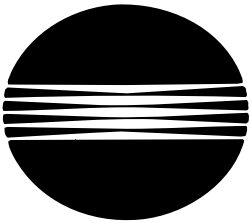
CF1501/CF2001

SERVICE MANUAL

[GENERAL]



MINOLTA

INDEX (GENERAL)

GENERAL

MECHANICAL/ELECTRICAL

This copier assumes that components be replaced by the unit. No circuit diagrams or electrical component layout drawings therefore contain any of electrical parts included in units.

In text, however, some of these electrical components are given for the sake of explanation of mechanical operations of different units.

GENERAL

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1. SPECIFICATIONS

Type	:	Freestanding scanner and printer separated from each other
Original Scanning	:	Scanning in main scanning direction with a reduction-type color CCD (RGB 3 lines)
PC Drum Type	:	OPC (organic photoconductor)
Copying System	:	Electrostatic dry-powdered image transfer to plain paper
Scanning Density	:	Equivalent to 600 dpi
Print Density	:	Equivalent to 600 dpi in main scanning direction x 1800 dpi in sub-scanning direction
Paper Feeding System (Standard)	:	Three-way system Manual Bypass Table ... Single 1st Drawer ..... 250 sheets (plain paper 80 g/m^2) 2nd Drawer ..... 500 sheets (plain paper 80 g/m^2)
Printing Process	:	Tandem-type indirect electrostatic recording system
Exposure System	:	LED Unit exposure for each of Y, M, C, and Bk
Developing System	:	NMT system
Charging System	:	DC comb electrode Scorotron system
Ozone Removal System	:	Ozone Filters
Image Transfer System	:	Intermediate transfer belt system
Paper Separating System	:	Selecting either nonwoven fabric float or ground
Transfer Belt Cleaning System	:	Blade cleaning
Fusing System	:	Belt fusing
Paper Charge Neutralizing	:	Charge Neutralizing Brush
Max. Original Size	:	A3

Copy Paper Type :

Paper Source		1st Drawer	2nd Drawer	Manual Bypass Table
Copy paper type	Plain paper (64 to 90 g/m^2)	❍	❍	❍
	Translucent paper	-	-	-
	OHP transparencies (dedicated)	❍ 20 sheets or less	-	❍
	Thick paper (91 to 163 g/m^2)	❍ 20 sheets or less	-	❍
	Thick paper (164 to 209 g/m^2)	-	-	❍
	Postcards	❍ 20 sheets or less	-	❍
Copy paper dimensions	Max. (width × length)	311 × 457 mm	Metric A3L Inch 11 × 17	311 × 457 mm
	Min. (width × length)	90 × 140 mm	Metric B5L/C Inch 8-1/2 × 11	90 × 140 mm

❍: Reliably fed -: Feeding prohibited

Multiple Copies	:	1 to 100 copies
Warming-up Time	:	5 min. or less (at ambient temperature of 20 °C and rated source voltage)

First Copy Time:

Full Color	15 sec. (A4C)
Mono Color	12 sec. (A4C)

(1st Drawer, full size, Manual Exposure)

Copying Speed for Multi-Copy Cycle (copies/min.):
Full Color / Mono Color

Area	Size	15-cpm Copier	20-cpm Copier
Metric	A3	10	10
	A4L	14	14
	A4C	15	20
	A5L	15	20
	A5C	15	20
	B4L	12	12
	B5L	14	14
	B5C	15	20

Area	Size	15-cpm Copier	20-cpm Copier
Inch	11 × 17	10	10
	8.5 × 11C	14	14
	8.5 × 11L	15	20
	5.5 × 8.5C	15	20
	5.5 × 8.5L	15	20

Zoom Ratios:

	Area Mode	Metric	Inch
Fixed	Full size	× 1.000	× 1.000
	Reduction	× 0.816 × 0.707 × 0.500	× 0.785 × 0.733 × 0.647 × 0.500
	Enlargement	× 1.154 × 1.414 × 2.000	× 1.214 × 1.294 × 1.545 × 2.000
Variable (in 0.001 increments)		× 0.500 to 4.000	

Lens : Through lens (f = 79 mm, F = 5.6)
Light Source : Halogen frost tube lamp

Power/Current Consumption (copier only):

Exposure Lamp (rating)	Roller Heater Lamps H1, 2, and 3 (rating)	Max. Power Consumption
70 V 150 W	110 V, 120 V, 127 V, 220-240 V, 650 W	1.5 kW

Power Requirements : 110 V, 120 V, 127 V, 220 to 240 V; 50/60 Hz

Environmental Conditions:

Temperature	10 to 30 °C (with a fluctuation of 10 °C or less per hour)
Humidity	25 to 85 % (with a fluctuation of 20 % or less)
Ambient Illumination	3,000 lux or less
Levelness	1° (1.75/100 or less)

Dimensions : With Rack
Width..... 620 mm(24-1/2 inch)
Depth ..... 787 mm(31 inch)
Height..... 1025 mm(40-1/4 inch)

Engine + 2nd Drawer
Width..... 596 mm(23-1/2 inch)
Depth ..... 730 mm(28-3/4 inch)
Height..... 523 mm(20-1/2 inch)

Scanner
Width..... 620 mm(24-1/2 inch)
Depth ..... 707 mm(27-3/4 inch)
Height..... 152 mm(6 inch)

Mass : Engine + 2nd Drawer: 85 kg(187-1/2 lbs)
Scanner: 26 kg(57-1/4 lbs)
Copier Stand: 18 kg(39-3/4 lbs)

2. PRECAUTIONS FOR INSTALLATION

2-1. Installation Site

To ensure safety and utmost performance of the copier, the copier should NOT be used in a place:

- Where it will be subjected to extremely high or low temperature or humidity.
- Where it will be subjected to sudden fluctuations in either temperature or humidity.
- Which is exposed to direct sunlight.
- Which is in the direct air stream of an air conditioner, heater or ventilator.
- Which has poor ventilation or is dusty.
- Which does not have a stable, level floor or where it will receive undue vibration.
- Which is near any kind of heating device.
- Which is near volatile flammables (thinner, gasoline, etc.).
- Where it may be splashed with water.
- Which puts the operator in the direct stream of exhaust from the copier.
- Where ammonia gas might be generated.

2-2. Power Source

- If any other electrical equipment is sourced from the same power outlet, make sure that the capacity of the outlet is not exceeded.
- Use a power source with little voltage fluctuation.
- Never connect by means of a multiple socket any other appliances or machines to the outlet being used for the copier.
- Ensure that the copier does not ride on the power cord or communications cable of other electrical equipment, and that it does not become wedged into or underneath the mechanism.
- Make the following checks at frequent intervals:

✻ Is the power plug abnormally hot?
✻ Are there any cracks or scrapes in the cord?
✻ Has the power plug been inserted fully into the outlet?
✻ Does something, including the copier itself, ride on the power cord?

Use an outlet with a capacity of 110/120/127 V, 15 A or more. 220-240 V, 10 A or more.

2-3. Grounding

- Always ground the copier to prevent receiving electrical shocks in the case of electrical leakage.
- Connect the ground wire to the ground terminal of the outlet or a grounding contact which complies with the local electrical standards.
- Never connect the grounding wire to a gas pipe, the ground wire for a telephone, lightning arrester, or a water pipe for fear of fire and electrical shock.

3. PRECAUTIONS FOR USE

3-1. To ensure that the copier is used in an optimum condition

- Never place a heavy object on the copier or subject the copier to shocks.
- Insert the power plug all the way into the outlet.
- Do not attempt to remove any panel or cover which is secured while the copier is making copies.
- Do not turn OFF the copier while it is making copies.
- Provide good ventilation when making a large number of copies continuously.
- Never use flammable sprays near the copier.
- If the copier becomes inordinately hot or produces abnormal noise, turn it OFF and unplug it.
- Do not turn ON the power switch at the same time when you plug the power cord into the outlet.
- When unplugging the power cord, do not pull on the cord; hold the plug and pull it out.
- Do not bring any magnetized object near the copier.
- Do not place a vase or vessel containing water on the copier.
- Be sure to turn OFF the power switch at the end of the workday or upon power failure.
- Use care not to drop paper clips, staples, or other small pieces of metal into the copier.

3-2. Operating Environment

The operating environmental requirements of the copier are as follows.

- Temperature: 10 to 30 °C
- Humidity: 25 to 85 %
- Rate of temperature change: 10 °C/h
- Rate of humidity change: 20 %/h

3-3. Power Requirements

The power source voltage requirements are as follows.

- Voltage fluctuation: AC 110, 120, 220, 240 V
  ± 10 % (copying performance assured)
  (127 V areas only; between -10 % and +6 %)
  +10 %
  -15 % (paper feeding performance assured)
- Frequency fluctuation: 50/60 Hz ± 0.3 %

3-4. Note

- It is prohibited to copy paper and hard currencies, government securities, and municipal bonds (even when they are stamped as “Sample”).
- For fear of infringement of copyright, it is also prohibited to copy copyrighted works, including books, music, works of art, maps, drawings, motion pictures, and photos except when the copy is to be used only personally.

4. HANDLING OF THE CONSUMABLES

Before using any consumables, always read the label on its container carefully.

- Paper can be easily damaged by dampness. To prevent absorption of moisture, store paper, which has been removed from its wrapper but not loaded in the drawer, in a sealed plastic bag in a cool, dark place.
- Keep consumables out of the reach of children.
- Do not touch the PC Drum with bare hands.
- The same sized paper is of two kinds, short grain and long grain. Short grain paper should only be fed through the copier crosswise, long grain paper should only be fed lengthwise.
- If your hands become soiled with toner, wash them with soap and water.
- Do not throw away any used consumables (PC Drum, starter, toner, etc.). They are to be collected.
- Do not burn, bury in the ground, or throw into the water any consumables (PC Drum, starter, toner, etc.).
- Do not store consumables in a place which:

✻ Is hot and humid.
✻ Is subject to direct sunlight.
✻ Has an open flame nearby.

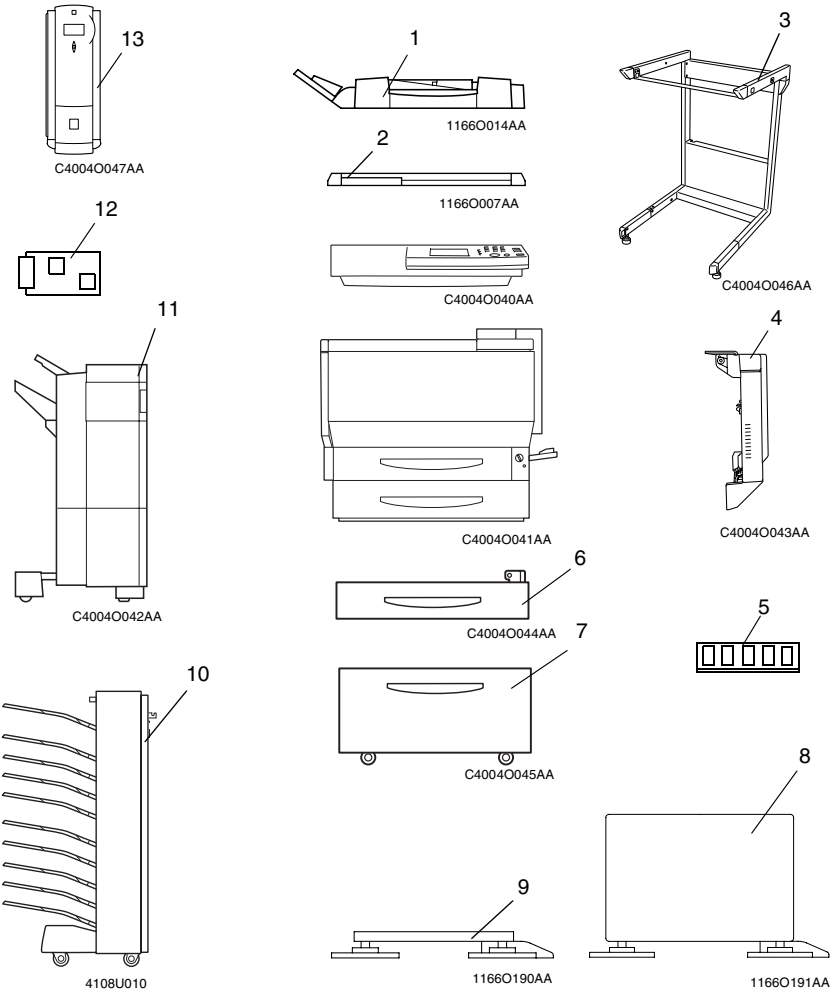
5. OTHER PRECAUTIONS

Use the following precautions when performing service jobs for a copier that uses a laser.

- When a service job needs to be performed in the laser beam path, such as when working around the printerhead or PC Drum, be sure first to unplug the power cord of the copier from the outlet.
- If the job requires that the power cord be left plugged in, observe the following precautions.

1. Take off your watch, ring and any other reflective object and wear laser protective goggles.
2. Keep users away from the job site.
3. Do not bring a highly reflective tool into the laser beam path during the service job.

6. SYSTEM OPTIONS



1. Duplexing Document Feeder AFR-16
2. Original Cover OC-2
3. Copier Stand
4. Duplex Unit AD-14
5. Memory(256 MB: 128 MB×2) M128-2
   15-cpm Copier: Option
   20-cpm Copier: Standard
6. Paper Feed Unit PF-118
7. Large Capacity Cabinet PF-117
8. Copy Desk
9. Copy Table
10. 10-Mailbin Sortor JS-1002
11. Finisher FN-107, FN-108
12. Data Terminal DT-105 (USA, Canada Only)
13. Printer Controller Fiery Z4
14. Printer Controller Fiery X3e
    (Illustration none)

MECHANICAL/ ELECTRICAL

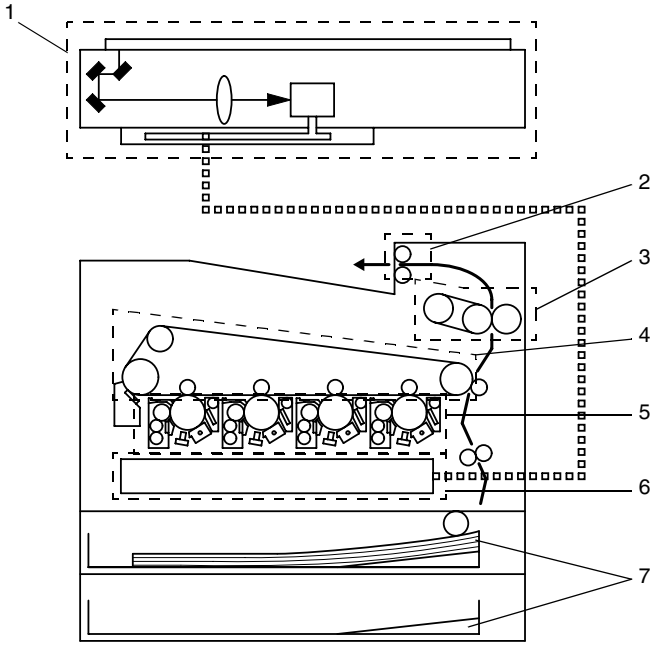
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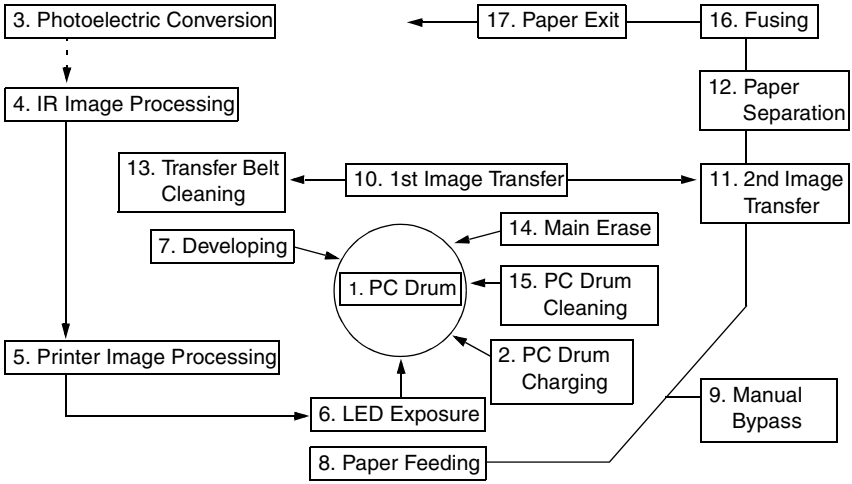
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1. CROSS-SECTIONAL VIEW



1. IR Section
2. Exit Section
3. Fusing Section
4. Transfer Belt Unit
5. Imaging Unit
6. LED Drive
7. Drawers

2. COPY PROCESS



1. PC Drum
- Changes the image of the original projected onto the surface of the PC Drum to an electrostatic latent image.

2. PC Drum Charging
- Deposits a negative DC charge across the entire surface of the PC Drum.

3. Photoelectric Conversion
- The light reflected off the surface of the original undergoes color separation through the color filters (R, G, and B) and then the CCD converts it to a corresponding electrical signal and outputs the signal to the IR Image Processing Unit.

4. IR Image Processing
- The electrical signal is converted to 8-bit digital image signals. After making some corrections, the Image Processing Unit outputs video signals (C, M, Y, and Bk) to the Printer Image Processing Unit.

5. Printer Image Processing
- The video signals (C, M, Y, and Bk) output from the IR Image Processing Unit go through some corrections. Following digital-to-analog conversion, these signals are then used for the control of the intensity level of the LED.

6. LED Exposure
- LED light illuminates the surface of the PC Drum to form an electrostatic latent image.

7. Developing
- The toner, agitated and negatively charged in the developing unit of each color, is attracted onto the electrostatic latent image formed on the surface of the PC Drum, changing it to a visible, developed image.
- AC and DC negative bias voltages are applied to the Sleeve/Magnet Roller to prevent toner from being attracted to the background area.

8. Paper Feeding
- Paper is fed from each drawer.

9. Manual Bypass
- Paper is fed from the Manual Bypass Table.

10. 1st Image Transfer
- A DC positive voltage is applied to the backside of the Transfer Belt so that the visible, developed image formed on each of the four PC Drums (Y, M, C, and Bk) is transferred to the surface of the Transfer Belt.

11. 2nd Image Transfer
- A DC positive voltage is applied to the backside of the paper so that the visible image on the surface of the Transfer Belt is transferred to the paper.

12. Paper Separation
- The Transfer Belt Paper Separator Fingers separate the paper properly from the Transfer Belt.

13. Transfer Belt Cleaning
- The residual toner left on the surface of the Transfer Belt is scraped off.

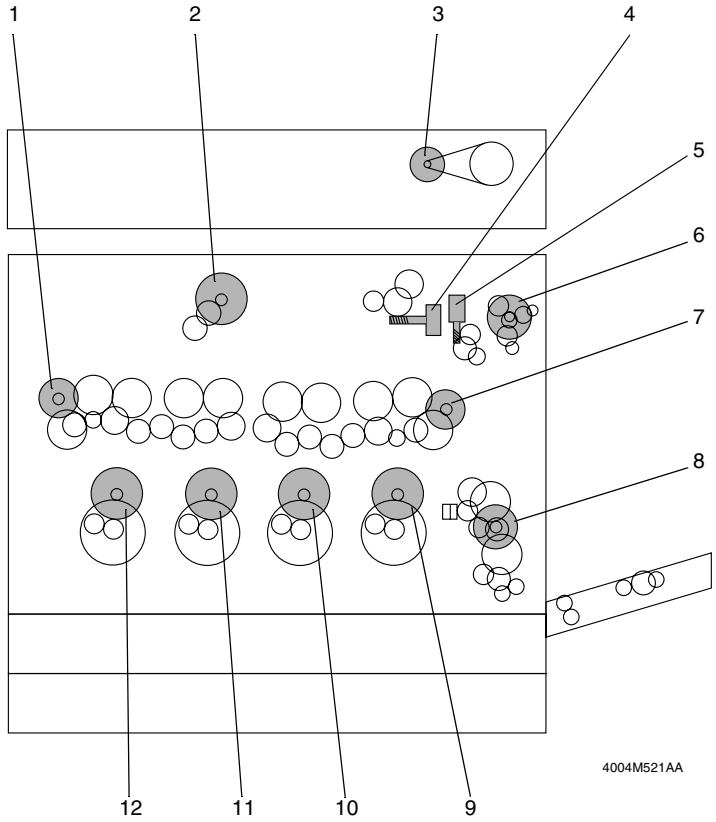
14. Main Erase
- Light from the Main Erase Lamp neutralizes any surface potential remaining on the surface of each PC Drum.

15. PC Drum Cleaning
- The Cleaning Blade scrapes off the residual toner left on the surface of the PC Drum.

16. Fusing
- The Upper and Lower Fusing Rollers apply heat and pressure to the paper so that the four different color layers of toner lying on the surface of the paper are mixed and fused together, as well as being fixed collectively to the paper.

17. Paper Exit
- Feeds the paper out of the copier onto the Paper Exit Tray.

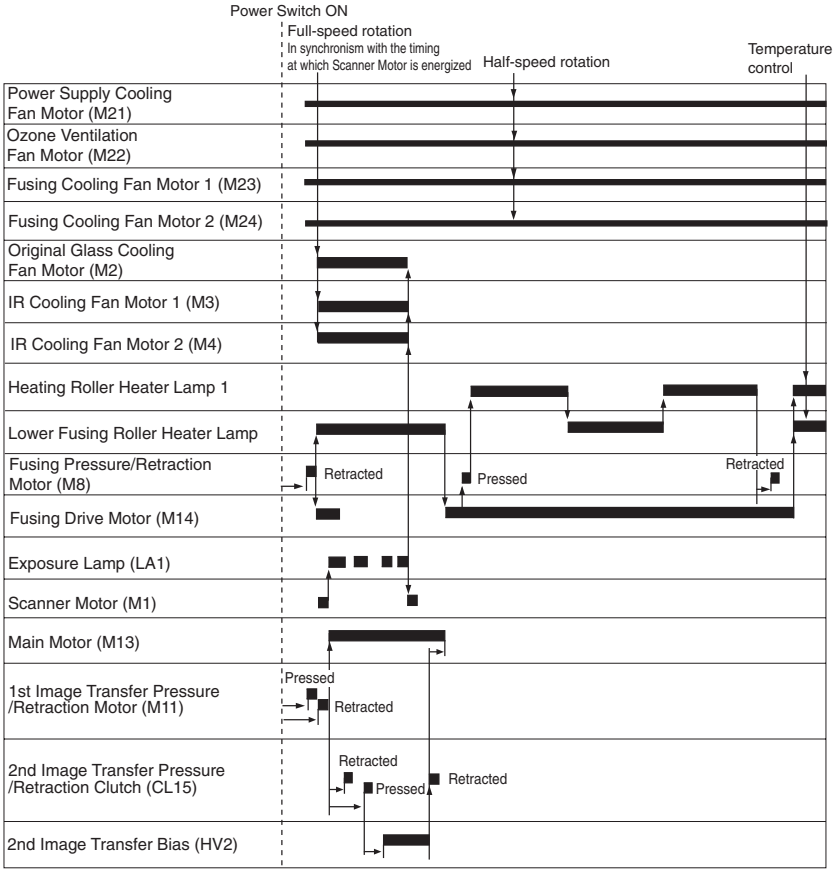
3. DRIVE SYSTEM



1. Toner Replenishing Motor Y/M (M10)
2. 1st Image Transfer Pressure/Retraction Motor (M11)
3. Scanner Motor (M1)
4. Cleaning Web Drive Motor (M5)
5. Fusing Pressure/Retraction Motor (M8)
6. Fusing Drive Motor (M14)
7. Toner Replenishing Motor C/Bk (M9)
8. Main Motor (M13)
9. Imaging Unit Motor Bk (M18)
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11. Imaging Unit Motor M (M16)
12. Imaging Unit Motor Y (M15)

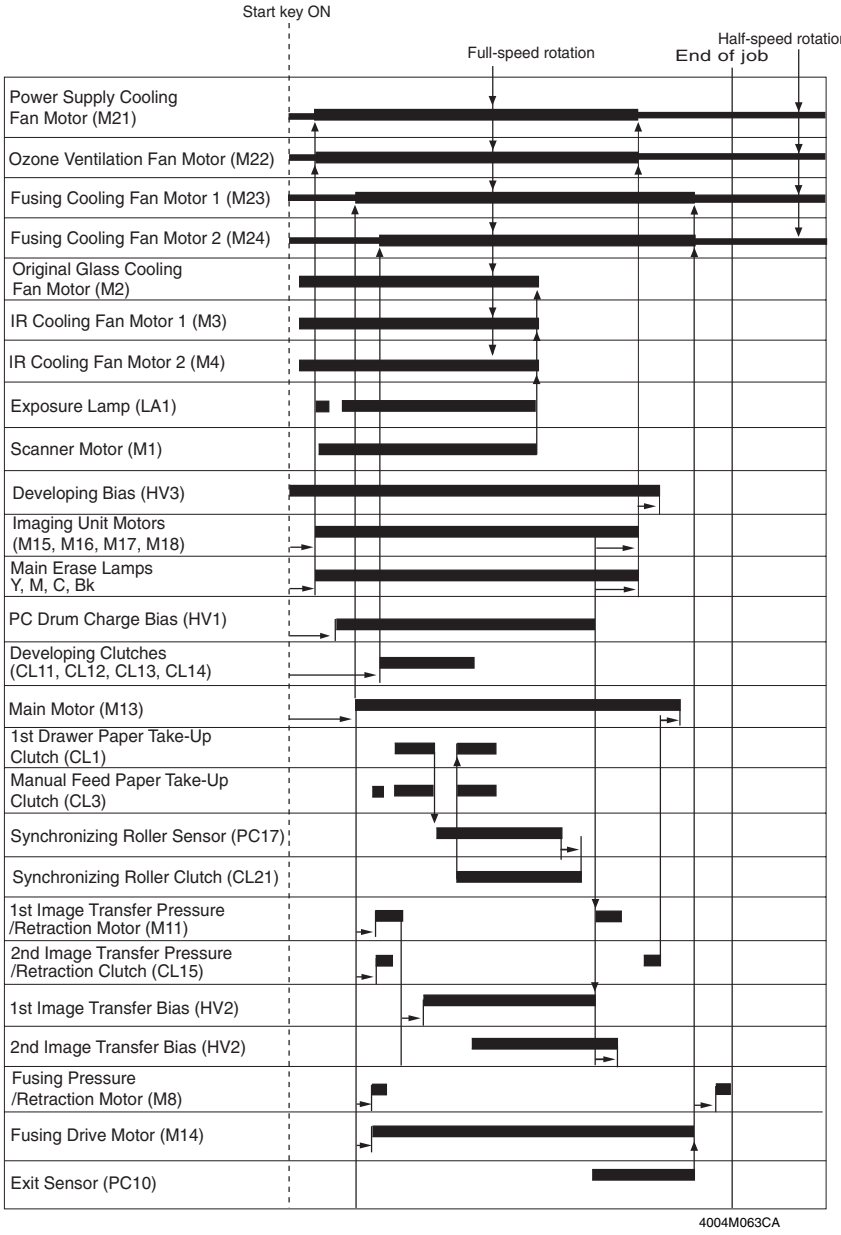
4. OPERATING SEQUENCE

- When Power Switch is Turned ON

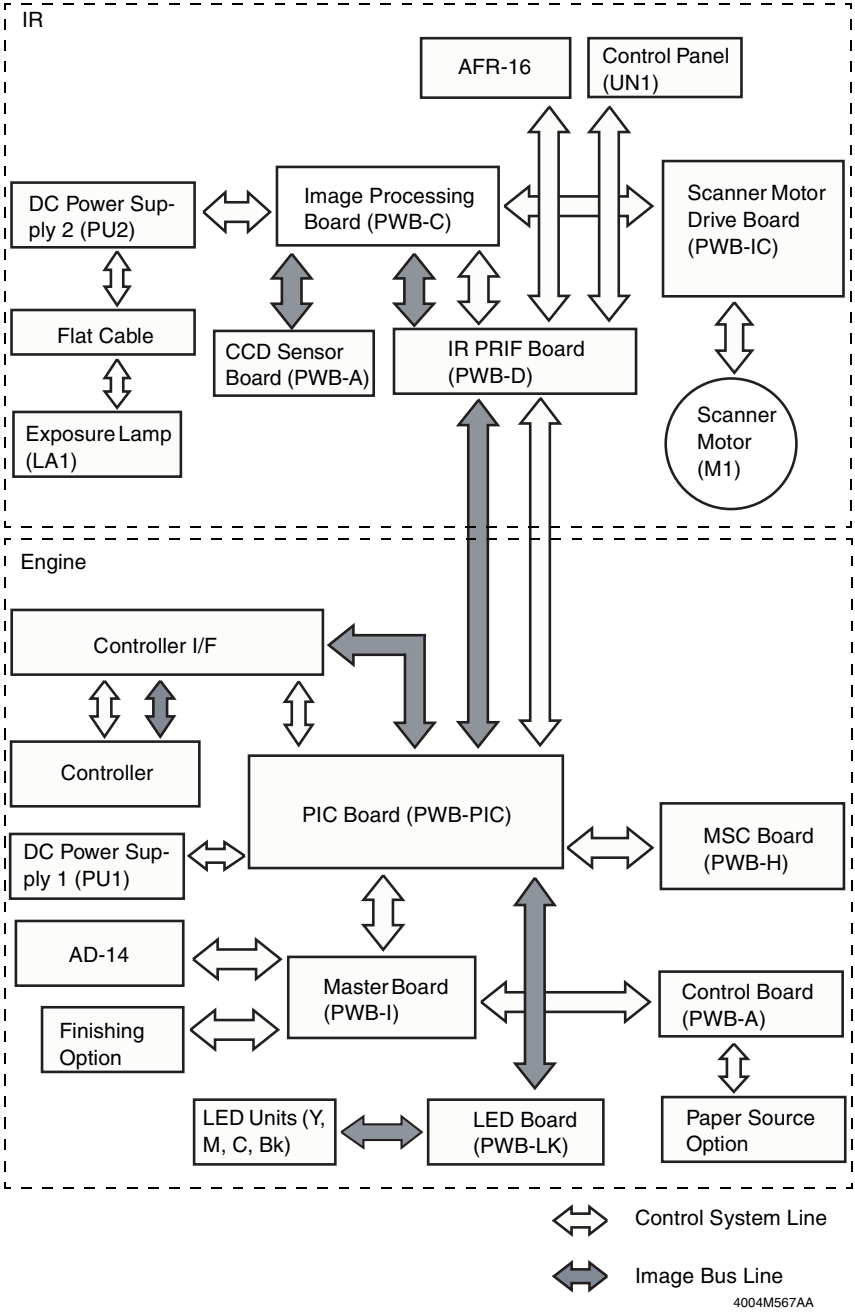


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• When Start key is Turned ON

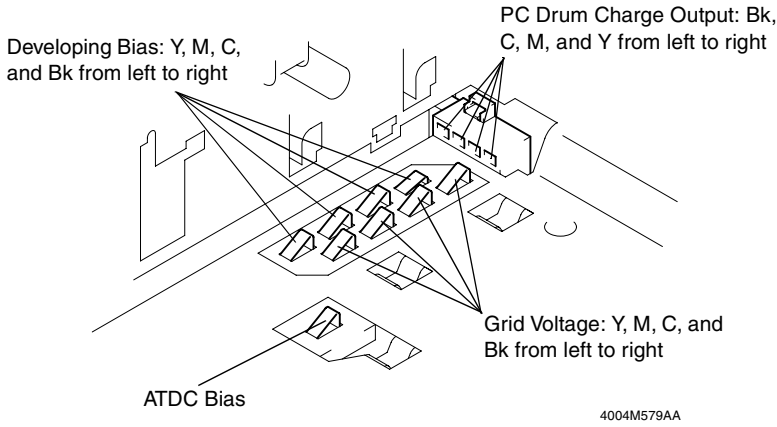


5. CONTROL BLOCK DIAGRAM

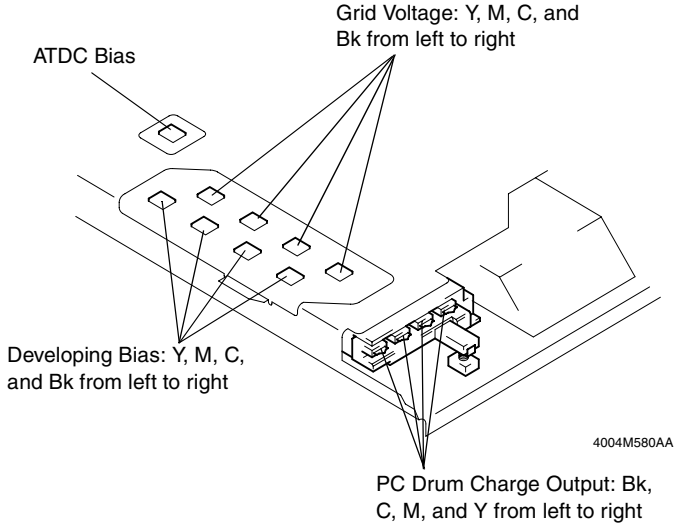


6. LOCATIONS OF TERMINALS

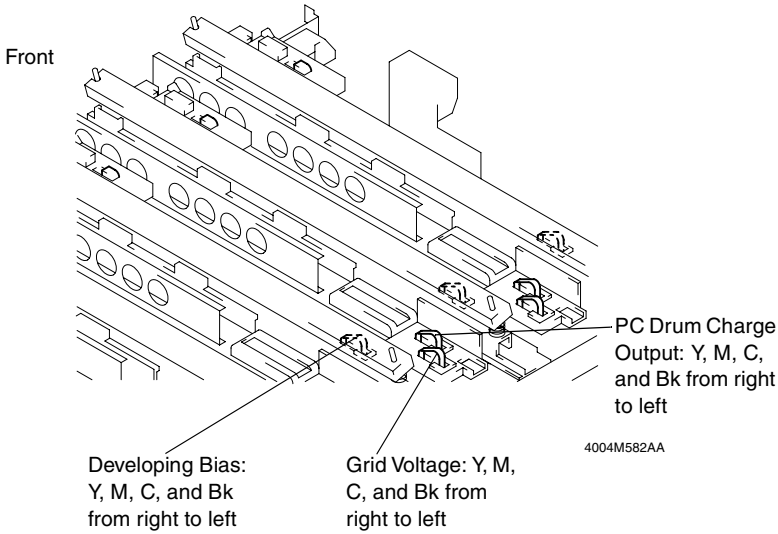
- Inside the Copier (under LED Unit)



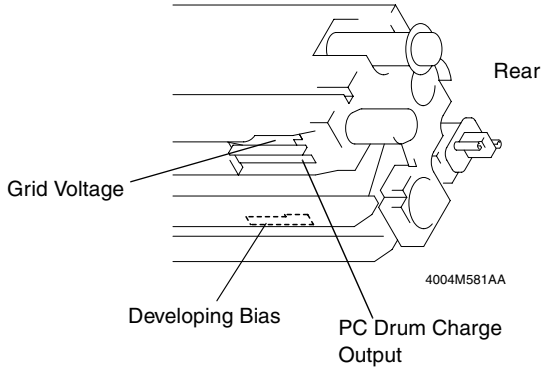
- Back of LED Unit



• LED Unit



• Imaging Unit

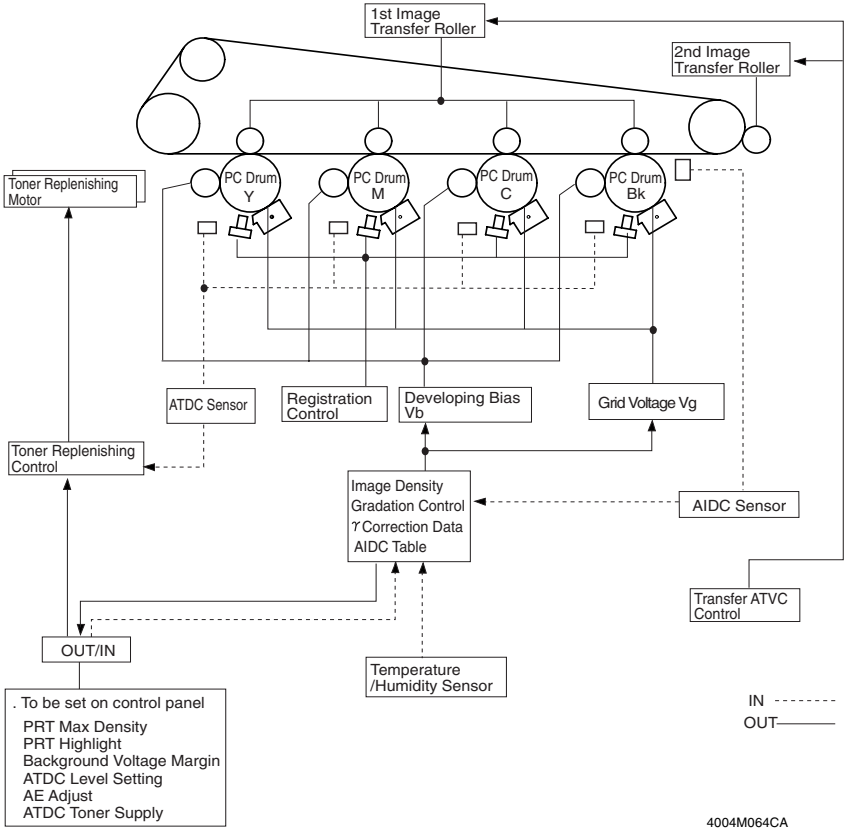


7. IMAGE STABILIZATION SYSTEM

- The copier provides the image stabilization control as detailed below to ensure stabilized copy image.

Purpose	Means	Control (Sensor)
• To stabilize image density • To stabilize gradation	• Background margin control • AIDC intensity control • Max. density control ✻ Registration control (Color Shift Correction) • γ correction control	• AIDC Sensor • Temperature/Humidity Sensor
• To stabilize toner density	✻ ATDC control (Y, M, C, Bk)	• ATDC Sensor
• To stabilize image transfer	✻ Image transfer output control	• Temperature/Humidity Sensor

✻ An explanation is given of the control for each section.

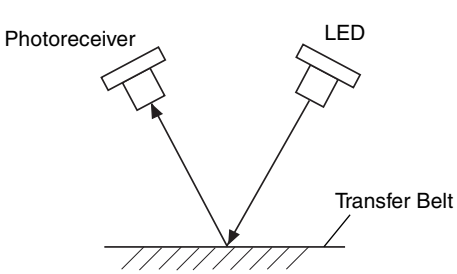


7-1. AIDC Detection

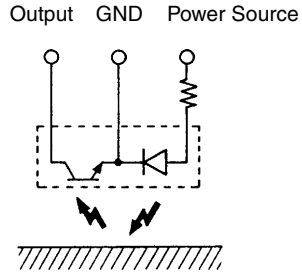
- Patterns are produced on the Transfer Belt and AIDC Sensors detect the amount of toner sticking to the patterns.

Amount of Toner Sticking	Intensity of Light Reflected	Output
Large	Low	Small
Small	High	Great

1. The light-emitting diode emits infrared rays illuminating the toner pattern on the Transfer Belt.
2. The photoreceiver detects the intensity of the infrared light reflected off the toner pattern on the Transfer Belt.
3. A voltage corresponding to the intensity of the reflected light is output to the PIC Board.



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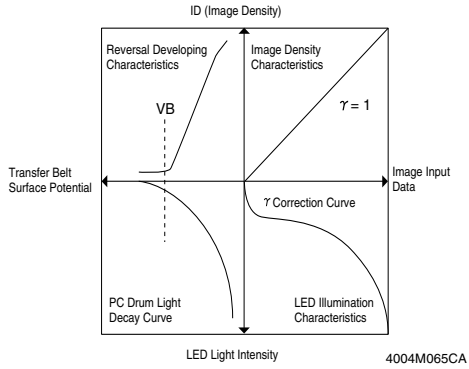


1136M068AA

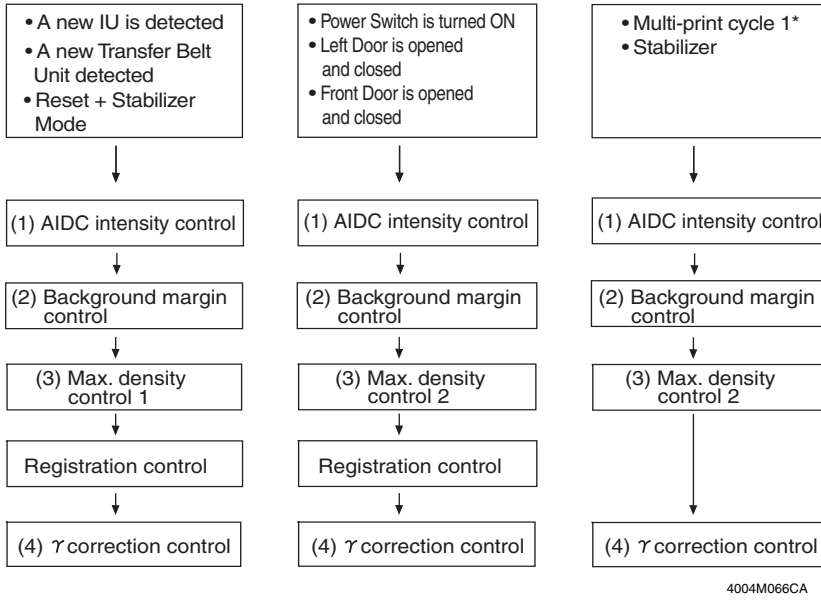
7-2. Image Stabilization System Control

- The copier uses the data obtained through AIDC detection to perform various operations, thereby finding the optimum γ correction exposure curve for image stabilization control.

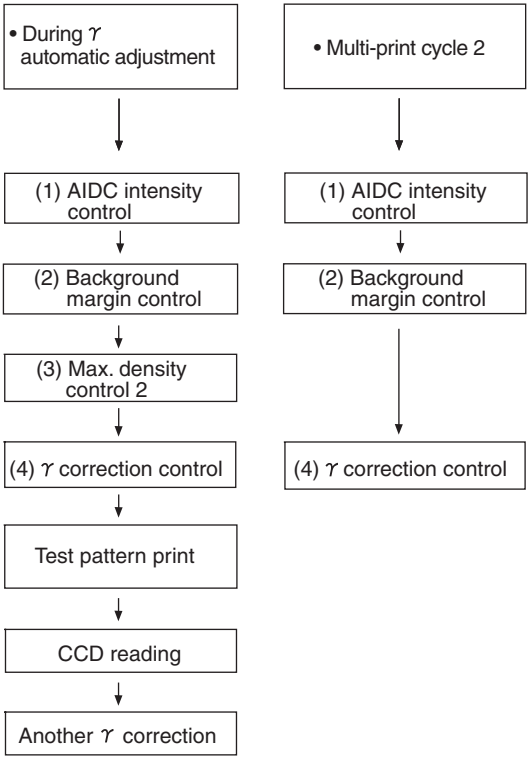
Sensitometry



- Operation Flow



✻ Multi-print cycle 1: If the copier has 20 or more pages to be printed as it completes printing 100 pages after the last image stabilization sequence, it suspends that particular print cycle and, instead, initiates an image stabilizer sequence. As it completes the image stabilization sequence, the machine resumes the suspended print cycle.



✻ Multi-print cycle 2: If the copier has less than 20 pages to be printed as it completes printing 100 pages after the last image stabilization sequence, it continues running that particular print cycle until it is completed before initiating an image stabilizer sequence.

(1) AIDC Sensor LED Intensity Control

- Controls changes in characteristics due to change with time and contamination of the AIDC Sensor, and part-to-part variations in the sensors, and change of environment.

Control Provided:
1. Adjusts the intensity (current value) of the LED on the surface of the Transfer Belt, on which no toner sticks.

(2) Background Margin Control

- Corrects changes in charging efficiency as a result of a deteriorated PC Drum and environmental condition changes.
- Controls the PC Drum Charge Corona grid voltage so that the background margin becomes 100 V.

Control Provided:
1. Determines the PC Drum Charge Corona grid voltage based on the information provided by various sensors, system speed, and the target surface potential. Target surface potential V0 (V) = Required developing bias voltage Vb (V) - 100 V

(3) Max. Density Control

- Adjusts the developing bias (Vb) to control changes in the solid density resulting from variations in developing characteristics and LED intensity, variations in sensitivity of the PC Drum, and changes in the environment, durability, and the amount of charge in toner.

Control Provided:
1. Produces patterns on the surface of the Transfer Belt and lets the AIDC Sensor detect the amount of toner sticking to them. 2. Selects the correction data appropriate for each color based on the correction data with four different levels for each color. 3. Computes from the detected data the developing bias and grid voltage values that result in the maximum density and stores the values in memory.

(4) γ Correction Control

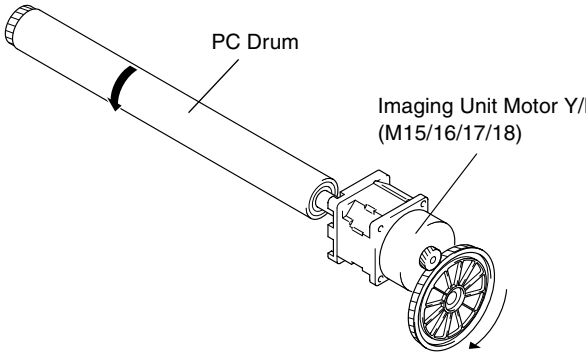
- Adjusts the LED intensity to correct changes in gradation characteristics to a linear one. The changes in gradation characteristics are caused by variations in the PC Drum sensitivity and developing characteristics and changes with time and in environment.

Control Provided:
1. Produces patterns on the surface of the Transfer Belt and lets the AIDC Sensor detect the amount of toner sticking to them. 2. According to the density measurements of different gradation levels, γ correction data is computed and the optimum LED intensity is set for each gradation level.

8. PC DRUM

8-1. PC Drum Drive Mechanism

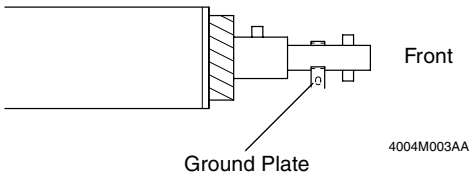
- A motor is used to turn the PC Drum of each color.
- It is a planet motor capable of transmitting highly accurate drive and preventing pitch noise.
- The motor employs planet rollers that transmit drive through friction to decelerate its speed, which means that it produces no noise or uneven rotation.



Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M15 Y	PJ12I-4A	L	H	15-B
M16 M	PJ12I-8A	L	H	17-B
M17 C	PJ12I-4B	L	H	16-C
M18 Bk	PJ12I-8B	L	H	17-D

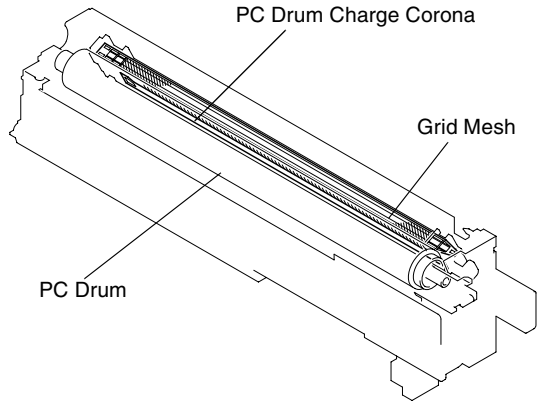
8-2. Grounding of the PC Drum

- The potential on the surface of the PC Drum exposed to the LED is grounded to the frame.



9. PC DRUM CHARGE CORONA

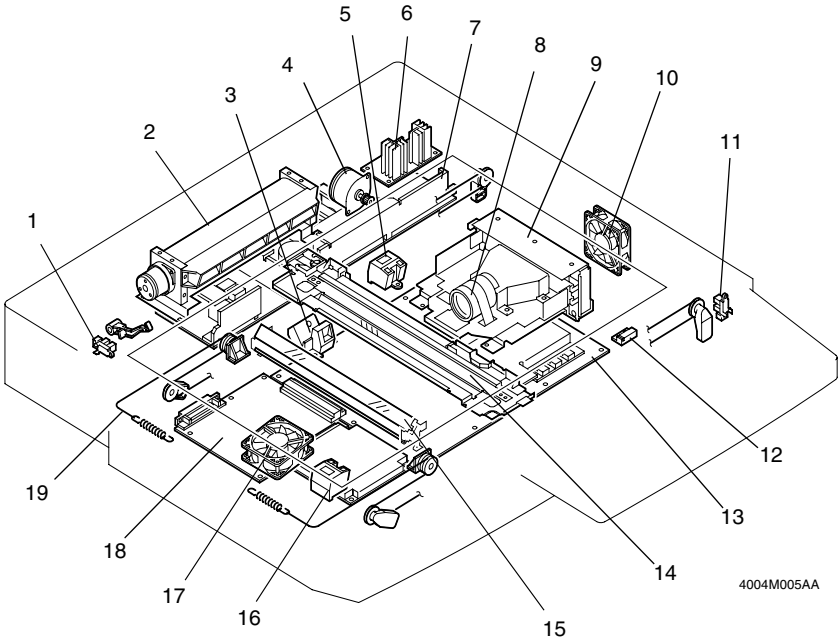
- The PC Drum Charge Corona generates corona emission to deposit a charge evenly across the surface of the PC Drum through a grid mesh.
- It has a comb electrode, which ensures that a charge is concentrated on the grid mesh, thus reducing the amount of ozone produced.
- The grid voltage applied to the grid mesh is generated by the Constant-Voltage Circuit in High Voltage Unit 1.
- The constant voltage of High Voltage Unit 1 is determined through image stabilization control.



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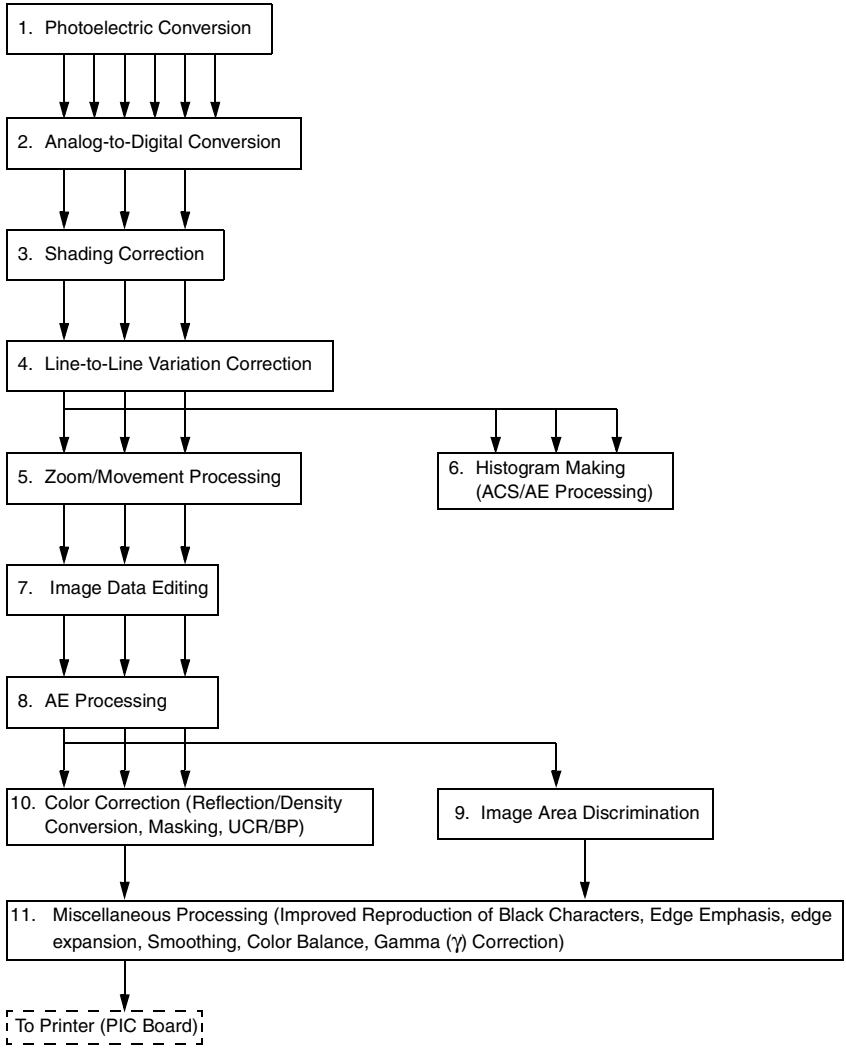
	Control Signal	ON	OFF	WIRING DIAGRAM
PC Drum Charger	PJ9I-6 (Y)	L	H	22-C
	PJ9I-8 (M)	L	H	
	PJ9I-10 (C)	L	H	
	PJ9I-12 (Bk)	L	H	

10. IMAGE READER (IR) SECTION



1. Original Cover Detecting Sensor PC25
2. Original Glass Cooling Fan Motor M2
3. Original Size Detecting Sensor FD1 PC30
4. Scanner Motor M1
5. Original Size Detecting Sensor FD2 PC31
6. Scanner Motor Drive Board PWB-IC
7. DC Power Supply 2 PU2
8. Lens
9. CCD Sensor Board PWB-A
10. IR Cooling Fan Motor 2 M4
11. Scanner Home Sensor PC24
12. Size Reset Switch S10
13. Image Processing Board PWB-C
14. Scanner
15. 2nd/3rd Mirror
16. Original Size Detecting Sensor CD1 PC32
17. IR Cooling Fan Motor 1 M3
18. IR PRIF Board PWB-D
19. Cable

10-1. IR Image Processing



1. Photoelectric Conversion

- A reduction-type color CCD Sensor is used.
- The R, G, and B chips of the CCD Sensor read the light reflected off the original and convert the optical data into a corresponding analog electric signal.
- To make data processing faster, data transfer and output are done through two channels, one for even-numbered pixels and the other for odd-numbered pixels.

2. Analog-to-Digital Conversion

- The odd and even analog signals output from the CCD Sensor are converted to 8-bit digital signals which are then synthesized.

3. Shading Correction

- An error is corrected that occurs due to variations in sensitivity of each CCD chip and the light distribution varying along the length of Exposure Lamp.

Operation:

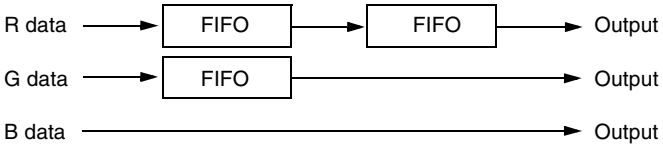
A. Before the start of each copy cycle, light from Exposure Lamp strikes the shading sheet and the CCD Sensor reads the light reflected off this sheet.
B. This reading is compared with the shading sheet reading reference value (white reference value = max. value of image data) to determine the correction value for each pixel.
C. When the image is scanned, each pixel data is corrected with the above correction value.

To prevent adverse effects on the image due to dust on the white plate (shading sheet), a correction is made based on the readings taken of multiple lines.

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4. Line-to-Line Variation Correction

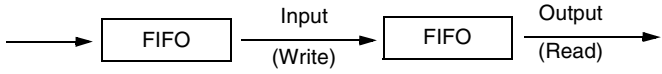
- The R, G, and B chips of the CCD Sensor are placed so that there is a gap of 4 lines in the sub-scanning direction between the two adjacent chips (R → G → B). This results in a deviation in the scanning position of the original. (The slower the scanning speed, the greater the amount of deviation.)
- A memory called FIFO* is used to compensate for this deviation. It retards the output timing for R and G data to match it with that for B data.



* FIFO (first-in-first-out): Data is output in the same order as it is input.

5. Zoom/Movement Processing

- The image is edited according to the editing features selected on the control panel (enlargement/reduction, Image Monitor)
- Two memories (FIFOs) are used to edit the image as required.



Zoom

- The synchronous timing of the input data (read) and output data (read) is varied to decrease (reduction) or increase (enlargement) the number of data readings, thereby reducing or enlarging the image in the main scanning direction.
- The image is reduced or enlarged in the sub-scanning direction by varying the speed at which the Scanner moves.

