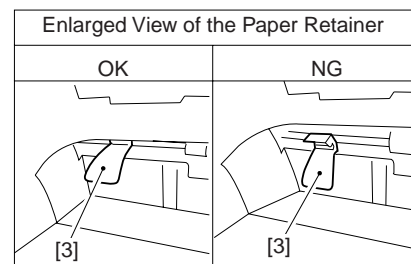
F-3-232



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



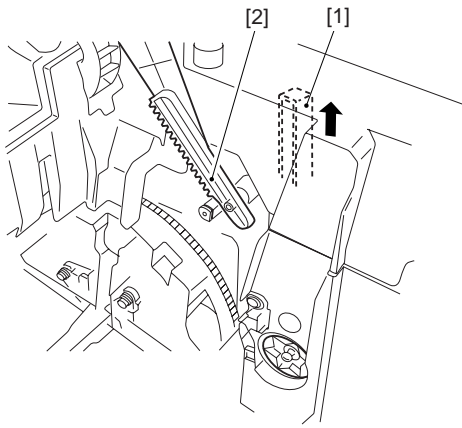
F-3-233



F-3-234



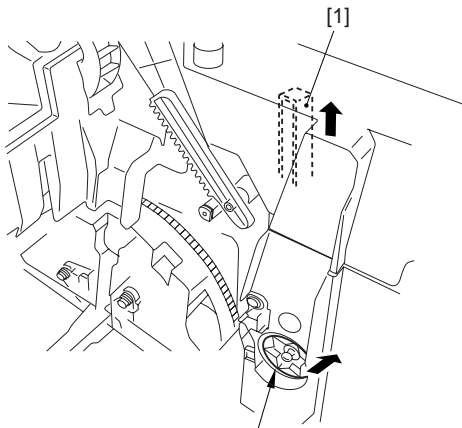
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-235



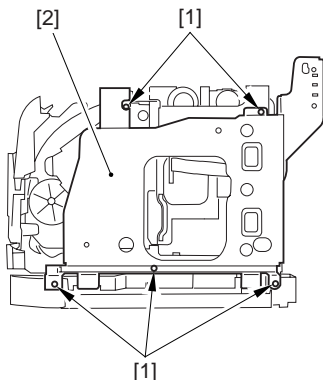
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-236

3.2.17.9 Removing the Right Frame

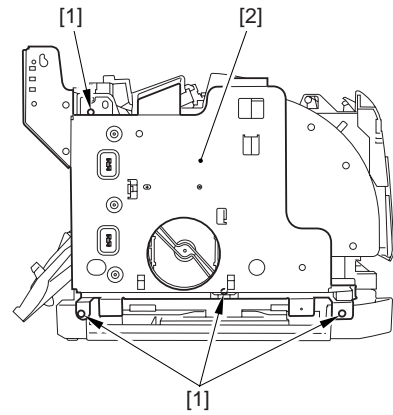
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-237

3.2.17.10 Removing the Left Frame

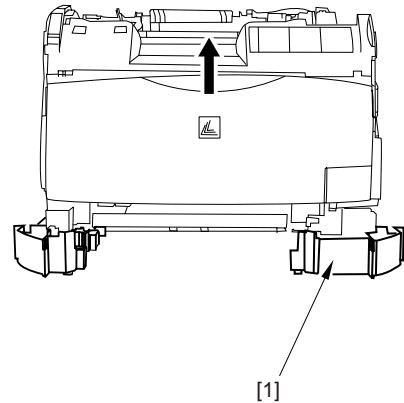
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-238

3.2.17.11 Removing the Cassette Feeder

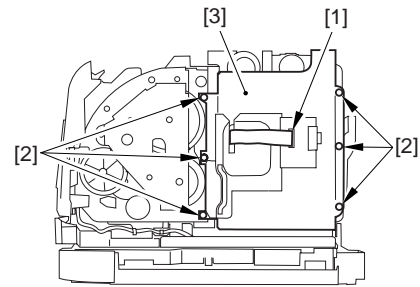
1) Lift the machine, and detach the cassette feeder [1].



F-3-239

3.2.17.12 Removing the Shield Plate

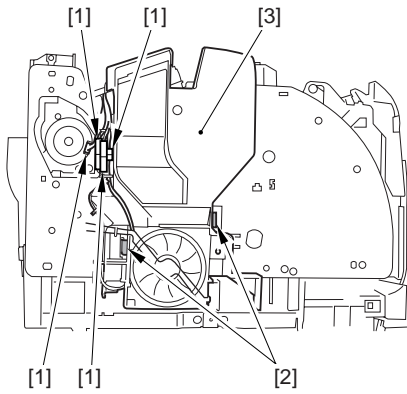
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-240

3.2.17.13 Removing the Fan Duct

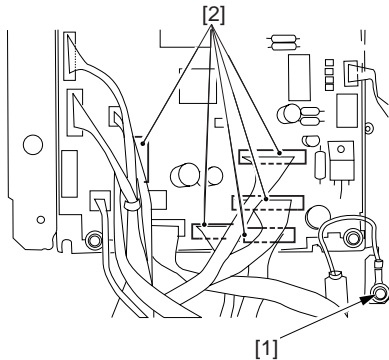
1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
2) Slide the fan duct [3] in upward direction to detach.



F-3-241

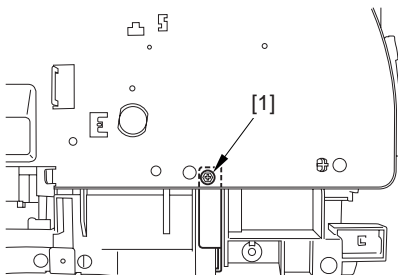
3.2.17.14 Removing the Lower Case Assembly

- 1) Remove the screw [1], and disconnect the 5 connectors [2].



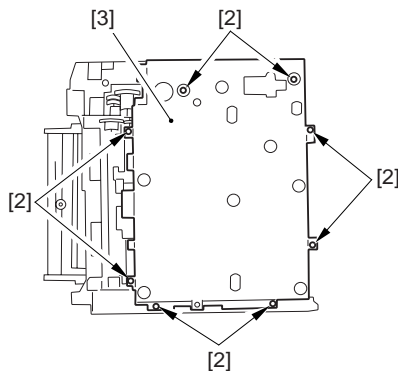
F-3-242

- 2) Remove the screw [1] from the left side of the machine.



F-3-243

- 3) With care, shift down the machine to the left; then, remove the 8 screws [2] from the bottom, and detach the lower case assembly [3].



F-3-244

! When you shift down the machine, be sure to take care to avoid injury by the edge of the side plate. Also, be sure to hold it by its grip segment. Be sure to place a cushioning material (g., towel) on the work table to protect the protrusions of the machine from damage. Moreover, be sure to tape the opening of the laser scanner assembly to prevent intrusion of toner in the optical path of the assembly before shifting

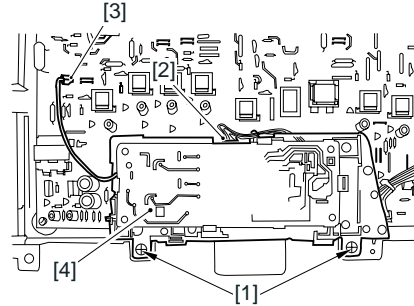
down the machine.



If you must detach the lower case assembly, base user to hold it by its bottom so as to avoid injury by the edge of its side plate.

3.2.17.15 Removing the Sub High-Voltage Power Supply PCB Unit

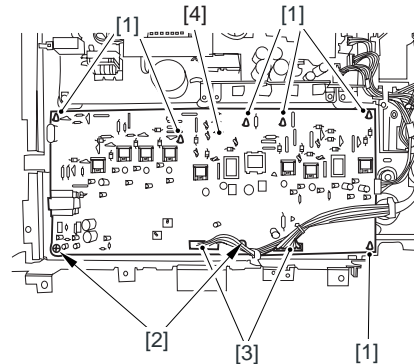
- 1) Remove 2 screws [1], disconnect the connector [2], remove the faston [3], and remove the 4 claws; then, detach the sub high-voltage power supply PCB unit [5].



F-3-245

3.2.17.16 Removing the High-Voltage Power Supply PCB

- 1) Remove the 6 claws [1], remove the 2 screws [2], and disconnect the 2 connectors [3]; then, detach the high-voltage power supply PCB [4].



F-3-246

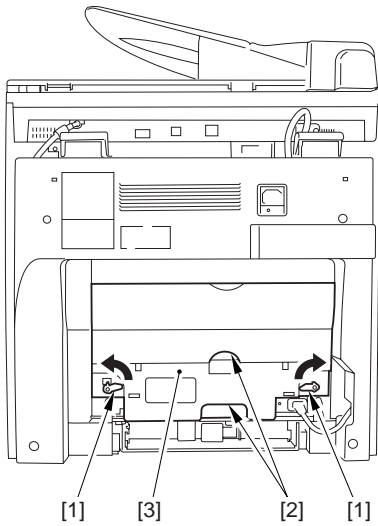
3.2.18 Sub High-Voltage Power Supply PCB

3.2.18.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



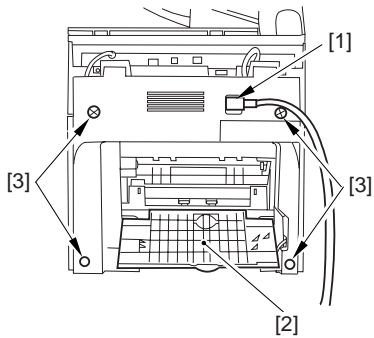
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-247

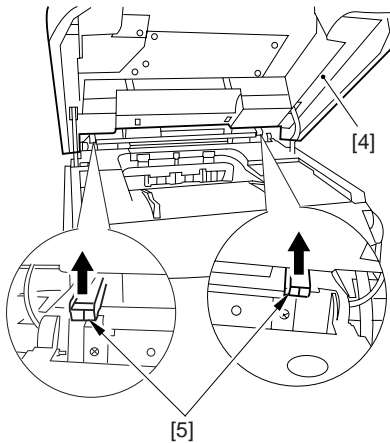
3.2.18.2 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



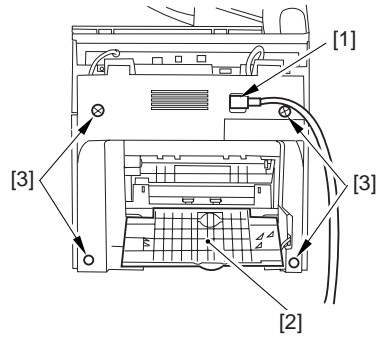
F-3-248

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-249

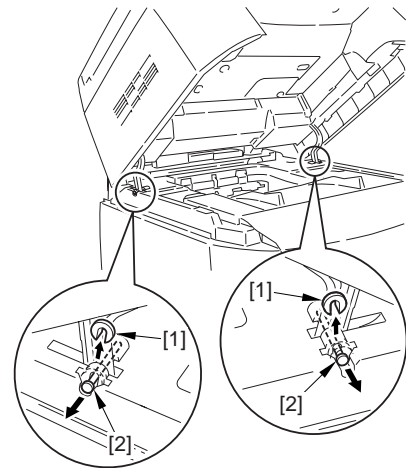
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-250

3.2.18.3 Removing the Reader Assembly

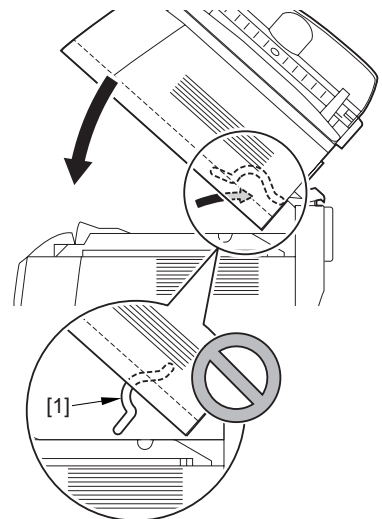
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-251

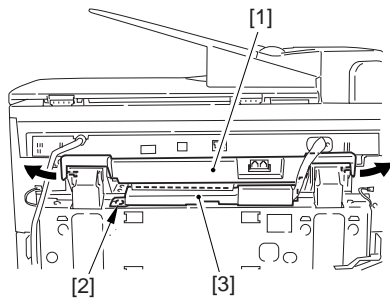


When closing the reader assembly, be sure to push in the arm [1] first.



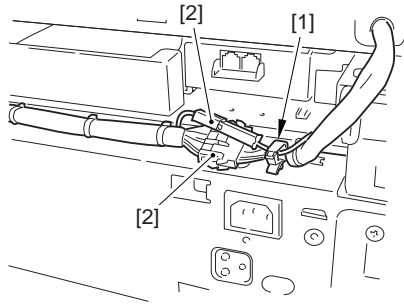
F-3-252

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



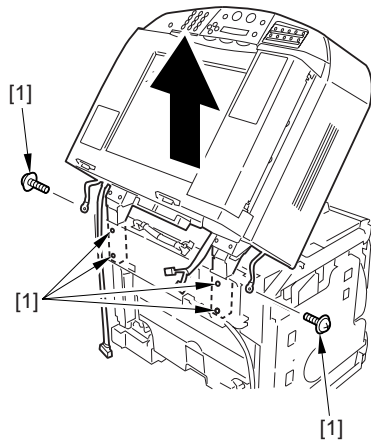
F-3-253

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-254

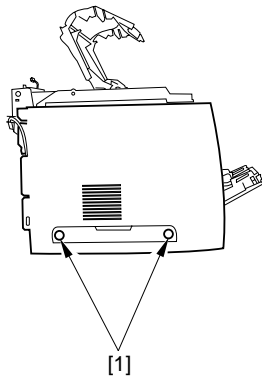
5) Remove the 6 screws [1], and lift the reader unit to detach.



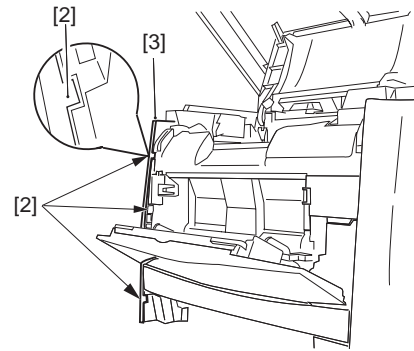
F-3-255

3.2.18.4 Removing the Right Cover

1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



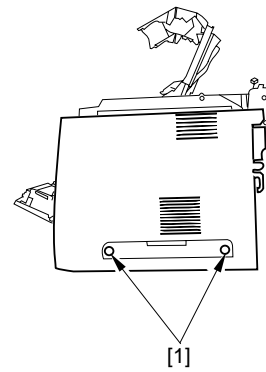
F-3-256



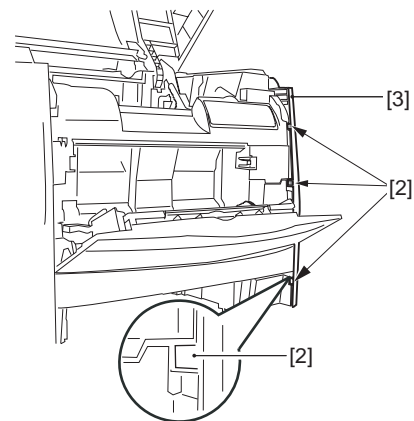
F-3-257

3.2.18.5 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



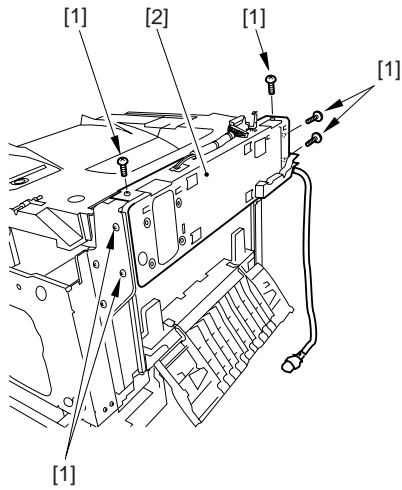
F-3-258



F-3-259

3.2.18.6 Removing the Power Supply Assembly

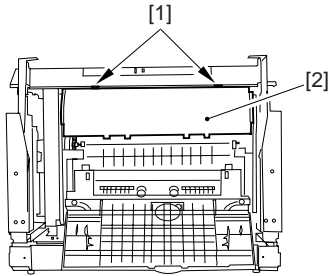
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-260

3.2.18.7 Removing the Face-Down Cover

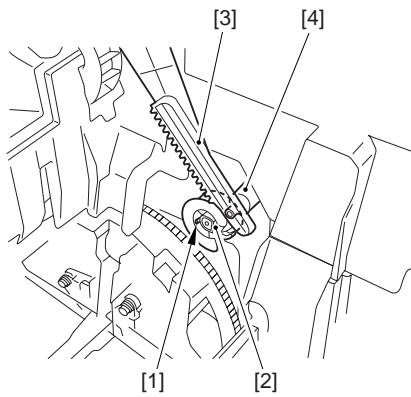
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-261

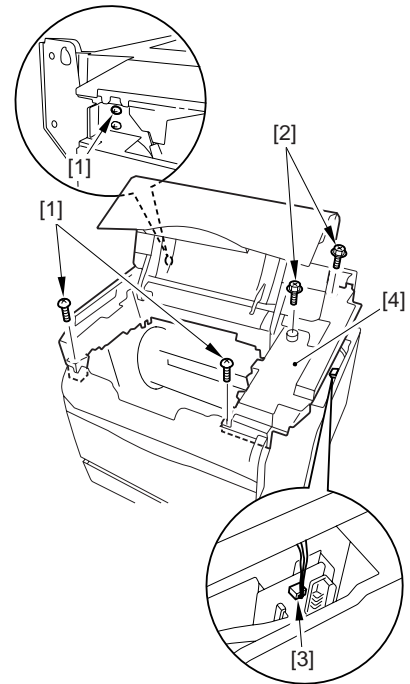
3.2.18.8 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-262

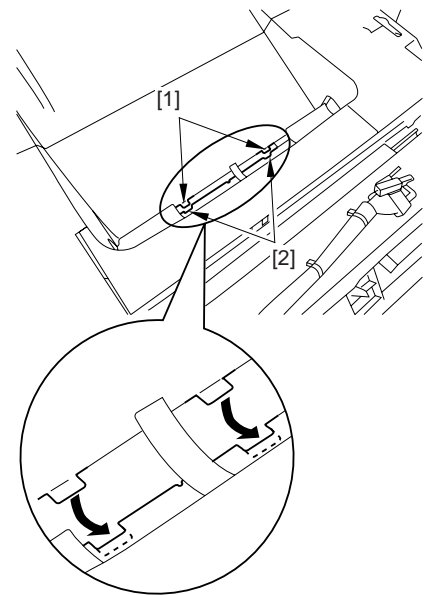
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



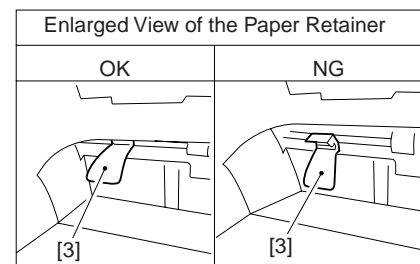
F-3-263



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



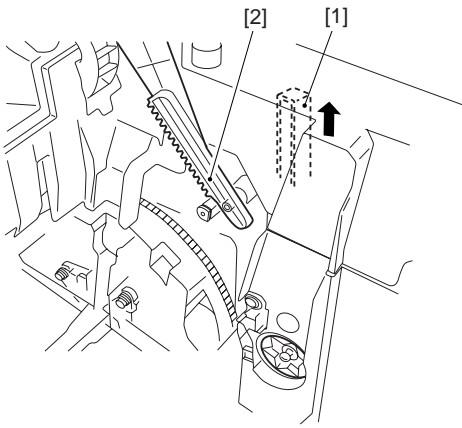
F-3-264



F-3-265



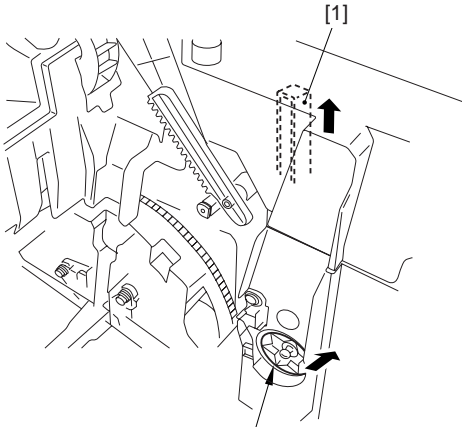
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-266



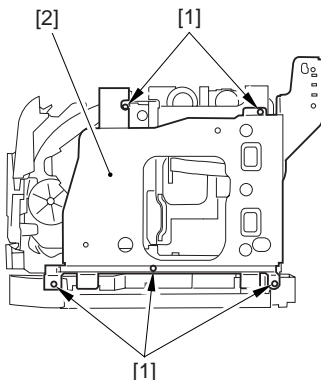
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-267

3.2.18.9 Removing the Right Frame

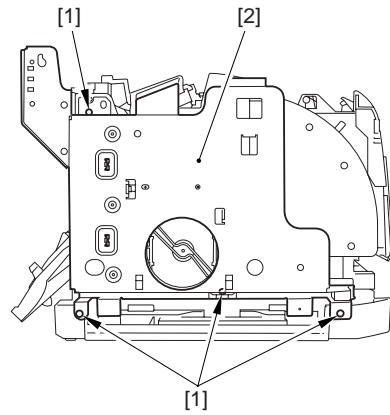
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-268

3.2.18.10 Removing the Left Frame

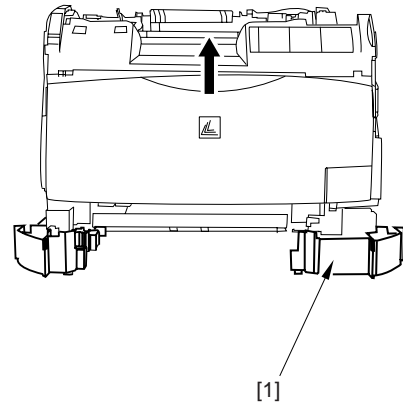
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-269

3.2.18.11 Removing the Cassette Feeder

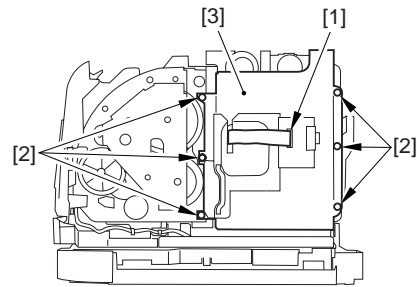
1) Lift the machine, and detach the cassette feeder [1].



F-3-270

3.2.18.12 Removing the Shield Plate

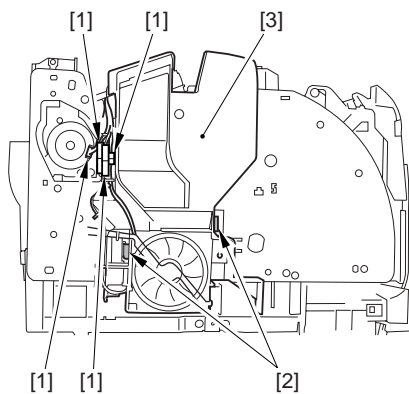
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-271

3.2.18.13 Removing the Fan Duct

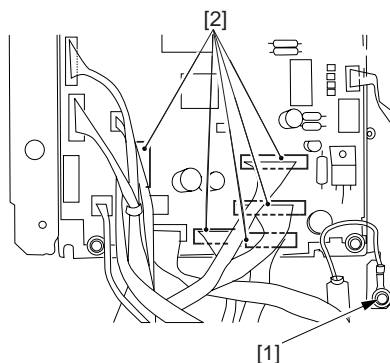
1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
2) Slide the fan duct [3] in upward direction to detach.



F-3-272

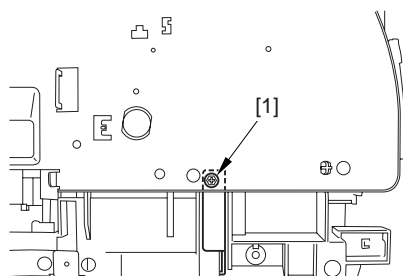
3.2.18.14 Removing the Lower Case Assembly

- 1) Remove the screw [1], and disconnect the 5 connectors [2].



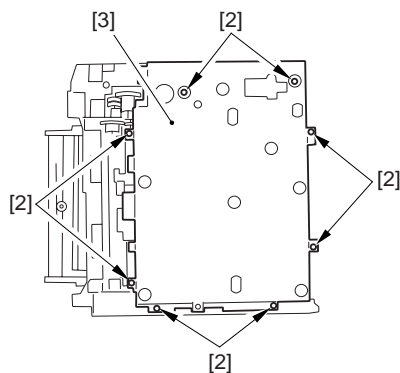
F-3-273

- 2) Remove the screw [1] from the left side of the machine.



F-3-274

- 3) With care, shift down the machine to the left; then, remove the 8 screws [2] from the bottom, and detach the lower case assembly [3].



F-3-275

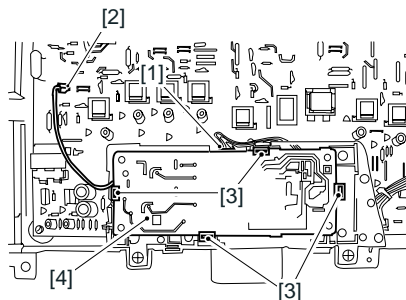
down the machine.



If you must detach the lower case assembly, base user to hold it by its bottom so as to avoid injury by the edge of its side plate.

3.2.18.15 Removing the Sub High-voltage Power Supply Board

- 1) Remove the connector [1] and the faston [2], and detach the 4 claws [3]; remove the sub high-voltage power supply board [4].

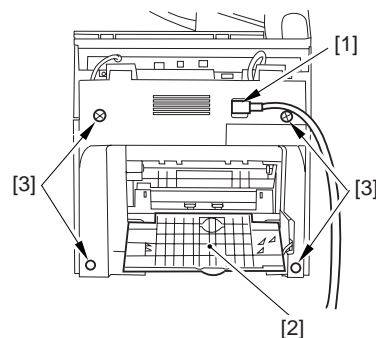


F-3-276

3.2.19 Internal Temperature Detection Thermistor

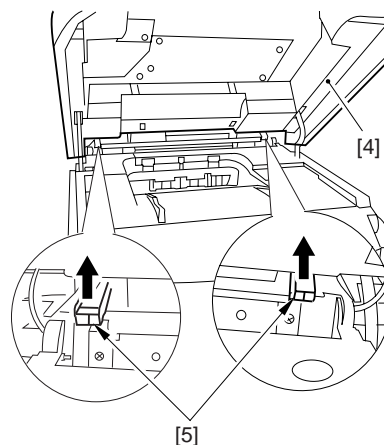
3.2.19.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-277

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].

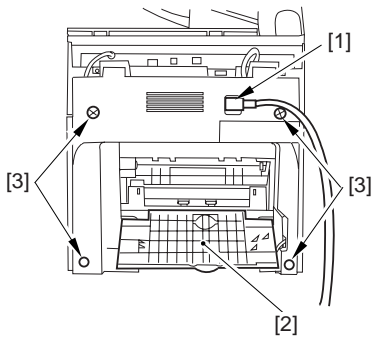


F-3-278

- 4) Close the reader assembly; then, detach the rear cover [1].



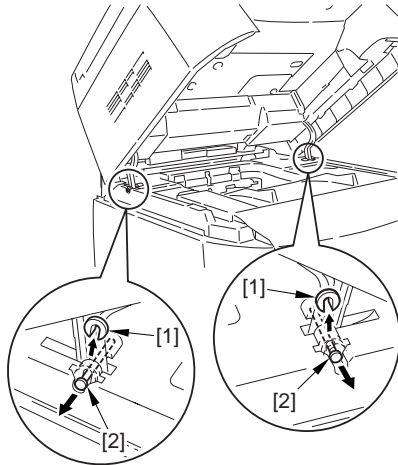
When you shift down the machine, be sure to take care to avoid injury by the edge of the side plate. Also, be sure to hold it by its grip segment. Be sure to place a cushioning material (g., towel) on the work table to protect the protrusions of the machine from damage. Moreover, be sure to tape the opening of the laser scanner assembly to prevent intrusion of toner in the optical path of the assembly before shifting



F-3-279

3.2.19.2 Removing the Reader Assembly

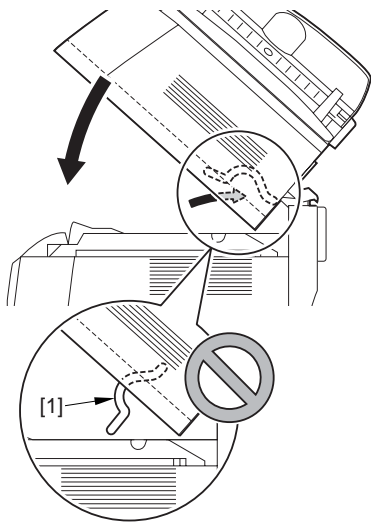
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-280

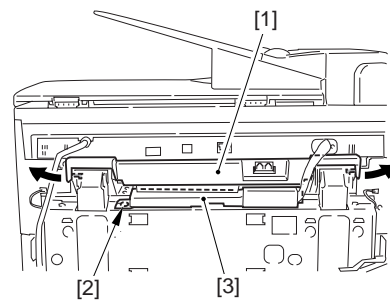


When closing the reader assembly, be sure to push in the arm [1] first.



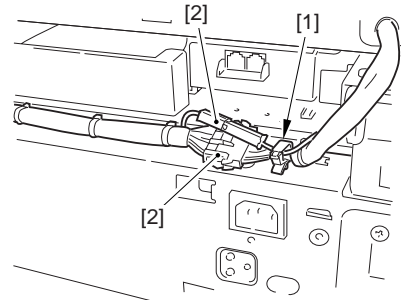
F-3-281

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



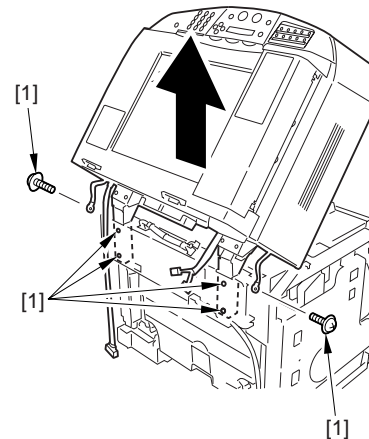
F-3-282

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-283

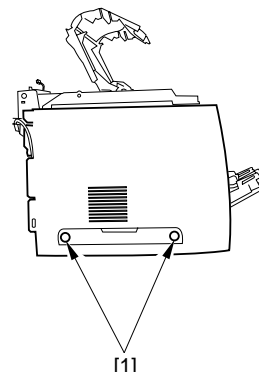
5) Remove the 6 screws [1], and lift the reader unit to detach.



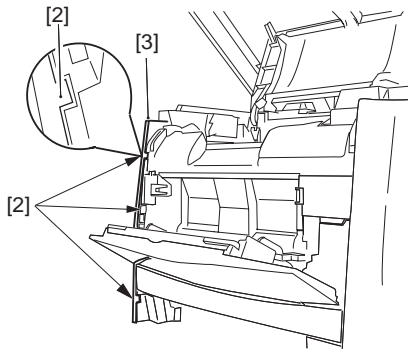
F-3-284

3.2.19.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



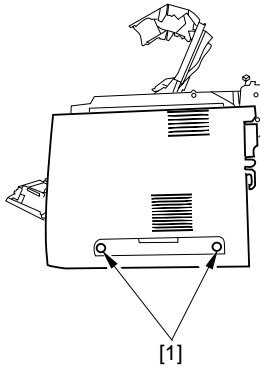
F-3-285



F-3-286

3.2.19.4 Removing the Left Cover

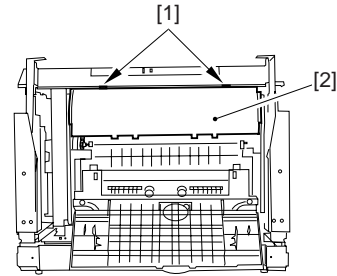
- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



F-3-287

3.2.19.6 Removing the Face-Down Cover

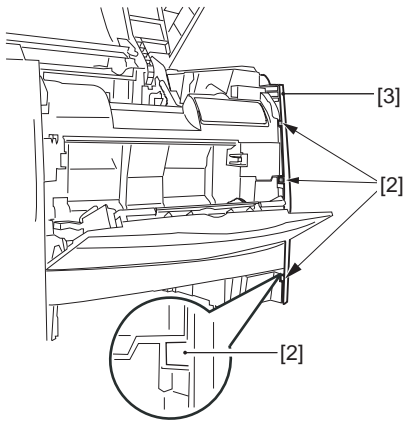
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-290

3.2.19.7 Removing the Top Cover

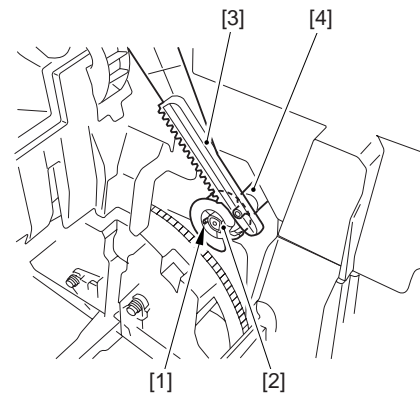
- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-288

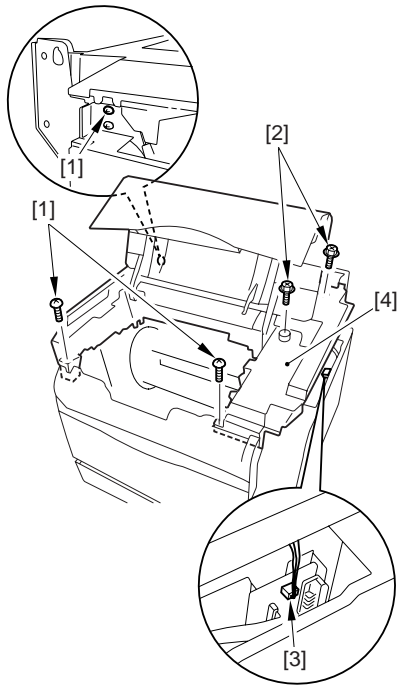
3.2.19.5 Removing the Power Supply Assembly

- 1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-291

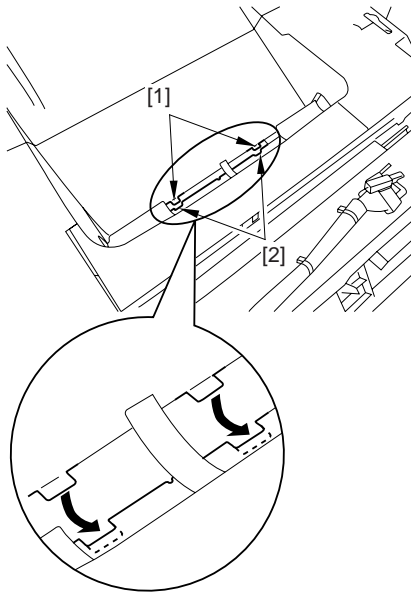
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



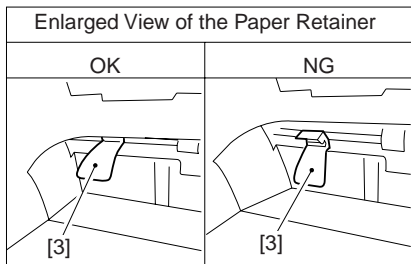
F-3-292



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



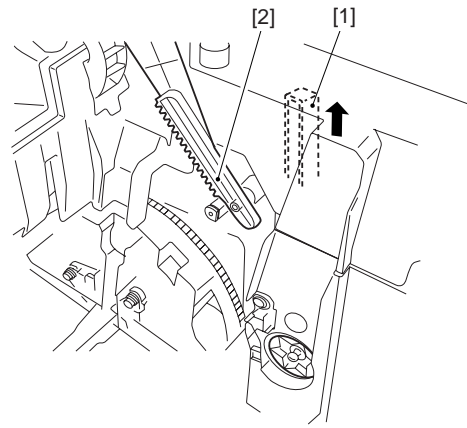
F-3-293



F-3-294



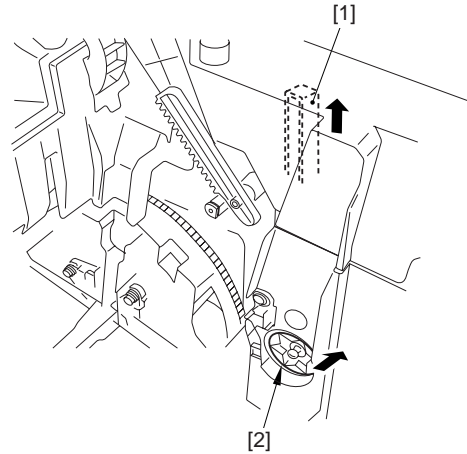
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-295



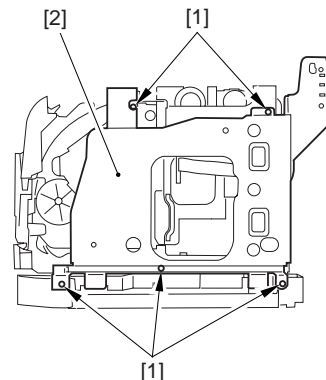
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-296

3.2.19.8 Removing the Right Frame

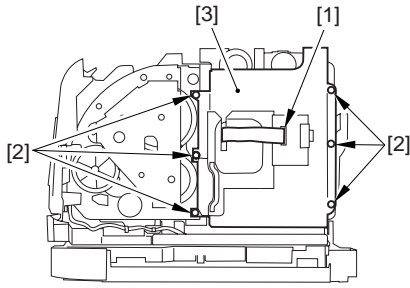
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-297

3.2.19.9 Removing the Shield Plate

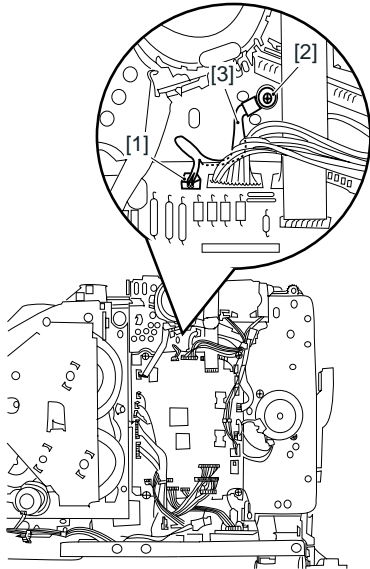
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-298

3.2.19.10 Removing the Machine Inside Temperature Thermistor

- 1) Disconnect the connector [1], and remove the screw [2]; then, detach the machine inside temperature thermistor [3].

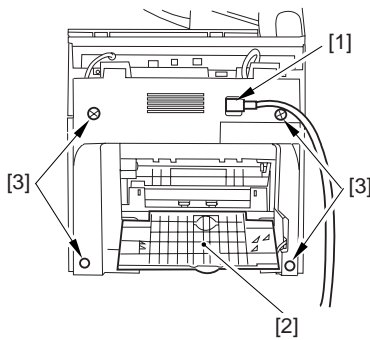


F-3-299

3.2.20 Cooling Fan

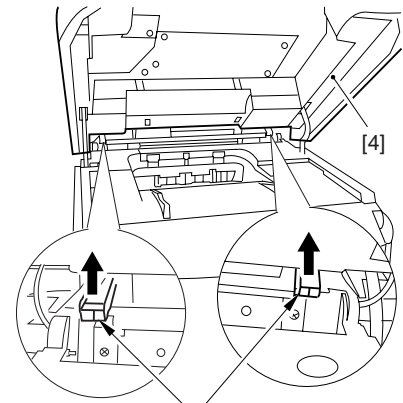
3.2.20.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-300

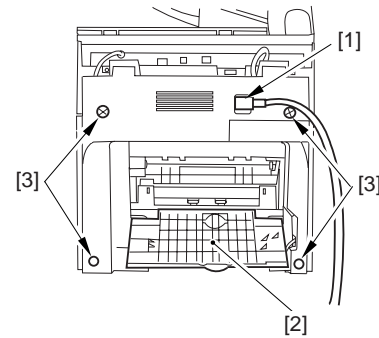
- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-301

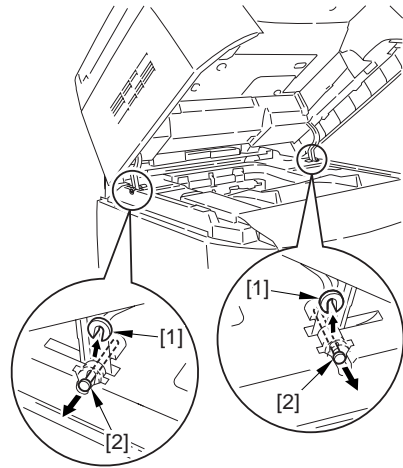
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-302

3.2.20.2 Removing the Reader Assembly

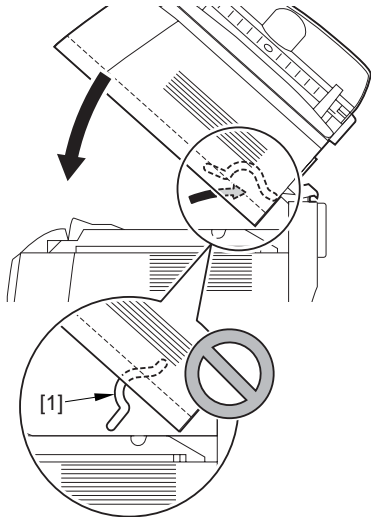
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-303

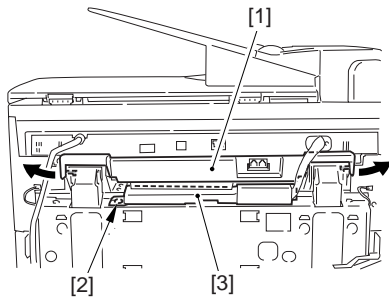


When closing the reader assembly, be sure to push in the arm [1] first.



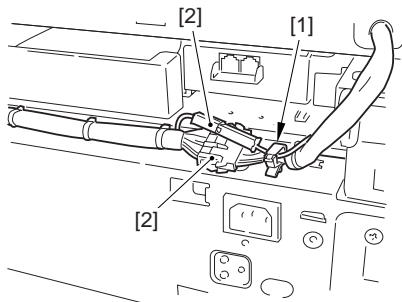
F-3-304

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



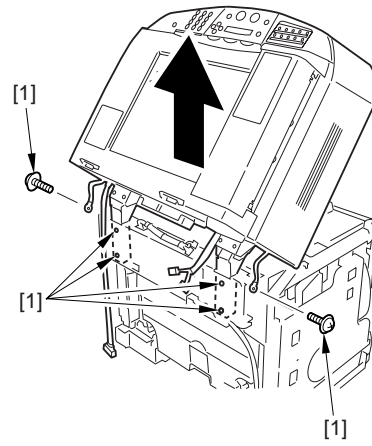
F-3-305

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-306

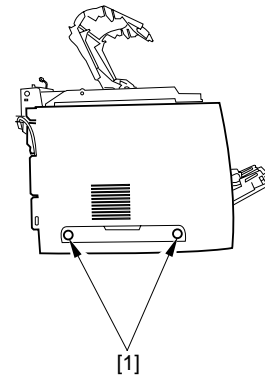
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



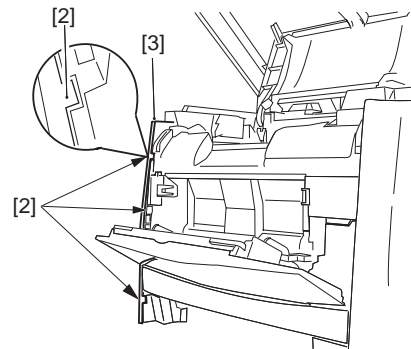
F-3-307

3.2.20.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



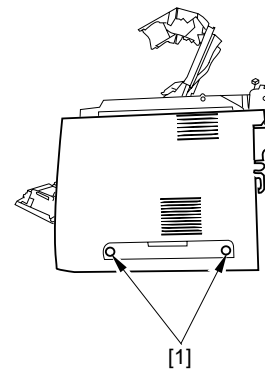
F-3-308



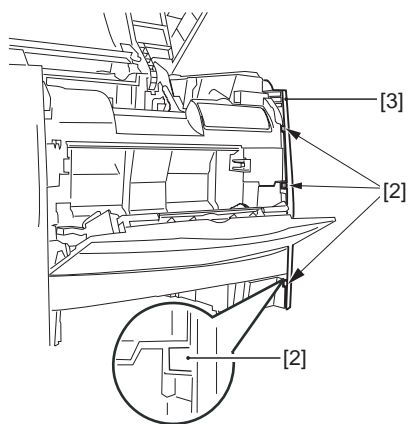
F-3-309

3.2.20.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



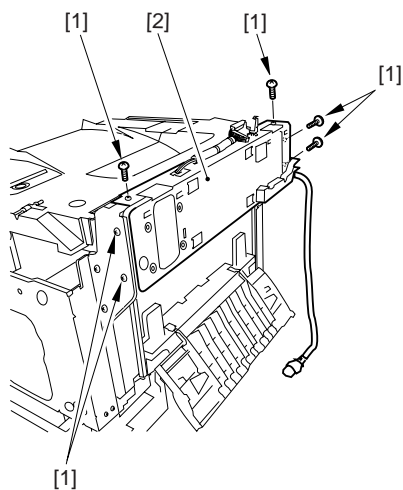
F-3-310



F-3-311

3.2.20.5 Removing the Power Supply Assembly

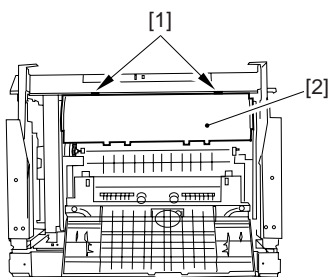
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-312

3.2.20.6 Removing the Face-Down Cover

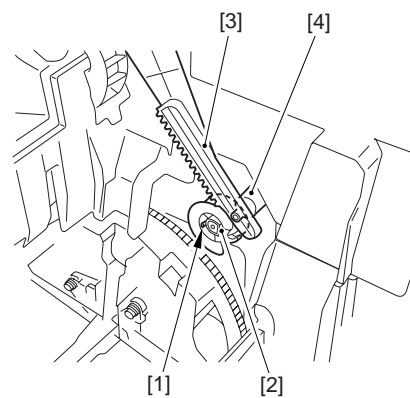
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-313

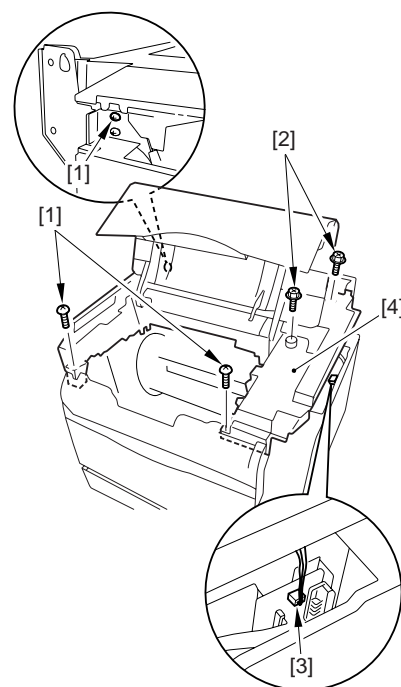
3.2.20.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



F-3-314

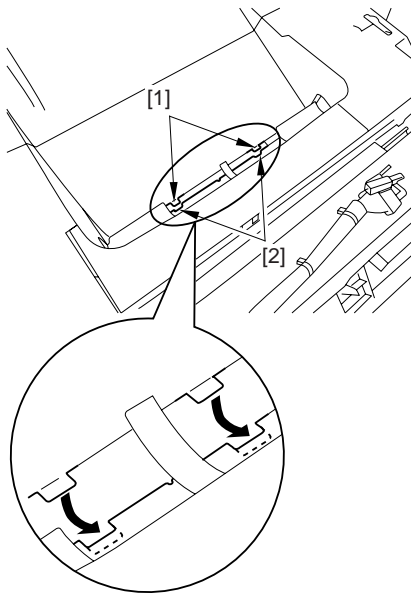
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



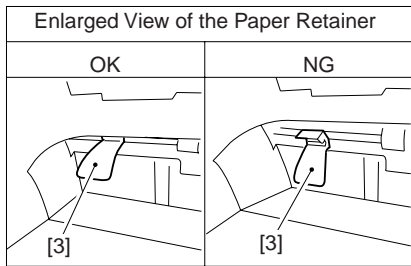
F-3-315



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



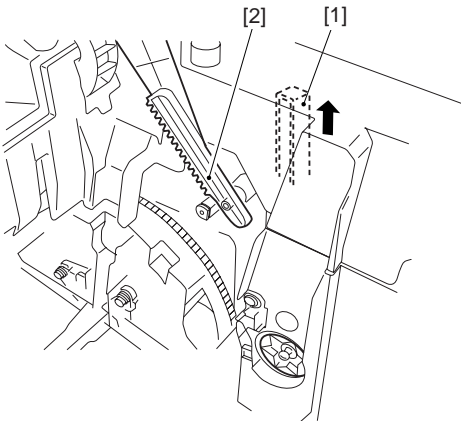
F-3-316



F-3-317



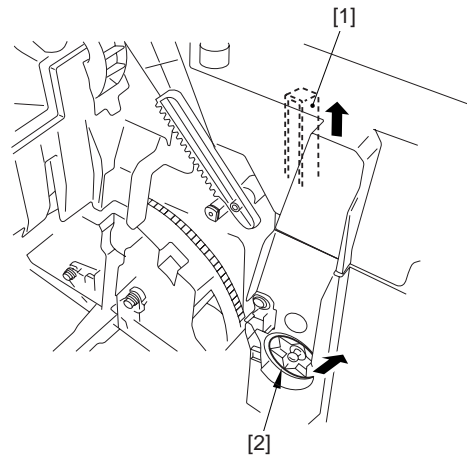
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-318



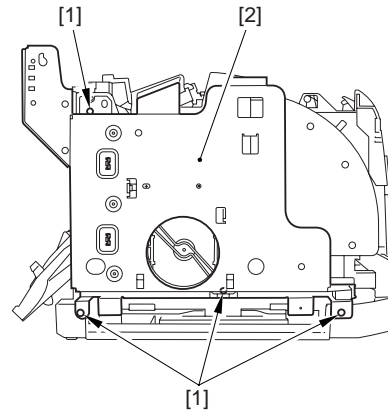
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-319

3.2.20.8 Removing the Left Frame

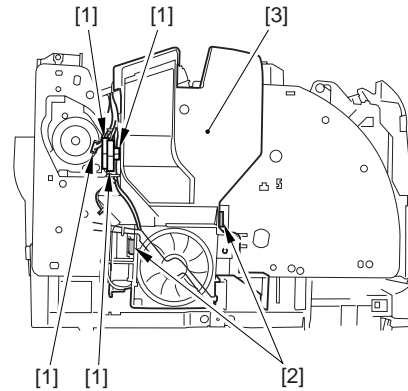
- 1) Remove the 4 screws [1], and detach the left frame [2].



F-3-320

3.2.20.9 Removing the Fan Duct

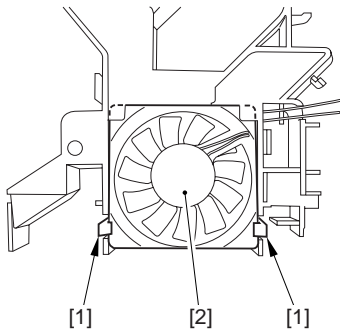
- 1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
- 2) Slide the fan duct [3] in upward direction to detach.



F-3-321

3.2.20.10 Removing the Cooling Fan

- 1) Remove the 2 claws [1], and detach the cooling fan [2].



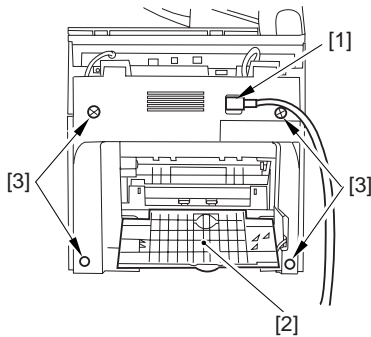
F-3-322

3.3 Document Feed/Exposure System

3.3.1 Scanner Unit

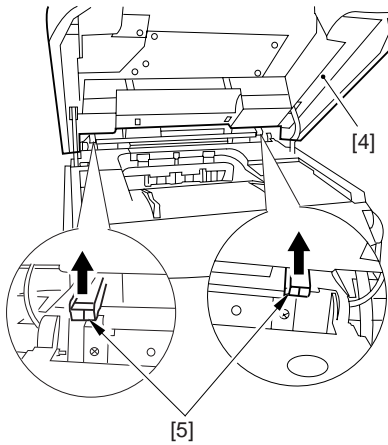
3.3.1.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



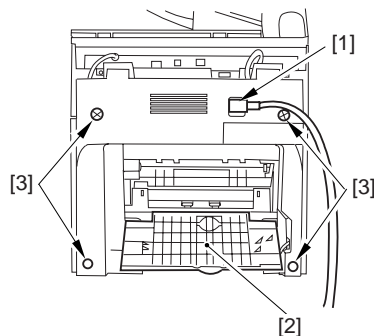
F-3-323

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-324

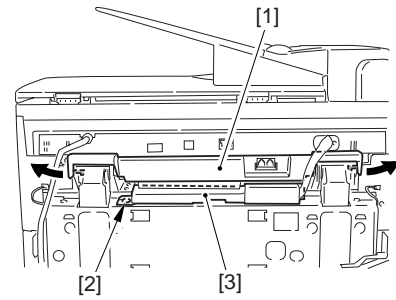
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-325

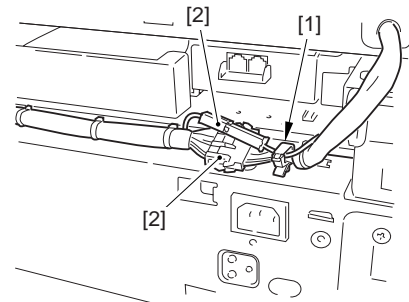
3.3.1.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



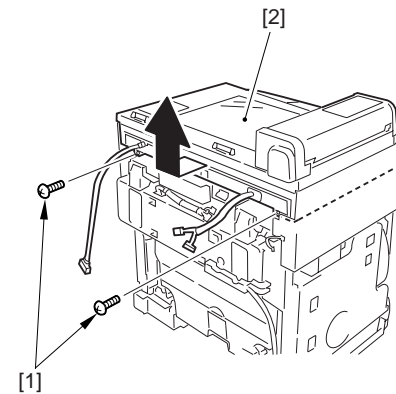
F-3-326

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-327

- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.

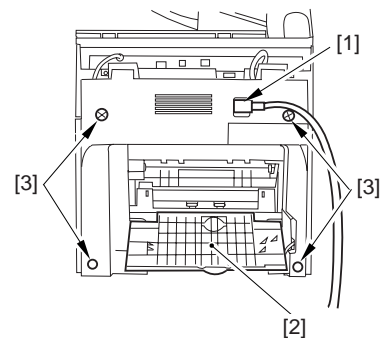


F-3-328

3.3.2 ADF Unit

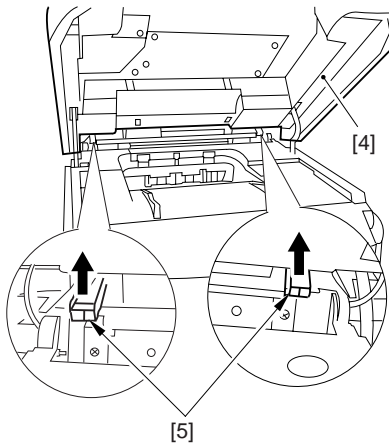
3.3.2.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



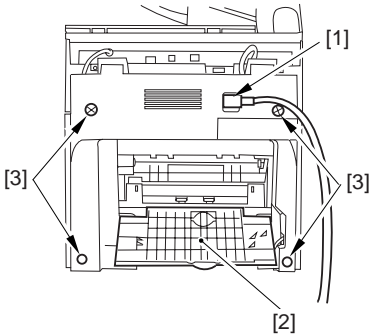
F-3-329

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-330

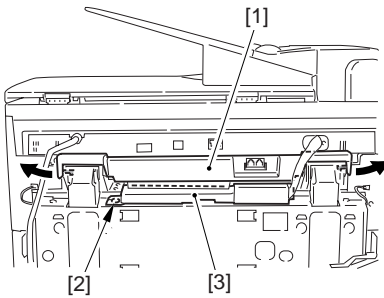
4) Close the reader assembly; then, detach the rear cover [1].



F-3-331

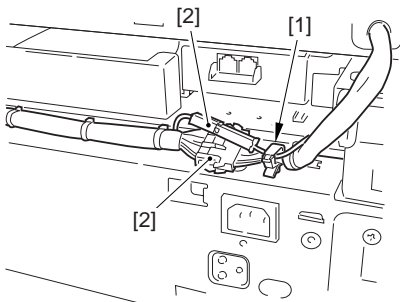
3.3.2.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



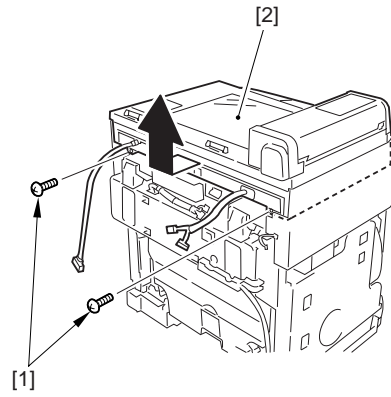
F-3-332

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-333

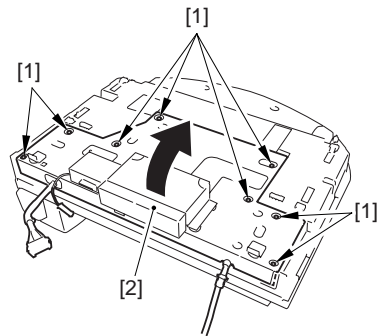
5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-334

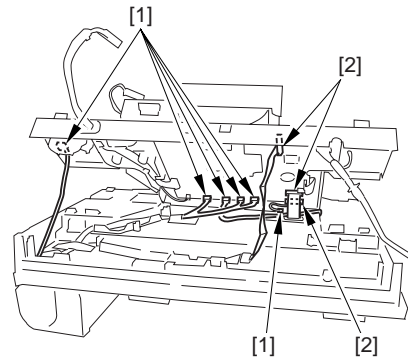
3.3.2.3 Removing the SCNT Board Unit

1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-335

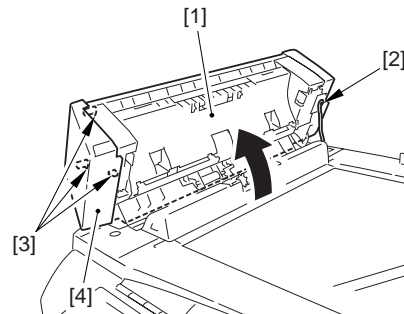
2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-336

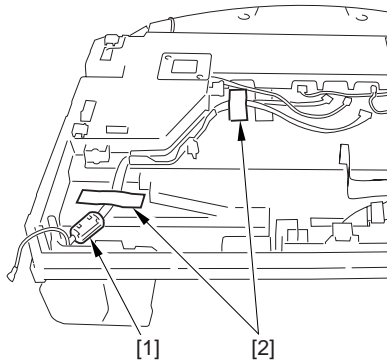
3.3.2.4 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



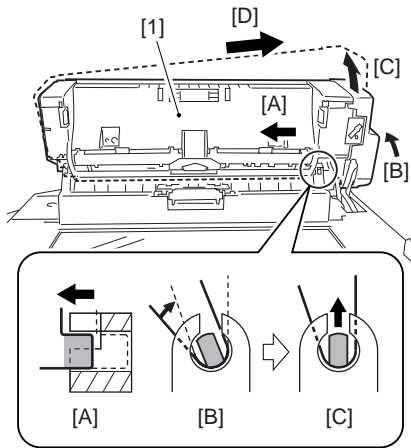
F-3-337

3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-338

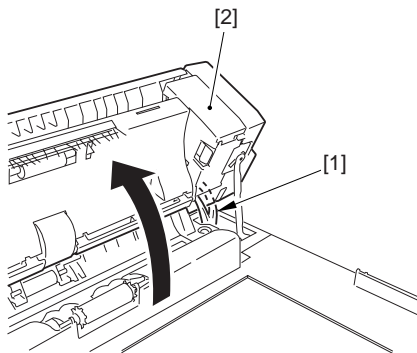
4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-339

3.3.2.5 Points to Note When Mounting the ADF Unit

Be sure to observe the following when mounting the ADF unit:
 If the harness [1] is too taut, a break in the line can occur. Be sure there is some slack when the ADF unit [2] is fully open.

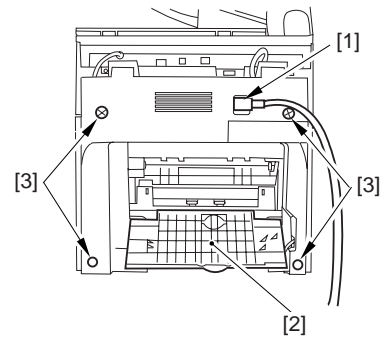


F-3-340

3.3.3 Scanner Cover Unit

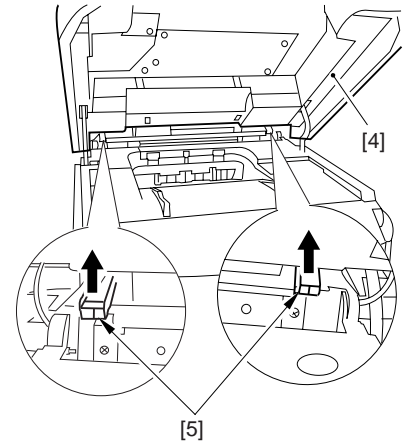
3.3.3.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



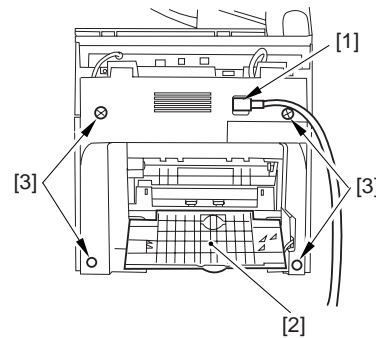
F-3-341

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-342

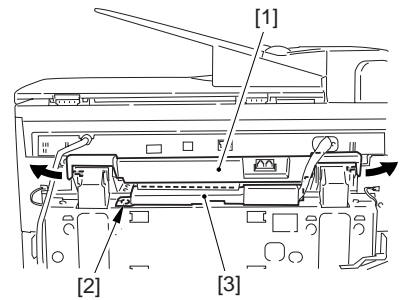
4) Close the reader assembly; then, detach the rear cover [1].



F-3-343

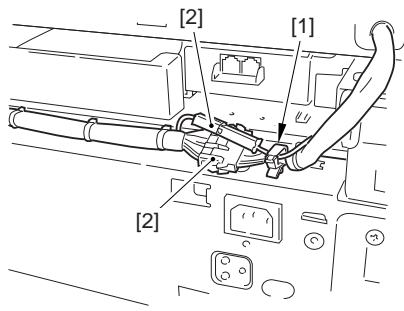
3.3.3.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



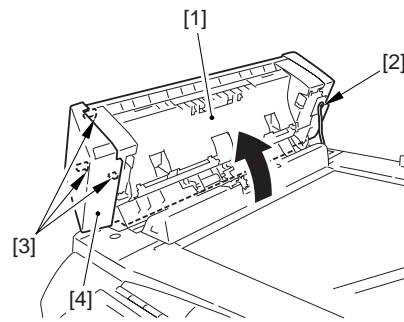
F-3-344

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



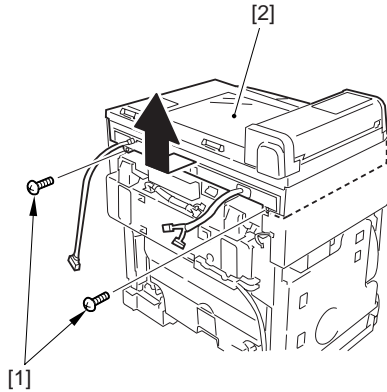
F-3-345

- Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-349

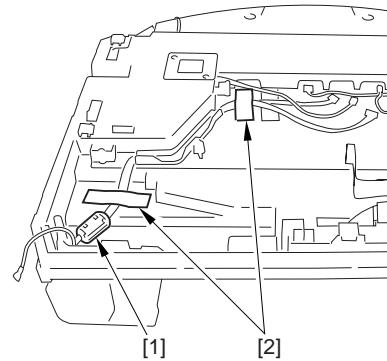
- Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-346

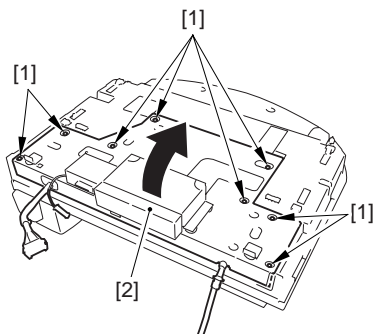
3.3.3.3 Removing the SCNT Board Unit

- Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



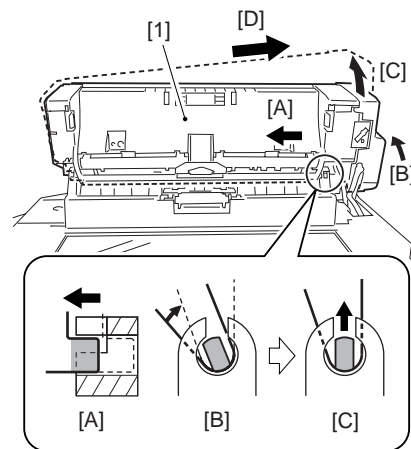
F-3-350

- Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-347

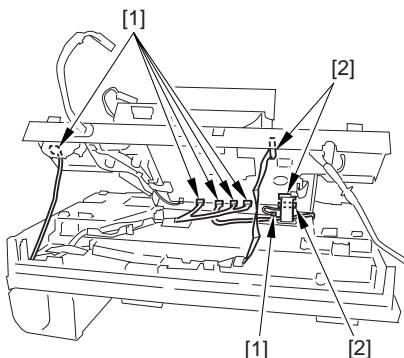
- Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-351

3.3.3.5 Removing the operation Panel

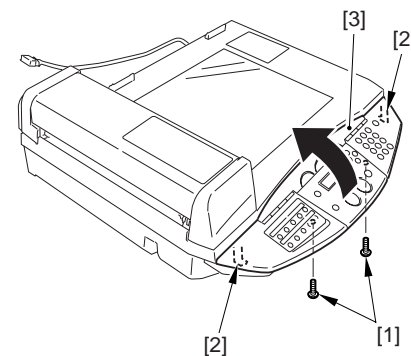
- Remove the 2 screws [1], and free the 2 claws [2] (left/right) to open the operation panel [3].



F-3-348

3.3.3.4 Removing the ADF Unit

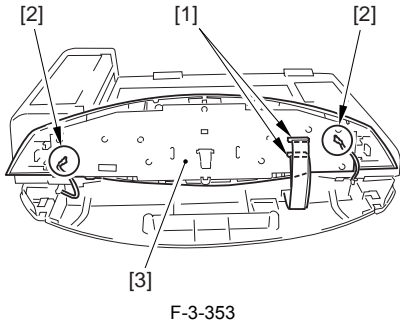
- Open the ADF unit [1], and detach the stopper [2].
- Remove the 3 claws [3], and detach the ADF front cover [4].



F-3-352

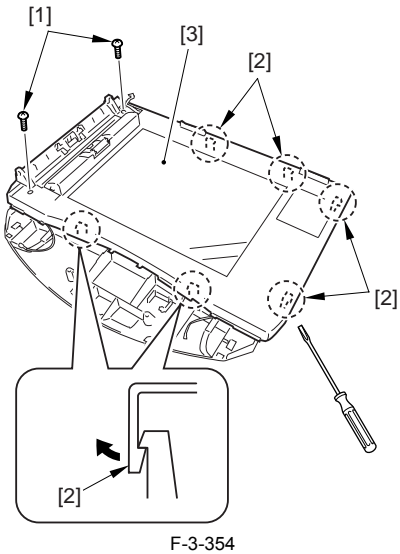
- Disconnect the 2 flat cables [1], and remove the 2 fastons [2]; then, detach

the operation panel [3].



3.3.3.6 Removing the Scanner Cover Unit

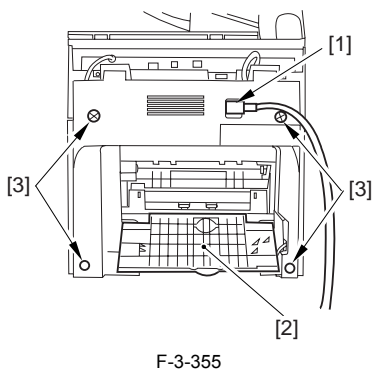
- 1) Remove the copyboard cover.
- 2) Remove the 2 screws [2].
- 3) Remove the 6 claws [2], and detach the scanner cover unit [3].



