

Service Manual

LBP3200 Series

LBP3200

Canon

Sep 30 2003

TONER
www.tonerplus.com.ua

Application

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

Corrections

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

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

Trademarks

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

Copyright

This manual is copyrighted with all rights reserved. Under the copyright laws, this manual may not be copied, reproduced or translated into another language, in whole or in part, without the written consent of Canon Inc.

COPYRIGHT © 2001 CANON INC.










Printed in Japan

Caution

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



Symbols Used

This documentation uses the following symbols to indicate special information:

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

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

In the diagrams,  represents the path of mechanical drive; where a signal name accompanies the symbol, the arrow  indicates the direction of the electric signal.

The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low". (The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.

In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine."

Contents

Chapter 1 PRODUCT DESCRIPTION

1.1 PRODUCT SPECIFICATIONS.....	1- 1
1.1.1Product Specifications.....	1- 1
1.2 Detailed Specifications.....	1- 3
1.2.1Printing Speed	1- 3
1.2.2Stack Upon Delivery	1- 3
1.3 NAMES OF PARTS	1- 5
1.3.1External View	1- 5
1.4 SAFETY	1- 7
1.4.1Safety of Laser Light.....	1- 7
1.4.2Regulations Under the Center for Devices and Radiological Health (CDRH)	1- 7
1.4.3Handling the Laser Unit	1- 7
1.4.4Safety of Toner	1- 8

Chapter 2 TECHNICAL REFERENCE

2.1 LASER EXPOSURE SYSTEM.....	2- 1
2.1.1 Overview/Configuration	2- 1
2.2 IMAGE FORMATION SYSTEM	2- 3
2.2.1 Overview/Configuration	2- 3
2.3 PICKUP AND FEEDING SYSTEM	2- 5
2.3.1 Overview/Configuration	2- 5
2.3.2 Detecting Jams	2- 6
2.4 FIXING SYSTEM.....	2- 9
2.4.1 Overview/Configuration	2- 9
2.4.2 Various Control Mechanisms	2- 10

Chapter 3 DISASSEMBLY AND ASSEMBLY

3.1 EXTERNAL AND CONTROLS SYSTEM	3- 1
3.1.1 Rear Cover	3- 1
3.1.2 Right Cover	3- 1
3.1.3 Left Cover	3- 2
3.1.4 Top Cover	3- 3
3.1.5 Front Cover	3- 4
3.1.6 Engine controller board.....	3- 4
3.1.7 Power supply board.....	3- 5
3.1.8 High-voltage board	3- 7
3.1.9 CAPT board	3- 10
3.1.10 Top sensor	3- 11
3.1.11 Delivery sensor	3- 13
3.2 IMAGE FORMATION SYSTEM	3- 16
3.2.1 Transfer Charging Roller	3- 16

3.3 LASER EXPOSURE SYSTEM	3- 17
3.3.1 Laser Scanner Unit	3- 17
3.4 PICKUP AND FEEDING SYSTEM.....	3- 19
3.4.1 Cassette Pickup Roller	3- 19
3.4.2 Cassette Separation Pad	3- 21
3.4.3 Cassette Pickup solenoid	3- 22
3.4.4 Gear Unit	3- 24
3.4.5 Main Motor	3- 26
3.4.6 Multi-purpose Pickup Roller	3- 29
3.4.7 Multi-purpose Pickup Solenoid.....	3- 32
3.5 FIXING SYSTEM.....	3- 36
3.5.1 Fixing Pressure Roller.....	3- 36
3.5.2 Fixing Film Unit.....	3- 38

Chapter 4 MAINTENANCE AND INSPECTION

4.1 Periodically Replaced Parts	4- 1
4.1.1Parts Requiring Periodical Replacement	4- 1
4.2 Consumables.....	4- 2
4.2.1Consumable	4- 2
4.3 Periodical Service	4- 3
4.3.1Items Requiring Scheduled Servicing	4- 3
4.4 Cleaning.....	4- 4
4.4.1Items Requiring Cleaning.....	4- 4
4.4.2Cleaning Method (external covers)	4- 5
4.4.3Cleaning Method (printer unit)	4- 5
4.5 Lubrications	4- 7
4.5.1Areas Requiring Application of Grease.....	4- 7
4.5.2Delivery Idler Gear	4- 7
4.5.3Fixing Drive Transmission Gear	4- 8
4.5.4Large Gear Bushing R	4- 8
4.5.5Large Gear	4- 9
4.5.6Feed Gear	4- 9
4.5.7Internal Gear	4- 10
4.5.8Large Gear Deceleration Gear/Plate R	4- 10
4.5.9Main Motor.....	4- 11
4.5.10Drive Releasing Arm	4- 12
4.5.11FU Delivery Roller	4- 12
4.5.12Pickup Idler Gear	4- 13
4.5.13Feed Deceleration Gear	4- 13
4.5.14Fixing Deceleration Gear.....	4- 14
4.5.15FD Delivery Roller	4- 15
4.5.16Large Gear Bushing F.....	4- 15
4.5.17Pressure roller	4- 16

Chapter 5 TROUBLESHOOTING

5.1 PHENOMENON TABLE	5- 1
5.1.1Symptoms	5- 1

5.2 Countermeasures	5- 2
5.2.1 Image Faults	5- 2
5.2.2 Malfunction	5- 2
5.2.3 Jam (Main Unit)	5- 3
5.3 MEASUREMENT AND ADJUSTMENT	5- 4
5.3.1 Basic Adjustment	5- 4
5.4 SERVICE TOOLS	5- 5
5.4.1 Special Tools	5- 5

Chapter 6 APPENDIX

6.1 OUTLINE OF ELECTRICAL COMPONENTS	6- 1
6.1.1 Sensor	6- 1
6.1.2 PCBs	6- 2

Chapter 1 PRODUCT DESCRIPTION

Contents

1.1	PRODUCT SPECIFICATIONS.....	1-1
1.1.1	Product Specifications	1-1
1.2	Detailed Specifications.....	1-3
1.2.1	Printing Speed	1-3
1.2.2	Stack Upon Delivery	1-3
1.3	NAMES OF PARTS	1-5
1.3.1	External View.....	1-5
1.4	SAFETY	1-7
1.4.1	Safety of Laser Light.....	1-7
1.4.2	Regulations Under the Center for Devices and Radiological Health (CDRH)	1-7
1.4.3	Handling the Laser Unit	1-7
1.4.4	Safety of Toner.....	1-8

1.1 PRODUCT SPECIFICATIONS

1.1.1 Product Specifications

0002-6360

Body installation method	Desk-top page printer
Photosensitive medium	OPC drum
Exposure method	Semi-conductor laser
Development method	Toner projection
Transfer method	Roller transfer
Separation method	Curvature/bias on static eliminator
Cassette pickup method	Pad separation
Multifeeder pickup method	Single feed
Drum cleaning method	Blade
Fixing method	On-demand fixing
Delivery method	face-down/face-up
Toner supply type	EP-26 toner cartridge; good for about 2500 prints
Warm-up time	0 second (Less than 8 seconds when the printer ON)
Print area	Within 5 mm of paper edge
Printing resolution	600 x 600 dpi
First print time	face-down mode: 10 sec or less (at 20 deg C; A4); face-up mode: 9 sec or less (at 20 deg C; A4) / The times are after the printer has received data.
Cassette paper size	A4, B5, A5, Letter, Legal*, Executive, Envelope C5, Envelope COM10, Envelope DL, Envelope Monarch / *If "LGL" is indicated in the cassette, you can load the legal-size paper in the cassette.
Multi-purpose paper size	A4, B5, A5, Legal, Letter, Executive, Envelope C5, Envelope COM10, Envelope DL, Envelope Monarch, Custom Paper(76.2 to 215.9 mm in width, 127.0 to 355.6 mm in length)
Cassette paper type	Plain paper (64 to 90 g/m ²), Heavy paper (91 to 128 g/m ²), Transparency, Label, Envelope

Multi-purpose paper type	Plain paper (64 to 90 g/m ²), Heavy paper (91 to 163 g/m ²), Transparency, Label, Envelope
Cassette capacity	Approx. 250 sheets (Plain paper, 64 to 80 g/m ²); Approx. 100 sheets (Heavy paper, 91 to 128 g/m ²); Approx. 100 sheets (Transparency); Approx. 100 sheets (Label); Approx. 20 sheets (Envelope)
Multi-purpose capacity	1 sheet (Plain paper, Heavy paper, Transparency, Label, Envelope)
Duplex method	Manual feed only (excluding transparency, envelope, label)
Memory	2 MB (built-in); no optional memory
Operating environment (Temperature range)	7.5 to 32.5 deg C (45.5 to 90.5 deg F)
Operating environment (Humidity range)	5 to 90 % RH
Noise	During standby: Background noise level, During print: 55 dB [A] or less
Power supply rating	120 V 50/60 Hz (+/-2 Hz), 220-240 V (+/-10 %) 50/60 Hz (+/-2 Hz)
Power consumption	120 V model: Average during operation; approx. 350 W, Average during standby; approx. 7 W / 220-240 V model: Average during operation; approx. 360 W, Average during standby; approx. 7 W
Dimensions	367 (W) x 376.3 (D) x 245 (H) mm
Weight	120 V model: Printer unit; approx.6.5 kg (Excluding the toner cartridge), Cassette; approx.0.9 kg, Toner cartridge; 0.7 kg / 220-240 V model: Printer unit; approx.6.1 kg (Excluding the toner cartridge), Cassette; approx.0.8 kg, Toner cartridge; 0.7 kg
Option	None

1.2 Detailed Specifications

1.2.1 Printing Speed

0002-6870

T-1-1

	Fixing mode				
Paper size	P l a i n paper	P l a i n paper L	H e a v y paper	H e a v y paper H	Transpare ncy
A4 (64 to 90 g/m2)	18	18	18	12	18
B5 (64 to 90 g/m2)	8	8	4	4	8
A5 (64 to 90 g/m2)	8	8	4	4	8
A4 (105 to 128 g/m2)	-	-	18	12	-
B5 (105 to 128 g/m2)	-	-	4	4	-
LTR (75 to 90 g/m2)	18	18	18	12	18
LGL (75 to 90 g/ m2)*	15	-	-	-	-
LTR (Bond 75 to 90 g/m2)	-	-	18	12	-
LTR (105 g/m2)	-	-	18	12	-
Envelope Monarch	-	-	4	-	-
Envelope DL	-	-	4	-	-
Envelope COM10	-	-	4	-	-
Envelope C5	-	-	4	-	-

(unit: sheets/min)

*If "LGL" is indicated in the cassette, you can load the legal-size in the cassette.

1.2.2 Stack Upon Delivery

0002-6888

T-1-2

Paper type	Face-down	Face-up
Plain paper (64 to 80 g/m2)	Approx. 100 sheets	1 sheet
Heavy paper (91 to 128 g/ m2)	Approx. 30 sheets	1 sheet

Paper type	Face-down	Face-up
Transparency	Approx. 5 sheets (for 120V model) Approx. 10 sheets (for 230V model)	1 sheet
Label	Approx. 10 sheets	1 sheet
Envelope	Approx. 10 sheets	1 sheet



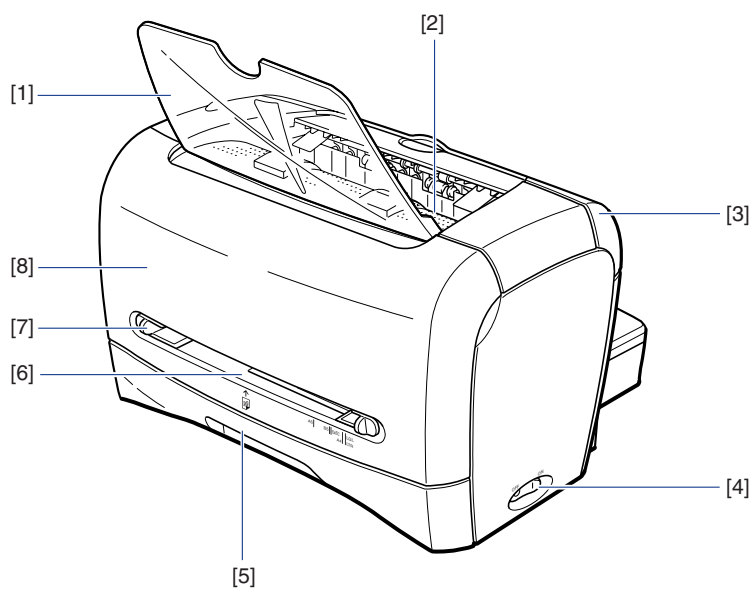
The values herein are estimates only and are subject to change for product improvement.

1.3 NAMES OF PARTS

1.3.1 External View

0002-9016

<Front View>



F-1-1

T-1-3

[1] Face-down delivery tray

[5] Cassette

[2] Face-down delivery area

[6] Manual feed slot

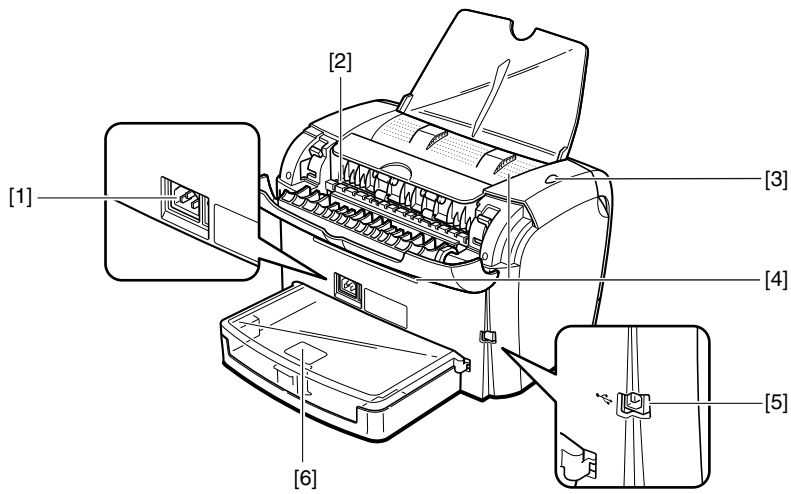
[3] Delivery selection cover

[7] Paper guide

[4] Power switch

[8] Front cover

<Rear View>



F-1-2

T-1-4

[1] Power socket

[2] face-up delivery slot

[3] Power indicator

[4] Ventilation slot

[5] USB connector

[6] Cassette protective cover

1.4 SAFETY

1.4.1 Safety of Laser Light

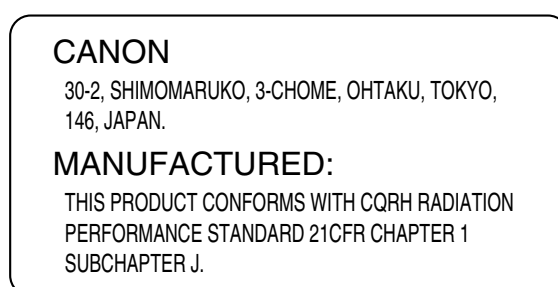
0002-4309

Laser radiation could be hazardous to the human body. For this reason, laser radiation emitted inside this machine is hermetically sealed within the protective housing and external cover. No radiation can leak from the machine in the normal operation of the product by the user.

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

0002-4310

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



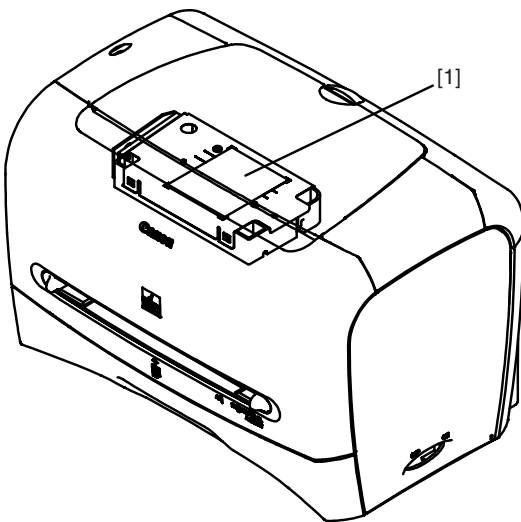
F-1-3

1.4.3 Handling the Laser Unit

0002-4553

The laser scanner unit emits invisible laser light inside it. If exposed to laser light, the human eye can irreparably be damaged. Never attempt to disassemble the laser scanner unit. (It is not designed for servicing in the field).

The covers around the laser scanner unit are identified by the following label [1].



F-1-4

1.4.4 Safety of Toner

0002-4556

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



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

Toner on the Skin or Clothes

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

Chapter 2 TECHNICAL REFERENCE

Contents

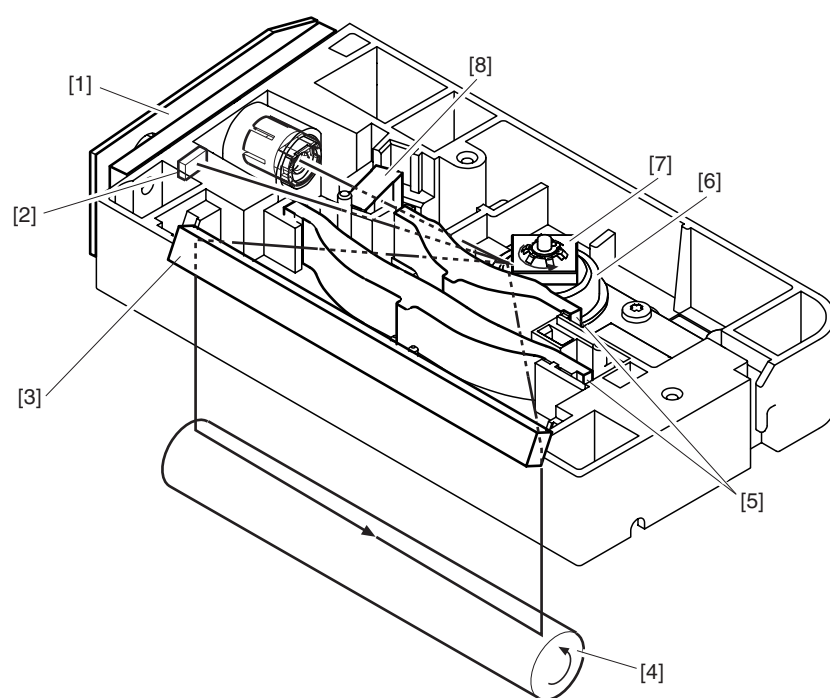
2.1 LASER EXPOSURE SYSTEM.....	2-1
2.1.1 Overview/Configuration.....	2-1
2.1.1.1 Overview	2-1
2.2 IMAGE FORMATION SYSTEM	2-3
2.2.1 Overview/Configuration.....	2-3
2.2.1.1 Overview	2-3
2.3 PICKUP AND FEEDING SYSTEM	2-5
2.3.1 Overview/Configuration.....	2-5
2.3.1.1 Overview	2-5
2.3.2 Detecting Jams	2-6
2.3.2.1 Jam Detection Outline	2-6
2.3.2.1.1 Type so Jams	2-6
2.3.2.2 Delay Jams.....	2-7
2.3.2.2.1 Pickup Delay Jam	2-7
2.3.2.2.2 Delivery Delay Jam	2-7
2.3.2.3 Stationary Jams.....	2-7
2.3.2.3.1 Pickup Stationary Jam	2-7
2.3.2.3.2 Delivery Stationary Jam	2-7
2.3.2.4 Other Jams	2-7
2.3.2.4.1 Wrap Jam.....	2-7
2.3.2.4.2 Initial Jam	2-8
2.3.2.4.3 Cover Open Jam	2-8
2.4 FIXING SYSTEM.....	2-9
2.4.1 Overview/Configuration.....	2-9
2.4.1.1 Overview	2-9
2.4.2 Various Control Mechanisms	2-10
2.4.2.1 Protective Functions	2-10
2.4.2.1.1 Protective Mechanisms.....	2-10
2.4.2.1.2 Detecting a Fault in the Fixing Assembly	2-11

2.1 LASER EXPOSURE SYSTEM

2.1.1 Overview/Configuration

2.1.1.1 Overview

0002-4749



F-2-1

T-2-1

[1] Laser driver PCB	[5] Imaging lends
[2] BD sensor	[6] Scanner motor
[3] Reflecting mirror	[7] 4-facet mirror
[4] Photosensitive drum	[8] Cylindrical lens

The machine's laser scanner assembly consists of the laser driver and the scanner motor, which are driven by signals coming from the engine controller.