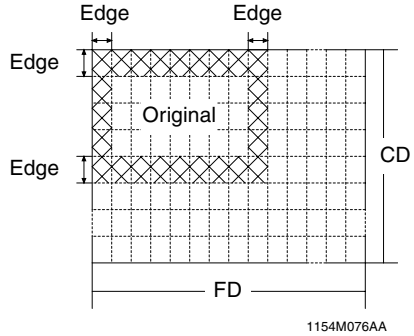
Image Monitor

- The input data (read) stored in the memory is output (read) several times.

6. Histogram Making

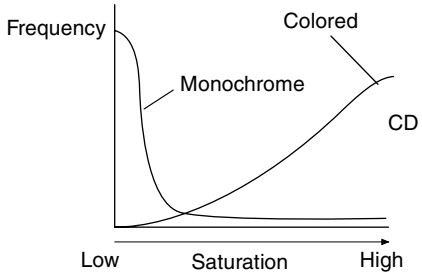
- The scanning area is divided into multiple blocks.
- The image data of the original (excluding the edges) is sampled during the prescan after the shading correction.
- A histogram is then generated of lightness by saturation.
- The number of color dots in each block is counted.
- The results of the counting are then used to determine whether each block on the original (excluding the edges) is colored or monochrome.
- Based on the results of the color/monochrome evaluation made of each block, the copier determines whether the entire original is colored or monochrome (ACS, or Auto Color Selection).

Block Division

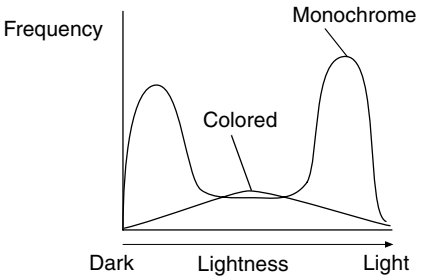


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Histogram



1154M077AA



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7. Image Data Editing

- R, G, and B data are converted to V (value), Cr, and Cb (color component) for color adjustments (saturation, lightness, and hue).

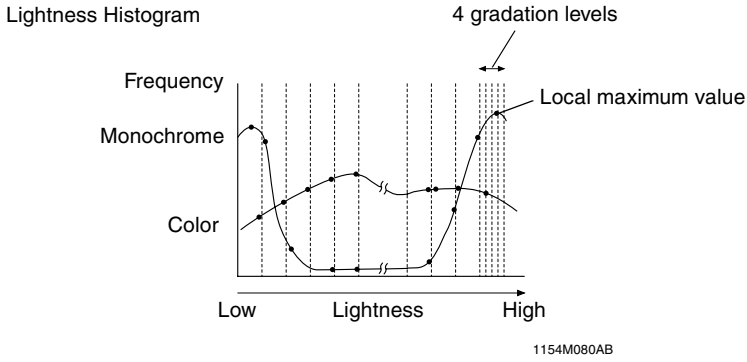
8. AE Processing

Histogram Making

- Lightness data readings are tallied up for each four gradation levels using the image data sampled through “Histogram Making.”
- The lightness data readings tallied up for each four gradation levels are totaled to generate one lightness histogram (for AE processing).

AE Level Evaluation

- From the histogram with lightness blocked into four gradation levels, the local maximum value of each block (the gradation level with the greatest frequency in each block) is extracted.
- Calculation is made to determine if there is any gradation level extracted, the sum of frequency of ±8 gradation levels of which accounts for a given level or more of the sum of frequency of the entire original. (Processing is done in the order of the gradation level of higher lightness).
- If there is, the AE level (local minimum value) is determined according to the lightness frequency at that local maximum value.
- If not, the AE level is determined according to the original mode.
- The AE processing table is determined based on the AE level.
- Background processing (AE processing) is performed as the AE processing table is determined.



9. Image Area Discrimination

- The image areas (color edge area, black edge area, dot area, continuous gradation area) are discriminated to optimize edge emphasis, smoothing and other processing just right for the image.
- Either edge emphasis or smoothing is selected according to the results of image area discrimination.

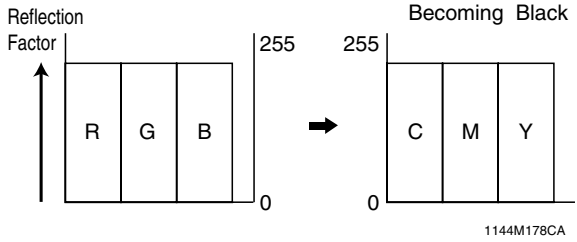
Original Mode	Original Area	Smoothing/Edge Emphasis
Text & Photo mode	Dot area	Smoothing processing
	Black edge area	Edge emphasis
	Color edge area	Edge emphasis
	Continuous gradation area	Smoothing processing
Photo Image mode	Edge area	Weak edge emphasis
	Continuous gradation area	———
Printed Image mode	Dot area	Smoothing processing
Text mode	Dot area	———
	Black edge area	BP amount 100 % (printed with Bk toner only)
	Color edge area	Edge emphasis
	Continuous gradation area	———
Map mode	Edge area	Strong edge emphasis
	Continuous gradation area	Smoothing processing

10. Color Correction

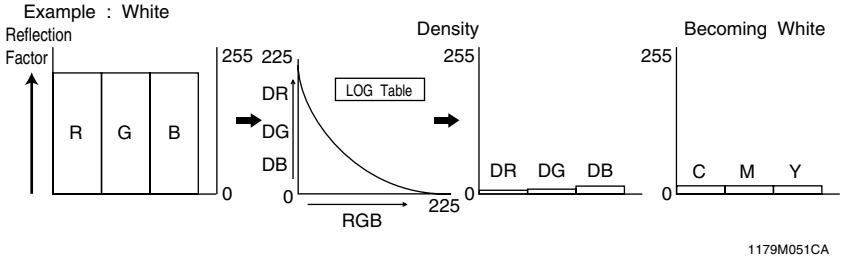
Reflection/Density Conversion

- Color reproduction faithful to the original is not possible if the original reflection data (R, G, B) obtained through the CCD Sensor is converted to the complementary color data for developing.

Example: White



- The R, G, and B data are therefore input to the LOG table shown below to convert to the density data (DR, DG, and DB).

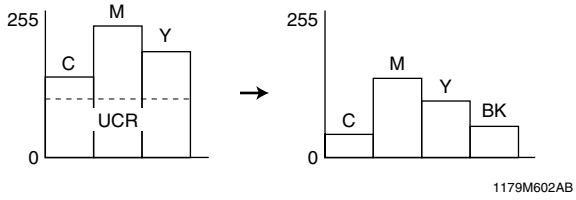


Masking

- Considering the spectral transmission characteristics of the R, G, and B filters of the CCD Sensor and the spectral reflection characteristics of the toner, the image data is corrected and the DR, DG, and DB data are replaced with C, M, and Y data, thereby enabling color reproduction faithful to the original.

UCR and BP

- In UCR, or Under Color Removal, the C, M, and Y data required for color reproduction areas are retained, while the C, M, and Y data of gray areas are removed.
- With BP, or Black Paint, a certain ratio of the gray area is replaced with Bk data, the ratio varying depending on the saturation of the color.



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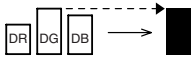
- Because of the spectral reflection characteristics of the toner, simply placing C, M, and Y toner one on top of the other does not make a pure black.
- If C, M, and Y toner are put together to create a color close to black, it results in an increased amount of toner sticking, meaning that more toner scatters and is consumed.

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11. Miscellaneous Processing

<Improved reproduction of black characters>

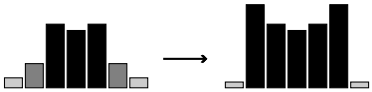
- The Bk data for black characters is replaced with MAX (DR, DG, DB) data, which improves reproduction of black fine lines, realizing reproduction of black characters that do not depend on line width very much.



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Edge Emphasis

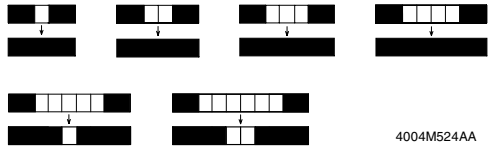
- The number of data readings on the edges of the image is increased to make the outline of the image sharper as it appears on the copy.


1144G04MBA

- The amount of edge emphasis is obtained in directions of 0°, 90°, 45°, and -45° and is determined using the greatest value obtained.

Edge Expansion

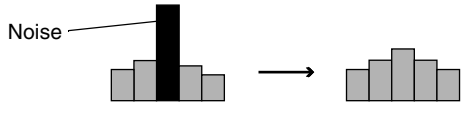
- Edge emphasis produces a difference in contrast between the edge and center of text. This processing expands edges toward the inner side and identifies them as a new edge.



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Smoothing

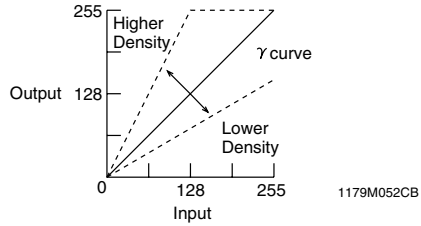
- The noise components contained in the image data are removed to smooth the data.



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Density Adjustment and Color Balance

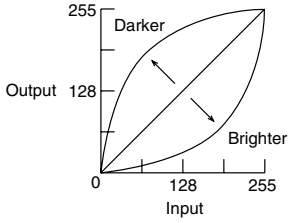
- Density adjustment is made by changing the angle of the γ curve that represents the relation between the input and output of the image data.
- Color balance is adjusted by changing the angle of the γ curve for each color.



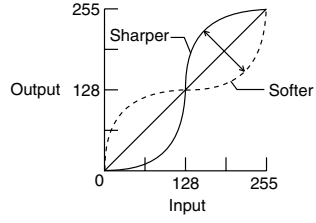
1179M052CB

Gamma (γ) Correction

- The type of γ curve is changed to make the image brighter or darker, or sharper or softer.



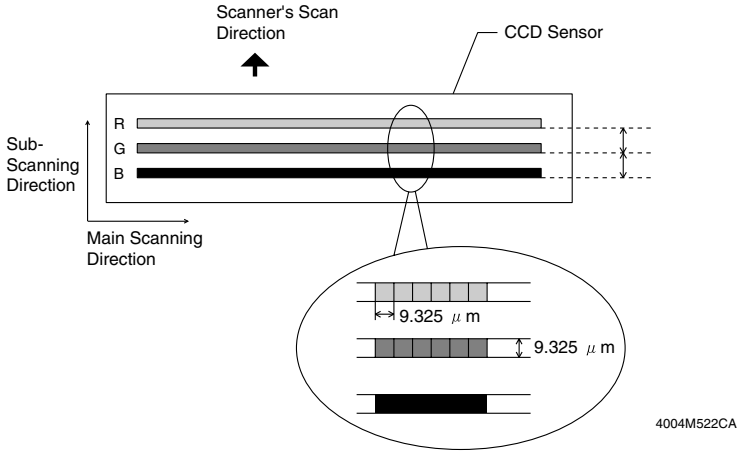
1179M053CB

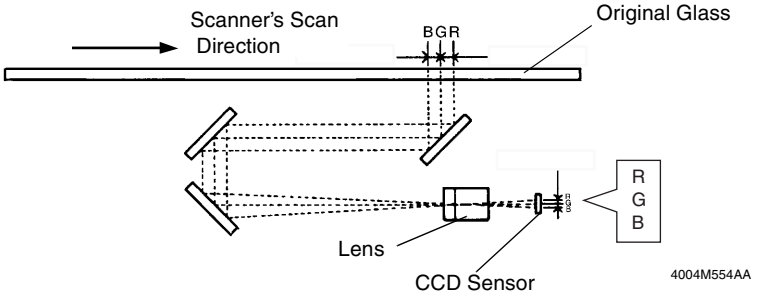


1179M054CB

10-2. CCD Sensor

- A reduction-type color CCD sensor is used.
- Each of the R, G, and B CCD chips is placed in a line with a given clearance from the adjacent chip and provided with a color filter.
- The interval at which each of these CCD chips scans the image on the surface of the Original Glass is predetermined through the lens and mirrors.
- The deviation produced in the scanning position of each pixel is therefore corrected by “4. Line-to-Line Variation Correction” of the IR image processing.
- The CCD sensor offers a resolution of 600 dpi on the surface of the Original Glass.
- Each of the R, G, and B chips has 7,500 effective pixels.

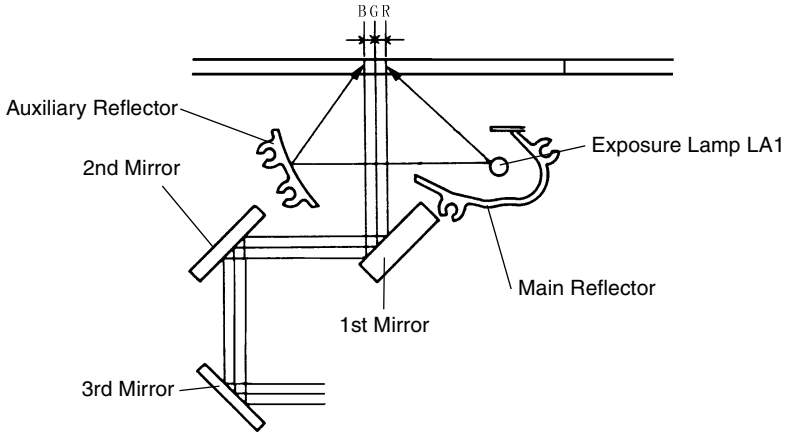




10-3. Exposure Components Section

1. Exposure Lamp
- Exposure Lamp uses a DC power supply to emit an even amount of light.
- A halogen frost lamp is used.

2. Main and Auxiliary Reflectors
- The Main and Auxiliary Reflectors are laid out to correct any deviation in condensing of the Exposure Lamp light that may result from Exposure Lamp positioned eccentrically or improperly.
- The illumination distribution in the sub-scanning direction on the surface of the original is made flat over a given width with reference to the G chip.

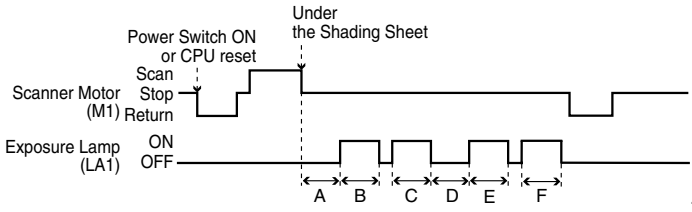


10-4. Exposure Lamp Control

- The Exposure Lamp is turned ON and OFF by the Scan Start Timing signal (PRE-TRIG) and Image Request signal (I-REQ) fed from the Master Board and the Lamp ON signal (LMPON) and Sub-Scanning Area signal (VD) from the Image Processing Board.

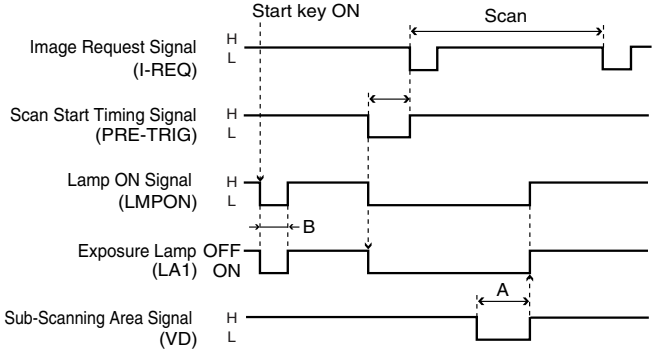
	Control Signal	WIRING DIAGRAM
LA1	PRE-TRIG (PWB-I PJ18I-6A)	21-G
	I-REQ (PWB-I PJ18I-7B)	
	LMP-REM (PWB-C PJ2C-9B)	
	VD (-)	

- When the Power Switch is turned ON, a misfeed or malfunction is reset, or the door is opened and closed:



A. Automatically adjusts the clamp value of the CCD Sensor output voltage for black level.
B. Automatically adjusts the intensity of the Exposure Lamp.
C. Automatically adjusts the gain value of the CCD Sensor output voltage for R, G, and B.
D. Readjusts the clamp value of the CCD Sensor output voltage for black level.
E. Readjusts the gain value, as the clamp level has been lowered as a result of readjustment of the clamp value.
F. Corrects the table used for shading correction.

- In Full Size Copying:



A: Varies for different paper sizes and zoom ratios.
B: Shading correction

4004M068CA

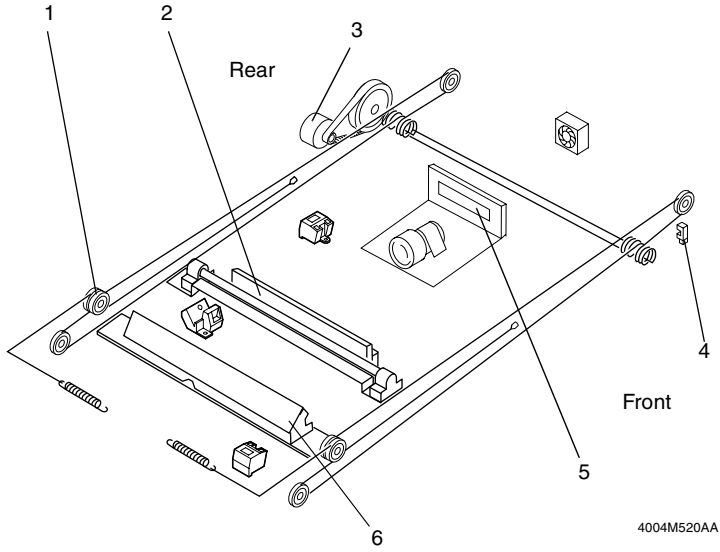
10-5. Scanner and 2nd/3rd Mirrors Carriage Movement Mechanism

(1) Scanner Movement Mechanism

- The Scanner moves at a speed according to the set zoom ratio with reference to that in the full size mode. It is driven by the Scanner Motor.
- The Scanner Home Sensor detects the Scanner at its home position.

(2) 2nd/3rd Mirrors Carriage Movement Mechanism

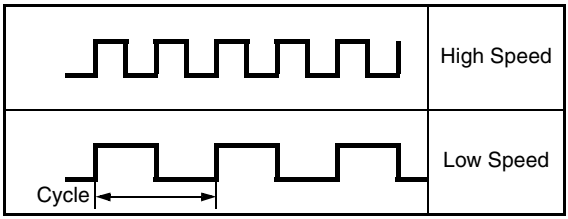
- The 2nd/3rd Mirrors Carriage moves at a speed half that of the Scanner to keep constant the optical path length between the original and CCD.



1. Scanner Drive Cable
2. Scanner
3. Scanner Motor (M1)
4. Scanner Home Sensor (PC24)
5. CCD
6. 2nd/3rd Mirrors Carriage

10-6. Scanner Motor Drive Control

- The speed at which the Scanner travels is controlled by varying the cycle of the motor drive pulse that is timed with the reference clock.

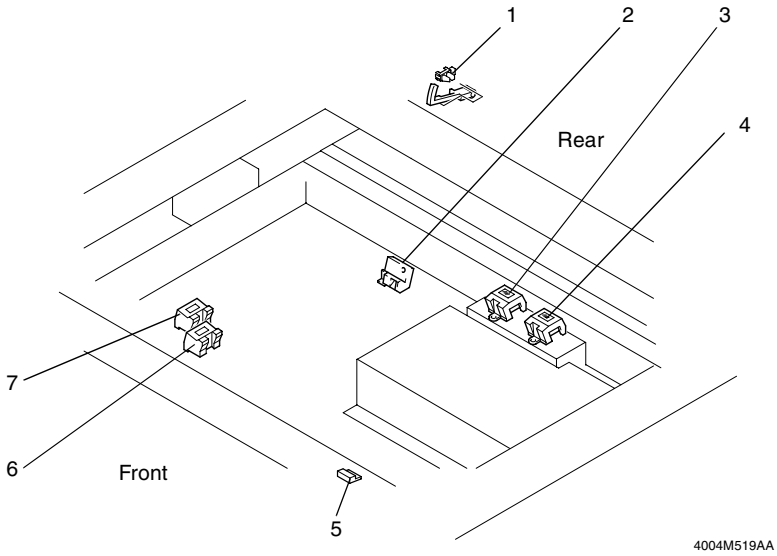


- The distance over which the Scanner travels is controlled by the number of motor drive pulses which is determined according to the paper size and zoom ratio.

Controlled Part	Control Signal	Deenergized	Energized	WIRING DIAGRAM
M1	PWB-C PJ2C-1~7A	Pulse Output		22-H

11. ORIGINAL SIZE DETECTING SECTION

- Original Size Detecting Sensors are provided for detecting the size of the original.

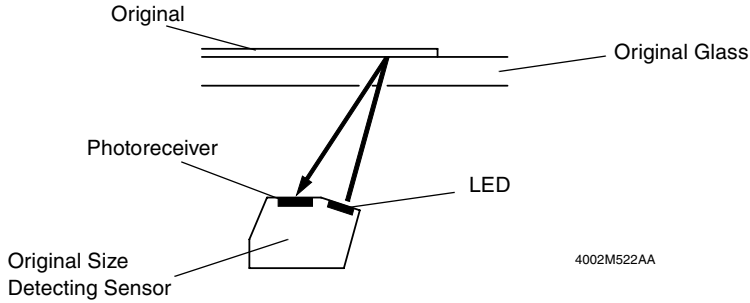


1. Original Cover Detecting Sensor (PC25)
2. Original Size Detecting Sensor FD1 (PC30)
3. Original Size Detecting Sensor FD2 (PC31)
4. Original Size Detecting Sensor FD3* (PC33)
5. Size Reset Switch (SW10)
6. Original Size Detecting Sensor CD2* (PC34)
7. Original Size Detecting Sensor CD1 (PC32)

*: Optional

11-1. Original Size Detecting Method

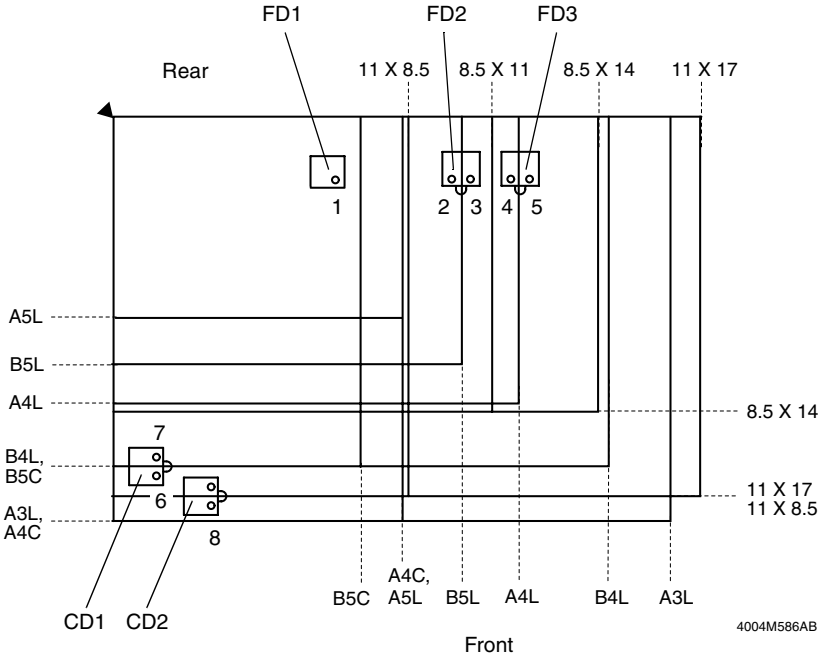
- The Original Size Detecting Sensors work on a principle that the intensity of light reflected off the original varies with different distances.
- Light emitted by the LED of each sensor is reflected off the surface of the original. When the photoreceiver of the sensor receives light of a given intensity level or higher, the copier then determines that there is an original on the Original Glass.



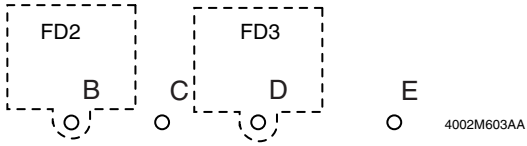
11-2. Locations of Original Size Detecting Sensors

- The Original Size Detecting Sensors are located at the following places so that various original sizes can be detected properly.
- Mounting optional Original Size Detecting Sensors will increase the number of original sizes to be detected.

	FD1	FD2	FD3	CD1	CD2
Metric Area	Standard	Standard	Optional	Standard	Optional
Inch Area	Optional	Standard	Optional	Standard	Optional



✻ Mounting Locations of FD2 and FD3



11-3. Determining the Original Size

- The Image Processing Board determines the size of the original by the combination of the original statuses, whether there is an original or not, determined by each of the Original Size Detecting Sensors.
- Even if an original is of an irregular size, the board rounds the size to the nearest standard size.

✻ Metric Area

Original Size	FD1	FD2		CD1	
	1	2	3	6	7
A3L	●	●	●	●	●
B4L	●	●	●	-	●
A4L	●	●	●	-	-
A4C	●	-	-	●	●
8.5 × 11	●	●	-	-	-
B5C	●	-	-	-	●
A5L	●	-	-	-	-

●: Original present -: Original not present

- When optional sensors are mounted

Original Size	FD1	FD2		FD3 (optional)		CD1		CD2 (optional)
	1	2	3	4	5	6	7	8
A3L	●	●	●	●	●	●	●	●
B4L	●	●	●	●	●	-	●	-
A4L	●	●	●	-	-	-	-	-
A4C	●	-	-	-	-	●	●	●
8.5 × 11	●	●	-	-	-	-	-	-
B5C	●	-	-	-	-	-	●	-
A5L	●	-	-	-	-	-	-	-
11 × 17	●	●	●	●	●	●	●	-
8.5 × 14	●	●	●	●	●	-	-	-
11 × 8.5	●	-	-	-	-	●	●	-
FLS	●	●	●	●	-	-	-	-

●: Original present -: Original not present

✻ Inch Area - Standard

Original Size	FD2		CD1	
	2	3	6	7
11 × 17	●	●	●	●
8.5 × 14	●	●	-	-
8.5 × 11	●	-	-	-
11 × 8.5	-	-	●	●
B4L	●	●	-	●
B5C	-	-	-	●

●: Original present -: Original not present

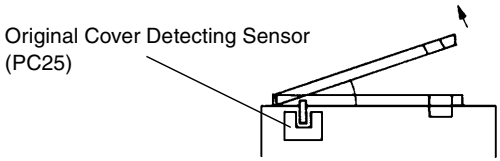
• When optional sensors are mounted

Original Size	FD1 (optional)	FD2		FD3 (optional)		CD1		CD2 (optional)
	1	2	3	4	5	6	7	8
11 × 17	●	●	●	●	●	●	●	-
8.5 × 14	●	●	●	●	●	-	-	-
8.5 × 11	●	●	-	-	-	-	-	-
11 × 8.5	●	-	-	-	-	●	●	-
B4L	●	●	●	●	●	-	●	-
B5C	●	-	-	-	-	-	●	-
8.5 × 5.5	●	-	-	-	-	-	-	-
A3L	●	●	●	●	●	●	●	●
A4L	●	●	●	-	-	-	-	-
A4C	●	-	-	-	-	●	●	●
FLS	●	●	●	●	-	-	-	-

●: Original present -: Original not present

11-4. Original Size Detection Timing

1. Original size detection : When the Original Cover is raised to an angle of 15° or more (Original Cover Detecting Sensor is unblocked).
2. Original size validation : When the Original Cover is lowered to an angle of less than 15° (Original Cover Detecting Sensor is blocked) or when the Start key is pressed with the Original Cover Detecting Sensor unblocked.
3. Original size reset : When the Original Cover Detecting Sensor is unblocked as the Original Cover is raised.

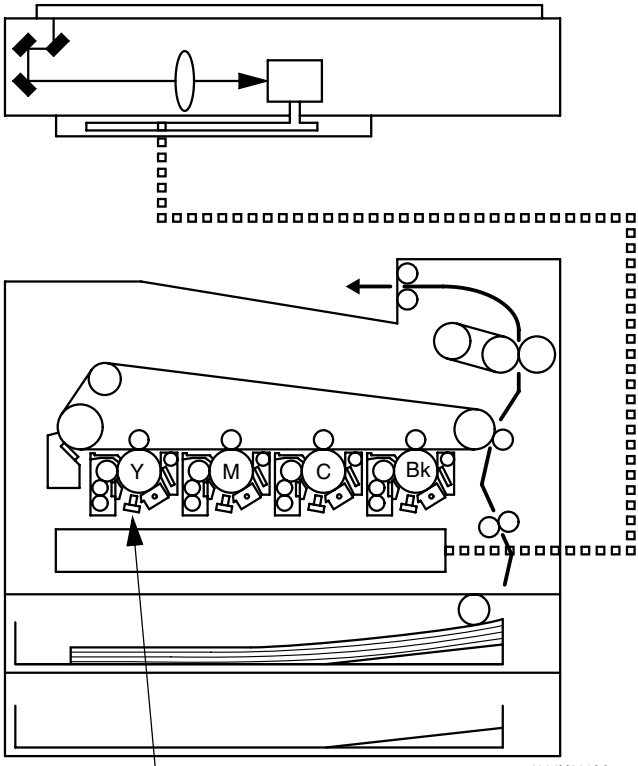


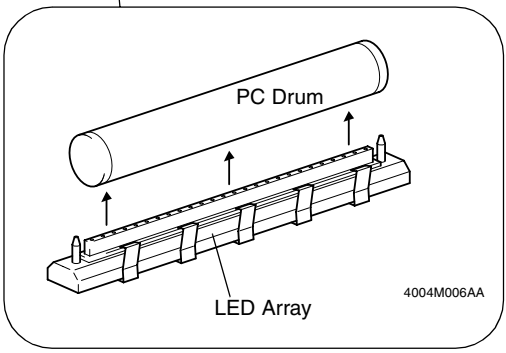
4004M512AA

Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC25	PWB-C PJ2C-2B	L	H	20-H

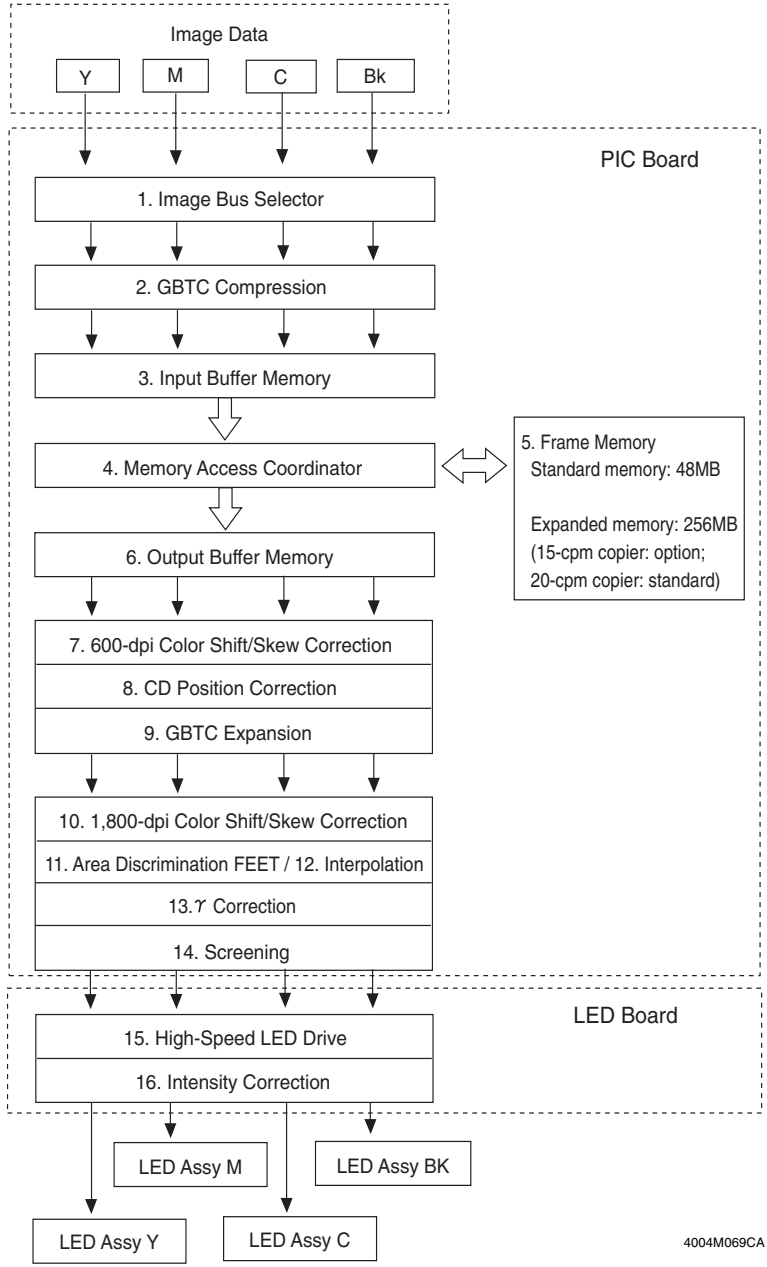
12. PRINTER SECTION

- The printer section makes necessary corrections of the image data output from the IR.
- The light from the LED illuminates the surface of the PC Drum to form an electrostatic latent image.





12-1. Printer Section Image Processing Block Diagram



1. Image Bus Selector
- Chooses between the image data from the Scanner and that from the printer controller.

2. GBTC (General Block Truncation Coding) Compression
- Compresses the Y, M, C, and Bk image data (8 bits, 256 gradation levels, 4 colors) to reduce its volume.

3. Input Buffer Memory
- Temporarily stores the CBTC-compressed image data.

4. Memory Access Coordinator
- Provides the control detailed below of the data stored in input buffer memory using Frame Memory:

Item	Specific Control
Drum-to-drum distance delay control	Delaying outputs to make up for the distance between two adjacent PC Drums of Y, M, C, and Bk.
I/O system speed adjustment	Adjusting the speeds of the Scanner at 135 mm/sec. and the printer at 90 mm/sec.
2-sided copying control ✻ Possible only when expanded memory is mounted	Using Frame Memory to sort image data output order in consideration of paper turnover time during 2-sided copying for efficient printing.
Memory retention	Refreshes the contents of SD (Synchronous Dynamic) RAM to ensure that data is retained.
2in1 control ✻ Possible only when expanded memory is mounted	Performs 2in1 control of image data.

5. Frame Memory
- Stores the Y, M, C, and Bk image data.
- Standard 48 MB (in PIC Board)
- Expanded memory 256 MB (128 MB x2), standard on 20-cpm copier and optional on 15-cpm copier

6. Output Buffer Memory
- Temporarily stores the image data output from Frame Memory.

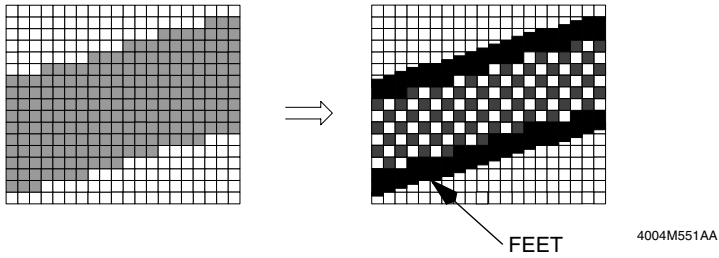
7. 600-dpi Color Shift/Skew Correction
- Corrects skew in the print position to ensure alignment in the main scanning direction between each of the Y, M, C, and Bk LED assemblies and PC Drums.

8. CD Position Correction
- Corrects any deviation in the print start position in the main scanning direction that occurs when each of the Y, M, C, and Bk LED Units illuminates the surface of the corresponding PC Drum.
- The correction is made through correcting deviation in the installed position of the LED Unit.
- It is made in SRAM (Static RAM) used in color shift/skew correction.

9. GBTC Expansion
- Expands the Y, M, C, and Bk image data (8 bits, 256 gradation levels, 4 colors).

10. 1,800-dpi Color Shift/Skew Correction
- Corrects skew in the print position to ensure alignment in the main scanning direction between each of the Y, M, C, and Bk LED assemblies and PC Drums.
- The maximum unit of correction is 1,800 dpi.

11. Area Discrimination FEET
- Discriminates the edges of text and line figure and, according to the results of the area discrimination, selects the appropriate gradation reproduction method.
- It ensures smooth reproduction of edges.



Original Image Type	Specific Processing Performed
Text & Photo	FEET + Screen optimized for gradation or screen optimized for resolution
Photo Image	Screen optimized for gradation or screen optimized for resolution
Printed Image	Screen optimized for gradation or screen optimized for resolution
Text	FEET + Screen processing cancel
Map	FEET + Screen optimized for map

12. Interpolation
- Provided for the PIC Board and used when resolution is changed from 600 dpi to 1,800 dpi.
- Applicable only for continuous gradation areas.
- Converts the resolution of a target pixel. At this time, correction is made using the target pixel and the ones adjacent to it in the sub-scanning direction.

13. γ Correction
- Makes necessary corrections using a correction table so that printed gradations have linear characteristics, since the image density of the input image data is not directly proportional to that of the printed image.

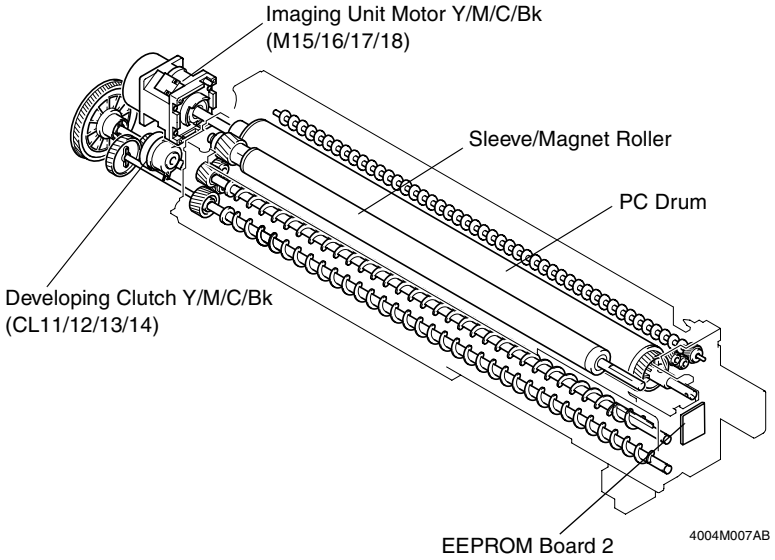
14. Screening
- Creates density distribution of a predetermined pattern to enable outstanding gradation reproduction.

15. High-Speed LED Drive
- Rearranges image data so that LEDs can then be illuminated and transfers the corrected image data.

16. Intensity Correction
- A number of LED chips, each having a resolution of 600 dpi in the main scanning direction, are placed.
- Corrects variations in each of these LED chips by adjusting the drive current for each, thereby ensuring that each emits a uniform intensity of light.

13. IMAGING UNIT

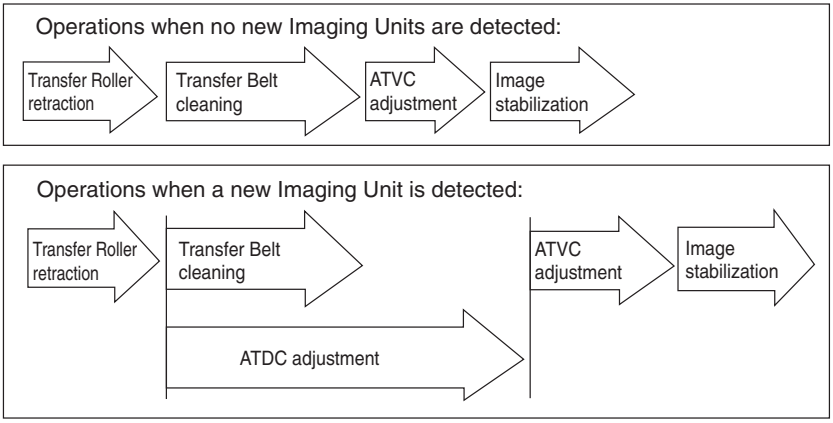
- The Imaging Unit carries out development process by allowing toner to stick to the electrostatic latent image formed on the surface of the PC Drum.



13-1. Control of Detection of New Imaging Unit

Each Imaging Unit is provided with EEPROM Board 2 that detects whether a new Imaging Unit is installed.

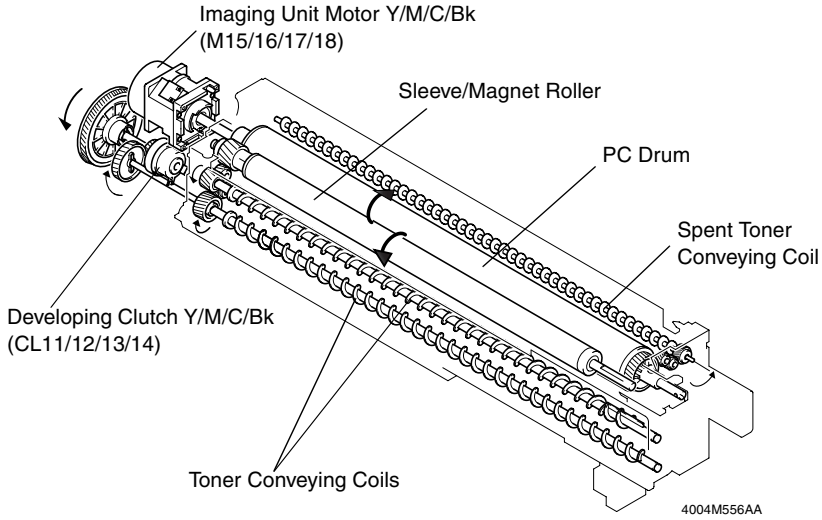
New Imaging Unit Detection Timing	Power Switch is turned ON
	Front Door is closed



4004M070CA

13-2. Imaging Unit Drive Mechanism

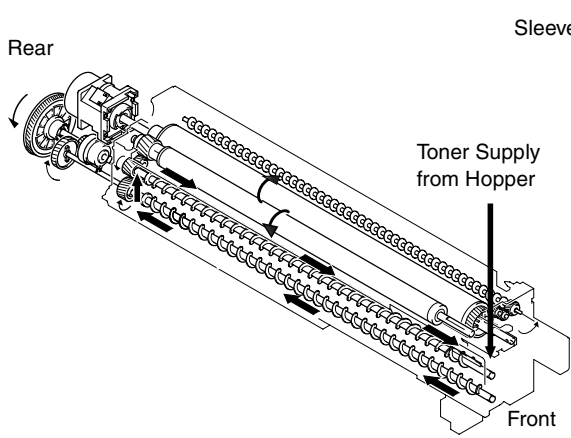
- Drive for each Sleeve/Magnet Roller is transmitted via the corresponding Developing Clutch from the corresponding Imaging Unit Motor.

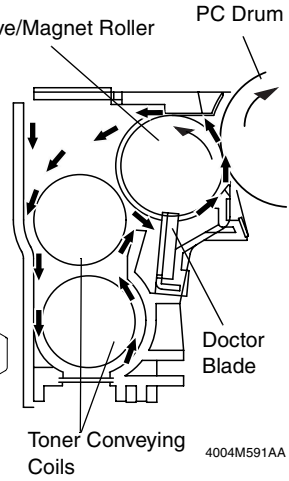


4004M556AA

• Developer Flow

1. Toner is supplied from the Hopper.
2. Toner is fed to the lower conveying coil.
3. Toner is fed on to the rear of the unit, while being mixed with developer and triboelectrically charged.
4. The ATDC Sensor installed on the underside of the Developing Unit detects toner-to-carrier ratio during this time.
5. The developer fed to the rear of the Developing Unit is conveyed further to the upper conveying coil.
6. Because of the magnetic pole positioning of the Sleeve/Magnet Roller, the developer is conveyed onto the lower part of the Sleeve/Magnet Roller.
7. The Doctor Blade then controls the height of the developer brush.
8. Toner sticks to the electrostatic latent image on the surface of the PC Drum.
9. The developer that is left on the Sleeve is returned to the upper conveying coil by the magnetic pole positioning of the Sleeve/Magnet Roller.

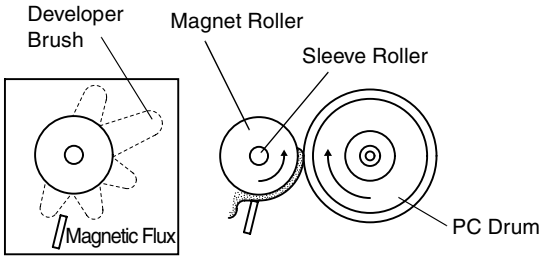




Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
CL11	PJ12I-1A	L	H	16-B
CL12	PJ12I-5A	L	H	17-B
CL13	PJ12I-1B	L	H	16-C
CL14	PJ12I-5B	L	H	18-D

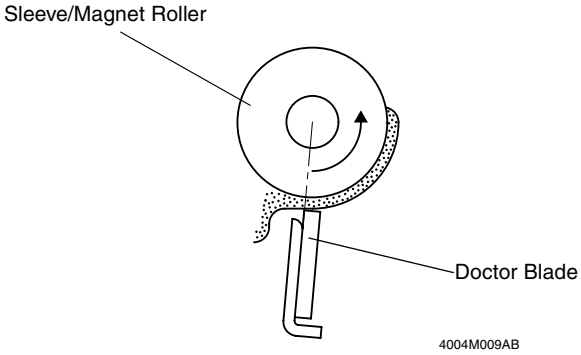
13-3. Sleeve/Magnet Roller

- The magnet roller having magnetic characteristics and the sleeve roller that rotates on the magnet roller work together to convey developer to the point of development.
- The magnetic force of the magnet roller is the strongest at the point of development so that the developer brush stands straight up to deliver the greatest amount of toner to the PC Drum.



13-4. Doctor Blade

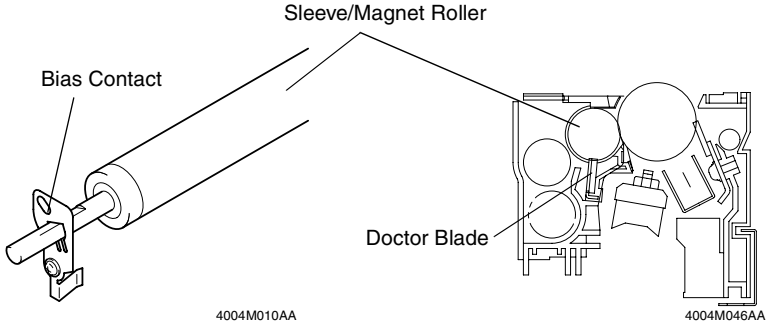
- The Doctor Blade controls the height of the developer brush, ensuring that the developer on the Sleeve/Magnet Roller levels out.



13-5. Developing Bias and ATDC Bias

1. Developing Bias

- The developing bias (Vb) is applied to the Sleeve/Magnet Roller to ensure that an adequate amount of toner is attracted to the PC Drum.
- It is applied through the bias contact via the Doctor Blade to prevent current leak.
- Only while development is taking place, DC(-) and AC Vb is applied to help toner fly more easily toward the surface of the PC Drum.
- During timing other than development, ordinary DC(-) Vb is applied.
- The DC(-) Vb value is set through “max. density control” of the image stabilization system.
- The Vb output voltage is supplied by High Voltage Unit 3.



2. ATDC Bias

- A DC(-) ATDC bias is applied to the Y, M, and C ATDC Sensor windows to prevent false detection by the sensors.
- The ATDC bias voltage is supplied from High Voltage Unit 3.

		Control Signal	DC(-)+AC	DC(-)	WIRING DIAGRAM
Vb(DC(-)+AC)	Y	PJ10I-10	L	H	20-B
	M	PJ10I-7	L	H	
	C	PJ10I-4	L	H	
	Bk	PJ10I-1	L	H	

		Control Signal	ON	OFF	WIRING DIAGRAM
Vb(DC(-))	Y	PJ10I-12	L	H	20-B
	M	PJ10I-9	L	H	
	C	PJ10I-6	L	H	
	Bk	PJ10I-3	L	H	

	Control Signal	ON	OFF	WIRING DIAGRAM
ATDC Bias REM	PJ10I-13	L	H	20-B

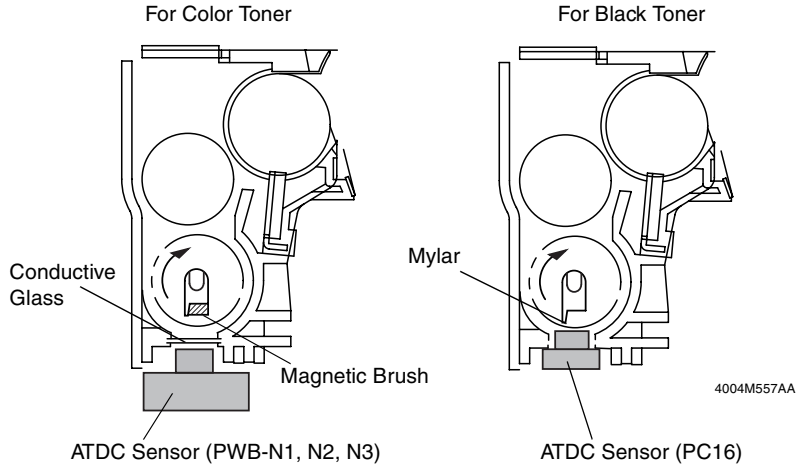
13-6. ATDC Sensor

(1) ATDC Sensor (Y, M, C)

- The ATDC Sensor for Y, M, and C is an optical type that detects toner-to-carrier ratio (T/C) of the developer.
- A DC(-) bias is applied to the ATDC Sensor window to prevent false detection as a result of toner sticking to it.
- There is a magnetic brush installed to ensure that the conductive glass surface is not damaged.
- The brush lets developer brush stand up and whisks toner off the surface of the ATDC Sensor window.

(2) ATDC Sensor (Bk)

- A magnetic sensor is used for the Bk ATDC Sensor, as black toner absorbs light.
- The mylar attached to the conveying coil scrapes toner off the surface of the ATDC Sensor window.

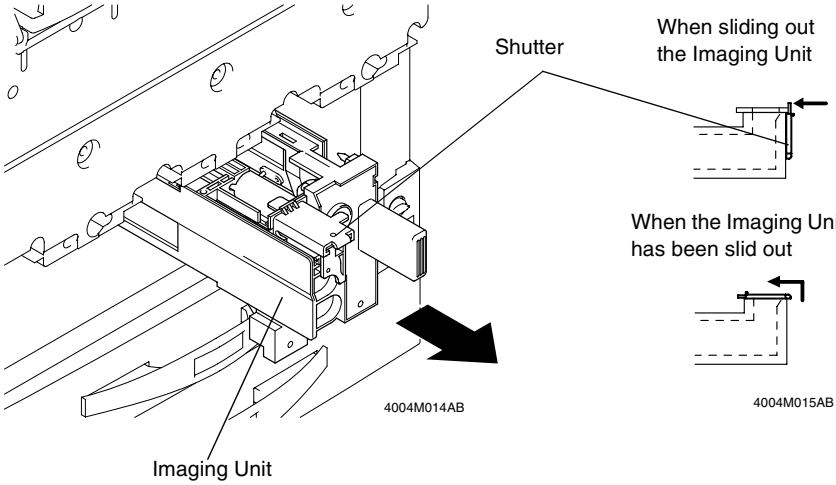


13-7. Toner Replenishing Control

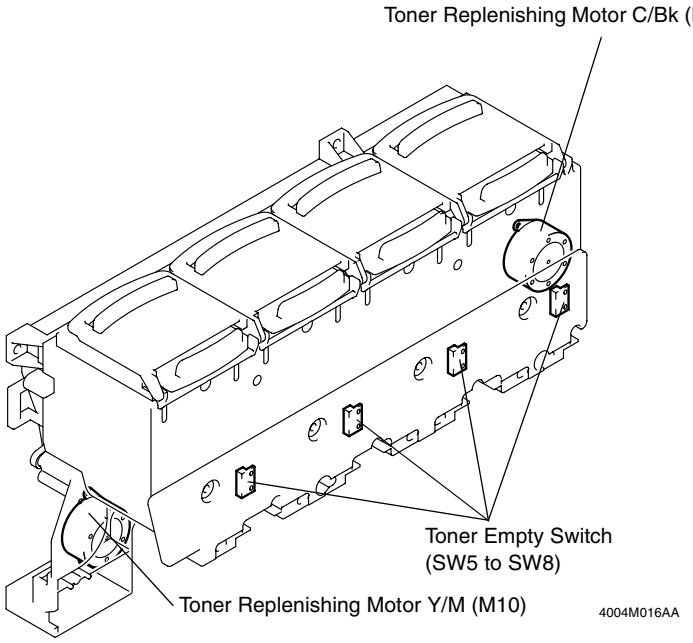
- The T/C ratio is detected when Developing Clutch C, M, Y, or Bk is energized (during a copy cycle).
- The detection time varies with the system speed.
- The copier compares the T/C reading against “ATDC Level Setting” of “Tech. Rep. Mode” to determine the toner replenishing time.
- The maximum length of time through which toner is replenished is fixed since toner replenishing is possible only while the developer is being agitated.
- If the copier fails to complete replenishing toner before the fixed maximum length of time elapses, it stores the excess time in memory and adds it to the next toner replenishing time.

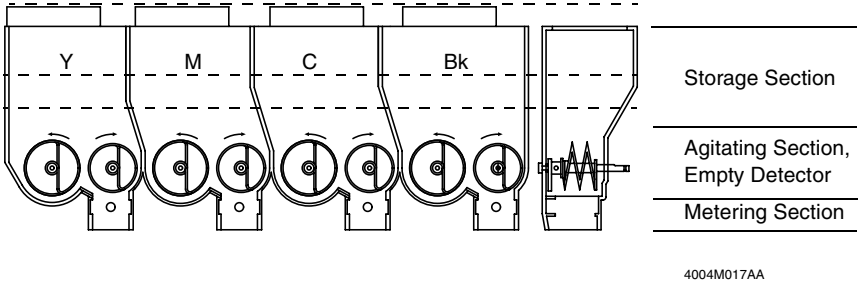
13-8. Toner Supply Port Covering/Uncovering Mechanism

- This mechanism prevents toner from being spilled through the Toner Supply Port when the Imaging Unit is slid out of the copier.



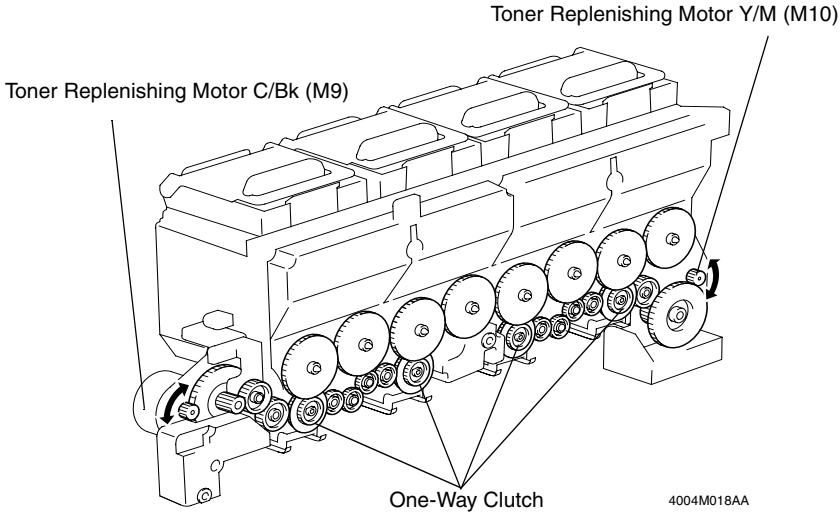
14. TONER HOPPER



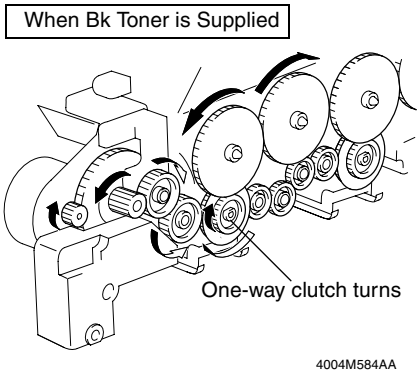


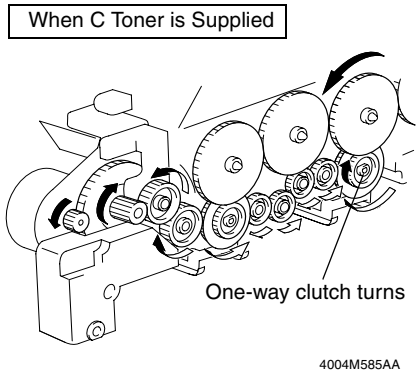
14-1. Toner Replenishing Mechanism

- Toner is supplied from the Hopper to the Imaging Unit.
- A single Toner Replenishing Motor is used to replenish two different colors of toner (i.e., one motor for Y and M and the other motor for C and Bk).

