KYOCERA

KM-1500

SERVICE MANUAL

Published in Mar. ’04
842DC113
Revision 3

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.

CAUTION

Double-pole/neutral fusing.

KYOCERA

Safety precautions

This booklet provides safety warnings and precautions for our service personnel to ensure the safety of their customers, their machines as well as themselves during maintenance activities. Service personnel are advised to read this booklet carefully to familiarize themselves with the warnings and precautions described here before engaging in maintenance activities.

Safety warnings and precautions

Various symbols are used to protect our service personnel and customers from physical danger and to prevent damage to their property. These symbols are described below:

⚠**DANGER**: High risk of serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**WARNING**:Serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**CAUTION**: Bodily injury or damage to property may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

Symbols

The triangle (△) symbol indicates a warning including danger and caution. The specific point of attention is shown inside the symbol.

 General warning.

 Warning of risk of electric shock.

 Warning of high temperature.

⃠ indicates a prohibited action. The specific prohibition is shown inside the symbol.

 General prohibited action.

 Disassembly prohibited.

● indicates that action is required. The specific action required is shown inside the symbol.

 General action required.

 Remove the power plug from the wall outlet.

 Always ground the copier.

1. Installation Precautions

⚠ WARNING

- Do not use a power supply with a voltage other than that specified. Avoid multiple connections to one outlet: they may cause fire or electric shock. When using an extension cable, always check that it is adequate for the rated current. .....

- Connect the ground wire to a suitable grounding point. Not grounding the copier may cause fire or electric shock. Connecting the earth wire to an object not approved for the purpose may cause explosion or electric shock. Never connect the ground cable to any of the following: gas pipes, lightning rods, ground cables for telephone lines and water pipes or faucets not approved by the proper authorities. .....

⚠ CAUTION:

- Do not place the copier on an infirm or angled surface: the copier may tip over, causing injury. .....

- Do not install the copier in a humid or dusty place. This may cause fire or electric shock. .....

- Do not install the copier near a radiator, heater, other heat source or near flammable material. This may cause fire. .....

- Allow sufficient space around the copier to allow the ventilation grills to keep the machine as cool as possible. Insufficient ventilation may cause heat buildup and poor copying performance. .....

- Always handle the machine by the correct locations when moving it. .....

- Always use anti-toppling and locking devices on copiers so equipped. Failure to do this may cause the copier to move unexpectedly or topple, leading to injury. .....

- Avoid inhaling toner or developer excessively. Protect the eyes. If toner or developer is accidentally ingested, drink a lot of water to dilute it in the stomach and obtain medical attention immediately. If it gets into the eyes, rinse immediately with copious amounts of water and obtain medical attention. .....

- Advice customers that they must always follow the safety warnings and precautions in the copier's instruction handbook. .....

2. Precautions for Maintenance

⚠WARNING

- Always remove the power plug from the wall outlet before starting machine disassembly. .....

- Always follow the procedures for maintenance described in the service manual and other related brochures. .....

- Under no circumstances attempt to bypass or disable safety features including safety mechanisms and protective circuits. .....

- Always use parts having the correct specifications. .....

- Always use the thermostat or thermal fuse specified in the service manual or other related brochure when replacing them. Using a piece of wire, for example, could lead to fire or other serious accident. .....

- When the service manual or other serious brochure specifies a distance or gap for installation of a part, always use the correct scale and measure carefully. .....

- Always check that the copier is correctly connected to an outlet with a ground connection. .....

- Check that the power cable covering is free of damage. Check that the power plug is dust-free. If it is dirty, clean it to remove the risk of fire or electric shock. .....

- Never attempt to disassemble the optical unit in machines using lasers. Leaking laser light may damage eyesight. .....

- Handle the charger sections with care. They are charged to high potentials and may cause electric shock if handled improperly. .....

⚠CAUTION

- Wear safe clothing. If wearing loose clothing or accessories such as ties, make sure they are safely secured so they will not be caught in rotating sections. .....

- Use utmost caution when working on a powered machine. Keep away from chains and belts. .....

- Handle the fixing section with care to avoid burns as it can be extremely hot. .....

- Check that the fixing unit thermistor, heat and press rollers are clean. Dirt on them can cause abnormally high temperatures. .....

- Do not remove the ozone filter, if any, from the copier except for routine replacement. .....

• Do not pull on the AC power cord or connector wires on high-voltage components when removing them; always hold the plug itself. .....

• Do not route the power cable where it may be stood on or trapped. If necessary, protect it with a cable cover or other appropriate item. .....

• Treat the ends of the wire carefully when installing a new charger wire to avoid electric leaks. .....

• Remove toner completely from electronic components. .....

• Run wire harnesses carefully so that wires will not be trapped or damaged. .....

• After maintenance, always check that all the parts, screws, connectors and wires that were removed, have been refitted correctly. Special attention should be paid to any forgotten connector, trapped wire and missing screws. .....

• Check that all the caution labels that should be present on the machine according to the instruction handbook are clean and not peeling. Replace with new ones if necessary. .....

• Handle greases and solvents with care by following the instructions below: .....
· Use only a small amount of solvent at a time, being careful not to spill. Wipe spills off completely.
· Ventilate the room well while using grease or solvents.
· Allow applied solvents to evaporate completely before refitting the covers or turning the main switch on.
· Always wash hands afterwards.

• Never dispose of toner or toner bottles in fire. Toner may cause sparks when exposed directly to fire in a furnace, etc. .....

• Should smoke be seen coming from the copier, remove the power plug from the wall outlet immediately. .....

3. Miscellaneous

⚠WARNING

• Never attempt to heat the drum or expose it to any organic solvents such as alcohol, other than the specified refiner; it may generate toxic gas. .....

CONTENTS

1-1-1 Specifications

Type	Desktop
Copying system	Indirect electrostatic system
Originals	Sheets of paper (Maximum original size: folio/8 1/2" × 14" [legal])
	Platen: Sheets of paper, books, 3-dimensional objects (Maximum original size: folio/8 1/2" × 14" [legal])
Original feed system	Contact glass: fixed
	Document processor (optional): sheet-through
Copy paper	Cassette: Plain paper (60 - 90 g/m^2 [thick paper mode: 90 - 105 g/m^2])
	Bypass table: Plain paper (60 - 90 g/m^2 [thick paper mode: 90 - 163 g/m^2])
	Special paper: Transparencies, letterhead, colored paper, recycled paper
	Note: Use the bypass table for special paper.
Copying sizes	Maximum: folio/8 1/2" × 14" [legal]
	Minimum: A6R /5 1/2" × 8 1/2"
Magnification ratios	Manual mode: 50 - 200%, 1% increments
Copy speed	At 100% magnification in copy mode:
	A4R/8 1/2" × 11": 15 copies/min.
First copy time	Within 9.5 s (A4/8 1/2" × 11", original placed on the platen)
Warm-up time	Within 15 s (room temperature 23°C/73.4°F, humidity 50% RH)
	Recovery from the low power mode: Within 10 s (room temperature 23°C/73.4°F, humidity 50% RH)
Paper feed system	Automatic feed
	Capacity:
	Cassette: 250 sheets (80 g/m^2)
	Manual feed
	Capacity:
	Bypass: 50 sheets (80 g/m^2)
Standard memory	16 MB (11 MB of bitmapping memory and 5 MB of image storage memory)
	(Approx. 30 pages of memory possible with A4, 6% black originals)
Additional memory	1 slot (16 MB, 32 MB, 64 MB or 128 MB)
Continuous copying	1 - 99 sheets
Scanning system	Flat bed scanning by CCD image sensor
Resolution	600 × 600 dpi
Light source	Cold cathode lamp
Photoconductor	OPC (drum diameter 30 mm)
Charging system	Single positive corona charging
Developing system	Single element reversing process
Transfer system	Transfer roller
Fixing system	Heat roller
	Heat source: halogen heaters (750 W)
	Control temperature: 180°C/356°F (at normal ambient temperature)
	Abnormally high temperature protection device: thermal cutout
Charge erasing system	Exposure by cleaning lamp
Cleaning system	Cleaning blade
Dimensions	496 (W) × 421 (D) × 385 (H) mm
	19 9/16" (W) × 16 5/8" (D) × 15 3/16" (H)
Weight	Approx. 14 kg/30.8 lbs
Floor requirements	496 (W) × 740 (D) mm
	19 9/16" (W) × 29 3/16" (D)
Functions	Auto exposure adjustment, Eco-copy mode, Zoom mode, Preset zoom mode, Off mode, Low power mode, Layout modes, Sort mode and Program function
Power source	120 V AC, 60 Hz, 7.3 A
	220 - 240 V AC, 50/60 Hz, 3.8 A
Power consumption	854 W
Options	Paper feeder, Document processor and Additional memory

1-1-2 Name of parts

(1) Copier

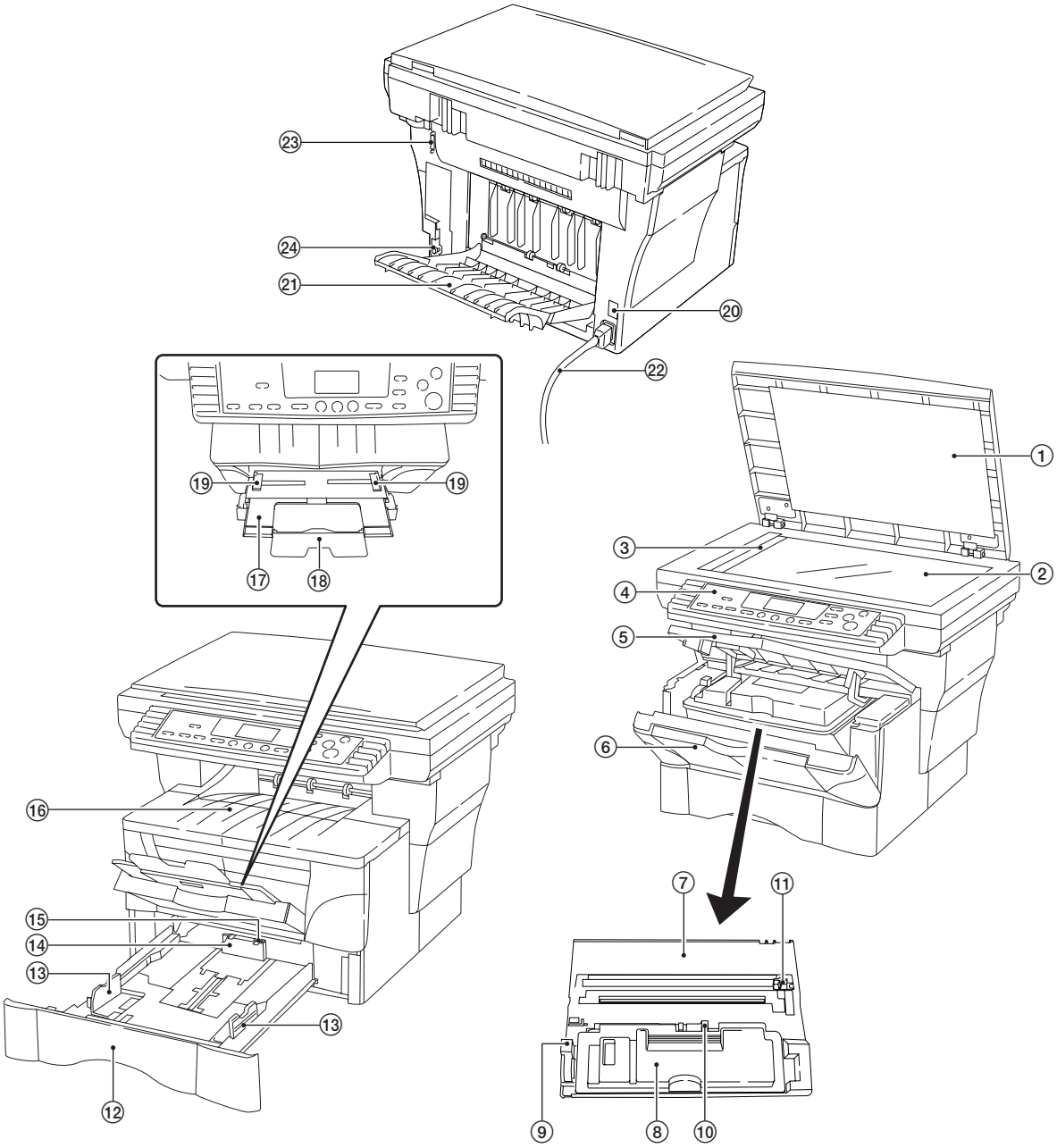


Figure 1-1-1 Name of parts

① Original holder
② Contact glass
③ Original size indicator
④ Operation panel
⑤ Front top cover
⑥ Front cover
⑦ Process unit
⑧ Toner container
⑨ Lock lever
⑩ Toner container release lever
⑪ Main charger cleaner
⑫ Cassette
⑬ Paper guide
⑭ Paper stopper
⑮ *Stopper extension lock*
⑯ Face-down output tray
⑰ MP tray
⑱ Extension tray
⑲ Slider
⑳ *Power switch*
㉑ Face-up output tray
㉒ Power cord
㉓ DP interface connector
㉔ Memory cover

(2) Operation panel

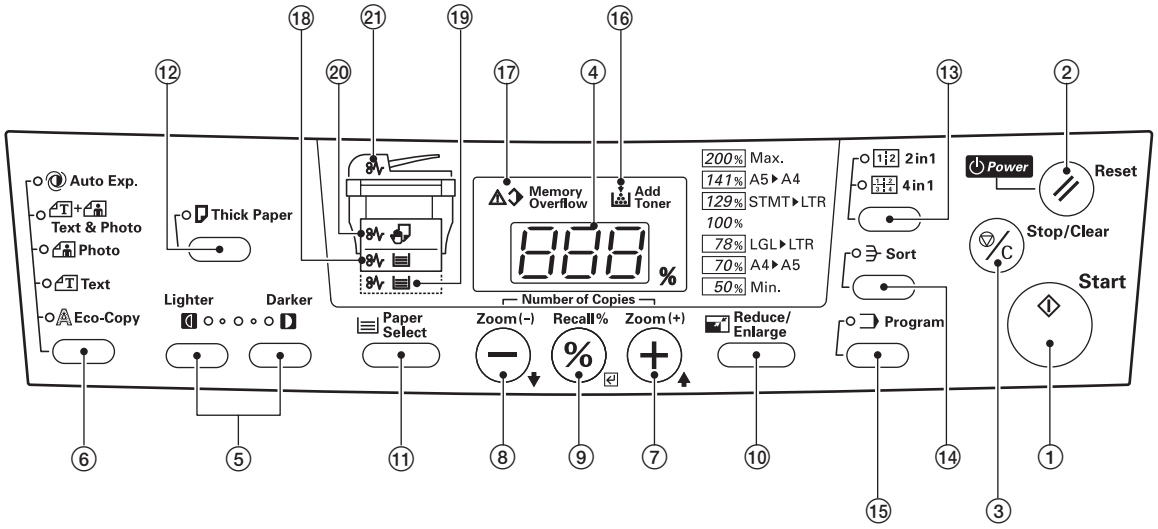


Figure 1-1-2

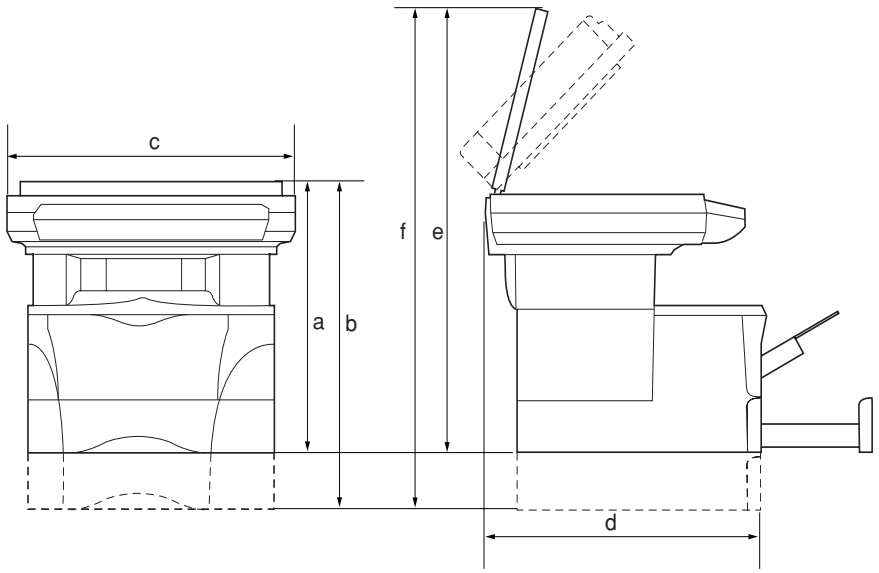
① Start key (Indicator)
② Reset/Power key
③ Stop/Clear key
④ Copy quantity/magnification display
⑤ Copy exposure adjustment keys
⑥ Image mode selection key
⑦ Number of Copies/Zoom (+) key
⑧ Number of Copies/Zoom (–) key
⑨ Recall%/Enter key
⑩ Reduce/Enlarge key
⑪ Paper Select key
⑫ Thick Paper key (Indicator)
⑬ 2in1/4in1 key (Indicators)
⑭ Sort key (Indicator)
⑮ Program key (Indicator)
⑯ Add toner indicator
⑰ Memory overflow indicator
⑱ Cassette misfeed indicator
⑲ Paper feeder indicator
⑳ Bypass tray misfeed indicator
㉑ DP indicator

1-2-1 Drum

Note the following when handling or storing the drum.
- When removing the process unit, never expose the drum surface to strong direct light.
- Keep the drum at an ambient temperature between 10°C/50°F and 32.5°C/90.5°F and at a relative humidity not higher than 80% RH. Avoid abrupt changes in temperature and humidity.
- Avoid exposure to any substance which is harmful to or may affect the quality of the drum.
- Do not touch the drum surface with any object. Should it be touched by hands or stained with oil, clean it.

1-2-2 Installation environment

1. Temperature: 10 - 32.5°C/50 - 90.5°F
2. Humidity: 20 - 80%RH
3. Power supply: 120 V AC, 7.3 A
   220 - 240 V AC, 3.8 A
4. Power source frequency: 50 Hz ±0.3%/60 Hz ±0.3%
5. Installation location
   - Avoid direct sunlight or bright lighting. Ensure that the photoconductor will not be exposed to direct sunlight or other strong light when removing paper jams.
   - Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.
   - Avoid dust and vibration.
   - Choose a surface capable of supporting the weight of the machine.
   - Place the machine on a level surface (maximum allowance inclination: 1°).
   - Avoid air-borne substances that may adversely affect the machine or degrade the photoconductor, such as mercury, acidic of alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.
   - Select a room with good ventilation.
6. Allow sufficient access for proper operation and maintenance of the machine.
   Machine front: 1000 mm/39 3/8" Machine rear: 300 mm/11 13/16"
   Machine right: 300 mm/11 13/16" Machine left: 300 mm/11 13/16"

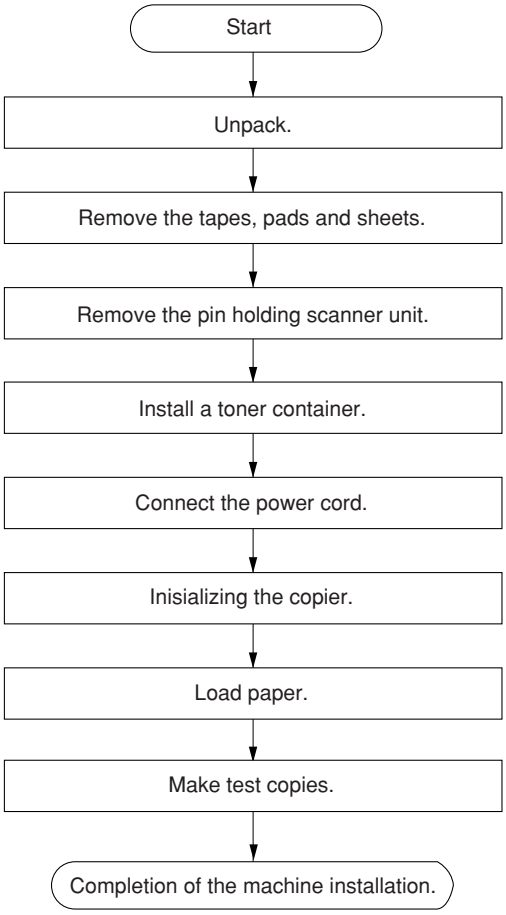


a: 385 mm/15 3/16"
b: 460 mm/18 1/8"
c: 496 mm/19 9/16"
d: 421 mm/16 5/8"
e: 665 mm/26 3/16"
f: 740 mm/29 3/16"

Figure 1-2-1 Installation dimensions

1-3-1 Unpacking and installation

(1) Installation procedure



Unpack.

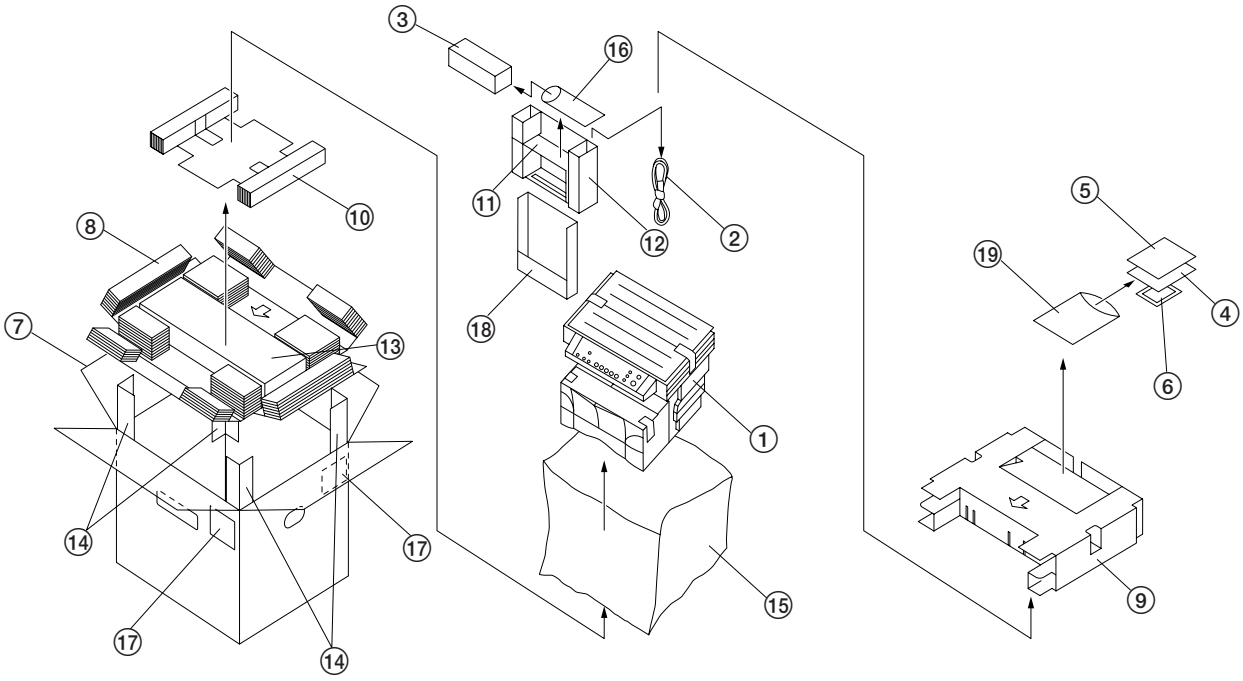


Figure 1-3-1 Unpacking

① Copier
② Power cord
③ Toner container
④ Operation guide
⑤ Installation guide
⑥ Cleaning cloth
⑦ Outer case
⑧ Bottom pad
⑨ Upper pad
⑩ Side pad
⑪ Front spacer
⑫ Front pad
⑬ Bottom spacer
⑭ Corner support
⑮ Products cover
⑯ Plastic bag
⑰ Bar code labels
⑱ Pocket spacer
⑲ Plastic bag

CAUTIONS

- Be sure to hold both the front and rear sides of the copier when carrying it, as shown in the illustration.
- Be sure not to pull the cassette out when holding the front of the copier.
- Be sure that the original cover is closed whenever transporting the copier.
- DO NOT attempt to carry the copier by holding only the top portion. Doing so may result in you dropping the copier and thereby damaging the copier and/or its covers.

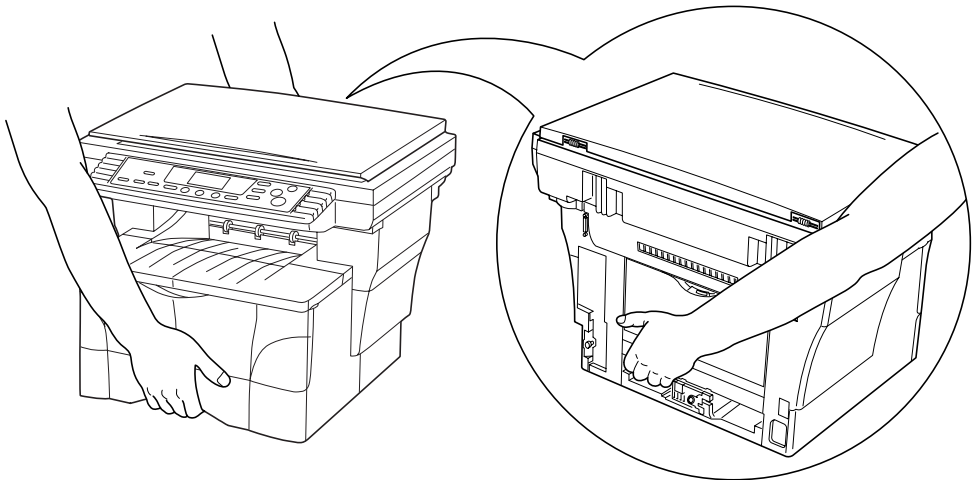


Figure 1-3-2

Remove the tapes, pads and sheets.

1. Remove the sheet and the two tapes.

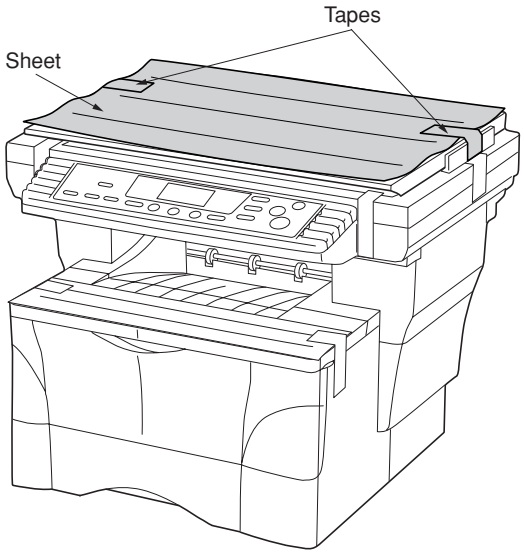


Figure 1-3-3

2. Open the original cover.

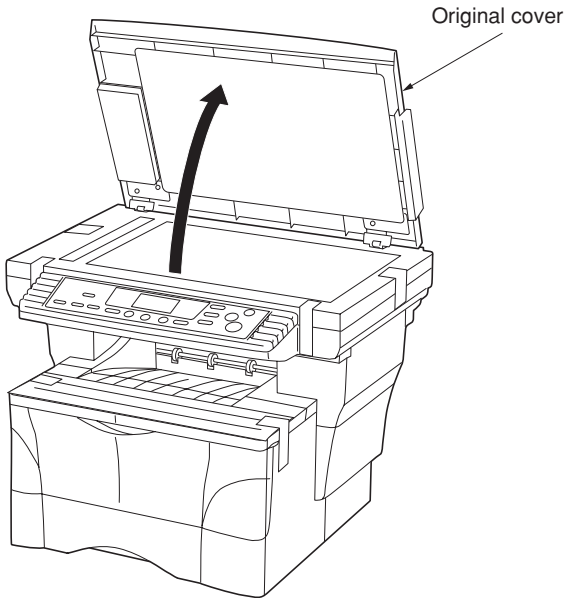


Figure 1-3-4

3. Remove the nine tapes, the three pads and the sheet.

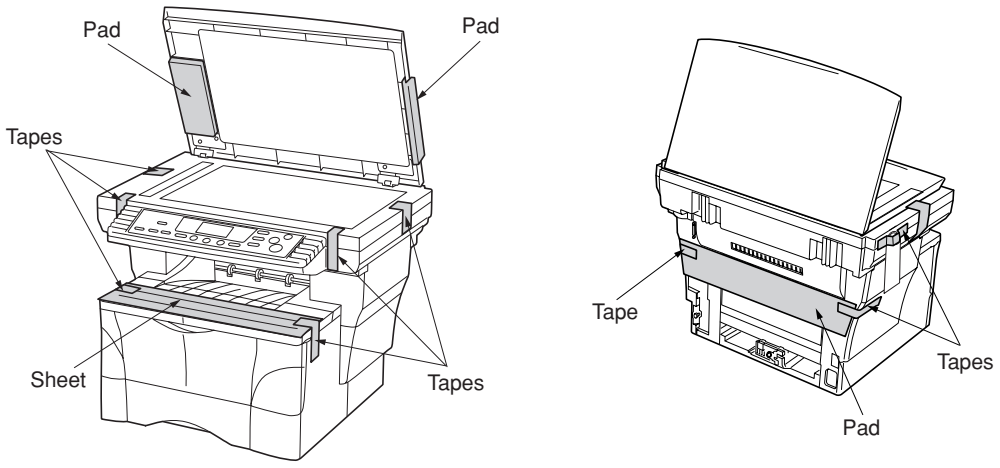


Figure 1-3-5

4. Pull the cassette out of the copier.

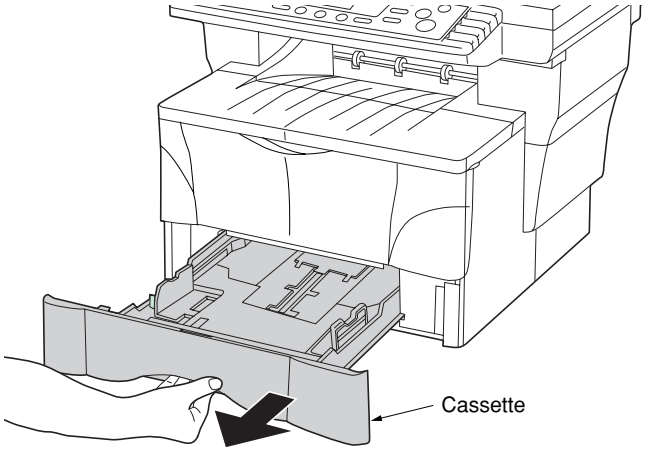


Figure 1-3-6

5. Remove the pad from inside the cassette.

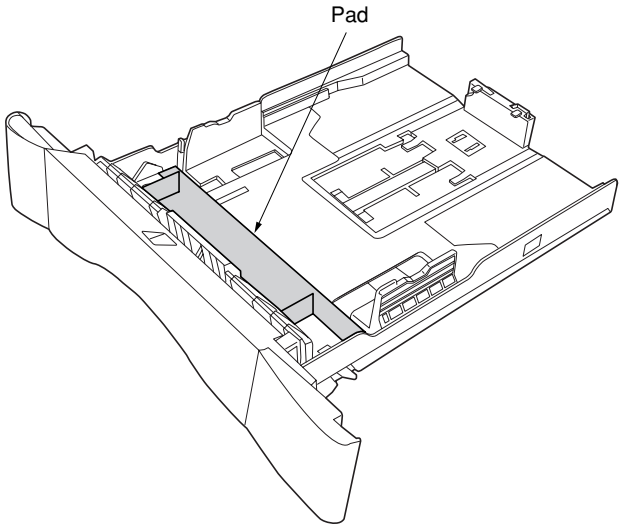


Figure 1-3-7

Remove the pin holding scanner unit.

1. Remove the yellow pin for scanner unit and the paper tag from the left side of the copier.

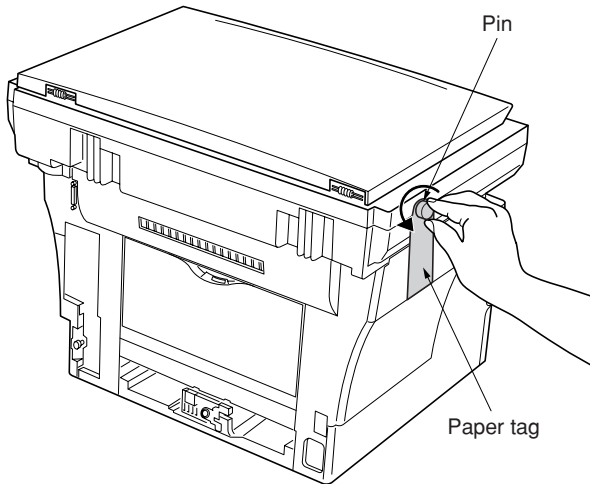


Figure 1-3-8

Install a toner container.

1. Open the front top cover and front cover.

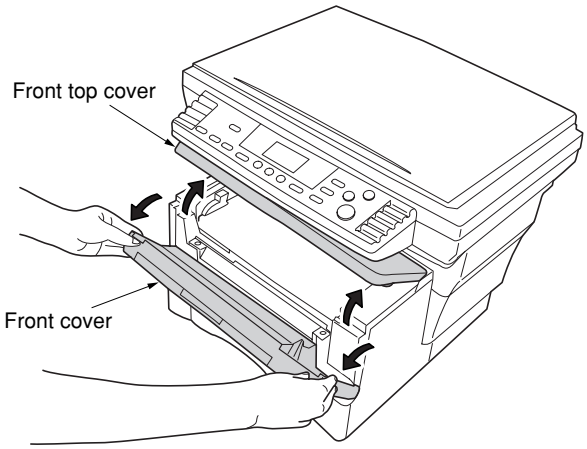


Figure 1-3-9

2. Store the pin for scanner unit on the inside of the front cover as shown in the illustration.
   * Be sure to save this pin as it is essential that it be used whenever the copier is moved. The location for storing the pin is clearly marked on the right side of the inside portion of the front cover.

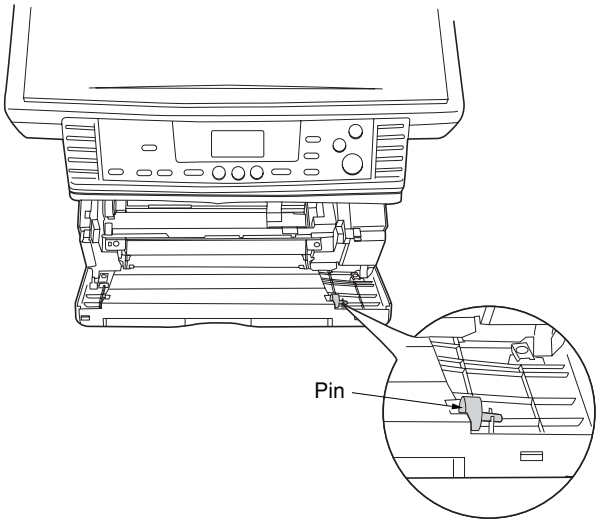


Figure 1-3-10

3. Remove the process unit from the copier.

CAUTIONS
- Place the process unit on a clean, level surface.
- Never expose the process unit to any sort of impact or shock.
- The drum in the process unit is sensitive to light. Never expose the drum even to normal office lighting (500 lux) for more than five minutes.

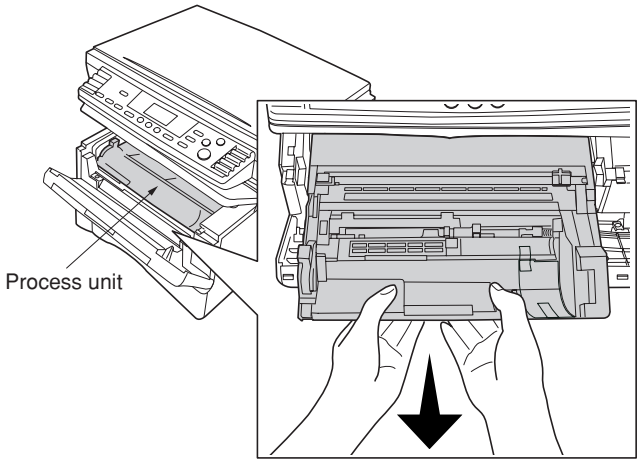


Figure 1-3-11

4. Remove the protective cardboard.

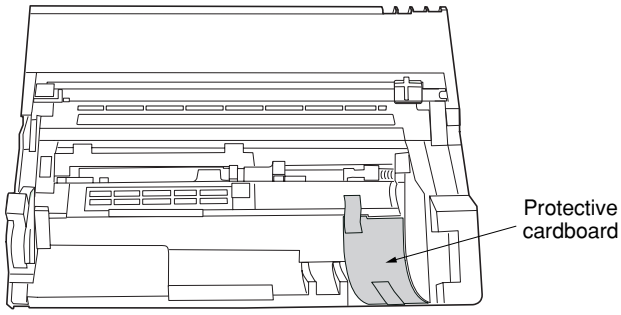


Figure 1-3-12

5. Move the lock lever until it is in its unlocked position (marked “UNLOCK”).

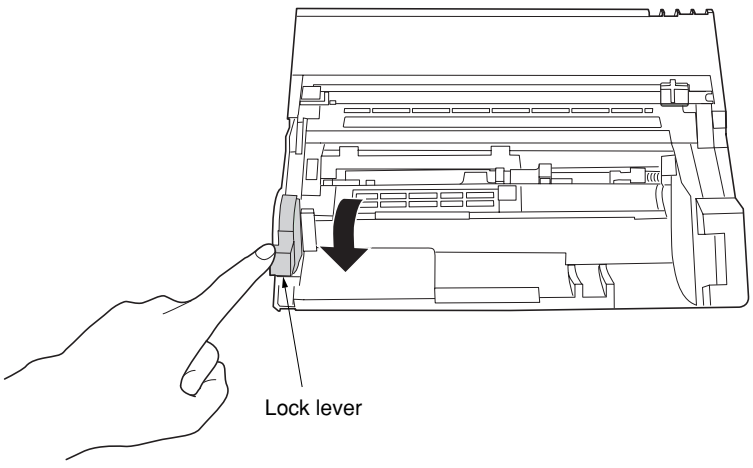


Figure 1-3-13

6. Shake the toner container horizontally back and forth five or six times so that the toner inside of it becomes evenly distributed.

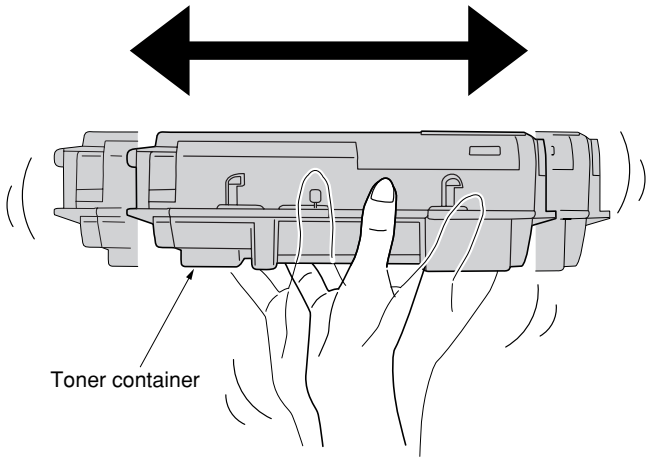


Figure 1-3-14

7. Remove the orange protective seal.

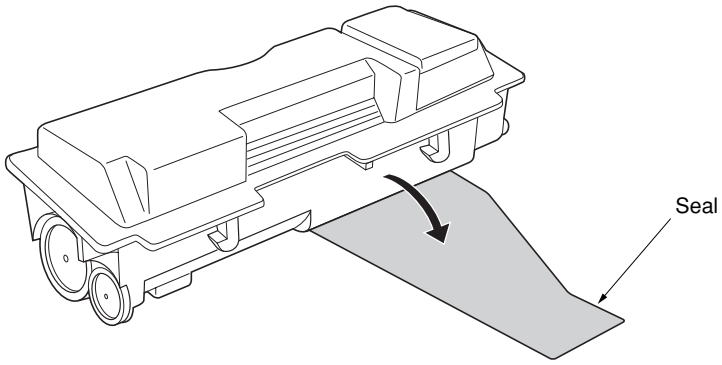


Figure 1-3-15

8. Set the toner container into the process unit.

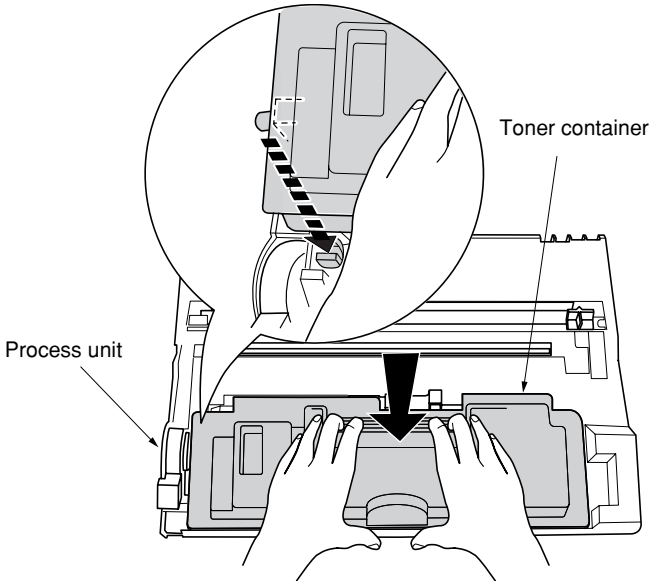


Figure 1-3-16

9. Hold the process unit stable and push in on the areas of the toner container marked “PUSH HERE” until the container clicks into place in the process unit.

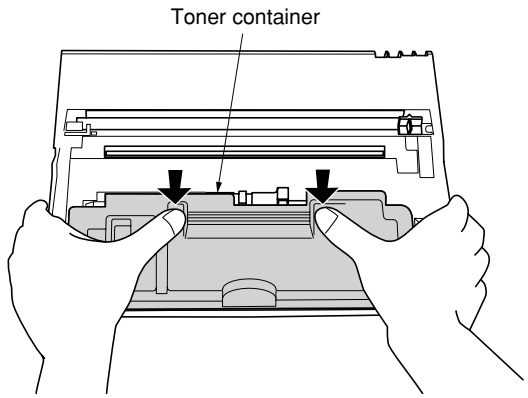


Figure 1-3-17

10. Push the lock lever back into its locked position.

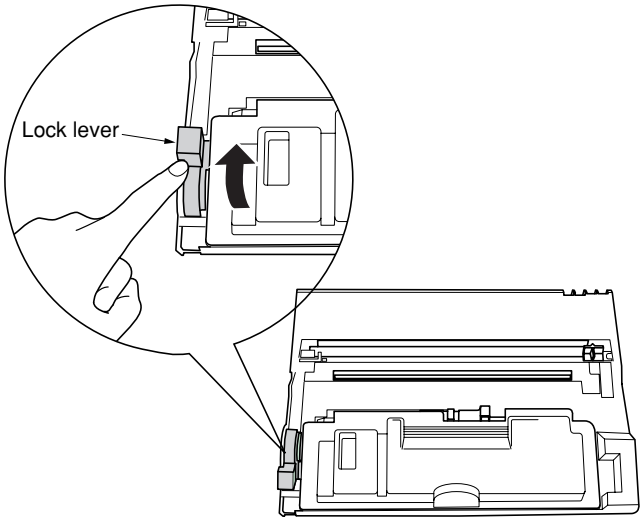


Figure 1-3-18

11. Set the process unit into the copier by aligning the pins on both sides of the process unit with the guides inside the copier, and then slide the process unit all the way back into the copier until it stops.

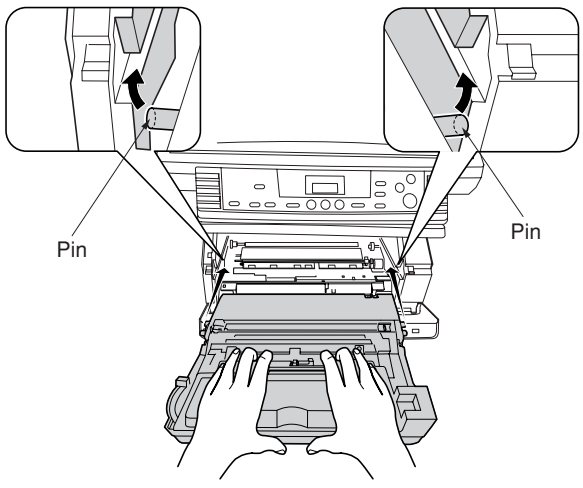


Figure 1-3-19

12. Close the front cover.

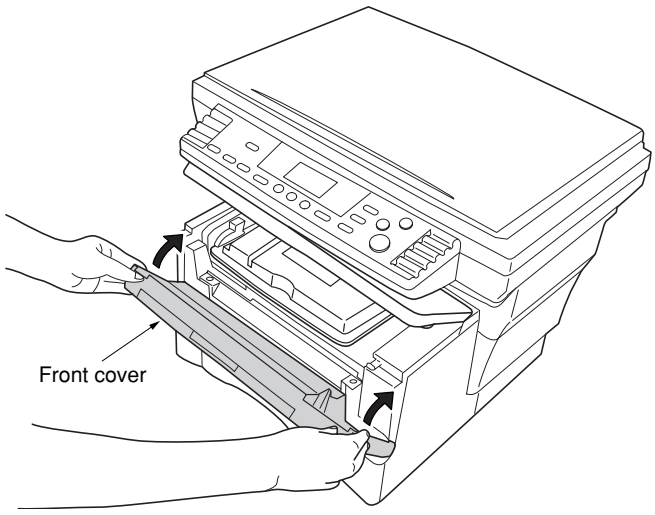


Figure 1-3-20

13. Close the front top cover.

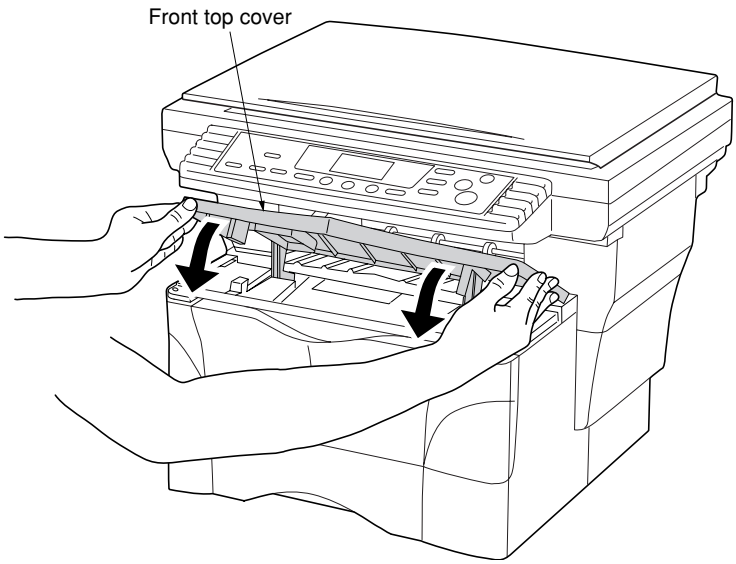


Figure 1-3-21

Connect the power cord.

1. Connect the power cord.

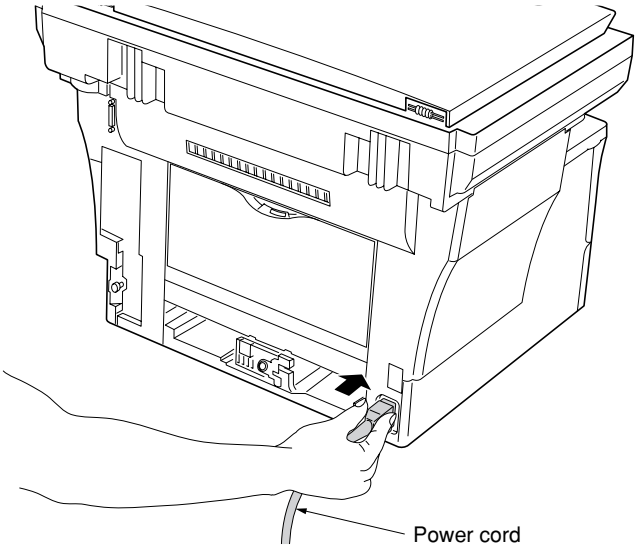


Figure 1-3-22

Initializing the copier.

1. Turn the power switch to the copier ON (|).

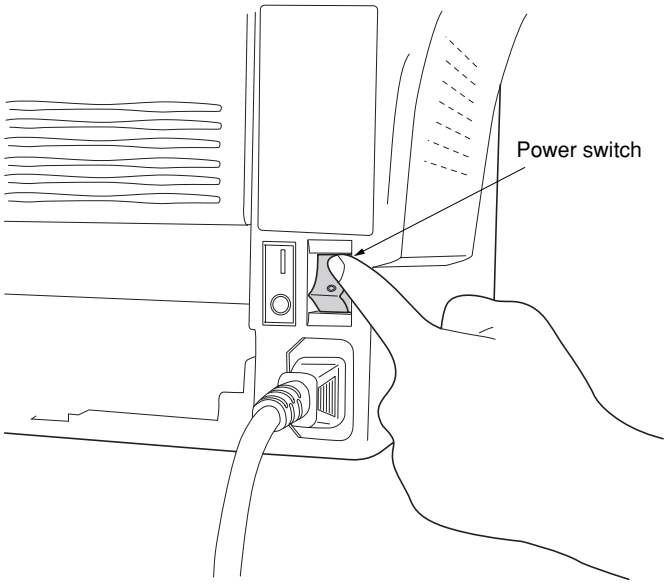


Figure 1-3-23

First “900” will appear in the copy quantity/ magnification display on the copier's operation panel. The copier will then begin operation and a countdown of the time until the copier will be ready will be shown (900 seconds = 15 minutes). As the copier is carrying out the necessary toner supply operation, you will need to wait until that operation is completed.
Once the copier is in a copy-ready state, “1” will appear in the copy quantity/magnification display and the Start indicator will light.

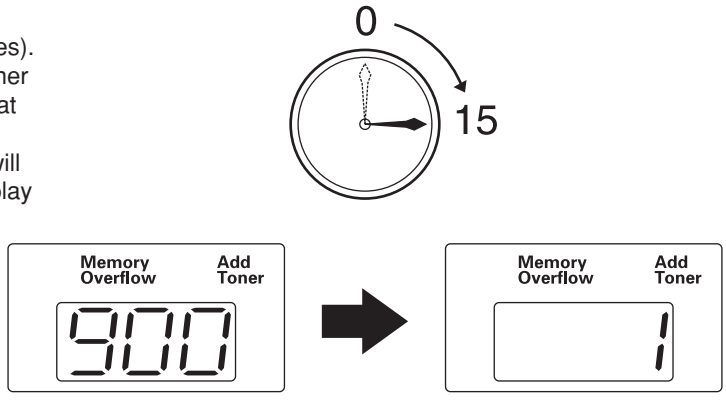


Figure 1-3-24

Load paper.

1. Pull the cassette out of the copier.

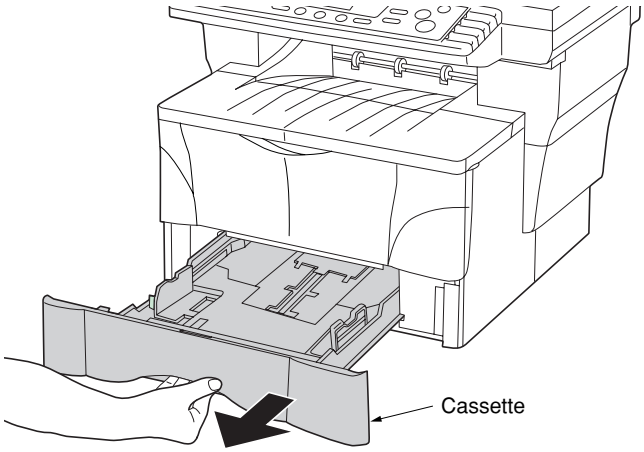


Figure 1-3-25

2. Adjust the paper stopper in the rear portion of the cassette to fit the size of the paper being loaded there by pressing in on the release buttons and sliding the paper stopper to the corresponding paper size.

NOTES

- The paper sizes are marked on the bottom of the cassette.
- The default factory setting is for A4/Letter size paper.

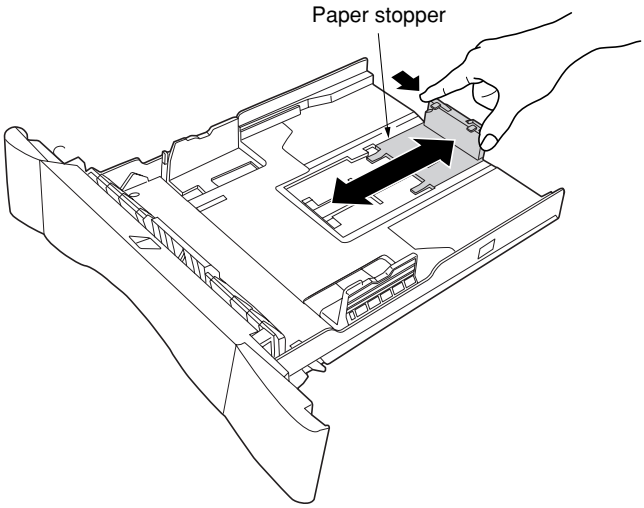


Figure 1-3-26

Adjusting the paper stopper for Folio or Oficio II size paper

1) Remove the stopper extension lock from the paper stopper.
2) Slide the paper stopper towards the rear of the cassette until the grooves that are cut into the paper stopper are aligned with the rear edge of the cassette.
3) Insert the stopper extension lock into the holes in the paper stopper, as shown in the illustration.

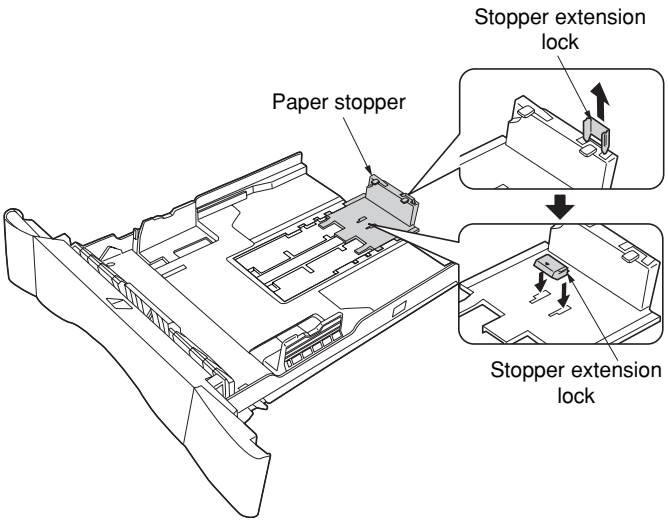


Figure 1-3-27

4) Press down on the stopper extension lock and slide the paper stopper towards the rear of the cassette to set the lock into place.
The paper stopper is in position for Folio and Oficio II size paper.

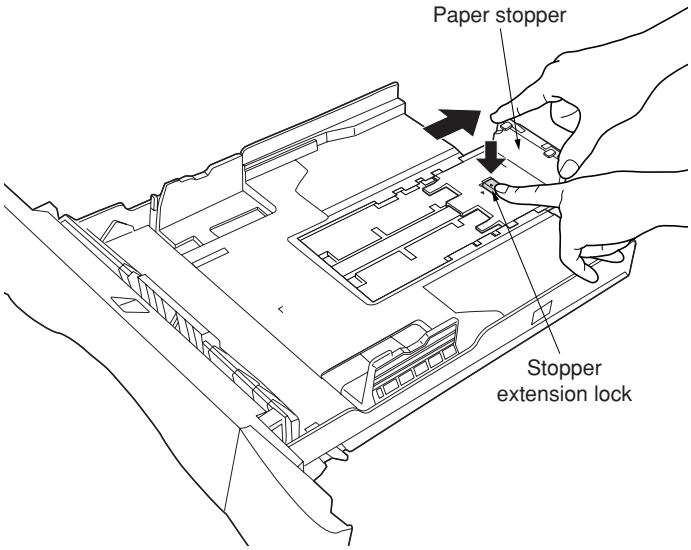


Figure 1-3-28

3. Adjust the paper width guides by pressing in on the release buttons and sliding the guides to fit the width of the paper being loaded in the cassette.

NOTES

- The paper sizes are marked on the bottom of the cassette.
- The default setting is for A4/Letter size paper.

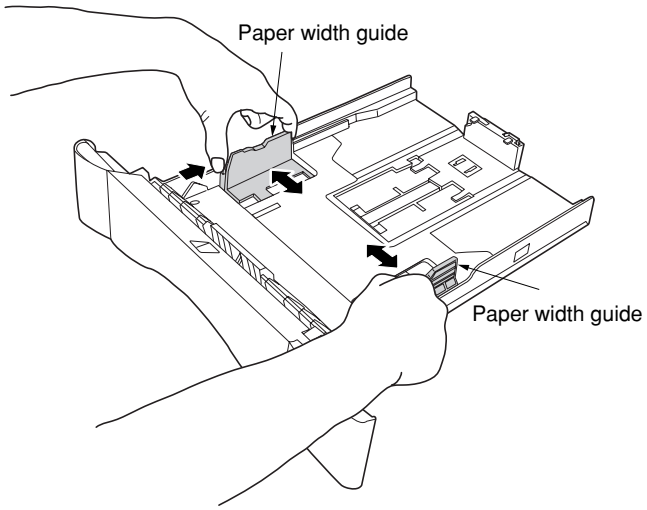


Figure 1-3-29

4. Set the paper in the cassette so that the leading edge is aligned against the paper stopper, but making sure that none of the paper gets caught on the overhanging tabs.

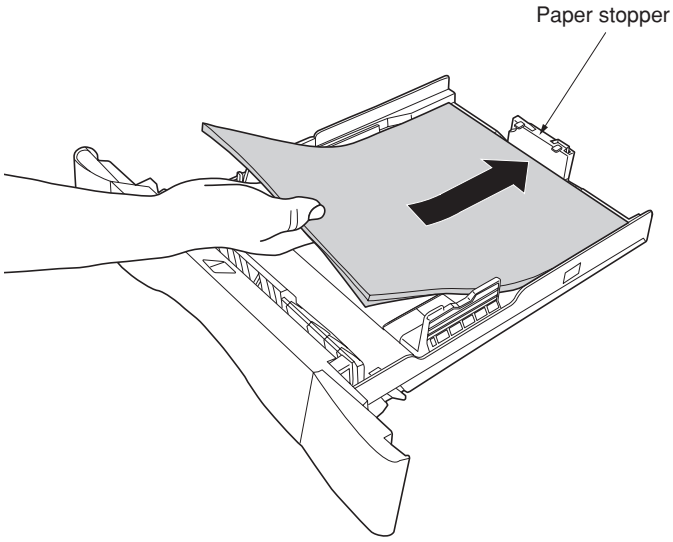


Figure 1-3-30

NOTES
- DO NOT set more paper than indicated by the lines located on the paper width guides.
- Be sure to load paper with the side to be copied onto facing down.