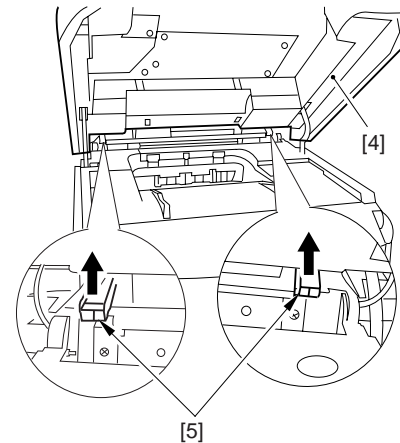
3.3.4 CCD Unit

3.3.4.1 Removing the Rear Cover

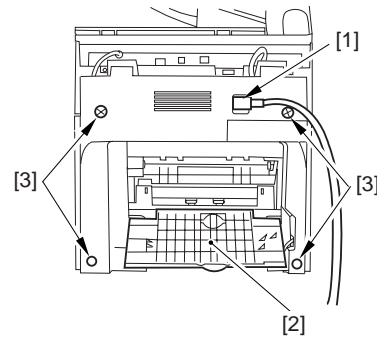
- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



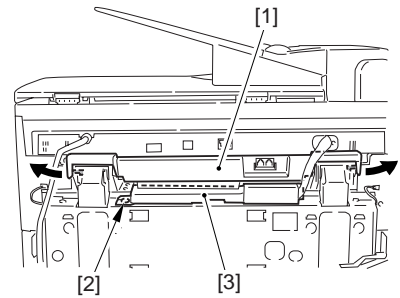
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-357

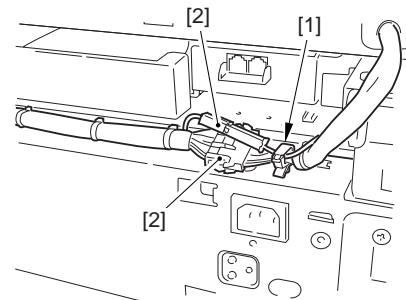
3.3.4.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



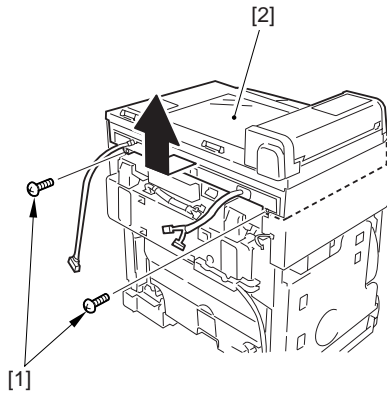
F-3-358

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-359

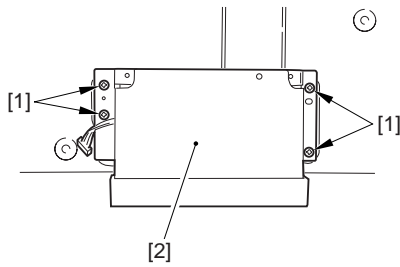
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-360

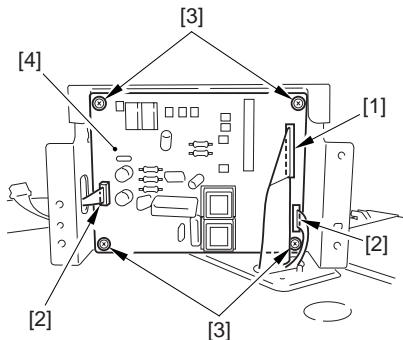
3.3.4.3 Removing the NCU Board

- 1) Remove the 4 screws [1], and open the NCU unit [2].



F-3-361

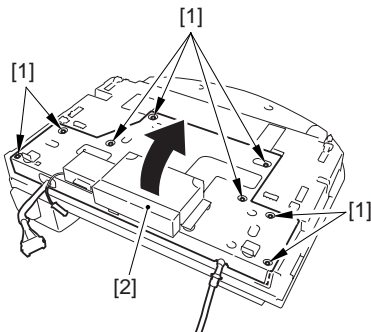
- 2) Disconnect the flat cable [1] and the 2 connectors [2]; then, remove the 4 screws [3], and detach the NCU board [4].



F-3-362

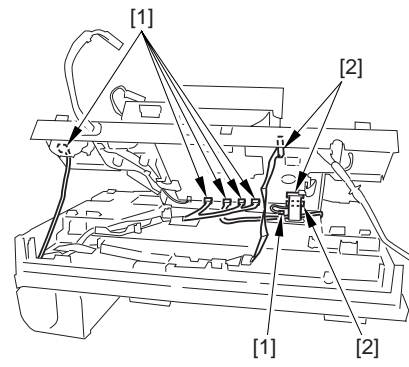
3.3.4.4 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-363

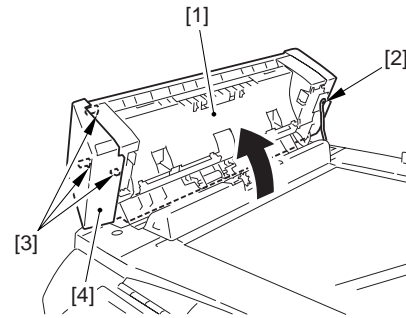
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-364

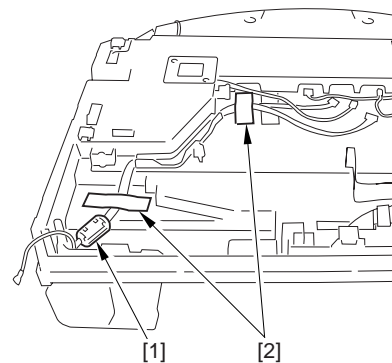
3.3.4.5 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



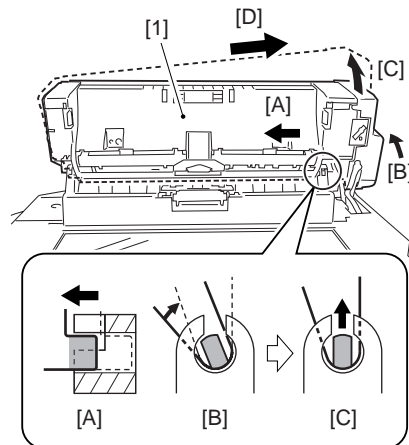
F-3-365

- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-366

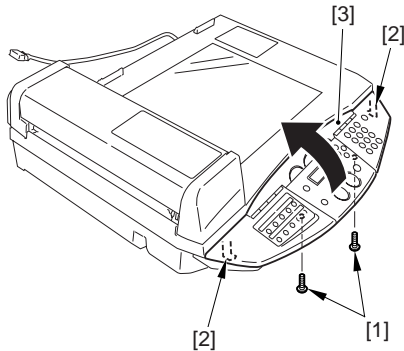
- 4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-367

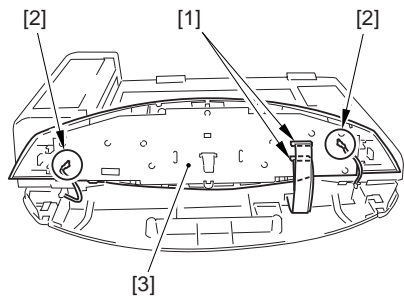
3.3.4.6 Removing the operation Panel

- 1) Remove the 2 screws [1], and free the 2 claws [2] (left/right) to open the operation panel [3].



F-3-368

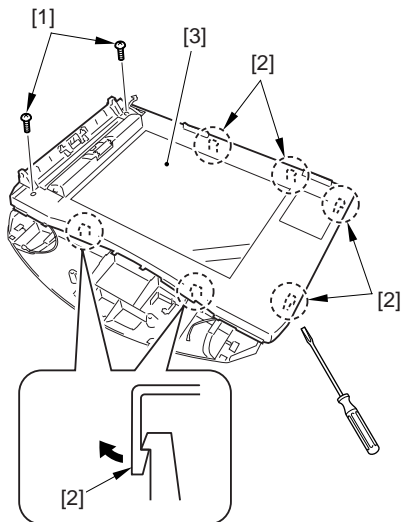
- 2) Disconnect the 2 flat cables [1], and remove the 2 fastons [2]; then, detach the operation panel [3].



F-3-369

3.3.4.7 Removing the Scanner Cover Unit

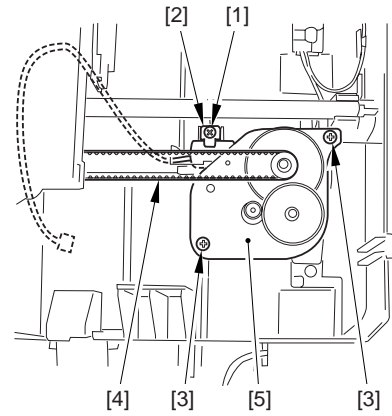
- 1) Remove the copyboard cover.
- 2) Remove the 2 screws [1].
- 3) Remove the 6 claws [2], and detach the scanner cover unit [3].



F-3-370

3.3.4.8 Removing the Flat Bed Motor Unit

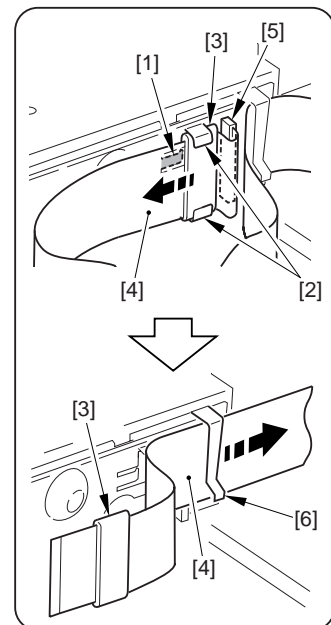
- 1) Remove the screw [1], and detach the plate [2].
- 2) Remove the 2 screws [3], and detach the flat bed motor unit [5] while paying attention to the drive belt [4] of the CCD unit.



F-3-371

3.3.4.9 Removing the CCD Unit

- 1) Push the claw [1], and free the core [3] and the flat cable [4] from the claw [2]; then, disconnect the connector [5].
- 2) Pull out the flat cable [4] from the core [3] and the flat cable retainer [6] by pulling it in the direction of the arrow.
- 3) Lift the shaft [7] to detach it from the groove; then, detach the CCD unit [8].

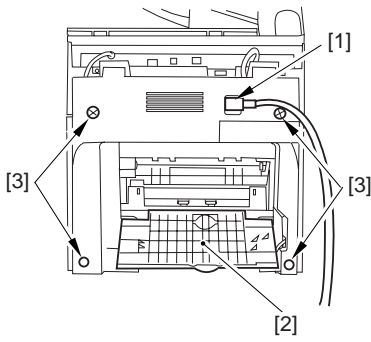


F-3-372

3.3.5 Separation Guide Unit

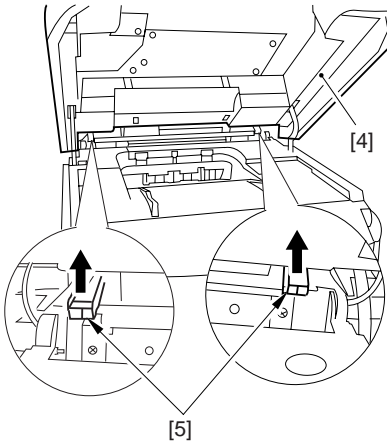
3.3.5.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



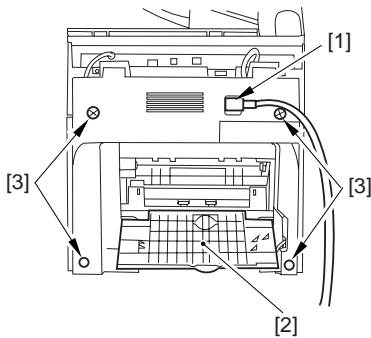
F-3-373

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-374

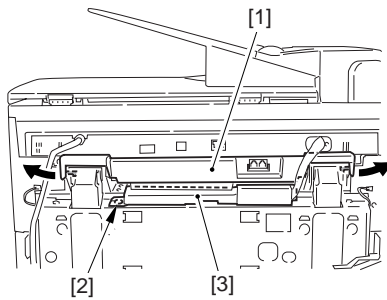
4) Close the reader assembly; then, detach the rear cover [1].



F-3-375

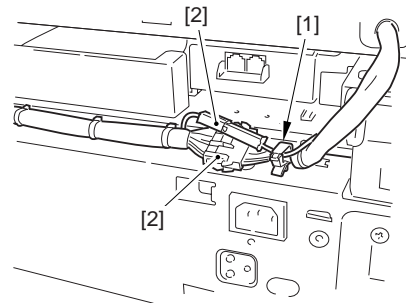
3.3.5.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



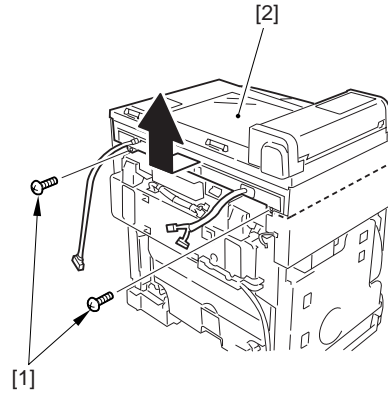
F-3-376

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-377

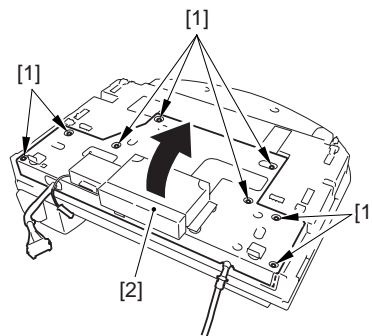
5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-378

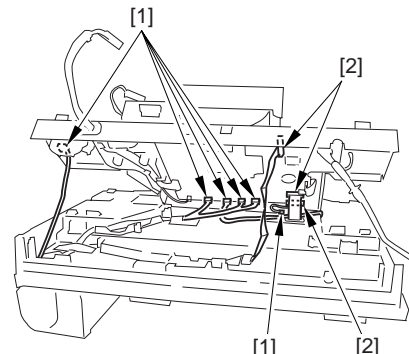
3.3.5.3 Removing the SCNT Board Unit

1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-379

2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



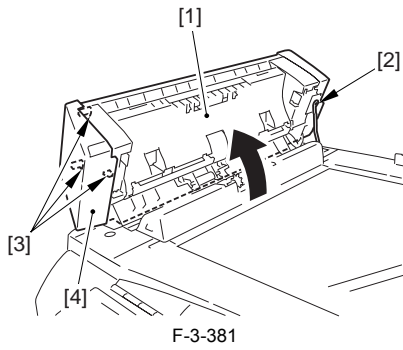
F-3-380

3.3.5.4 Removing the ADF Unit

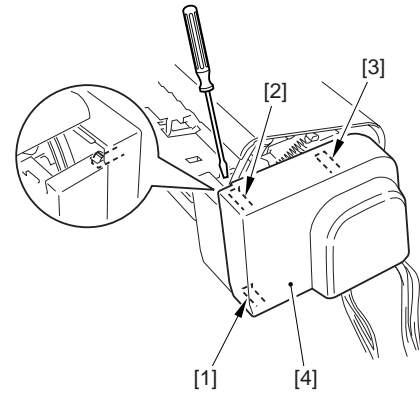
- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].

3.3.5.6 Removing the Document Pickup Roller Unit

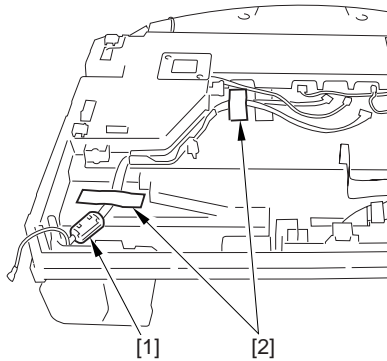
- 1) Remove the following claws in the order indicated, and detach the ADF rear cover [3]: claw [1], claw [2], claw [3].



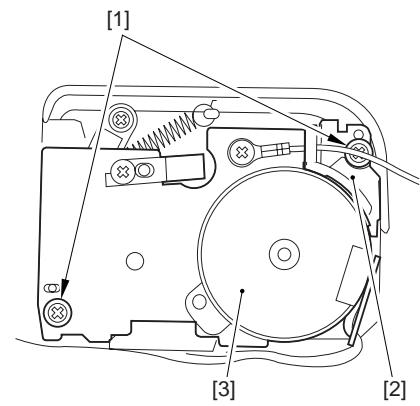
- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



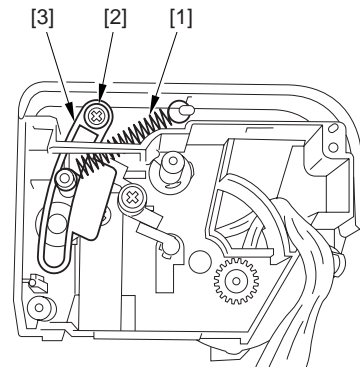
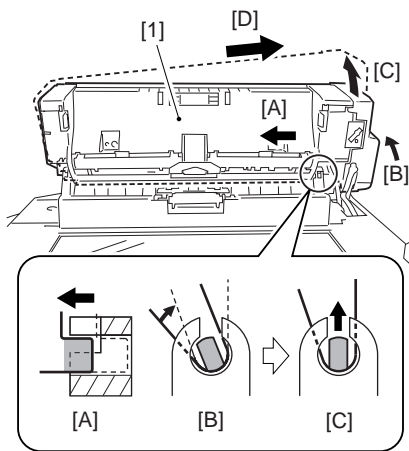
- 2) Remove the 2 screws [1], and detach the harness guide [2] and the Document feed motor unit [3].



- 4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



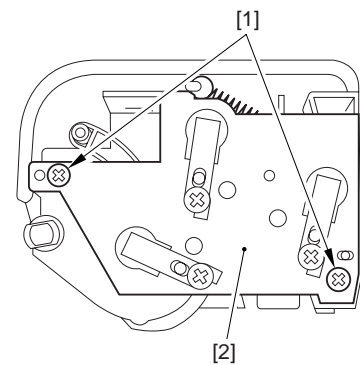
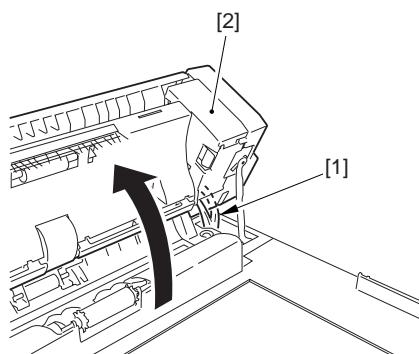
- 3) Remove the spring [1] and the screw [2], and detach the arm [3].



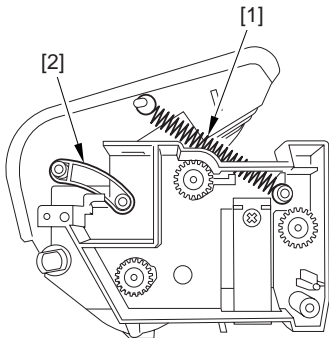
- 4) Remove the 2 screws [1], and detach the drive unit [2].

3.3.5.5 Points to Note When Mounting the ADF Unit

Be sure to observe the following when mounting the ADF unit:
If the harness [1] is too taut, a break in the line can occur. Be sure there is some slack when the ADF unit [2] is fully open.

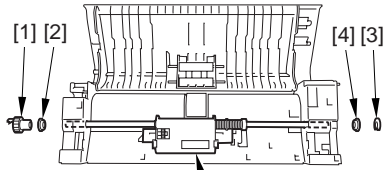


- 5) Remove the spring [1], and detach the arm [2].



F-3-389

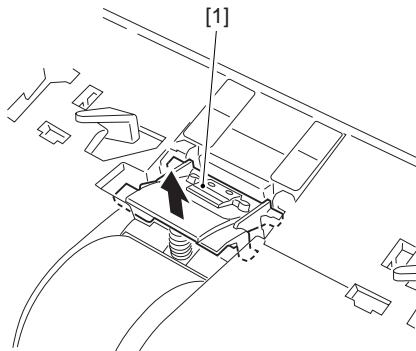
6) Remove the 2 gears [1] [3]; then, detach the 2 bearings [2] [4], and detach the pickup roller unit [5].



F-3-390

3.3.5.7 Removing the Separation guide unit

1) Remove the Separation guide unit [1].

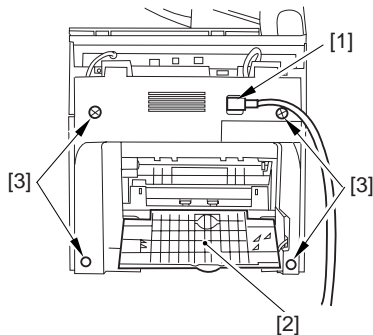


F-3-391

3.3.6 Feed Roller

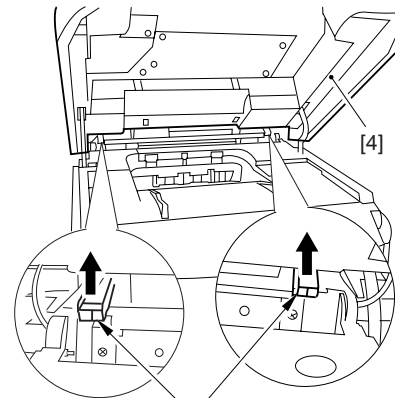
3.3.6.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



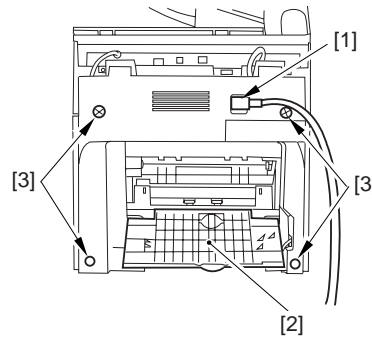
F-3-392

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-393

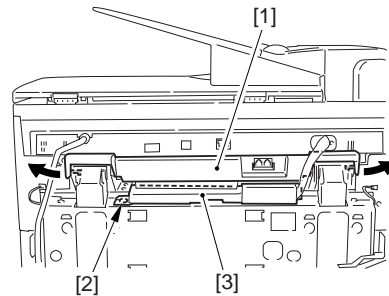
4) Close the reader assembly; then, detach the rear cover [1].



F-3-394

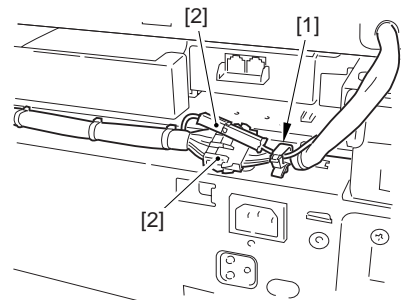
3.3.6.2 Removing the Scanner Unit

1) Remove the platen glass cover.
2) While removing the left and right claws, detach the hinge cover [1].
3) Remove the screw [2], and detach the cable guide [3].



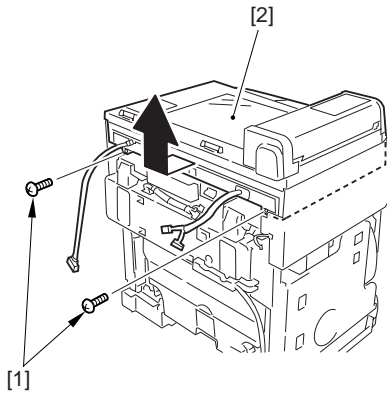
F-3-395

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-396

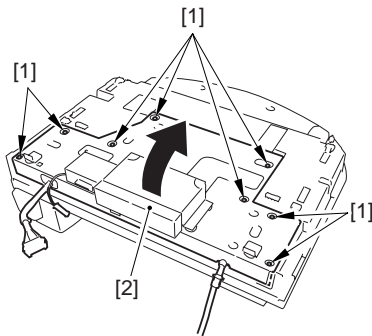
5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-397

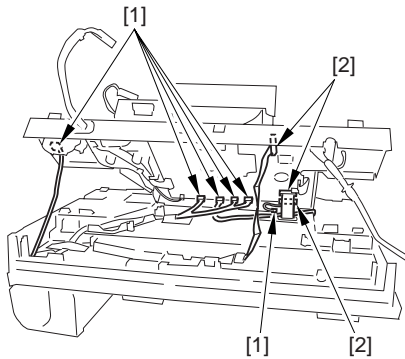
3.3.6.3 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-398

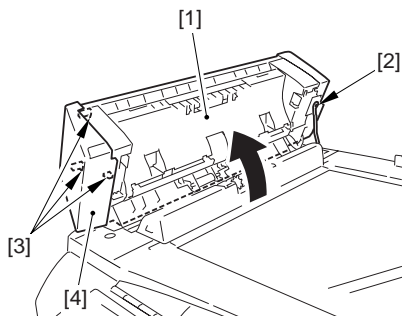
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-399

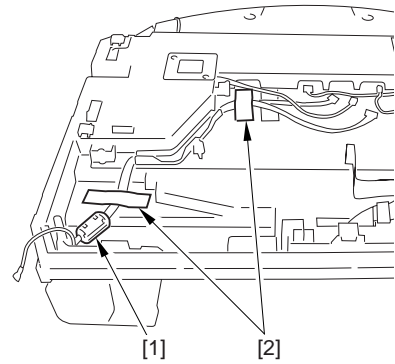
3.3.6.4 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



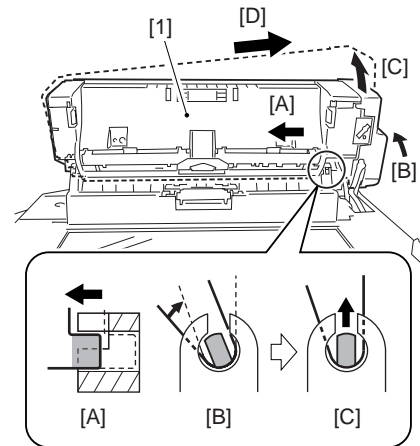
F-3-400

- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-401

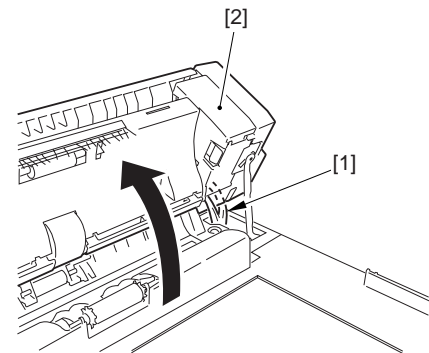
- 4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-402

3.3.6.5 Points to Note When Mounting the ADF Unit

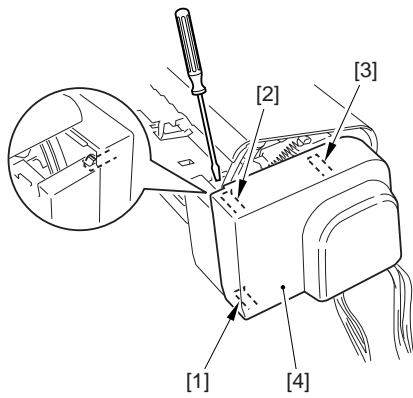
Be sure to observe the following when mounting the ADF unit:
If the harness [1] is too taut, a break in the line can occur. Be sure there is some slack when the ADF unit [2] is fully open.



F-3-403

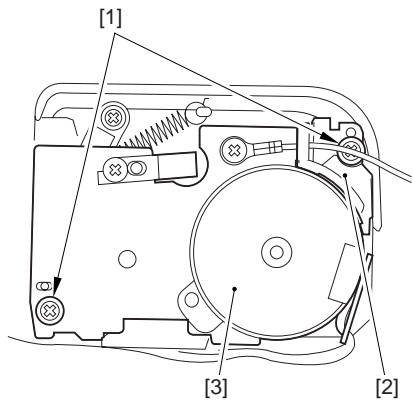
3.3.6.6 Removing the Document feed roller

- 1) Remove the following claws in the order indicated, and detach the ADF rear cover [3]: claw [1], claw [2], claw [3].



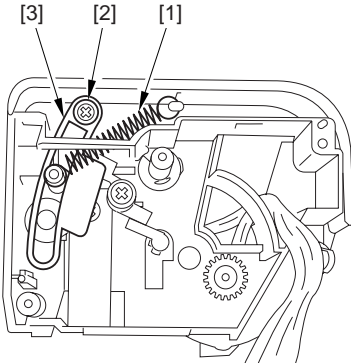
F-3-404

- 2) Remove the 2 screws [1], and detach the harness guide [2] and the Document feed motor unit [3].



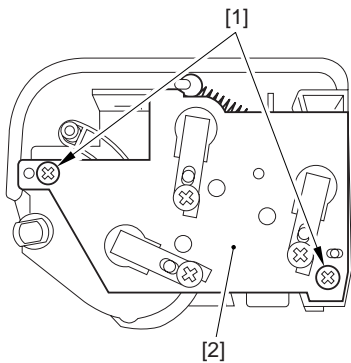
F-3-405

- 3) Remove the spring [1] and the screw [2], and detach the arm [3].



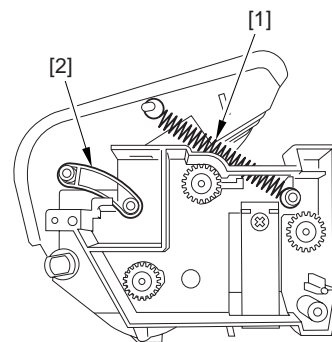
F-3-406

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



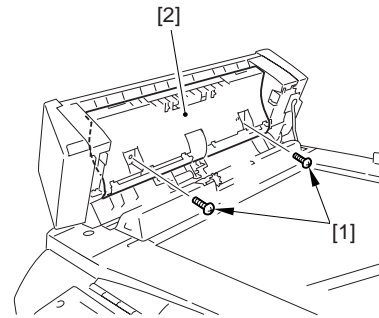
F-3-407

- 5) Remove the spring [1], and detach the arm [2].



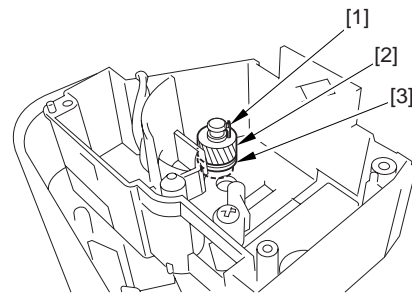
F-3-408

- 6) Remove the 2 screws [1], and detach the ADF inside cover [2].



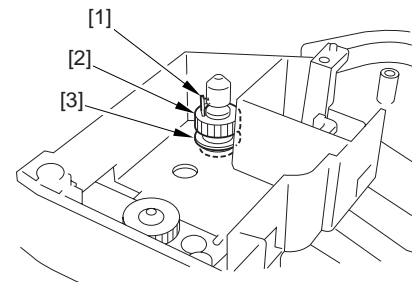
F-3-409

- 7) Remove the claw [1], and detach the gear [2] and the bearing [3].



F-3-410

- 8) Remove the claw [1], and detach the gear [2] and the bearing [3].

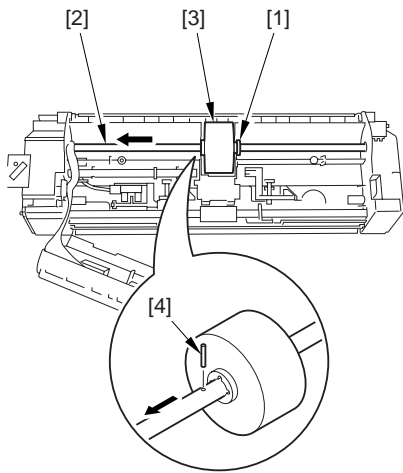


F-3-411

- 9) Remove the E-ring [1], and slide the shaft [2] in the direction of the arrow to detach the feed roller [3].

Note:

When removing the feed roller, pay attention to the parallel pin [4] of the shaft.

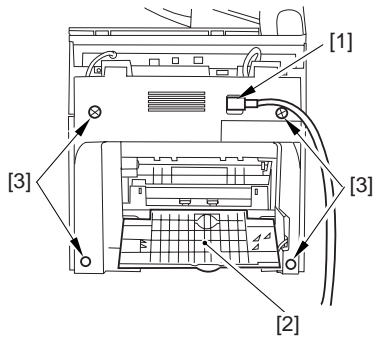


F-3-412

3.3.7 Pickup Roller Unit

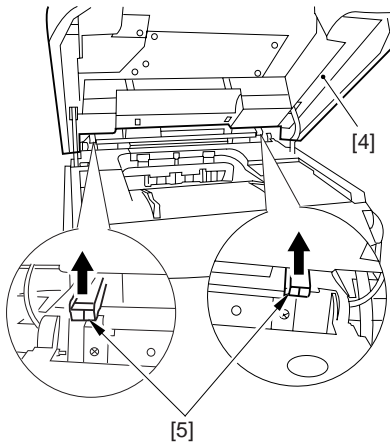
3.3.7.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



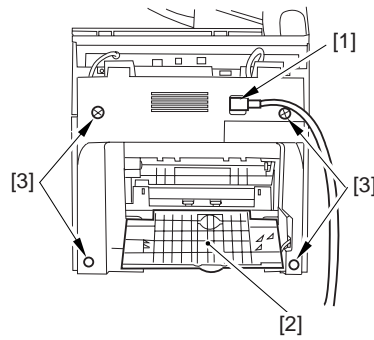
F-3-413

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-414

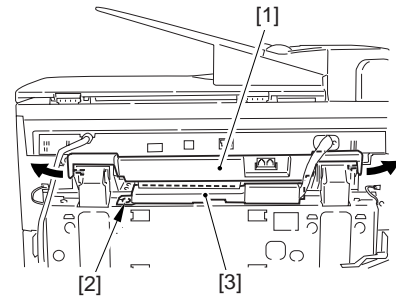
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-415

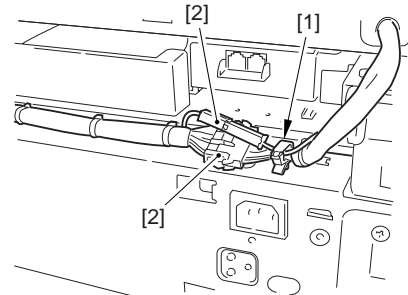
3.3.7.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



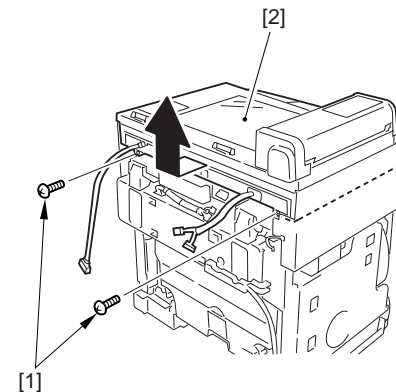
F-3-416

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-417

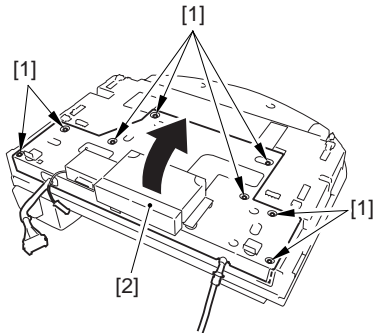
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-418

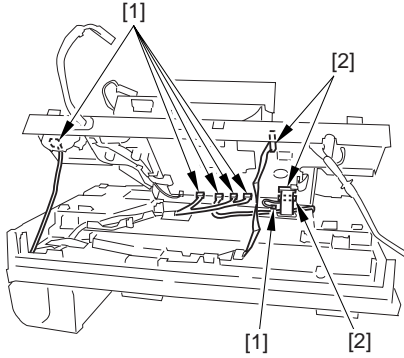
3.3.7.3 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-419

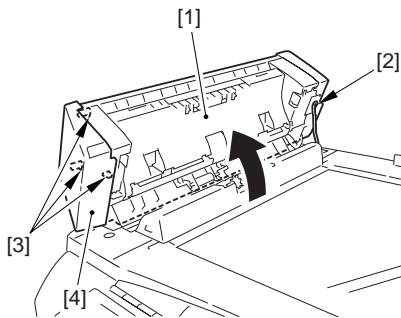
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-420

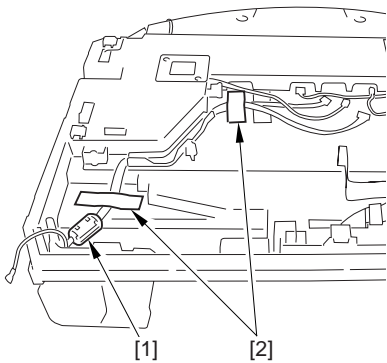
3.3.7.4 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



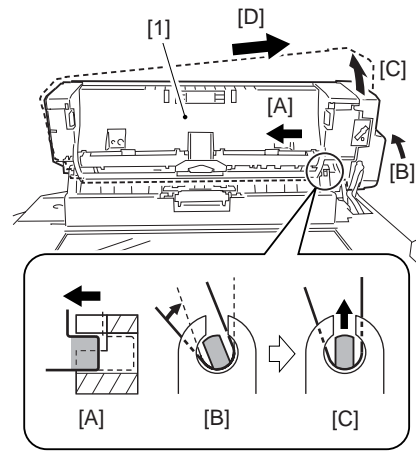
F-3-421

- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-422

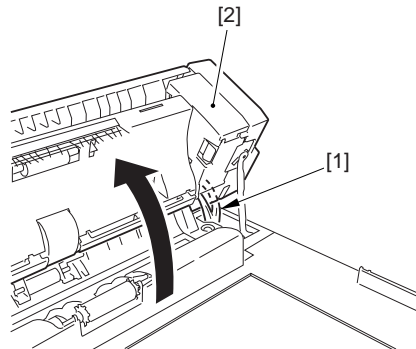
- 4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-423

3.3.7.5 Points to Note When Mounting the ADF Unit

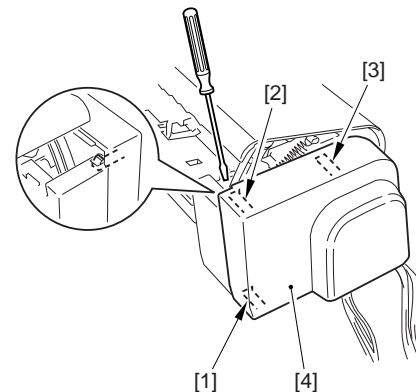
Be sure to observe the following when mounting the ADF unit:
If the harness [1] is too taut, a break in the line can occur. Be sure there is some slack when the ADF unit [2] is fully open.



F-3-424

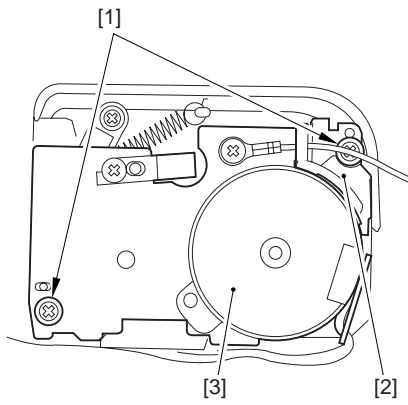
3.3.7.6 Removing the Document Pickup Roller Unit

- 1) Remove the following claws in the order indicated, and detach the ADF rear cover [3]: claw [1], claw [2], claw [3].



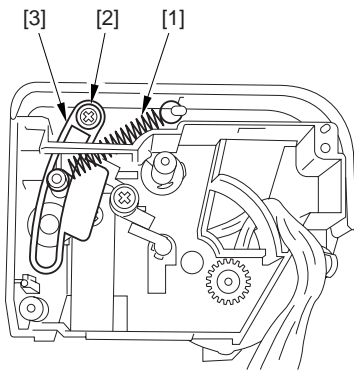
F-3-425

- 2) Remove the 2 screws [1], and detach the harness guide [2] and the Document feed motor unit [3].



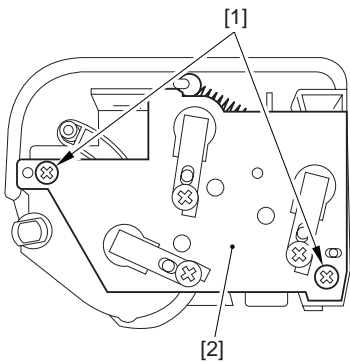
F-3-426

3) Remove the spring [1] and the screw [2], and detach the arm [3].



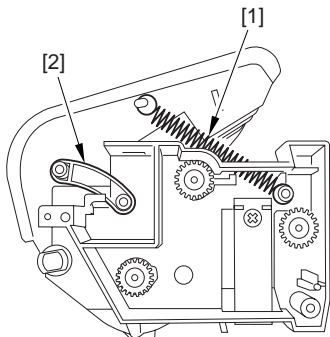
F-3-427

4) Remove the 2 screws [1], and detach the drive unit [2].



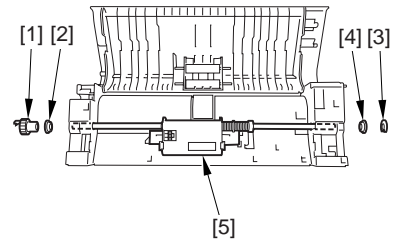
F-3-428

5) Remove the spring [1], and detach the arm [2].



F-3-429

6) Remove the 2 gears [1] [3]; then, detach the 2 bearings [2] [4], and detach the pickup roller unit [5].

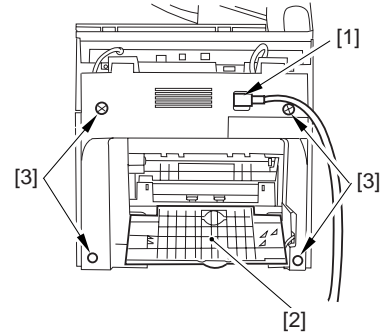


F-3-430

3.3.8 Reader Unit

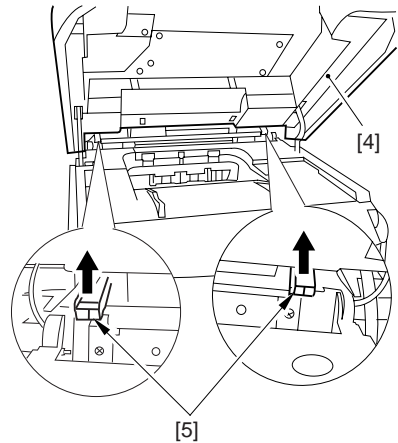
3.3.8.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



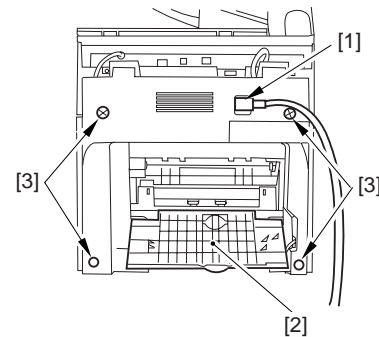
F-3-431

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-432

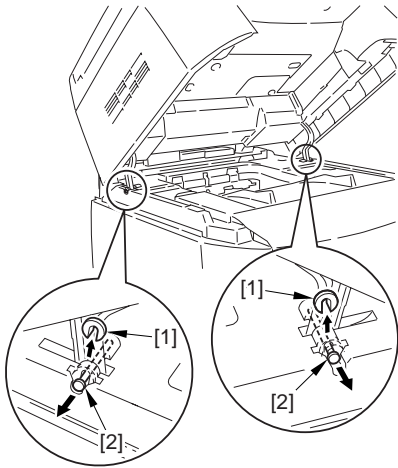
4) Close the reader assembly; then, detach the rear cover [1].



F-3-433

3.3.8.2 Removing the Reader Assembly

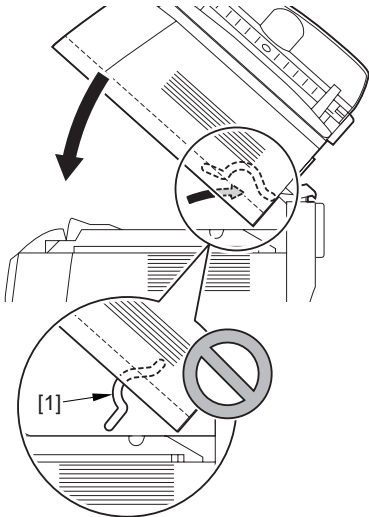
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-434

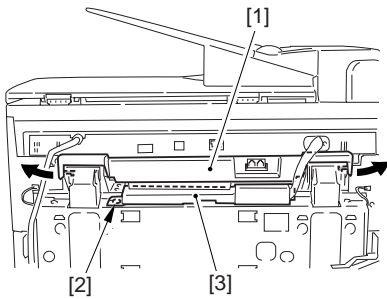


When closing the reader assembly, be sure to push in the arm [1] first.



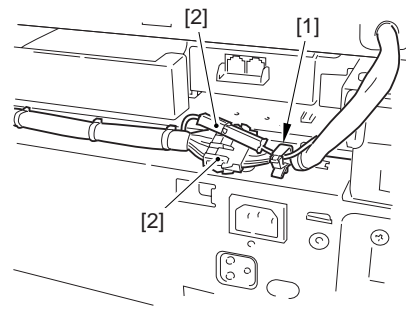
F-3-435

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



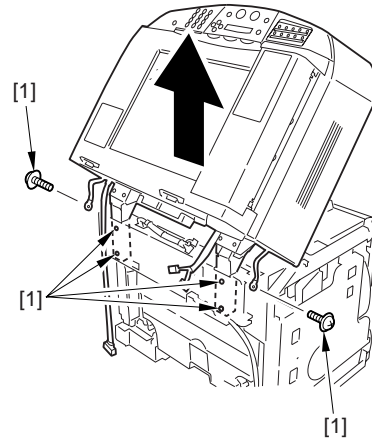
F-3-436

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-437

- 5) Remove the 6 screws [1], and lift the reader unit to detach.

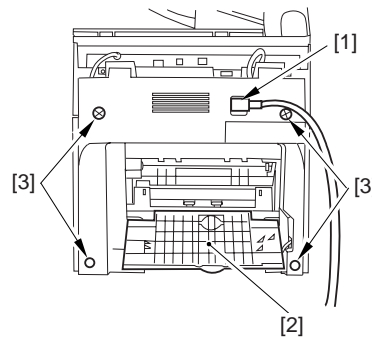


F-3-438

3.3.9 Flatbed Motor Unit

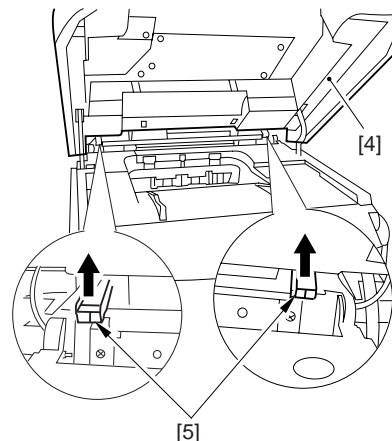
3.3.9.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



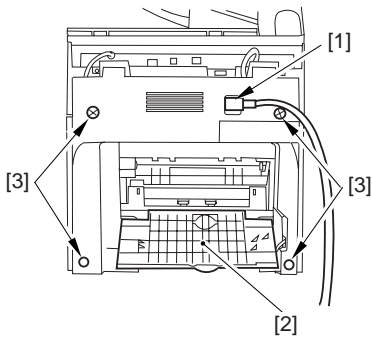
F-3-439

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-440

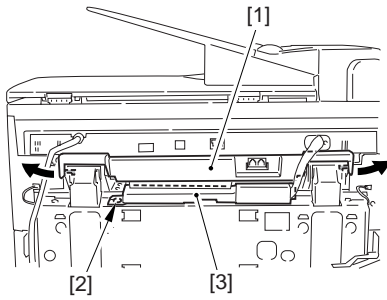
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-441

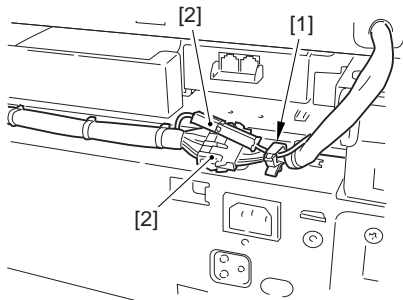
3.3.9.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



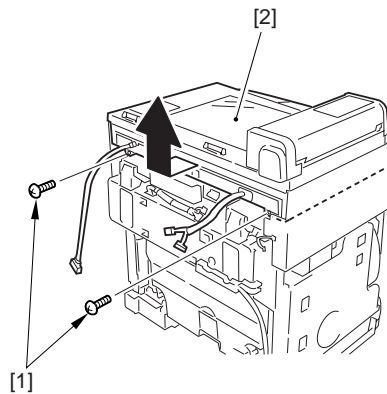
F-3-442

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-443

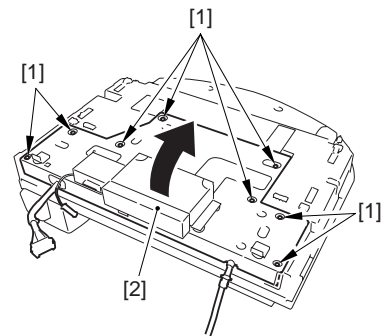
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-444

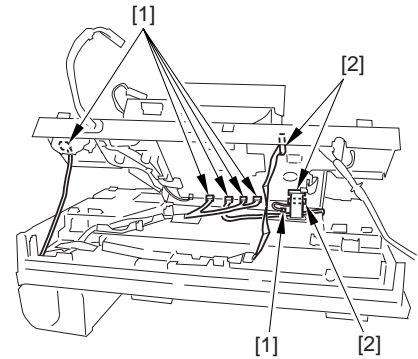
3.3.9.3 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-445

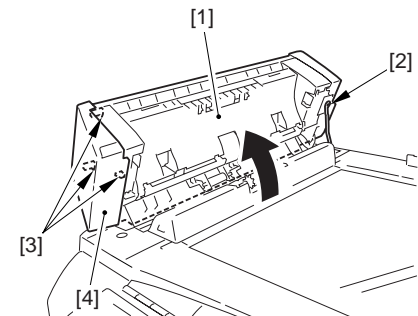
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-446

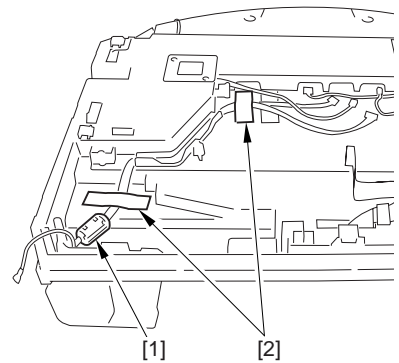
3.3.9.4 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



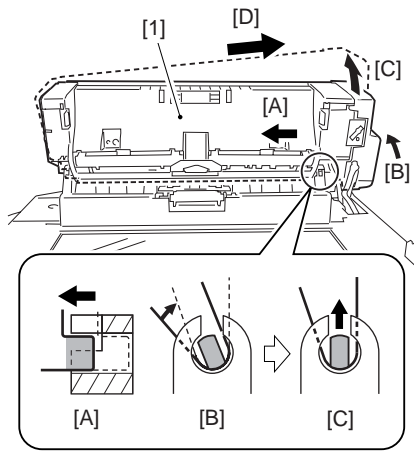
F-3-447

- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



F-3-448

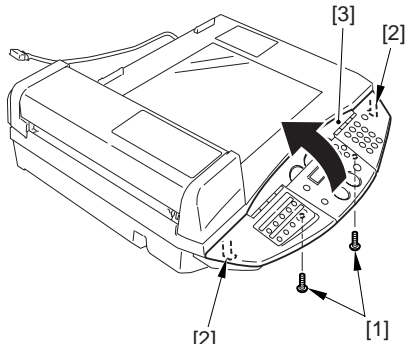
- 4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-449

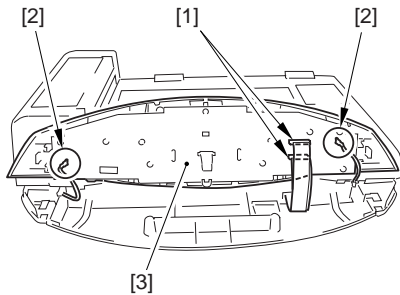
3.3.9.5 Removing the operation Panel

- 1) Remove the 2 screws [1], and free the 2 claws [2] (left/right) to open the operation panel [3].



F-3-450

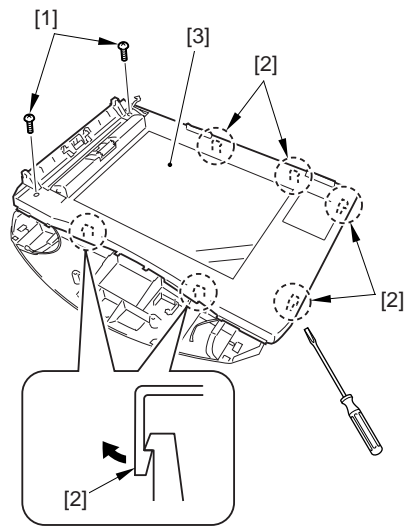
- 2) Disconnect the 2 flat cables [1], and remove the 2 fastons [2]; then, detach the operation panel [3].



F-3-451

3.3.9.6 Removing the Scanner Cover Unit

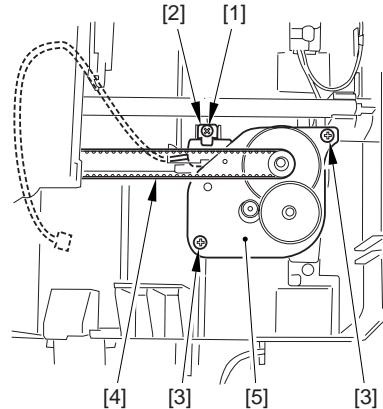
- 1) Remove the copyboard cover.
- 2) Remove the 2 screws [1].
- 3) Remove the 6 claws [2], and detach the scanner cover unit [3].



F-3-452

3.3.9.7 Removing the Flat Bed Motor Unit

- 1) Remove the screw [1], and detach the plate [2].
- 2) Remove the 2 screws [3], and detach the flat bed motor unit [5] while paying attention to the drive belt [4] of the CCD unit.

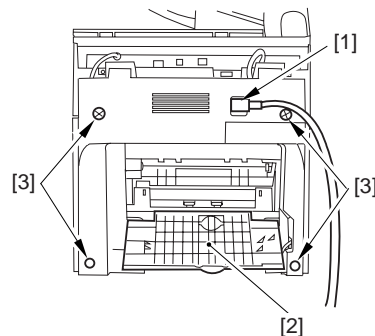


F-3-453

3.3.10 Document Feed Motor

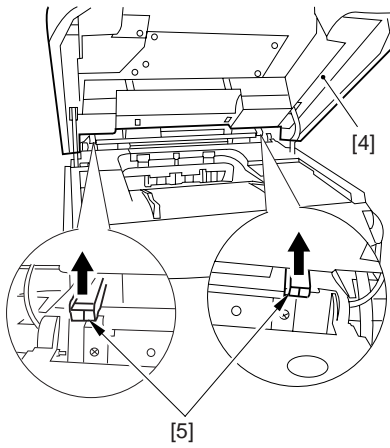
3.3.10.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



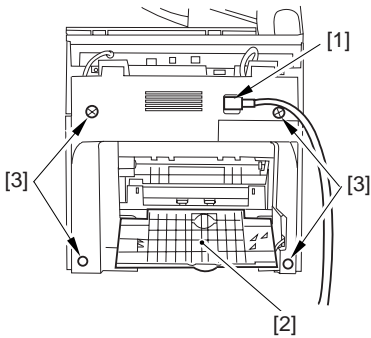
F-3-454

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-455

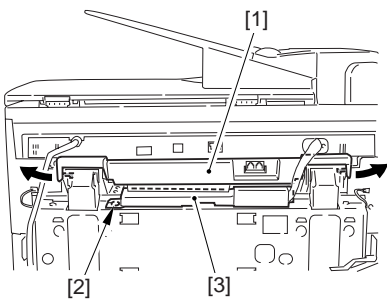
4) Close the reader assembly; then, detach the rear cover[1].



F-3-456

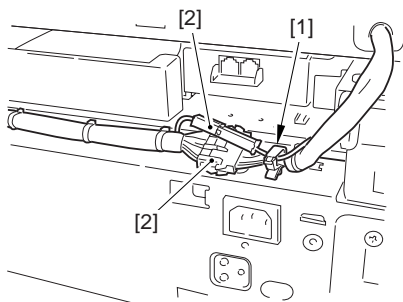
3.3.10.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



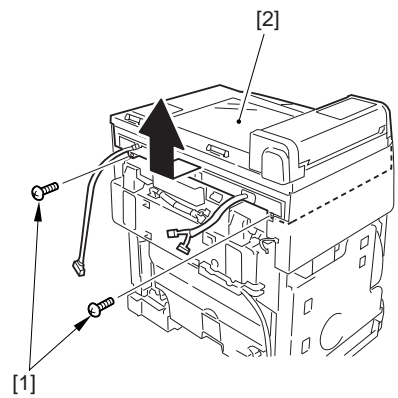
F-3-457

4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-458

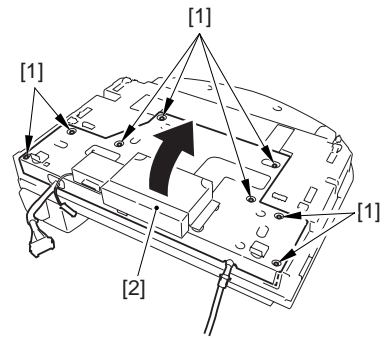
5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-459

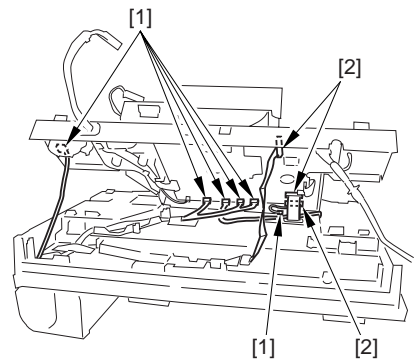
3.3.10.3 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-460

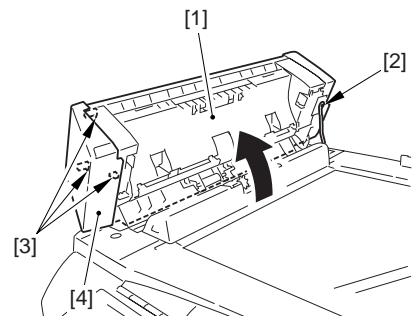
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-461

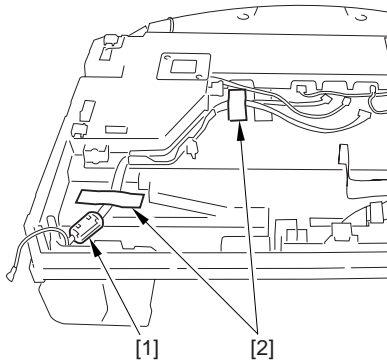
3.3.10.4 Removing the ADF Unit

- 1) Open the ADF unit [1], and detach the stopper [2].
- 2) Remove the 3 claws [3], and detach the ADF front cover [4].



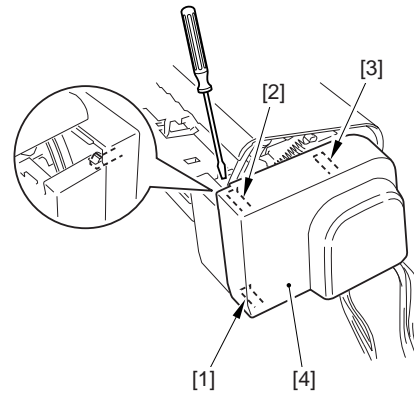
F-3-462

- 3) Remove the ferrite core [1] from behind the scanner unit; then, free the harness from the tape [2].



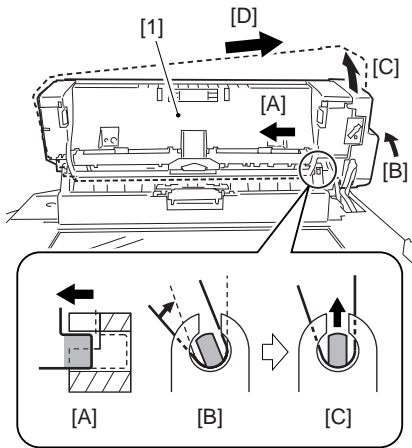
F-3-463

4) Open the ADF unit [1] as shown; then, disengage it starting with the rear and then the front.



F-3-466

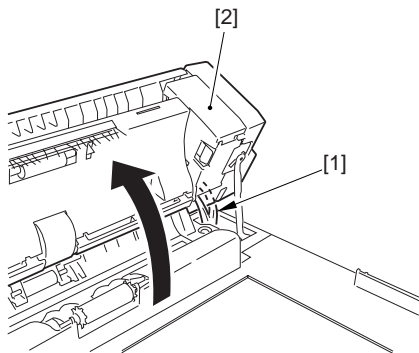
2) Remove the 2 screws [1], and detach the harness guide [2] and the Document feed motor unit [3].



F-3-464

3.3.10.5 Points to Note When Mounting the ADF Unit

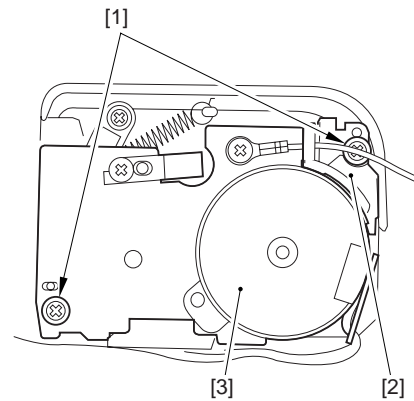
Be sure to observe the following when mounting the ADF unit:
If the harness [1] is too taut, a break in the line can occur. Be sure there is some slack when the ADF unit [2] is fully open.



F-3-465

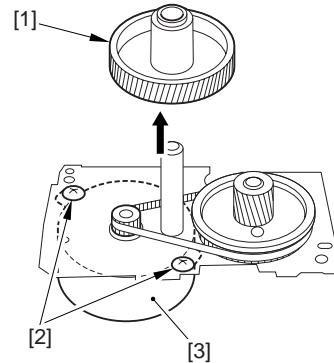
3.3.10.6 Removing the Document feed motor

1) Remove the following claws in the order indicated, and detach the ADF rear cover [3]: claw [1], claw [2], claw [3].



F-3-467

3) Remove the gear [1] and the 2 screws [2]; then, detach the Document feed motor [3].

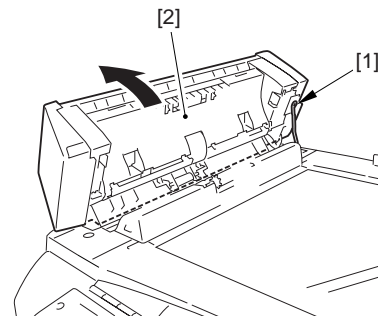


F-3-468

3.3.11 DS Sensor

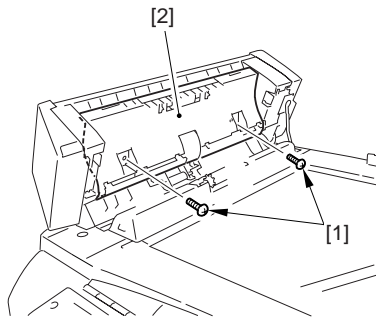
3.3.11.1 Removing the ADF Paper Sensor

1) Remove the stopper [1], and fully open the ADF unit [2].



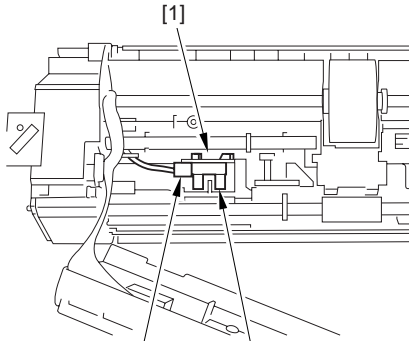
F-3-469

2) Remove the 2 screws [1], and detach the ADF inside cover [2].



F-3-470

3) Remove the 4 claws [1], and disconnect the connector [2]; then, detach the ADF paper sensor [3].

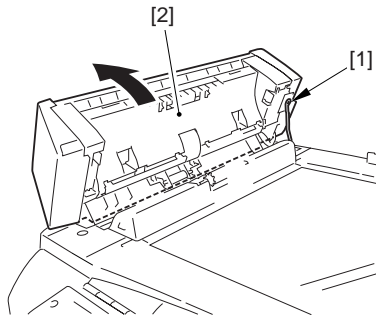


F-3-471

3.3.12 DES Sensor

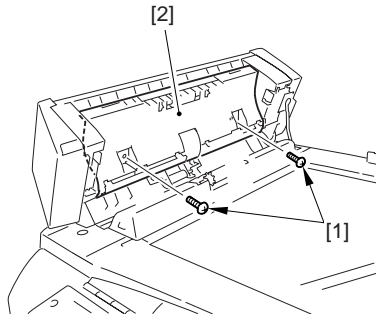
3.3.12.1 Removing the ADF Feed Sensor

1) Remove the stopper [1], and fully open the ADF unit [2].



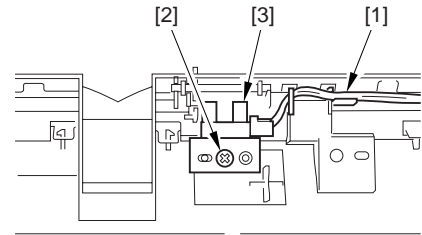
F-3-472

2) Remove the 2 screws [1], and detach the ADF inside cover [2].



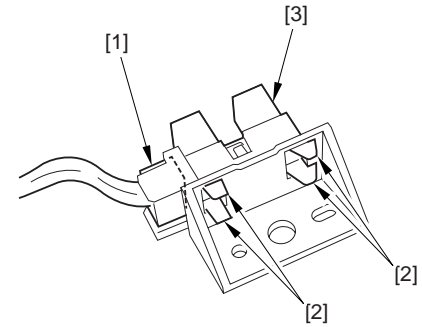
F-3-473

3) Free the harness [1] from the guide, and remove the screw [2]; then, detach the sensor unit [3].



F-3-474

4) Disconnect the connector [1], and remove the 4 claws [4]; then, detach the ADF feed sensor [3].

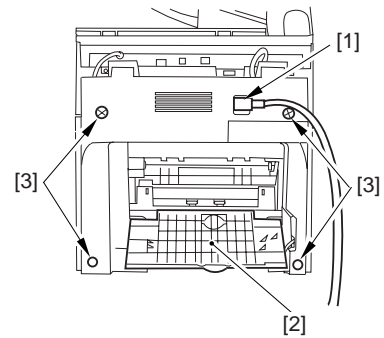


F-3-475

3.3.13 Speaker

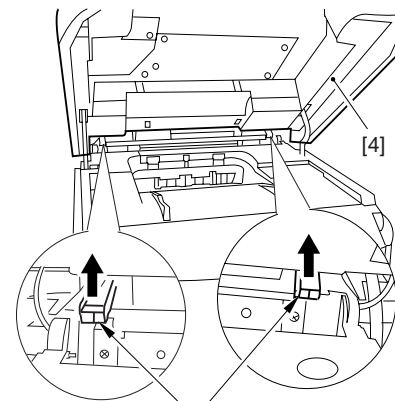
3.3.13.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



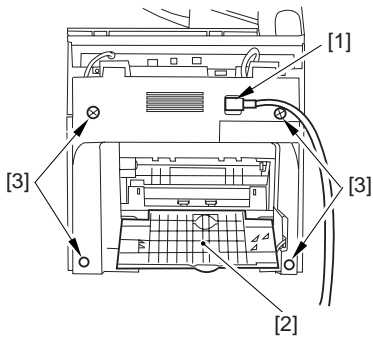
F-3-476

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-477

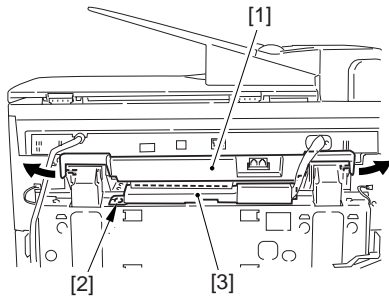
4) Close the reader assembly; then, detach the rear cover [1].



F-3-478

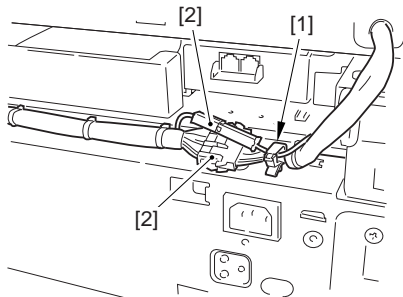
3.3.13.2 Removing the Scanner Unit

- 1) Remove the platen glass cover.
- 2) While removing the left and right claws, detach the hinge cover [1].
- 3) Remove the screw [2], and detach the cable guide [3].



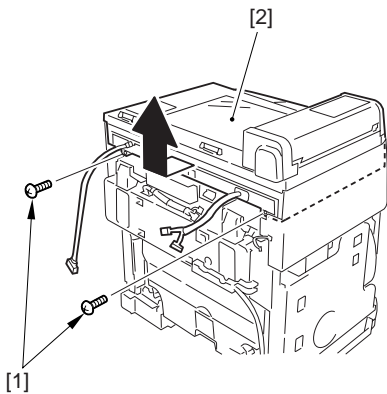
F-3-479

- 4) Open the harness band [1], and free the 2 cables [2] connected to the reader assembly.



F-3-480

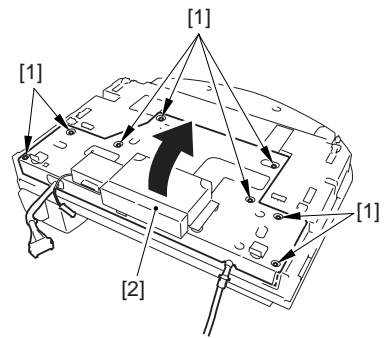
- 5) Remove the 2 screws [1] from the back; then, shift the scanner unit [2] to the back, and lift it to detach.



F-3-481

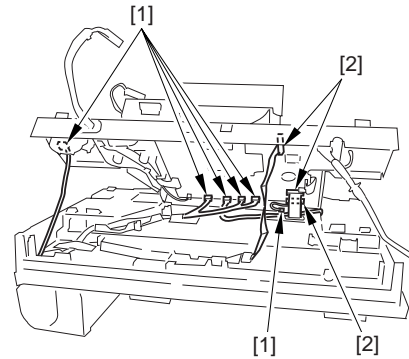
3.3.13.3 Removing the SCNT Board Unit

- 1) Remove the 8 screws [1] from behind the scanner unit, and shift up the SCNT board unit [2].