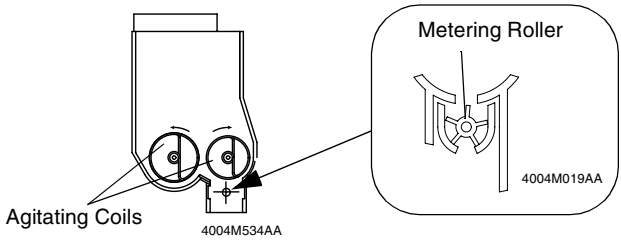


Depending on whether the motor turns forward or backward, either one of the two drive gears of the two Hoppers turns because of the functioning of the one-way clutch.





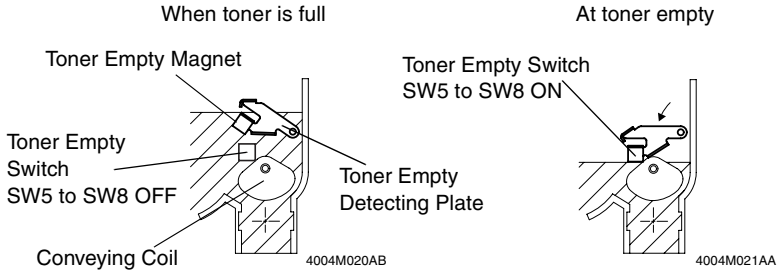
1. The Toner Replenishing Motor turns the Agitating Coils inside the Toner Hopper.
2. The Metering Chamber provided at the Toner Supply Port controls the amount of toner supplied. The amount is controlled by varying the period of time through which the Metering Roller turns.
3. Toner is supplied from the Toner Hopper to the Imaging Unit.

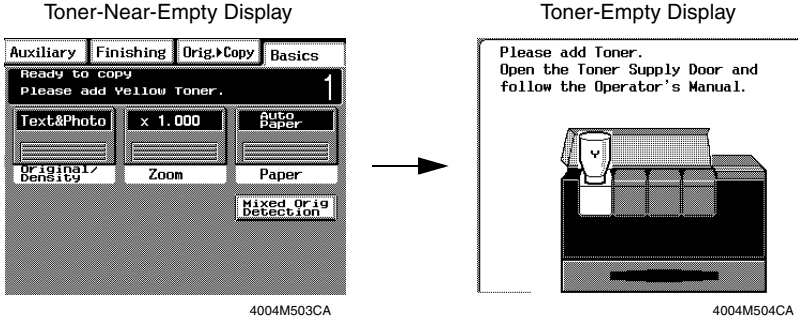


Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M9	PJ5I-1~4B	Pulse Output		10-A
M10	PJ5I-7~10A	Pulse Output		12-B

14-2. Toner Empty Detection Control

- A toner-empty condition is detected by the Toner Empty Switch.
- Whether the Toner Empty Switch is actuated or deactuated is detected while the Toner Replenishing Motor turns one complete turn.
- A toner-near-empty condition results if the Toner Empty Switch is actuated a predetermined number of times after it has been actuated twice consecutively.
- A toner-empty condition results if the Toner Empty Switch is actuated a predetermined number of times after the toner-near-empty warning message has appeared.



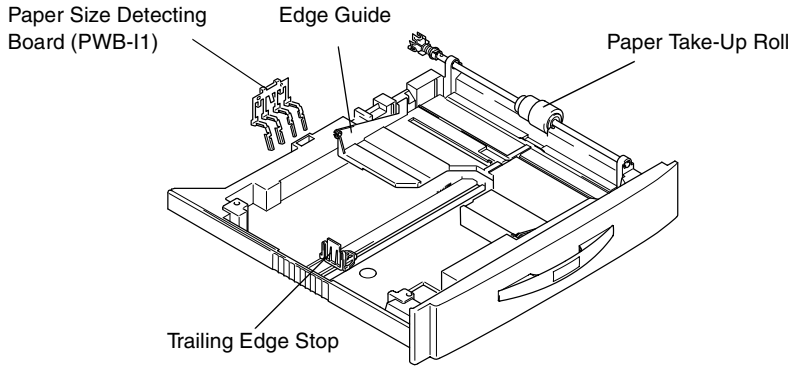


Controlled Part	Control Signal	ON	OFF	WIRING DIAGRAM
SW5 Bk	PJ5I-5B	L	H	10-B
SW6 C	PJ5I-5A	L	H	12-B
SW7 M	PJ5I-3A	L	H	12-A
SW8 Y	PJ5I-1A	L	H	12-A

15. PAPER TAKE-UP SECTION

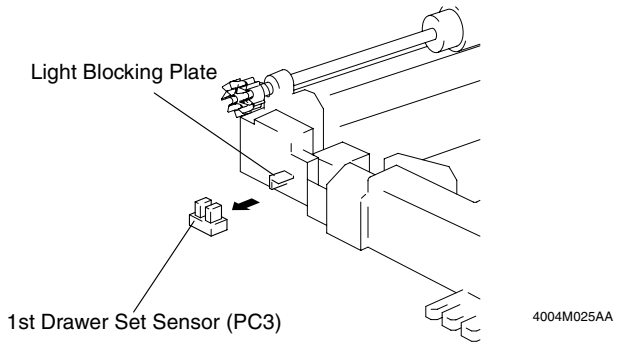
NOTE

- *For details of the 2nd Drawer (optional paper source), see the relevant option service manual.*



15-1. Drawer-in-Position Detecting Mechanism

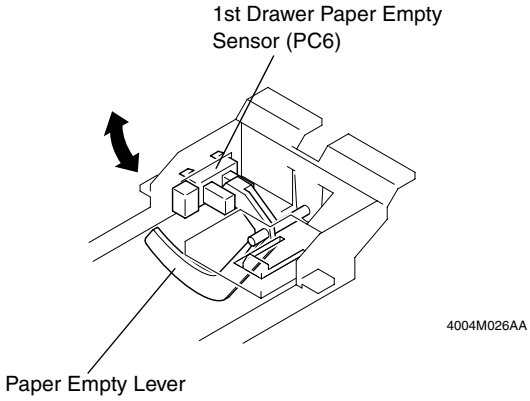
- When the drawer is slid into the copier, the Light Blocking Plate blocks the Set Sensor. The copier then determines that the drawer has been slid in position.



Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC3	PJ17I-9A	H	L	8-C

15-2. Drawer Paper Empty Detecting Mechanism

- The Paper Empty Sensor is used to detect a paper-empty condition of the drawer.

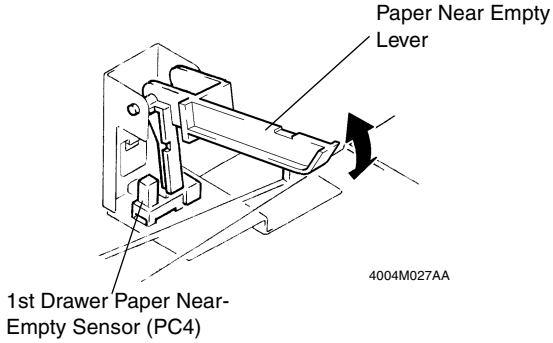


Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC6	PJ3I-8A	H	L	8-B

15-3. Drawer Paper Near Empty Detecting Mechanism

- A paper-near-empty condition is detected.
- When the number of sheets of paper still available for use becomes a predetermined level, the copier determines that it is a paper-near-empty condition.

	Predetermined No. of Sheets
Paper near empty	50 ± 30

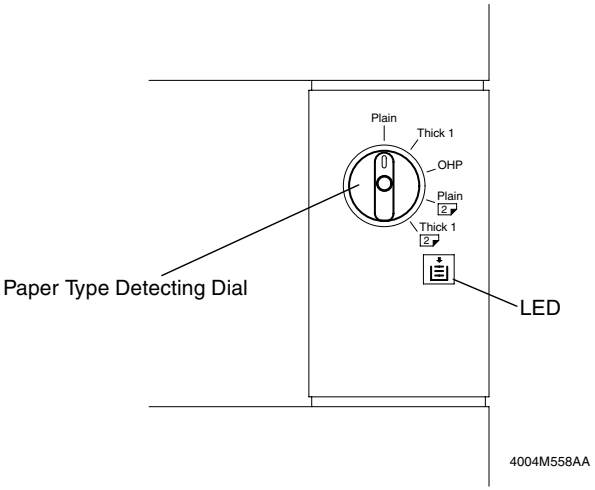


Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC4	PJ17I-6A	H	L	8-B

15-4. Paper Supply Level LED Display

- The paper supply level is indicated by a lit, blinking, or OFF LED as detailed below.
- Details are as follows.

Item	LED
When drawer is slid out	ON
Paper empty	ON
Paper near empty	Blinking
Normal supply level	OFF



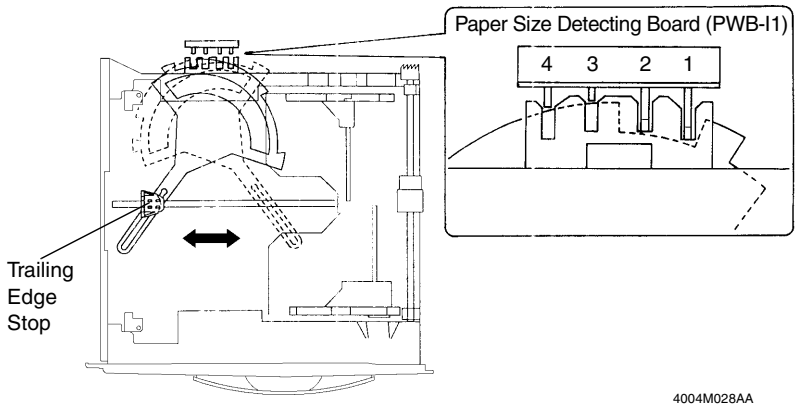
15-5. Paper Size Detecting System

- The width (CD) and length (FD) of the paper are detected. The copier determines the paper size according to the combination of the different states of the paper size detecting switches and sensor.
- Metric Area

Paper Size Detecting Switch (PWB-I1)				CD Paper Size Detecting Sensor (PC5)	Paper Size
1	2	3	4		
-	ON	-	ON	H	A6L
-	ON	-	ON	L	A5C
ON	-	ON	-	H	B6L
ON	-	ON	-	L	B5C
-	ON	-	-	H	A5L
-	ON	-	-	L	A4C
-	ON/-	ON	ON/-	H	B5L
ON/-	-	-	-	L	A4L
-	-	-	ON	L	FLS L 203 × 330.3
ON	ON	ON	ON	L	A3L
ON	ON	ON	-	L	A3 Wide

- Inch Area

Paper Size Detecting Switch (PWB-I1)				CD Paper Size Detecting Sensor (PC5)	Paper Size
1	2	3	4		
-	ON	-	ON	L	Invoice C 8.5 × 5.5
ON	-	ON	-	L	Exe C 10.5 × 7.25
-	ON	-	-	L	Letter C 11 × 8.5
-	ON	-	-	H	Invoice L 5.5 × 8.5
-	ON	ON	-	H	Exe L 7.25 × 10.5
ON	ON	-	-	L	Letter L 8.5 × 11
-	ON	ON	ON	L	Leagal L 8.5 × 14
ON	ON	ON	ON	L	W Letter 14 × 17
ON	ON	ON	-	L	A3 Wide



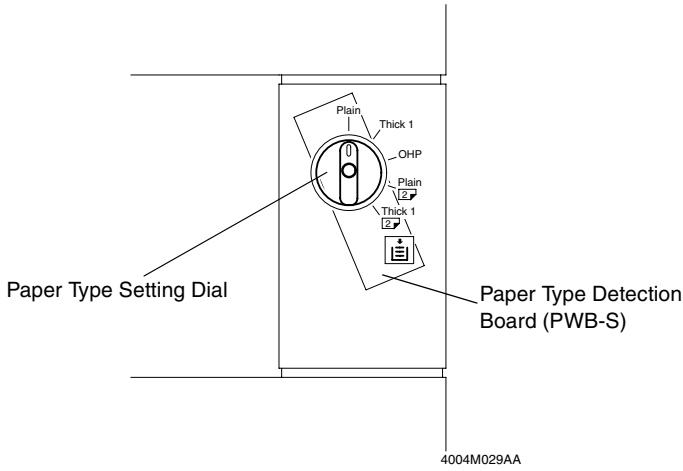
Controlled Part	Control Signal	ON	OFF	WIRING DIAGRAM
PWB-I1(1)	PJ17I-4B	L	H	8-D
PWB-I1(2)	PJ17I-5B	L	H	
PWB-I1(3)	PJ17I-6B	L	H	
PWB-I1(4)	PJ17I-7B	L	H	

Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC5	PJ3I-11A	H	L	8-B

15-6. Paper Type Setting

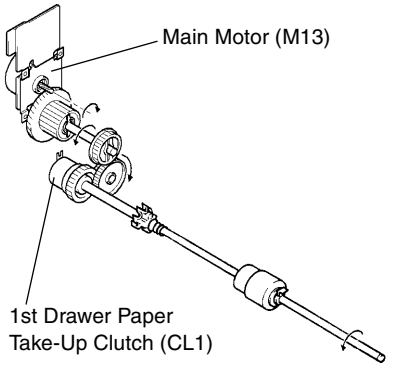
- The type of paper is set by the Paper Type Setting Dial.
- It ensures that paper is fed through the copier at a system speed corresponding to the paper type.

Paper Type Setting Dial	Paper Type	System Speed
Plain	Plain paper	90 mm/s
Thick 1	Thick paper 1	60 mm/s
OHP	OHP transparencies	60 mm/s
Plain 2	Plain paper 2-sided	90 mm/s
Thick1 2	Thick paper 1 2-sided	60 mm/s

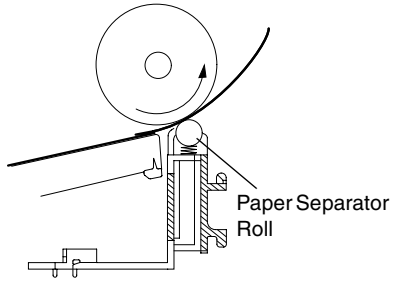


15-7. Drawer Paper Take-Up Mechanism

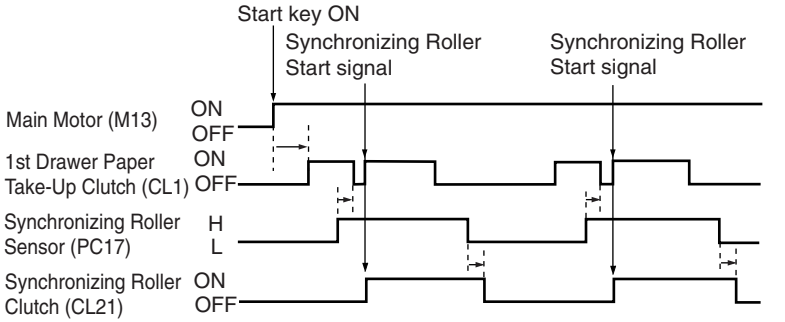
- Paper take-up drive is provided by a motor through the Paper Take-Up Clutch.
- A Paper Separator Roll is used to prevent double feed.



4004M031AA



4004M601AA

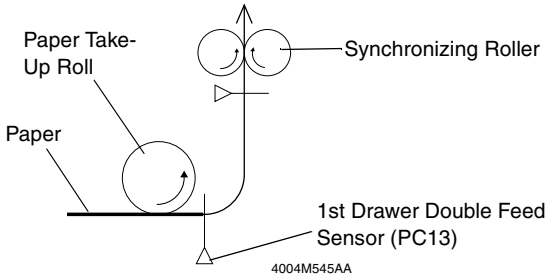


4004M071CA

Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M13	PJ13I-8A	L	H	36-A
CL1	PJ15I-11A	L	H	8-A

15-8. Double Feed Control

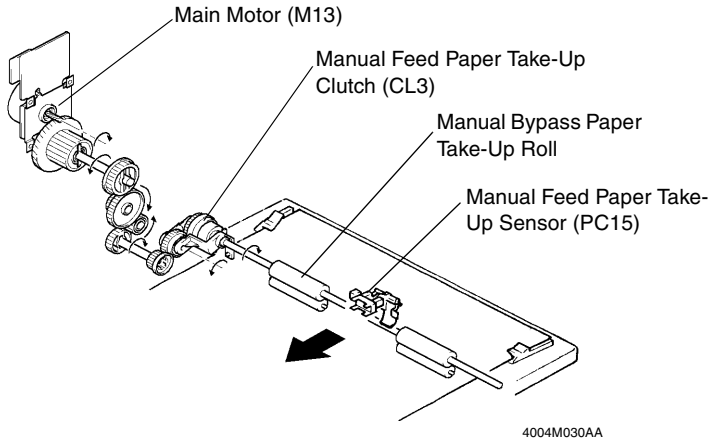
- Double feed control is provided to reduce paper misfeed caused by double feed.
- If the second sheet of paper reaches the Double Feed Sensor after the first one has been taken up, the copier delays the paper take-up sequence to provide an adequate interval between the sheets of paper.

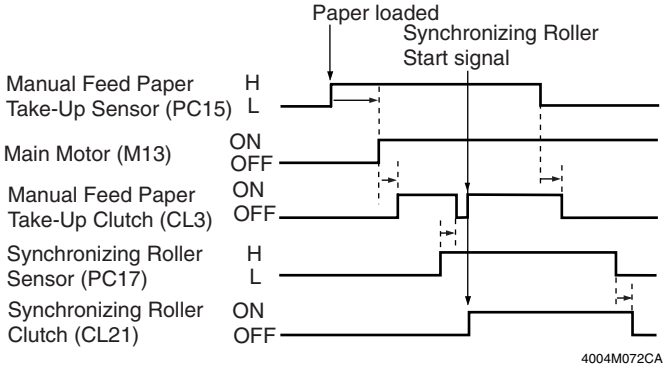


Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC13	PJ5I-8B	H	L	8-C

16. MANUAL BYPASS PAPER TAKE-UP SECTION

- Manual bypass paper take-up drive is provided by a motor through the Manual Feed Paper Take-Up Clutch.

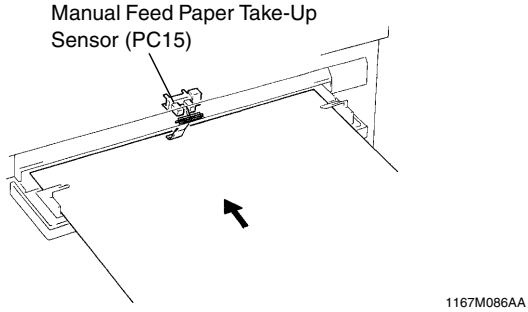




Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
CL3	PJ15I-9A	L	H	2-A

16-1. Manual Bypass Paper Take-Up Detecting Mechanism

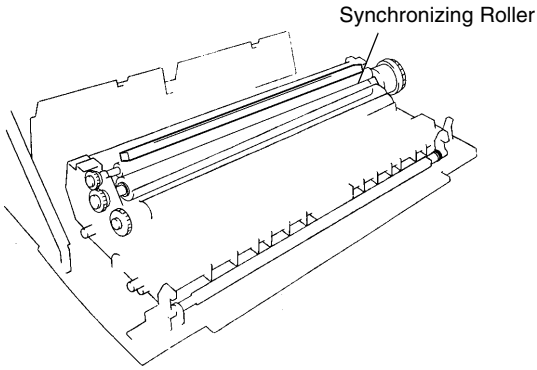
- The Manual Feed Paper Take-Up Sensor detects a sheet of paper as it is placed on the Manual Bypass Table.
- The size and type of paper for manual bypass is set on the control panel.



Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC15	PJ15I-7B	H	L	2-B

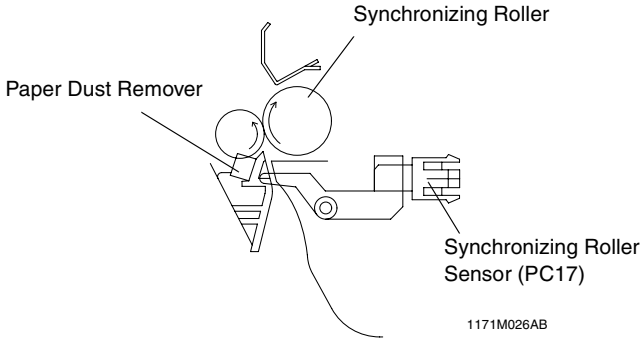
17. SYNCHRONIZING ROLLERS

- The Synchronizing Rollers synchronizes the image transfer section (2nd image transfer) with the paper transport (paper).



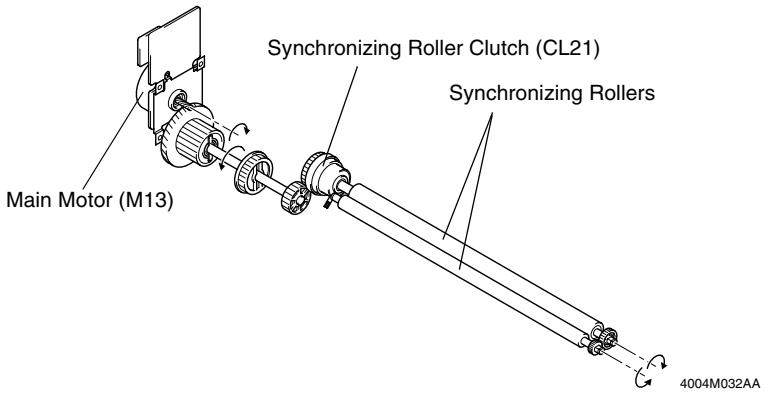
17-1. Paper Dust Remover

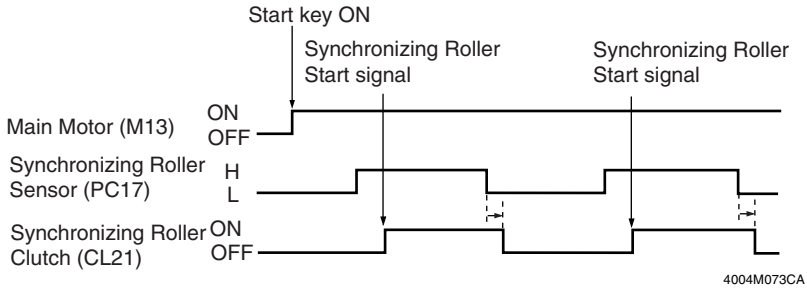
- Through static attraction, paper dust is attracted onto the surface of the driven Synchronizing Roller and the Paper Dust Remover removes paper dust from the roller.



17-2. Synchronizing Roller Drive Mechanism

- The Synchronizing Roller is driven by a motor through a clutch.





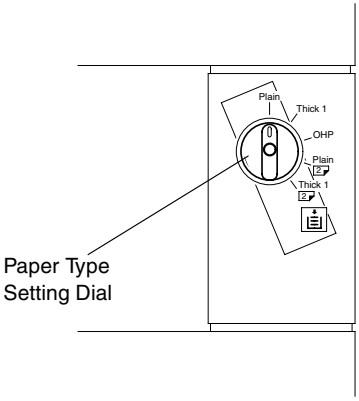
Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
CL21	PJ14I-14A	L	H	2-H

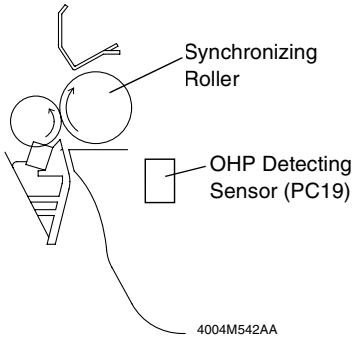
Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC17	PJ14I-9B	H	L	2-I

17-3. OHP Detecting Mechanism

- OHP detection determines whether the paper type setting matches the results of OHP detection.
- The OHP Detecting Sensor performs this function.
- OHP detection is made after a loop has been formed in the paper before the Synchronizing Rollers.

Position Selected with Paper Type Setting Dial	Results of Detection by OHP Detecting Sensor	Operation
OHP	Other than OHP	• Copier determines there is a mismatch of paper type, stopping on the spot. • A paper type mismatch display is given on the control panel.
Other than OHP	OHP	





Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC19	PJ14I-2B	L	H	2-H

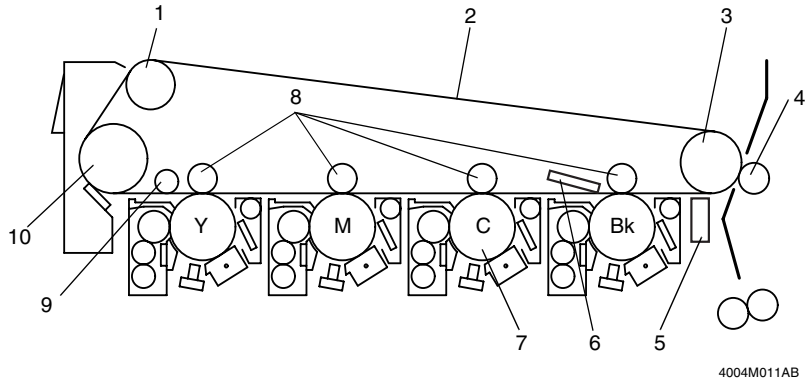
18. IMAGE TRANSFER SECTION

1. 1st Image Transfer

- In the 1st image transfer stage, image transfer current from High Voltage Unit 2 is applied to the 1st Image Transfer Roller for each color to transfer the toner images produced by the Imaging Units onto the Transfer Belt, one image on top of another in the order of Y, M, C, and Bk.

2. 2nd Image Transfer

- In the 2nd image transfer stage, the image transfer current from High Voltage Unit 2 is applied to the 2nd Image Transfer Roller to transfer the images in four colors of toner, which have been transferred to the surface of the Transfer Belt one on top of another, all at once to the paper.

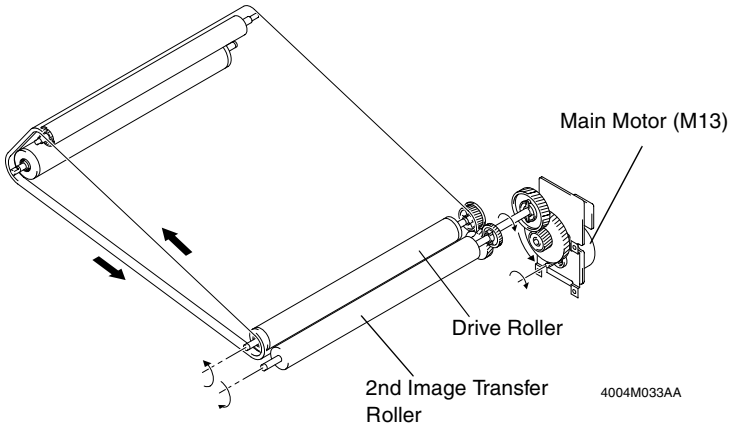


1. Tension Roller
2. Transfer Belt
3. Drive Roller
4. 2nd Image Transfer Roller
5. Registration Sensors (UN20, UN21)
6. Lifting Mylar
7. PC Drum
8. 1st Image Transfer Rollers
9. Retraction Roller
10. Driven Roller

18-1. Transfer Belt Unit Drive Mechanism

- The Transfer Belt Unit is driven by the Main Motor.
- The speed at which the Transfer Belt turns is selected according to the type of paper as detailed below.

Paper Type	During Copying
Plain paper	90 mm/s
Thick paper 1, thick paper 2, OHP	60 mm/s

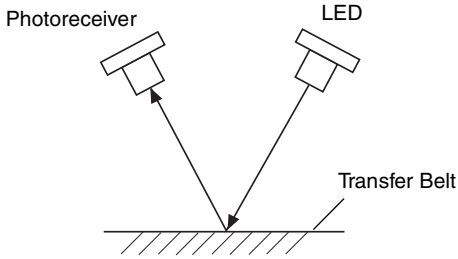


Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M13	PJ13I-8A	L	H	36-A

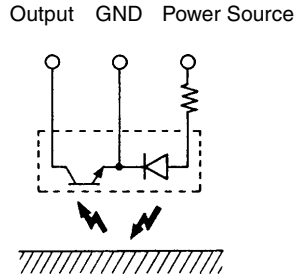
18-2. Color Shift Detection

- Patterns are produced on the surface of the Transfer Belt and the Registration Sensors detect any color misalignment on the patterns.

1. A light-emitting diode emits infrared rays illuminating the color shift pattern on the Transfer Belt.
2. The photoreceiver detects the intensity of the infrared light reflected off the color shift pattern on the Transfer Belt.
3. A voltage corresponding to the intensity of the reflected light is output to the PIC Board.



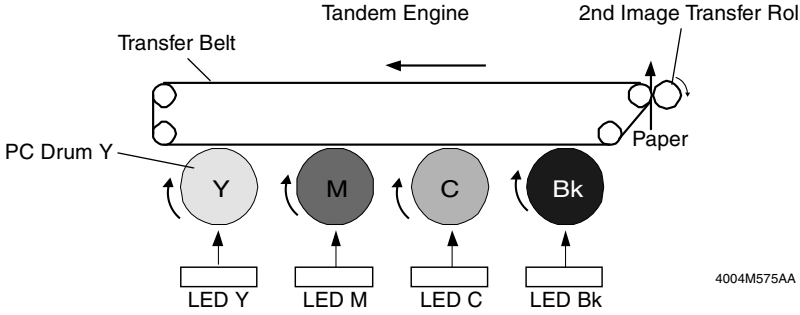
4004M532AA



1136M068AA

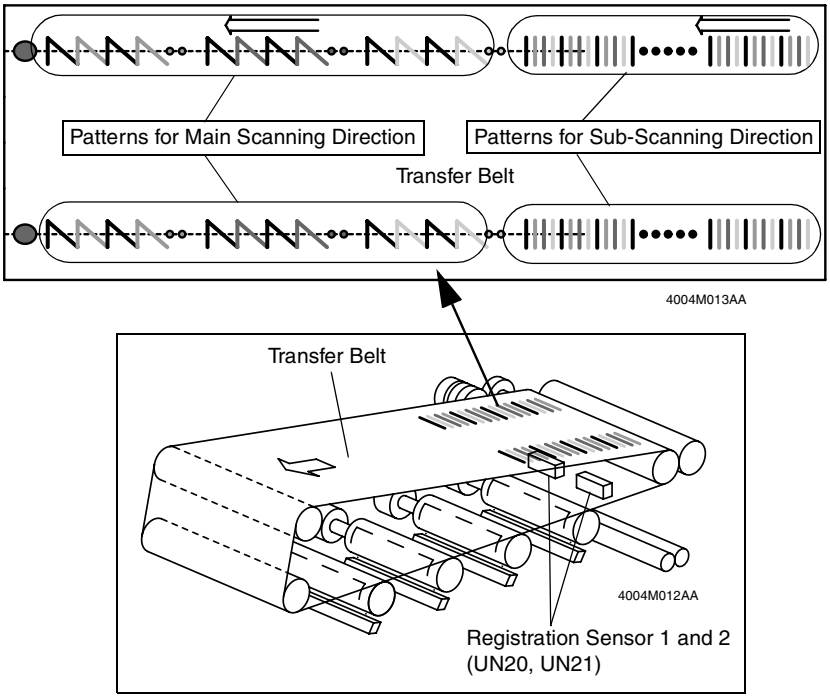
18-3. Color Shift Correction

- In a tandem engine provided with a separate image reproduction process for each of the four different colors of toner, incorrect color registration, or color shift, is more likely to occur due to positional deviations among different LED Units. Any misalignment among different colors is automatically detected and corrected both in the main scanning and sub-scanning directions.



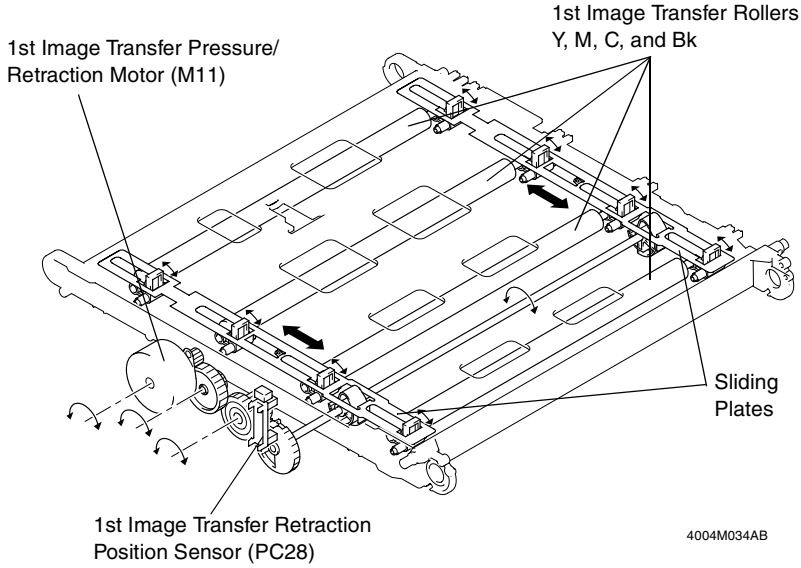
(1) Outline of Color Shift Detection

- Patterns are produced in the main scanning and sub-scanning directions on the Transfer Belt.
- The Registration Sensors read the patterns to allow color shift corrections to be made as necessary.



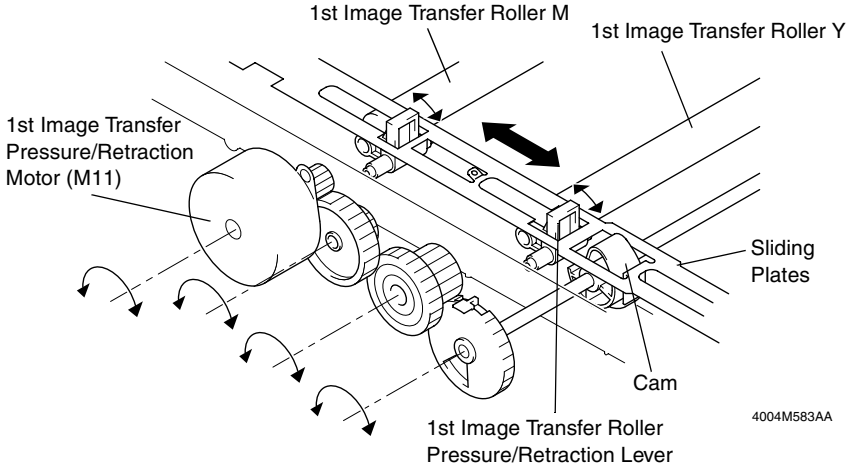
18-4. 1st Image Transfer Roller Pressure/Retraction Mechanism

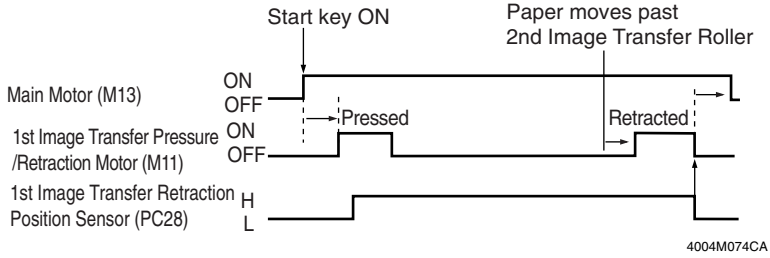
- The Sliding Plates press the 1st Image Transfer Rollers against, and retract them from, the corresponding PC Drums.
- The drive for these operations comes from a motor dedicated to the purpose.
- The retracted position is detected by the 1st Image Transfer Retraction Position Sensor.
- The pressure position is detected by counting a given number of motor pulses of the 1st Image Transfer Pressure/Retraction Motor. It is the position at which the Transfer Belt contacts the PC Drum.



• Transfer Belt Pressure/Retraction Operation

1. Drive from the 1st Image Transfer Pressure/Retraction Motor turns the cam.
2. The Sliding Plates move.
3. The 1st Image Transfer Roller Pressure/Retraction Lever moves.
4. The 1st Image Transfer Rollers are pressed against, or retracted from, the Transfer Belt.





Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M11	PJ16I-4~7B	Pulse Output		6-D

Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC28	PJ17I-1A	L	H	6-C

18-5. Pressure Position Changing Mechanism

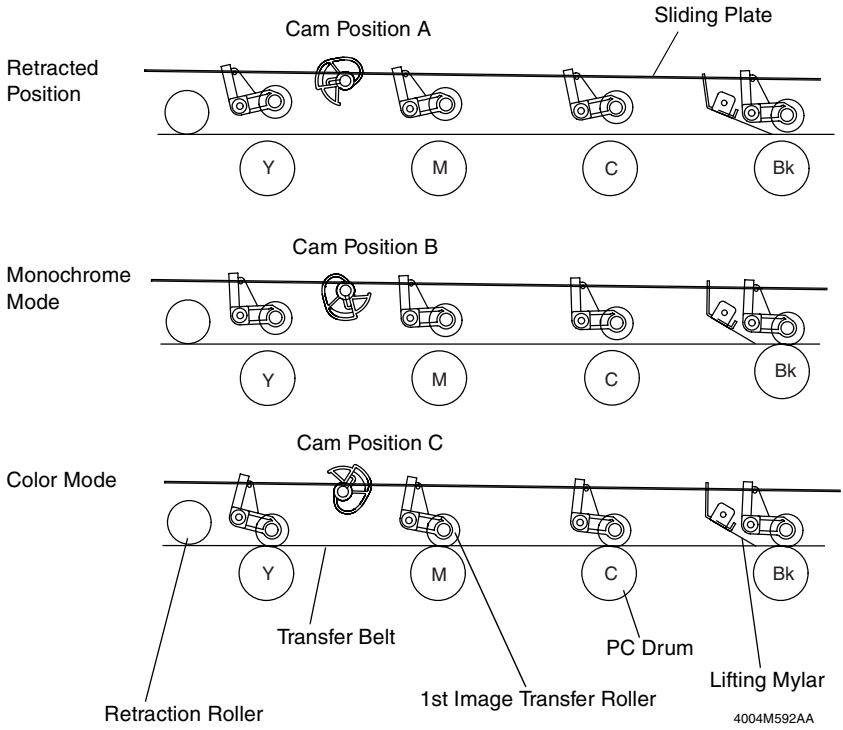
- The pressure position of the Y, M, and C Image Transfer Rollers is made different from that of the Bk Image Transfer Roller in the monochrome mode by changing the pulse count of the 1st Image Transfer Pressure/Retraction Motor.
- Changing the motor pulse count results in the position at which each of the Image Transfer Rollers is pressed against the Transfer Belt being changed through a cam.

1. Monochrome mode

- The pressure position in the monochrome mode is where only the Bk PC Drum is in contact with the Transfer Belt.
- The Y, M, and C PC Drums leave the Transfer Belt, which allows the Y, M, and C PC Drums to remain stationary in this mode, extending the service life of the PC Drums.

2. Color Mode

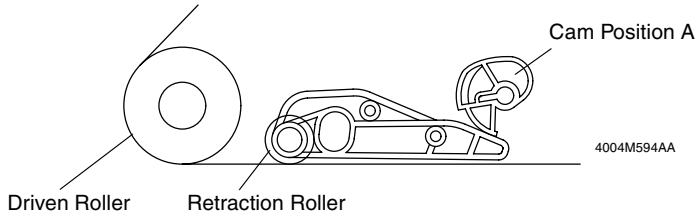
- The pressure position of the Image Transfer Rollers is where the PC Drum is in contact with the Transfer Belt for all four colors.



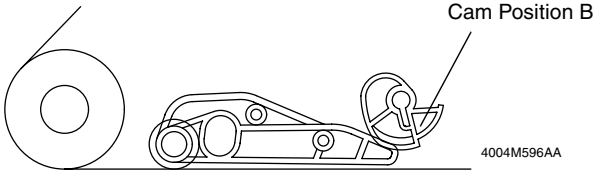
18-6. Retraction Mechanism

- The Transfer Belt face is changed between the color mode and monochrome mode.
- To accomplish this, the pressure position is changed.
- The pressure position is changed between the color mode and monochrome mode by changing the cam position, which moves the Retraction Roller up or down.

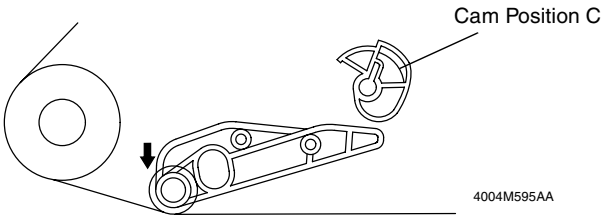
1. Retracted Position



2. Monochrome Mode
- The cam turns to the position shown below.
- The Retraction Roller does not move.
- Only the Bk PC Drum contacts the Transfer Belt.

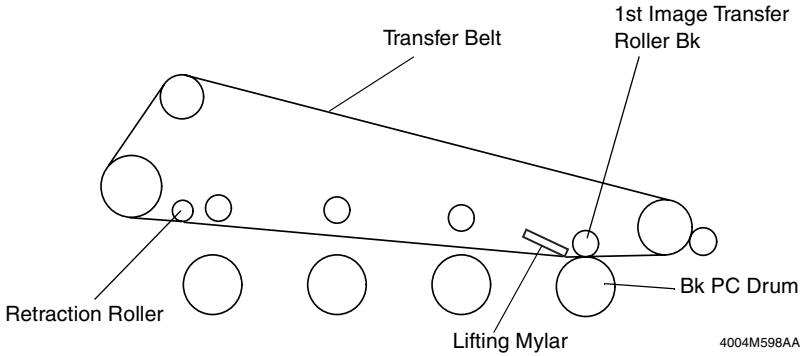


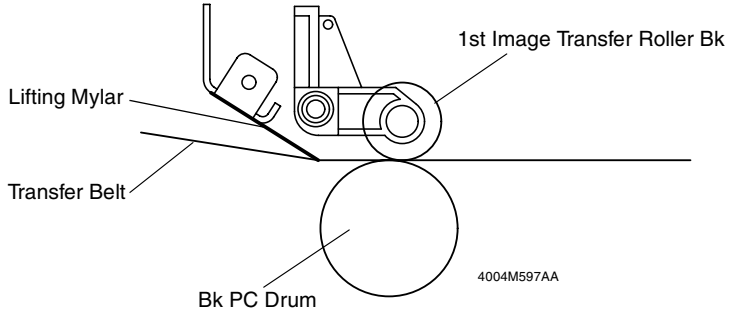
3. Color Mode
- The cam turns to the position shown below.
- The Retraction Roller pushes down the Transfer Belt.
- The PC Drums of all four colors contact the Transfer Belt.



18-7. Backup Mechanism

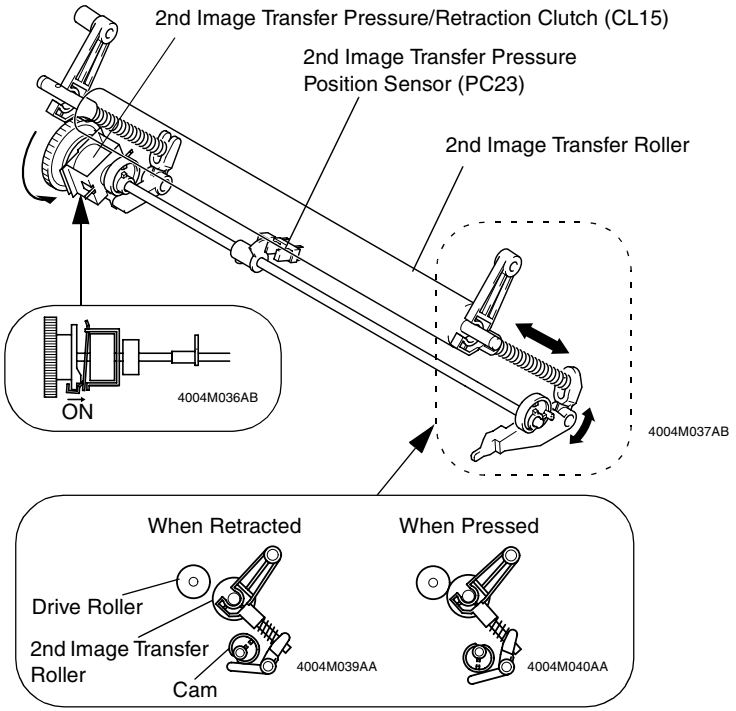
- The Lifting Mylar pushes the Transfer Belt in the pressed position of the monochrome mode.
- This ensures that the Bk PC Drum makes contact with the Transfer Belt in the same manner as in the color mode.
- It takes up any slack in the Transfer Belt to prevent void image from occurring.

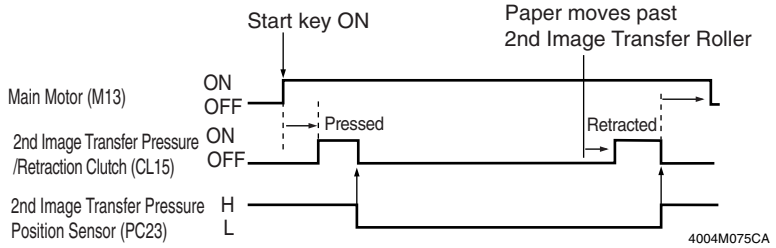




18-8. 2nd Image Transfer Roller Pressure/Retraction Mechanism

- The 2nd Image Transfer Roller is pressed against, and retracted from, the Transfer Belt by a clutch.
- The pressed position is detected by the 2nd Image Transfer Pressure Position Sensor.
- The retracted position is where the cam turns a half turn with the clutch energized.





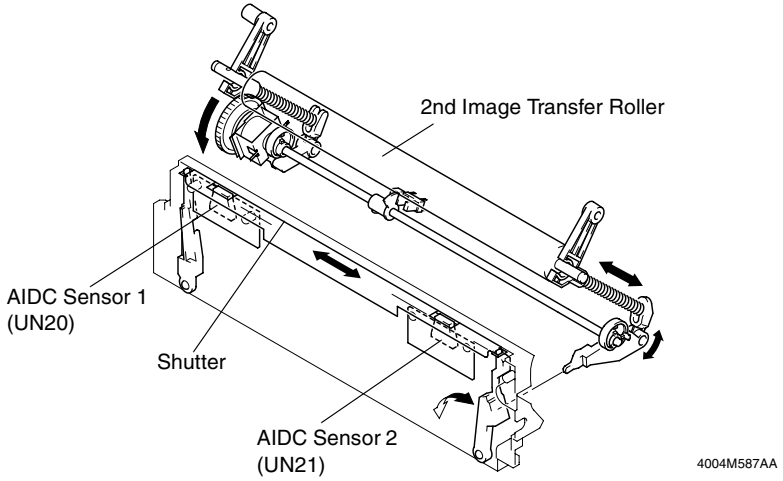
Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
CL15	PJ14I-9A	L	H	6-E

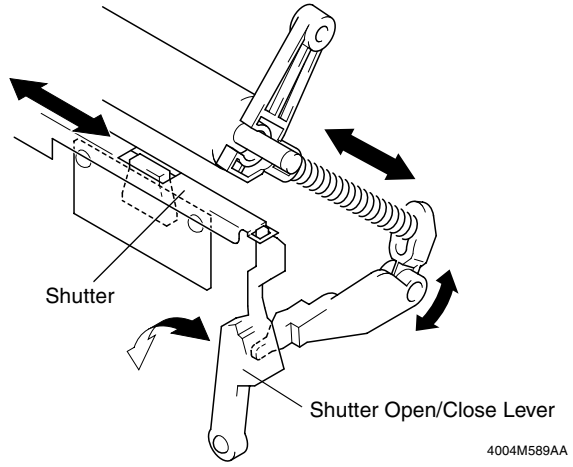
Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC23	PJ14I-6B	H	L	6-F

18-9. AIDC Sensor Shutter Mechanism

- In the 2nd image transfer stage, the shutter is moved to cover the AIDC Sensors to prevent them from being dirtied with toner.
- The shutter operation is in synchronism with the pressure and retraction motion of the 2nd Image Transfer Roller.

2nd Image Transfer Roller	Shutter
Retracted	Uncovers sensors
Pressed	Covers sensors

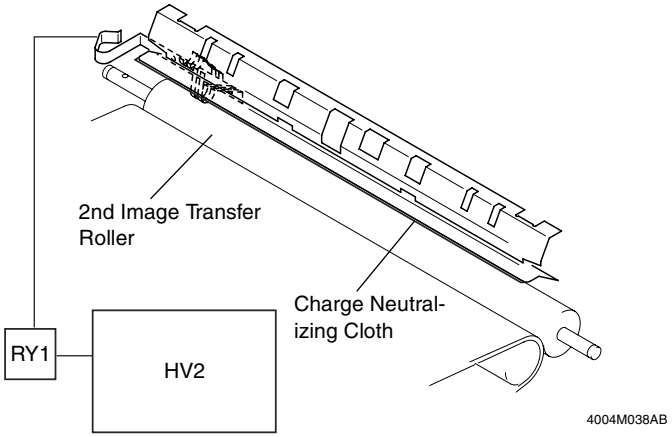




18-10. Paper Charge Neutralization

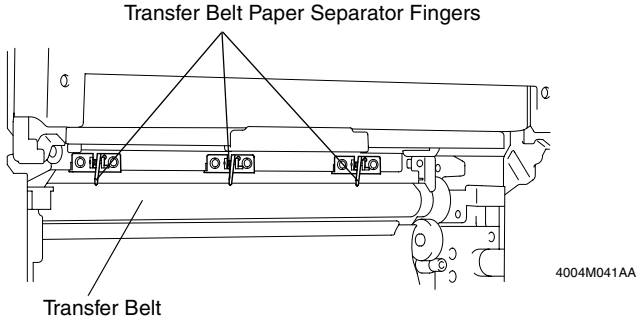
- A Charge Neutralizing Cloth is used to neutralize any residual charge left on the paper which has undergone the 2nd image transfer stage.
- The Charge Neutralizing Cloth is floated under conditions of high temperature and high humidity to prevent image transfer failure from occurring due to damp paper.

High temperature/humidity condition, 1-sided printing, first cycle of 2-sided printing	Turns OFF RY1 to float the cloth.
In conditions other than above	Connected to GND from RY1 via HV2.



18-11. Transfer Belt Paper Separator Fingers

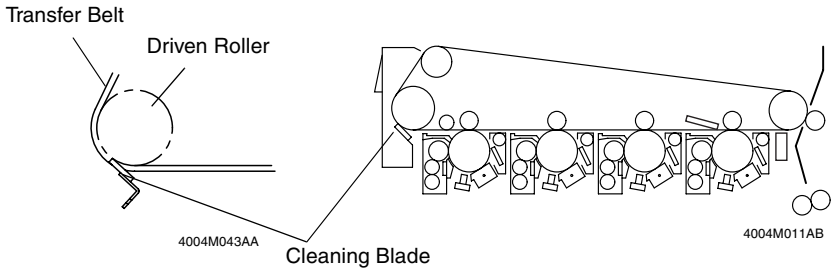
- The Paper Separator Fingers separate paper from the Transfer Belt.



18-12. Transfer Belt Cleaning Mechanism

- The Cleaning Blade scrapes any residual toner off the surface of the Transfer Belt.
- The Transfer Belt is turned backward to remove paper dust wedged between the Cleaning Blade and Transfer Belt.

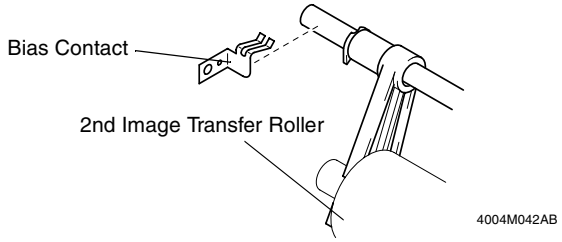
Operation Timing	When Power Switch is turned ON
	For every 100 copies made

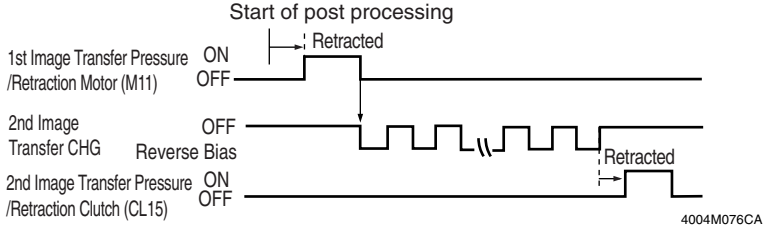


18-13. 2nd Image Transfer Roller Cleaning Mechanism

- To remove residual toner from the surface of the 2nd Image Transfer Roller, a reverse bias is applied to the roller.
- The residual toner is moved to the surface of the Transfer Belt, from which the Cleaning Blade scrapes it.

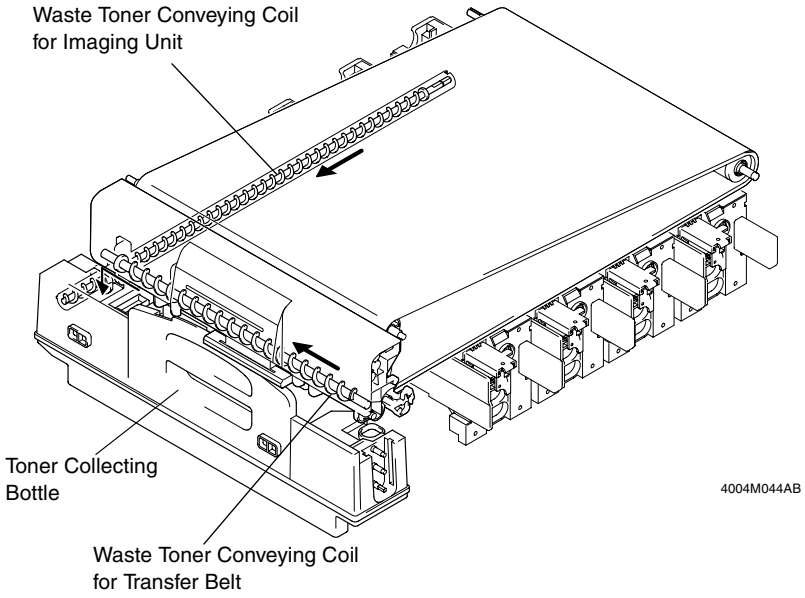
Operation Timing	When Power Switch is turned ON
	When Front Door is opened and closed
	For every 100 copies made





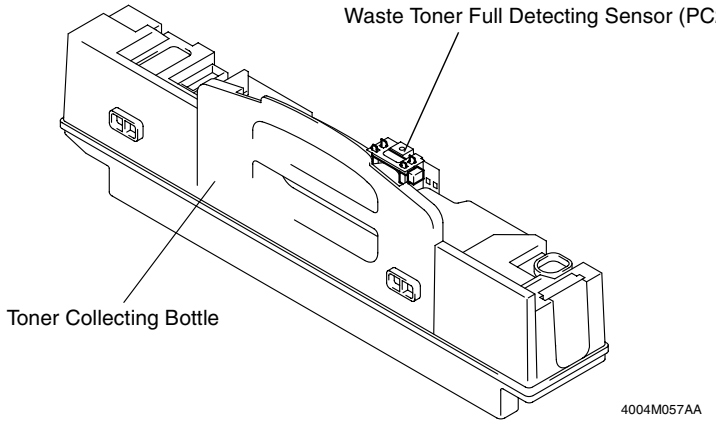
18-14. Waste Toner Collecting Mechanism

- Toner on the Transfer Belt is collected in the Toner Collecting Bottle.
- Waste toner that overflows from the Waste Toner Tank of the Imaging Unit is collected.
- The Conveying Coil is turned by the drive from the Main Motor.