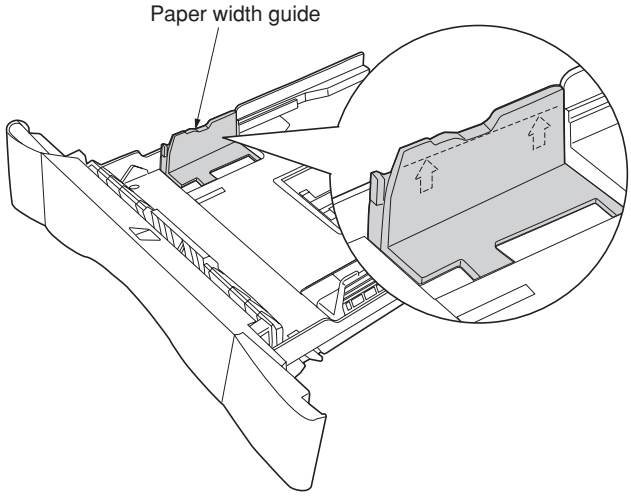


Figure 1-3-31

5. Push the cassette securely all the way back into the copier until it stops.

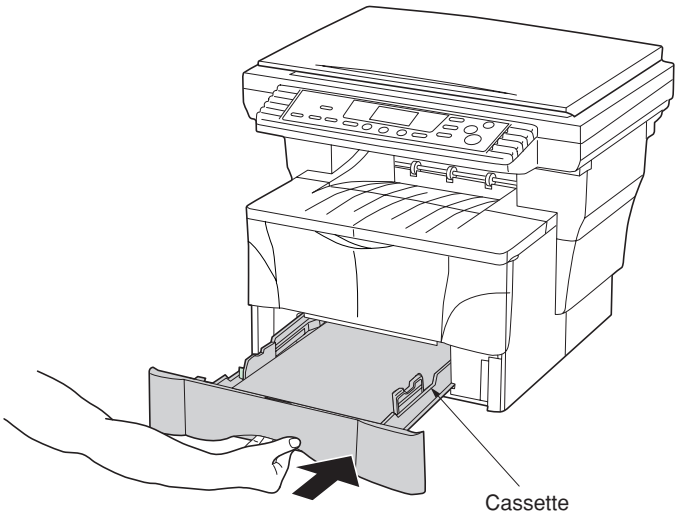


Figure 1-3-32

Make test copies.

Completion of machine installation.

1-3-2 Installing the document processor (option)

Procedure

1. Remove all of the components to the document processor from the box.
   CAUTION
   Be sure to hold both sides of the document processor when carrying it, as shown in the illustration.
   Be particularly careful NOT to touch the guide film or the thin white surface indicated by the Ⓐ in the illustration.

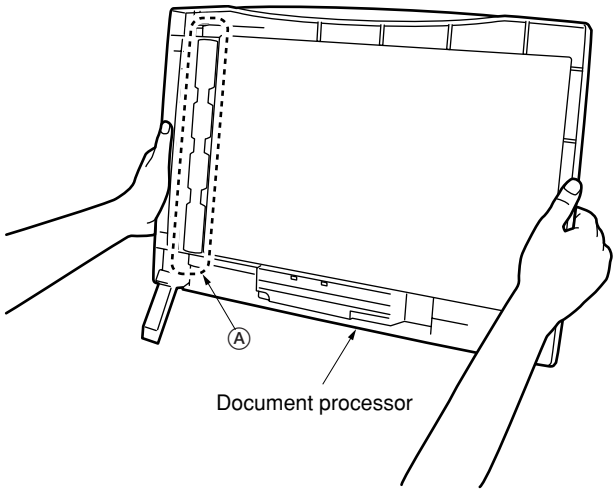


Figure 1-3-33

2. Turn the power switch to the copier OFF (O).

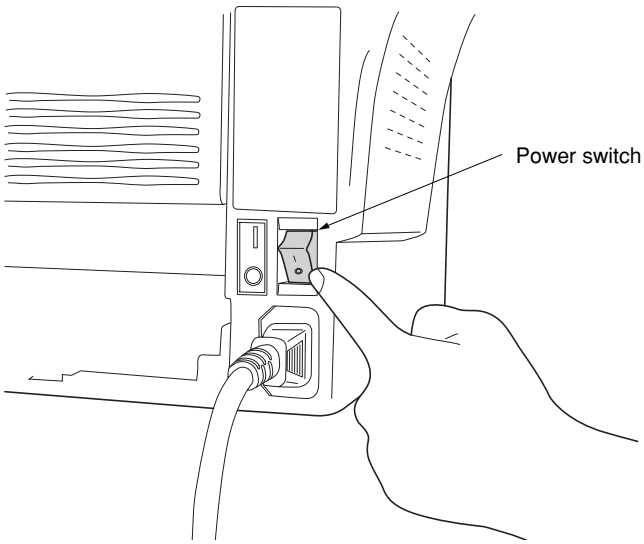


Figure 1-3-34

3. Open the original cover and lift it upward to remove it from the copier.

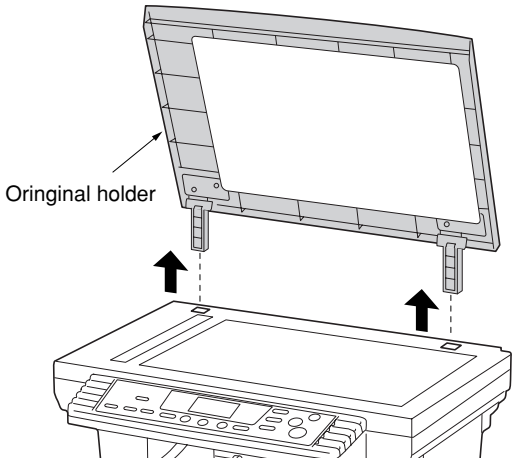


Figure 1-3-35

4. Attach the document processor to the copier.
   CAUTION
   Be sure that the connection cable does not get caught between the document processor and the copier when attaching the document processor to the copier.

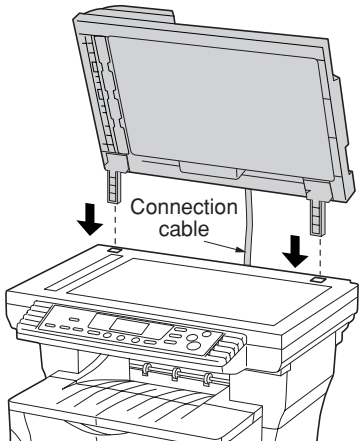


Figure 1-3-36

5. Gently close the document processor.

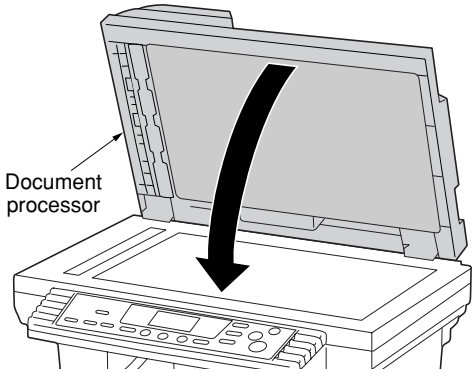


Figure 1-3-37

6. Attached the open end of the connection cable to the connector on the copier.

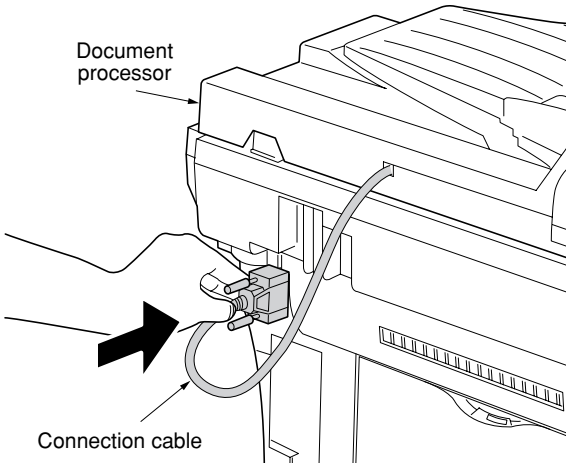


Figure 1-3-38

CAUTION
Be sure to tighten the pins securely when connecting the cable.

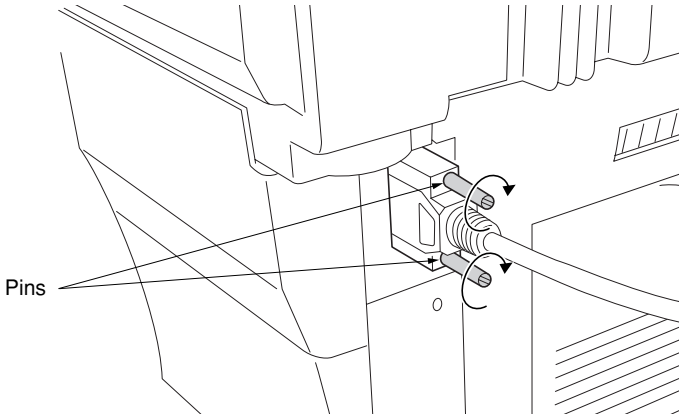


Figure 1-3-39

7. Turn the power switch to the copier back ON (|). Warm up will begin. “1” will appear on the operation panel and the Start indicator will light when the copier is in a copy-ready state.

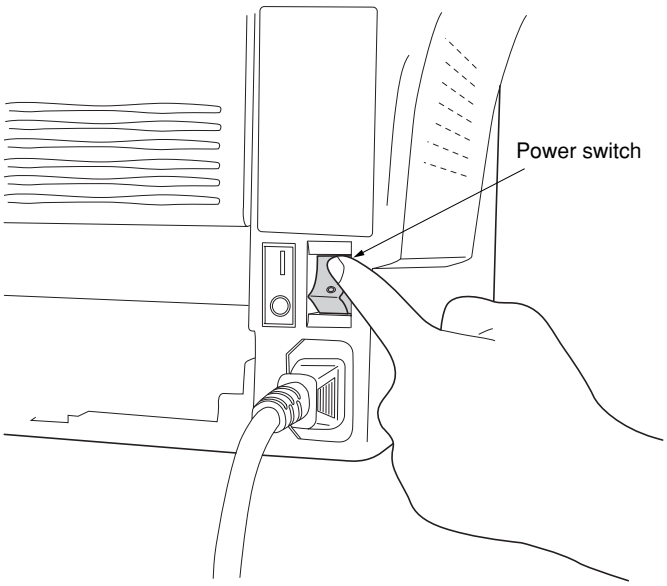


Figure 1-3-40

1-3-3 Installing the expanding memory (option)

The main board of the copier is equipped with one socket for memory expansion. Expansion memory is available in the form of DIMM (Dual In-line Memory Module).

CAUTION
Take precautions that no foreign substances such as metal chips or liquid get inside the copier during the installation process. Operation of the copier during the presence of a foreign substance may lead to fire or electric shock.

WARNING
Turn the copier's power switch off. Unplug the copier's power cable.

Procedure

1. Remove the one screw and then remove the memory cover.
3. Open the clips on both ends of the DIMM socket.
4. Insert the DIMM into the DIMM socket so that the notches on the DIMM align with the corresponding protrusions in the slot.
5. Close the clips on the DIMM slot to secure the DIMM.

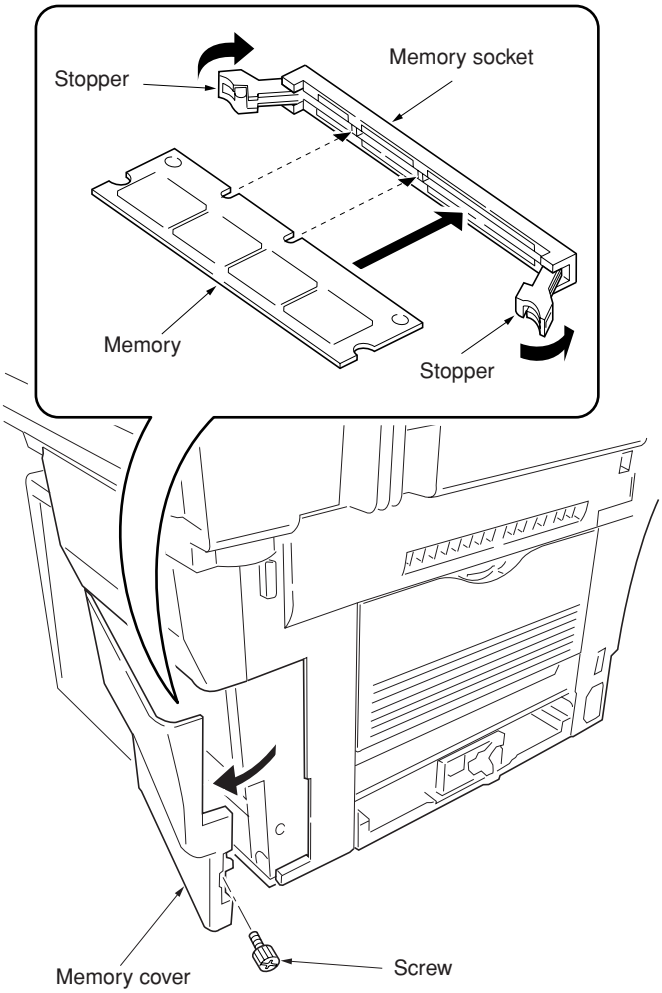
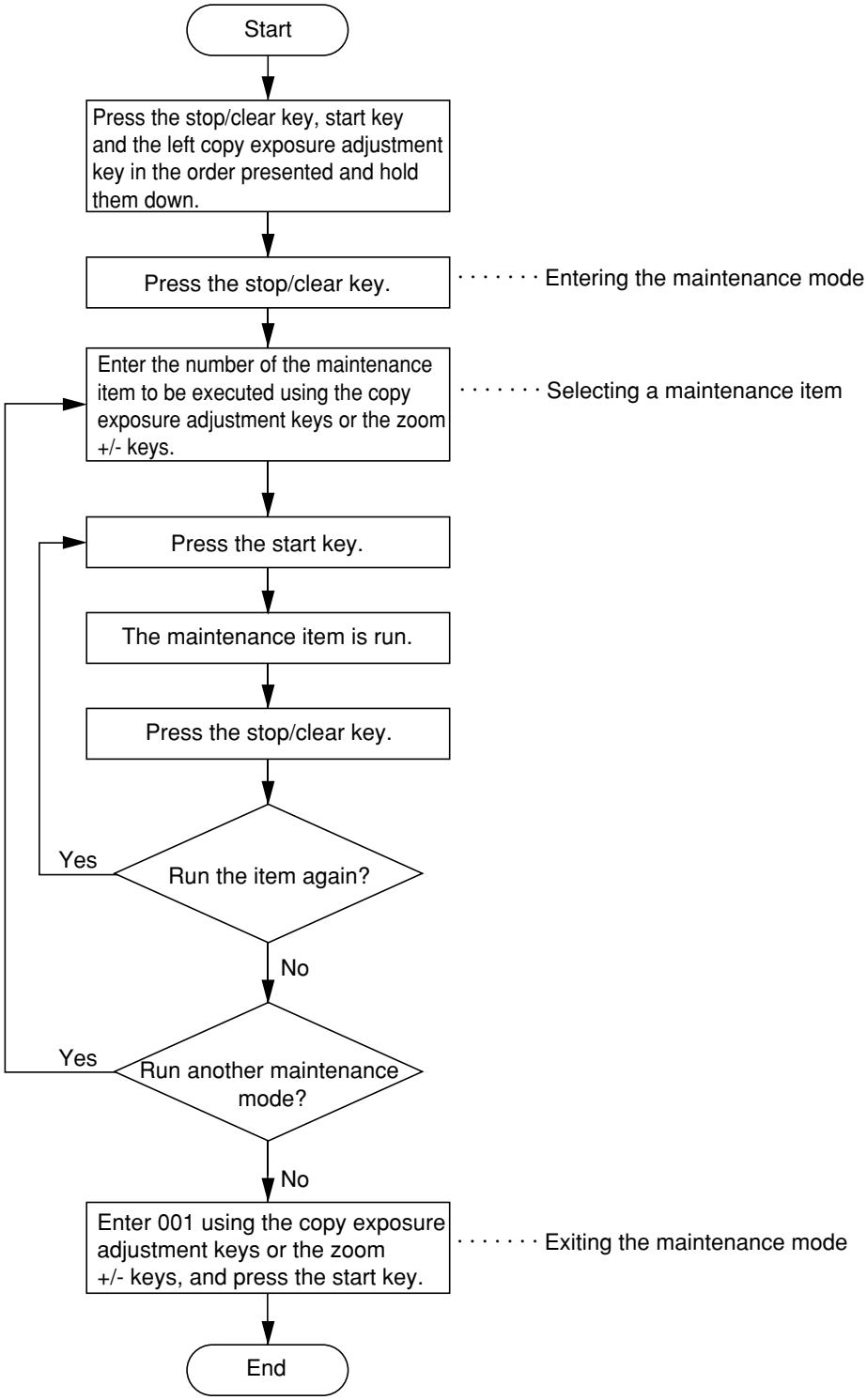


Figure 1-3-41 Inserting the DIMM

1-4-1 Maintenance mode

The copier is equipped with a maintenance function which can be used to maintain and service the machine.

(1) Executing a maintenance item



(2) Maintenance mode item list

Section	Item No.	Maintenance item contents	Initial setting*
General	U000	Outputting an own-status report	—
	U001	Exiting the maintenance mode	—
	U004	Checking the machine number	—
	U005	Copying without paper	—
	U019	Displaying the ROM version	—
Initialization	U020	Initializing all data	—
	U021	Initializing memories	—
Drive, paper feed and paper conveying system	U030	Checking motor operation	—
	U031	Checking sensors for paper conveying	—
	U032	Checking clutch operation	—
	U034	Adjusting the print start timing • Adjusting the leading edge registration • Adjusting the center line	 0.8 0
	U051	Adjusting the amount of slack in the paper • Drawer • Bypass tray • Optional drawer	 0 0 0
Optical	U060	Adjusting the scanner input properties	12
	U063	Adjusting the shading position	0
	U065	Adjusting the scanner magnification • Main scanning direction • auxiliary scanning direction	 0 0
	U066	Adjusting the leading edge registration for scanning an original on the contact glass	0
	U067	Adjusting the center line for scanning an original on the contact glass	7
	U070	Adjusting the DP magnification	-8
	U071	Adjusting the DP scanning timing • Adjusting leading edge registration • Adjusting trailing edge registration	 12 0
	U072	Adjusting the DP center line	2.7
	U073	Checking scanner operation	—
	U074	Adjusting the DP input light luminosity	1
	U087	Turning the DP scanning position adjust mode on/off • Setting the mode on/off • Setting the reference data for identifying dust	 On 35
	U088	Setting the input filter (moiré reduction mode)	Off
	U089	Outputting a MIP-PG pattern	—
	U091	Checking shading	—
	U092	Adjusting the scanner automatically	—
	U093	Setting the exposure density gradient • Text/text and photo/photo mode	 0
High voltage	U100	Setting the main high voltage	—
	U101	Setting the other high voltages • Developing bias clock frequency • Developing bias clock duty • Transfer charging output OFF timing • Transfer charging output ON timing	 26 55 48 45
Developing	U144	Setting toner loading operation	0
	U157	Checking/clearing the developing drive time	—
	U158	Checking/clearing the developing count	—

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
Fixing and cleaning	U161	Setting the fixing control temperature • Primary stabilization fixing temperature • Secondary stabilization fixing temperature • Copying operation temperature 1 • Copying operation temperature 2 • Number of sheets for fixing control	 135 145 190 195 5
	U162	Stabilizing fixing forcibly	—
	U163	Resetting the fixing problem data	—
	U199	Checking the fixing temperature	—
Operation panel and support equipment	U200	Turning all LEDs on	—
	U203	Operating DP separately	—
	U207	Checking the operation panel keys	—
	U243	Checking the operation of the DP motors	—
	U244	Checking the DP switches	—
Mode setting	U252	Setting the destination	Europe
	U254	Turning auto start function on/off	On
	U255	Setting auto clear time	90
	U258	Switching copy operation at toner empty detection	Single mode
	U260	Changing the copy count timing	After ejection
	U265	Setting the destination specifications	0
	U332	Setting the size conversion factor	1.0
	U342	Setting the ejection restriction	On
Image processing	U402	Adjusting margins for printing	—
	U403	Adjusting margins for scanning an original on the contact glass	—
	U404	Adjusting margins for scanning an original from the DP	—
Others	U901	Checking/clearing copy counts by paper feed locations	—
	U903	Checking/clearing the paper jam counts	—
	U904	Checking/clearing the service call counts	—
	U905	Checking/clearing counts by the DP	—
	U908	Checking the total count	—
	U910	Clearing the black ratio data	—
	U911	Checking/clearing copy counts by paper size	—
	U927	Clearing accounting counter	—
	U990	Checking/clearing the time for the exposure lamp to light	—
	U991	Checking the scanner count	—
	U993	Outputting a VTC-PG pattern	—

* Initial setting for executing maintenance item U020

(3) Contents of maintenance mode items

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U000</td><td>
Outputting an own-status report
Description
Outputs lists of the current settings of the maintenance items, and paper jam and service call occurrences.
Purpose
To check the current setting of the maintenance items, or paper jam or service call occurrences.
Before initializing the backup RAM, output a list of the current settings of the maintenance items to reenter the settings after initialization or replacement.
Method
1. Press the start key. A selection item appears.
2. Select the item to be output using the copy exposure adjustment keys.
<table>
<tr><th>Display</th><th>Output list</th></tr>
<tr><td>d-L
J-L
C-L</td><td>List of the current settings of the maintenance modes
List of the paper jam occurrences
List of the service call occurrences</td></tr>
</table>
3. Press the start key. The test copy mode is entered and a list is output.
When A4/11" × 8 1/2" paper is available, a report of this size is output. If not, specify the paper feed location.
When output is complete, the selected item appears.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U001</td><td>
Exiting the maintenance mode
Description
Exits the maintenance mode and returns to the normal copy mode.
Purpose
To exit the maintenance mode.
Method
Press the start key. The normal copy mode is entered.
</td></tr>
<tr><td>U004</td><td>
Checking the machine number
Description
Displays the machine number.
Purpose
To check the machine number.
Method
1. Press the start key. The currently set machine number is displayed.
2. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Copy quantity display</th></tr>
<tr><td>Exp. 1 (lit)
Exp. 2 (lit)
Exp. 3 (lit)
Exp. 1 (flashing)
Exp. 2 (flashing)
Exp. 3 (flashing)
Exp. 1 (flashing)
Exp. 2 (flashing)
Exp. 3 (flashing)
Exp. 1 (flashing)</td><td>1st digit of machine number
2nd digit of machine number
3rd digit of machine number
4th digit of machine number
5th digit of machine number
6th digit of machine number
7th digit of machine number
8th digit of machine number
9th digit of machine number
10th digit of machine number</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U005</td><td>
Copying without paper
Description
Simulates the copy operation without paper feed.
Purpose
To check the overall operation of the machine.
Method
1. Press the start key. A selection item appears.
2. Select the item to be operated using the copy exposure adjustment keys.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>P
P-d</td><td>Only the copier operates.
Both the copier and DP operate.</td></tr>
</table>
3. Press the program key.
4. Set the operation conditions required. Changes in the following settings can be made.
• Paper feed locations
• Magnifications
• Number of copies: continuous copying is performed when set to 99.
• Copy density
• Keys on the operation panel other than the reset/power key
5. To control the paper feed pulley, remove all the paper in the drawers, or the drawers. With the paper present, the paper feed pulley does not operate.
6. Press the start key. The operation starts.
Copy operation is simulated without paper under the set conditions. When operation is complete, the selected item appears.
7. To stop continuous operation, press the stop/clear key.
Completion
Press the stop/clear key at the screen for selecting an item. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U019</td><td>
Displaying the ROM version
Description
Displays the build number of the ROM fitted to each board.
Purpose
To check the build number or to decide if the ROM version is new.
Method
1. Press the start key. A selection item appears.
2. Select the item to be displayed using the image mode selection key and copy exposure adjustment keys.
<table>
<tr><th>Image mode LEDs</th><th>Copy exposure indicator</th><th>Copy quantity display</th></tr>
<tr><td>○ Auto Exp.
○ Text & Photo
○ Photo
○ Text
● Eco-Copy</td><td>Exp. 1

Exp. 2</td><td>number of the main ROM

number of the main ROM sub</td></tr>
<tr><td>○ Auto Exp.
○ Text & Photo
○ Photo
● Text
● Eco-Copy</td><td>Exp. 1

Exp. 2</td><td>number of the engine ROM

number of the engine ROM sub</td></tr>
</table>
○ : Off, ● : On
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U020</td><td>
Initializing all data
Description
Initializes all the backup RAM on the main board to return to the original settings. U004, however, is not initialized.
Purpose
Run as needed.
Method
1. Press the start key.
2. Select “on” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>– – –
on</td><td>Canceling initialization
Executing initialization</td></tr>
</table>
3. Press the start key. All data in the backup RAM is initialized, and the original settings for EUROPE specifications are set.
When initialization is complete, the machine automatically returns to the same status as when the power switch is turned on.
Completion
To exit this maintenance item without executing initialization, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U021</td><td>
Initializing memories
Description
Initializes the setting data other than that for adjustments due to variations between respective machines, i.e., settings for counters, service call history and mode settings. As a result, initializes the backup RAM according to the specifications depending on the destination selected in U252. U004, however, is not initialized.
Purpose
Used to return the machine settings to the factory settings.
Method
1. Press the start key.
2. Select “on” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>– – –
on</td><td>Canceling initialization
Executing initialization</td></tr>
</table>
3. Press the start key. All data other than that for adjustments due to variations between machines is initialized based on the destination setting. When initialization is complete, the machine automatically returns to the same status as when the power switch is turned on.
Completion
To exit this maintenance item without executing initialization, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U030</td><td>
Checking motor operation
Description
Drives each motor.
Purpose
To check the operation of each motor.
Method
1. Press the start key. A selection item appears.
2. Select the motor to be operated using the copy exposure adjustment keys. When selecting the feed motor, pull out the optional drawer in advance.
<table>
<tr><th>Display</th><th>Motor</th></tr>
<tr><td>A
F1</td><td>Main motor
Optional feed motor</td></tr>
</table>
3. Press the start key. The selected motor operates.
4. To stop operation, press the stop/clear key.
Completion
Press the stop/clear key after operation stops. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U031</td><td>
Checking sensors for paper conveying
Description
Displays the on-off status of each paper detection sensor on the paper path.
Purpose
To check if the sensors for paper conveying operate correctly.
Method
1. Press the start key.
2. Turn each sensor on and off manually to check the status. When the on-status of a sensor is detected, the image mode LED corresponding to the operated sensor lights.
<table>
<tr><th>Image mode LEDs</th><th>Description</th></tr>
<tr><td>● Auto Exp.
○ Text & Photo
○ Photo
○ Text
○ Eco-Copy</td><td>Exit sensor</td></tr>
<tr><td>○ Auto Exp.
● Text & Photo
○ Photo
○ Text
○ Eco-Copy</td><td>Registration sensor</td></tr>
</table>
○ : Off, ● : On
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U032</td><td>
Checking clutch operation
Description
Turns each clutch on.
Purpose
To check the operation of each clutch.
Method
1. Press the start key. A selection item appears.
2. Select the clutch to be operated using the copy exposure adjustment keys.
3. Press the start key. The selected clutch turns on for 1 s.
<table>
<tr><th>Display</th><th>Clutch</th></tr>
<tr><td>P1
Pb
2F</td><td>Feed clutch
MP feed clutch
Registration clutch</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U034</td><td>
Adjusting the print start timing
Adjustment
See pages 1-6-41 and 42.
</td></tr>
<tr><td>U051</td><td>
Adjusting the amount of slack in the paper
Adjustment
See page 1-6-44.
</td></tr>
<tr><td>U060</td><td>
Adjusting the scanner input properties
Description
Adjusts the image scanning density.
Purpose
Used when the entire image appears too dark or light.
Method
Press the start key.
Setting
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Image scanning density</td><td>0 to 23</td><td>12</td></tr>
</table>
Increasing the setting makes the density lower, and decreasing it makes the density higher.
2. Press the start key. The value is set.
Test copy mode
While this maintenance item is being performed, copying from an original can be made in test copy mode.
Completion
Press the stop/clear key at the screen for selecting an item. The indication for selecting a maintenance item No. appears.
Caution
The following settings are also reset to the initial values by performing this maintenance item:
• Exposure density gradient set in maintenance mode (U093)
• Exposure set in the copy default item of the copier management mode
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U063</td><td>
Adjusting the shading position
Description
Changes the shading position.
Purpose
Used when white lines continue to appear longitudinally on the image after the shading plate is cleaned. This is due to flaws or stains inside the shading plate. To prevent this problem, the shading position should be changed so that shading is possible without being affected by the flaws or stains.
Method
1. Press the start key.
2. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th><th>Change in value per step</th></tr>
<tr><td>Shading position</td><td>–5 to +5</td><td>0</td><td>0.254 mm</td></tr>
</table>
Increasing the setting moves the shading position toward the machine left, and decreasing it moves the position toward the machine right.
3. Press the start key. The value is set.
Test copy mode
While this maintenance item is being performed, copying from an original can be made in test copy mode.
Completion
Press the stop/clear key at the screen for adjustment. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U065</td><td>
Adjusting the scanner magnification
Adjustment
See pages 1-6-45 and 46.
</td></tr>
<tr><td>U066</td><td>
Adjusting the leading edge registration for scanning an original on the contact glass
Adjustment
See page 1-6-47.
</td></tr>
<tr><td>U067</td><td>
Adjusting the center line for scanning an original on the contact glass
Adjustment
See page 1-6-48.
</td></tr>
<tr><td>U070</td><td>
Adjusting the DP magnification
Adjustment
See page 1-6-50.
</td></tr>
<tr><td>U071</td><td>
Adjusting the DP scanning timing
Adjustment
See pages 1-6-51 and 52.
</td></tr>
<tr><td>U072</td><td>
Adjusting the DP center line
Adjustment
See page 1-6-53.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U073</td><td>
Checking scanner operation
Description
Simulates the scanner operation under arbitrary conditions.
Purpose
To check scanner operation.
Method
1. Press the start key.
2. Select the item to be changed by lighting a copy exposure indicator using the copy exposure adjustment keys.
3. Change the setting using the zoom +/– keys.
<table>
<tr><th>Copy exposure indicator</th><th>Operating conditions</th><th>Setting range</th></tr>
<tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>Magnification
Paper size
On and off of the exposure lamp</td><td>50 to 200%
See below.
on or off</td></tr>
</table>
Paper size for each setting
<table>
<tr><th>Setting</th><th>Paper size</th><th>Setting</th><th>Paper size</th></tr>
<tr><td>9
40
41
42</td><td>B5
A4R
B5R
A5R</td><td>47
55
56
58</td><td>Folio
$8\frac{1}{2}" \times 14"$
$8\frac{1}{2}" \times 11"$R
$5\frac{1}{2}" \times 8\frac{1}{2}"$R</td></tr>
</table>
4. Press the start key. Scanning starts under the selected conditions.
5. To stop operation, press the stop/clear key.
Completion
Press the stop/clear key when scanning stops. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U074</td><td>
Adjusting the DP input light luminosity
Description
Adjusts the luminosity of the exposure lamp for scanning originals from the DP.
Purpose
Used if the exposure amount differs significantly between when scanning an original on the contact glass and when scanning an original from the DP.
Method
Press the start key.
Setting
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>DP input light luminosity</td><td>0 to 8</td><td>1</td></tr>
</table>
Increasing the setting makes the luminosity higher, and decreasing it makes the luminosity lower.
2. Press the start key. The value is set.
Test copy mode
While this maintenance item is being performed, copying from an original can be made in test copy mode.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

Maintenance item No.	Description
U087	**Turning the DP scanning position adjust mode on/off** **Description** Turns on or off the DP scanning position adjust mode, in which the DP original scanning position is adjusted automatically by determining the presence or absence of dust on the slit glass. Also changes the reference data for identifying dust. **Reference** In the DP original scanning position adjust mode, the presence or absence of dust is determined by comparing the scan data of the original trailing edge and that taken after the original is conveyed past the DP original scanning position. If dust is identified, the DP original scanning position is adjusted for the following originals. **Purpose** Used to prevent appearance of black lines due to dust adhering in the original scanning position on the slit glass when the DP is used. **Method** 1. Press the start key. 2. Select the item to be set by lighting a copy exposure indicator using the copy exposure adjustment keys.

Copy exposure indicator	Description
Exp. 1 Exp. 2	Setting the mode on/off Setting the reference data for identifying dust

Setting the mode on/off

1. Select “on” or “oFF” using the zoom +/– keys.

Display	Description
on oFF	DP scanning position adjust mode on DP scanning position adjust mode off

Initial setting: on

2. Press the start key. The setting is set.

Setting the reference data for identifying dust

Available only when the mode is turned on.

1. Change the setting using the zoom +/– keys.

Description	Setting range	Initial setting
Minimum density to be regarded as dust	10 to 95	35

Example

The figure indicates the density in 256 levels of gray (0: white, 255: black). When the setting is 35, data of the level of 35 or higher is regarded as dust and data of lower level is regarded as the background (scan data taken when there is no original).

2. Press the start key. The value is set.

Completion

To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U088</td><td>
Setting the input filter (moiré reduction mode)
Description
Turns moiré reduction mode on and off by switching the input filter on and off.
Purpose
Used to prevent regular density unevenness (moiré) on halftone image areas of the copy image in text mode and text and photo mode. Such moiré is more likely to appear when an enlargement or reduction copy is made in text mode from an original containing large halftone image areas.
Method
Press the start key.
Setting
1. Select “on” or “oFF” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>on
oFF</td><td>Moiré reduction mode
Normal copy mode</td></tr>
</table>
Initial setting: oFF
If moiré on the copy image is significant, change the setting to “on”. Note that when the moiré reduction mode is turned on, the resolution may be slightly reduced.
2. Press the start key. The value is set. The indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U089</td><td>
Outputting a MIP-PG pattern
Description
Selects and outputs a MIP-PG pattern created in the copier.
Purpose
When performing respective image printing adjustments, used to check the machine status apart from that of the scanner with a non-scanned output MIP-PG pattern.
Method
1. Press the start key.
2. Select the MIP-PG pattern to be output using the copy exposure adjustment keys.
<table>
<tr><th>Display</th><th>Setting</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>G-S
0
FFL
1-d</td><td>Gray scale
Mono level
256 level
1-dot level</td><td>-
0 to 255
-
-</td><td>-
0
-
-</td></tr>
</table>
3. Press the program key. The machine enters the PG pattern output mode.
4. Press the start key. A MIP-PG pattern is output.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

Maintenance item No.	Description
U091	**Checking shading**

Description

Performs scanning under the same conditions as before and after shading is performed, displaying the original scanning values at nine points of the contact glass.

Purpose

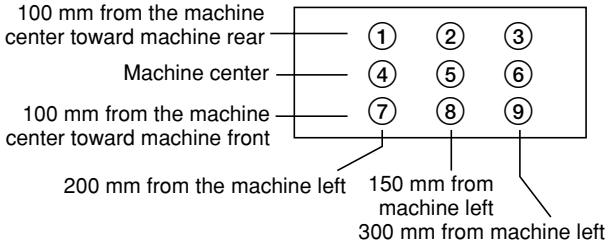
To check the change in original scanning values before and after shading. The results may be used to decide the causes for fixing unevenness (uneven density) of the gray area of an image: either due to optical (shading or CCD) or other problems.
Also to check the causes for a white or black line appearing longitudinally.

Method

1. Press the start key. A selection item appears.
2. Select the item to be operated using the zoom +/– keys.

Display	Operation
on	Performs scanning before shading and displays the result.
oFF	Performs scanning after shading and displays the result.

3. Press the start key. Scanning is performed under the selected conditions and the result is displayed.
4. Change the measurement point by lighting a copy exposure indicator or making one flash using the copy exposure adjustment keys. For the correspondence between the measurement points and the copy exposure indicators, see Figure 1-4-1.



Point	Copy exposure indicator	Point	Copy exposure indicator
①	● ○ ○ exp.1 exp.2 exp.3	⑥	○ ○ ☼ exp.1 exp.2 exp.3
②	○ ● ○ exp.1 exp.2 exp.3	⑦	☼ ○ ○ exp.1 exp.2 exp.3
③	○ ○ ● exp.1 exp.2 exp.3	⑧	○ ☼ ○ exp.1 exp.2 exp.3
④	☼ ○ ○ exp.1 exp.2 exp.3	⑨	○ ○ ☼ exp.1 exp.2 exp.3
⑤	○ ☼ ○ exp.1 exp.2 exp.3		

○ : Off
● : On
☼: Flashing

Figure 1-4-1

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U091</td><td>When scanning is performed before shading, the scan value at the machine center should be slightly different from those at the machine front and rear. When scanning is performed after shading, there should be no difference between respective values. Any differences between the values at machine front and rear indicates that scanner problem causes the fixing unevenness.
If the displayed results indicate no shading problems, the fixing unevenness (uneven copy density) is caused by factors other than in the scanner section (shading or CCD).
If a black line appears, the cause may be assumed based on the results of the scanning operation before shading: if a white line appears, they may be assumed based on the results of the scanning operation after shading. Note that depending on the thickness and location of the black or white line, it may not be possible to use this method to determine the cause. This is because the displayed values obtained from scanning at the limit of nine points are insufficient to provide significant information.

5. Press the stop/clear key. The selected item appears.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.</td></tr>
<tr><td>U092</td><td>Adjusting the scanner automatically
Description
Makes auto scanner adjustments in the order below using the specified original.
• Adjusting the scanner center line (U067)
• Adjusting the scanner leading edge registration (U066)
• Adjusting scanner magnification in the auxiliary direction (U065)
When this maintenance item is performed, the settings in U065, U066 and U067 are also changed.
Purpose
Used to make respective auto adjustments for the scanner.
Method
1. Place the specified original (P/N: 2A168070) on the contact glass.
2. Press the start key. “on” appears.
3. Press the start key. Auto adjustment starts. When adjustment is complete, “Gd” appears.
4. Display each setting value after adjustment by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table><tr><th>Copy exposure indicator</th><th>Setting value</th></tr><tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>Scanner center line
Scanner leading edge registration
Scanner magnification in the auxiliary scanning direction</td></tr></table>If a problem occurs during auto adjustment, “nG” is displayed and operation stops. Lighting the copy exposure indicator exp. 2 and then exp. 3 using the copy exposure adjustment keys will display the error code. Determine the details of the problem and either repeat the procedure from the beginning, or adjust the remaining items manually by running the corresponding maintenance items.
Completion
Press the stop/clear key after auto adjustment is complete. The indication for selecting a maintenance item No. appears.
If the stop/clear key is pressed during auto adjustment, adjustment stops and no settings are changed.</td></tr>
</table>

Maintenance item No.	Description
U093	**Setting the exposure density gradient**

Description

Changes the exposure density gradient in manual density mode, depending on respective image modes (text, text and photo, photo).

Purpose

To set how the image density is altered by a change of one step in the manual density adjustment. Also used to make copy image darker or lighter.

Start

1. Press the start key. A selection item appears.
2. Select the image mode to be adjusted by lighting image mode LEDs using the image mode selection key.
3. Press the start key. The machine enters the setting mode.

Image mode LEDs	Description
○ Auto Exp. ○ Text & Photo ○ Photo ○ Text ● Eco-Copy	Density in text mode
○ Auto Exp. ○ Text & Photo ○ Photo ● Text ● Eco-Copy	Density in text and photo mode
○ Auto Exp. ○ Text & Photo ● Photo ● Text ● Eco-Copy	Density in photo mode

○ : Off, ● : On

Setting

1. Select the item to be adjusted by lighting a copy exposure indicator using the copy exposure adjustment keys.
2. Adjust the setting using the zoom +/– keys.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	Change in density when manual density is set dark	0 to 3	0
Exp. 2	Change in density when manual density is set light	0 to 3	0

Increasing the setting makes the change in density larger, and decreasing it makes the change smaller.

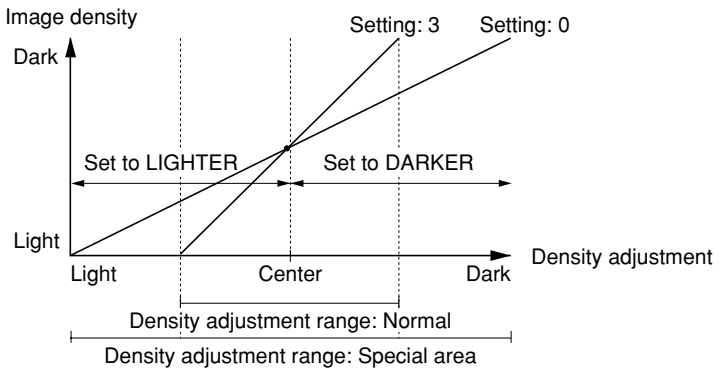


Figure 1-4-2 Exposure density gradient

3. Press the start key. The value is set.
4. Press the stop/clear key. The selected item appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U093</td><td>
Test copy mode
While this maintenance item is being performed, copying from an original can be made in test copy mode.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U100</td><td>
Setting the main high voltage
Description
Performs main charging.
Purpose
Checks the main charging.
Method
1. Press the start key. A selection item appears.
2. Select the item using the cpoy exposure adjustment keys.
<table>
<tr><th>Display (copy exposure indicator)</th><th>Description</th></tr>
<tr><td>on1 (exp. 1)
on2 (exp. 2)</td><td>Turning the main charger on
Turning the main charger on and the laser scanner unit on and off</td></tr>
</table>
3. Press the start key. The selected operation starts.
4. To stop operation, press the stop/clear key.
Test copy mode
While this maintenance item is being performed, copying from an original can be made in test copy mode.
Completion
Press the stop/clear key when main charger output stops while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U101</td><td>
Setting the other high voltages
Description
Changes the developing bias clock and the transfer charging output timing.
Purpose
To check the developing bias clock and the transfer charging output timing. Do not change the preset value.
Method
Press the start key. The screen for selecting an item is displayed.
Setting
1. Select the item to be set by lighting a copy exposure indicator using the copy exposure adjustment keys.
2. Change the setting using the zoom +/– keys.
<table>
<tr><th>Copy exposure indicator</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Exp. 1 (lit)
Exp. 2 (lit)
Exp. 3 (lit)
Exp. 1 (flashing)</td><td>Developing bias clock frequency
Developing bias clock duty
Transfer charging output OFF timing
Transfer charging output ON timing</td><td>2 to 255
1 to 99
0 to 255
0 to 255</td><td>26
55
48
45</td></tr>
</table>
3. Press the start key. The value is set.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U144</td><td>
Setting toner loading operation
Description
Sets toner loading operation.
Purpose
To run when drum filming (background blur in paper edge section) occurs. Change the setting value to 3 when poor-quality paper is used and filming occurs frequently.
Method
Press the start key. The screen for selecting an item is displayed.
Setting
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>0</td><td>Toner not loaded</td></tr>
<tr><td>1</td><td>Executes toner loading operation before starting driving based on the printing ratio.</td></tr>
<tr><td>2</td><td>Executes toner loading operation between sheets of paper based on the printing ratio.</td></tr>
<tr><td>3</td><td>Executes toner loading operation between sheets of paper every time.</td></tr>
</table>
Initial setting: 0
2. Press the start key. The value is set.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U157</td><td>
Checking/clearing the developing drive time
Description
Displays the developing drive time for checking, clearing or changing a figure.
Purpose
To check the developing drive time.
Method
1. Press the start key.
2. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Exp. 1</td><td>First 3 digits</td><td>000 to 999 (min)</td><td>000</td></tr>
<tr><td>Exp. 2</td><td>Last 3 digits</td><td>000 to 999 (min)</td><td>000</td></tr>
<tr><td>Exp. 3</td><td>Clearing the drive time</td><td>———</td><td>———</td></tr>
</table>
Clearing
1. Light exp. 3.
2. Press the start key. The time is cleared, and the indication for selecting a maintenance item No. appears.
Setting
1. Change the drive time (in minutes) using the zoom +/– keys.
2. Press the start key. The time is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the time, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U158</td><td>
Checking/clearing the developing count
Description
Displays the developing count for checking, clearing or changing a figure.
Purpose
To check the developing count.
Method
1. Press the start key.
2. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits
Last 3 digits
Clearing the count</td><td>000 to 999
000 to 999
———</td><td>000
000
———</td></tr>
</table>
Clearing
1. Light exp. 3.
2. Press the start key. The count is cleared, and the indication for selecting a maintenance item No. appears.
Setting
1. Change the count using the zoom +/– keys.
2. Press the start key. The count is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the count, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U161</td><td>
Setting the fixing control temperature
Description
Changes the fixing control temperature.
Purpose
Normally no change is necessary. However, can be used to prevent curling or creasing of paper, or solve a fixing problem on thick paper.
Method
Press the start key. The screen for selecting an item is displayed.
Setting
1. Select the item to be set by lighting a copy exposure indicator using the copy exposure adjustment keys.
2. Change the setting using the zoom +/– keys.
<table>
<tr><th>Copy exposure indicator</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Exp. 1 (lit)
Exp. 2 (lit)
Exp. 3 (lit)
Exp. 1 (flashing)
Exp. 2 (flashing)</td><td>Primary stabilization fixing temperature
Secondary stabilization fixing temperature
Copying operation temperature 1
Copying operation temperature 2
Number of sheets for fixing control</td><td>100 to 165 (°C)
100 to 165 (°C)
160 to 220 (°C)
160 to 220 (°C)
1 to 99</td><td>135
145
190
195
5</td></tr>
</table>
Copying operation temperature 1: Temperature in copying operation at the start of copying
Copying operation temperature 2: Temperature in copying operation after the specified number of sheets for fixing control have passed
Number of sheets for fixing control: The number of sheets to be counted for switching from copying operation temperature 1 to copying operation temperature 2
The temperatures are to be set such that “Secondary” ≧ “Primary”.
3. Press the start key. The value is set.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U162</td><td>
Stabilizing fixing forcibly
Description
Stops the stabilization fixing drive forcibly, regardless of fixing temperature.
Purpose
To forcibly stabilize the machine before the fixing section reaches stabilization temperature.
Method
1. Press the start key. “on” appears.
2. Press the start key. The forced stabilization mode is entered, and stabilization operation stops regardless of fixing temperature. The indication for selecting a maintenance item No. appears.
To exit the forced stabilization mode, turn the power off and on.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U163</td><td>
Resetting the fixing problem data
Description
Resets the detection of a service call code indicating a problem in the fixing section.
Purpose
To prevent accidents due to an abnormally high fixing temperature.
Method
1. Press the start key. “CLE” appears.
2. Press the start key. The fixing problem data is initialized.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U199</td><td>
Checking the fixing temperature
Description
Displays the fixing temperature and the ambient temperature.
Purpose
To check the fixing temperature and the ambient temperature.
Method
1. Press the start key.
2. Display each temperature by lighting the respective copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Description</th></tr>
<tr><td>Exp. 1
Exp. 2</td><td>Fixing temperature (°C)
Ambient temperature (°C)</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U200</td><td>
Turning all LEDs on
Description
Turns all the LEDs on the operation panel on.
Purpose
To check if all the LEDs on the operation panel light.
Method
Press the start key. All the LEDs on the operation panel light.
Press the stop/clear key or wait for 10 s. The LEDs turns off, and the indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U203</td><td>
Operating DP separately
Description
Simulates the original conveying operation separately in the DP.
Purpose
To check the DP.
Method
1. Press the start key.
2. Place an original in the DP if running this simulation with paper.
3. Select the item to be operated using the copy exposure adjustment keys.
<table>
<tr><th>Display (copy exposure indicator)</th><th>Operation</th></tr>
<tr><td>d-P (exp. 1)
d-n (exp. 2)</td><td>With paper
Without paper (continuous operation)</td></tr>
</table>
4. Press the start key. The operation starts.
5. To stop continuous operation, press the stop/clear key.
Completion
Press the stop/clear key when the operation stops. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U207</td><td>
Checking the operation panel keys
Description
Checks operation of the operation panel keys.
Purpose
To check operation of all the keys and LEDs on the operation panel.
Method
1. Press the start key.
2. “1” appears on the copy quantity display and the leftmost LED on the operation panel lights.
3. As the keys on the operation panel are pressed in order from the left to right, the figure shown on the copy quantity display increases in increments of 1. If there is an LED corresponding to the key pressed, the LED will light.
4. When all the keys on the operation panel have been pressed, all the LEDs light for up to 10 seconds.
5. When the LEDs go off, press the start key. All the LEDs light for 10 seconds again.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
• After this check starts, the operation cannot be canceled until all the keys are checked.
</td></tr>
<tr><td>U243</td><td>
Checking the operation of the DP motors
Description
Turns the motors in the DP on.
Purpose
To check the operation of the DP motors.
Method
1. Press the start key.
2. Select the motor to be operated using the copy exposure adjustment keys.
3. Press the start key. The operation starts.
<table>
<tr><th>Indication (copy exposure indicator)</th><th>Operation</th></tr>
<tr><td>F-0 (exp. 1)
C-0 (exp. 2)</td><td>Drives the original feed system.
Drives the original conveying system.</td></tr>
</table>
4. To turn each motor off, press the stop/clear key.
Completion
Press the stop/clear key when operation stops. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

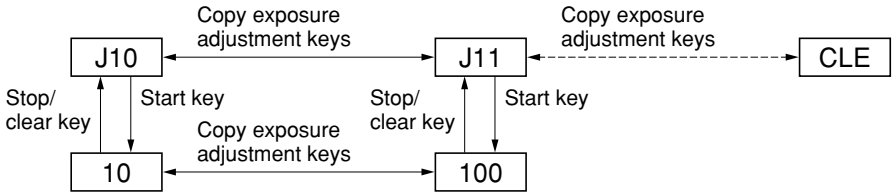
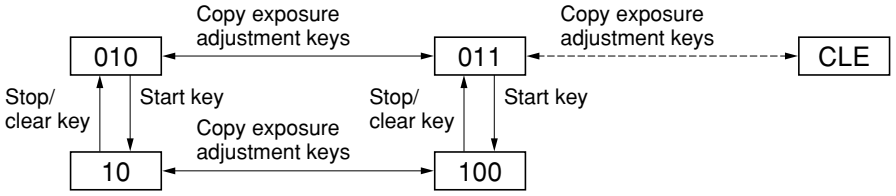
<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U244</td><td>
Checking the DP switches
Description
Displays the status of the switches in the DP.
Purpose
To check if switches in the DP operate correctly.
Method
1. Press the start key. "-S-" appears.
2. Manually turn on and off each switch to check the status. When the on-status of a switch is detected, the image mode LED corresponding to the operated switch lights.
<table>
<tr><th>Image mode LEDs</th><th>Description</th></tr>
<tr><td>● Auto Exp.
○ Text & Photo
○ Photo
○ Text
○ Eco-Copy</td><td>DP original detection switch</td></tr>
<tr><td>○ Auto Exp.
● Text & Photo
○ Photo
○ Text
○ Eco-Copy</td><td>DP timing switch</td></tr>
<tr><td>○ Auto Exp.
○ Text & Photo
● Photo
○ Text
○ Eco-Copy</td><td>DP open/close switch</td></tr>
<tr><td>○ Auto Exp.
○ Text & Photo
○ Photo
● Text
○ Eco-Copy</td><td>DP original cover switch</td></tr>
</table>
○ : Off, ● : On
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U252</td><td>
Setting the destination
Description
Switches the operations and screens of the machine according to the destination.
Purpose
To return the destination setting to its default setting after initializing the backup RAM by running maintenance item U020.
Method
Press the start key.
Setting
1. Select the destination using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Inc
EUP
ASA</td><td>Inch (North America) specifications
Metric (Europe) specifications
Metric (Asia Pacific) specifications</td></tr>
</table>
2. Press the start key. The setting is set, and the machine automatically returns to the same status as when the power is turned on.
Completion
To exit this maintenance item without changing the current count, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U254</td><td>
Turning auto start function on/off
Description
Selects if the auto start function is turned on.
Purpose
Normally no change is necessary. If incorrect operation occurs, turn the function off: this may solve the problem.
Method
Press the start key.
Setting
1. Select either “on” or “oFF” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>on
oFF</td><td>Auto start function on
Auto start function off</td></tr>
</table>
Initial setting: on
2. Press the start key. The setting is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U255</td><td>
Setting auto clear time
Description
Sets the time to return to initial settings after copying is complete.
Purpose
To be set according to frequency of use. Set to a comparatively long time for continuous copying at the same settings, and a comparatively short time for frequent copying at various settings.
Method
Press the start key. The current setting is displayed.
Setting
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Auto clear time</td><td>0 to 270 (s)</td><td>90</td></tr>
</table>
The setting can be changed by 10 s per step.
When set to 0, the auto clear function is cancelled.
2. Press the start key. The value is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U258</td><td>
Switching copy operation at toner empty detection
Description
Selects if continuous copying is enabled after toner empty is detected.
Method
Press the start key. The screen for selecting an item is displayed. The current setting is displayed.
Setting
1. Select single or continuous copying using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Sin
Con</td><td>Enables only single copying.
Enables single and continuous copying.</td></tr>
</table>
Initial setting: Sin
2. Press the start key. The setting is set, and the indication for selecting a maintenance item No. appears.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U260</td><td>
Changing the copy count timing
Description
Changes the copy count timing for the total counter and other counters.
Purpose
To be set according to user (copy service provider) request.
If a paper jam occurs frequently in the eject section when the number of copies is counted at the time of paper ejection, copies are provided without copy counts. The copy service provider cannot charge for such copying. To prevent this, the copy timing should be made earlier.
If a paper jam occurs frequently in the paper conveying or fixing sections when the number of copies is counted before the paper reaches those sections, copying is charged without a copy being made. To prevent this, the copy timing should be made later.
Method
Press the start key.
Setting
1. Select the copy count timing using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>FEd
EJE</td><td>When secondary paper feed starts
When the paper is ejected</td></tr>
</table>
Initial setting: EJE
2. Press the start key. The setting is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U265</td><td>
Setting the destination specifications
Description
Sets whether or not to print the product name on the reports that users print.
Purpose
To be set according to user request.
Method
Press the start key. The current setting appears.
Setting
1. Enter “0” or “2” using the zoom +/– keys.
<table>
<tr><th>Setting</th><th>Description</th></tr>
<tr><td>0
2</td><td>Product name printed
Product name not printed</td></tr>
</table>
Initial setting: 0
2. Press the start key. The setting is set.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U332</td><td>
Setting the size conversion factor
Description
Sets the coefficient of nonstandard sizes in relation to the A4/11" × 8 1/2" size. The coefficient set here is used to convert the black ratio in relation to the A4/11" × 8 1/2" size and to display the result in user simulation.
Purpose
To set the coefficient for converting the black ratio for nonstandard sizes in relation to the A4/11" × 8 1/2" size for copying and printing respectively.
Method
Press the start key. The current setting is displayed.
Setting
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Size conversion factor</td><td>0.0 to 3.0</td><td>1.0</td></tr>
</table>
2. Press the start key. The value is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U342</td><td>
Setting the ejection restriction
Description
Sets or cancels the restriction on the number of sheets to be ejected continuously.
When the restriction is set, the number of sheets that can be ejected continuously to the internal eject tray will be limited to 100.
Purpose
According to user request, sets or cancels restriction on the number of sheets.
Method
Press the start key.
Setting
1. Select “on” or “oFF” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>on
oFF</td><td>The number of sheets restricted.
The number of sheets not restricted.</td></tr>
</table>
Initial setting: on
2. Press the start key. The setting is set. The indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U402</td><td>Adjusting margins of image printing
Adjustment
See page 1-6-43.</td></tr>
<tr><td>U403</td><td>Adjusting margins for scanning an original on the contact glass
Adjustment
See page 1-6-49.</td></tr>
<tr><td>U404</td><td>Adjusting margins for scanning an original from the DP
Adjustment
See page 1-6-54.</td></tr>
<tr><td>U901</td><td>Checking/clearing copy counts by paper feed locations
Description
Displays or clears copy counts by paper feed locations.
Purpose
To check the time to replace consumable parts. Also to clear the counts after replacing the consumable parts.
Method
1. Press the start key.
2. Select the paper feed location (group No.) for which the count is to be checked or cleared by lighting image mode LEDs using the image mode selection key.
3. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th colspan="2">Image mode LED (group No.)</th><th>Copy exposure indicator</th><th>Copy quantity display (count value)</th></tr>
<tr><td>1</td><td>○ Auto Exp.
○ Text & Photo
○ Photo
○ Text
● Eco-Copy</td><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits of bypass copy count
Last 3 digits of bypass copy count
Clearing the count (CLE)</td></tr>
<tr><td>2</td><td>○ Auto Exp.
○ Text & Photo
○ Photo
● Text
● Eco-Copy</td><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits of the drawer copy count
Last 3 digits of the drawer copy count
Clearing the count (CLE)</td></tr>
<tr><td>3</td><td>○ Auto Exp.
○ Text & Photo
● Photo
● Text
● Eco-Copy</td><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits of the optional drawer copy count
Last 3 digits of the optional drawer copy count
Clearing the count (CLE)</td></tr>
<tr><td>4</td><td>○ Auto Exp.
● Text & Photo
● Photo
● Text
● Eco-Copy</td><td>Off</td><td>Clearing all counts (CLE)</td></tr>
</table>
○ : Off, ● : On
Note: When no optional paper feed device is installed, the counts corresponding to optional paper feed devices will not appear.
Clearing copy counts by paper feed locations
1. Select the paper feed location to clear the count.
2. Light exp. 3 using the copy exposure adjustment key.
3. Press the start key. The count is cleared.
Clearing copy counts for all paper feed locations
1. Select group 4.
2. Press the start key. The counts are cleared.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.</td></tr>
</table>

Maintenance item No.	Description
U903	**Checking/clearing the paper jam counts** **Description** Displays or clears the jam counts by jam locations. **Purpose** To check the paper jam status. Also to clear the jam counts after replacing consumable parts. **Method** 1. Press the start key. 2. Display the jam code to check the count using the copy exposure adjustment keys. 3. Press the start key. The jam count appears. If the jam count is a 4-digit value, the first digit and the last 3 digits are displayed alternately. 4. Press the stop/clear key. The jam code appears again.  **Figure 1-4-3** **Clearing all jam counts** 1. Display “CLE” using the copy exposure adjustment keys. Jam counts cannot be cleared individually. 2. Press the start key. The counts are cleared. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.
U904	**Checking/clearing the service call counts** **Description** Displays or clears the service call code counts by types. **Purpose** To check the service call code status by types. Also to clear the service call code counts after replacing consumable parts. **Method** 1. Press the start key. 2. Display the service call code to check the count using the copy exposure adjustment keys. 3. Press the start key. The service call count appears. If the service call count is a 4-digit value, the first digit and the last 3 digits are displayed alternately. 4. Press the stop/clear key. The service call code appears again.  **Figure 1-4-4** **Clearing counts by service call codes** 1. Display the service call code to clear the count. 2. Press the reset key. The count is cleared. **Clearing all service call counts** 1. Display “CLE” using the copy exposure adjustment keys. 2. Press the start key. The counts are cleared. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.