F-3-482

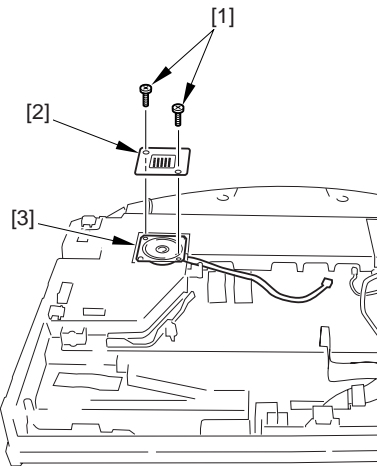
- 2) Open the SCNT board unit; then, disconnect the 6 connectors [1] and the 3 flat cables [2].



F-3-483

3.3.13.4 Removing the Speaker

- 1) Remove the 2 screws [1], and detach the speaker cover [2]; then, detach the speaker [3].



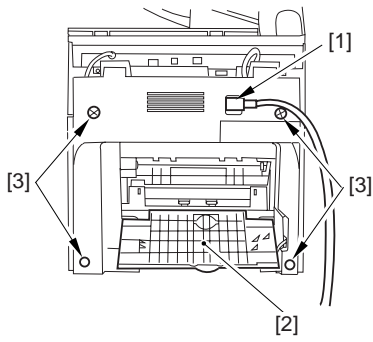
F-3-484

3.4 LASER EXPOSURE SYSTEM

3.4.1 Laser/Scanner Unit

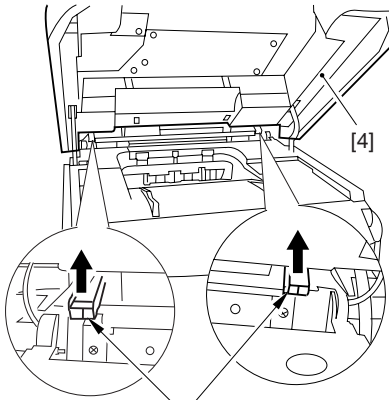
3.4.1.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-485

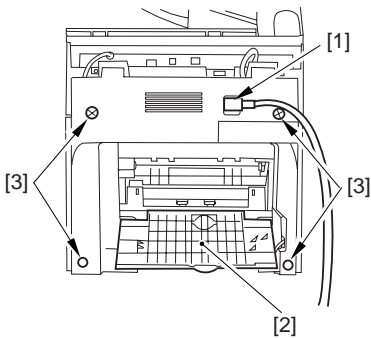
3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-486

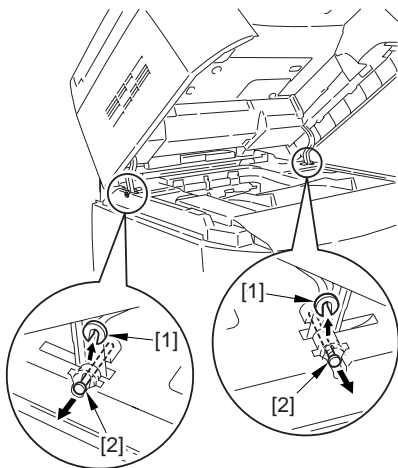
4) Close the reader assembly; then, detach the rear cover [1].



F-3-487

3.4.1.2 Removing the Reader Assembly

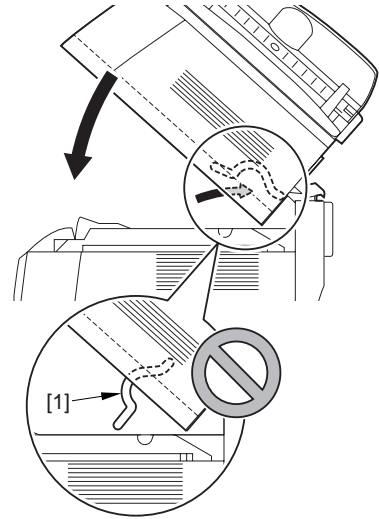
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-488



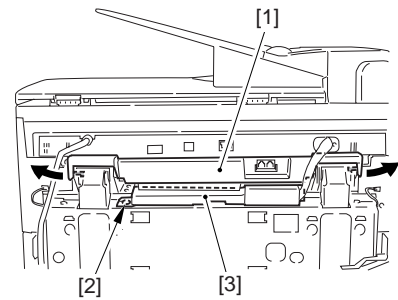
When closing the reader assembly, be sure to push in the arm [1] first.



F-3-489

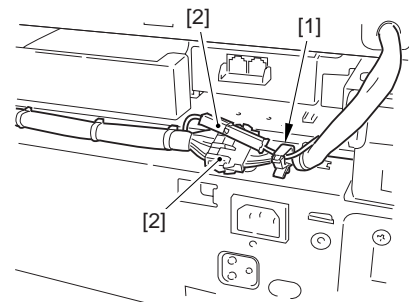
2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].

3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



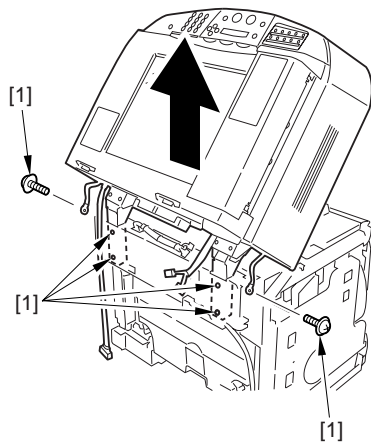
F-3-490

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-491

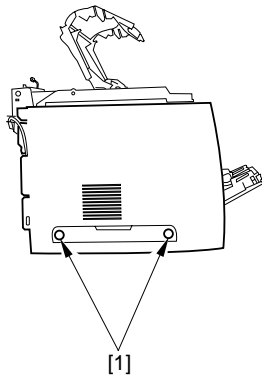
5) Remove the 6 screws [1], and lift the reader unit to detach.



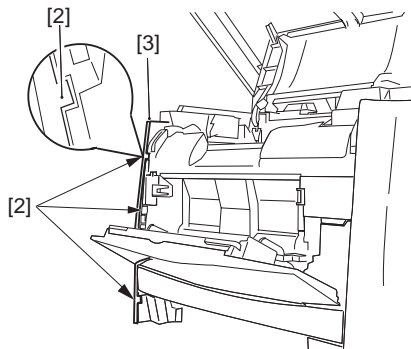
F-3-492

3.4.1.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



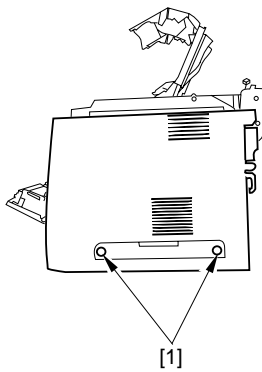
F-3-493



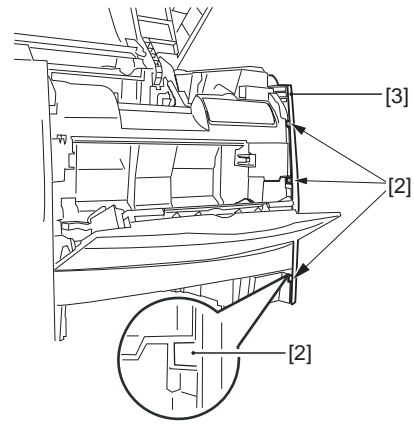
F-3-494

3.4.1.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



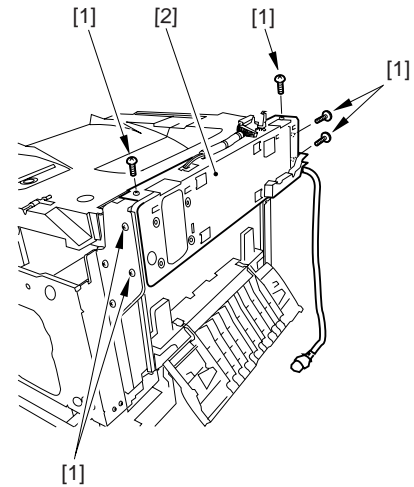
F-3-495



F-3-496

3.4.1.5 Removing the Power Supply Assembly

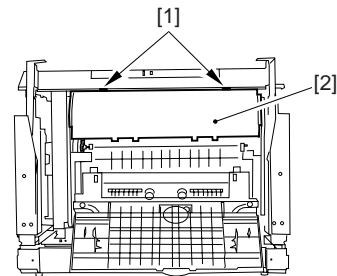
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-497

3.4.1.6 Removing the Face-Down Cover

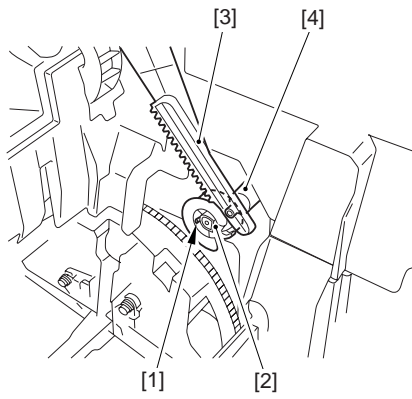
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-498

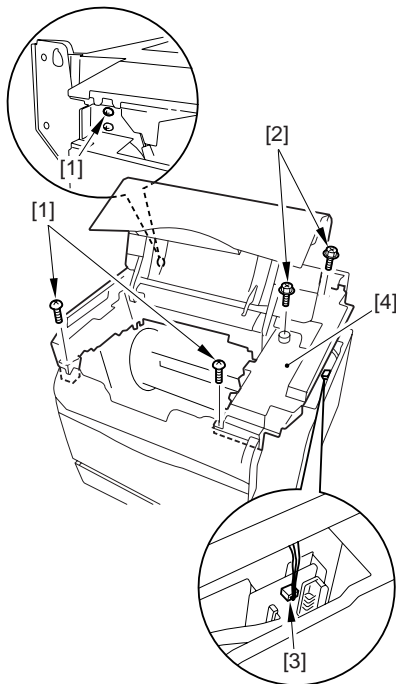
3.4.1.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



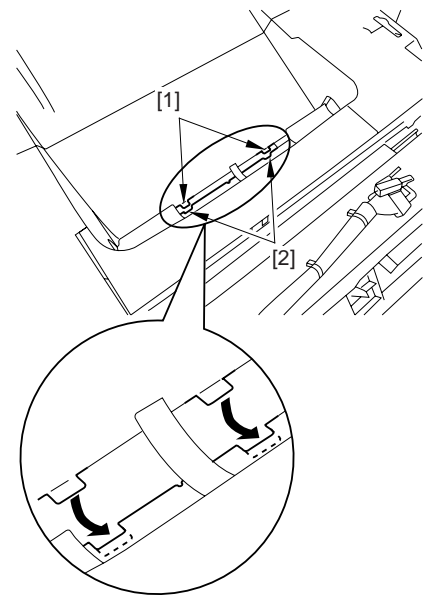
F-3-499

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

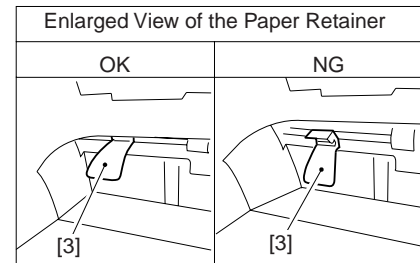


F-3-500

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

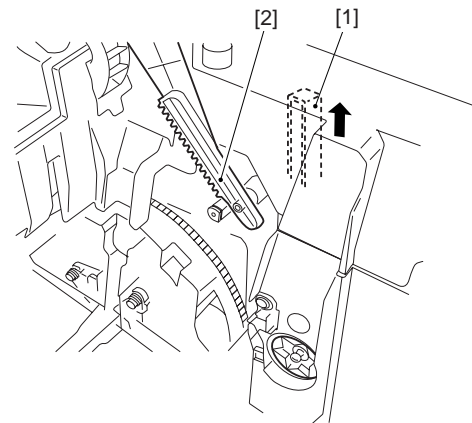


F-3-501



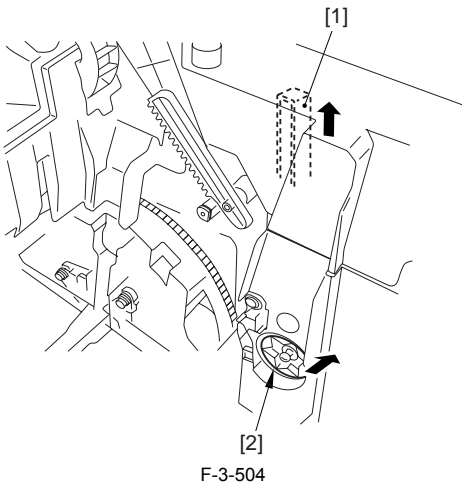
F-3-502

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



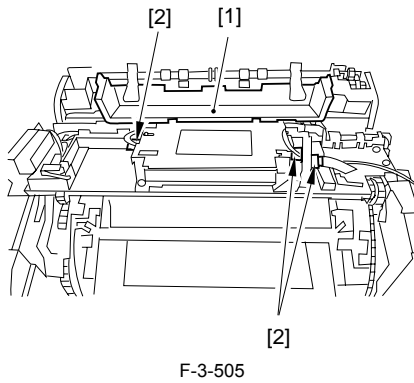
F-3-503

! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.

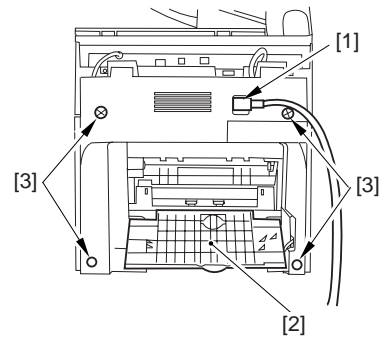
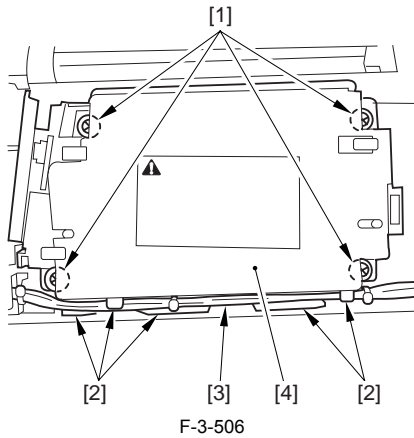


3.4.1.8 Removing the Laser Scanner Unit

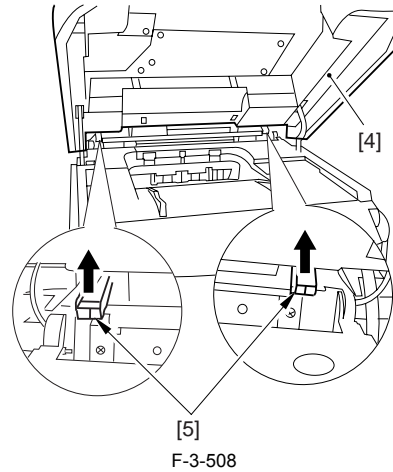
- 1) Remove the face-down sub cover [1].
- 2) Disconnect the 3 connectors [2].



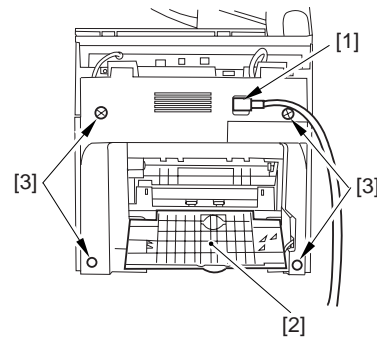
- 3) Remove the 4 screws [1], and free the harness [3] from the harness guide [2]; then, detach the laser scanner unit [4].



- 3) Open the reader assembly [4], and lift to free the 2 claws [5].

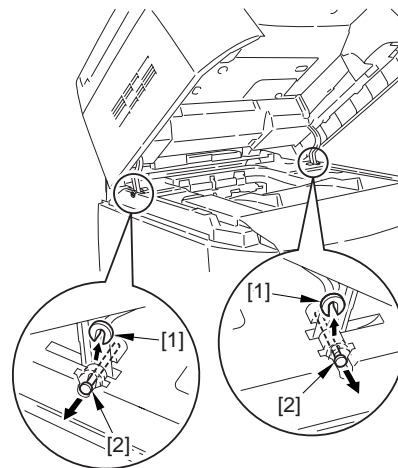


- 4) Close the reader assembly; then, detach the rear cover [1].



3.5.1.2 Removing the Reader Assembly

- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



3.5 IMAGE FORMATION SYSTEM

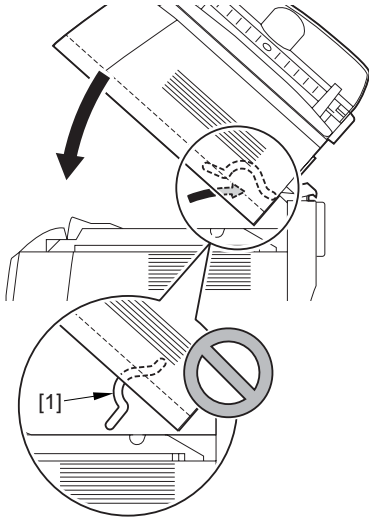
3.5.1 Rotary Drive Unit

3.5.1.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.

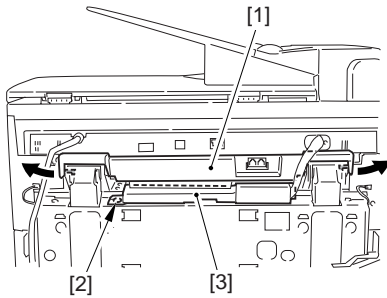


When closing the reader assembly, be sure to push in the arm [1] first.



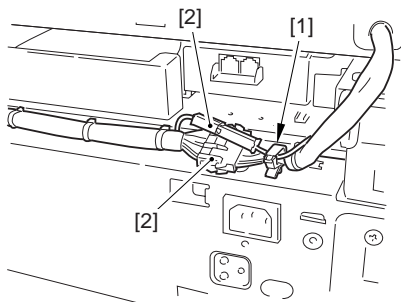
F-3-511

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



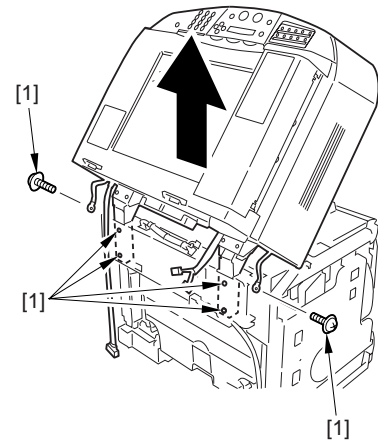
F-3-512

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-513

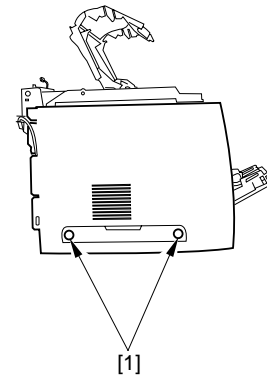
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



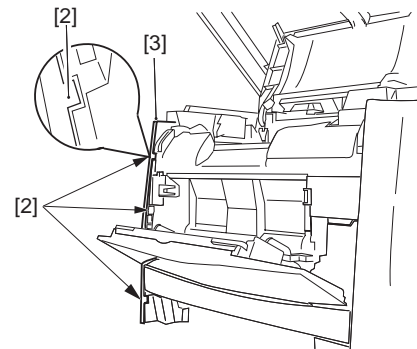
F-3-514

3.5.1.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



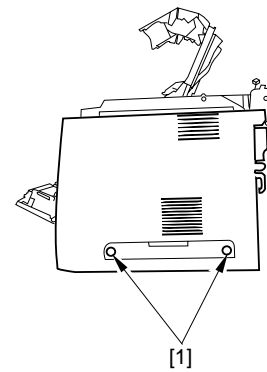
F-3-515



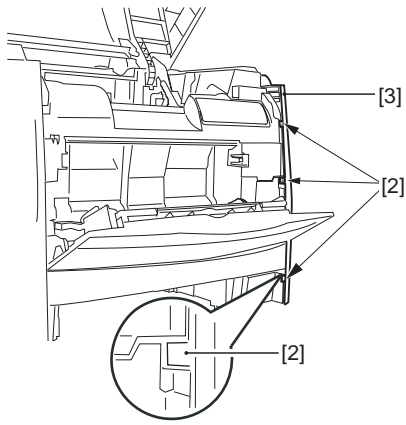
F-3-516

3.5.1.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



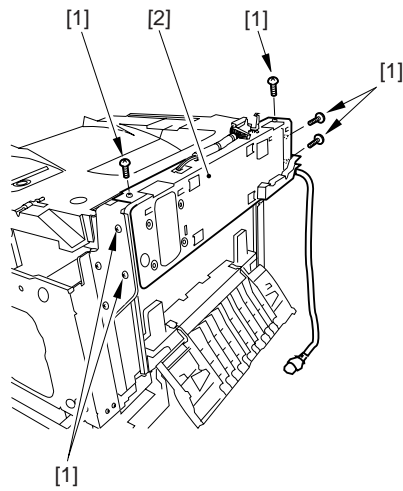
F-3-517



F-3-518

3.5.1.5 Removing the Power Supply Assembly

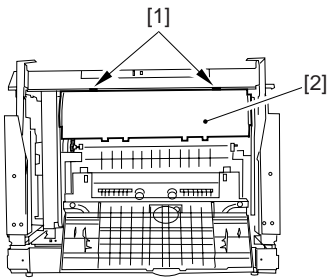
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-519

3.5.1.6 Removing the Face-Down Cover

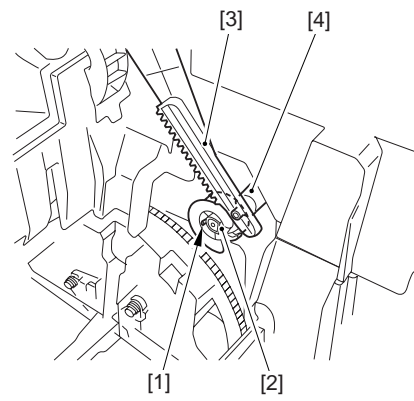
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-520

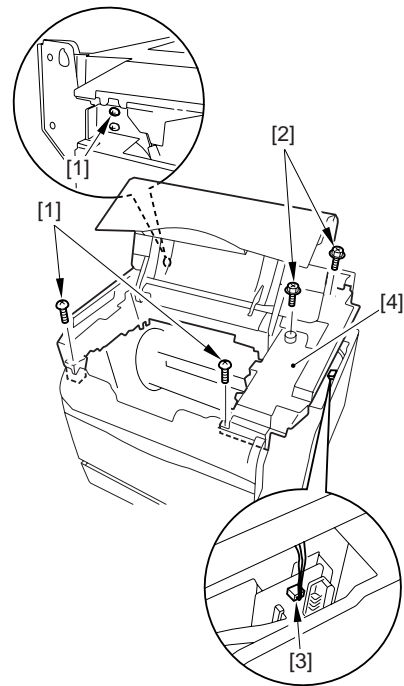
3.5.1.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



F-3-521

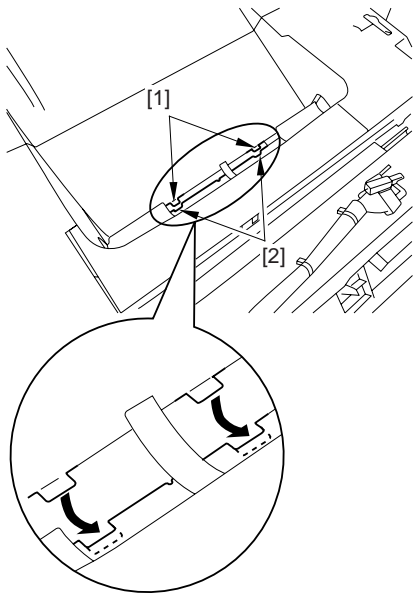
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



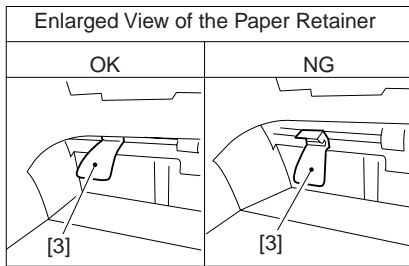
F-3-522



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



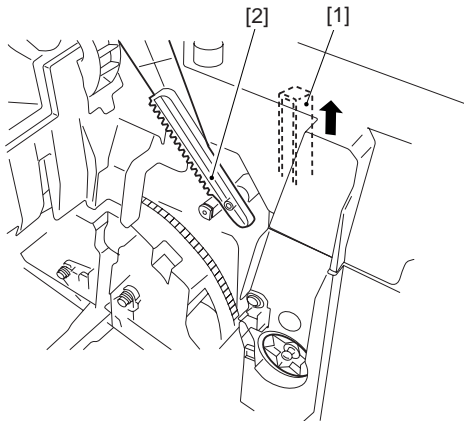
F-3-523



F-3-524



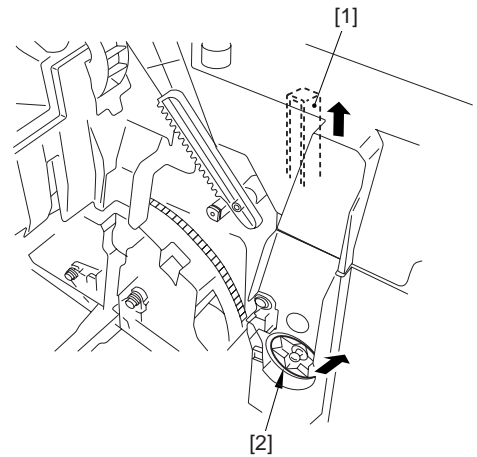
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-525



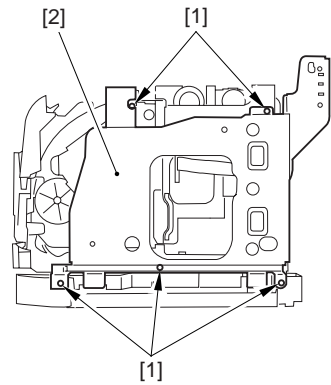
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-526

3.5.1.8 Removing the Right Frame

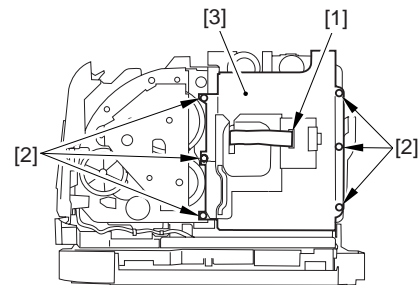
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-527

3.5.1.9 Removing the Shield Plate

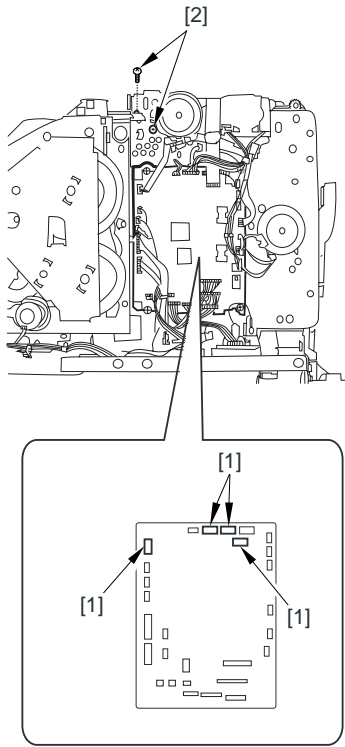
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-528

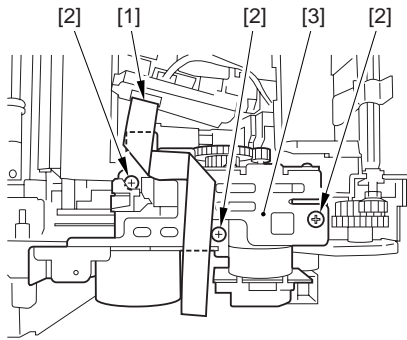
3.5.1.10 Removing the Rotary Drive Assembly

- 1) Disconnect the 4 connectors [1], and remove the 2 screws [2].



F-3-529

2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].



F-3-530

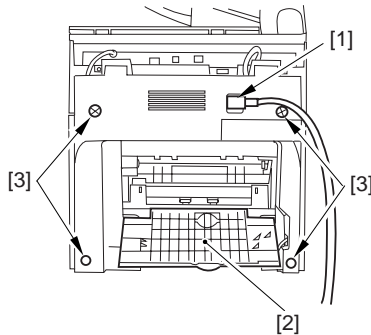


Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.2 Drum Cartridge Memory Tag Contact

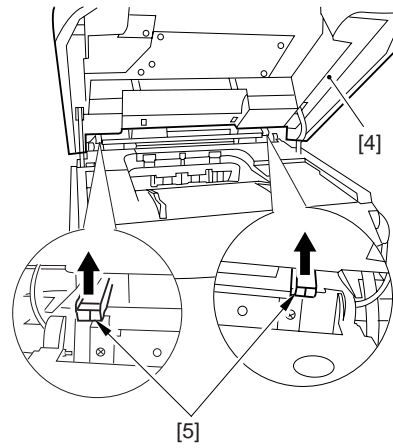
3.5.2.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



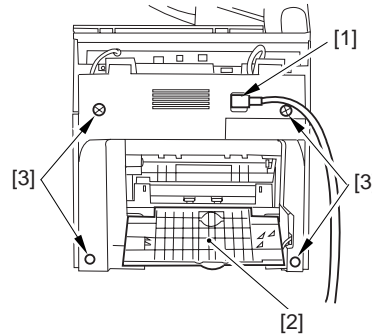
F-3-531

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-532

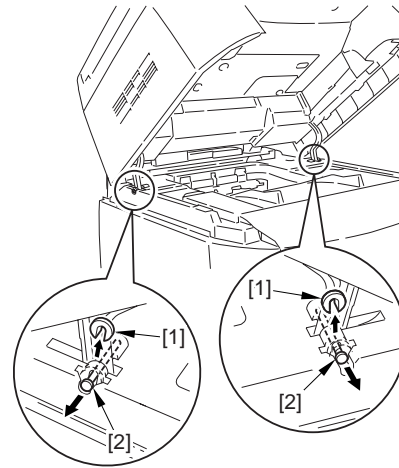
4) Close the reader assembly; then, detach the rear cover [1].



F-3-533

3.5.2.2 Removing the Reader Assembly

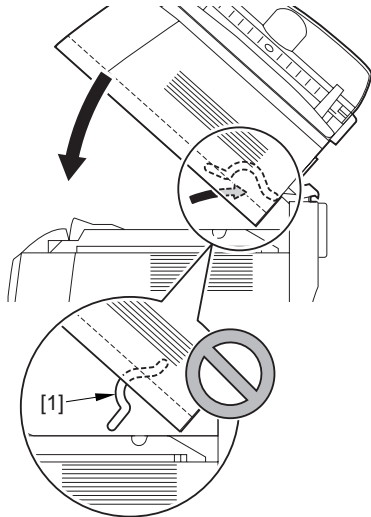
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-534

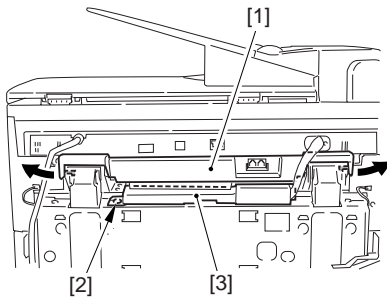


When closing the reader assembly, be sure to push in the arm [1] first.



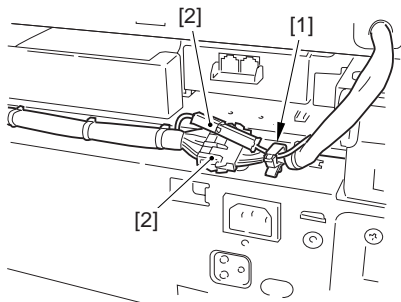
F-3-535

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



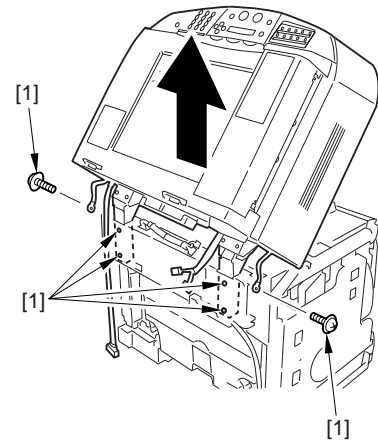
F-3-536

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-537

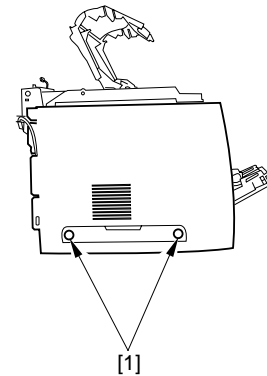
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



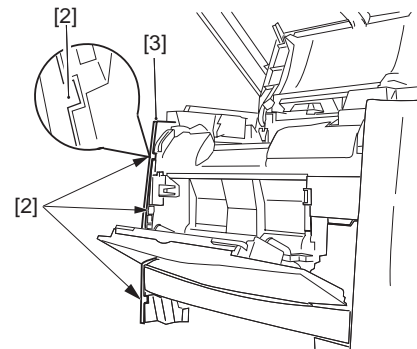
F-3-538

3.5.2.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



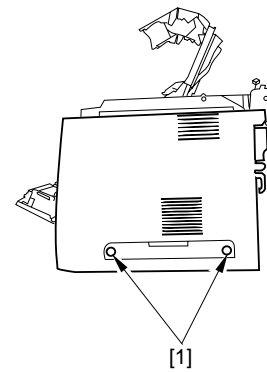
F-3-539



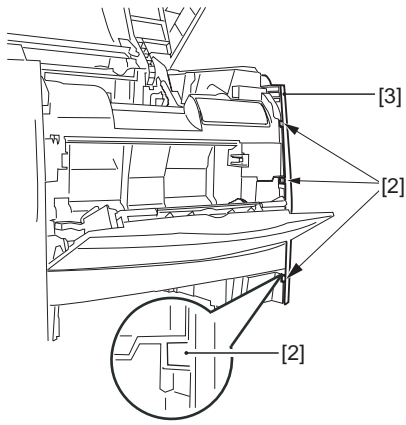
F-3-540

3.5.2.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



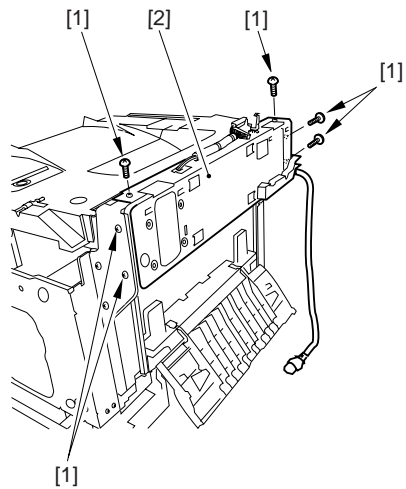
F-3-541



F-3-542

3.5.2.5 Removing the Power Supply Assembly

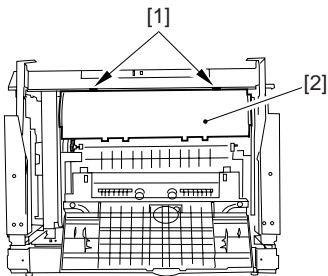
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-543

3.5.2.6 Removing the Face-Down Cover

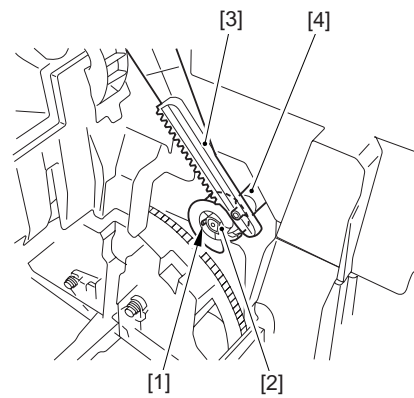
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-544

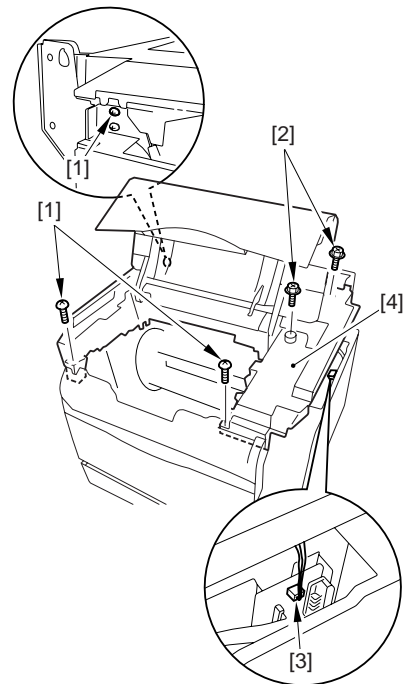
3.5.2.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
 2) Free the link lever [3] from the shaft [4].



F-3-545

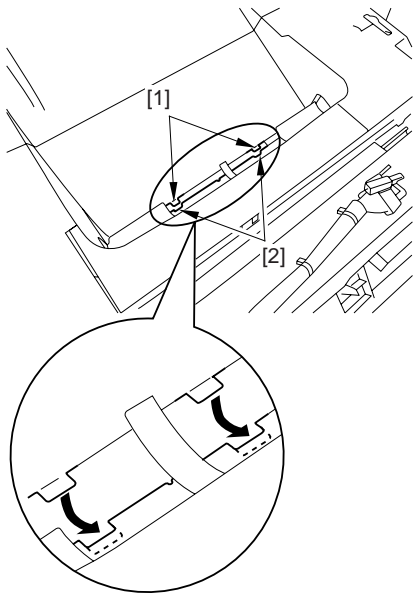
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



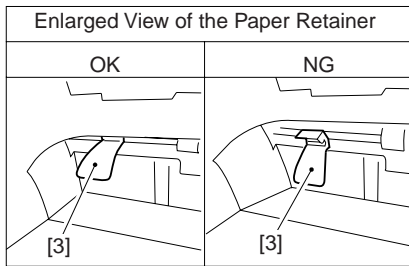
F-3-546



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



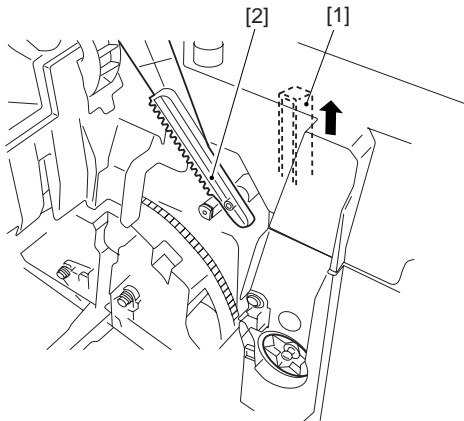
F-3-547



F-3-548



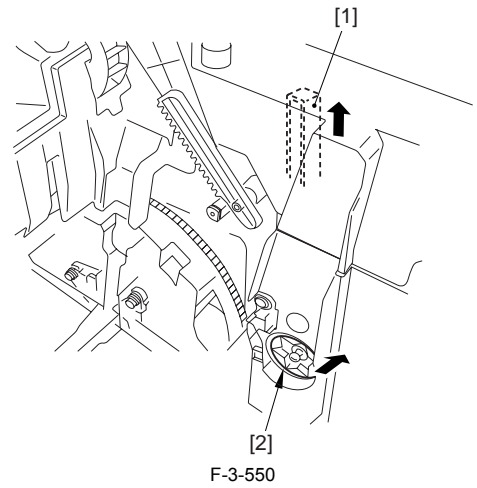
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-549



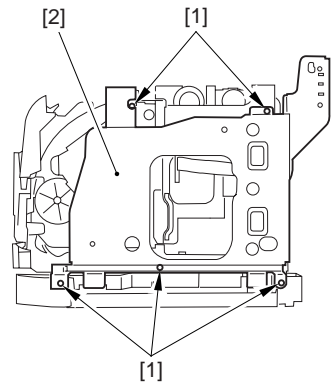
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-550

3.5.2.8 Removing the Right Frame

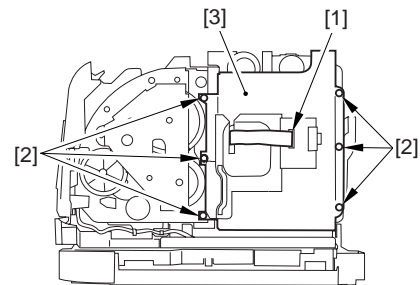
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-551

3.5.2.9 Removing the Shield Plate

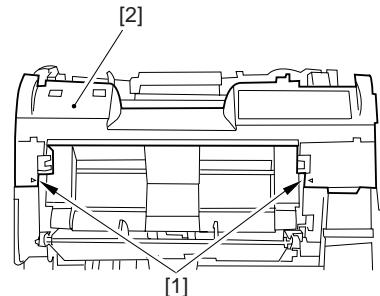
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-552

3.5.2.10 Removing the Inside Cover

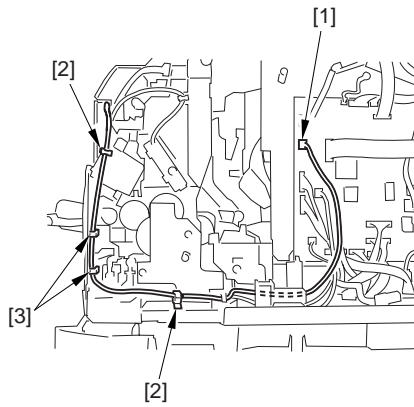
- 1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-553

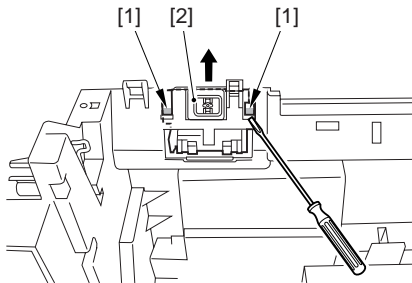
3.5.2.11 Removing the Drum Cartridge Memory Tag Contact

- 1) Disconnect the connector [1] from the DC controller board; then, free the harness from the guide [2].



F-3-554

- 2) Remove the 2 claws [1], and detach the drum cartridge memory tag contact [2].

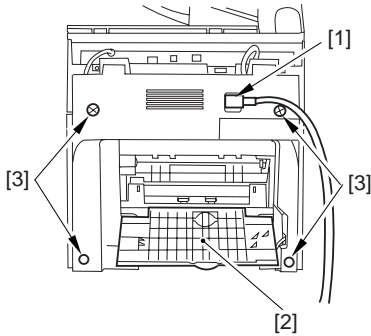


F-3-555

3.5.3 Developing Rotary Unit

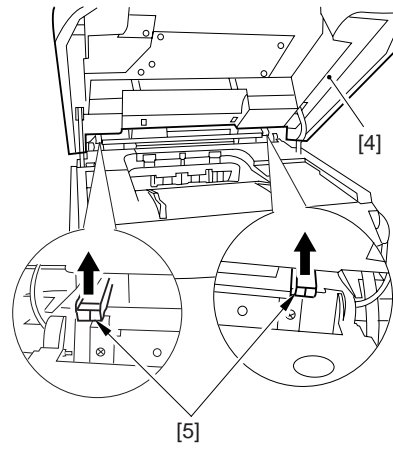
3.5.3.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



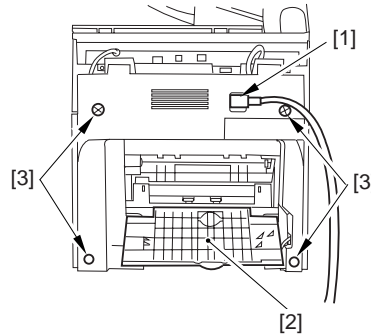
F-3-556

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-557

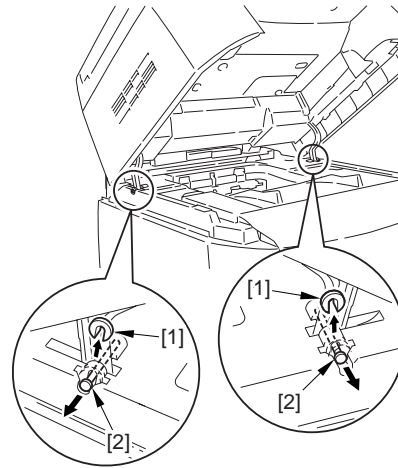
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-558

3.5.3.2 Removing the Reader Assembly

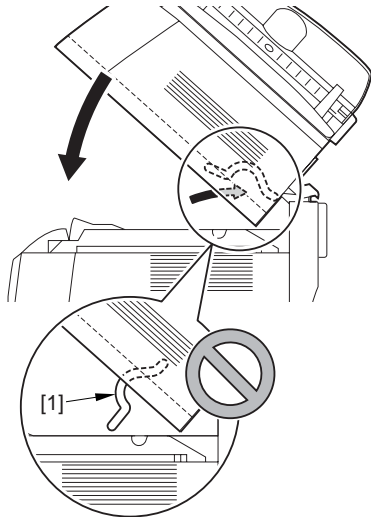
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-559

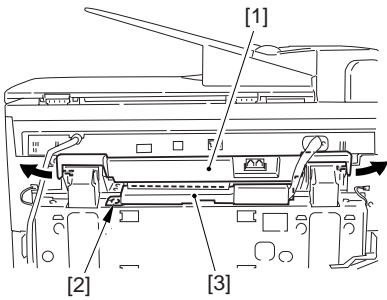


When closing the reader assembly, be sure to push in the arm [1] first.



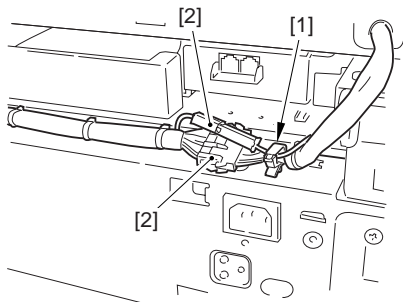
F-3-560

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



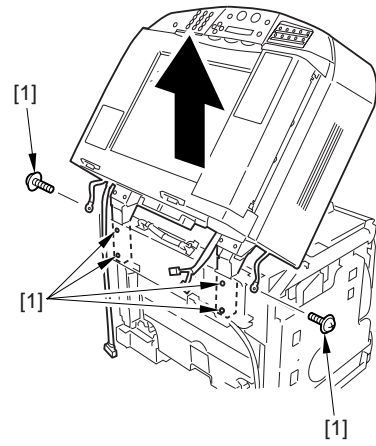
F-3-561

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-562

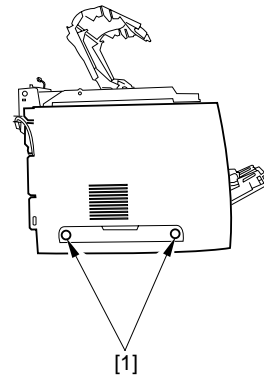
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



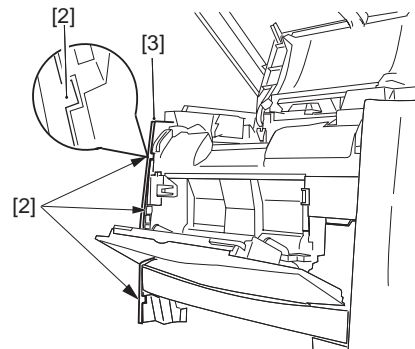
F-3-563

3.5.3.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



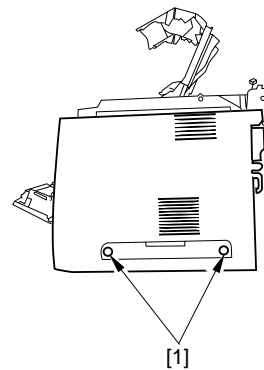
F-3-564



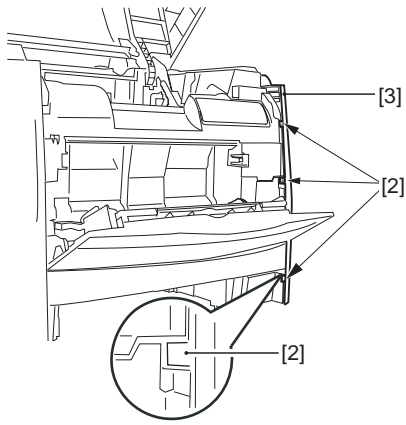
F-3-565

3.5.3.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



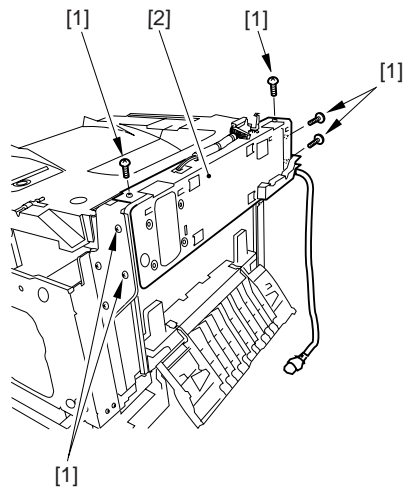
F-3-566



F-3-567

3.5.3.5 Removing the Power Supply Assembly

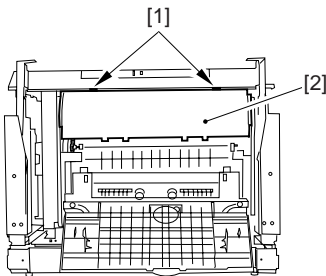
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-568

3.5.3.6 Removing the Face-Down Cover

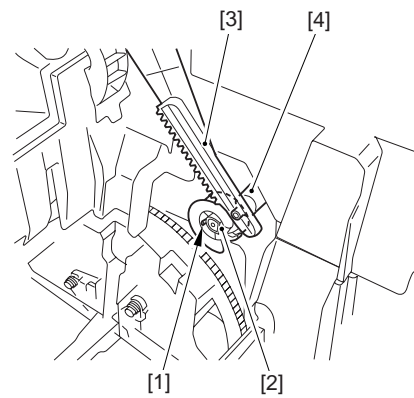
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-569

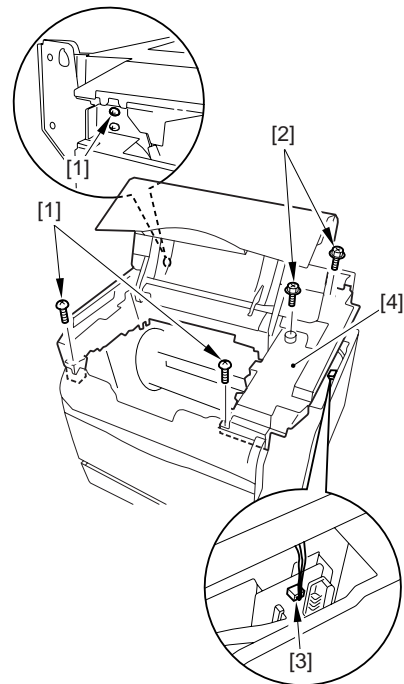
3.5.3.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
 2) Free the link lever [3] from the shaft [4].



F-3-570

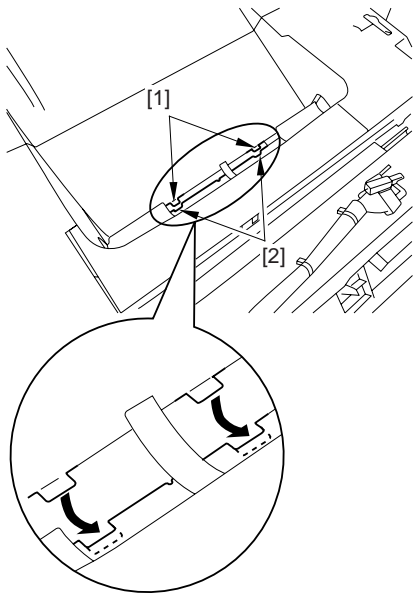
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



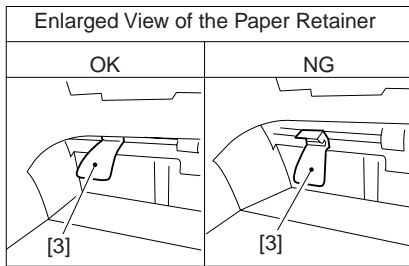
F-3-571



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



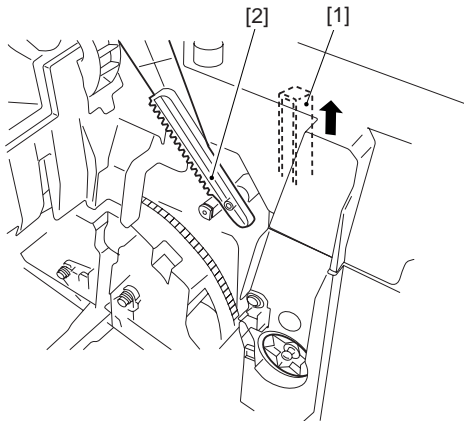
F-3-572



F-3-573



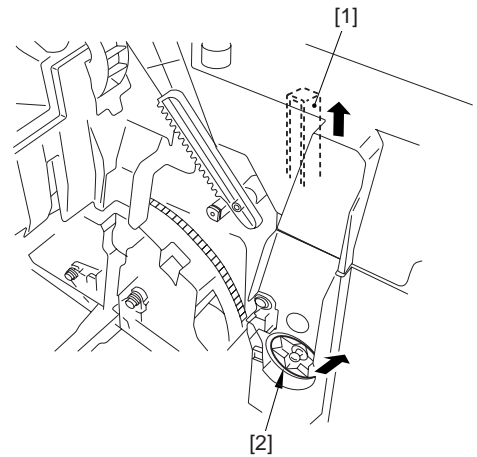
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-574



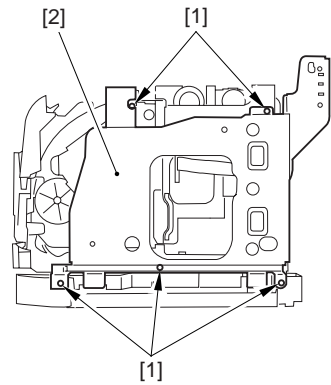
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-575

3.5.3.8 Removing the Right Frame

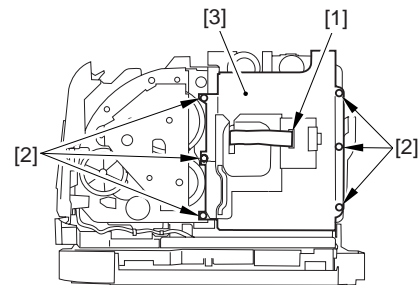
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-576

3.5.3.9 Removing the Shield Plate

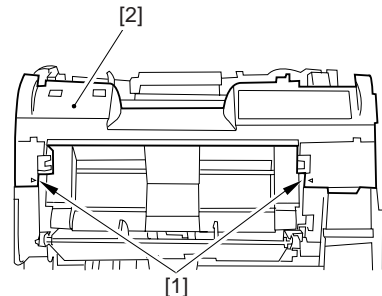
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-577

3.5.3.10 Removing the Inside Cover

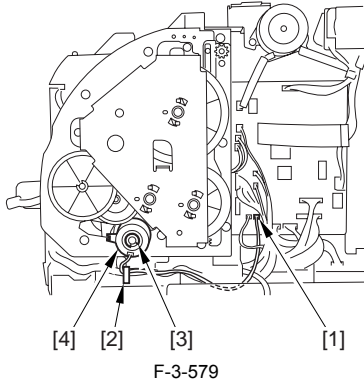
- 1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-578

3.5.3.11 Removing the Registration Clutch

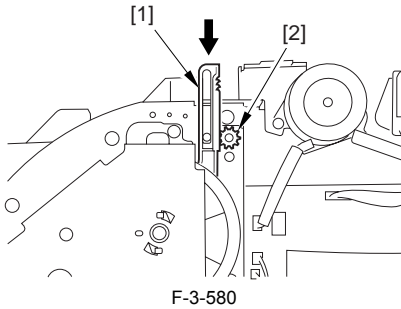
- 1) Disconnect the connector [1], and open the harness band [2].
- 2) Remove the E-ring [3], and detach the registration clutch [4].



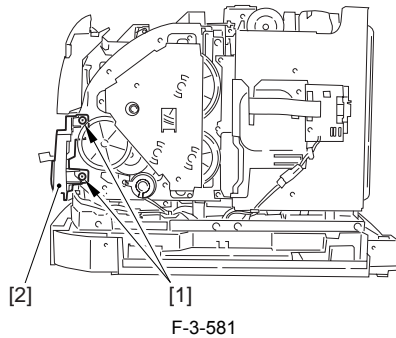
⚠ The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

3.5.3.12 Removing the Main Drive Assembly

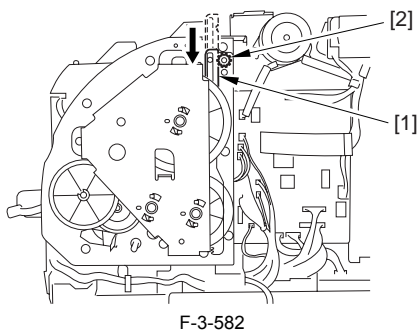
- 1) Shift down the drive release lever [1], and remove the gear [2].



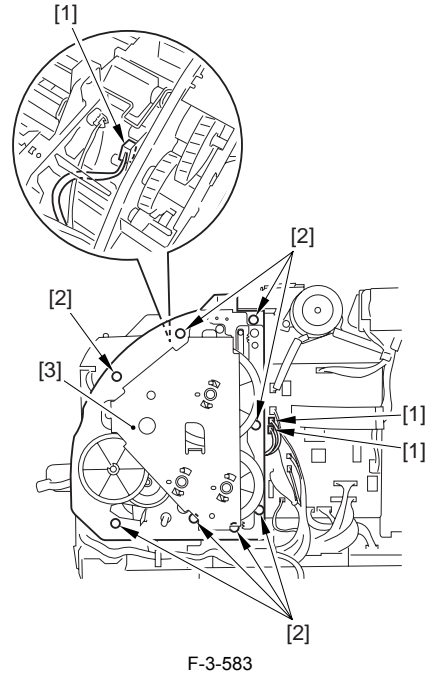
- 2) Remove the 2 screws [1], and detach the front sub cover [2].



⚠ When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.

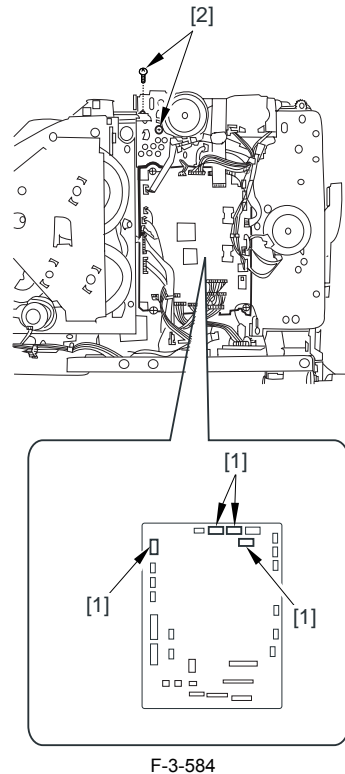


- 3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].

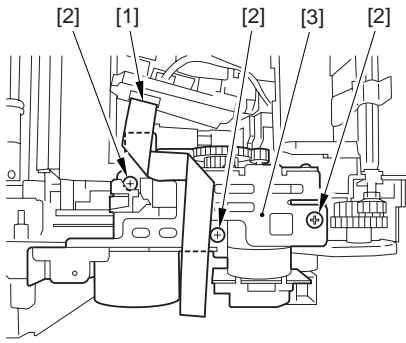


3.5.3.13 Removing the Rotary Drive Assembly

- 1) Disconnect the 4 connectors [1], and remove the 2 screws [2].



- 2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].



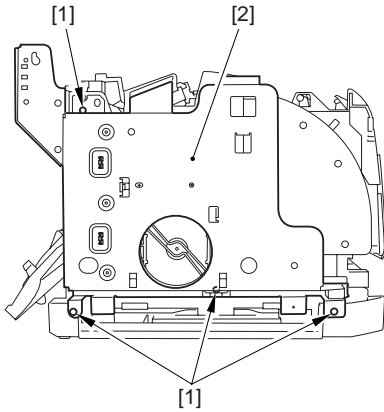
F-3-585



Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.3.14 Removing the Left Frame

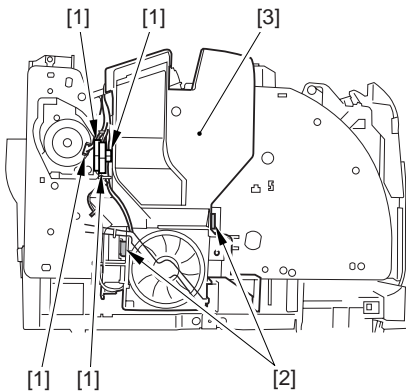
- 1) Remove the 4 screws [1], and detach the left frame [2].



F-3-586

3.5.3.15 Removing the Fan Duct

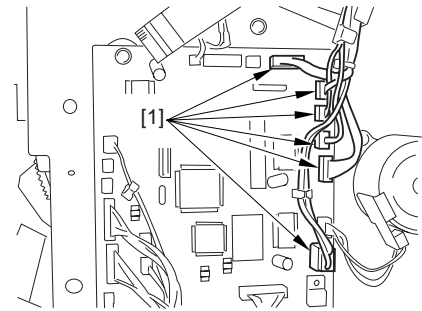
- 1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
- 2) Slide the fan duct [3] in upward direction to detach.



F-3-587

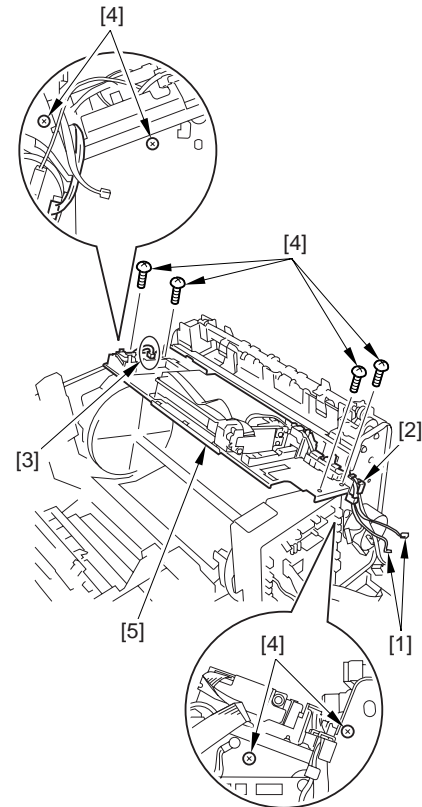
3.5.3.16 Removing the Laser Scanner Unit Base

- 1) Disconnect the 6 connectors [1] of the DC controller board.



F-3-588

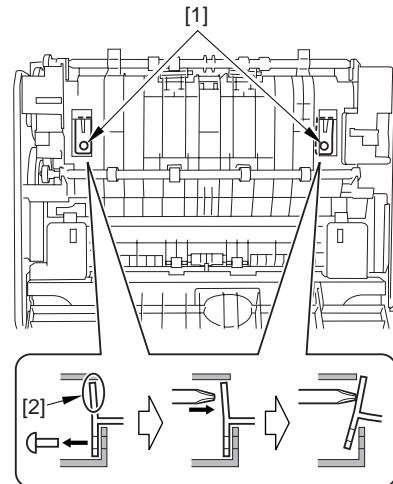
- 2) Free the harness [1] from the harness guide [2].
- 3) Disconnect the connector [3], and remove the 8 screws [4]; then, detach the laser scanner base [5].



F-3-589

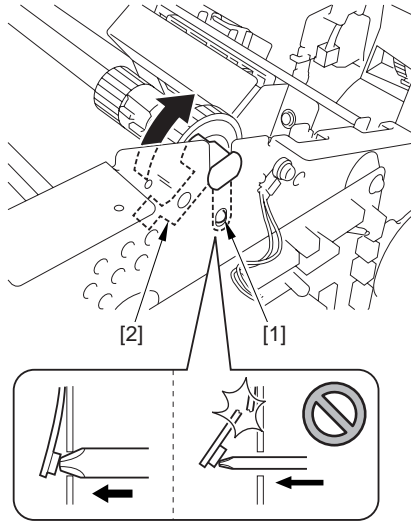
3.5.3.17 Removing the Developing Rotary Assembly

- 1) Remove the 2 screws [1].
- 2) Push in the top [2] of the rotary holder toward the inside of the machine using the tip of a screwdriver to see that the holder has been disengaged from the machine.



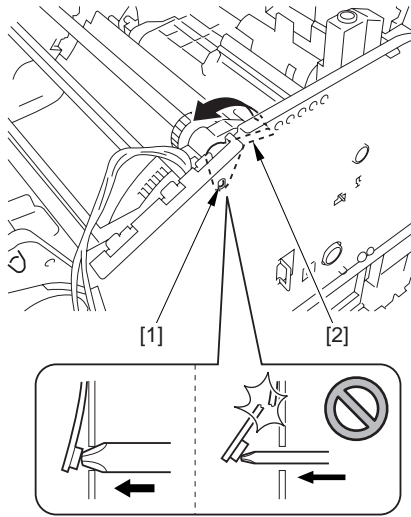
F-3-590

- 3) While pushing the boss [1], release the rotary release lever (right) [2] in upward direction.



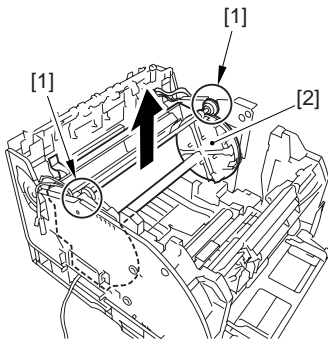
F-3-591

- 4) While pushing the boss [1], release the rotary release lever (left) [2] in upward direction.



F-3-592

- 5) While paying attention to the engagement of the rotary release lever (left/right) [1], lift the developing rotary assembly [2] to detach.



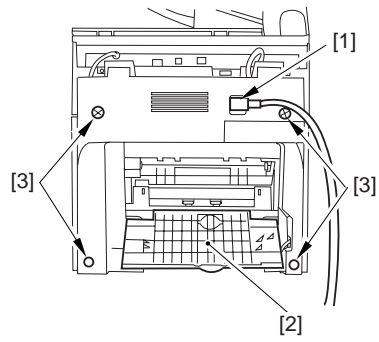
F-3-593

⚠ When mounting the developing rotary assembly, be sure that the 2 tips of the rotary holder are fully fitted to the frame of the machine.

3.5.4 Engaging Motor

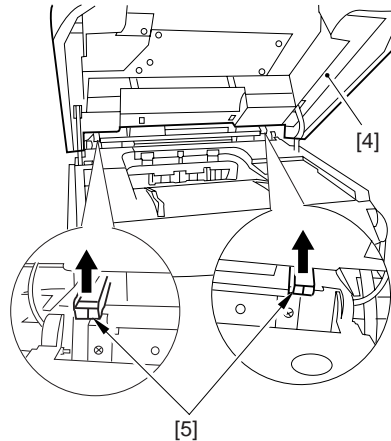
3.5.4.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



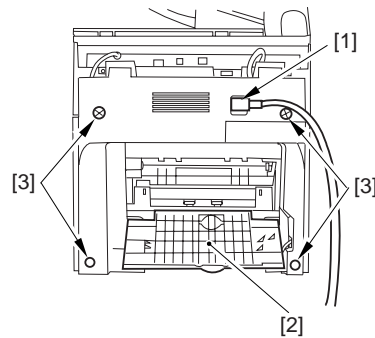
F-3-594

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-595

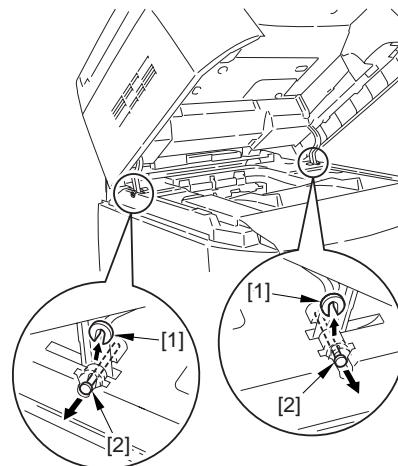
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-596

3.5.4.2 Removing the Reader Assembly

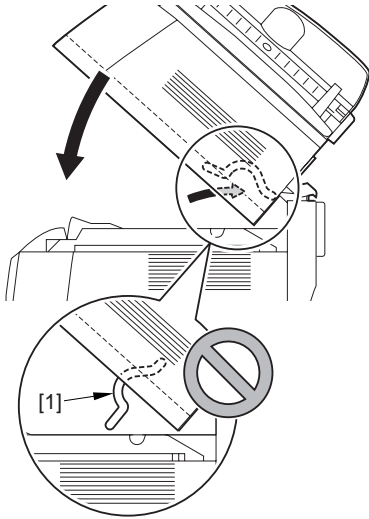
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-597

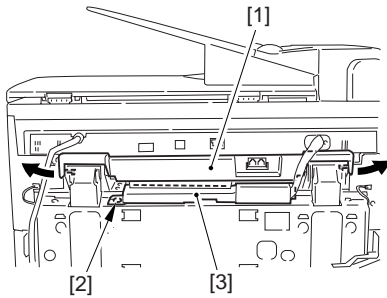


When closing the reader assembly, be sure to push in the arm [1] first.