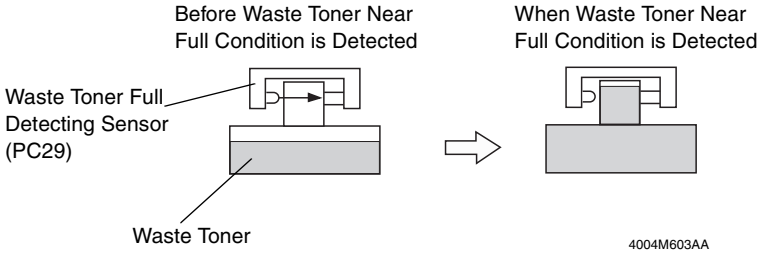
18-15. Waste Toner Near Full and Full Detecting Mechanism

- Waste toner near full and full conditions are detected.



1. Waste Toner Near Full

- The Waste Toner Full Detecting Sensor is used to detect a waste toner near full condition.
- When the sensor is blocked by the toner collected in the bottle, the copier determines that it is a waste toner near full condition.
- A reflector type sensor is used.



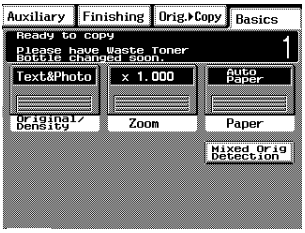
2. Waste Toner Full

- When a given number of copies are made after the waste toner near full condition has been detected, a waste toner full condition results and the copier inhibits the initiation of a new copy cycle.

A predetermined number of copies	About 4,500 copies using A4 paper

- Warning messages are given on the screen for waste toner near full and full conditions.

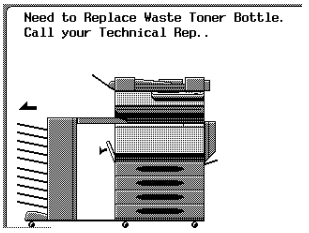
Waste Toner Near Full Warning Message



4004M501CA

After a given number of copies are made

Waste Toner Full Warning Message



4004M502CA

- To reset the warning message display, perform the following procedures.
  · Change the Toner Collecting Bottle.
  · Clear the waste toner counter.

Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC29	PJ7I-7B	L	H	36-F

18-16. Image Transfer ATVC Control

- The copier measures resistance of the Transfer Belt and adjusts the 1st and 2nd image transfer output voltages so that the values of current that flows from the 1st and 2nd Image Transfer Rollers are optimized.
- The image transfer ATVC adjustment is made when the Power Switch is turned ON.

✻ ATVC = Auto Transfer Voltage Control

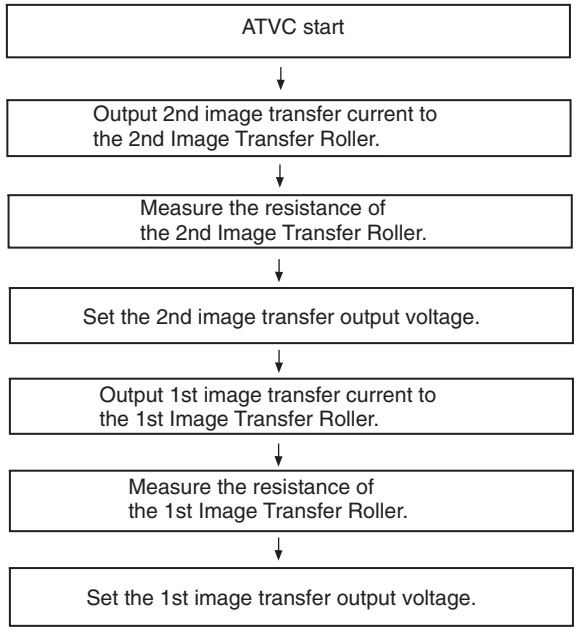
1. 1st Image Transfer ATVC

- The 1st image transfer ATVC current for each color is output and resistance of the 1st Image Transfer Roller of each color is measured.
- Based on the measurement taken, the 1st image transfer voltage for each color is determined.

2. 2nd Image Transfer ATVC

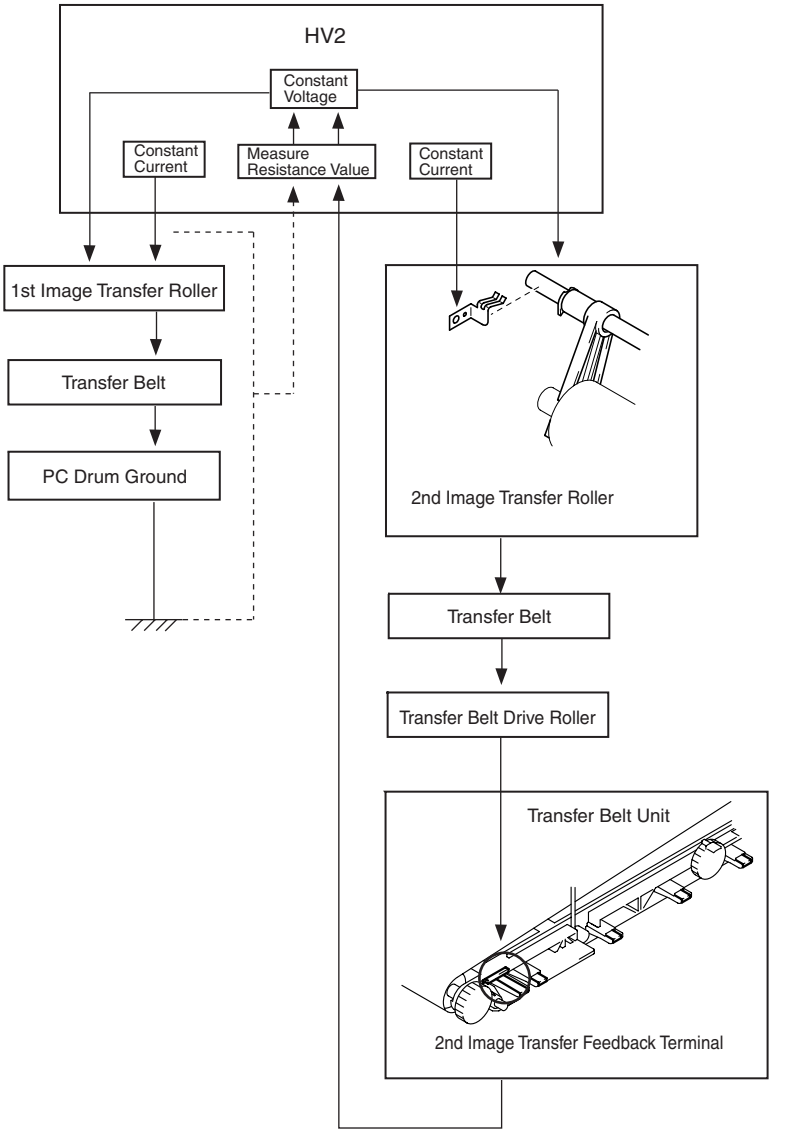
- The 2nd image transfer ATVC current is output and resistance of the 2nd Image Transfer Roller is measured.
- The 2nd image transfer voltage is determined according to the measured resistance, paper type, temperature, humidity, humidity table, and whether the cycle is for a color copy or monochrome copy.

- Outline of Adjustment Steps



4004M077CA

• Outline of Adjustment Operations



4004M078CB

18-17. Detection of a New Transfer Belt Unit

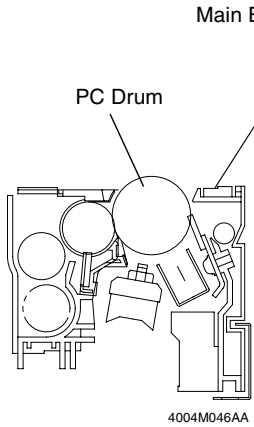
- A new Transfer Belt Unit is detected when it is mounted.

	New Unit Detection Timing
Transfer Belt Unit	Power Switch is turned ON. Front Door is opened and closed. Right Door is opened and closed.

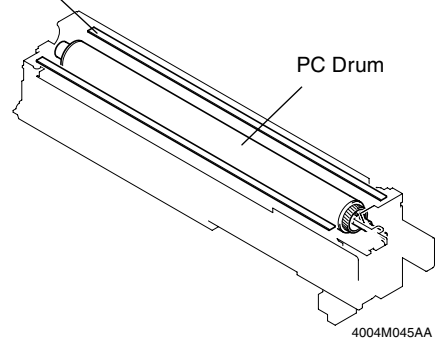
- When a new unit is detected, the copier performs the Transfer Belt initial operation sequence, ATVC, and image stabilization sequence.
- It automatically resets the corresponding counter (of “Life” under “Tech. Rep. Mode”).

19. MAIN ERASE LAMP

- The Main Erase Lamp LED illuminates the surface of the PC Drum to neutralize any residual charge left thereon.



4004M046AA

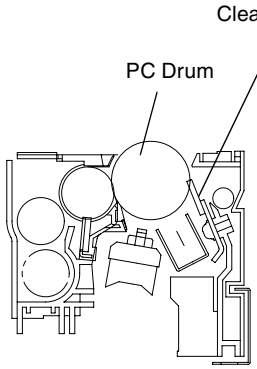


4004M045AA

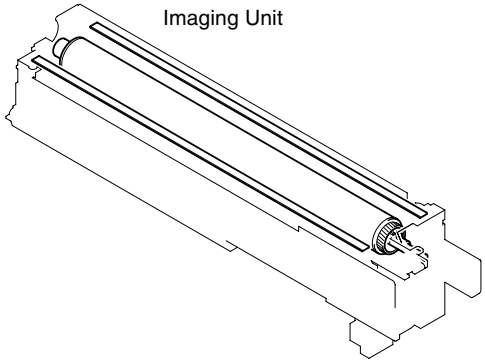
20. PC DRUM CLEANING UNIT

20-1. Cleaning Mechanism

- The Cleaning Blade scrapes residual toner off the surface of the PC Drum.



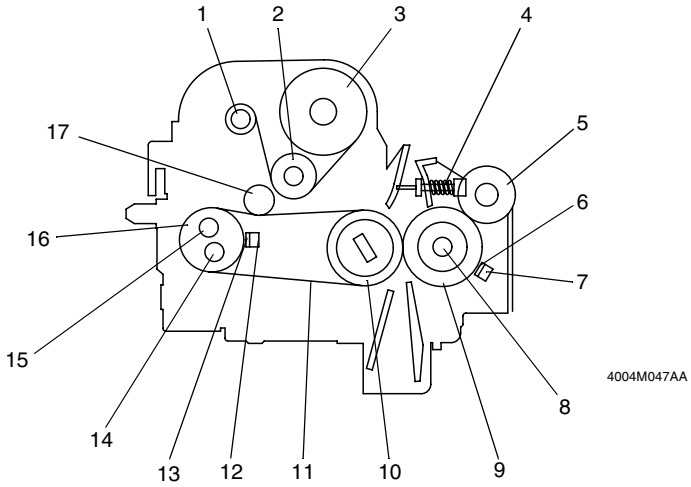
4004M046AA



4004M045AA

21. FUSING SECTION

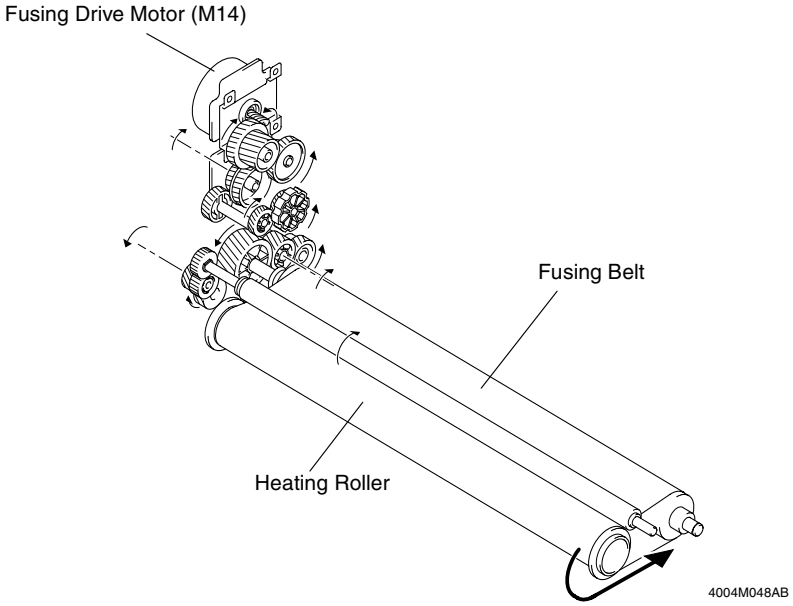
- Toner is permanently fixed onto the paper by heat and pressure applied by the Fusing Belt and Lower Fusing Roller.



1. Web Take-Up Roller
2. Backup Roller
3. Web
4. Pressure Spring
5. Oil Coating Roller
6. Fusing Thermistor 2
7. Fusing Thermostat 2
8. Lower Fusing Roller Heater Lamp
9. Lower Fusing Roller
10. Upper Fusing Roller
11. Fusing Belt
12. Fusing Thermostat 1
13. Fusing Thermistor 1
14. Heating Roller Heater Lamp 1
15. Heating Roller Heater Lamp 2
16. Heating Roller
17. Oil Donor Roller

21-1. Fusing Section Drive Mechanism

- The fusing section is driven by a motor.



Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M14	PJ13I-2A	L	H	2-E

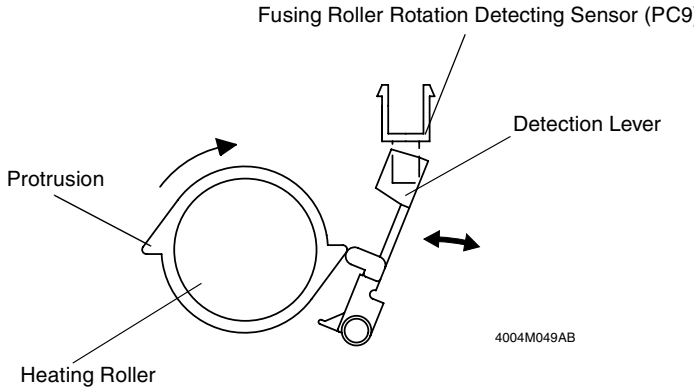
21-2. Fusing Speed Control

- The fusing speed is changed according to the paper type.

Paper Type	During a Copy Cycle
Plain paper	90 mm/s
Thick paper 1, thick paper 2, OHP	60 mm/s

21-3. Fusing Roller Stabilized Rotation Control

- The copier provides Fusing Roller stabilized rotation control when a copy cycle is initiated.
- To enhance fusing performance, the fusing speed set according to the paper type is corrected to a stabilized one.
- The Heating Roller is provided with two protrusions so that the Fusing Roller Rotation Detecting Sensor can determine the time it takes the Heating Roller to turn a half turn.

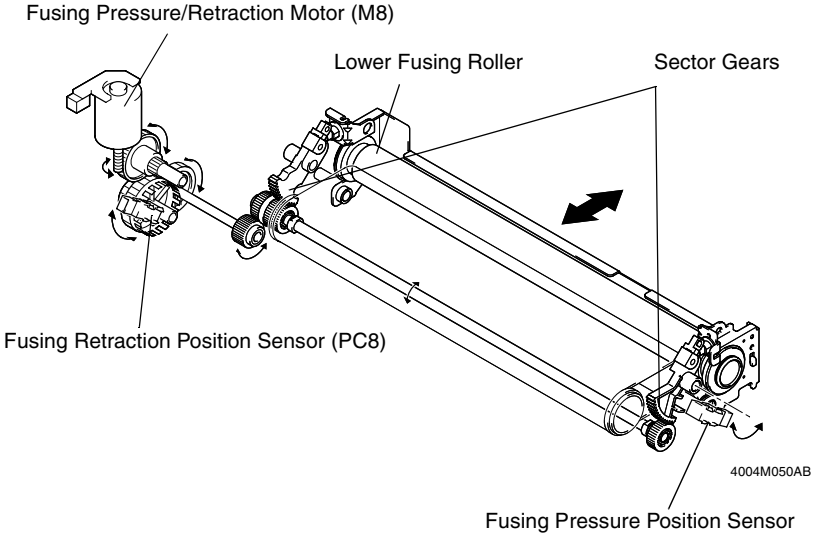


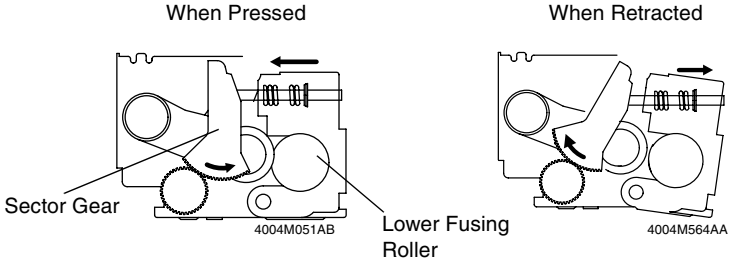
21-4. Lower Fusing Roller Pressure/Retraction Mechanism

- To extend the service life of the Fusing Belt, the Lower Fusing Roller is retracted from the Fusing Belt at any time except during a copy cycle or when there is a paper misfeed.
- A motor dedicated to the purpose is used to press the Lower Fusing Roller up against, and retract it from, the Fusing Belt.
- The Lower Fusing Roller at the pressed position is detected by the Fusing Pressure Position Sensor.
- The Fusing Pressure Position Sensor is also used to count a given number of pulses, as started counting from the pressed position to stop the Lower Fusing Roller at the retracted position.

- Pressure/Retraction Timing

Conditions		Pressure/Retraction Operation
Power Switch ON	Not in retracted position	Pressed → retracted
Warm-up	Start	Retracted → pressed
	End	Pressed → retracted
In standby	–	Retracted
Copy cycle	Start	Retracted → pressed
	End	Pressed → retracted
When heaters are forced OFF	–	Retracted





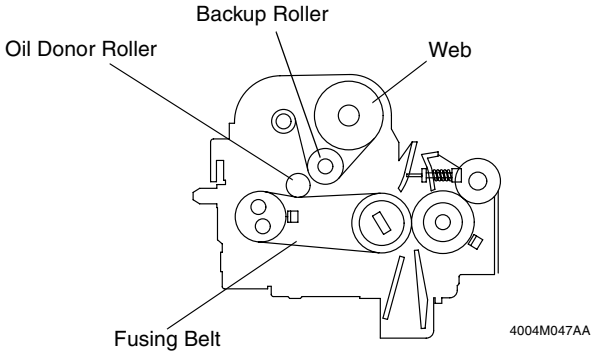
Controlled Part	Control Signal	During pressure operation	During retraction operation	WIRING DIAGRAM
M8	PJ14A-4A	L	H	2-F
	PJ14A-5A	H	L	

Controlled Part	Control Signal	Blocked	Unblocked	WIRING DIAGRAM
PC8	PJ17I-3B	H	L	2-G

21-5. Fusing Unit Cleaning Mechanism

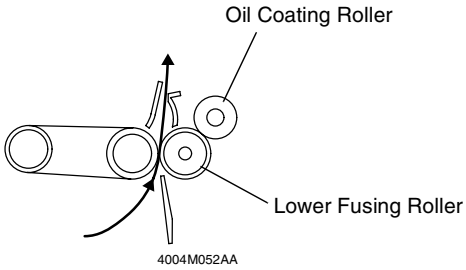
(1) Fusing Oil Application Mechanism

- Oil is applied to the Fusing Belt to prevent offset and ensure better paper separation.
- Toner sticking to the Fusing Belt is removed with the Web by way of the Oil Donor Roller.



(2) Oil Coating Roller

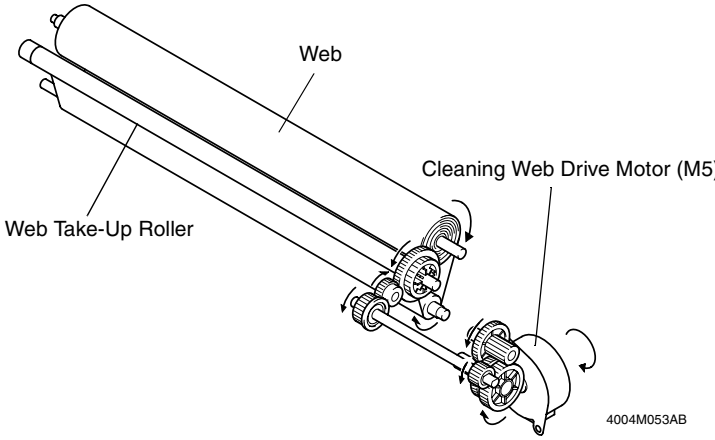
- The Oil Coating Roller cleans the Lower Fusing Roller, prevents offset, and ensures better paper separation.



(3) Web Take-Up Mechanism

- Oil is applied from the Web to the Oil Donor Roller.
- The Web is taken up by a motor.
- The Cleaning Web Drive Motor controls the amount of web taken up.

Web Take-Up Amount	0.125 mm per sec.



Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M5	PJ4I-11~14	Pulse Output		2-E

(4) Web Slack Take-Up Control

- The slack in the Web is taken up by energizing the Cleaning Web Drive Motor.
- The Cleaning Web Drive Motor is energized for a given period of time when the Fusing Roller remains stationary.

Operation Timing	After a misfeed has been cleared
	After the Web has been changed

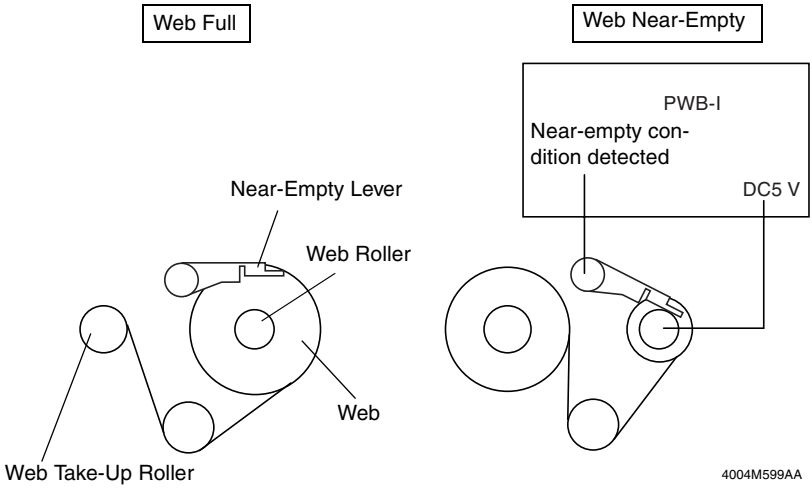
21-6. Fusing Web Near Empty and Empty Detection

1. Fusing Web Near Empty

- A web near-empty condition is detected if either of the following two events, whichever occurs earlier, occurs.

Detection Timing	"Life" of "Tech. Rep. Mode": "Fusing Web Unit" counter reads 16,000.
	Detected by the Near-Empty Lever (See below.)

- The Master Board detects a web near-empty condition when the Near-Empty Lever contacts the Web Roller.



2. Fusing Web Empty

- A web empty condition is detected when a given number of copies are made after a near-empty condition has been detected.

	"Life" Counter of "Tech. Rep. Mode"
A given number of copies	Corresponds to "1,000" on "Fusing Web Unit" counter

21-7. New Fusing-Related Parts Detection

- The copier detects a new Fusing Unit, Web, and Oil Coating Roller.

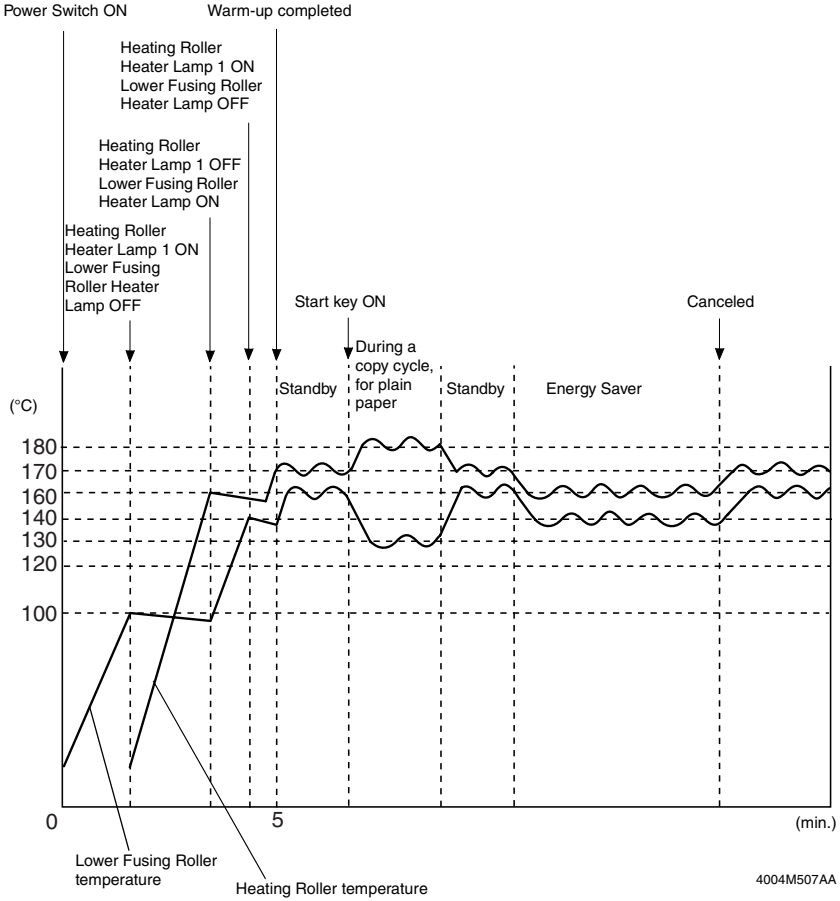
	New Part Detection Timing
Fusing Unit	Power Switch is ON. Fusing Door is opened and closed.
Web	
Oil Coating Roller	

- The corresponding counter (of "Life" under "Tech. Rep. Mode") is automatically reset.

21-8. Fusing Temperature Control

- Heater lamps are turned ON and OFF to keep the surface temperatures of the Heating Roller and Fusing Roller at predetermined levels.
- The surface temperatures of the Heating Roller and Lower Fusing Roller are detected by thermistors that convert temperatures to corresponding electrical signals.
- If the surface temperatures of the Heating Roller and Lower Fusing Roller run inordinately high, power to the heater lamps is shut down.
- The fusing temperature during copy cycles can be fine-adjusted using “Tech. Rep. Mode.”

<table>
<tr><th>Part Name</th><th>Function</th></tr>
<tr><td>Heating Roller Heater Lamp 1</td><td>• Turns ON during a warm-up cycle.
• Turns ON during a copy cycle (large size CD width 217 mm or more)
<table><tr><td rowspan="2"></td><td colspan="2">Set Temperature (°C)</td></tr><tr><td colspan="2">Ambient Temperature</td></tr><tr><td>Less than 18 °C</td><td>18 °C or more</td></tr><tr><td>Plain paper</td><td>185</td><td>180</td></tr><tr><td>OHP</td><td>180</td><td>180</td></tr><tr><td>Thick paper 1</td><td>185</td><td>185</td></tr><tr><td>Thick paper 2</td><td>195</td><td>195</td></tr></table>• Turns ON in the standby state after a warm-up cycle.</td></tr>
<tr><td>Heating Roller Heater Lamp 2</td><td>• Turns ON during a copy cycle (small size CD width 216 mm or less)
• Set temperatures are the same as those for Heating Roller Heater Lamp 1.</td></tr>
<tr><td>Lower Fusing Roller Heater Lamp</td><td>• Turns ON during a warm-up cycle.
• Turns ON during a copy cycle
• 130 °C
• Turns ON in the standby state after a warm-up cycle.</td></tr>
<tr><td>Fusing Thermistor 1</td><td>• Detects the surface temperature of the Heating Roller.
• Temperature control in standby state: 170 °C
• Energy Saver temperature control: 160 °C
• Abnormally high temperature of 220 °C of the Heating Roller detected: C0520</td></tr>
<tr><td>Fusing Thermistor 2</td><td>• Detects the surface temperature of the Lower Fusing Roller.
• Temperature control in standby state: 160 °C
• Energy Saver temperature control: 140 °C
• Abnormally high temperature of 190 °C of the Lower Fusing Roller detected: C0521</td></tr>
<tr><td>Fusing Thermostat 1</td><td>• Abnormally high temperature of 230 °C of the Heating Roller detected: Shuts down power supply to Heating Roller Heater Lamp 1.</td></tr>
<tr><td>Fusing Thermostat 2</td><td>• Abnormally high temperature of 200 °C of the Lower Fusing Roller detected: Shuts down power supply to Lower Fusing Roller Heater Lamp.</td></tr>
</table>


Power Switch ON
Warm-up completed
Heating Roller
Heater Lamp 1 ON
Lower Fusing Roller
Heater Lamp OFF
Heating Roller
Heater Lamp 1 OFF
Lower Fusing Roller
Heater Lamp ON
Heating Roller
Heater Lamp 1 ON
Lower Fusing
Roller Heater
Lamp OFF
Start key ON
Canceled
During a
copy cycle,
for plain
paper
Standby
Standby
Energy Saver
(°C)
180
170
160
140
130
120
100
0
5
(min.)
Lower Fusing Roller
temperature
Heating Roller temperature
4004M507AA

22. OTHER MECHANISMS

22-1. Memory Backup

- IC5 (RAM) connected to the MSC Board stores the settings and adjustments made, and counter values entered using the Tech. Rep. Mode.
- IC5 (RAM) has a built-in backup memory.

NOTE

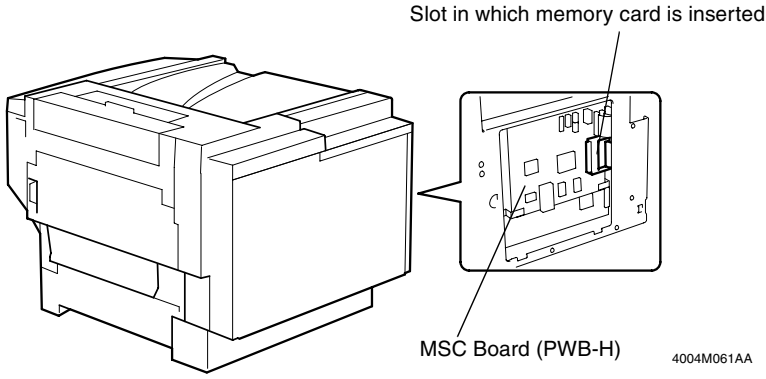
- *When the MSC Board is to be replaced with a new one, use care not to replace IC5 (RAM) together with the board.*

22-2. Flash Memory

- Flash memory is used on the MSC Board for updating data when upgrading software.
- Insert a memory card, in which data has previously been written, into the socket on the MSC Board and perform the updating procedure. This rewrites the data.

NOTE

- *For details, refer to DIS/REASSEMBLY, ADJUSTMENT.*



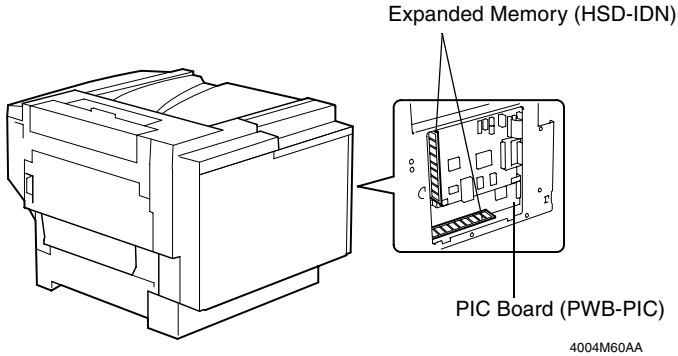
22-3. Expanded Memory

- Expanded memory of 256 MB (128 MB ×2) is made optionally available.

15-cpm copier	Option
20-cpm copier	Standard

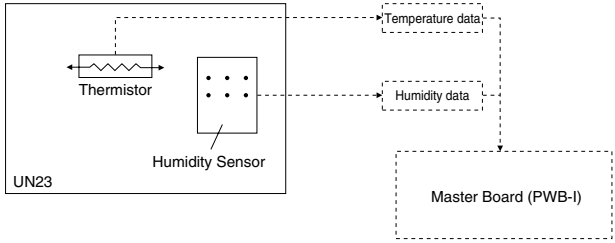
- Mounting the expanded memory permits the following control.

2-sided copying
2in1 copying

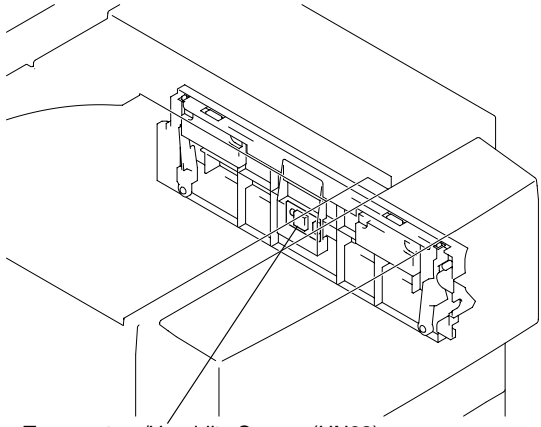


22-4. Temperature/Humidity Sensor

- The Temperature/Humidity Sensor detects temperature and humidity inside the copier.



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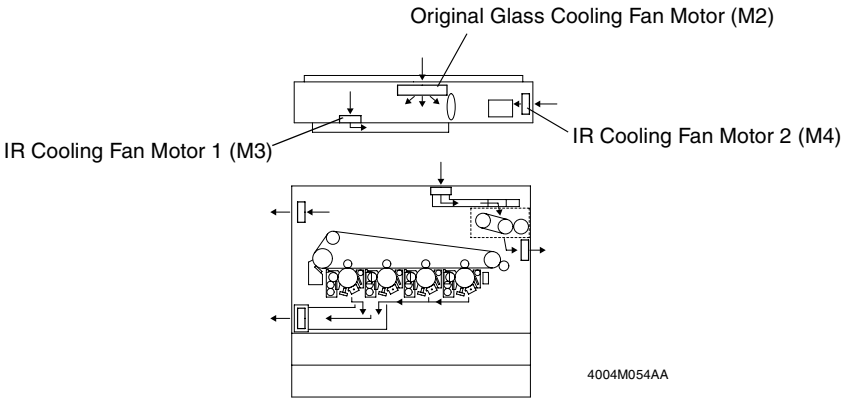


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22-5. Copier Interior Cooling Mechanism

(1) IR Section Cooling Mechanism

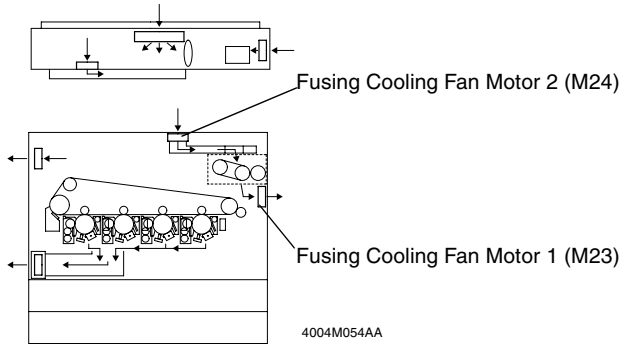
- Fan motors draw air from the outside into the inside of the copier to cool the IR section (Original Glass, CCD Sensor, Image Processing Board, etc.).



Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M2	PJ2C-4B	H	L	20-I
M3	PJ6C-4	H	L	20-H
M4	PJ6C-7	H	L	20-H

(2) Fusing Section Cooling Mechanism

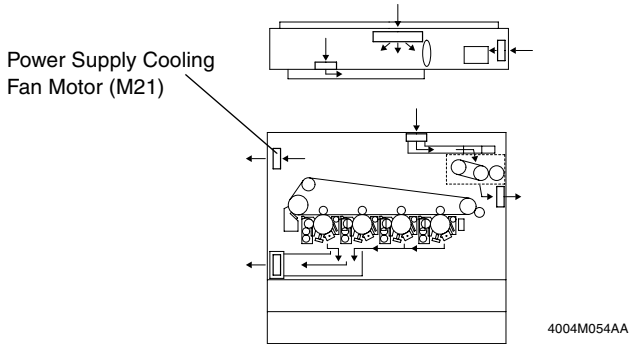
- Fan motors draw air from the area around the Fusing Unit to the outside to prevent the copier interior temperature from running high.



Controlled Part	Control Signal	Full Speed	Half Speed	WIRING DIAGRAM
M23	PJ14I-11A	H	L	2-G
M24	PJ14I-1A	H	L	2-F

(3) Power Supply Section Cooling Mechanism

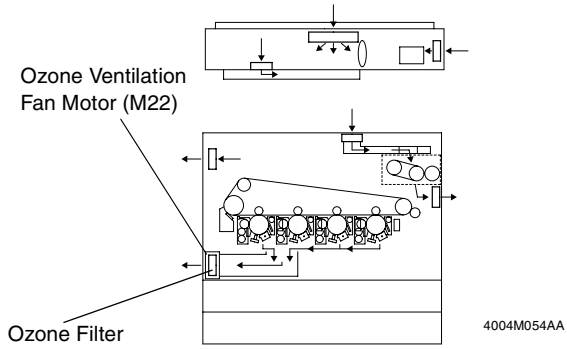
- A fan motor draws air from the area around the Power Supply Unit to the outside to prevent the Power Supply Unit temperature from running high.



Controlled Part	Control Signal	Full Speed	Half Speed	WIRING DIAGRAM
M21	PJ2I-6	L	H	29-E

22-6. PC Drum Charge Corona Ozone Removal Mechanism

- Ozone produced from the PC Drum Charge Corona is removed.
- It is absorbed by the Ozone Filter from the air drawn by a fan motor to the outside.



Controlled Part	Control Signal	Energized	Deenergized	WIRING DIAGRAM
M22	PJ10I-14	H	L	19-A



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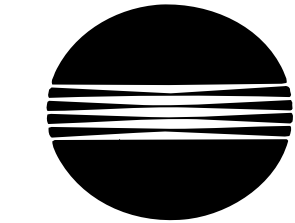
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SERVICE MANUAL

[FIELD SERVICE]



MINOLTA

INDEX (FIELD SERVICE)

DIS/REASSEMBLY, ADJUSTMENT

SWITCHES ON PWBs, TECH. REP. SETTINGS

Safety Precautions for Inspection and Service

When performing inspection and service procedures, observe the following precautions to prevent accidents and ensure utmost safety.

✻ Depending on the model, some of the precautions given in the following do not apply.

Different markings are used to denote specific meanings as detailed below.

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

The following graphic symbols are used to give instructions that need to be observed.

Used to call the service technician's attention to what is graphically represented inside the marking (including a warning).

Used to prohibit the service technician's from doing what is graphically represented inside the marking.

Used to instruct the service technician's to do what is graphically represented inside the marking.

WARNING

1. Always observe precautions.
   - Parts requiring special attention in this product will include a label containing the mark shown on the left plus precautionary notes. Be sure to observe the precautions.
   - Be sure to observe the "Safety Information" given in the Operator's Manual.

2. Before starting the procedures, be sure to unplug the power cord.
   - This product contains a high-voltage unit and a circuit with a large current capacity that may cause an electric shock or burn.
   - The product also contains parts that can jerk suddenly and cause injury.
   - If this product uses a laser, laser beam leakage may cause eye damage or blindness.

3. Use the specified parts.
   - For replacement parts, always use the genuine parts specified in the manufacturer's parts manual. Installing a wrong or unauthorized part could cause dielectric breakdown, overload, or undermine safety devices resulting in possible electric shock or fire.
   - Replace a blown electrical fuse or thermal fuse with its corresponding genuine part specified in the manufacturer's parts manual. Installing a fuse of a different make or rating could lead to a possible fire. If a thermal fuse blows frequently, the temperature control system may have a problem and action must be taken to eliminate the cause of the problem.

4. Handle the power cord with care and never use a multiple outlet.



- Do not break, crush or otherwise damage the power cord. Placing a heavy object on the power cord, or pulling or bending it may damage it, resulting in a possible fire or electric shock.
- Do not use a multiple outlet to which any other appliance or machine is connected.
- Be sure the power outlet meets or exceeds the specified capacity.

5. Be careful with the high-voltage parts.



- A part marked with the symbol shown on the left carries a high voltage. Touching it could result in an electric shock or burn. Be sure to unplug the power cord before servicing this part or the parts near it.

6. Do not work with wet hands.



- Do not unplug or plug in the power cord, or perform any kind of service or inspection with wet hands. Doing so could result in an electric shock.

7. Do not touch a high-temperature part.



- A part marked with the symbol shown on the left and other parts such as the exposure lamp and fusing roller can be very hot while the machine is energized. Touching them may result in a burn.
- Wait until these parts have cooled down before replacing them or any surrounding parts.

8. Maintain a grounded connection at all times. (This item may not apply in the USA.)



- Be sure to connect the ground wire to the ground terminal even when performing an inspection or repair. Without proper grounding, electrical leakage could result in an electric shock or fire.
- Never connect the ground wire to a gas pipe, water pipe, telephone ground wire, or a lightning conductor.

9. Do not remodel the product.



- Modifying this product in a manner not authorized by the manufacturer may result in a fire or electric shock. If this product uses a laser, laser beam leakage may cause eye damage or blindness.

10. Restore all parts and harnesses to their original positions.



- To promote safety and prevent product damage, make sure the harnesses are returned to their original positions and properly secured in their clamps and saddles in order to avoid hot parts, high-voltage parts, sharp edges, or being crushed.
- To promote safety, make sure that all tubing and other insulating materials are returned to their original positions. Make sure that floating components mounted on the circuit boards are at their correct distance and position off the boards.

CAUTION

1. Precautions for Service Jobs

- A toothed washer and spring washer, if used originally, must be reinstalled. Omitting them may result in contact failure which could cause an electric shock or fire.
- When reassembling parts, make sure that the correct screws (size, type) are used in the correct places. Using the wrong screw could lead to stripped threads, poorly secured parts, poor insulating or grounding, and result in a malfunction, electric shock or injury.
- Take great care to avoid personal injury from possible burrs and sharp edges on the parts, frames and chassis of the product.
- When moving the product or removing an option, use care not to injure your back or allow your hands to be caught in mechanisms.

2. Precautions for Servicing with Covers and Parts Removed

- Wherever feasible, keep all parts and covers mounted when energizing the product.
- If energizing the product with a cover removed is absolutely unavoidable, do not touch any exposed live parts and use care not to allow your clothing to be caught in the moving parts. Never leave a product in this condition unattended.
- Never place disassembled parts or a container of liquid on the product. Parts falling into, or the liquid spilling inside, the mechanism could result in an electric shock or fire.
- Never use a flammable spray near the product. This could result in a fire.
- Make sure the power cord is unplugged before removing or installing circuit boards or plugging in or unplugging connectors.
- Always use the interlock switch actuating jig to actuate an interlock switch when a cover is opened or removed. The use of folded paper or some other object may damage the interlock switch mechanism, possibly resulting in an electric shock, injury or blindness.

3. Precautions for the Working Environment

- The product must be placed on a flat, level surface that is stable and secure.
- Never place this product or its parts on an unsteady or tilting workbench when servicing.
- Provide good ventilation at regular intervals if a service job must be done in a confined space for a long period of time.
- Avoid dusty locations and places exposed to oil or steam.
- Avoid working positions that may block the ventilation ports of the product.

4. Precautions for Handling Batteries (Lithium, Nickel-Cadmium, etc.)

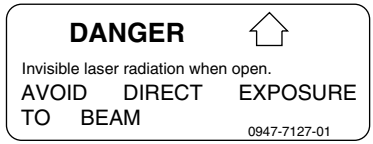
- Replace a rundown battery with the same type as specified in the manufacturer's parts manual.
- Before installing a new battery, make sure of the correct polarity of the installation or the battery could burst.
- Dispose of used batteries according to the local regulations. Never dispose of them at the user's premises or attempt to try to discharge one.

5. Precautions for the Laser Beam (Only for Products Employing a Laser)

- Removing the cover marked with the following caution label could lead to possible exposure to the laser beam, resulting in eye damage or blindness. Be sure to unplug the power cord before removing this cover.
- If removing this cover while the power is ON is unavoidable, be sure to wear protective laser goggles that meet specifications.
- Make sure that no one enters the room when the machine is in this condition.
- When handling the laser unit, observe the “Precautions for Handling Laser Equipment.”



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Other Precautions

- When handling circuit boards, observe the “HANDLING of PWBs”.
- The PC Drum is a very delicate component. Observe the precautions given in “HANDLING OF THE PC DRUM” because mishandling may result in serious image problems.
- Note that replacement of a circuit board may call for readjustments or resetting of particular items, or software installation.

Used Batteries Precautions

ALL Areas

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Germany

VORSICHT!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.
Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter batterien nach Angaben des Herstellers.

France

ATTENTION

Ily a danger d'explosion s'ily a remplacement incorrec de la batterie.
Remplacer uniquement avec une batterie du meme type ou d'un type équivalent recommande par le constructueur.
Mettre au rebut les batteries usageés conformément aux instructions du fabricant.

Denmark

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Norway

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

Sweden

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

Finland

VAROITUS

Paristo voi räjähtää, los se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä Käytetty paristo valmistajan ohjeiden mukaisesti.

Precautions for Service

When performing inspection and service procedures, observe the following precautions to prevent mishandling of the machine and its parts.
✻ Depending on the model, some of the precautions given in the following do not apply.

Precautions Before Service

- When the user is using a word processor or personal computer from a wall outlet of the same line, take necessary steps to prevent the circuit breaker from opening due to overloads.
- Never disturb the LAN by breaking or making a network connection, altering termination, installing or removing networking hardware or software, or shutting down networked devices without the knowledge and express permission of the network administrator or the shop supervisor.

How to Use this Book

1. DIS/REASSEMBLY, ADJUSTMENT
- To reassemble the product, reverse the order of disassembly unless otherwise specified.

2. TROUBLESHOOTING
- If a component on a PWB or any other functional unit including a motor is defective, the text only instructs you to replace the whole PWB or functional unit and does not give troubleshooting procedures applicable within the defective unit.
- All troubleshooting procedures contained herein assume that there are no breaks in the harnesses and cords and all connectors are plugged into the right positions.
- The procedures preclude possible malfunctions due to noise and other external causes.

Precautions for Service

- Check the area surrounding the service site for any signs of damage, wear or need of repair.
- Keep all disassembled parts in good order and keep tools under control so that none will be lost or damaged.
- After completing a service job, perform a safety check. Make sure that all parts, wiring and screws are returned to their original positions.
- Do not pull out the toner hopper while the toner bottle is turning. This could result in a damaged motor or locking mechanism.
- If the product is to be run with the front door open, make sure that the toner hopper is in the locked position.
- Do not use an air gun or vacuum cleaner for cleaning the ATDC Sensor and other sensors, as they can cause electrostatic destruction. Use a blower brush and cloth. If a unit containing these sensors is to be cleaned, first remove the sensors from the unit.

Precautions for Dis/Reassembly

- Be sure to unplug the copier from the outlet before attempting to service the copier.
- The basic rule is not to operate the copier anytime during disassembly. If it is absolutely necessary to run the copier with its covers removed, use care not to allow your clothing to be caught in revolving parts such as the timing belt and gears.
- Before attempting to replace parts and unplug connectors, make sure that the power cord of the copier has been unplugged from the wall outlet.
- Be sure to use the Interlock Switch Actuating Jig whenever it is necessary to actuate the Interlock Switch with the covers left open or removed.
- While the product is energized, do not unplug or plug connectors into the circuit boards or harnesses.
- Never use flammable sprays near the copier.
- A used battery should be disposed of according to the local regulations and never be discarded casually or left unattended at the user's premises.
- When reassembling parts, make sure that the correct screws (size, type) and toothed washer are used in the correct places.
- If it becomes necessary to replace the thermal fuse or any other fuse mounted on a board, be sure to use one of the rating marked on the blown fuse. Always note the rating marked on the fuse, as the rating and mounting site or number used are subject to change without notice.

Precautions for Circuit Inspection

- Never create a closed circuit across connector pins except those specified in the text and on the printed circuit.
- When creating a closed circuit and measuring a voltage across connector pins specified in the text, be sure to use the GND wire.

Handling of PWBs

1. During Transportation/Storage:

- During transportation or when in storage, new P.W. Boards must not be indiscriminately removed from their protective conductive bags.
- Do not store or place P.W. Boards in a location exposed to direct sunlight and high temperature.
- When it becomes absolutely necessary to remove a Board from its conductive bag or case, always place it on its conductive mat in an area as free as possible from static electricity.
- Do not touch the pins of the ICs with your bare hands.
- Protect the PWBs from any external force so that they are not bent or damaged.

2. During Inspection/Replacement:

- Avoid checking the IC directly with a multimeter; use connectors on the Board.
- Never create a closed circuit across IC pins with a metal tool.
- Before unplugging connectors from the P.W. Boards, make sure that the power cord has been unplugged from the outlet.
- When removing a Board from its conductive bag or conductive case, do not touch the pins of the ICs or the printed pattern. Place it in position by holding only the edges of the Board.
- When touching the PWB, wear a wrist strap and connect its cord to a securely grounded place whenever possible. If you cannot wear a wrist strap, touch a metal part to discharge static electricity before touching the PWB.
- Note that replacement of a PWB may call for readjustments or resetting of particular items.

Handling of Other Parts

- The magnet roller generates a strong magnetic field. Do not bring it near a watch, floppy disk, magnetic card, or CRT tube.

Handling of the PC Drum

✻ Only for Products Not Employing an Imaging Cartridge.

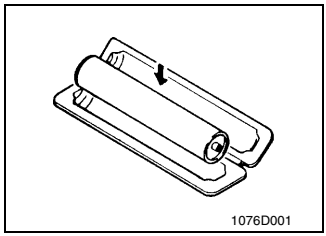
1. During Transportation/Storage:

- Use the specified carton whenever moving or storing the PC Drum.
- The storage temperature is in the range between –20°C and +40°C.
- In summer, avoid leaving the PC Drum in a car for a long time.

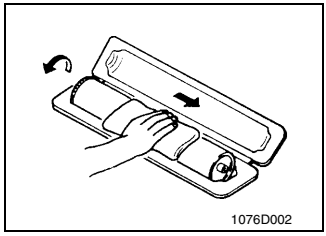
2. Handling:

- Ensure that the correct PC Drum is used.
- Whenever the PC Drum has been removed from the copier, store it in its carton or protect it with a Drum Cloth.
- The PC Drum exhibits greatest light fatigue after being exposed to strong light over an extended period of time. Never, therefore, expose it to direct sunlight.
- Use care not to contaminate the surface of the PC Drum with oil-base solvent, fingerprints, and other foreign matter.
- Do not scratch the surface of the PC Drum.
- Do not apply chemicals to the surface of the PC Drum.
- Do not attempt to wipe clean the surface of the PC Drum.

If, however, the surface is contaminated with fingerprints, clean it using the following procedure.



1. Place the PC Drum into one half of its carton.

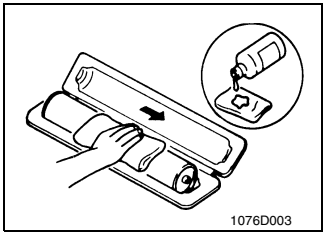


2. Gently wipe the residual toner off the surface of the PC Drum with a dry, Dust-Free Cotton Pad.

A. Turn the PC Drum so that the area of its surface on which the line of toner left by the Cleaning Blade is present is facing straight up. Wipe the surface in one continuous movement from the rear edge of the PC Drum to the front edge and off the surface of the PC Drum.

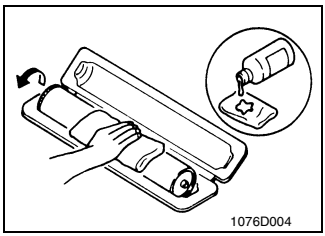
B. Turn the PC Drum slightly and wipe the newly exposed surface area with a CLEAN face of the Dust-Free Cotton Pad. Repeat this procedure until the entire surface of the PC Drum has been thoroughly cleaned.

✻ At this time, always use a CLEAN face of the dry Dust-Free Cotton Pad until no toner is evident on the face of the Pad after wiping.



3. Soak a small amount of either ethyl alcohol or isopropyl alcohol into a clean, unused Dust-Free Cotton Pad which has been folded over into quarters. Now, wipe the surface of the PC Drum in one continuous movement from its rear edge to its front edge and off its surface one to two times.

✻ Never move the Pad back and forth.



4. Using the SAME face of the Pad, repeat the procedure explained in the latter half of step 3 until the entire surface of the PC Drum has been wiped. Always OVERLAP the areas when wiping. Two complete turns of the PC Drum would be appropriate for cleaning.

NOTES

- *Even when the PC Drum is only locally dirtied, wipe the entire surface.*
- *Do not expose the PC Drum to direct sunlight. Clean it as quickly as possible even under interior illumination.*
- *If dirt remains after cleaning, repeat the entire procedure from the beginning one more time.*

Handling of the Imaging Cartridge

✻ Only for Products Employing an Imaging Cartridge.

1. During Transportation/Storage:

- The storage temperature is in the range between –20°C and +40°C.
- In summer, avoid leaving the Imaging Cartridge in a car for a long time.

2. Handling:

- Store the Imaging Cartridge in a place that is not exposed to direct sunlight.

3. Precautionary Information on the PC Drum Inside the Imaging Cartridge:

- Use care not to contaminate the surface of the PC Drum with oil-base solvent, fingerprints, and other foreign matter.
- Do not scratch the surface of the PC Drum.
- Do not attempt to wipe clean the surface of the PC Drum.

DIS/REASSEMBLY, ADJUSTMENT

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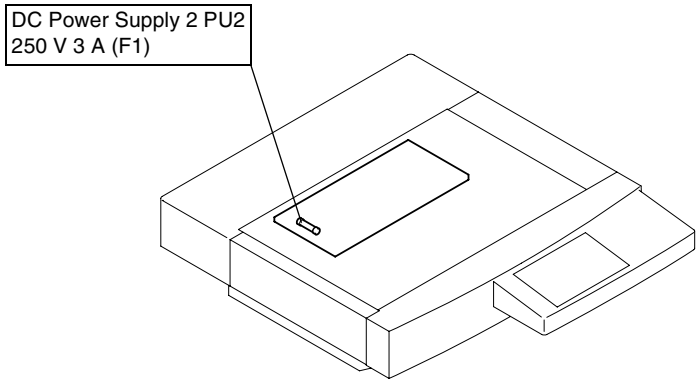
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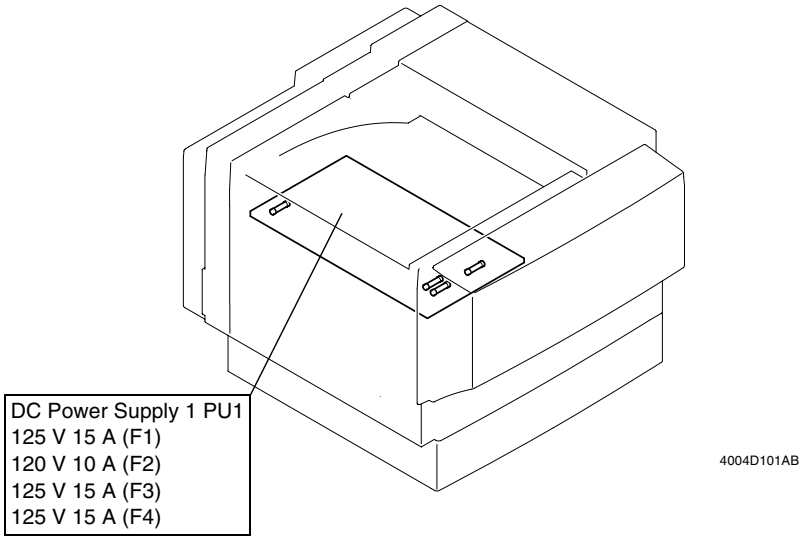
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1. SERVICE INSTRUCTIONS

1-1. IDENTIFICATION OF FUSES





1-2. PARTS WHICH MUST NOT BE TOUCHED

(1) Red Painted Screws

Purpose of Application of Red Paint

- *Red painted screws show that the assembly or unit secured can only be adjusted or set at the factory and should not be adjusted, set, or removed in the field.*
- *Note that when two or more screws are used on the part in questions, only one representative screw may be marked with red paint.*

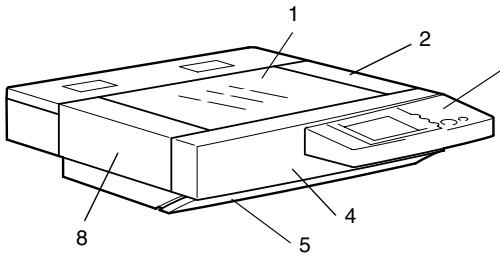
(2) Variable Resistors on Board

Do not turn the variable resistors on boards for which no adjusting instructions are given in ADJUSTMENT.