The laser driver serves to turn on the laser diode according to the laser control signal and video signals from the engine controller.

The laser beam moves thorough the collimator less and the cylindrical lens to reach the 4-facet mirror rotating at a specific speed.

The leaser beam reflected by the 4-facet mirror moves through the imaging lens arranged in front of the 4-facet mirror

and the reflecting mirror to reach and focus on the photosensitive drum.

When the 4-facet mirror rotates at a specific speed, the laser beam scans the photosensitive drum in keeping with the mirror rotation, thus drawing static images on the photosensitive drum.

Memo:

BD Fault

The machine identifies a BD fault if it does not detect the /BDI signal within 0.1 sec after the scanner motor is forced to accelerate. It also detects a BD fault if it does not detect a specific interval of /BDI signals for 2 sec continuously after the scanner motor has reached a specific revolution (number of rotations).

Scanner Fault

If the machine does not detect the /BDI signal 1.4 sec after it has stopped forcing the scanner motor to accelerate, it extends the period of detection by 120 sec; if it still does not detect a specific interval of /BDI signals, it identifies a scanner fault.

BD Error

The machine identifies a BD error if it does not detect the /BDI signal at a specific interval while the /BDI signal is being generated. It, however, does not identify a BD error under the following condition:

- the door is identified as being open within 0.2 sec after detection of a BD error.
 - a BD fault or a scanner fault is detected after a BD error has been identified.
-



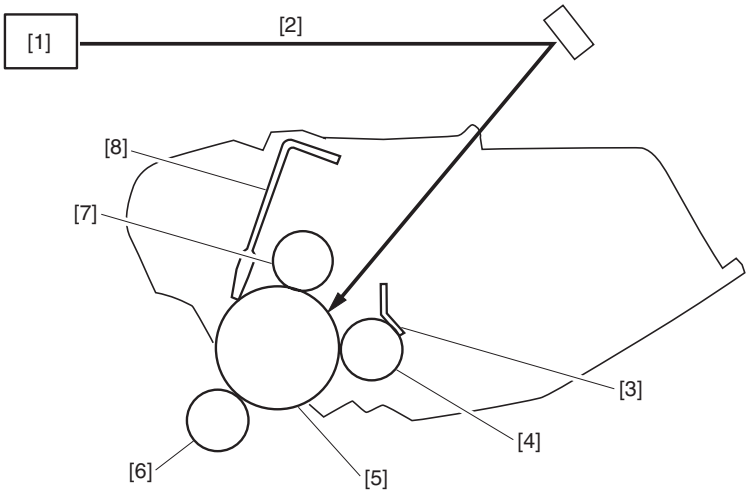
The laser/scanner unit contains parts that cannot be adjusted in the field. Do not attempt to disassemble the laser/scanner unit.

2.2 IMAGE FORMATION SYSTEM

2.2.1 Overview/Configuration

2.2.1.1 Overview

0002-8228



F-2-2

T-2-2

[1] Laser/scanner assembly	[5] Photosensitive drum
[2] Laser beam	[6] Transfer charging roller
[3] Blade	[7] Primary charging roller
[4] Developing cylinder	[8] Cleaning blade

In response to a print command, the engine controller turns on the main motor to drive the photosensitive drum, developing cylinder, primary charging roller, and transfer charging roller.

Thereafter, the machine uses the primary charging roller to charge the surface of the photosensitive drum to an even, negative potential and, at the same time, directs the laser beam across the surface of the photosensitive drum. (The laser beam is modulated to according to the incoming video signals.)

The image thus formed on the photosensitive drum is a static, latent image; it is turned into a visible image by means of the toner from the developing cylinder. The resulting toner image is then transferred to paper by the work of the transfer charging roller, and the paper is sent to the fixing assembly. The surface of the photosensitive drum is cleaned by the cleaning blade so that it is free of residual toner; after cleaning, the primary charging roller once again charges the surface to an even, negative potential to prepare for the formation of a new static, latent image.

**Drum Cover Shutter**

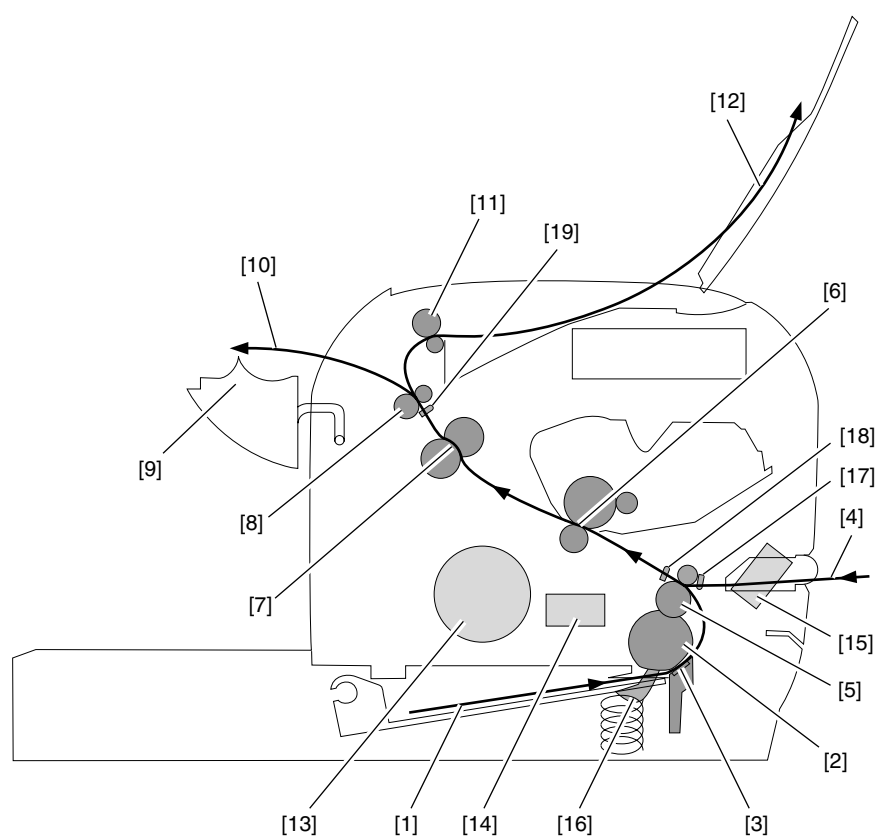
If the surface of the photosensitive drum is exposed to strong light, it develops what is known as "photo memory," which can cause white spots or black lines in images. To protect the drum against light, the machine is equipped with a drum cover shutter. The drum cover shutter must never be opened unless doing so proves to be absolutely necessary.

2.3 PICKUP AND FEEDING SYSTEM

2.3.1 Overview/Configuration

2.3.1.1 Overview

0002-8681



F-2-3

T-2-3

- | | |
|---|----------------------------------|
| [1] Cassette feed | [11] Face-down delivery roller |
| [2] Cassette pickup roller | [12] Face-down delivery |
| [3] Separation pad | [13] Main motor |
| [4] Manual feed | [14] Cassette pickup solenoid |
| [5] Feed roller | [15] Manual feed pickup solenoid |
| [6] Transfer assembly (photosensitive drum, transfer charging roller) | [16] Cassette paper sensor |

[7] Fixing assembly (fixing film, fixing pressure roller)	[17] Manual feed paper sensor
[8] Delivery roller	[18] Top sensor
[9] Face-up cover	[19] Delivery sensor
[10] Face-up delivery	

Pickup and Feed Operation (from the cassette)

If the cassette paper sensor detects the presence of paper while the absence of paper is identified in the manual feed pickup assembly, the machine picks up paper from the cassette.

When the main motor operates and the cassette pickup solenoid goes on, the cassette pickup roller makes a single rotation to pick up paper. The paper is then moved from the transfer assembly to the fixing assembly by the feed roller; it is ultimately delivered outside the machine by the work of the delivery roller.

When the face-up cover is open, the paper is delivered face-up at the rear of the machine. If the face-up cover is closed, on the other hand, the paper is moved along the feed guide of the cover, and is delivered face-down at the top of the machine by the work of the face-down delivery roller.

Pickup and Feed Operation (from the manual feed section)

When paper is inserted into the pickup assembly, the manual feed paper sensor detects the presence of paper, and the machine uses the feed roller to pick and hold the leading edge of the paper. When printing starts, the machine turns on the manual feed pickup solenoid to stop the rotation of the feed roller so that the paper will not move forward until the laser/scanner and the fixing unit become ready for operation. When the laser/scanner and the fixing unit become ready for operation, the machine turns off the manual feed pickup solenoid to rotate the feed roller, thus moving the paper forward; the operation thereafter is identical to the operation used for pickup from the cassette.

2.3.2 Detecting Jams

2.3.2.1 Jam Detection Outline

2.3.2.1.1 Type so Jams

0002-8759

The machine identifies the following types of jams:

Pickup Delay Jam

The top sensor does not go on within a specific period of time after pickup starts.

Pickup Stationary Jam

The top sensor goes on, but does not go off within a specific period of time.

Delivery Delay Jam

The top sensor goes on, but the delivery sensor does not go on within a specific period of time.

Wrap Jam

The delivery sensor goes on, but it goes off before a specific period of time passes.

Delivery Stationary Jam

The delivery sensor goes on, but it does not go off within a specific period of time.

Initial Jam

The top sensor or the delivery sensor goes on while the main motor is starting to rotate.

Cover Open Jam

The machine identifies a condition in which the front cover is opened while it is moving paper.

2.3.2.2 Delay Jams**2.3.2.2.1 Pickup Delay Jam**0002-8760

If the top sensor does not detect the leading edge of paper within 1.2 sec after the start of pickup operation, the machine initiates pickup operation once gain. The machine identifies a pickup delay jam if the top sensor does not detect the leading edge of paper within 1.2 sec after the 2nd pickup operation.

2.3.2.2.2 Delivery Delay Jam0002-8762

The machine identifies a delay jam if the delivery sensor does not detect the leading edge of paper within 1.615 sec after the top sensor has detected the leading edge of paper.

2.3.2.3 Stationary Jams**2.3.2.3.1 Pickup Stationary Jam**0002-8761

The machine identifies a pickup stationary jam if the top sensor does not detect the absence of paper within 3.575 sec after the top sensor has detected the leading edge of paper.

2.3.2.3.2 Delivery Stationary Jam0002-8763

The machine moves to a delivery stationary jam sequence if it does not detect a wrap jam.

The machine identifies a delivery stationary jam if the delivery sensor does not detect the trailing edge of paper for 1.715 sec after the top sensor has detected the trailing edge of paper.

2.3.2.4 Other Jams**2.3.2.4.1 Wrap Jam**0002-8764

The machine starts a wrap jam detection sequence in 0.1 sec if it does not detect a delivery delay jam.

It identifies a wrap jam if the delivery sensor detects the trailing edge of paper within 1.06 sec after the top sensor has detected the trailing edge of paper.

The term "wrap jam" refers to paper that wraps around the fixing pressure roller; its leading edge passes through the delivery sensor, but it jams thereafter. The machine is designed to identify such a jam so as to prevent wrapping paper from fully moving into the fixing assembly.

2.3.2.4.2 Initial Jam

0002-8765

The machine identifies an initial jam if the top sensor or the delivery sensor detects the presence of paper when the main motor starts to rotate.

2.3.2.4.3 Cover Open Jam

0002-8766

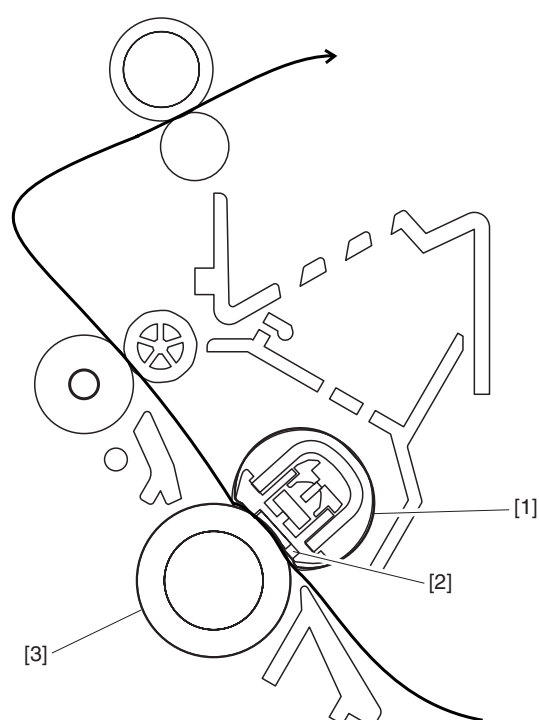
The machine identifies a cover open jam if it detects that the front cover is open with the top sensor or the delivery sensor detecting the presence of paper (while paper is being moved or the machine is not running a jam check).

2.4 FIXING SYSTEM

2.4.1 Overview/Configuration

2.4.1.1 Overview

0002-8375



F-2-4

T-2-4

[1] Fixing film unit

[2] Fixing heater

[3] Pressure roller

The machine's fixing system is an on-demand type, and its fixing assembly consists of the fixing film unit and the pressure roller: the fixing film has a built-in fixing heater, thermistor, and thermal fuse.

The toner transferred to paper is heated by the fixing heater, which provides heat through the fixing film; the toner is forced under the pressure roller so that it is fused into the fibers of the paper under both heat and pressure.

2.4.2 Various Control Mechanisms

2.4.2.1 Protective Functions

2.4.2.1.1 Protective Mechanisms

0002-8543

The machine is equipped with the following 3 types of protective mechanisms used to prevent its fixing heater from going awry.

1. protective mechanism by the CPU
2. protective mechanism by the fixing heater safety circuit
3. protective mechanism by the thermal fuse

1. Protective Mechanism by the CPU

The machine's CPU monitors the voltage of the fixing heater temperature detection signal from the main thermistor and the sub thermistor at all times, and it cuts the power to the fixing heater if it finds that the fixing temperature appreciably exceeds a specific level.

When the fixing temperature abnormally increases and the voltage of the fixing heater temperature detection signal from the main thermistor drops to about 0.775 V (equivalent of 235 deg C) or less, the CPU causes the fixing heater drive signal to go Low and turns off the photo triac coupler, thus cutting power to the fixing heater.

If the temperature of the fixing heater abnormally increases and the voltage of the fixing heater temperature detection signal from the sub thermistor reaches about 2.779 V (equivalent of 320 deg C) or more, the CPU causes the fixing heater drive signal to go Low and turns off the photo triac couple, thus cutting off the power to the fixing heater.

2. Protective Mechanism by the Fixing Heater Safety Circuit

The fixing heater safety circuit monitors the voltage of the fixing heater temperature detection signal from the main thermistor and the sub thermistor at all times.

If the fixing temperature appreciably exceeds a specific level, the machine cuts off the power to the fixing heater regardless of the instructions from the CPU.

When the temperature of the fixing heater increases abnormally and the voltage of the fixing heater temperature detection signal of the main thermistor reaches about 0.775 V (equivalent of 235 deg C) or less, the output of the comparator turns Low to turn off the relay, thus cutting off the power to the fixing heater.

Likewise, if the temperature of the fixing heater increases abnormally and the voltage of the fixing heater temperature detection signal of the sub thermistor reaches about 2.779 V (equivalent of 320 deg C) or more, the output of the comparator turns Low to turn off the transistor, thus turning off the relay and cutting off the power to the fixing heater regardless of the relay drive signal from the CPU.

3. Protective Mechanism by the Thermal Fuse

If the temperature of the fixing heater increases abnormally and the temperature of the thermal fuse exceeds about 228 deg C, the thermal fuse starts to melt to cut off the power to the fixing heater.

2.4.2.1.2 Detecting a Fault in the Fixing Assembly

0002-8551

The CPU identifies a fault in the fixing assembly for the following conditions (a. thorough g.) and operates as described:

1. the CPU causes the fixing heater drive signal to go Low to cut off the power to the fixing heater.
 2. the CPU causes the relay drive signal to go Low to turn off the relay.
 3. the CPU, if it detects a fault while printing is under way, discharges the paper being picked up or moved at the time, and immediately turns off the main motor, scanner motor, and high-voltage system and puts the printer unit in an error state.
- a) the reading of the main thermistor does not exceed 50 deg C within 2.34 sec after the start-up temperature control mechanism is started.
 - b) the CPU detects that the reading of the main thermistor remains 235 deg C or more for 1 sec continuously while fixing temperature control is under way.
 - c) the CPU detects that the reading of the main thermistor remains 100 deg C or less for 1.2 sec continuously while paper passage temperature control is under way; or the CPU detects that the reading of the main thermistor remains 50 deg C or less for 0.3 sec continuously while between-sheets temperature control is under way.
 - d) the CPU detects that the reading of the main thermistor remains less than 20 deg C for 0.3 sec continuously while fixing heater temperature control is under way.
 - e) the temperature of the main thermistor does not exceed 100 deg C within 20 sec after the start of start-up temperature control.
 - f) the CPU detects that the reading of the sub thermistor remains less than 35 deg C for 0.15 sec continuously while fixing heater temperature control is under way.
 - g) the CPU detects that the reading of the sub thermistor remains 320 deg C for 0.15 sec continuously while fixing heater temperature control is under way.