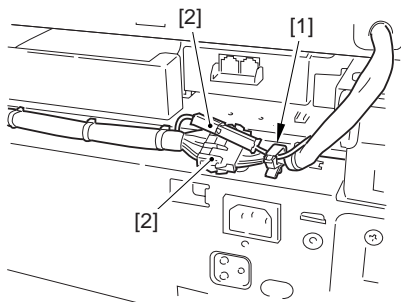
F-3-598

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



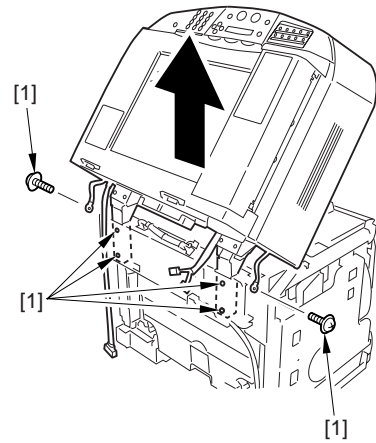
F-3-599

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-600

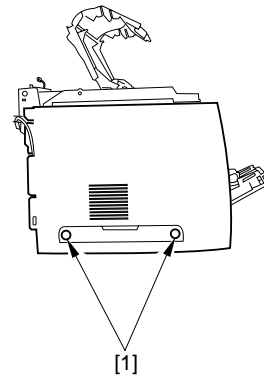
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



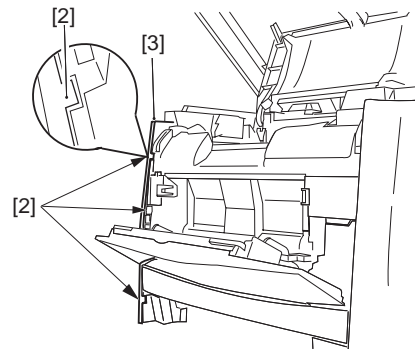
F-3-601

3.5.4.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



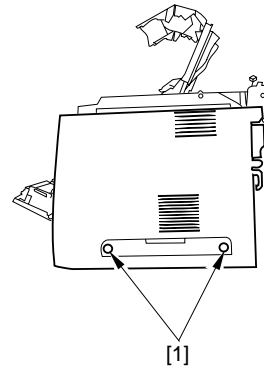
F-3-602



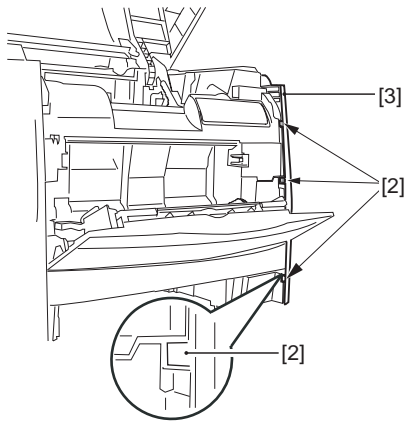
F-3-603

3.5.4.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



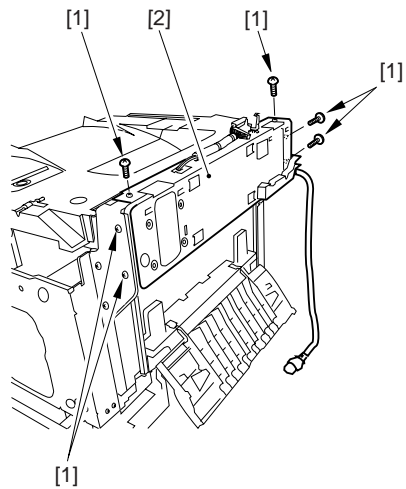
F-3-604



F-3-605

3.5.4.5 Removing the Power Supply Assembly

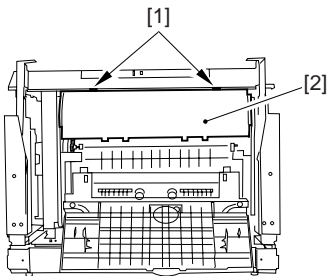
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-606

3.5.4.6 Removing the Face-Down Cover

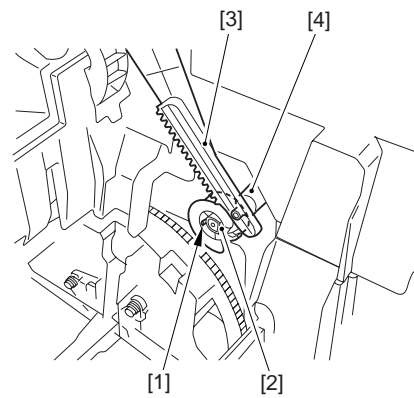
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-607

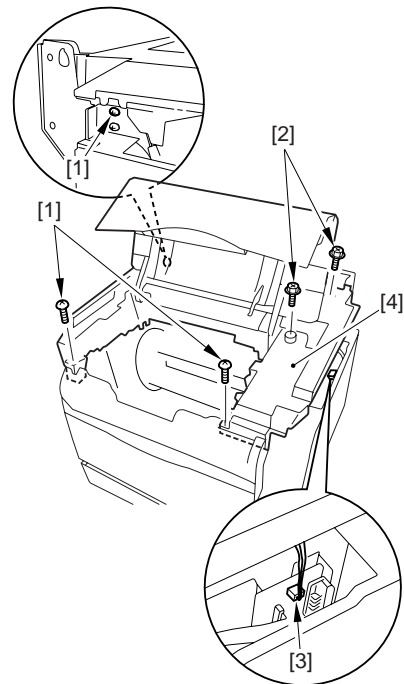
3.5.4.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



F-3-608

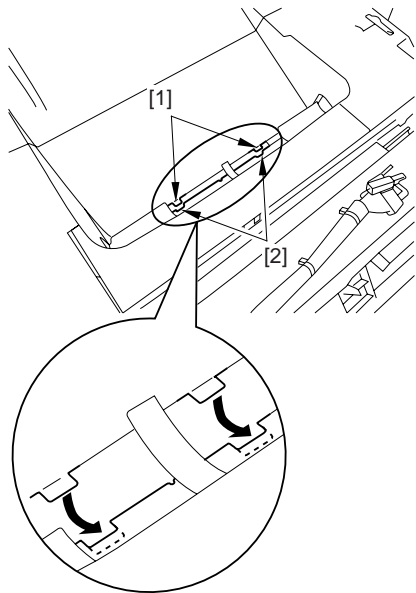
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



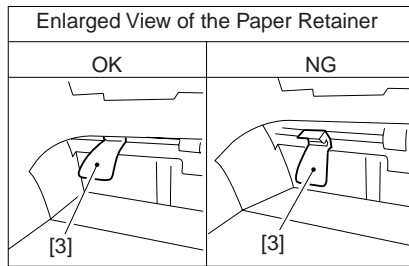
F-3-609



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



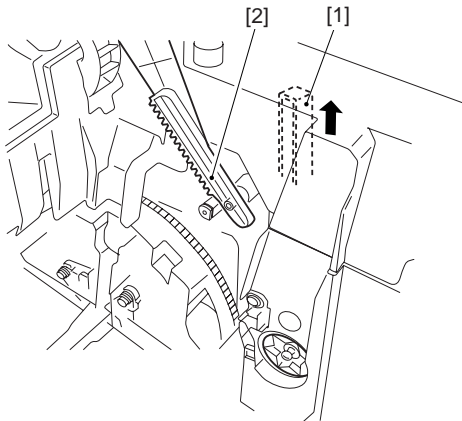
F-3-610



F-3-611



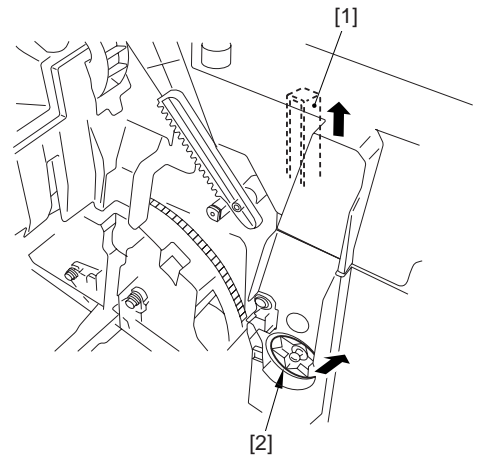
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-612



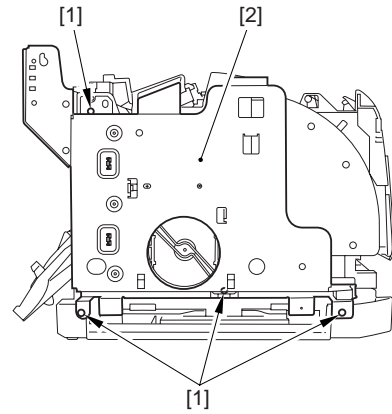
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-613

3.5.4.8 Removing the Left Frame

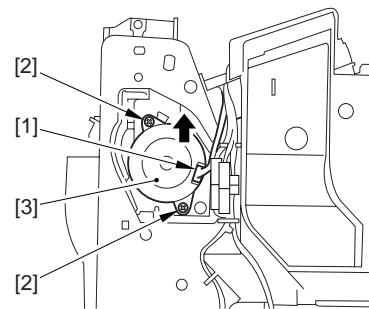
- 1) Remove the 4 screws [1], and detach the left frame [2].



F-3-614

3.5.4.9 Removing the Shift Motor

- 1) Disconnect the connector [1], and remove the 2 screws [2].
- 2) Slide the shift motor [3] in upward direction to detach.

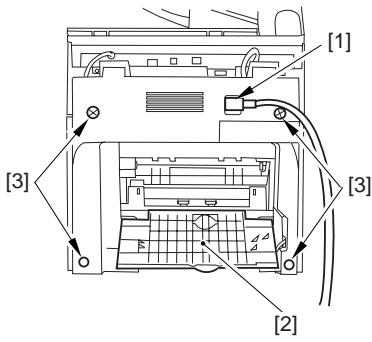


F-3-615

3.5.5 Developing Rotary Motor

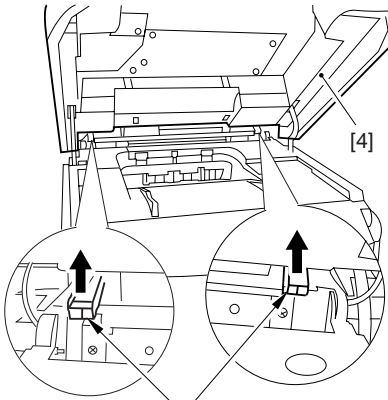
3.5.5.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-616

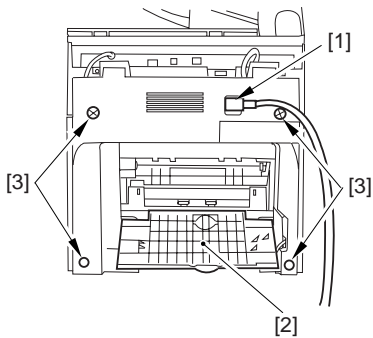
3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-617

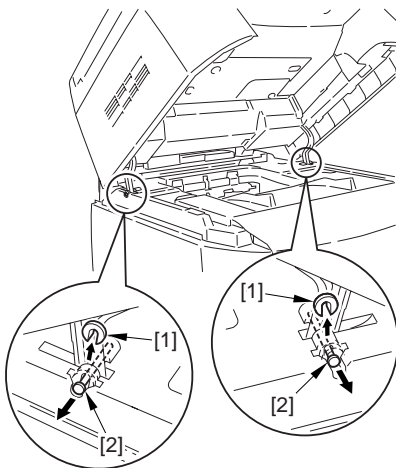
4) Close the reader assembly; then, detach the rear cover [1].



F-3-618

3.5.5.2 Removing the Reader Assembly

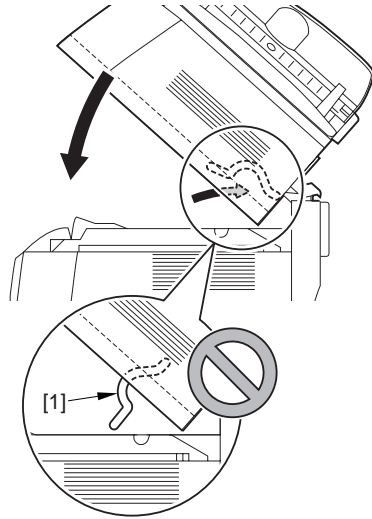
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-619



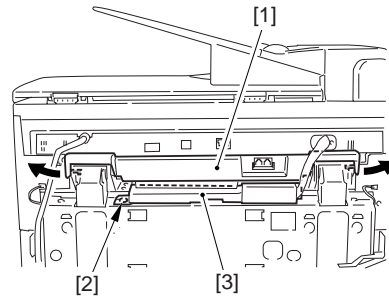
When closing the reader assembly, be sure to push in the arm [1] first.



F-3-620

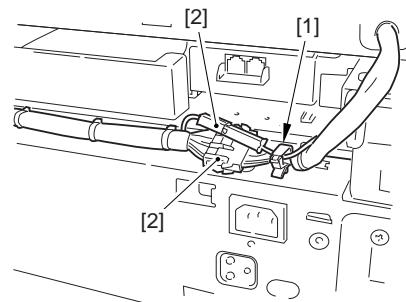
2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].

3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



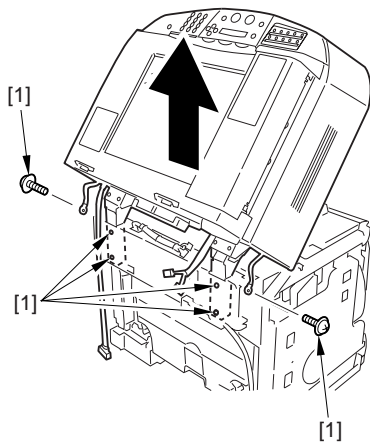
F-3-621

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-622

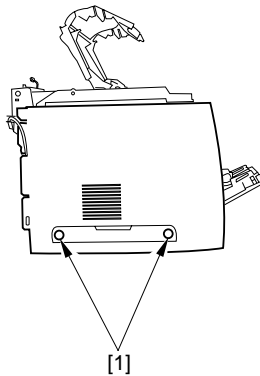
5) Remove the 6 screws [1], and lift the reader unit to detach.



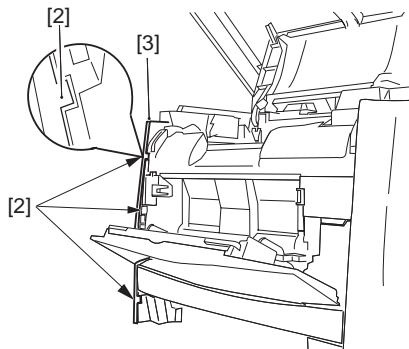
F-3-623

3.5.5.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



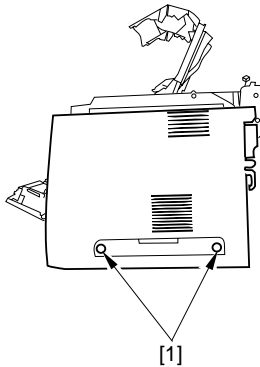
F-3-624



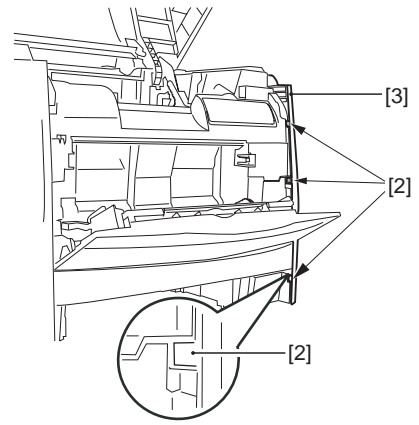
F-3-625

3.5.5.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



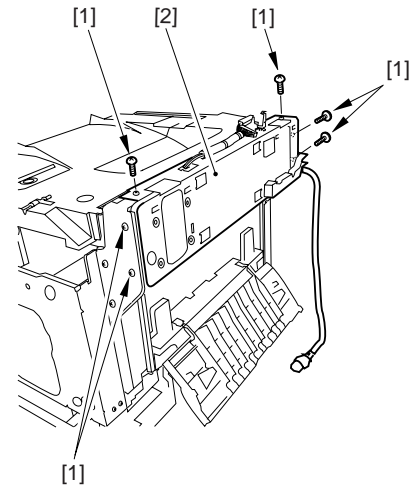
F-3-626



F-3-627

3.5.5.5 Removing the Power Supply Assembly

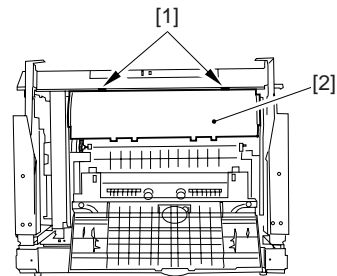
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-628

3.5.5.6 Removing the Face-Down Cover

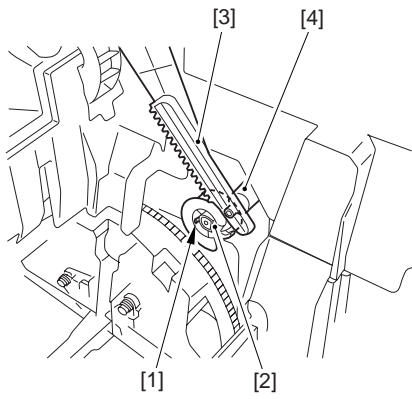
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-629

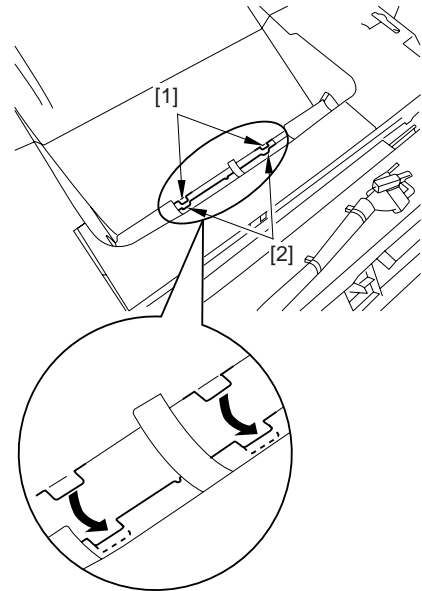
3.5.5.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

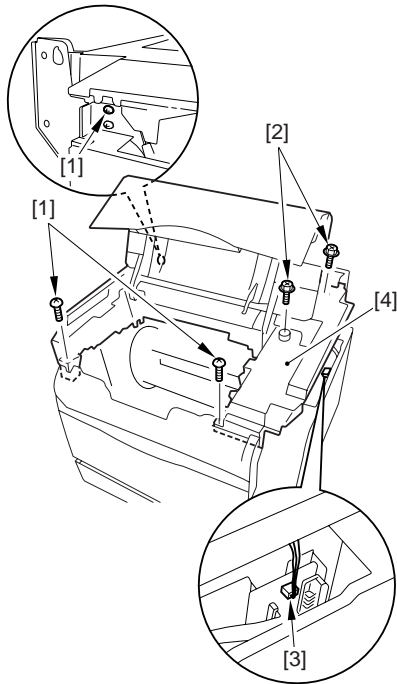


F-3-630

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

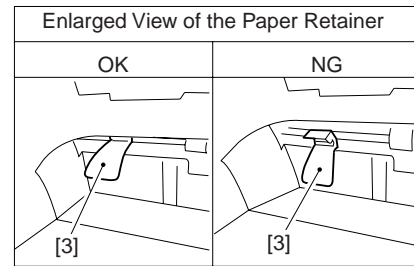


F-3-632



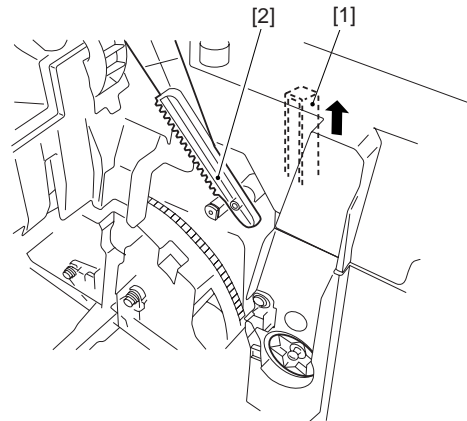
F-3-631

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



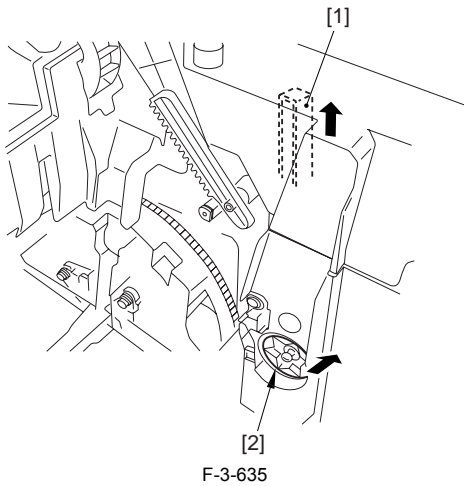
F-3-633

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-634

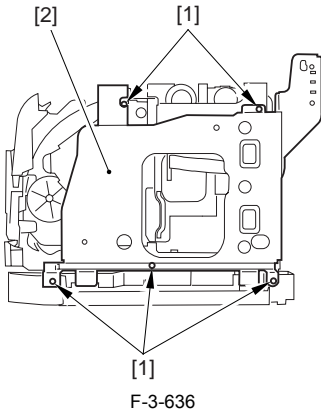
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-635

3.5.5.8 Removing the Right Frame

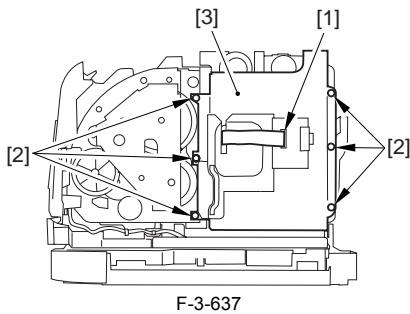
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-636

3.5.5.9 Removing the Shield Plate

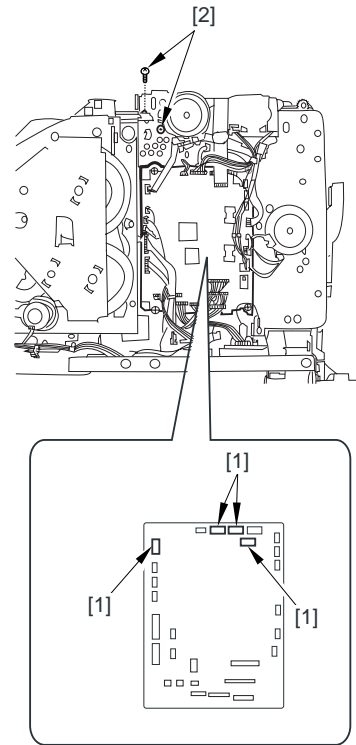
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-637

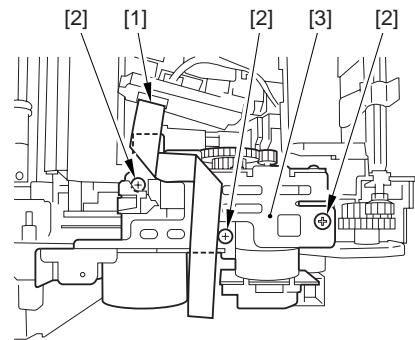
3.5.5.10 Removing the Rotary Drive Assembly

- 1) Disconnect the 4 connectors [1], and remove the 2 screws [2].



F-3-638

- 2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].

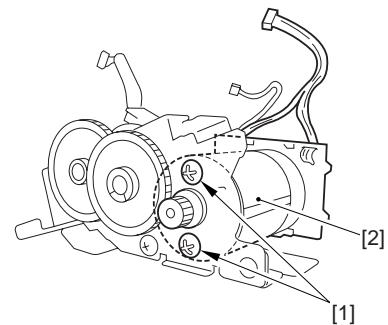


F-3-639

! Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.5.11 Removing the Developing Rotary Motor

- 1) Remove the 2 screws [1], and detach the toner cartridge motor [2] from the rotary drive assembly.



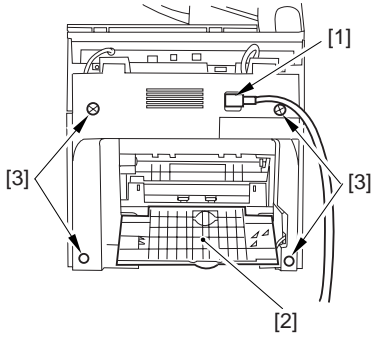
F-3-640

3.5.6 Developing Rotary Stopper Solenoid

3.5.6.1 Removing the Rear Cover

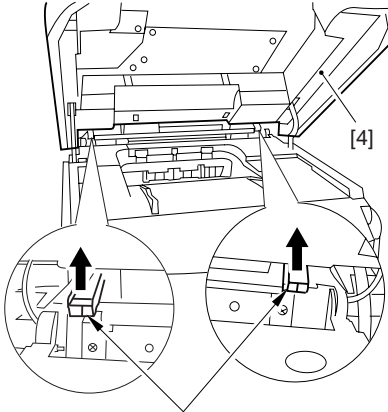
- 1) Disconnect the cable [1] of the power supply assembly.

2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



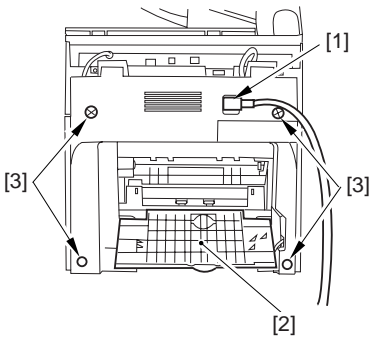
F-3-641

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-642

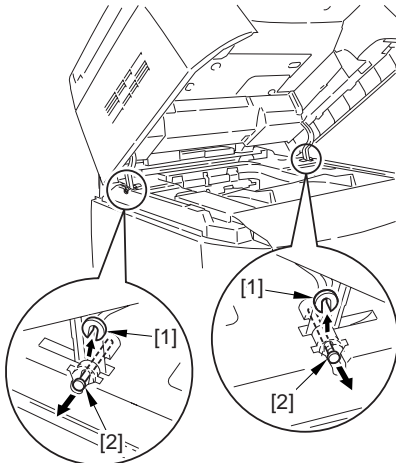
4) Close the reader assembly; then, detach the rear cover [1].



F-3-643

3.5.6.2 Removing the Reader Assembly

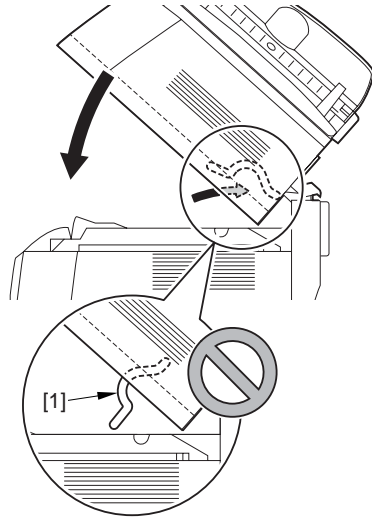
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-644

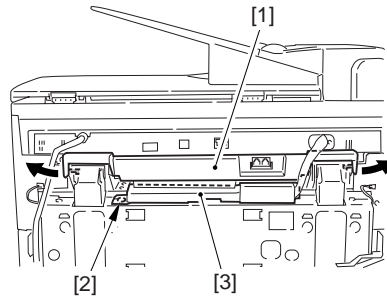


When closing the reader assembly, be sure to push in the arm [1] first.



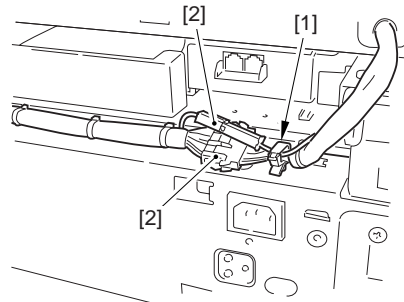
F-3-645

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



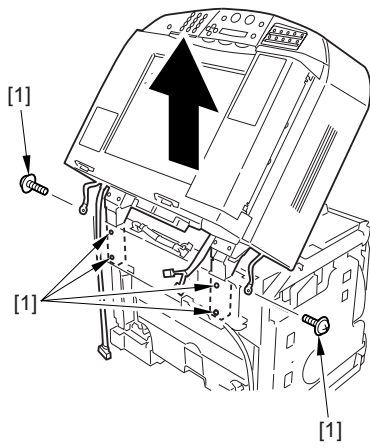
F-3-646

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-647

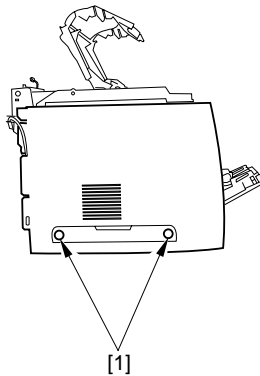
5) Remove the 6 screws [1], and lift the reader unit to detach.



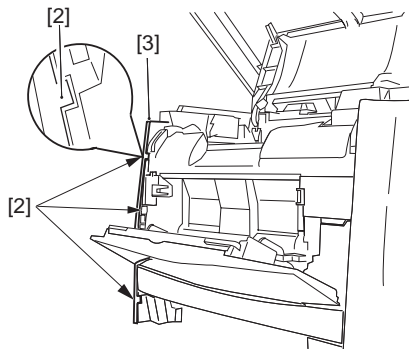
F-3-648

3.5.6.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



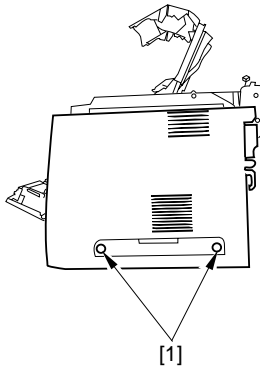
F-3-649



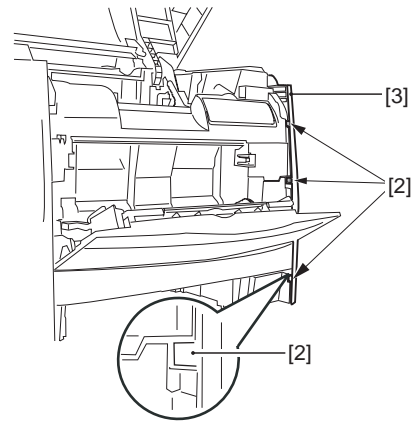
F-3-650

3.5.6.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



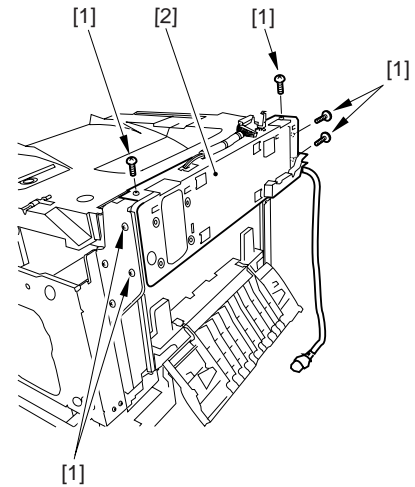
F-3-651



F-3-652

3.5.6.5 Removing the Power Supply Assembly

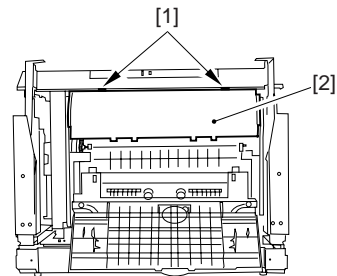
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-653

3.5.6.6 Removing the Face-Down Cover

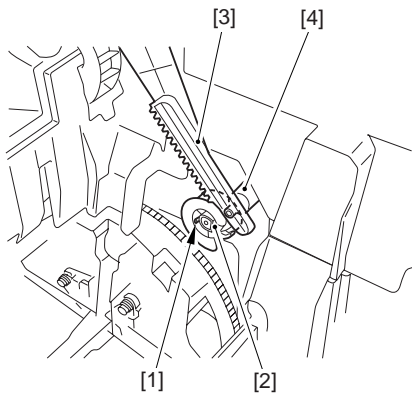
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-654

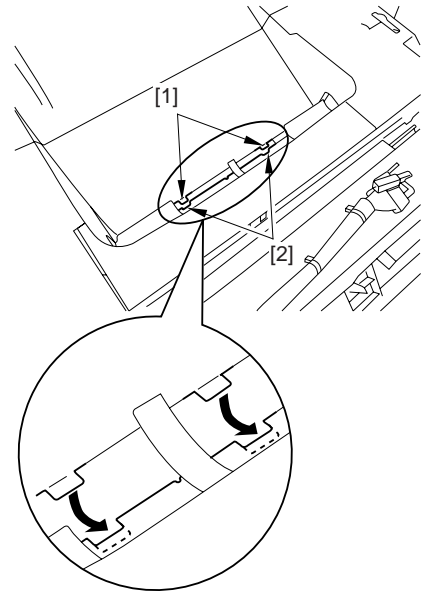
3.5.6.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

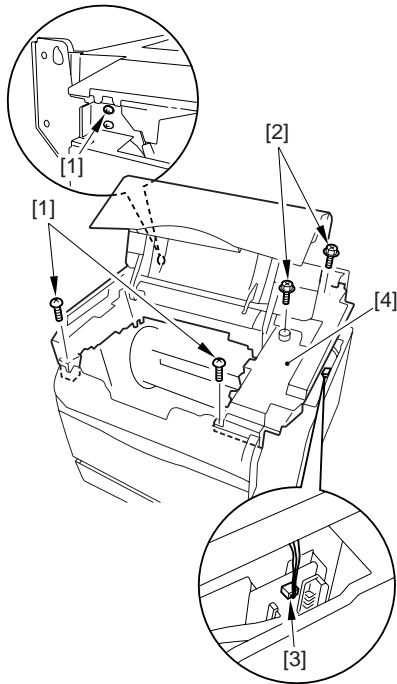


F-3-655

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

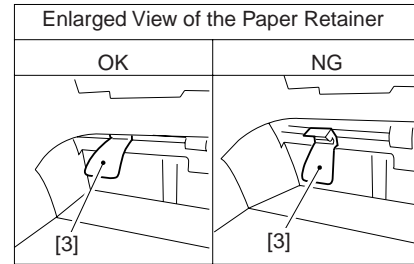


F-3-657



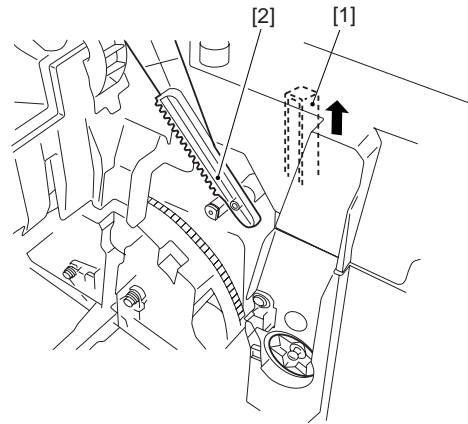
F-3-656

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



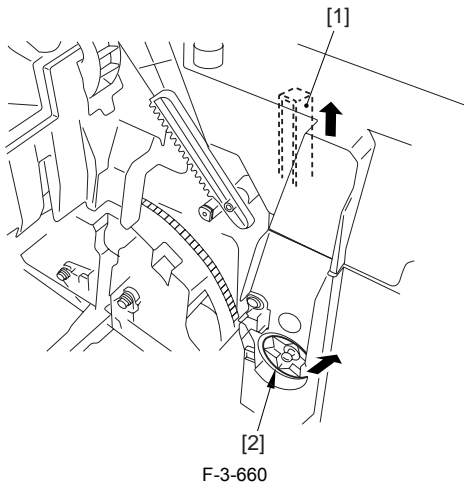
F-3-658

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-659

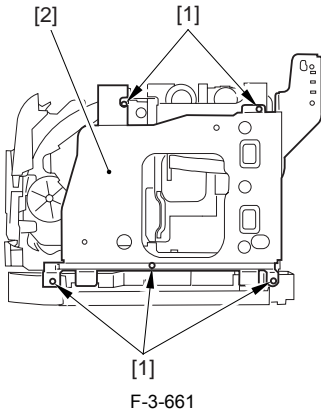
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-660

3.5.6.8 Removing the Right Frame

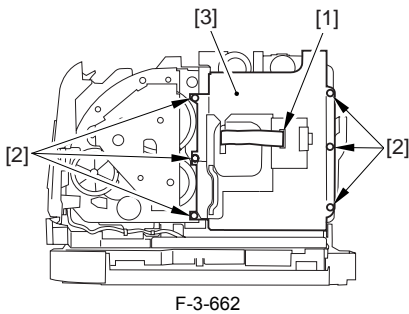
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-661

3.5.6.9 Removing the Shield Plate

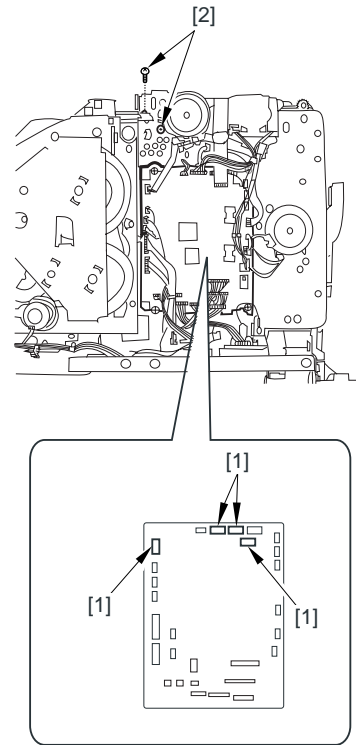
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-662

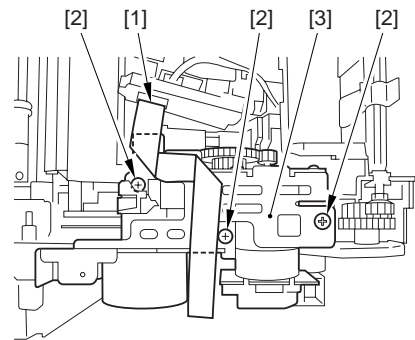
3.5.6.10 Removing the Rotary Drive Assembly

- 1) Disconnect the 4 connectors [1], and remove the 2 screws [2].



F-3-663

- 2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].

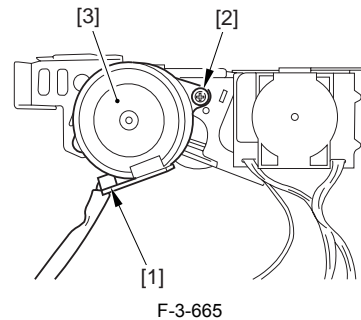


F-3-664

! Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.6.11 Removing the Toner Cartridge Motor

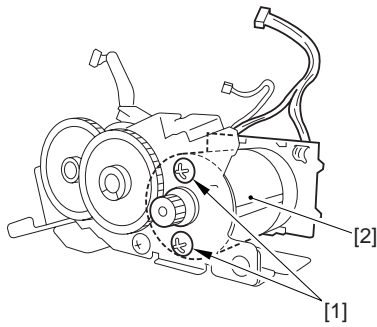
- 1) Disconnect the connector [1], and remove the screw [2]; then, detach the toner cartridge motor [3] from the rotary drive assembly.



F-3-665

3.5.6.12 Removing the Developing Rotary Motor

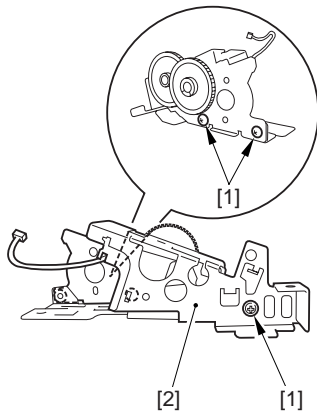
- 1) Remove the 2 screws [1], and detach the toner cartridge motor [2] from the rotary drive assembly.



F-3-666

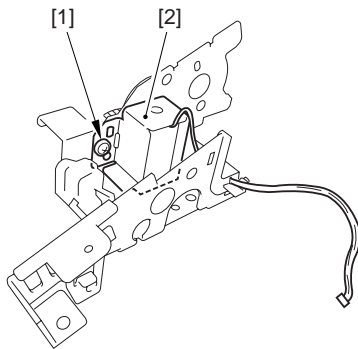
3.5.6.13 Removing the Developing Rotary Stopper Solenoid

1) Remove the 3 screws [1], and detach the motor base [2] from the rotary drive assembly.



F-3-667

2) Remove the screw [1], and detach the developing rotary stopper solenoid [2] from the rotary drive assembly.

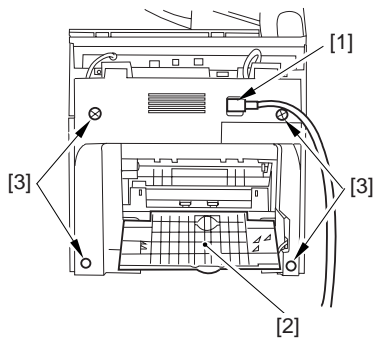


F-3-668

3.5.7 Density Detection PCB

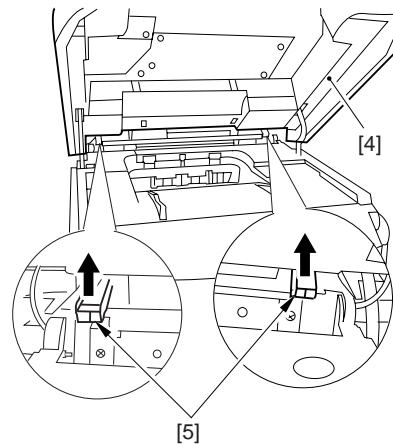
3.5.7.1 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



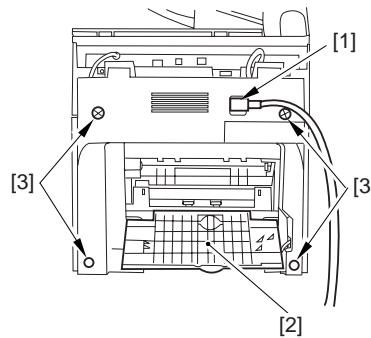
F-3-669

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-670

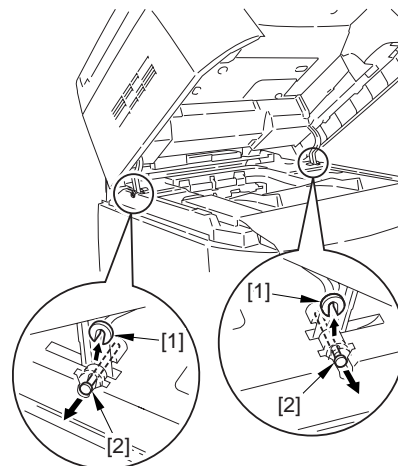
4) Close the reader assembly; then, detach the rear cover [1].



F-3-671

3.5.7.2 Removing the Reader Assembly

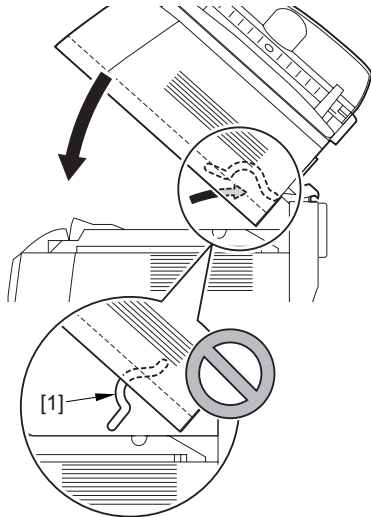
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-672

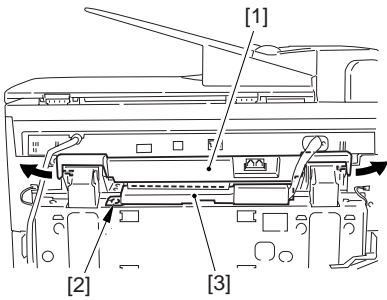


When closing the reader assembly, be sure to push in the arm [1] first.



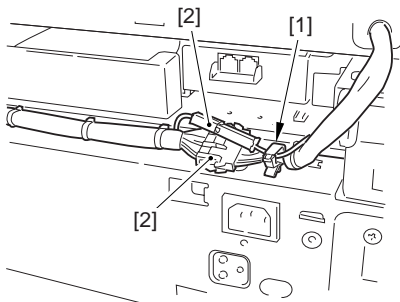
F-3-673

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



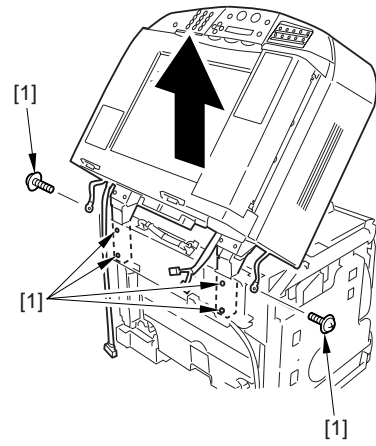
F-3-674

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-675

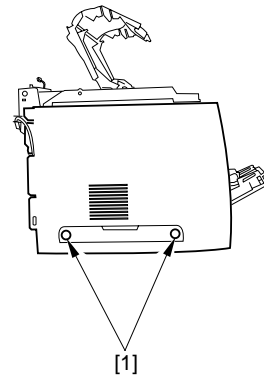
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



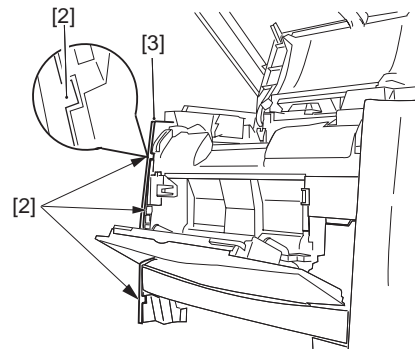
F-3-676

3.5.7.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



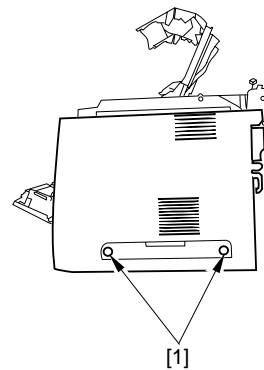
F-3-677



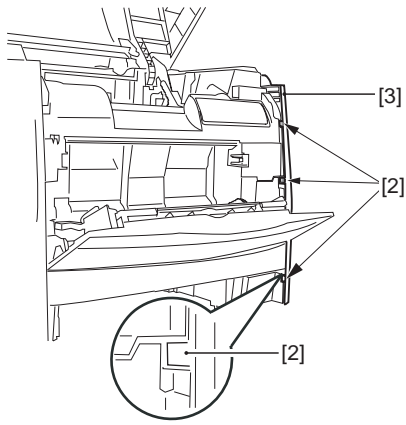
F-3-678

3.5.7.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



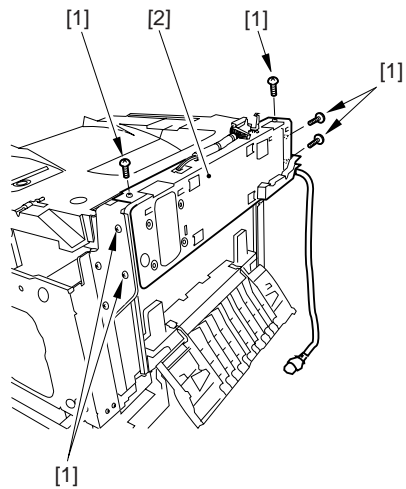
F-3-679



F-3-680

3.5.7.5 Removing the Power Supply Assembly

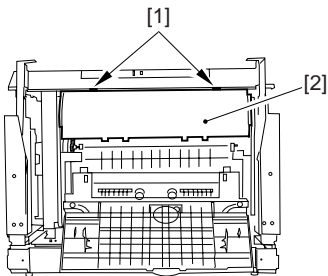
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-681

3.5.7.6 Removing the Face-Down Cover

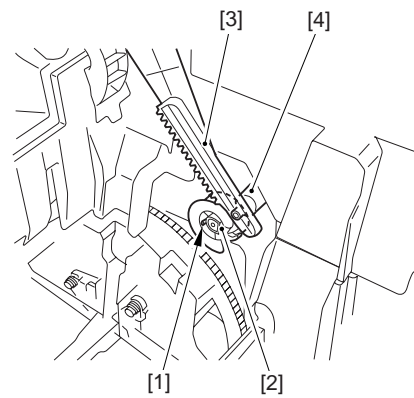
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-682

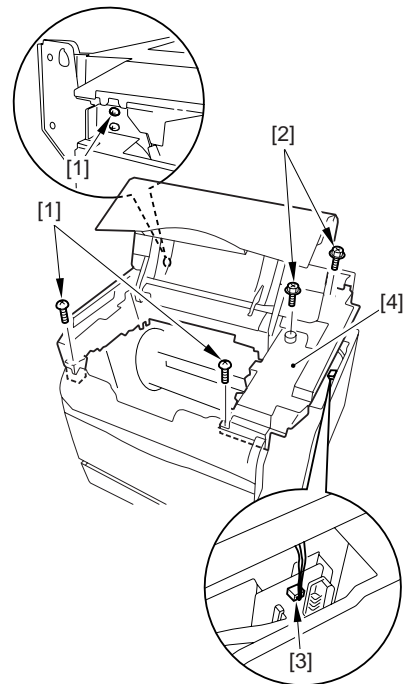
3.5.7.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



F-3-683

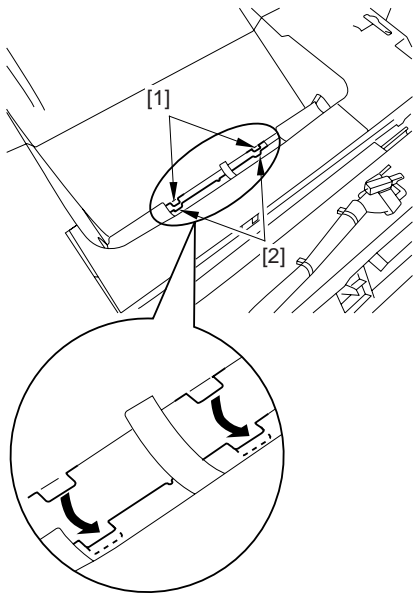
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



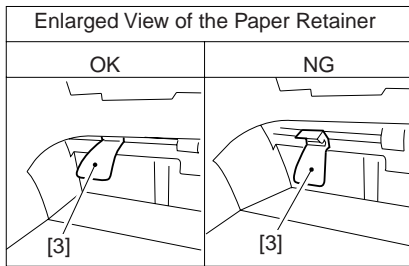
F-3-684



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



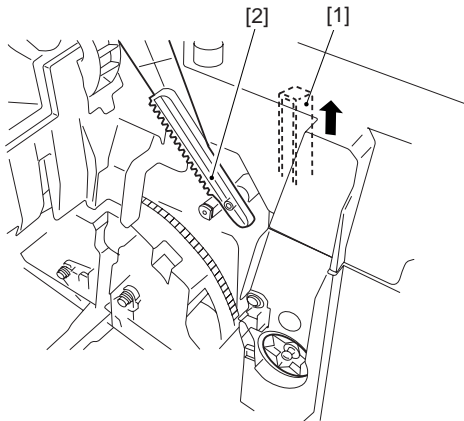
F-3-685



F-3-686



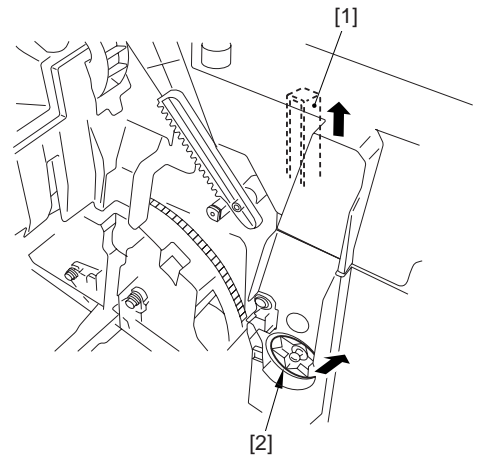
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-687



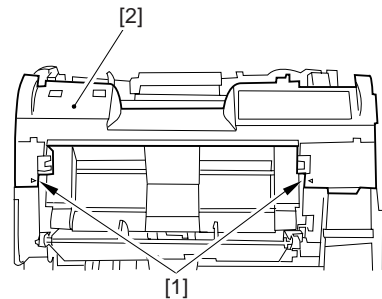
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-688

3.5.7.8 Removing the Inside Cover

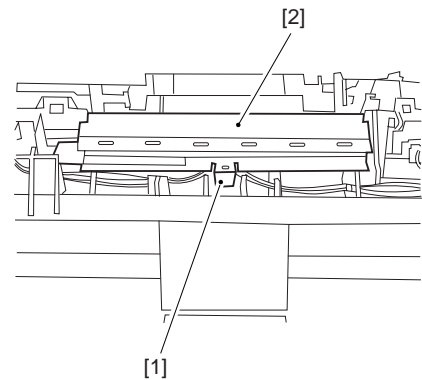
- 1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-689

3.5.7.9 Removing the Dust-Blocking Cover

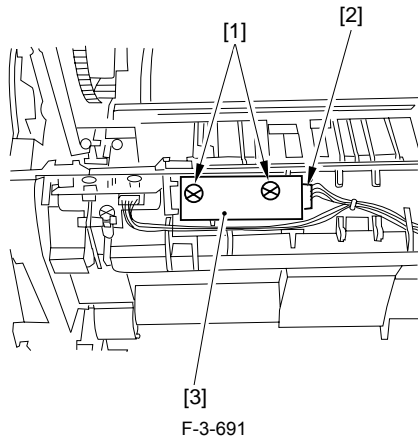
- 1) Remove the claw [1], and detach the dust-blocking cover [2].



F-3-690

3.5.7.10 Removing the Density Detection PCB

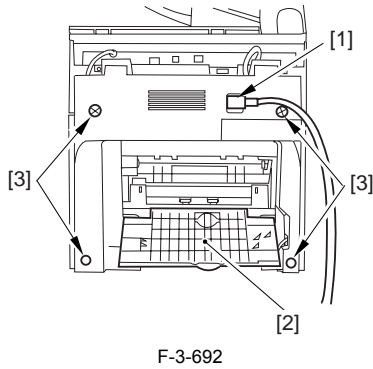
- 1) Remove the 2 screws [1], and disconnect the connector [2]; then, detach the density detection PCB [3].



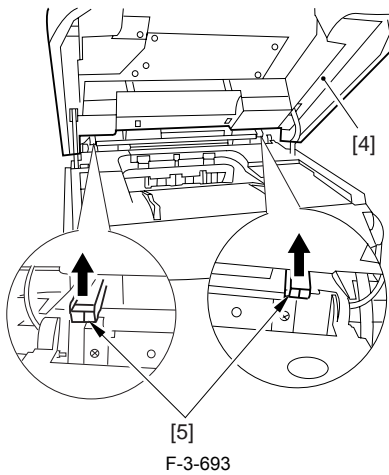
3.5.8 ITB Home Position Detection PCB

3.5.8.1 Removing the Rear Cover

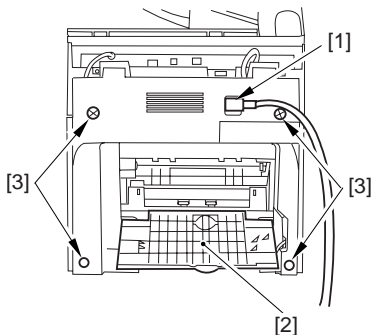
- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



- 3) Open the reader assembly [4], and lift to free the 2 claws [5].

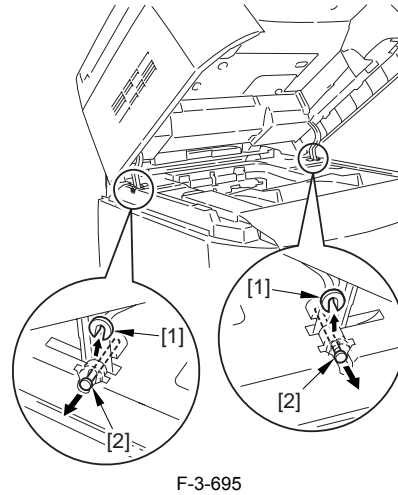


- 4) Close the reader assembly; then, detach the rear cover [1].

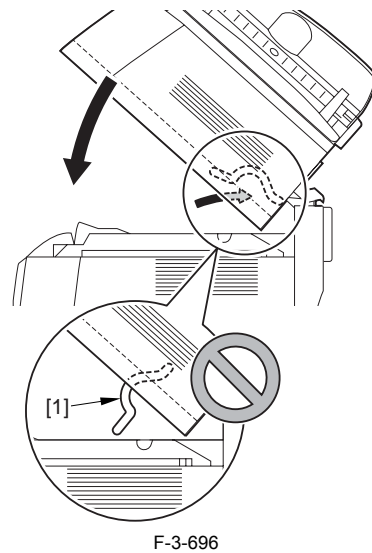


3.5.8.2 Removing the Reader Assembly

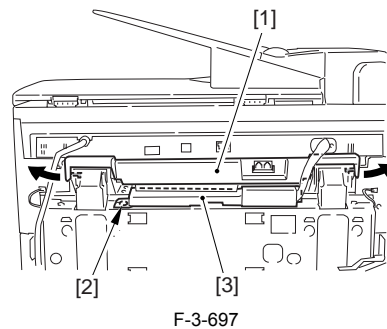
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



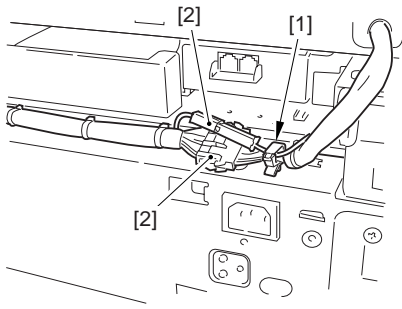
When closing the reader assembly, be sure to push in the arm [1] first.



- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.

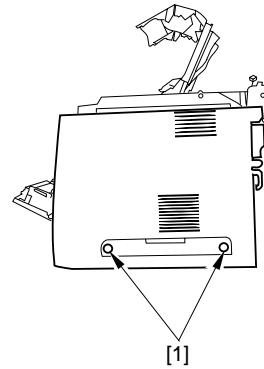


- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

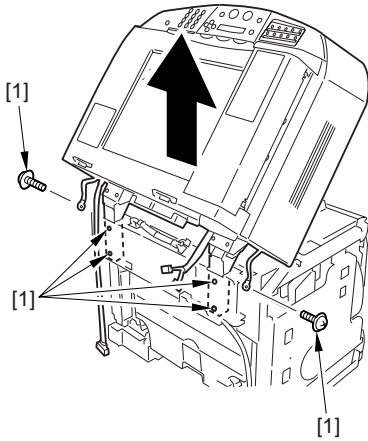


F-3-698

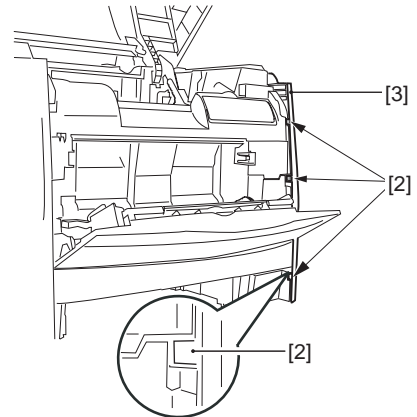
5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-702



F-3-699



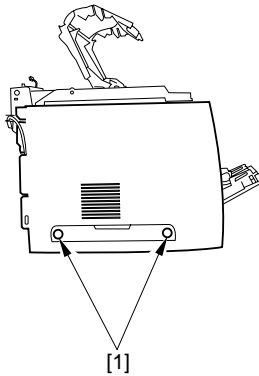
F-3-703

3.5.8.3 Removing the Right Cover

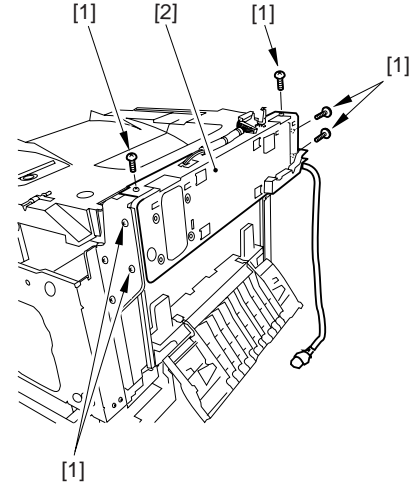
1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].

3.5.8.5 Removing the Power Supply Assembly

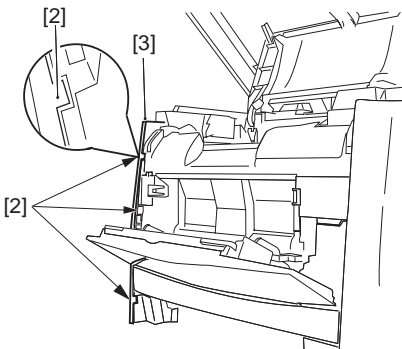
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-700



F-3-704



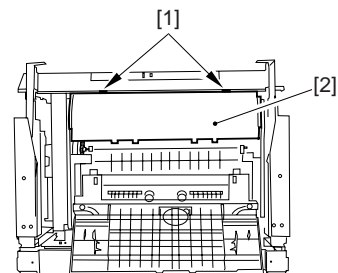
F-3-701

3.5.8.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].

3.5.8.6 Removing the Face-Down Cover

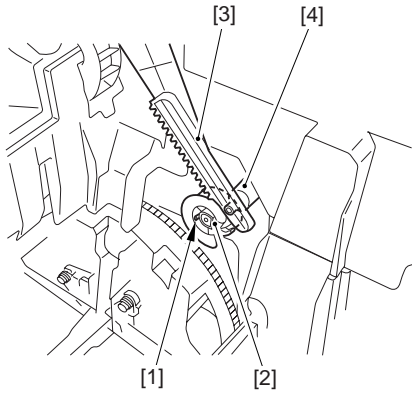
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-705

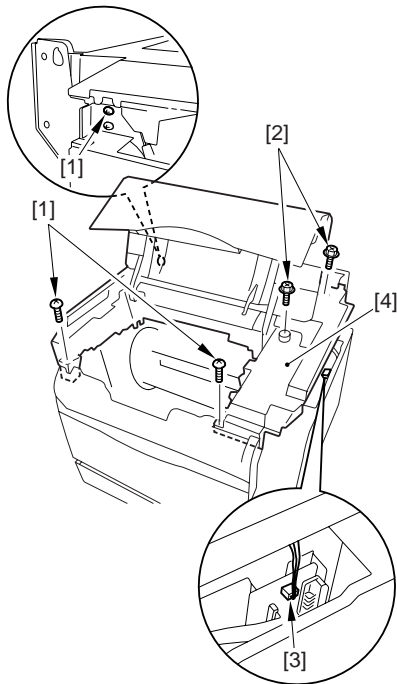
3.5.8.7 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



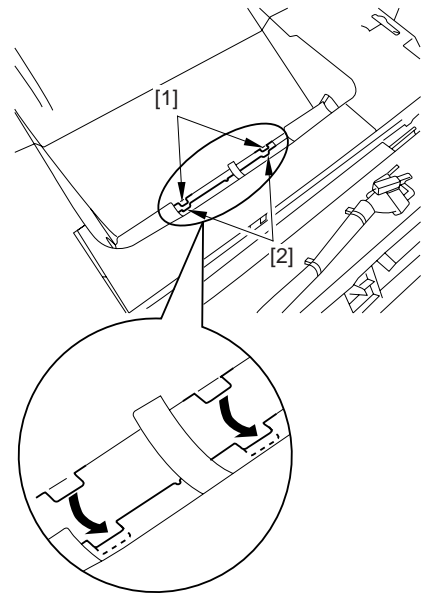
F-3-706

- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

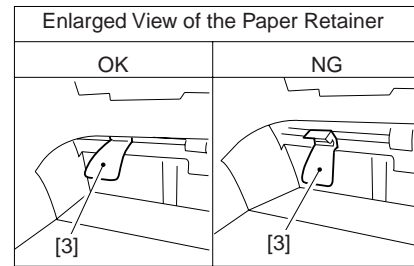


F-3-707

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

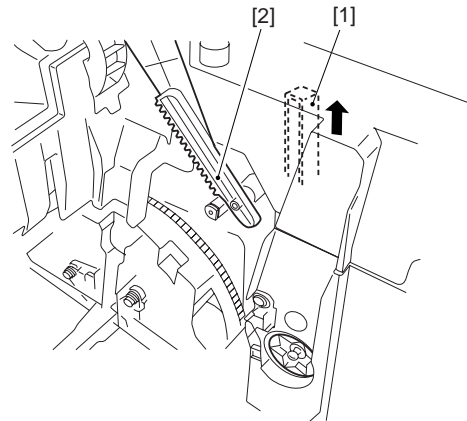


F-3-708



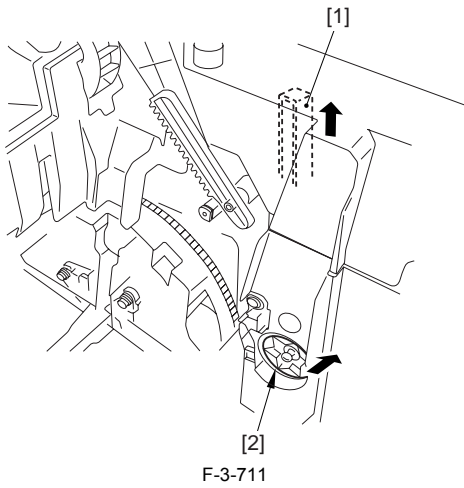
F-3-709

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-710

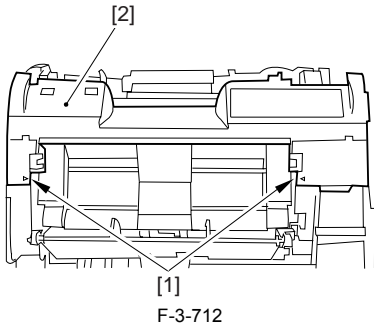
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-711

3.5.8.8 Removing the Inside Cover

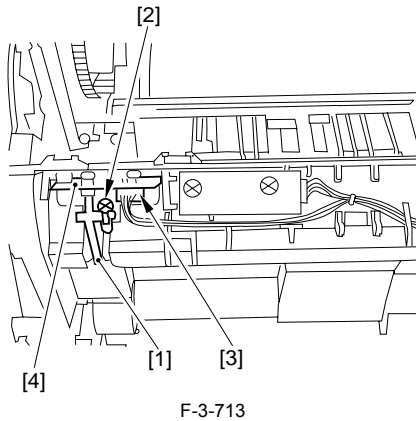
1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-712

3.5.8.9 Removing the ITB Home Position Detection PCB

1) Remove the test print switch lever [1].
 2) Remove the screw [2], and disconnect the connector [3]; then, detach the ITB home position detection PCB [4].

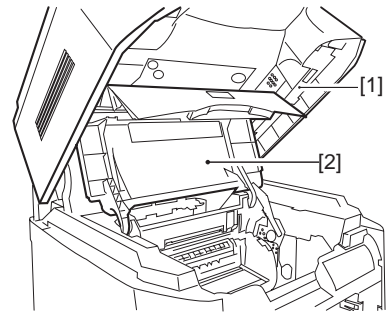


F-3-713

3.5.9 Transfer Charging Roller

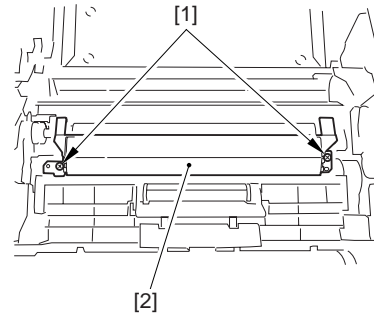
3.5.9.1 Removing the Transfer Charging Roller

1) Open the reader assembly [1] and the top cover [2].



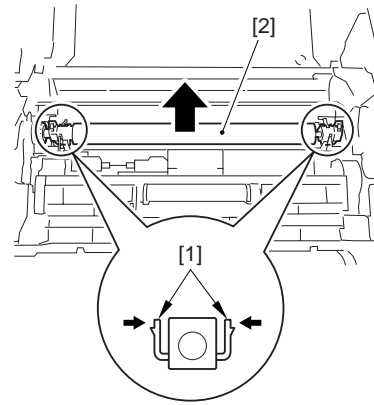
F-3-714

2) Remove the 2 screws [1], and detach the transfer inlet guide [2].



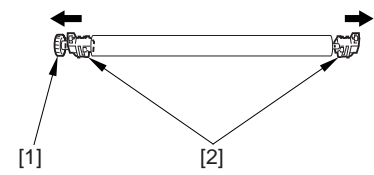
F-3-715

3) Remove the 2 claws [1] of the left and right bushings; then, detach the transfer charging roller [2].



F-3-716

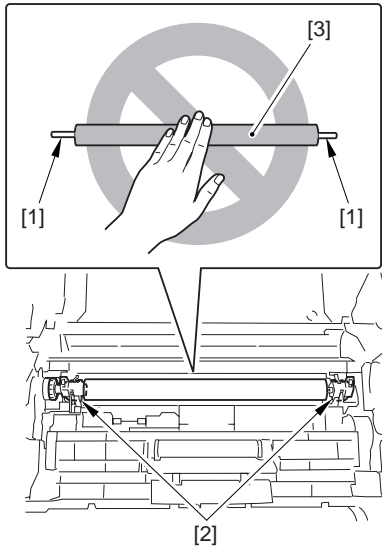
3) Remove the gear [1] and the bushing [2]; then, detach the transfer charging roller.