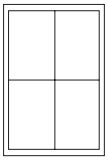
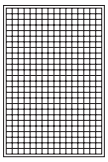
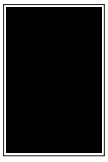
<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U905</td><td>
Checking/clearing counts by the DP
Description
Displays or clears the counts of the DP.
Purpose
To check the use of the DP. Also to clear the counts after replacing consumable parts.
Method
1. Press the start key.
2. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Copy quantity display (count value)</th></tr>
<tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits of the number of original replacement
Last 3 digits of the number of original replacement
Clearing the count (CLE)</td></tr>
</table>
Clearing
1. Light exp. 3 using the copy exposure adjustment keys.
2. Press the start key. The count is cleared.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U908</td><td>
Checking the total count
Description
Display the total count value.
Purpose
To check the total count value.
Method
1. Press the start key.
2. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Copy quantity display (count value)</th></tr>
<tr><td>Exp. 1
Exp. 2</td><td>First 3 digits of the total count
Last 3 digits of the total count</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U910</td><td>
Clearing the black ratio data
Description
Clears the accumulated black ratio data for A4/11" × 8 1/2" sheets.
Purpose
To clear data as required at times such as during maintenance service.
Method
1. Press the start key.
2. Select “on” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>– – –
on</td><td>Canceling the clearing
Executing the clearing</td></tr>
</table>
3. Press the start key. The accumulated black ratio data is cleared.
Completion
To exit this maintenance item without clearing the data, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

Maintenance item No.	Description
U911	**Checking/clearing copy counts by paper size** **Description** Displays or clears the paper feed count value by paper size. **Purpose** To check the time to replace consumable parts. Also to clear the counts after replacing the consumable parts. **Method** 1. Press the start key. 2. Select the paper size (group No.) for which the count is to be checked or cleared by lighting image mode LEDs using the image mode selection key. 3. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.

Image mode LED (group No.)		Copy exposure indicator	Copy quantity display (count value)
1	○ Auto Exp. ○ Text & Photo ○ Photo ○ Text ● Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-A4" display the A4 size First 3 digits of A4 size copy count Last 3 digits of A4 size copy count Clearing the count (CLE)
2	○ Auto Exp. ○ Text & Photo ○ Photo ● Text ● Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-A5" display the A5 size First 3 digits of A5 size copy count Last 3 digits of A5 size copy count Clearing the count (CLE)
3	○ Auto Exp. ○ Text & Photo ● Photo ● Text ● Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-A6" display the A6 size First 3 digits of A6 size copy count Last 3 digits of A6 size copy count Clearing the count (CLE)
4	○ Auto Exp. ● Text & Photo ● Photo ● Text ● Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-Fo" display the FOLIO size First 3 digits of FOLIO size copy count Last 3 digits of FOLIO size copy count Clearing the count (CLE)
5	● Auto Exp. ● Text & Photo ● Photo ● Text ● Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-Lg" display the Legal size First 3 digits of Legal size copy count Last 3 digits of Legal size copy count Clearing the count (CLE)
6	● Auto Exp. ● Text & Photo ● Photo ● Text ☼ Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-Lt" display the Letter size First 3 digits of Letter size copy count Last 3 digits of Letter size copy count Clearing the count (CLE)
7	● Auto Exp. ● Text & Photo ● Photo ☼ Text ☼ Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-St" display the Statement size First 3 digits of Statement size copy count Last 3 digits of Statement size copy count Clearing the count (CLE)
8	● Auto Exp. ● Text & Photo ☼ Photo ☼ Text ☼ Eco-Copy	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 1 (flashing)	"-ot" display the other size First 3 digits of other size copy count Last 3 digits of other size copy count Clearing the count (CLE)
9	● Auto Exp. ☼ Text & Photo ☼ Photo ☼ Text ☼ Eco-Copy	*Off*	Clearing all counts (CLE)

○ : Off ● : On ☼ : Flashing

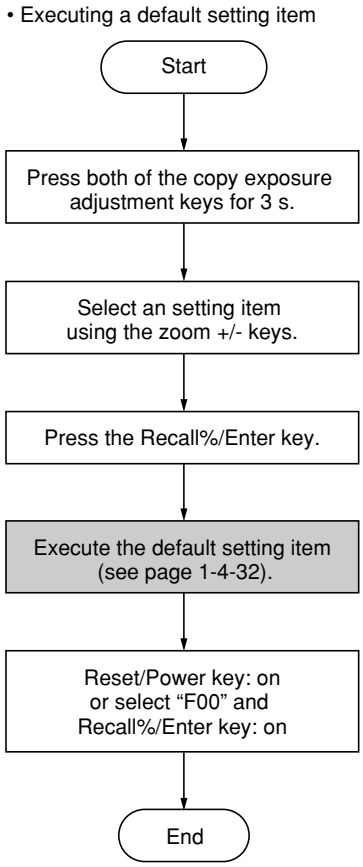
<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U911</td><td>
Clearing copy counts by paper size
1. Select the paper size to clear the count.
2. Display “CLE” using the copy exposure adjustment keys.
3. Press the start key. The count is cleared.
Clearing copy counts for all paper size
1. Select group 9.
2. Press the start key. The counts are cleared.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U927</td><td>
Clearing accounting counter
Description
Clears the total count and the scanner count. The counts, however, can be cleared only one time. If either of the total count or the scanner count exceeds 1,000, this mode cannot be run.
Purpose
To start the counters with value 0 when installing the machine.
Method
1. Press the start key. If the counters have been already cleared or either of the total counter or the scanner counter exceeds 1,000, this mode cannot be run and “nG” is displayed.
2. Select “on” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>– – –
on</td><td>Canceling the clearing
Executing the clearing</td></tr>
</table>
3. Press the start key. The accounting counter is cleared.
Completion
To exit this maintenance item without clearing the data, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U990</td><td>
Checking/clearing the time for the exposure lamp to light
Description
Displays or clears the accumulated time for the exposure lamp to light.
Purpose
To check duration of use of the exposure lamp. Also to clear the accumulated time for the lamp after replacement.
Method
1. Press the start key.
2. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Copy quantity display</th></tr>
<tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>First 3 digits of the lamp-on time (minutes)
Last 3 digits of the lamp-on time (minutes)
Clearing the lamp-on time (CLE)</td></tr>
</table>
Clearing
1. Light exp. 3.
2. Press the start key. The accumulated time is cleared, and the indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the accumulated time, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U991</td><td>
Checking the scanner count
Description
Display the scanner count value.
Purpose
To check the scanner count value.
Method
1. Press the start key.
2. Change the indication of the copy quantity display by lighting a copy exposure indicator using the copy exposure adjustment keys.
<table>
<tr><th>Copy exposure indicator</th><th>Copy quantity display (count value)</th></tr>
<tr><td>Exp. 1
Exp. 2</td><td>First 3 digits of the scanner count
Last 3 digits of the scanner count</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U993</td><td>
Outputting a VTC-PG pattern
Description
Selects and outputs a VTC-PG pattern created in the copier.
Purpose
When performing respective image printing adjustments, used to check the machine status apart from that of the scanner with a non-scanned output VTC-PG pattern.
Method
1. Press the start key.
2. Select the VTC-PG pattern to be output using the copy exposure adjustment keys.
<table>
<tr><th>Display</th><th>PG pattern to be output</th><th>Purpose</th></tr>
<tr><td>0</td><td>  </td><td>• Center line adjustment</td></tr>
<tr><td>1</td><td>  </td><td>• Lateral squareness adjustment
• Magnification adjustment</td></tr>
<tr><td>2</td><td>  </td><td>• Checking the fixing performance (fixing pressure)</td></tr>
</table>
3. Press the program key. The machine enters the PG pattern output mode.
4. Press the start key. A VTC-PG pattern is output.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

1-4-2 Copier management

In addition to a maintenance function for service, the copier is equipped with a management function which can be operated by users (mainly by the copier administrator). In this copier management mode, default settings can be changed.

(1) Executing a copier management item



(2) Default settings

User status report

Outputs the details of the default settings.
1. Select “F01” and press the Recall%/Enter key.
   User status report is printed out.

Exposure mode

Selects the image mode at power-on.
1. Select “F02” and press the Recall%/Enter key.
2. Select the exposure mode and press the Recall%/Enter key.
   Exposure mode: 1 (auto exposure)/
   2 (text and photo)/3 (photo)/4 (text)/5 (eco-print)

Exposure steps

Sets the number of exposure steps for the manual exposure mode.
1. Select “F03” and press the Recall%/Enter key.
2. Select “5 steps” or “7 steps” and press the Recall%/Enter key.
   Setting range: 1 (5 steps)/2 (7 steps)

Auto exposure adjustment

Adjusts the exposure for the auto exposure mode.
1. Select “F04” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 to 5

Text and photo original exposure adjustment

Adjusts the exposure to be used when text and photo original is selected for the image mode.
1. Select “F05” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 to 5

Photo original exposure adjustment

Adjusts the exposure to be used when photo original is selected for the image mode.
1. Select “F06” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 to 5

Text original exposure adjustment

Adjusts the exposure to be used when text original is selected for the image mode.
1. Select “F07” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 to 5

Black line correction

Makes black lines less apparent when feeding originals from the optional DP.
1. Select “F08” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 (off)/2 (weak)/3 (strong)
   Note: This setting item will not be available when the photo mode is selected as the image quality mode.

Photo processing

Copies will come out clearer if selecting “Error diffusion” when using originals with both text and photos and “Dithering” when using originals with mainly photos.
1. Select “F09” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 (Error diffusion)/2 (Dithering)

Default drawer

Sets the drawer to be selected in case such as after the stop/reset key is pressed.
1. Select “F10” and press the Recall%/Enter key.
2. Select default drawer and Recall%/Enter key: on
   Default drawer: 1 (drawer)/2 (optional drawer)
   Note: This setting item will not be displayed if the optional drawer is not installed.

Automatic drawer switching

Sets if the automatic drawer switching function is available.
1. Select “F11” and press the Recall%/Enter key.
2. Select “on” or “off” and press the Recall%/Enter key.
   Note: This setting item will not be displayed if the optional drawer is not installed.

Drawer paper size

Sets the size of paper loaded in the drawer.
1. Select “F12” and press the Recall%/Enter key.
2. Select the size of paper and press the Recall%/Enter key.
   Paper size: -A4 (A4)/-A5 (A5)/-Fo (Folio)/
   -Lg ($8^1/_2$" × 14")/-Lt ($8^1/_2$" × 11")/-o2 ($8^1/_2$" × 13")

Optional drawer paper size

Sets the size of paper loaded in the optional drawer.
1. Select “F13” and press the Recall%/Enter key.
2. Select the size of paper and press the Recall%/Enter key.
   Paper size: -A4 (A4)/-A5 (A5)/-Fo (Folio)/-Lg (8 1/2" × 14")/-Lt (8 1/2" × 11")/-o2 (8 1/2" × 13")
   Note: This setting item will not be displayed if the optional drawer is not installed.

Bypass tray paper size

Sets the size of paper that is fed from the bypass tray.
1. Select “F14” and press the Recall%/Enter key.
2. Select the size of paper and press the Recall%/Enter key.
   Paper size: -A4 (A4)/-A5 (A5)/-A6 (A6)/-Fo (Folio)/-Lg (8 1/2" × 14")/-St (5 1/2" × 8 1/2")/-Lt (8 1/2" × 11")/-o2 (8 1/2" × 13")/XXX (non-standard size*)
   * Setting of non-standard size paper width for bypass tray

Non-standard size paper width setting for bypass tray

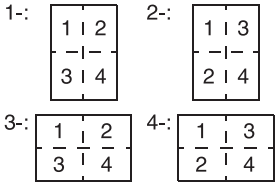
Sets the paper width when non-standard size is fed from the bypass tray.
1. Select “F15” and press the Recall%/Enter key.
2. Enter the setting and press the Recall%/Enter key.
   Setting range is 4.13" to 8.50" (105 to 216 mm).

Copy limit

Sets the limit of the number of copies that can be made at a time.
1. Select “F16” and press the Recall%/Enter key.
2. Enter the setting and press the Recall%/Enter key.
   Setting range is 1 to 99 copies.

Layout (4 in 1)

Sets whether to place the originals vertically or horizontally for 4 in 1 layout copying.
1. Select “F17” and press the Recall%/Enter key.
2. Select “vertical” or “horizontal” and press the Recall%/Enter key.
   Setting range: 1 to 4



Layout (borderline)

Selects the type of borderline for layout copying.
1. Select “F18” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1 (none)/2 (solid line)/3 (dotted line)

Silent mode

Sets the length of time from when copying ends to when entering the silent mode.
1. Select “F19” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 0/5/10/15/30 (s)

Auto clear

Sets if the auto clear function is available.
1. Select “F20” and press the Recall%/Enter key.
2. Select “on” or “off” and press the Recall%/Enter key.

Off mode

Sets if the off mode is available.
1. Select “F21” and press the Recall%/Enter key.
2. Select “on” or “off” and press the Recall%/Enter key.

Auto clear time

Sets the amount of time after each copy job is finished until the auto clear function automatically engages.
1. Select “F22” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting is available between 10 and 270 s in 10 s steps.
   Setting range: 10 to 270 (s)

Low power mode time

Sets the amount of time after each copy job is finished until the low power mode automatically engages.
1. Select “F23” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 1/5/15/30/45/60/90/120/180/240 (min.)

Off mode time

Sets the amount of time without any operation being performed until the off mode automatically engages.
1. Select “F24” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: 15/30/45/60/90/120/180/240 (min.)

Alarm

Selects whether the alarm which sounds when an error occurs, etc., will be turned on or off.
1. Select “F25” and press the Recall%/Enter key.
2. Select the “on” or “off” and press the Recall%/Enter key

DP leading edge timing adjustment

Adjusts the location of the copied image if it is shifted off-center (either forward or backward) when the optional DP is used to make copies.
1. Select “F26” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: -32 to 32
   (Each one-step adjustment is equal to a 0.3 mm shift.)
   Note: This setting item will not be displayed if the optional DP is not installed.

Paper feed shifting adjustment (drawer)

Adjusts displacement of the copy image.
1. Select “F27” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: -1.0 to +3.0 (1 steps moves 0.1)
   Use A4R/8$^1/_2$" × 11"R size paper.

Paper feed shifting adjustment (optional drawer)

Adjusts displacement of the copy image.
1. Select “F28” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: -1.0 to +3.0 (1 steps moves 0.1)
   Use A4R/8$^1/_2$" × 11"R size paper.
   Note: This setting item will not displayed if the optional drawer is not installed.

Paper feed shifting adjustment (bypass tray)

Adjusts displacement of the copy image.
1. Select “F29” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: -1.0 to +3.0 (1 steps moves 0.1)
   Use A4R/8$^1/_2$" × 11"R size paper.

Paper feed shifting adjustment (optional DP)

Adjusts for skewed feeding of originals in the optional DP.
1. Select “F30” and press the Recall%/Enter key.
2. Select the setting and press the Recall%/Enter key.
   Setting range: -6.6 to +6.6 (1 steps moves 0.1)
   Note: This setting item will not displayed if the optional DP is not installed.

Folio length setting (bypass tray)

Sets the length when folio is selected as the paper size.
1. Select “F31” and press the Recall%/Enter key.
2. Enter the setting and press the Recall%/Enter key.
   Setting is available between 200 and 216 mm.

Toner coverage report

Outputs the report that shows the number of copies made and average amount of toner used.
1. Select “F31” and press the Recall%/Enter key.
   The report is printed out.

1-5-1 Paper misfeed detection

(1) Paper misfeed indication

When a paper misfeed occurs, the copier immediately stops copying and displays the jam location on the operation panel.
Paper misfeed counts sorted by the detection condition can be checked in maintenance item U903.
To remove paper jammed in the copier, open the face-up output tray, front top cover, front cover or pull the drawer out.
To remove original jammed in the DP, open the DP original cover.
Paper misfeed detection can be reset by opening and closing the respective covers to turn interlock switch off and on.

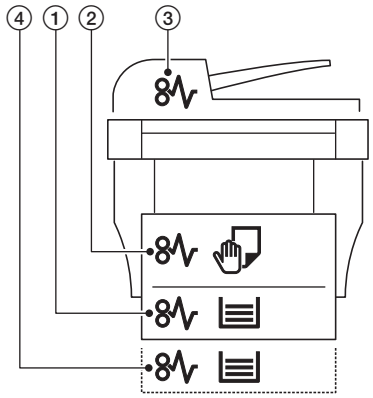


Figure 1-5-1

① Misfeed in the paper feed section
② Misfeed in the paper conveying section, fixing section or the exit section
③ Misfeed in the DP
④ Misfeed in the optional drawer

(2) Paper misfeed detection conditions

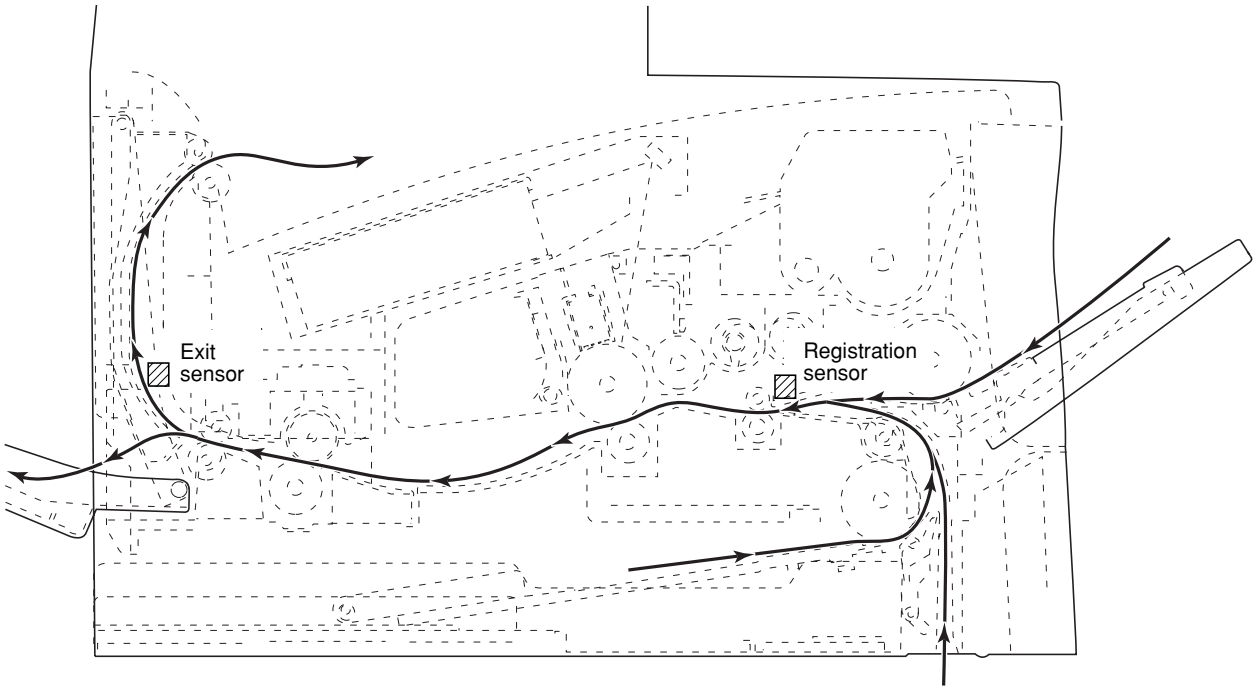


Figure 1-5-2

Section	Jam code	Description	Conditions
System	00	No paper feed	When the power switch is turned on, the machine detects activation of the registration sensor or the exit sensor.
	04	Cover open JAM	A cover open state is detected during copying.
	05	Secondary paper feed timeout	When the machine waits for secondary paper feed, 30 s or more have elapsed.
Paper feed section	10	No paper feed from the MP tray	The registration sensor does not turn on within 1350 ms of the MP feed clutch turning on; the clutch is then successively held off for 1 s and turned back on once, but the sensor again fails to turn on within 1350 ms.
	11	No paper feed from the drawer	Registration sensor does not turn on within 1120 ms of the feed clutch turning on; the clutch is then successively turned off for 1 s and turned back on once, but the sensor again fails to turn on within 1120 ms.
	12	No paper feed from the optional drawer	Registration sensor does not turn on within 1160 ms of the feed clutch turning on; the clutch is then successively turned off for 1 s and turned back on once, but the sensor again fails to turn on within 1160 ms.
	20	Multiple sheets in the MP tray	The registration sensor does not turn off within 5055 ms of the registration clutch turning on (when paper is fed from the MP tray).
	21	Multiple sheets in the drawer	The registration sensor does not turn off within 5055 ms of the registration clutch turning on (when paper is fed from the drawer).
	22	Multiple sheets in the optional drawer	The registration sensor does not turn off within 5055 ms of the registration clutch turning on (when paper is fed from the optional drawer).
Fixing section	40	Misfeed in the fixing section	The exit sensor does not turn on within 2765 ms of the registration clutch turning on.
Exit section	50	Misfeed in the exit section	The exit sensor does not turn off within 2765 ms of the registration sensor turning off.
DP	70	No original feed	When the power switch is turned on, the machine detects activation of the DP timing switch. The machine cannot detect activation of the DP timing switch even after 600 ms elapses since the start of primary paper feed and cannot detect it at the same timing even after four times of retry.
	71	An original jam in the original conveying section	The machine cannot detect deactivation of the DP timing switch even after 4100 ms elapses since the start of secondary paper feed.

(3) Paper misfeeds

• Copier

Problem	Causes/check procedures	Corrective measures
(1) A paper jam in the conveying, fixing or exit section is indicated as soon as the power switch is turned on. Jam code 00	A piece of paper torn from copy paper is caught around registration sensor or exit sensor.	Check visually and remove it, if any.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Defective exit sensor.	Run maintenance item U031 and turn exit sensor on and off manually. Replace exit sensor if indication of the corresponding sensor is not light.
(2) A paper jam in the paper feed section is indicated during copying (no paper feed from the MP tray). Jam code 10	Paper on the MP tray is extremely curled.	Change the paper.
	Check if the MP feed roller is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the MP feed clutch malfunctions.	Run maintenance item U032 and select the MP feed clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the MP feed clutch.	Check.
(3) A paper jam in the paper feed section is indicated during copying (no paper feed from the drawer). Jam code 11	Paper in the drawer is extremely curled.	Change the paper.
	Check if the feed roller is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the feed clutch malfunctions.	Run maintenance item U032 and select the feed clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the feed clutch.	Check.
(4) A paper jam in the paper feed section is indicated during copying (no paper feed from the optional drawer). Jam code 12	Paper in the optional drawer is extremely curled.	Change the paper.
	Check if the feed roller of the optional drawer is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the feed clutch malfunctions.	Run maintenance item U032 and select the feed clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the feed clutch.	Check.

Problem	Causes/check procedures	Corrective measures
(5) A paper jam in the paper feed section is indicated during copying (multiple sheets in the MP tray). Jam code 20	Check if the MP feed roller is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the registration clutch malfunctions.	Run maintenance item U032 and select the registration clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the registration clutch.	Check.
(6) A paper jam in the paper feed section is indicated during copying (multiple sheets in the drawer). Jam code 21	Check if the feed roller is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the registration clutch malfunctions.	Run maintenance item U032 and select the registration clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the registration clutch.	Check.
(7) A paper jam in the paper feed section is indicated during copying (multiple sheets in the optional drawer). Jam code 22	Check if the feed roller of the optional drawer is deformed.	Check visually and replace any deformed roller.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Check if the registration clutch malfunctions.	Run maintenance item U032 and select the registration clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the registration clutch.	Check.
(8) A paper jam in the fixing section is indicated during copying (jam in the fixing section). Jam code 40	Defective exit sensor.	Run maintenance item U031 and turn exit sensor on and off manually. Replace exit sensor if indication of the corresponding sensor is not light.
	Check if the registration clutch malfunctions.	Run maintenance item U032 and select the registration clutch to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the registration clutch.	Check.
	Check if the upper and lower registration rollers contact each other.	Check visually and remedy if necessary.
	Check if the lower exit roller and exit pulleys contact each other.	Check visually and remedy if necessary.
	Check if the press roller is extremely dirty or deformed.	Clean or replace if necessary.
	Check if the separators are dirty or deformed.	Clean or replace if necessary.

Problem	Causes/check procedures	Corrective measures
(9) A paper jam in the exit section is indicated during copying (jam in the exit section). Jam code 50	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Defective exit sensor.	Run maintenance item U031 and turn exit sensor on and off manually. Replace exit sensor if indication of the corresponding sensor is not light.
	Check if the lower exit roller and exit pulleys contact each other.	Check visually and remedy if necessary.
	Check if the upper exit roller and exit pulleys contact each other.	Check visually and remedy if necessary.

• **DP**

Problem	Causes/check procedures	Corrective measures
(1) An original jams when the power switch is turned on.	A piece of paper torn from an original is caught around the DP timing switch.	Remove any found.
	Defective DP timing switch.	Run maintenance item U244 and turn DP timing switch on and off manually. Replace DP timing switch if indication of the corresponding switch is not light.
(2) An original jams in the DP is indicated during copying (no original feed). Jam code 70	Defective DP timing switch.	Run maintenance item U244 and turn DP timing switch on and off manually. Replace DP timing switch if indication of the corresponding switch is not light.
	Check if the forwarding pulley or feed pulley is deformed.	Check visually and replace the deformed pulley.
(3) An original jams in the DP during copying (a jam in the original conveying section). Jam code 71	Defective DP timing switch.	Run maintenance item U244 and turn DP timing switch on and off manually. Replace DP timing switch if indication of the corresponding switch is not light.
	Check if the conveying roller or exit roller is deformed.	Check visually and replace the deformed roller.
(4) Original jams frequently.	An original outside the specifications is used.	Use only originals conforming to the specifications.
	The forwarding pulley or feed pulley is dirty with paper powder.	Clean with isoproply alcohol.
	The conveying roller and conveying pulleys do not contact correctly.	Check and remedy.
	The exit roller and exit pulleys do not contact correctly.	Check and remedy.

1-5-2 Self-diagnosis

(1) Self-diagnostic function

This unit is equipped with a self-diagnostic function. When a problem is detected, copying is disabled. "C" and a number between 0100 and 7990 altenates, indicating the nature of the problem.
After removing the problem, the self-diagnostic function can be reset by turning interlock switch off and back on.

(2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C0100	**Backup memory read/write problem (main board (KP-5060))** • Read and write data does not match.	Defective backup RAM or main board (KP-5060).	Replace the main board (KP-5060) and check for correct operation.
C0110 (A0110*)	**Backup memory data problem (main board (KP-5060))** • Data in the specified area of the backup memory does not match the specified values.	Problem with the backup memory data.	Turn interlock switch off and back on and run maintenance item U020 to set the contents of the backup memory data again.
		Defective backup RAM.	If the C0110 is displayed after re-setting the backup memory contents, replace the backup RAM or main board (KP-5060).
C0150	**Backup memory read/write problem (engine board (KP-5061))** • Read and write data does not match.	Defective backup RAM or engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
C0160 (A0160*)	**Backup memory data problem (engine board (KP-5061))** • Data in the specified area of the backup memory does not match the specified values.	Problem with the backup memory data.	Turn interlock switch off and back on and run maintenance item U020 to set the contents of the backup memory data again.
		Defective backup RAM.	If the C0160 is displayed after re-setting the backup memory contents, replace the backup RAM or engine board (KP-5061).
C0170	**Accounting count problem** • When the power is turned on, the total count and the scan count are abnormal both on the main board (KP-5060) and the engine board (KP-5061).	Defective main board (KP-5060) or engine board (KP-5061).	Replace the main board (KP-5060) or engine board (KP-5061) and check for correct operation.
C0180	**Machine number mismatch** • When the power is turned on, the machine number does not match between the main board (KP-5060) and the engine board (KP-5061).	Defective main board (KP-5060) or engine board (KP-5061).	Replace the main board (KP-5060) or engine board (KP-5061) and check for correct operation.
C0210 (A0210*)	**Communication problem between the main board (KP-5060) and engine board (KP-5061)** • When the power is turned on, the machine does not detect the low level of SBSY and the high level of SDIR for three seconds.	Poor contact in the connector terminals.	Check the connection of connectors YC3 on the main board (KP-5060) and YC3 on the engine board (KP-5061), and the continuity across the connector terminals. Repair or replace if necessary.
		Defective main board (KP-5060) or engine board (KP-5061).	Replace the main board (KP-5060) or engine board (KP-5061) and check for correct operation.

"A" is displayed on the market.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C0610 (A0610*)	**Bitmap (DIMM) problem** • There is a problem with the data or address bus of the bitmap DRAM.	Defective main board (KP-5060).	Replace the main board (KP-5060) and check for correct operation.
		DIMM installed incorrectly.	Check if the DIMM is inserted into the socket on the main board (KP-5060) correctly.
		Defective DIMM.	Replace the DIMM and check for correct operation.
C0620 (A0620*)	**Memory input interface problem** • Reading-in of an image does not complete within 10 s of the start of image transmission.	Defective main board (KP-5060).	Replace the main board (KP-5060) and check for correct operation.
C0630 (A0630*)	**DMA problem** • DMA transmission of compressed, decompressed, rotated, relocated or blanked-out image data does not complete within the specified period of time.	Defective main board (KP-5060).	Replace the main board (KP-5060) and check for correct operation.
C0800 (A0800*)	**Image processing problem** • JAM05 is detected twice.	Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
C2000 (A2000*)	**Main motor problem** • LOCK ALM signal remains high for 1 s, 1 s after the main motor has turned on.	Poor contact in the main motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective main motor rotation control circuit.	Replace the main motor.
		Defective drive transmission system.	Check if the rollers and gears rotate smoothly. If not, grease the bushings and gears. Check for broken gears and replace if any.
C3100 (A3100*)	**Scanner carriage problem** • The home position is not correct when the power is turned on or copying the document placed on the contact glass.	Poor contact of the connector terminals.	Check the connection of connectors YC10, 11 on the engine board (KP-5061) and the continuity across the connector terminals. Repair or replace if necessary.
		Defective scanner home position sensor.	Replace the scanner home position sensor.
		Defective engine board (KP-5061) or scanner board (KP-5063).	Replace the engine board (KP-5061) or scanner board (KP-5063) and check for correct operation.
		Defective scanner motor.	Replace the scanner motor.

"A" is displayed on the market.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C3200 (A3200*)	**Exposure lamp problem** • In indicator check before starting copying, the average value in scanning of the shading plate with the CCD is 128 or more.	Defective scanner board (KP-5063).	Replace the scanner board (KP-5063) and check for correct operation.
		Defective exposure lamp or inverter board.	Replace the exposure lamp or inverter board.
		Incorrect shading position.	Adjust the position of the contact glass (shading plate). If the problem still occurs, replace the scanner home position sensor.
		Poor contact of the connector terminals.	Check the connection of connector YC-6 on the scanner board (KP-5063), and the continuity across the connector terminals. Repair or replace if necessary.
C3300 (A3300*)	**Optical system (AGC) problem** • After AGC, correct input is not obtained at CCD.	Insufficient exposure lamp luminosity.	Replace the exposure lamp or inverter board.
		Defective scanner board (KP-5063).	Replace the scanner board (KP-5063) and check for correct operation.
		Incorrect shading position.	Adjust the position of the contact glass (shading plate). If the problem still occurs, replace the scanner home position sensor.
C4000 (A4000*)	**Polygon motor synchronization problem** • The polygon motor does not reach the stable speed within 15 s of the START signal turning on.	Poor contact in the polygon motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective polygon motor.	Replace the LSU.
		Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
C4010 (A4010*)	**Polygon motor steady-state problem** • The polygon motor rotation is not stable for 5 s after the polygon motor rotation has been stabilized.	Poor contact in the polygon motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective polygon motor.	Replace the LSU.
		Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
C4200 (A4200*)	**BD steady-state problem** • The MIC detects a BD error for 600 ms after the polygon motor rotation has been stabilized.	Defective laser diode.	Replace the LSU.
		Defective polygon motor.	Replace the LSU.
		Defective main board (KP-5060).	Replace the main board (KP-5060) and check for correct operation.

"A" is displayed on the market.

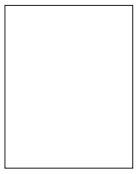
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C6000	**Broken fixing heater wire** • In fixing warm-up, the time to reach 50°C/122 °F exceeds 13.5 s, the time to reach 100°C/212 °F exceeds 10 s, the time to reach the primary stabilization exceeds 10 s or the time to reach the secondary stabilization exceeds 24 s.	Poor contact in the thermistor connector terminals.	Check the connection of connector CN4 on the power supply board (KP-5059) and the continuity across the connector terminals. Repair or replace if necessary.
		Thermistor installed incorrectly.	Check and reinstall if necessary.
		Thermal cutout triggered.	Check for continuity. If none, replace the thermal cutout.
		Heater lamp installed incorrectly.	Check and reinstall if necessary.
		Broken heater lamp wire.	Check for continuity. If none, replace the heater lamp.
C6020	**Abnormally high fixing unit thermistor temperature** • The fixing temperature exceeds 230°C/446 °F for 40 ms.	Shorted thermistor.	Measure the resistance. If it is 0 Ω, replace the thermistor.
		Broken heater control circuit on the power supply board (KP-5059).	Replace the power supply board (KP-5059) and check for correct operation.
C6050	**Abnormally low fixing unit thermistor temperature** • The fixing temperature remains below 90°C/194°F for 1 s.	Poor contact in the thermistor connector terminals.	Check the connection of connector CN4 on the power supply board (KP-5059) and the continuity across the connector terminals. Repair or replace if necessary.
		Broken thermistor wire.	Measure the resistance. If it is ∞ Ω, replace the thermistor.
		Thermistor installed incorrectly.	Check and reinstall if necessary.
		Thermal cutout triggered.	Check for continuity. If none, replace the thermal cutout.
		Heater lamp installed incorrectly.	Check and reinstall if necessary.
		Broken heater lamp wire.	Check for continuity. If none, replace the heater lamp.
C6400	**Zero-crossing signal problem** • The engine board (KP-5061) does not detect the zero-crossing signal for the time specified below. At power-on: 3 s Others: 5 s	Poor contact in the connector terminals.	Check the connection of connectors YC7 on the engine board (KP-5061) and CN2 on the power supply board (KP-5059), and the continuity across the connector terminals. Repair or replace if necessary.
		Defective power supply board (KP-5059).	Check if the zero-crossing signal is output from CN2-11 on the power supply board (KP-5059). If not, replace the power supply board (KP-5059).
		Defective engine board (KP-5061).	Replace the engine board (KP-5061) if C6400 is detected while CN2-11 on the power supply board (KP-5059) outputs the zero-crossing signal.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C7800 (A7800*)	**Broken external temperature thermistor** • The input voltage is 0.5 V or less.	Poor contact in the operation board connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective external temperature thermistor.	Replace the operation board and check for correct operation.
C7810 (A7810*)	**Short-circuited external temperature thermistor** • The input voltage is 4.5 V or more.	Poor contact in the operation board connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective external temperature thermistor.	Replace the operation board and check for correct operation.
C7980	**Waste toner reservoir overflow problem (when the total number of copies is less than 100 thousand sheets)** • After E31 is displayed, 1,000 sheets are copied. Or waste toner exceeds 5 g.	*Defective waste toner sensor or engine board (KP-5061).*	*Shake the process unit from side to side and turn the power switch off and then on. If the problem cannot be solved, replace the process unit.* *After replacing the process unit, turn the power switch off and then on. If the problem cannot be solved, replace the waste toner sensor or the engine board (KP-5061).*
C7990	**Waste toner reservoir overflow problem (when the total number of copies is 100 thousand sheets or more)** • After E31 is displayed, 1,000 sheets are copied. Or waste toner exceeds 5 g.	*Defective waste toner sensor or engine board (KP-5061).*	*Shake the process unit from side to side and turn the power switch off and then on. If the problem cannot be solved, replace the process unit.* *After replacing the process unit, turn the power switch off and then on. If the problem cannot be solved, replace the waste toner sensor or the engine board (KP-5061).*

"A" is displayed on the market.

1-5-3 Image formation problems

(1) No image appears (entirely white).



See page 1-5-14

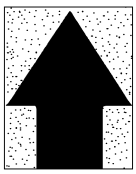
(2) No image appears (entirely black).

See page 1-5-14

(3) Image is too light.

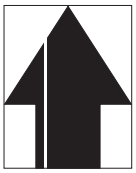
See page 1-5-15

(4) Background is visible.



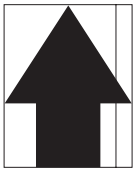
See page 1-5-15

(5) A white line appears longitudinally.



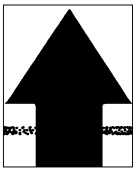
See page 1-5-15

(6) A black line appears longitudinally.



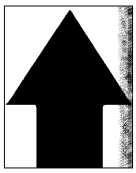
See page 1-5-16

(7) A black line appears laterally.



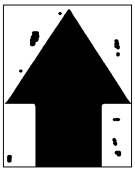
See page 1-5-16

(8) One side of the copy image is darker than the other.



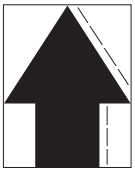
See page 1-5-16

(9) Black dots appear on the image.



See page 1-5-17

(10) Image is blurred.

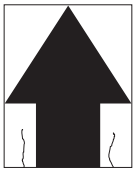


See page 1-5-17

(11) The leading edge of the image is consistently misaligned with the original.

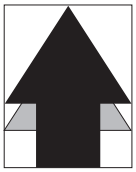
See page 1-5-17

(12) Paper creases.



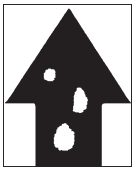
See page 1-5-18

(13) Offset occurs.



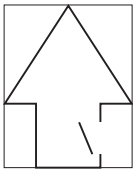
See page 1-5-18

(14) Image is partly missing.



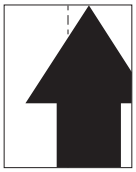
See page 1-5-18

(15) Fixing is poor.



See page 1-5-19

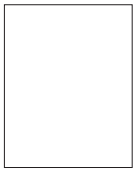
(16) Image center does not align with the original center.



See page 1-5-19

(1) No image appears (entirely white).

Causes
1. No transfer charging.



Causes	Check procedures/corrective measures
1. No transfer charging.	
A. The connector terminals of the high voltage board make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
B. Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
C. Defective high voltage board.	Replace the high voltage board and check for correct operation.

(2) No image appears (entirely black).

Causes
1. No main charging.
2. Exposure lamp fails to light.

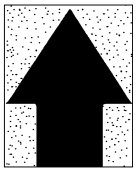
Causes	Check procedures/corrective measures
1. No main charging.	
A. Broken main charger wire.	Replace the process unit.
B. Leaking main charger housing.	Replace the process unit.
C. The connector terminals of the high voltage board make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
D. Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.
E. Defective high voltage board.	Replace the high voltage board and check for correct operation.
2. Exposure lamp fails to light.	
A. The connector terminals of the exposure lamp make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
B. Defective CCD board (KP-5065).	Replace the CCD board (KP-5065) and check for correct operation.
C. Defective scanner board (KP-5063).	Replace the scanner board (KP-5063) and check for correct operation.
D. Defective engine board (KP-5061).	Replace the engine board (KP-5061) and check for correct operation.

(3) Image is too light.

Causes
1. Insufficient toner.
2. Deteriorated developer.
3. Dirty or deteriorated drum.

Causes	Check procedures/corrective measures
1. Insufficient toner.	If the add toner indicator lights, replace the toner container.
2. Deteriorated developer.	Replace the process unit.
3. Dirty or deteriorated drum.	Replace the process unit.

(4) Background is visible.



Causes
1. Deteriorated developer.

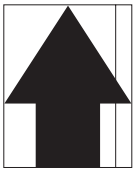
Causes	Check procedures/corrective measures
1. Deteriorated developer.	Replace the process unit.

(5) A white line appears longitudinally.

Causes
1. Dirty or flawed main charger wire.
2. Foreign matter in the developing section.
3. Flawed drum.
4. Dirty shading plate.

Causes	Check procedures/corrective measures
1. Dirty or flawed main charger wire.	Replace the process unit.
2. Foreign matter in the developing section.	Replace the process unit.
3. Flawed drum.	Replace the process unit.
4. Dirty shading plate.	Clean the shading plate.

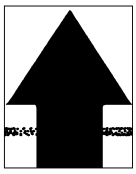
(6) A black line appears longitudinally.



Causes
1. Dirty contact glass.
2. Dirty or flawed drum.
3. Deformed or worn cleaning blade.
4. Dirty scanner mirror.

Causes	Check procedures/corrective measures
1. Dirty contact glass.	Clean the contact glass.
2. Dirty or flawed drum.	Replace the process unit.
3. Deformed or worn cleaning blade.	Replace the process unit.
4. Dirty scanner mirror.	Clean the scanner mirror.

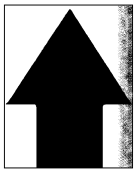
(7) A black line appears laterally.



Causes
1. Flawed drum.
2. Dirty developing section.
3. Leaking main charger housing.

Causes	Check procedures/corrective measures
1. Flawed drum.	Replace the process unit.
2. Dirty developing section.	Replace the process unit.
3. Leaking main charger housing.	Replace the process unit.

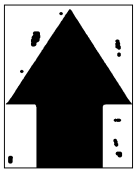
(8) One side of the copy image is darker than the other.



Causes
1. Dirty main charger wire.
2. Defective exposure lamp.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Replace the process unit.
2. Defective exposure lamp.	Check if the exposure lamp light is distributed evenly. If not, replace the exposure lamp (see page 1-6-34).

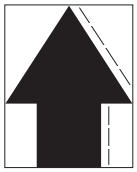
(9) Black dots appear on the image.



Causes
1. Dirty or flawed drum.
2. Dirty contact glass.
3. Deformed or worn cleaning blade.

Causes	Check procedures/corrective measures
1. Dirty or flawed drum.	Replace the process unit.
2. Dirty contact glass.	Clean the contact glass.
3. Deformed or worn cleaning blade.	Replace the process unit.

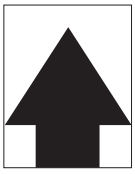
(10) Image is blurred.



Causes
1. Deformed press roller.
2. Paper conveying section drive problem.

Causes	Check procedures/corrective measures
1. Deformed press roller.	Replace the press roller (see page 1-6-26).
2. Paper conveying section drive problem.	Check the gears and belts and, if necessary, grease them.

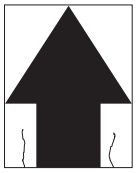
(11) The leading edge of the image is consistently misaligned with the original.



Causes
1. Misadjusted leading edge registration.
2. Misadjusted scanner leading edge registration.

Causes	Check procedures/corrective measures
1. Misadjusted leading edge registration.	Readjust the leading edge registration (see pages 1-6-41).
2. Misadjusted scanner leading edge registration.	Readjust the scanner leading edge registration (see page 1-6-47).

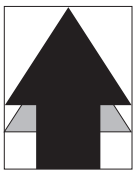
(12) Paper creases.



Causes
1. Paper curled.
2. Paper damp.

Causes	Check procedures/corrective measures
1. Paper curled.	Check the paper storage conditions.
2. Paper damp.	Check the paper storage conditions.

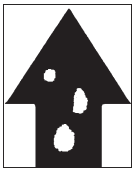
(13) Offset occurs.



Causes
1. Defective cleaning blade.

Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the process unit.

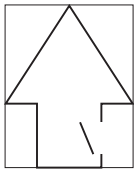
(14) Image is partly missing.



Causes
1. Paper damp.
2. Paper creased.
3. Flawed drum.

Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions.
2. Paper creased.	Replace the paper.
3. Flawed drum.	Replace the process unit.

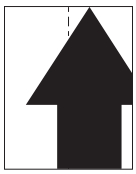
(15) Fixing is poor.



Causes
1. Wrong paper.
2. Flawed press roller.

Causes	Check procedures/corrective measures
1. Wrong paper.	Check if the paper meets specifications.
2. Flawed press roller.	Replace the press roller (see page 1-6-26).

(16) Image center does not align with the original center.



Causes
1. Misadjusted center line of image printing.
2. Misadjusted scanner center line.
3. Original placed incorrectly.

Causes	Check procedures/corrective measures
1. Misadjusted center line of image printing.	Readjust the center line of image printing (see pages 1-6-42).
2. Misadjusted scanner center line.	Readjust the scanner center line (see page 1-6-48).
3. Original placed incorrectly.	Place the original correctly.

1-5-4 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate when the power switch is turned on.	No electricity at the power outlet.	Measure the input voltage.
	The power cord is not plugged in properly.	Check the contact between the power plug and the outlet.
	The front cover is not closed completely.	Check the front cover.
	Broken power cord.	Check for continuity. If none, replace the cord.
	Defective power switch.	Check for continuity across the contacts. *If none, replace the power switch.*
	Blown fuse in the power supply board (KP-5059).	Check for continuity. If none, remove the cause of blowing and replace the fuse.
	Defective interlock switch.	Check for continuity across the contacts of switch. If none, replace the switch.
	Defective power supply board (KP-5059).	With AC present, check for 24 V DC at CN2-6 and 5 V DC at CN2-1 on the power supply board (KP-5059). If none, replace the power supply board (KP-5059).
(2) The main motor does not operate (C2000).	Poor contact in the main motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken main motor gear.	Check visually and replace the main motor if necessary.
	Defective main motor.	Run maintenance item U030 and check if the main motor operates and replace the main motor if necessary.
	Defective engine board (KP-5061).	Run maintenance item U030 and check if YC4-9 on the engine board (KP-5061) go low. If not, replace the engine board (KP-5061).
(3) The scanner motor does not operate.	Broken scanner motor coil.	Check for continuity across the coil. If none, replace the scanner motor.
	Poor contact in the scanner motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(4) Cooling fan does not operate.	Broken Cooling fan coil.	Check for continuity across the coil. If none, replace Cooling fan.
	Poor contact in the Cooling fan connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(5) The feed clutch does not operate.	Broken feed clutch coil.	Check for continuity across the coil. If none, replace the feed clutch.
	Poor contact in the feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine board (KP-5061).	Run maintenance item U032 and check if YC4-1 on the engine board (KP-5061) goes low. If not, replace the engine board (KP-5061).

Problem	Causes	Check procedures/corrective measures
(6) The MP feed clutch does not operate.	Broken MP feed clutch coil.	Check for continuity across the coil. If none, replace the MP feed clutch.
	Poor contact in the MP feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine board (KP-5061).	Run maintenance item U032 and check if YC5-2 on the engine board (KP-5061) goes low. If not, replace the engine board (KP-5061).
(7) The registration clutch does not operate.	Broken registration clutch coil.	Check for continuity across the coil. If none, replace the registration clutch.
	Poor contact in the registration clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine board (KP-5061).	Run maintenance item U032 and check if YC6-2 on the engine board (KP-5061) goes low. If not, replace the engine board (KP-5061).
(8) The eraser lamp does not turn on.	Poor contact in the eraser lamp connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective eraser lamp.	Check for continuity. If none, replace the eraser lamp.
	Defective engine board (KP-5061).	If the eraser lamp turns on when YC14-2 on the engine board (KP-5061) is held low, replace the engine board (KP-5061).
(9) The exposure lamp does not turn on.	Poor contact in the exposure lamp connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective scanner board (KP-5063).	Check if the exposure lamp turns on with YC6-1 and YC6-2 on the scanner board (KP-5063) goes low. If not, replace the scanner board (KP-5063).
	Defective engine board (KP-5061).	Check if the exposure lamp turns on with YC11-10 on the engine board (KP-5061) goes low. If not, replace the engine board (KP-5061).
(10) The exposure lamp does not turn off.	Defective scanner board (KP-5063).	Check if the exposure lamp turns on with YC6-1 and YC6-2 on the scanner board (KP-5063) goes low. If not, replace the scanner board (KP-5063).
	Defective engine board (KP-5061).	Check if the exposure lamp turns on with YC11-10 on the engine board (KP-5061) goes low. If not, replace the engine board (KP-5061).
(11) The heater lamp does not turn on.	Broken wire in heater lamp.	Check for continuity across heater lamp. If none, replace the heater lamp.
	Thermal cutout triggered.	Check for continuity across thermal cutout. If none, remove the cause and replace the thermal cutout.
(12) The heater lamp does not turn off.	Broken heater lamp wire.	Measure the resistance. If it is $\infty\Omega$, replace the thermistor.
	Dirty sensor part of the thermistor.	Check visually and clean the thermistor sensor parts.

Problem	Causes	Check procedures/corrective measures
(13) Main charging is not performed.	Broken main charger wire.	See page 1-5-14.
	Leaking main charger housing.	
	Poor contact in the high voltage board connector terminals.	
	Defective engine board (KP-5061).	
	Defective high voltage board.	
(14) Transfer charging is not performed.	Poor contact in the high voltage board connector terminals.	See page 1-5-14.
	Defective engine board (KP-5061).	
	Defective high voltage board.	
(15) A paper jam in the paper feed or exit section is indicated when the power switch is turned on.	A piece of paper torn from copy paper is caught around registration sensor or exit sensor.	Check and remove if any.
	Defective registration sensor.	Run maintenance item U031 and turn registration sensor on and off manually. Replace registration sensor if indication of the corresponding sensor is not light.
	Defective exit sensor.	Run maintenance item U031 and turn exit sensor on and off manually. Replace exit sensor if indication of the corresponding sensor is not light.
(16) The message requesting cover to be closed is displayed when the front cover is closed.	Poor contact in the connector terminals of interlock switch.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective interlock switch.	Check for continuity across switch. If there is no continuity when the switch is on, replace it.
(17) Others.	Wiring is broken, shorted or makes poor contact.	Check for continuity. If none, repair.
	Noise.	Locate the source of noise and remove.

1-5-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the feed roller and MP feed roller are dirty with paper powder.	Clean with isopropyl alcohol.
	Check if the feed roller and MP feed roller are deformed.	Check visually and replace any deformed rollers (see page 1-6-5, 6).
	Electrical problem with the feed clutch and MP feed clutch.	See pages 1-5-20, 21.
(2) No secondary paper feed.	Check if the surfaces of the upper and lower registration rollers are dirty with paper powder.	Clean with isopropyl alcohol.
	Electrical problem with the registration clutch.	See page 1-5-21.
(3) Skewed paper feed.	Deformed width guide in a drawer.	Repair or replace if necessary .
(4) The scanner does not travel.	The scanner motor malfunctions.	See page 1-5-20.
(5) Multiple sheets of paper are fed at one time.	Deformed drawer claw.	Check the drawer claw visually and correct or replace if necessary.
(6) Paper jams.	Check if the paper is curled.	Change the paper.
	Deformed guides along the paper conveying path.	Check visually and replace any deformed guides.
	Check if the contact between the upper and lower registration rollers is correct.	Check visually and remedy if necessary.
	Check if the press roller is extremely dirty or deformed.	Clean or replace the press roller.
	Check if the contact between the heat roller and its separation claws is correct.	Repair if any springs are off the separation claws.
(7) Abnormal noise is heard.	Check if the rollers and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic clutches are installed correctly: feed clutch, MP feed clutch and registration clutch.	Correct.

1-6-1 Precautions for assembly and disassembly

(1) Precautions

- Be sure to turn the power switch off and disconnect the power plug before starting disassembly.
- When handling PCBs, do not touch connectors with bare hands or damage the board.
- Do not touch any PCB containing ICs with bare hands or any object prone to static charge.
- Use only the specified parts to replace the fixing unit thermostat. Never substitute electric wires, as the copier may be seriously damaged.
- Do not perform aging without the waste toner tank installed during maintenance service.
- Use the following testers when measuring voltages:
  Hioki 3200
  Sanwa MD-180C
  Sanwa YX-360TR
  Beckman TECH300
  Beckman DM45
  Beckman 330*
  Beckman 3030*
  Beckman DM850*
  Fluke 8060A*
  Arlec DMM1050
  Arlec YF1030C
  * Capable of measuring RMS values.
- Prepare the following as test originals:
  1. NTC (new test chart)
  2. NPTC (newspaper test chart)

1-6-2 Removing the process unit

1. Open the front top cover.
2. Open the front cover.
3. Lift the process unit together with the toner container out of the copier.

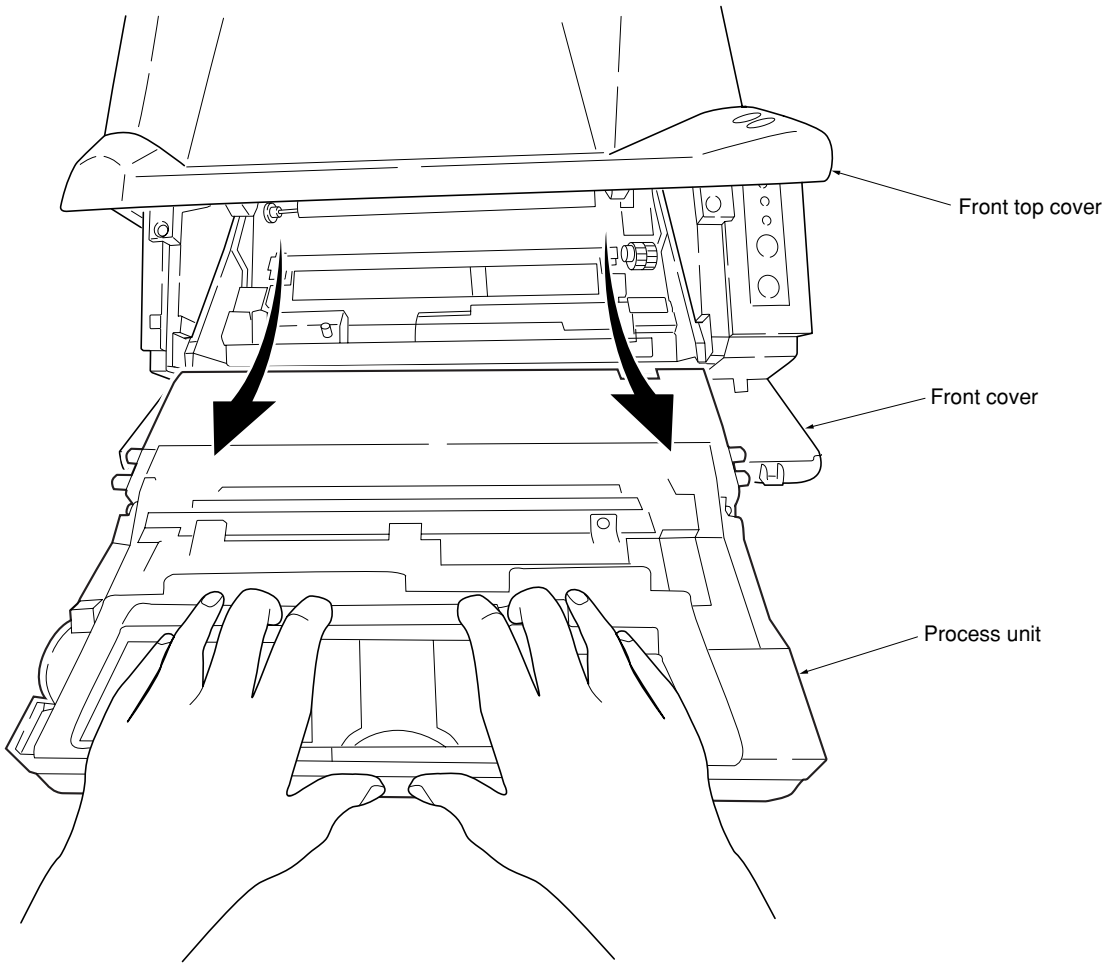


Figure 1-6-1 Removing the process unit

CAUTIONS

- After removing the process unit, seal it in the protective bag and place it on flat surface. Do not place the process unit in a dusty area.
- Do not give impact to the process unit.
- Do not place floppy disks near the process unit.
- If the process unit is replaced for some reason, the toner installation mode must be run.
  While pressing and hold down the Stop/clear key, Zoom (+) key, and Zoom (-) key simultaneously for five seconds, turn the power switch off and then on to run the toner installation mode. “900” will appear in the copy quantity/magnification display on the copier's operation panel. Then perform aging for approximately 15 minutes to replenish toner into the developing section in the process unit and a countdown of the time until the copier will be in a copy-ready state (900 seconds = 15 minutes). Once the copier is in a copy-ready state, “1” will appear in the copy quantity/magnification display and the Start indicator will light.
  * Run the toner installation mode only when you have replaced the process unit with a new one. (Do not run it when toner remains in the process unit.)