Chapter 3 DISASSEMBLY AND ASSEMBLY

Contents

3.1 EXTERNAL AND CONTROLS SYSTEM	3-1
3.1.1 Rear Cover.....	3-1
3.1.1.1 Removing the Cassette	3-1
3.1.1.2 Removing the Rear Cover	3-1
3.1.2 Right Cover	3-1
3.1.2.1 Removing the Cassette	3-1
3.1.2.2 Removing the Rear Cover	3-1
3.1.2.3 Removing the Top Cover	3-1
3.1.2.4 Removing the Right Cover.....	3-2
3.1.3 Left Cover.....	3-2
3.1.3.1 Removing the Cassette	3-2
3.1.3.2 Removing the Rear Cover	3-2
3.1.3.3 Removing the Top Cover	3-2
3.1.3.4 Removing the Left Cover	3-3
3.1.4 Top Cover.....	3-3
3.1.4.1 Removing the Cassette	3-3
3.1.4.2 Removing the Rear Cover	3-3
3.1.4.3 Removing the Top Cover	3-3
3.1.5 Front Cover.....	3-4
3.1.5.1 Removing the Front Cover	3-4
3.1.6 Engine controller board	3-4
3.1.6.1 Removing the Cassette	3-4
3.1.6.2 Removing the Rear Cover	3-4
3.1.6.3 Removing the Top Cover	3-4
3.1.6.4 Removing the Left Cover	3-5
3.1.6.5 Removing the Engine Controller Board	3-5
3.1.7 Power supply board	3-5
3.1.7.1 Removing the Cassette	3-5
3.1.7.2 Removing the Front Cover	3-5
3.1.7.3 Removing the Rear Cover	3-5
3.1.7.4 Removing the Top Cover	3-6
3.1.7.5 Removing the Right Cover.....	3-6
3.1.7.6 Removing the Left Cover	3-6
3.1.7.7 Removing the Power Supply Shield Plate.....	3-7
3.1.7.8 Removing the Power Supply Assembly	3-7
3.1.7.9 Removing the Power Supply Board	3-7
3.1.8 High-voltage board.....	3-7
3.1.8.1 Removing the Cassette	3-7
3.1.8.2 Removing the Front Cover	3-7
3.1.8.3 Removing the Rear Cover	3-8
3.1.8.4 Removing the Top Cover	3-8
3.1.8.5 Removing the Right Cover.....	3-8
3.1.8.6 Removing the Left Cover	3-9
3.1.8.7 Removing the Power Supply Shield Plate.....	3-9

3.1.8.8 Removing the Power Supply Assembly	3-9
3.1.8.9 Removing the High-Voltage Power Supply Board.....	3-10
3.1.9 CAPT board	3-10
3.1.9.1 Removing the Cassette.....	3-10
3.1.9.2 Removing the Rear Cover.....	3-10
3.1.9.3 Removing the Top Cover.....	3-10
3.1.9.4 Removing the Left Cover	3-10
3.1.9.5 Removing the CAPT Board.....	3-11
3.1.10 Top sensor.....	3-11
3.1.10.1 Removing the Cassette.....	3-11
3.1.10.2 Removing the Front Cover	3-11
3.1.10.3 Removing the Rear Cover.....	3-11
3.1.10.4 Removing the Top Cover.....	3-12
3.1.10.5 Removing the Right Cover	3-12
3.1.10.6 Removing the Left Cover	3-12
3.1.10.7 Removing the Power Supply Shield Plate	3-12
3.1.10.8 Removing the Power Supply Assembly	3-13
3.1.10.9 Removing the Top Sensor.....	3-13
3.1.11 Delivery sensor	3-13
3.1.11.1 Removing the Cassette.....	3-13
3.1.11.2 Removing the Rear Cover.....	3-13
3.1.11.3 Removing the Top Cover.....	3-14
3.1.11.4 Removing the Left Cover	3-14
3.1.11.5 Removing the Power Supply Shield Plate	3-14
3.1.11.6 Removing the Delivery Sensor	3-14
3.2 IMAGE FORMATION SYSTEM.....	3-16
3.2.1 Transfer Charging Roller.....	3-16
3.2.1.1 Removing the Transfer Charging Roller	3-16
3.3 LASER EXPOSURE SYSTEM	3-17
3.3.1 Laser Scanner Unit	3-17
3.3.1.1 Removing the Cassette.....	3-17
3.3.1.2 Removing the Rear Cover.....	3-17
3.3.1.3 Removing the Top Cover.....	3-17
3.3.1.4 Removing the Left Cover	3-17
3.3.1.5 Removing the Laser/Scanner Unit.....	3-17
3.4 PICKUP AND FEEDING SYSTEM.....	3-19
3.4.1 Cassette Pickup Roller.....	3-19
3.4.1.1 Removing the Cassette.....	3-19
3.4.1.2 Removing the Front Cover	3-19
3.4.1.3 Removing the Rear Cover.....	3-19
3.4.1.4 Removing the Top Cover.....	3-19
3.4.1.5 Removing the Right Cover	3-20
3.4.1.6 Removing the Left Cover	3-20
3.4.1.7 Removing the Gear Unit.....	3-20
3.4.1.8 Removing the Tooth-Missing Gear	3-20
3.4.1.9 Removing the Cassette Pickup Roller	3-21
3.4.2 Cassette Separation Pad	3-21
3.4.2.1 Removing the Cassette.....	3-21
3.4.2.2 Removing the Rear of the Cassette.....	3-21

3.4.2.3 Removing the Cassette Separation Pad	3-21
3.4.3 Cassette Pickup solenoid	3-22
3.4.3.1 Removing the Cassette	3-22
3.4.3.2 Removing the Front Cover	3-22
3.4.3.3 Removing the Rear Cover	3-22
3.4.3.4 Removing the Top Cover	3-23
3.4.3.5 Removing the Right Cover	3-23
3.4.3.6 Removing the Left Cover	3-23
3.4.3.7 Removing the Power Supply Shield Plate	3-23
3.4.3.8 Removing the Power Supply Assembly	3-24
3.4.3.9 Removing the Cassette Pickup Solenoid	3-24
3.4.4 Gear Unit	3-24
3.4.4.1 Removing the Cassette	3-24
3.4.4.2 Removing the Front Cover	3-24
3.4.4.3 Removing the Rear Cover	3-25
3.4.4.4 Removing the Top Cover	3-25
3.4.4.5 Removing the Right Cover	3-25
3.4.4.6 Removing the Left Cover	3-26
3.4.4.7 Removing the Gear Unit	3-26
3.4.5 Main Motor	3-26
3.4.5.1 Removing the Cassette	3-26
3.4.5.2 Removing the Front Cover	3-26
3.4.5.3 Removing the Rear Cover	3-27
3.4.5.4 Removing the Top Cover	3-27
3.4.5.5 Removing the Right Cover	3-27
3.4.5.6 Removing the Left Cover	3-28
3.4.5.7 Removing the Power Supply Shield Plate	3-28
3.4.5.8 Removing the Power Supply Assembly	3-28
3.4.5.9 Removing the Main Motor	3-29
3.4.6 Multi-purpose Pickup Roller	3-29
3.4.6.1 Removing the Cassette	3-29
3.4.6.2 Removing the Front Cover	3-29
3.4.6.3 Removing the Rear Cover	3-29
3.4.6.4 Removing the Top Cover	3-29
3.4.6.5 Removing the Right Cover	3-30
3.4.6.6 Removing the Left Cover	3-30
3.4.6.7 Removing the Gear Unit	3-30
3.4.6.8 Removing the Tooth-Missing Gear	3-30
3.4.6.9 Removing the Engine Controller Board	3-31
3.4.6.10 Removing the Manual Feed Stay	3-31
3.4.6.11 Removing the Paper Feed Guide	3-31
3.4.6.12 Removing the Paper Feed Roller	3-31
3.4.7 Multi-purpose Pickup Solenoid	3-32
3.4.7.1 Removing the Cassette	3-32
3.4.7.2 Removing the Front Cover	3-32
3.4.7.3 Removing the Rear Cover	3-32
3.4.7.4 Removing the Top Cover	3-32
3.4.7.5 Removing the Right Cover	3-33
3.4.7.6 Removing the Left Cover	3-33

3.4.7.7 Removing the Gear Unit	3-33
3.4.7.8 Removing the Tooth-Missing Gear	3-33
3.4.7.9 Removing the Power Supply Shield Plate	3-34
3.4.7.10 Removing the Power Supply Assembly	3-34
3.4.7.11 Removing the Manual Pickup Solenoid	3-34
3.5 FIXING SYSTEM	3-36
3.5.1 Fixing Pressure Roller	3-36
3.5.1.1 Removing the Cassette.....	3-36
3.5.1.2 Removing the Front Cover	3-36
3.5.1.3 Removing the Rear Cover.....	3-36
3.5.1.4 Removing the Top Cover.....	3-36
3.5.1.5 Removing the Right Cover	3-37
3.5.1.6 Removing the Left Cover	3-37
3.5.1.7 Removing the Fixing Film Unit.....	3-37
3.5.1.8 Removing the Fixing Pressure Roller.....	3-38
3.5.2 Fixing Film Unit	3-38
3.5.2.1 Removing the Cassette.....	3-38
3.5.2.2 Removing the Front Cover	3-38
3.5.2.3 Removing the Rear Cover.....	3-39
3.5.2.4 Removing the Top Cover.....	3-39
3.5.2.5 Removing the Right Cover	3-39
3.5.2.6 Removing the Left Cover	3-40
3.5.2.7 Removing the Fixing Film Unit.....	3-40

3.1 EXTERNAL AND CONTROLS SYSTEM

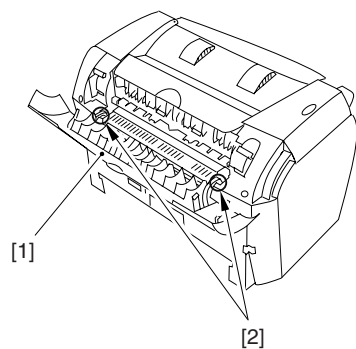
3.1.1 Rear Cover

3.1.1.1 Removing the Cassette 0002-3466

- 1) Remove the cassette by holding the cassette handle.

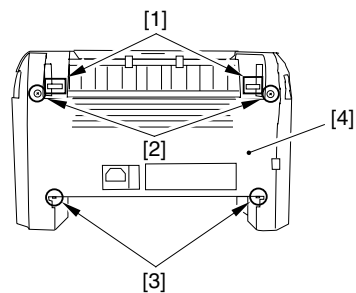
3.1.1.2 Removing the Rear Cover 0002-3475

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-1

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



F-3-2

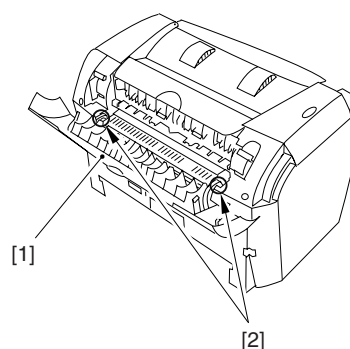
3.1.2 Right Cover

3.1.2.1 Removing the Cassette 0002-3484

- 1) Remove the cassette by holding the cassette handle.

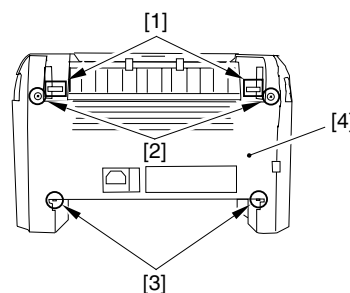
3.1.2.2 Removing the Rear Cover 0002-3487

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-3

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



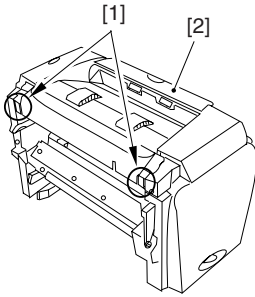
F-3-4

3.1.2.3 Removing the Top Cover 0002-3490

- 1) Open the front cover. (This step may be skipped if

the front cover has already been removed.)

- 2) Free the 2 claws [1], and detach the top cover [2].



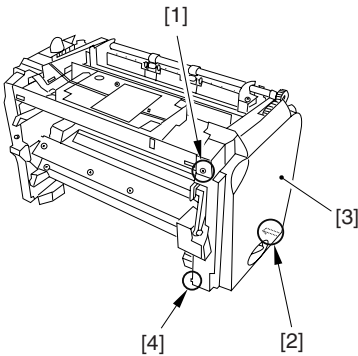
F-3-5

3.1.2.4 Removing the Right

Cover

0002-3493

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.



F-3-6

3.1.3 Left Cover

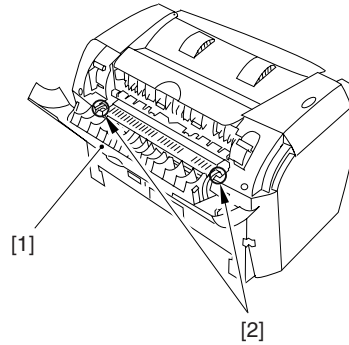
3.1.3.1 Removing the Cassette 0002-3485

- 1) Remove the cassette by holding the cassette handle.

3.1.3.2 Removing the Rear Cover

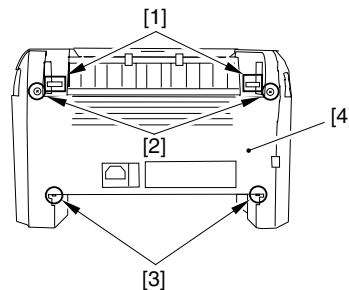
0002-3488

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-7

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

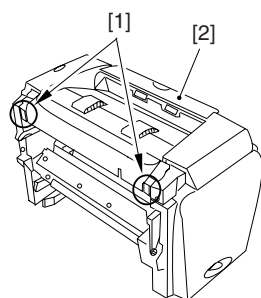


F-3-8

3.1.3.3 Removing the Top Cover

0002-3492

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

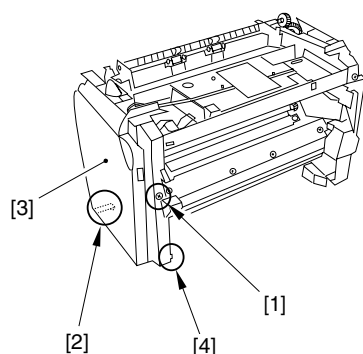


F-3-9

3.1.3.4 Removing the Left Cover

0002-3501

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.



F-3-10

3.1.4 Top Cover

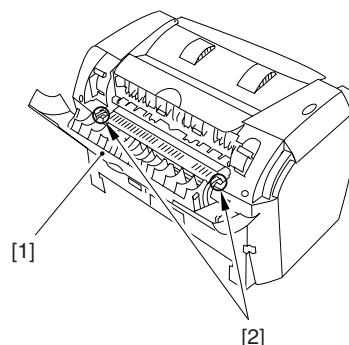
3.1.4.1 Removing the Cassette 0002-3468

- 1) Remove the cassette by holding the cassette handle.

3.1.4.2 Removing the Rear

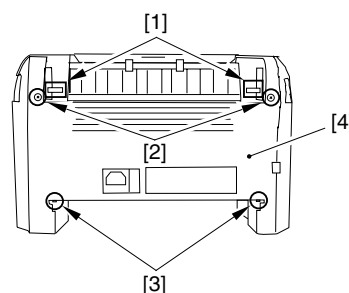
Cover 0002-3479

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-11

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

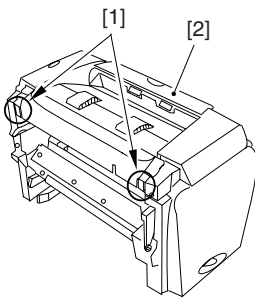


F-3-12

3.1.4.3 Removing the Top Cover

0002-3481

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].



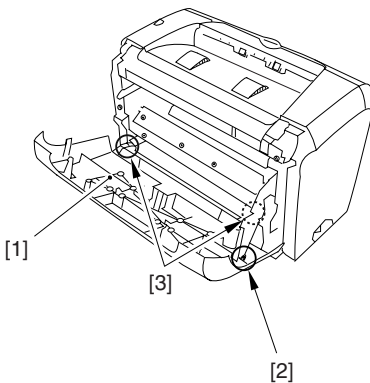
F-3-13

3.1.5 Front Cover

3.1.5.1 Removing the Front Cover

0002-3448

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.



F-3-14

3.1.6 Engine controller board

3.1.6.1 Removing the Cassette

0002-3581

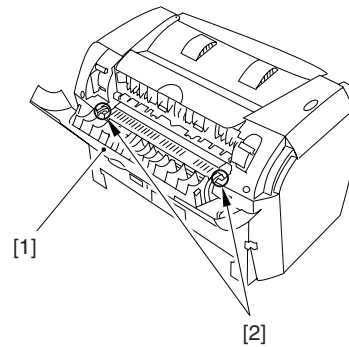
- 1) Remove the cassette by holding the cassette handle.

3.1.6.2 Removing the Rear Cover

Cover

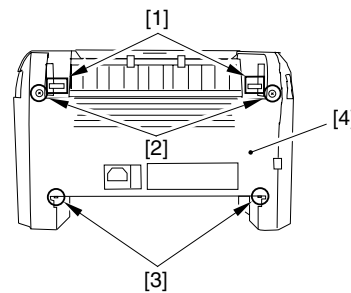
0002-3584

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-15

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

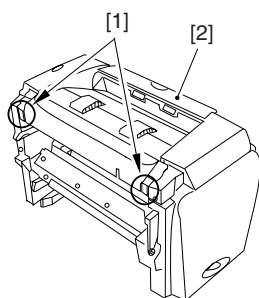


F-3-16

3.1.6.3 Removing the Top Cover

0002-3585

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

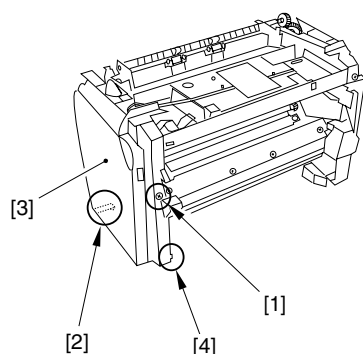


F-3-17

3.1.6.4 Removing the Left Cover

0002-3586

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

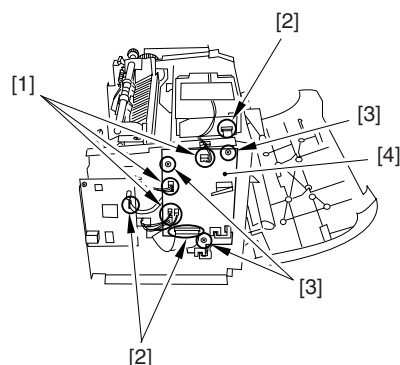


F-3-18

3.1.6.5 Removing the Engine Controller Board

0002-3587

- 1) Disconnect the 5 connectors [1], and remove the 3 flat cables [2].
- 2) Remove the 3 screws [3], and detach the engine controller board [4] while paying attention to the sensor flag.



F-3-19

3.1.7 Power supply board

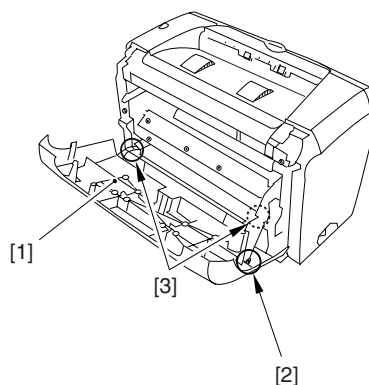
3.1.7.1 Removing the Cassette 0002-3735

- 1) Remove the cassette by holding the cassette handle.

3.1.7.2 Removing the Front Cover

0002-3736

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

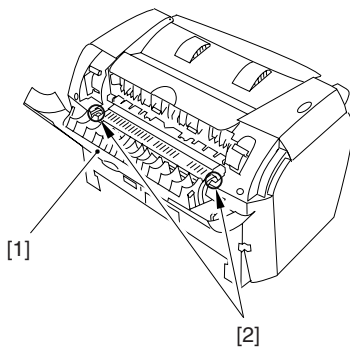


F-3-20

3.1.7.3 Removing the Rear Cover

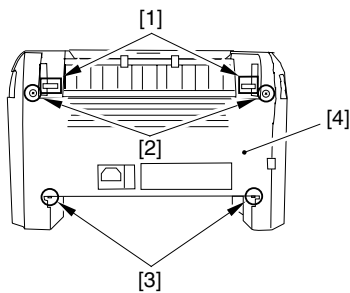
0002-3738

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-21

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

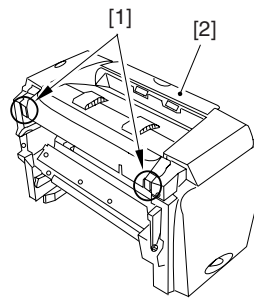


F-3-22

3.1.7.4 Removing the Top Cover

0002-3740

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

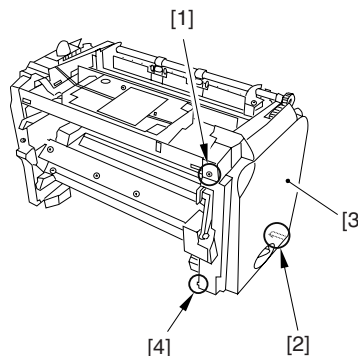


F-3-23

3.1.7.5 Removing the Right Cover

0002-3742

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

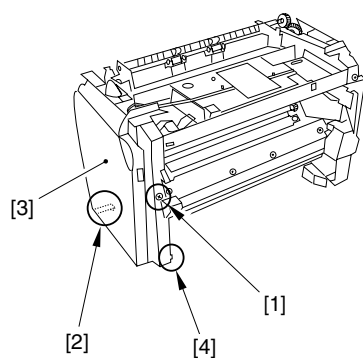


F-3-24

3.1.7.6 Removing the Left Cover

0002-3744

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

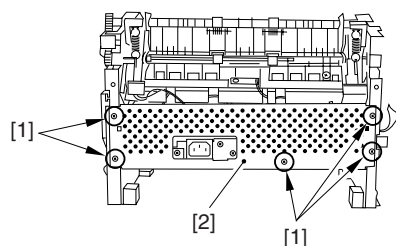


F-3-25

3.1.7.7 Removing the Power Supply Shield Plate

0002-3746

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].