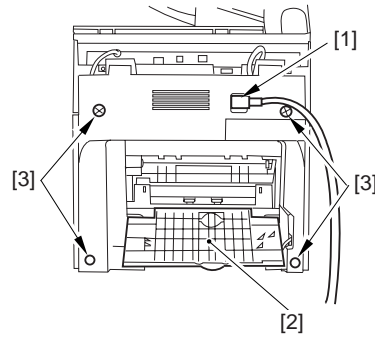
F-3-717



When replacing the transfer charging roller, be sure to hold it by its shaft [1] and its bushing [2]; be sure never to touch the sponge segment [3]. Also, when mounting the transfer charging roller, be sure that the spring is securely fitted to the boss of the bushing so that the bushing pushes the spring.



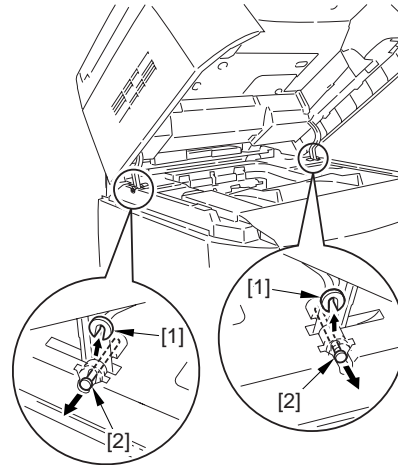
F-3-718



F-3-721

3.5.10.2 Removing the Reader Assembly

- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-722

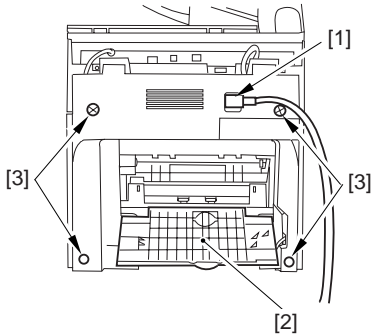


When closing the reader assembly, be sure to push in the arm [1] first.

3.5.10 Waste toner Detection PCB

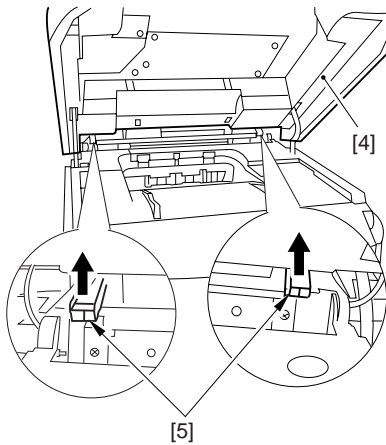
3.5.10.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



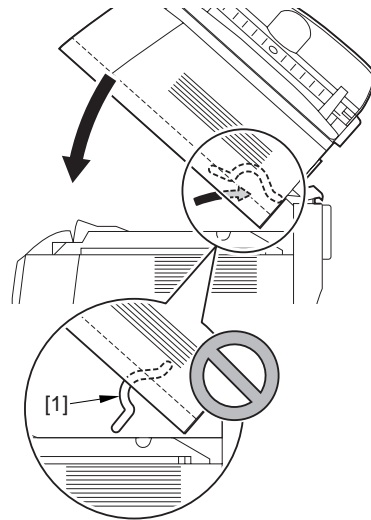
F-3-719

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



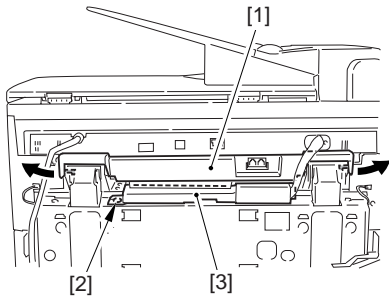
F-3-720

- 4) Close the reader assembly; then, detach the rear cover [1].



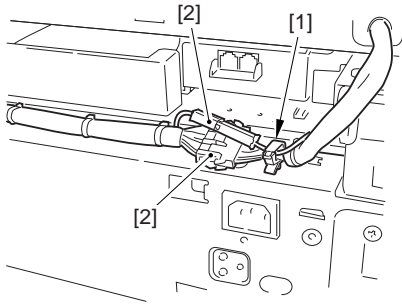
F-3-723

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



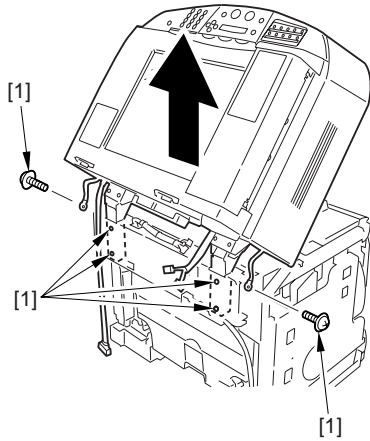
F-3-724

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-725

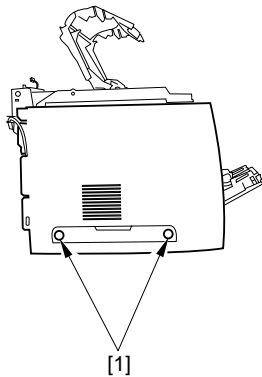
5) Remove the 6 screws [1], and lift the reader unit to detach.



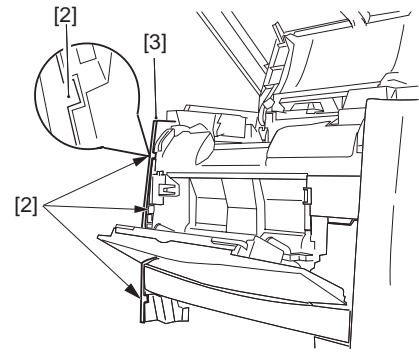
F-3-726

3.5.10.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



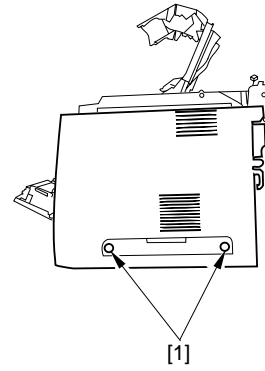
F-3-727



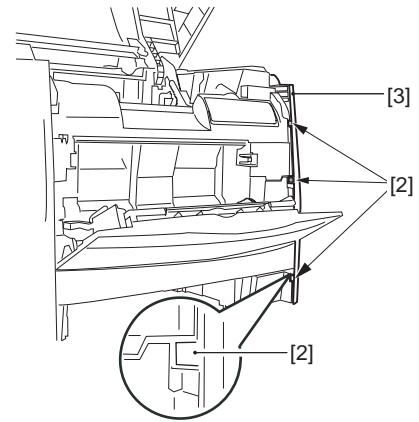
F-3-728

3.5.10.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



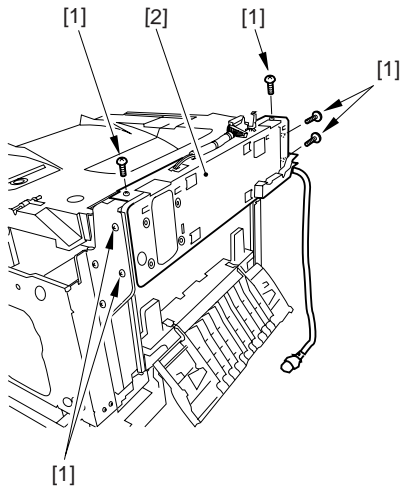
F-3-729



F-3-730

3.5.10.5 Removing the Power Supply Assembly

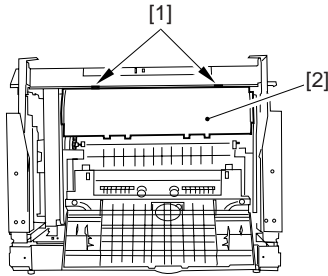
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-731

3.5.10.6 Removing the Face-Down Cover

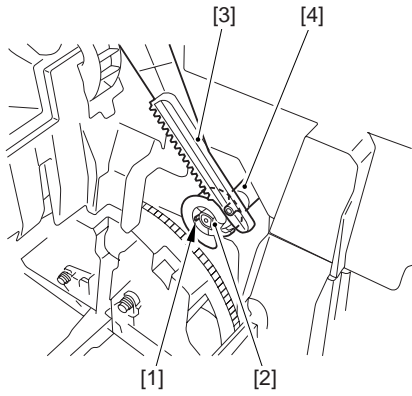
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-732

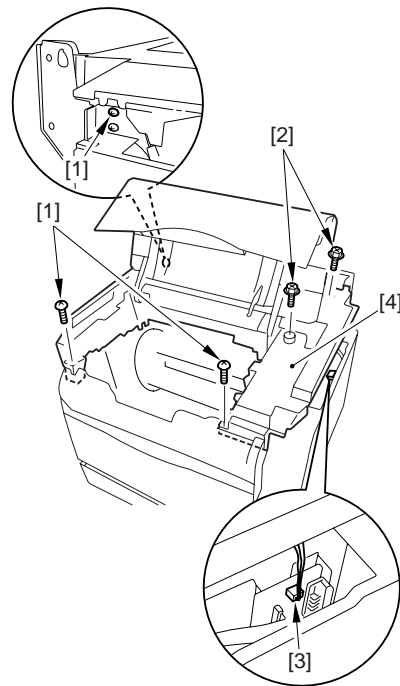
3.5.10.7 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



F-3-733

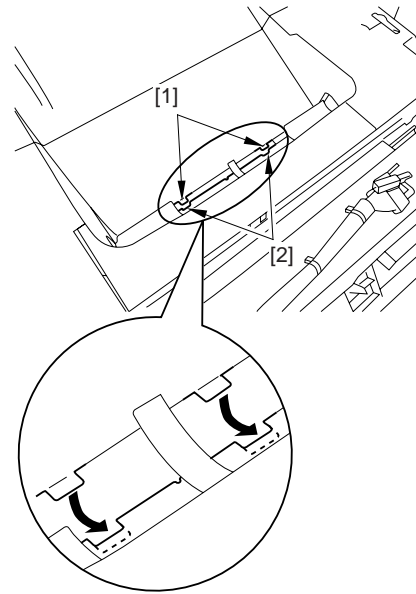
- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



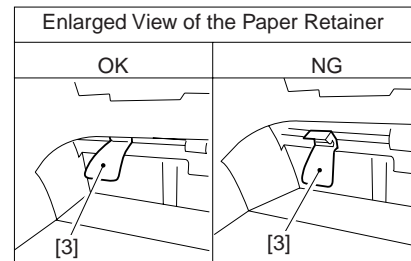
F-3-734



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



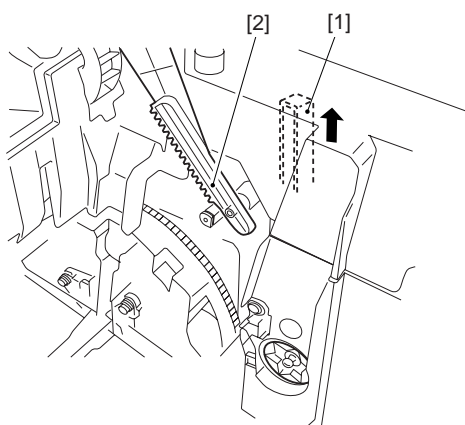
F-3-735



F-3-736



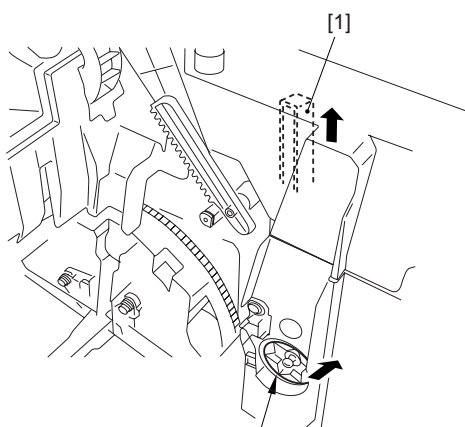
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-737



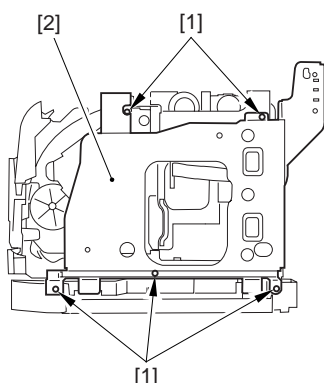
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-738

3.5.10.8 Removing the Right Frame

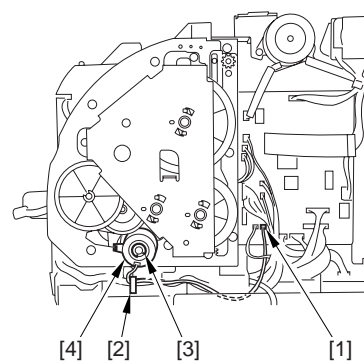
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-739

3.5.10.9 Removing the Registration Clutch

1) Disconnect the connector [1], and open the harness band [2].
2) Remove the E-ring [3], and detach the registration clutch [4].



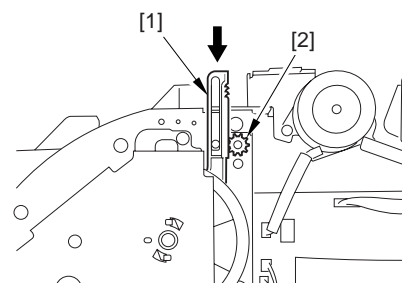
F-3-740



The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

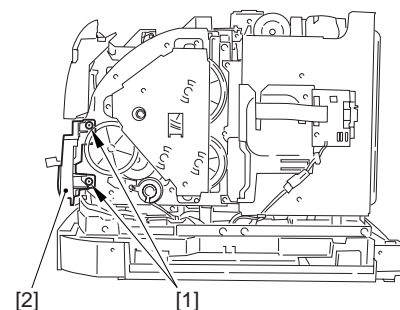
3.5.10.10 Removing the Main Drive Assembly

1) Shift down the drive release lever [1], and remove the gear [2].



F-3-741

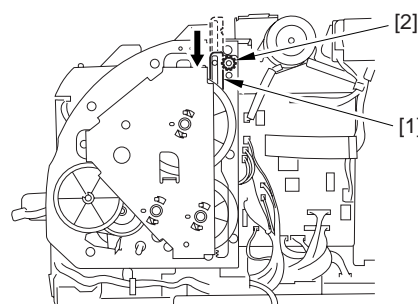
2) Remove the 2 screws [1], and detach the front sub cover [2].



F-3-742

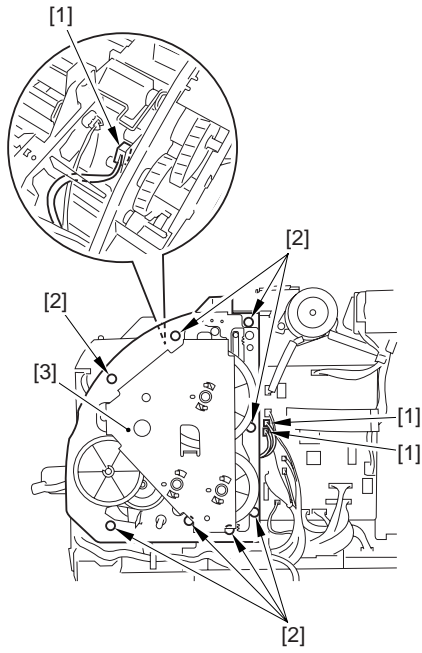


When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



F-3-743

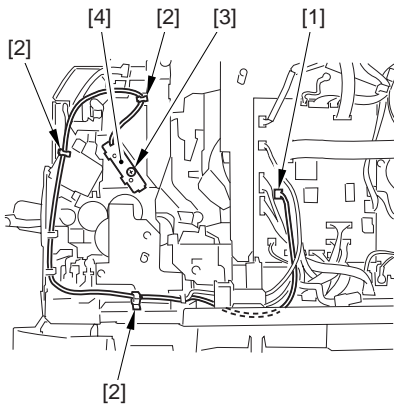
3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].



F-3-744

3.5.10.11 Removing the Waste Toner Detection PCB

- 1) Disconnect the connector (J108) [1] of the DC controller box; then, free the harness from the harness clamp [2].
- 2) Remove the screw [3], and detach the waste toner detection PCB.

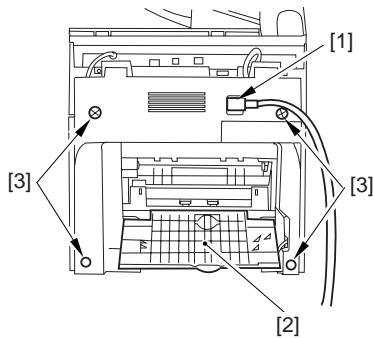


F-3-745

3.5.11 Developing Rotary/Toner Level Detection PCB

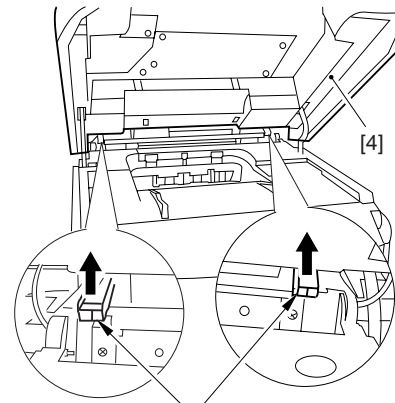
3.5.11.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



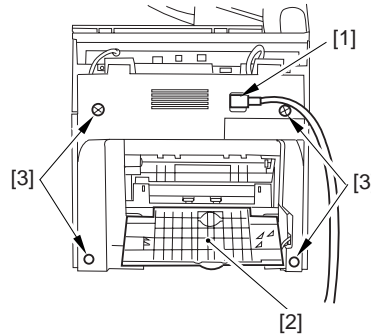
F-3-746

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-747

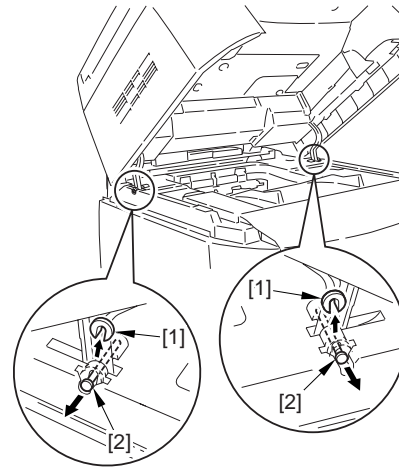
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-748

3.5.11.2 Removing the Reader Assembly

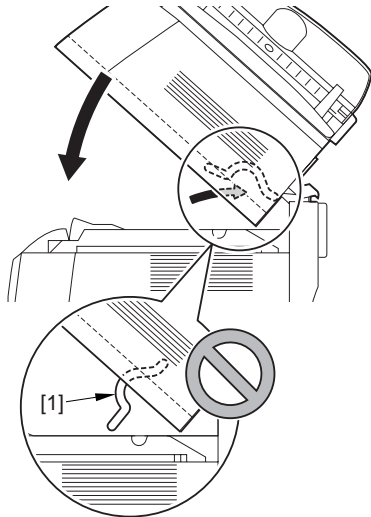
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-749

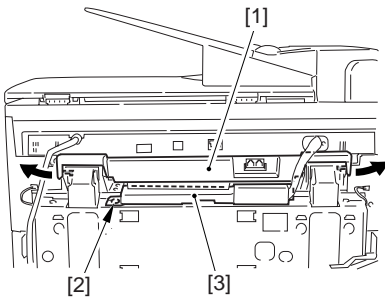


When closing the reader assembly, be sure to push in the arm [1] first.



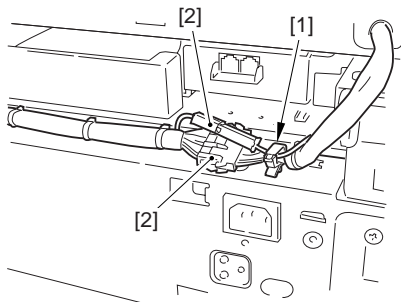
F-3-750

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



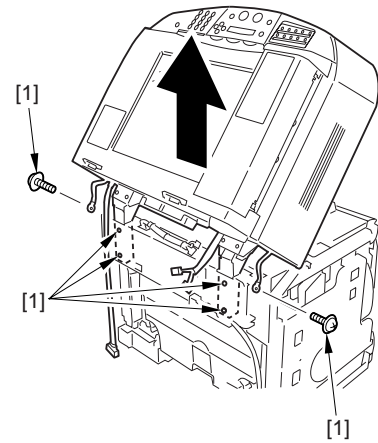
F-3-751

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-752

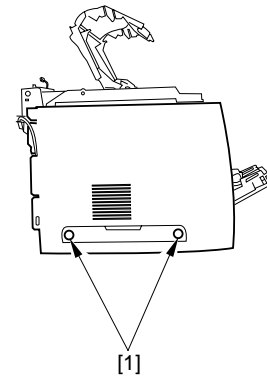
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



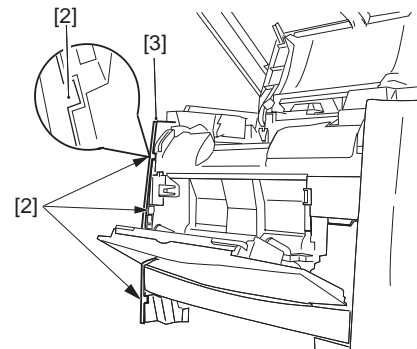
F-3-753

3.5.11.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



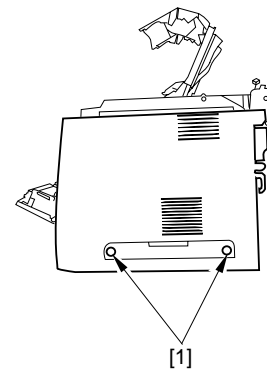
F-3-754



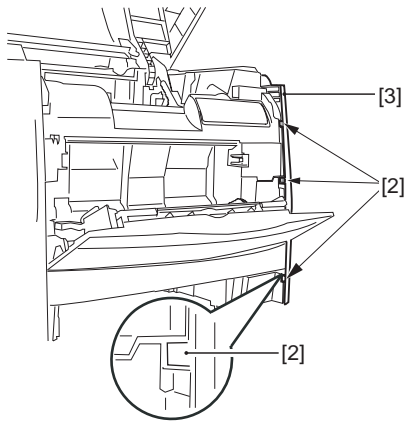
F-3-755

3.5.11.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



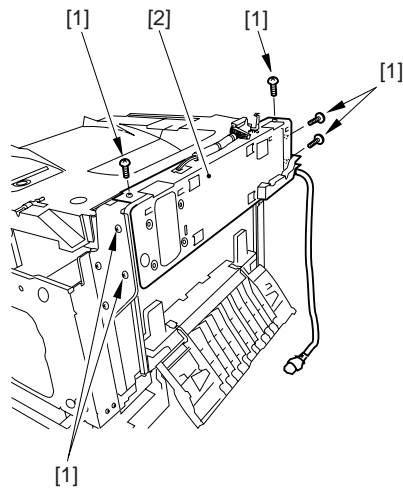
F-3-756



F-3-757

3.5.11.5 Removing the Power Supply Assembly

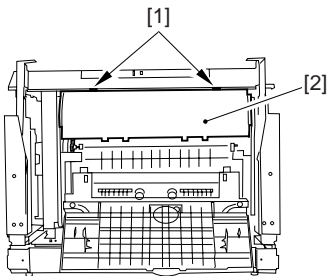
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-758

3.5.11.6 Removing the Face-Down Cover

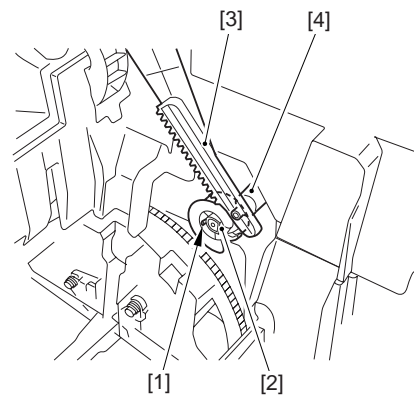
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-759

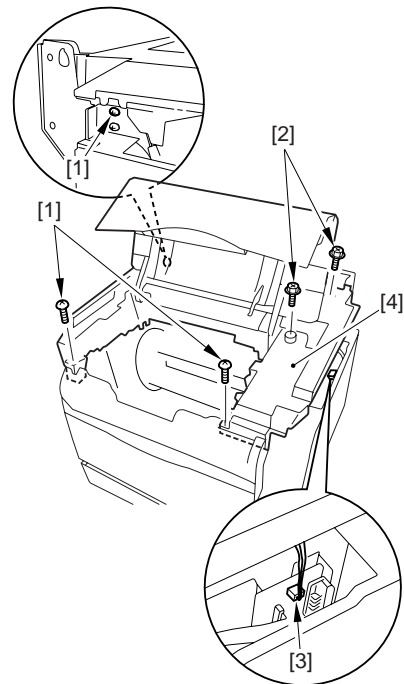
3.5.11.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
 2) Free the link lever [3] from the shaft [4].



F-3-760

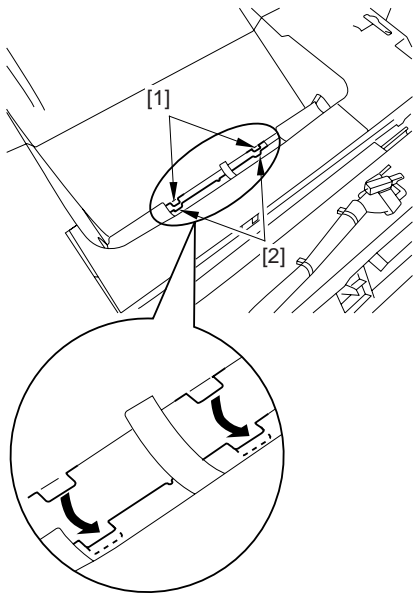
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



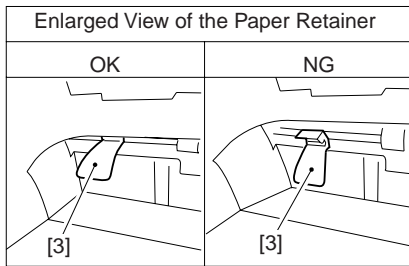
F-3-761



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



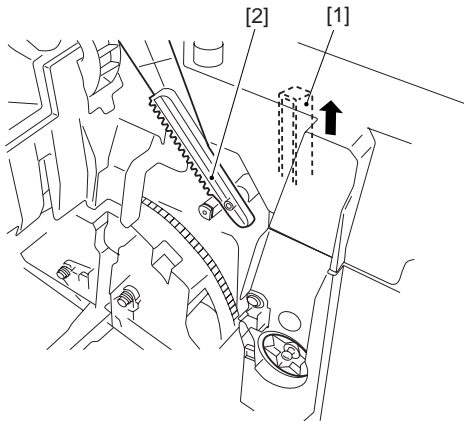
F-3-762



F-3-763



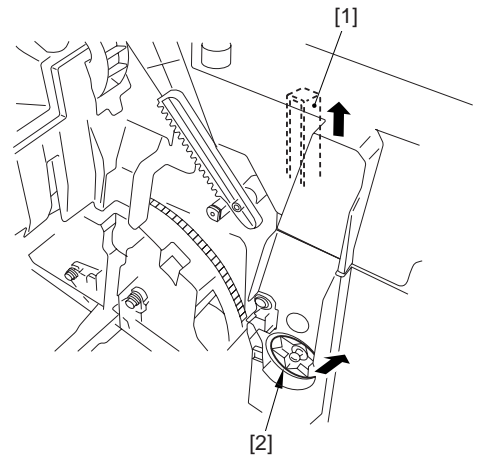
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-764



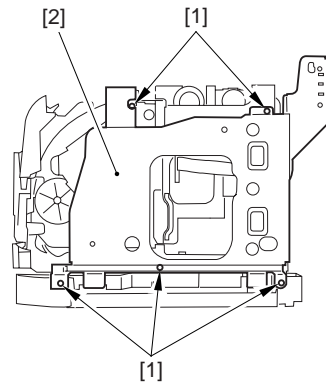
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-765

3.5.11.8 Removing the Right Frame

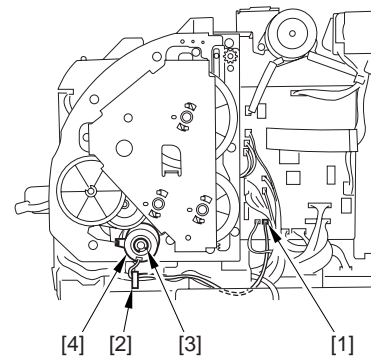
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-766

3.5.11.9 Removing the Registration Clutch

- 1) Disconnect the connector [1], and open the harness band [2].
- 2) Remove the E-ring [3], and detach the registration clutch [4].



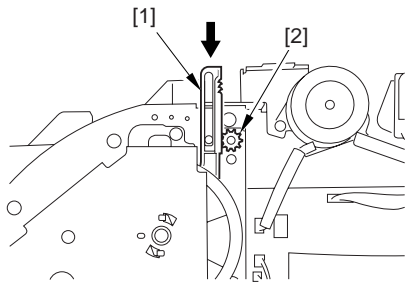
F-3-767



The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration PCB clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

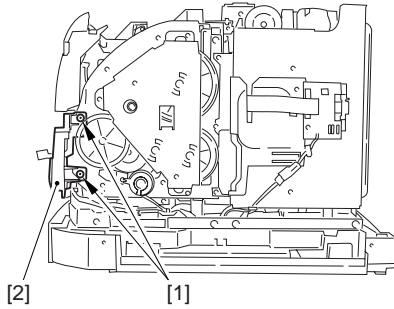
3.5.11.10 Removing the Main Drive Assembly

- 1) Shift down the drive release lever [1], and remove the gear [2].



F-3-768

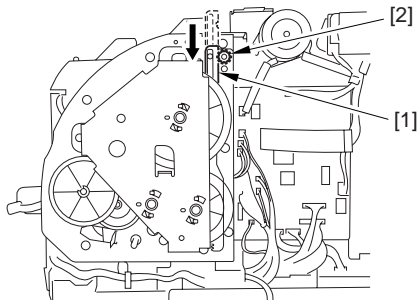
2) Remove the 2 screws [1], and detach the front sub cover [2].



F-3-769

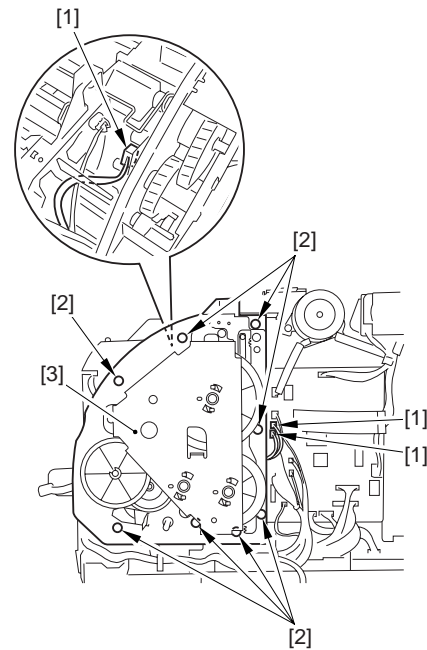


When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



F-3-770

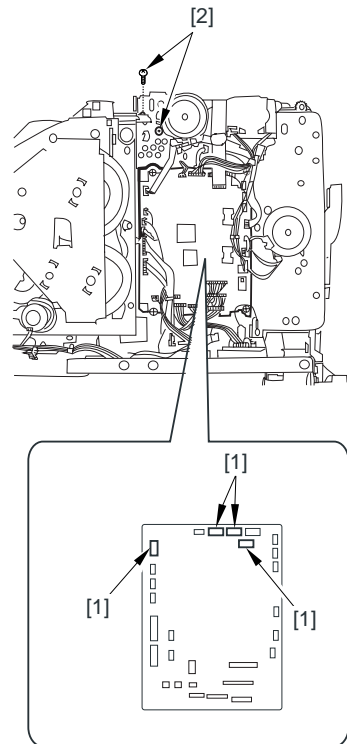
3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].



F-3-771

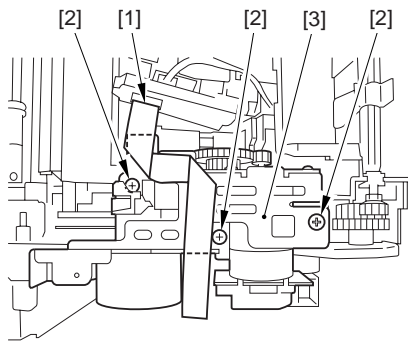
3.5.11.11 Removing the Rotary Drive Assembly

1) Disconnect the 4 connectors [1], and remove the 2 screws [2].



F-3-772

2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].



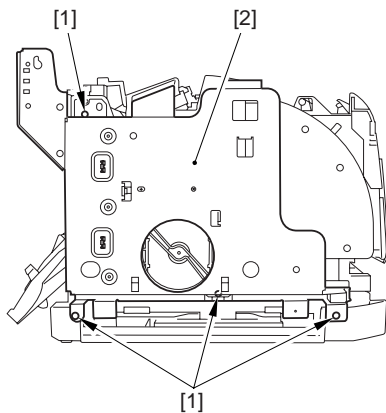
F-3-773



Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.11.12 Removing the Left Frame

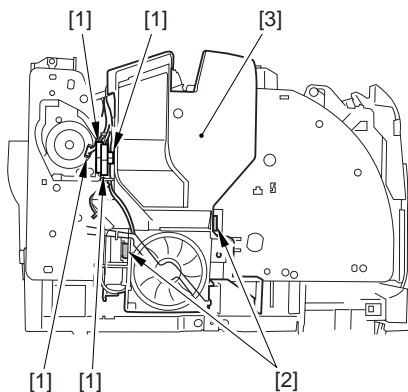
- 1) Remove the 4 screws [1], and detach the left frame [2].



F-3-774

3.5.11.13 Removing the Fan Duct

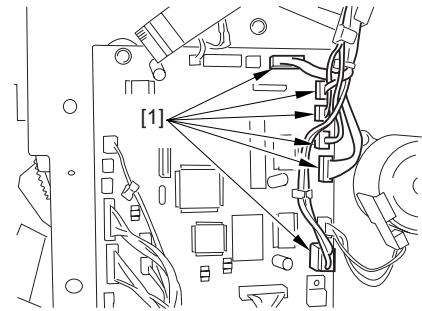
- 1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
- 2) Slide the fan duct [3] in upward direction to detach.



F-3-775

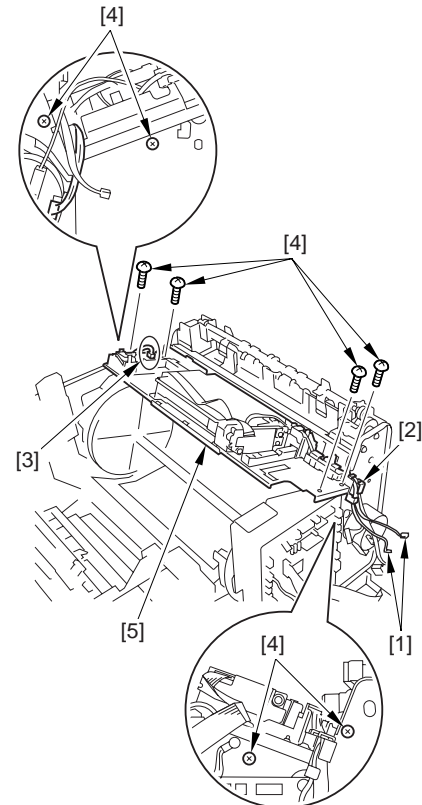
3.5.11.14 Removing the Laser Scanner Unit Base

- 1) Disconnect the 6 connectors [1] of the DC controller board.



F-3-776

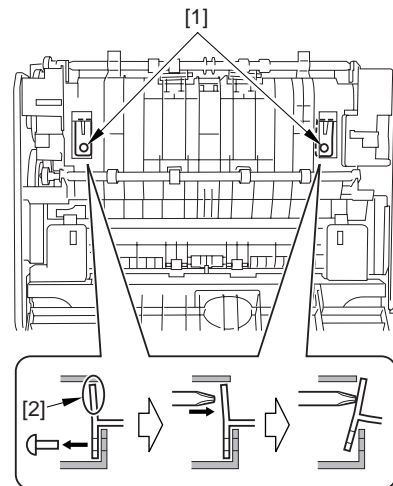
- 2) Free the harness [1] from the harness guide [2].
- 3) Disconnect the connector [3], and remove the 8 screws [4]; then, detach the laser scanner base [5].



F-3-777

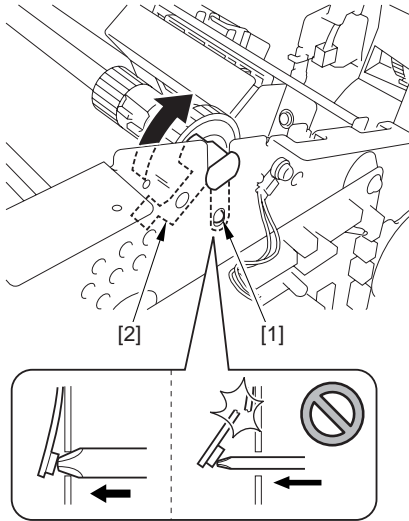
3.5.11.15 Removing the Developing Rotary Assembly

- 1) Remove the 2 screws [1].
- 2) Push in the top [2] of the rotary holder toward the inside of the machine using the tip of a screwdriver to see that the holder has been disengaged from the machine.



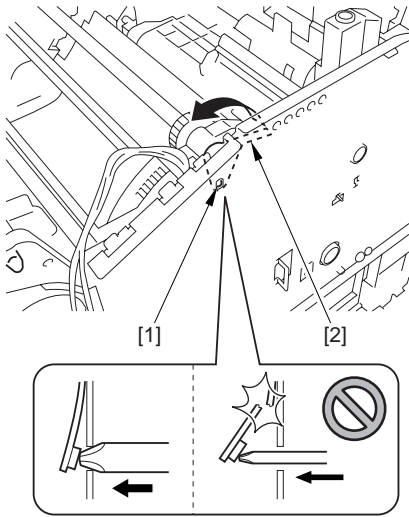
F-3-778

- 3) While pushing the boss [1], release the rotary release lever (right) [2] in upward direction.



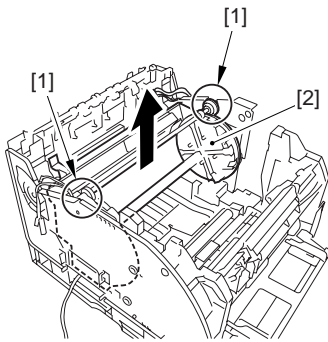
F-3-779

- 4) While pushing the boss [1], release the rotary release lever (left) [2] in upward direction.



F-3-780

- 5) While paying attention to the engagement of the rotary release lever (left/right) [1], lift the developing rotary assembly [2] to detach.

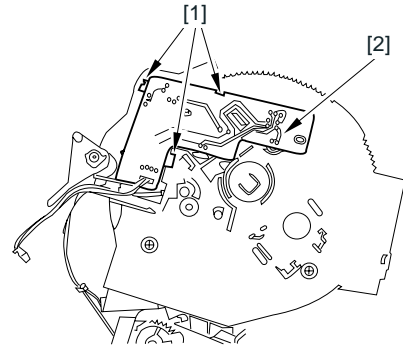


F-3-781

⚠ When mounting the developing rotary assembly, be sure that the 2 tips of the rotary holder are fully fitted to the frame of the machine.

3.5.11.16 Removing the Developing Rotary/Toner Level Detection PCB

- 1) Remove the 3 claws [1], and detach the developing rotary/toner level detection PCB [2] from the developing rotary assembly.

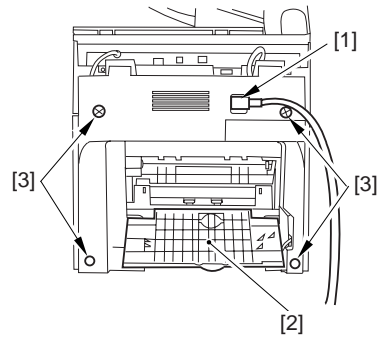


F-3-782

3.5.12 Toner Cartridge Motor

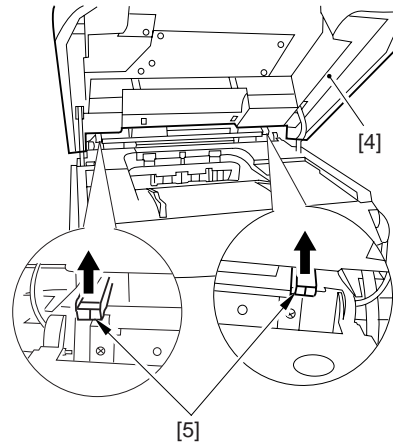
3.5.12.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



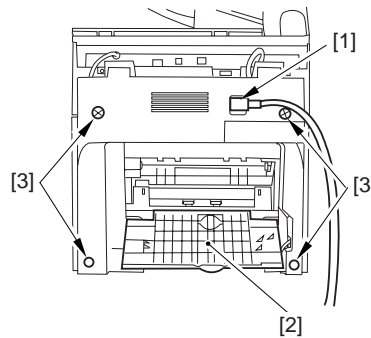
F-3-783

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-784

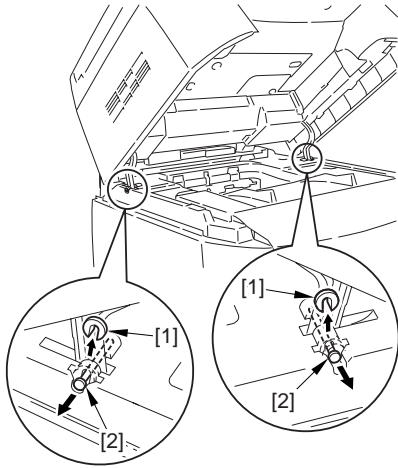
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-785

3.5.12.2 Removing the Reader Assembly

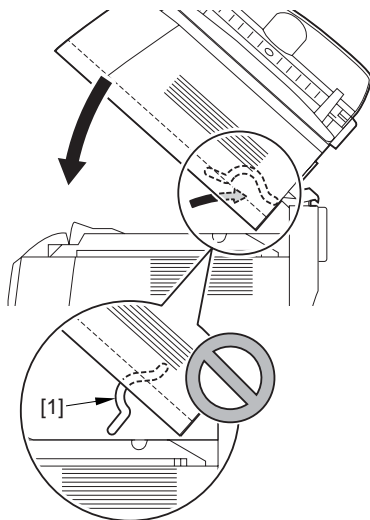
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-786

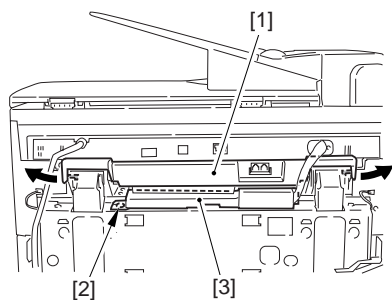


When closing the reader assembly, be sure to push in the arm [1] first.



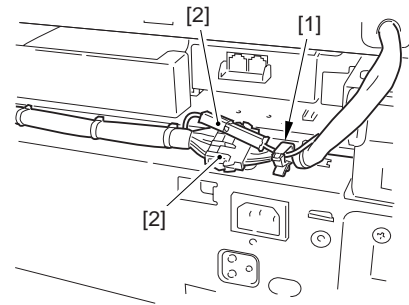
F-3-787

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



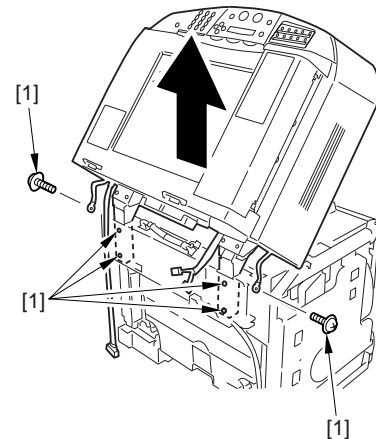
F-3-788

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-789

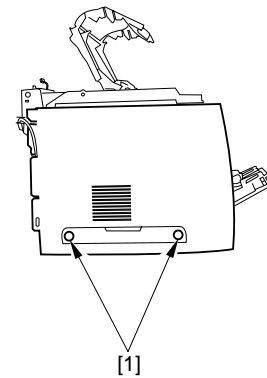
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



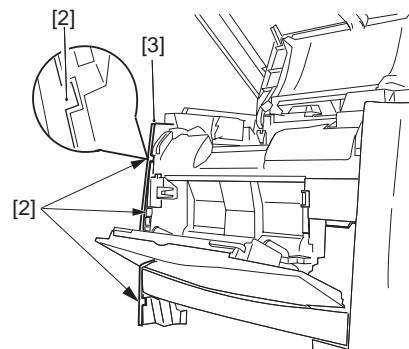
F-3-790

3.5.12.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



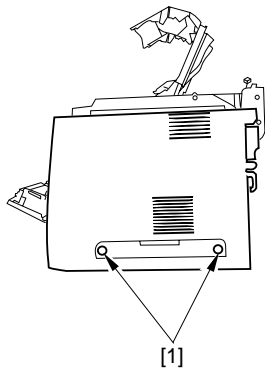
F-3-791



F-3-792

3.5.12.4 Removing the Left Cover

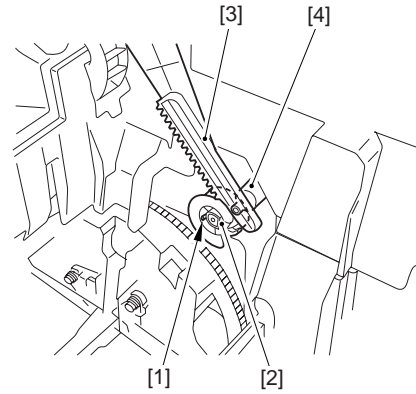
- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



F-3-793

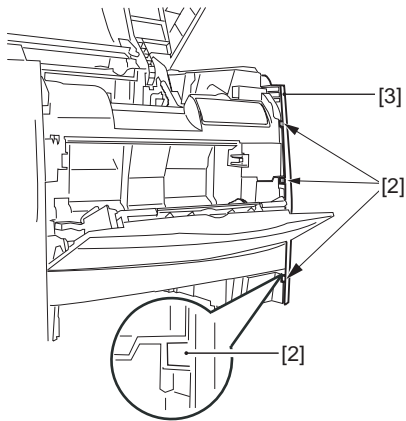
3.5.12.7 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].

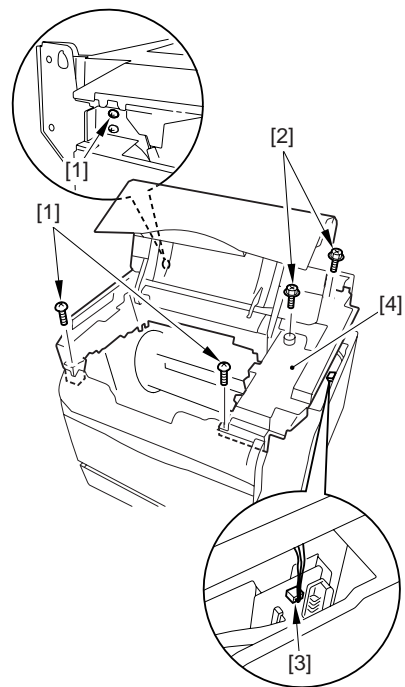


F-3-797

- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



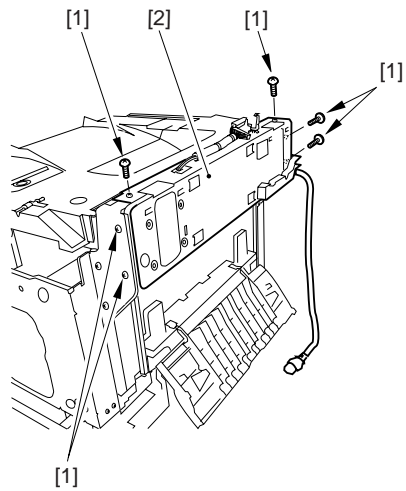
F-3-794



F-3-798

3.5.12.5 Removing the Power Supply Assembly

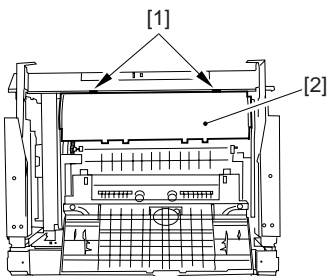
- 1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-795

3.5.12.6 Removing the Face-Down Cover

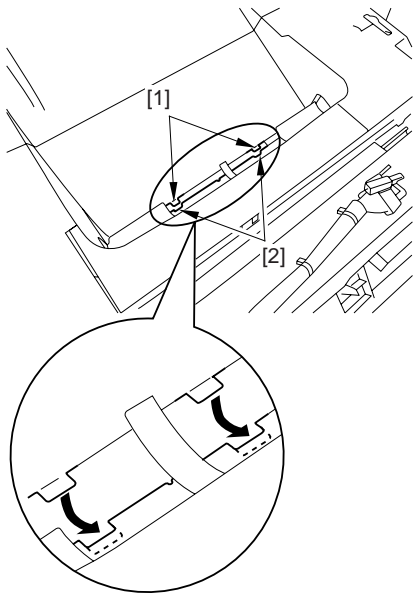
- 1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



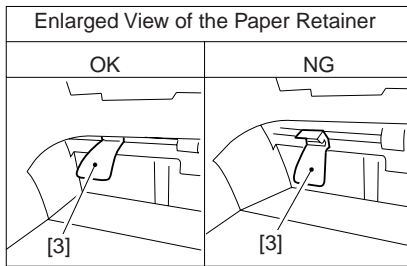
F-3-796



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



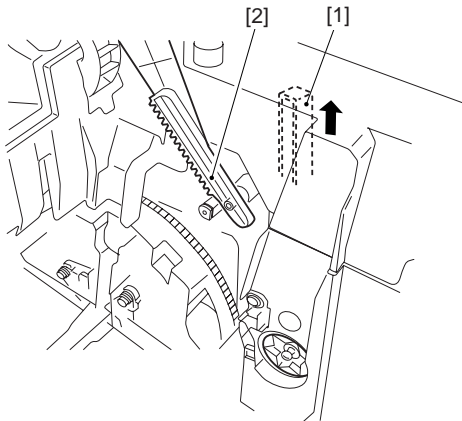
F-3-799



F-3-800



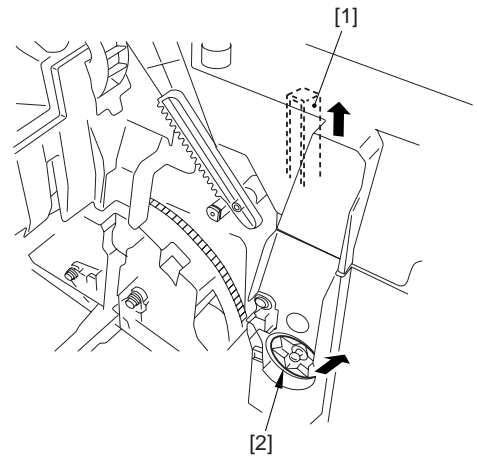
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-801



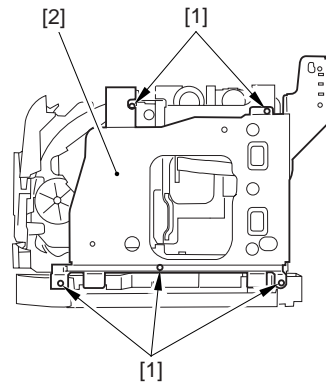
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-802

3.5.12.8 Removing the Right Frame

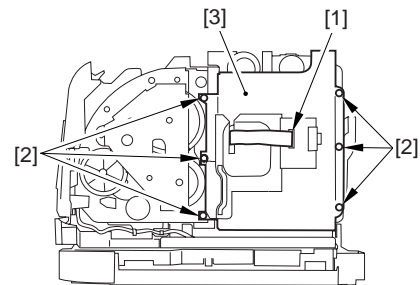
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-803

3.5.12.9 Removing the Shield Plate

- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-804

3.5.12.10 Removing the Rotary Drive Assembly

- 1) Disconnect the 4 connectors [1], and remove the 2 screws [2].

3.6 PICKUP AND FEEDING SYSTEM

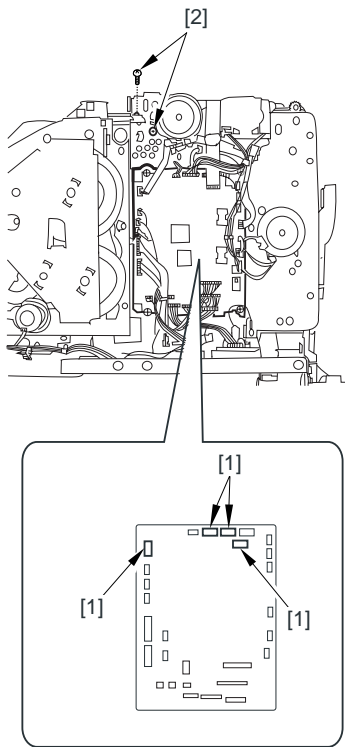
3.6.1 Cassette Pickup Roller

3.6.1.1 Removing the Cassettes

- 1) Hold the grip, and take out the cassette.

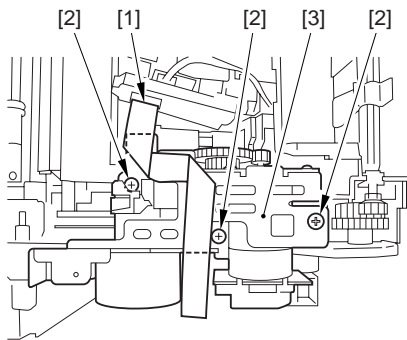
3.6.1.2 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-805

- 2) Disconnect the connector [1], and remove the 3 screws [2]; then, detach the rotary drive assembly [3].



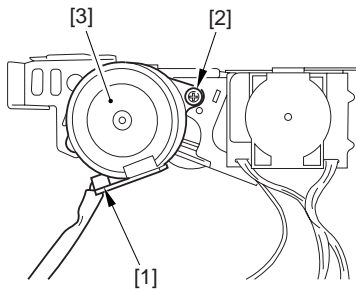
F-3-806



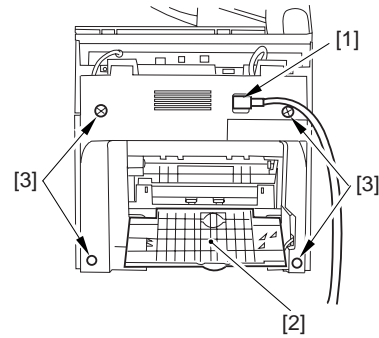
Be sure to tighten the self-tapping screw used to secure the rotary drive assembly only at the end of the work.

3.5.12.11 Removing the Toner Cartridge Motor

- 1) Disconnect the connector [1], and remove the screw [2]; then, detach the toner cartridge motor [3] from the rotary drive assembly.

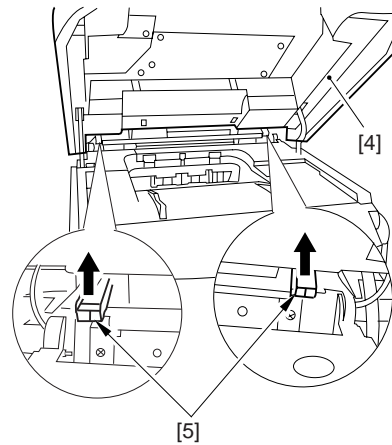


F-3-807



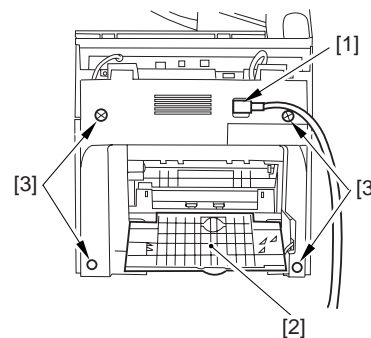
F-3-808

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-809

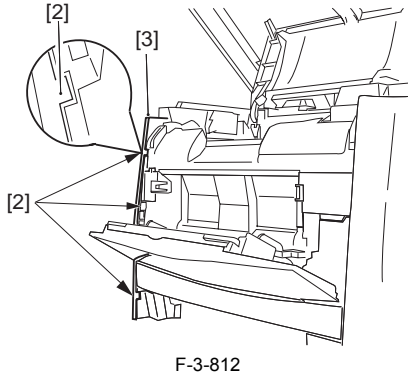
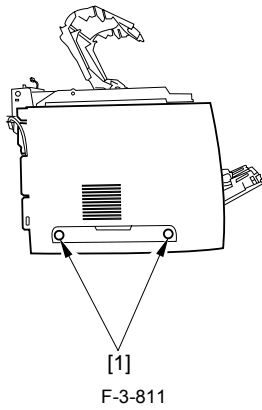
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-810

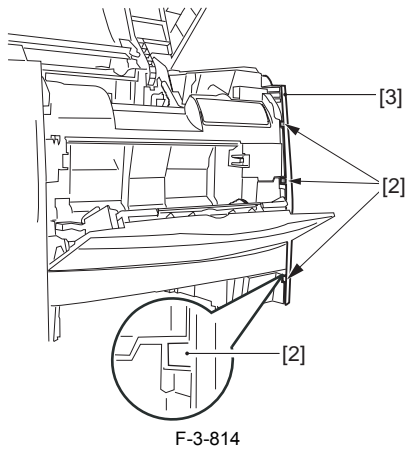
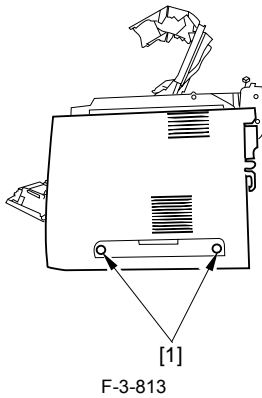
3.6.1.3 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



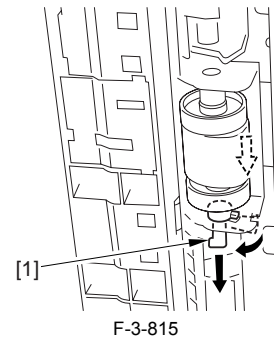
3.6.1.4 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].

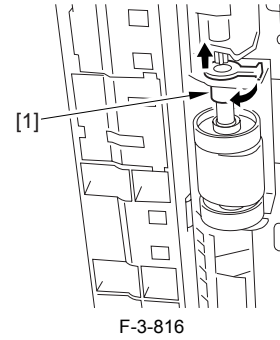


3.6.1.5 Removing the Cassette Pickup Roller

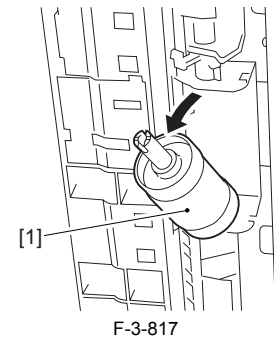
- 1) Shift down the machine to the left.
- 2) While lifting the release knob [1] slightly, turn it about 90 deg toward the front; then, slide the release knob to detach.



- 3) Lift the release knob [1] slightly, and turn it about 90 deg toward the rear; then, slide the release knob fully.



- 4) Slide the pickup roller [1] fully; then, slide the pickup roller at an angle in downward direction to detach.



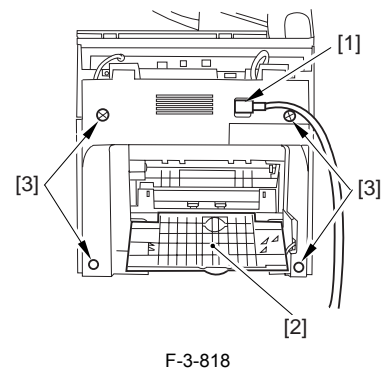
3.6.2 Cassette Paper Sensor

3.6.2.1 Removing the Cassettes

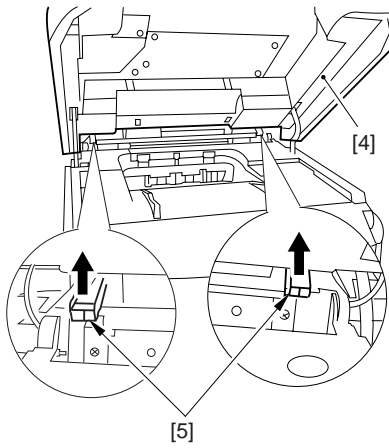
- 1) Hold the grip, and take out the cassette.

3.6.2.2 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.

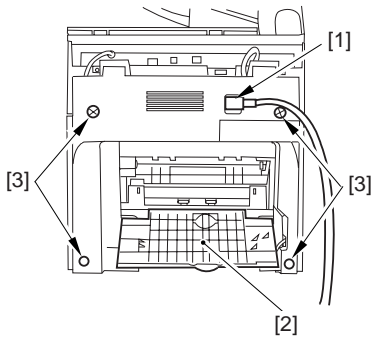


- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-819

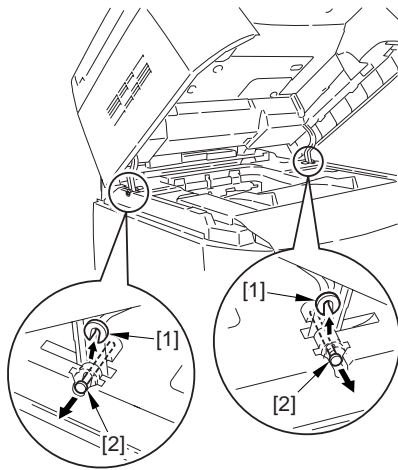
4) Close the reader assembly; then, detach the rear cover[1].



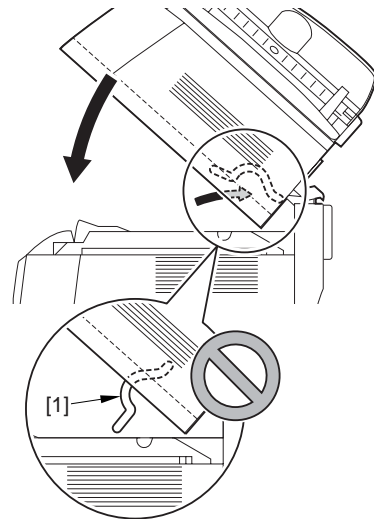
F-3-820

3.6.2.3 Removing the Reader Assembly

1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].

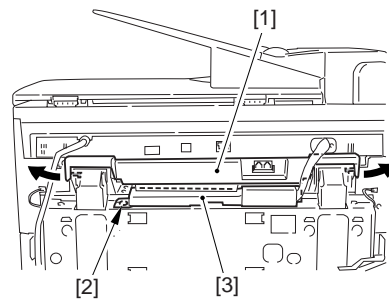


F-3-821



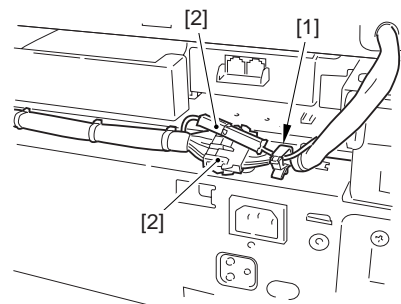
F-3-822

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



F-3-823

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

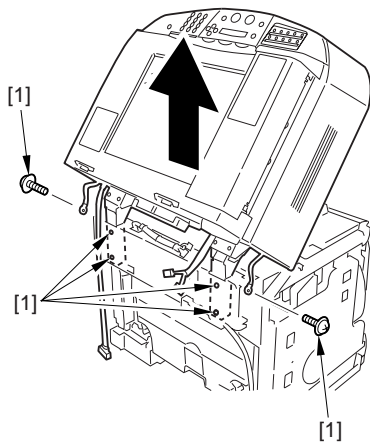


F-3-824

5) Remove the 6 screws [1], and lift the reader unit to detach.



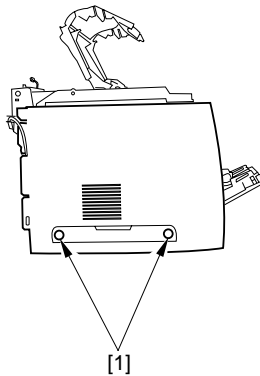
When closing the reader assembly, be sure to push in the arm [1] first.



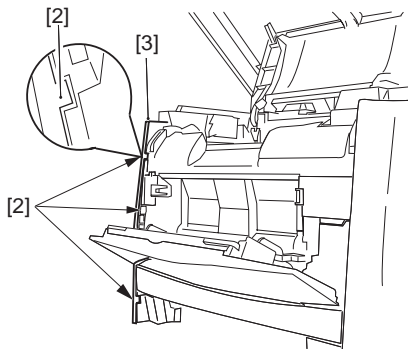
F-3-825

3.6.2.4 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



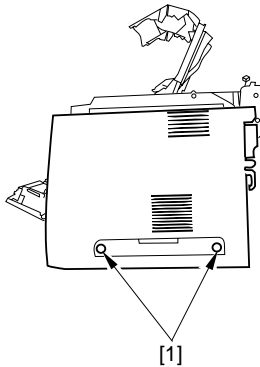
F-3-826



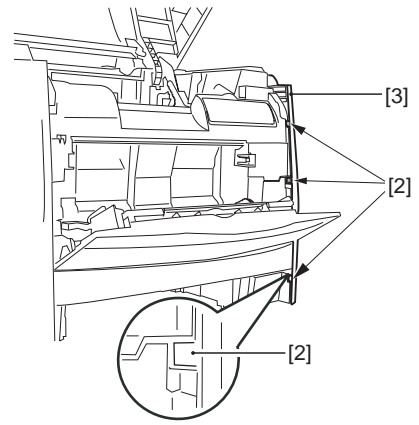
F-3-827

3.6.2.5 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



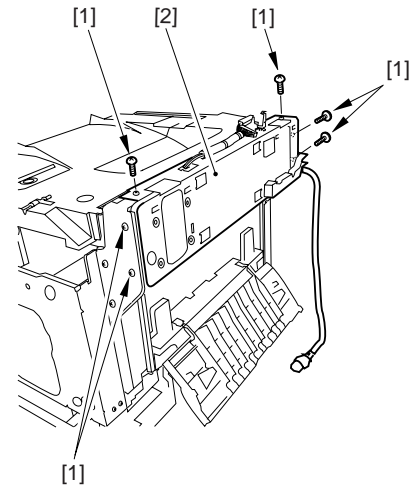
F-3-828



F-3-829

3.6.2.6 Removing the Power Supply Assembly

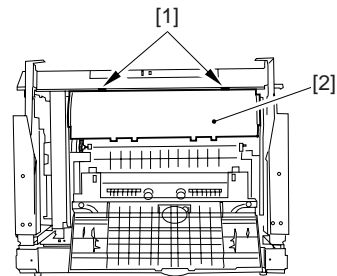
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-830

3.6.2.7 Removing the Face-Down Cover

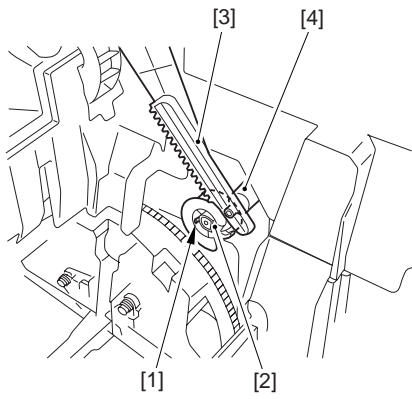
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-831

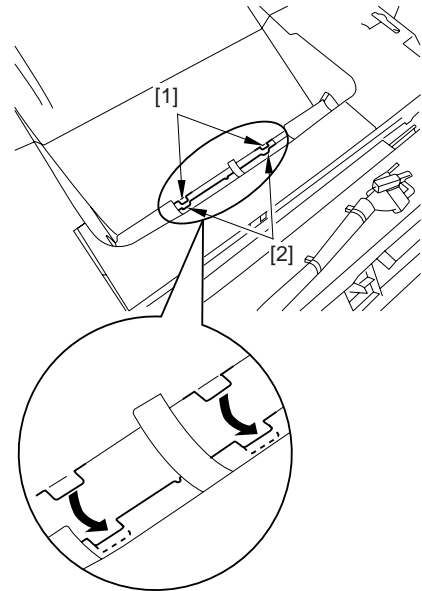
3.6.2.8 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

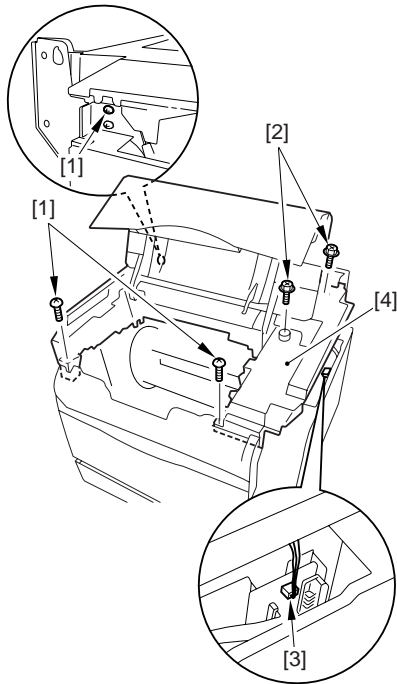


F-3-832

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

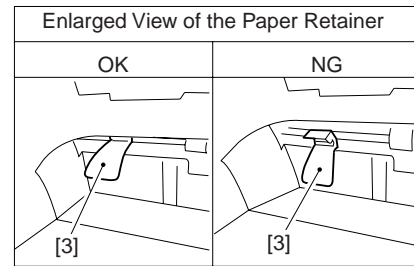


F-3-834



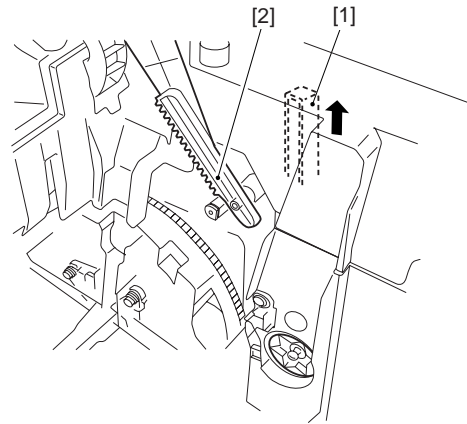
F-3-833

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



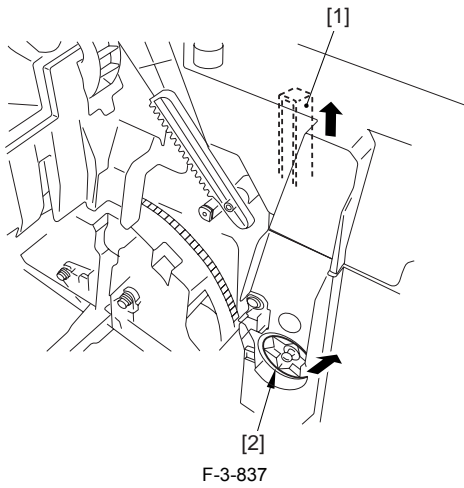
F-3-835

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-836

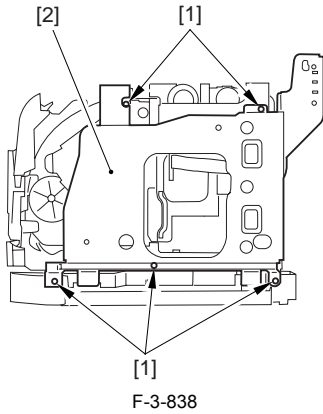
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-837

3.6.2.9 Removing the Right Frame

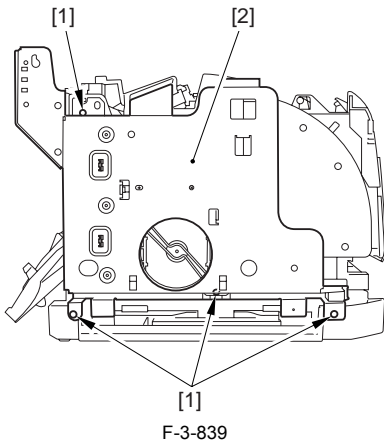
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-838

3.6.2.10 Removing the Left Frame

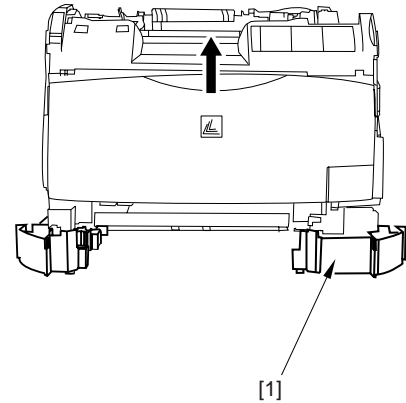
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-839

3.6.2.11 Removing the Cassette Feeder

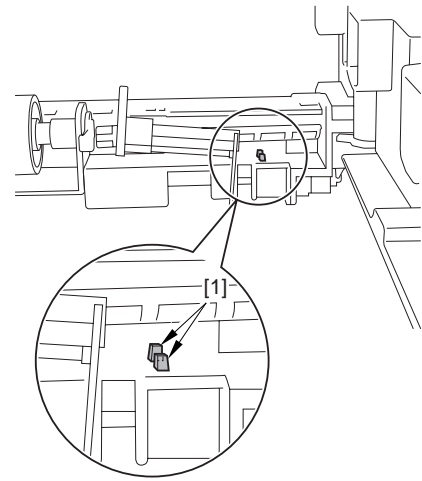
1) Lift the machine, and detach the cassette feeder [1].