1-6-3 Removing the principal outer covers

(1) Removing the front top cover/face-down output tray

1. Remove the one screw and then remove the memory cover.
2. Remove the one screw and then remove the rear cover.

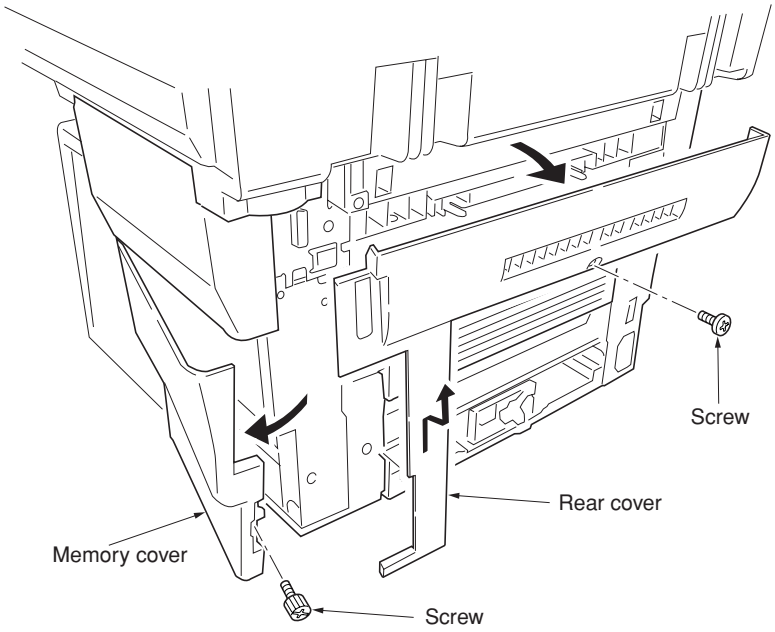


Figure 1-6-2 Removing the memory cover and rear cover

3. While unlatching the two latches and then remove the front top cover/face-down output tray.

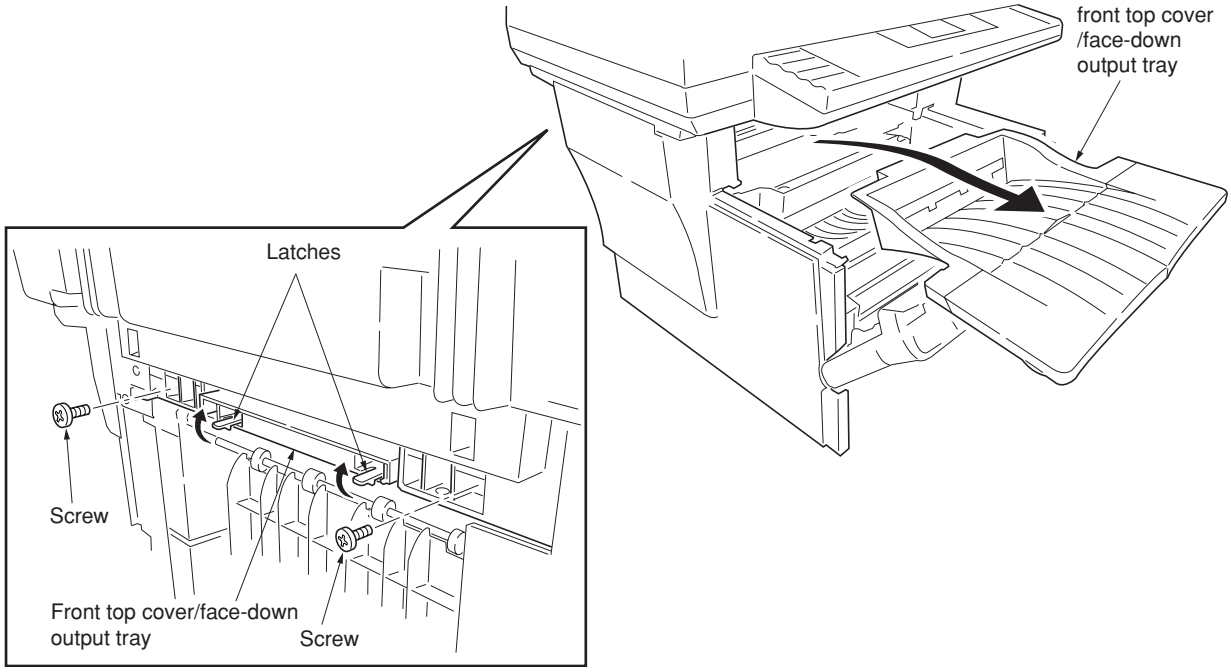


Figure 1-6-3 Removing the front top cover/face-down output tray

(2) Removing the right cover

1. Remove the front top cover/face-down output tray (See page1-6-3).
2. Remove the memory cover (See page 1-6-3).
3. Unlatch the snaps and hook, remove the right cover.

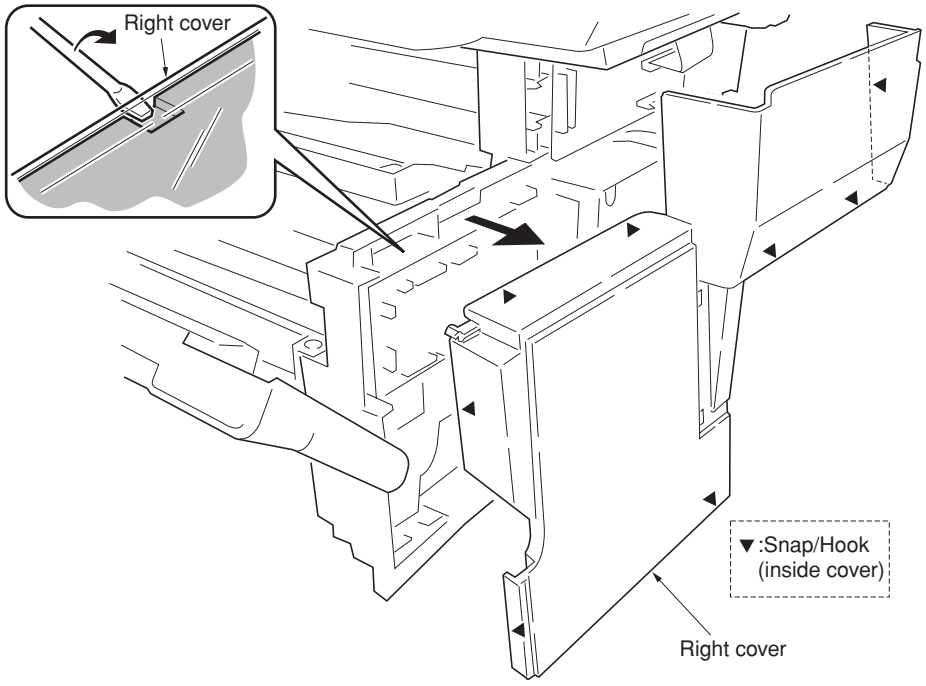


Figure 1-6-4 Removing the right cover

(3) Removing the left cover

1. Remove the front top cover/face-down output tray (See page1-6-3).
2. Unlatch the snaps and hooks, remove the left cover.

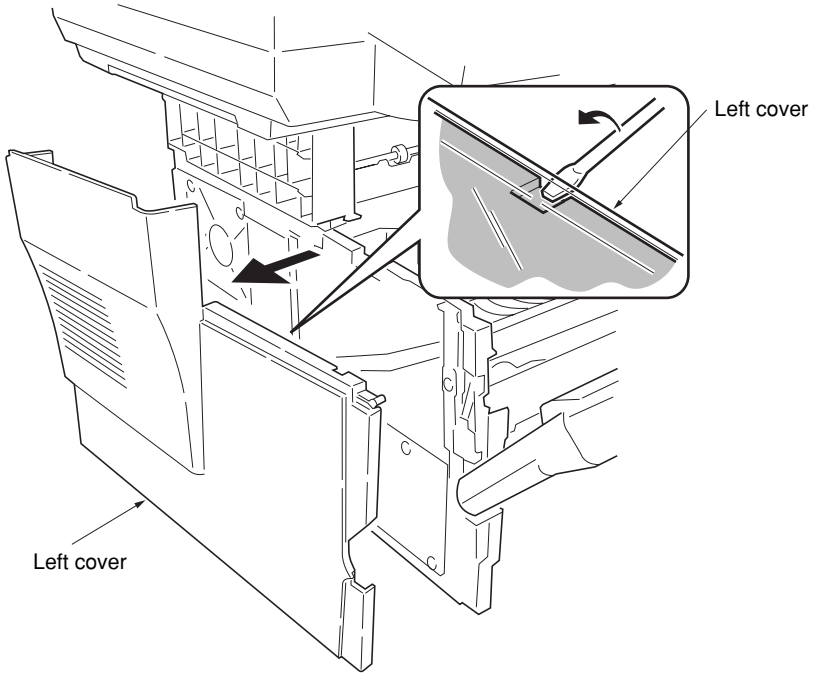


Figure 1-6-5 Removing the left cover

1-6-4 Removing the feed roller

CAUTION
When refit the feed roller, fit the D-cut shaft into the D-shape hole of the feed roller.

1. Remove the paper cassette and the process unit (See page 1-6-2).
2. Stand the machine the front side up.
3. Move the feed roller in the direction Ⓐ, and remove the feed roller.

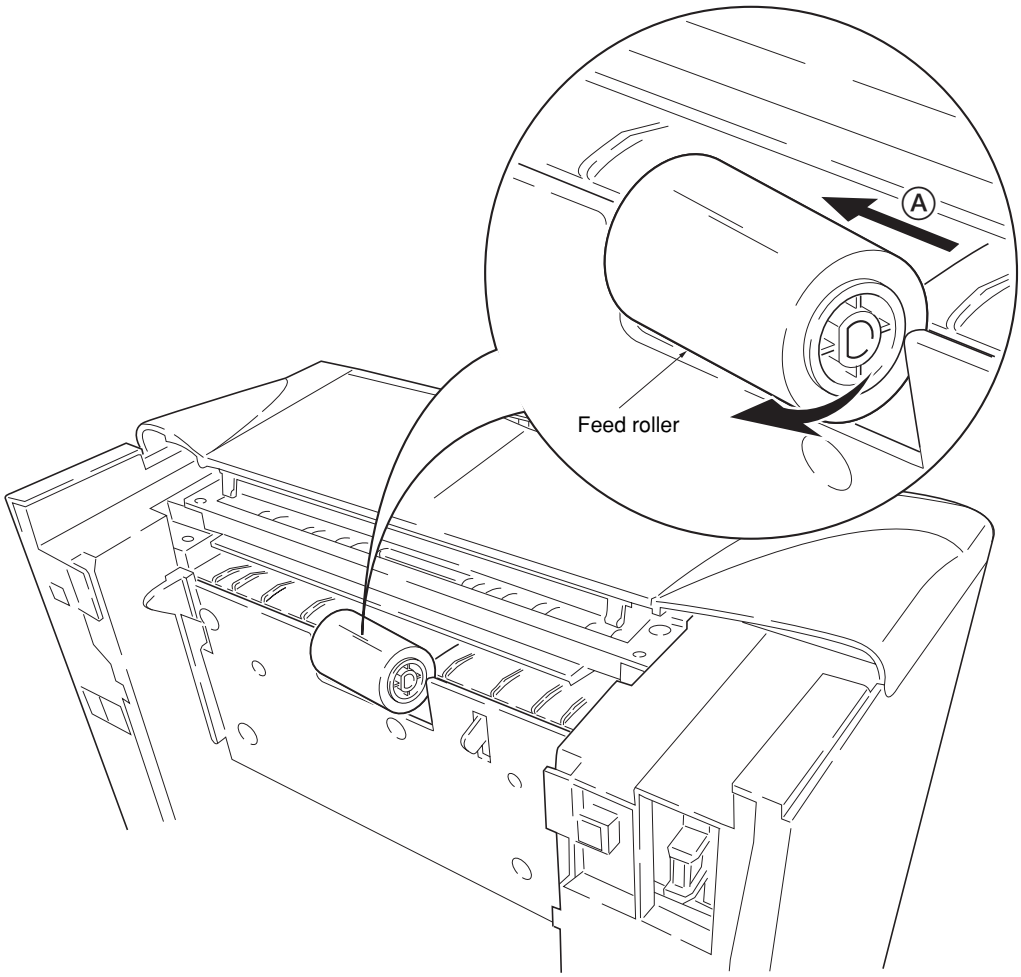


Figure 1-6-6 Removing the feed roller

1-6-5 Removing the MP feed roller

1. Remove the engine board (See page 1-6-9).
2. Remove one screw.
3. Remove the grounding plate.
4. Remove one stop ring .
5. Remove the MP feed clutch.

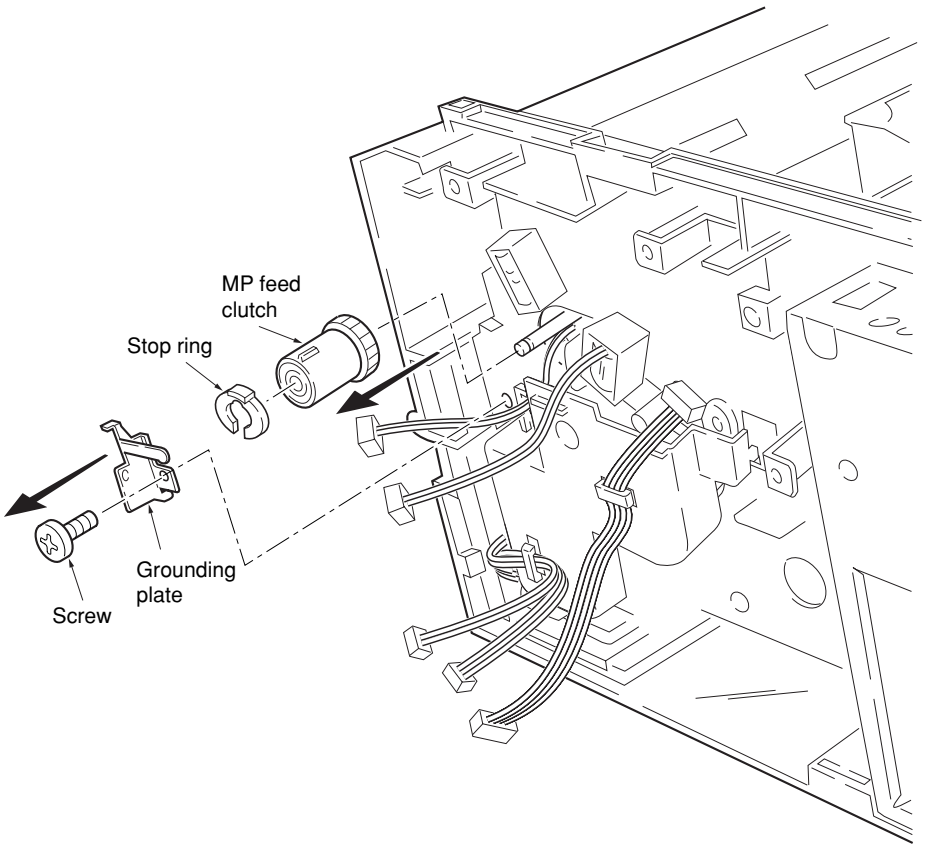


Figure 1-6-7 Removing the MP feed clutch

6. Remove one screw.
7. Remove the toner sensor and spring.
8. Remove two screws.
9. While pressing the latch by using the driver and then remove the MP feed unit.

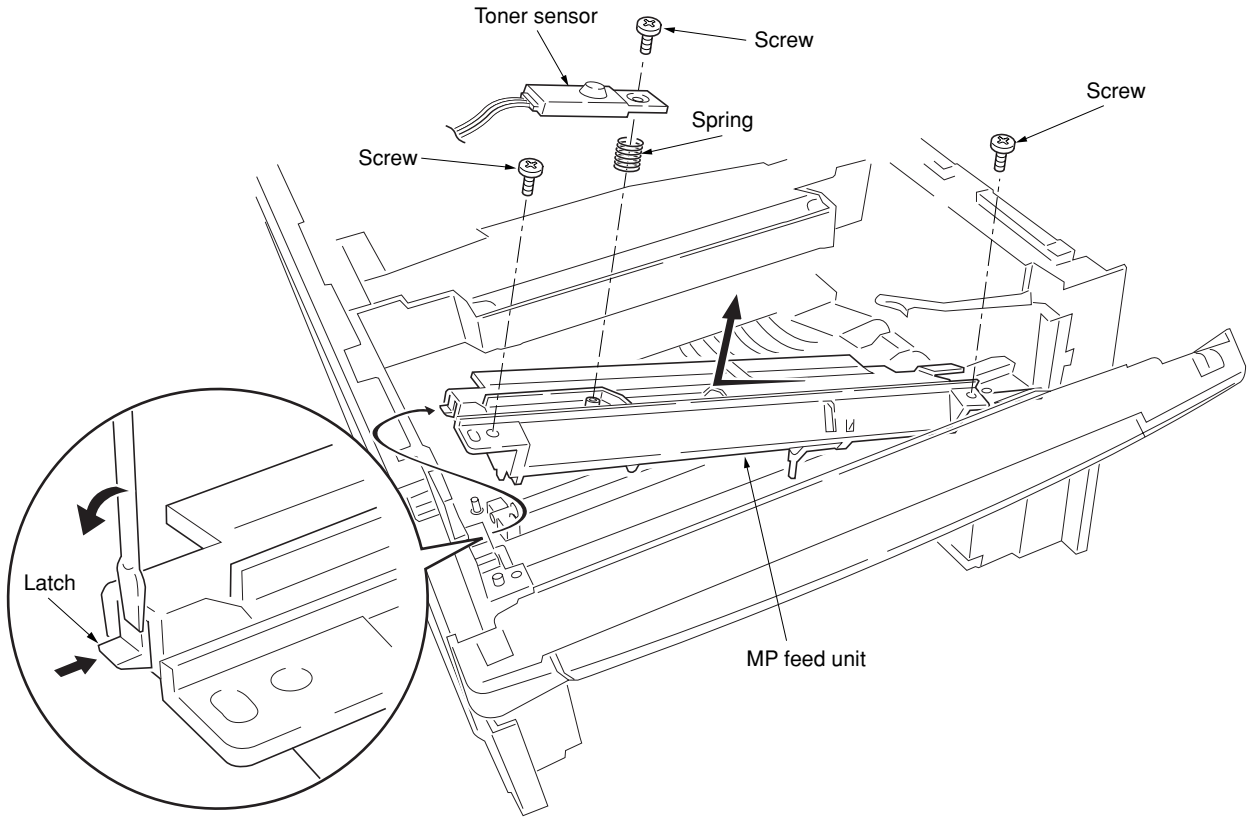


Figure 1-6-8 Removing the MP feed unit

10. Remove the stop ring and then remove the MP feed roller.

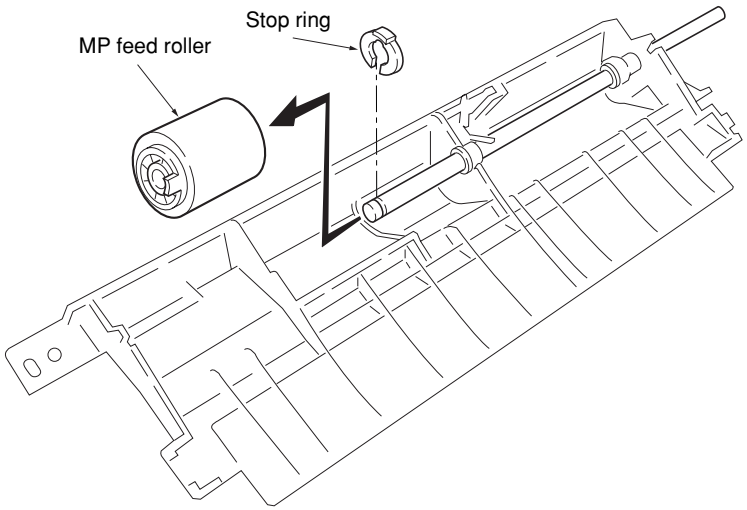


Figure 1-6-9 Removing the MP feed roller

1-6-6 Removing the transfer roller

CAUTION
Do not touch the transfer roller (sponge) surface. Oil and dust (particles of paper, etc.) on the transfer roller can significantly deteriorate the print quality (white spots, etc.).

When refitting the bushes and springs, make sure to refit the black colored bush and spring on the left side. Also, observe the correct direction to which the bush is fit in reference to the paper passing direction.

1. Remove the process unit (See page 1-6-2).
2. Remove the transfer roller from the both bushes.

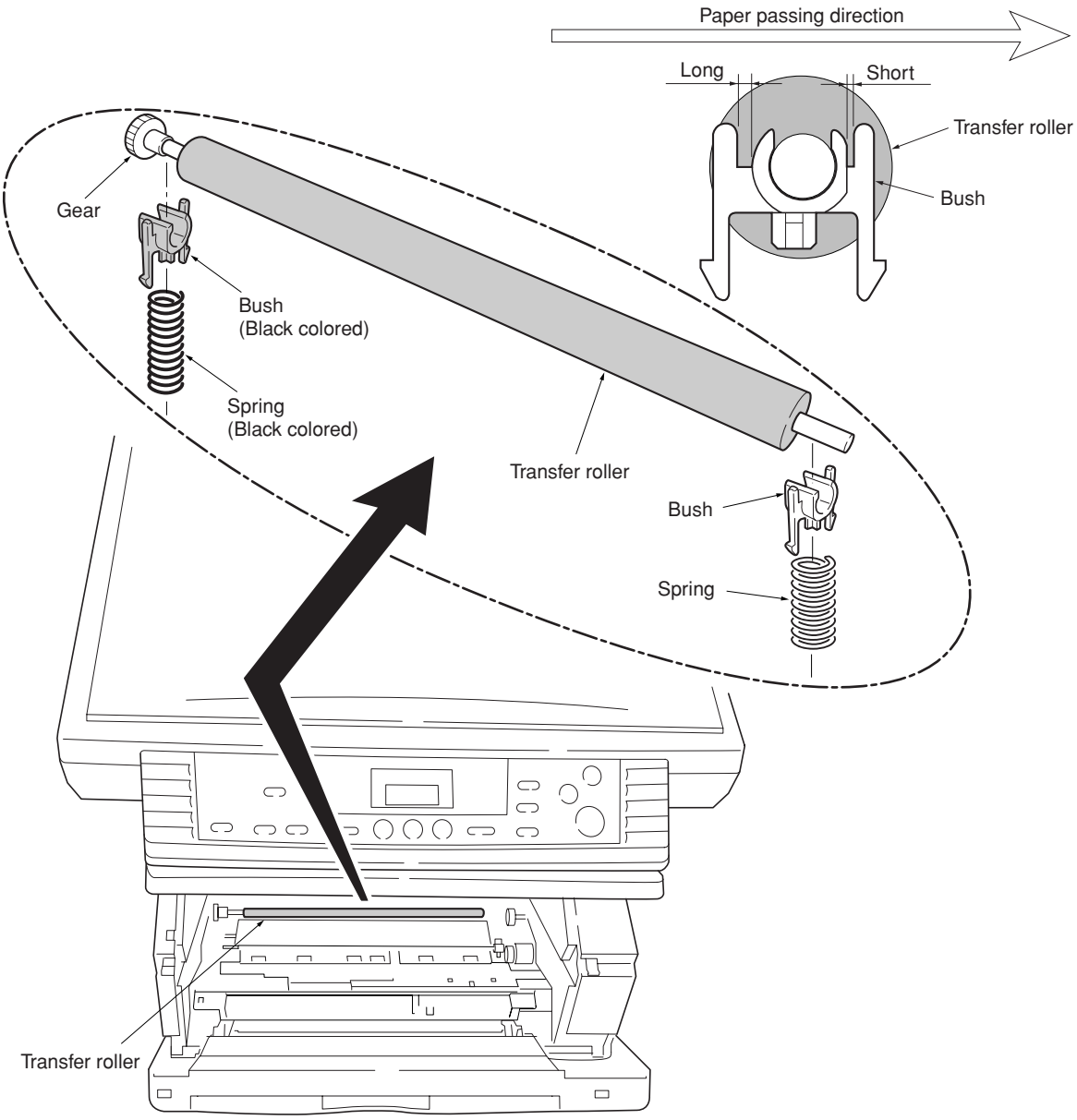


Figure 1-6-10 Removing the transfer roller

1-6-7 Removing the principal circuit boards

(1) Removing the engine board

1. Remove the right cover (See page 1-6-4).
2. Remove all (twelve) connectors from the engine board.
3. Remove three screws.
4. Remove the engine board.

* When replacing the board with a new board, remove the EEPROM from the old board and mount it to the new board.

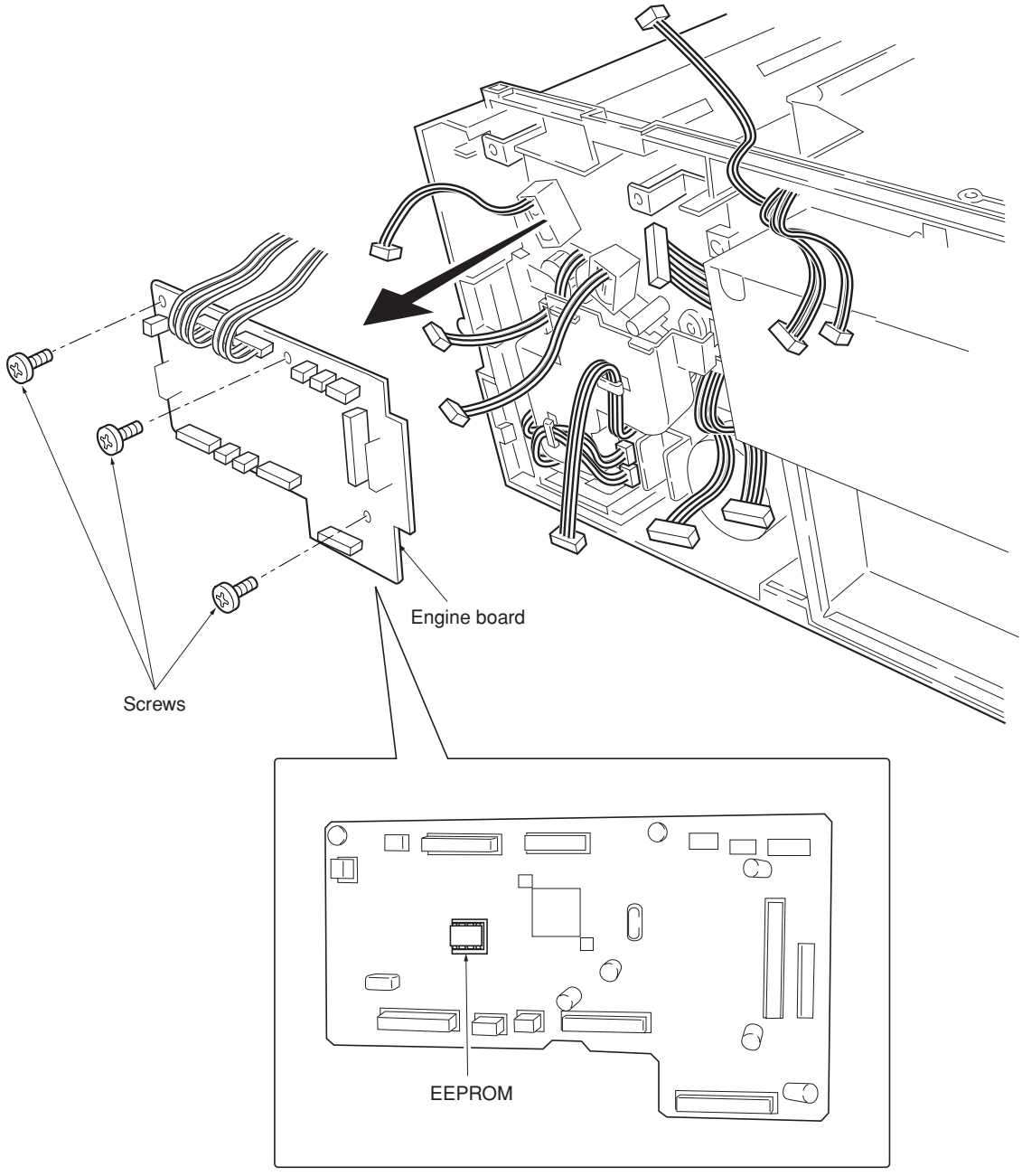


Figure 1-6-11 Removing the engine board

(2) Removing the main board

1. Remove the right cover (See page 1-6-4).
2. Remove the three connectors.
3. Remove the one flexible flat cable.
4. Remove the seven screws and then remove the main controller shield (with main board).

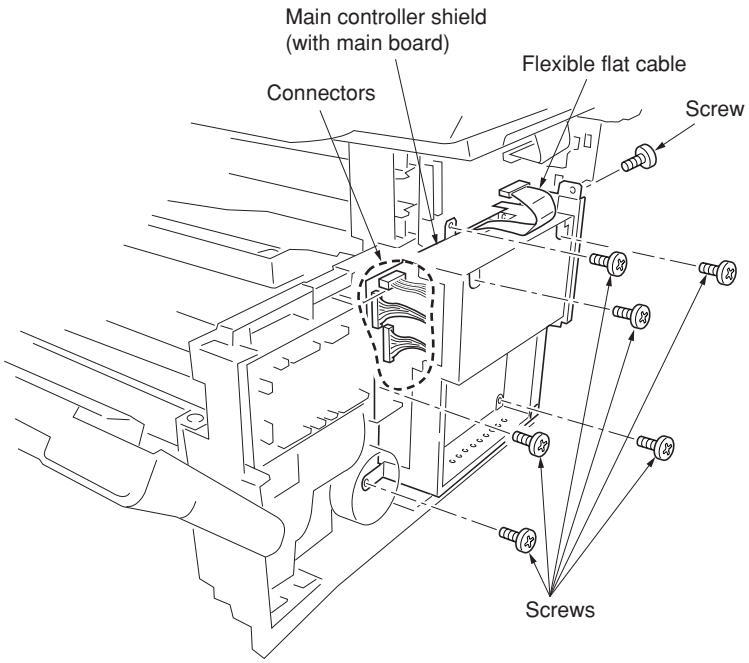


Figure 1-6-12 Removing the main controller shield (with main board)

5. Remove two screws at the back of the main board.
   * When replacing the board with a new board, remove the EEPROM from the old board and mount it to the new board.

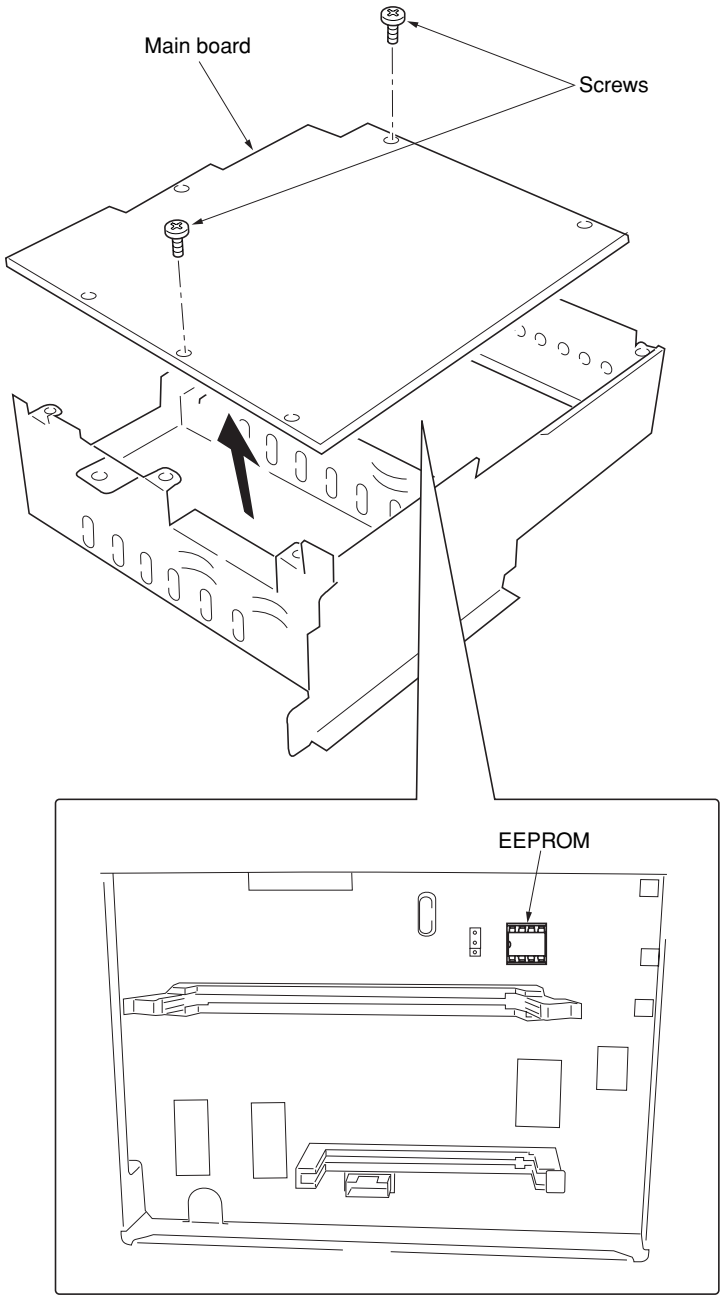


Figure 1-6-13 Removing the main board

(3) Removing the power supply board and high voltage board

1. Remove the process unit (See page 1-6-2).
2. Remove the left cover (See page 1-6-4).
3. Remove three connectors from the power supply board.
4. Remove eight screws.
5. Remove the power supply board and high voltage board. (Note: The high voltage board is directly connected to the bias board.)
6. Separate the high voltage board from the power supply board.

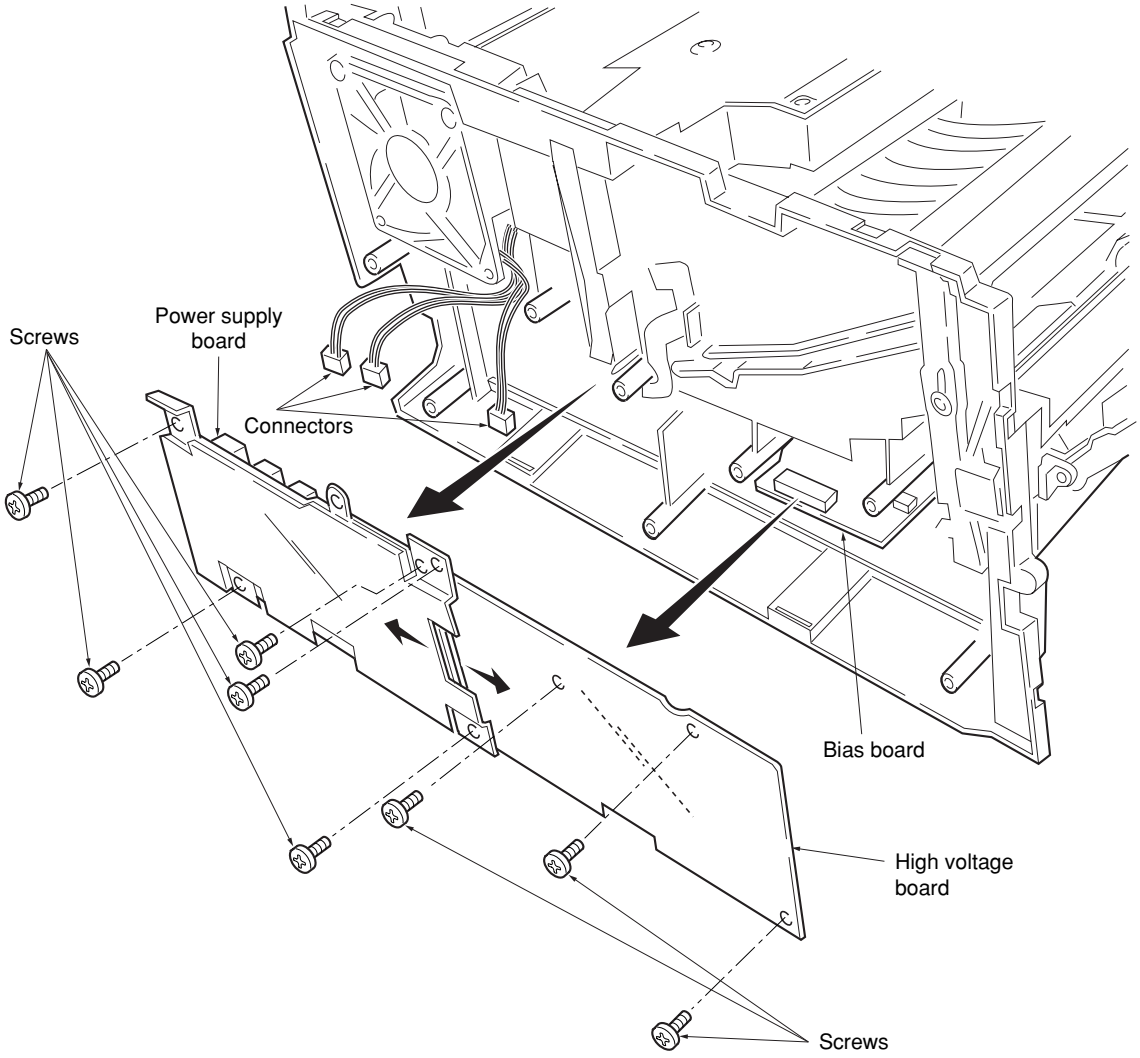


Figure 1-6-14 Removing the power supply board and high voltage board

(4) Removing the bias board

1. Remove the cassette and process unit (See page 1-6-2).
2. Remove the left cover (See page 1-6-4).
3. Remove the power supply board and high voltage board (See the previous page).
4. Stand the machine with the front side up.
5. Remove one connector from the bias board.
6. Remove five screws.
7. Remove the bottom cover.
8. Remove the two connectors from the bias board.
9. Remove the bias board.

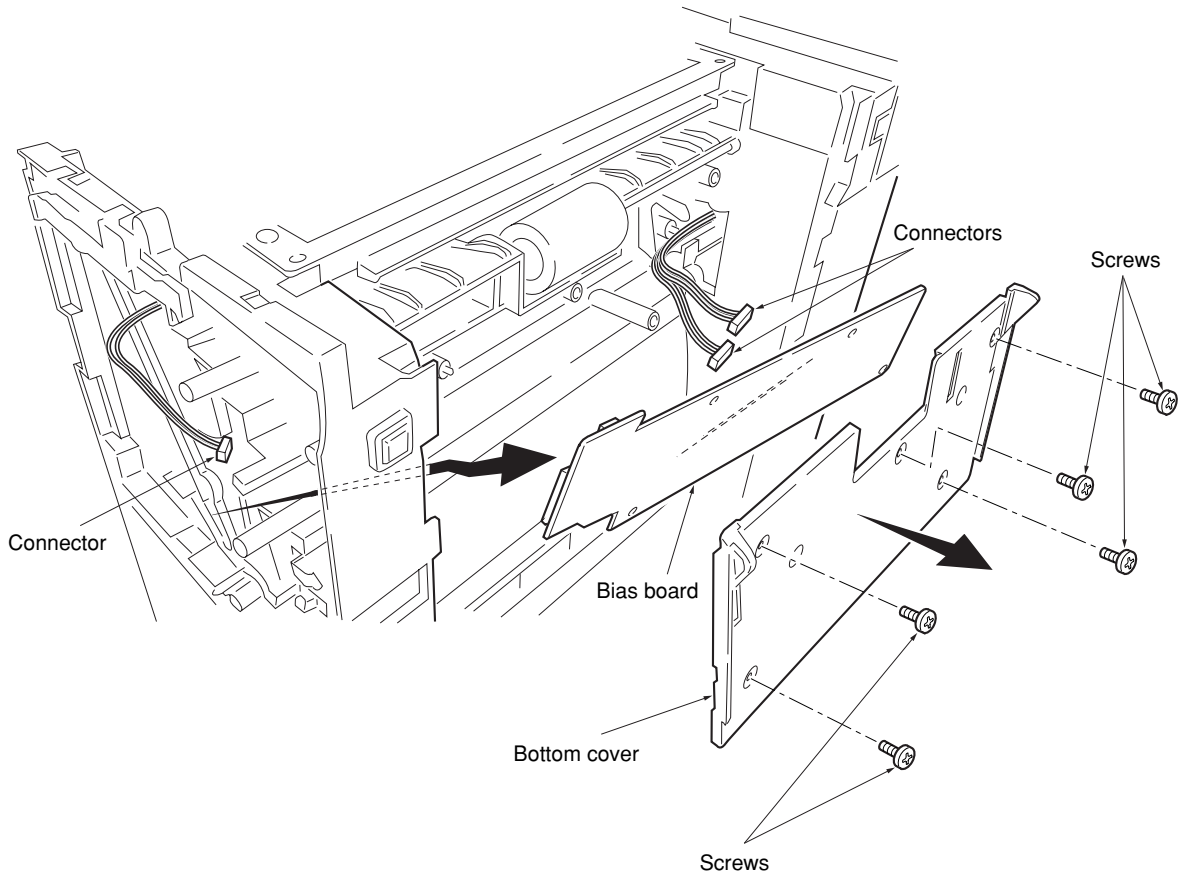


Figure 1-6-15 Removing the bias board

1-6-8 Removing the main motor and drive unit

1. Remove the cassette and process unit (See page 1-6-2).
2. Remove the right cover (See page 1-6-4).
3. Remove three connectors from the main motor.
4. Remove four screws.
5. Remove main motor.

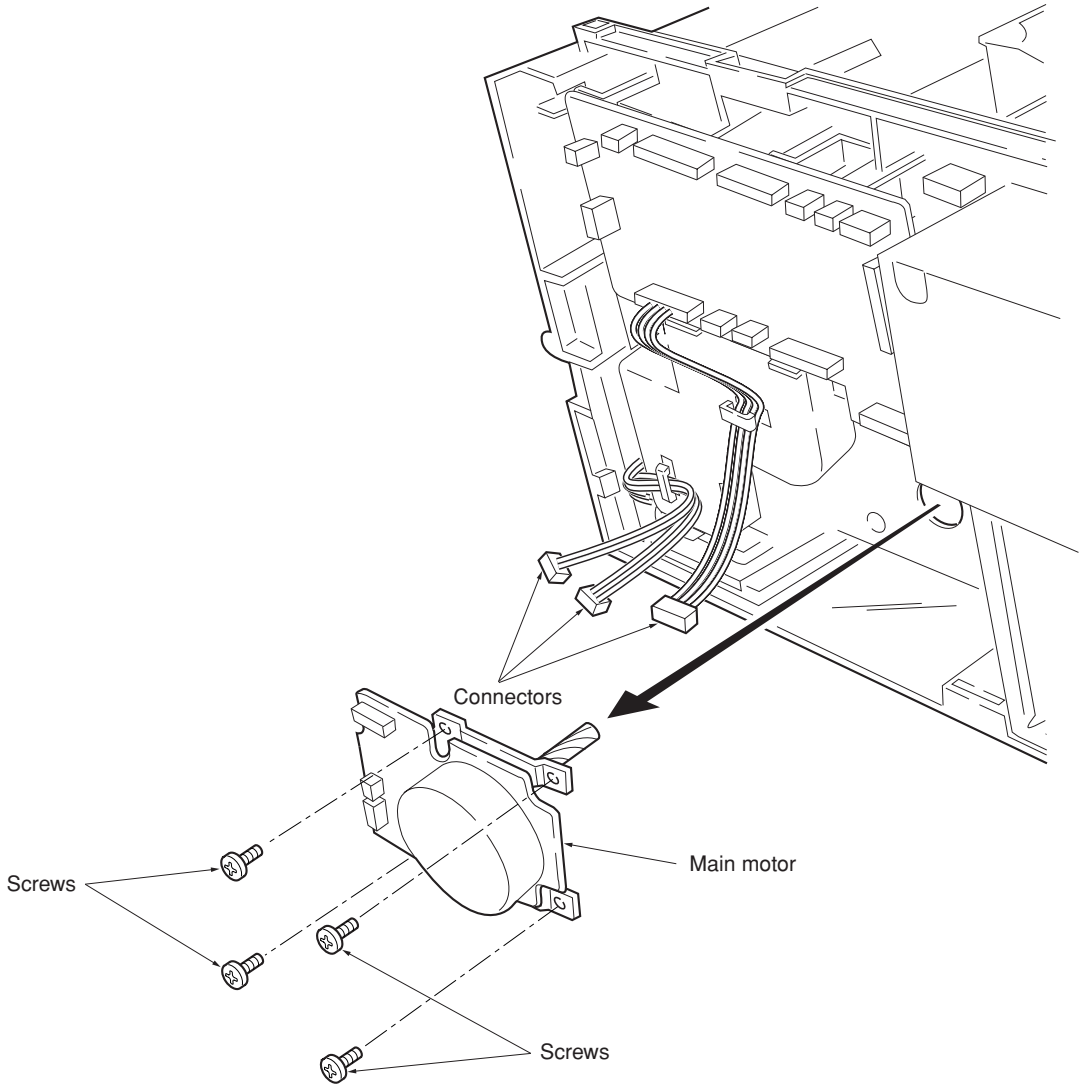


Figure 1-6-16 Removing the main motor

6. Remove the engine board (See page 1-6-9).
7. Remove wires from wire saddles on the cord cover.
8. Remove one screw.
9. Remove the cord cover.

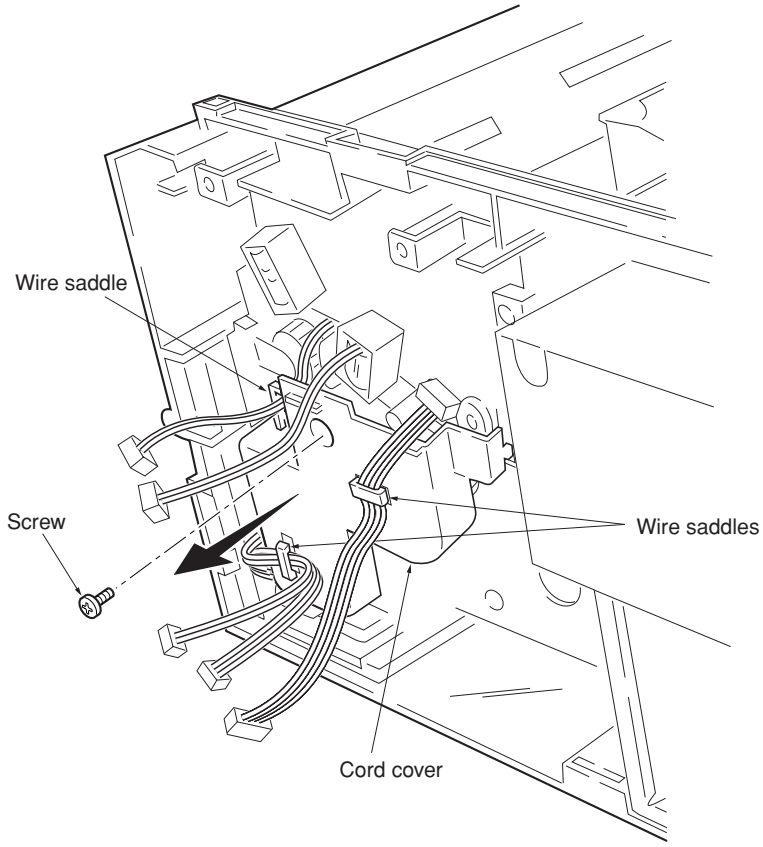


Figure 1-6-17 Removing the cord cover

10. Remove the main board (See page 1-6-10).
11. Remove one screw and then remove the grounding plate.
12. Remove one screw and then remove the feed clutch.
13. Remove three stop rings.
14. Remove MP feed clutch (gear), feed clutch (gear), and registration clutch (gear).

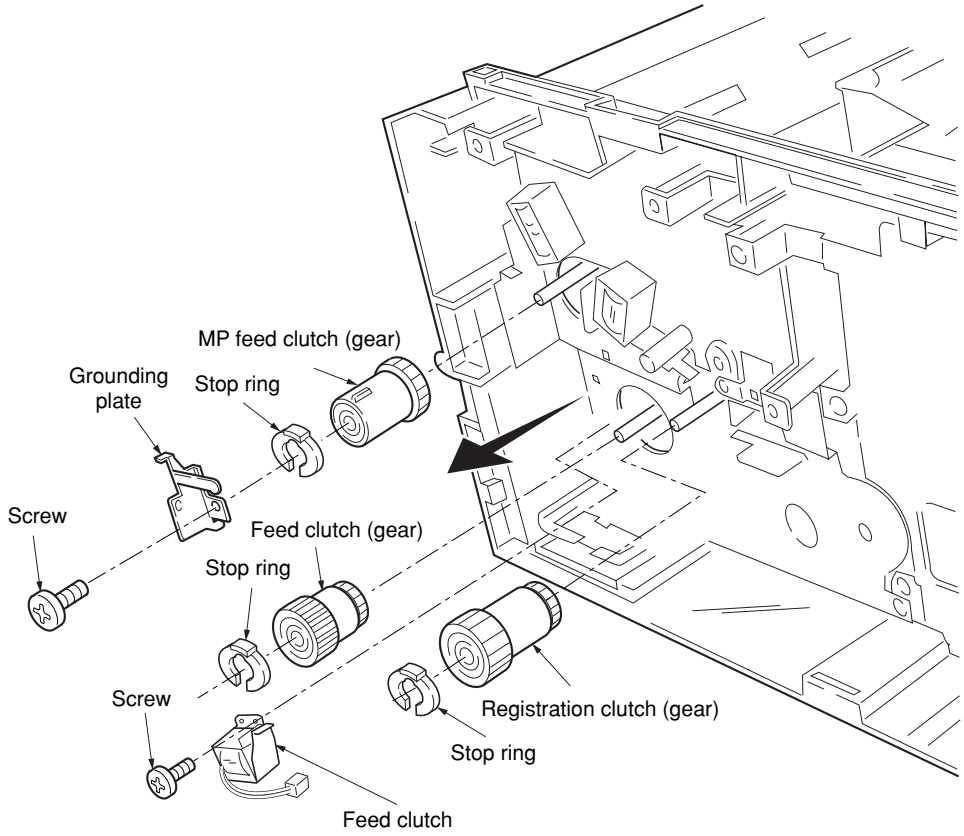


Figure 1-6-18 Removing the clutches

15. Remove the four screws.
16. Remove the drive unit.

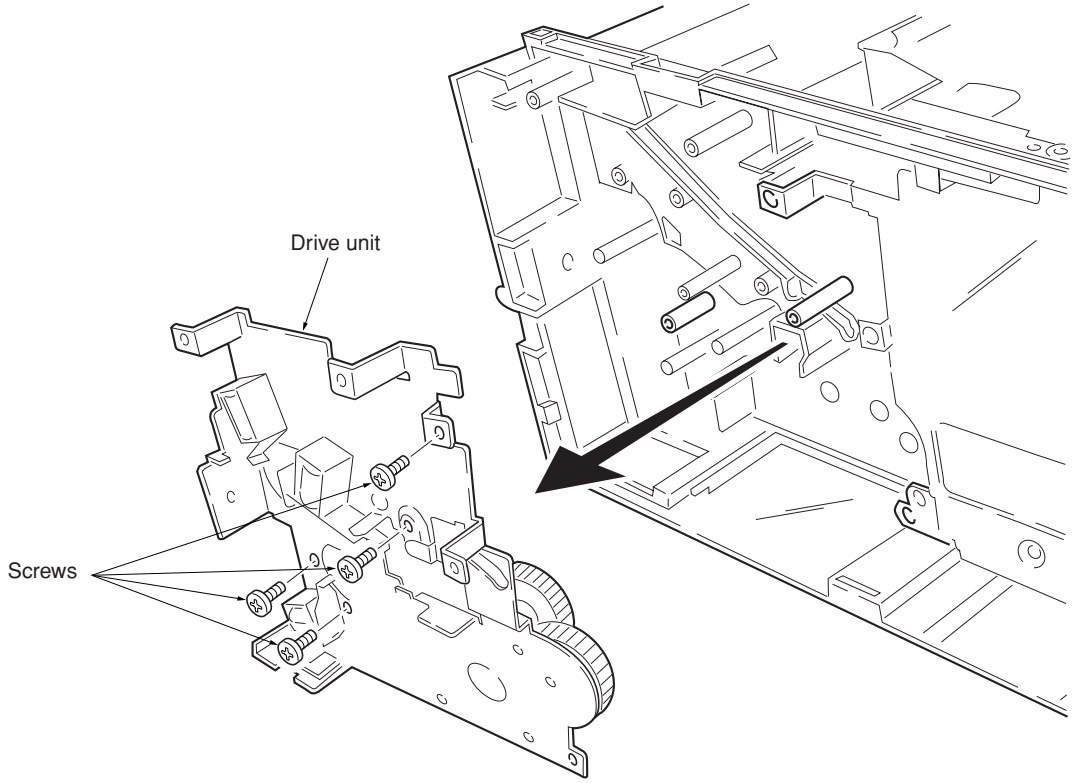


Figure 1-6-19 Removing the drive unit

1-6-9 Removing and splitting the fuser unit

WARNING
• The fuser unit is hot after the copier was running. Wait until it cools down.

CAUTION
• When refitting the fuser unit, make sure the fuser unit gear and the copier's drive gear are properly meshed with each other. For this, rotate the main motor several turns before fixing screws.

1. Remove the rear cover (See page 1-6-3).
2. Remove the right and left cover (See page 1-6-4).
3. Remove the two connectors.
4. Remove two screws.
5. Remove the fuser unit.

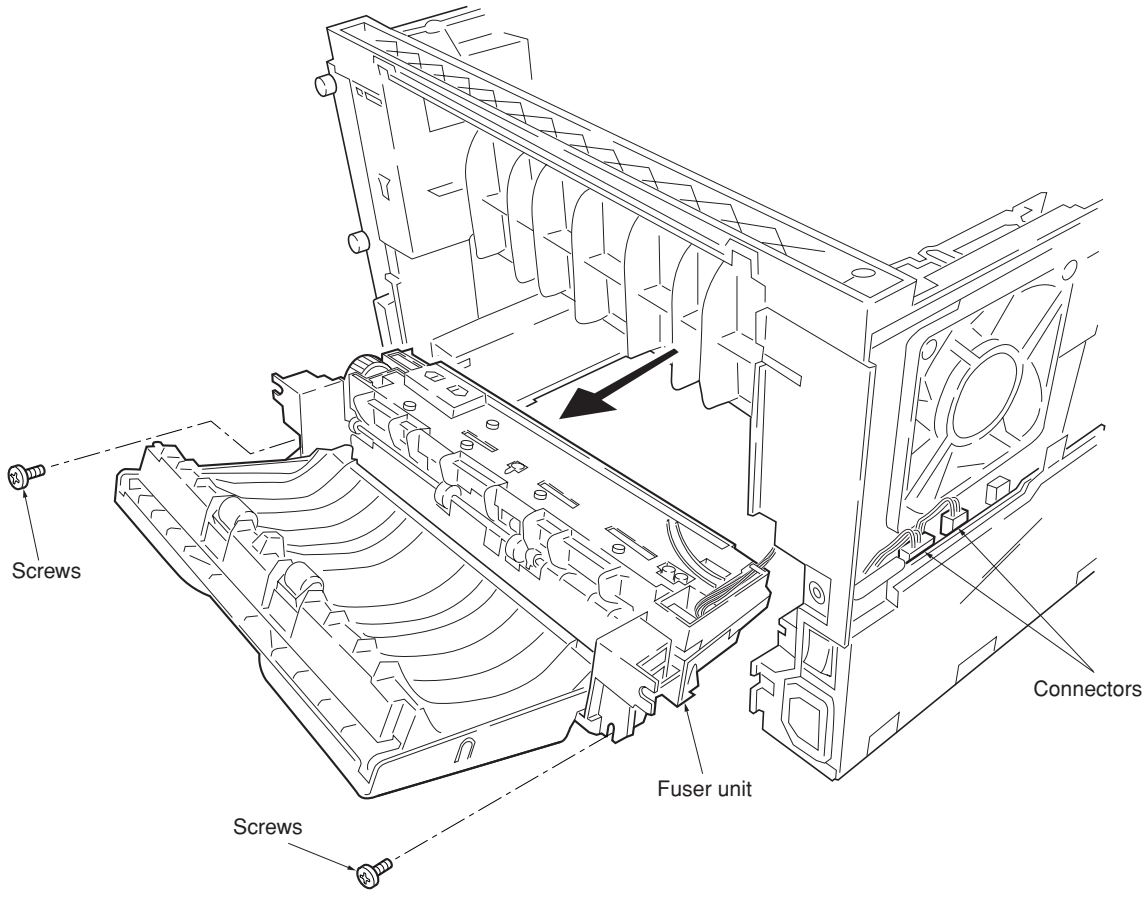


Figure 1-6-20 Removing the fuser unit

6. Remove two screws.
7. Open and split the fuser unit.

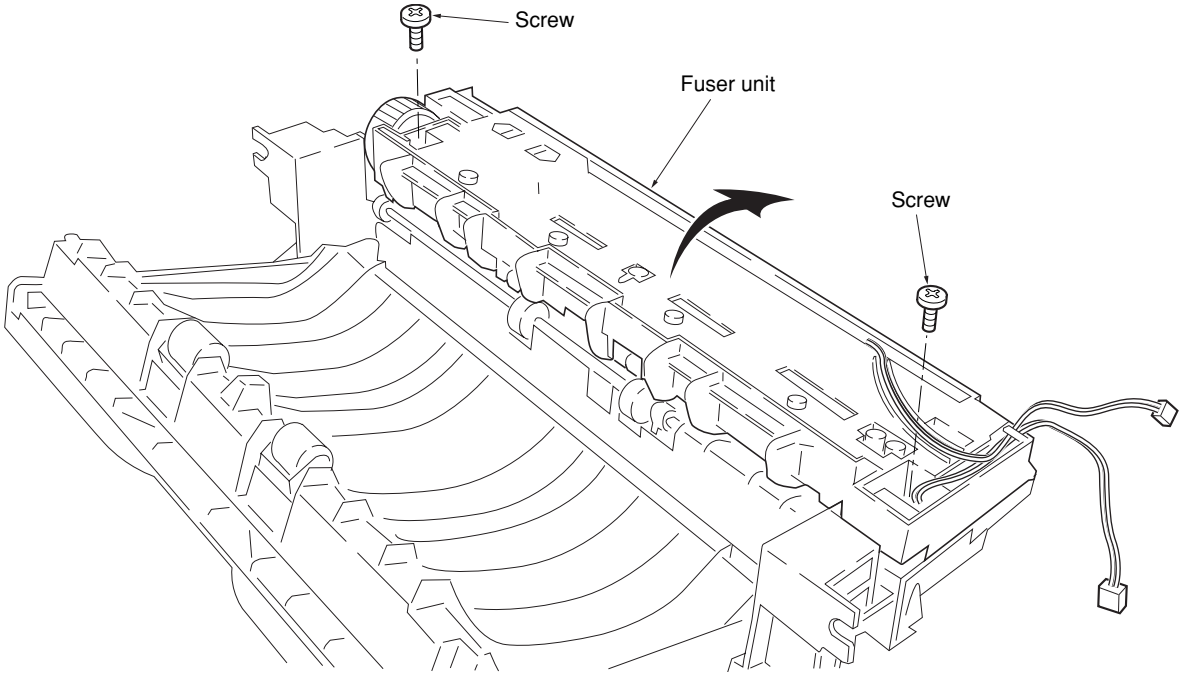


Figure 1-6-21 Splitting the fuser unit

(1) Removing the separation claws

WARNING
The separation claws are extremely hot immediately after the copier was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-18).
2. Loosen the stopper screws.
3. Hold the separation claw upright, and remove the separation claw and separation claw springs.