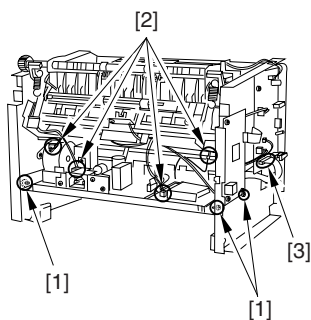


F-3-26

3.1.7.8 Removing the Power Supply Assembly

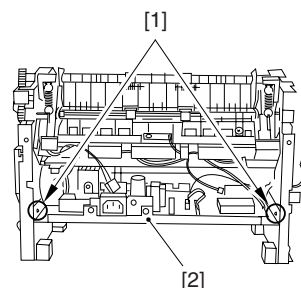
0002-3747

- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat cable [3] of the engine controller board.



F-3-27

- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.

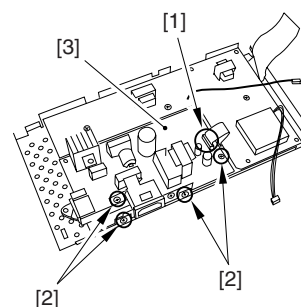


F-3-28

3.1.7.9 Removing the Power Supply Board

0002-3748

- 1) Remove the flat cable [1].
- 2) Remove the 4 screws [2], and detach the power supply board [3].



F-3-29

3.1.8 High-voltage board

3.1.8.1 Removing the Cassette

0002-3734

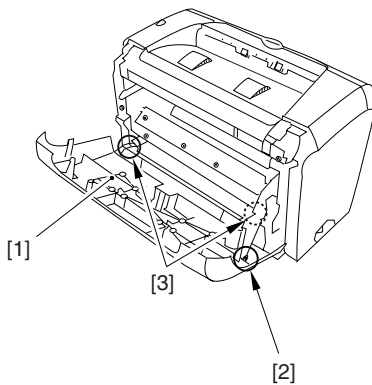
- 1) Remove the cassette by holding the cassette handle.

3.1.8.2 Removing the Front Cover

0002-3737

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front

cover.

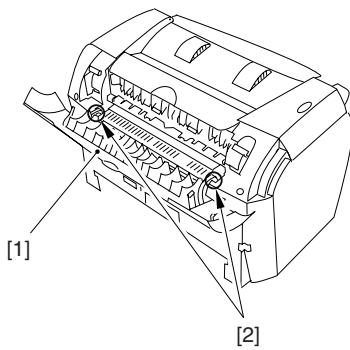


F-3-30

3.1.8.3 Removing the Rear Cover

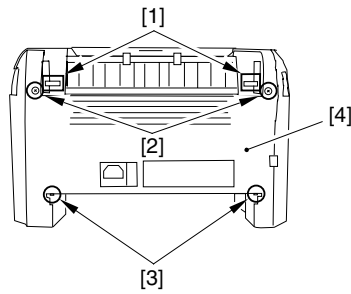
0002-3739

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-31

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

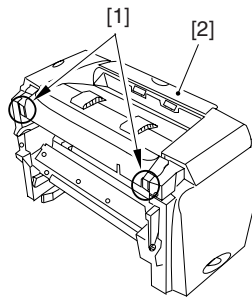


F-3-32

3.1.8.4 Removing the Top Cover

0002-3741

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

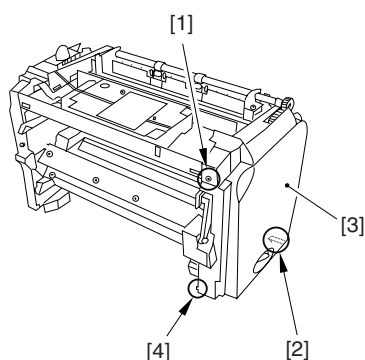


F-3-33

3.1.8.5 Removing the Right Cover

0002-3743

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

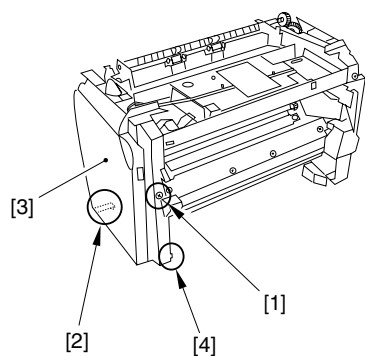


F-3-34

3.1.8.6 Removing the Left Cover

0002-3745

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

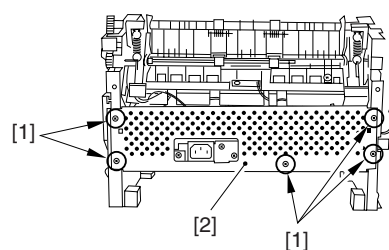


F-3-35

3.1.8.7 Removing the Power Supply Shield Plate

0002-3750

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].

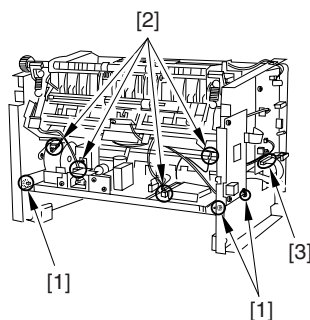


F-3-36

3.1.8.8 Removing the Power Supply Assembly

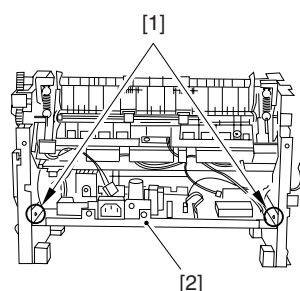
0002-3751

- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat cable [3] of the engine controller board.



F-3-37

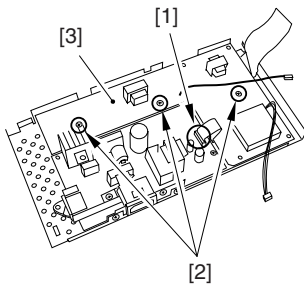
- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.



F-3-38

3.1.8.9 Removing the High-Voltage Power Supply Board 0002-3749

- 1) Remove the flat cable [1].
- 2) Remove the 3 screws [2], and detach the high-voltage power supply board [3].



F-3-39

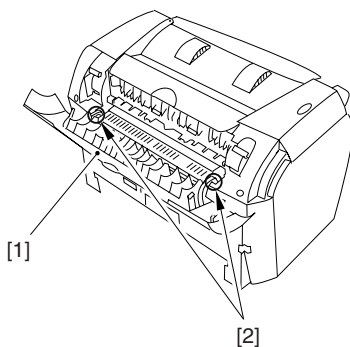
3.1.9 CAPT board

3.1.9.1 Removing the Cassette 0002-3591

- 1) Remove the cassette by holding the cassette handle.

3.1.9.2 Removing the Rear Cover 0002-3592

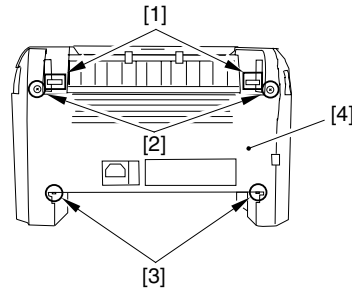
- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-40

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].

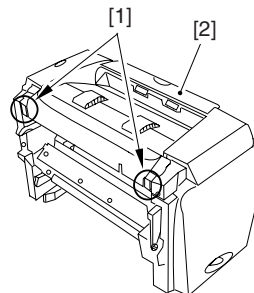
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



F-3-41

3.1.9.3 Removing the Top Cover 0002-3593

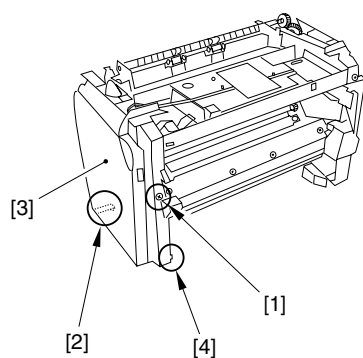
- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].



F-3-42

3.1.9.4 Removing the Left Cover 0002-3594

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.



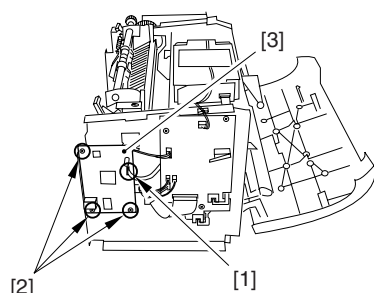
F-3-43

3.1.9.5 Removing the CAPT

Board

0002-3596

- 1) Removing the flat cable [1].
- 2) Remove the 3 screws [2], and detach the CAPT board [3].



F-3-44

3.1.10 Top sensor

3.1.10.1 Removing the Cassette 0002-3757

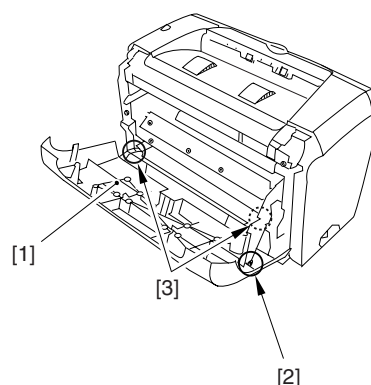
- 1) Remove the cassette by holding the cassette handle.

3.1.10.2 Removing the Front

Cover

0002-3760

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.



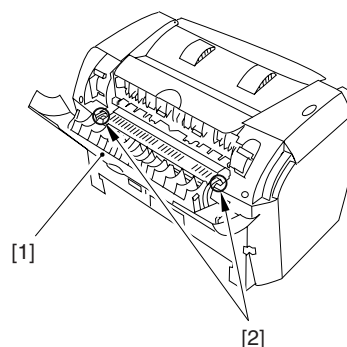
F-3-45

3.1.10.3 Removing the Rear

Cover

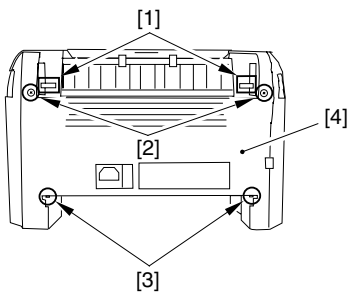
0002-3763

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-46

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

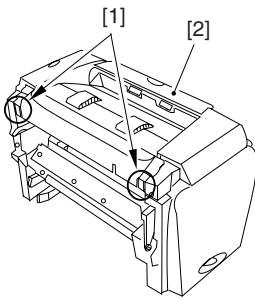


F-3-47

3.1.10.4 Removing the Top Cover

0002-3766

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

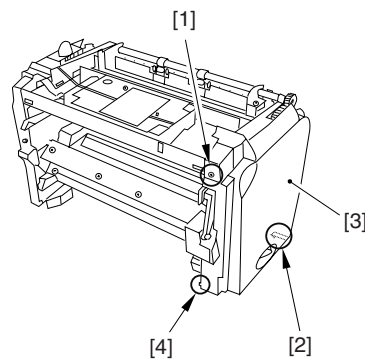


F-3-48

3.1.10.5 Removing the Right Cover

0002-3769

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

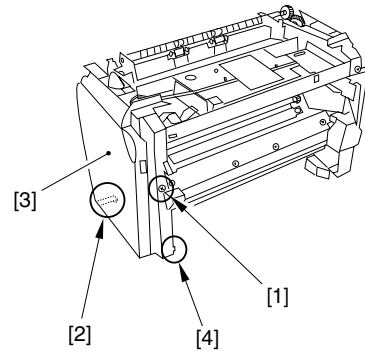


F-3-49

3.1.10.6 Removing the Left Cover

0002-3772

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

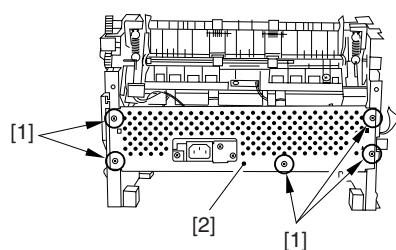


F-3-50

3.1.10.7 Removing the Power Supply Shield Plate

0002-3775

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].



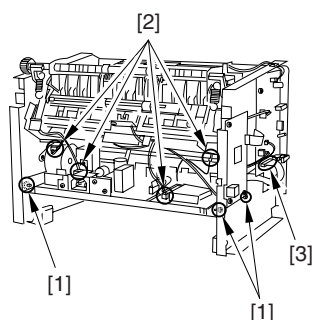
F-3-51

3.1.10.8 Removing the Power

Supply Assembly

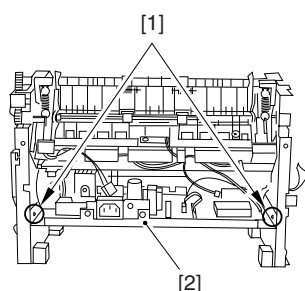
0002-3778

- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat cable [3] of the engine controller board.



F-3-52

- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.

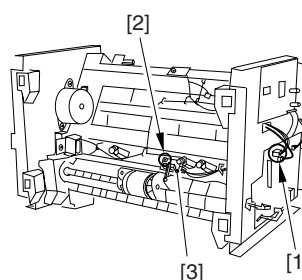


F-3-53

3.1.10.9 Removing the Top Sensor

0002-3781

- 1) Shift down the main unit so that its front faces down (i.e., the inside of the main unit is in view).
- 2) Disconnect the connector [1] of the engine controller board, and free the cable from the cable guide.
- 3) Removing the screw [2], and detach the top sensor.



F-3-54

3.1.11 Delivery sensor

3.1.11.1 Removing the Cassette

0002-3759

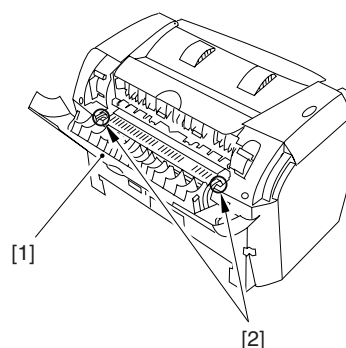
- 1) Remove the cassette by holding the cassette handle.

3.1.11.2 Removing the Rear

Cover

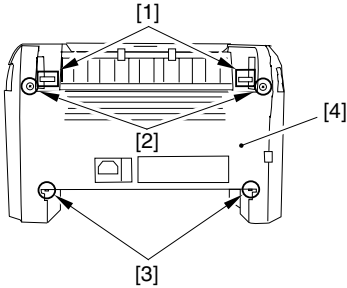
0002-3764

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-55

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

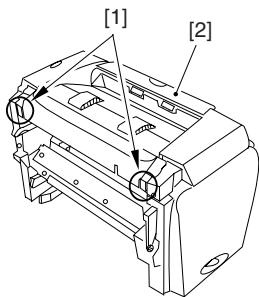


F-3-56

3.1.11.3 Removing the Top Cover

0002-3765

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

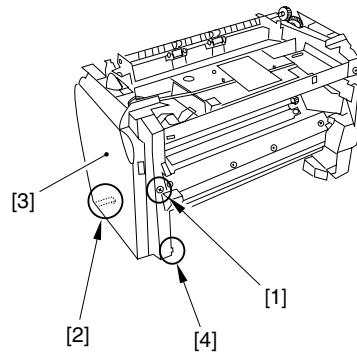


F-3-57

3.1.11.4 Removing the Left Cover

0002-3773

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

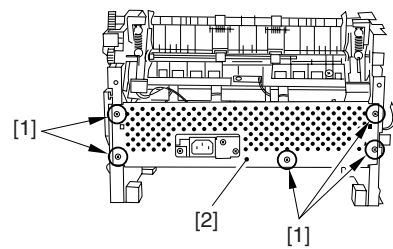


F-3-58

3.1.11.5 Removing the Power Supply Shield Plate

0002-3776

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].

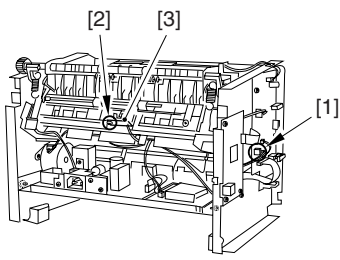


F-3-59

3.1.11.6 Removing the Delivery Sensor

0002-3777

- 1) Disconnect the connector [1] of the engine controller board, and free the cable from the cable guide.
- 2) Remove the screw [2], and detach the delivery sensor [3].



F-3-60

3.2 IMAGE FORMATION SYSTEM

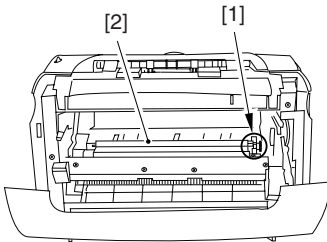
3.2.1 Transfer Charging Roller

3.2.1.1 Removing the Transfer

Charging Roller

0002-3718

- 1) Open the front cover.
- 2) Pick the 2 claws [1] on the right side of the roller, and lift it.
- 3) Slide the transfer charging roller [2] to the right to detach.



F-3-61

3.3 LASER EXPOSURE SYSTEM

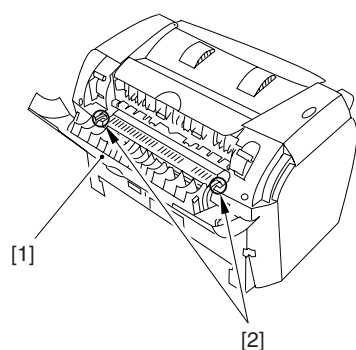
3.3.1 Laser Scanner Unit

3.3.1.1 Removing the Cassette 0002-3683

- 1) Remove the cassette by holding the cassette handle.

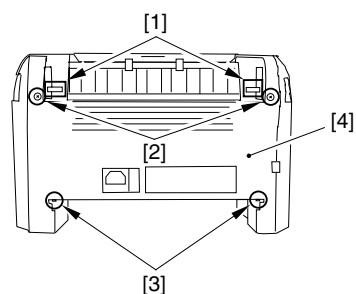
3.3.1.2 Removing the Rear Cover 0002-3684

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-62

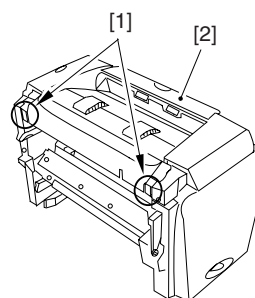
- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



F-3-63

3.3.1.3 Removing the Top Cover 0002-3685

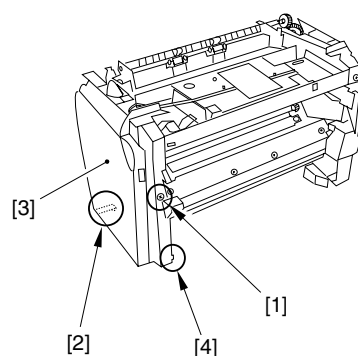
- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].