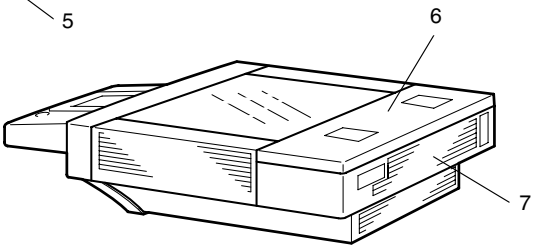
2. DISASSEMBLY/REASSEMBLY

2-1. DOORS, COVERS, AND EXTERIOR PARTS: IDENTIFICATION AND REMOVAL PROCEDURES

IR

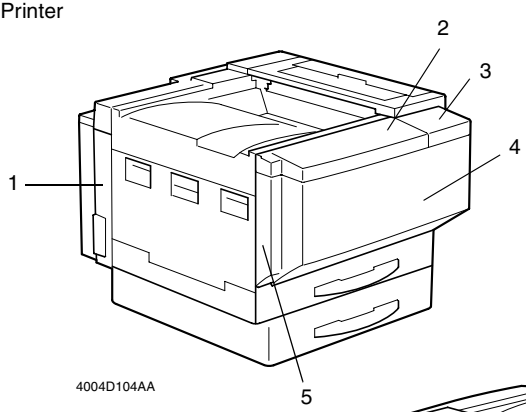


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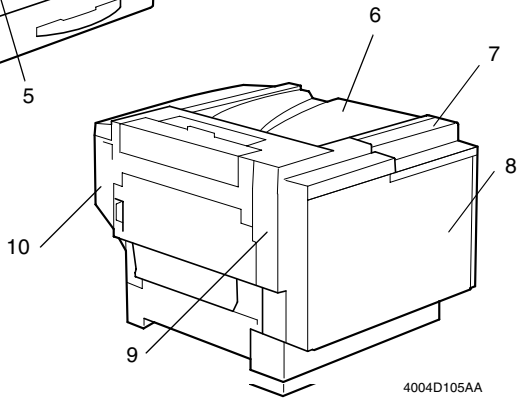


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Printer



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IR

No.	Name	Removal Procedure
1	Original Glass	Remove the IR Right Cover. → Remove the IR Rear Cover. → Remove one screw and the Original Glass fixing brackets (front and rear). → Remove the Original Glass.
2	IR Right Cover	Remove two screws and the IR Right Cover.
3	Control Panel	Remove two covers below the Control Panel. → Remove two screws, unplug one connector, and remove the Control Panel.
4	IR Front Cover	Remove the Control Panel. → Demount the IR Unit from the Copier Stand. → Remove one screw and the Control Panel fixing brackets (two). → Remove one screw and the Scanner Home Sensor Assy. → Remove the IR Lower Front Cover. → Remove two screws and the IR Front Cover.
5	IR Lower Front Cover	Remove the Control Panel. → Demount the IR Unit from the Copier Stand. → Remove two screws and the IR Lower Front Cover.
6	IR Rear Upper Cover	Remove the Original Cover. → Remove three screws and the Rear Upper Cover.
7	IR Rear Cover	Disconnect the power cable and IR hookup cable. → Remove four screws and the IR Rear Cover.
8	IR Left Cover	Remove the IR Front Cover. → Remove the IR Rear Upper Cover. → Remove three screws and the IR Left Cover.

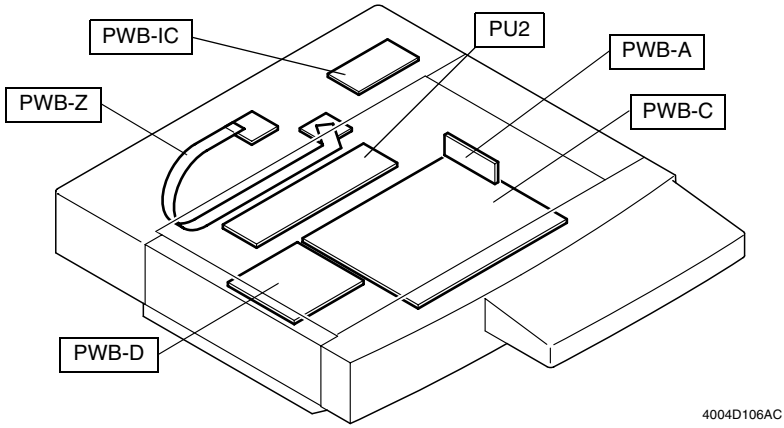
Printer

No.	Name	Removal Procedure
1	Rear Left Cover	Open the Left Door. → Remove the Waste Toner Bottle. → Remove the Ozone Filter. → Remove two screws and the Rear Left Cover.
2	Hopper Door	Open the Right Door. → Open the Upper Right Door. → Remove the actuator of the Toner Supply Door Sensor. → Snap off one retaining ring E type from the left hinge of the Hopper Door and slide the Hopper Door in closed position to the right to take it off.
3	Panel Door	Open the Front Door. → Open the Hopper Door. → Remove one screw and the Panel Door.
4	Front Door	Open the Front Door. → Lift the Front Door off the copier.
5	Hopper Left Cover	Open the Front Door. → Open the Hopper Door. → Remove one screw and lift the Hopper Left Cover upward to take it off.
6	Paper Output Cover	Open the Right Door. → Open the Upper Right Door. → Remove two screws and the Paper Output Cover.
7	Rear Upper Cover	Remove the Paper Output Cover. → Remove the Rear Cover. → Remove three screws and the Rear Upper Cover.
8	Rear Cover	Remove seven screws and the Rear Cover.
9	Rear Right Cover	Open the Right Door. → Remove one screw and the Rear Right Cover.
10	Front Right Cover	Remove the Panel Door. → Remove one screw and the Front Right Cover.

2-2. REMOVAL OF CIRCUIT BOARDS AND OTHER ELECTRICAL COMPONENTS

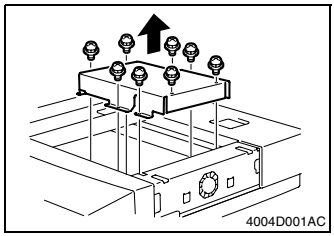
- When removing a circuit board or other electrical component, refer to “Handling of PWBs” and follow the corresponding removal procedures.
- The removal procedures given in the following omit the removal of connectors and screws securing the circuit board support or circuit board.
- Where it is absolutely necessary to touch the ICs and other electrical components on the board, be sure to ground your body.

IR

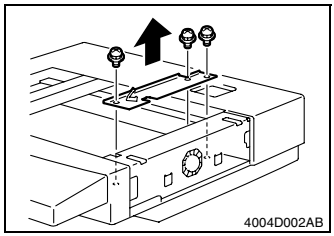


Symbol	Name	Removal Procedures
PWB-A	CCD Sensor Board	☞ D-6
PWB-C	Image Processing Board	☞ D-6
PWB-D	IR PRIF Board	☞ D-9
PWB-IC	Scanner Motor Drive Board	☞ D-10
PWB-Z	Flat Cable	☞ D-10
PU2	DC Power Supply 2	☞ D-11

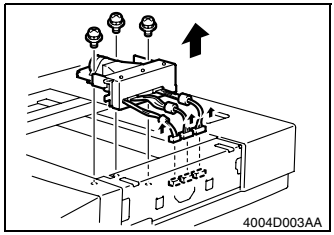
(1) Removal of the CCD Unit



1. Remove the IR Right Cover and Original Glass.
2. Remove eight screws and the optical cover.

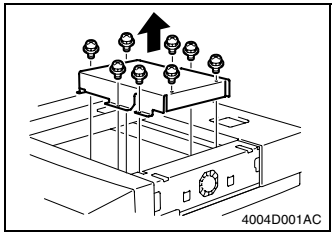


3. Remove three screws and the imaging processing lid on the right inside the IR.

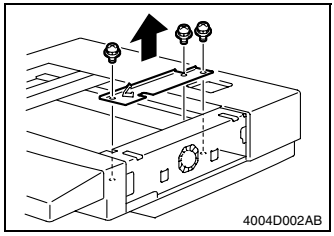


4. Unplug three connectors.
5. Remove three screws and the CCD Unit.

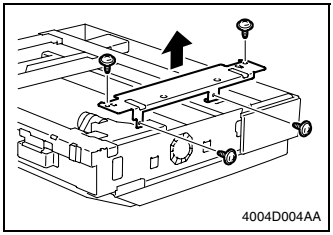
(2) Removal of the Image Processing Board



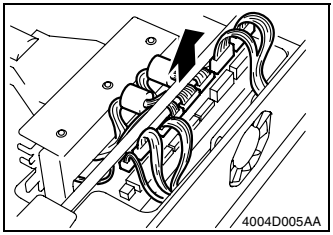
1. Remove the IR Right Cover, IR Front Cover, IR Lower Front Cover, and IR Rear Upper Cover.
2. Remove the Original Glass.
3. Remove eight screws and the optical cover.



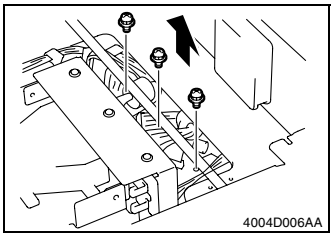
4. Remove three screws and the imaging processing lid on the right inside the IR.



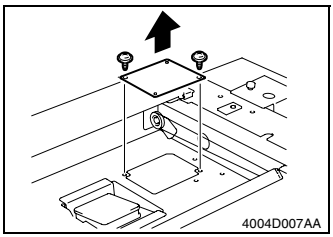
5. Remove four screws and the metal bracket on the upper right of the IR.



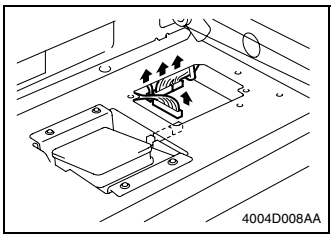
6. Unplug eight connectors on the Image Processing Board.



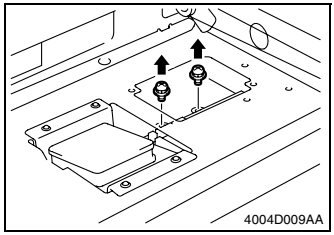
7. Remove three screws that secure the Image Processing Unit on the right.



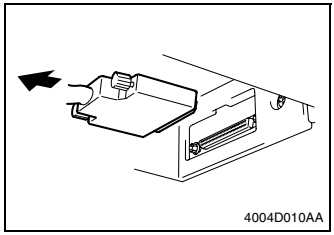
8. Remove two screws and the image processing lid on the left inside the IR.



9. Unplug four connectors on the Image Processing Board.



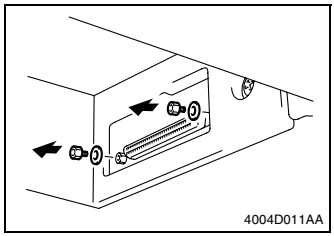
10. Remove two screws that secure the Image Processing Unit on the left.



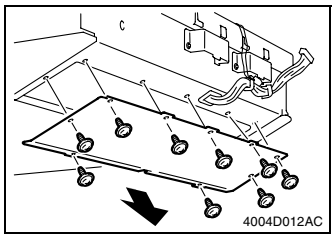
11. Remove the IR hookup cable.

Precautions for Removal/Reinstallation of the IR Hookup Cable

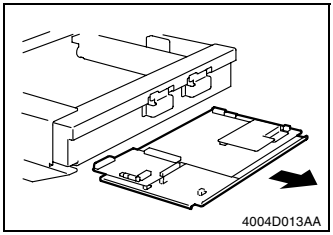
- *Be sure to hold onto the connector of the cable when removing or reinstalling the cable. NEVER pull on the cable.*
- *At reinstallation, make sure that the connector is not tilt.*
- *When securing the connector, use a flat-blade screwdriver and tighten the connector firmly.*



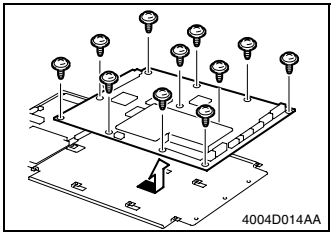
12. Remove two screws and two washers.



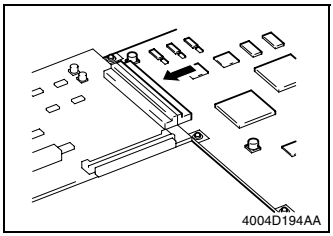
13. Remove nine screws and the Image Processing Unit protective guide.



14. Pull out the Image Processing Unit.



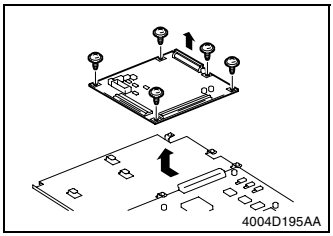
15. Remove 11 screws and the Image Processing Board.



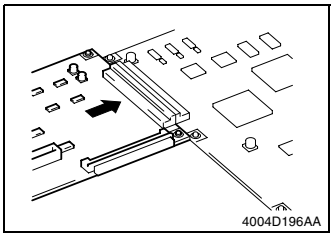
NOTE

- *At reinstallation, make sure that the Image Processing Board is properly connected to the IR PRIF Board.*

(3) Removal of the IR PRIF Board



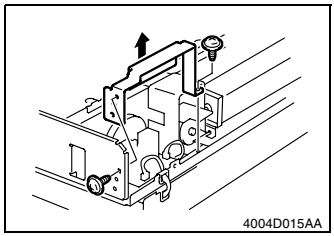
1. Pull out the Image Processing Board Unit.
☞ D-6 (steps 1 through 14)
2. Remove five screws and the IR PRIF Board.



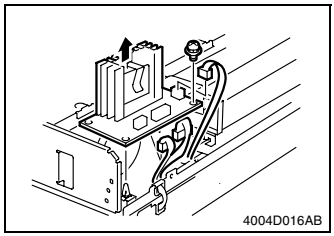
NOTE

- *At reinstallation, make sure that the IR PRIF Board is properly connected to the Image Processing Board.*

(4) Removal of the Scanner Motor Drive Board



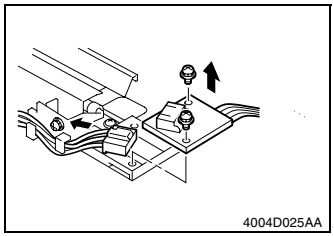
1. Remove the IR Right Cover, IR Rear Right Cover, IR Rear Upper Cover, and IR Rear Cover.
2. Remove two screws and the reinforcement frame.



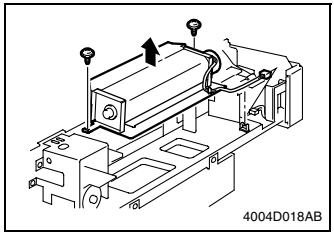
3. Unplug three connectors.
4. Remove one screw. Then, remove the Scanner Motor Drive Board from the PWB support.

(5) Removal of the Flat Cable

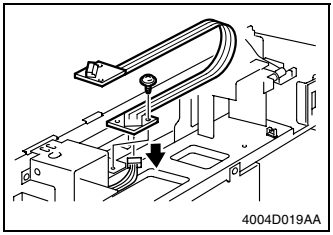
1. Remove the IR Rear Upper Cover and IR Rear Cover.
2. Remove the Original Glass.
3. Remove the Scanner Assy.



4. Remove two screws, unplug one connector, and remove the Scanner Assy Flat Cable.

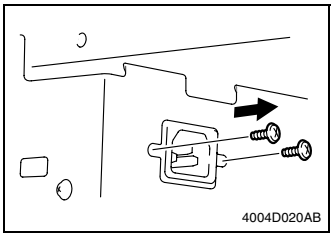


5. Unplug one connector and remove the harness from one wiring saddle.
6. Remove two screws and the Original Glass Cooling Fan Motor.

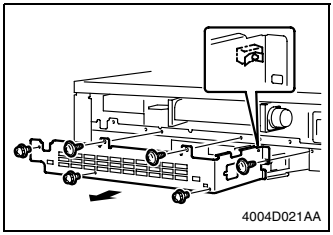


7. Remove one screw, unplug one connector, and remove the Flat Cable.

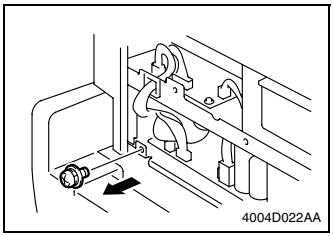
(6) Removal of DC Power Supply 2



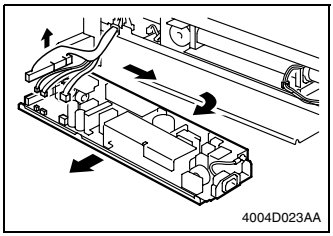
1. Remove the IR Rear Cover.
2. Remove two screws that secure the IR power receptacle.



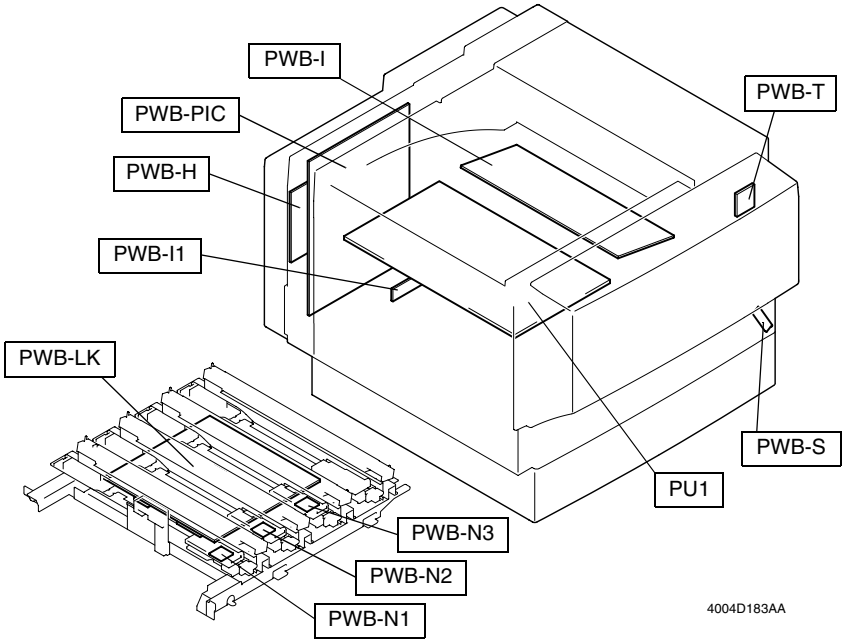
3. Remove six screws, two harness holders, and the DC Power Supply 2 cover.



4. Remove one screw that secures DC Power Supply 2 in position.

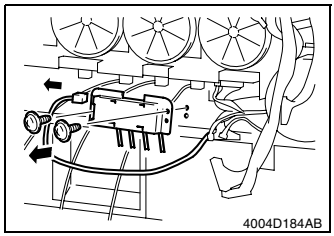


5. Unplug six connectors.
6. Take off DC Power Supply 2 by sliding it to the right.



Symbol	Name	Removal Procedures
PWB-H	MSC Board	Remove the Rear Cover. → Remove the Rear Left Cover. → Remove the PWB Shield Cover. → Unplug two connectors and remove four screws and the MSC Board.
PWB-I	Master Board	Remove the Paper Output Cover. → Unplug 21 connectors and remove six screws and the Master Board.
PWB-I1	Paper Size Detecting Board	☞ D-13
PWB-LK	LED Board	☞ D-13
PWB-N1	ATDC Sensor Y	
PWB-N2	ATDC Sensor M	
PWB-N3	ATDC Sensor C	
PWB-PIC	PIC Board	Remove the Rear Cover. → Remove the Rear Left Cover. → Remove the PWB Shield Cover. → Remove the MSC Board. → Unplug two connectors and remove 12 screws and the PIC Board.
PWB-S	Paper Type Detection Board	Open the Front Door. → Remove one screw and the Paper Type Detection Board cover. → Unplug one connector and remove one screw and the Paper Type Detection Board.
PWB-T	Tech. Rep. Setting Switches Board	Open the Front Door. → Remove the Right Front Cover. → Unplug one connector and remove one screw and the Tech. Rep. Setting Switches Board.

(7) Removal of the Paper Size Detecting Board



1. Remove High Voltage Unit 1 and 2.
☞ D-56 (steps 1 through 8)
2. Remove two screws, unplug one connector, and remove the Paper Size Detecting Board.

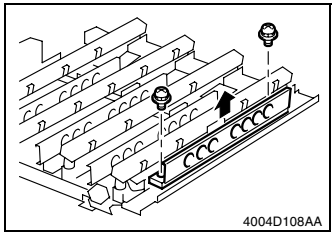
(8) Removal of the LED Board and ATDC Sensors Y, M, and C

NOTE

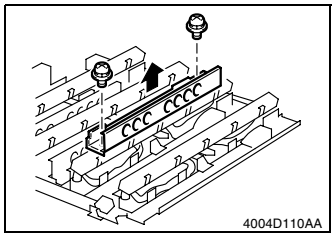
- *Whenever the Imaging Unit has been slid out of the copier, be sure to cover it with the light blocking bag (black) or light blocking cloth for packing purposes and place it in a dark place. Avoid leaving it to stand for a long time.*

1. Remove the LED Unit.
☞ D-22

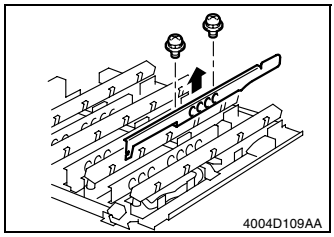
✻ Removal of the LED Assy Bk



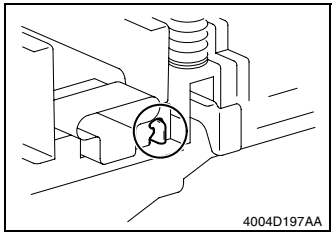
2. Remove two screws and the Right Guide.



3. Remove two screws and the Right Guide for C.

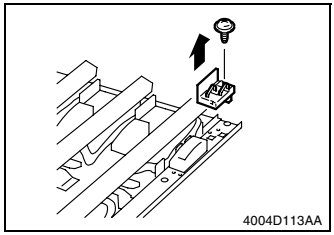


4. Remove two screws and the Left Guide.

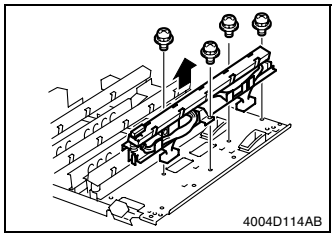


NOTE

- *At reinstallation, ensure that the front hook makes positive engagement.*

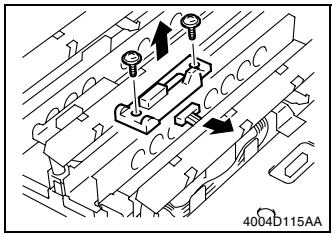


5. Remove one screw and the holder.



6. Remove four screws, unplug two connectors, and remove the LED Assy Bk.

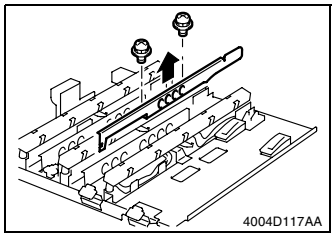
✻ Removal of the LED Assy C



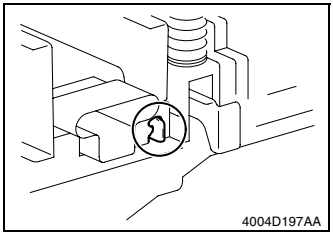
7. Remove two screws, unplug one connector, and remove the ATDC Sensor C.

NOTE

- *When the ATDC Sensor is replaced, the Imaging Unit should also be replaced.*

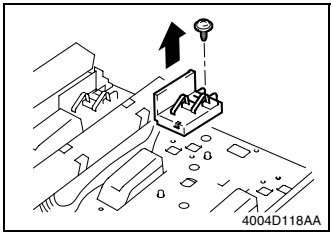


8. Remove two screws and the Left Guide.

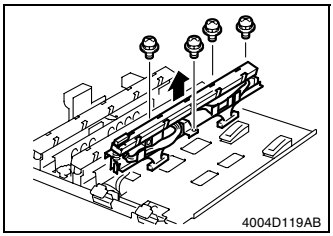


NOTE

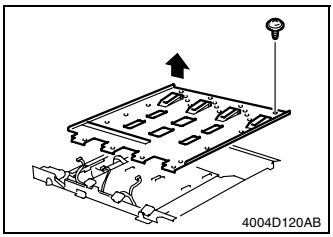
- *At reinstallation, ensure that the front hook makes positive engagement.*



9. Remove one screw and the holder.



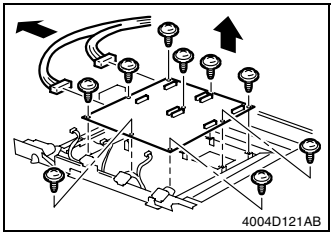
10. Remove four screws, unplug two connectors, and remove LED Assy C.
11. Following the same procedure as when removing LED Assy C, remove LED Assemblies M and Y.



12. Remove 23 screws and the LED Board Cover.

NOTE

- *The illustration shows only the representative screw. Remove all (23 in total) LED Board Cover mounting screws.*



13. Unplug two connectors.
14. Remove nine screws and the LED Board.

2-3. MAINTENANCE SCHEDULE

- To ensure that the copier produces good copies and to extend its service life, it is recommended that the maintenance jobs described in this schedule be carried out as instructed.

	PM Parts	Maintenance Cycle		Parts No.	Qty	Ref. Page in This Manual	Ref. Page in Unit Replacement Manual
		Clean	Replace				
Paper Take-Up Section	Paper Take-Up Roll	When malfunction occurs	200 K	4004-3002-01 4658-3027-01	1	☞ D-38 ☞ D-60	—
	Separator Roll Assy	When malfunction occurs	200 K	4658-0151-01	1	☞ D-38 ☞ D-61	—
IR Section	Scanner Rail	Upon call	—	—	—	☞ D-25	—
	Mirrors (1st, 2nd, and 3rd)	Upon call	—	—	—	☞ D-25	—
	Lens	Upon call	—	—	—	☞ D-25	—
	Original Glass	Upon call	—	—	—	☞ D-26	—
Image Transfer Section	Transfer Belt Unit (✻1)	When malfunction occurs	121 K	4697-161	1	—	☞ P-26
	Transfer Roller Unit (✻1)	—	121 K	4697-171	1	—	☞ P-26
	Synchronizing Roller	Upon call	—	—	—	☞ D-38	—
	Paper Dust Remover (✻1)	Upon call	121 K	4004-0156-02	1	☞ D-39	☞ P-26
	Waste Toner Bottle	—	(✻2)	4697-101	1	—	☞ P-19
	Around waste toner collecting port	Upon call	—	—	—	☞ D-41	—
Developing Section	Imaging Unit C/M/Y	—	4562 M	—	1 each	—	☞ P-11
	Imaging Unit Bk	—	7204 M	—	1	—	☞ P-21
	LED	Upon call	—	—	—	☞ D-40	—
	Ozone Filter (✻1)	—	121 K	4004-0347-01	1	—	☞ P-26
Fusing Section	Fusing Unit	—	102 (✻3)	4697-111 (100 V) 4697-121 (120 V) 4697-131 (230 V)	1	—	☞ P-22
	Fusing Web Unit	—	(✻4)	4697-141	1	—	☞ P-2
	Oil Coating Unit	—	34 K or 325,000 sec	4697-151	1	—	☞ P-6
	Fusing Entrance Guide Plate	Upon call	—	—	—	☞ D-41	—

✻ 1: Replace the Transfer Belt Unit, Transfer Roller Unit, Paper Dust Remover, and Ozone Filter at the same time.
✻ 2: About 4.5 K after a waste toner near full condition has been detected.
✻ 3: Forced to a stop when 110 K is reached.
✻ 4: About 1 K after 17 K has been reached or a web near empty condition has been detected.

NOTES
- *K = 1,000 copies*
- *The contents of the above maintenance schedule are subject to change without notice.*

2-4. Guidelines for Life Specifications Values by Unit

NOTES

- *The life specifications values represent the number of copies made or figures equivalent to it when given conditions are met. They can be more or less depending on the copier operating conditions of each individual user.*
- *The initiation of a new copy cycle is inhibited upon 1 K after a near life condition has been detected for all units (except the Toner Bottle and Waste Toner Bottle).*

Unit	Life Spec. Value	Copying Condition	Description	Near Life Value	Life Value
Toner Bottle	—	B/E	An approximate life value is 10 K under the specified conditions.	—	10 K
Waste Toner Bottle	40 K	B/C/D/E/F	A waste toner full condition is detected when about 4.5 K copies are made after a waste toner near-full condition has been detected.	—	40 K
Fusing Web Unit	17 K	B/C/D/F	The life specifications value is based on A4C or Letter C. A near life condition is detected when a web empty condition is detected or a predetermined number of copies are made, whichever arrives earlier.	16 K	17 K
20-cpm copier Oil Coating Unit	33 K	A/B/C/D/F	The life specifications value is based on A4C or Letter C. A near life condition or a life condition is detected when the Oil Coating Roller has turned a predetermined period of time or a predetermined number of copies are made, whichever arrives earlier.	33 K	34 K
15-cpm copier Oil Coating Unit	26 K			26 K	27 K
Fusing Unit	101 K	B/C/D/F	The life specifications value is based on A4C or Letter C.	101 K	✻1 102 K
Transfer Belt Unit	120 K	A/B/C/D/F	The life specifications value is based on A4C or Letter C.	✻2 120 K (17400 M)	✻2 121 K (17545 M)
20-cpm copier Imaging Unit (C, M, and Y)	30 K	A/B/C/D/F	The near life and life time values are detected when the PC Drum has turned or the Developing Unit has been energized for a predetermined period of time, whichever arrives earlier.	✻3 4415 M (30 K)	✻3 4562 M (31 K)
15-cpm copier Imaging Unit (C, M, and Y)	27 K			✻3 4415 M (27 K)	✻3 4562 M (28 K)
20-cpm copier Imaging Unit (Bk)	50 K			✻3 6972 M (50 K)	✻3 7122 M (51 K)
15-cpm copier Imaging Unit (Bk)	47 K			✻3 6972 M (47 K)	✻3 7122 M (48 K)

M: minutes

✻ 1: As a rule, the Fusing Unit is to be replaced at the same time that the Fusing Web Unit is replaced a sixth time (17 K × 6 = 102 K). If the Fusing Web Unit is replaced before 17 K is reached, there will be a discrepancy in the replacement cycle, resulting in a near life and life value ranging between 90 K and 110 K.

✻ 2: The life of the Transfer Belt Unit is controlled based on the number of copies made. The life counter gives a time value display.

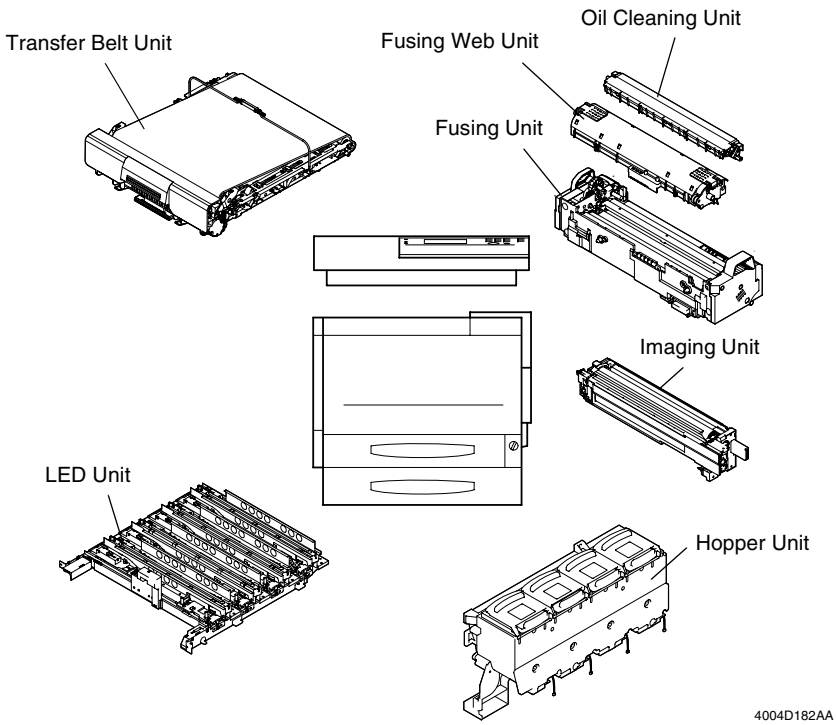
✻ 3: The life of the Imaging Unit is controlled based on a time value. The life counter gives a time value display.

• Conditions for Life Specifications Values

Copying Conditions		20-cpm Copier	15-cpm Copier
Job Type	A	Making two copies per job	
Paper Size	B	A4 or Letter	
Color Ratio	C	C (color) to Bk (black) = 5 to 1	C (color) to Bk (black) = 2.5 to 1
CV/M	D	6 K	3.5 K
Original Density	E	B/W = 5 % for each color	
No. of Operating Days per Month	F	20 days (Power Switch turned ON and OFF 20 times per month)	

2-5. Removal of Units

- Note that replacement of a unit may call for recheck and readjustments of some items.



NOTE

- *For the removal of the Imaging Unit, Transfer Belt Unit, Fusing Unit, Fusing Web Unit, and Oil Coating Unit, see the Unit Replacement Manual.*

(1) Removal of the Toner Hopper Unit

NOTE

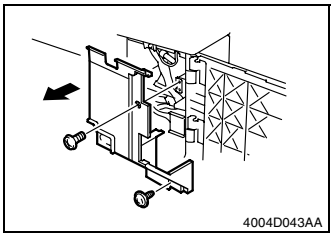
- *Whenever the Imaging Unit has been slid out of the copier, be sure to cover it with the light blocking bag (black) or light blocking cloth for packing purposes and place it in a dark place. Avoid leaving it to stand for a long time.*

1. Remove the Paper Output Cover.
2. Open the Front Door.
3. Remove the Toner Supply Door.
4. Remove the Hopper Left Cover.
5. Slide out the Imaging Unit (C/M/Y/Bk).

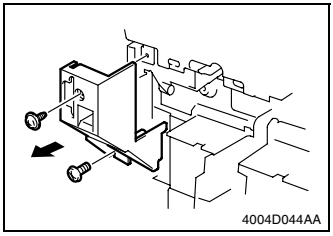
☞ Unit Replacement Manual

NOTES

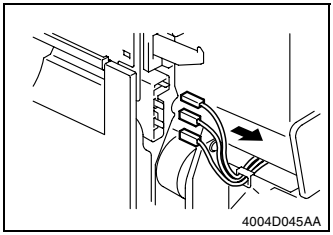
- *After the Imaging Unit has been pulled out, place the Imaging Unit lock lever back into the locked position.*
- *When sliding the Imaging Unit back in, make sure that the shutter is opened if the Imaging Unit Lower Cover is not to be used.*



6. Remove two screws and the Right Front Cover.

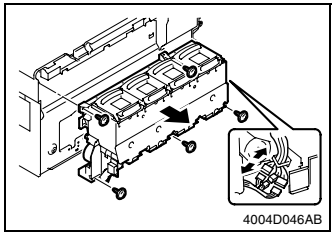


7. Remove two screws and the Front Door Switch Cover.



8. Disconnect three terminals.

✻ Terminals: Blue, white, and green from top down



9. Unplug three connectors.
10. Remove five screws and the Toner Hopper Unit.

(2) Removal of the LED Unit

NOTE

- *Whenever the Imaging Unit has been slid out of the copier, be sure to cover it with the light blocking bag (black) or light blocking cloth for packing purposes and place it in a dark place. Avoid leaving it to stand for a long time.*

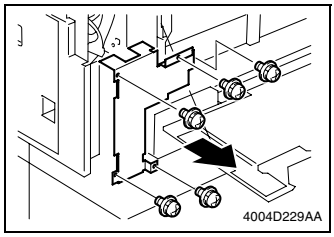
1. Open the Front Door.
2. Slide out the Imaging Unit (C/M/Y/Bk).

☞ Unit Replacement Manual

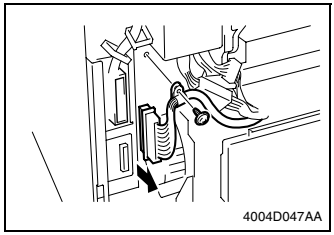
NOTES

- *After the Imaging Unit has been pulled out, place the Imaging Unit lock lever back into the locked position.*
- *When sliding the Imaging Unit back in, make sure that the shutter is opened if the Imaging Unit Lower Cover is not to be used.*

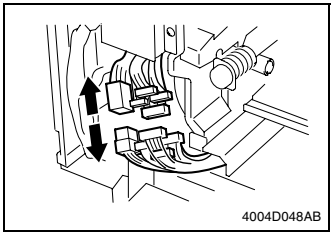
3. Open the Right Door and Rear Left Cover.
4. Remove the Ozone Filter, Waste Toner Bottle, and Transfer Belt Unit.
5. Remove the Rear Cover and Rear Left Cover.



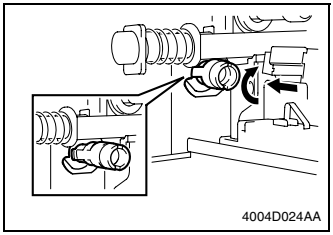
6. Remove five screws and the cover.



7. Remove one screw and unplug one connector on the PIC Board.



8. Unplug five connectors.



9. Lock the Imaging Unit (C/M/Y/Bk) drive hub.

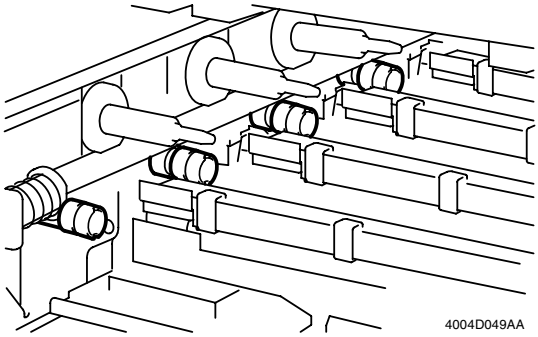
NOTES

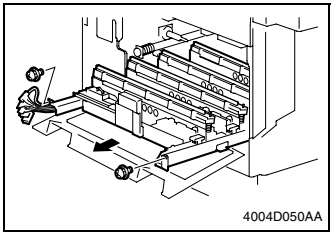
- *During the locking procedure, use care not to touch the LED surface.*
- *Should the LED surface be touched, clean it with the LED Cleaning Jig.*

☞ D-40

NOTE

- *Make sure that all four hubs are locked in position.*

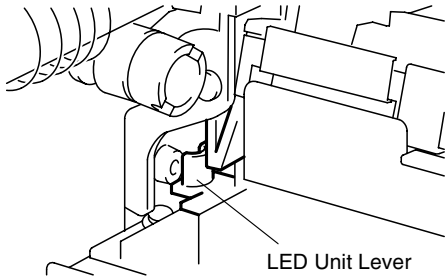




10. Remove two screws and slide out the LED Unit.

Precaution for Reinstalling the LED Unit

- *The lever of the LED Unit must be fit into the space between the metal bracket in the rear of the copier and another lever as illustrated below.*

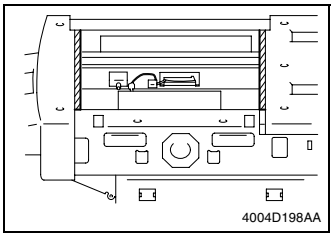


Precaution for Replacement of the LED Unit

- *When the LED Unit is to be replaced, remove the ATDC Sensor from the old LED Unit and remount it on the new one.*
  This step is not, however, necessary if the Imaging Unit is replaced at the same time.

2-6. Cleaning and Disassembly of the IR Unit

(1) Cleaning of the Scanner Rails

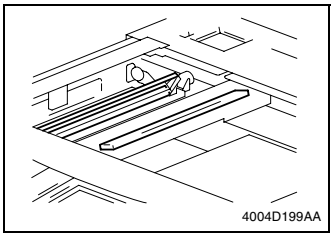


1. Remove the IR Right Cover and Original Glass.
2. Using a soft cloth dampened with alcohol, wipe the Scanner Rails clean of dirt.

NOTE

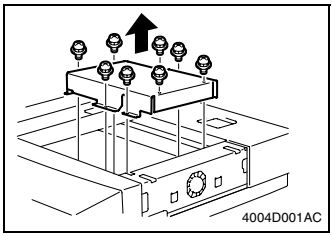
- *Lubricate the rails after cleaning.*

(2) Cleaning of the Mirrors (1st/2nd/3rd)

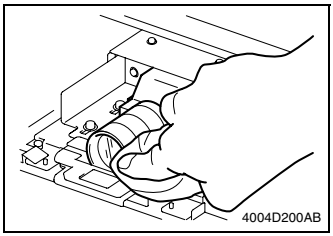


1. Remove the IR Right Cover and Original Glass.
2. Using a soft cloth dampened with alcohol, wipe mirrors clean of dirt.

(3) Cleaning of the Lens

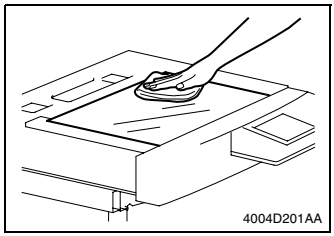


1. Remove the IR Right Cover and Original Glass.
2. Remove eight screws and the optical cover.



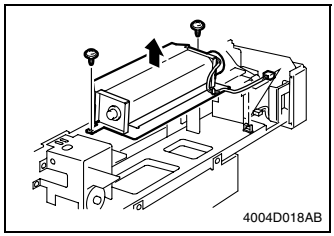
3. Using a soft cloth dampened with alcohol, wipe the Lens clean of dirt.

(4) Cleaning of the Original Glass



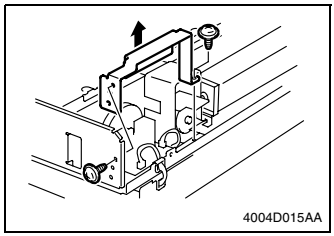
1. Using a soft cloth dampened with alcohol, wipe the Lens clean of dirt.

(5) Removal of the Original Glass Cooling Fan Motor

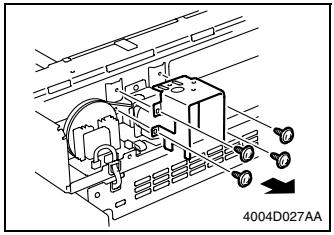


1. Remove the IR Rear Upper Cover and IR Rear Cover.
2. Unplug one connector and remove the harness from one wiring saddle.
3. Remove two screws and the Original Glass Cooling Fan Motor.

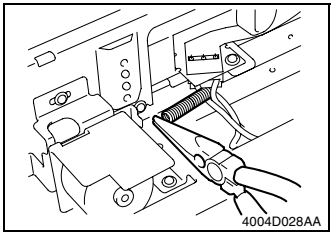
(6) Removal of the Scanner Motor



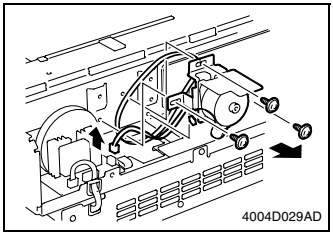
1. Remove the IR Rear Upper Cover, IR Rear Cover, and IR Rear Right Cover.
2. Remove the Original Glass Cooling Fan Motor.
3. Remove two screws and the reinforcement frame.



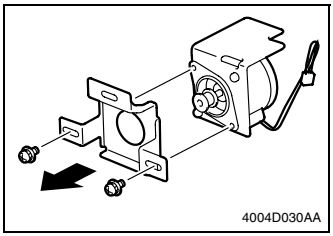
4. Remove four screws and the hinge support in the rear of the IR.



5. Remove the tension spring for the Scanner Motor timing belt.



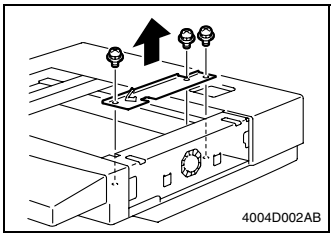
6. Remove the harness from one cord clamp and one edge cover.
7. Remove three screws and the Scanner Motor Assy.



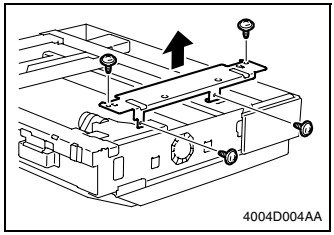
8. Remove two screws and the Scanner Motor.

(7) Removal of IR Cooling Fan Motor 2

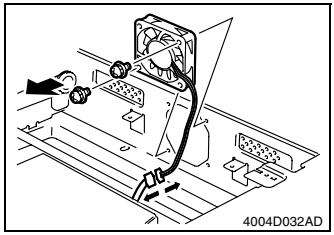
1. Remove the IR Right Cover.
2. Remove the Original Glass.
3. Remove the Control Panel.
4. Remove the IR Lower Front Cover, IR Front Cover, and IR Rear Upper Cover.
5. Remove the optical cover.



6. Remove three screws and the Imaging Processing Lid on the right inside the IR.

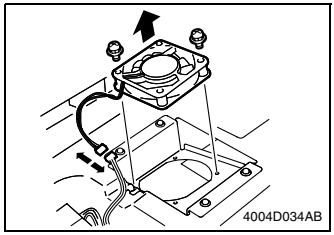


7. Remove four screws and the IR upper right metal bracket.



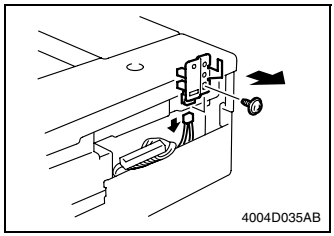
8. Unplug one connector.
9. Remove two screws and IR Cooling Fan Motor 2.

(8) Removal of IR Cooling Fan Motor 1

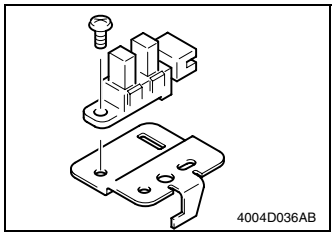


1. Remove the IR Right Cover and Original Glass.
2. Unplug one connector.
3. Remove two screws and IR Cooling Fan Motor 1.

(9) Removal of the Scanner Home Sensor

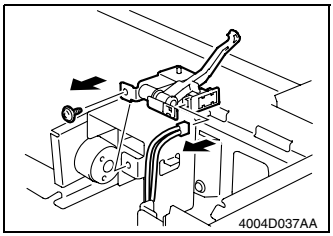


1. Remove the Control Panel.
2. Unplug one connector.
3. Remove one screw and the Scanner Home Sensor Assy.

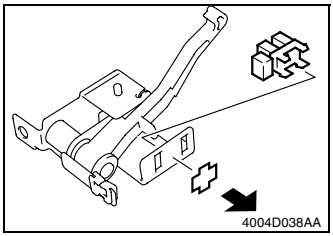


4. Remove one screw and the Scanner Home Sensor.

(10) Removal of the Original Cover Detecting Sensor

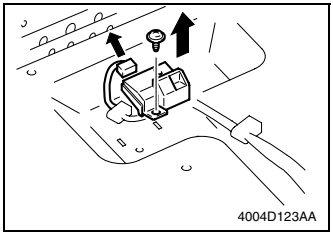


1. Remove the IR Rear Upper Cover and IR Rear Cover.
2. Unplug one connector.
3. Remove one screw and the Original Cover Detecting Sensor Assy.

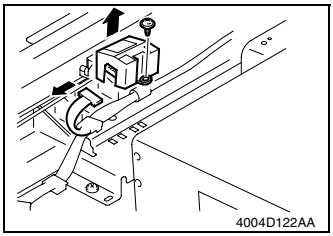


4. Remove the sensor fixing bracket and the Original Cover Detecting Sensor.

(11) Removal of Original Size Detecting Sensors FD1 and FD2

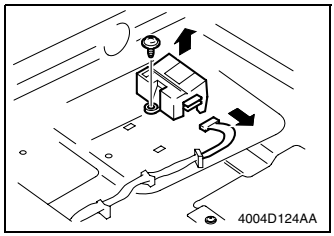


1. Remove the IR Right Cover and Original Glass.
2. Unplug one connector.
3. Remove one screw and Original Size Detecting Sensor FD1.



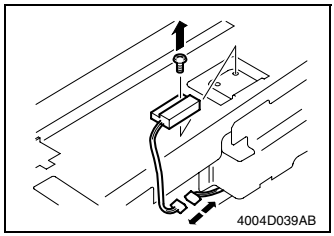
4. Unplug one connector.
5. Remove one screw and Original Size Detecting Sensor FD2.

(12) Removal of Original Size Detecting Sensor CD1



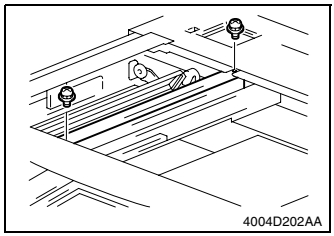
1. Remove the IR Right Cover and Original Glass.
2. Unplug one connector.
3. Remove one screw and Original Size Detecting Sensor CD1.

(13) Removal of the Size Reset Switch

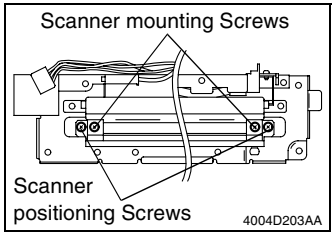


1. Remove the Control Panel and IR Front Cover.
2. Unplug one connector.
3. Remove one screw and Size Reset Switch.

(14) Removal of the Scanner Assy

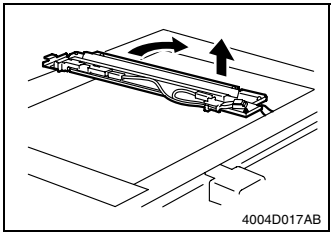


1. Remove the IR Right Cover and Original Glass.
2. Move the Scanner Assy to the location shown and remove one mounting screw each at the front and rear end.



NOTE

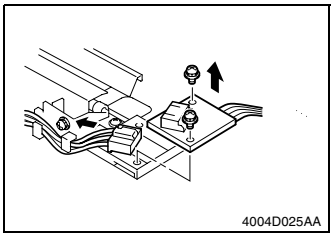
- *Do not remove the Scanner Positioning Screw.*



3. Take out the Scanner Assy by turning it in the direction of the arrow shown.

NOTE

- *The Scanner Assy cannot be completely taken off the copier as a Flat Cable is still connected to it at this time.*

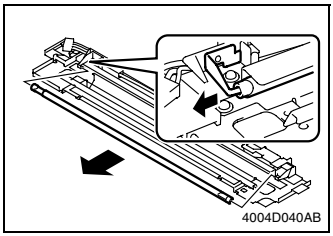


4. Remove two screws, unplug one connector, and remove the Scanner Assy Flat Cable.
5. Remove the Scanner Assy.

(15) Removal of the Exposure Lamp

1. Remove the IR Right Cover and Original Glass.
2. Remove the Scanner Assy.

☞ D-30

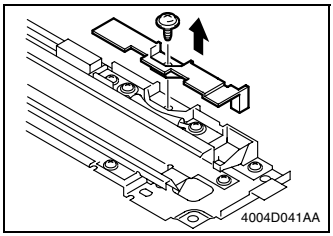


3. Remove the Exposure Lamp from the Lamp Terminals.
4. Remove the Exposure Lamp.

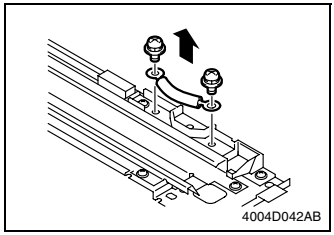
(16) Removal of the Temperature Fuse

1. Remove the IR Right Cover and Original Glass.
2. Remove the Scanner Assy.

☞ D-30



3. Remove one screw and the fuse cover.

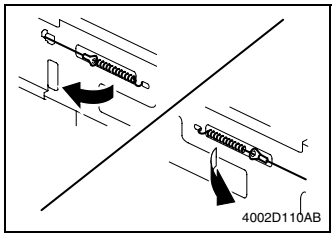


4. Remove two screws and the Temperature Fuse.

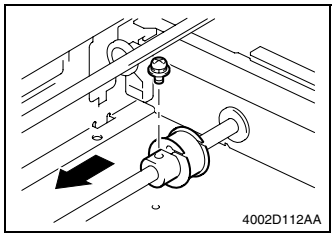
(17) Removal of the Scanner Drive Cables

1. Remove the Control Panel.
2. Remove the IR Right Cover, IR Lower Front Cover, IR Rear Upper Cover, and IR Rear Cover.
3. Remove the Original Glass.
4. Remove the optical cover.
5. Remove the Scanner Assy and Flat Cable.

☞ D-30, D-10



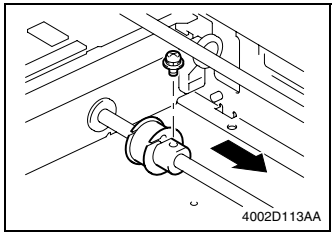
6. Unhook the springs of the Scanner Drive Cables on the hook side, one each at the front and in the rear.
7. Remove the front and rear Scanner Drive Cables.



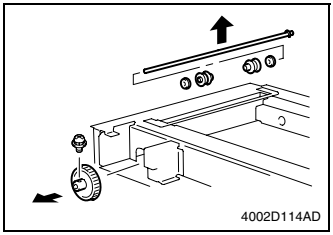
8. Remove the Scanner Motor Assy.

☞ D-26 (steps 4 through 8)

9. Remove one screw and then slide the front pulley and bushing toward the rear.

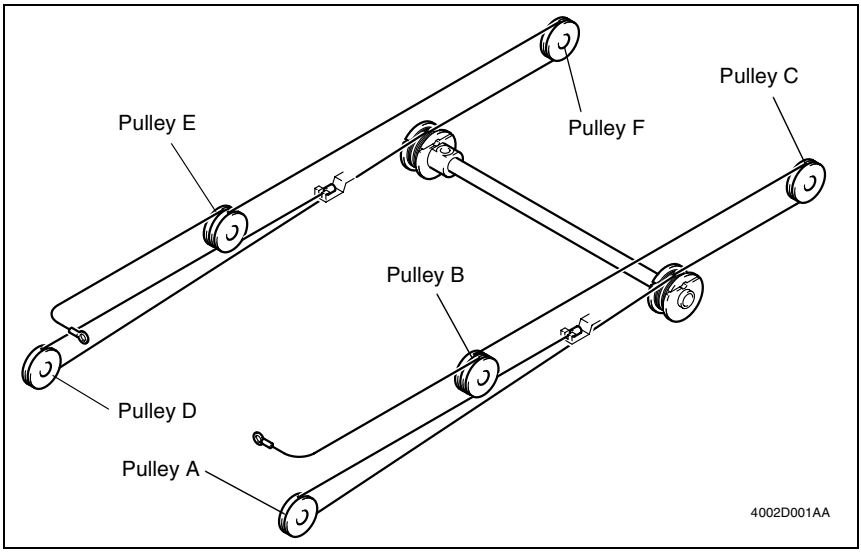


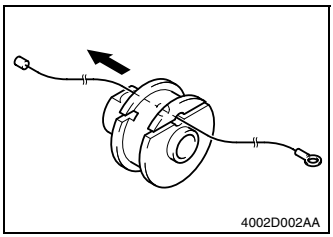
10. Remove one screw and then slide the rear pulley and bushing toward the front.