F-3-840

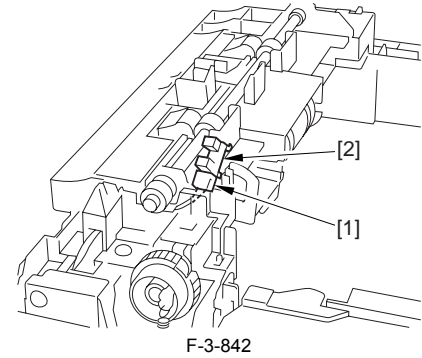
3.6.2.12 Removing the Cassette Paper Sensor

1) Remove the 2 claws [1].



F-3-841

2) Disconnect the connector [1], and detach the paper sensor [2].



F-3-842

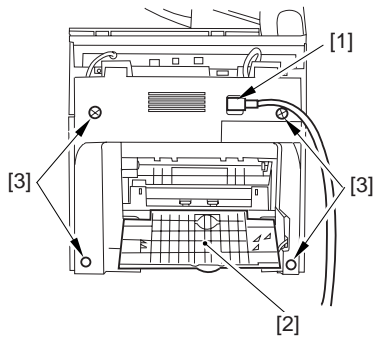
3.6.3 Cassette Feed Sensor

3.6.3.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

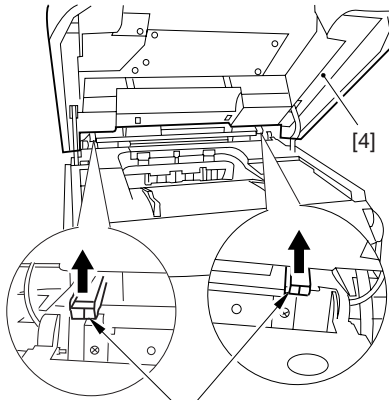
3.6.3.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



F-3-843

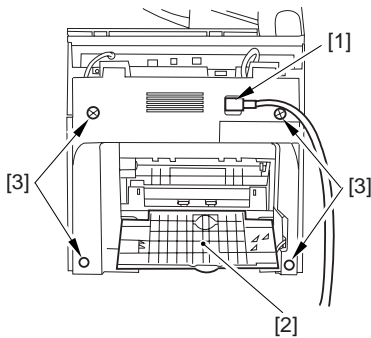
3) Open the reader assembly [4], and lift to free the 2 claws [5].



[5]

F-3-844

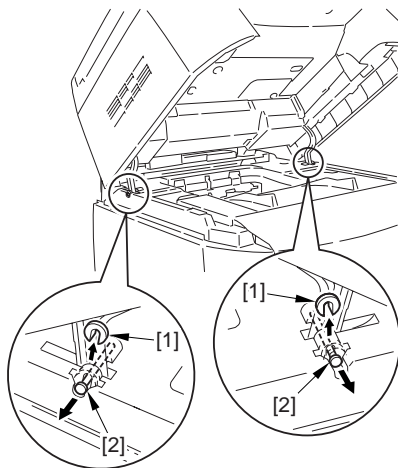
4) Close the reader assembly; then, detach the rear cover [1].



F-3-845

3.6.3.3 Removing the Reader Assembly

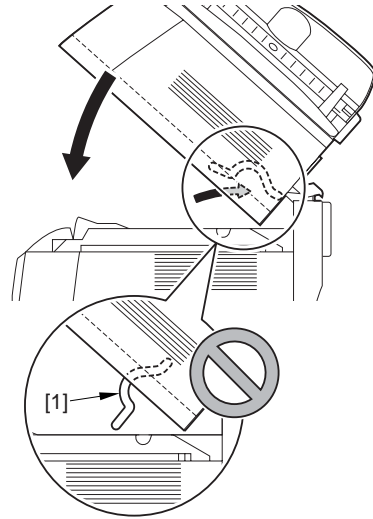
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-846



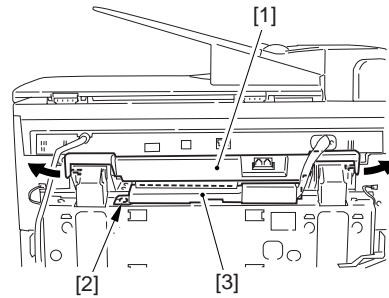
When closing the reader assembly, be sure to push in the arm [1] first.



F-3-847

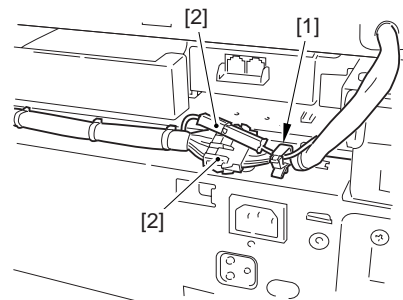
2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].

3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



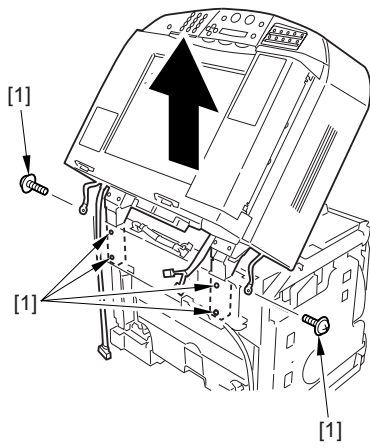
F-3-848

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-849

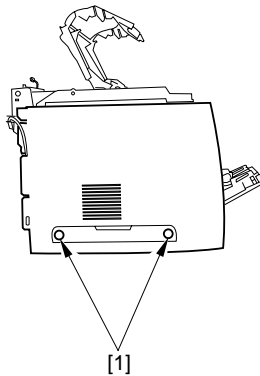
5) Remove the 6 screws [1], and lift the reader unit to detach.



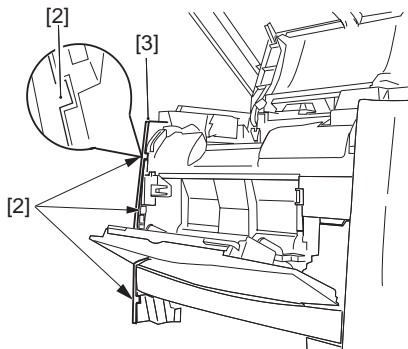
F-3-850

3.6.3.4 Removing the Right Cover

1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



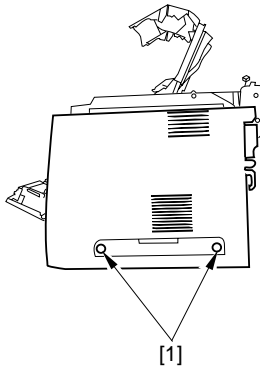
F-3-851



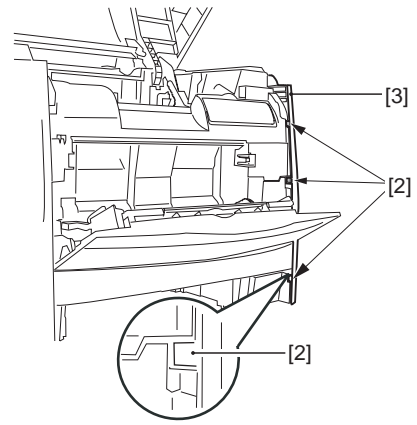
F-3-852

3.6.3.5 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



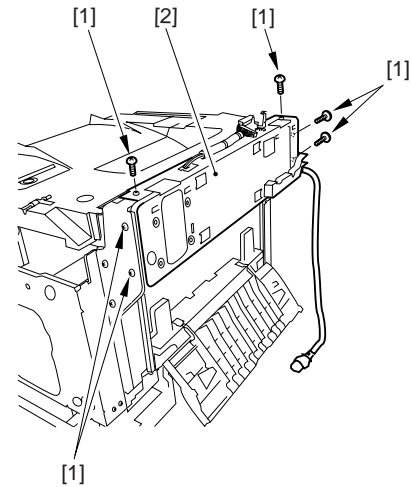
F-3-853



F-3-854

3.6.3.6 Removing the Power Supply Assembly

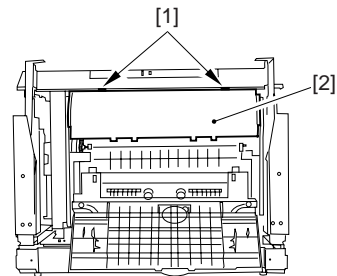
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-855

3.6.3.7 Removing the Face-Down Cover

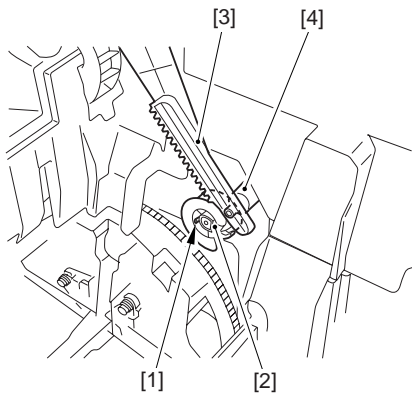
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-856

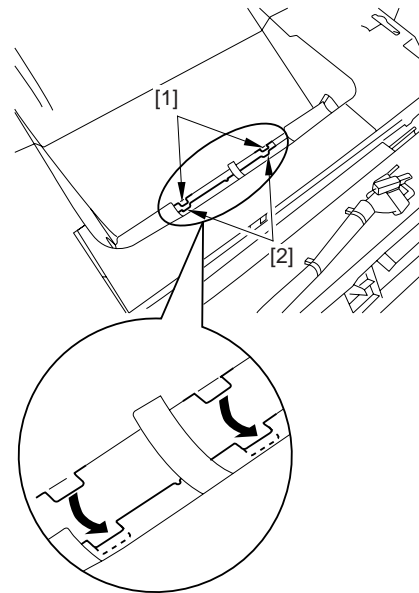
3.6.3.8 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

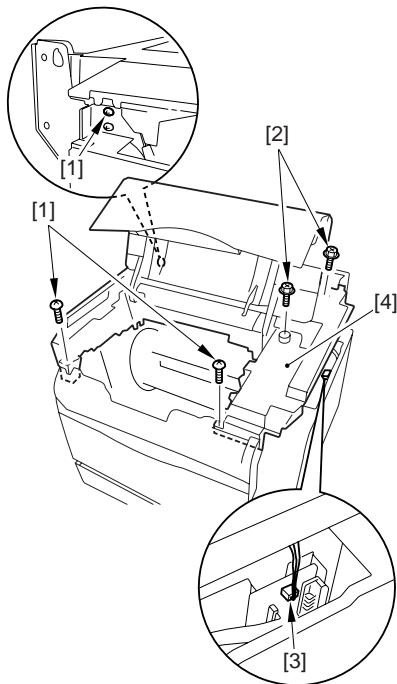


F-3-857

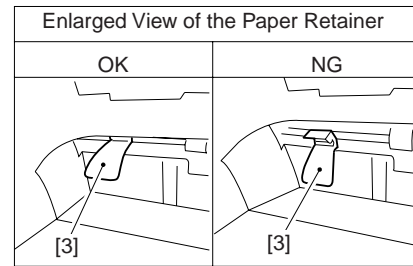
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



F-3-859



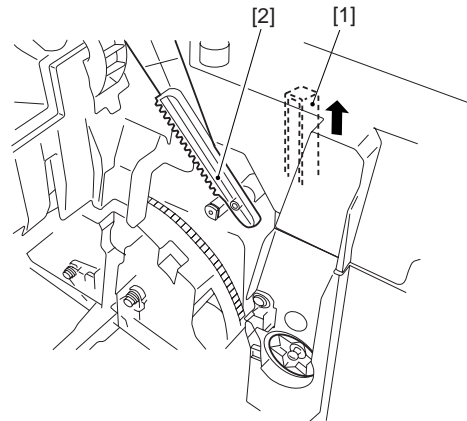
F-3-858



F-3-860

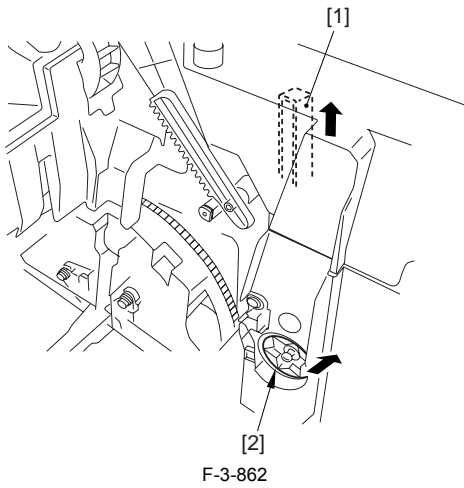
! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-861

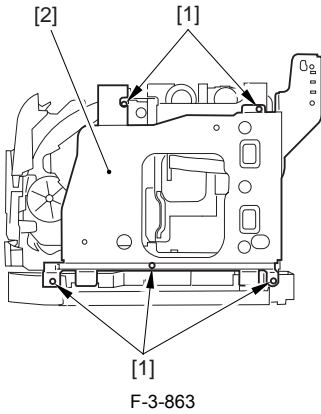
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-862

3.6.3.9 Removing the Right Frame

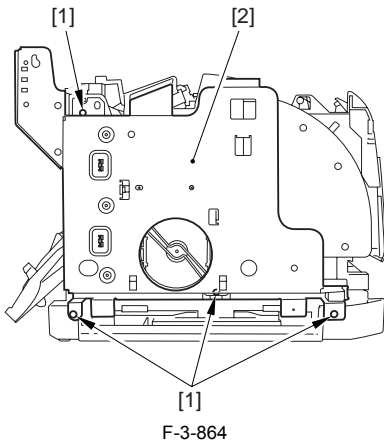
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-863

3.6.3.10 Removing the Left Frame

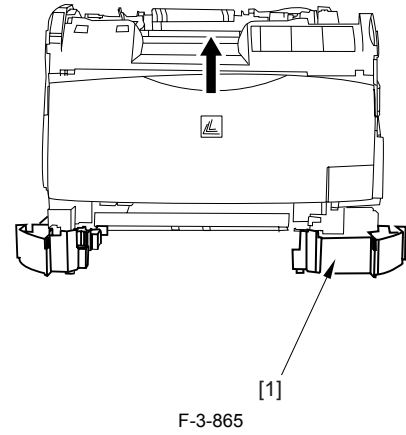
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-864

3.6.3.11 Removing the Cassette Feeder

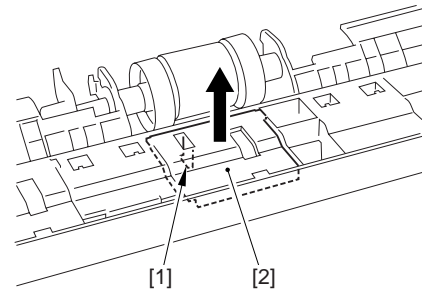
1) Lift the machine, and detach the cassette feeder [1].



F-3-865

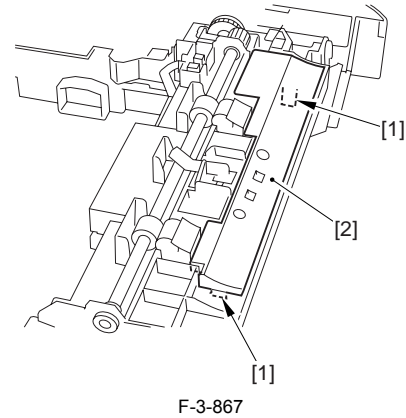
3.6.3.12 Removing the Cassette Feed Sensor

1) Remove the claw [1], and detach the sensor cover [2].



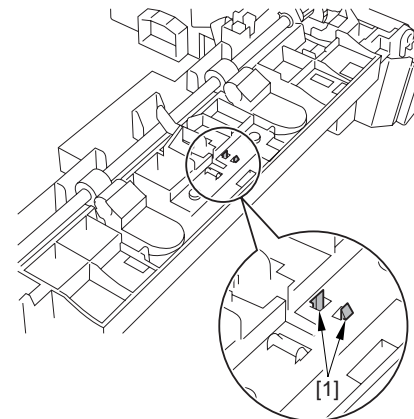
F-3-866

2) Remove the 2 claws [1], and detach the sensor cover [2].



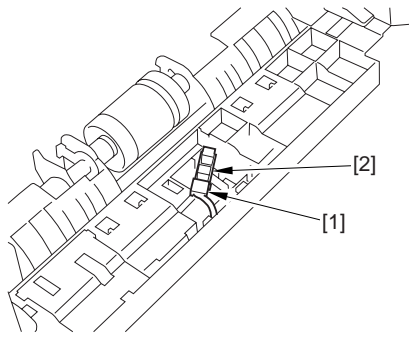
F-3-867

3) Remove the 2 claws [1].



F-3-868

4) Disconnect the connector [1], and detach the cassette feed sensor [2].



F-3-869

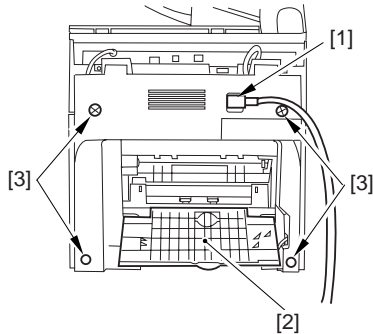
3.6.4 Cassette Pickup Solenoid

3.6.4.1 Removing the Cassettes

1) Hold the grip, and take out the cassette.

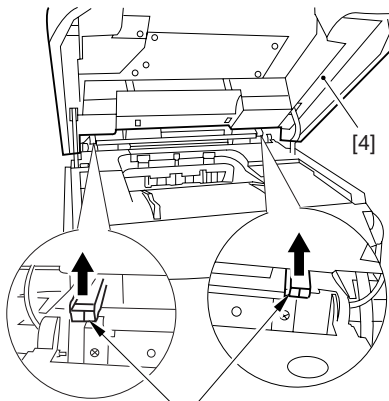
3.6.4.2 Removing the Rear Cover

1) Disconnect the cable [1] of the power supply assembly.
2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



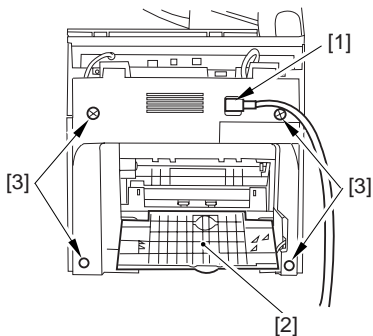
F-3-870

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-871

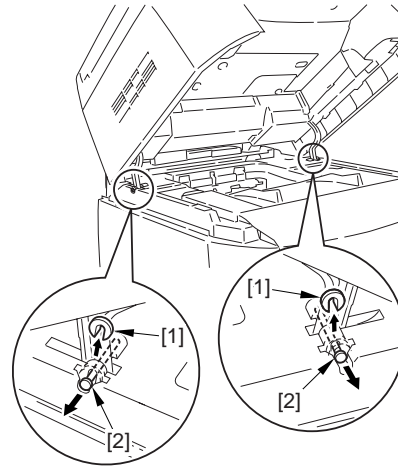
4) Close the reader assembly; then, detach the rear cover [1].



F-3-872

3.6.4.3 Removing the Reader Assembly

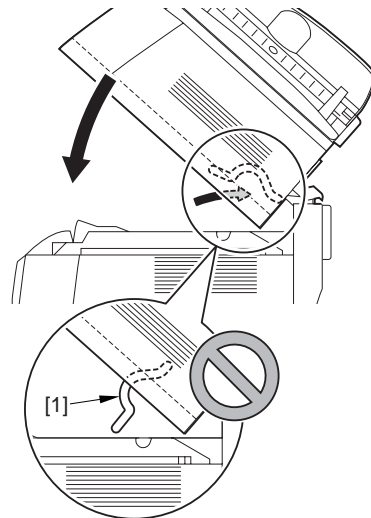
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-873



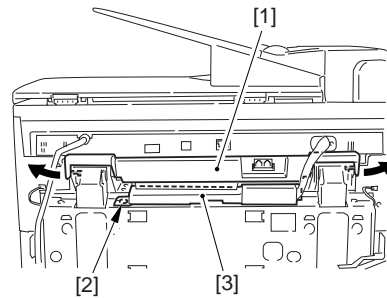
When closing the reader assembly, be sure to push in the arm [1] first.



F-3-874

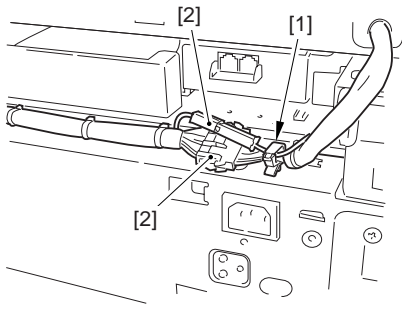
2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].

3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



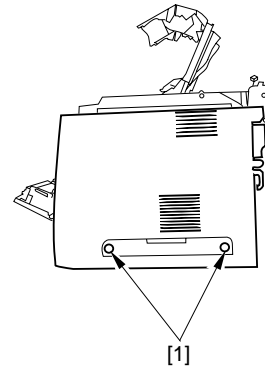
F-3-875

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

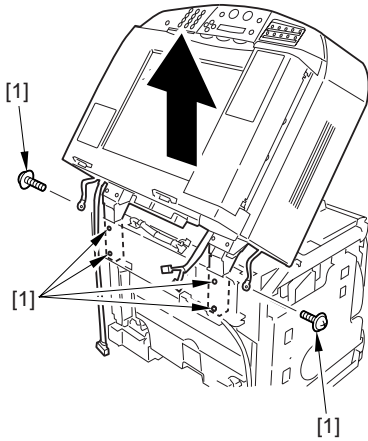


F-3-876

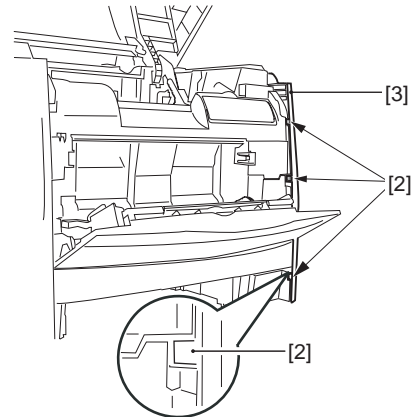
5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-880



F-3-877



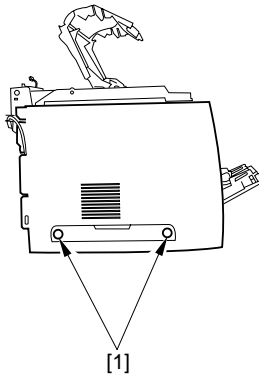
F-3-881

3.6.4.4 Removing the Right Cover

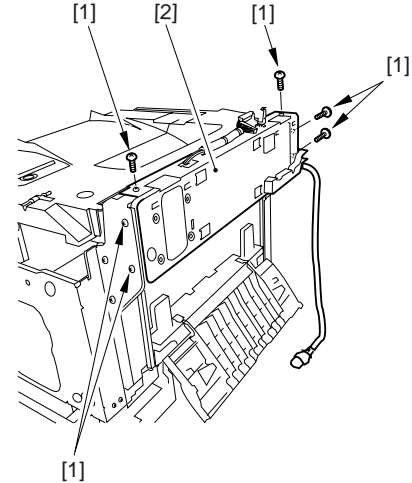
1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].

3.6.4.6 Removing the Power Supply Assembly

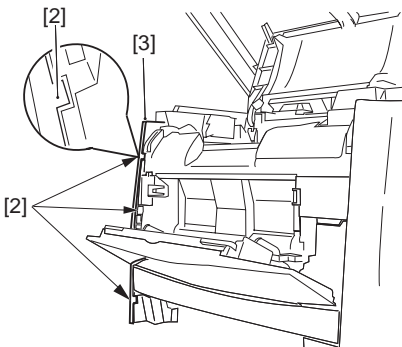
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-878



F-3-882



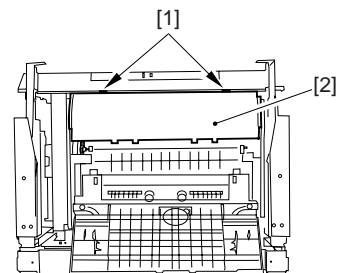
F-3-879

3.6.4.7 Removing the Face-Down Cover

1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.

3.6.4.5 Removing the Left Cover

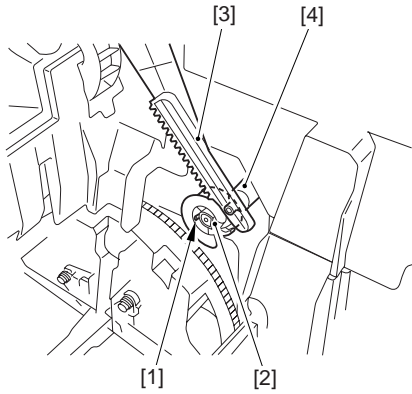
1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



F-3-883

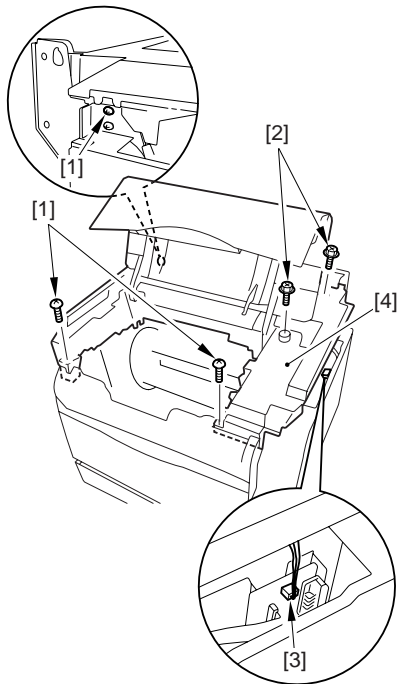
3.6.4.8 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



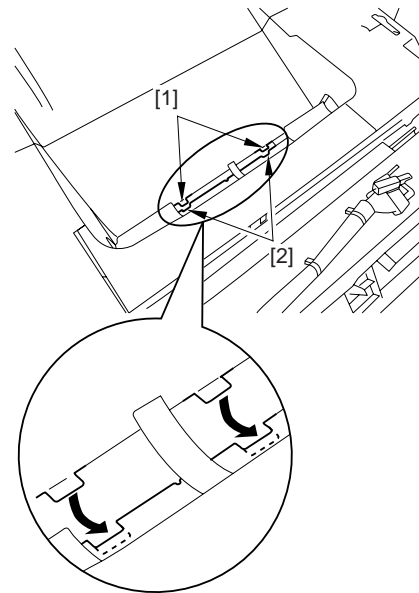
F-3-884

- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

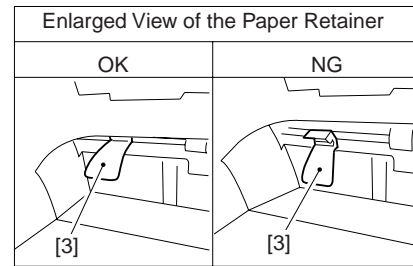


F-3-885

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

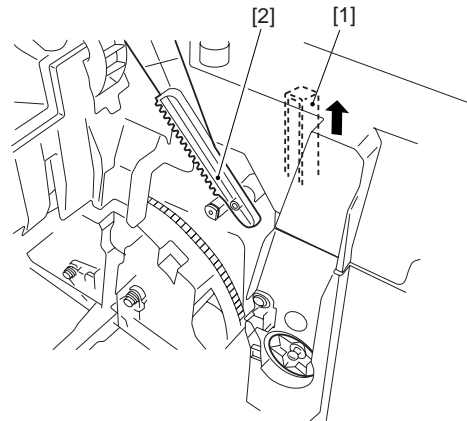


F-3-886



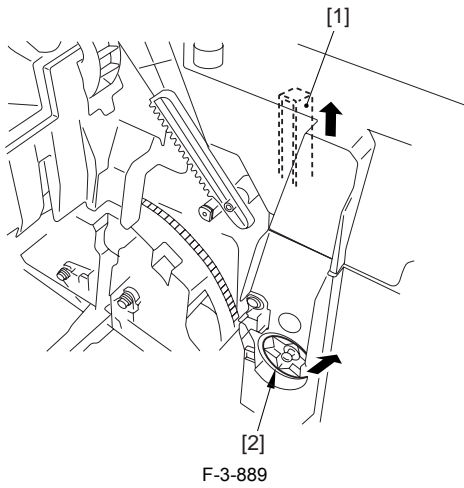
F-3-887

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



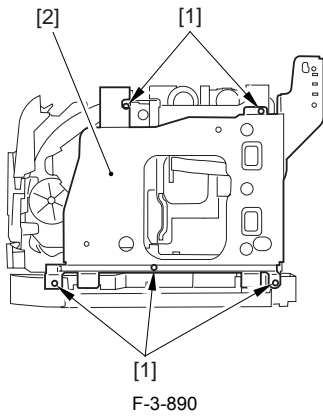
F-3-888

! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



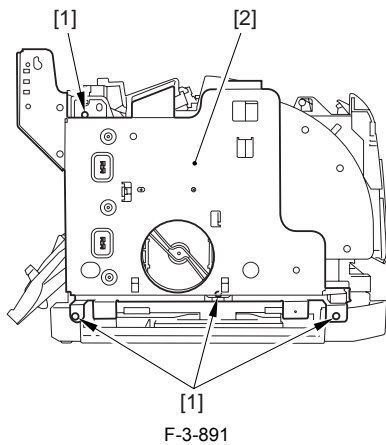
3.6.4.9 Removing the Right Frame

1) Remove the 5 screws [1], and detach the right frame [2].



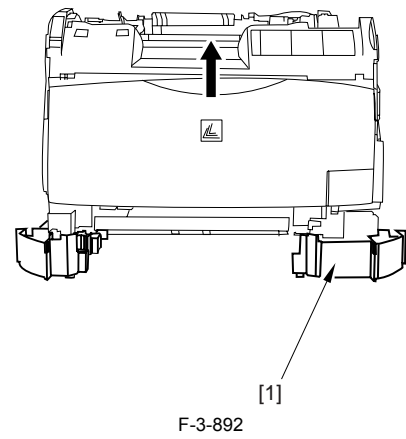
3.6.4.10 Removing the Left Frame

1) Remove the 4 screws [1], and detach the left frame [2].



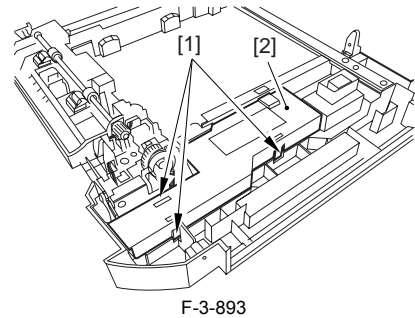
3.6.4.11 Removing the Cassette Feeder

1) Lift the machine, and detach the cassette feeder [1].

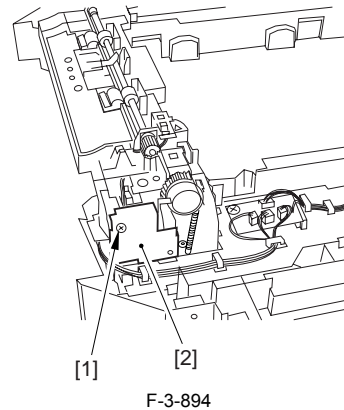


3.6.4.12 Removing the Cassette Pickup Solenoid

1) Remove the 3 claws [1], and slide the PCB cover [2] to detach.

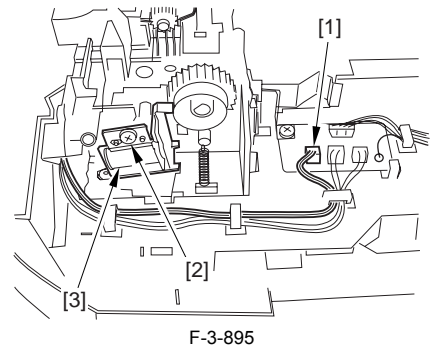


2) Remove the screw [1], and detach the dust-blocking plate [2].



3) Disconnect the connector [1].

4) Remove the screw [2], and detach the cassette pickup solenoid [3].



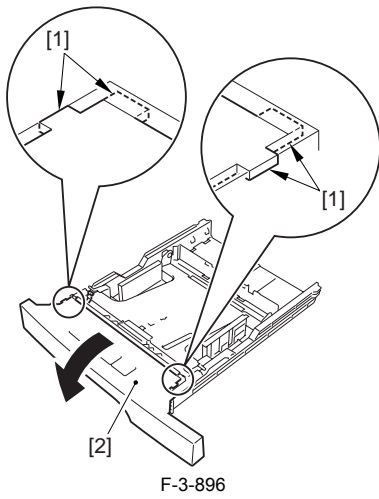
3.6.5 Cassette Separation Pad

3.6.5.1 Removing the Cassette

1) Hold the grip, and take out the cassette.

3.6.5.2 Removing the Front of the Cassette

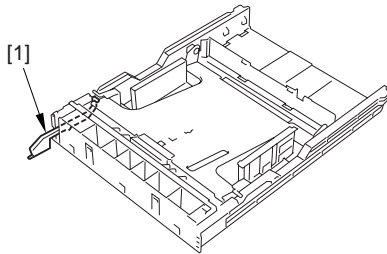
1) Remove the 4 claws [1], and detach the front [2] of the cassette.



F-3-896

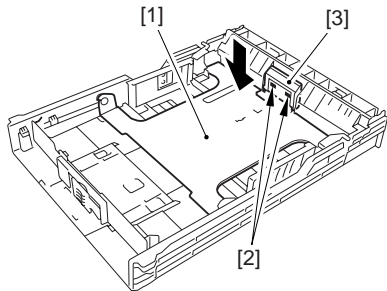
3.6.5.3 Removing the Cassette Separation Pad

- 1) Detach the paper level check lever [1] (RB-0866) found on the left of the cassette.



F-3-897

- 2) While holding down the holding plate [1], remove the 2 claws [2], and detach the separation pad [3].

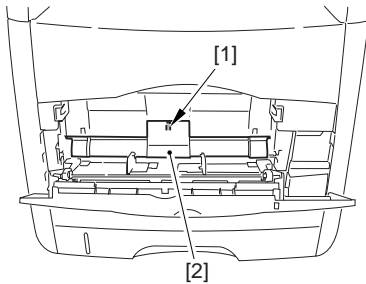


F-3-898

3.6.6 Manual Pickup Roller

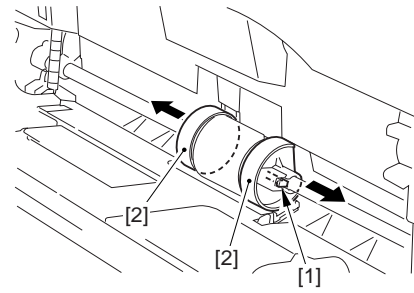
3.6.6.1 Removing the Manual Pickup Roller

- 1) Open the front cover.
- 2) Remove the claw [1], and detach the pickup roller protective cover [2].



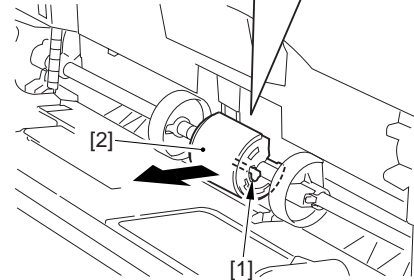
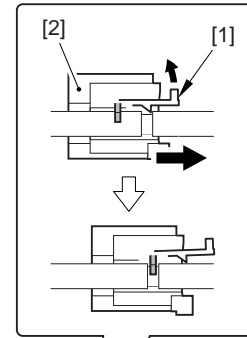
F-3-899

- 3) Pick the release claw [1], and slide the bush [2] in the direction of the arrow.



F-3-900

- 4) Pick the release claw [1], and slide the manual feed pickup roller [2] to the right to detach.

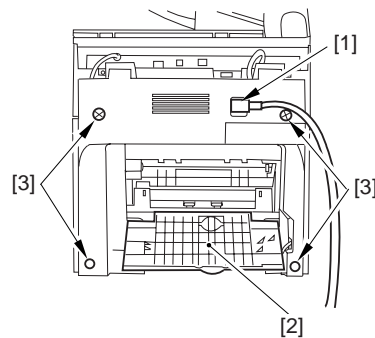


F-3-901

3.6.7 Manual Pickup Solenoid

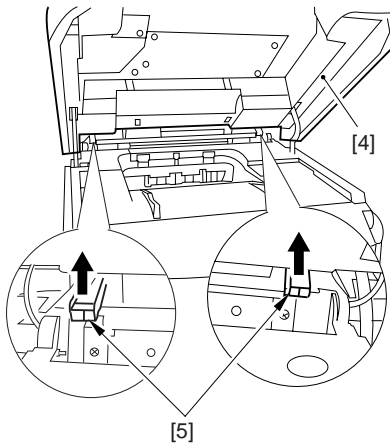
3.6.7.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



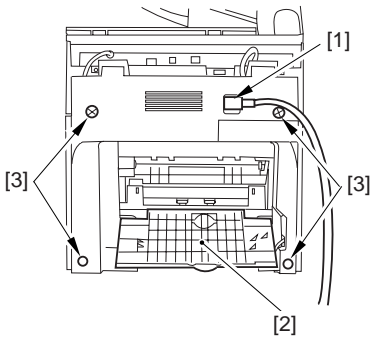
F-3-902

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-903

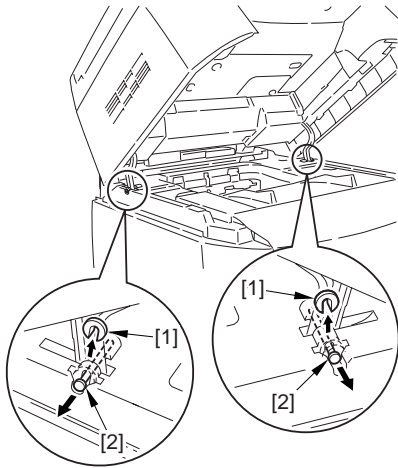
4) Close the reader assembly; then, detach the rear cover [1].



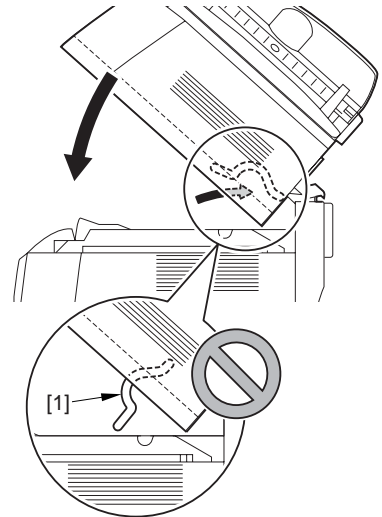
F-3-904

3.6.7.2 Removing the Reader Assembly

1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].

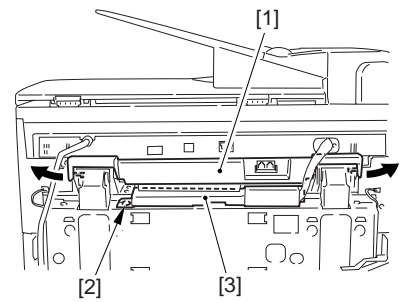


F-3-905



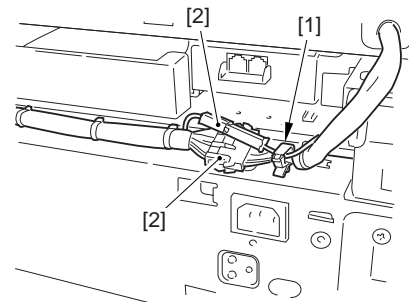
F-3-906

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



F-3-907

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

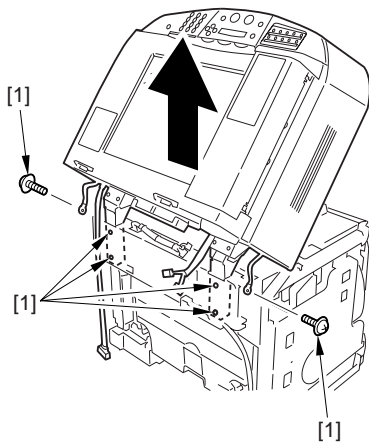


F-3-908

5) Remove the 6 screws [1], and lift the reader unit to detach.



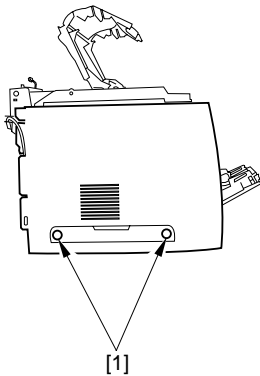
When closing the reader assembly, be sure to push in the arm [1] first.



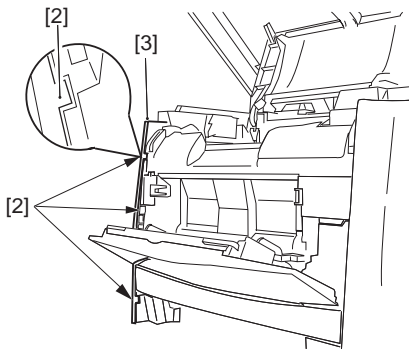
F-3-909

3.6.7.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



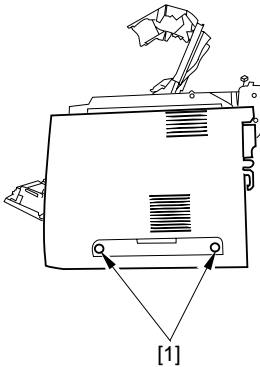
F-3-910



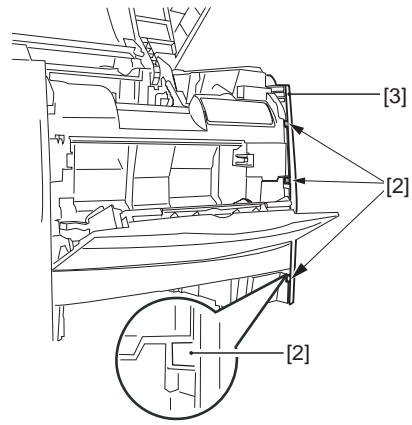
F-3-911

3.6.7.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



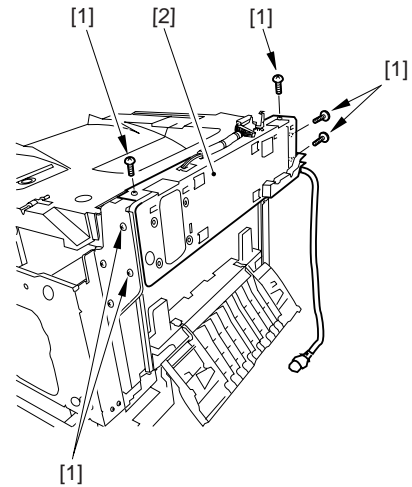
F-3-912



F-3-913

3.6.7.5 Removing the Power Supply Assembly

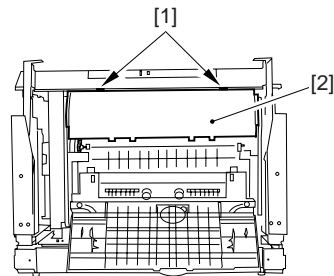
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-914

3.6.7.6 Removing the Face-Down Cover

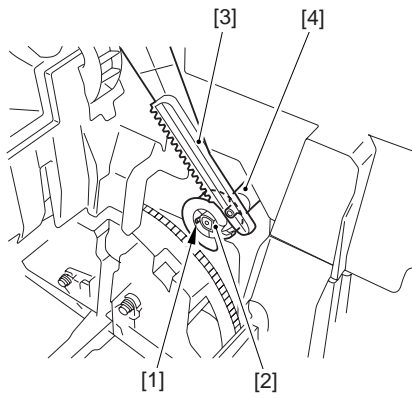
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-915

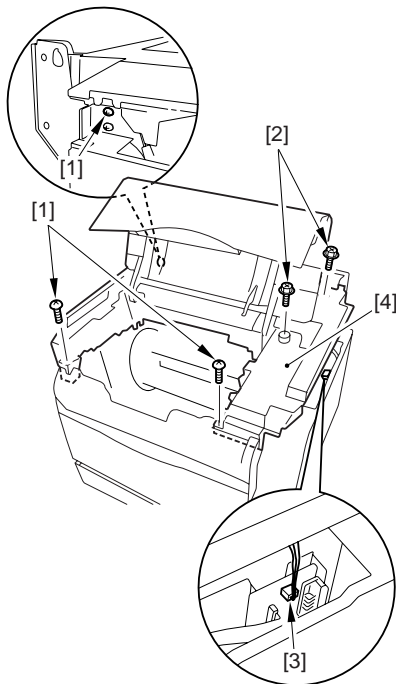
3.6.7.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



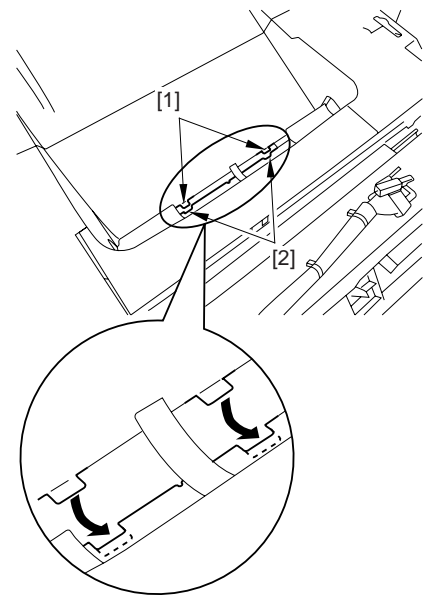
F-3-916

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



F-3-917

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.

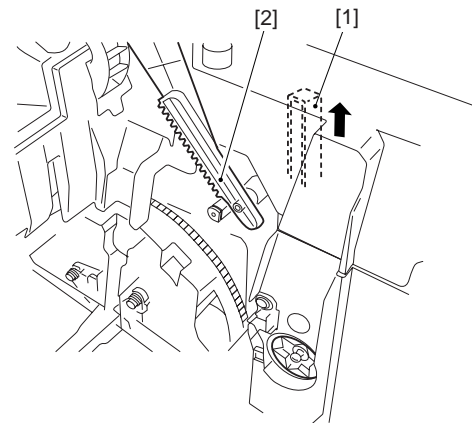


F-3-918

Enlarged View of the Paper Retainer	
OK	NG

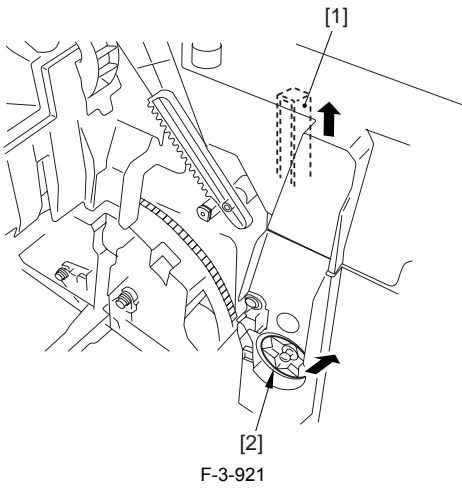
F-3-919

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-920

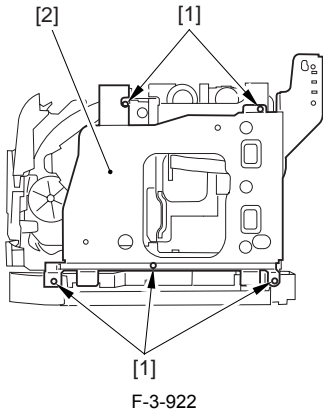
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-921

3.6.7.8 Removing the Right Frame

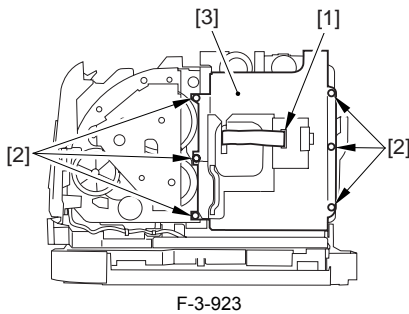
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-922

3.6.7.9 Removing the Shield Plate

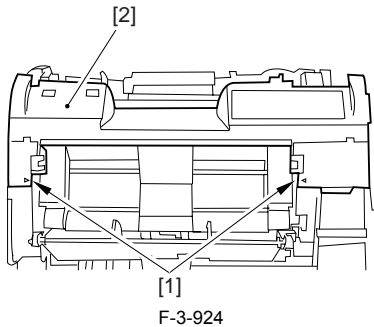
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-923

3.6.7.10 Removing the Inside Cover

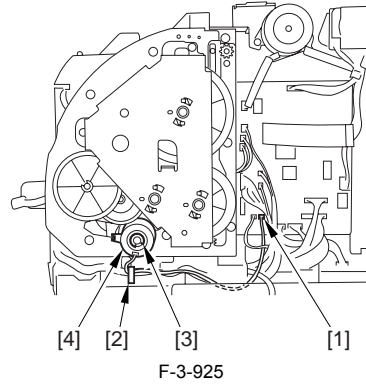
- 1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-924

3.6.7.11 Removing the Registration Clutch

- 1) Disconnect the connector [1], and open the harness band [2].
- 2) Remove the E-ring [3], and detach the registration clutch [4].



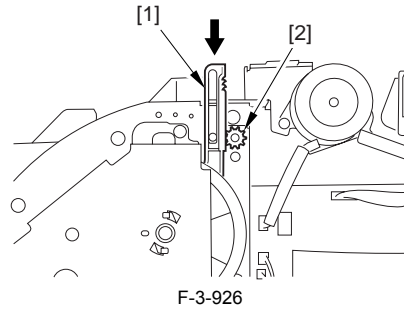
F-3-925



The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

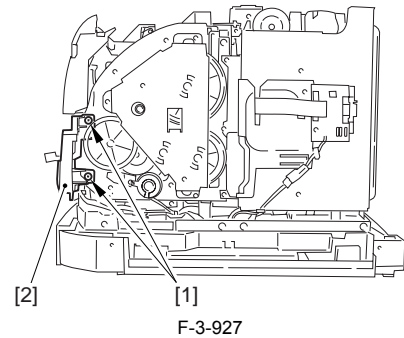
3.6.7.12 Removing the Main Drive Assembly

- 1) Shift down the drive release lever [1], and remove the gear [2].



F-3-926

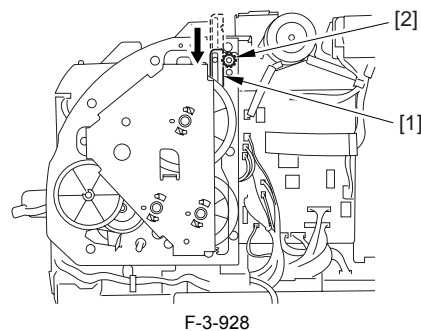
- 2) Remove the 2 screws [1], and detach the front sub cover [2].



F-3-927

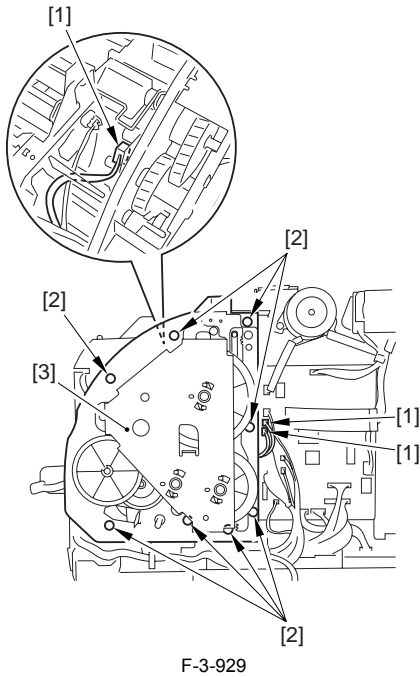


When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



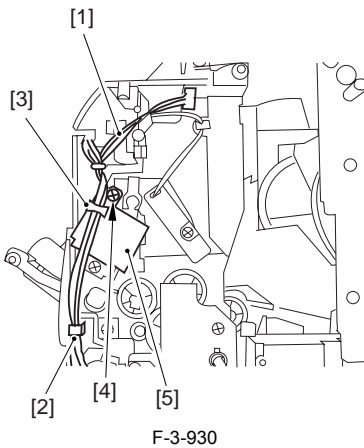
F-3-928

- 3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].

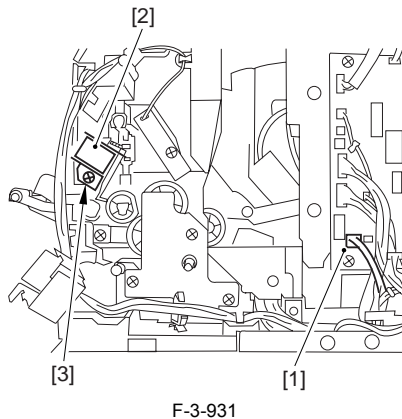


3.6.7.13 Removing the Manual Pickup Feed Solenoid

- 1) Disconnect the 2 connectors [1], and free the harness [2] from the harness guide [3].
- 2) Free the cable [1] of the density detection board and the ITB home position detection board from the harness guide [2]: then, free the cable from the clamp of the pickup solenoid cover [3].
- 3) Remove the screw [4], and detach the pickup solenoid cover [5].



- 4) Disconnect the connector [1], and remove the screw [2]; then, detach the manual feed pickup solenoid [3].



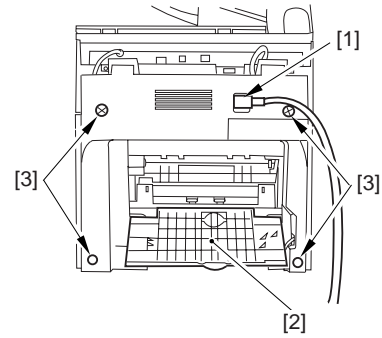
3.6.8 Manual Separation Roller

3.6.8.1 Removing the Cassettes

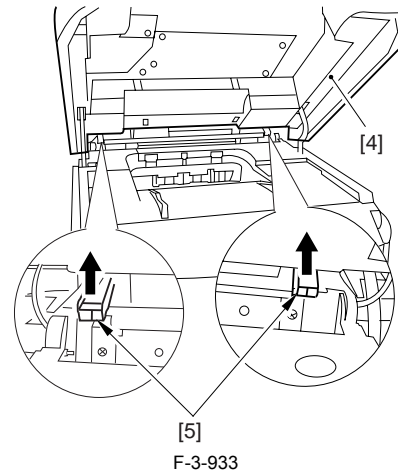
- 1) Hold the grip, and take out the cassette.

3.6.8.2 Removing the Rear Cover

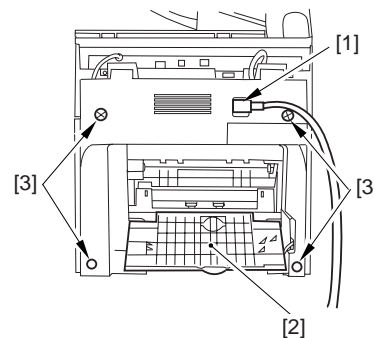
- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



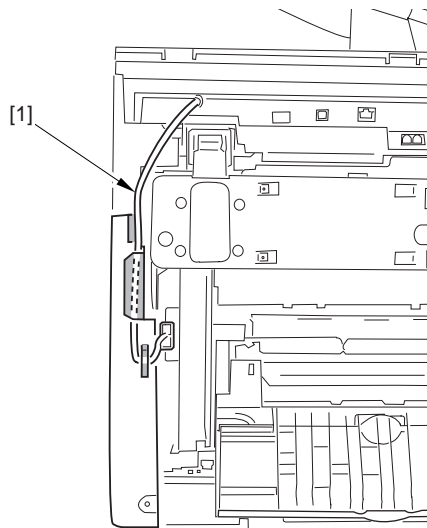
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-934

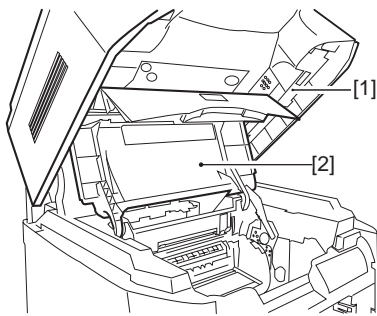
3.6.8.3 Removing the Right Cover (with the reader assembly intact)

- 1) Free the cable [1] of the reader assembly.



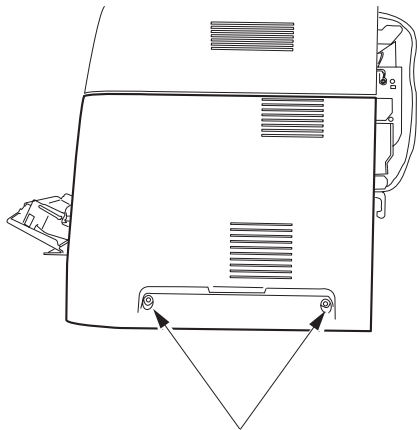
F-3-935

2) Open the reader assembly [1] and the top cover [2].



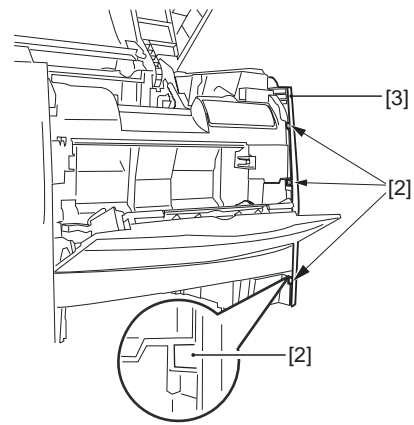
F-3-936

3) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



F-3-937

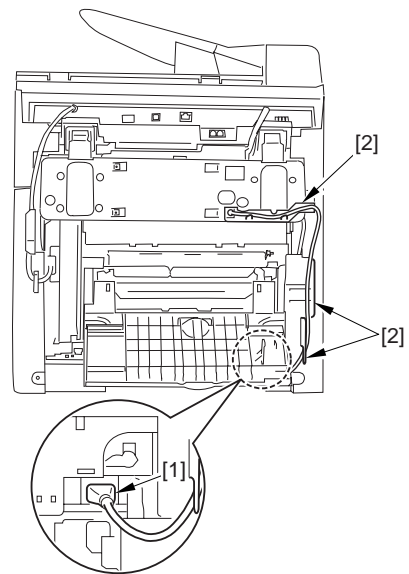
MEMO
It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.



F-3-938

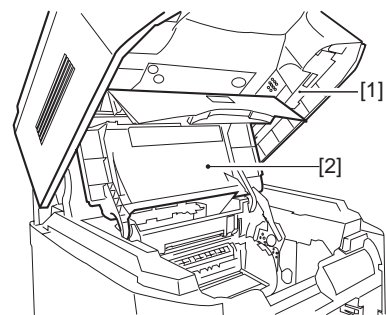
3.6.8.4 Removing the Left Cover (with the reader assembly intact)

1) Disconnect the plug [1], and free the cable [2] of the reader assembly from the guide.



F-3-939

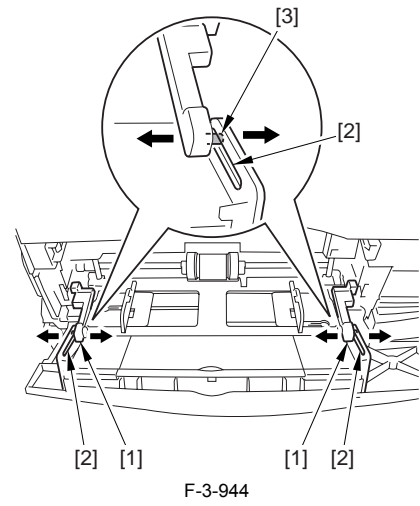
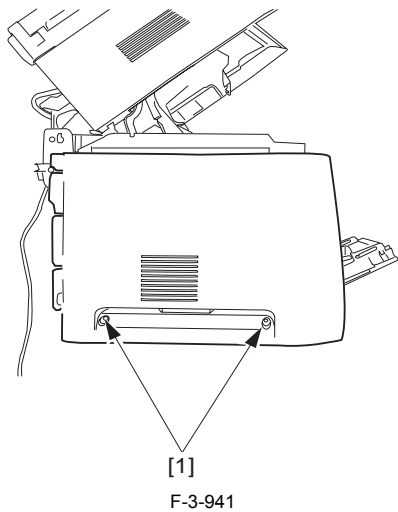
2) Open the reader assembly [1] and the top cover [2].



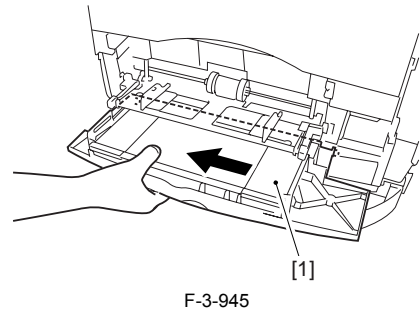
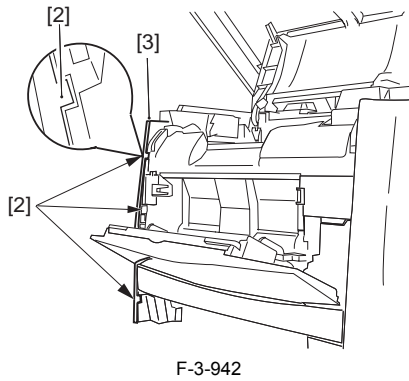
F-3-940

3) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the right cover [3].

MEMO
It is difficult to release three claws [2]. If you release the lowest one first, the second lowest, and then the top, it becomes easy.



2) Slide the front cover [1] to the left to detach.

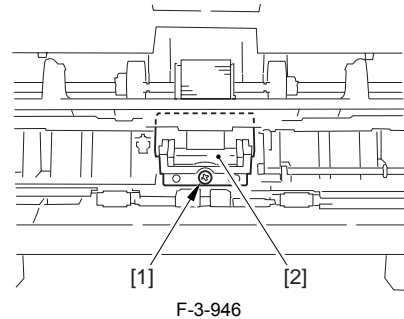
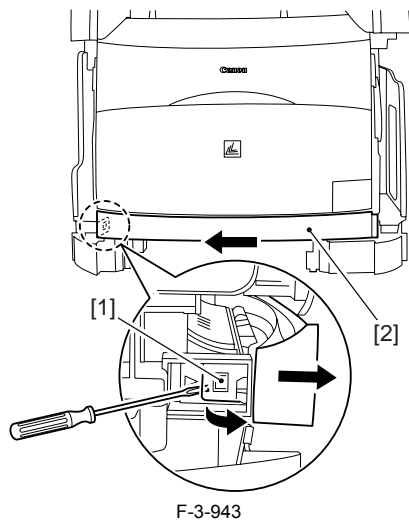


3.6.8.5 Removing the Lower Front Cover

1) Free the claw [1] using a flat-blade screwdriver; then, slide the lower cover [2] to the left to detach.

3.6.8.7 Removing the Manual Feed Pickup Separation Pad

1) Remove the screw [1], and detach the manual feed pickup separation pad [2].



3.6.8.6 Removing the Front Cover

1) Push the 2 bosses [1] used to hold the manual feed tray toward the inside while pushing the guide assembly [2] toward the outside to free the bosses.

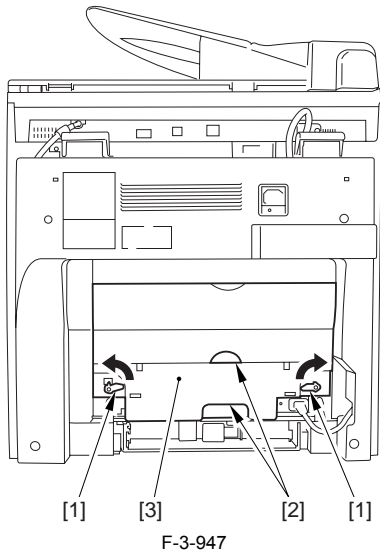
3.6.9 Registration Detection PCB

3.6.9.1 Removing the Fixing Assembly

1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



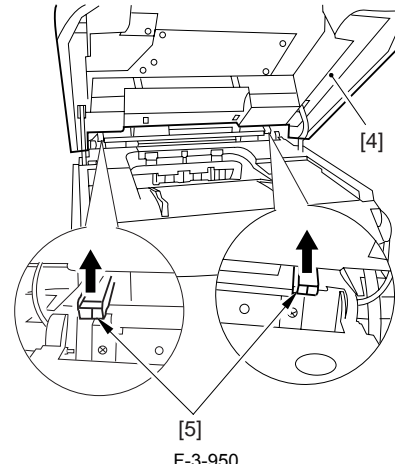
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



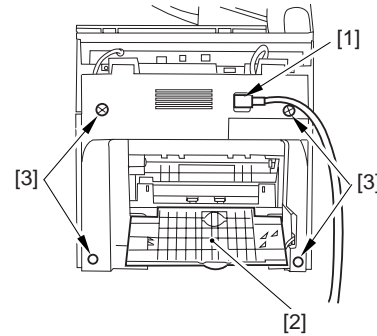
3.6.9.2 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.

! Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



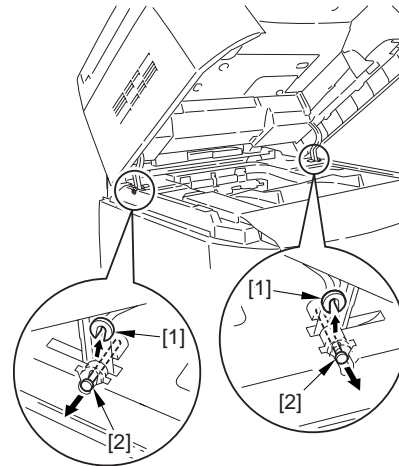
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-951

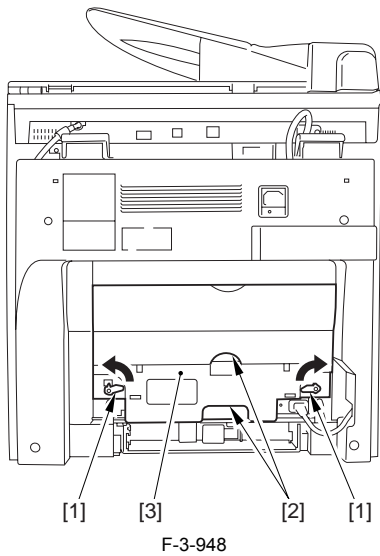
3.6.9.4 Removing the Reader Assembly

- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



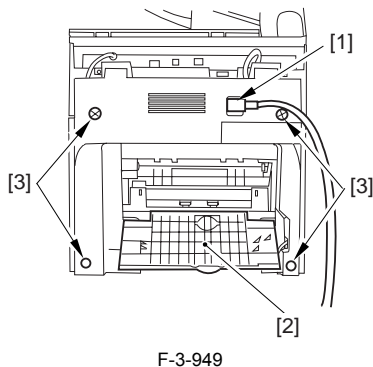
F-3-952

! When closing the reader assembly, be sure to push in the arm [1] first.