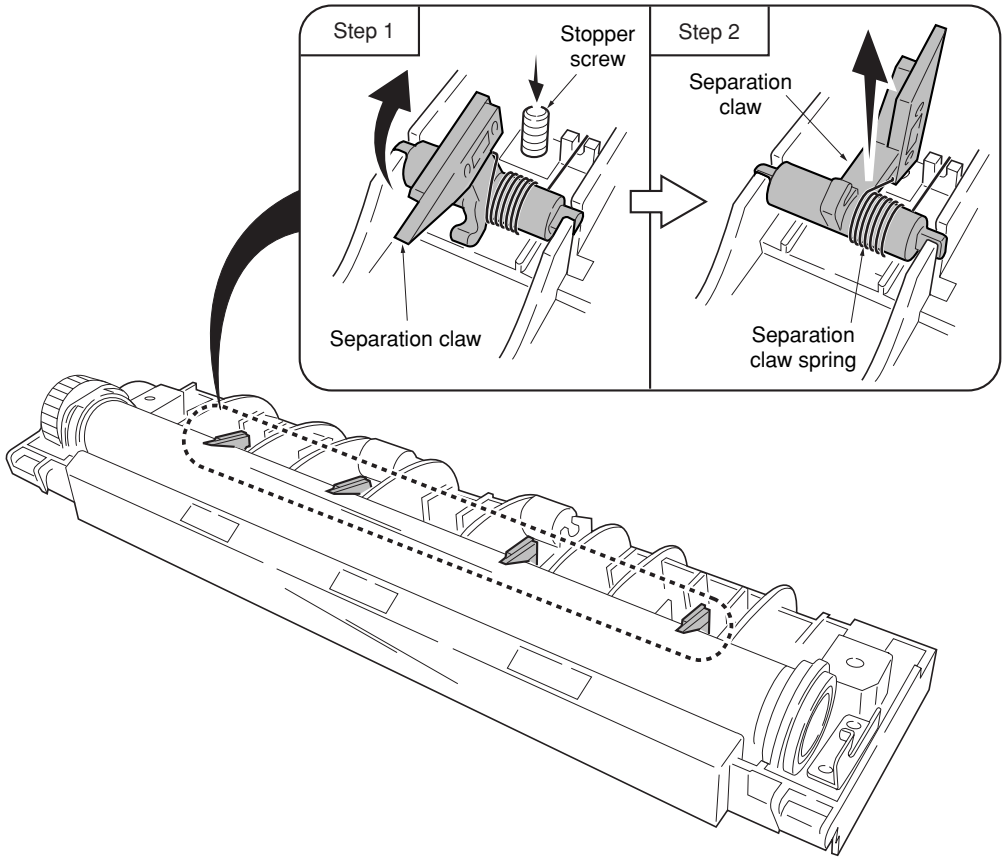


Figure 1-6-22 Removing the separation claws

(2) Removing the heater lamp

WARNING
- The heater lamp is extremely hot immediately after the copier was running.
- Allow substantial period of time until it cools down. Also, the heater lamp is fragile: Handle it with great care.

CAUTION
- The heater lamps are fragile. Use extreme care when handling not to drop or break.
- Do not directly touch on the heater lamp. Finger prints on the heater lamp's outer surface can prevent proper fusing of toner on paper. When holding
- When refitting the heater lamp, direct the short distance side from the projection in the middle of the lamp facing the machine's left side.

1. Remove and split the fuser unit (See page 1-6-18).
2. Remove all (four) separation claws (See previous page).
3. Remove one screw, release the tension of the lamp A holder.
4. Remove the heater lamp form the lamp B holder.
5. Remove the heater lamp from the heat roller.

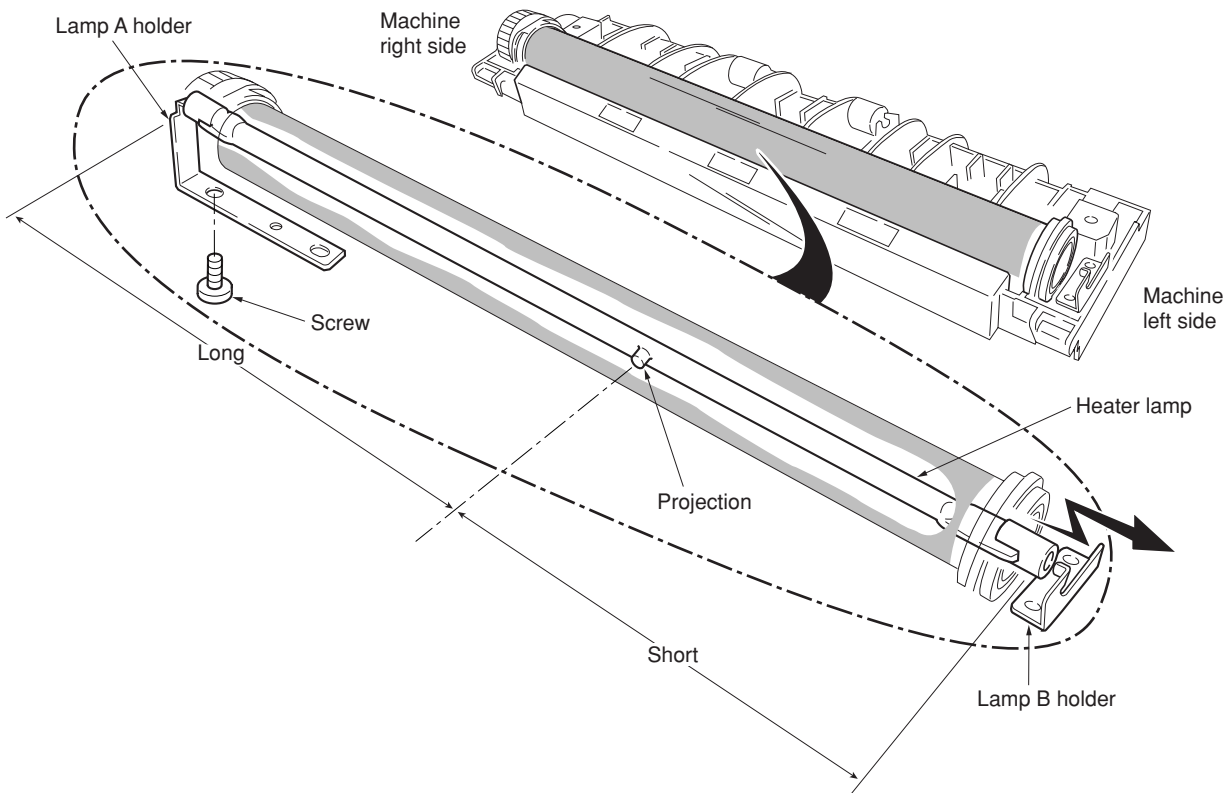


Figure 1-6-23 Removing the heater lamp

(3) Removing the heat roller

WARNING

- The heat roller is extremely hot immediately after the copier was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-18).
2. Remove the heater lamp (See previous page).
3. Press the lamp A holder away from the heat roller. Pull up both heat R bush and heat L bush at the same time.

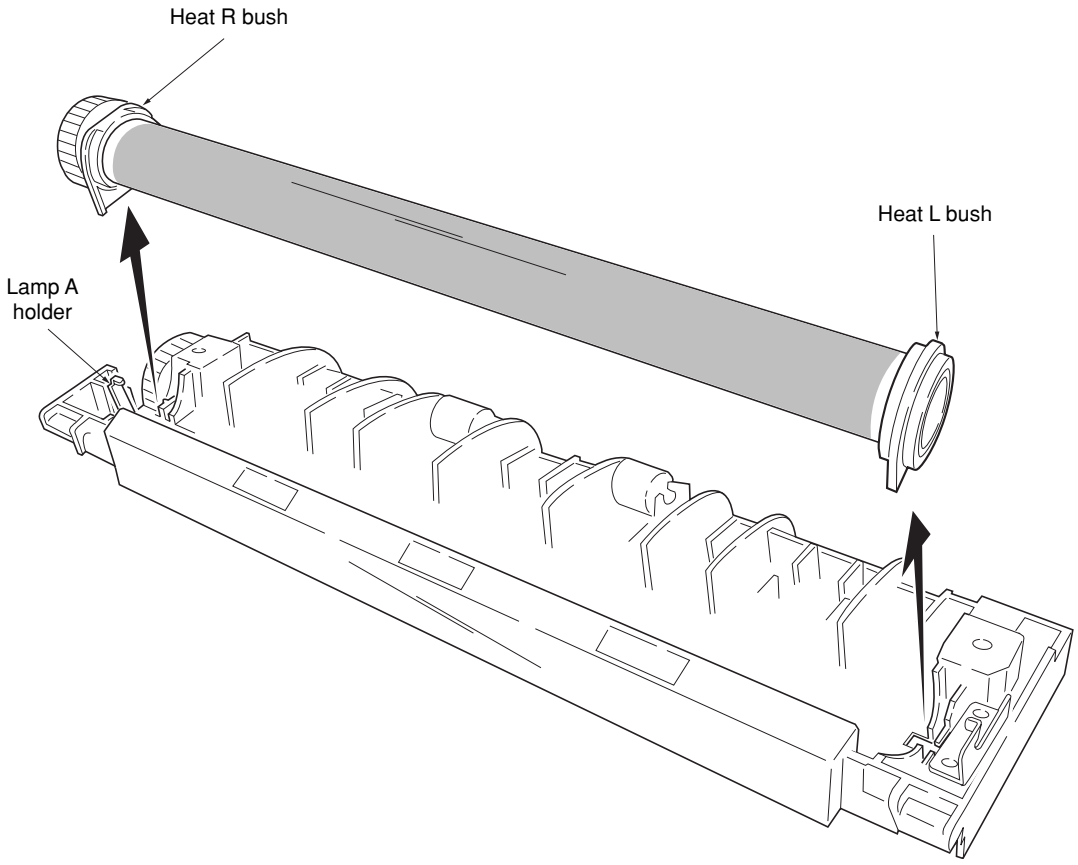


Figure 1-6-24 Removing the heat R bush and heat L bush

4. Remove the heat gear Z33, heat R bush, and heat L bush from the heat roller.

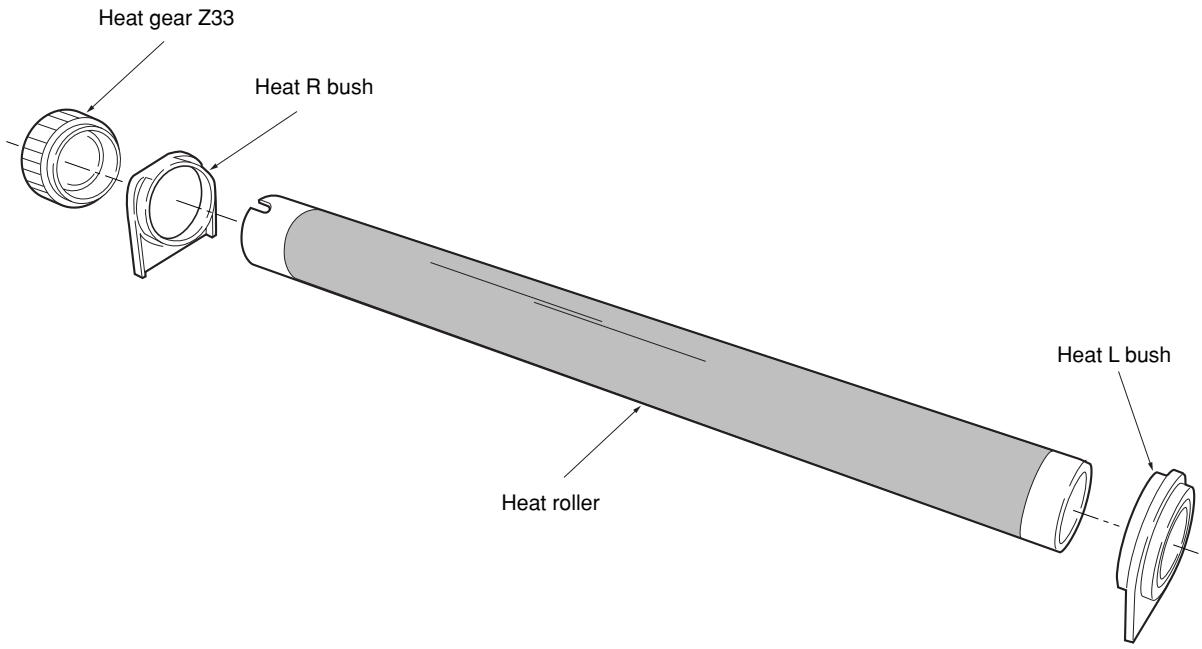


Figure 1-6-25 Removing the heat roller

(4) Removing the thermistor

1. Remove and split the fuser unit (See page 1-6-18).
2. Remove the heater lamp (See page 1-6-21).
3. Remove the heat roller (See page 1-6-22).
4. Remove one screw.
5. Remove the thermistor.

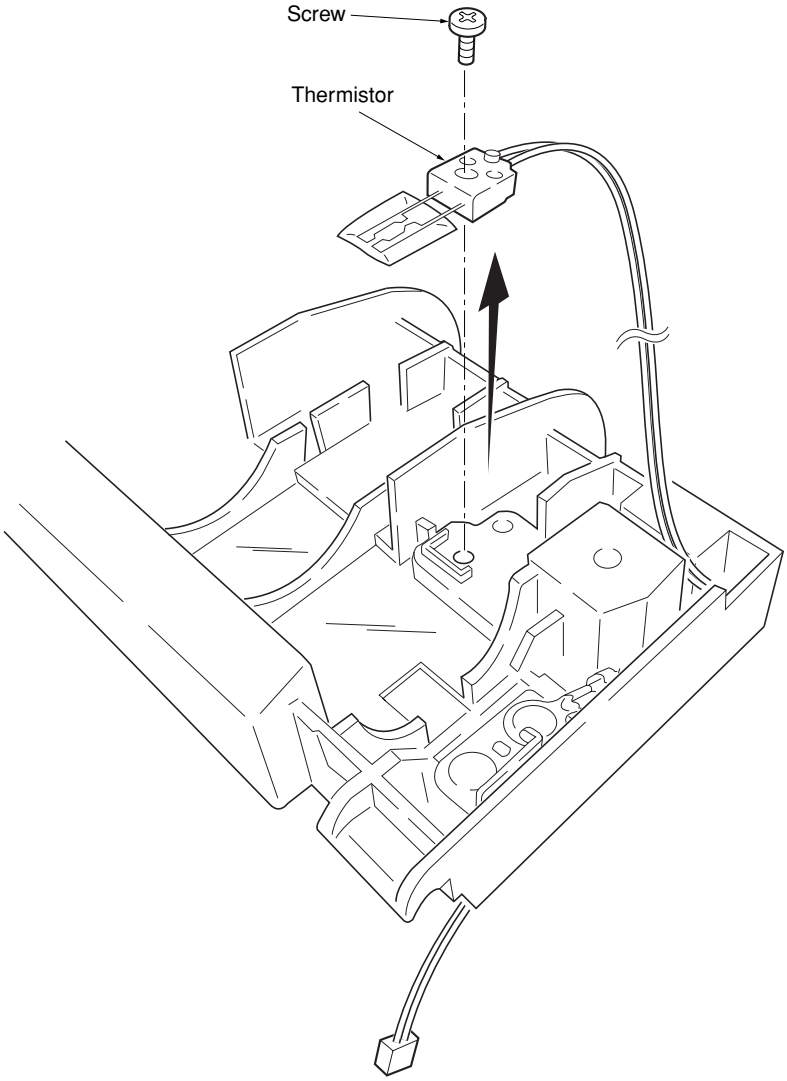


Figure 1-6-26 Removing the thermistor

(5) Removing the thermal cutout

CAUTION
• Do not bend the terminals of the thermal cutout.

1. Remove and split the fuser unit (See page 1-6-18).
2. Remove the heater lamp (See page 1-6-21).
3. Remove the heat roller (See page 1-6-22).
4. Remove the two screws.
5. Remove the thermal cutout.

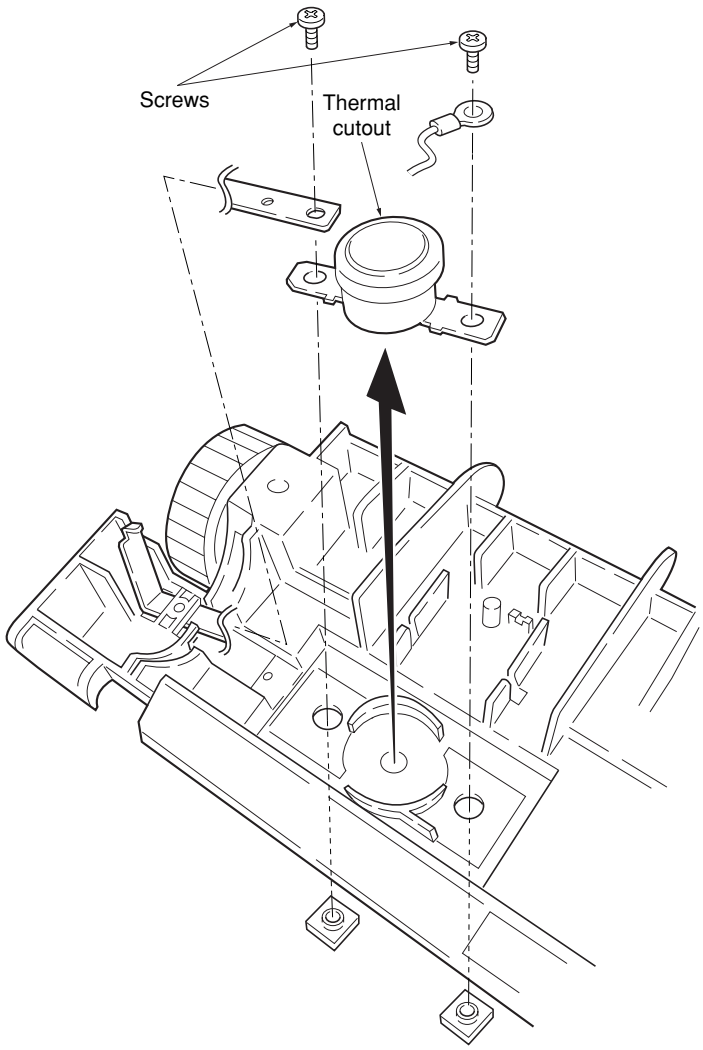


Figure 1-6-27 Removing the thermal cutout

(6) Removing the press roller

WARNING

- The press roller is extremely hot immediately after the copier was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-18).
2. Remove the press roller from the fuser unit.

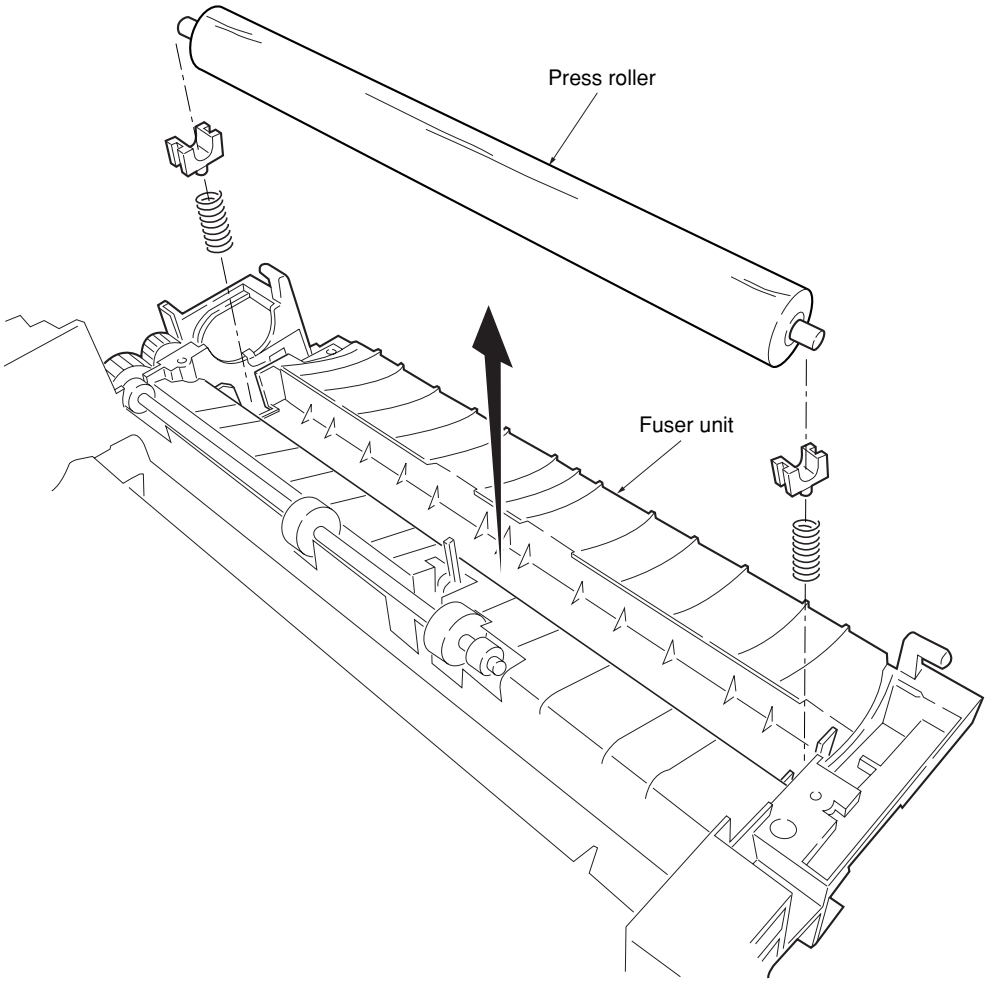


Figure 1-6-28 Removing the press roller

1-6-10 Removing the scanner unit

1. Remove the right and left cover (See page 1-6-4).
2. Remove the five connectors and two flexible flat cables from the scanner board.
3. Remove the five screws and then remove the scanner board.

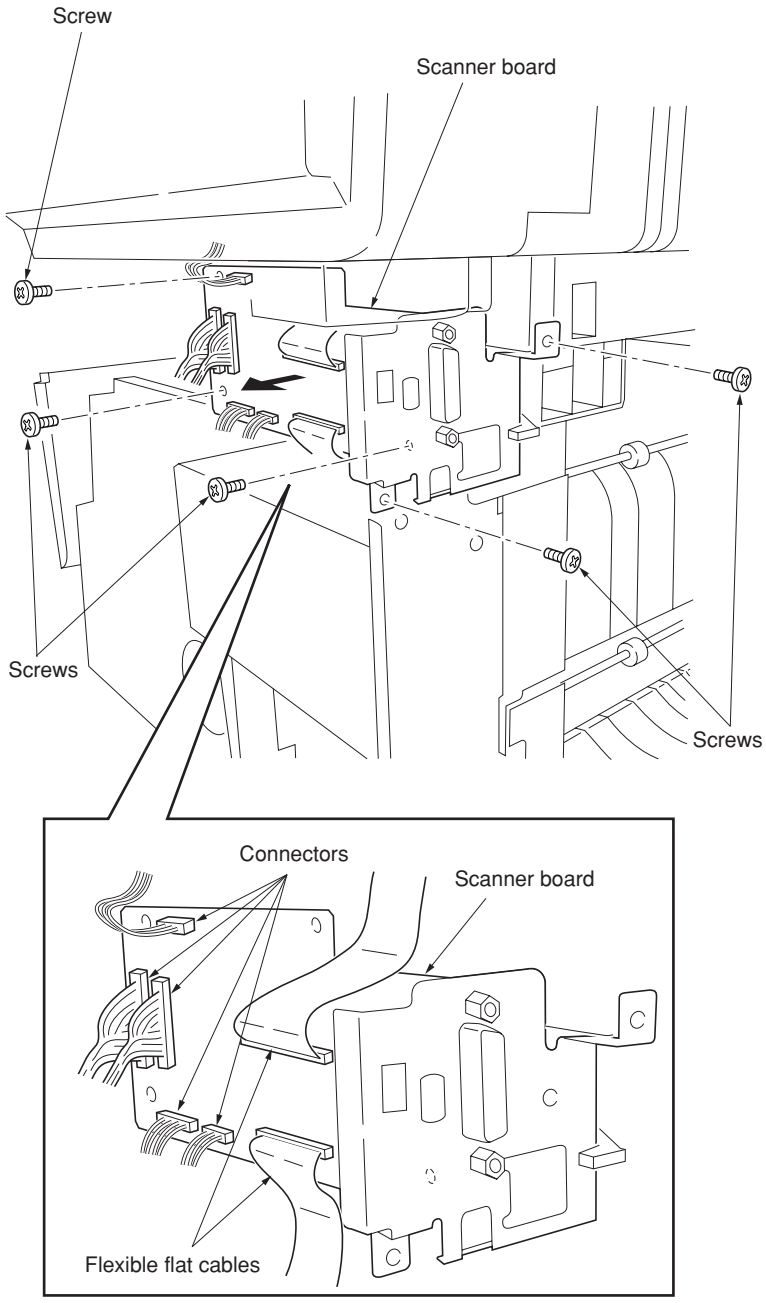


Figure 1-6-29 Removing the scanner PWB

4. Remove the two screws.
5. Slide the scanner unit and then remove the scanner unit.

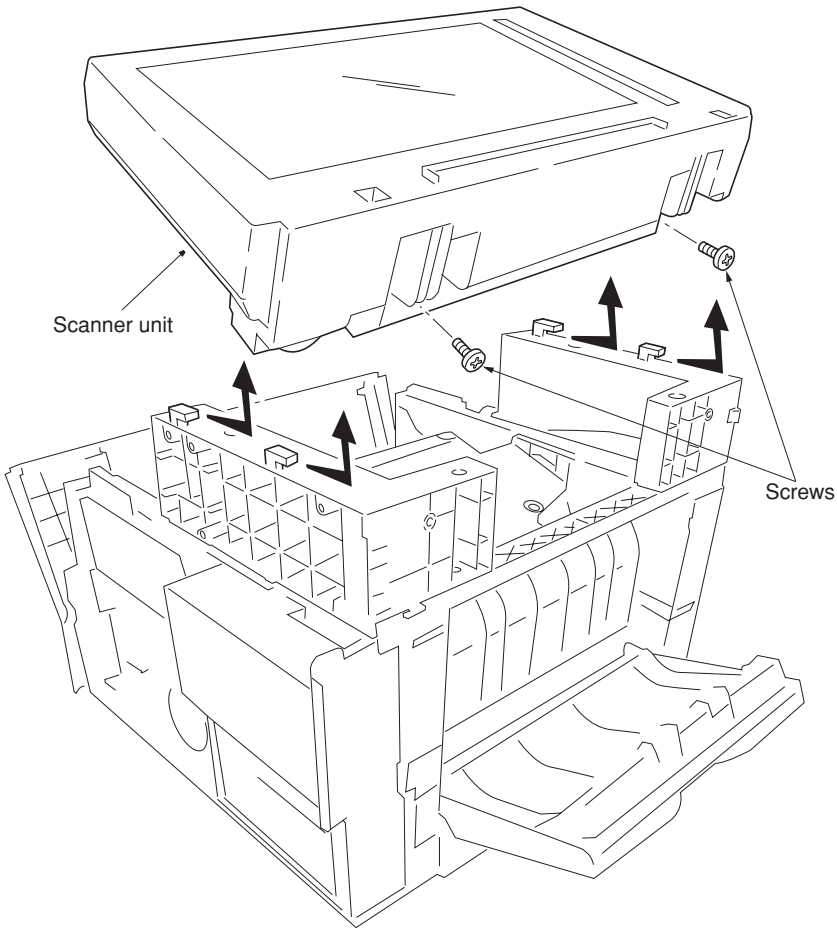


Figure 1-6-30 Removing the scanner unit

1. Remove the scanner unit (See page 1-6-27).
2. Remove each two screws and then remove two grounding plates.
3. Remove each two screws and then remove the right and left scanner stays.

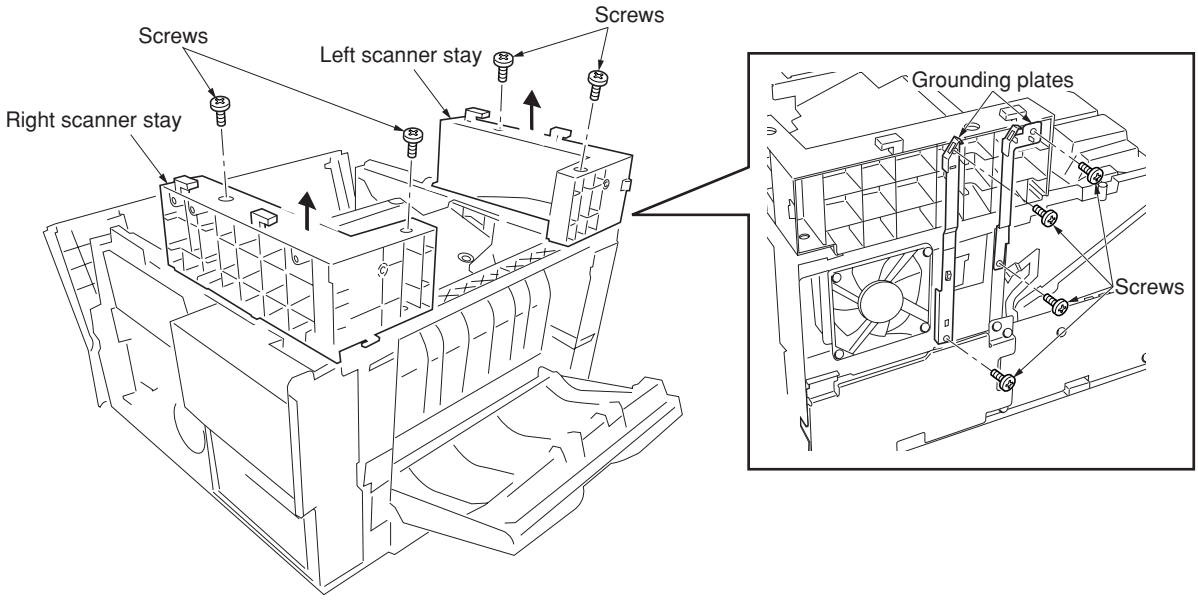


Figure 1-6-31 Removing the right and left stays

4. Remove four connectors.
5. Remove six screws and then remove the LSU shield.
   * When refitting the LSU shield, tighten a screw in order of ④ from ①.

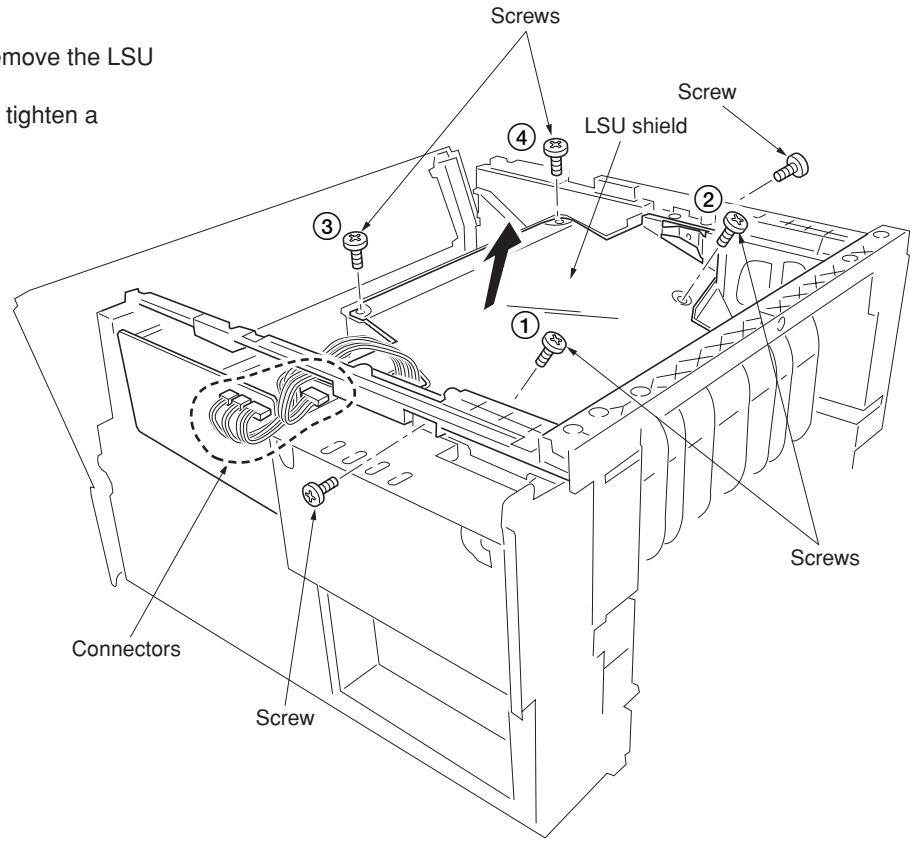


Figure 1-6-32 Removing the LSU shield

6. Remove three screws.
7. Remove two connectors from the laser scanner unit.
8. Remove the laser scanner unit.
   * When refitting the laser scanner unit, tighten a screw in order of ③ from ①.

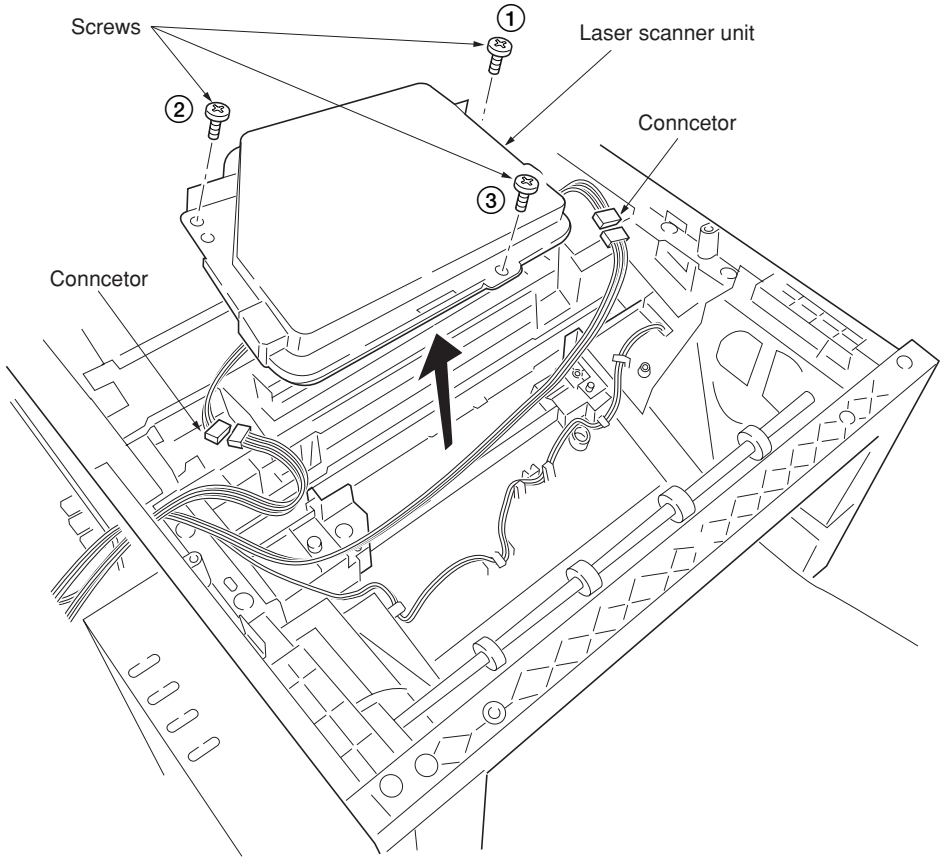
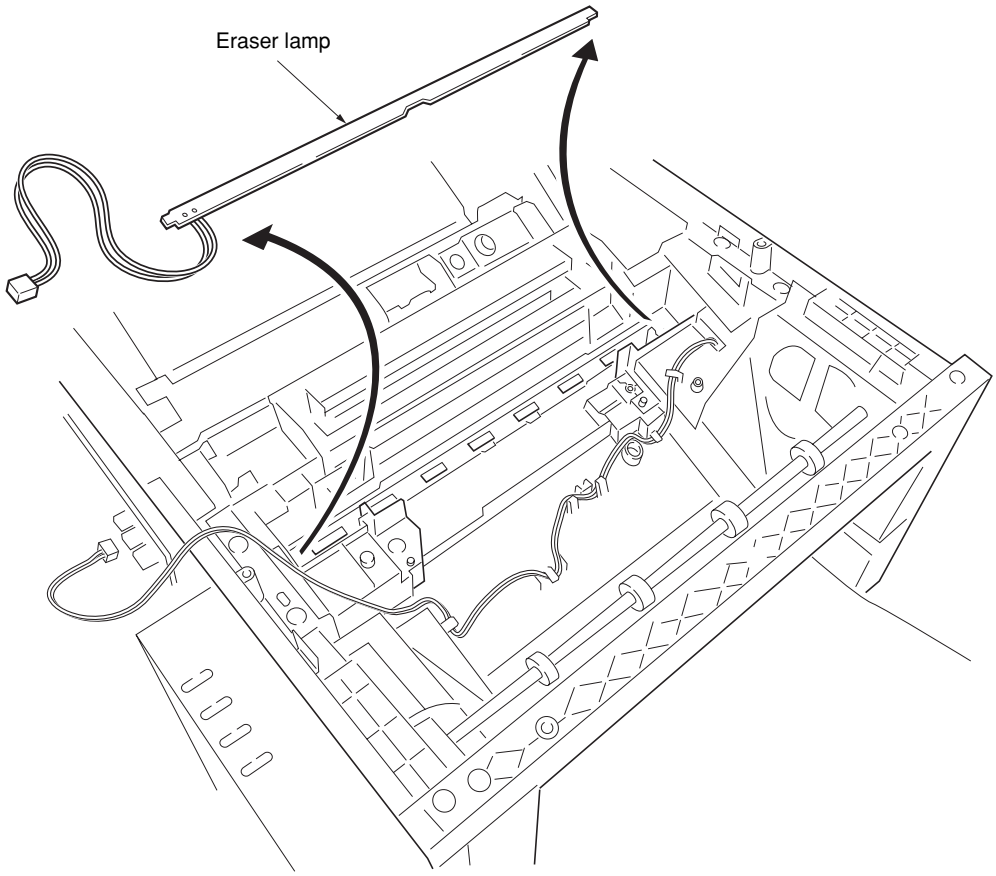


Figure 1-6-33 Removing the laser scanner unit

9. Remove the eraser lamp.



5-2-34 Removing the eraser lamp

1-6-12 Removing the ISU unit

1. Unhook the two hooks by using screw driver through the holes and then remove the operation unit.

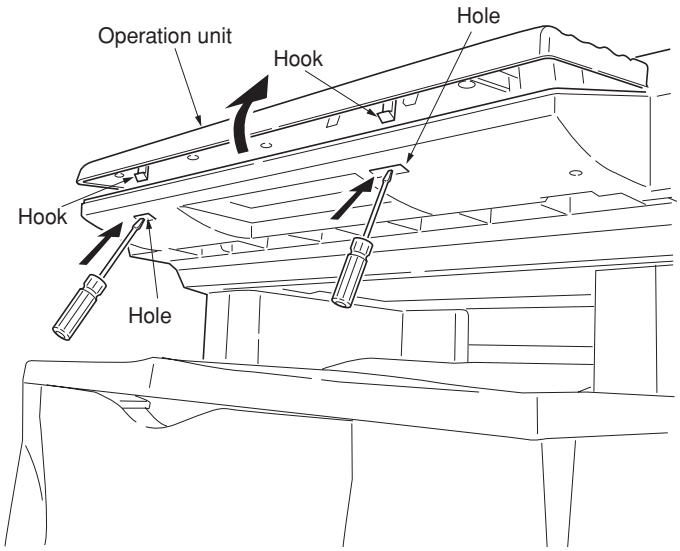


Figure 1-6-35 Removing the operation unit

2. Remove two screws and then remove the original holder cover.

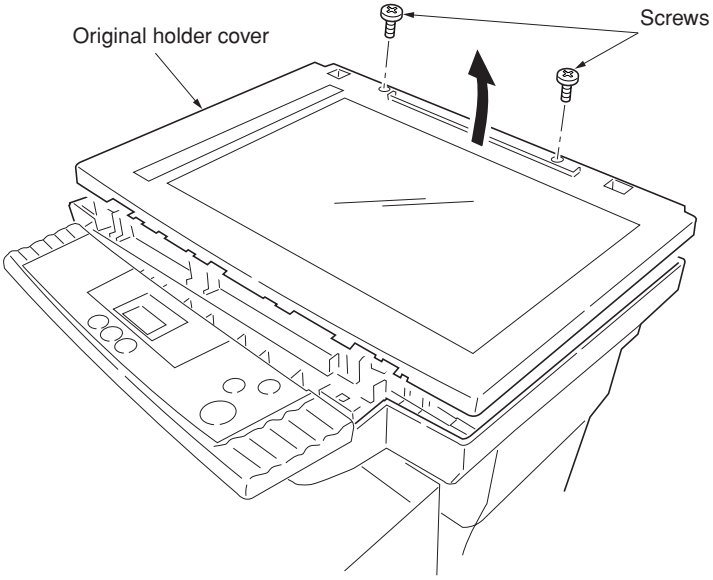


Figure 1-6-36 Removing the original holder cover

3. Remove two screws and then remove two grounding plates.
4. Remove the one stopper ring and then detach the scanner shaft.
   * Detach the shaft taking care to tilt it as little as possible.

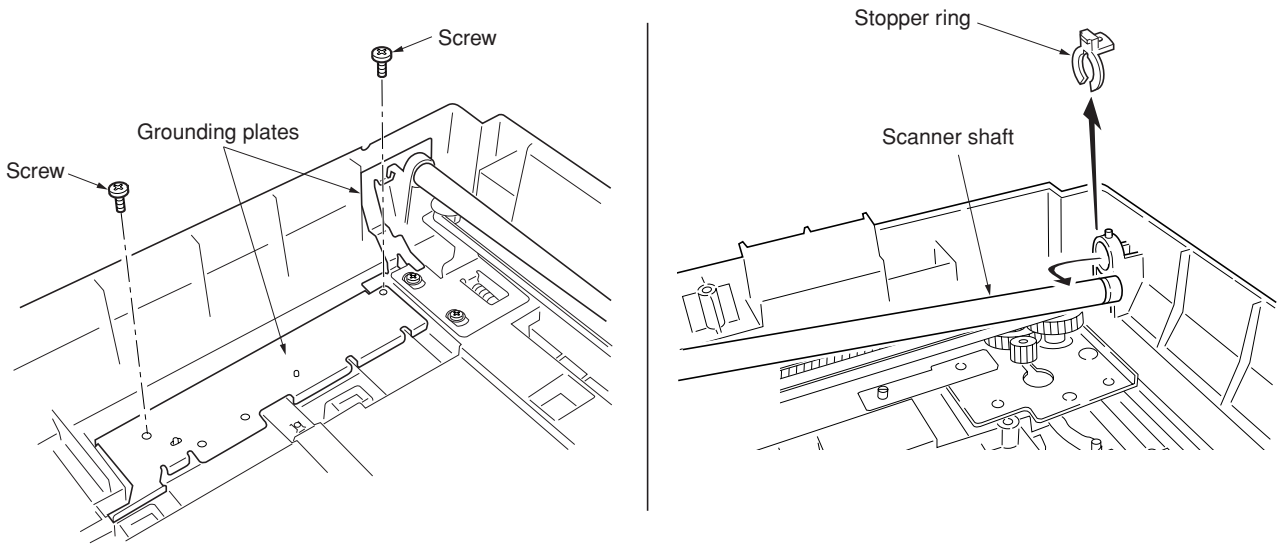


Figure 1-6-37 Detaching the scanner shaft

5. Remove the flexible flat cable from the ISU board's connector.
6. Remove the scanner belt from the belt hook of scanner unit.
7. Remove the ISU unit from the scanner shaft.
   * Remove the ISU unit taking care not to lose the M4 nut located in the ISU unit.

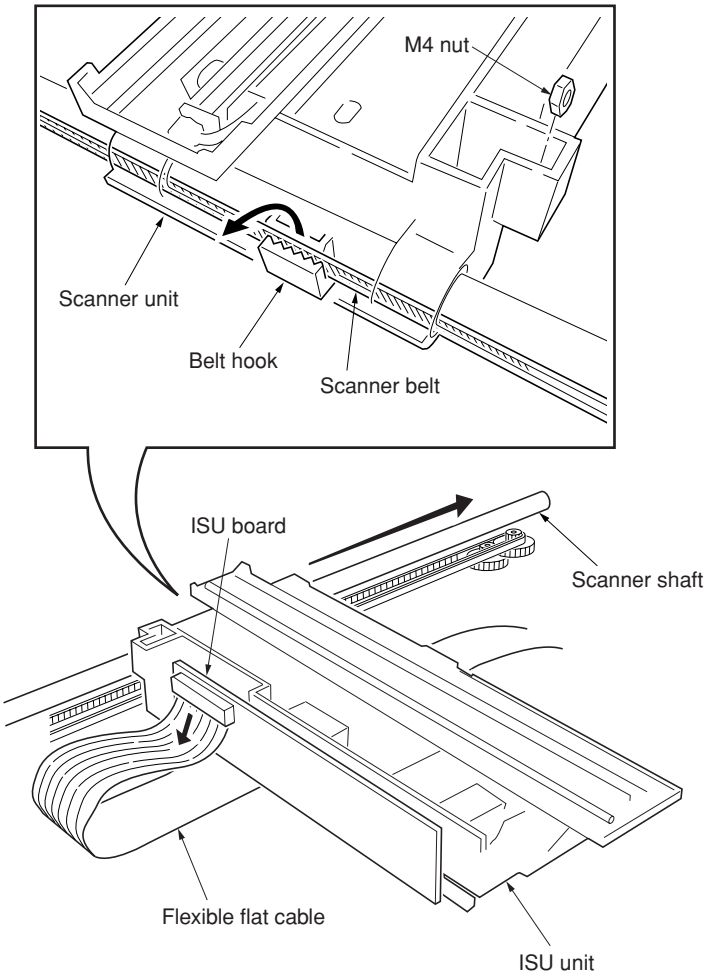


Figure 1-6-38 Removing the ISU unit

1-6-13 Removing the exposure lamp

1. Remove the ISU unit (See page 1-6-32).
2. Remove the two connectors from the inverter board.
3. Remove the one screw and then remove the inverter board.

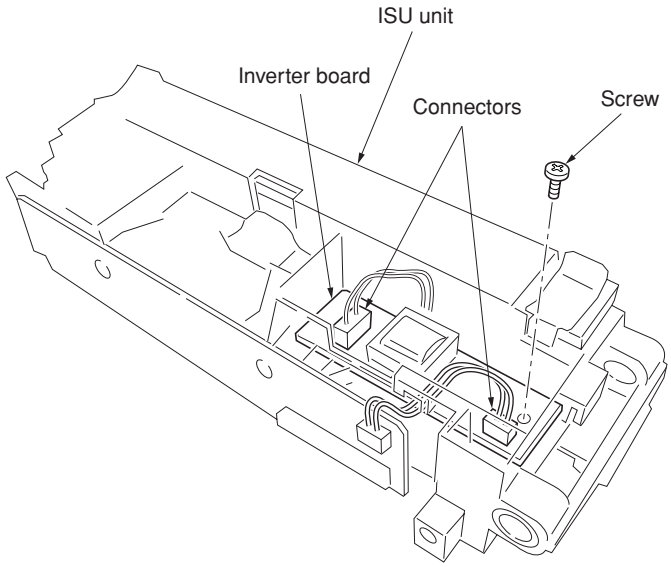


Figure 1-6-39 Removing the inverter board

4. While unhooking the hook and then slide the exposure lamp mount.

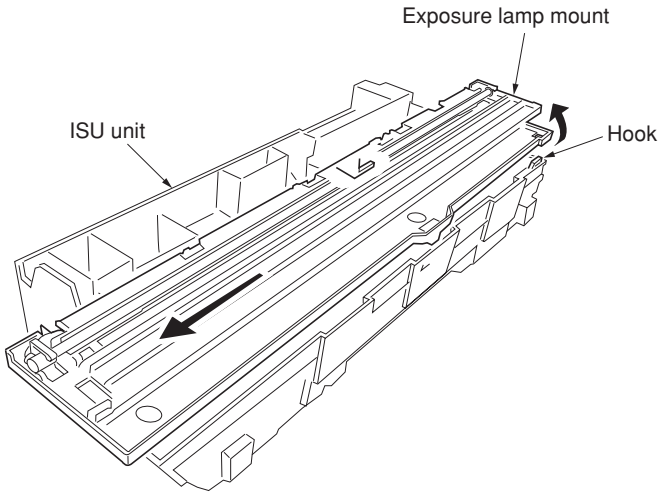


Figure 1-6-40 Removing the exposure lamp mount

5. Remove the exposure lamp and cables from the exposure lamp mount.
   • Do not touch the glass surfaces of the exposure lamp with bare hands.

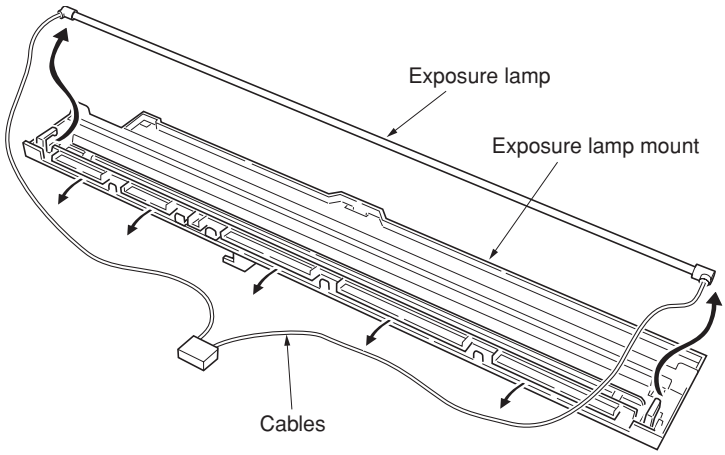


Figure 1-6-41 Removing the exposure lamp

1-6-14 Removing the scanner mirror A

1. Remove the ISU unit (See page 1-6-32).
2. Remove the exposure lamp (See page 1-6-34).
3. Unhook the two mirror A holders and then remove the scanner mirror A.

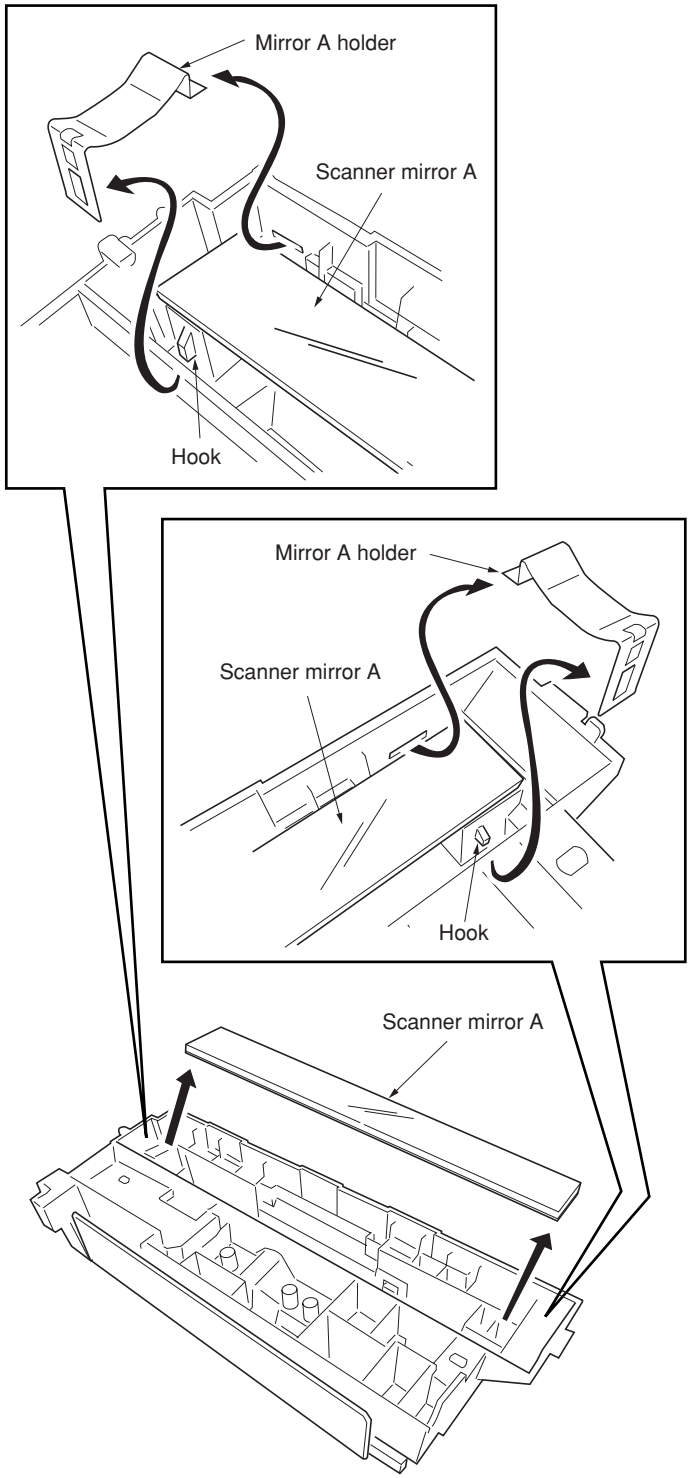


Figure 1-6-42 Removing the scanner mirror A

1-6-15 Removing the scanner motor

1. Remove the original holder cover (See page 1-6-32).
2. Remove the left cover (See page 1-6-4).
3. Remove the one connector from the scanner board.

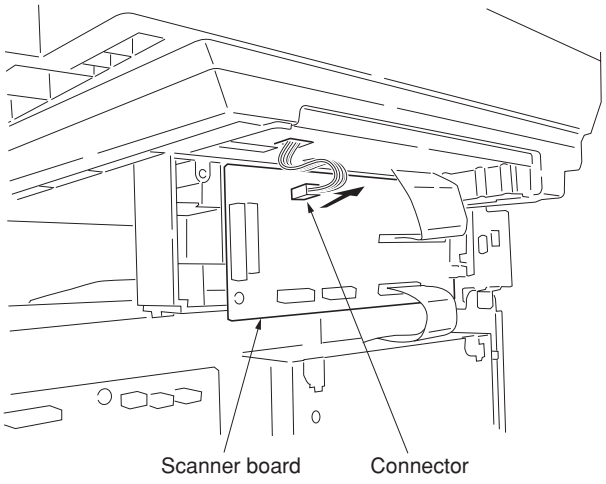


Figure 1-6-43 Removing the scanner motor (1)

4. Remove two screws and then remove two grounding plates.

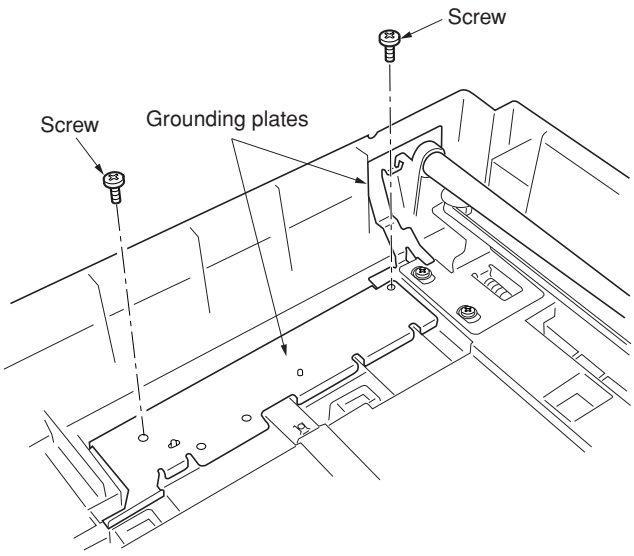


Figure 1-6-44 Removing the scanner motor (2)

5. Loosen two screws and then release the tension of a scanner belt.
6. Remove the scanner belt.

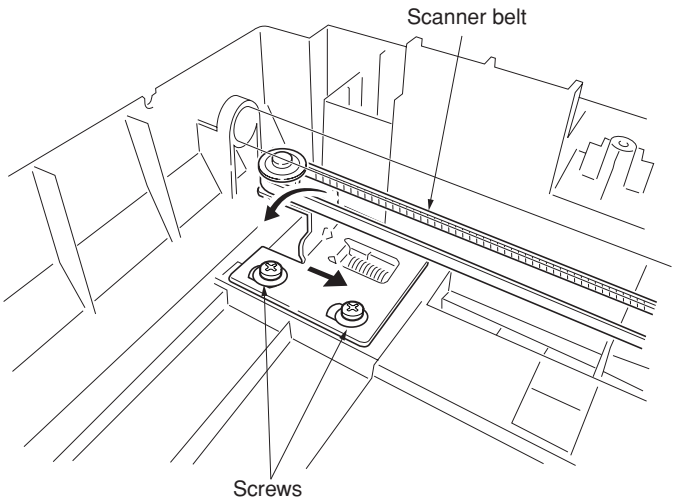


Figure 1-6-45 Removing the scanner motor (3)

7. Remove three screws and then remove the grounding plate.

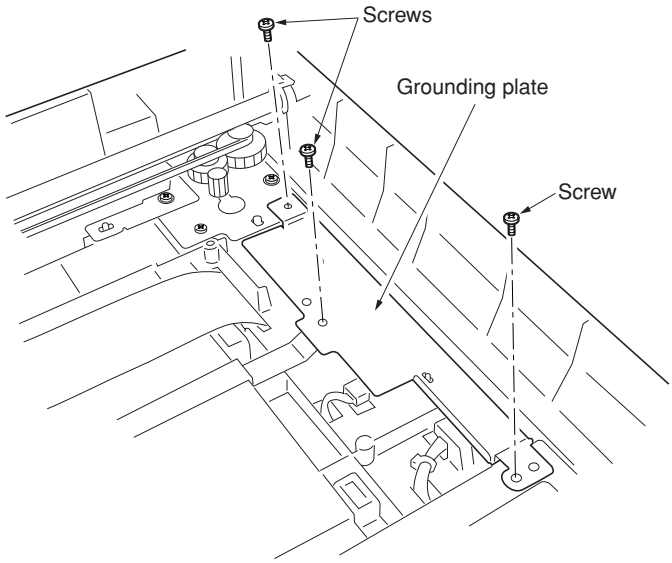


Figure 1-6-46 Removing the scanner motor (4)

8. Remove the one stopper ring and then detach the scanner shaft.
   * Detach the shaft taking care to tilt it as little as possible.

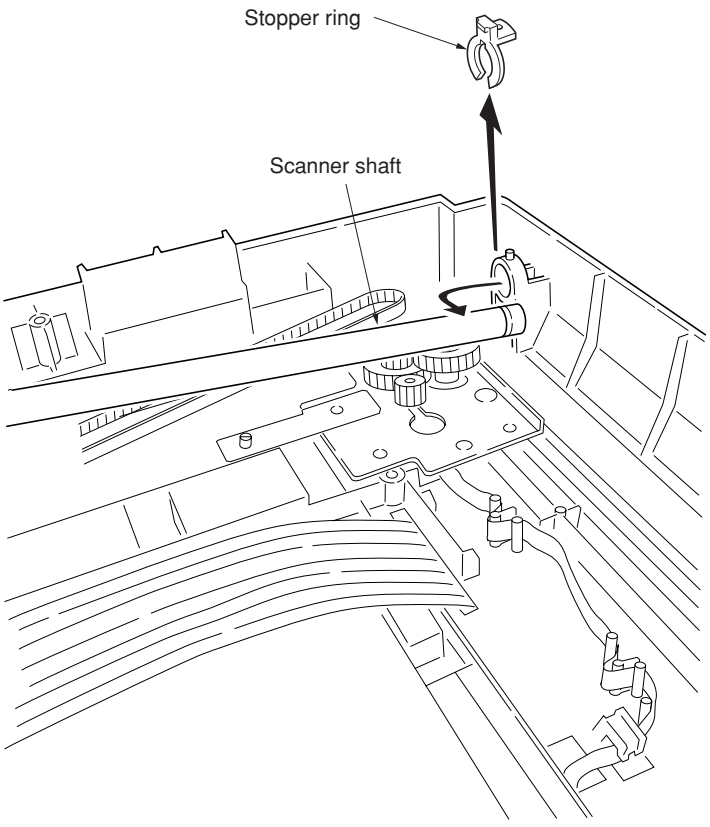


Figure 1-6-47 Removing the scanner motor (5)

9. Remove the cable from the cable clamps.
10. Remove the four screws and then remove the scanner motor mount with scanner motor.