11. Remove the Scanner Drive Gear, pulleys and bushings at the front and rear, and the shaft.

(18) Winding of the Scanner Drive Cables



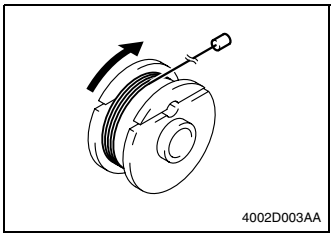


Front

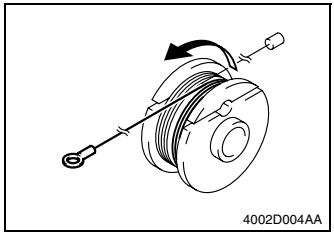
1. Position the round bead of the Scanner Drive Cable in the pulley as shown.

NOTE

- *Make sure that the bead snugly rests in the slit in the pulley.*

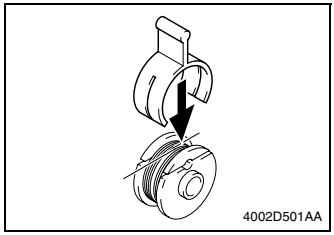


2. Wind the fixed bead end of the cable around the pulley five turns clockwise, from the rear toward the front side.

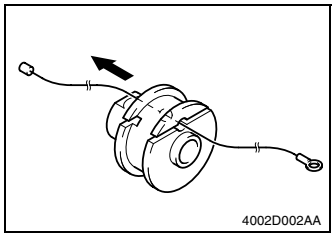


3. Wind the hook end of the cable around the pulley five turns counterclockwise, from the front toward the rear side.

NOTE
- *Make sure that no part of the cable rides on the other.*



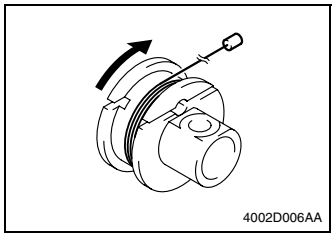
4. Slip the Cable Holding Jig onto the pulley to secure the cable in position.



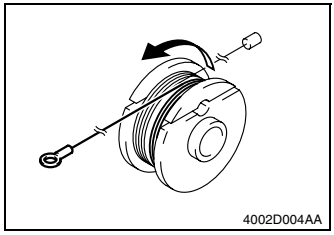
Rear

5. Position the round bead of the Scanner Drive Cable in the pulley as shown.

NOTE
- *Make sure that the bead snugly rests in the slit in the pulley.*

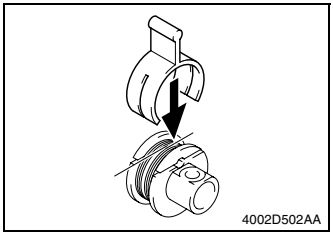


6. Wind the fixed bead end of the cable around the pulley five turns clockwise, from the front toward the rear side.

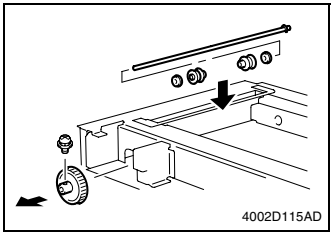


7. Wind the hook end of the cable around the pulley five turns counterclockwise, from the rear toward the front side.

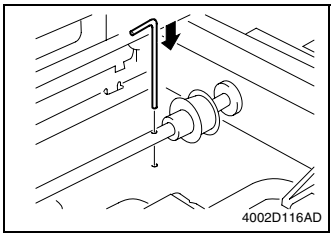
NOTE
- *Make sure that no part of the cable rides on the other.*



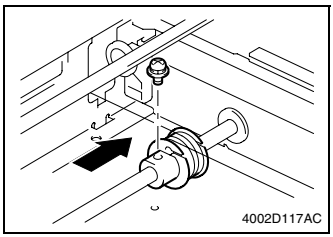
8. Slip the Cable Holding Jig onto the pulley to secure the cable in position.



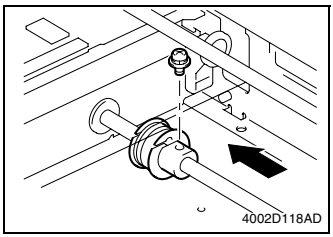
9. Mount the front and rear pulleys and bushings on the shaft and install the shaft to the Scanner Unit.
10. Mount the Scanner Drive Gear on the shaft and secure it in position with one screw.



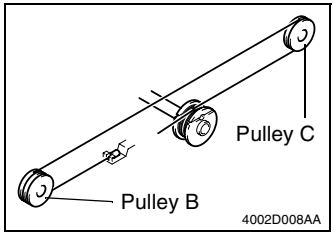
11. Install an Allen wrench into the holes in the shaft and the IR Base Plate.



12. Slide the front pulley and bushing to the front and install one mounting screw.

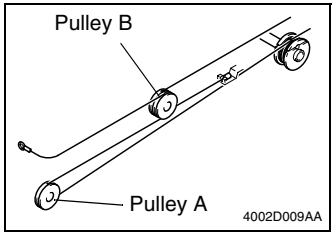


13. Slide the rear pulley and bushing to the rear and install one mounting screw.

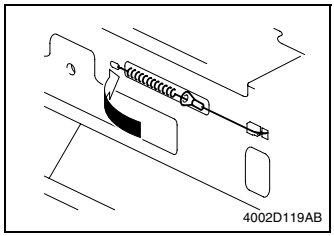


Front

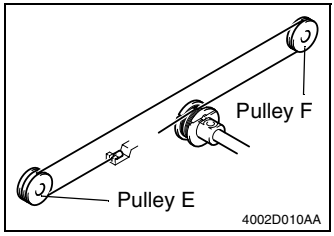
14. Wind the bead end of the cable around pulley C and pulley B, then hook the bead onto the Adjustable Anchor.



15. Wind the hook end of the cable around pulley A and pulley B.

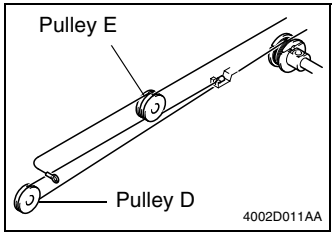


16. Fit the hook end of the cable into the groove in the Cable Guide and hook the spring.

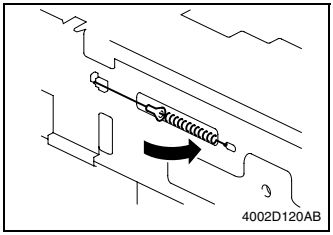


Rear

17. Wind the bead end of the cable around pulley F and pulley E, then hook the bead onto the Adjustable Anchor.



18. Wind the hook end of the cable around pulley D and pulley E.



19. Fit the hook end of the cable into the groove in the Cable Guide and hook the spring.

20. Mount the Scanner Motor Assy.
21. Remove the Cable Holding Jigs from the front and rear pulleys.
22. Remove the Allen wrench.
23. Mount the Scanner Assy and Flat Cable.
24. Reinstall the optical cover.
25. Reinstall the Original Glass.
26. Reinstall the IR Right Cover, IR Lower Front Cover, IR Front Cover, IR Rear Upper Cover, and IR Rear Cover.
27. Reinstall the Control Panel.
28. Adjust the position of the Scanner and 2nd/3rd Mirrors Carriage.

☞ D-90

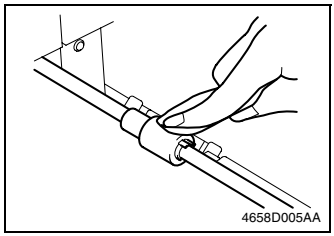
NOTE

- *Whenever the Scanner Drive Cables have been removed, be sure to carry out the "FD-Mag" adjustment procedure.*

☞ D-85

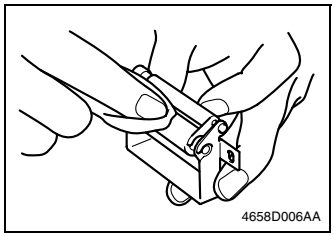
2-7. CLEANING AND DISASSEMBLY OF THE ENGINE PARTS

(1) Cleaning of the Paper Take-Up Roll



1. Slide out the drawer.
2. Using a soft cloth dampened with alcohol, wipe the Paper Take-Up Roll clean of dirt.

(2) Cleaning of the Paper Separator Roll

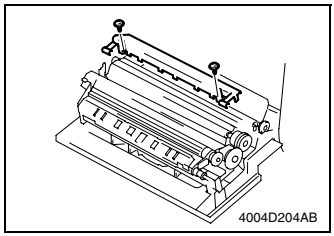


1. Remove the Paper Separator Roll Mounting Assy.

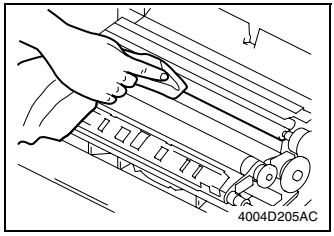
☞ D-61

2. Using a soft cloth dampened with alcohol, wipe the Paper Separator Roll clean of dirt.

(3) Cleaning of the Synchronizing Rollers

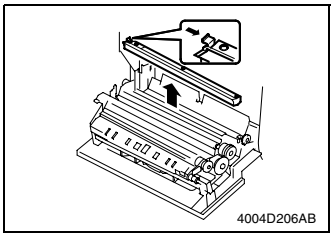


1. Open the Right Door.
2. Remove two screws and the guide.

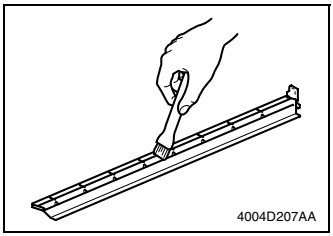


3. Using a soft cloth dampened with alcohol, wipe the Synchronizing Rollers clean of dirt.

(4) Cleaning of the Paper Dust Remover



1. Open the Right Door.
2. Remove the Paper Dust Remover.

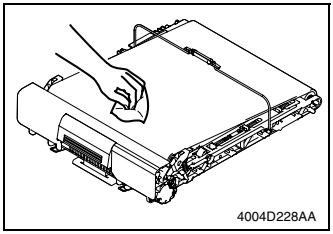


3. Using a brush, whisk dust off the Paper Dust Remover.

(5) Cleaning of the Transfer Belt Unit

NOTES

- *If any solvent is to be used, select one from among the following: IPA, ethyl alcohol, PPC Cleaner, and Solmix AP-7.*
- *When the solvent has been used for cleaning, make 28 or more copies using A3 blank sheets of paper to remove image noise.*



1. Remove the Transfer Belt Unit.

☞ Unit Replacement Manual

2. Wipe the surface of the Transfer Belt with a dry cloth.

NOTES

- *If the dry cloth is not effective in removing dirt, dampen it with alcohol.*
- *Do not use a cloth wet with water.*

(6) Cleaning of the LED

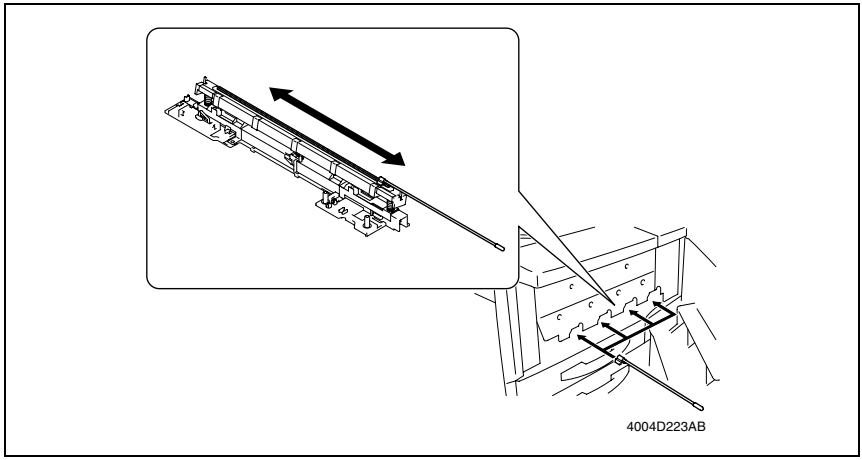
NOTE

- *Whenever the Imaging Unit has been slid out of the copier, be sure to cover it with the light blocking bag (black) or light blocking cloth for packing purposes and place it in a dark place. Avoid leaving it to stand for a long time.*

1. Open the Front Door.
2. Remove the Imaging Unit (C/M/Y/Bk).
3. Using the LED Cleaning Jig, clean the four LEDs.

NOTE

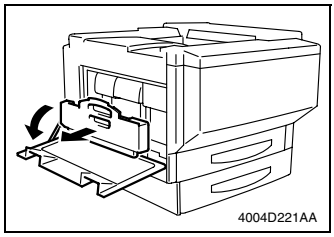
- *Use the specified LED Cleaning Jig only.*



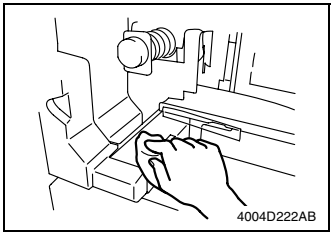
(7) Cleaning of the Area around the Waste Toner Collecting Port

NOTE

- *If spilled toner is left as is, scattering toner particles go into the copier, resulting in an image quality problem.*

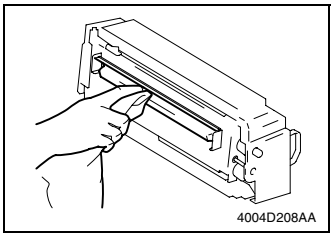


1. Open the Rear Left Cover.
2. Remove the Waste Toner Bottle.



3. Wipe the areas around the Waste Toner Collecting Port clean of spilled toner and dirt using a soft cloth dampened with water or alcohol.

(8) Cleaning of the Fusing Entrance Guide Plate



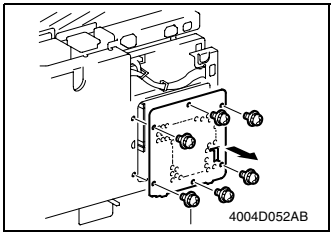
1. Remove the Fusing Unit.
☞ Unit Replacement Manual
2. Wipe the Fusing Entrance Guide Plate clean of dirt using a waste cloth dampened with alcohol.

(9) Removal of the Imaging Unit Motor C/M/Y/Bk

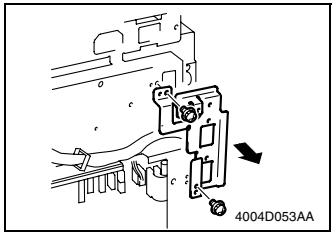
NOTE

- *Whenever the Imaging Unit has been slid out of the copier, be sure to cover it with the light blocking bag (black) or light blocking cloth for packing purposes and place it in a dark place. Avoid leaving it to stand for a long time.*

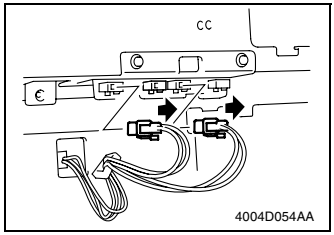
1. Remove the Rear Cover.
2. Open the Upper Right Door.
3. Remove the Rear Upper Cover.
4. Open the Right Door.
5. Remove the Rear Right Cover.
6. Remove the Ozone Filter.
7. Open the Left Door.
8. Remove the Waste Toner Bottle.
9. Remove the Rear Left Cover.



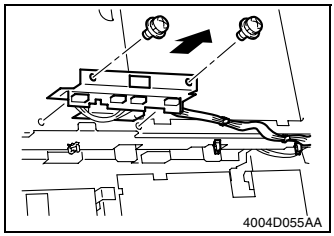
10. Remove six screws and the MSC Cover.



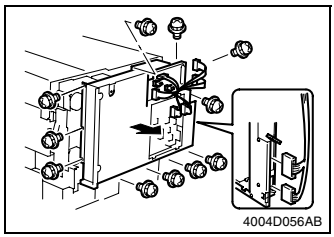
11. Remove two screws and the mounting bracket.



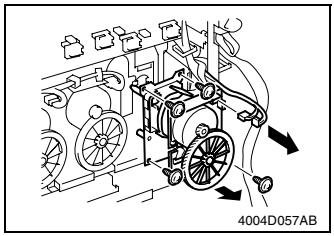
12. Unplug two connectors of the 2nd Drawer.



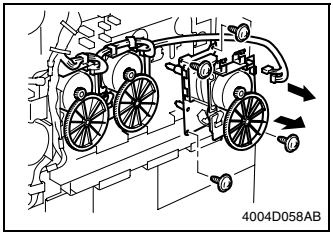
13. Remove two screws and the power line mounting bracket for the 2nd Drawer.
14. Remove the harness from two wiring saddles.



15. Unplug eight connectors.
16. Remove 11 screws and the MSC/PIC Board Box.

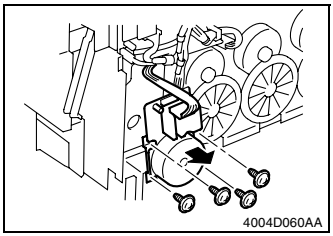


17. Remove the LED Unit.
☞ D-22
18. Unplug two connectors.
19. Remove four screws and Imaging Unit Motor Y.



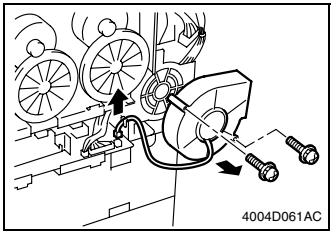
20. Remove the harness from the wiring saddle.
✻ Wiring saddle: Two for M/C; one for Bk
21. Unplug two connectors each.
22. Remove four screws each and Imaging Unit Motor M/C/Bk.

(10) Removal of the Main Motor



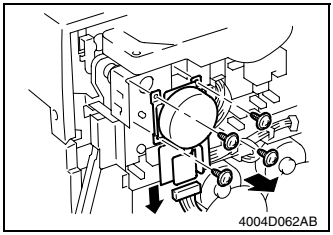
1. Remove the MSC/PIC Board Box.
☞ D-41 (steps 1 through 8)
2. Unplug one connector.
3. Remove four screws and the Main Motor.

(11) Removal of the Ozone Ventilation Fan Motor



1. Remove the MSC/PIC Board Box.
☞ D-41 (steps 1 through 8)
2. Unplug one connector.
3. Remove four screws and the Ozone Ventilation Fan Motor.

(12) Removal of the Fusing Drive Motor



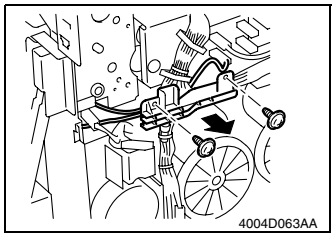
1. Remove the MSC/PIC Board Box.
☞ D-41 (steps 1 through 8)
2. Unplug one connector.
3. Remove four screws and the Fusing Drive Motor.

(13) Removal of the Fusing Pressure/Retraction Motor

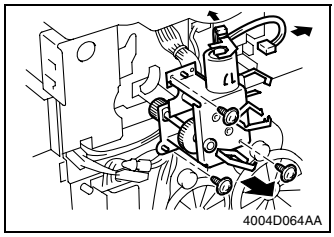
1. Remove the MSC/PIC Board Box.

☞ D-41 (steps 1 through 8)

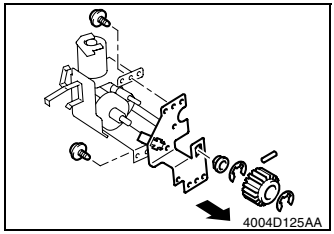
2. Remove the Fusing Drive Motor.



3. Remove two screws and the harness holder.



4. Unplug two connectors.
5. Remove three screws and the Fusing Pressure/ Retraction Motor Assy.

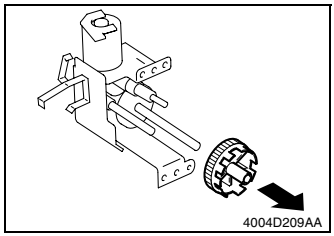


6. Snap off one E-ring and remove the gear and pin.

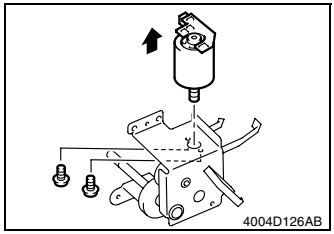
NOTE

- *Use care not to lose the pin.*

7. Snap off one E-ring and remove the bushing.
8. Remove two screws and the Fusing Retraction Position Sensor mounting bracket.



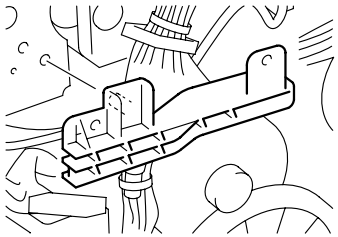
9. Remove the gear (black).



10. Remove two screws and the Fusing Pressure/ Retraction Motor.

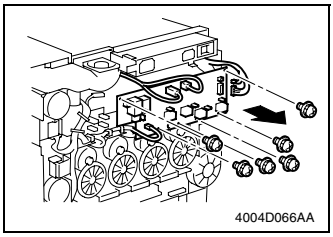
Precaution for Reinstallation

- *When reinstalling the harness holder, make sure that the protrusion on the backside of the holder fits into the hole in the metal bracket.*



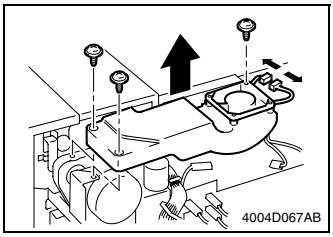
4004D065AB

(14) Removal of the 1st Image Transfer Pressure/Retraction Motor



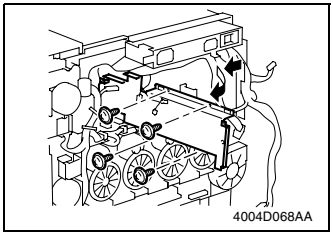
4004D066AA

1. Remove the MSC/PIC Board Box.
☞ D-41 (steps 1 through 8)
2. Unplug three connectors and remove two terminals.
3. Remove six screws and High Voltage Unit 2.



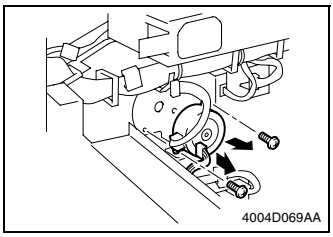
4004D067AB

4. Unplug one connector.
5. Remove three screws and the Fusing Cooling Fan Motor 2 Unit.



4004D068AA

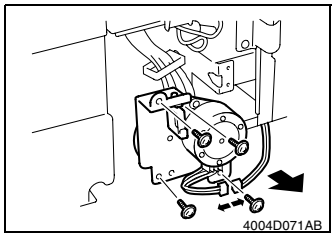
6. Remove four screws and, sliding the board holder to the left, take it off.



4004D069AA

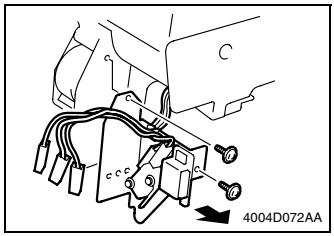
7. Unplug one connector.
8. Remove two screws and the 1st Image Transfer Pressure/Retraction Motor.

(15) Removal of Toner Replenishing Motor C/Bk



1. Open the Front Door.
2. Remove the Right Front Cover.
3. Unplug one connector.
4. Remove four screws and the Toner Replenishing Motor C/Bk Assy.

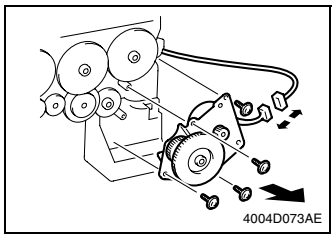
(16) Removal of Toner Replenishing Motor Y/M



1. Remove the Toner Hopper.

☞ D-21

2. Remove two screws and the Front Door Switch Assy.



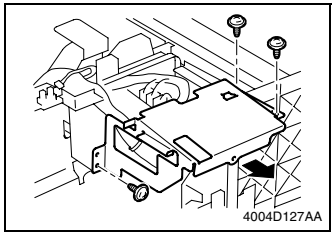
3. Unplug one connector.
4. Remove four screws and the Toner Replenishing Motor Y/M Assy.

(17) Removal of the Cleaning Web Drive Motor

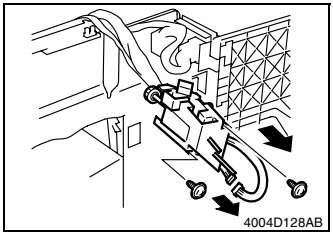
1. Remove the Toner Hopper.

☞ D-21

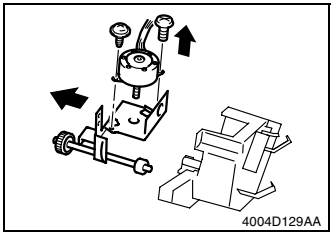
2. Remove the Upper Right Front Cover.
3. Open the Right Door and Upper Right Door.
4. Slid out the Fusing Unit.



5. Remove three screws and the Upper Right Front Cover Guide.

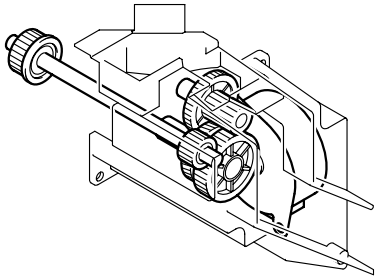


6. Unplug one connector.
7. Remove two screws and the Cleaning Web Drive Motor Assy.

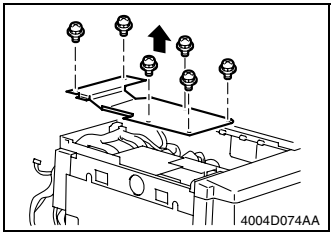


8. Remove two screws and the Cleaning Web Drive Motor.

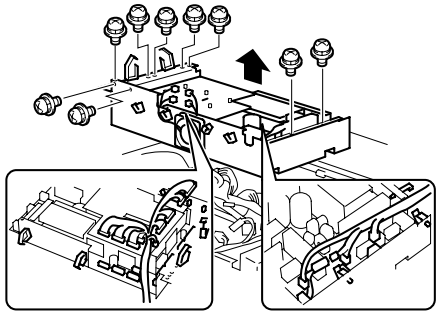
Gear Assy Construction



(18) Removal of the Power Supply Cooling Fan Motor

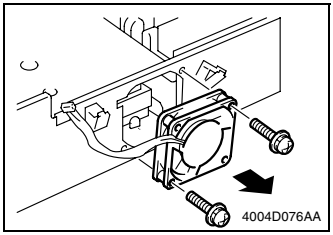


1. Remove the Paper Output Cover, Rear Cover, and Rear Upper Cover.
2. Remove six screws and the DC Power Supply 1 Cover.



4004D075AB

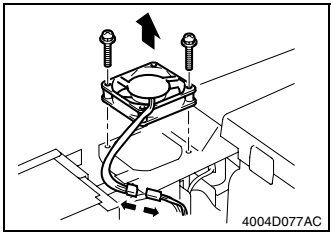
3. Unplug 15 connectors and remove the harness from 13 cord clamps and five wiring saddles.
4. Remove nine screws and DC Power Supply 1.



4004D076AA

5. Remove two screws and the Power Supply Cooling Fan Motor.

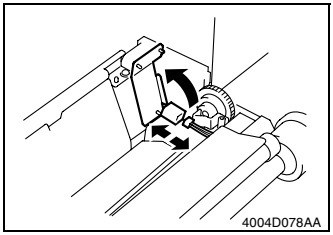
(19) Removal of Fusing Cooling Fan Motor 2



4004D077AC

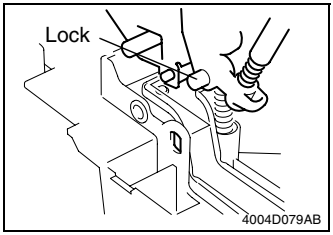
1. Remove the Paper Output Cover, Rear Cover, and Rear Upper Cover.
2. Unplug one connector.
3. Remove two screws and Fusing Cooling Fan Motor 2.

(20) Removal of Fusing Cooling Fan Motor 1

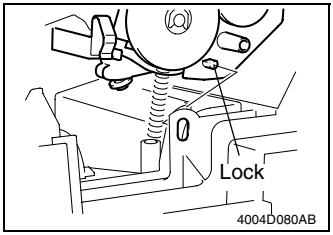


4004D078AA

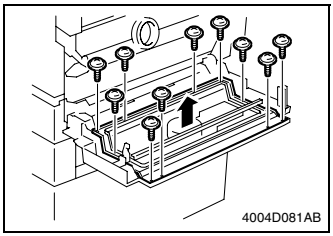
1. Open the Right Door.
2. Open the cover.
3. Unplug one connector.



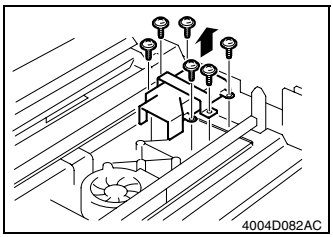
4. Disengage the lock at the front.



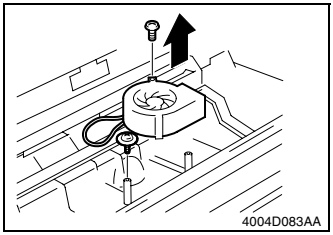
5. Disengage the lock in the rear and remove the 2nd Image Transfer Roller.



6. Remove ten screws and the Right Door reinforcement frame.

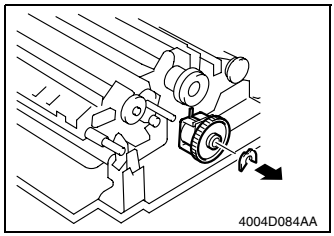


7. Remove two screws and the support.
8. Remove four screws and the fan motor duct.

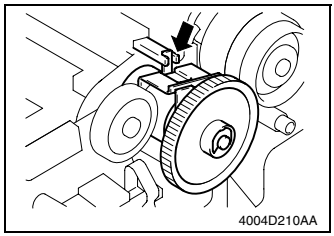


9. Remove two screws and Fusing Cooling Fan Motor 1.

(21) Removal of the 2nd Image Transfer Pressure/Retraction Clutch



1. Open the Right Door.
2. Unplug one connector.
3. Snap off one C-clip and remove the 2nd Image Transfer Pressure/Retraction Clutch.

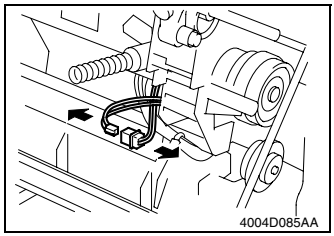


NOTE

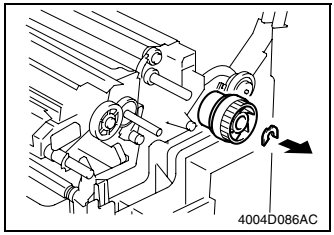
- *When reinstalling the 2nd Image Transfer Pressure/Retraction Clutch, make sure that it is installed correctly as shown.*

(22) Removal of the Synchronizing Roller Clutch

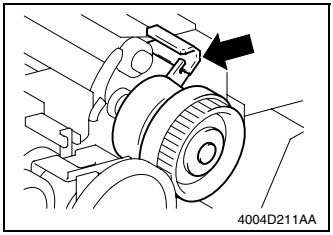
1. Open the Right Door.
2. Remove the 2nd Image Transfer Pressure/Retraction Clutch.
3. Remove the 2nd Image Transfer Roller.



4. Unplug one connector of the Synchronizing Roller Clutch.



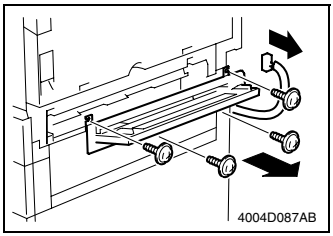
5. Snap off one C-clip and remove the Synchronizing Roller Clutch.



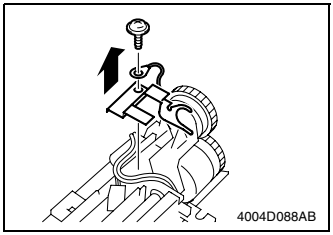
NOTE

- *When reinstalling the Synchronizing Roller Clutch, make sure that it is installed correctly as shown.*

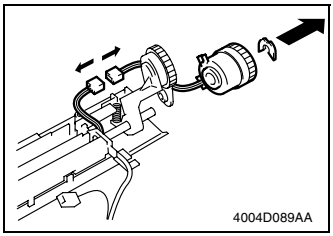
(23) Removal of the Manual Feed Paper Take-Up Clutch



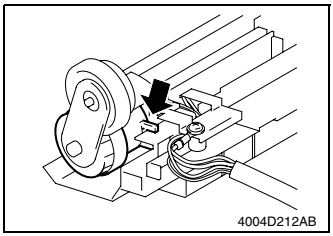
1. Remove the Rear Right Cover.
2. Unplug one connector.
3. Remove four screws and the Manual Bypass Unit.



4. Remove one screw and the ground plate.



5. Unplug one connector.
6. Snap off one C-clip and remove the Manual Feed Paper Take-Up Clutch.



NOTE

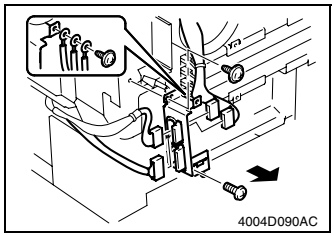
- *When reinstalling the Manual Feed Paper Take-Up Clutch, make sure that it is installed correctly as shown.*

(24) Removal of the Paper Take-Up Clutch

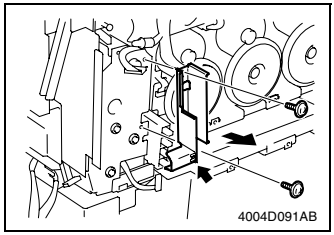
1. Remove the Rear Cover and Rear Right Cover.
2. Remove the MSC/PIC Board Box.

☞ D-41 (steps 1 through 14)

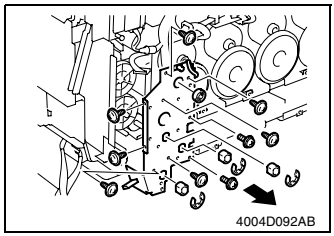
3. Remove the Main Motor.



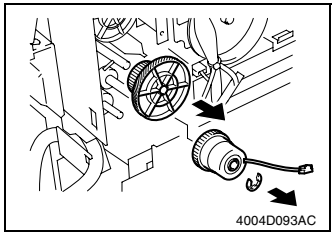
4. Unplug two connectors, disconnect three ground connections, and remove the harness from the wiring saddle.
5. Remove two screws and the hookup connector metal bracket.



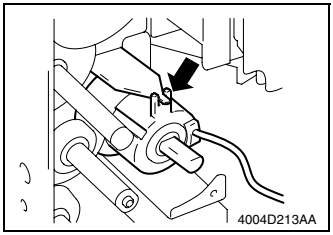
6. Remove two screws and the harness guide.
7. Remove the harness from one edge cover.



8. Remove one bearing.
9. Snap off three E-rings and remove three bushings.
10. Remove nine screws and the Gear Assy Guide.



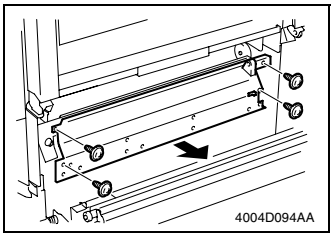
11. Remove one gear.
12. Snap off one E-ring and remove the Paper Take-Up Clutch.



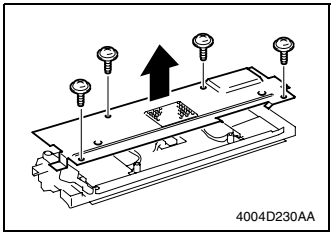
NOTE

- *When reinstalling the Paper Take-Up Clutch, make sure that it is installed correctly as shown.*

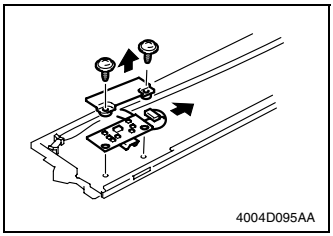
(25) Removal of AIDC/Registration Sensor 1/2



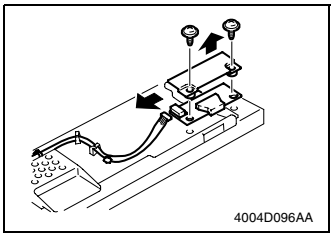
1. Open the Right Door.
2. Remove four screws and the Synchronizing Roller entrance guide.



3. Remove four screws and the cover.

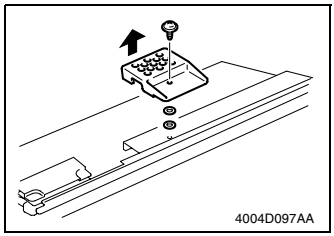


4. Remove two screws, unplug one connector, and remove AIDC/Registration Sensor 1.



5. Remove two screws, unplug one connector, and remove AIDC/Registration Sensor 2.

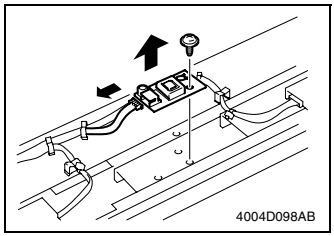
(26) Removal of the Temperature/Humidity Sensor



1. Remove the Synchronizing Roller entrance guide.

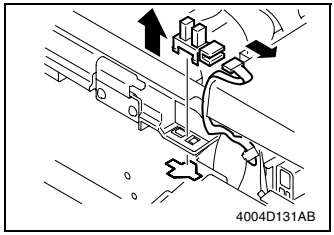
☞ D-53 (steps 1 and 2)

2. Remove one screw, two washers, and the cover.



3. Remove one screw, unplug one connector, and remove the Temperature/Humidity Sensor.

(27) Removal of the Toner Supply Door Sensor



1. Remove the Toner Hopper.

☞ D-21

2. Unplug one connector.
3. Remove the sensor fixing bracket and Toner Supply Door Sensor.

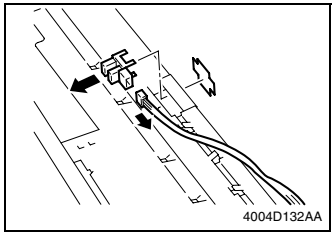
(28) Removal of the Manual Feed Paper Take-Up Sensor

1. Remove the Rear Right Cover.
2. Remove the Manual Bypass Unit.

☞ D-51

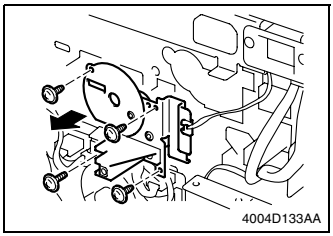
3. Remove the ground plate.

☞ D-50

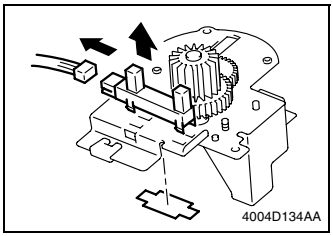


4. Unplug one connector.
5. Remove the sensor fixing bracket and Manual Feed Paper Take-Up Sensor.

(29) Removal of the 1st Image Transfer Retraction Position Sensor

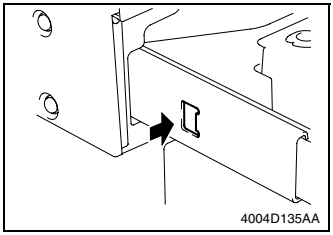


1. Remove the 1st Image Transfer Pressure/Retraction Motor.
☞ D-43
2. Remove four screws and the 1st Image Transfer Retraction Position Sensor Assy.

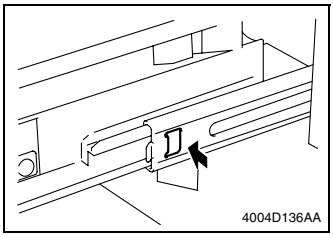


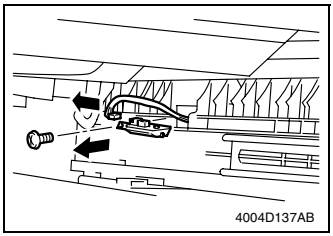
3. Unplug one connector.
4. Remove the sensor fixing bracket and 1st Image Transfer Retraction Position Sensor.

(30) Removal of the Double Feed Sensor



1. Pressing the tabs of the right and left rails, slide out the drawer.



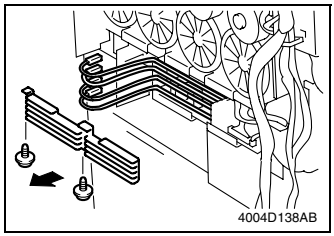


2. Unplug one connector.
3. Remove one screw and the Double Feed Sensor.

(31) Removal of the Drawer Set Sensor and Drawer Paper Near-Empty Sensor

1. Slide out the drawer.
2. Remove the Rear Upper Cover, Rear Right Cover, Rear Left Cover, and Rear Cover.
3. Remove the MSC/PIC Board Box.

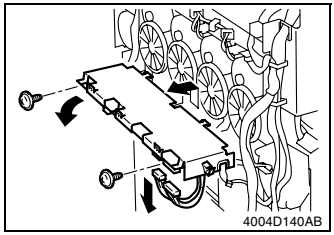
☞ D-41 (steps 1 through 8)



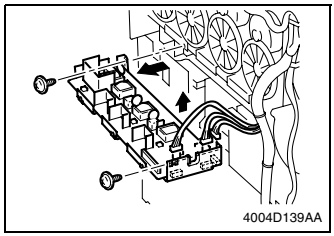
4. Remove four terminals.

✻ Terminal colors: White, blue, red, and orange from top down

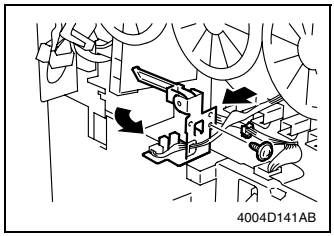
5. Remove two screws and the terminal harness guide.



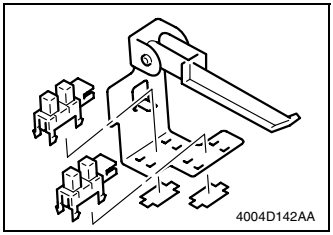
6. Remove two screws and High Voltage Unit 1.
7. Unplug two connectors.
8. Remove the harness from one cord clamp and one edge cover.



9. Unplug three connectors.
10. Remove the harness from one edge cover.
11. Remove two screws and High Voltage Unit 1.

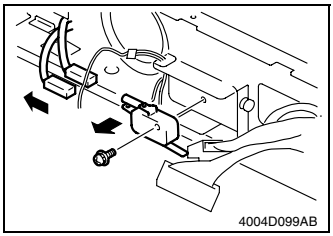


12. Remove one screw and the sensor assy.
13. Remove the harness from one edge cover and unplug two connectors.



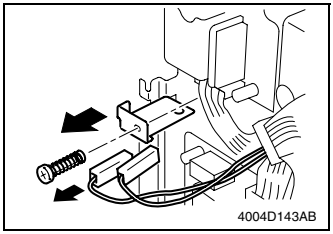
14. Remove the sensor fixing bracket and take off the Drawer Set Sensor and Drawer Paper Near-Empty Sensor.

(32) Removal of the Left Door Switch

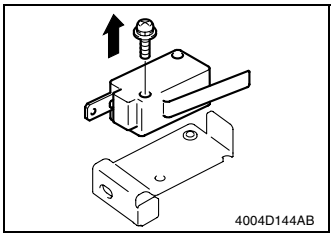


1. Remove the power supply box.
☞ D-47 (steps 1 through 5)
2. Remove two terminals.
3. Remove one screw and the Left Door Switch.

(33) Removal of the Right Door Switch



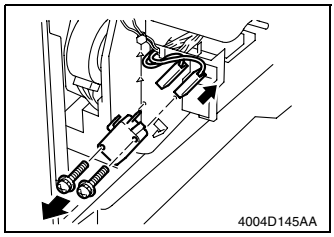
1. Remove the MSC/PIC Board Box.
☞ D-43 (steps 1 through 8)
2. Remove two terminals.
3. Remove one screw and the Right Door Switch Assy.



4. Remove one screw and the Right Door Switch.

(34) Removal of the Front Door Switch

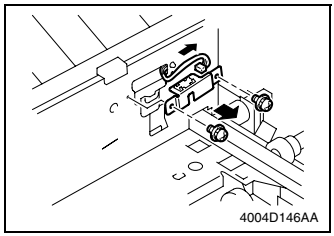
1. Open the Front Door.
2. Open the Toner Supply Door.
3. Remove the Hopper Left Cover.



4. Remove two terminals.
5. Remove two screws and the Front Door Switch.

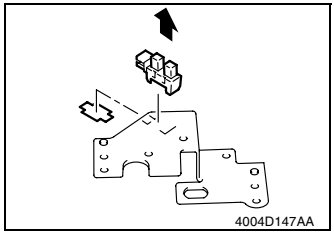
(35) Removal of the Fusing Roller Rotation Detecting Sensor

1. Open the Right Door and Upper Right Door.
2. Slide out the Fusing Unit.



3. Unplug one connector.
4. Remove two screws and the Fusing Roller Rotation Detecting Sensor.

(36) Removal of the Fusing Retraction Position Sensor

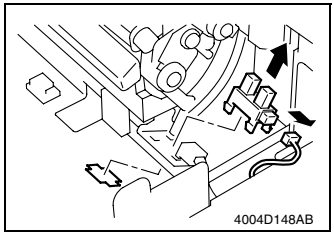


1. Remove the Fusing Pressure/Retraction Motor Assy.

☞ D-44 (steps 1 through 5)

2. Remove the sensor fixing bracket and Fusing Retraction Position Sensor.

(37) Removal of the Exit Sensor

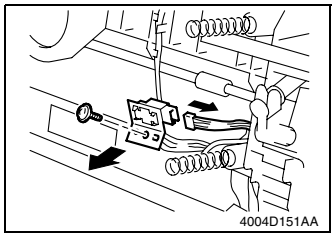


1. Open the Upper Right Door.
2. Unplug one connector.
3. Remove the sensor fixing bracket and Exit Sensor.

(38) Removal of the 2nd Image Transfer Pressure Position Sensor

1. Open the Right Door.
2. Remove the 2nd Image Transfer Roller.

☞ D-48 (steps 1 through 3)

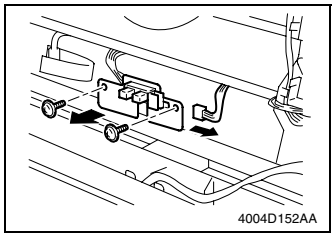


3. Unplug one connector.
4. Remove one screw and the 2nd Image Transfer Pressure Position Sensor.

(39) Removal of the Synchronizing Roller Sensor

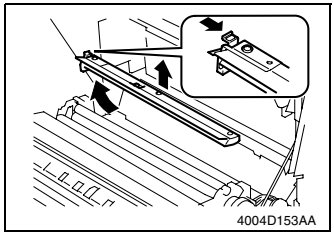
1. Open the Right Door.
2. Remove the 2nd Image Transfer Roller.

☞ D-48 (steps 1 through 3)

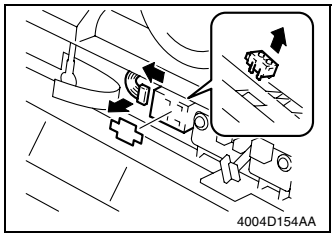


3. Unplug one connector.
4. Remove two screws and the Synchronizing Roller Sensor.

(40) Removal of the OHP Detecting Sensor



1. Open the Right Door.
2. Remove the Paper Dust Remover Unit.

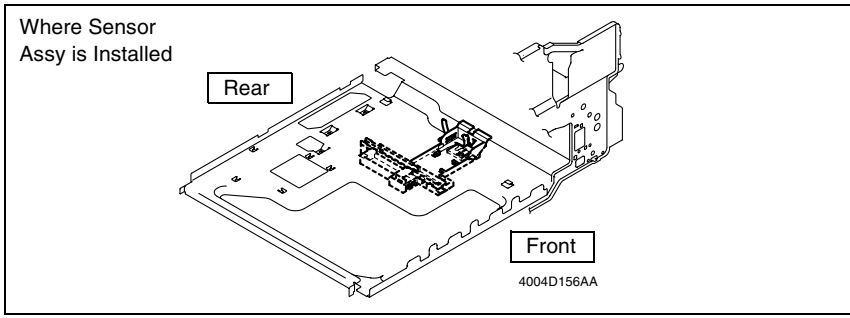


3. Remove the 2nd Image Transfer Roller.

☞ D-48 (steps 1 through 3)

4. Unplug one connector.
5. Remove the sensor fixing bracket and OHP Detecting Sensor.

(41) Removal of the CD Paper Size Detecting Sensor Assy

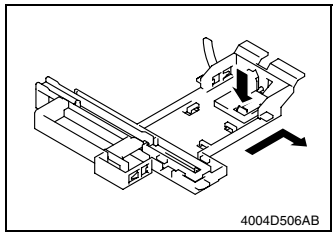


1. Remove the LED Unit.

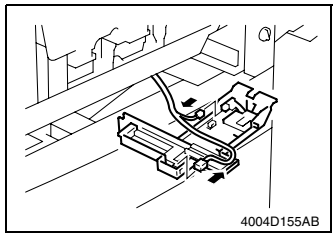
☞ D-22

2. Slide out the drawer.

☞ D-55 (step 1)

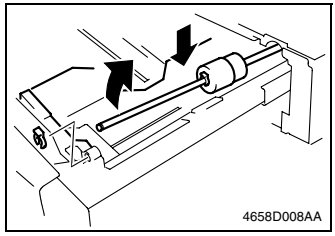


3. Pressing the portion indicated by the arrow of the CD Paper Size Detecting Sensor Assy, slide the assy to the right and take it off.

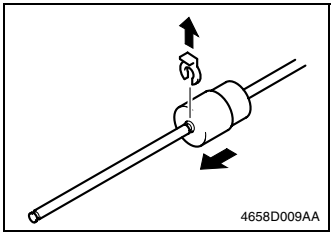


4. Unplug two connectors.

(42) Removal of the Paper Take-Up Roll

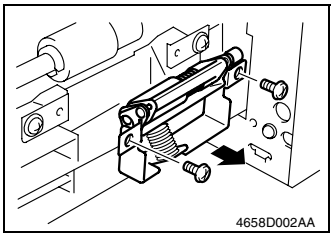


1. Slide out the drawer.
2. Lock the Paper Lifting Plate into position.
3. Snap off one C-clip from the Paper Take-Up Roll Assy.
4. Slide the Paper Take-Up Roll Assy to the rear and take its shaft off the front bushing.

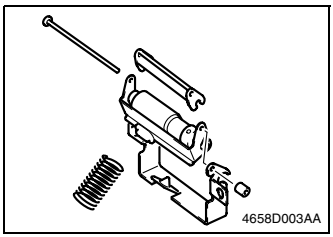


5. Snap off one C-clip and remove the Paper Take-Up Roll.

(43) Removal of the Paper Separator Roll



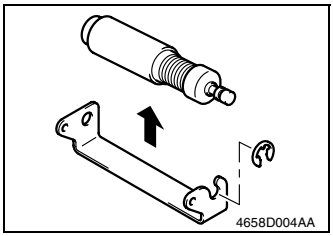
1. Slide out the drawer.
2. Remove two screws and the Paper Separator Roll mounting bracket assy.



3. Take off the rubber stopper, shaft, spring, and guide plate to remove the Paper Separator Roll fixing bracket assy.

NOTE

- *At reinstallation, make sure that the rubber stopper is on the rear side of the copier.*



4. Snap off one E-ring and the Paper Separator Roll Assy.

(44) Removal of High Voltage Unit 1

☞ D-45 (steps 1 through 2)

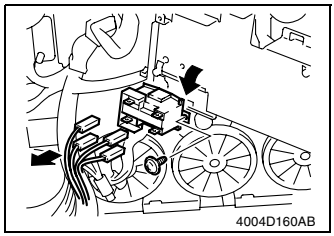
(45) Removal of High Voltage Unit 2/3

☞ D-56 (steps 1 through 8)

(46) Removal of DC Power Supply 1

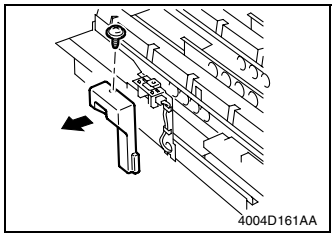
☞ D-47 (steps 1 through 5)

(47) Removal of the Charge Neutralizing Relay

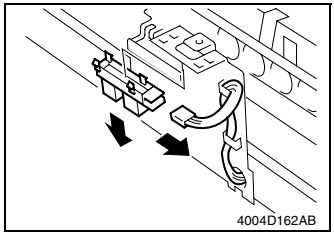


1. Remove the MSC/PIC Board Box.
☞ D-41 (steps 1 through 8)
2. Remove four terminals.
3. Remove one screw and the Charge Neutralizing Relay.

(48) Removal of the Waste Toner Full Detecting Sensor

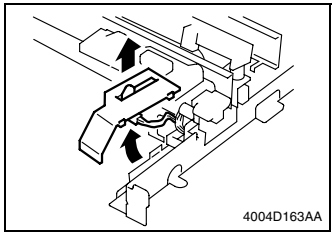


1. Remove the LED Unit.
☞ D-22
2. Remove one screw and the Waste Toner Full Detecting Sensor Cover.

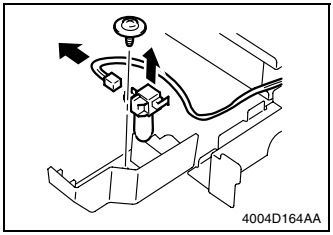


3. Unplug one connector and remove the Waste Toner Full Detecting Sensor.

(49) Removal of the Waste Toner Bottle Set Sensor

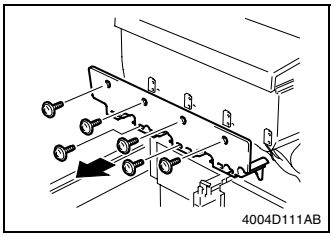


1. Remove the LED Unit.
☞ D-22
2. Disengage two locking tabs and remove the Waste Toner Bottle Set Sensor Assy.

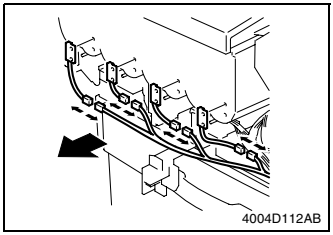


3. Unplug one connector.
4. Remove one screw and the Waste Toner Bottle Set Sensor.

(50) Removal of the Toner Empty Switch (Y/M/C/Bk)



1. Open the Front Door.
2. Remove six screws and the Toner Empty Switch Cover.

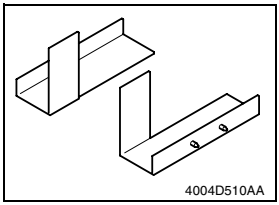


3. Unplug one connector each and remove the Toner Empty Switch.

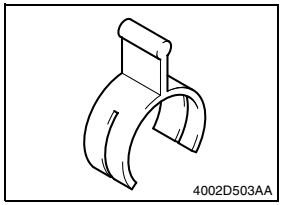
3. ADJUSTMENTS

- The adjustment procedures must be carried out in the order of printer and IR.