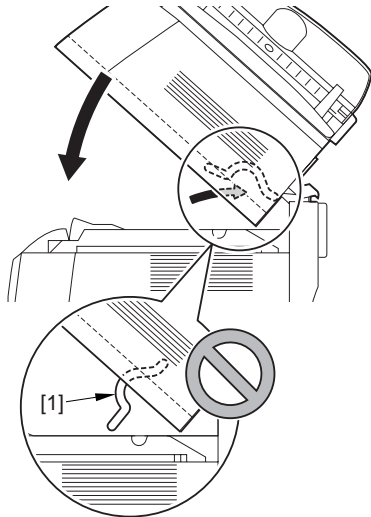
3.6.9.3 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



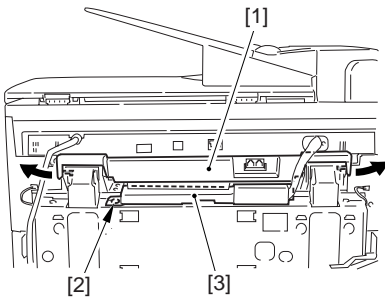
F-3-949

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



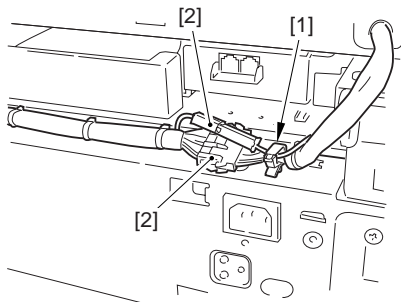
F-3-953

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



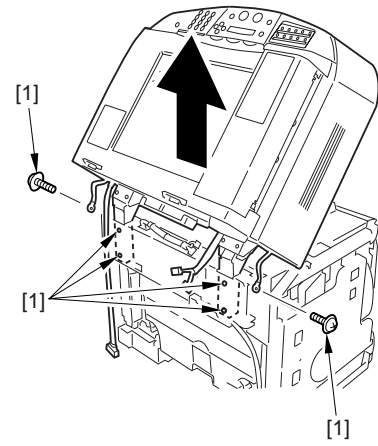
F-3-954

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-955

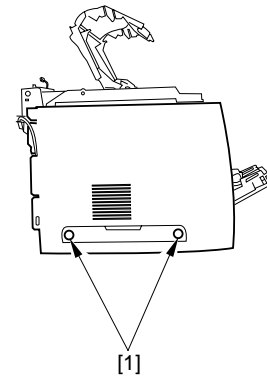
- 5) Remove the 6 screws [1], and lift the reader unit to detach.



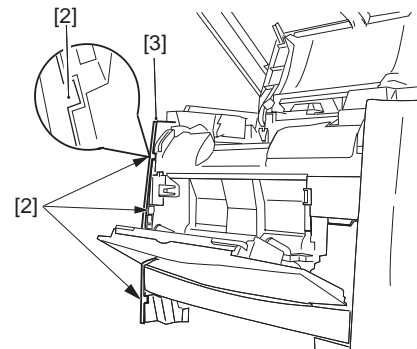
F-3-956

3.6.9.5 Removing the Right Cover

- 1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].



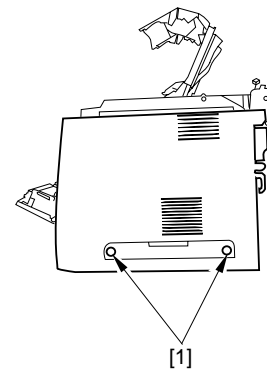
F-3-957



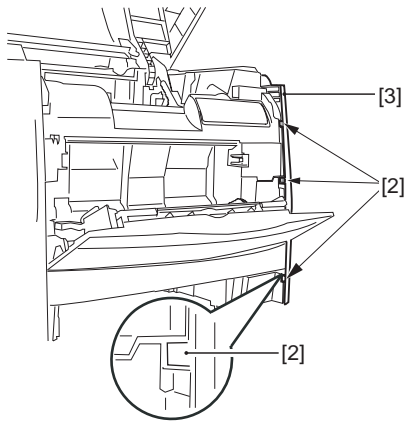
F-3-958

3.6.9.6 Removing the Left Cover

- 1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].



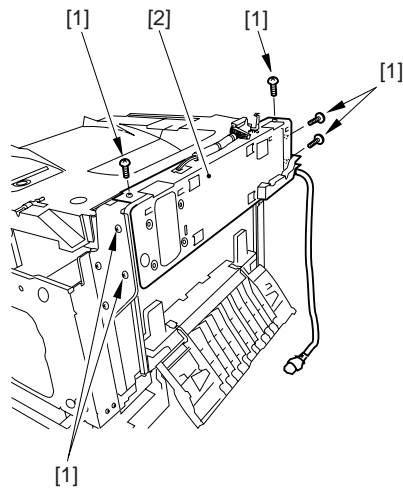
F-3-959



F-3-960

3.6.9.7 Removing the Power Supply Assembly

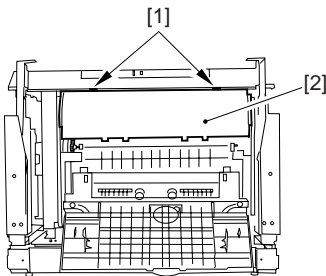
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-961

3.6.9.8 Removing the Face-Down Cover

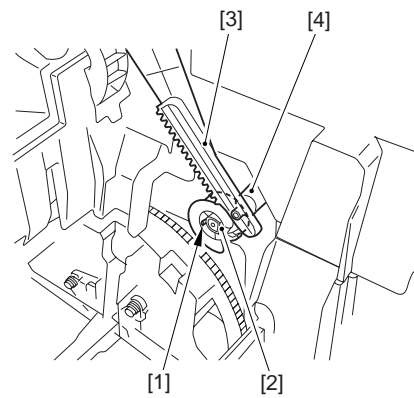
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-962

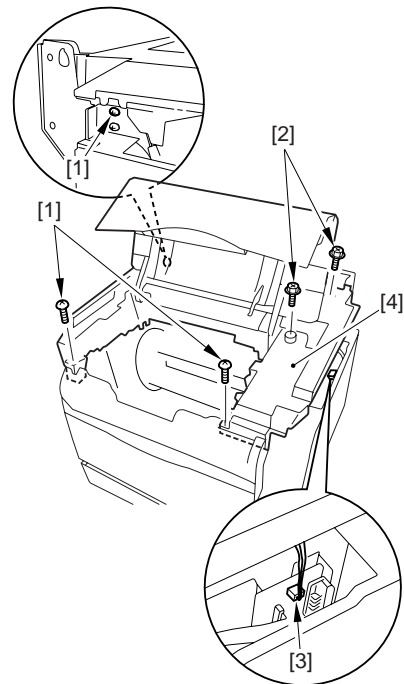
3.6.9.9 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].



F-3-963

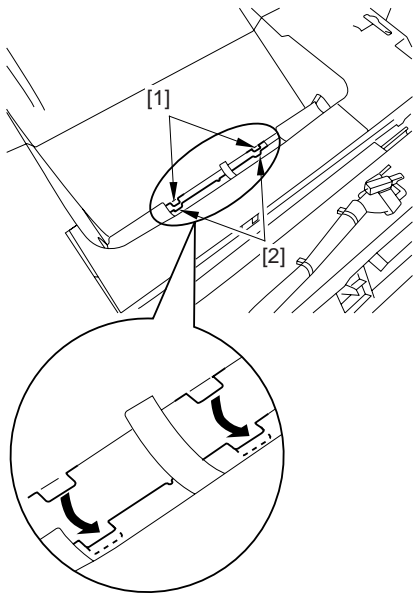
3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].



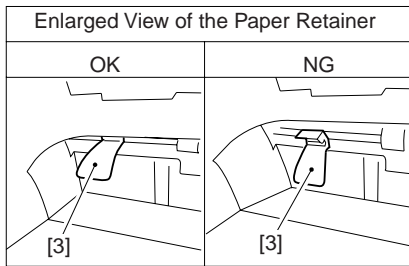
F-3-964



When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



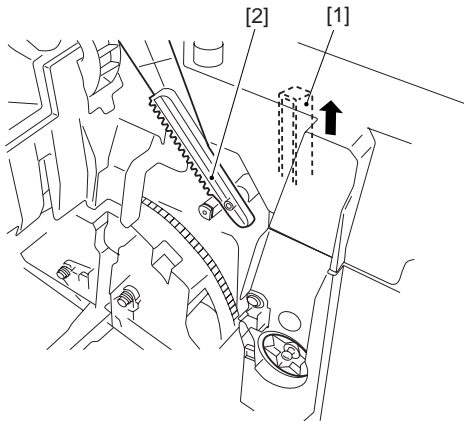
F-3-965



F-3-966



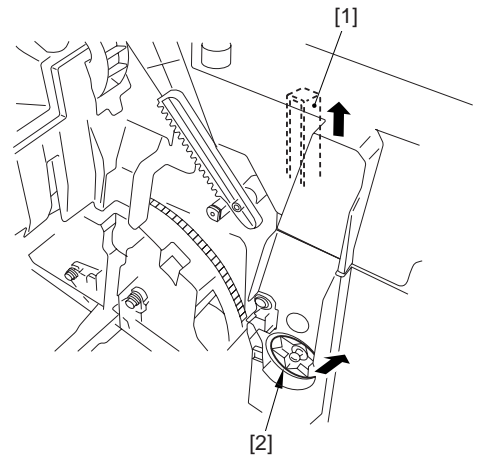
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-967



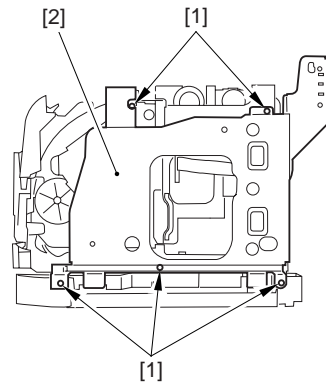
If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-968

3.6.9.10 Removing the Right Frame

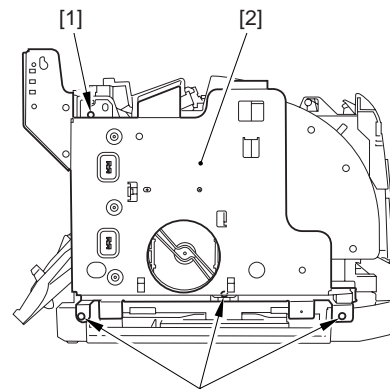
- 1) Remove the 5 screws [1], and detach the right frame [2].



F-3-969

3.6.9.11 Removing the Left Frame

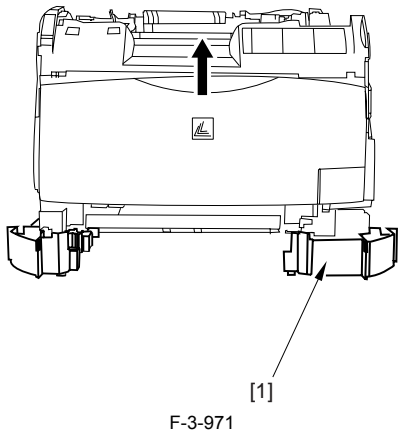
- 1) Remove the 4 screws [1], and detach the left frame [2].



F-3-970

3.6.9.12 Removing the Cassette Feeder

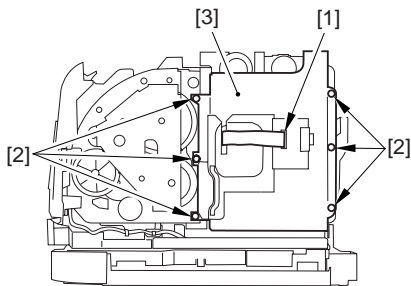
- 1) Lift the machine, and detach the cassette feeder [1].



F-3-971

3.6.9.13 Removing the Shield Plate

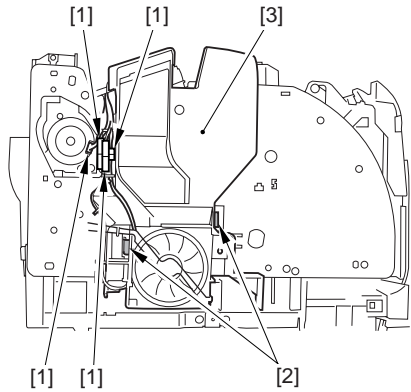
- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-972

3.6.9.14 Removing the Fan Duct

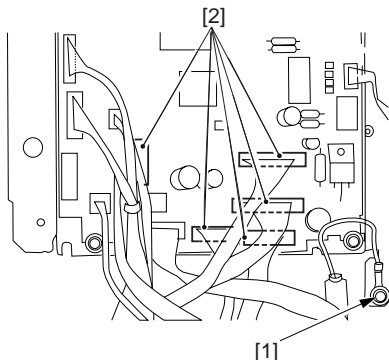
- 1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
- 2) Slide the fan duct [3] in upward direction to detach.



F-3-973

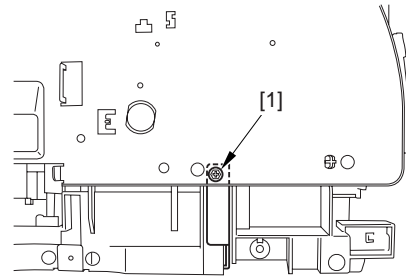
3.6.9.15 Removing the Lower Case Assembly

- 1) Remove the screw [1], and disconnect the 5 connectors [2].



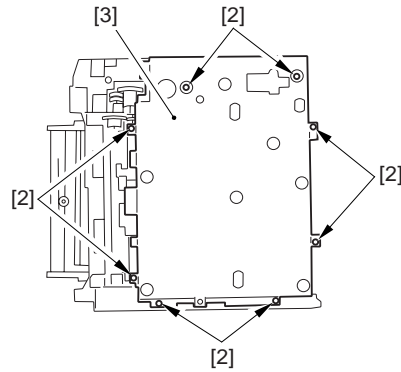
F-3-974

- 2) Remove the screw [1] from the left side of the machine.



F-3-975

- 3) With care, shift down the machine to the left; then, remove the 8 screws [2] from the bottom, and detach the lower case assembly [3].



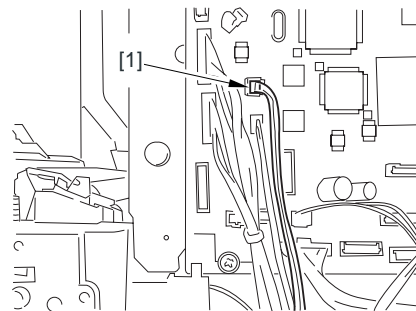
F-3-976

! When you shift down the machine, be sure to take care to avoid injury by the edge of the side plate. Also, be sure to hold it by its grip segment. Be sure to place a cushioning material (g., towel) on the work table to protect the protrusions of the machine from damage. Moreover, be sure to tape the opening of the laser scanner assembly to prevent intrusion of toner in the optical path of the assembly before shifting down the machine.

! If you must detach the lower case assembly, base user to hold it by its bottom so as to avoid injury by the edge of its side plate.

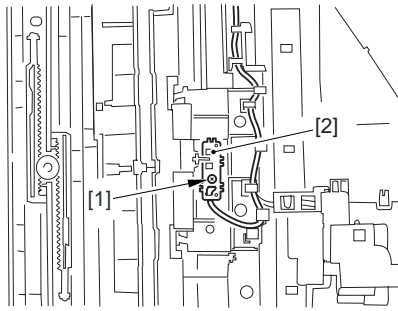
3.6.9.16 Removing the Registration Detection PCB

- 1) Disconnect the connector [1] found on the DC controller board.



F-3-977

- 2) Remove the screw [1], and detach the registration detection PCB.

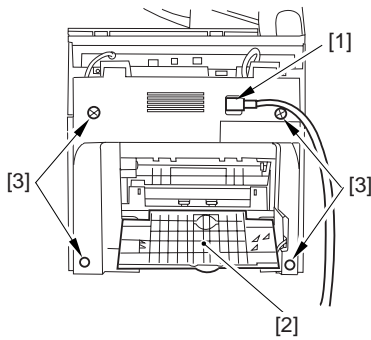


F-3-978

3.6.10 Main Motor

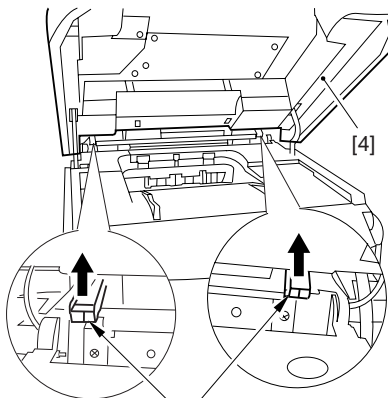
3.6.10.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



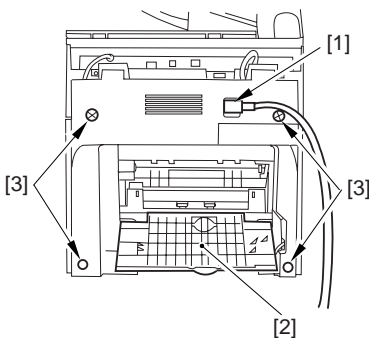
F-3-979

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-980

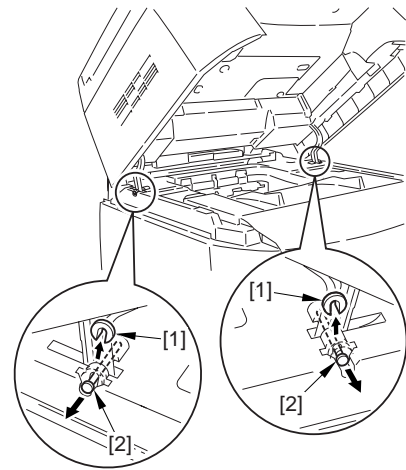
- 4) Close the reader assembly; then, detach the rear cover [1].



F-3-981

3.6.10.2 Removing the Reader Assembly

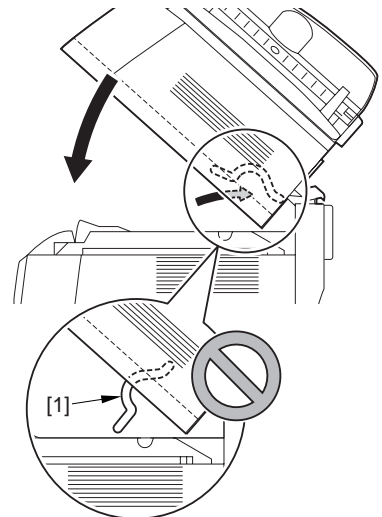
- 1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-982

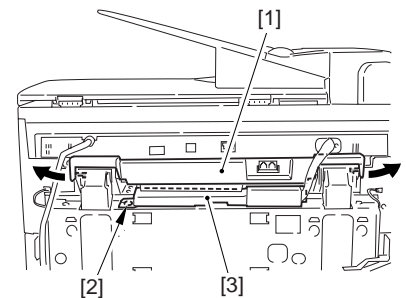


When closing the reader assembly, be sure to push in the arm [1] first.



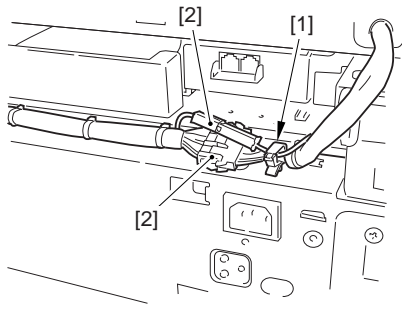
F-3-983

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



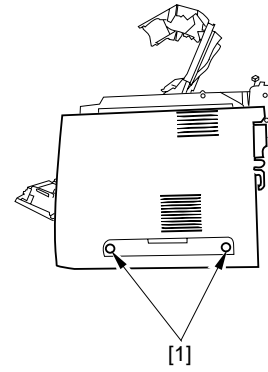
F-3-984

- 4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

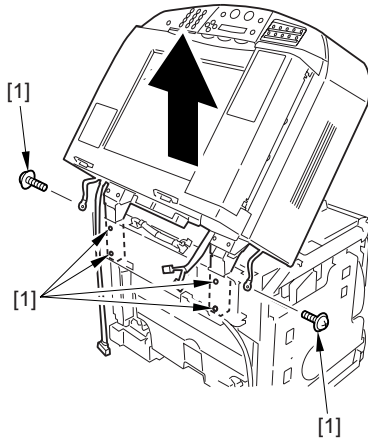


F-3-985

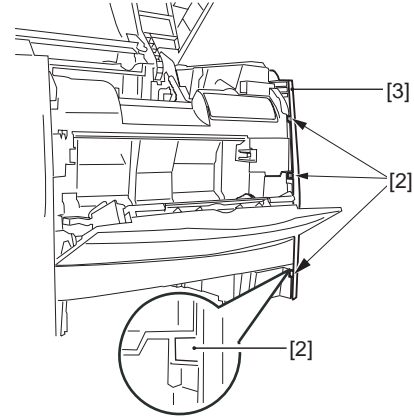
5) Remove the 6 screws [1], and lift the reader unit to detach.



F-3-989



F-3-986



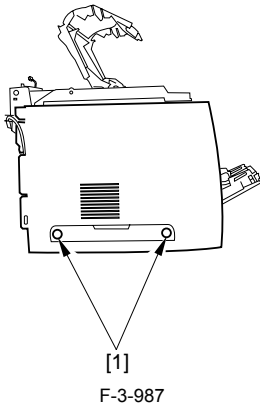
F-3-990

3.6.10.3 Removing the Right Cover

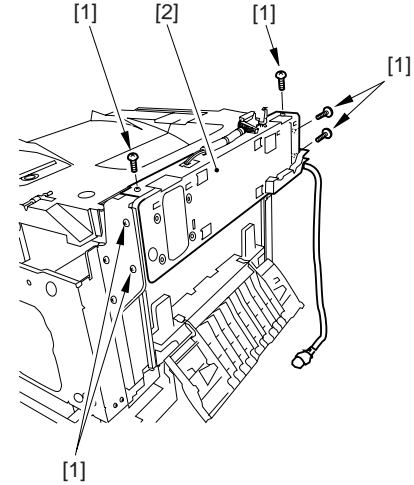
1) Remove the 2 screws [1] of the side; then, remove the 3 claws [2] to detach the left cover [3].

3.6.10.5 Removing the Power Supply Assembly

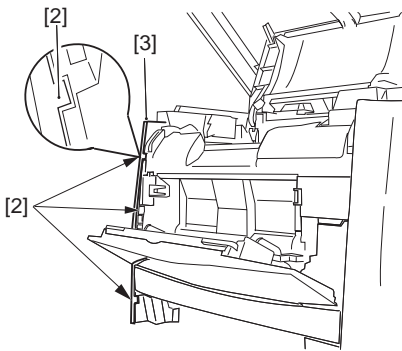
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-987



F-3-991



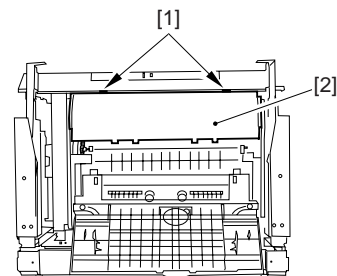
F-3-988

3.6.10.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side; then, remove the 3 claws [2] to detach the right cover [3].

3.6.10.6 Removing the Face-Down Cover

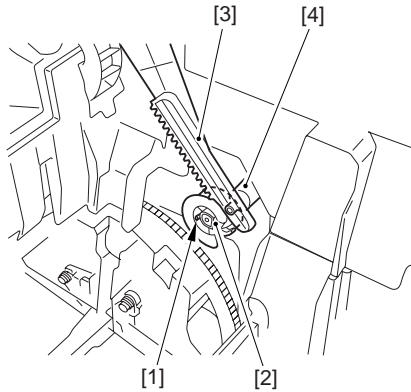
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-992

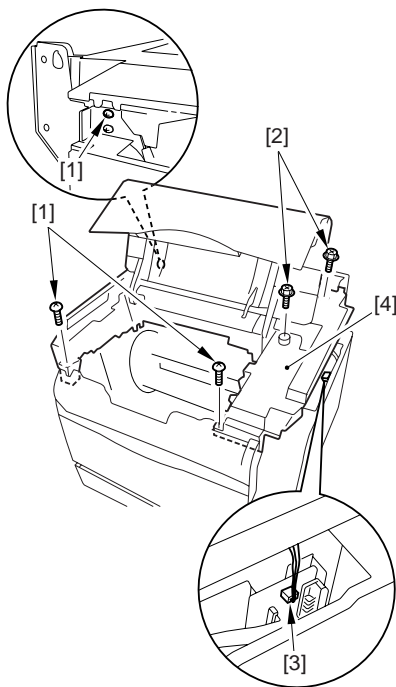
3.6.10.7 Removing the Top Cover

- 1) Remove the claw [1], and detach the ring gear [2].
- 2) Free the link lever [3] from the shaft [4].



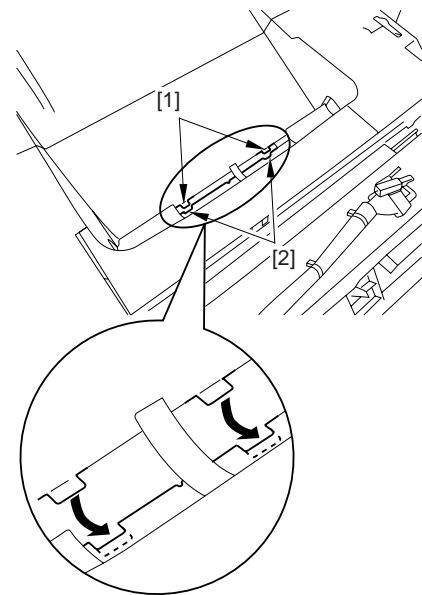
F-3-993

- 3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

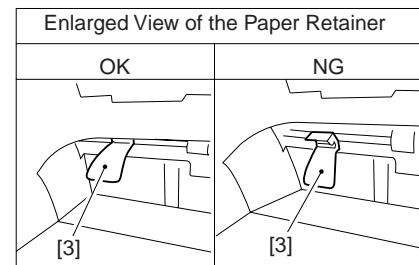


F-3-994

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



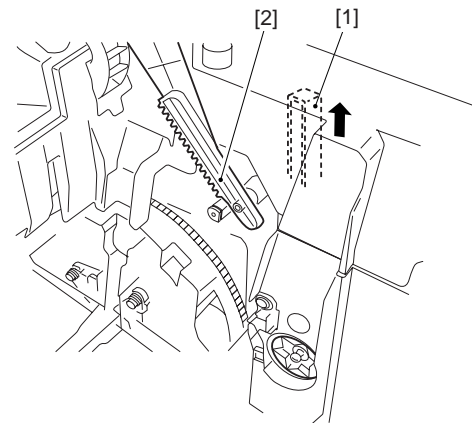
F-3-995



F-3-996



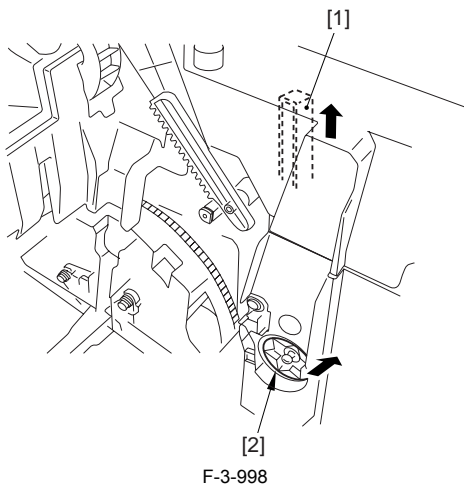
When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-997

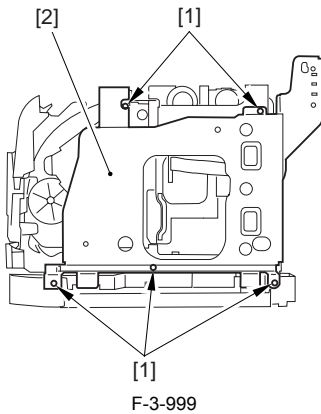


If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



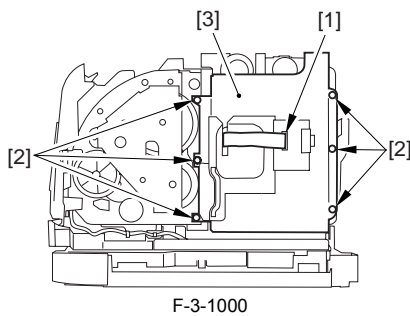
3.6.10.8 Removing the Right Frame

- 1) Remove the 5 screws [1], and detach the right frame [2].



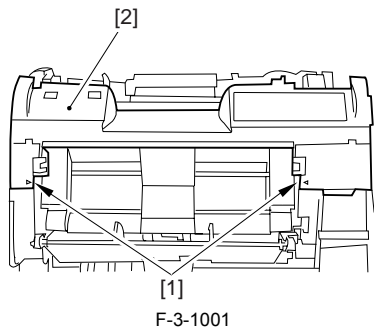
3.6.10.9 Removing the Shield Plate

- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



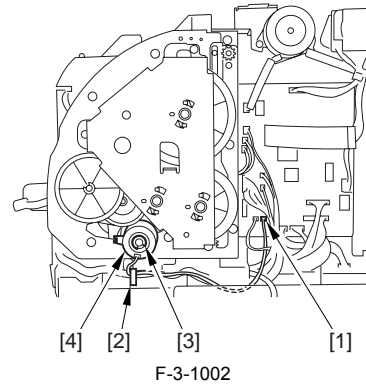
3.6.10.10 Removing the Inside Cover

- 1) Remove the 2 claws [1], and detach the inside cover [2].



3.6.10.11 Removing the Registration Clutch

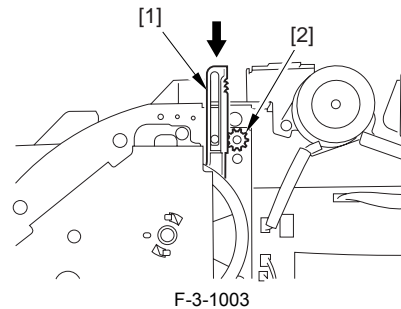
- 1) Disconnect the connector [1], and open the harness band [2].
- 2) Remove the E-ring [3], and detach the registration clutch [4].



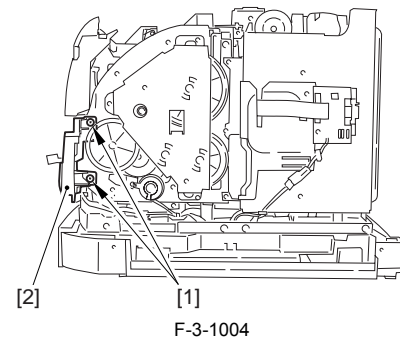
The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

3.6.10.12 Removing the Main Drive Assembly

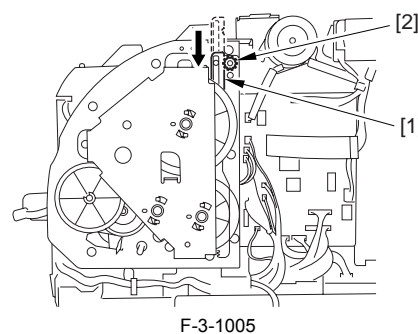
- 1) Shift down the drive release lever [1], and remove the gear [2].



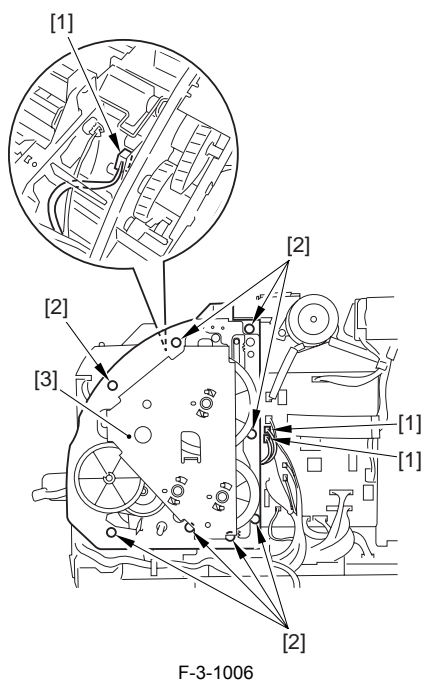
- 2) Remove the 2 screws [1], and detach the front sub cover [2].



When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



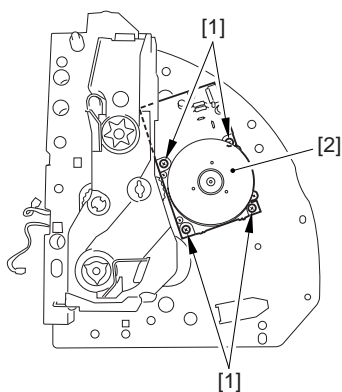
- 3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].



F-3-1006

3.6.10.13 Removing the Main Motor

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



F-3-1007

3.7 FIXING SYSTEM

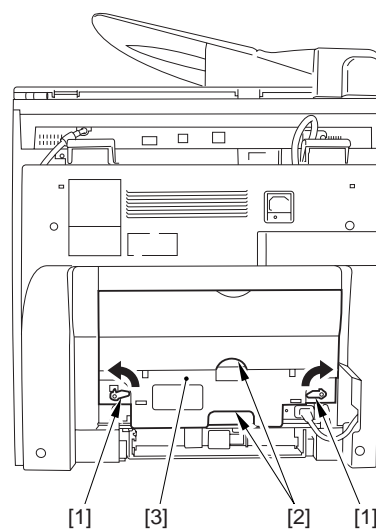
3.7.1 Fixing Unit

3.7.1.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-1008

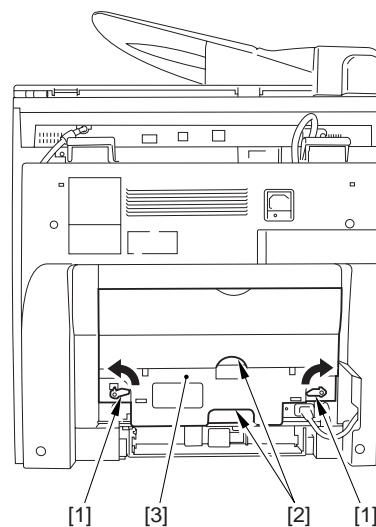
3.7.2 Fixing Film Unit

3.7.2.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



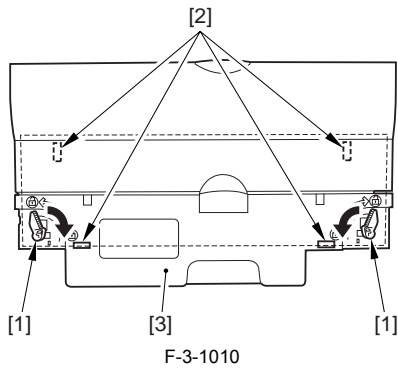
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-1009

3.7.2.2 Removing the Face-Up Cover

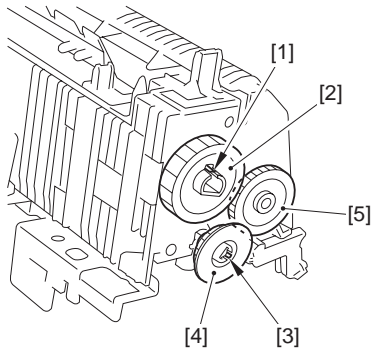
- 1) Turn the fixing lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) Remove the 4 claws [2], and detach the face-up cover [3] from the fixing assembly.



F-3-1010

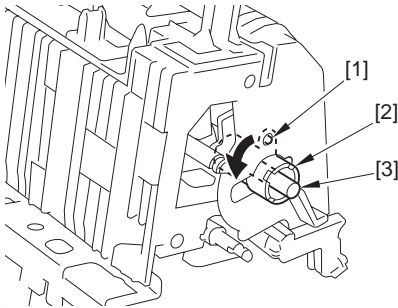
3.7.2.3 Removing the Fixing Film Unit

- 1) Unhook the 1 claw [1] and remove the pressure roller gear [2].
- 2) Unhook the 1 claw [3] and remove the delivery roller gear [4].
- 3) Remove the idle gear [5].



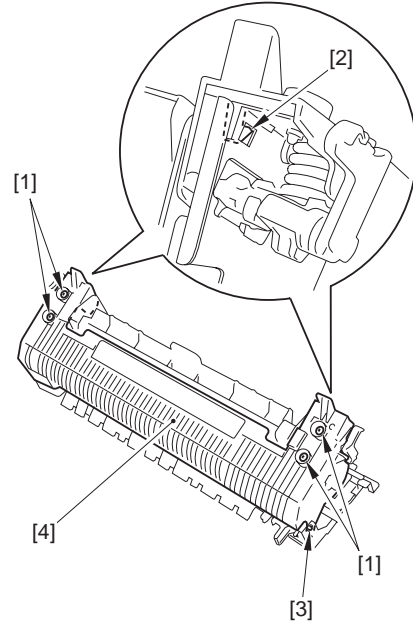
F-3-1011

- 4) Pressing the boss [1] inward, rotate the delivery idle gear shaft holder [2] in the direction of the arrow and remove the holder together with the delivery idle gear shaft [3].



F-3-1012

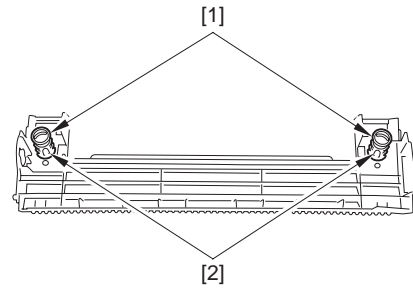
- 5) Remove the 4 screws [1]; then, remove the 2 claws [2] and the boss [3] to detach the fixing upper cover [4].



F-3-1013

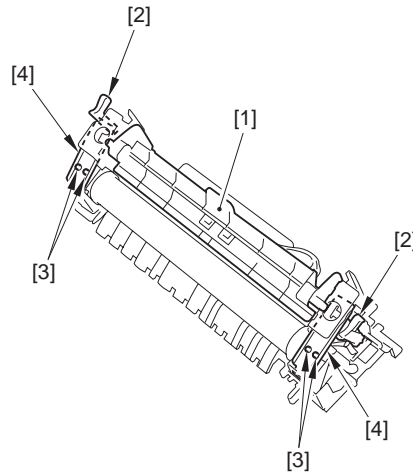


Make sure that the 2 springs are fitted onto the bosses on the fixing upper cover when reassembling the cover. See the figure for the correct positions of the boss and springs (shown on the left).



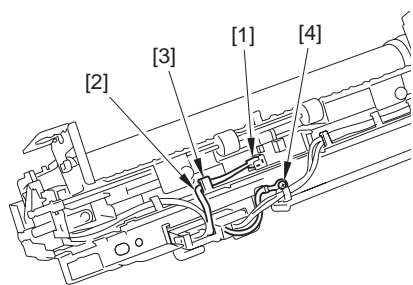
F-3-1014

- 6) Remove the upper separation guide [1].
- 7) Remove the 2 releasing levers [2].
- 8) Slide the pressure plate [4] in upward direction, and remove the 2 bosses [3].
- 9) Remove the pressure plate [4] from the fixing assembly.



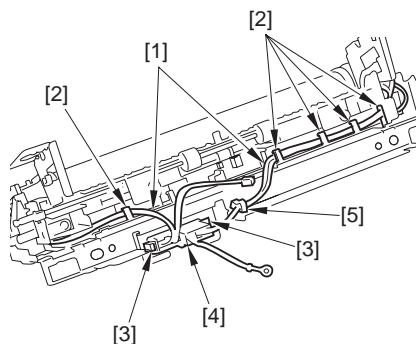
F-3-1015

- 10) Disconnect the connector [1], and free the cable [2] from the clamp [3].
- 11) Remove the screw [4].



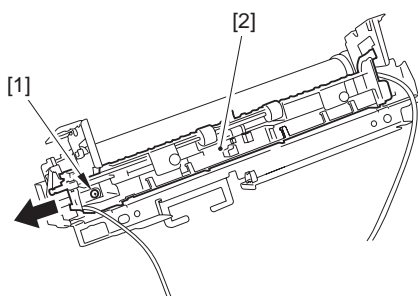
F-3-1016

- 12) Remove the cable [1] from the guide [2].
- 13) Remove the 2 claws [4], and disconnect the connector [3].
- 14) Free the cable from the edge saddle [5].



F-3-1017

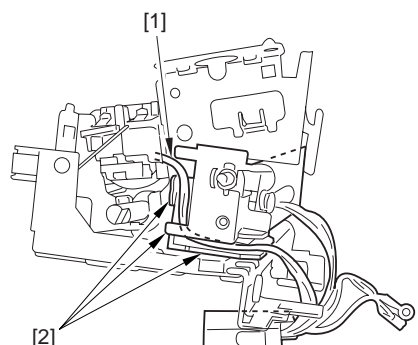
- 15) Remove the 1 screw [1] and slide the fixing separation guide [2] out to the left.



F-3-1018

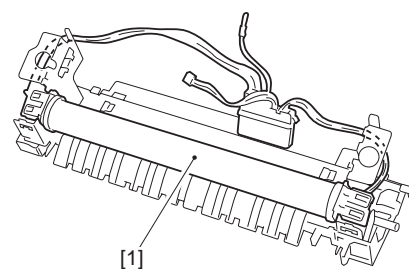


Make sure that all cables on the fixing film unit are hooked into the fixing separation guide when reassembling the guide. Especially the right-side cables are easy to be pinched unless properly hooked into the guide.



F-3-1019

- 16) Lift the fixing film unit [1] up straight in horizontal position to take it out of the fixing unit.



F-3-1020

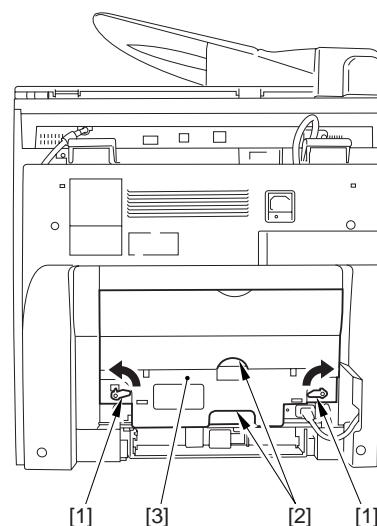
3.7.3 Fixing Pressure Roller

3.7.3.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



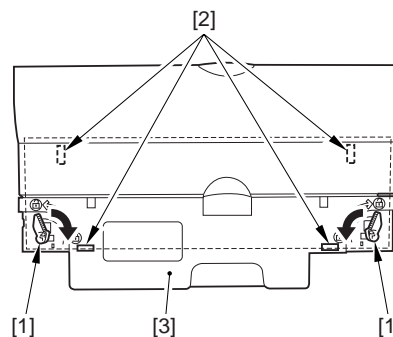
Whenever you have to replace the fixing assembly, be sure to disconnect the power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-1021

3.7.3.2 Removing the Face-Up Cover

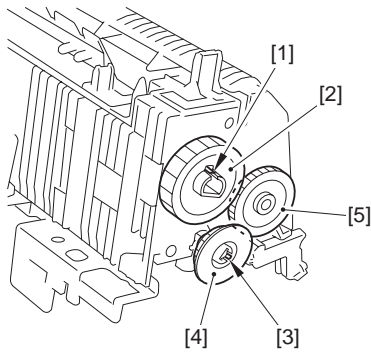
- 1) Turn the fixing lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) Remove the 4 claws [2], and detach the face-up cover [3] from the fixing assembly.



F-3-1022

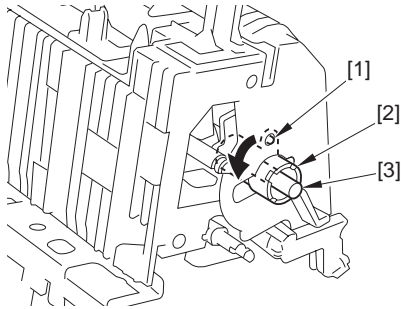
3.7.3.3 Removing the Fixing Film Unit

- 1) Unhook the 1 claw [1] and remove the pressure roller gear [2].
- 2) Unhook the 1 claw [3] and remove the delivery roller gear [4].
- 3) Remove the idle gear [5].



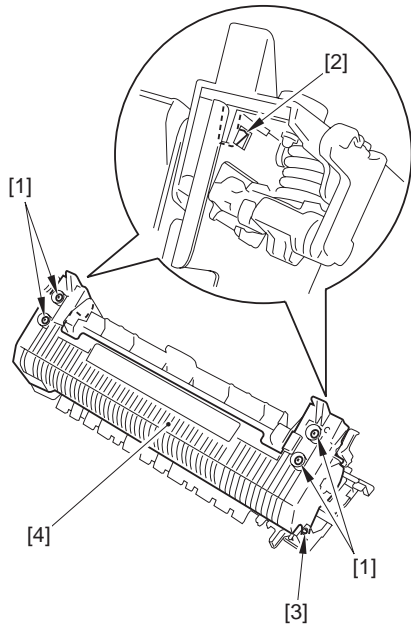
F-3-1023

- 4) Pressing the boss [1] inward, rotate the delivery idle gear shaft holder [2] in the direction of the arrow and remove the holder together with the delivery idle gear shaft [3].



F-3-1024

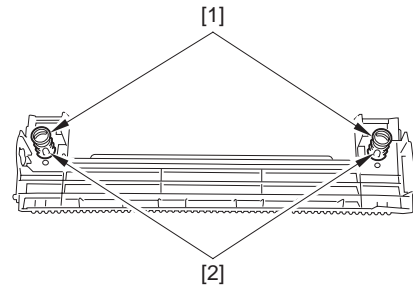
- 5) Remove the 4 screws [1]; then, remove the 2 claws [2] and the boss [3] to detach the fixing upper cover [4].



F-3-1025

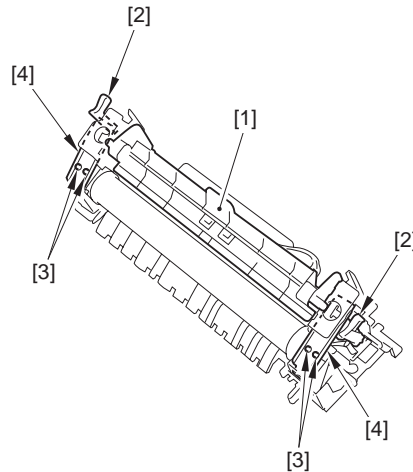


Make sure that the 2 springs are fitted onto the bosses on the fixing upper cover when reassembling the cover. See the figure for the correct positions of the boss and springs (shown on the left).



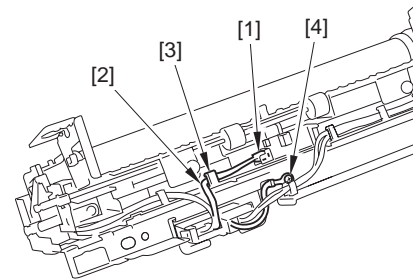
F-3-1026

- 6) Remove the upper separation guide [1].
 7) Remove the 2 releasing levers [2].
 8) Slide the pressure plate [4] in upward direction, and remove the 2 bosses [3].
 9) Remove the pressure plate [4] from the fixing assembly.



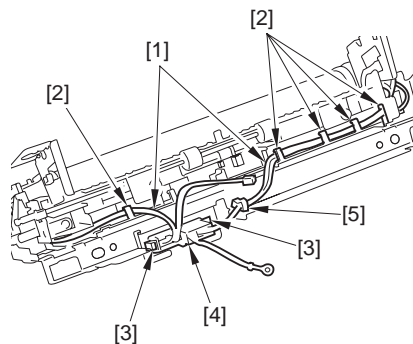
F-3-1027

- 10) Disconnect the connector [1], and free the cable [2] from the clamp [3].
 11) Remove the screw [4].



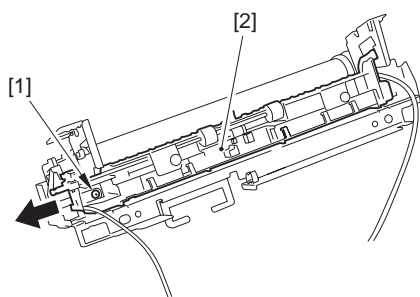
F-3-1028

- 12) Remove the cable [1] from the guide [2].
 13) Remove the 2 claws [4], and disconnect the connector [3].
 14) Free the cable from the edge saddle [5].



F-3-1029

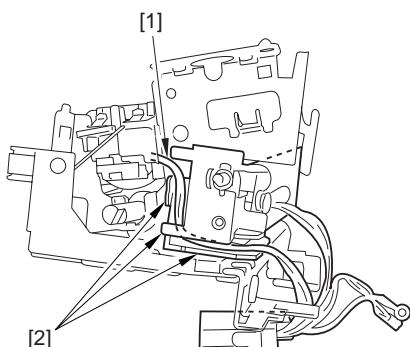
- 15) Remove the 1 screw [1] and slide the fixing separation guide [2] out to the left.



F-3-1030

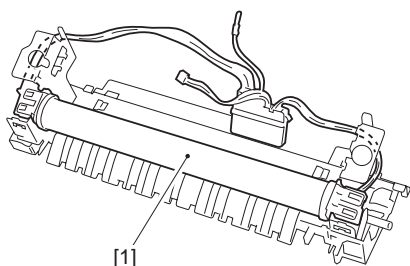


Make sure that all cables on the fixing film unit are hooked into the fixing separation guide when reassembling the guide. Especially the right-side cables are easy to be pinched unless properly hooked into the guide.



F-3-1031

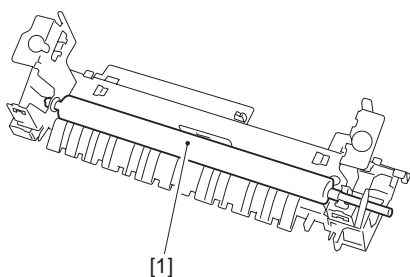
16) Lift the fixing film unit [1] up straight in horizontal position to take it out of the fixing unit.



F-3-1032

3.7.3.4 Removing the Fixing Pressure Roller

1) Remove the pressure roller [1] from the fixing unit.



F-3-1033

3.7.4 Fixing Delivery Paper Sensor

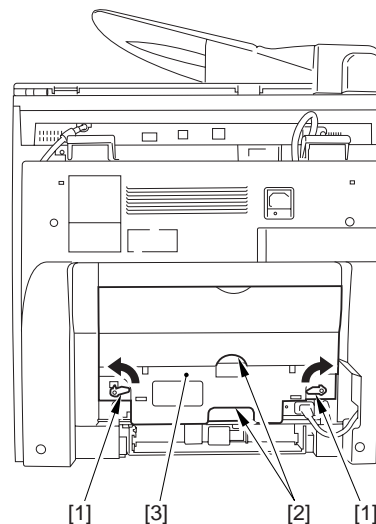
3.7.4.1 Removing the Fixing Assembly

- 1) Turn the lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) While holding the grip [2], slide out the fixing assembly [3] toward the front and out of the machine.



Whenever you have to replace the fixing assembly, be sure to disconnect the

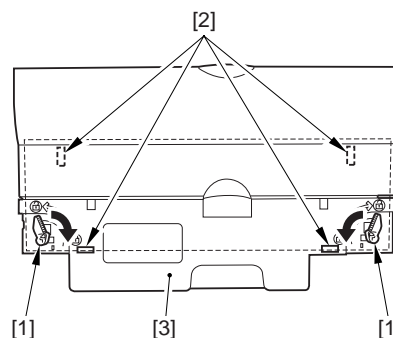
power cord first. Also, be sure to wait until the fixing assembly has cooled before removing it after disconnecting the power cord.



F-3-1034

3.7.4.2 Removing the Face-Up Cover

- 1) Turn the fixing lever [1] of the fixing assembly 90 deg in the direction of the arrow.
- 2) Remove the 4 claws [2], and detach the face-up cover [3] from the fixing assembly.

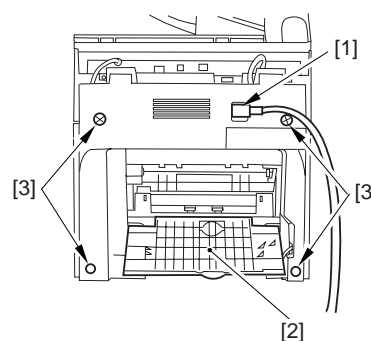


F-3-1035

3.7.5 Pre-Fixing Paper Detection Sensor

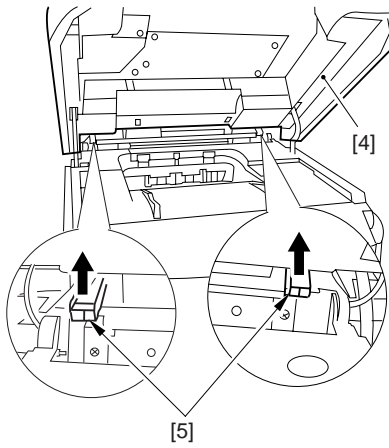
3.7.5.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.



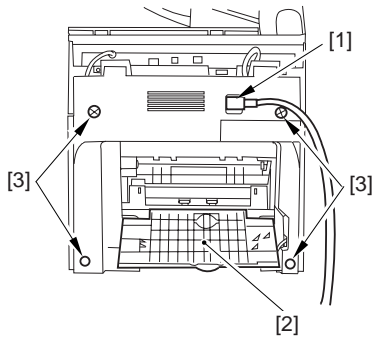
F-3-1036

- 3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-1037

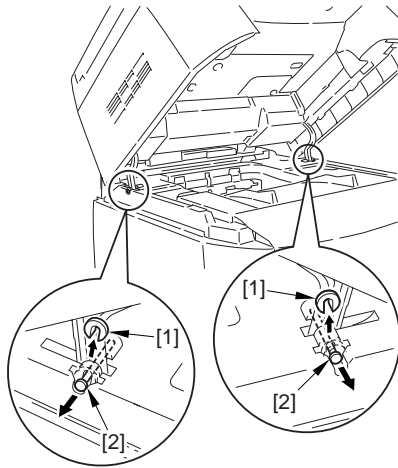
4) Close the reader assembly; then, detach the rear cover[1].



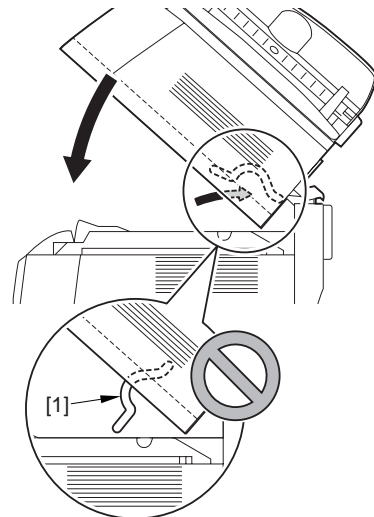
F-3-1038

3.7.5.2 Removing the Reader Assembly

1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].

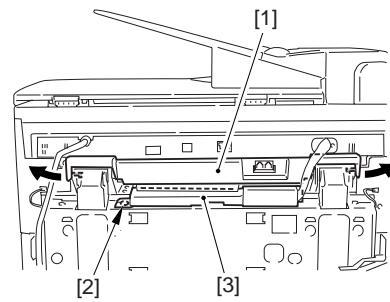


F-3-1039



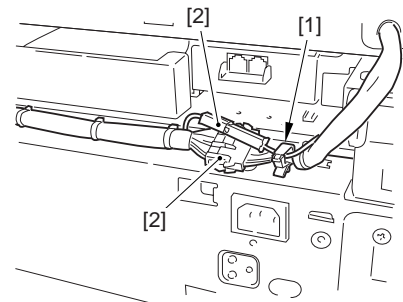
F-3-1040

- 2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
- 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



F-3-1041

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.

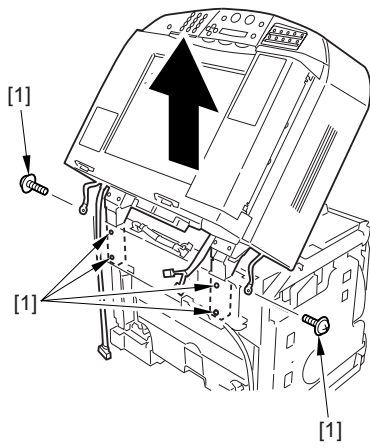


F-3-1042

5) Remove the 6 screws [1], and lift the reader unit to detach.



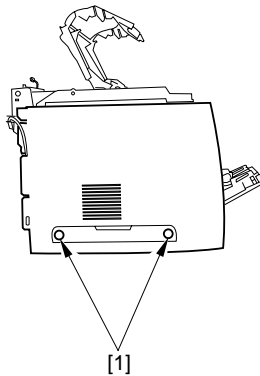
When closing the reader assembly, be sure to push in the arm [1] first.



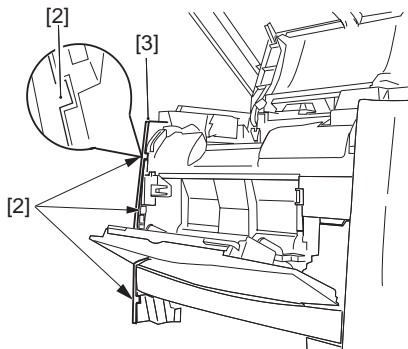
F-3-1043

3.7.5.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



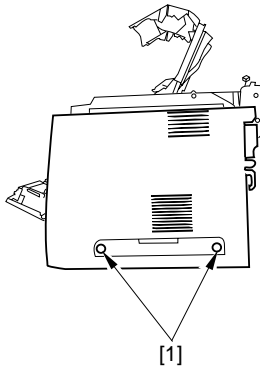
F-3-1044



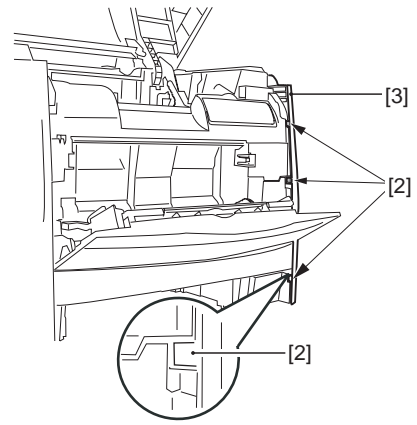
F-3-1045

3.7.5.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



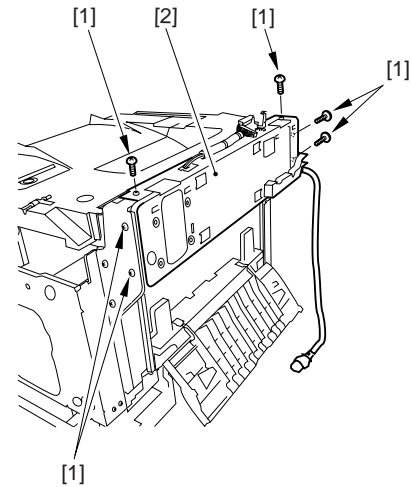
F-3-1046



F-3-1047

3.7.5.5 Removing the Power Supply Assembly

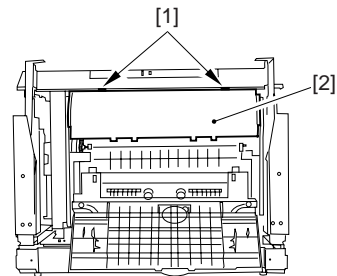
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-1048

3.7.5.6 Removing the Face-Down Cover

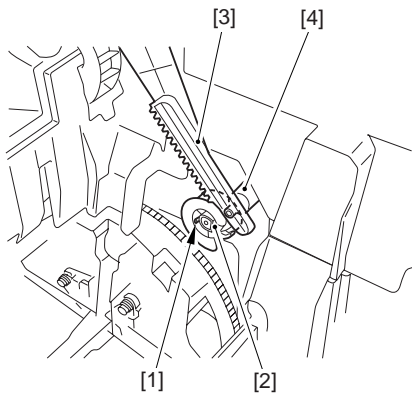
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-1049

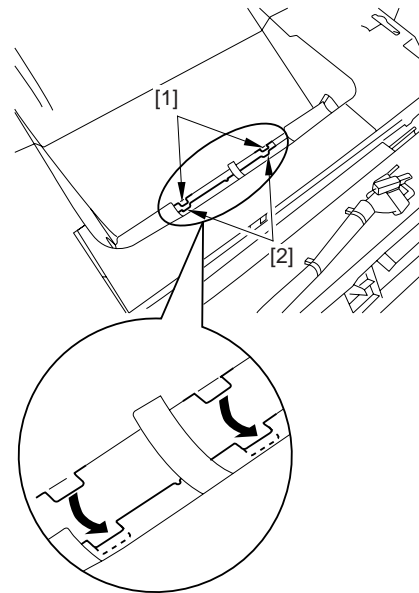
3.7.5.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

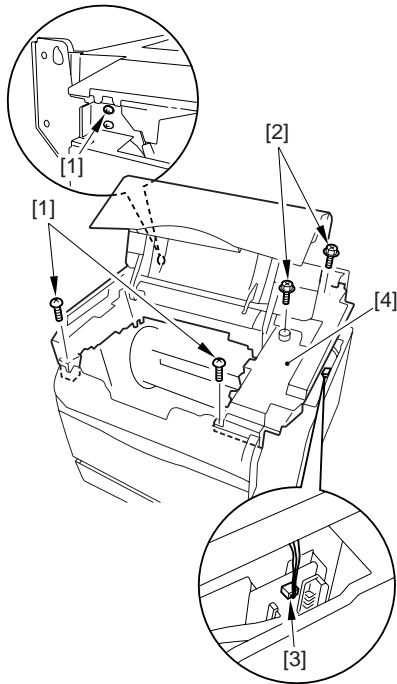


F-3-1050

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

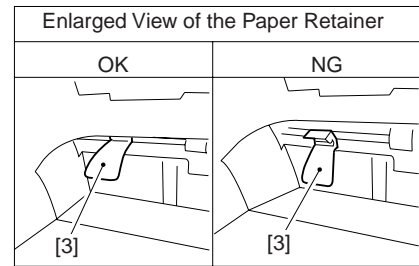


F-3-1052



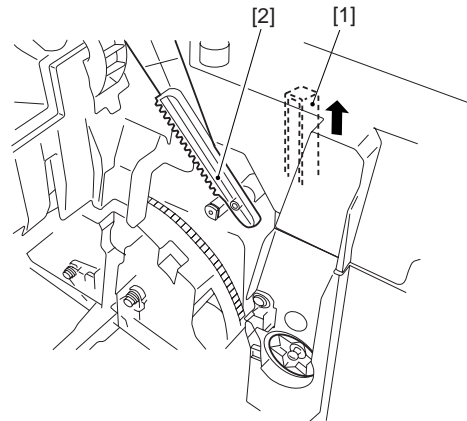
F-3-1051

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



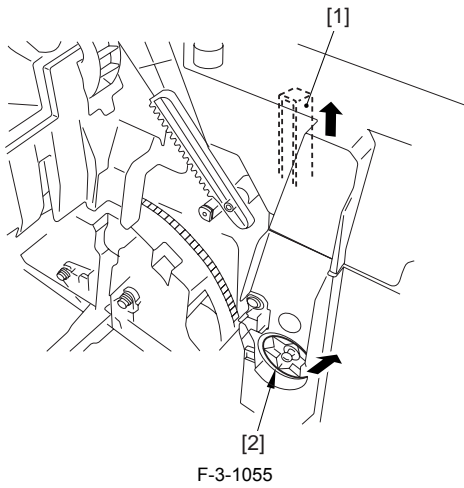
F-3-1053

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



F-3-1054

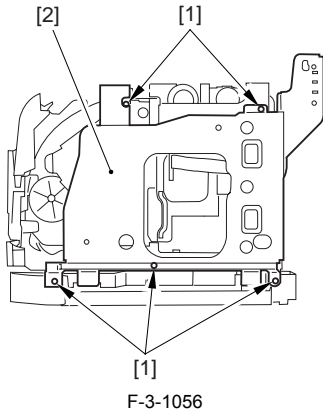
! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



F-3-1055

3.7.5.8 Removing the Right Frame

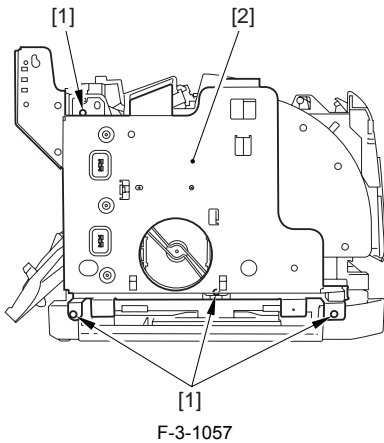
1) Remove the 5 screws [1], and detach the right frame [2].



F-3-1056

3.7.5.9 Removing the Left Frame

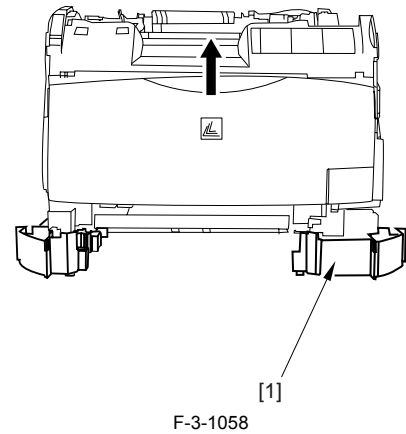
1) Remove the 4 screws [1], and detach the left frame [2].



F-3-1057

3.7.5.10 Removing the Cassette Feeder

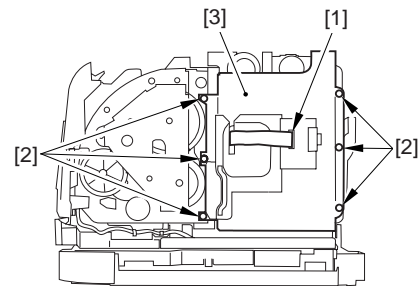
1) Lift the machine, and detach the cassette feeder [1].



F-3-1058

3.7.5.11 Removing the Shield Plate

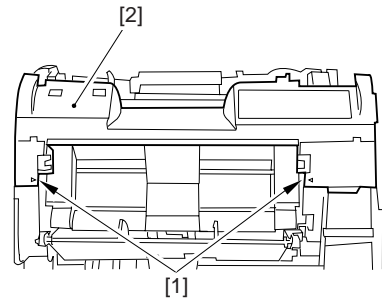
1) Free the flat cable [1] from the connector.
2) Remove the 6 screws [2], and detach the shielding plate [3].



F-3-1059

3.7.5.12 Removing the Inside Cover

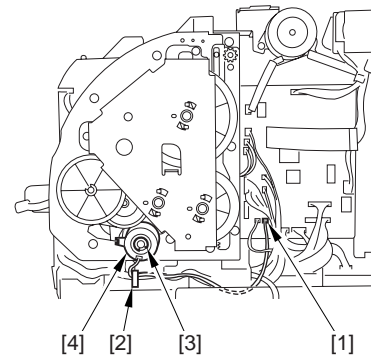
1) Remove the 2 claws [1], and detach the inside cover [2].



F-3-1060

3.7.5.13 Removing the Registration Clutch

1) Disconnect the connector [1], and open the harness band [2].
2) Remove the E-ring [3], and detach the registration clutch [4].

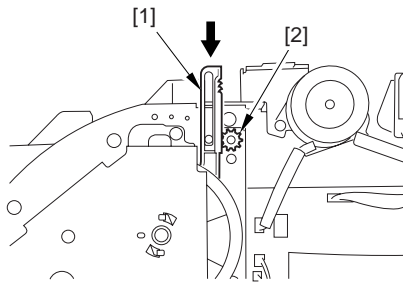


F-3-1061

! The connector on the registration clutch side is designed to prevent disconnection. If you have to detach the registration clutch, be sure to disconnect the connector (J113) on the DC controller PCB side.

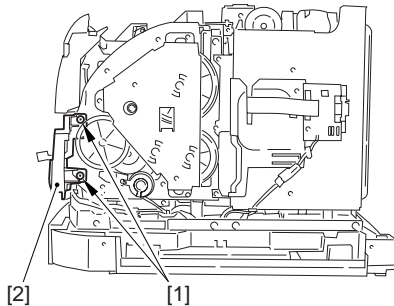
3.7.5.14 Removing the Main Drive Assembly

1) Shift down the drive release lever [1], and remove the gear [2].



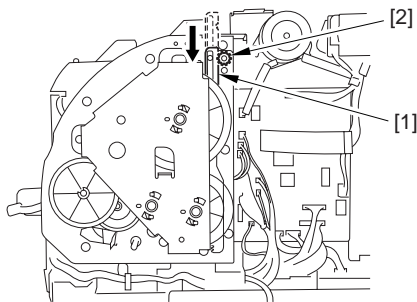
F-3-1062

2) Remove the 2 screws [1], and detach the front sub cover [2].