F-3-64

3.3.1.4 Removing the Left Cover 0002-3686

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.



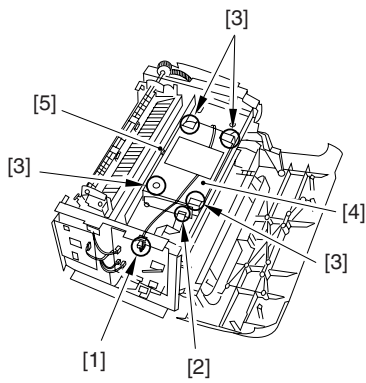
F-3-65

3.3.1.5 Removing the Laser/Scanner Unit 0002-3687

- 1) Disconnect the connector [1] of the engine

controller board, and free the cable from the cable guide.

- 2) Remove the flat cable [2] from the laser/scanner unit board.
- 3) Remove the 4 screws [3], and detach the laser/scanner unit [4]. At this time, take care not to lose the grounding plate [5].



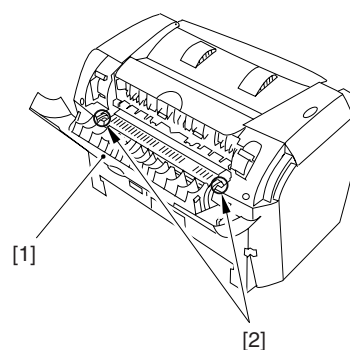
F-3-66

3.4 PICKUP AND FEEDING SYSTEM

3.4.1 Cassette Pickup Roller

3.4.1.1 Removing the Cassette 0002-3510

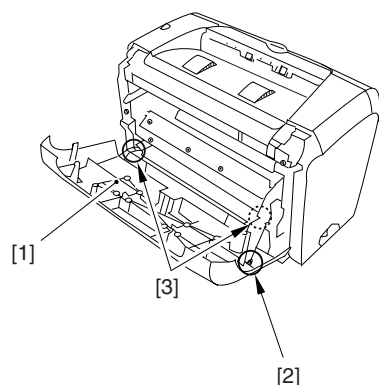
- 1) Remove the cassette by holding the cassette handle.



F-3-68

3.4.1.2 Removing the Front Cover 0002-3513

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

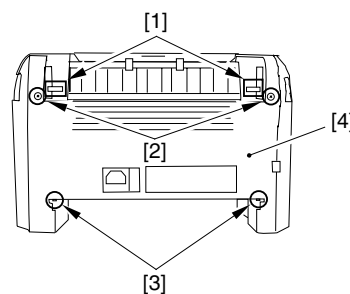


F-3-67

3.4.1.3 Removing the Rear Cover 0002-3515

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.

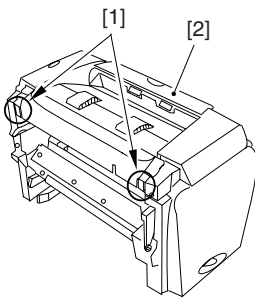
- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



F-3-69

3.4.1.4 Removing the Top Cover 0002-3521

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

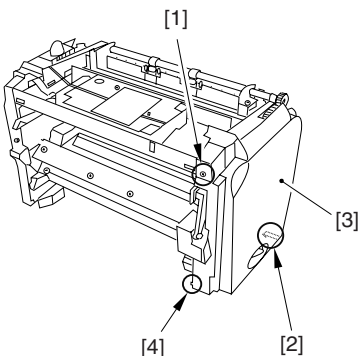


F-3-70

3.4.1.5 Removing the Right Cover

0002-3524

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

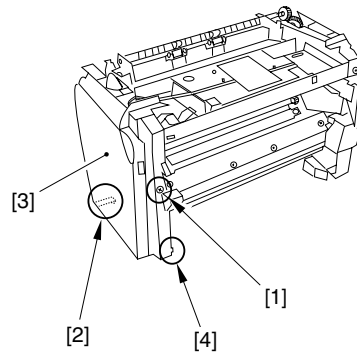


F-3-71

3.4.1.6 Removing the Left Cover

0002-3526

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

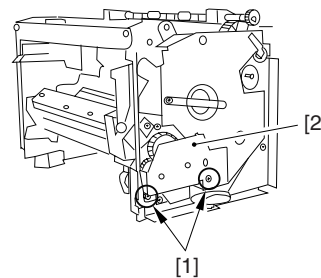


F-3-72

3.4.1.7 Removing the Gear Unit

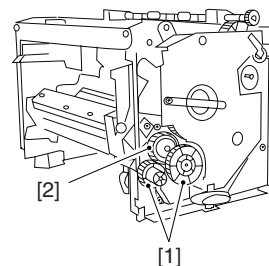
0002-3533

- 1) Remove the 2 screws [1], and detach the drive plate (small) [2].



F-3-73

- 2) Remove the 2 gears [1].
- 3) While freeing the claw, detach the gear unit [2].

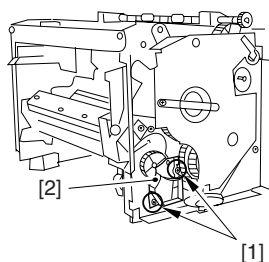


F-3-74

3.4.1.8 Removing the Tooth-Missing Gear

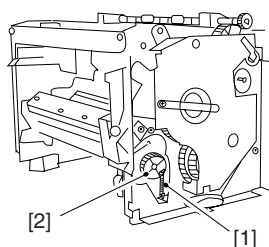
0002-3548

- 1) Remove the 2 screws [1], and detach the gear support [2].



F-3-75

- 2) Remove the spring [1].
- 3) While freeing the claw, detach the tooth-missing gear [2].

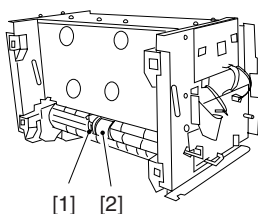


F-3-76

3.4.1.9 Removing the Cassette Pickup Roller

0002-3565

- 1) Shift down the main unit so that its front faces down (i.e., the inside of the main unit is in view).
- 2) Remove the boss of the bushing [1], and turn it to the front; then, slide it to detach the bushing.
- 3) Slide the pickup roller [2] to remove it.



F-3-77

3.4.2 Cassette Separation Pad

3.4.2.1 Removing the Cassette

0002-2788

- 1) Remove the cassette by holding the cassette handle.

3.4.2.2 Removing the Rear of the Cassette

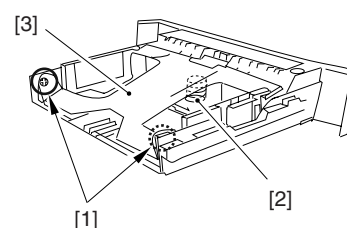
0002-2797

- 1) Lift the rear of the cassette, and separate the rear from the front.

3.4.2.3 Removing the Cassette Separation Pad

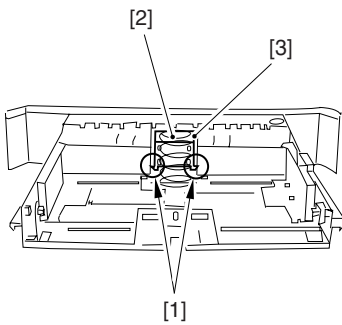
0002-2799

- 1) Remove the shafts [1] on both sides of the lifting plate. Remove the lifting plate [3] while watching the lifting plate spring [2] carefully.



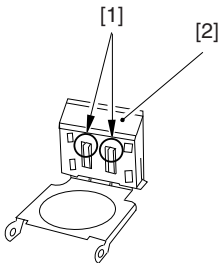
F-3-78

- 2) Remove the 2 claws [1] on both sides of the cassette separation pad and lift it up while watching the lifting plate spring [2] carefully. Ensure that the separation pad spring does not get lost.
- 3) Remove both the plate and the cassette separation pad [3] by sliding them to the left.



F-3-79

- 4) Remove the 2 claws [1] and remove the cassette separation pad [2] by sliding it up.



F-3-80

3.4.3 Cassette Pickup solenoid

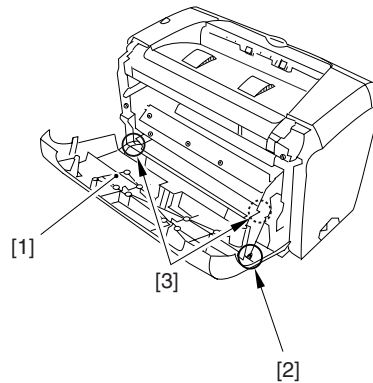
3.4.3.1 Removing the Cassette 0002-3511

- 1) Remove the cassette by holding the cassette handle.

3.4.3.2 Removing the Front

Cover 0002-3514

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

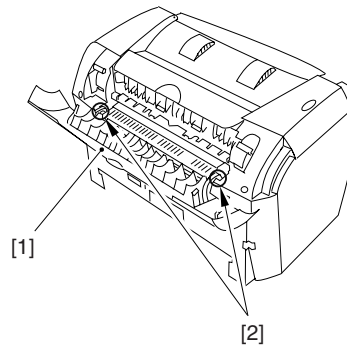


F-3-81

3.4.3.3 Removing the Rear

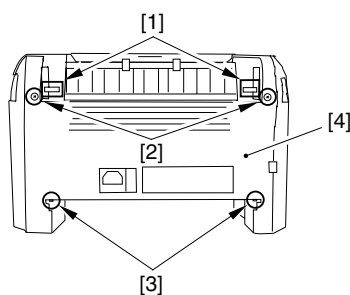
Cover 0002-3516

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-82

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

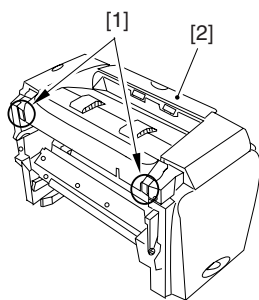


F-3-83

3.4.3.4 Removing the Top Cover

0002-3522

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

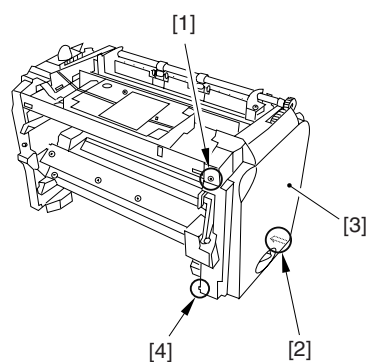


F-3-84

3.4.3.5 Removing the Right Cover

0002-3531

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

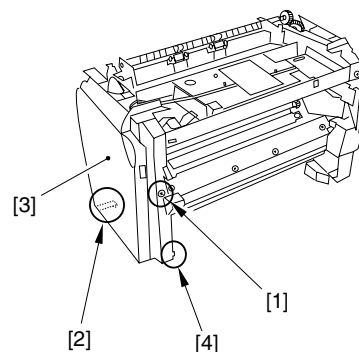


F-3-85

3.4.3.6 Removing the Left Cover

0002-3528

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

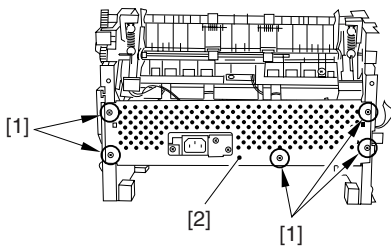


F-3-86

3.4.3.7 Removing the Power Supply Shield Plate

0002-3752

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].



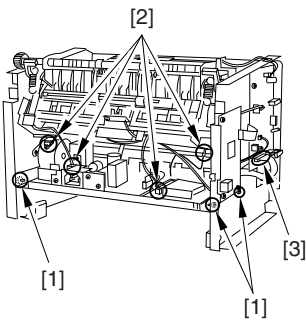
F-3-87

3.4.3.8 Removing the Power

Supply Assembly

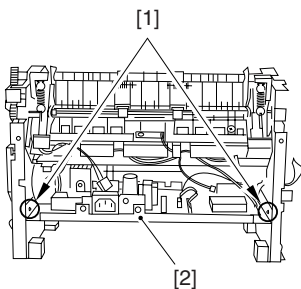
0002-3753

- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat cable [3] of the engine controller board.



F-3-88

- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.



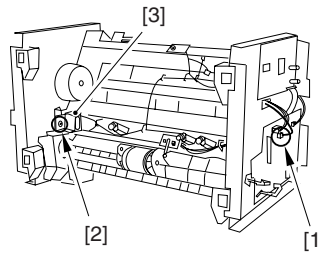
F-3-89

3.4.3.9 Removing the Cassette

Pickup Solenoid

0002-3754

- 1) Shift down the main unit so that its front faces down (i.e., the inside of the main unit is in view).
- 2) Disconnect the connector [1] of the engine controller board and free the cable from the cable guide.
- 3) Remove the screw [2], and detach the cassette pickup solenoid [3] (rear of the main motor).



F-3-90

3.4.4 Gear Unit

3.4.4.1 Removing the Cassette

0002-3688

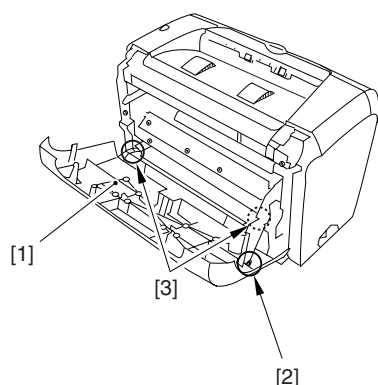
- 1) Remove the cassette by holding the cassette handle.

3.4.4.2 Removing the Front

Cover

0002-3689

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

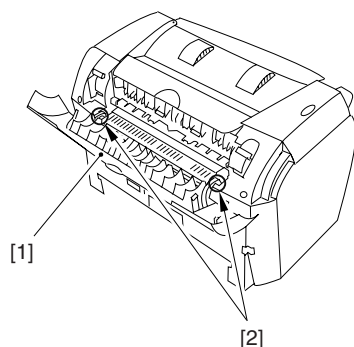


F-3-91

3.4.4.3 Removing the Rear Cover

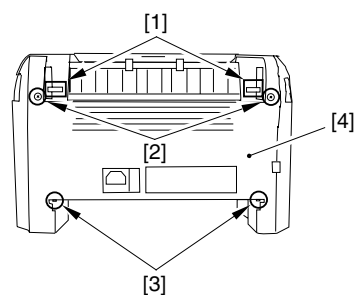
0002-3691

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-92

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

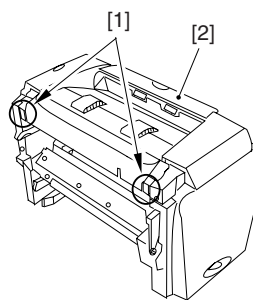


F-3-93

3.4.4.4 Removing the Top Cover

0002-3692

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

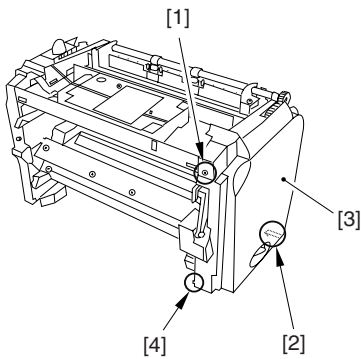


F-3-94

3.4.4.5 Removing the Right Cover

0002-3693

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

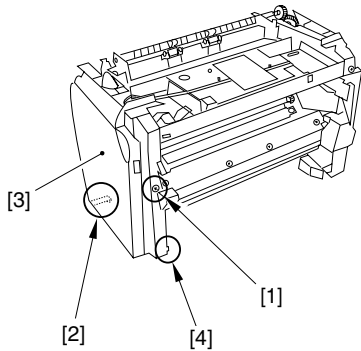


F-3-95

3.4.4.6 Removing the Left Cover

0002-3694

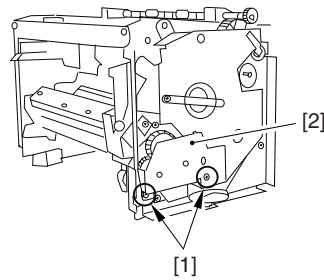
- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.



F-3-96

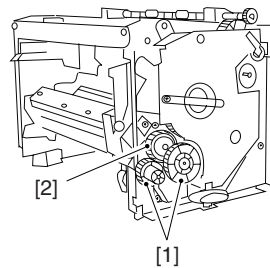
3.4.4.7 Removing the Gear Unit 0002-3695

- 1) Remove the 2 screws [1], and detach the drive plate (small) [2].



F-3-97

- 2) Remove the 2 gears [1].
- 3) While freeing the claw, detach the gear unit [2].



F-3-98

3.4.5 Main Motor

3.4.5.1 Removing the Cassette 0002-3755

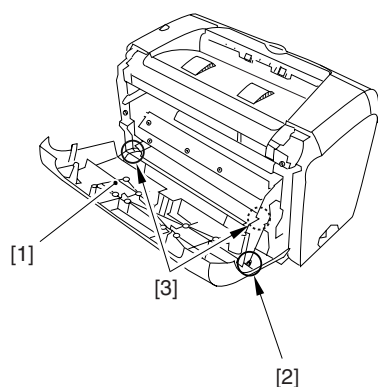
- 1) Remove the cassette by holding the cassette handle.

3.4.5.2 Removing the Front

Cover

0002-3761

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

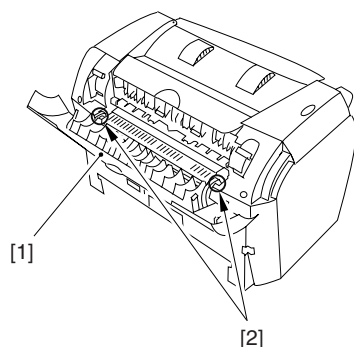


F-3-99

3.4.5.3 Removing the Rear Cover

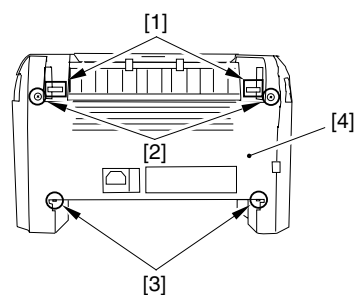
0002-3762

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-100

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

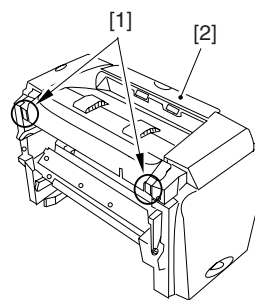


F-3-101

3.4.5.4 Removing the Top Cover

0002-3770

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

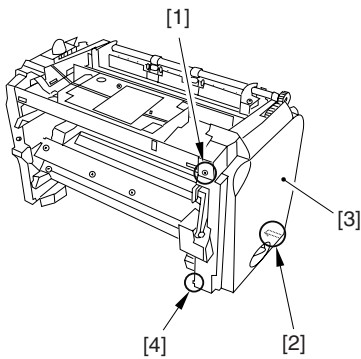


F-3-102

3.4.5.5 Removing the Right Cover

0002-3768

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

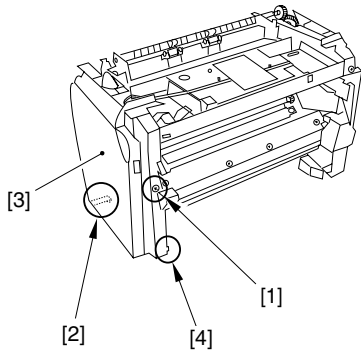


F-3-103

3.4.5.6 Removing the Left Cover

0002-3771

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

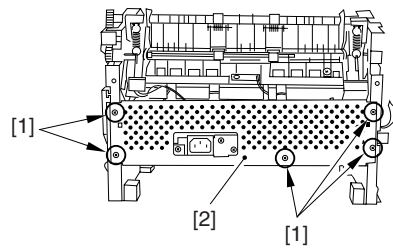


F-3-104

3.4.5.7 Removing the Power Supply Shield Plate

0002-3774

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].