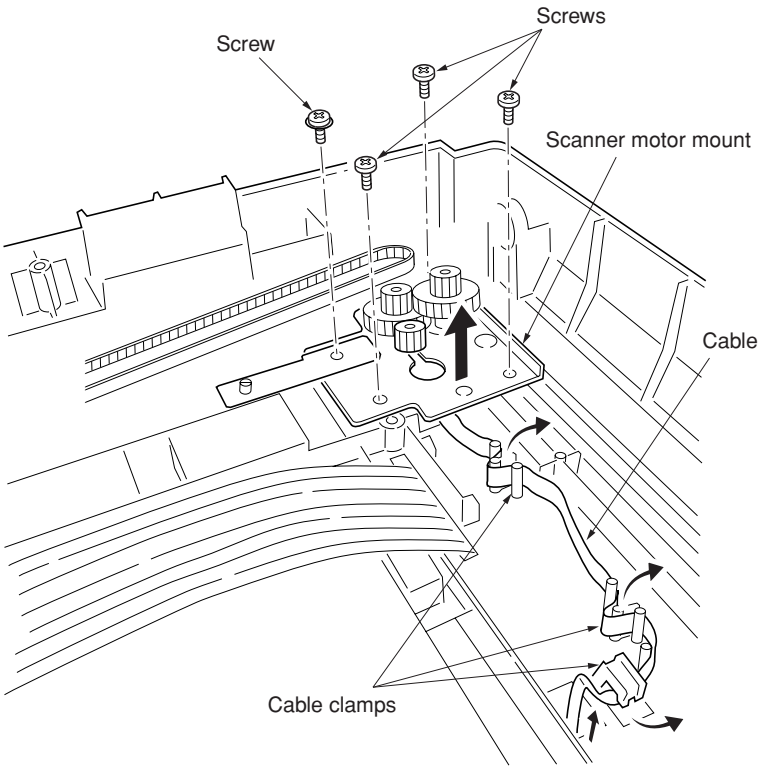


Figure 1-6-48 Removing the scanner motor (6)

11. Remove the one screw and then remove the scanner motor.

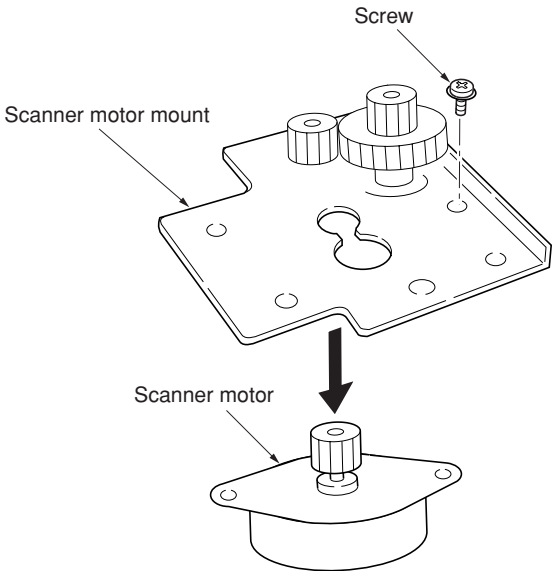


Figure 1-6-49 Removing the scanner motor (7)

1-6-16 Removing the main charger unit

1. Remove the process unit from the copier (See page 1-6-2).
2. Unlatch the three snaps, and remove the main charger cap.
3. Draw the main charger unit in the direction of arrow Ⓐ, then pull it out in the direction of arrow Ⓑ.

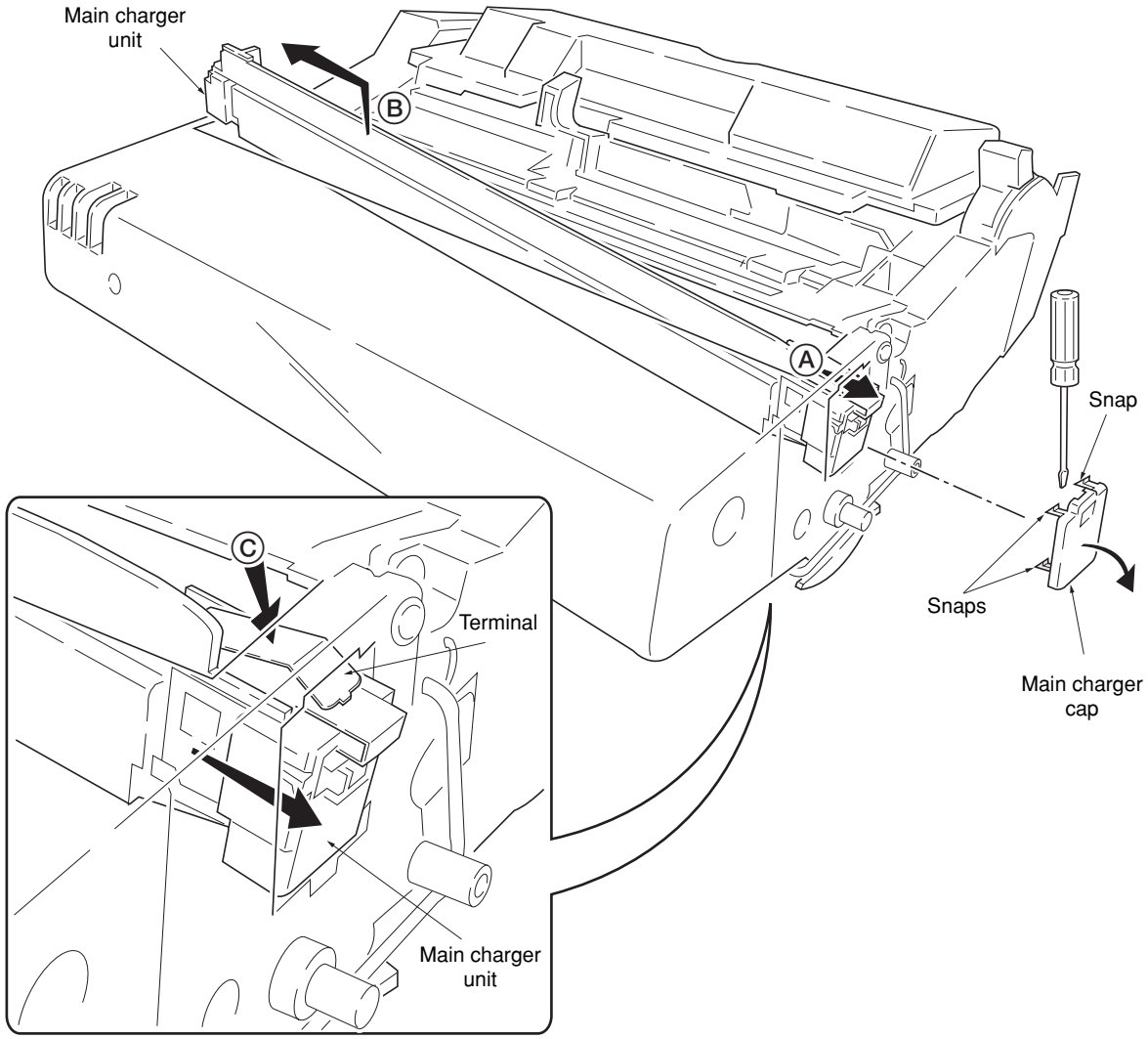


Figure 1-6-50 Removing the main charger unit

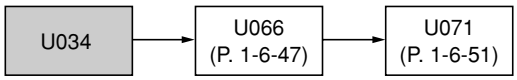
CAUTION

• When refitting the main charger unit, hold terminal down Ⓒ, then push frontwards. Use care not to deform the terminal.

1-6-17 Adjustment the maintenance mode

(1) Adjusting the leading edge registration of image printing

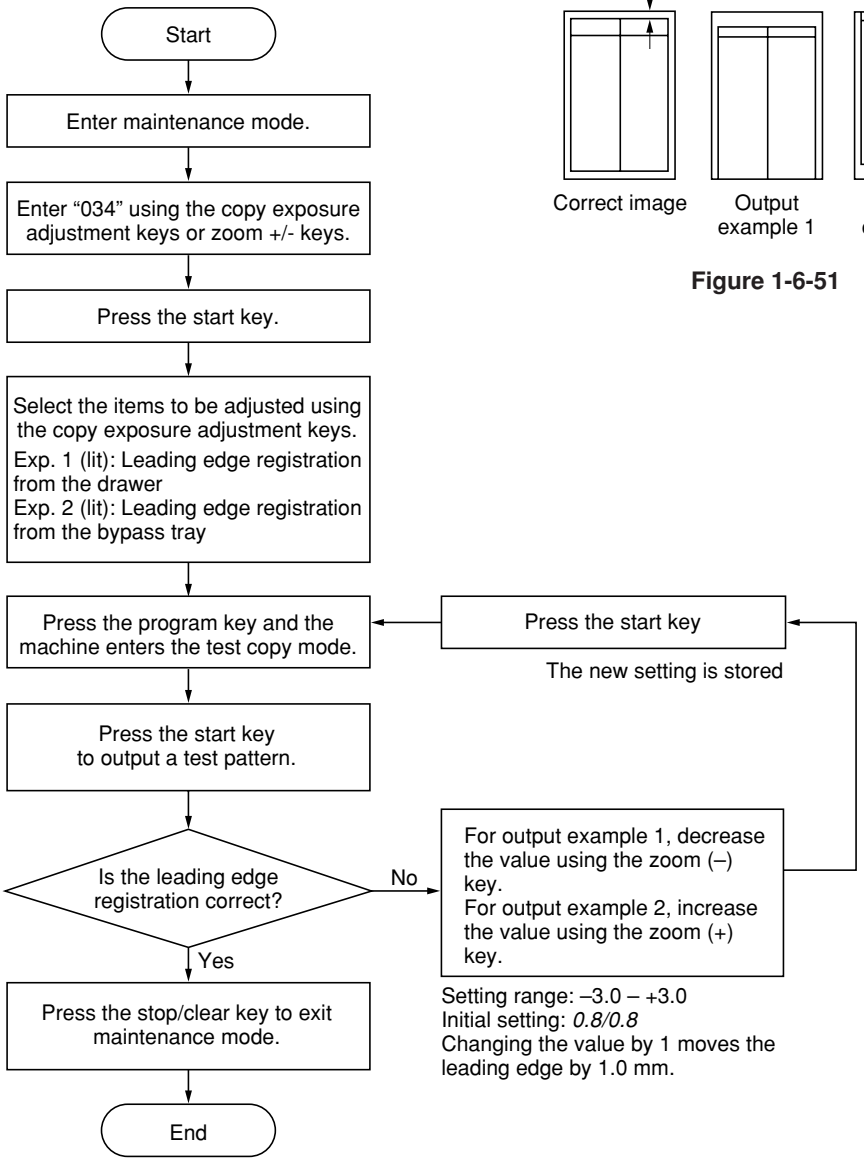
Make the following adjustment if there is a regular error between the leading edges of the copy image and original.



Caution:

Check the copy image after the adjustment. If the image is still incorrect, perform the above adjustments in maintenance mode.

Procedure



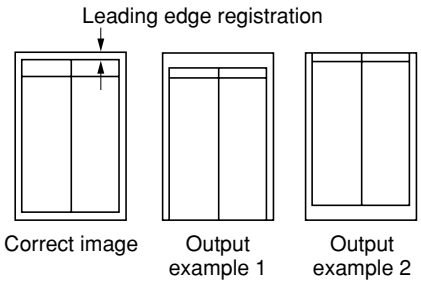
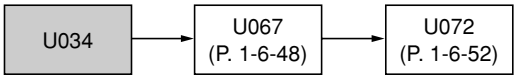


Figure 1-6-51

(2) Adjusting the center line of image printing

Make the following adjustment if there is a regular error between the center lines of the copy image and original when paper is fed from the drawer.



Caution:

Check the copy image after the adjustment. If the image is still incorrect, perform the above adjustments in maintenance mode.

Procedure

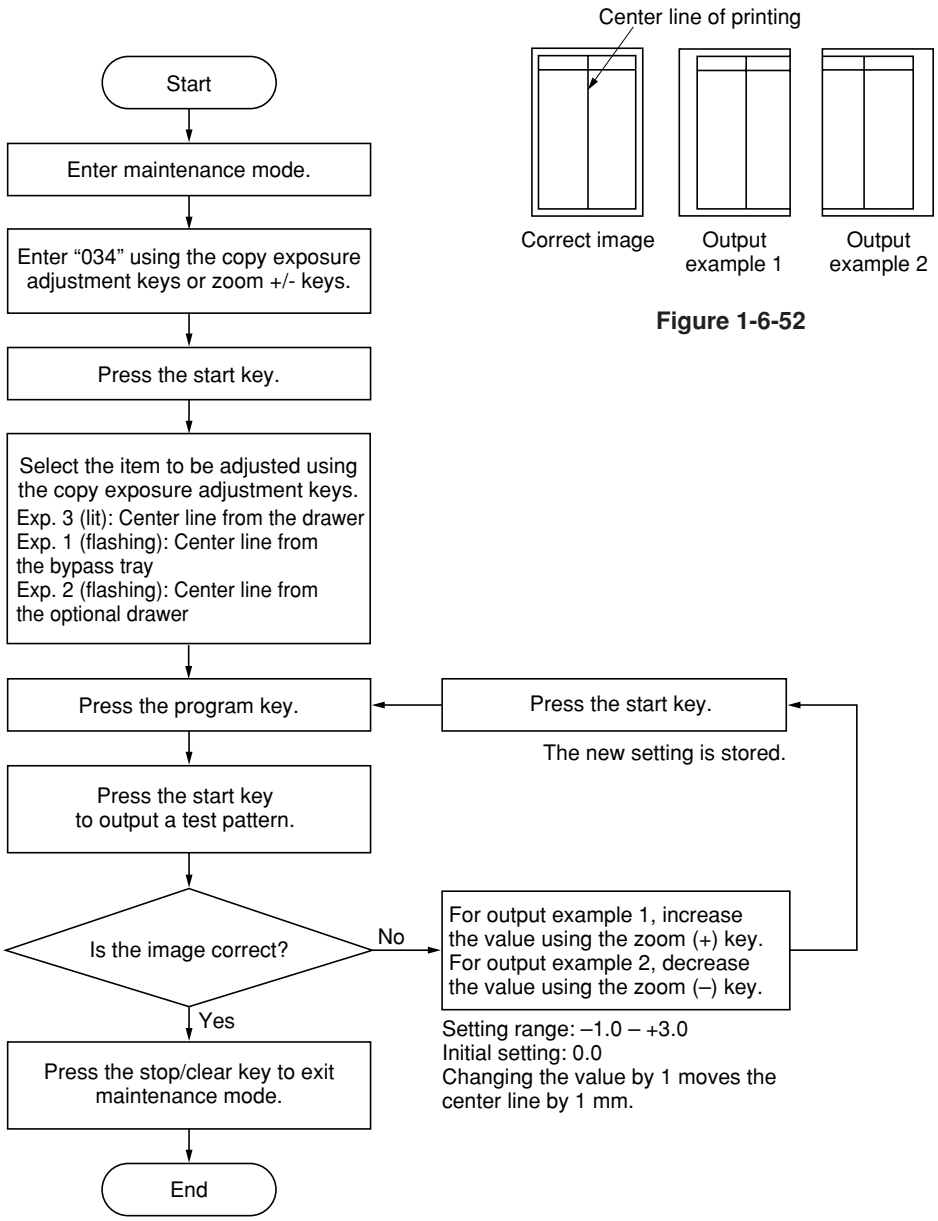
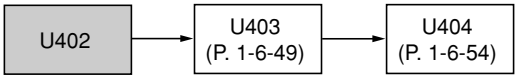


Figure 1-6-52

(3) Adjusting the margins for printing

Make the following adjustment if the margins are not correct.



Caution:

Check the copy image after the adjustment. If the margins are still incorrect, perform the above adjustments in maintenance mode.

Procedure

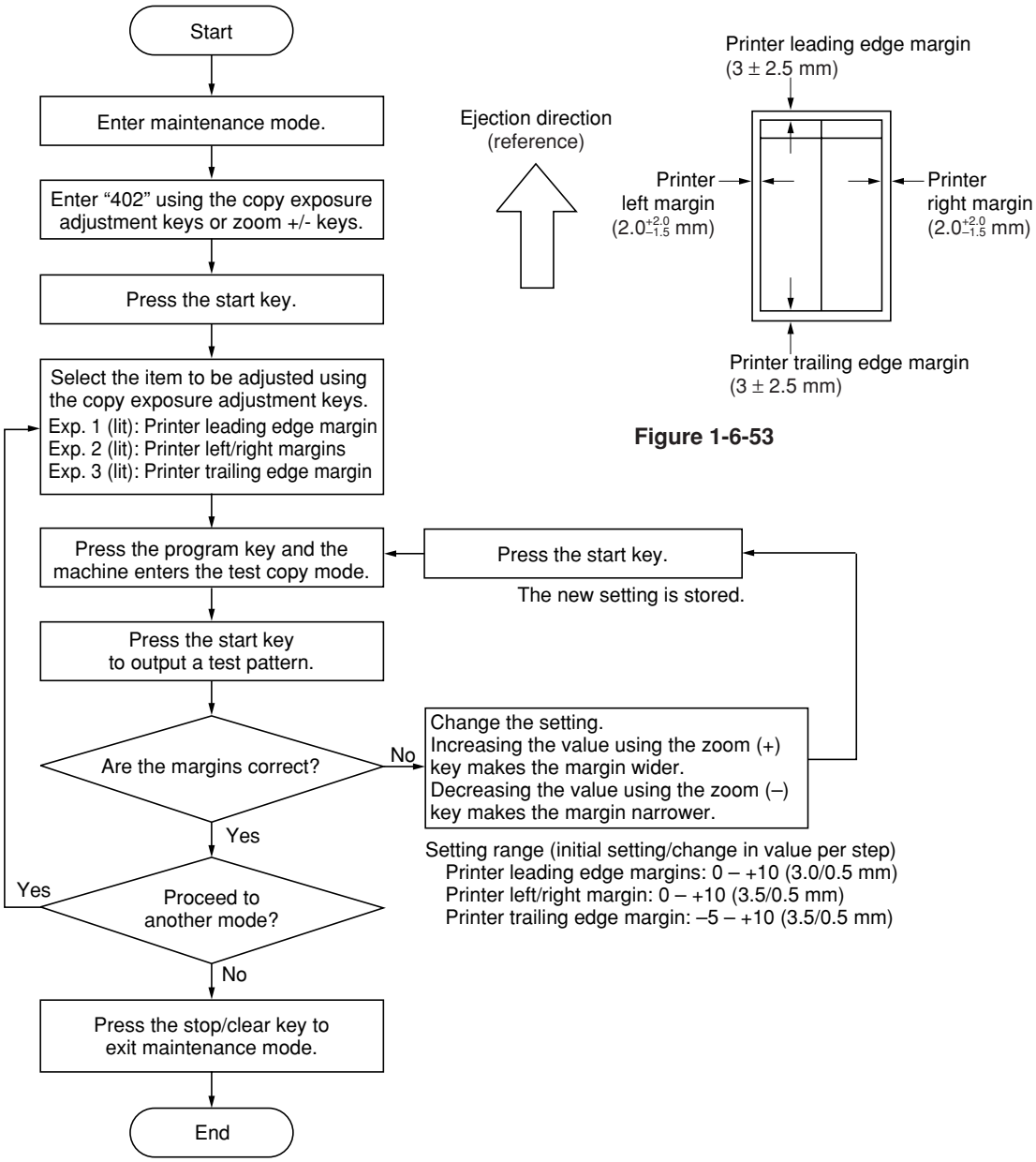


Figure 1-6-53

(4) Adjusting the amount of slack in the paper

Make the following adjustment if the leading edge of the copy image is missing or varies randomly, or if the copy paper is Z-folded.

Procedure

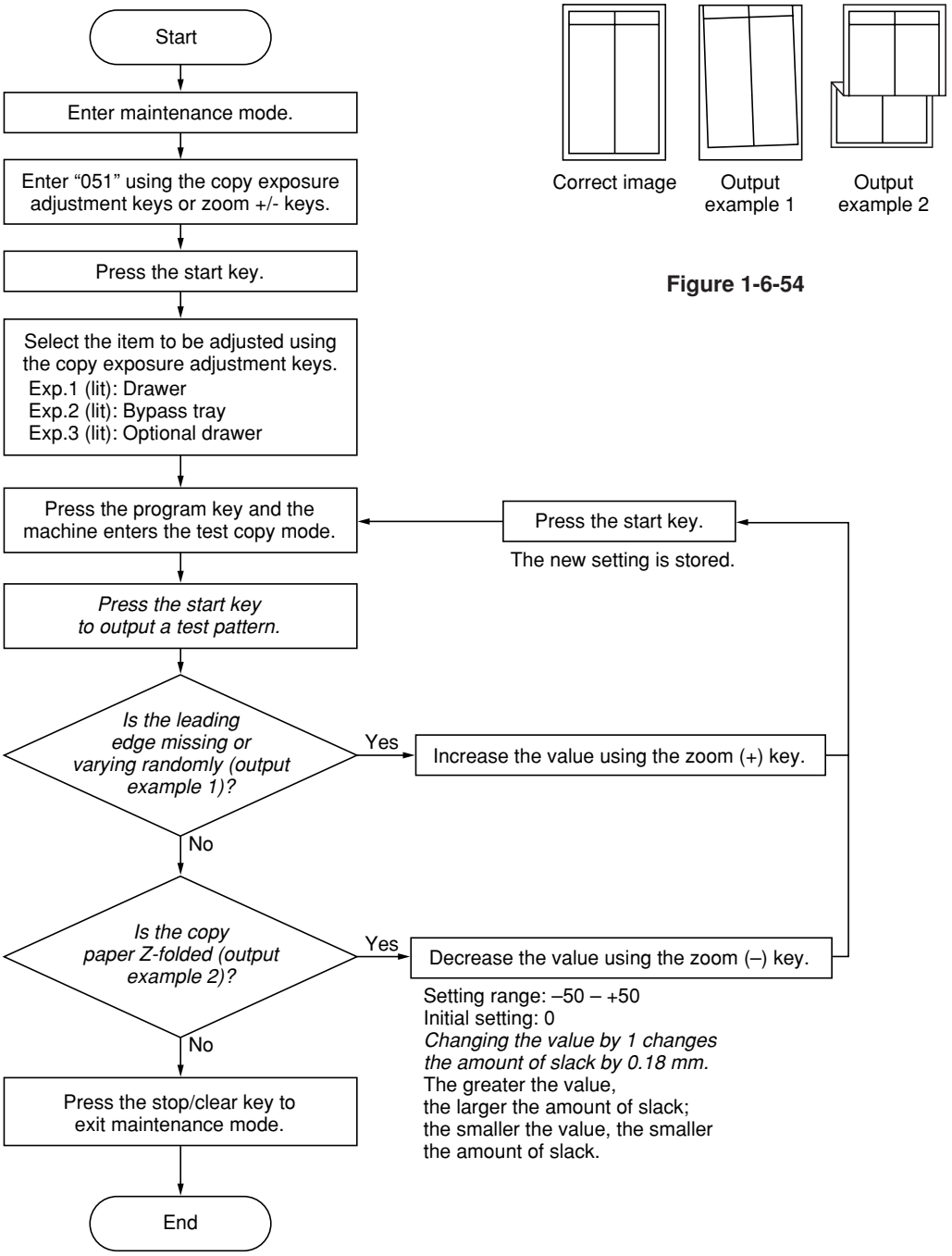
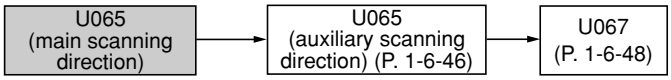


Figure 1-6-54

(5) Adjusting magnification of the scanner in the main scanning direction

Perform the following adjustment if the magnification in the main scanning direction is not correct.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode. Also, perform "(6) Adjusting magnification of the scanner in the auxiliary scanning direction" (page 1-6-46) and "(8) Adjusting the scanner center line" (page 1-6-48) after this adjustment.

Procedure

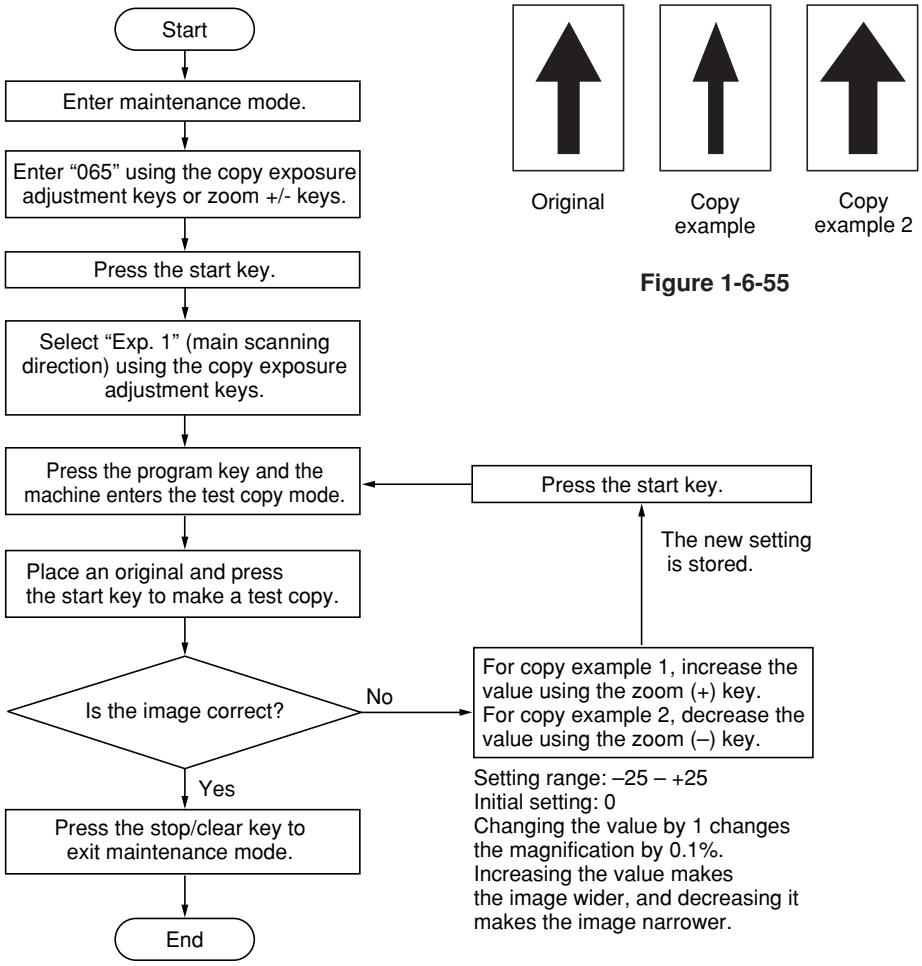
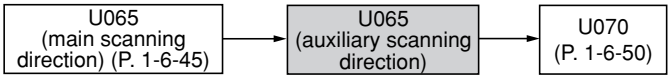


Figure 1-6-55

(6) Adjusting magnification of the scanner in the auxiliary scanning direction

Perform the following adjustment if the magnification in the auxiliary scanning direction is not correct.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

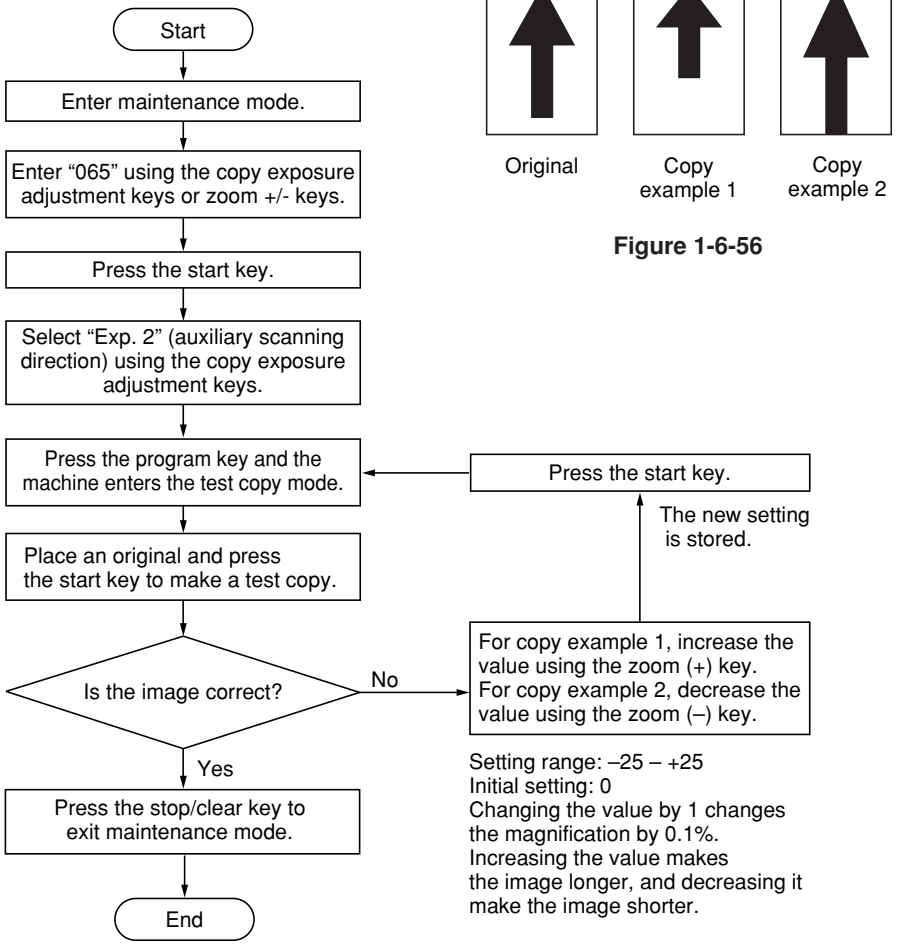
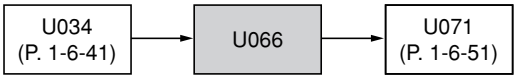


Figure 1-6-56

(7) Adjusting the scanner leading edge registration

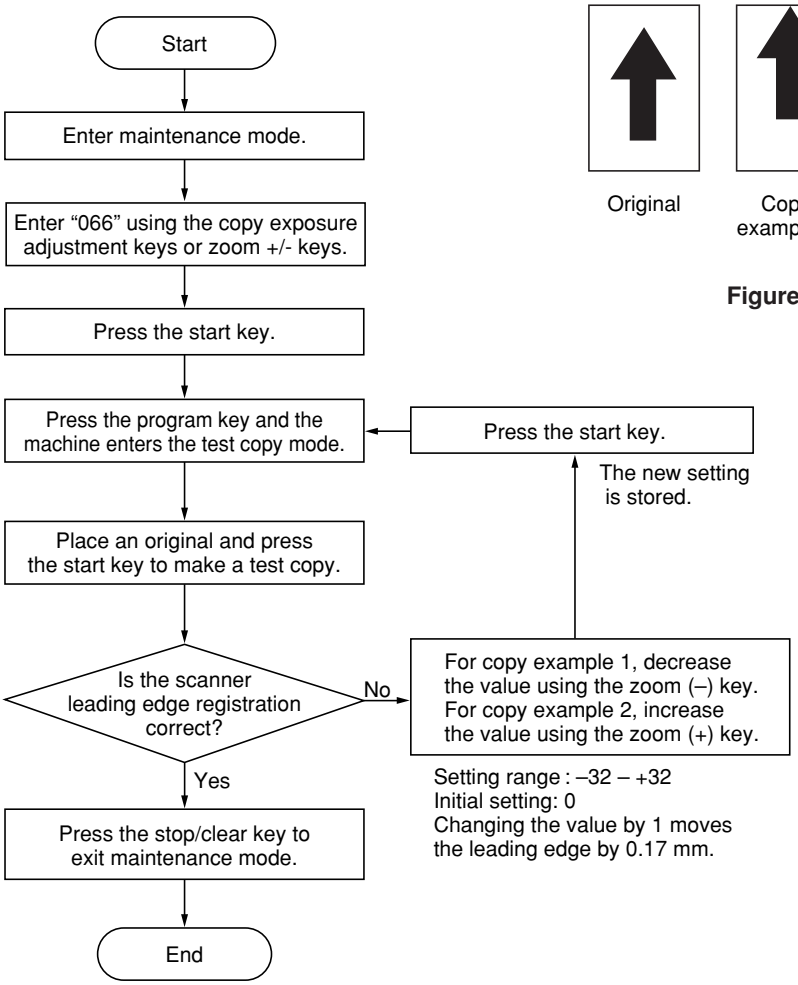
Perform the following adjustment if there is regular error between the leading edges of the copy image and original.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure



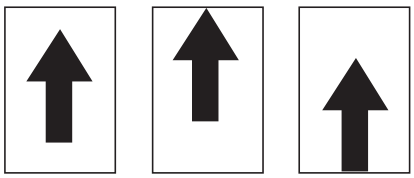
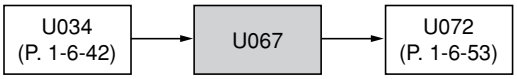


Figure 1-6-57

(8) Adjusting the scanner center line

Perform the following adjustment if there is a regular error between the center lines of the copy image and original.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

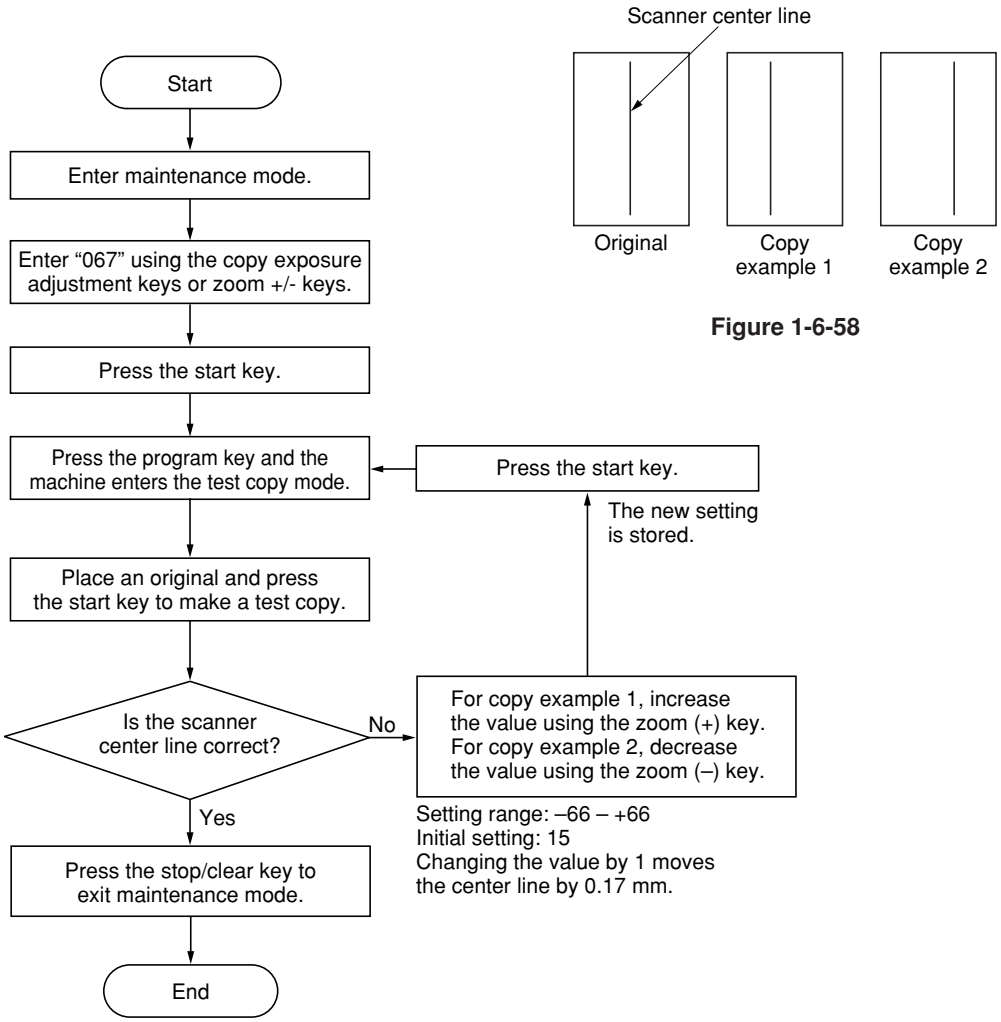
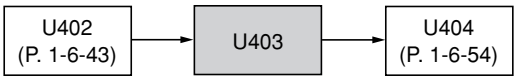


Figure 1-6-58

(9) Adjusting the margins for scanning an original on the contact glass

Perform the following adjustment if the margins are not correct.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

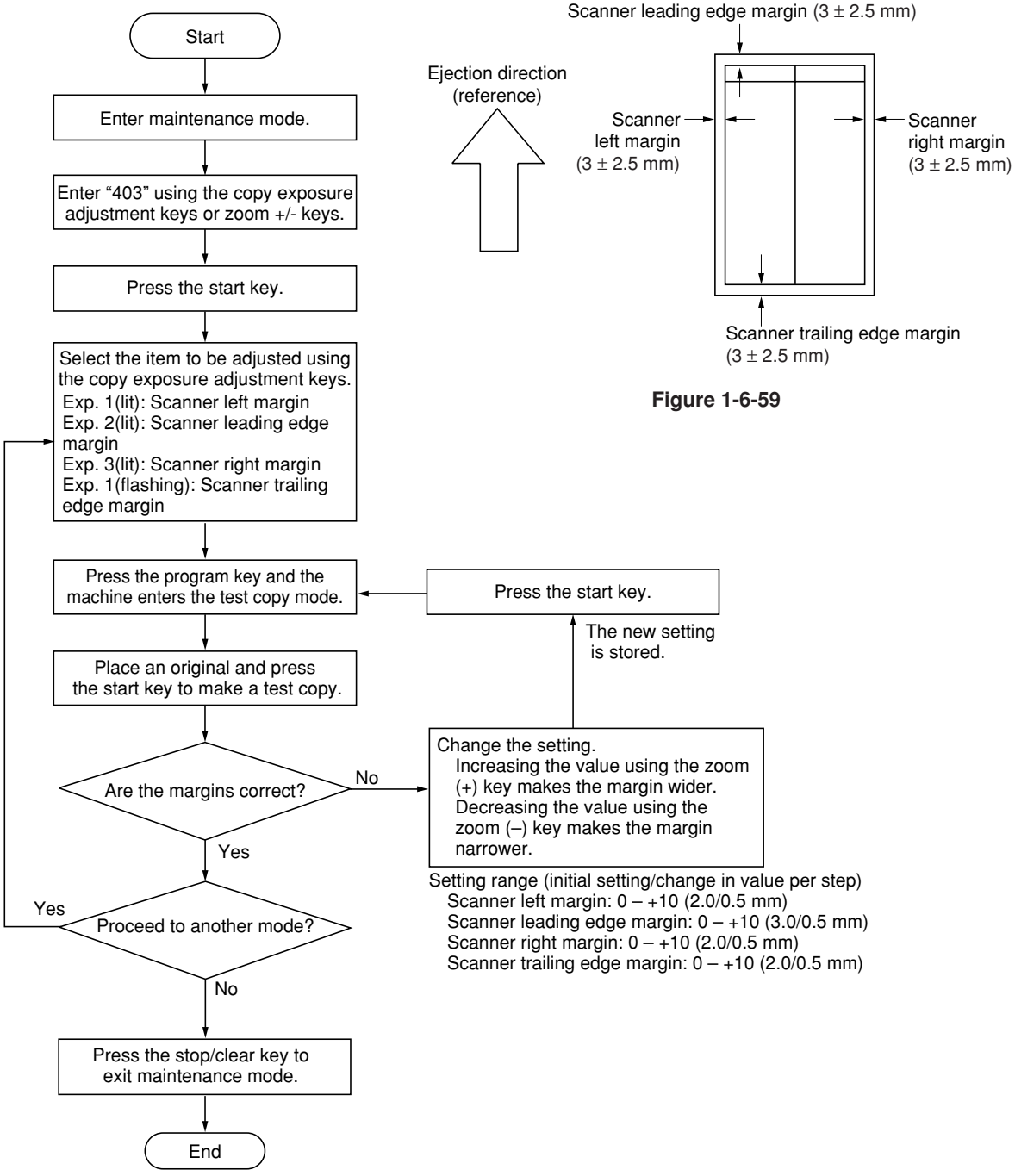


Figure 1-6-59

(10) Adjusting the DP magnification

Adjust magnification in the auxiliary scanning direction if magnification is incorrect when the DP is used.

U065 (P. 1-6-46) → U070

Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

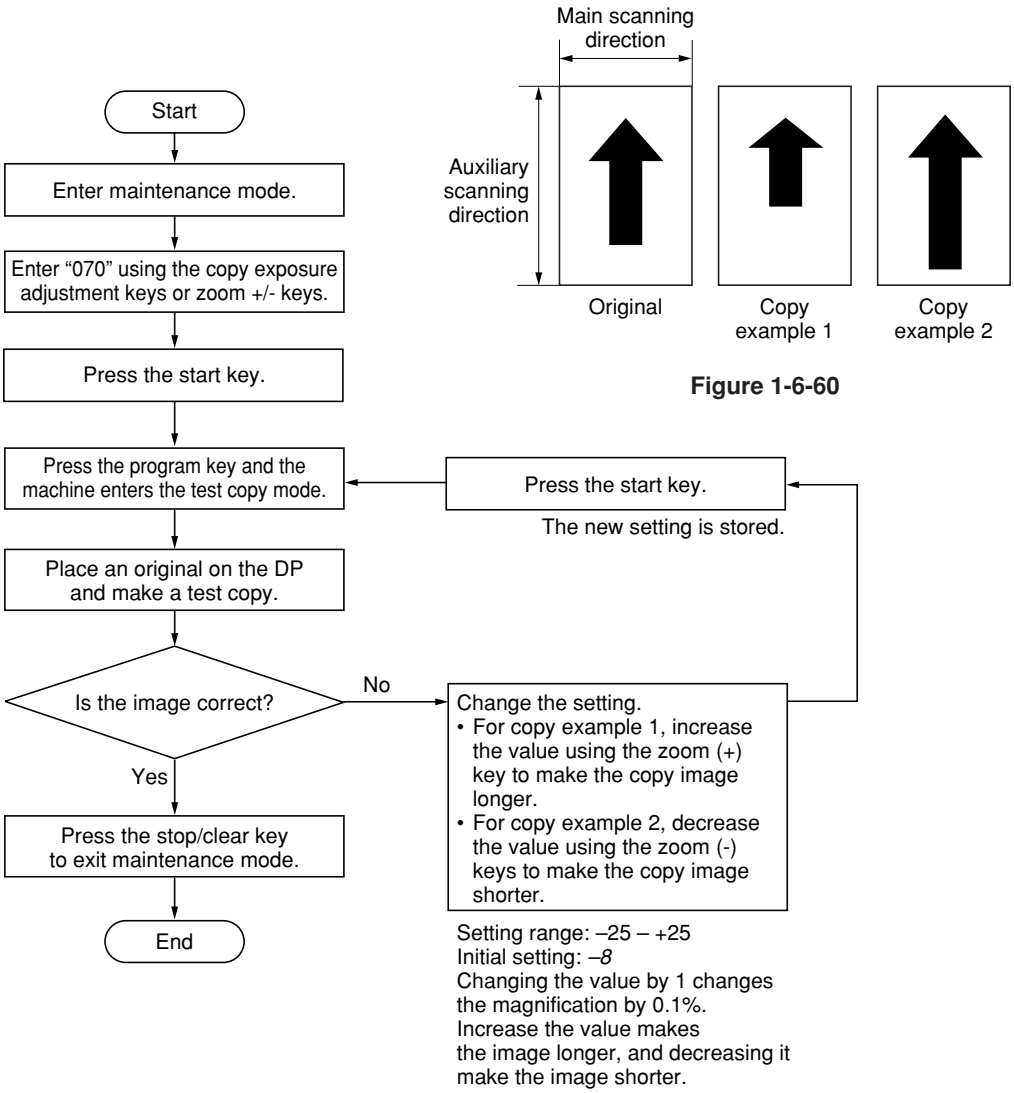


Figure 1-6-60

(11) Adjusting the DP leading edge registration

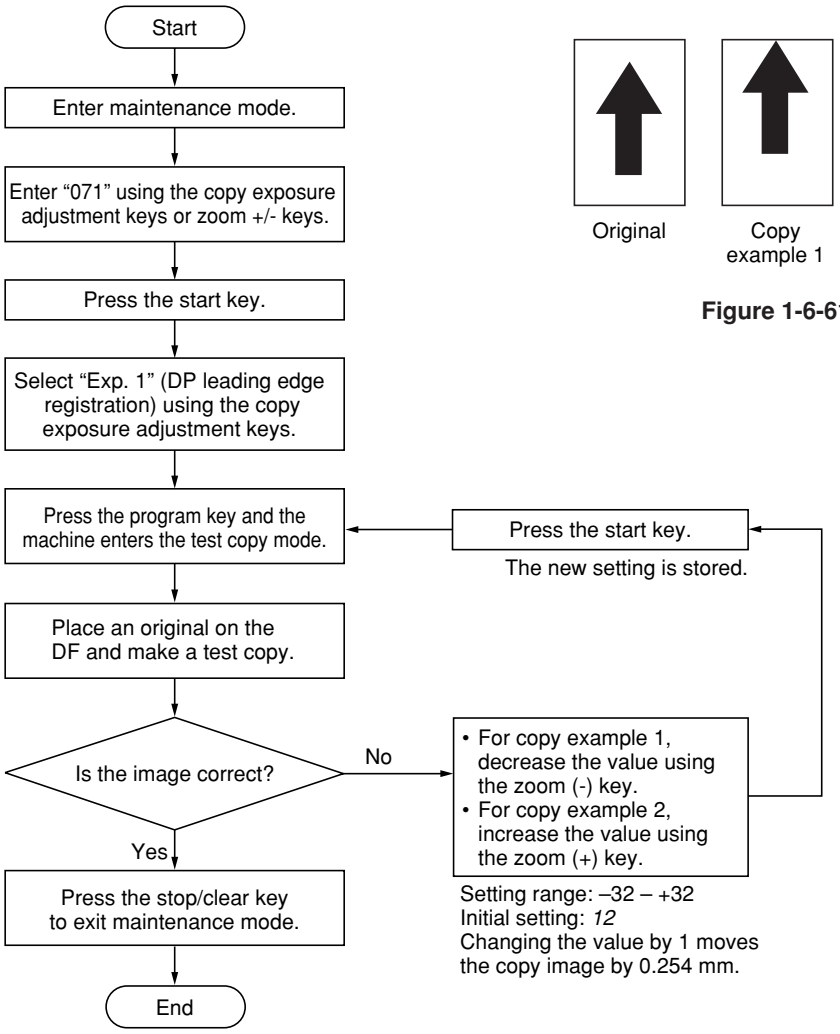
Perform the following adjustment if there is a regular error between the leading edge of the original and the copy image.

U034 (P. 1-6-41) → U066 (P. 1-6-47) → U071

Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure



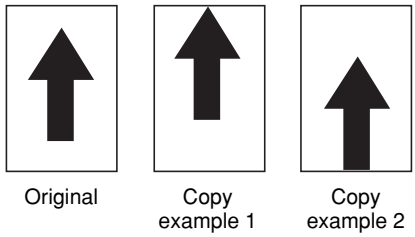


Figure 1-6-61

(12) Adjusting the DP trailing edge registration

Perform the following adjustment if the original scanning end position is not correct when the DP is used.

Caution:

If the copy image looks like copy example 2, clean the DP original scanning section.

Procedure

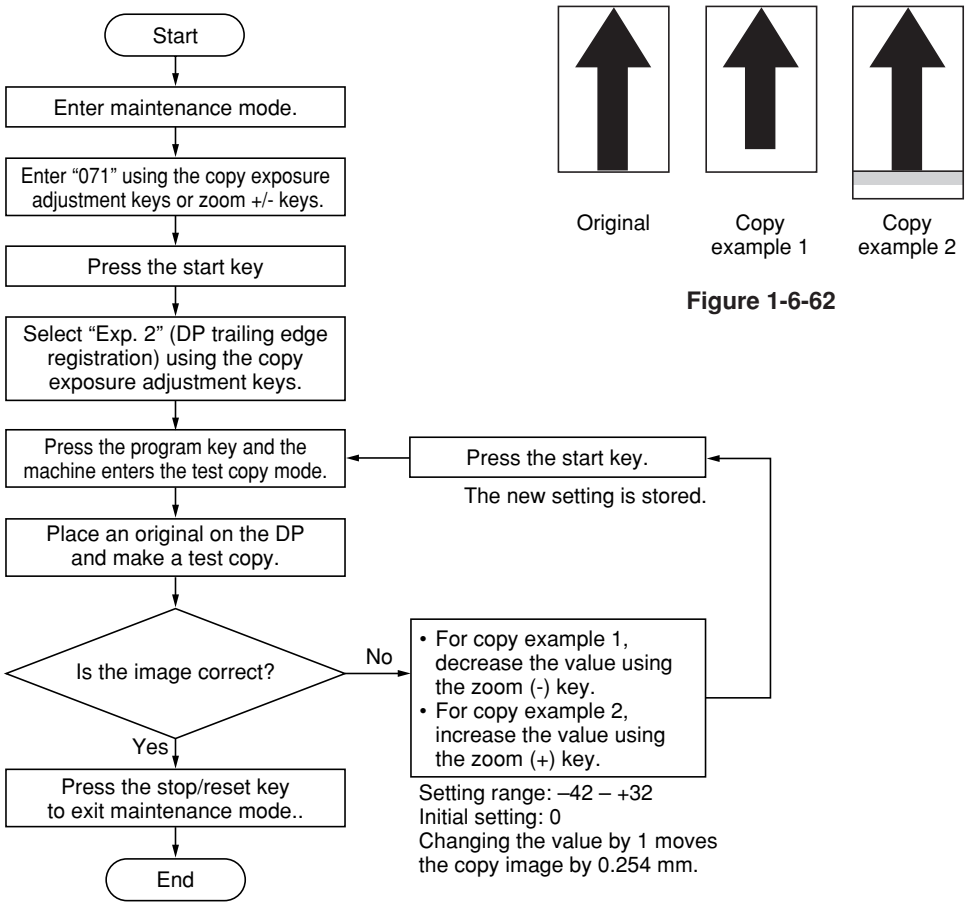
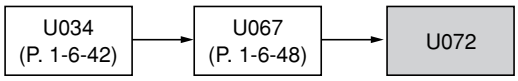


Figure 1-6-62

(13) Adjusting the DP center line

Perform the following adjustment if there is a regular error between the centers of the original and the copy image.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

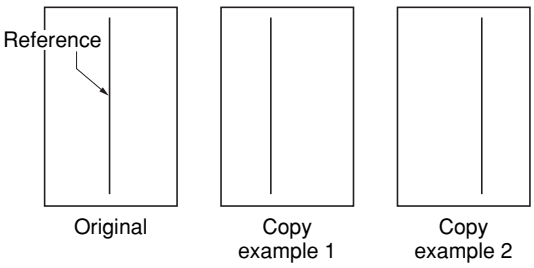
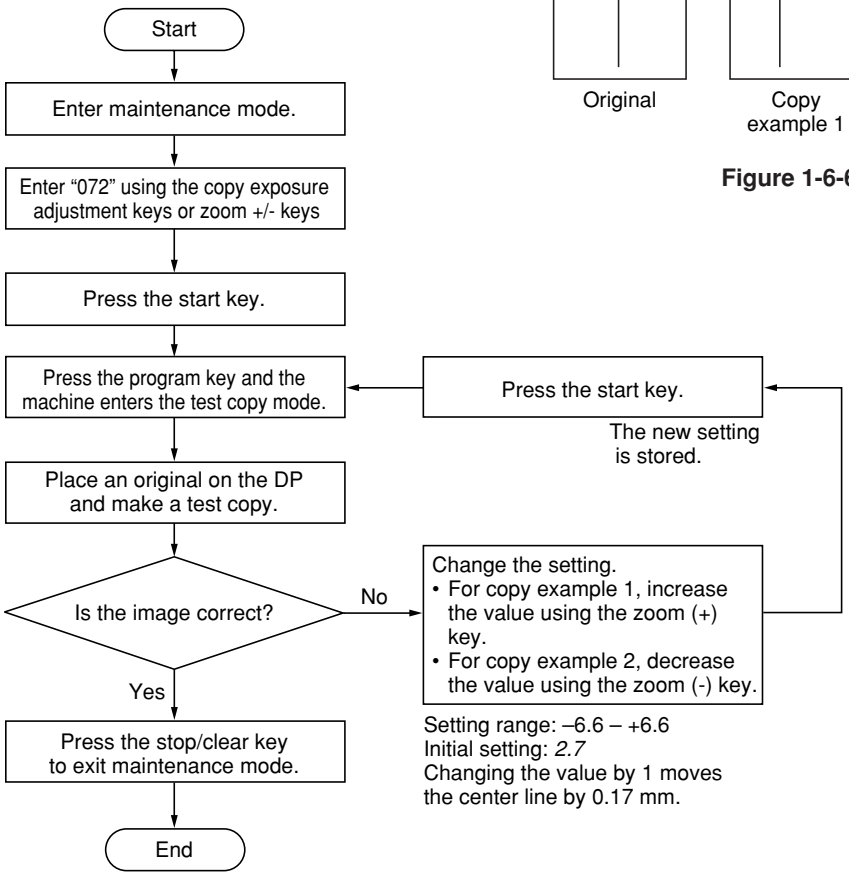
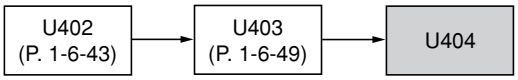


Figure 1-6-63



(14) Adjusting the margins for scanning the original from the DP

Perform the following adjustment if margins are not correct.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

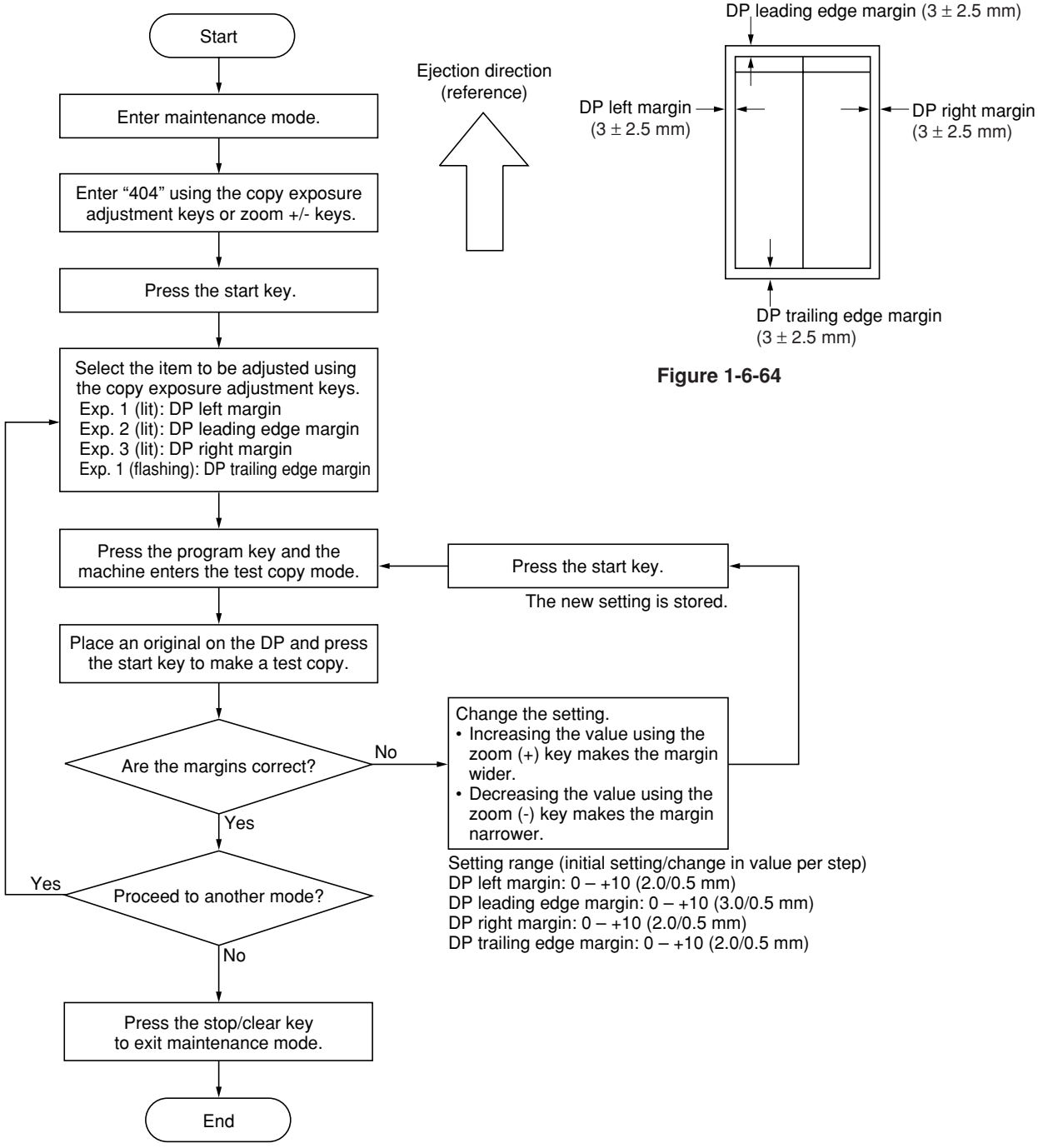
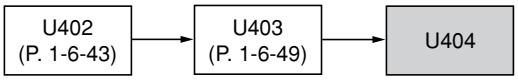


Figure 1-6-64

(14) Adjusting the margins for scanning the original from the DP

Perform the following adjustment if margins are not correct.



Caution:

Before making the following adjustment, ensure that the above adjustments have been made in maintenance mode.