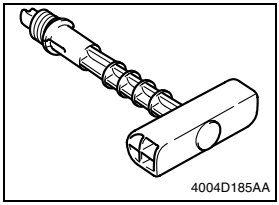
3-1. ADJUSTMENT JIGS AND TOOLS USED



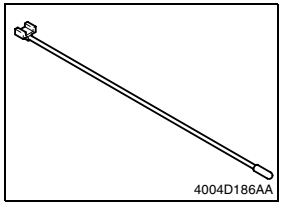
Scanner Positioning Jigs



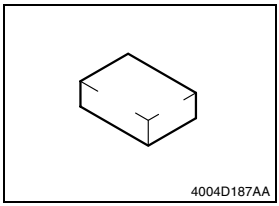
Scanner Drive Cable Holding Jig



Imaging Unit Pull-out Jig



LED Cleaning Jig



LED Cleaning Jig Pad

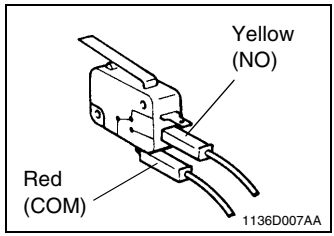
3-2. ADJUSTMENT REQUIREMENTS LIST

	Adjustment Item	Requirements	Ref. Page
Printer	Touch Panel Adj.	Automatically adjusted	☞ D-69
	Top Margin	5.0 ± 1.0 mm	☞ D-70
	Left Margin	3.0 ± 1.0 mm	☞ D-72
	Dup. Left Margin	3.0 ± 1.0 mm	☞ D-73
	Paper Loop	Test print tilts ± 0.	☞ D-74
	Color Shift Correction	FD, CD, and tilt ± 0 with reference to Bk.	☞ D-75
	Fuser Nip	7 ± 0.5 mm	☞ D-78
	Fuser Temp.	—	☞ D-80
	Fuser Speed	—	☞ D-81
	Gradation Adjust	—	☞ D-87
	PRT Max Density	—	☞ D-88
	PRT Highlight	—	☞ D-88
	Background Voltage Margin	—	☞ D-89
IR	Left Image	0 ± 1.0 mm	☞ D-82
	Top Image	10 ± 1.0 mm	☞ D-83
	CD-Mag.	200 ± 1.0 mm	☞ D-84
	FD-Mag.	300 ± 1.5 mm	☞ D-85
	Org. Detect Sensor	Automatically adjusted	☞ D-86

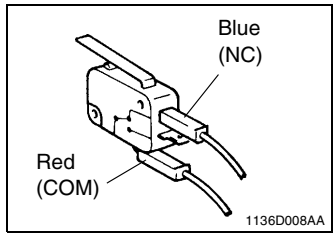
3-3. ADJUSTMENT OF SWITCHES

(1) Microswitches

The following microswitches are used in various parts of this copier.



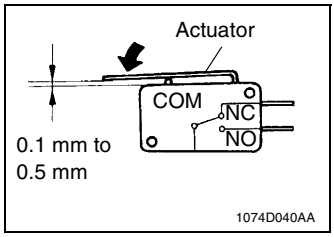
Wiring for the NO Type



Wiring for the NC Type

NC (Normally-Closed)	:	Current flows between NC and COM when the actuator is open.
NO (Normally-Open)	:	Current flows between NO and COM when the actuator is closed.
COM (Common)	:	Common contact for NC and NO.

Requirement

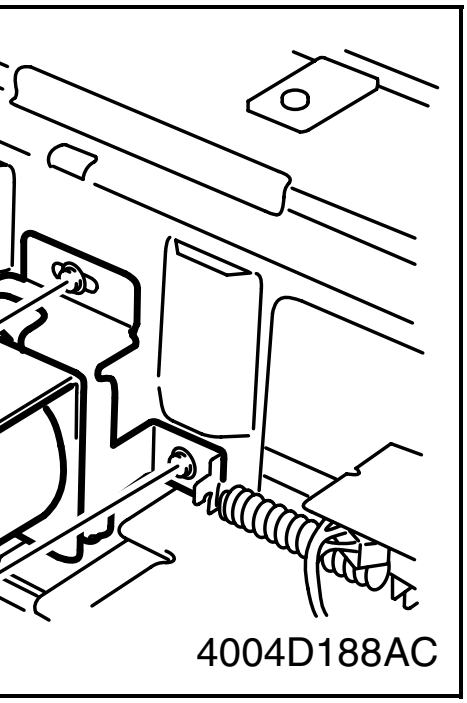


The gap between the switch and actuator should be 0.1 to 0.5 mm when the actuator is closed.

Out-of-Adjustment (When the actuator is closed)

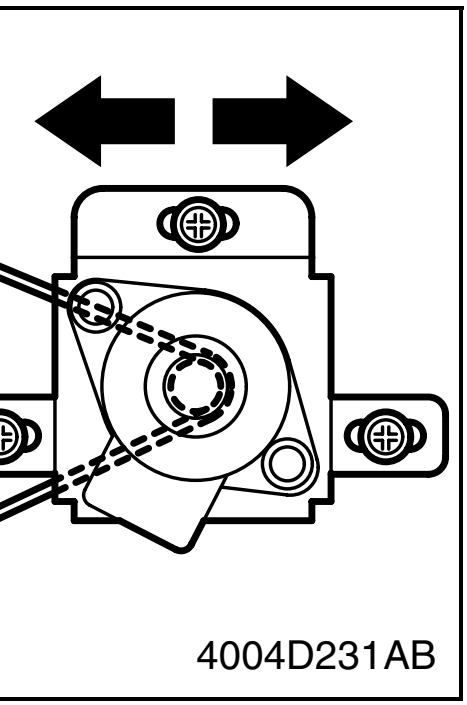
- If the gap between the switch and actuator is too big, current dose not at times flow to NC or NO.
- If there is no gap between the switch and actuator, the actuator is bent or the switch can be broken.

iginal Glass Cooling Fan Motor.



4004D188AC

2. Loosen the three screws th
   Motor mounting bracket.



4004D231AB

3. With the Scanner Drive Ge
   positioned on the motor sid
   Motor to the right and left t
4. Tighten the three screws th
   Motor mounting bracket.

3-5. ELECTRICAL/IMAGE ADJUSTMENT

(1) Accessing the Tech. Rep. Mode

1. Press the Utility key.
2. Touch [Meter Count].
3. Press the following keys in this order:
   Stop → 0 → 0 → Stop → 0 → 1

(2) Producing a Test Print

1. Call the Tech. Rep. Mode to the screen.
2. Touch [Test Print].
3. Select the desired test pattern type.
4. Make the necessary settings.
5. Press the Start key.

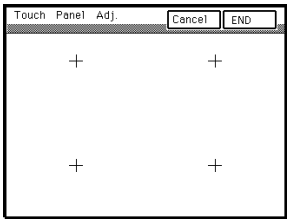
✻ Press the Stop key to terminate the Test Print function.

(3) Touch Panel Adj.

NOTE

- *Make this adjustment if the Touch Panel is slow to respond to a pressing action.*

1. Press the following keys:
   Stop → 0 → Stop → 3

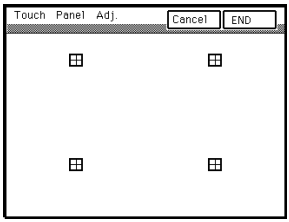


1155D191CA

2. Using the tip of a pen or similar object, touch the four crosses (+) on the screen in sequence.

NOTES

- *These crosses may be touched in any order; but be sure to touch the center of each cross.*
- *Use care not to damage the screen surface with the tip of the pen.*

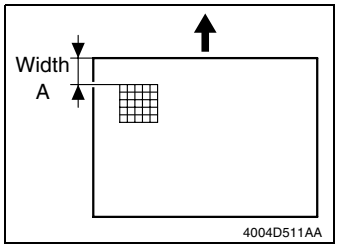


1155D192CA

3. The cross touched changes into a grid marker that consists of a square with a cross superimposed.
4. Touch [END].

(4) Top Margin

Requirement



Width A on the test pattern produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
5.0 or 7.0 ± 1.0 mm	Top Margin	-2.0 mm to +2.0 mm

✻ The leading edge erase width is set to 5 mm or 7 mm by “Erase” under “Administrator Mode.”

This adjustment must be made in any of the following cases:

- *The LED Unit has been replaced.*
- *The paper type has been changed.*
- *The image on the copy deviates in the FD direction.*
- *A faint image occurs on the leading edge of the image.*
- *A misfeed occurs at the 2nd image transfer section.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “PRT Area” → “Top Margin.”
3. Load the 1st Drawer with A3 plain paper.
4. Select plain paper on the Paper Type Setting Dial.
5. Press the Start key to let the copier produce a test pattern.
6. Check the dimension of width A on the test pattern.

✻ If width A is outside the specified range:

7. Touch “Paper Send Position” and then change the setting using the Up/Down key.

Adjustment Instructions

If width A is longer than the specifications, make the setting value smaller than the current one.

If width A is shorter than the specifications, make the setting value greater than the current one.

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8. Press the Start key to let the copier produce a test pattern.
9. Check the dimension of width A on the test pattern.
10. If width A is outside the specified range, change the setting again and make a check again.
11. If width A falls within the specified range, touch “MENU.”
12. Following the same procedure, adjust for thick paper and OHP.
13. Go back to the initial Tech. Rep. Mode screen.
14. Touch “Test Print.”
15. Select “Halftone Pattern.”

16. Select “Cyan,” “SINGLE,” and “HYPER.”
17. Press the Clear key to clear the density setting.
18. Enter “255” from the 10-Key Pad.
19. Press the Start key to let the copier produce a test pattern.
20. Check to see if the image on the leading and trailing edges of the test pattern is faint.

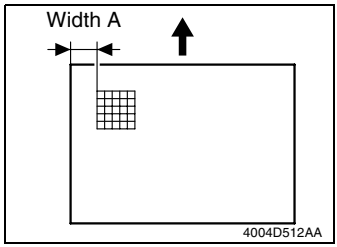
✻ If the image is faint:
21. Touch these keys in this order: “Machine Adjust” → “PRT Area” → “Top Margin.”
22. Touch “2nd Transfer Timing” and then use the Down key to decrease the setting.

NOTE
- *Decreasing the setting makes transfer timing faster. An abnormally low setting could, however, result in a paper misfeed.*

23. Touch “MENU.”
24. Produce a halftone test pattern again.
25. Check the image on the leading and trailing edges of the test pattern.
26. If the image on the leading and trailing edges of the test pattern is faint, change the setting and make a check again.

(5) Left Margin

Requirement



Width A on the test pattern produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
3.0 ± 1.0 mm	Left Margin	-3.0 mm to +3.0 mm

This adjustment must be made in any of the following cases:

- *The LED Unit has been replaced.*
- *A paper feed unit has been added.*
- *The image on the copy deviates in the CD direction.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “PRT Area” → “Left Margin.”
3. Load the 1st Drawer with A3 plain paper.
4. Select plain paper on the Paper Type Setting Dial.
5. Select the 1st Drawer.
6. Press the Start key to let the copier produce a test pattern.
7. Check the dimension of width A on the test pattern.

✻ If width A is outside the specified range:

8. Touch “1st” and then change the setting using the Up/Down key.

Adjustment Instructions

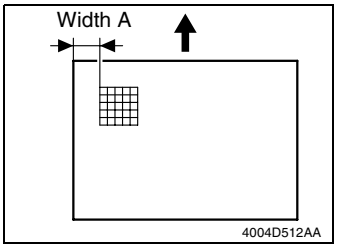
If width A is longer than the specifications, make the setting value smaller than the current one.

If width A is shorter than the specifications, make the setting value greater than the current one.

9. Press the Start key to let the copier produce a test pattern.
10. Check the dimension of width A on the test pattern.
11. If width A is outside the specified range, change the setting again and make a check again.
12. If width A falls within the specified range, touch “MENU.”
13. Following the same procedure, adjust for all other paper sources.

(6) Dup. Left Margin

Requirement



Width A on the test pattern produced should fall within the following range.

NOTE

- *Make this check with the backside of the test pattern produced.*

Specifications	Adjustment Mode	Setting Range
3.0 ± 1.0 mm	Dup. Left Margin	-3.0 mm to +3.0 mm

This adjustment must be made in any of the following cases:

- *The Duplex Unit has been set up.*
- *The image on the backside of the 2-sided copy deviates in the CD direction.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “PRT Area” → “Dup. Left Margin.”
3. Load the 1st Drawer with A3 plain paper.
4. Select plain paper on the Paper Type Setting Dial.
5. Select the 1st Drawer.
6. Press the Start key to let the copier produce a test pattern.
7. Check the dimension of width A on the test pattern.

✻ If width A is outside the specified range:

8. Touch “1st” and then change the setting using the Up/Down key.

Adjustment Instructions

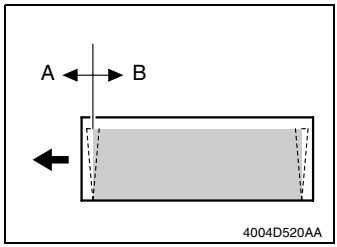
If width A is longer than the specifications, make the setting value smaller than the current one.

If width A is shorter than the specifications, make the setting value greater than the current one.

9. Press the Start key to let the copier produce a test pattern.
10. Check the dimension of width A on the test pattern.
11. If width A is outside the specified range, change the setting again and make a check again.
12. If width A falls within the specified range, touch “MENU.”
13. Following the same procedure, adjust for all other paper sources.

(7) Paper Loop

Requirement



The test pattern produced should not deviate in the direction of either A or B.

Adjustment Mode	Setting Range
Paper Loop	-5 to +5

This adjustment must be made in any of the following cases:

- *The void image along the leading edge varies from one copy to another.*
- *Paper skew occurs.*
- *Paper is folded.*
- *Paper misfeed occurs.*

Adjustment Procedure

1. Select the paper source, for which the adjustment is to be made.
2. Call the Tech. Rep. Mode to the screen.
3. Touch “Test Print.”
4. Touch “Halftone Pattern.”
5. Press the Start key and then immediately press the Stop key to let the copier produce the test pattern.
6. Fold the test pattern in half lengthwise to check for deviation in the pattern.

✻ If there is any deviation in the pattern:

7. Go back to the Tech. Rep. Mode initial screen.
8. Touch “Machine Adjust.”
9. Touch “Paper Loop.”
10. Select the paper and paper source to be adjusted.
11. Press the Clear key to clear the current setting.
12. Enter the setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

Setting Instructions

If the test pattern deviates in the direction of A, decrease the setting.
If the test pattern deviates in the direction of B, increase the setting.

13. Touch “MENU.”
14. Let the copier produce a test pattern again.
15. Check the test pattern for deviation.
16. If there is any deviation, change the setting for Paper Loop and make a check again.
17. If there is no deviation, use the same procedure to adjust for all other paper types and sources.

(8) Color Shift Correction

This adjustment must be made in the following case:

- *Color shift occurs.*

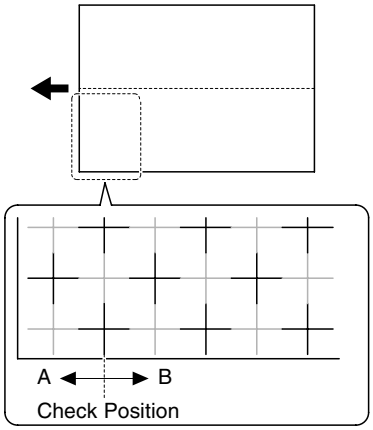
Adjustment Procedure

1. Make the “Paper Loop” adjustment.

☞ D-74

2. Go back to the Tech. Rep. Mode initial screen.
3. Touch these keys in this order: “Machine Adjust” → “Color Shift Correction.”
4. Touch “Color Shift Correction (Bk).”
5. Press the Start key to let the copier produce a test pattern.
6. Fold the test pattern in half lengthwise.
7. Check to see if the black cross at the location shown below deviates or not.
8. If it deviates, change the setting using the Up/Down key.
   If it does not deviate, go to step 12.

Setting Instructions



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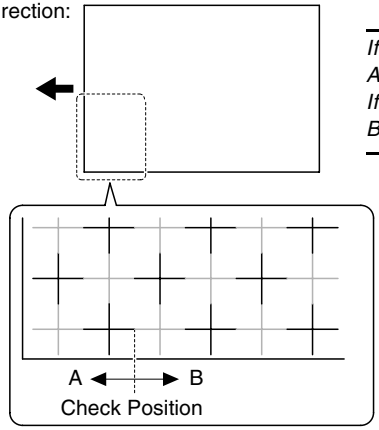
If the cross deviates in the direction of A, decrease the setting.
If the cross deviates in the direction of B, increase the setting.

9. Press the Start key to let the copier produce a test pattern.
10. Check to see if the cross on the test pattern deviates.
11. If it deviates, change the setting and then make a check again.
    If it does not deviate, go to step 12.
12. Touch “MENU.”
13. Touch “Color Shift Correction (C).”
14. Press the Start key to let the copier produce a test pattern.
15. Check to see if any of the cyan, magenta, and yellow crosses deviates with reference to the black cross.

✻ If any of the crosses deviates:
16. Touch the color of the deviated cross.
17. Change the settings for X and Y using the Up/Down key.

Setting Instructions

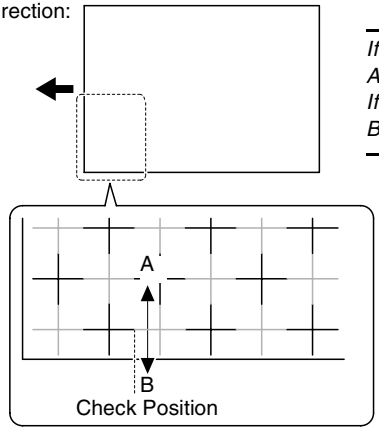
For X direction:



4004D507AB

If the cross deviates in the direction of A, decrease the setting.
If the cross deviates in the direction of B, increase the setting.

For Y direction:



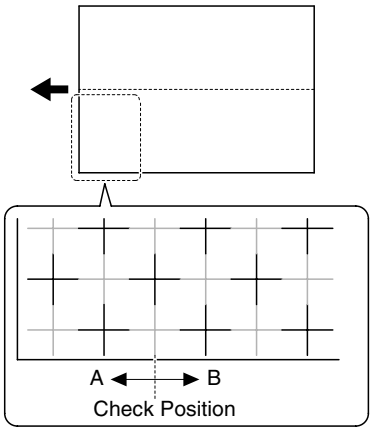
4004D508AB

If the cross deviates in the direction of A, decrease the setting.
If the cross deviates in the direction of B, increase the setting.

18. Fold the test pattern in half lengthwise.
19. Check to see if any of the cyan, magenta, and yellow crosses deviates with reference to the black cross.

✻ If any of the crosses deviates:
20. Touch the color of the deviated cross.
21. Change the setting for skew using the Up/Down key.

Setting Instructions



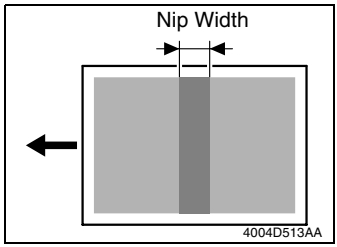
If the cross deviates in the direction of A, decrease the setting.
If the cross deviates in the direction of B, increase the setting.

4004D521AA

22. Press the Start key to let the copier produce a test pattern.
23. Check to see if any of the cyan, magenta, and yellow crosses deviates with reference to the black cross.
24. If any of the crosses deviates, change the setting and make a check again.

(9) Fuser Nip

Requirement



The nip width on the test pattern produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
7.0 ± 0.5 mm	Fuser Nip	—

This adjustment must be made in any of the following cases:

- *Fusing performance is poor.*
- *A misfeed occurs at the fusing section.*
- *Gloss failure occurs.*
- *Image problems relating to copies made on OHP transparencies occur.*

Adjustment Procedure

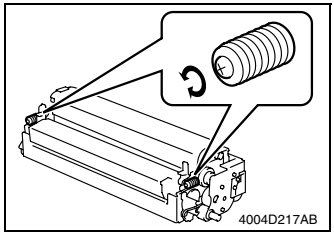
1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “Fuse Nip.”
3. Load the 1st Drawer with A4 crosswise paper.
4. Select plain paper on the Paper Type Setting Dial.
5. Press the Start key to let the copier produce a test pattern.
6. Check the nip width on the test pattern.

✻ If the nip width is outside the specified range:

7. Slide out the Fusing Unit.

☞ Unit Replacement Manual

8. Remove the front and rear covers from the Fusing Unit.



9. Turn the adjusting screws at the front and rear to adjust the nip width.

Adjustment Instructions

If the nip width on the test pattern is longer than the specifications, loosen the adjusting screws.

If the nip width on the test pattern is shorter than the specifications, tighten the adjusting screws.

10. Reinstall the front and rear covers and the Fusing Unit in position.
11. Close the Right Door and Upper Right Door.
12. Produce a test pattern again.
13. Check the nip width on the test pattern.
14. If the nip width does not fall within the specifications, turn the adjusting screws as necessary and then make a check again.

(10) Fuser Temp.

This adjustment must be made in the following case:

- *Fusing performance is poor or offset occurs when the paper type or environmental conditions are changed.*

As a general rule, the following settings should not be changed:

- *Plain (Lower)*
- *OHP Film (Lower)*
- *Thick 1 (Lower)*
- *Thick 2 (Lower)*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “Fuse Temp.”
3. Select the paper type.
4. Press the Clear key to clear the current setting.
5. Enter the new setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

Adjustment Instructions

If fusing performance is poor, increase the setting.
If offset occurs, decrease the setting.

✻ *The temperature does not change immediately when the setting is change. Wait a while before performing the subsequent steps.*

6. Touch “MENU.”
7. Go back to the Basic screen.
8. Make an ordinary copy using the paper type selected in step 3.
9. Check the image on the copy to ensure that there are no image problems evident.
10. If fusing performance is still poor or offset is evident, change the setting and make a check again.

(11) Fuser Speed

This adjustment must be made in the following case:

- *Brush effect or blurred image is evident as a result of changes in environmental conditions or degraded durability.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “Fuse Speed.”
3. Select the paper type.
4. Press the Clear key to clear the current setting.
5. Enter the new setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

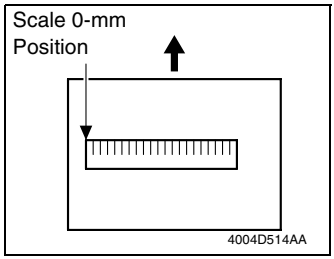
Adjustment Instructions

If brush effect is evident, decrease the setting.
If a blurred image occurs, increase the setting.

6. Touch “MENU.”
7. Go back to the Basic screen.
8. Make an ordinary copy using the paper type selected in step 3.
9. Check the image on the copy to ensure that there are no image problems evident.
10. If brush effect or blurred image is still evident, change the setting and make a check again.

(12) Left Image

Requirement



The position of 0 mm of the scale on the sample copy produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
0 ± 1.0 mm	Left Image	-10.0 to +10.0

This adjustment must be made in any of the following cases:

- *The Original Glass has been replaced.*
- *The Scanner Home Sensor has been replaced.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “IR Area.”
3. Touch “Left Image.”
4. Place a scale on the Original Glass so that it runs parallel with the Original Width Scale and its leading edge is aligned with the Original Length Scale.
5. Press the Start key to make a copy.
6. Check the image on the copy produced.

✻ If the image does not meet the specifications:

7. Change the setting using the Up/Down key.

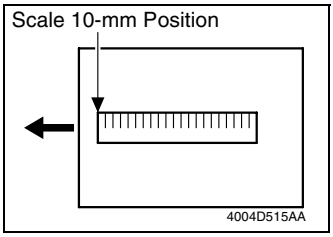
Adjustment Instructions

If the 0-mm position on the sample copy is on the right side of the correct 0-mm position perpendicularly to the feeding direction (less than -1 mm), decrease the setting.
If the 0-mm position on the sample copy is on the left side of the correct 0-mm position perpendicularly to the feeding direction (exceeding 1 mm), increase the setting.

8. Press the Start key to make a copy.
9. Check the image on the copy to see if the specifications are met.
10. If it fails to meet the specifications, change the setting and make a check again.
11. If it meets the specifications, touch “MENU.”

(13) Top Image

Requirement



The position of 10 mm of the scale on the sample copy produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
10.0 ± 1.0 mm	Top Image	-5.0 to +5.0

This adjustment must be made in any of the following cases:

- *The CCD Unit has been replaced.*
- *The Original Glass has been replaced.*
- *The Original Scale has been replaced.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “IR Area.”
3. Touch “Top Image.”
4. Place a scale on the Original Glass so that it runs parallel with the Original Length Scale and its leading edge is aligned with the Original Width Scale.
5. Press the Start key to make a copy.
6. Check the image on the copy produced.

✻ If the image does not meet the specifications:

7. Change the setting using the Up/Down key.

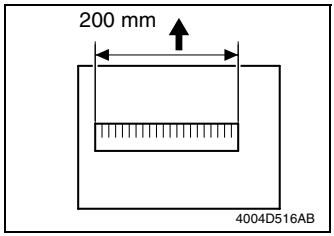
Adjustment Instructions

If the 10-mm position on the sample copy is on the right side of the correct 10-mm position parallel to the feeding direction (less than 9 mm), decrease the setting.
If the 10-mm position on the sample copy is on the left side of the correct 10-mm position parallel to the feeding direction (exceeding 11 mm), increase the setting.

8. Press the Start key to make a copy.
9. Check the image on the copy to see if the specifications are met.
10. If it fails to meet the specifications, change the setting and make a check again.
11. If it meets the specifications, touch “MENU.”

(14) CD-Mag.

Requirement



The 200-mm width of the scale on the sample copy produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
200 ± 1.0 mm	CD-Mag.	0.990 to 1.010

This adjustment must be made in any of the following cases:

- *The CCD Unit has been replaced.*
- *The lens has been replaced.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “IR Area.”
3. Touch “CD-Mag.”
4. Place a scale on the Original Glass so that it runs parallel with the Original Width Scale and its leading edge is aligned with the Original Length Scale.
5. Press the Start key to make a copy.
6. Check the image on the copy produced.

✻ If the image does not meet the specifications:

7. Change the setting using the Up/Down key.

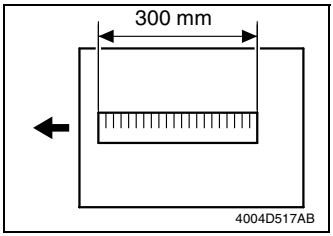
Adjustment Instructions

If the specified width on the copy is less than 199 mm, increase the setting.
If the specified width on the copy exceeds 201 mm, decrease the setting.

8. Press the Start key to make a copy.
9. Check the image on the copy to see if the specifications are met.
10. If it fails to meet the specifications, change the setting and make a check again.
11. If it meets the specifications, touch “MENU.”

(15) FD-Mag.

Requirement



The 300-mm width of the scale on the sample copy produced should fall within the following range.

Specifications	Adjustment Mode	Setting Range
300 ± 1.5 mm	FD-Mag.	0.990 to 1.010

This adjustment must be made in any of the following cases:

- *The Scanner Assy has been replaced.*
- *The Scanner Motor has been replaced.*
- *The Scanner Drive Cables have been replaced.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Machine Adjust” → “IR Area.”
3. Touch “FD-Mag.”
4. Place a scale on the Original Glass so that it runs parallel with the Original Length Scale and its leading edge is aligned with the Original Width Scale.
5. Press the Start key to make a copy.
6. Check the image on the copy produced.

✻ If the image does not meet the specifications:

7. Change the setting using the Up/Down key.

Adjustment Instructions

If the specified width on the copy is less than 298.5 mm, increase the setting.
If the specified width on the copy exceeds 301.5 mm, decrease the setting.

8. Press the Start key to make a copy.
9. Check the image on the copy to see if the specifications are met.
10. If it fails to meet the specifications, change the setting and make a check again.
11. If it meets the specifications, touch “MENU.”

(16) Org. Detect Sensor

This adjustment must be made in any of the following cases:

- *The Original Size Detecting Sensor has been replaced.*
- *The optional Original Size Detecting Sensors have been added.*
- *The copier fails to detect the size of the original correctly.*

Adjustment Procedure

1. Place a blank sheet of A3 paper on the Original Glass and lower the Original Cover.
2. Call the Tech. Rep. Mode to the screen.
3. Touch these keys in this order: “Machine Adjust” → “Org. Detect Sensor.”
4. Press the Start key.

If the adjustment has been successfully made, it completes the adjustment procedure.
If the adjustment has turned out to be unsuccessful, check the optional Original Size Detecting Sensors for correct installation and change the defective sensor or harness.

(17) Gradation Adjust

This adjustment must be made in the following case:

- *Color reproduction performance becomes poor.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch “Gradation Adjust.”
3. Press the Start key to let the copier produce a test pattern.
4. Place the test pattern produced on the Original Glass.
5. Place ten blank sheets of A3 paper on the test pattern and then lower the Original Cover.
6. Press the Start key (to let the copier start scanning the original).

✻ When the copier completes scanning the data on the original, the “Tech. Rep. Mode” initial screen reappears.

7. Repeat steps from 2 to 6 twice (a total of three cycles).
8. Touch “Gradation Adjust” and check the Conv. Value on the screen.

Results:

If Max. falls within 0 ± 100 and Highlight within 0 ± 60, then it completes the adjustment procedure.
If neither Max. nor Highlight falls outside the specified range, perform steps from 2 to 6.
If the specifications are not met after another cycle of steps 2 to 6, make a copy and check the image.

9. For any image quality problem, take action by referring to TROUBLESHOOTING.

(18) PRT Max Density

This adjustment must be made in the following case:

- *An image quality problem is not corrected even after Gradation Adjust has been run.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Image Adjust” → “PRT Max Density.”
3. Select the color to be adjusted.
4. Press the Clear key to clear the current setting.
5. Enter the new setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

6. When the adjustment has been made, touch “MENU” to go back to the “Image Adjust” menu screen.
7. Touch “Stabilizer.”
8. Select “Stabilizer Mode.”
9. Press the Start key to validate the adjustment value.

(19) PRT Highlight

This adjustment must be made in the following case:

- *An image quality problem is not corrected even after Gradation Adjust has been run.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Image Adjust” → “PRT Highlight.”
3. Select the color to be adjusted.
4. Press the Clear key to clear the current setting.
5. Enter the new setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

6. When the adjustment has been made, touch “MENU” to go back to the “Image Adjust” menu screen.
7. Touch “Stabilizer.”
8. Select “Stabilizer Mode.”
9. Press the Start key to validate the adjustment value.

(20) Background Voltage Margin

This adjustment must be made in the following case:

- *Foggy background occurs.*

Adjustment Procedure

1. Call the Tech. Rep. Mode to the screen.
2. Touch these keys in this order: “Image Adjust” → “Background Voltage Margin.”
3. Select the color to be adjusted.
4. Press the Clear key to clear the current setting.
5. Enter the new setting from the 10-Key Pad.

✻ Use the Access key to select the sign of + or -.

6. When the adjustment has been made, touch “MENU” to go back to the “Image Adjust” menu screen.
7. Touch “Stabilizer.”
8. Select “Stabilizer Mode.”
9. Press the Start key to validate the adjustment value.

4. OTHER ADJUSTMENTS

4-1. Adjustment of the Position of the Scanner and 2nd/3rd Mirrors Carriage

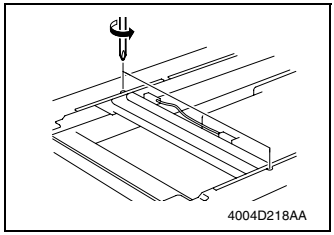
Requirement

- *With the Scanner Assy fixed to the Scanner Drive Cables, there should be no gap between the Scanner/Mirrors Carriage Positioning Jig and the Scanner and also between the Scanner/Mirrors Carriage Positioning Jig and the 2nd/3rd Mirror Carriage.*

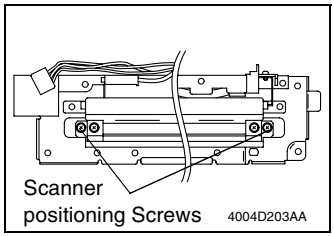
This adjustment must be made in any of the following cases:

- *The Scanner Drive Cable has been replaced.*
- *The Scanner Fixing Bracket has been removed from the Scanner Drive Cable.*
- *The Scanner Drive Cable comes unwound.*

Adjustment Procedure

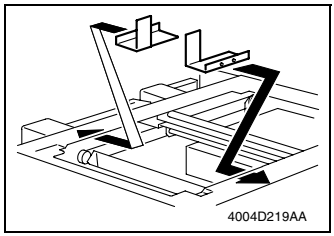


1. Remove the IR Rear Upper Cover, IR Front Cover, IR Right Cover, and Original Glass.
2. Move the Scanner Assy so that the Scanner Positioning Screw is aligned with the hole in the upper frame.
3. Insert a screwdriver into the hole in the upper frame and loosen the Scanner Positioning Screw.

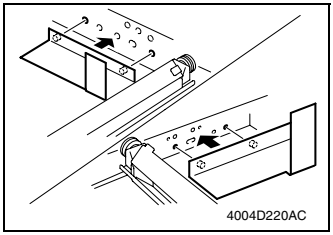


NOTE

- *Do not remove the Scanner Positioning Screw.*

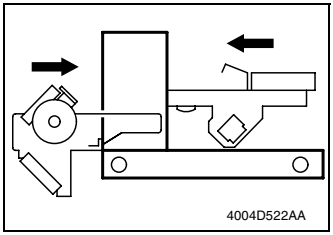


4. Install the Scanner Positioning Jigs between the Scanner Assy and the 2nd/3rd Mirrors Carriage Assy.

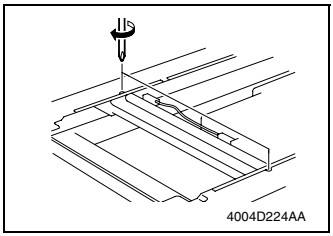


NOTE

- *When installing the Scanner Positioning Jigs, be sure to fit the tabs on the jigs into the holes at the front and rear ends of the frame.*

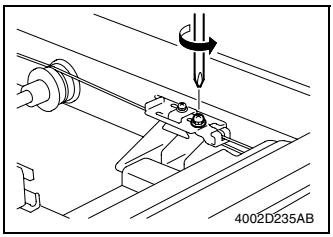


5. Press the Scanner Assy and 2nd/3rd Mirrors Carriage Assy tightly up against the Scanner Positioning Jigs.

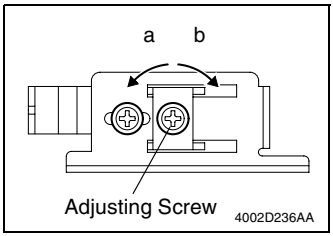


6. Tighten the two Scanner Positioning Screws.

(1) Adjustment of the 2nd/3rd Mirrors Carriage Assy for Parallel Alignment



1. Remove the Original Glass.
2. Loosen one screw that secures the adjusting plate.



3. Turn the adjusting screw as necessary.

Adjustment Instructions

If there is a gap between the 2nd/3rd Mirrors Carriage Assy and the Scanner Positioning Jig at the front, turn the adjusting screw clockwise.

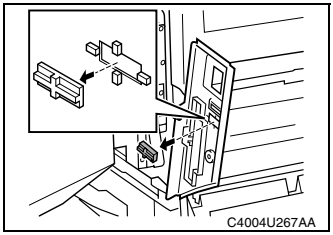
If there is a gap between the 2nd/3rd Mirrors Carriage Assy and the Scanner Positioning Jig in the rear, turn the adjusting screw counterclockwise.

4. Lightly press the 2nd/3rd Mirrors Carriage Assy up against the Scanner Positioning Jigs and make sure there is no gap.
5. Tighten one screw to secure the adjusting plate in position.

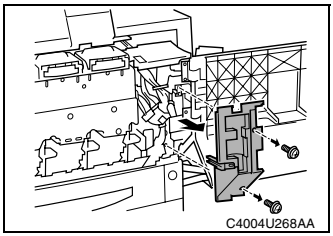
5. MISCELLANEOUS

5-1. INSTALLATION OF THE MECHANICAL COUNTER (OPTION)

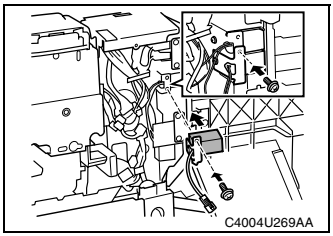
1. Open the Front Door.
2. Open the Toner Supply Door.
3. Remove the Panel Cover.
4. Open the Right Door.
5. Remove the Front Right Cover.



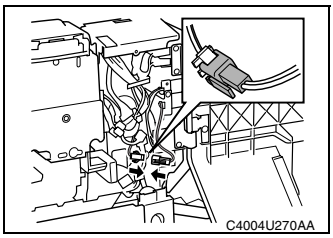
6. Cut out the knockout in the Front Right Cover.



7. Remove two screws and the Right Front Cover.



8. Secure the mechanical counter with one screw.



9. Connect one connector.

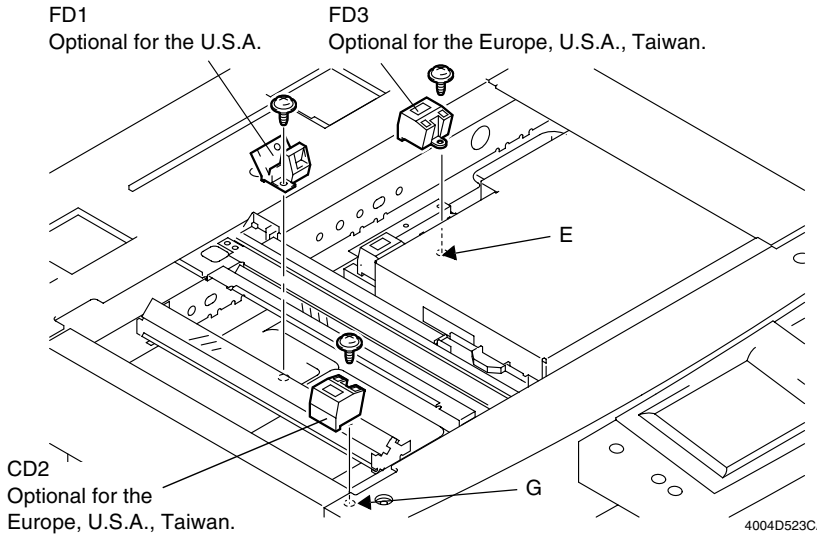
5-2. MOUNTING OF THE ORIGINAL SIZE DETECTING SENSORS (OPTION)

NOTE

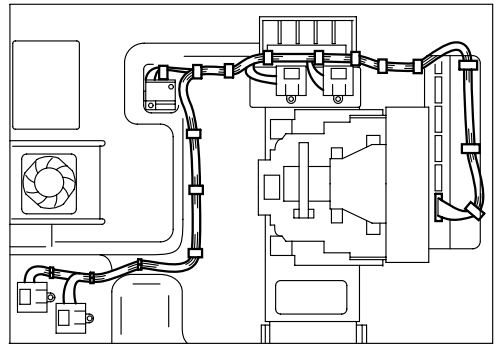
- *When an Original Size Detecting Sensor has been added, select "SET" in "Org. Detect Option Sensor" of "System Input" available from the "Tech. Rep. Mode" and run "Org. Detect Sensor" of "Machine Adjust."*

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1. Remove the IR Right Cover and Original Glass.
2. Remove the optical cover.
3. Install the harness.
4. Mount the Original Size Detecting Sensor (option).



How the Harness should be Placed



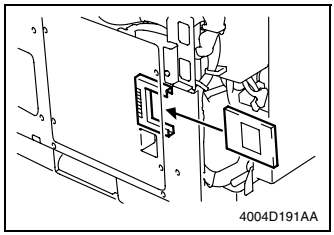
5-3. FLASH MEMORY

Software has conventionally been upgraded by replacing ROM on each board.
This copier employs flash memory for the system control IC mounted on the MSC Board.
Its contents are reprogrammed easily by performing the following steps using the IC card (memory card), into which data has been previously downloaded.

NOTE

• NEVER remove or insert the memory card with the copier power turned ON.

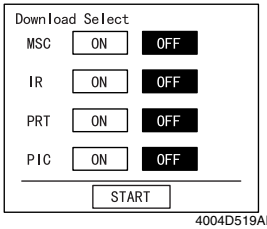
1. With the Power Switch in the OFF position, unplug the power cord from the power outlet.
2. Remove the Ozone Filter.
3. Open the Left Door.
4. Remove the Waste Toner Bottle.
5. Remove the Rear Left Cover.



6. Insert the memory card into the slot.

7. Plug the power cord into the power outlet and turn ON the Power Switch.

✻ Four different types of F/W appear on the Touch Panel.



8. Select the particular type of F/W to be updated.

9. Press the Start key.

✻ This starts the data rewriting sequence. (At this time, the Start key starts blinking red.)

Time Required for Rewriting

Four types at once: Approx. 13 min.

Individual: MSC (approx. 1 min. 30 sec.), PRT (approx. 6 min.), IR (approx. 7 min.), PIC (approx. 6 min.)

10. Check that the Touch Panel shows the message indicating that the data has been rewritten correctly (“Downloading Completed”). Check also the Check Sum value (“Check Sum XXXX”) shown on the Touch Panel. (The Start key blinks green.)

11. Unplug the power cord from the power outlet.

NOTE

- Do not turn OFF the Power Switch.

12. Remove the memory card from the slot and turn OFF the Power Switch.
13. Check that the “ROM Version” of “Tech. Rep. Mode” matches the version marked on the memory card.

✻ Action When Data Transfer Fails

If “NG” appears on the Touch Panel, indicating that rewriting has been unsuccessful (in which case the Start key lights up red), take the following steps.

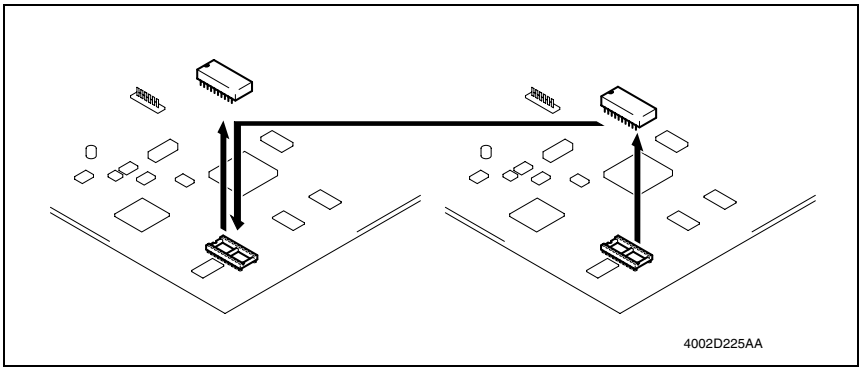
14. Perform the data rewriting procedure again.
15. If the procedure is abnormally terminated, change the memory card for a new one and try another rewriting sequence.
16. If the procedure is still abnormally terminated, change the board that has caused “NG” and carry out data rewriting procedure.

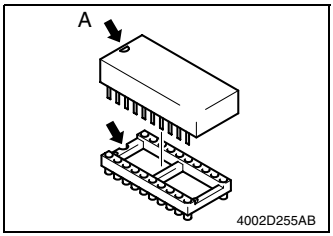
5-4. REMOUNTING RAM IC (IC5)

NOTE

- *If the MSC Board has replaced, be sure to remount RAM IC from the old to new board.*
- *If the MSC Board has been replaced and RAM IC is not to be remounted, be sure to record all data of User's Choice and Tech. Rep. Choice functions and make entries again of these numeric values. Note that the RAM IC contains no data in this case.*

1. Remove the MSC Board.
2. Remove RAM IC from the new MSC Board.
3. Remove RAM IC from the old MSC Board and remount it onto the new MSC Board.





NOTE

- *Note the alignment notch (A) on RAM IC when mounting it.*

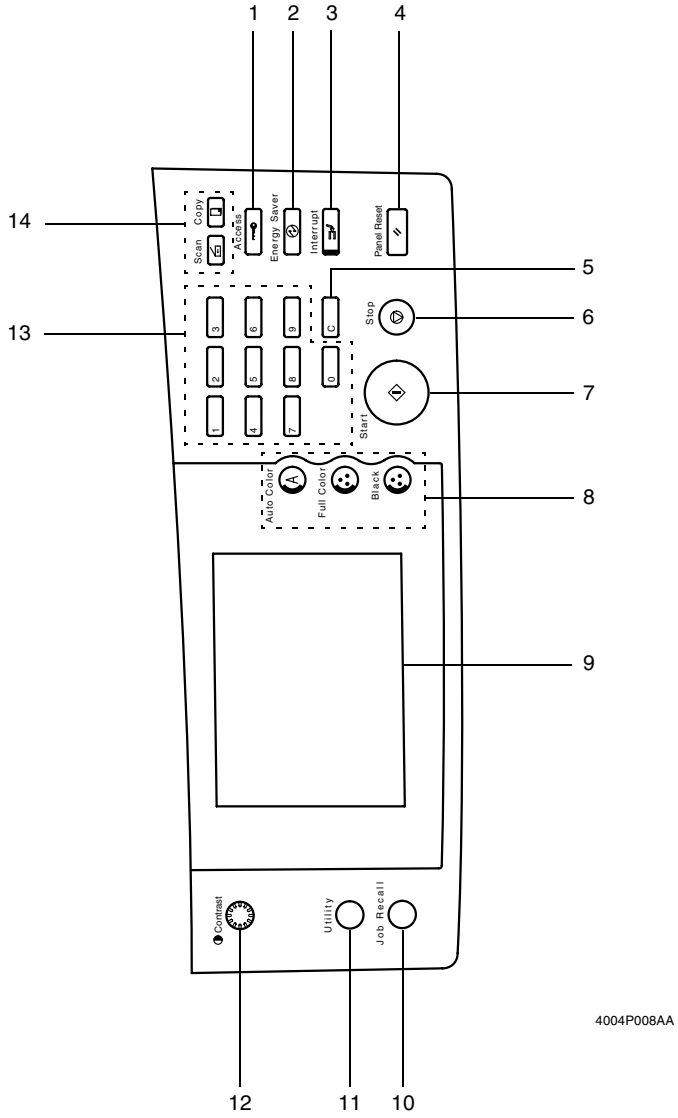
SWITCHES ON PWBs, TECH. REP. SETTINGS

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1. CONTROL PANEL KEYS AND TOUCH PANEL

1-1. Control Panel Keys



1. Access Mode Key
- Press to enter the access number when Copy Track of the Administrator mode available. Press the access Key.

2. Energy Saver Key
- Press to set machine into the Energy saver mode.

3. Interrupt Key
- Press to select the Interrupt mode.

4. Panel Reset Key
- Press to set the machine into the initial mode, clearing all settings made on the control panel.

5. Clear Key
- Clear the various numeric values.

6. Stop Key
- Stop a scanning cycle.

7. Start Key
- Start a print cycle.

8. Auto Color/Full Color/Black Keys
- Auto Color Key: Press to make copies according to the type of the original being used.
- Full Color Key: Press to make full color copies.
- Black Key: Press to make black-and-white copies.

9. Touch Panel
- Shows various screens and message.

10. Job Recall Key
- Press to display the Job Recall screen.

11. Utility Key
- Press to show the Utility Mode menu.

12. Display Contrast Control Knob
- Use to adjust the brightness of the Touch Panel.

13. 10-Key Pad
- The number of copies to be made.
- The various numeric values.

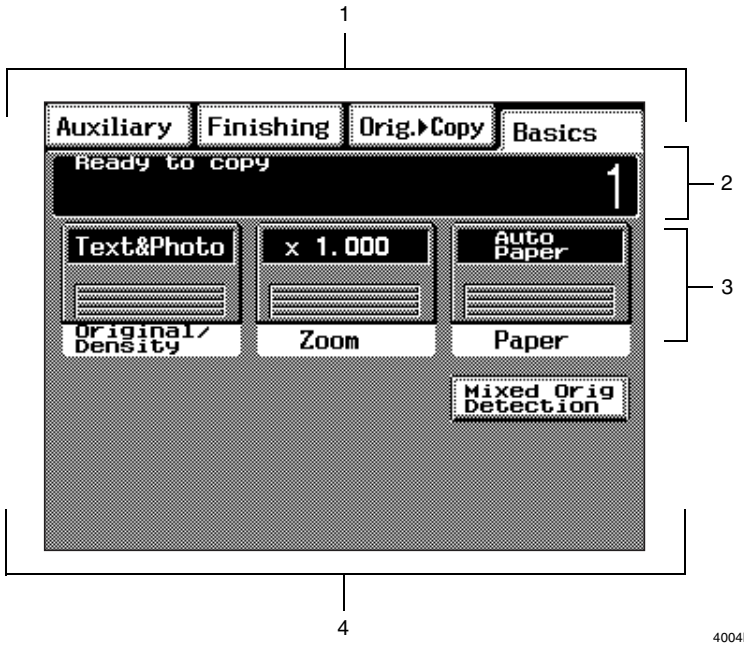
14. Copy Key/Scan Key
- Press to select the Scanner mode and the Copy mode.

✻ The Scan mode is enabled when a printer controller is mounted on the copier.

1-2. Explanation of the Touch Panel

(1) Basic Screen

The Basic screen is the initial screen that appears when the copier is turned ON.



1. Supplementary Function Keys
- Select the Auxiliary, Finishing, Orig. ▶ Copy, or Basics function.

2. Message Display
- Shows the current copier status, operating instructions and precautions, and other data including the number of copies selected.

3. Basic Display
- Select the Text & Photo, Zoom, or Paper function.

4. Set Function Display
- Shows graphic representations of the copying functions currently set for use.

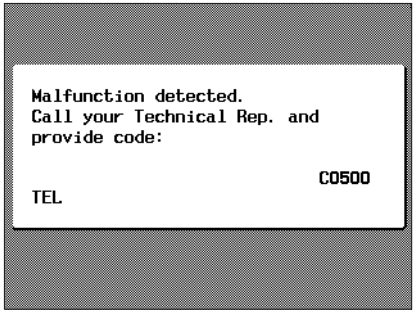
(2) Warning Screens

The Warning screen may be a malfunction display, error display, warning display, or a caution display.

<Malfunction Display>

Given when a malfunction occurs.

E.g.: Malfunctions that can be identified with a specific code.

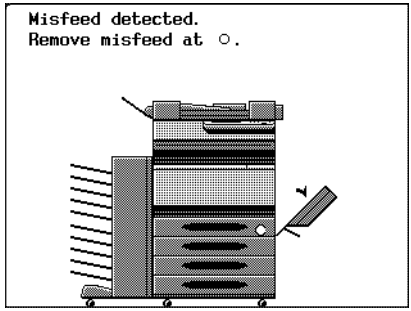


4004P023CB

<Error Display>

Given when an error occurs.

E.g.: Paper misfeed, door open, etc.

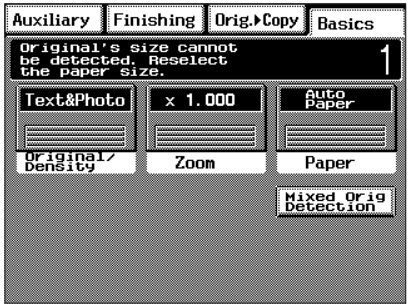


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<Warning Display>

Given when only a defective copy will be produced because of erroneous or illegal panel settings.

E.g.: Unmatched paper size in Auto Paper.

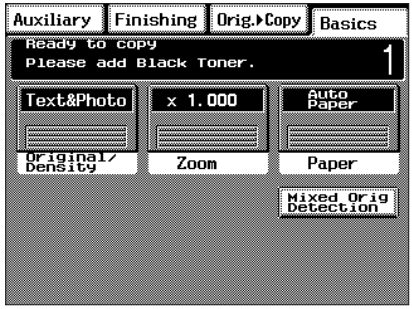


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<Caution Display>

Given when, though further copier operation will be possible, it could eventually result in a malfunction.

E.g.: Toner near empty, etc.



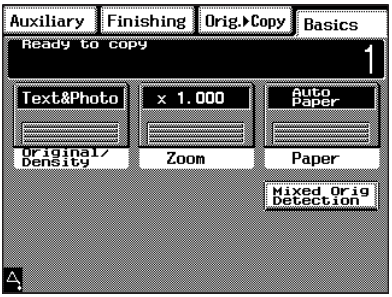
4004P026CB

<Engine / IR Warning>

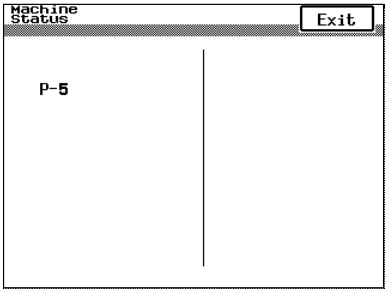
When the engine or IR develops a faulty condition, a ⚠ mark appears at the lower left corner of the Basic screen. Touch this mark, and the display shows the details of the fault.

NOTE

- *For details, see TROUBLE SHOOTING.*



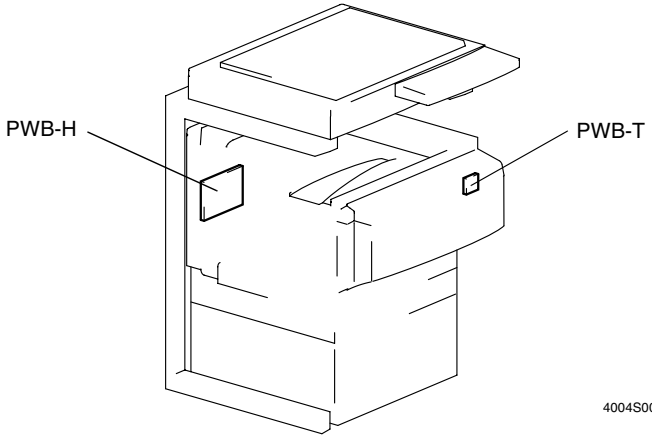
4004P027CB



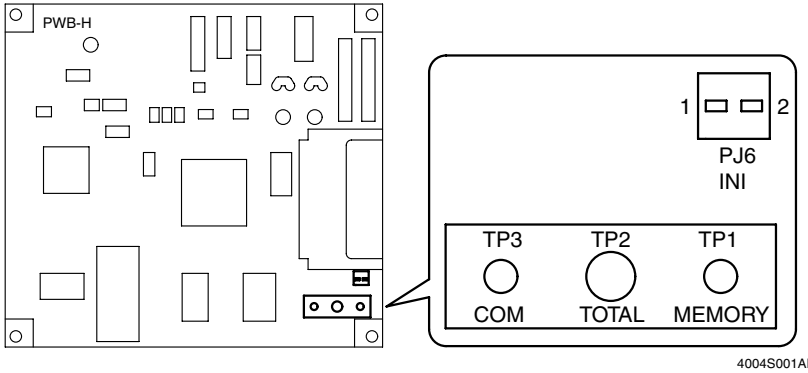
4004P028CA

2. FUNCTION OF SWITCHES AND OTHER PARTS ON PWBs

2-1. PWB Location

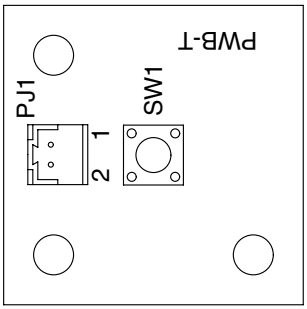


2-2. PWB-H (MSC Board)



Symbol	Name	Description
PJ2	Initialize Switch	Resets a misfeed, malfunction, and erratic display.
TP1	Memory Clear Test Point	Clears choice-related data. ***NOTE*** • *It does not, however, clear data of Electronic Counters, Administrator, RD mode, Scanner Addr. Input, and IR backup data.*
TP3	COM Test Point	Ground used for memory clear.

2-3. PWB-T (Tech. Rep. Setting Switches Board)



4004S003AB

Symbol	Name	Description
SW1	Trouble Reset Switch	Resets the malfunction display.

(1) Clearing Procedures

Initialize

1. Turn ON the Power Switch.
2. With the circuit across pins of PJ2 closed, turn OFF then ON the Power Switch.
3. Open the circuit in about 5 seconds.
4. Check that the message “Initialize Completed” is displayed on the Touch Panel and then touch the “Enter” key.

Memory Clear

1. Turn ON the Power Switch.
2. With the circuit across TP1 and TP3 closed, turn OFF then ON the Power Switch.
3. Open the circuit in about 5 seconds.
4. Check that the message “Memory Clear Completed” is displayed on the Touch Panel and then touch the “Enter” key.