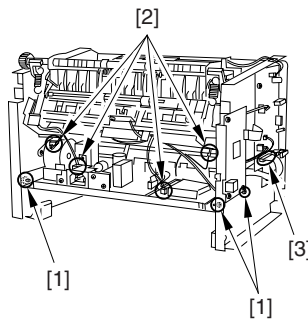


F-3-105

3.4.5.8 Removing the Power Supply Assembly

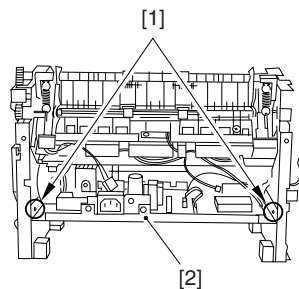
0002-3779

- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat cable [3] of the engine controller board.



F-3-106

- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.



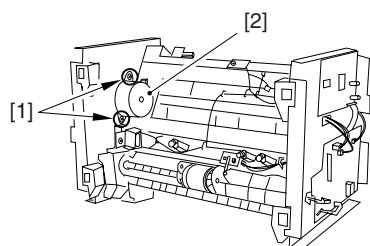
F-3-107

3.4.5.9 Removing the Main

Motor

0002-3780

- 1) Shift down the main unit so that its front faces down (i.e., the inside of the main unit is in view).
- 2) Remove the 2 screws [1], and detach the main motor [2].



F-3-108

3.4.6 Multi-purpose Pickup Roller

3.4.6.1 Removing the Cassette 0002-3696

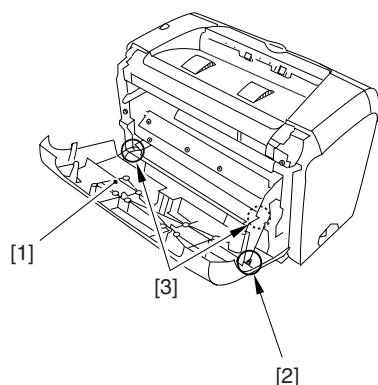
- 1) Remove the cassette by holding the cassette handle.

3.4.6.2 Removing the Front

Cover

0002-3698

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.



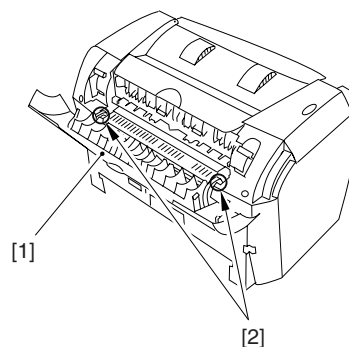
F-3-109

3.4.6.3 Removing the Rear

Cover

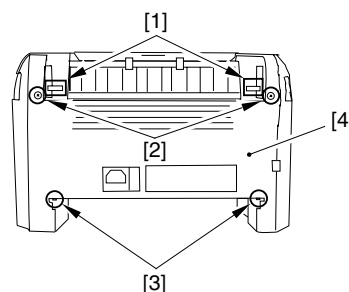
0002-3700

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-110

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



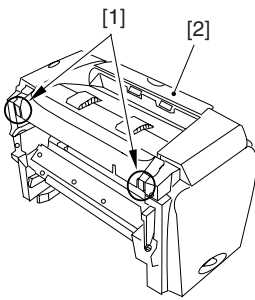
F-3-111

3.4.6.4 Removing the Top

Cover

0002-3703

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

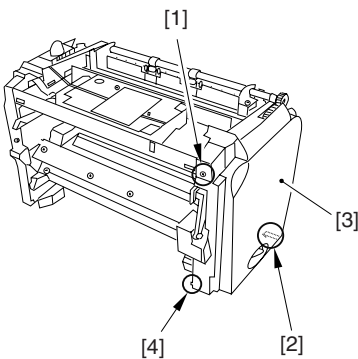


F-3-112

3.4.6.5 Removing the Right Cover

0002-3705

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

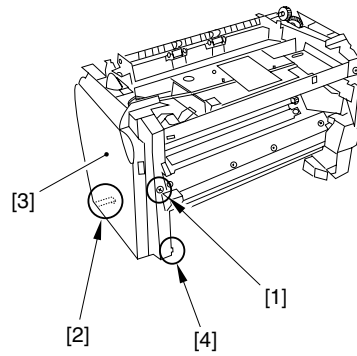


F-3-113

3.4.6.6 Removing the Left Cover

0002-3707

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

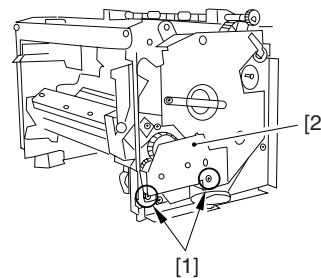


F-3-114

3.4.6.7 Removing the Gear Unit

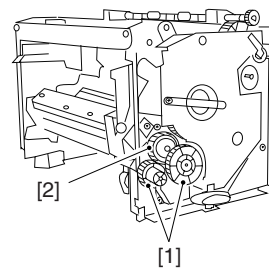
0002-3710

- 1) Remove the 2 screws [1], and detach the drive plate (small) [2].



F-3-115

- 2) Remove the 2 gears [1].
- 3) While freeing the claw, detach the gear unit [2].

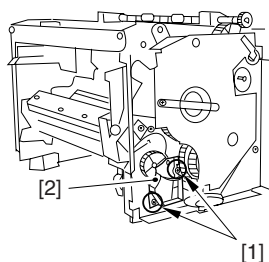


F-3-116

3.4.6.8 Removing the Tooth-Missing Gear

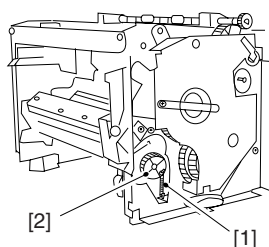
0002-3712

- 1) Remove the 2 screws [1], and detach the gear support [2].



F-3-117

- 2) Remove the spring [1].
- 3) While freeing the claw, detach the tooth-missing gear [2].



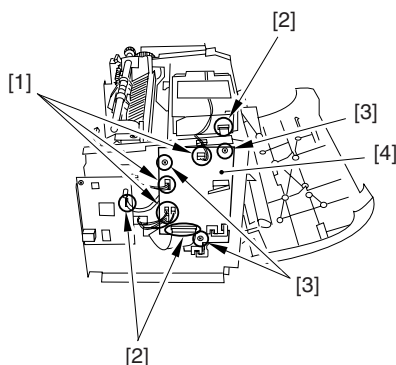
F-3-118

3.4.6.9 Removing the Engine

Controller Board

0002-3714

- 1) Disconnect the 5 connectors [1], and remove the 3 flat cables [2].
- 2) Remove the 3 screws [3], and detach the engine controller board [4] while paying attention to the sensor flag.



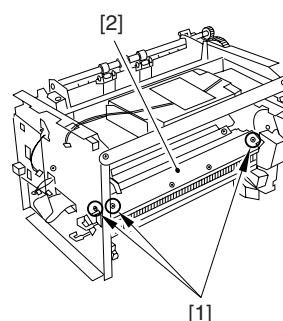
F-3-119

3.4.6.10 Removing the Manual

Feed Stay

0002-3715

- 1) Remove the 3 screws [1], and detach the manual feed stay [2] while paying attention to the sensor flag.



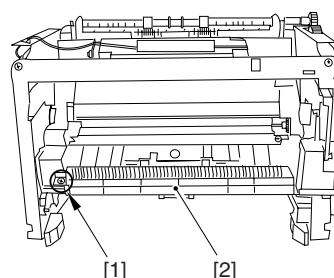
F-3-120

3.4.6.11 Removing the Paper

Feed Guide

0002-3716

- 1) Remove the screw [1], and detach the paper feed guide [2].



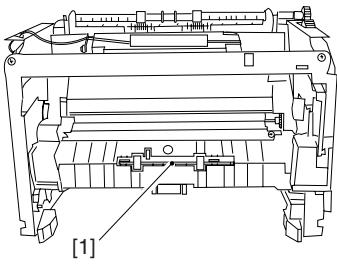
F-3-121

3.4.6.12 Removing the Paper

Feed Roller

0002-3717

- 1) Lift the left side of the paper feed roller [1], and slide it to detach.



F-3-122

3.4.7 Multi-purpose Pickup Solenoid

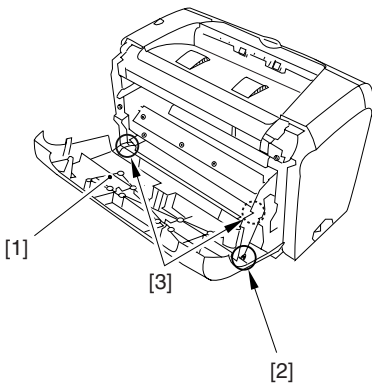
3.4.7.1 Removing the Cassette 0002-3697

- 1) Remove the cassette by holding the cassette handle.

3.4.7.2 Removing the Front

Cover 0002-3699

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

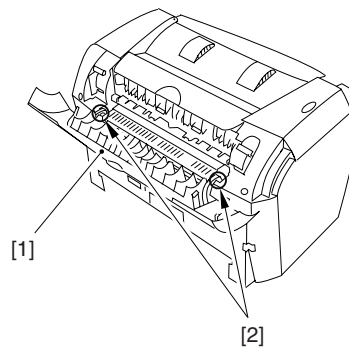


F-3-123

3.4.7.3 Removing the Rear

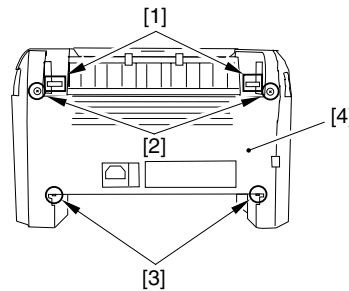
Cover 0002-3702

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-124

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

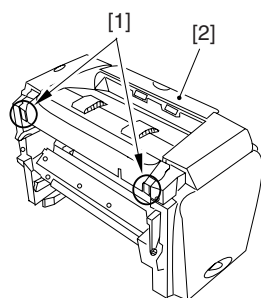


F-3-125

3.4.7.4 Removing the Top

Cover 0002-3704

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

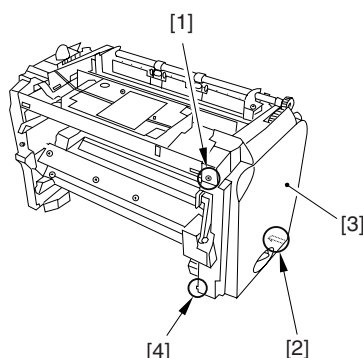


F-3-126

3.4.7.5 Removing the Right Cover

0002-3706

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

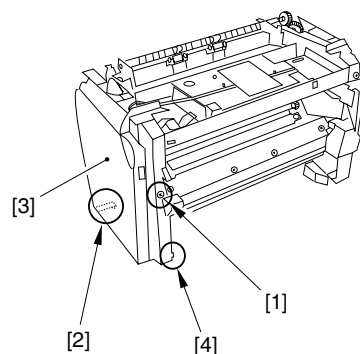


F-3-127

3.4.7.6 Removing the Left Cover

0002-3709

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

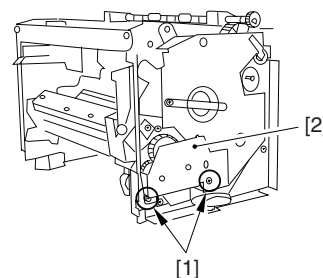


F-3-128

3.4.7.7 Removing the Gear Unit

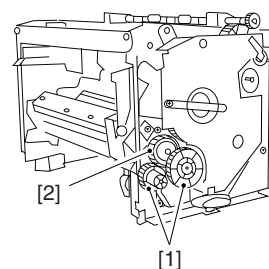
0002-3711

- 1) Remove the 2 screws [1], and detach the drive plate (small) [2].



F-3-129

- 2) Remove the 2 gears [1].
- 3) While freeing the claw, detach the gear unit [2].

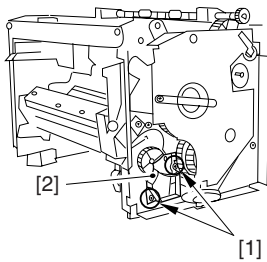


F-3-130

3.4.7.8 Removing the Tooth-Missing Gear

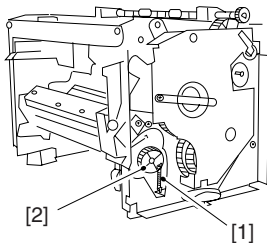
0002-3713

- 1) Remove the 2 screws [1], and detach the gear support [2].



F-3-131

- 2) Remove the spring [1].
- 3) While freeing the claw, detach the tooth-missing gear [2].

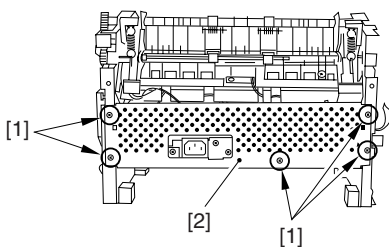


F-3-132

3.4.7.9 Removing the Power Supply Shield Plate

0002-6262

- 1) Remove the 5 screws [1], and detach the power supply shield plate [2].



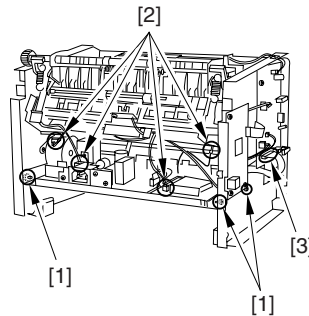
F-3-133

3.4.7.10 Removing the Power Supply Assembly

0002-6263

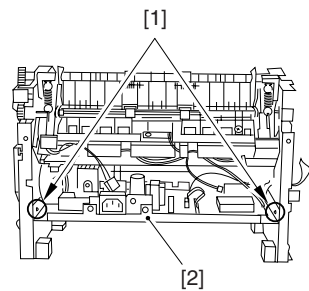
- 1) Remove the 3 screws [1].
- 2) Disconnect the 4 connectors [2], and free the flat

cable [3] of the engine controller board.



F-3-134

- 3) Push down the front of the power supply assembly [2] while feeding the left/right boss [2]; then, slide it out to detach.

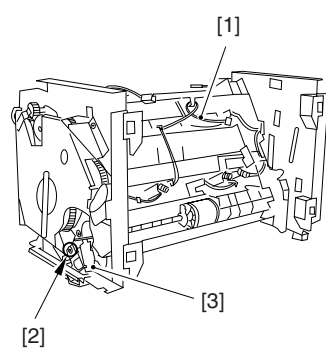


F-3-135

3.4.7.11 Removing the Manual Pickup Solenoid

0002-6265

- 1) Shift down the main unit so that its front faces down (i.e., the inside of the main unit is in view).
- 2) Free the cable [1] front the cable guide.
- 3) Remove the screw [2], and detach the manual pickup solenoid [3].



F-3-136

3.5 FIXING SYSTEM

3.5.1 Fixing Pressure Roller

3.5.1.1 Removing the Cassette 0002-3720

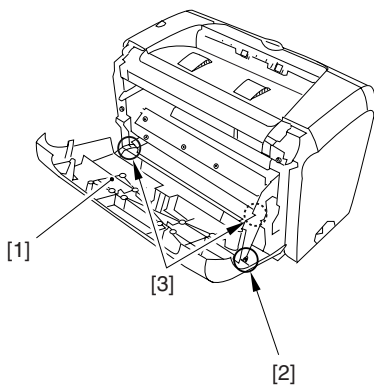
- 1) Remove the cassette by holding the cassette handle.

3.5.1.2 Removing the Front

Cover

0002-3722

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.



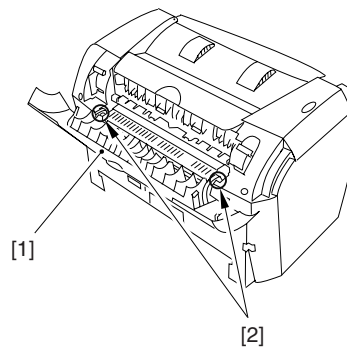
F-3-137

3.5.1.3 Removing the Rear

Cover

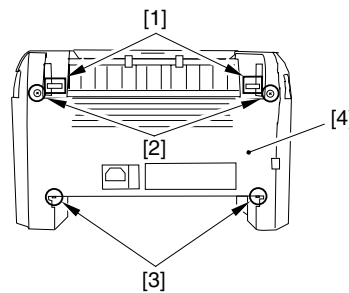
0002-3724

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-138

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.



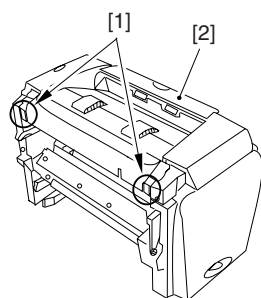
F-3-139

3.5.1.4 Removing the Top

Cover

0002-3726

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

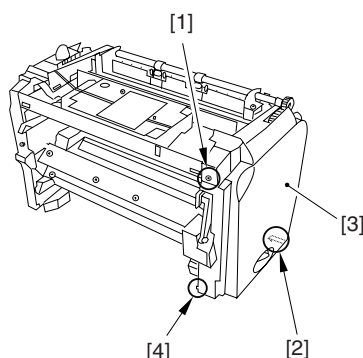


F-3-140

3.5.1.5 Removing the Right Cover

0002-3728

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

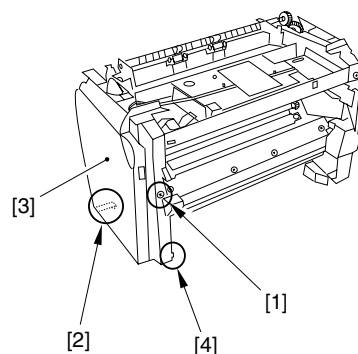


F-3-141

3.5.1.6 Removing the Left Cover

0002-3730

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

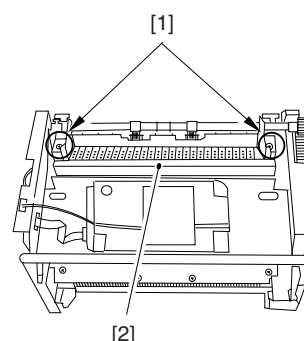


F-3-142

3.5.1.7 Removing the Fixing Film Unit

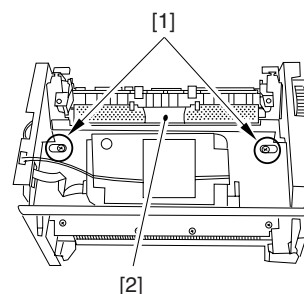
0002-3732

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



F-3-143

- 2) Remove the 2 screws [1], and detach the fixing entrance guide [2] by sliding it to the left and right.