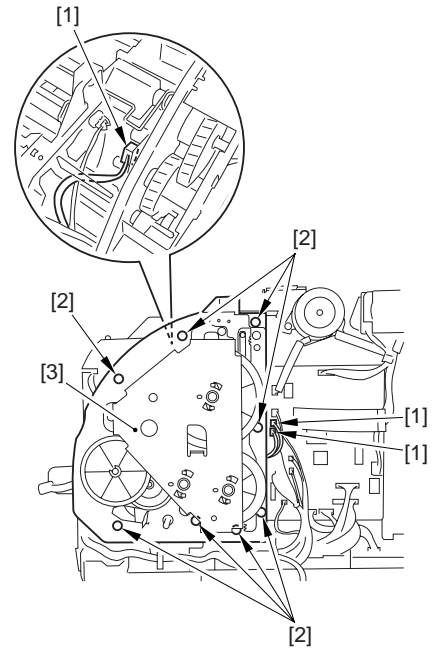
F-3-1063

! When mounting the main drive assembly, be sure to fit the gear [2] as shown with the drive release lever [1] in down position (i.e., with drive engaged). At this time, be sure that the position of the gear is correct so that it is fully engaged with the gear of the drive release lever.



F-3-1064

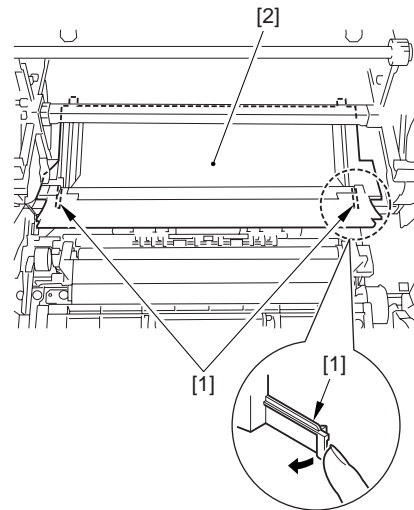
3) Disconnect the 3 connectors [1], and remove the 8 screws [2]; then, detach the main drive assembly [3].



F-3-1065

3.7.5.15 Removing the Toner Tray

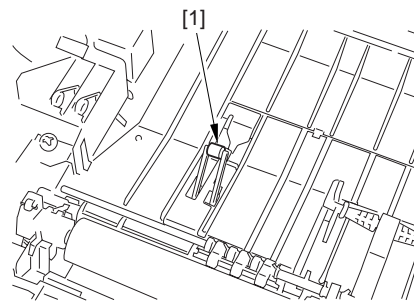
1) Remove the 2 claws [1], and detach the toner tray [2].



F-3-1066

3.7.5.16 Removing the Fixing Front Paper Sensor Spacer

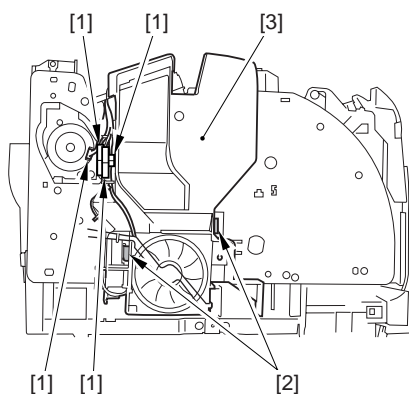
1) Remove the fixing front paper sensor spacer [1].



F-3-1067

3.7.5.17 Removing the Fan Duct

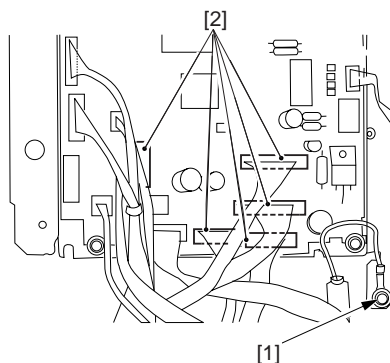
1) Disconnect the 4 connectors [1], and remove the 2 claws [2].
2) Slide the fan duct [3] in upward direction to detach.



F-3-1068

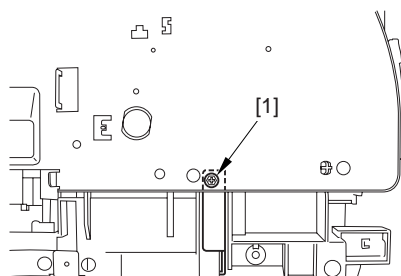
3.7.5.18 Removing the Lower Case Assembly

- 1) Remove the screw [1], and disconnect the 5 connectors [2].



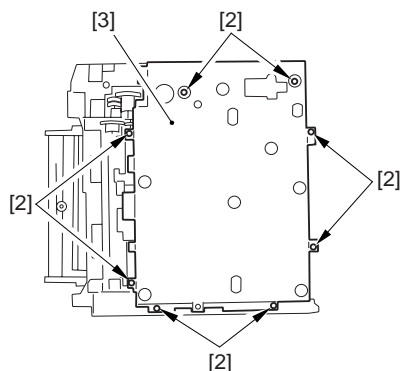
F-3-1069

- 2) Remove the screw [1] from the left side of the machine.



F-3-1070

- 3) With care, shift down the machine to the left; then, remove the 8 screws [2] from the bottom, and detach the lower case assembly [3].



F-3-1071

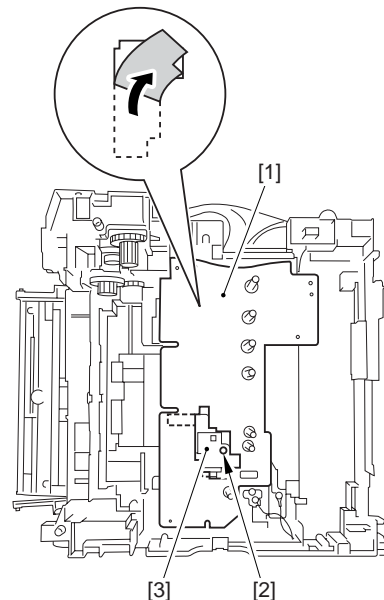
down the machine.



If you must detach the lower case assembly, base user to hold it by its bottom so as to avoid injury by the edge of its side plate.

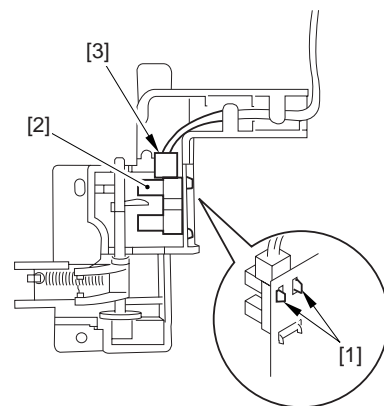
3.7.5.19 Removing the Fixing Front Paper Sensor

- 1) Bend over the plastic sheet [1].
- 2) Remove the screw [2], and detach the fixing front paper sensor assembly [3].



F-3-1072

- 3) Remove the 2 claws [1], and detach the fixing front paper sensor [2]; then, disconnect heat connector [3].



F-3-1073

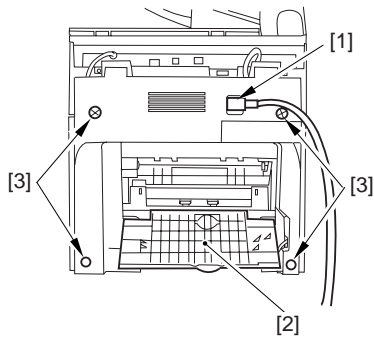
3.7.6 Fixing Motor

3.7.6.1 Removing the Rear Cover

- 1) Disconnect the cable [1] of the power supply assembly.
- 2) Open the face-up cover [2], and remove the 4 screws [3] of the rear cover.

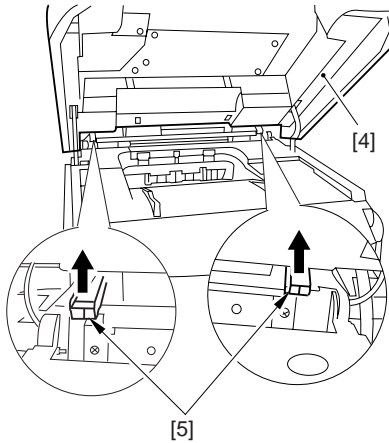


When you shift down the machine, be sure to take care to avoid injury by the edge of the side plate. Also, be sure to hold it by its grip segment. Be sure to place a cushioning material (g., towel) on the work table to protect the protrusions of the machine from damage. Moreover, be sure to tape the opening of the laser scanner assembly to prevent intrusion of toner in the optical path of the assembly before shifting



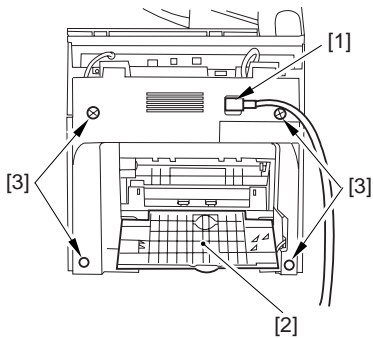
F-3-1074

3) Open the reader assembly [4], and lift to free the 2 claws [5].



F-3-1075

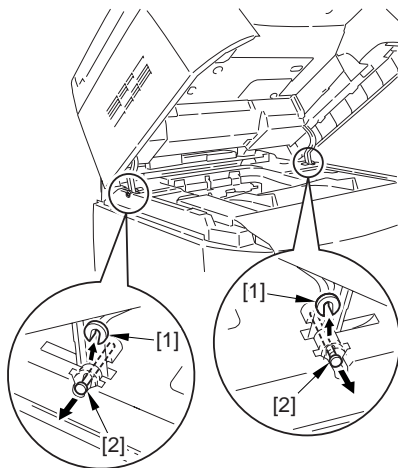
4) Close the reader assembly; then, detach the rear cover [1].



F-3-1076

3.7.6.2 Removing the Reader Assembly

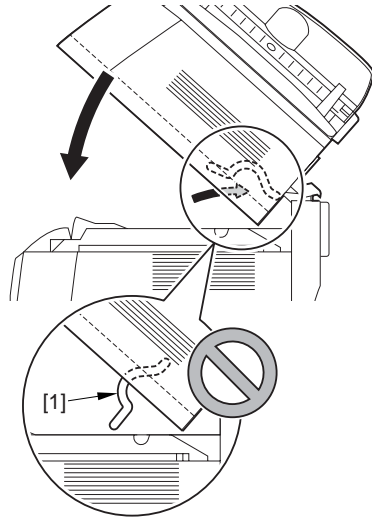
1) Open the reader assembly, and remove the left and right E-rings [1]; then, pull out the pin [2].



F-3-1077

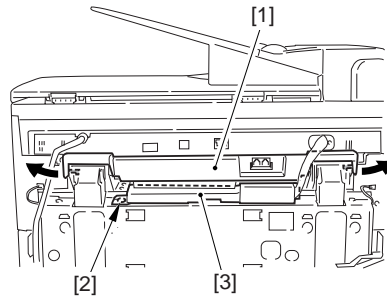


When closing the reader assembly, be sure to push in the arm [1] first.



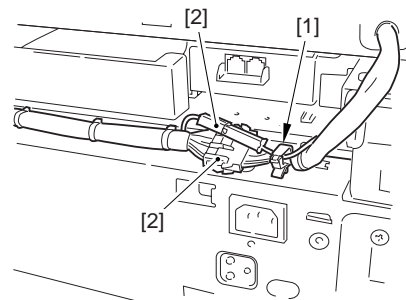
F-3-1078

2) Open the left and right claws in the direction of the arrows, and detach the hinge cover [1].
 3) Free the 2 harness bands [1], and disconnect the 2 cables [2] connected to the reader assembly.



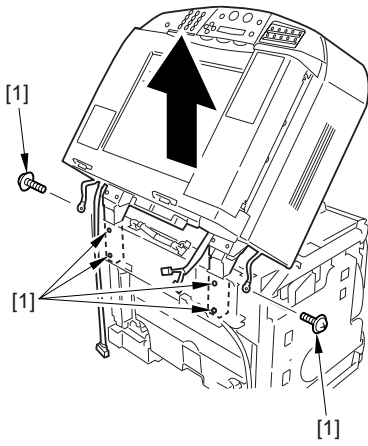
F-3-1079

4) Open the harness band [1], and disconnect the 2 cables connected to the reader assembly.



F-3-1080

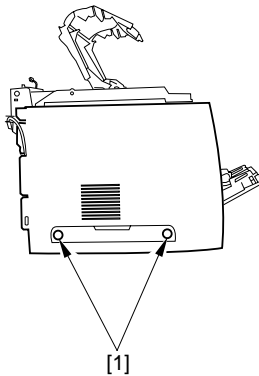
5) Remove the 6 screws [1], and lift the reader unit to detach.



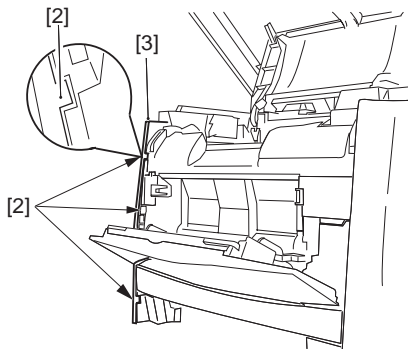
F-3-1081

3.7.6.3 Removing the Right Cover

1) Remove the 2 screws [1] of the side, then, remove the 3 claws [2] to detach the left cover [3].



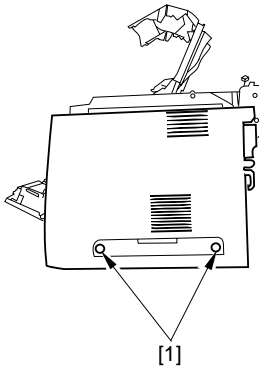
F-3-1082



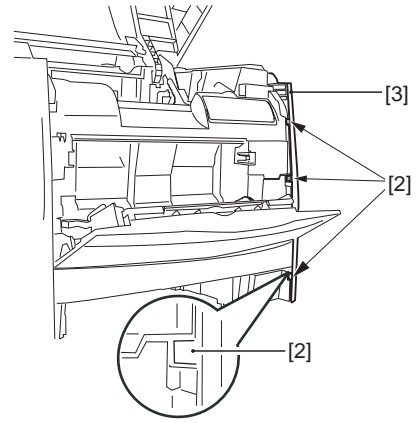
F-3-1083

3.7.6.4 Removing the Left Cover

1) Remove the 2 screws [1] from the side, then, remove the 3 claws [2] to detach the right cover [3].



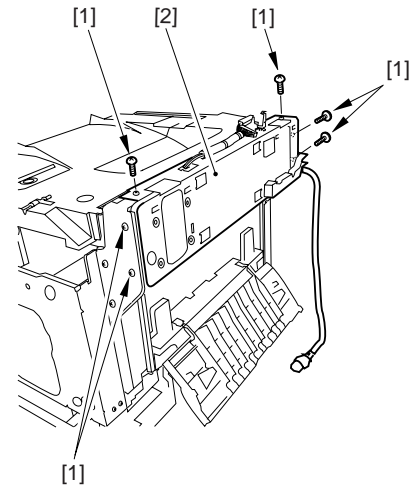
F-3-1084



F-3-1085

3.7.6.5 Removing the Power Supply Assembly

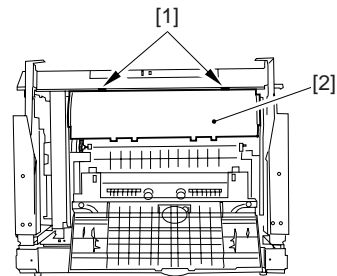
1) Remove the 6 screws [1], and detach the power supply assembly [2].



F-3-1086

3.7.6.6 Removing the Face-Down Cover

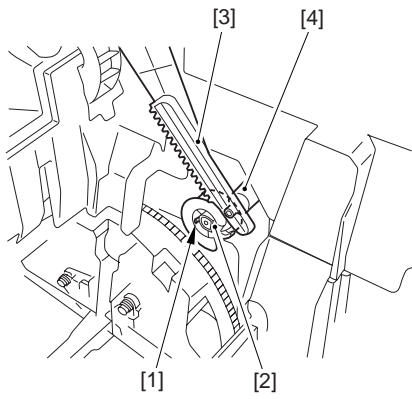
1) Remove the 2 screws [1], and slide the face-down cover [2] in downward direction to detach.



F-3-1087

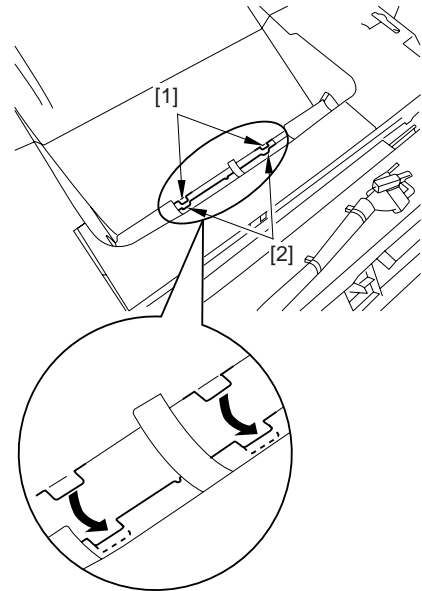
3.7.6.7 Removing the Top Cover

1) Remove the claw [1], and detach the ring gear [2].
2) Free the link lever [3] from the shaft [4].

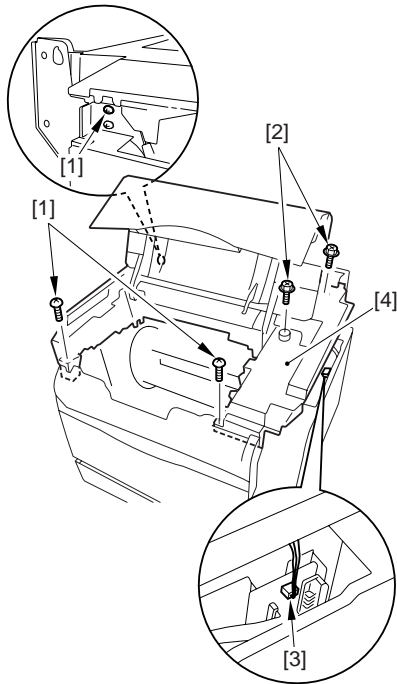


F-3-1088

3) Remove the 3 binding screws [1] and 2 TP screws [2]; then, disconnect the connector [3], and detach the top cover [4].

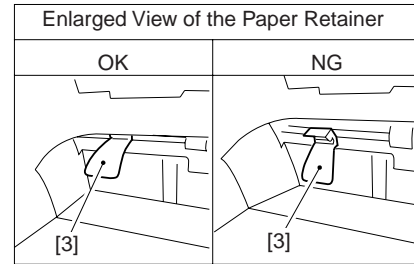


F-3-1090



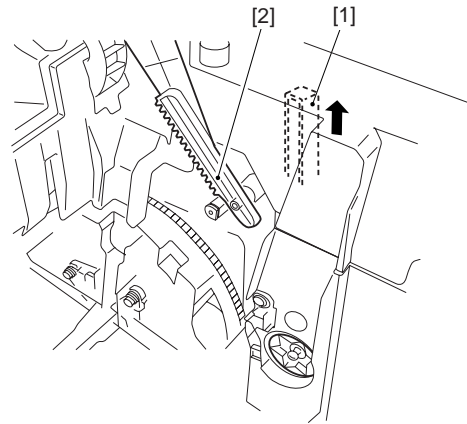
F-3-1089

! When attaching the top cover, be sure to match its 2 positioners [1] and the 2 cut-offs [2] of the face-down sub cover, while making sure that the paper retainer [3] is not blocking the feed path.



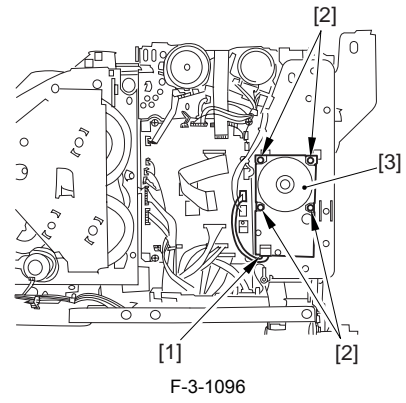
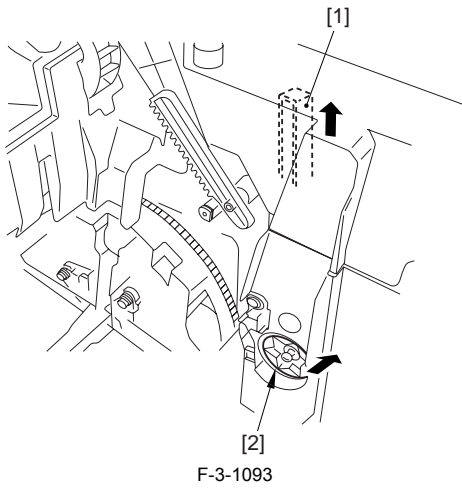
F-3-1091

! When attaching the top cover, be sure to fit the link lever [2] while keeping the drive release lever [1] in up position (i.e., with drive disengaged).



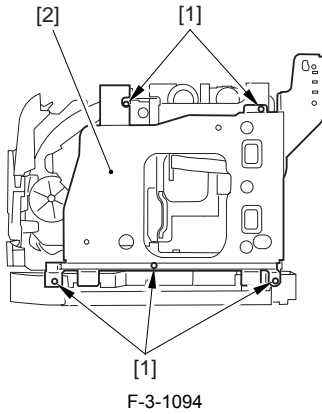
F-3-1092

! If you are fitting the drum cartridge in the machine with the top cover removed, be sure to do so with the drive release lever [1] fully in up position (i.e., with drive disengaged). If the drive release lever is in low position (i.e., with drive engaged), it forces out the coupling [2], causing the coupling to interface with the drum cartridge and to suffer damage.



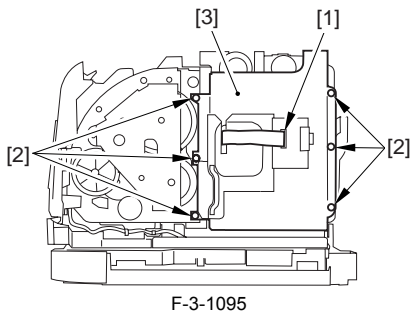
3.7.6.8 Removing the Right Frame

- 1) Remove the 5 screws [1], and detach the right frame [2].



3.7.6.9 Removing the Shield Plate

- 1) Free the flat cable [1] from the connector.
- 2) Remove the 6 screws [2], and detach the shielding plate [3].



3.7.6.10 Removing the Fixing Motor

- 1) Unplug the 1 connector [1] and remove the 4 screws [2].
- 2) Remove the fixing motor [3] from main unit.

Chapter 4 MAINTENANCE AND INSPECTION

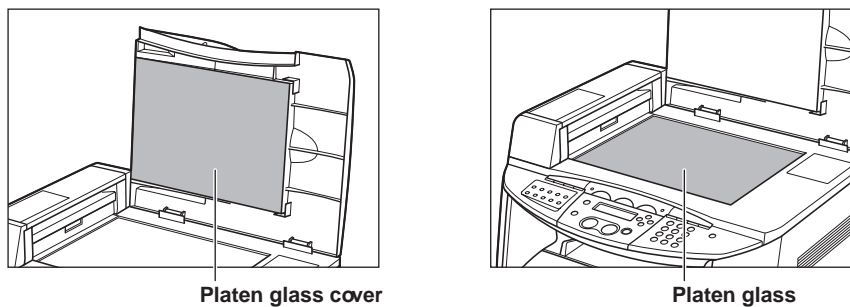
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4.1 User Maintenance

4.1.1 Cleaning the Scanning Area

Wipe the scanning area (shaded area) with a clean, soft, lint-free cloth moistened with water, then wipe with a clean, soft, dry, lint-free cloth.

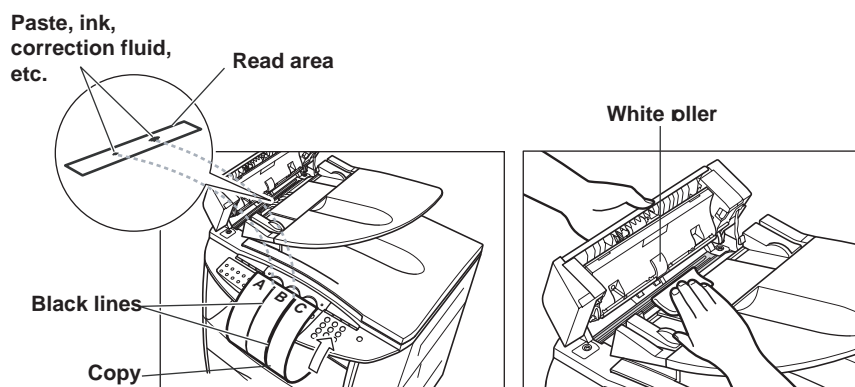


F-4-1

4.1.2 Cleaning the ADF Area

Black lines may appear in copies when the ADF is used to feed documents. This is caused by paste, ink, correction fluid, or other foreign matters in the read area of the platen glass (shaded area). Use a clean soft cloth to wipe the read area clean. Take particular care to clean at the locations where the black lines are appearing on copies.

If you have trouble getting the glass clean, wipe with a cloth moistened with water or a mild neutral detergent, and then wipe the glass dry with another cloth.



F-4-2

4.1.3 Toner Cartridge

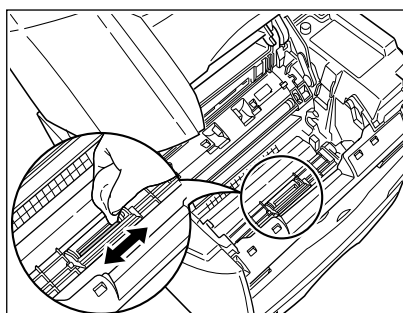
Replace it as necessary.

4.1.4 Drum Cartridge

Replace it as necessary.

4.1.5 Mylar Sheet

If necessary, clean the mylar sheet with a firmly squeezed wet soft cloth.



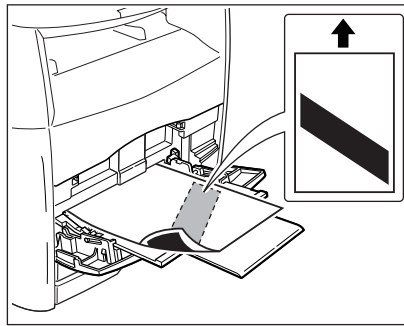
F-4-3

4.1.6 Pressure Roller (fixing assembly)

The following is a procedure for cleaning the pressure roller.

- 1) Open the multifeeder tray.
- 2) Open the face-up delivery tray.
- 3) Place a sheet of A4 or LTR paper in the multifeeder tray.
- 4) Press [menu] on the control panel, and make the following selections: 10. maintenance > 3. roller cleaning > 2. cleaning paper print. Then, press [OK] to print out a cleaning paper.
- 5) Place the cleaning page from step 4) in the multifeeder with the printed side facing downward and in the direction of the arrow.

6) Press [menu] on the control panel, and make the following selections: 10. maintenance>3. roller cleaning>2. start cleaning. Then, press [OK] to start cleaning.



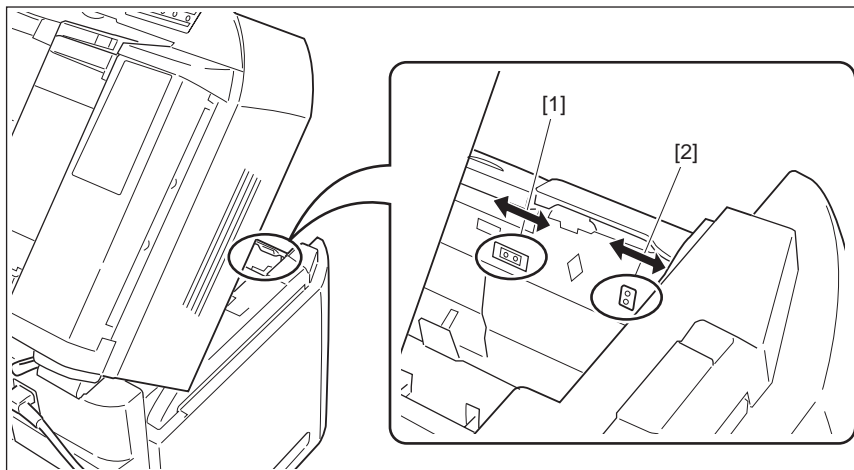
F-4-4



- Take care. Once the machine starts cleaning, you will not be able to stop it in the middle.
- It take about 3 min to clean the fixing assembly (i.e., from when you have placed the cleaning paper in the manual feed tray to when the paper is delivered). Do not turn off the power or open the cover during this period of time.

4.1.7 Density Sensor/ITB Home Position Sensor

When replacing the drum cartridge or contamination is found in the printer, clean the detection windows of the density detection sensor, as well as of the ITB home position detection sensor.



F-4-5

T-4-1

- [1] Density sensor
- [2] ITB home position sensor



The printer may indicate an image defect when density detection sensor or the ITB home position detection sensor is not clean. In these cases, clean the detection windows according to the procedures shown above.

4.2 Periodically Replaced Parts

4.2.1 Periodic Replacement Parts

- No parts require periodic replacement in this printer.

4.3 Consumables

4.3.1 Expected Service Life of Consumable Parts

- Some parts of the machine are likely to require replacement once or more because of wear or damage. Replace them when they are found to be faulty by referring to the following table:

Timing of Replacing the Fixing Assembly

When the fixing assembly starts to approach the end of its life, you are likely to see ghost images in non-image areas of printouts or may notice general lowering of print quality (e.g., because of poor fixing). Paper may also start to wrinkle. You may need to replace the fixing assembly when these symptoms start to occur.

T-4-2

No.	Parts name	Parts No.	Q'ty	Estimated life
1	Fixing assembly(230V)	RG5-7442-000	1	50,000 prints

4.4 Periodical Service

4.4.1 Periodic Service

The printer has no parts that require periodic servicing.

Chapter 5 TROUBLESHOOTING

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5.1 Measurement and Adjustment

5.1.1 Initial Checkup

5.1.1.1 Initial Check

Check the following items before you diagnose malfunction. If any failure is found, a service engineer is to clear the problem and to give the instruction to a user.

1) Installation environment

- The power voltage is $\pm 10\%$ of the rated voltage.
- The printer is securely installed on a level surface.
- The room temperature is kept between 10 and 30 deg C, and the relative humidity, between 10 and 80 %.
- Avoid sites generating ammonia gas, high temperature or high humidity (near water faucet, kettle, or humidifier), cold places, open flames, dusty area and sites the wind blows in from the air-conditioning duct.
- Avoid sites exposed to direct sunlight. If unavoidable, advise the customer to hang curtains.
- A well-ventilated place.
- Make sure that the power cord is inserted to the machine and the outlet securely.

2) Paper checks

- The recommended paper for the printer is used.
- Paper is not damp.
- Paper is not dirty.

3) Paper sets

- The amount of paper in the pick-up source is within specifications.
- Paper is correctly set on the selected pick-up source.
- The size guides are aligned with paper.

4) Cartridge sets

- Make sure the EP-87 toner cartridges in each color are set in the printer properly.
- Make sure the EP-87 drum cartridge is set in the printer properly.

5) Fixing unit sets

- Make sure the fixing unit is set in the printer properly.

6) External cover sets

- Make sure the top cover and memory cover are closed securely.

7) Condensation

During winter, if the printer is brought from a cold place such as a warehouse into a warm room, condensation will appear inside the printer, causing various problems.

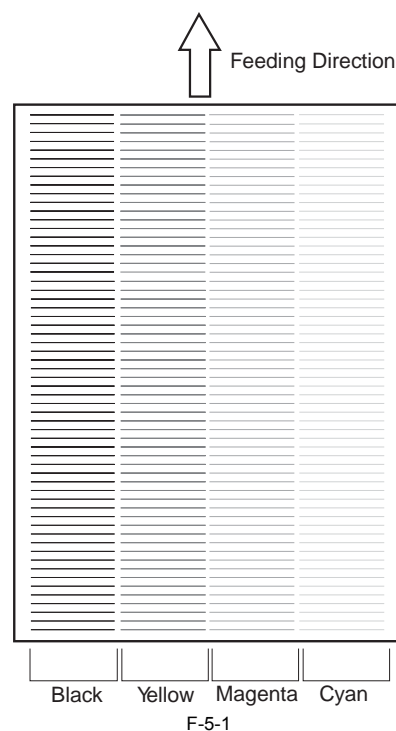
Ex.)

- Condensation in the optical system (four-sided mirror, reflective mirror, lens, etc.) will result in a light print image.
- As the photosensitive drum is cold, the resistance of the photoconductive layer is high; this will lead to incorrect contrast.
If condensation appears, either wipe the parts with dry cloth, or leave the printer on for 10 to 20 minutes.
If the toner cartridges are opened soon after being moved from a cold room to a warm room, condensation may appear inside the cartridge and may cause various problems.
Be sure to instruct the user that it is necessary to leave the printer for one to two hours at a room temperature to allow it to acclimatize to the temperature.

5.1.2 Test Printing

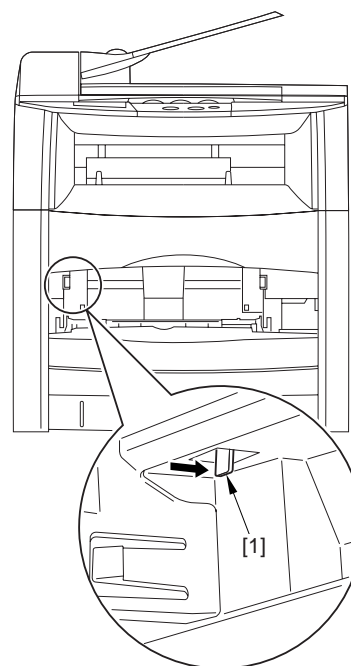
5.1.2.1 Test Print

The machine permits printing of engine test prints. Try printing out test prints so that you may use them for identifying the location of a printer error. In test printing, the machine prints out the following text pattern in 4 colors (magenta, cyan, yellow, black):



To Print out Engine Test Prints

- When the machine is in a standby state, press [COLOR START KEY] on the control panel to generate a color print.
- Open the machine's manual feed tray, and press the test print switch [1] found on the front left to generate a single test pattern.



F-5-2

5.1.3 Electrical Adjustment

5.1.3.1 Work After Replacing the Laser/Scanner Unit

The flash ROM mounted on the SCNT board retains PWM adjustment settings that are specific to individual laser/scanner units, requiring you to update the settings whenever you have replaced a laser/scanner unit. Be sure to execute PWM adjustment in service mode, thereby updating the PWM settings retained in the flash ROM on the SCNT board.

Executing PWM Adjustment

- Press [MENU] and then [#] to enter service mode.
- Go to [#TEXT MODE], and press [OK] and [*] in sequence to start [ADJUST TEST].
- Press [1] to start PWM adjustment.
- When done, see that the indication has changed to "OK".



After PWM adjustment, the machine should start initialization sequence.

5.1.3.2 When Replacing the SCNT Board

The flash ROM mounted on the SCNT board retains PWM adjustment settings that are specific to individual laser/scanner units, requiring you to update the settings whenever you have replaced a laser/scanner unit.

If you have replaced the SCNT board, be sure to go through the following steps:

1. Initializing the ROM

- 1) Press [MENU]; then, press [#] to start service mode.
- 2) Move to [#CLEAR], and press [OK].
- 3) Move to [ALL], and press [OK] to initialize the ROM.

2. PWM Adjustment

- 1) Press [MENU], and then press [#] to start service mode.
- 2) Go to [#TEST MODE]; then, press [OK] and [*] to start [ADJUST TEST].
- 3) Press [1], and see that [OK] is indicated.



At the end of PWM adjustment, the machine starts its initialization sequence.

5.1.4 Fixing System

5.1.4.1 Checking the Nip Width of the Lower Fixing Roller

The fixing unit is not designed to allow the adjustment of the pressure (nip width); however, incorrect nip width can cause fixing defects.

Check the nip width by following the procedures below. If the nip width does not satisfy specifications, replace the fixing unit.

- 1) Make an all-black print of A4 size using the cartridge of this printer by operating external devices, and take the print to the customer's site.

- 2) Place the all-black print facing down on the Cassette.

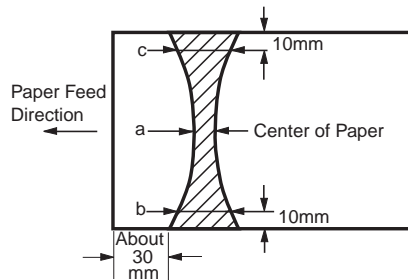
- 3) Select face-up delivery.

- 4) Press the test print switch.

- 5) Open the delivery door immediately after the leading edge of the print has come out to the face-up tray. Take out the print from the printer after 10 seconds from turning off the power switch.

- 6) Measure the width of the glossy band across the paper and check that it meets the following requirements shown in figure.

- Center (a): 6 to 7.5 mm
- Difference between right/left and center (b - a, c - a): 0.6 mm or less
- Difference between right and left (b - a): 0.5 mm or less



F-5-3

5.2 Service Tools

5.2.1 Standard Tools

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

T-5-1

No.	Tool name	Tool No.	Remark
1	Tool case	TKN-0001	With a clip
2	Jumper wire	TKN-0069	0.02 to 0.3 mm
3	Clearance gauge	CK-0057	0 to 600 g for checking the cassette spring pressure
4	Compression spring scale	CK-0058	M4, M5 Length : 363 mm
5	Phillips screwdriver	CK-0101	
6	Phillips screwdriver	CK-0104	M3, M4 Length: 155 mm
7	Phillips screwdriver	CK-0105	M4, M5 Length: 191 mm
8	Phillips screwdriver	CK-0106	M4, M5 Length: 85 mm
9	Flat-blade screwdriver	CK-0111	
10	Precision flat-blade screwdriver set	CK-0114	6-piece set
11	Allen wrench set	CK-0151	5-piece set
12	File, fine	CK-0161	
13	Allen (hex) screwdriver	CK-0170	M4 Length: 107 mm
14	Diagonal cutting pliers	CK-0201	
15	Needle-nose pliers	CK-0202	
16	Pliers	CK-0203	Applied to the axis ring
17	Retaining ring pliers	CK-0205	
18	Crimper	CK-0218	
19	Tweezers	CK-0302	Employed to measure 150 mm
20	Ruler	CK-0303	

No.	Tool name	Tool No.	Remark
21	Soldering iron	CK-0309	100V, 30 W
22	Mallet, plastic head	CK-0314	
23	Brush	CK-0315	
24	Penlight	CK-0327	
25	Plastic bottle	CK-0327	100cc
26	Solder	CK-0329	1.5 (mm dia) × 1 (mm)
27	Desoldering wick	CK-0330	1.5 mm
28	Lint-free paper	CK-0336	500SH/PKG
29	Oiler	CK-0349	30cc
30	Plastic jar	CK-0351	30cc
31	Digital multi-measure	FY9-2032	

5.2.2 Special Tools

No special tools are required for this printer besides the standard tools.

5.2.3 Solvent/Oil List

T-5-2

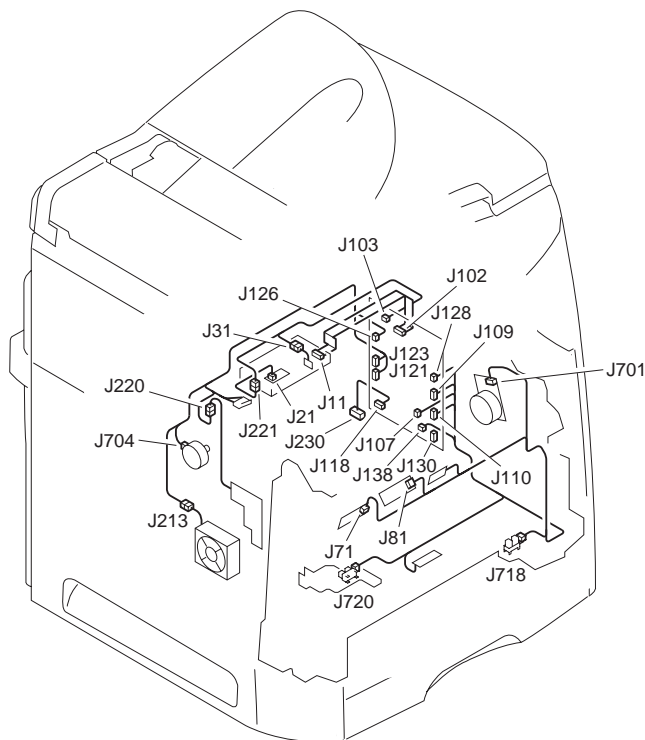
No.	Name	Use	Remarks
1	Alcohol	Cleaning: plastic(note), rubber, metal, oil, and toner stains	- Flammable: keep away from flame - Purchase locally
2	Lubricating oil	Apply between gear and shaft	- Tool No. CK-8003 (100 ml bottle)
3	Lubricant	Apply to gears (developing rotary unit)	- Tool No. FY9-6015 (20g tube)
4	Lubricant	Apply to gears	- Tool No. HY9-0007 (20g tube)



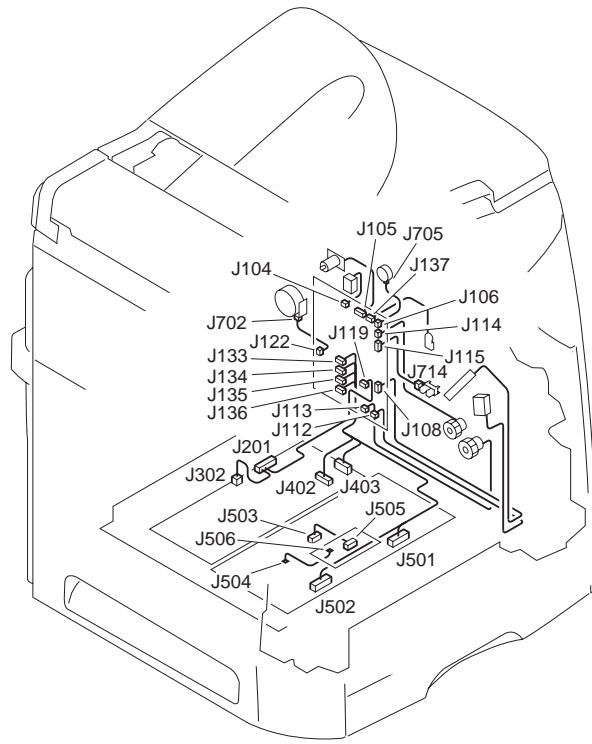
When cleaning the external covers, use a firmly squeezed wet cloth.

5.3 Location of Connectors

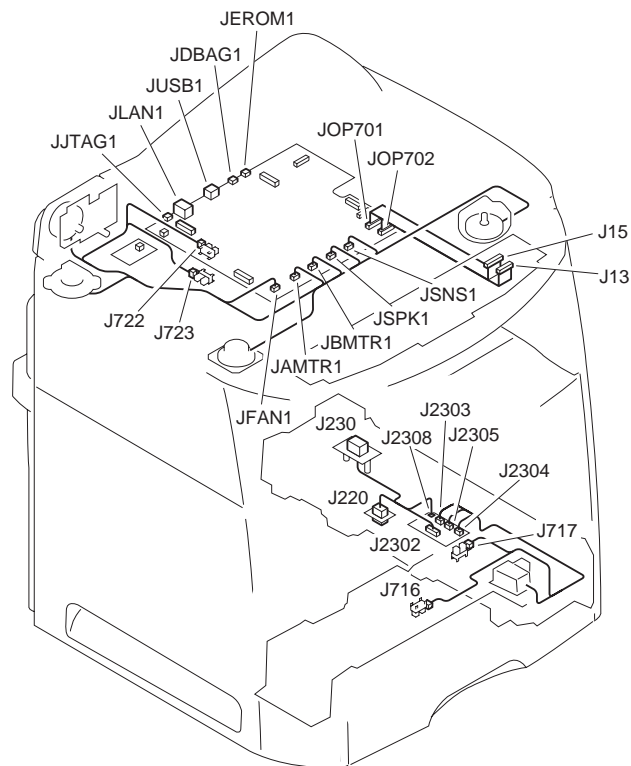
5.3.1 Location of Connectors



F-5-4



F-5-5



F-5-6

Code	Main cause/description	Remedial action
E010	main motor fault	Check the connector of the main motor. Replace the main motor. replace the DCNT Borad.
E021	developing rotary motor fault	Check the connector of the developing rotary motor. Replace the developing rotary motor. Replace the DCNT Borad PCB.
E022	developing rotary drive mechanism fault	Check the connector of the developing rotary drive sensor. Check the connector of the drive motor. Replace the developing rotary drive sensor. Replace the drive motor. Replace the DC controller PCB.
E071	ITB home position sensor fault	Check the connector of the ITB home position sensor. Replace the ITB home position sensor. Replace the DC controller PCB.
E078	secondary transfer roller drive mechanism fault	Check the connector of the roller drive sensor. Check the connector of the roller drive clutch. Replace the main drive assembly (roller Drive sensor). Replace the drum cartridge (roller drive cam). Replace the DC controller PCB.
E100	scanner fault	Check the connector of the laser scanner assembly. Replace the laser scanner assembly. Replace the DCNT Borad.
E196	DCNT Borad memory fault	Replace the DCNT Borad.
E197	engine communication error	Replace the DCNT Borad.
E747	SCNT board memory fault	Replace the SCNT Borad.
E805	fan fault	Check the connector of the cooling fan. Replace the cooling fan. Replace the DCNT Borad.

5.5 Service Mode

5.5.1 Outline

5.5.1.1 Hardware Switches

This fax has the following hardware switches. Be sure not to use those switches not discussed herein; they are for use at the factory.

SCNT Board

Jumper switch (J971)

The clock IC is backed up with a lithium battery by short-circuiting with a jumper plug.

5.5.1.2 Service Data Setting

Service mode has the following service data items. These items can be checked/changed according to the menu on the display.

#SSSW (Service Soft Switch settings)

These setting items are for basic fax service functions such as error management, echo countermeasures, and communication trouble countermeasures.

#MENU (MENU switch settings)

These setting items are for communication functions, such as NL equalizer and transmission levels.

#NUMERIC PARAMETER (NUMERIC parameter settings)

These setting items are for inputting numeric parameters such as the various conditions for the RTN signal transmission.

#SPECIAL

These setting items are for telephone network control functions.

#NCU (NCU settings)

These setting items are for telephone network control functions such as the selection signal transmission conditions and the detection conditions, for the control signals sent from the exchange.

#FAX

Do not use.

#SCAN

Do not use.

#PRINT

Do not use.

#NETWORK

Do not use.

#CODEC

Do not use.

#SYSTEM

Do not use.

#COUNTER (Counter indication)

Count data such as the read and print are displayed.

#REPORT (Report output)

Use it to output reports on various service data.

#DOWNLOAD

Do not use.

#CLEAR (data initialization mode)

Various data are initialized by selecting one of these setting items.

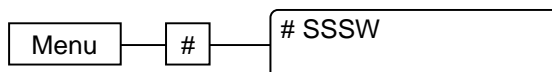
#ROM (ROM management)

ROM data such as the version number and checksum are displayed.

The effective SSSWs/parameters and their default values in this machine are shown in Service Data Flowchart. However, detailed descriptions of only service data newly added to this machine are provided. For descriptions of other service data, which have been used with existing machines, please see the G3 Facsimile SERVICE DATA HANDBOOK (Rev. 0), which is supplied separately.

5.5.1.3 Service Data Entry Method

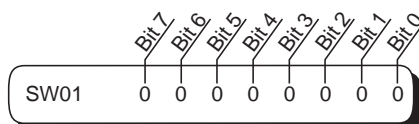
You can enter the Service Mode with the following operation.



F-5-8

5.5.2 Service Soft Switch Settings (SSSW)**5.5.2.1 Outline****5.5.2.1.1 Explanation of # SSSW**0008-1883

The items registered and set by each of these switches comprise 8-bit switches. The figure below shows which numbers are assigned to which bits. Each bit has a value of either 0 or 1.



F-5-9

Below are examples showing how to read bit switch tables.

Bit	Function	1	0
0	Service error code	Output	Not Output*
1	Not used	-	-
2	Not used	-	-
3	Not used	-	-
4	Not used	-	-
5	Not used	-	-
6	Not used	-	-
7	Not used	-	-

Indicates that the setting is "1".

Indicates that the setting is "0".

Indicates the default settings.

F-5-10

5.5.2.2 SSSW-SW14**5.5.2.2.1 Details of Bit 0 and Bit 1**0008-1885

Set the type of document scanning size (standard paper) to be used.

The following types are set in accordance with the combination of parameters of Bit 0 and Bit1.

T-5-4

(Bit0, Bit1)= (0, 0) A-series document
 (0, 1) inch-type document
 (1, 0) A-series document
 (1, 1) A-series document

5.5.2.3 SSSW-SW18

5.5.2.3.1 List of Functions

0008-1886

T-5-5

Bit	Function	1	0
0	Detection of carrier disconnection between the DCS signal and the TCF signal	Yes	No*
1	Waiting time for carrier disconnection between the DCS signal and the TCF signal	600 msec	300 msec*
2	Not used	-	-
3	Not used	-	-
4	Not used	-	-
5	Not used	-	-
6	Not used	-	-
7	Not used	-	-

5.5.2.3.2 Details of Bit 0

0008-1887

It is possible to select whether or not to detect carrier disconnection between the DCS signal and the TCF signal during reception.

If the receiving machine returns an FTT signal while the other machine (PC-FAX) is transmitting a TCF signal and a reception error occurs, set this bit to "1". If the error still occurs, set bit 1 of #SSSW SW18 to "1".

5.5.2.3.3 Details of Bit 1

0008-1889

It is possible to select the detection time for carrier disconnection between the DCS signal and TCF signal during reception.

This bit is available for use when #SSSW SW18 Bit0 is set to "1".

If the symptom is not resolved by setting SW18 Bit 0 to "1," set this bit to "1."

5.5.3 Data Initialization Mode (CLEAR)

5.5.3.1 # CLEAR

Registration/settings of user data and service data are initialized with CLEAR ALL, and go back to factory defaults.

Reference

Since the TYPE setting of #CLEAR item goes back to STANDARD when #CLEAR ALL is executed, there is a need to change the TYPE setting to conform to the communications standards of a specific country/region.

5.5.4 Test Mode (TEST)

5.5.4.1 Overview

5.5.4.1.1 Test Mode Overview

0008-1953

The following test modes are available from the menu on the display.

D-RAM tests

Writes data to DRAM image storage areas and reads that data to check operations.

Print test

Printing a test pattern in the printing area.

Modem, NCU tests

The frequency test, G3 signal transmission test, and V.34 G3 signal transmission test.

FACULTY test

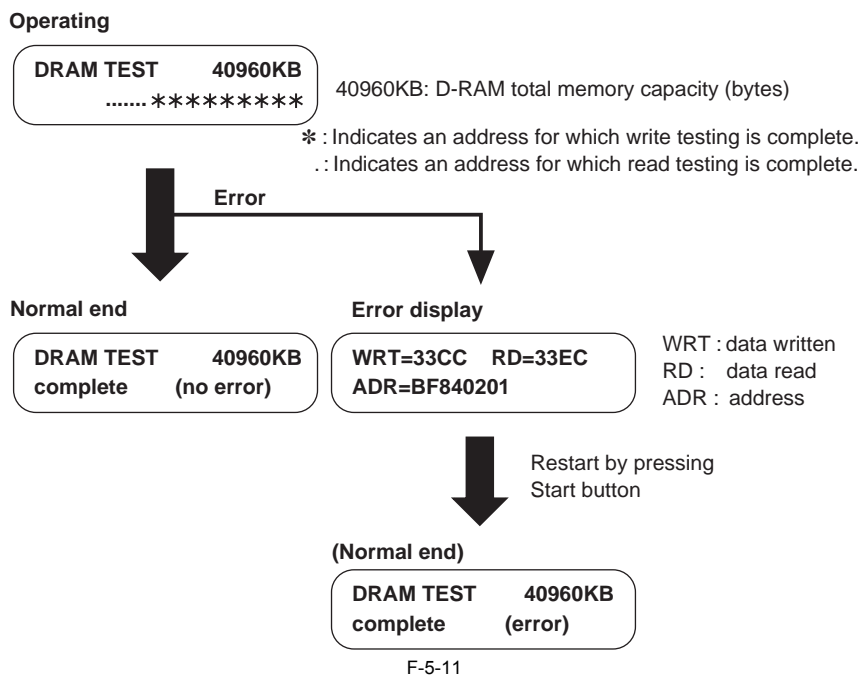
Testing the sensors and functions of the operation panel.

5.5.4.2 DRAM Test

5.5.4.2.1 D-RAM Test

0008-1979

D-RAM test menu is selected by pressing the numeric key 1 from the test mode menu. D-RAM Test 1 writes data to the entire D-RAM region and reads it out to check that operations are correct. D-RAM Test 2 just reads data at high speed.



Before D-RAM test, output all image data in image memory. When D-RAM test is performed, all image data are cleared.

5.5.4.3 Print Test

5.5.4.3.1 PRINT Test

0008-1980

The Print Test menu is selected by pressing the numeric key 3 from the test mode menu.

In this test, various print patterns are output from the printer. As service print patterns, press the numeric key 2 from the Print Test menu to select "3-2: BLACK" or press the numeric key 6 to select "3-6: ENDURANCE". Do not use the other patterns. They are for development and factory use.

Check for white stripes and unevenness on the Black pattern, and check for image shrinkig, stretching, soiling, and black strips on the Endurance pattern.



F-5-12

Memo

After completion of the print test, if the printing was normal, copy a document. If there is any defect in the copied image, there is a defect in the scan section.

5.5.4.4 Modem Test

5.5.4.4.1 Modem Tests

0008-1981

The Modem Test menu is selected by pressing the numeric key 4 from the test mode menu.

These tests test modem and NCU transmission and reception. The modem tests check whether signals are sent correctly from the modem by comparing the sound of the signals from the speaker with the sounds from a normal modem.

End this test by pressing the Stop/Reset key.

T-5-6

Modem test type	Overview
Frequency test	The modem sends tonal signals from the modular jack and the speaker.
G3 signal transmission test	The modem sends G3 signals from the modular jack and the speaker.
V.34 G3 signal transmission test	The modem sends V.34 G3 signals from the modular jack and the speaker.

5.5.4.4.2 Frequency Test

0008-1982

The frequency test menu is selected by pressing the numeric key 2 from the MODEM test menu. Signals of the frequencies below are sent from the modem using the modular jack and the speaker. The frequency can be changed with the numeric keys.

T-5-7

Numeric key	Frequency
0	462 Hz
1	1100 Hz
2	1300 Hz
3	1500 Hz
4	1650 Hz
5	1850 Hz
6	2100 Hz

5.5.4.4.3 G3 Signal Transmission Test

0008-1983

The G3 signal transmission test menu is selected by pressing the numeric key 4 from the MODEM test menu. The G3 signals below are sent from the modem using the modular jack and the speaker. The Speed can be changed with the numeric keys.

T-5-8

Numeric button	Speed
0	300 bps
1	2400 bps
2	4800 bps
3	7200 bps
4	9600 bps
5	TC7200 bps
6	TC9600 bps
7	12000 bps
8	14400 bps

Memo

The transmission level for each frequency follows the service data.

5.5.4.4.4 V.34 G3 Signal Transmission Test

0008-1984

The V.34 G3 signal transmission test menu is selected by pressing the numeric key 8 from the MODEM test menu. The V.34 G3 signals below are sent from the modem using the modular jack and the speaker by pressing the B/W Start key. The Baud rate can be changed with the numeric keys, and the Speed can be changed with the cursor keys.

T-5-9

Numeric key	Baud rate
0	3429 baud
1	3200 baud
2	3000 baud
3	2800 baud
4	2743 baud
5	2400 baud

T-5-10

Cursor key	Speed
	33.6 kbps
	31.2 kbps
	28.8 kbps
<>	26.4 kbps
	24.0 kbps
	21.6 kbps
	19.2 kbps
	16.8 kbps
	14.4 kbps
	12.0 kbps
	9.6 kbps

Cursor key	Speed
	7.2 kbps
	4.8 kbps
	2.4 kbps

Memo

The transmission level for each baud rate and speed follows the service data.

5.5.4.5 Faculty Test**5.5.4.5.1 FACULTY Tests**

0008-1992

The faculty tests are selected by pressing the numeric key 6 from the test mode menu. These tests test the following faculties of this fax.

T-5-11

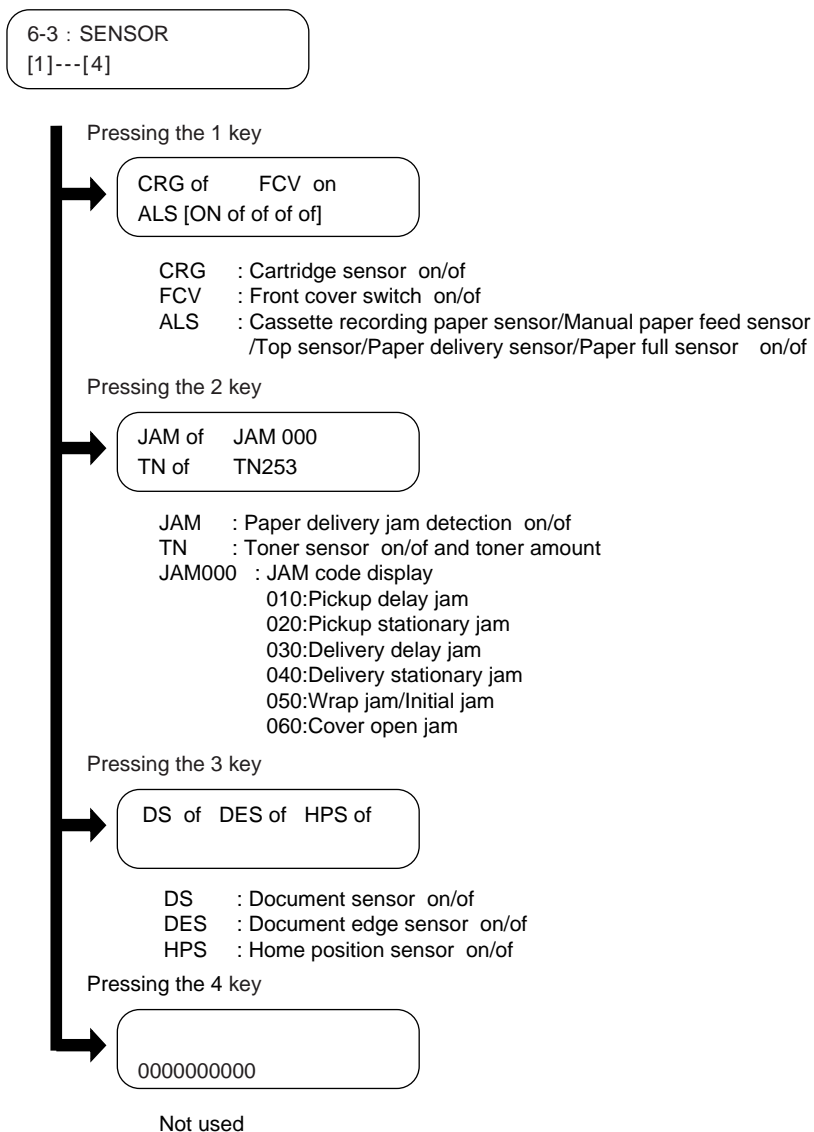
Test type	Overview
Sensor tests	Test whether the sensors are operating correctly.
Operation panel test	Tests whether the button switches on the control panel are operating correctly.
Line signal reception test	Tests whether the NCU board signal sensor and frequency counter are operating correctly.

5.5.4.5.2 Sensor Tests

0008-1993

The sensor test is selected by pressing the numeric key 3 from the faculty test menu. In this test, you can check the status of each sensor of this fax in items 1 to 4 on the display.

You can also check if sensors that use actuators and microswitches are operating correctly by moving the actuator or microswitch.



F-5-13

5.5.4.5.3 Operation Panel Tests

0008-1995

The operation panel test is selected by pressing the numeric key 7 from the faculty test menu. In this test, check that the display, LED lamps and keys on the operation panel are operating correctly.

Display test

Pressing the B/W Start key from the operation panel menu, "H" is displayed 20 characters by 2 lines. The next time the B/W Start key is pressed, all the LCD dots are displayed. Check for any LCD dots in the display that are not displayed.

LED lamp test

All the lamps on the operation panel light by pressing the B/W Start key after the display test. Check for any LED that does not blink during the test. (However, the Energy Saver key does not go on at this time.)

Operation Key Test

The operation key test is selected with the B/W Start key after the LED lamp test is done. In this test, a character disappears when its operation key is pressed. The list of characters and their operation keys is as follows. Check to make sure at this time that all characters properly disappear when their operation keys are pressed.

T-5-12

Character	Operation key	Character	Operation key
0-9,*,#	Numeric key	J	SCAN key
A	Cursor key (+)	K	Hook key
B	Cursor key (-)	L	Redial/Pause key
C	Set key	M	FAX key
D	Menu key	P	Directory key
E	Status Monitor key	O	Clear key
D	Collate key	N	Coded Dial key
F	Image Quality key	Q	Energy Saver key
G	Enlarge/Reduce key	R	Paper Select key
H	Exposure key	S	Color Start key
I	COPY key		

One-Touch Dial Key Test

The one-touch dial key test starts once all characters disappear in the operation key test.

The characters 0 to #, 0 to 6 corresponding to 01 to 19 are displayed, and a character disappears when its one-touch key is pressed. Check to make sure at this time that all characters properly disappear when their one-touch keys are pressed.

Chapter 6 APPENDIX

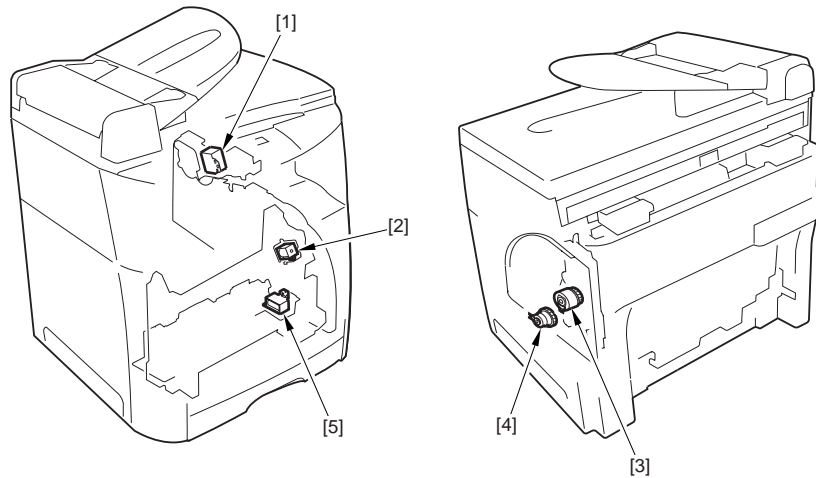
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6.1 Outline of Electrical Components

6.1.1 Cluth/Solenoid

6.1.1.1 Cluth/Solenid

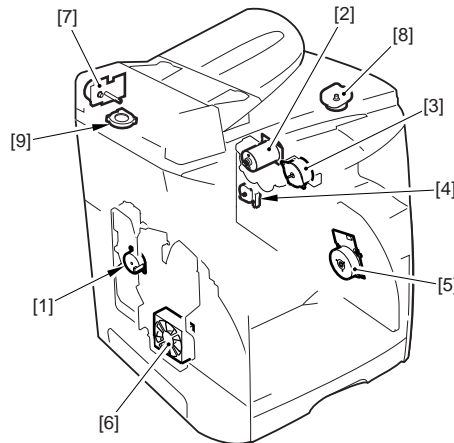


F-6-1
T-6-1

NO.	Name	Notation
[1]	Developing rotary stopper solenoid	SL93
[2]	Multi-purpose tray pick-up solenoid	SL92
[3]	Roller engaging clutch	CL2
[4]	Registration clutch	CL1
[5]	Cassette pick-up solenoid	SL9

6.1.2 Motor/Fan

6.1.2.1 Motor/Fan

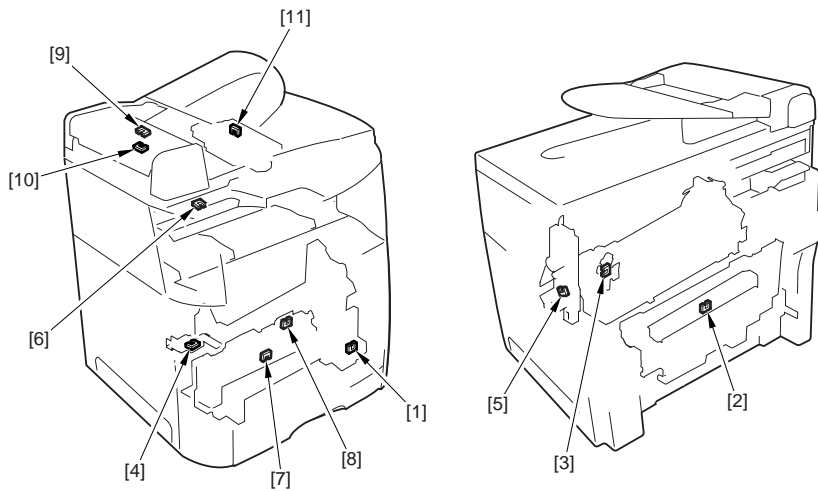


F-6-2
T-6-2

NO.	Name	Notation
[1]	Engaging motor	PM704
[2]	Developing rotary motor	DCM703
[3]	Toner cartridge motor	PM705
[4]	Fixing motor	DCM702
[5]	Main motor	DCM701
[6]	Cooling fan	FM721
[7]	Document feed Motor	DCM706
[8]	Flatbed Motor	DCM707
[9]	Reader cooling fan	FM722

6.1.3 Sensor

6.1.3.1 Sensor

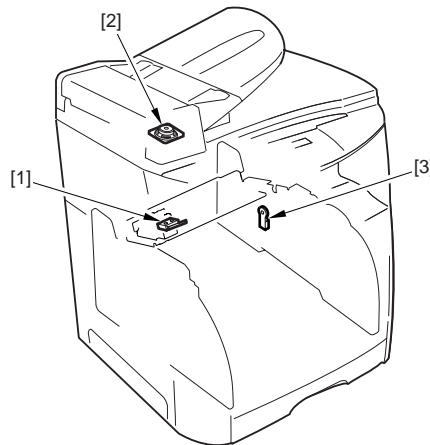


F-6-3
T-6-3

NO.	Name	Notation
[1]	Multi-purpose tray paper sensor	PS718
[2]	Fixing delivery paper sensor	PS1
[3]	Developing rotary engaging sensor	PS712
[4]	Front fixing paper detection sensor	PS720
[5]	Roller engaging sensor	PS714
[6]	Paper Delivery Sensor	PS721
[7]	Cassette Feeder Sensor	PS717
[8]	Cassette Paper Sensor	PS716
[9]	ADF Paper Sensor	PS722
[10]	ADF Feeder Sensor	PS723
[11]	CCD Unit HP Sensor	PS724

6.1.4 Switch

6.1.4.1 Switch/Speaker/Thermistor

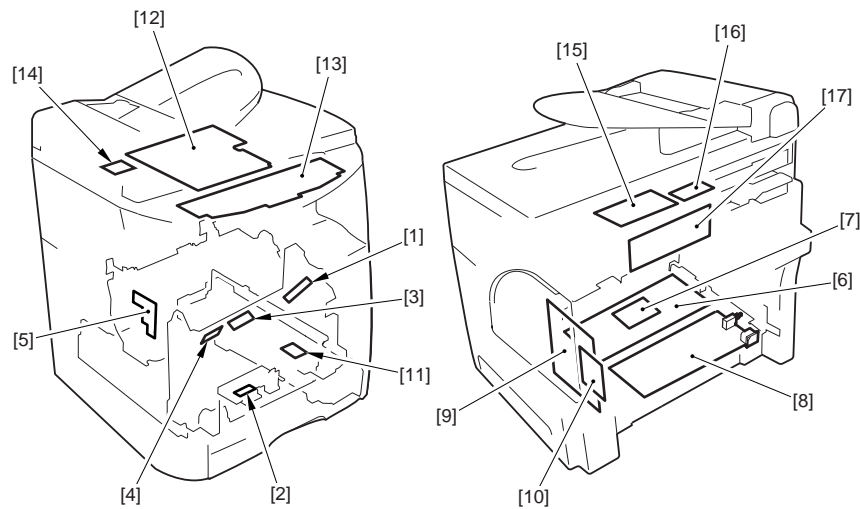


F-6-4
T-6-4

NO.	Name	Notation
[1]	Door open detection switch	SW1
[2]	Speaker	SP1
[3]	Thermistor	TM1

6.1.5 PCBs

6.1.5.1 PCBs



F-6-5
T-6-5

- | | |
|---|-------------------------------|
| [1] Waste toner detection PCB | [10] Relay PCB |
| [2] Registration detection PCB | [11] Paper feeder Driver PCB |
| [3] Density detection PCB | [12] SCNT PCB |
| [4] ITB home position detection PCB | [13] Operation Panel PCB |
| [5] Developing rotary/toner level detection PCB | [14] Capacitor Board |
| [6] High-voltage power supply PCB | [15] NCU Board |
| [7] Sub high-voltage power supply PCB | [16] Modular Board |
| [8] Print Power supply PCB | [17] Scanner Power supply PCB |
| [9] DC controller PCB | |

6.1.6 Variable Resistors(VR), LED, and Check Pins by PCB

6.1.6.1 Variable Resistors (VR), Test Pins, Jumpers, and Switches

This section lists only the variable resistors (VR), LEDs, test pins, jumpers, and switches required for after-sales service in the field. All other VRs, test pins, etc. are for the factory use only. The adjustment and check using these test pins, etc. require special tools, measuring instruments, and high precision. Do not touch them in the field.

1) ITB home position detection PCB



F-6-6
T-6-6

SW No.	Function
SW201	Test print switch

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