Procedure

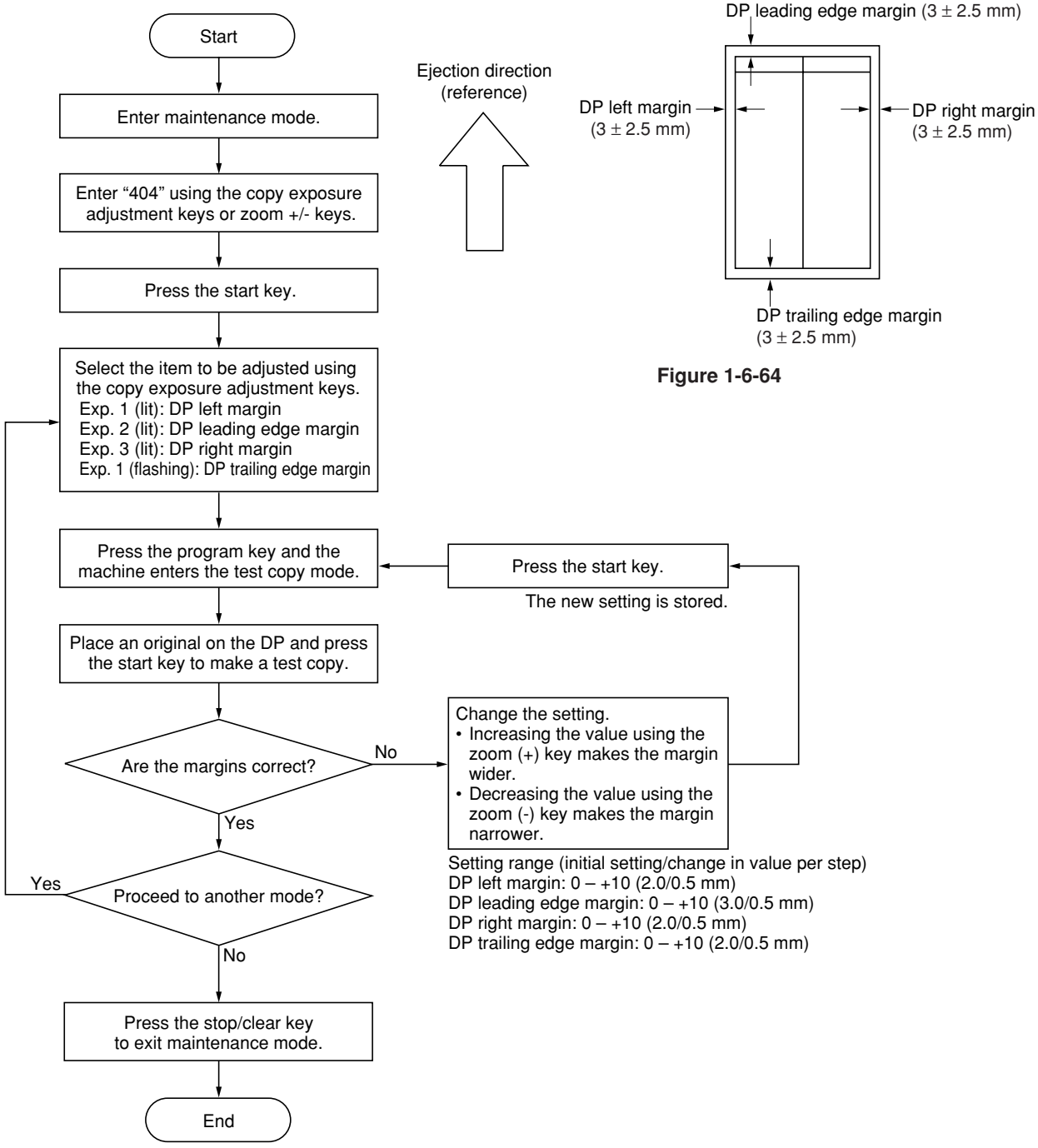


Figure 1-6-64

1-7-1 Upgrading the firmware on the main PCB

Firmware upgrading requires the following tools:
Flash DIMM (P/N 2DC01090)

Procedure

1. Run maintenance mode U019 to check the version of the ROM.
2. Turn the power switch off and disconnect the power plug.
3. Remove the rear cover and change the jumper switch position on the main PCB to the lower side.
4. Insert the DIMM into the DIMM slot on the main PCB. Insert the power plug.
5. The upgrade operation starts and the Copy quantity/magnification display changes as follows: JIG → 1% → 99%.
6. When the upgrade operation is complete, the checksum will be displayed and a beep indicating the completion will sound.
7. Remove the power plug, remove the DIMM from the main PCB, and return the jumper switch to its original position. Reattach the rear cover to its original position.
8. Insert the power plug and turn the power switch on.
9. Run maintenance mode U019 to check that the version of the ROM has changed.

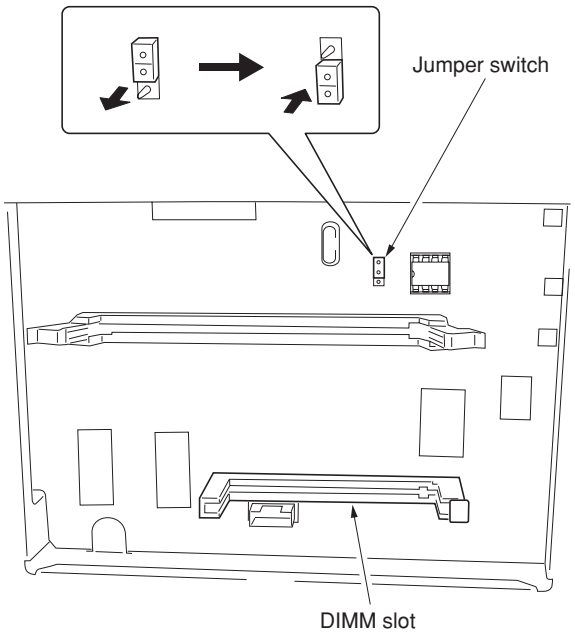


Figure 1-7-1

2-1-1 Paper feeding system

The paper feeding system picks up paper from the cassette, MP tray, or if installed, the paper feeder, feeds it in the copier, and delivers in the output tray. Paper is fed at the precise timing in synchronization with data processing. The paper feeding system finally delivers the printed page to either the face-down or face-up tray as manipulated by the user.

The figure below shows the components in the paper feeding system and the paths through which the paper travels. The sensors, clutches, etc., are described in the following pages.

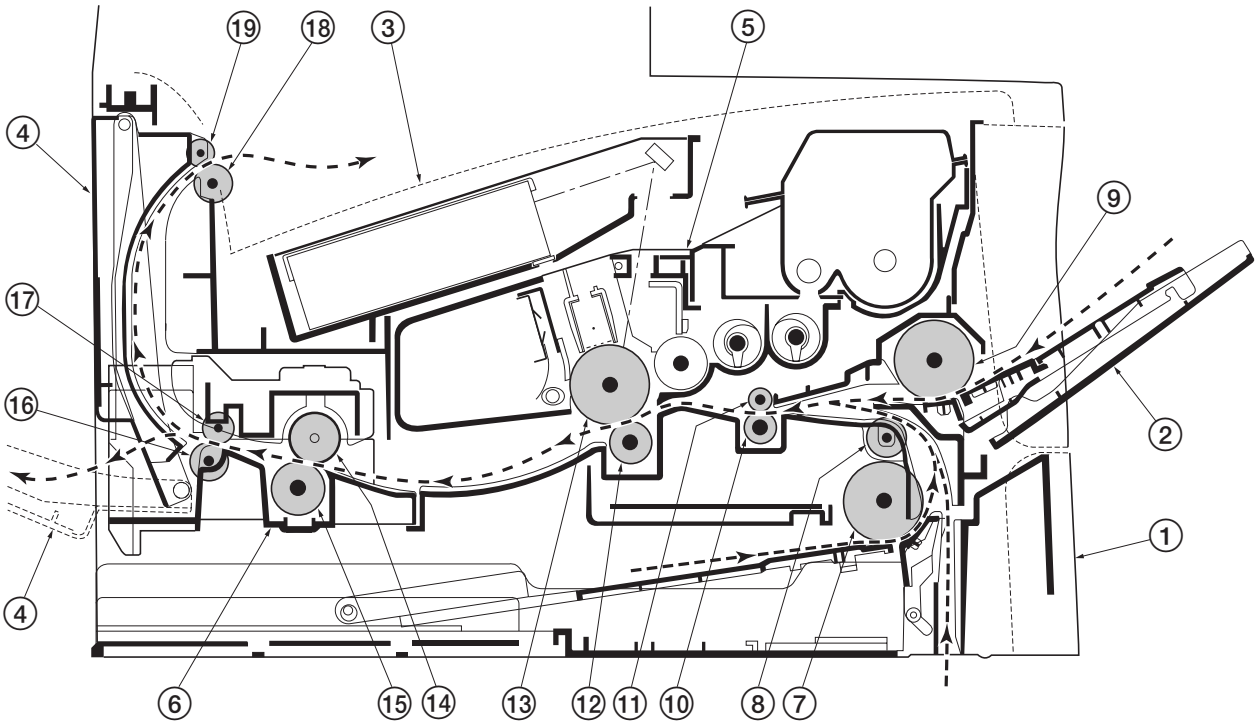


Figure 2-1-1 Paper feeding path

① Cassette
② MP tray
③ Face-down output tray
④ Face-up output tray
⑤ Process unit
⑥ Fuser unit
⑦ Feed roller
⑧ Feed pulley
⑨ MP feed roller
⑩ Lower registration roller
⑪ Upper registration roller
⑫ Transfer roller
⑬ Drum
⑭ Heat roller
⑮ Press roller
⑯ Lower exit roller
⑰ Exit pulley
⑱ Upper exit roller
⑲ Exit pulley

(1) Paper feed control

The following diagram shows interconnectivity of the feeding system components including the sensors and rollers. The engine board provides the signals in conjunction with the electrophotography process that is driven by the main board.

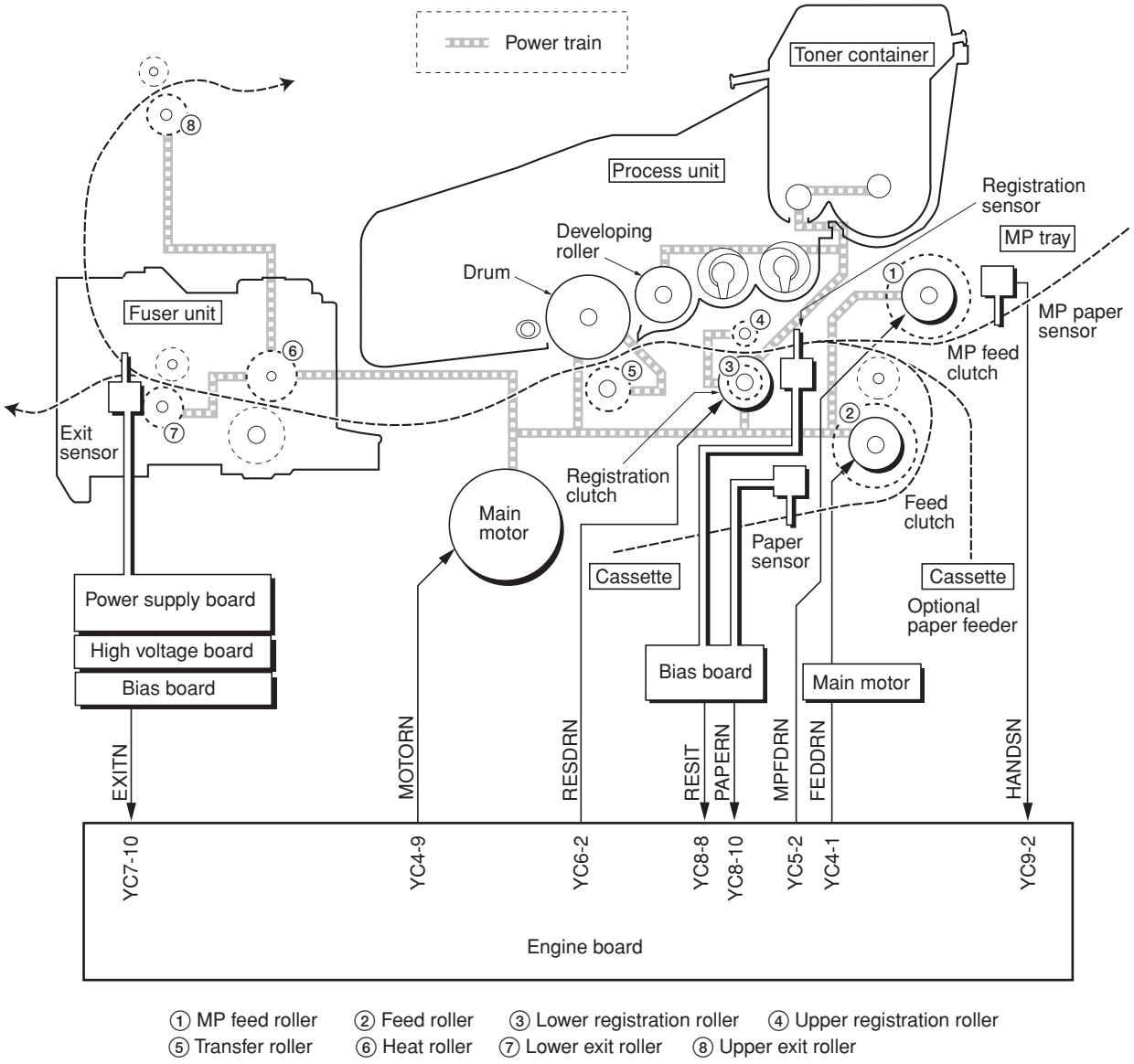


Figure 2-1-2 Paper feed control

(2) Paper feeding mechanism

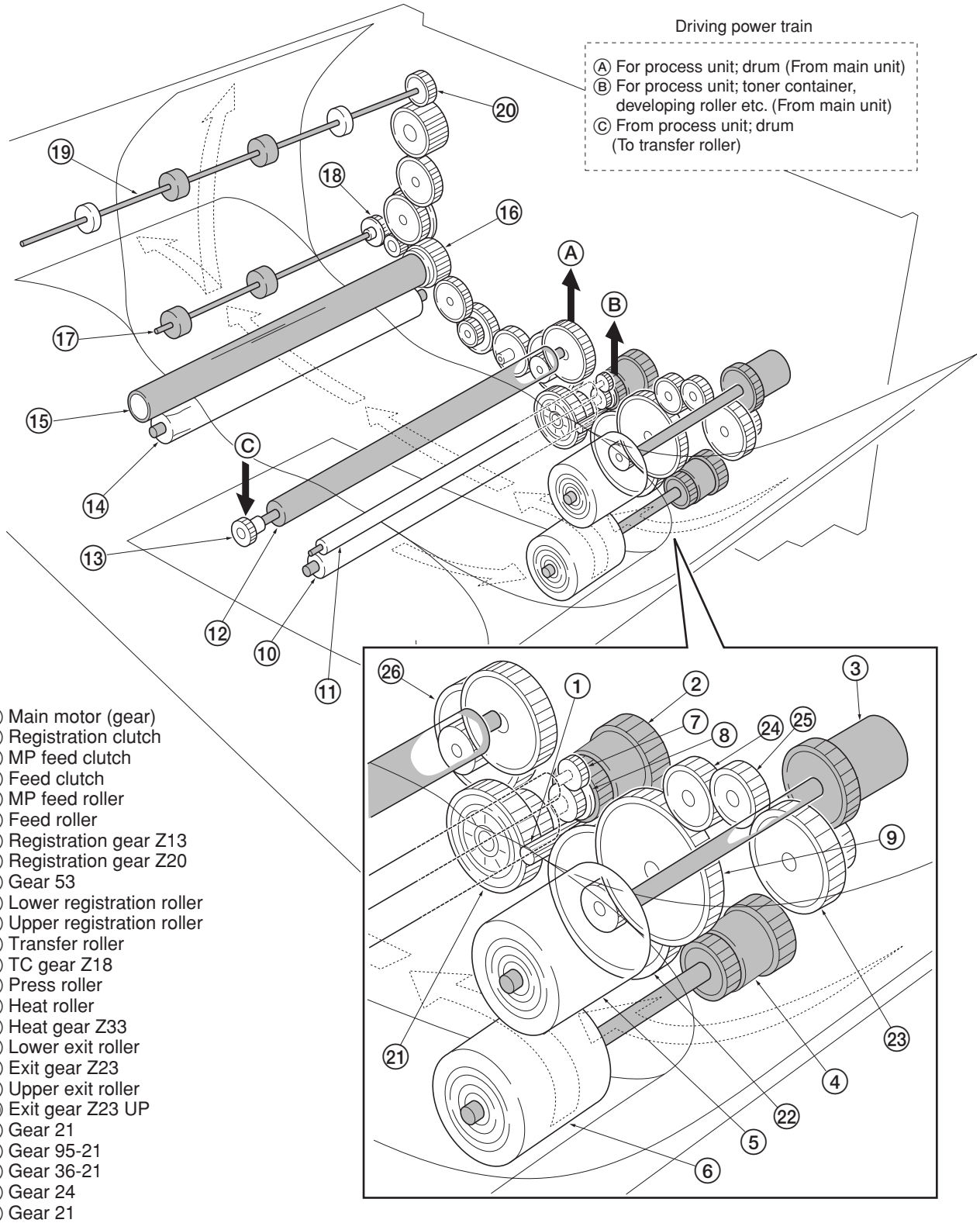


Figure 2-1-3 Paper feeding mechanism

2-1-2 Original scanning system

The scanner unit consists of the image scanning unit (ISU) for main-direction scanning, and drive part for traveling the ISU unit to sub-direction.

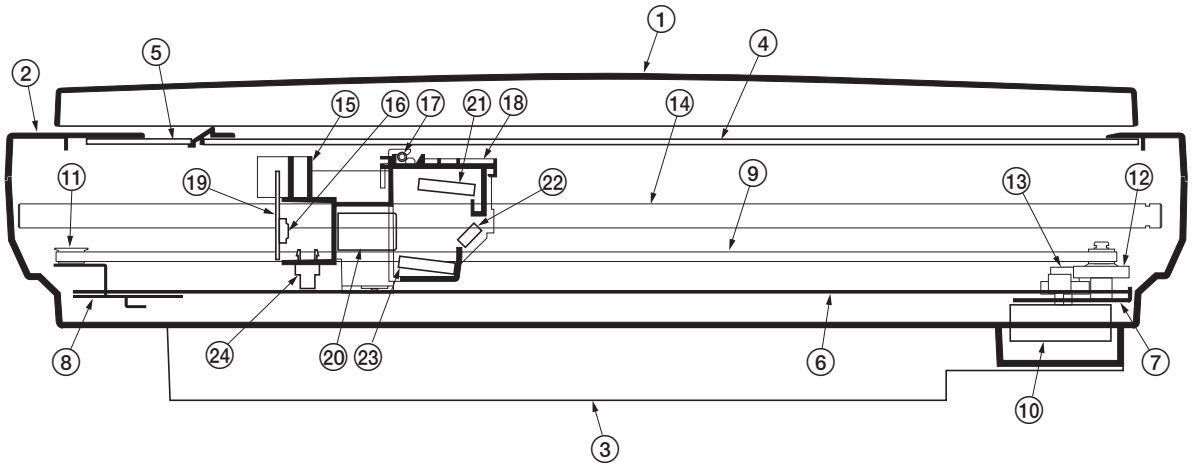


Figure 2-1-4 Scanner unit

① Original holder
② Scanner upper frame
③ Scanner lower frame
④ Contact glass
⑤ DP Contact glass
⑥ Scanner rail
⑦ Scanner motor mount
⑧ Tension pulley mount
⑨ Scanner belt
⑩ Scanner motor
⑪ Tension pulley
⑫ Scanner gear 45/18
⑬ Scanner gear 39/22
⑭ Scanner shaft
⑮ ISU housing
⑯ CCD image sensor
⑰ Exposure lamp
⑱ Exposure lamp mount
⑲ CCD board
⑳ ISU lens
㉑ Mirror A
㉒ Mirror B
㉓ Mirror A
㉔ Scanner home position sensor

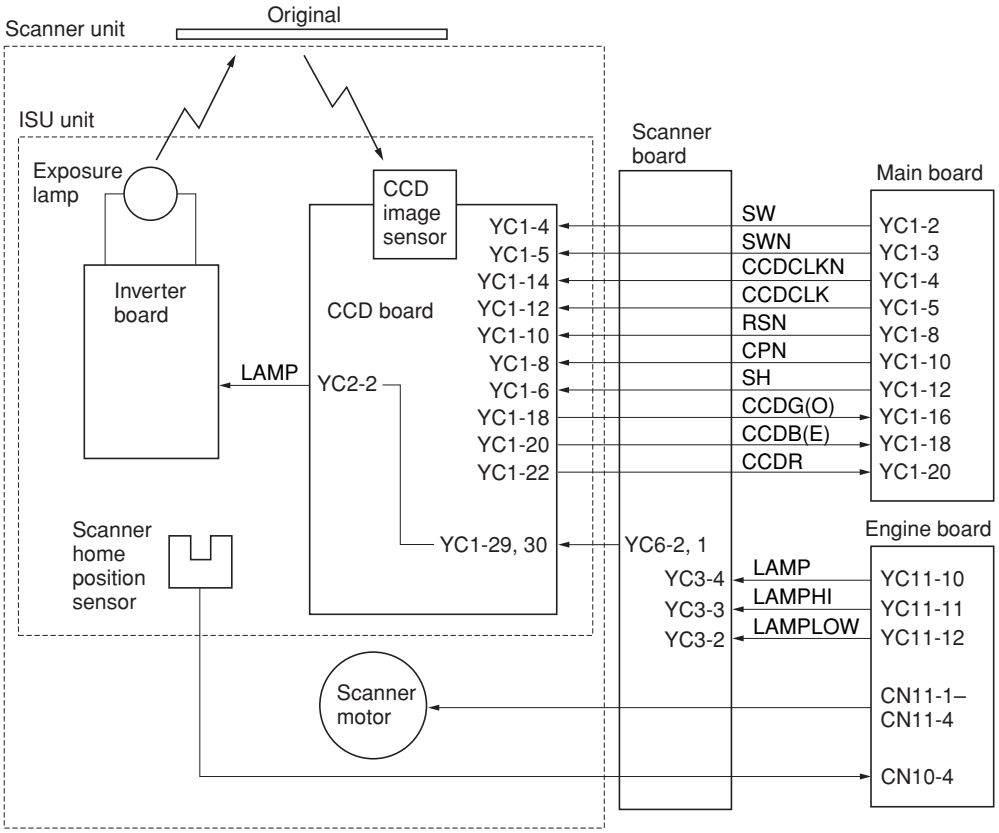


Figure 2-1-5 Scanner control circuit block diagram

(1) ISU unit

The ISU unit consists of an exposure lamp, three mirrors, an ISU lens, a CCD board, and so on. Also an inverter board for driving the exposure lamp and a scanner home position sensor for detecting the home position of the ISU unit are incorporated.

The original on the contact glass is exposed to the light of the exposure lamp that is reflected by the reflector. The image is input through reflection by the three mirrors and through the ISU lens to the CCD image sensor on the CCD board. The CCD image sensor scans one row of the image in the main scan direction, converts it to electric signals, and outputs them to the main board. Then the ISU unit is moved in the sub scan direction along the scanner shaft, and the CCD image sensor scans the next row of the image in the main scan direction. The operation described above is repeated for scanning the overall image of the original. If an optional DP is used, the ISU unit stops at the position of the DP contact glass and scans sequentially one row of the image on the original in synchronization with the moving timing of the original in the sub scan direction by driving the DP.

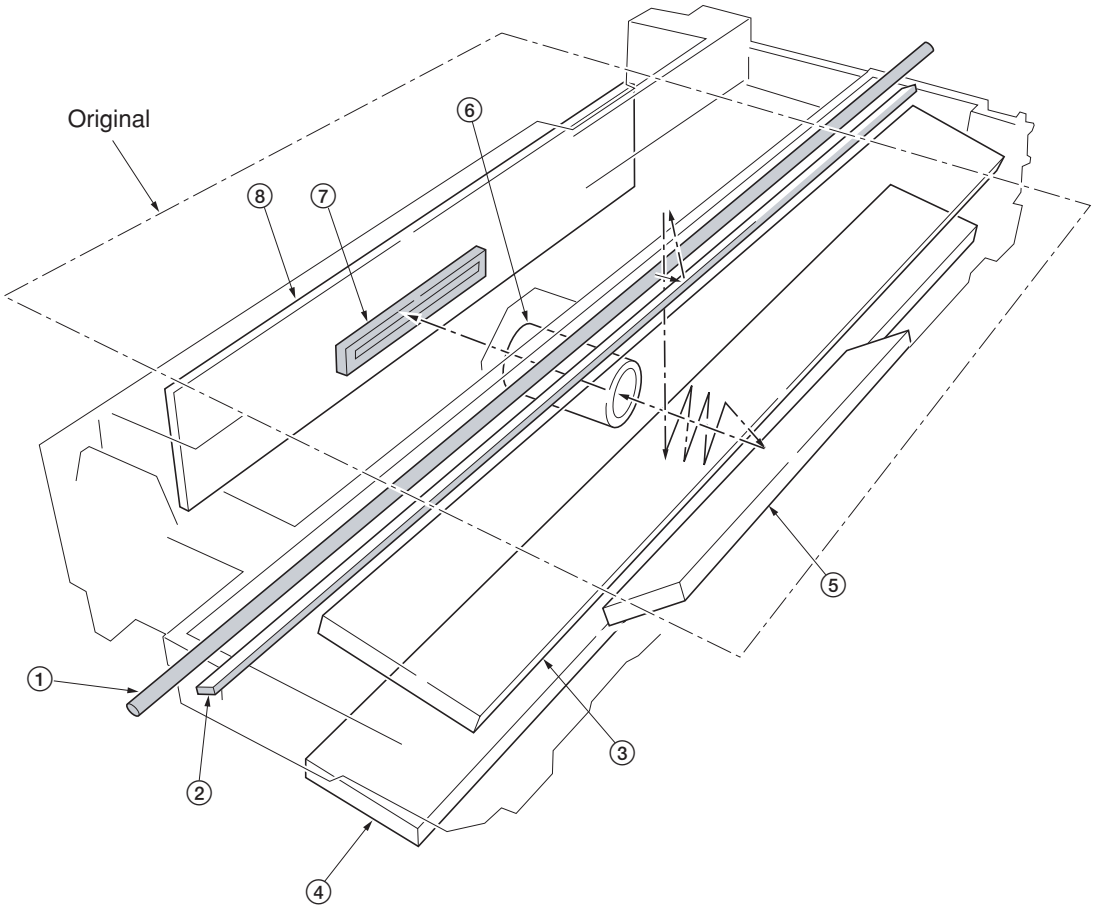


Figure 2-1-6 ISU unit

① Exposure lamp
② Scanner reflector
③ Mirror A
④ Mirror A
⑤ Mirror B
⑥ ISU lens
⑦ CCD image sensor
⑧ CCD board

2-1-3 Electrophotographic system

Electrophotography is the technology used in laser printing which transfer data representing texts or graphics objects into a visible image which is developed on the photosensitive drum, finally fusing on paper, using light beam generated by a laser diode.

This section provides technical details on the copier's electrophotography system.

(1) Electrophotographic cycle
The electrophotography system of the copier performs a cyclic action made of six steps as follows. Each step is technically explained in the following sections.

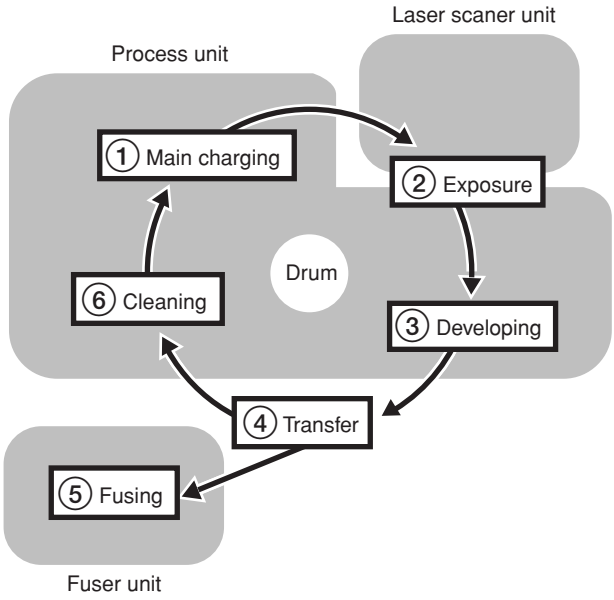


Figure 2-1-7 Electrophotographic cycle

The sections for main charging, exposure (drum), developing, and cleaning are modularized in one Process unit.

(1-1) Process unit mechanism

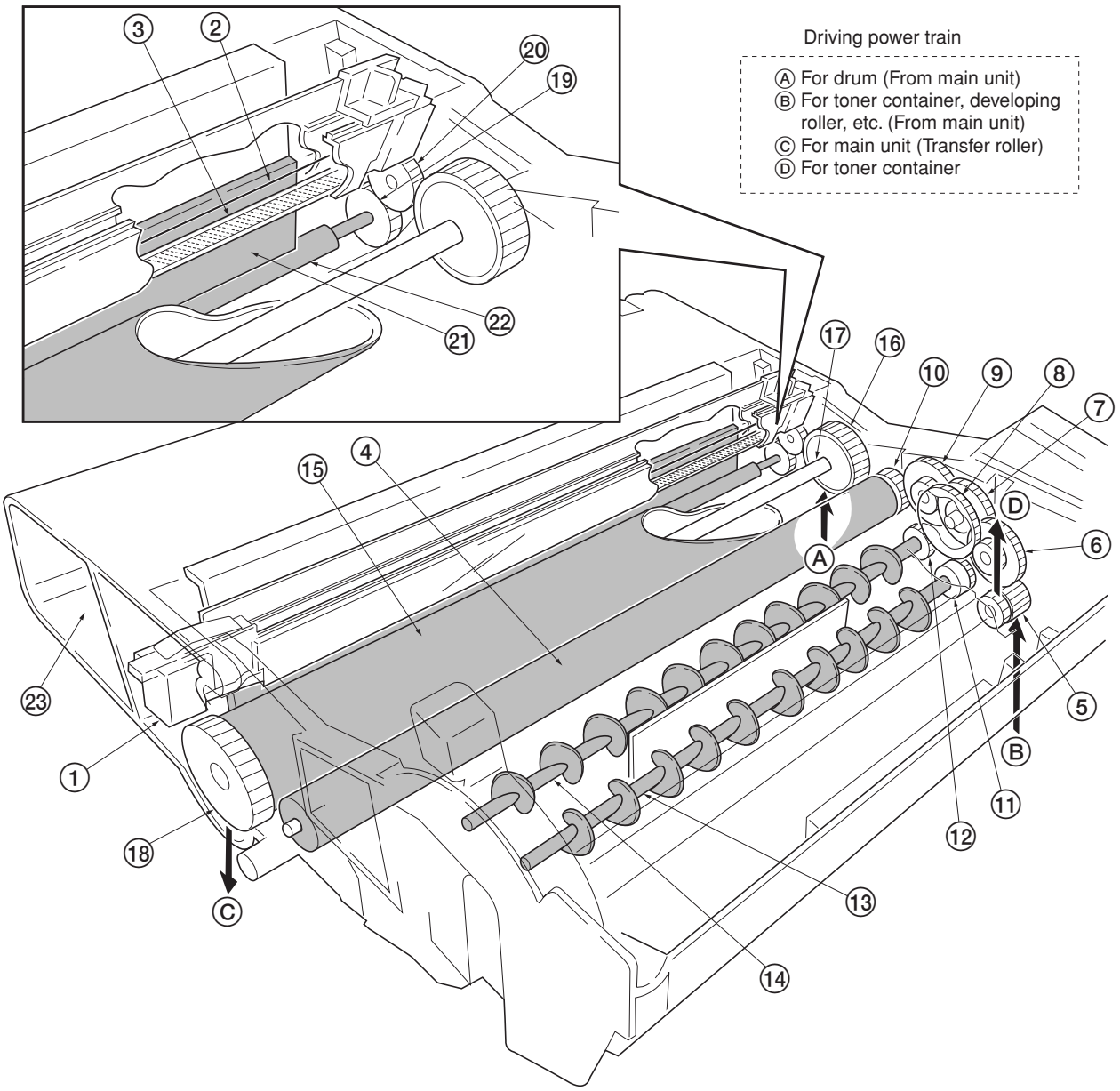


Figure 2-1-8 Process unit mechanism

① Main charger unit
② Charger wire
③ Grid
④ Developing roller
⑤ Gear Z14-Z18
⑥ Gear Z14-Z36
⑦ Gear Z18-Z36
⑧ Free gear Z40
⑨ Gear Z18-Z35H
⑩ MAG gear Z24H
⑪ Mixer gear Z20 B
⑫ Mixer gear Z20 A
⑬ DLP screw B
⑭ DLP screw A
⑮ Drum
⑯ Drum gear Z35H
⑰ Drum shaft
⑱ Drum gear Z36
⑲ Sweep gear Z13
⑳ Idle gear 18H
㉑ Cleaning blade
㉒ Sweep roller
㉓ Waste toner reservoir

(2) Main charging

(2-1) Photo conductive drum

The durable layer of organic photoconductor (OPC) is coated over the aluminum cylinder base. The OPC tend to reduce its own electrical conductance when exposed to light. After a cyclic process of charging, exposure, and development, the electrostatic image is constituted over the OPC layer.

Since the OPC is materialized by resin, it is susceptible to damage caused by sharp edges such as a screwdriver, etc., resulting in a print quality problem. Also, finger prints can cause deterioration of the OPC layer, therefore, the drum (in the process unit) must be handled with care. Substances like water, alcohol, organic solvent, etc., should be strictly avoided.

As with all other OPC drums, the exposure to a strong light source for a prolonged period can cause a print quality problem. The limit is approximately 500 lux for less than five minutes. If the drum (process unit) remains removed form the copier, it should be stored in a cool, dark place.

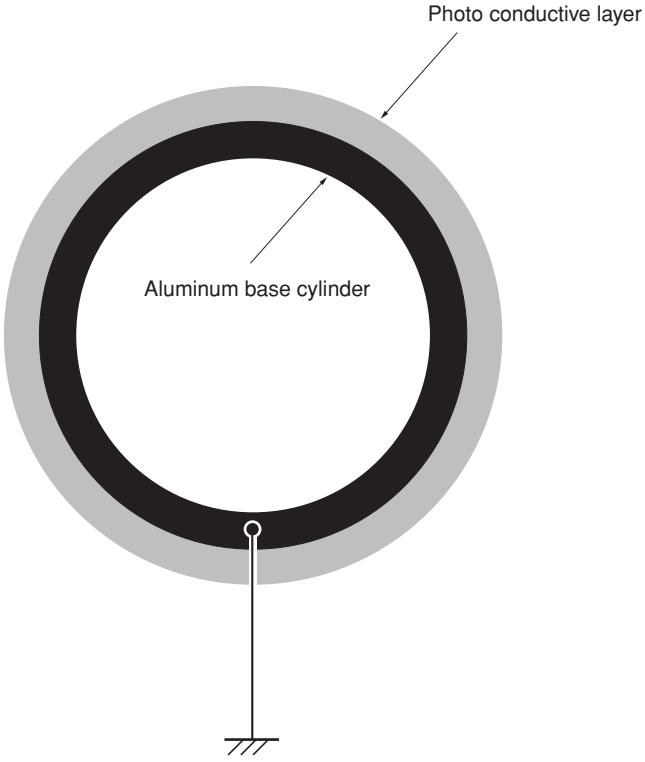


Figure 2-1-9 Photo conductive drum

(2-2) Charging the drum

The following shows a simplified diagram of the electrophotographic components in relation to the engine system. Charging the drum is done by the main charger unit Ⓐ.

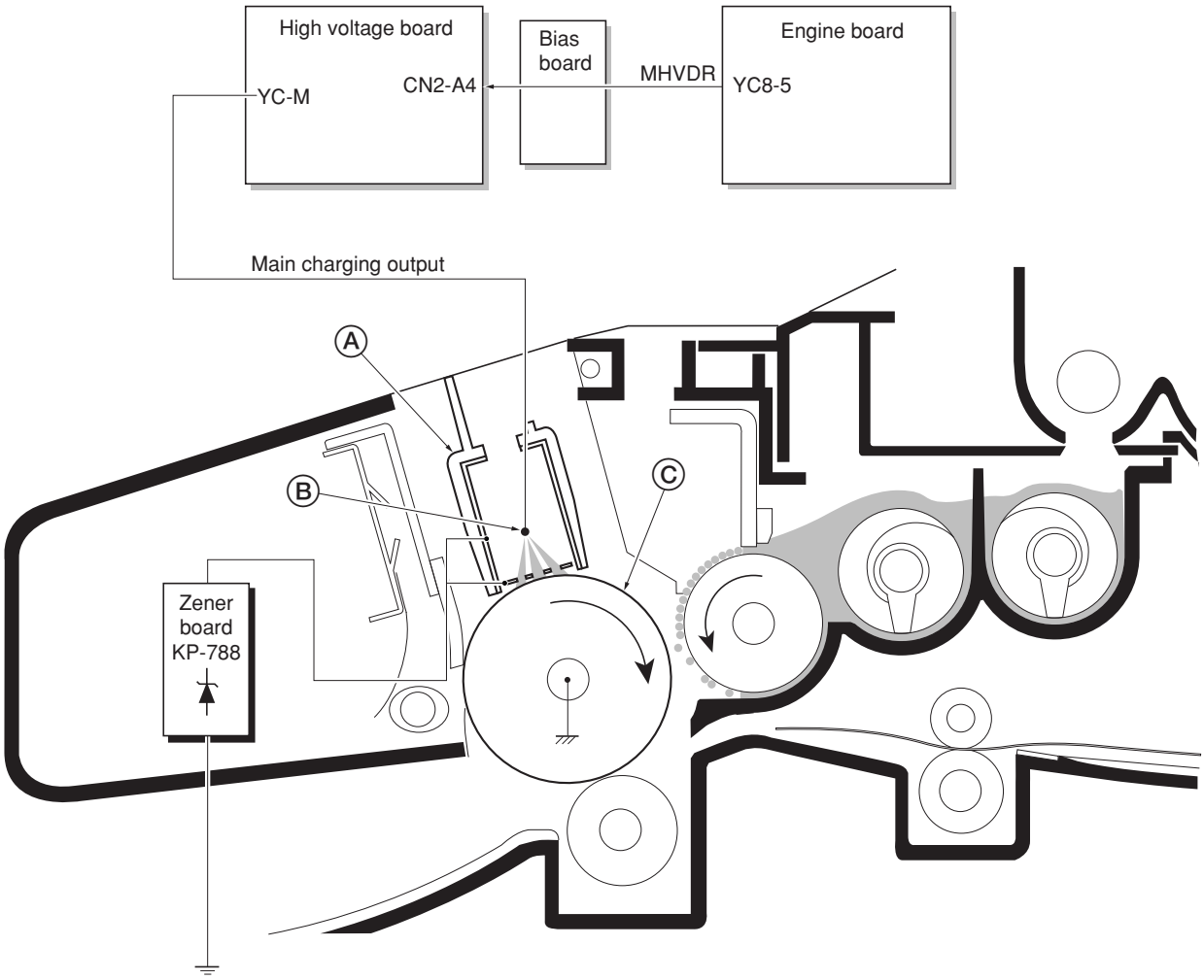


Figure 2-1-10 Charging the drum

As the drum Ⓒ rotates in a “clean (neutral)” state, its photoconductive layer is given a uniform, positive (+) corona charge dispersed by the main charger wire Ⓑ.

Due to high-voltage scorotron charging, the charging wire can get contaminated by oxidization after a long run. Therefore, it must be cleaned periodically from time to time. Cleaning the charging wire prevents print quality problems such as black streaks.

(3) Exposure
The charged surface of the drum Ⓐ is then scanned by the laser beam from the laser scanner unit Ⓑ.

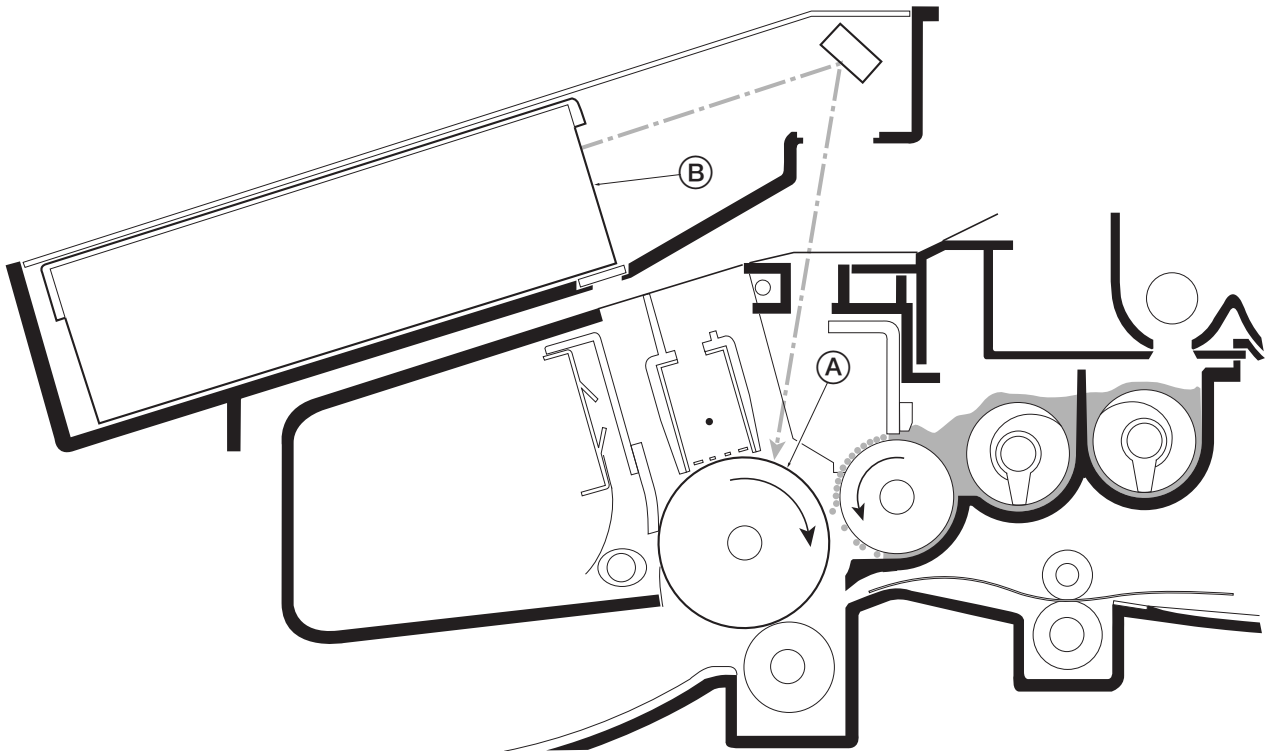


Figure 2-1-11 Exposure

The laser beam (780 nm wavelength) beam is dispersed as the polygon motor (polygon mirrors) revolves to reflect the laser beam over the drum. Various lenses and mirror are housed in the scanner unit, adjust the diameter of the laser beam, and focalize it at the drum surface.

(3-1) Laser scanner unit

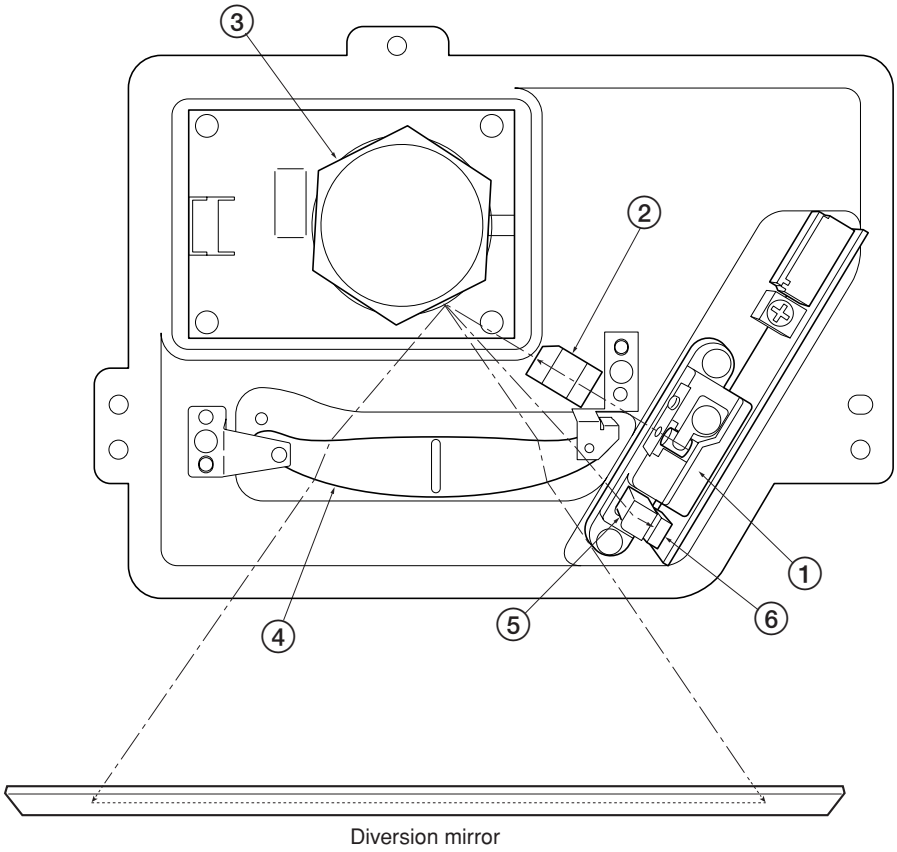


Figure 2-1-12 Laser scanner unit

① Laser diode	Emits diffused, visible laser.
② Cylindrical lens	Compensates the vertical angle at which the laser beam hits a polygon mirror segment.
③ Polygon mirror (motor)	Has six mirror segments around its hexagonal circumference; each mirror corresponding to one scanned line width on the drum when laser beam scans on it.
④ F-theta lens	The f-theta lens equalizes focusing distortion on the far ends of the drum.
⑤ Sensor mirror	Bends the very first shot of a laser scan towards the beam detection sensor (⑥).
⑥ Pin photo sensor	When shone by the sensor mirror above, this photo-sensor generates a trigger signal for the engine controller to start activating the paper feeding system.

(3-2) Drum surface potential

The laser beam is continually switched on and off depending on the print data. It is on for a black (exposed) dot and off for a white (blank) dot. Since the drum surface is evenly charged, whenever it is illuminated by the laser beam, the electrical resistance of the photoconductor is reduced and the potential on the photoconductor is also lowered. Resulted on the drum surface is an electrostatic image which represents the data to print. Note that the area to be printed black has the low potential, constituting a “positively exposed” image.

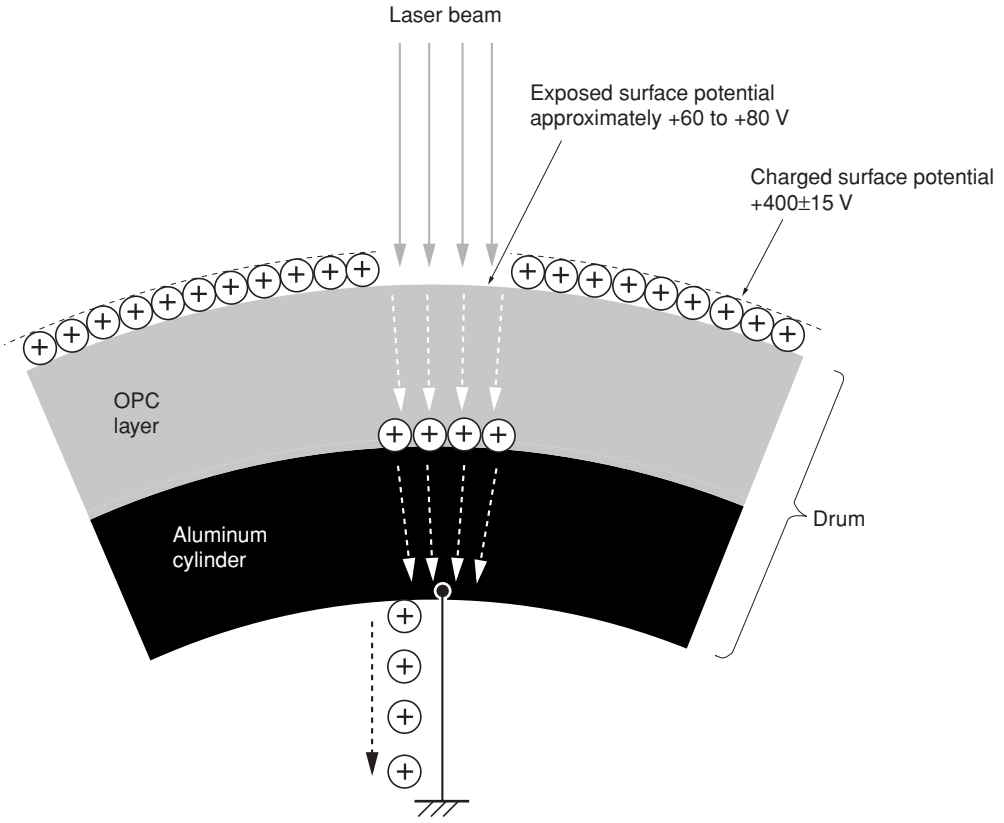


Figure 2-1-13 Drum surface potential

(4) Development
The latent image constituted on the drum is developed into a visible image. The developing roller Ⓐ contains a 3-pole (S-N-S) magnet core Ⓑ and an aluminum cylinder rotating around the magnet core Ⓑ. Toner attracts to the developing roller Ⓐ since it is powdery ink made of black resin bound to iron particles. Doctor blade Ⓒ, magnetized by magnet Ⓓ, is positioned approximately 0.3 mm above the developing roller Ⓐ to constitute a smooth layer of toner in accordance with the roller revolution.

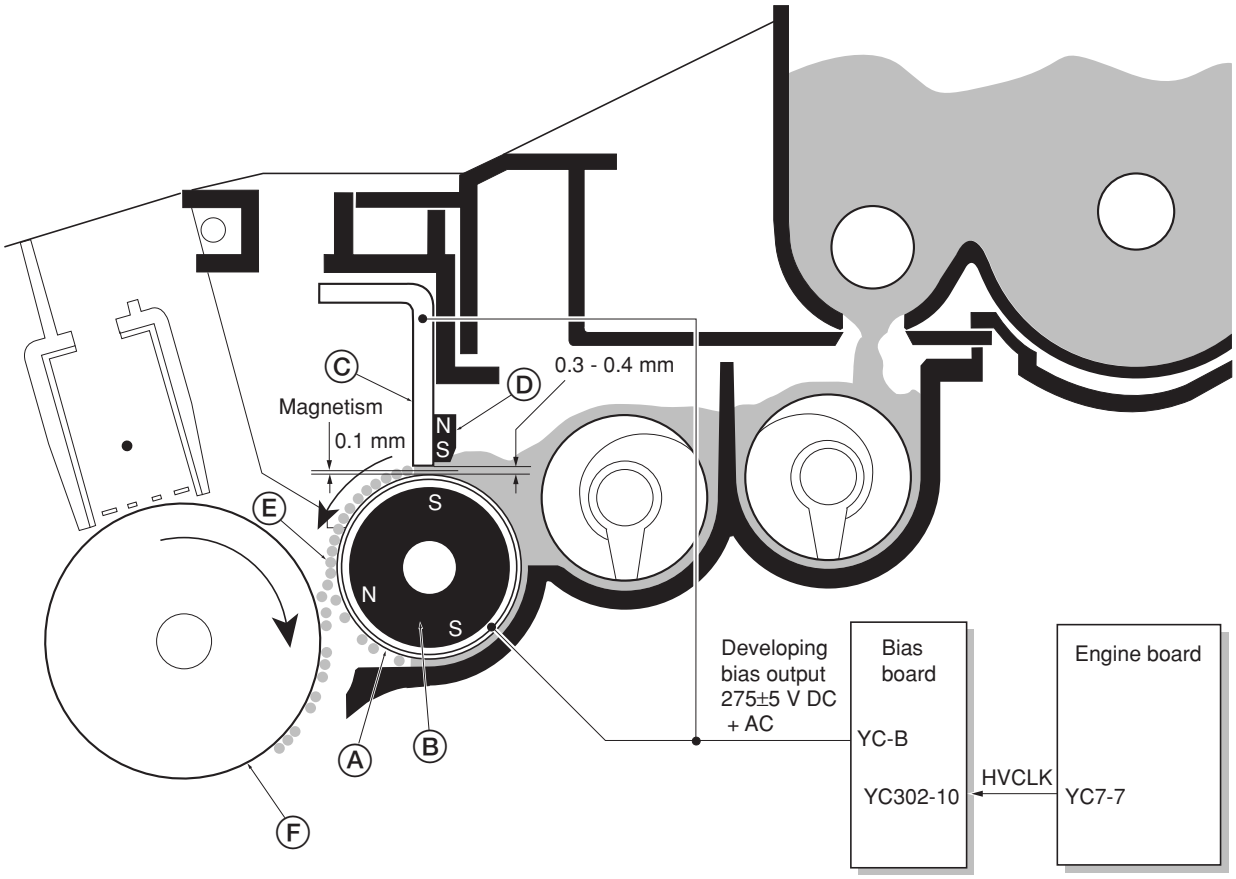


Figure 2-1-14 Development

The developing roller Ⓐ is applied with the AC-weighted, positive DC power source. Toner Ⓔ on the developing roller Ⓐ is given a positive charge. The positively charged toner Ⓔ is then attracted to the areas of the drum Ⓕ which was exposed to the laser light. (The gap between the drum Ⓕ and the developing roller Ⓐ is approximately 0.3 mm.) The non-exposed areas of the drum Ⓕ repel the positively charged toner as these areas maintain the positive charge. The developing roller Ⓐ is also AC-biased to ensure contrast in yielding by compensating the toner's attraction and repelling action during development.

(5) Transfer

The image developed by toner on the drum Ⓐ is transferred onto the paper because of the electrical attraction between the toner itself and the transfer roller Ⓑ. The transfer roller is negatively biased so that the positively charged toner is attracted onto the paper while it is pinched by the drum and the transfer roller.

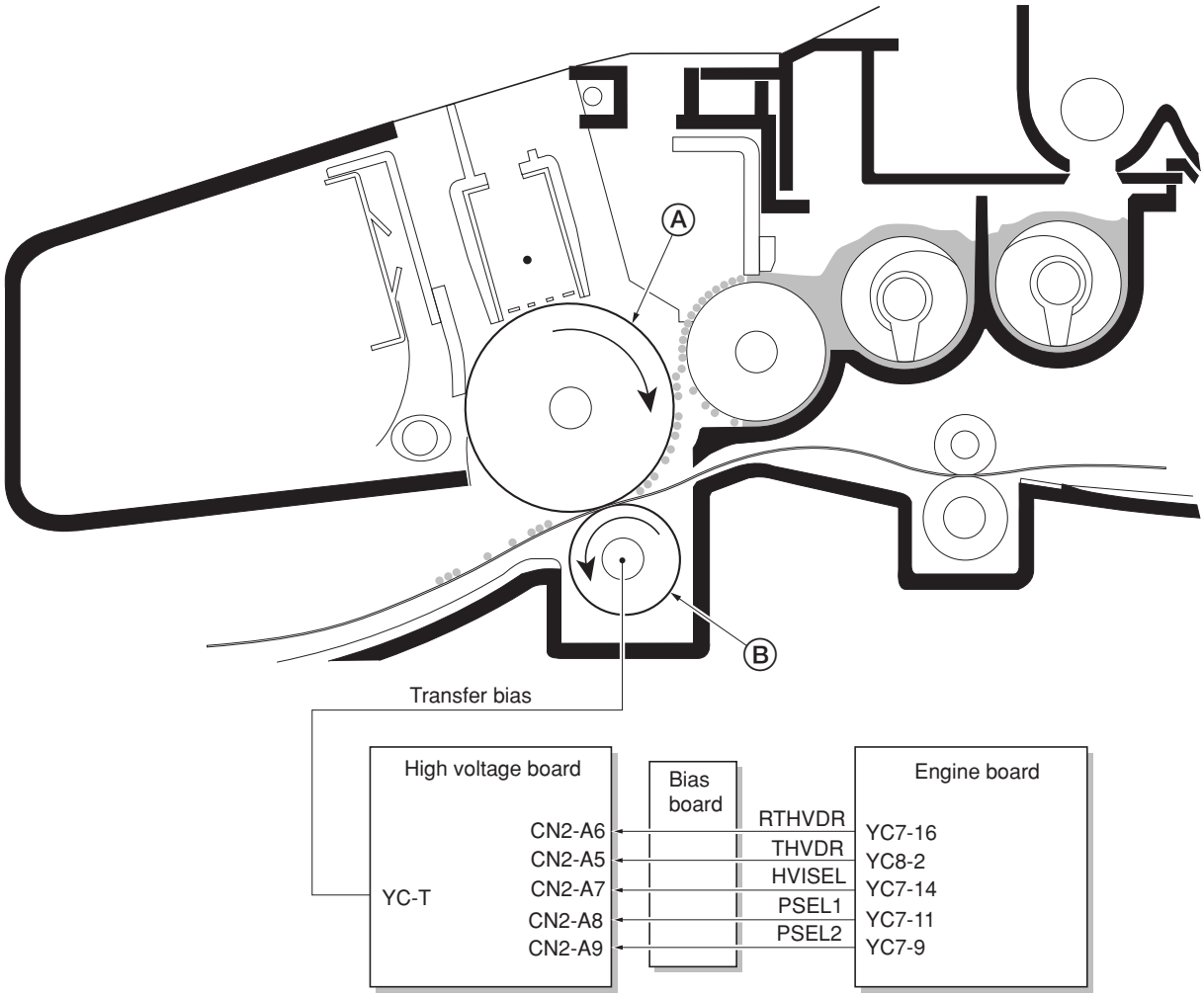


Figure 2-1-15 Transfer

The nominal transfer bias is set to approximately -1.8 kV (limit) with the -6 mA current. Since the ideal potential of the transfer bias depends on the thickness of paper, the bias is raised to approximately -2.5 kV/-6 mA for thicker paper. On the other hand, the bias current is reduced to -1.8 kV/-6 mA for thin paper.

(6) Fusing
The toner on the paper is molten and pressed into the paper as it passes between the heat roller Ⓐ and the press roller Ⓑ in the fuser unit.