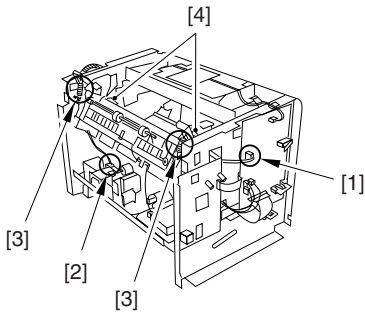


F-3-144

- 3) Disconnect the connector [1] of the engine

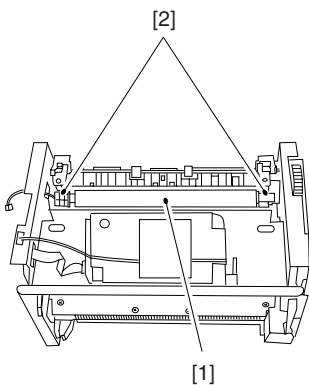
controller board, and free the cable from the cable clamp.

- 4) Disconnect the connector [2] of the power supply board.
- 5) Remove the left/right pressure spring and grounding spring [3].
- 6) Remove the left/right pressure plate [4].



F-3-145

- 7) While holding the left/right frame [2] of the fixing film unit [1], lift it at an angle to detach the fixing film unit.

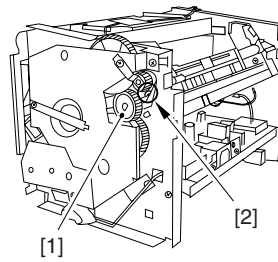


F-3-146

3.5.1.8 Removing the Fixing Pressure Roller

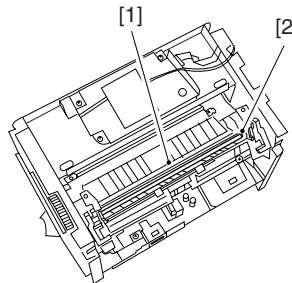
0002-3733

- 1) Remove the gear [1] while freeing the claw.
- 2) Remove the boss of the bushing [2], and turn it to detach the bushing.



F-3-147

- 3) Lift the shorter shaft [2] of the fixing pressure roller [1] at an angle to detach it from the bushing; then, slide it to detach the fixing pressure roller.



F-3-148

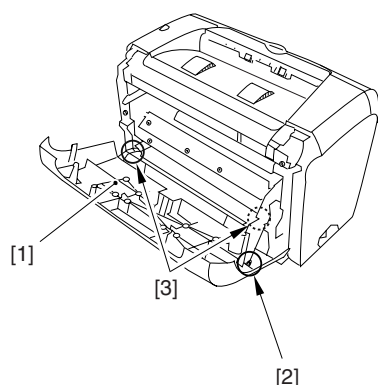
3.5.2 Fixing Film Unit

3.5.2.1 Removing the Cassette 0002-3719

- 1) Remove the cassette by holding the cassette handle.

3.5.2.2 Removing the Front Cover 0002-3721

- 1) Open the front cover [1], and free the claw [2] of the arm to separate.
- 2) Remove the left/right shaft [3], and detach the front cover.

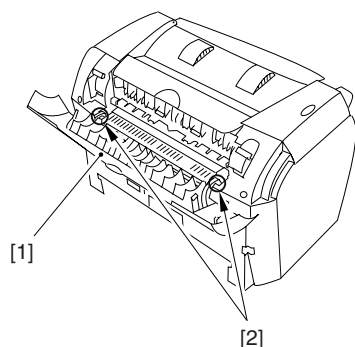


F-3-149

3.5.2.3 Removing the Rear Cover

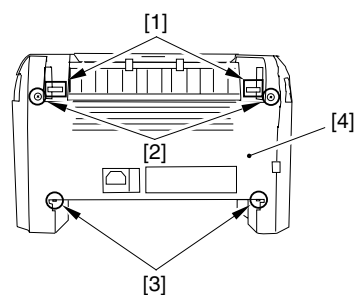
0002-3723

- 1) Open the face-up cover [1], and remove the left/right shaft [2]; then, detach the face-up cover.



F-3-150

- 2) Shift down the left/right fixing pressure release lever [1] to release the pressure.
- 3) Remove the 2 screws [2].
- 4) Free the 2 claws [3] at the bottom; then, slide the rear cover [4] to the rear to detach.

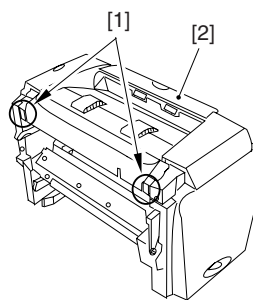


F-3-151

3.5.2.4 Removing the Top Cover

0002-3725

- 1) Open the front cover. (This step may be skipped if the front cover has already been removed.)
- 2) Free the 2 claws [1], and detach the top cover [2].

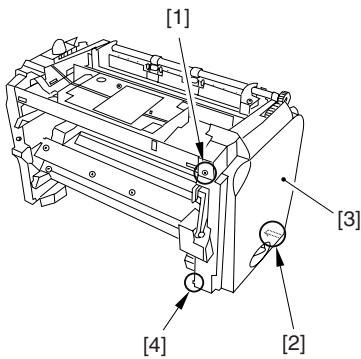


F-3-152

3.5.2.5 Removing the Right Cover

0002-3727

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the right cover [3] to the front.
- 3) While opening the bottom of the right cover [3] slightly toward the outside, slide upward to detach the right cover.

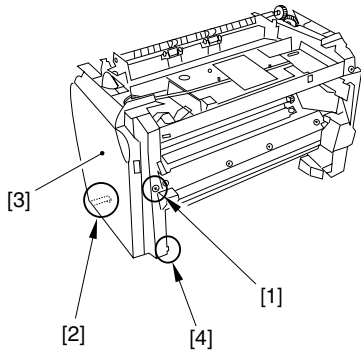


F-3-153

3.5.2.6 Removing the Left Cover

0002-3729

- 1) Remove the screw [1].
- 2) Free the claw [2] at the rear; then, free the claw [4] at the front bottom as by sliding the bottom of the left cover [3] to the front.
- 3) While opening the bottom of the left cover [3] slightly toward the outside, slide upward to detach the left cover.

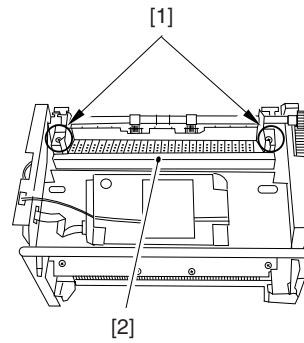


F-3-154

3.5.2.7 Removing the Fixing Film Unit

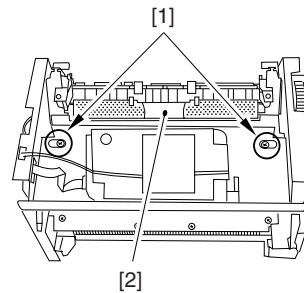
0002-3731

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



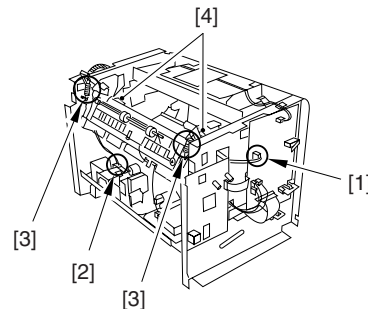
F-3-155

- 2) Remove the 2 screws [1], and detach the fixing entrance guide [2] by sliding it to the left and right.



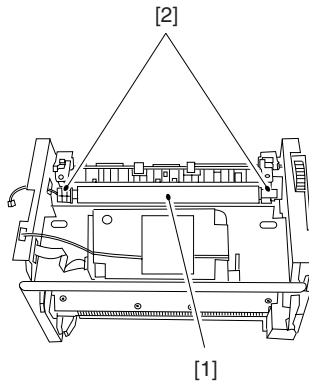
F-3-156

- 3) Disconnect the connector [1] of the engine controller board, and free the cable from the cable clamp.
- 4) Disconnect the connector [2] of the power supply board.
- 5) Remove the left/right pressure spring and grounding spring [3].
- 6) Remove the left/right pressure plate [4].



F-3-157

- 7) While holding the left/right frame [2] of the fixing film unit [1], lift it at an angle to detach the fixing film unit.



F-3-158

Chapter 4 MAINTENAN CE AND INSPECTION

Contents

4.1 Periodically Replaced Parts	4-1
4.1.1 Parts Requiring Periodical Replacement	4-1
4.2 Consumables	4-2
4.2.1 Consumable	4-2
4.3 Periodical Service	4-3
4.3.1 Items Requiring Scheduled Servicing	4-3
4.4 Cleaning	4-4
4.4.1 Items Requiring Cleaning	4-4
4.4.2 Cleaning Method (external covers)	4-5
4.4.3 Cleaning Method (printer unit)	4-5
4.5 Lubrications	4-7
4.5.1 Areas Requiring Application of Grease	4-7
4.5.2 Delivery Idler Gear	4-7
4.5.3 Fixing Drive Transmission Gear	4-8
4.5.4 Large Gear Bushing R	4-8
4.5.5 Large Gear	4-9
4.5.6 Feed Gear	4-9
4.5.7 Internal Gear	4-10
4.5.8 Large Gear Deceleration Gear/Plate R	4-10
4.5.9 Main Motor	4-11
4.5.10 Drive Releasing Arm	4-12
4.5.11 FU Delivery Roller	4-12
4.5.12 Pickup Idler Gear	4-13
4.5.13 Feed Deceleration Gear	4-13
4.5.14 Fixing Deceleration Gear	4-14
4.5.15 FD Delivery Roller	4-15
4.5.16 Large Gear Bushing F	4-15
4.5.17 Pressure roller	4-16

4.1 Periodically Replaced Parts

4.1.1 Parts Requiring Periodical Replacement

0002-4267

The machine does not have parts that require periodical replacement.

4.2 Consumables

4.2.1 Consumable

0002-4308

T-4-1

Work by	Item	Interval (guide)
User	EP-26 toner cartridge	every 2500 prints (approx.)
Service technician	None	

4.3 Periodical Service

4.3.1 Items Requiring Scheduled Servicing

0002-4268

The machine does not have items that require scheduled servicing.

4.4 Cleaning

4.4.1 Items Requiring Cleaning

0002-4316

T-4-2

Work by	Item	Intervals
User	External covers	As needed (when soiled)
Service technician	Cassette pickup roller	When paper pickup performance has lowered
	Cassette separation pad	When paper separation performance has lowered
	Feed roller	When paper feed performance has lowered
	Transfer charging roller	When the back of paper tends to become soiled; or, when a white spot appears in the images at intervals of about 46 mm
	Static eliminator	When dots appear in images
	Paper feed guide	When the back of paper tends to become soiled
	Fixing entrance guide	When paper tends to become soiled; when a black line appears vertically at irregular intervals; when paper jams; when paper wrinkles
	Fixing film	When images tend to become soiled at intervals of about 57 mm
	Fixing pressure roller	When the back of paper shows traces at intervals of about 64 mm; when fixing faults occur; when paper jams; when paper wrinkles



Before starting cleaning work, be sure to turn off the power and disconnect the power plug to avoid fires and electric shocks.

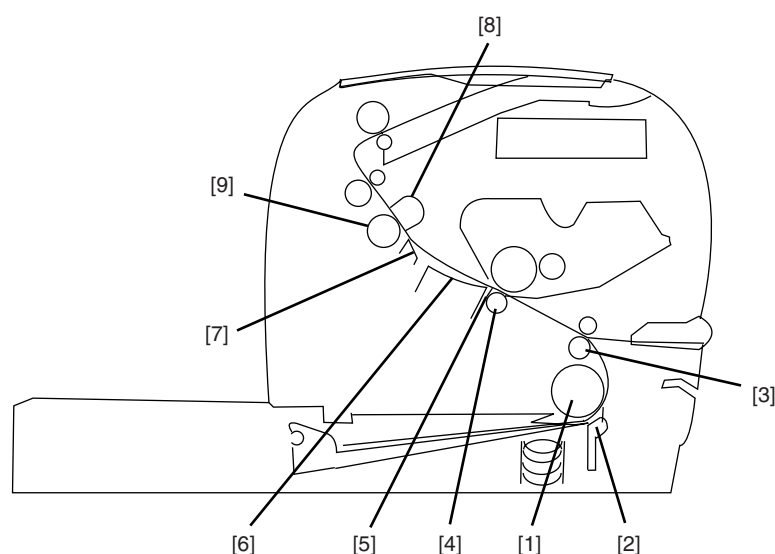
4.4.2 Cleaning Method (external covers)

0002-4545

Moisten a soft cloth with water or solution of mild detergent, making sure it is well wrung; then, wipe the soiling. If you have used detergent, be sure to remove its residue using a soft, moist cloth. After removing all soiling, dry wipe the area with a soft, dry cloth.

4.4.3 Cleaning Method (printer unit)

0002-4507



F-4-1

[1] Cassette Pickup Roller

Use lint-free paper to remove soiling.

[2] Cassette Separation Pad

Use lint-free paper to remove soiling.

[3] Feed Roller

Use lint-free paper to remove soiling.

[4] Transfer Charging Roller

Use lint-free paper to remove toner and paper lint.



- Do not touch the sponge area of the transfer charging roller to avoid soiling the back of paper or white spots in the images.
- Never use solvent.
- If the soiling cannot be removed using lint-free paper or the roller is deformed, replace the roller.

[5] Static Eliminator

Remove dust and paper lint using a brush.

[6] Paper Feed Guide

Use lint-free paper to remove soiling.

[7] Fixing Inlet Guide

Use lint-free paper moistened with isopropyl alcohol to remove the soiling.

[8] Fixing Film

Use lint-free paper to remove soiling.

[9] Fixing Pressure Roller

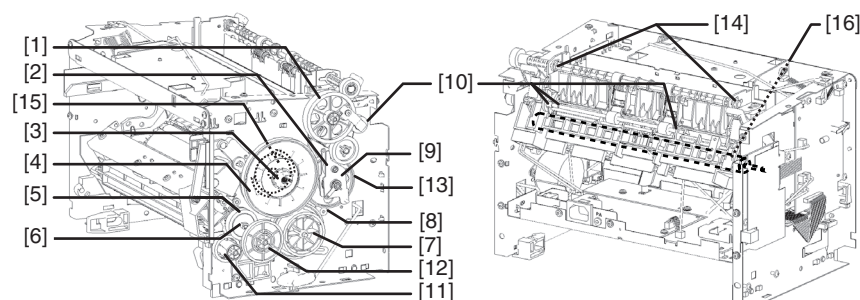
Use lint-free paper to remove soiling.

4.5 Lubrications

4.5.1 Areas Requiring Application of Grease

0002-4235

The machine has areas that require grease to permit smooth movement of parts or ensure good electrical conductivity. If you have replaced a part in these areas or if you have removed the grease, be sure to apply grease.



F-4-2

T-4-3

[1] Delivery idler gear	[9] Drive releasing arm
[2] Fixing drive transmission gear	[10] FU delivery roller
[3] Large gear bushing R	[11] Pickup idler gear
[4] Large gear	[12] Feed deceleration gear
[5] Feed gear	[13] Fixing deceleration gear
[6] Internal gear	[14] FD delivery roller
[7] Large gear deceleration gear/Plate R	[15] Large gear bushing F
[8] Main motor	[16] Pressure roller

4.5.2 Delivery Idler Gear

0002-4236

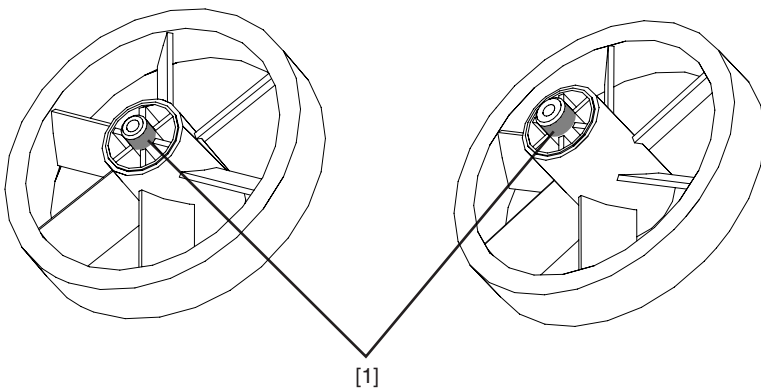
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 40 +/-10 mg

Location of application:

- 2 locations on gear support shaft in opposition
- spread in axial direction



F-4-3

4.5.3 Fixing Drive Transmission Gear

0002-4240

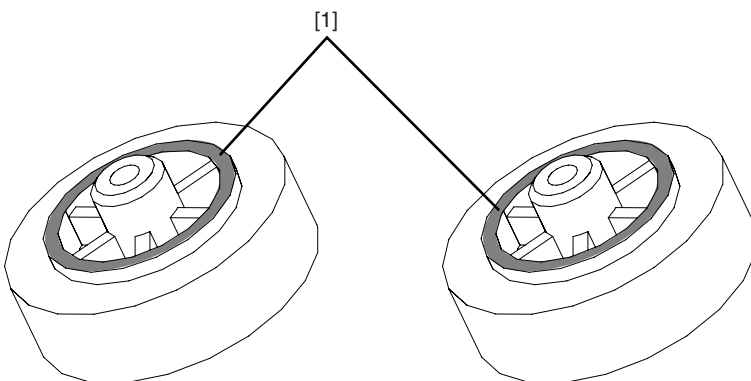
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- 2 locations on gear butting ribs in opposition
- spread in circumferential direction over a length of 1/4 or more



F-4-4

4.5.4 Large Gear Bushing R

0002-4248

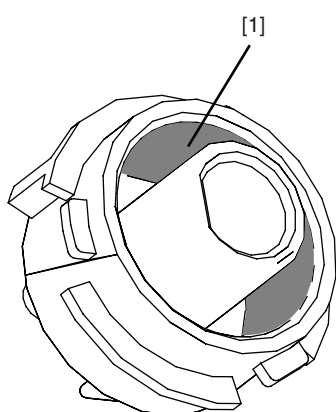
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

location of application:

- wall surface on inner circumferential side of bushing
- spread in circumferential direction over a length of 1/2 or more



F-4-5

4.5.5 Large Gear

0002-4249

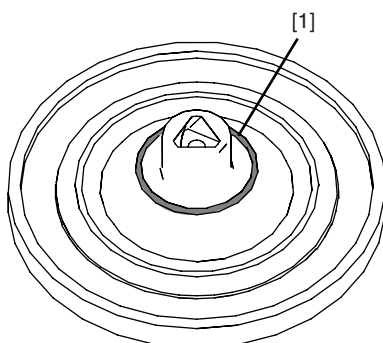
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 20 +/-10 mg

Location of application:

- rib against which gear is butted
- spread in circumferential direction over a length of 1/2 or more



F-4-6

4.5.6 Feed Gear

0002-4250

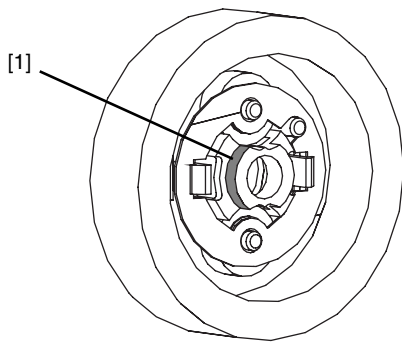
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- 1 location on boss engaging with internal gear
- spread in axial direction



F-4-7

4.5.7 Internal Gear

0002-4251

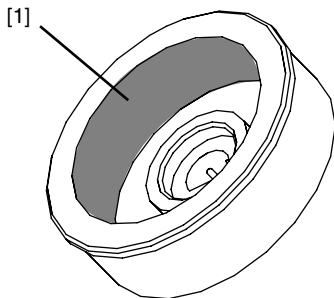
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 40 +/-10 mg