NOTES

- *If the copier exhibits an erratic display or operation, reset and clear in the following order: Initialize → Memory Clear.*
- *If Memory Clear has been performed, make settings of various functions once again.*

(2) Data/Conditions Cleared by Reset Switches/Pins

Data Cleared \ Clearing Method		Front Door Open/Close	Trouble Reset Switch SW1	Initialize PJ6	Memory Clear TP1
Misfeed display		❍	–	❍	–
Malfunction display	Fusing/ Optical Scanner ROM faults	–	❍	❍	–
	Others	❍	❍	❍	–
Erratic operation/display		–	❍	❍	❍
Job/Image		–	–	–	❍
User's Choice		–	–	–	❍
Tech. Rep. Mode		–	–	–	❍
Security Mode		–	–	–	❍
Touch Panel Correction Mode		–	–	–	❍

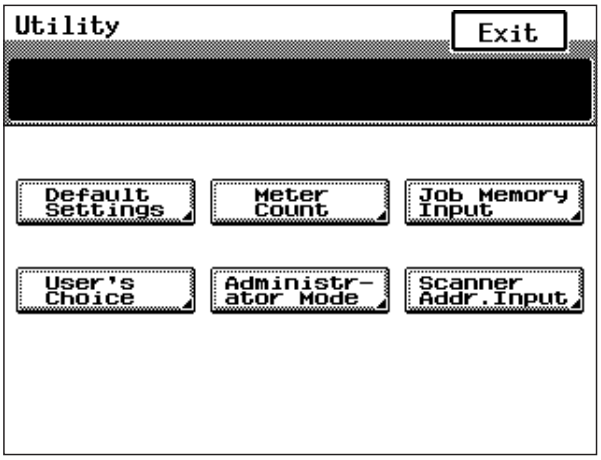
❍: Cleared –: Not cleared

3. UTILITY MODE

- Utility Mode is used to make various settings according to the user's need.

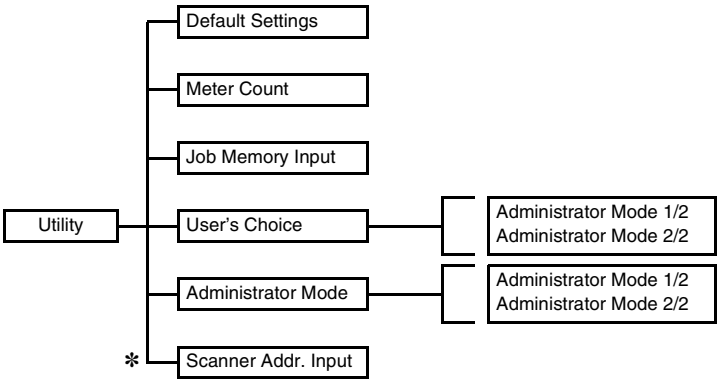
3-1. Utility Mode Selection Screen

- Press the Utility key on the control panel



4004P044CB

3-2. Utility Mode Function Tree



✻ Displayed when "Mode 2, 3 or 4" is selected for "Peripheral Mode" available from the Service mode.

3-3. Settings in the Utility Mode

Touch Panel Display	Setting
Default Settings	Select the copying function settings established when the Power Switch is turned ON or the Panel Reset key is pressed. ***NOTE*** • *To designate the "Current Settings," first make the necessary settings on the control panel, then touch "Current Settings."* Current Settings / **Factory Settings**
Meter Count	Displays the counts of various counters. Pressing the Start key will let the copier produce a printed page of the counts of various counters.
Job Memory Input	Permits programming of various functions, including copying jobs.
User's Choice	User's Choice is used to make various settings according to the user's need.
Administrator Mode	The entry of the "Administrator #" set using the Tech. Rep. mode permits the settings of the following functions.
Scanner Addr. Input	Program the one-touch address for the Scanner mode.

(1) User's choice mode

• User's Choice is used to make various settings according to the user's need.

1. User's Choice Function Setting Procedure

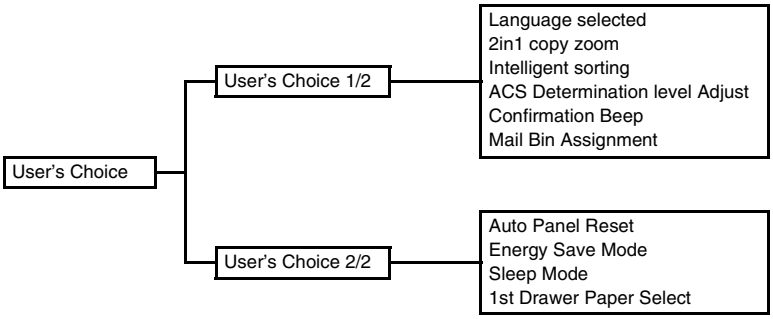
<Procedure>

1. Press the Utility key.
2. Touch the "User's Choice" key.
3. Select the appropriate screen from the menu.
4. Select the appropriate function.
5. After the settings are complete, touch the "OK" key to validate the settings.

<Exiting the Mode>

• Press the "OK" key.

2. User's Choice Mode Function Tree



3. Settings in the User's Choice Mode

Touch Panel Display	Setting (The default is **Highlighted**).
Language	Select the language of the Touch Panel messages. Metric Areas: **ENGLISH** / GERMAN / FRENCH / DUTCH / ITALIAN / SPANISH / PORTUGUESE / DANISH / NORWEGIAN / SWEDISH / FINISH / JAPANESE Inch Areas: **ENGLISH** / FRENCH / SPANISH / JAPANESE
2in1 copy zoom	Select whether or not to set the default zoom ratio, ×0.647 for the inch areas and ×0.707 for the metric areas, when 2in1 is selected. **ON** / OFF
Intelligent Sort	Select whether to enable or disable the function that automatically switches between Sort and Non-Sort according to the number of originals and the number of copy sets to be made. Applicable when the system is equipped with a finishing option and using an ADF. **Auto Select** / Non-Auto
ACS Determination level Adjust	Set the mode evaluation level for the Auto Color mode. Black / 1 / 2 / **3** (std) / 4 / 5 / Full Color
Confirmation Beep	Select whether to enable or disable the beep that sounds each time a key on the control panel is pressed or a function on the Touch Panel touched. **ON** / OFF

<table>
<tr><th>Touch Panel Display</th><th>Setting (The default is Highlighted).</th></tr>
<tr><td>Mail Bin Assignment</td><td>Select whether or not to designate specific bin or bins for the output via the PC when a Mailbin Finisher is mounted.
<table><tr><td>2-10 Bin</td><td>OFF</td></tr></table>NOTE
• When a specific bin is designated, that bin and subsequent bins are assigned for the output via the PC.
• Example: If the 7th Bin is designated
The 7th to 10th Bins will be assigned for the output via the PC and the 1st to 6th Bins usable only for copy bins.</td></tr>
<tr><td>Auto Panel Reset</td><td>Select the time it takes the Auto Panel Reset function, which resets the panel settings when the set period of time elapses after a copy cycle has been completed or the last key operated, to be activated. Use the 10-Key Pad to set the time.
<table><tr><td>OFF</td><td>1 to 9 (5 min.)</td></tr></table></td></tr>
<tr><td>Energy Save Mode</td><td>Select the time it takes the copier to enter the Energy Saver mode after a copy cycle has been completed or the last key operated. Use the 10-Key Pad to set the time.
<table><tr><td>1 to 240 (15 min.)</td></tr></table></td></tr>
<tr><td>Sleep Mode</td><td>Select the time it takes the Sleep function, which shuts down the copier when the set period of time elapses after a copy cycle has been completed or the last key operated, to be activated.
NOTE
• The option of “OFF” becomes available on the screen if “Yes” is selected for “Disable Sleep” of the “Administrator Mode” function.
<table><tr><td>15 to 240 (15min.)</td><td>OFF</td></tr></table></td></tr>
<tr><td>1st Drawer Paper Select</td><td>Select the paper size setting method for the 1st Drawer.
<table><tr><td>Auto Detect</td><td>Input Size</td></tr></table></td></tr>
</table>

(2) Administrator Mode

- The entry on the “Administrator #” set using the Tech. Rep. mode permits the settings of the following functions.

1. Administrator Mode Function Setting Procedure

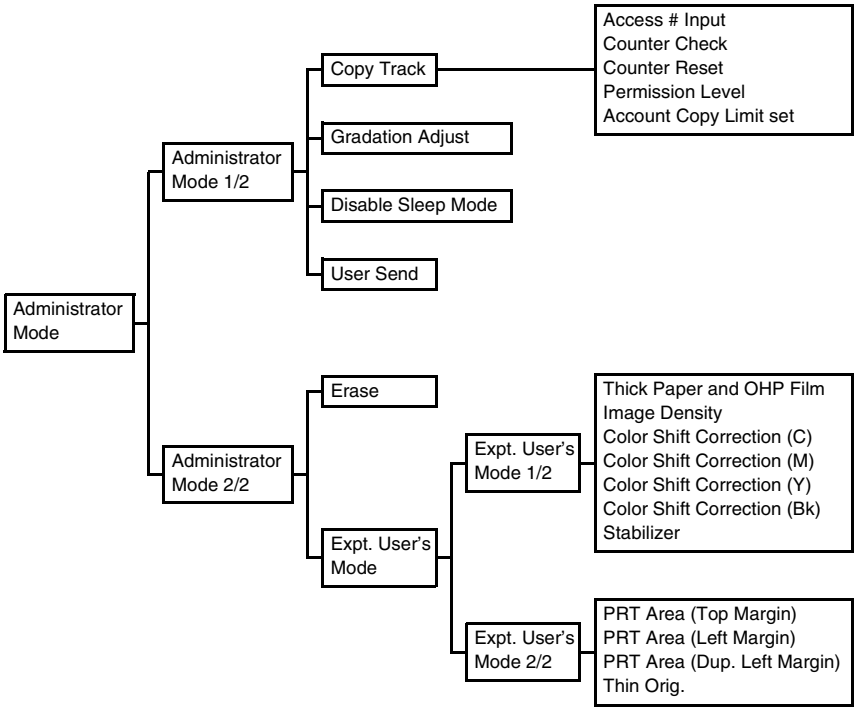
<Procedure>

1. Press the Utility key.
2. Touch the “Administrator Mode” key.
3. Enter the Administrator number from the 10-Key pad.
4. Select the appropriate function.
5. After the settings are complete, touch the “Enter” key to validate the settings.

<Exiting the Mode>

- Press the “OK” key.

2. Administrator Mode Function Tree



✻ Available on the screen when the settings are made for “Mainte. Center” when a Data Terminal is mounted.

3. Settings in the Administrator Mode

<table>
<tr><td>Touch Panel Display</td><td>Setting (The default is Highlighted).</td></tr>
<tr><td>Administrator Mode</td><td>The entry on the “Administrator #” set using the Tech. Rep. mode permits the settings of the following functions.</td></tr>
<tr><td>Administrator Mode 1/2</td><td>Displays the various setting screens including Copy Track and Gradation Adjust.</td></tr>
<tr><td>Copy Track Functions</td><td>Select the number of accounts to be controlled.<table><tr><td>ON</td><td>OFF</td></tr></table></td></tr>
<tr><td>Access # Input</td><td>From the 10-Key Pad, enter the access number (ID), which can range 0001 to 9999.<table><tr><td>Account #</td><td>Use ▼ or ▲ key to select the account number, for which an access number is to be programmed.</td></tr><tr><td>Access #</td><td>Enter a 4-digit access number from the 10-Key Pad.</td></tr></table></td></tr>
<tr><td>Counter Check</td><td>Check the counter value for the account.
<Procedure>
1. Place the required number of sheets of A4L or Letter L paper on the 1st Drawer.
2. Press the Start key to let the copier print the counter list.</td></tr>
<tr><td>Counter Reset</td><td>Reset the counter value for the account.
<Procedure>
1. Using the ▼ or ▲ key, select the account number, for which the counter is to be reset. Touch “All Accts” to reset the counters of all accounts.
2. Touch the “Cancel” key.
3. Touch the “YES” key.
4. Touch “OK” to reset the counter.</td></tr>
<tr><td>Permission Level</td><td>Select whether to enable (“Permit”) or disable (“Prohibit”) copying according to the color or black mode for each account.
<Procedure>
1. Using the ▼ or ▲ key, select the account number for which Permission Level is to be set.
2. Select either Permit or Prohibit copying according to the color or black mode.</td></tr>
<tr><td>Account Copy Limit set</td><td>Set the maximum number of copies to be made at one time for each account and copying mode using the 10-Key Pad.<table><tr><td>Common</td><td>Copy limit is not set for each copying mode.</td></tr><tr><td>Individual</td><td>Copy limit is set for each copying mode.</td></tr></table>
<Procedure>
1. Using the ▼ or ▲ key, select the account number for which Copy Limit is to be set.
2. Select either Common or Individual.
3. Select whether to turn ON or OFF Copy Limit and then enter the maximum number of copies to be made from the 10-Key Pad.</td></tr>
</table>

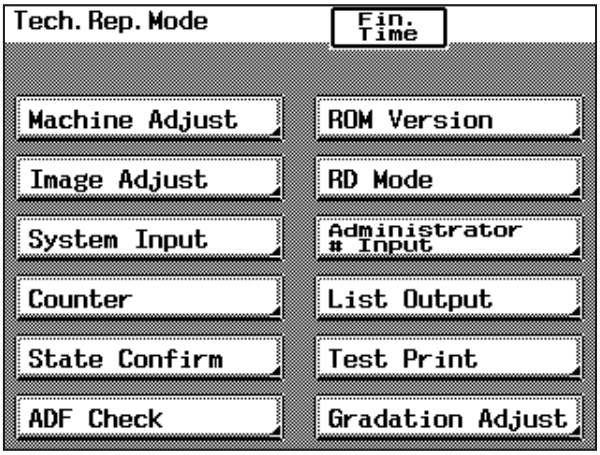
<table>
<tr><th>Touch Panel Display</th><th>Setting (The default is Highlighted).</th></tr>
<tr><td>Gradation Adjust</td><td>When an image failure occurs, run this function to automatically correct the gamma curve.
✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.</td></tr>
<tr><td>Disable Sleep Mode</td><td>Select whether to enable or disable the setting of the “Sleep” function available from User’s Choice.
<table><tr><td>No</td><td>Not displayed.</td></tr><tr><td>Yes</td><td>Displayed.</td></tr></table></td></tr>
<tr><td>Data Send</td><td>Transmits various data to the Center when a Data Terminal is mounted.</td></tr>
<tr><td>Administrator Mode 2/2</td><td>Displays the various setting screens for Erase and Expert User’s Mode.</td></tr>
<tr><td>Erase</td><td>Select the leading edge erase.
<table><tr><td>5 mm</td><td>7 mm</td></tr></table></td></tr>
<tr><td>Expert. User’s Mode</td><td>Allows the image-related and paper passage-related functions to be set.</td></tr>
<tr><td>Expert. User’s Mode 1/2</td><td>Displays the image-related function adjustment screens.</td></tr>
<tr><td>Thick Paper and OHP Film Image Density</td><td>Correct the image density for copying on thick paper and OHP transparencies for each color.
Lighter Darker
</td></tr>
<tr><td>Color Shift Correction (C)</td><td>Correct (fine-adjust) color shift of the cyan image in each of X, Y, and θ directions.
✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.</td></tr>
<tr><td>Color Shift Correction (M)</td><td>Correct (fine-adjust) color shift of the magenta image in each of X, Y, and θ directions.
✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.</td></tr>
<tr><td>Color Shift Correction (Y)</td><td>Correct (fine-adjust) color shift of the yellow image in each of X, Y, and θ directions.
✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.</td></tr>
<tr><td>Color Shift Correction (Bk)</td><td>Correct (fine-adjust) color shift of the black image in the θ direction.
✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.</td></tr>
<tr><td>Stabilizer</td><td>If an image failure is not rectified even with Gradation Adjust, select “Reset and Stabilizer Mode.”
<table><tr><td>Reset and Stabilizer Mode</td><td>Stabilizer Mode</td></tr></table>✻ If “Reset and Stabilizer Mode” is run, run “Gradation Adjust” after the sequence has been completed.</td></tr>
</table>

Touch Panel Display	Setting (The default is **Highlighted**).
Expert. User's Mode 2/2	Displays the paper passage-related function adjustment screens.
PRT Area (Top Margin)	Adjust the image position for each paper source by varying the print start position of the printer in the sub scanning direction. Setting: -2 mm ..... **0** ..... +2 mm
PRT Area (Left Margin)	Adjust the image position for each paper source by varying the print start position of the printer in the main scanning direction. Setting: -3 mm ..... **0** ..... +3 mm
PRT Area (Dup. Left Margin)	Adjust the image position for each paper source in the 2-Sided Mode by varying the print start of the printer in the main scanning direction. Setting: -3 mm ..... **0** ..... +3 mm
Thin Orig.	Select whether or not to make the "Thin Orig." option available in the Orig. ▶ Copy type selection screen. ON / **OFF**

4. Tech. Rep. Mode

- This mode is used by the Tech. Rep. to check, set, adjust, and/or program various service functions.

4-1. Tech. Rep. Mode Menu Screen



4004P030CB

4-2. Tech. Rep. Mode Function Setting Procedure

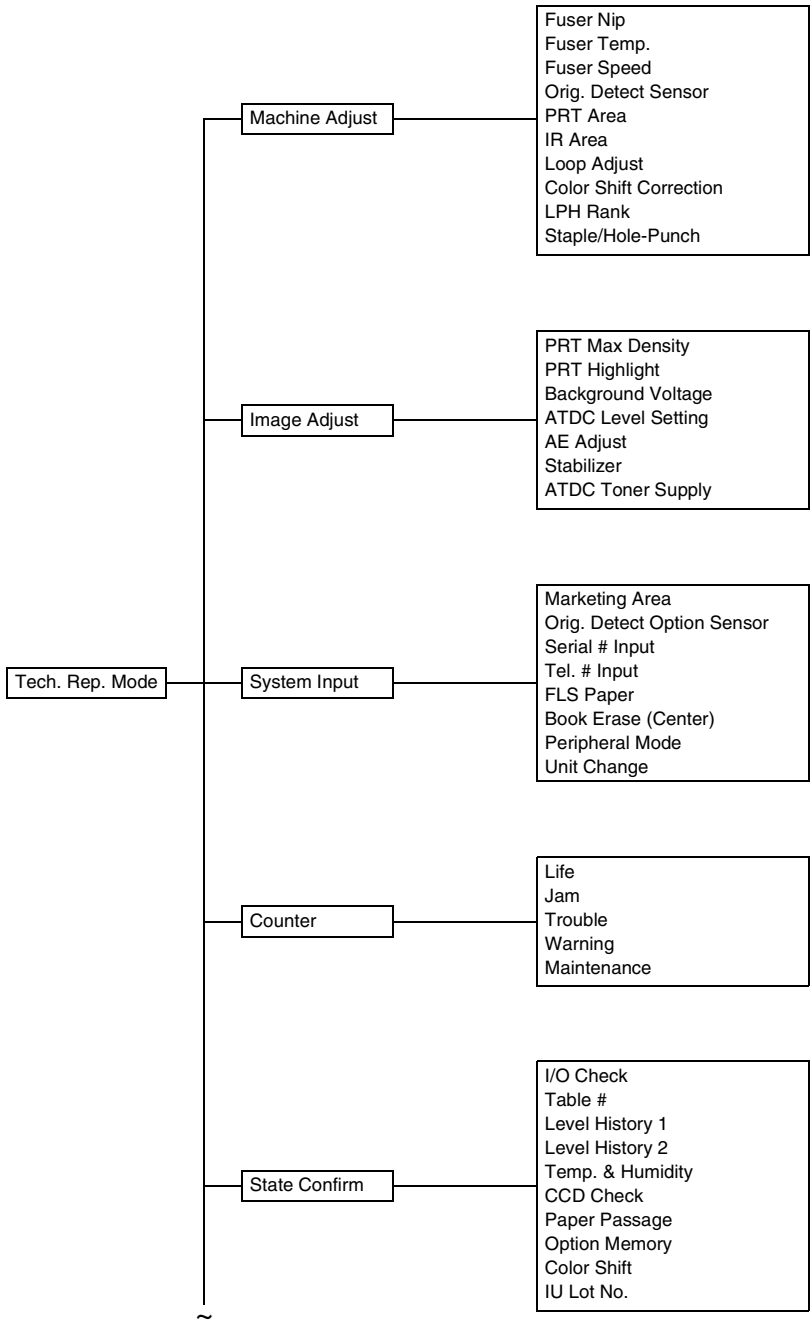
<Procedure>

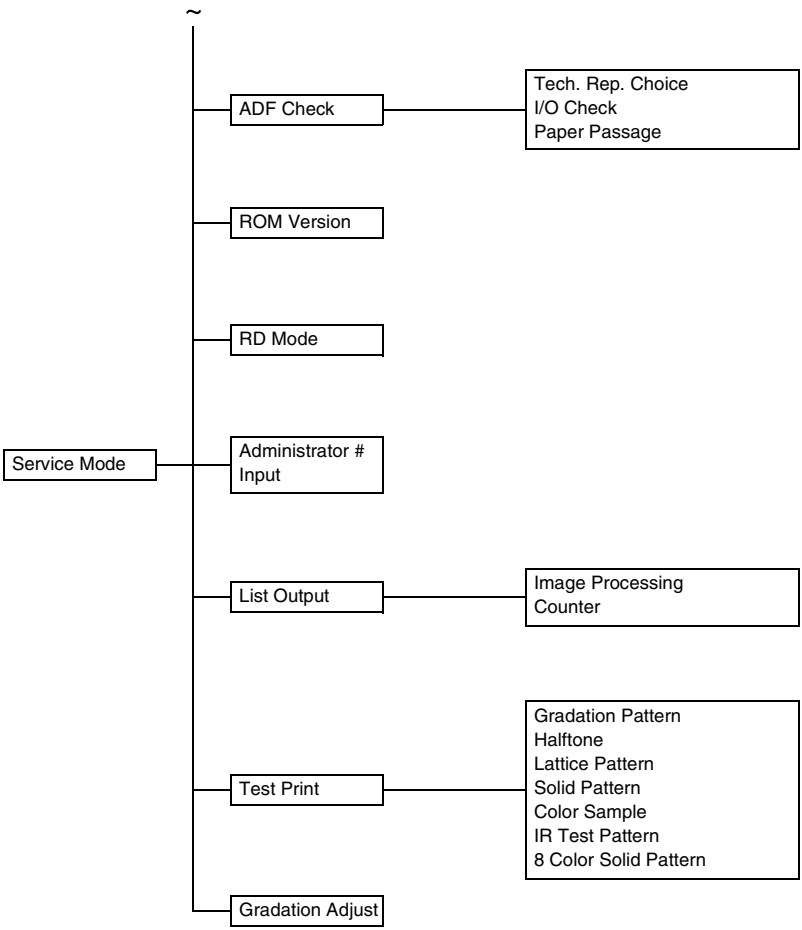
1. Press the Utility key.
2. Press the Meter Count key.
3. Press the following keys in this order:
   Stop → 0 → 0 → Stop → 0 → 1
4. Select the desired Service Mode function.

<Exiting the Mode>

- Press the “Fine. Time” key.

4-3. Tech. Rep. Mode Menu Function Tree




~
ADF Check
Tech. Rep. Choice
I/O Check
Paper Passage
ROM Version
RD Mode
Service Mode
Administrator #
Input
List Output
Image Processing
Counter
Test Print
Gradation Pattern
Halftone
Lattice Pattern
Solid Pattern
Color Sample
IR Test Pattern
8 Color Solid Pattern
Gradation Adjust

4-4. Setting in the Tech. Rep. Mode

(1) Machine Adjust

- These functions are used to make the various mechanical adjustments of the copier.

NOTE

- *For details, see DIS/REASSEMBLY, ADJUSTMENT or Option service manual.*

Touch Panel Display	Setting
Fuser Nip	Produces a sample copy for the check of the Fusing Roller nip width.
Fuser Temp.	Set the temperature for fusing temperature control according to the operating environment and the type of paper used.
Fuser Speed	Adjust the fusing speed.
Org. Detect Sensor	Automatically adjusts the threshold level of the Original Size Detecting Sensor.
PRT Area	Displays the print area adjustment screen.
Top Margin	Paper Send Position Vary the paper sending timing to adjust the image position in the sub-scanning direction. 2nd Transfer Timing Vary the second transfer timing to adjust the image transfer timing in the sub-scanning direction.
Left Margin	Adjust the image position for each paper source by varying the print start position of the printer in the main scanning direction.
Dup. Left Margin	Adjust the image position for each paper source in the 2-Sided Mode by varying the print start of the printer in the main scanning direction.
IR Area	Left Image Adjust the image position by varying the image reading position of the IR in the main scanning direction. Top Image Adjust the image position by varying the image reading position of the IR in the sub scanning direction. CD-Mag. Adjust the zoom ratio in the crosswise direction by varying the number of pixels to be read by the CCD. FD-Mag. Adjust the zoom ratio in the lengthwise direction by varying the scan speed of the Scanner.
Paper Loop	Set the length of the loop to be formed in paper before the Synchronizing Rollers.

Touch Panel Display	Setting
Color Shift Correction	Color Shift Correction (C) Correct (fine-adjust) color shift of the cyan image in each of X, Y, and θ directions. Color Shift Correction (M) Correct (fine-adjust) color shift of the magenta image in each of X, Y, and θ directions. Color Shift Correction (Y) Correct (fine-adjust) color shift of the yellow image in each of X, Y, and θ directions. Color Shift Correction (Bk) Correct (fine-adjust) color shift of the black image in the θ direction.
LPH Rank	This mode is for factory adjustment only and should NOT be used. It is confirmed that the numerical value is “0”.
Staple/Hole-Punch	The staple position or the punch hole position is confirmed. ✻ The content changes by the installed exit option.

(2) Image Adjust

- These functions are used to make image adjustments.

NOTE

- *For details, see TROUBLE SHOOTING.*

<table>
<tr><th>Touch Panel Display</th><th>Setting (The default is Highlighted).</th></tr>
<tr><td>PRT Max Density</td><td>Adjust the image density by varying the maximum amount of toner sticking to paper.
<table><tr><td>Setting</td><td>-10 ..... 0 ..... +10</td></tr><tr><td>Description</td><td>Lighter ◄——► Darker</td></tr></table></td></tr>
<tr><td>PRT Highlight</td><td>Adjust the image density of the highlighted area.
<table><tr><td>Setting</td><td>-10 ..... 0 ..... +10</td></tr><tr><td>Description</td><td>Lighter ◄——► Darker</td></tr></table></td></tr>
<tr><td>Background Voltage Margin</td><td>Adjust the fog level on the background.
<table><tr><td>Setting</td><td>-5 ..... 0 ..... +5</td></tr><tr><td>Description</td><td>Foggier ◄——► Less Foggy</td></tr></table></td></tr>
<tr><td>ATDC Level Setting</td><td>Select the ATDC control level with the corresponding T/C ratio.
<table><tr><td>Setting</td><td>-2 -1 0 +1 +2</td></tr><tr><td>Description</td><td>Lighter ◄——► Darker</td></tr></table></td></tr>
<tr><td>AE Adjust</td><td>Adjust the AE Reference.
<table><tr><td>Setting</td><td>0 1 2 3 4</td></tr><tr><td>Description</td><td>Foggy ◄——► Less Foggier</td></tr></table></td></tr>
<tr><td>Stabilizer</td><td>If an image failure is not rectified even with Gradation Adjust, select “Reset and Stabilizer Mode.”
<table><tr><td>Reset And Stabilizer Mode</td><td>Stabilizer Mode</td></tr></table>✻ If “Reset and Stabilizer Mode” is run, run “Gradation Adjust” after the sequence has been completed.</td></tr>
<tr><td>ATDC Toner Supply</td><td>If T/C is lower than the specifications:
Only toner replenishing sequence is run.
If T/C is higher than the specifications:
Only developer agitation sequence is run (with no toner supplied).</td></tr>
</table>

NOTE

- *If the image density has been adjusted in “PRT Max Density,” “PRT Highlight,” or “Background Voltage Margin,” select “Stabilizer Mode” in “Stabilizer” to run Stabilizer after the adjustment has been made. Or, turn OFF and ON the Power Switch.*

(3) System Input

- The function allows the Tech. Rep. to define the marketing area, and make settings.

<table>
<tr><th>Touch Panel Display</th><th>Setting (The default is Highlighted).</th></tr>
<tr><td>Marketing Area</td><td>Set the marketing area.
<table><tr><td>MSJ</td><td>MC</td><td>ME</td></tr></table></td></tr>
<tr><td>Org. Detect Option Sensor</td><td>Select “ON” when the optional Original Size Detecting Sensor is mounted.
<table><tr><td>Set</td><td>Unset</td></tr></table>✻ After “Set” has been selected, run “Orig. Detect Option Sensor.”</td></tr>
<tr><td>Serial # Input</td><td>Enter the serial number of each system component including options from the 10-Key Pad.
NOTE
• This procedure must be performed to allow the adjustment data on the IR side to be transmitted to the copier.
• When the “END” key is touched after the IR serial number has been input, data is transmitted to the copier.</td></tr>
<tr><td>Tel. # Input</td><td>Enter the telephone number that will appear on the Touch Panel when a malfunction occurs in the copier.
<Procedure>
1. Enter the phone number from the 10-Key Pad. Use the Interrupt key to enter a hyphen “-.”
2. Touch “END” to validate the phone number setting.</td></tr>
<tr><td>FLS Paper</td><td>Set the size for FLS.
<table><tr><td>F: 330.2 mm
C: 203.2 mm</td><td>F: 330 mm
C: 210 mm</td><td>F: 330.2 mm
C: 215.9 mm</td><td>F: 330 mm
C: 220 mm</td></tr></table></td></tr>
<tr><td>Book Erase (Center)</td><td>Adjust the center erase width in Book copying.
<table><tr><td>Setting</td><td>+2 ..... 15 .....+30</td></tr><tr><td>Description</td><td>Smaller ◄——————► Greater</td></tr></table></td></tr>
<tr><td>Peripheral Mode</td><td>Select the type of the external I/F operation when a printer controller is mounted.
<table><tr><td>Mode 1</td><td>External I/F operation mode 1</td></tr><tr><td>Mode 2</td><td>External I/F operation mode 2</td></tr><tr><td>Mode 3</td><td>External I/F operation mode 3</td></tr><tr><td>Mode 4</td><td>External I/F operation mode 4</td></tr><tr><td>Mode 5</td><td>External I/F operation mode 5</td></tr></table></td></tr>
</table>

<table>
<tr><th>Touch Panel Display</th><th>Setting (The default is Highlighted).</th></tr>
<tr><td>Unit Change</td><td>Select who is to replace a unit when its replacement time arrives, either “User” or “Service.”
Set the type of “Warning” message displayed on the Touch Panel when the replacement time arrives depending on the setting.
<table>
<tr><th>Unit</th><th colspan="2">To be replaced by</th></tr>
<tr><td>Toner</td><td>User</td><td>Service</td></tr>
<tr><td>Waste Toner Bottle</td><td>User</td><td>Service</td></tr>
<tr><td>Fusing Web Unit</td><td>User</td><td>Service</td></tr>
<tr><td>Oil Coating Unit</td><td>User</td><td>Service</td></tr>
<tr><td>Fusing Unit</td><td>User</td><td>Service</td></tr>
<tr><td>Transfer Belt Unit</td><td>User</td><td>Service</td></tr>
<tr><td>Imaging Unit</td><td>User</td><td>Service</td></tr>
</table>
Example: Toner
To be replaced by “User”:
A message that prompts the user to change the Toner Bottle appears.
To be replaced by “Service”:
A message that tells the user to call the Tech. Rep. appears.</td></tr>
</table>

(4) Counter

- Shows the number of copies made on each paper size or type.

<Clearing a Count>

1. Open the counter menu screen.
2. Select the counter to be cleared.
3. Press the Clear key.
   Press the Stop key to undo the clearing operation, restoring the original count.
4. Touch “END”.

<table>
<tr><th>Touch Panel Display</th><th>Setting</th></tr>
<tr><td>Life</td><td>Counts the frequency of use of each of the different parts of the copier.
<table>
<tr><th></th><th>Display</th><th>Description</th></tr>
<tr><td>✻</td><td>Fusing Unit</td><td>No. of times a sheet of paper is fed through</td></tr>
<tr><td>✻</td><td>Fusing Web Unit</td><td>No. of times a sheet of paper is fed through</td></tr>
<tr><td>✻</td><td>Oil Coating Unit</td><td>No. of times a sheet of paper is fed through</td></tr>
<tr><td></td><td>1st.</td><td>No. of sheets of paper fed from the 1st Drawer</td></tr>
<tr><td></td><td>2nd.</td><td>No. of sheets of paper fed from the 2nd Drawer</td></tr>
<tr><td></td><td>3rd.</td><td>No. of sheets of paper fed from the 3rd Drawer</td></tr>
<tr><td></td><td>4th.</td><td>No. of sheets of paper fed from the 4th Drawer</td></tr>
</table>
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>ADF Feed</td><td>No. of sheets of paper fed through the ADF take-up section</td></tr>
<tr><td>ADF Rev.</td><td>No. of sheets of paper fed through the turnover unit of the ADF</td></tr>
<tr><td>Sorter/Finisher</td><td>No. of sheets of paper fed out of the Sorter</td></tr>
<tr><td>Staple</td><td>No. of stapling sequences performed</td></tr>
<tr><td>Punch</td><td>No. of holes made</td></tr>
<tr><td>LCC Parts1</td><td>No. of sheets of paper fed from the LCC</td></tr>
<tr><td>LCC Parts2</td><td>No. of sheets of paper fed from the LCC</td></tr>
</table>
<table>
<tr><th></th><th>Display</th><th>Description</th></tr>
<tr><td>✻</td><td>Cyan IU</td><td>Period of time over which the Cyan Developing Unit has been used.</td></tr>
<tr><td>✻</td><td>Magenta IU</td><td>Period of time over which the Magenta Developing Unit has been used.</td></tr>
<tr><td>✻</td><td>Yellow IU</td><td>Period of time over which the Yellow Developing Unit has been used.</td></tr>
<tr><td>✻</td><td>Black IU</td><td>Period of time over which the Black Developing Unit has been used.</td></tr>
<tr><td></td><td>Transfer Belt Unit</td><td>Period of time over which the Transfer Belt Unit has been used.</td></tr>
<tr><td></td><td>LPH(C)</td><td>Period of time over which the Cyan LPH has been used.</td></tr>
<tr><td></td><td>LPH(M)</td><td>Period of time over which the Magenta LPH has been used.</td></tr>
</table>
✻ : It is not possible to clear the Life counter. It is automatically reset when a new unit has been installed.
For “Fusing Web Unit,” however, it is possible to reset the counter and enter a count from the 10-Key Pad.</td></tr>
</table>

<table>
<tr><th>Touch Panel Display</th><th>Setting</th></tr>
<tr><td>Life</td><td>
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>LPH (Y)</td><td>Period of time over which the Yellow LPH has been used.</td></tr>
<tr><td>LPH (Bk)</td><td>Period of time over which the Black LPH has been used.</td></tr>
</table>
</td></tr>
<tr><td>Jam</td><td>Counts the number of misfeeds that have occurred at different locations in the copier.
<table>
<tr><th>Display</th></tr>
<tr><td>1st.
2nd.
3rd.
4th.
Manual
Vertical Transport
Secondary Transfer</td></tr>
</table>
<table>
<tr><th>Display</th></tr>
<tr><td>Fusing Unit
Exit
LCC Feed
LCC Movement
Duplex Transport
Duplex
Horizontal Transport</td></tr>
</table>
<table>
<tr><th>Display</th></tr>
<tr><td>Sorter/Finisher Trans.
Sorter/Finisher Exit
Staple
ADF</td></tr>
</table>
</td></tr>
<tr><td>Trouble</td><td>Counts the number of malfunctions that have occurred at different parts of the copier.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>C0000/1</td><td>Trans. Motor</td></tr>
<tr><td>C0010/1</td><td>Cyan PC Motor</td></tr>
<tr><td>C0012/3</td><td>Magenta PC Motor</td></tr>
<tr><td>C0014/5</td><td>Yellow PC Motor</td></tr>
<tr><td>C0016/7</td><td>Black PC Motor</td></tr>
<tr><td>C0040</td><td>Suction Fan</td></tr>
<tr><td>C0046</td><td>Fuser Cooling Fan</td></tr>
<tr><td>C004C</td><td>Exhaust Fan</td></tr>
</table>
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>C004E</td><td>Cooling Fan</td></tr>
<tr><td>C0060/1</td><td>Fuser Motor</td></tr>
<tr><td>C0094</td><td>2nd Transfer Separation</td></tr>
<tr><td>C0096</td><td>Transfer Belt Separation</td></tr>
<tr><td>C0098</td><td>Fuser Separation</td></tr>
<tr><td>C0200</td><td>Cyan PC Charge</td></tr>
<tr><td>C0202</td><td>Magenta PC Charge</td></tr>
<tr><td>C0204</td><td>Yellow PC Charge</td></tr>
</table>
</td></tr>
</table>

Touch Panel Display	Setting
Trouble	

Display	Description
C0206	Black PC Charge
C0400	Exposure Lamp off
C0410	Exposure Lamp On
C0500	Fuser (Upper)
C0501	Fuser (Lower)
C0510	Abnormal Low Temp. (Upper)
C0511	Abnormal Low Temp. (Lower)
C0520	Abnormal High Temp. (Upper)

Display	Description
C0521	Abnormal High Temp. (Lower)
C0650	Home Sensor
C0660	Over Run
C099X	LCC
C0B0X	Finisher/Sorter Trans.
C0B2X	Staple Unit. (CD direction)
C0B3X	Finisher Alignment
C0B48X	Finisher Staple Transport (Exit)

Display	Description
C0B4A	Finisher Staple Transport (Receipt)
C0B5	Staple Unit (Rotation)
C0B7	Punch
C0B8	Shift
C0BAXX	Finisher Elevator Tray
C0F30/1/A	Cyan ATDC Sensor
C0F32/3/B	Magenta ATDC Sensor
C0F34/5/C	Yellow ATDC Sensor

Display	Description
C0F36/7/D	Black ATDC Sensor
C13C8	New Transfer Belt Unit
C13CA	New Fusing Unit
C13CB	New Fusing Web Unit
C13CC	New Oil Coating Unit
C13D1	EEPROM Access (C)
C13D2	EEPROM Access (M)
C13D3	EEPROM Access (Y)

Display	Description
C13D4	EEPROM Access (Bk)
C3310	CCD Gain
C37X0	Scanner Cooling Fan
C3A00	PIC I/F
C3A01	PIC

<table>
<tr><th>Touch Panel Display</th><th>Setting</th></tr>
<tr><td>Warning</td><td>Displays the number of warnings issued for different parts.
<table>
<tr><th>Display</th></tr>
<tr><td>AIDC Sensor (Front)
AIDC Sensor (Back)
Cyan IU
Magenta IU
Yellow IU
Black IU
S/P</td></tr>
</table>
<table>
<tr><th>Display</th></tr>
<tr><td>CCD Gain
Exp. Lamp Adjust
Color Shift Test Pattern
Color Shift Adjust
ATVC (C)
ATVC (M)
ATVC (Y)</td></tr>
</table>
<table>
<tr><th>Display</th></tr>
<tr><td>ATVC (Bk)
ATVC (2nd)</td></tr>
</table></td></tr>
<tr><td>Maintenance</td><td>Set different count values for the Maintenance Counter.
When the preset count is reached, the maintenance call reminder message appear on the Touch Panel.
<Procedure>
1. Touch “Maint. Set”.
2. Press the Clear key to clear the current value.
Press the Interrupt key to undo the clearing operation, restoring the original value.
3. Enter the value from the 10-Key Pad.
4. Touch “END”.</td></tr>
</table>

(5) State Confirm

- These functions are used to confirm machine state.

<table>
<tr><th>Touch Panel Display</th><th>Setting</th></tr>
<tr><td>I/O Check</td><td>• The following functions are used to locate the faulty spot.
• Shows the states of the I/O ports when the copier is in the standby state.
✻ For details, see TROUBLESHOOTING.</td></tr>
<tr><td>Table #</td><td>Use this function to show the output values of the developing bias and grid voltage.
<table>
<tr><th>Developing Bias</th><th>Grid Voltage</th></tr>
<tr><td>Vb-C</td><td>Vg-C</td></tr>
<tr><td>Vb-M</td><td>Vg-M</td></tr>
<tr><td>Vb-Y</td><td>Vg-Y</td></tr>
<tr><td>Vb-Bk</td><td>Vg-Bk</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Touch Panel Display</th><th>Setting</th></tr>
<tr><td>Level History 1</td><td>Displays ATDC, AIDC, and fusing temperatures.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>ATDC-C</td><td>ATDC Sensor, cyan ratio (%)</td></tr>
<tr><td>ATDC-M</td><td>ATDC Sensor, magenta ratio (%)</td></tr>
<tr><td>ATDC-Y</td><td>ATDC Sensor, yellow ratio (%)</td></tr>
<tr><td>ATDC-Bk</td><td>ATDC Sensor, black ratio (%)</td></tr>
<tr><td>AIDC1</td><td>AIDC Sensor output value 1 (V)</td></tr>
<tr><td>AIDC2</td><td>AIDC Sensor output value 2 (V)</td></tr>
<tr><td>Temp-Upr.</td><td>Upper Fusing Roller temperature (°C)</td></tr>
<tr><td>Temp-Lwr.</td><td>Lower Fusing Roller temperature (°C)</td></tr>
</table></td></tr>
<tr><td>Level History 2</td><td>Displays the AIDC adjustment values.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>AIDC Sensor Adjust Value 1</td><td>Intensity adjustment value of AIDC background level (UN20)</td></tr>
<tr><td>AIDC Sensor Adjust Value 2</td><td>Intensity adjustment value of AIDC background level (UN21)</td></tr>
</table></td></tr>
<tr><td>Temp. & Humidity</td><td>Use this function to show the temperature and humidity inside the copier.</td></tr>
<tr><td>CCD Check</td><td>Use this function to show the CCD data.
<table>
<tr><td rowspan="2">CLAMP</td><td>RO RE GO GE BO BE</td></tr>
<tr><td>D/A values of clamp R, G, and B</td></tr>
<tr><td rowspan="2">GAIN</td><td>RO RE GO GE BO BE</td></tr>
<tr><td>D/A values of gain R, G, and B</td></tr>
</table>
<table>
<tr><td>Lamp Adjust Value</td></tr>
</table></td></tr>
<tr><td>Paper Passage</td><td>A check is made for paper passage performance.
<Procedure>
1. Select the paper source.
2. Press the Start key to start the paper passage cycle.
3. Press the Stop key to stop the paper passage cycle.</td></tr>
<tr><td>Optical Memory</td><td>Displays the mounting of optional memories.</td></tr>
<tr><td>Color Shift</td><td>Displays the amount of correction for color shift.</td></tr>
<tr><td>IU Lot No.</td><td>Displays the lot number for each of C, M, Y, and Bk IUs.</td></tr>
</table>

(6) ADF Check

- Allows the Tech. Rep. to make the various functional tests and adjustments of the (ADF).

✻ For details, see Option service manual.

Touch Panel Display	Setting
Tech. Rep. Choice	Displays the screens used to adjust.
Original Stop Position	Adjust the document stop position in each of the ADF modes.
Registration Loop	Set the length of the loop to be formed in paper before the Registration Rollers.
I/O Check	The following functions are used to locate the faulty spot. Shows the states of the I/O ports when the copier is in the standby state.
Paper Passage	Makes a paper passage check through the ADF.

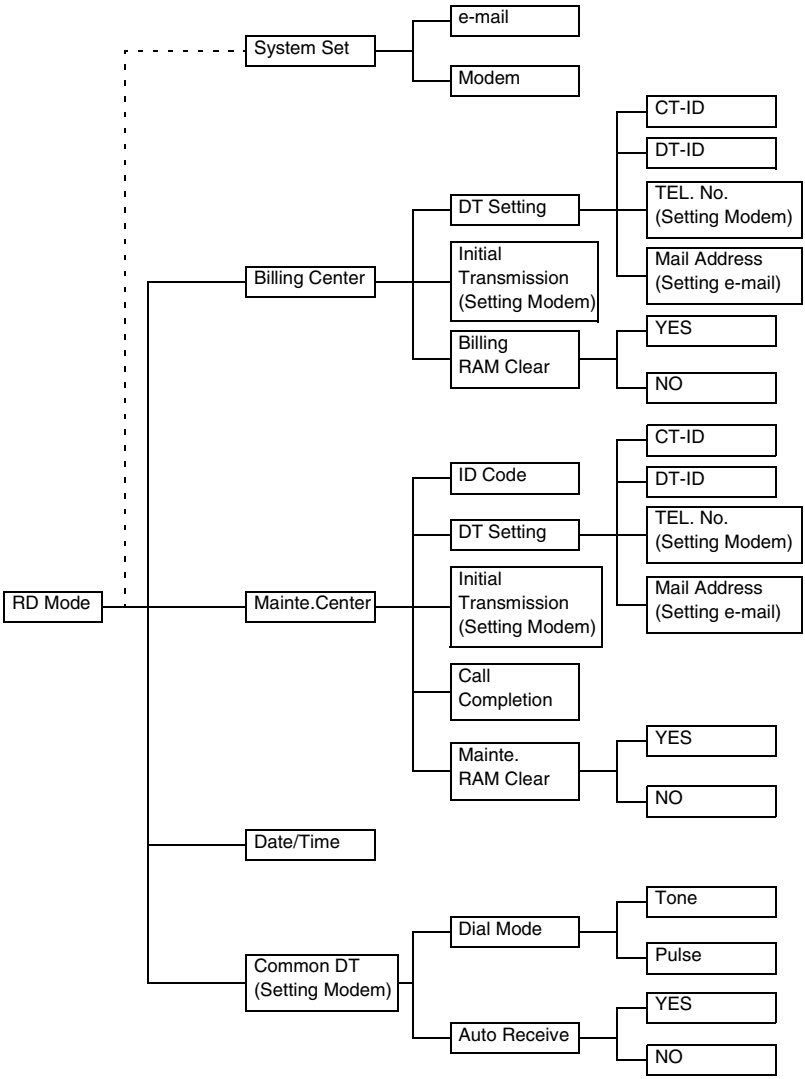
(7) ROM Version

- Shows the ROM versions.

(8) RD Mode

- Make the initial settings of the copier for the Data Terminal.

1. RD Mode Menu Function Tree



2. Setting in the RD Mode

Touch Panel Display	Setting (The default is **Highlighted**).
System Set	Set the control system. e-mail / Modem
Billing Center	Displays the various setting screens.
DT Setting	Displays the setting screens for CT-ID, DT-ID, and telephone number. The mail address is also displayed if “e-mail” is set for System Set.
CT-ID	Enter the ID number of the Center PC from the 10-Key Pad.
DT-ID	Enter the ID number of the Data Terminal from the 10-Key Pad.
TEL No.	Enter the telephone number of the modem connected to the Center PC.
Initial Transmission	Performs the initial transmission from the PPC to the Center to check for correct communication after the Data Terminal has been set up.
Billing RAM Clear	Initializes the Data Terminal settings. YES / **NO**
Mainte. Center	Displays the various setting screens.
ID Code	Enter the ID code. <Procedure> 1. Touch the ID Code key. 2. Enter the ID code from the 10-Key Pad. 3. Touch the ID Code key. (This executes the transmission of MAINT. START to the Center.)
DT Setting	Displays the setting screens for CT-ID, DT-ID, and telephone number. The mail address is also displayed if “e-mail” is set for System Set.
CT-ID	Enter the ID number of the Center PC from the 10-Key Pad.
DT-ID	Enter the ID number of the Data Terminal from the 10-Key Pad.
TEL No.	Enter the telephone number of the modem connected to the Center PC.
Initial Transmission	Performs the initial transmission from the PPC to the Center to check for correct communication after the Data Terminal has been set up.
Call Completion	Transmits the signal of notifying the completion of service job to the Center.
Mainte. RAM Clear	Initializes the Data Terminal settings. YES / **NO**

Touch Panel Display	Setting (The default is **Highlighted**).
Date/Time Set	Set the date and time-of-day for Date Printing.
Common DT	Displays the screens for communications settings.
Dial Mode	Sets the type of telephone line of the user. Tone / **Pulse**
Auto Receive	Sets the auto reception function. YES / **NO**

(9) Administrator # Input

- Set an ID number for opening the “Admin. Mode” screen of Utility Mode from the 10-Key Pad.

(10) List Output

- This function produces a list of the various Service mode data.

<Procedure>
1. Check that A4L or Letter L paper is loaded.
2. Select the desired function.
3. Press the Start key.

Touch Panel Display	Setting
Image Processing	Produces a list of image-related data. Produces a list of counter-related data.
Counter	Produces a list of counter-related data.

Details of List Output

Image Counter

Date/Time	IR Area
OHP Speed	ADF Original Position
Transfer Table	Count Up Select
PC Action	ATDC Sensor Volume
Fuser Action	AIDC Level
PC PAT.	PRT max Density
Paper Size	PRT Highlight
Marketing Area	Background Voltage
Serial #	ATDC Level Setting
Fuser Oil Choice	VB Shift
Fuser Oil Change	AE Adjust
Fuser Speed	Table #
AIDC Offset	PC dev. Status
Transfer Output	Bk Toner Sup. Status
Feed Motor Speed	Temp & Humidity
PRT Area Top-Margin	CCD Check
PRT Area Left-Margin	ROM Version
PRT Area Dup. Left-Margin	Gradation Adjust
Transfer Timing	Stabilizer Trouble
Loop Adjust	

Counter

Date/Time	Jam Counter
Life Counter	Warning Counter
Trouble Counter	Meter Count

(11) Test Print

- Output the test pattern.

<Procedure>
1. Select the test pattern type.
2. Make the necessary settings according to the specific Test Print function (Color mode, density, etc.).
3. Press the Start key to start the output sequence.

✻ The test print is produced on paper of the maximum size among those loaded in the drawers.

Touch Panel Display	Setting
Gradation Pattern	Use to output a gradation pattern. Used to check for gradation reproduction on the engine side.
Halftone	Use to output a halftone pattern. Used to check for uneven density, uneven pitch, and image noise on the engine side.
Lattice Pattern	Use to output a lattice pattern. Used to check for fine line reproduction and toner scattering on the engine side.
Solid Pattern	Use to output a solid pattern. Used to check for image density reproduction on the engine side.
Color Sample	Use to output a color sample pattern. Used to check for reproduction of each color on the engine side.
IR Test Pattern	Use to output a IR test pattern. Used to determine whether the engine or the IR is responsible for an image failure that has occurred.
8 Color Solid Pattern	Use to output a 8 color solid pattern. Used to check for reproduction and uneven density of each color on the engine side.

(12) Gradation Adjust

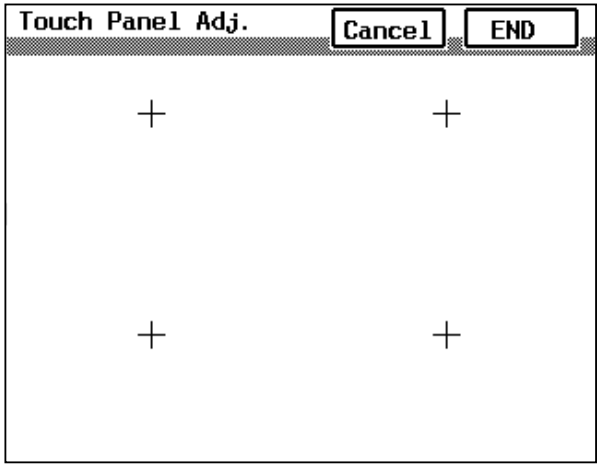
- Displays the Adj. Value and Conv. Value of Max. and Highlight for each color.
- If an image failure occurs, this function can be run to let the copier automatically correct the gamma curve.

✻ For details, see DIS/REASSEMBLY, ADJUSTMENT.

5. TOUCH PANEL CORRECTION MODE

- Corrects deviation in the sensitive area of the Touch Panel.

5-1. Touch Panel Correction Mode Screen



4004P031CA

5-2. Touch Panel Correction Mode Setting Procedures

<Procedure>

1. Press the following keys in this order.
   Stop → 0 → Stop → 3
2. Sequentially touch the four points marked with + on the screen.

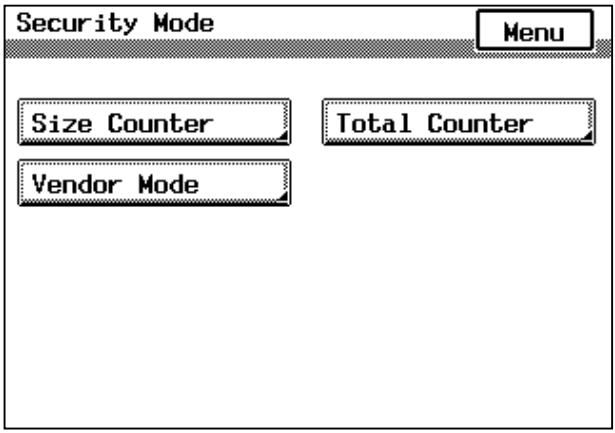
NOTE

- *Lightly touch the one dot portion at the exact center of the "+" marking using the tip of a pen or similar object.*

6. SECURITY MODE

- Allows the Tech. Rep. to set the various counters.

6-1. Security Mode Screen



4004P032CA

6-2. Security Mode Setting Procedures

<Procedure>

1. Show the Tech. Rep. mode menu screen.
2. Press the following keys in this order:
   Stop → 9
3. Select the particular function.

<Exiting the Mode>

- Press the “Menu” key.

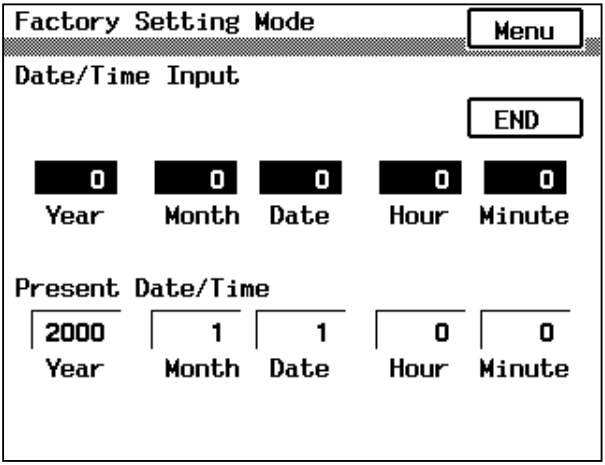
6-3. Settings in the Security Mode

<table>
<tr><td>Touch Panel Display</td><td>Setting (The default is Highlighted).</td></tr>
<tr><td>Size Counter</td><td>Select the size of the paper to be counted by the Size Counter.
<table>
<tr><td>No Count</td><td>A3/11×17</td></tr>
<tr><td>A3/B4/11×17/Legal</td><td>A3/B4/FLS/11×17/Legal</td></tr>
</table></td></tr>
<tr><td>Total Counter</td><td>Select the condition by which the Counter count is increased.
<table>
<tr><td>Mode 1</td><td>1 Copy per 1 copy cycle</td></tr>
<tr><td>Mode 2</td><td>Multiple count-up according to paper size 1/2-sided copying</td></tr>
</table></td></tr>
<tr><td></td><td><Count-up Table>
<table>
<tr><td>Copying</td><td colspan="4">1-Sided</td><td colspan="4">2-Sided</td></tr>
<tr><td>Size</td><td colspan="2">Sizes Other than those set</td><td colspan="2">Set sizes</td><td colspan="2">Sizes Other than those set</td><td colspan="2">Set sizes</td></tr>
<tr><td rowspan="2">Total</td><td colspan="2">Mode</td><td colspan="2">Mode</td><td colspan="2">Mode</td><td colspan="2">Mode</td></tr>
<tr><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td><td>2</td></tr>
<tr><td>Total Counter</td><td>1</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td><td>2</td><td>4</td></tr>
<tr><td>Size Counter</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>2</td><td>2</td></tr>
<tr><td>2-sided Total Counter</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
</table>
0: No count 1: 1 count 2: 2 counts 4: 4 counts</td></tr>
<tr><td>Vender Mode</td><td>Set the initial screen according to the type of vender mounted on the copier.
<table>
<tr><td>Set</td></tr>
<tr><td>Unset</td></tr>
</table>
→
<table>
<tr><td>Coin</td><td>Card</td></tr>
</table></td></tr>
</table>

7. DATE/TIME INPUT MODE

- This mode is used to set time-of-day and date.

7-1. Date/Time Input mode Screen



4004P033CA

7-2. Date/Time Input Mode Setting Procedure

<Procedure>

1. Press the following keys in this order.
   Stop → 1 → 1 → 4 → 4 Clear
2. Enter year, month, day, hour, and minute, in that order, from 10-key Pad.
3. Make sure that correct figures have been entered and then touch “OK.”

NOTE

- *When setting the month, day, hour, or minute, enter “0” first if the data one digit.*