Location of application:

- 5 teeth or more of internal gear in opposition
- 2 locations in circumferential direction



F-4-8

4.5.8 Large Gear Deceleration Gear/Plate R

0002-4252

Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 40 +/-10 mg

Location of application:

- 5 teeth or more (covering entire small-dia tooth area)

Area of application: [2]

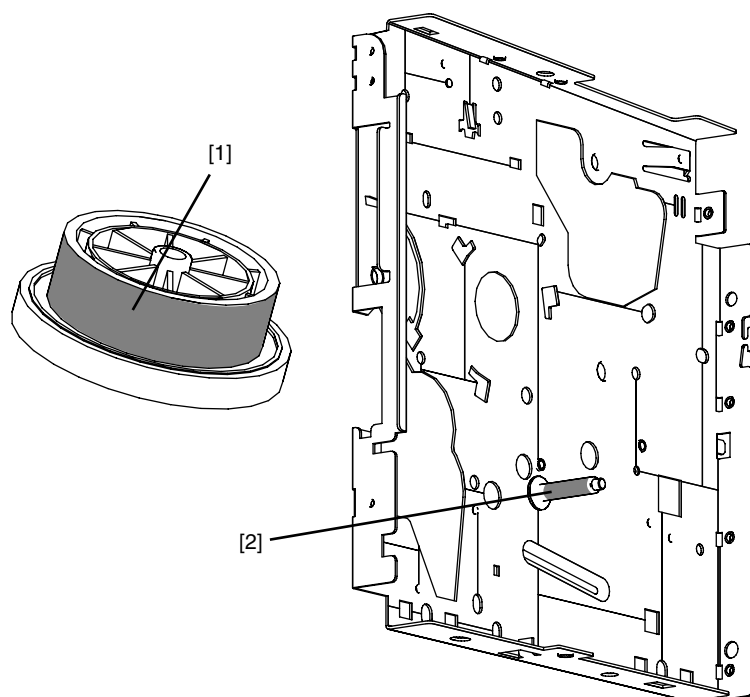
Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application

- support shaft of plate R (sliding surface against large gear deceleration gear)

- spread in axial direction



F-4-9

4.5.9 Main Motor

0002-4255

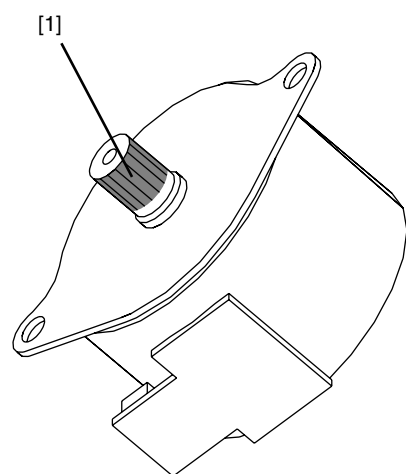
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 40 +/-10 mg

Location of application:

- 5 teeth or more (covering entire gear width)



F-4-10

4.5.10 Drive Releasing Arm

0002-4256

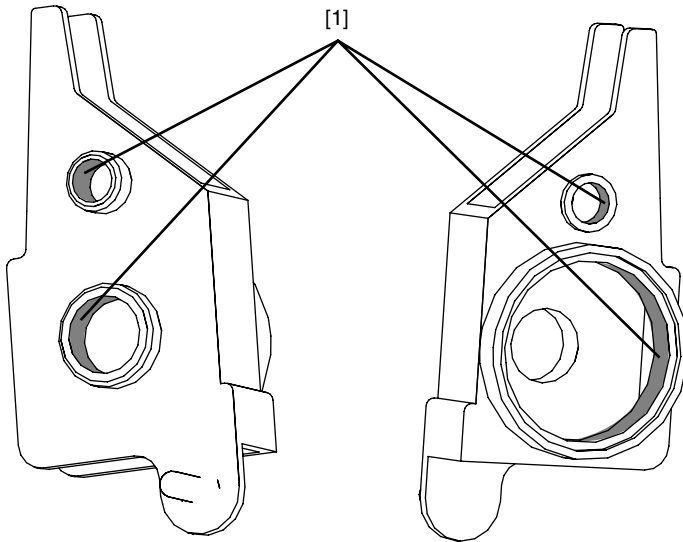
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- 4 locations on sliding surface against gear support shaft of drive releasing arm



F-4-11

4.5.11 FU Delivery Roller

0002-4260

Area of application: [1]

Grease: MOLYKOTE 41

Amount: 10 +/-5 mg

Location of application:

- edge of FU delivery roller shaft (sliding surface against FU grounding spring)

Area of application: [2]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- sliding surface between FU delivery roller shaft and FU delivery roller bushing

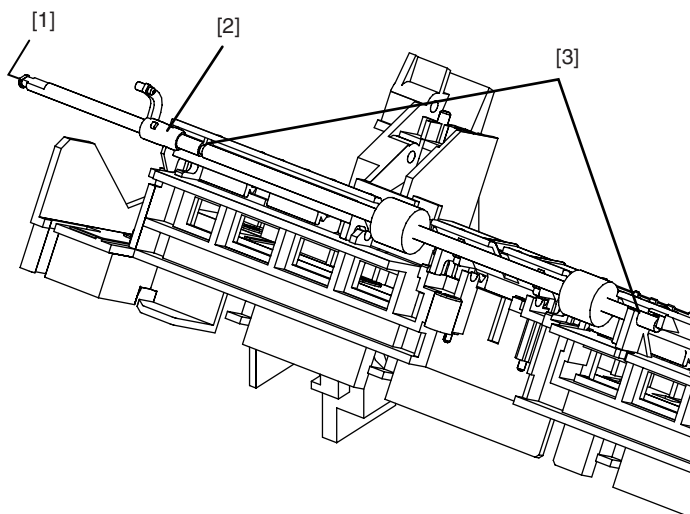
Area of application: [3]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- sliding surface between FU delivery roller shaft and delivery guide (FU delivery roller shaft stop rib)



F-4-12

4.5.12 Pickup Idler Gear

0002-4258

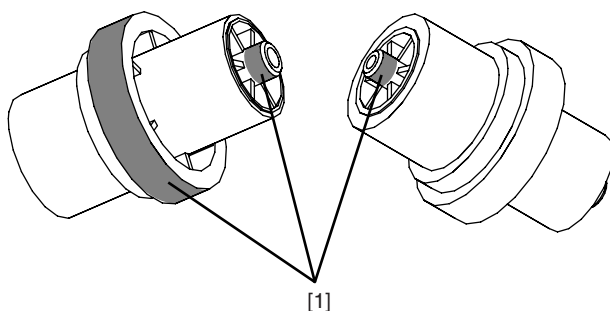
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- 2 locations on pickup idler gear support shaft
- 5 teeth or more (covering entire large-diameter tooth surface of pickup idler gear)



F-4-13

4.5.13 Feed Deceleration Gear

0002-4259

Area of application: [1]

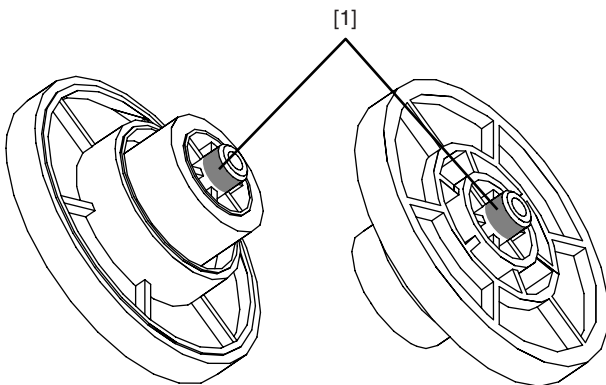
Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- 2 locations on feed deceleration gear support shaft

- spread in axial direction



F-4-14

4.5.14 Fixing Deceleration Gear

0002-4261

Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 40 +/-10 mg

Location of application

- 5 teeth or more (covering entire surface of fixing deceleration gear; small-diameter teeth)

Area of application: [2]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location application:

- tip of feed deceleration gear butting rib in circumferential direction over a length of 1/2 or more

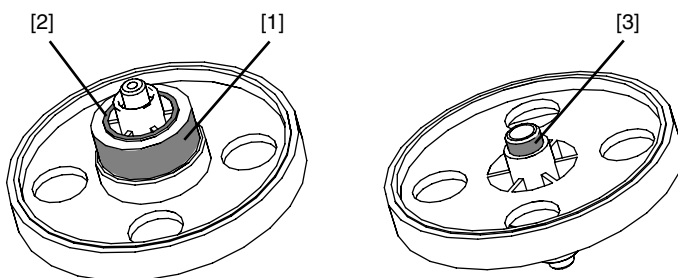
Area of location: [3]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- sliding surface against plate R of fixing deceleration gear in circumstantial direction over a length of 1/2 or more



F-4-15

4.5.15 FD Delivery Roller

0002-4262

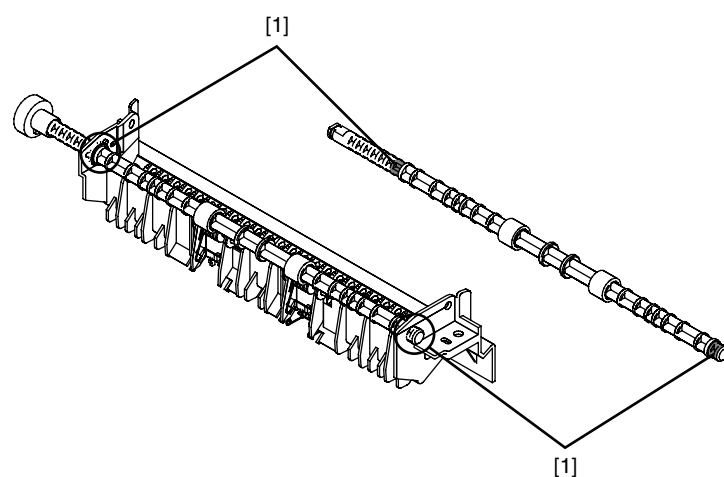
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 30 +/-5 mg

Location of application

- entire sliding surface against FD delivery bushing



F-4-16

4.5.16 Large Gear Bushing F

0002-4263

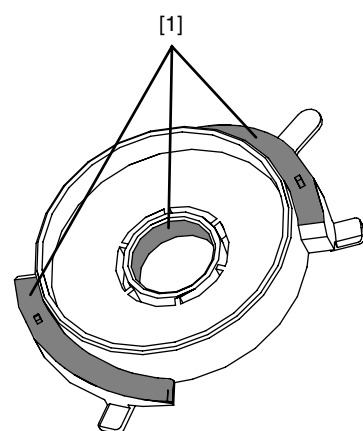
Area of application: [1]

Grease: MOLYKOTE EM-50L

Amount: 10 +/-5 mg

Location of application:

- entire sliding surface against large gear support shaft



F-4-17

4.5.17 Pressure roller

0002-4264

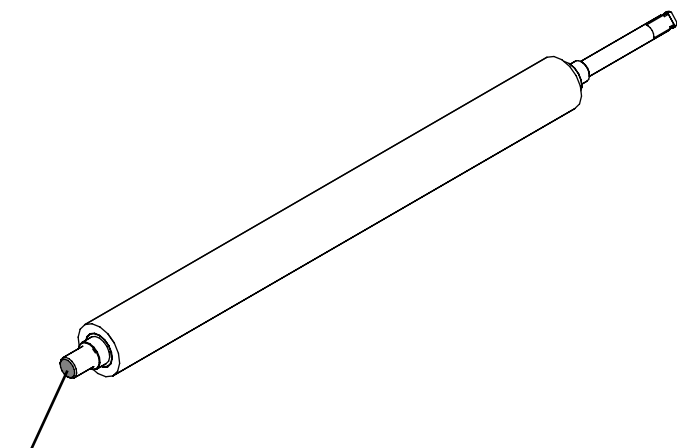
Area of application: [1]

Grease: MOLYKOTE 41

Amount: 10 +/-10 mg

Location of application:

- edge of pressure roller shaft (sliding surface against contact spring F)



[1]
F-4-18

Chapter 5 TROUBLESHOOTING

Contents

5.1 PHENOMENON TABLE	5-1
5.1.1 Symptoms	5-1
5.2 Countermeasures	5-2
5.2.1 Image Faults	5-2
5.2.1.1 Smudged/Streaked.....	5-2
5.2.1.1.1 There are vertical black lines or a vertical white line in a solid black image.....	5-2
5.2.2 Malfunction	5-2
5.2.2.1 No Power	5-2
5.2.2.1.1 The machine at times fails to go on when its power is turned on after it has been turned off.	5-2
5.2.2.2 Malfunction/Faulty Detection	5-2
5.2.2.2.1 The machine does not permit correct placement of paper in its manual feed tray after it has delivered paper.	5-2
5.2.3 Jam (Main Unit)	5-3
5.2.3.1 The machine identifies a jam when it is turned off and then on with paper in its manual feed section. 5-3	
5.3 MEASUREMENT AND ADJUSTMENT.....	5-4
5.3.1 Basic Adjustment	5-4
5.3.1.1 Items of Adjustment	5-4
5.4 SERVICE TOOLS	5-5
5.4.1 Special Tools	5-5

5.1 PHENOMENON TABLE

5.1.1 Symptoms

0002-9647

T-5-1

Level 1 classification	Description
Image faults	There are vertical black lines or a vertical white line in a solid black image.
Malfunction	The machine at times fails to go on when its power is turned on after it has been turned off. After the machine delivers paper, it does not permit correct placement of paper in its manual feed section.
Jam (Main Unit)	The machine identifies a jam when its power is turned off and then on with paper in its manual feed section.

For details, see the instructions given as remedial action.

5.2 Countermeasures

5.2.1 Image Faults

5.2.1.1 Smudged/Streaked

5.2.1.1.1 There are vertical black lines or a vertical white line in a solid black image.

0003-1622

<Cause>

The vertical black lines are likely to have been caused by the ribs of the heater holder. The vertical white line is likely to have been caused by the thermal fuse (if it corresponds to the location of the fuse).

<Field Remedy>

Select heavy paper mode.

5.2.2 Malfunction

5.2.2.1 No Power

5.2.2.1.1 The machine at times fails to go on when its power is turned on after it has been turned off.

0003-1624

<Cause>

If the machine is tuned on immediately after it has been turned off, residual power can momentarily start up the scanner motor, causing an overload (i.e., in excess of the rating indicated for power-on).

<Field Remedy>

If the machine fails to go on, turn off its power switch; then, turn it back on after waiting for 30 sec.

5.2.2.2 Malfunction/Faulty Detection

5.2.2.2.1 The machine does not permit correct placement of paper in its manual feed tray after it has delivered paper.

0003-1625

<Cause>

The machine cannot recognize insertion of paper from its manual feed tray while the main motor is on (rotating rollers) after delivery.

<Field Remedy>

Insert paper from the manual feed tray only after the main motor (roller rotation) has stopped.

5.2.3 Jam (Main Unit)

5.2.3.1 The machine identifies a jam when it is turned off and then on with paper in its manual feed section.

0003-1626

<Cause>

The machine is designed to identify a jam if the manual feed paper sensor is on when it is tuned on, as it is not sure whether the paper is set correctly or incorrectly.

<Field Remedy>

Remove the paper, open and close the front cover, and place the paper back in the manual feed section.

5.3 MEASUREMENT AND ADJUSTMENT

5.3.1 Basic Adjustment

5.3.1.1 Items of Adjustment

0002-4265

The machine does not have items that are cited for adjustment.

5.4 SERVICE TOOLS

5.4.1 Special Tools

0002-4333

T-5-2

Tool	Description	Parts No.
Grease(MOLYKOTE EM-50L)	Apply to specified areas.	HY9-0007
Grease (MOLYKOTE 41)	Apply to specified areas.	CK-8007

Chapter 6 APPENDIX

Contents

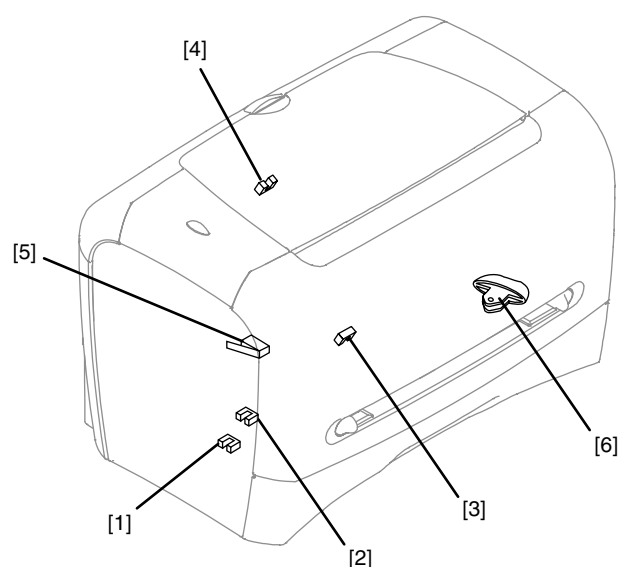
6.1 OUTLINE OF ELECTRICAL COMPONENTS	6-1
6.1.1 Sensor	6-1
6.1.1.1 Arrangement of Sensors and Switches	6-1
6.1.2 PCBs	6-2
6.1.2.1 Arrangement of PCBs.....	6-2

6.1 OUTLINE OF ELECTRICAL COMPONENTS

6.1.1 Sensor

6.1.1.1 Arrangement of Sensors and Switches

0002-4576



F-6-1

[1] Cassette Paper Sensor

Used to detect the presence/absence of paper in the cassette.

[2] Manual Feed Paper Sensor

Used to detect the presence/absence of paper in the manual feed section.

[3] Paper Leading Edge Sensor (top sensor)

Used to detect the leading/trailing edge of paper being moved.

[4] Paper Delivery Sensor

Used to monitor the delivery of paper.

[5] Front Cover Switch

Used to detect the state (open/closed) of the front cover.

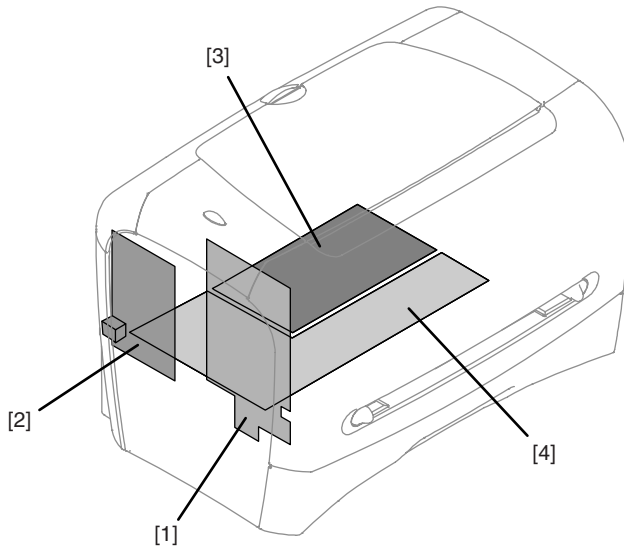
[6] Power Switch

On and off of the power through the arm operating in conjunction with the switch on the power supply board.

6.1.2 PCBs

6.1.2.1 Arrangement of PCBs

0002-4575



F-6-2

[1] Engine Controller Board

Used to control the operation of the printer unit.

[2] CAPT Board

Used to serve as the interface between a PC and the printer unit.

[3] Power Supply Board

Used to control the supply of power to various components.

[4] High-Voltage Power Supply Board

Used to supply high-voltage power to the printer unit.

Sep 30 2003

Canon