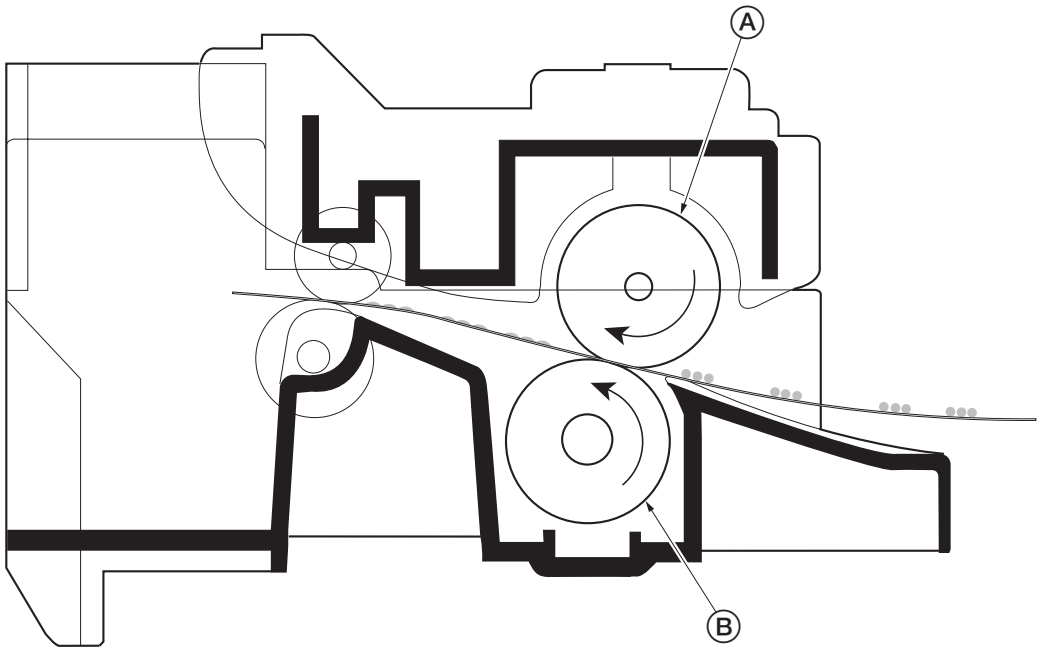


Figure 2-1-16 Fusing

The heat roller has a halogen lamp inside which continuously turns on and off by the thermistor to maintain the constant temperature onto the heat roller surface.
The heat roller is resin coated by florin to prevent toner from accumulating on the roller after a long run. Care must be taken while handling the heat roller not to scratch the roller surface as doing so may result in print problems.
The heat roller has four claws which are continuously in contact with its surface. These claws prevent the paper on which toner has been fused from being wound around the heat roller causing paper jam.

The pressure roller is made of the heat-resistant silicon rubber. This roller is used to strongly press the paper towards the heat roller by means of coil springs.
The temperature of the heat roller is constantly monitored by the engine board using the thermistor and triac. Should the temperature of the heat roller exceed the predetermined value, the thermal cutout is activated to effectively disconnect the heater (halogen) lamp from power.

(6-1) Fuser unit mechanism

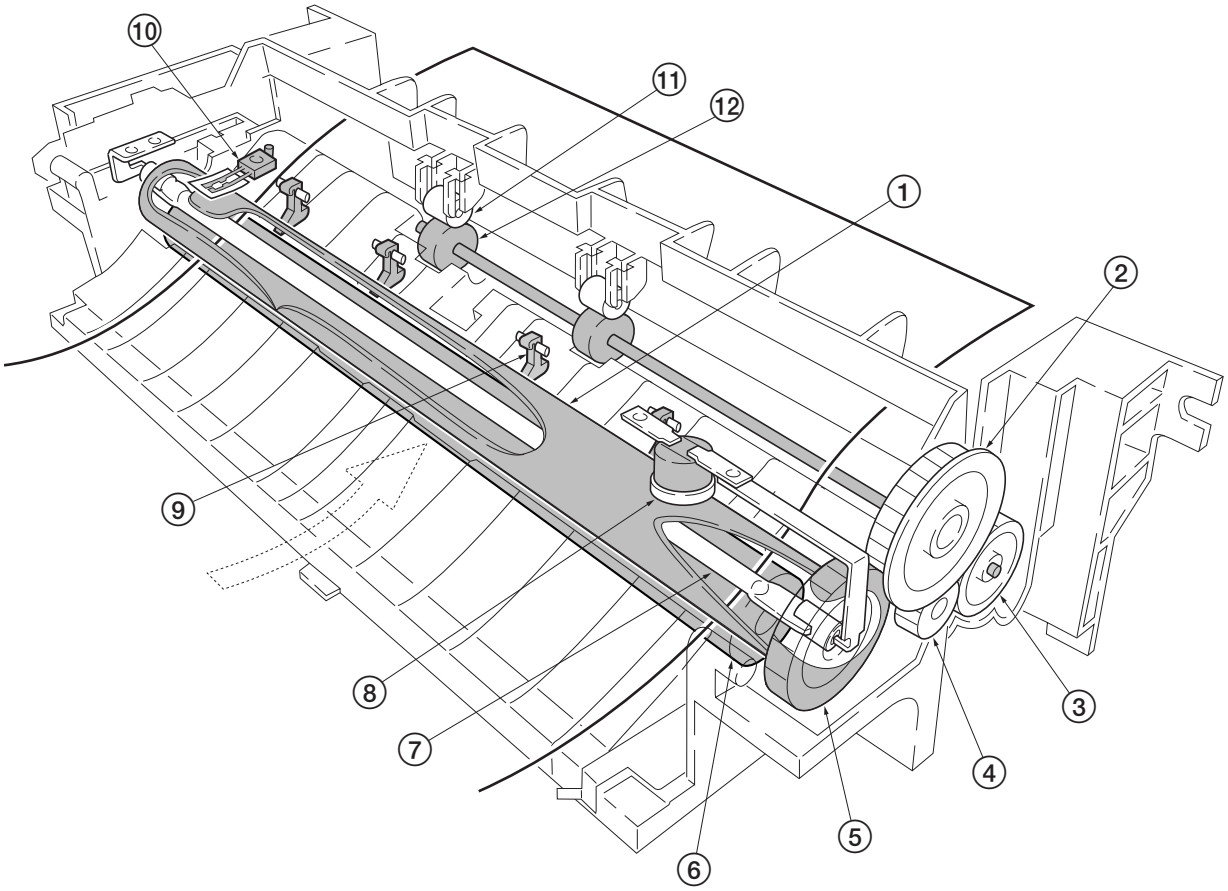


Figure 2-1-17 Fuser unit mechanism

① Heat roller
② Idle gear Z34
③ Exit gear Z23
④ Idle gear Z18
⑤ Heat gear Z33
⑥ Press roller
⑦ Heater lamp
⑧ Thermal cutout
⑨ Separator(s)
⑩ Thermistor
⑪ Exit pulley(s)
⑫ Lower exit roller

(7) Cleaning
After the transferring process, the drum needs to be physically cleaned of toner which is residual after the development process. The cleaning blade Ⓐ is constantly pressed against the drum Ⓑ and scrapes the residual toner off to the sweep roller Ⓒ. The waste toner is collected at the output end of the sweep roller Ⓒ and sent back to the toner container, into the waste toner reservoir Ⓓ.

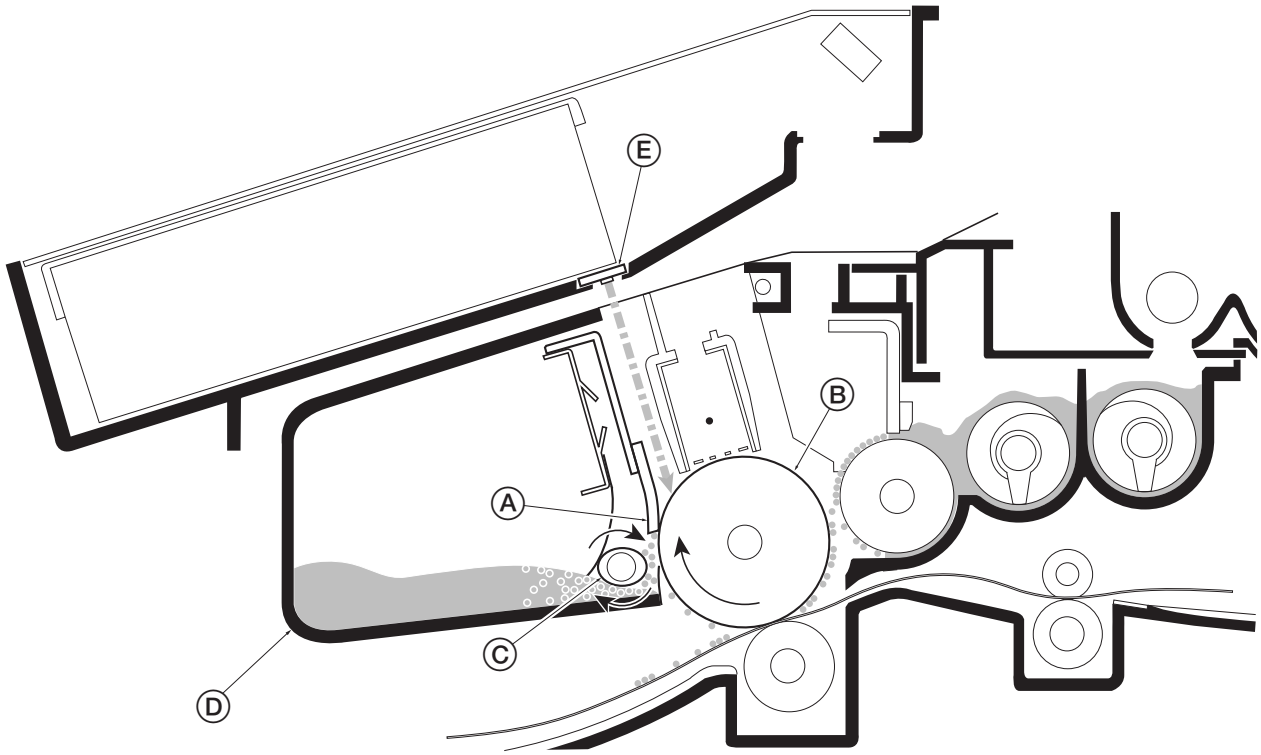


Figure 2-1-18 Drum cleaning and erasing static charge

After the drum Ⓑ is physically cleaned, it then must be cleaned to the electrically neutral state. This is necessary to erase any residual positive charge, ready to accept the uniform charge for the next print process. The residual charge is canceled by exposing the drum Ⓑ to the light emitted from the eraser lamp Ⓔ. This lowers the electrical conductivity of the drum surface making the residual charge on the drum surface escape to the ground.

2-2-1 Electrical parts layout

(1) Main unit

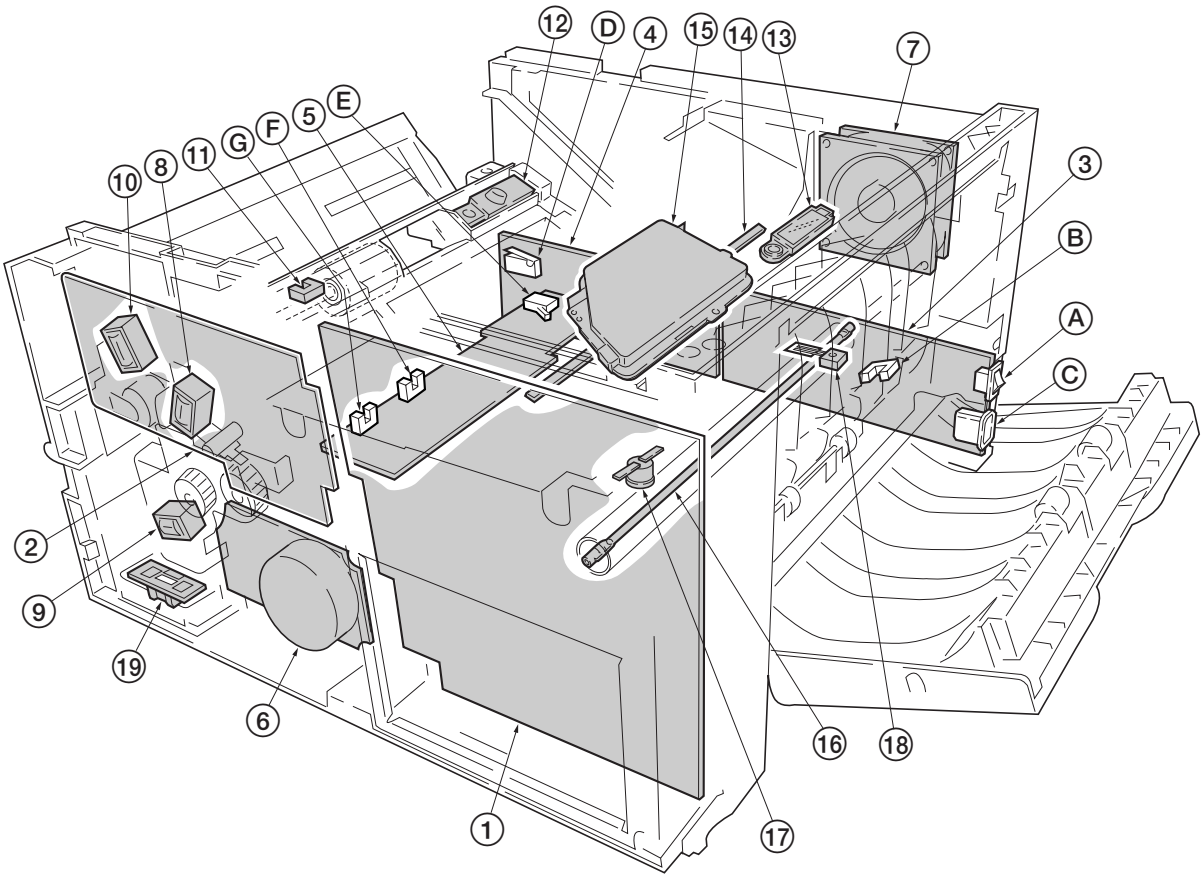


Figure 2-2-2 Main unit

① Main board (KP-5060)
② Engine board (KP-5061)
③ Power supply board (KP-5059)
  Ⓐ Power switch
  Ⓑ Exit sensor
  Ⓒ AC Inlet
④ High voltage board
  Ⓓ Interlock switch
⑤ Bias board (KP-5067)
  Ⓔ Cassette switch
  Ⓕ Registration sensor
  Ⓖ Paper sensor
⑥ Main motor
⑦ Cooling fan
⑧ Registration clutch
⑨ Feed clutch
⑩ MP feed clutch
⑪ MP paper sensor
⑫ Toner sensor [PWB] (KP-786)
⑬ Waste toner sensor [PWB] (KP-786)
⑭ Eraser lamp [PWB] (KP-790)
⑮ Laser scanner unit
⑯ Heater lamp
⑰ Thermal cutout
⑱ Thermistor
⑲ Paper feeder interface connector

(2) Scanner unit

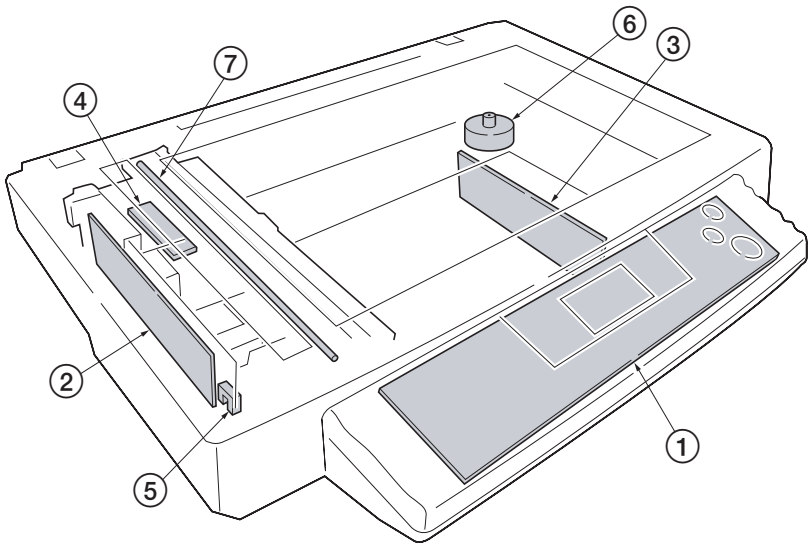


Figure 2-2-2 Scanner unit

① Operation board
② CCD board (KP-5065)
③ Scanner board (KP-5063)
④ Inverter board
⑤ Scanner home position sensor
⑥ Scanner motor
⑦ Exposure lamp

2-3-1 Main board

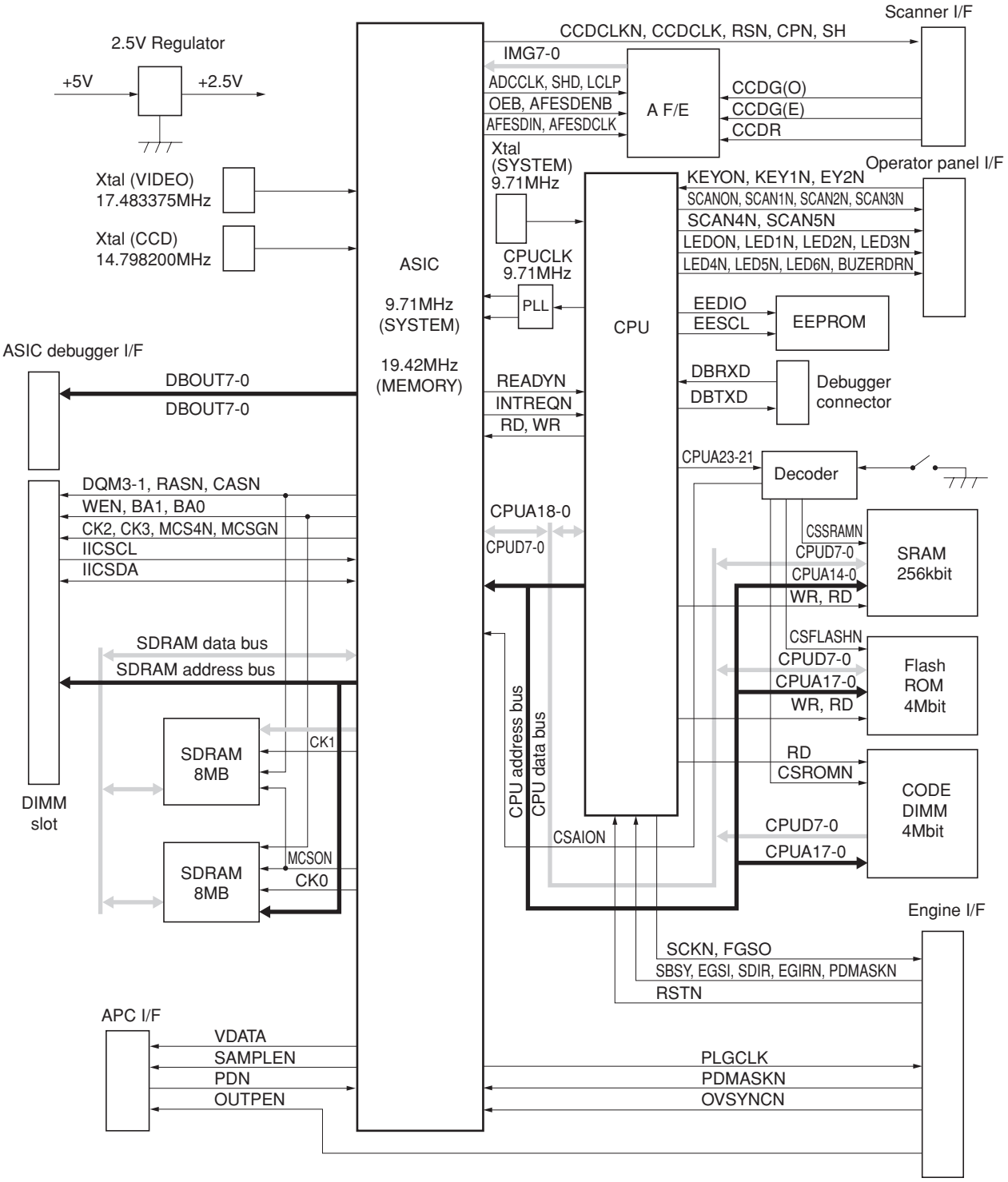


Figure 2-3-1 Main board circuit block diagram

2-3-2 Engine board

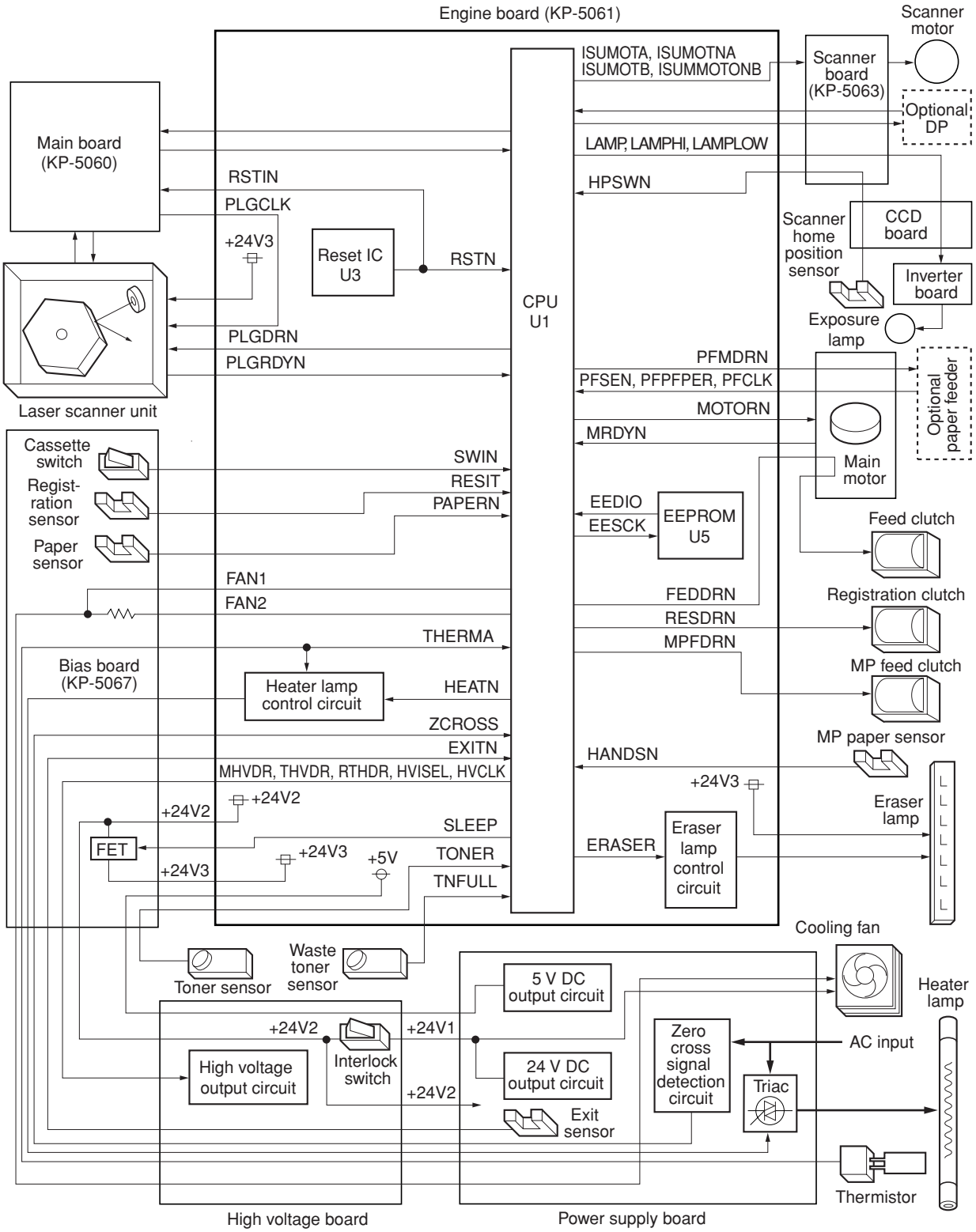


Figure 2-3-2 Engine board circuit block diagram

(1) Eraser lamp control circuit

The CPU (U1) turns pin #86 (ERASER) of U1 to H level, transistors (Q18) turns on consequently, and the 24 V DC given at pin #1 of connector YC14 applies to the eraser lamps. The eraser lamps thus illuminate as the current flows through the eraser lamp, the pin #2 of connector YC14, resistors (R109, R110, and R111), transistor Q18 and the ground.

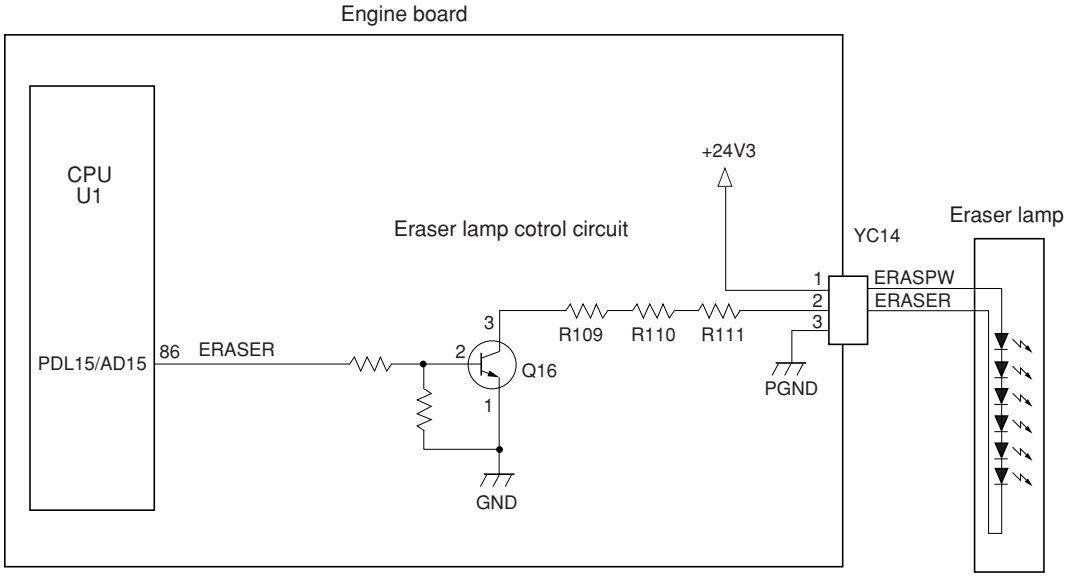


Figure 2-3-3 Eraser lamp control circuit

(2) Heater lamp control circuit

Activation of the heater lamp is dominated by the HEAT signal which is derived by the engine CPU (U1) at its pin #74. When its level is high, transistor Q8 turns on, photo-triac PC2 and triac TRC1 turn on simultaneously, and the heater lamp is applied with the primary AC voltage in turn.

Switching of triac TRC1, as affected by the HEAT signal is made in synchronization with the zero-cross signal ZCROSS which is generated by the power supply unit. The zero-cross signal detector watches the transition of alternating plus and negative current and detects the zero crosses. This detector derives the resultant ZCROSS signal at its pin #43 of the engine CPU (U1). Since abrupt change in the current flow can be significantly avoided by synchronizing triac TRC1 with the zero-cross signal, the possibility of noise due to the primary AC supply is greatly reduced.

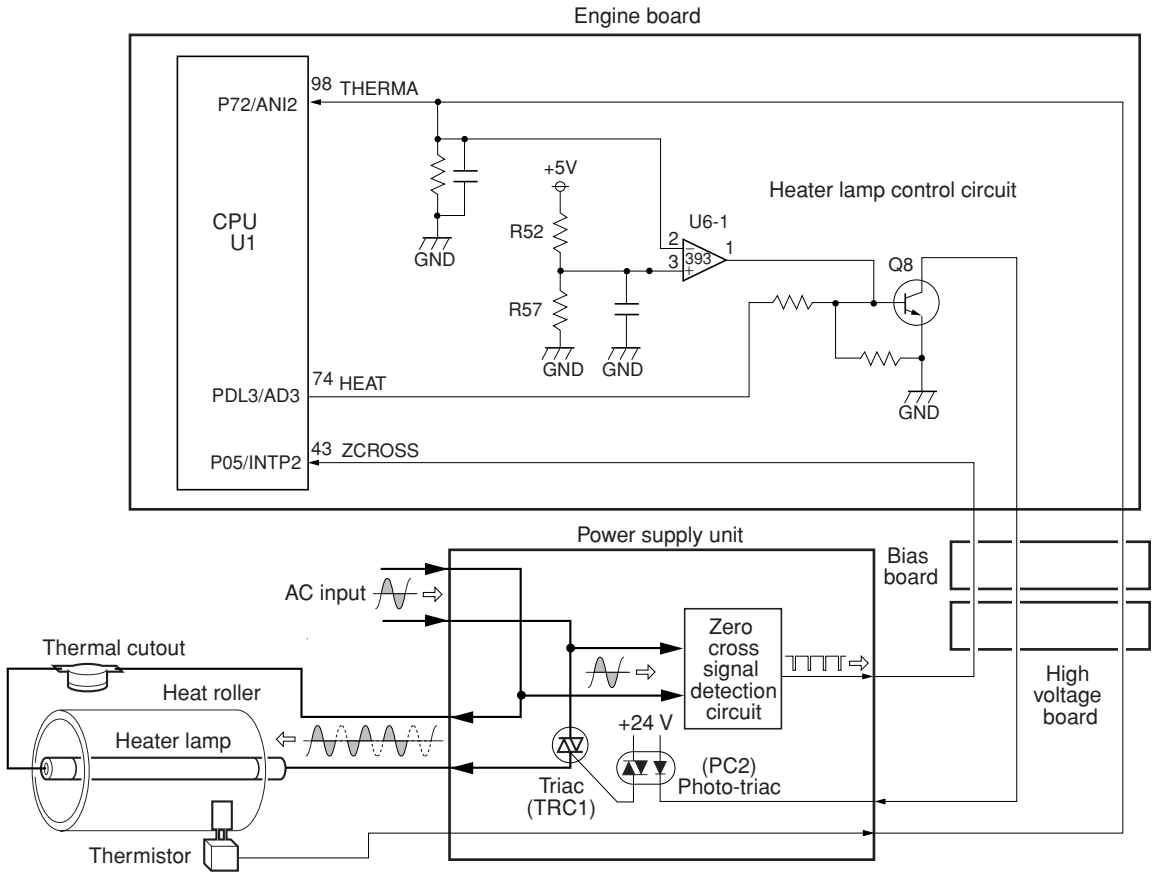


Figure 2-3-4 Heater lamp control circuit

The AC power for the heater is applied in one of the five variations of the zero cross switchings as shown in Figure 2-3-5. Each variation is constituted with the unit of ten positive and negative envelops in five cycles, as obtained by varying the duration during which TRC1 turns on. The heater lamp is energized while TRC1 is kept on; the heater lamp is turned off while TRC1 is kept off. For example, the duty cycle (the period of a cycle during which the heater lamp is turned on) is maximum for variation No.1 as the heater lamp is energized for the whole envelops. The duty cycle is 60 % for variation No.3 as the heater lamp is energized for the 6 positive and negative envelops out of 10. The duty cycle is 0 since the heater lamp is kept turned off for the whole envelops.

CPU (U1) selectively switches among those variations for applying voltages to the heater lamp according to the THERMA signal which appears at pin #98 as feedback.

A fraction of THERMA is applied to pin #2 of comparator U6-1. The comparator maintains comparison of the potential at pin #2 and pin #3 which gives a reference for the possible anomaly in the heater temperature (bred by resistors R52 and R57). Should the voltage at pin #2 exceed that at pin #98, the level at pin #1 becomes low. Since pin #1 is wired to the output line for the HEAT signal, the HEAT signal is enforced to be low regardless the behavior of CPU (U1), thus preventing possible heat overrun.

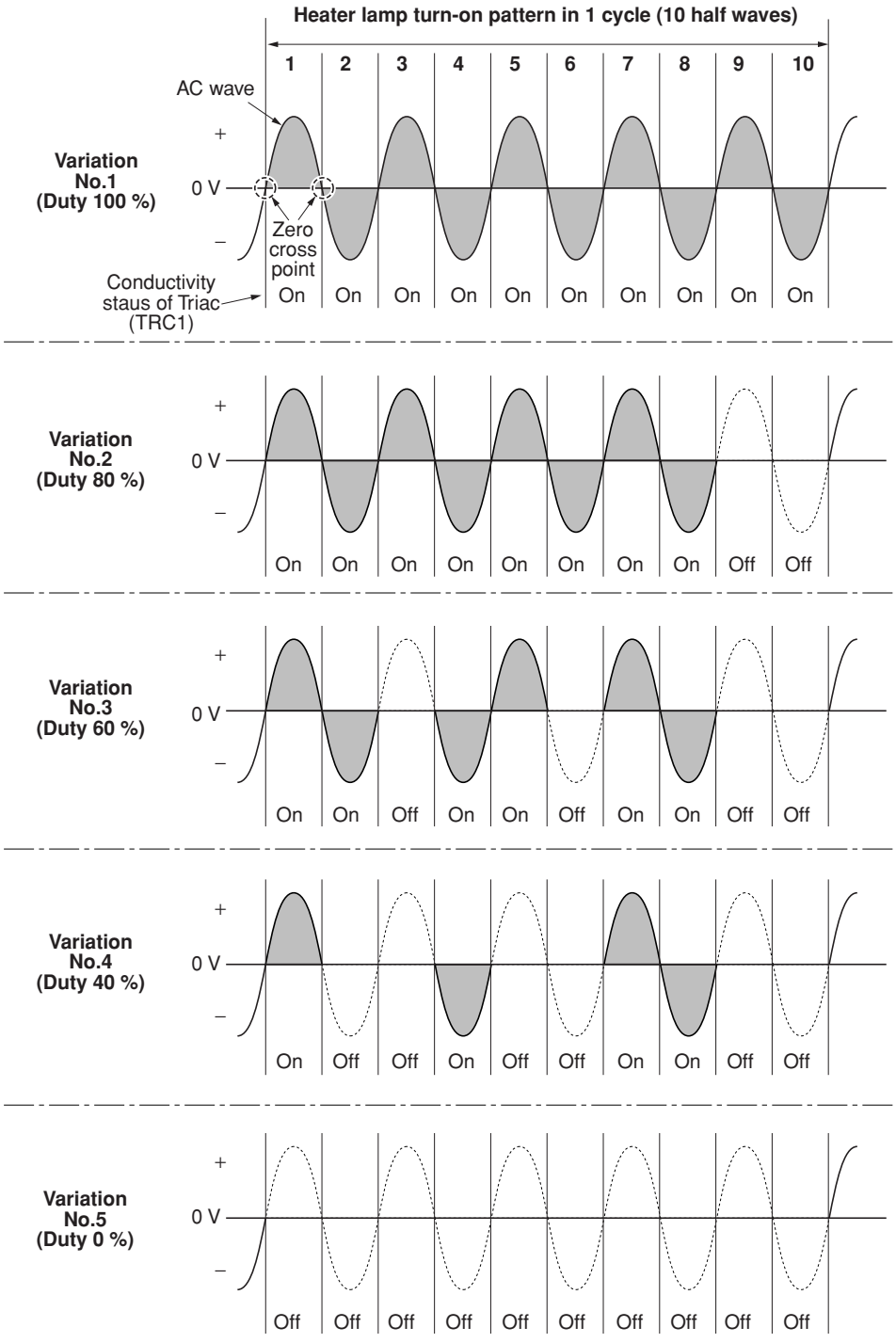


Figure 2-3-5 Heater lamp turn-on variations

(3) Polygon motor control circuit

The main controller board supplies the 2598.4 Hz clock pulse (PLGCLK) via the engine board to the PLL control IC (IC1) for the polygon motor. To begin printing, the engine CPU U1 turns PLGDR to H level, the PLL control IC (IC1) starts to revolve the polygon motor so that the revolution is 25,984 rpm which depends on the PLGCLK clock pulse. When PLL control IC (IC1) finds that the polygon motor is revolving at the rated speed, turns PLGDRN to L level to acknowledge the engine CPU that the rated speed has been achieved.

On the contrary, if PLGRDYN does not turn to L level within 8 seconds since PLGDRN has been L level.

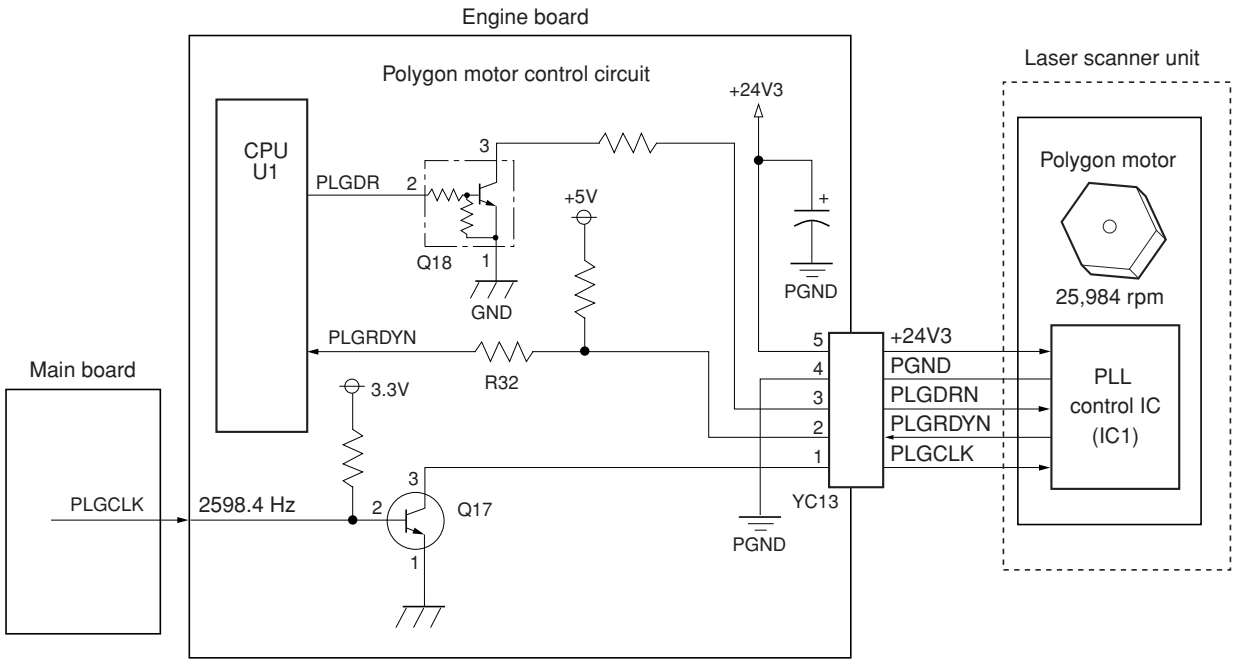


Figure 2-3-6 Polygon motor control circuit

2-3-3 Power supply board

The power supply board provides the AC power input and DC power and outputs. The high voltage bias generator circuit is mounted on a separate board. A simplified schematic diagram is shown below.

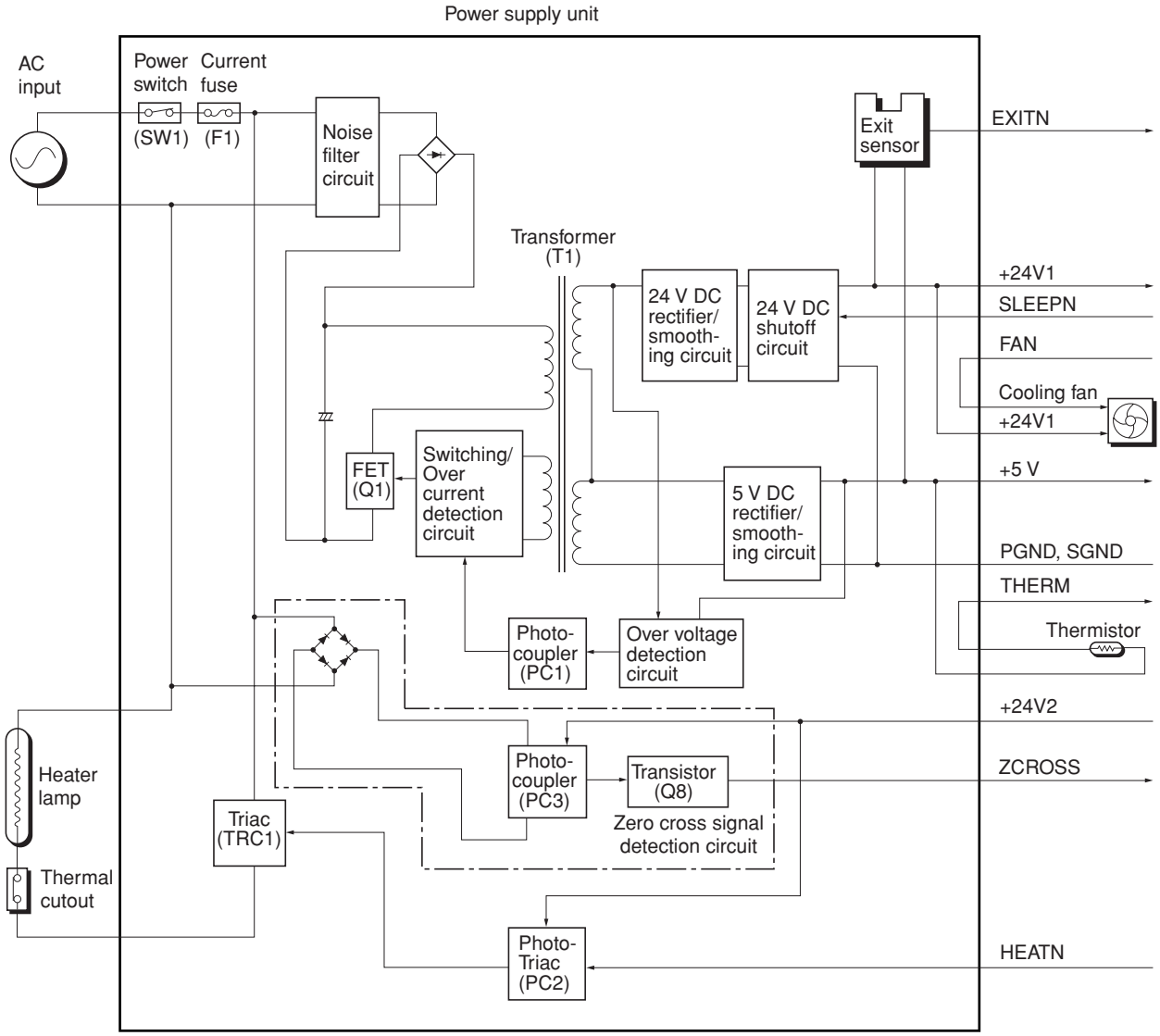


Figure 2-3-7 Power supply board circuit block diagram

2-3-4 Bias board

The bias board contains the developing bias output circuit, registration sensor, paper empty sensor, and the cassette switch. It also provides a liaison connection to the high voltage board, power supply, and the toner sensor.

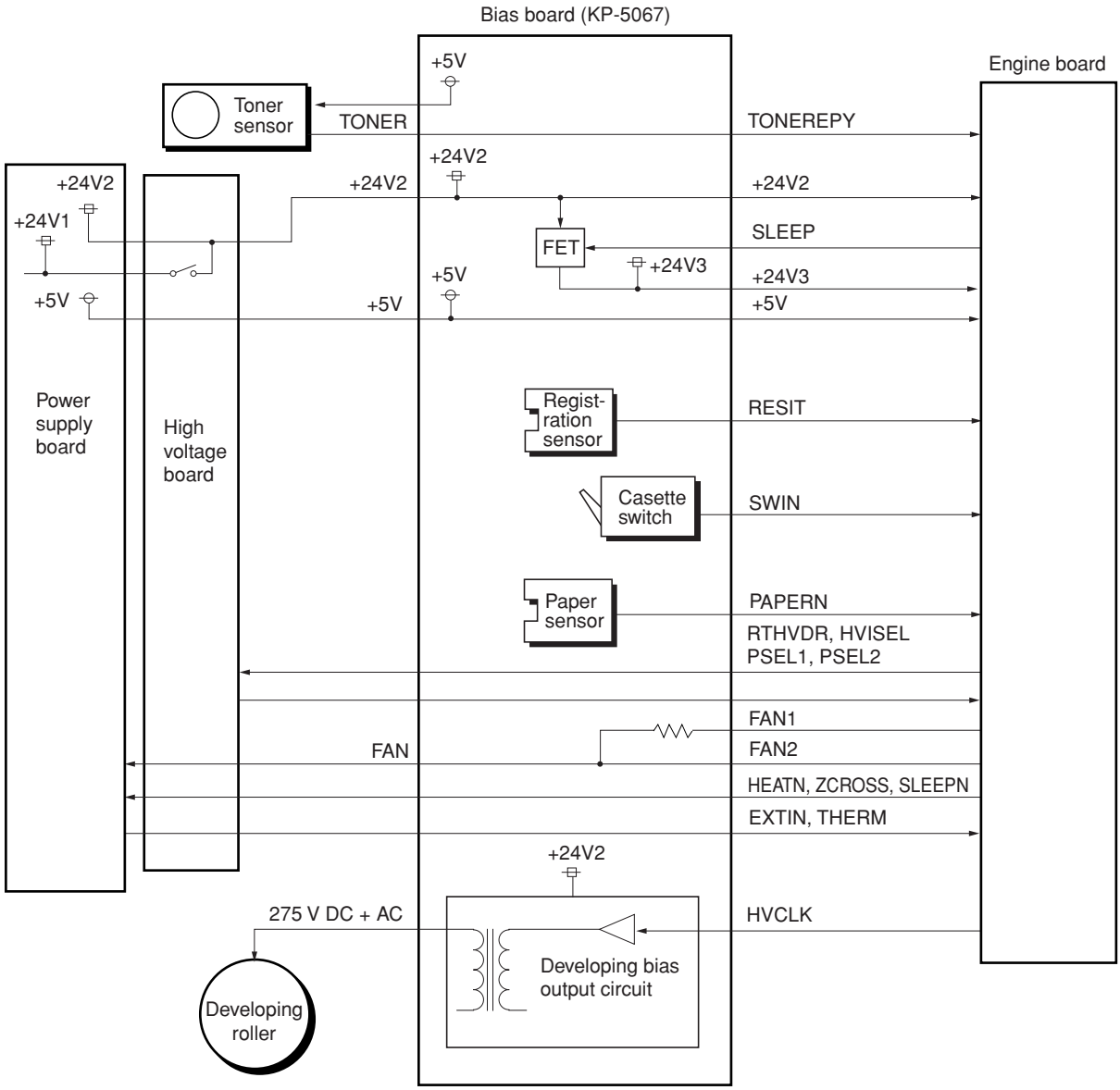


Figure 2-3-8 Bias board circuit block diagram

2-3-5 High voltage board

The high voltage board contains the high voltage output circuit, interlock switch circuit as well as providing a liaison connection with the power supply board, bias board, and the engine board.

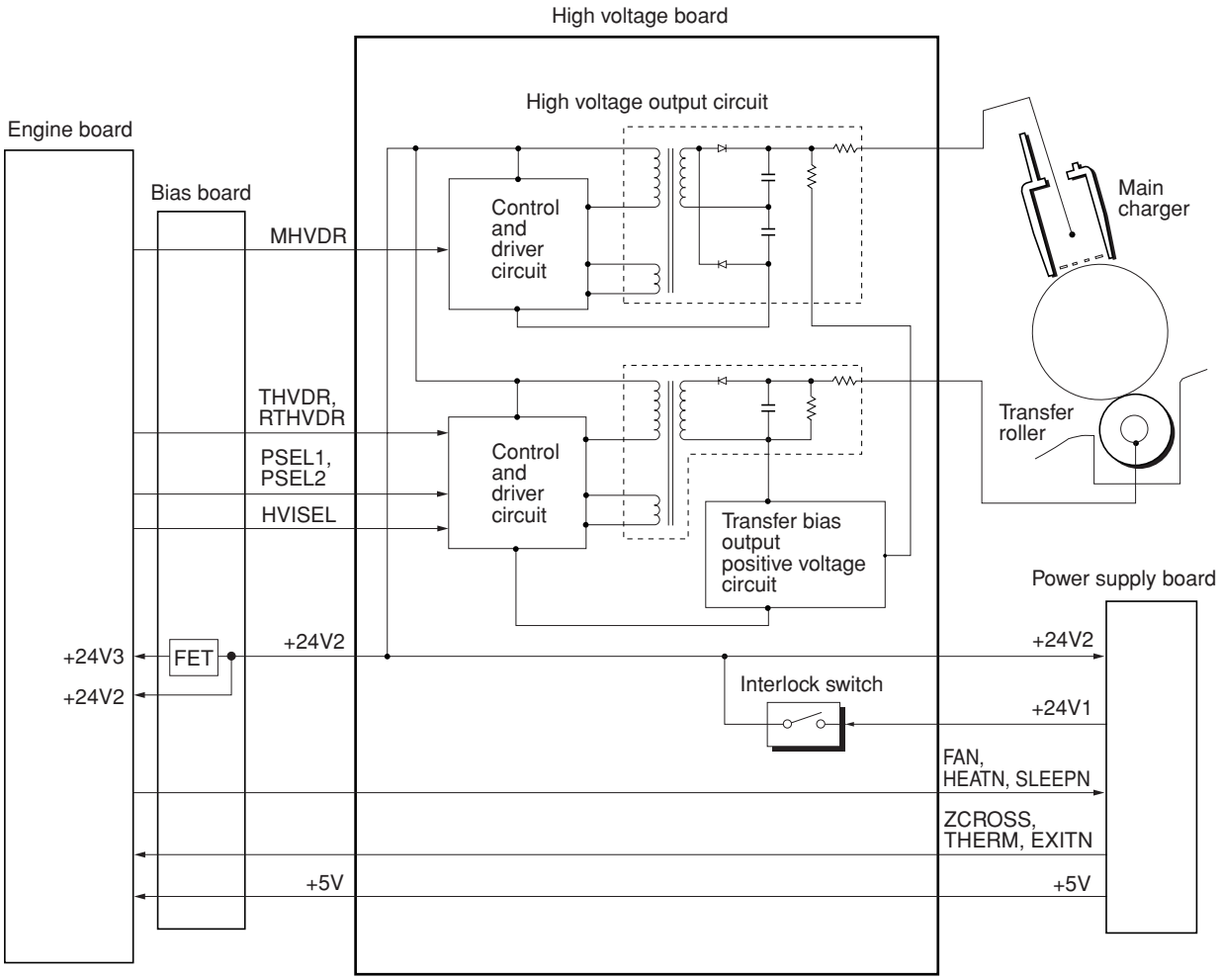


Figure 2-3-9 High voltage board circuit block diagram

(1) Interlock switch

The interlock switch is located on the high voltage board and opened and closed in conjunction with the front cover or the front top cover via the interlock lever. This switch connects and disconnects the +24 V DC power supply line. If the front cover or the front top cover is open, the interlock switch is open, and the +24 V DC to the high voltage output circuit, bias board, engine board, and the power supply board is disconnected, deactivating the high voltage output, laser output, main motor output for safety. The cooling fan is an exception: Since the cooling fan is directly fed with +24 V DC from the power supply unit at the primary side (+24V1) of the interlock switch, the cooling fan is not deactivated even the cover is open.

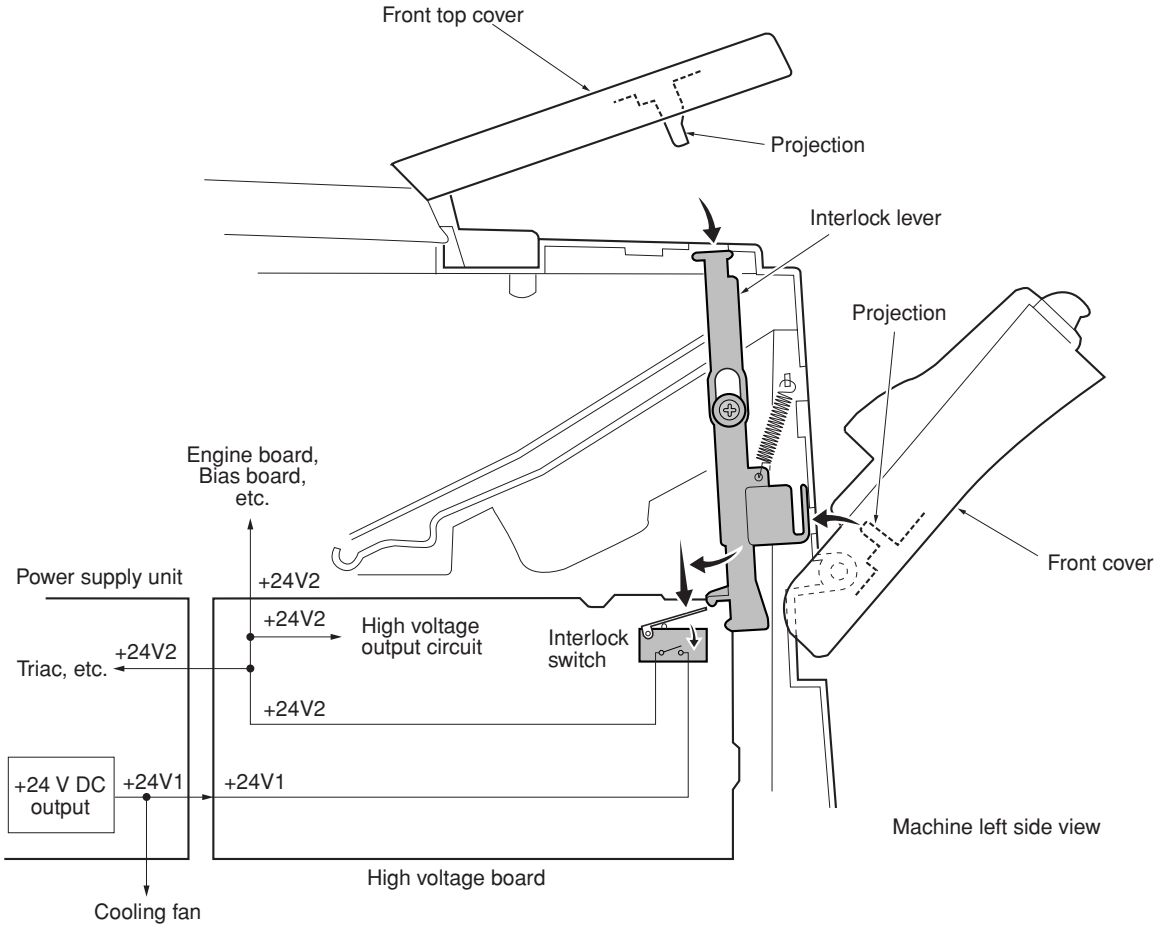


Figure 2-3-10 Interlock switch

2-3-6 CCD board

The CCD board consists mainly of a CCD sensor (U4) that scans an original. The CCD sensor (U4) is driven to scan an original by the CCD sensor control signals (CCDCLKN, SH_BW, SH_RGB, SW, SWN, CPN, and RSN) based on the clock for driving the CCD sensor (CCDCLK) supplied from the main board through the scanner board.
The image signals obtained from scanning of an original are divided into three analog signals (CCDR2, CCDG2, and CCDB2) for output. These signals are current-amplified by the amplification circuit that consists of transistors (TR1 to TR6), operational amplifiers (U6 and U7), and so on and transmitted to the analog signal processing circuit on the main board through the scanner board.
Also the CCD board relays signal lines of the scanner home position sensor and the exposure lamp.

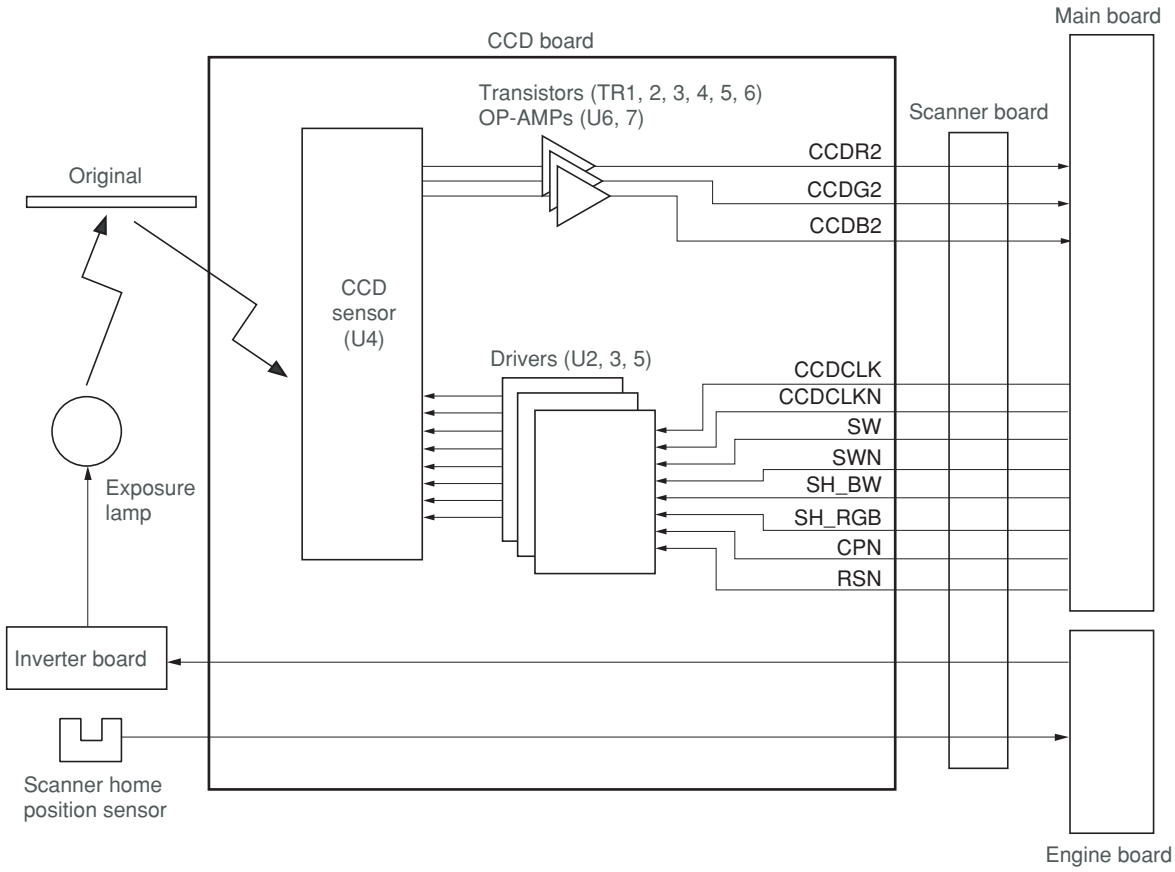


Figure 2-3-11 CCD board circuit block diagram

2-3-7 Operation board

The operation board consists of key switches, LEDs and 7-segment LED. The lighting of LEDs is determined by scan signals (SCAN0N to SCAN5N) and LED lighting selection signals (LED0N to LED7N) from the main board. The key switches operated are identified by the scan signals (SCAN0N to SCAN5N) and the return signals (KEY0N to KEY2N).
As an example, to light “L1”, the LED lighting selection signal (LED0N) should be driven low in synchronization with a low level on the scan signal (SCAN0N). LEDs can be lit dynamically by repeating such operations.
As another example, if “K2” is pressed, the corresponding key switch is turned on feeding the low level of the scan signal (SCAN1N) back to the main board via the return signal (KEY0N). The main board locates the position where the line outputting the scan signal and the line inputting the return signal cross, and thereby determines which key switch was operated.

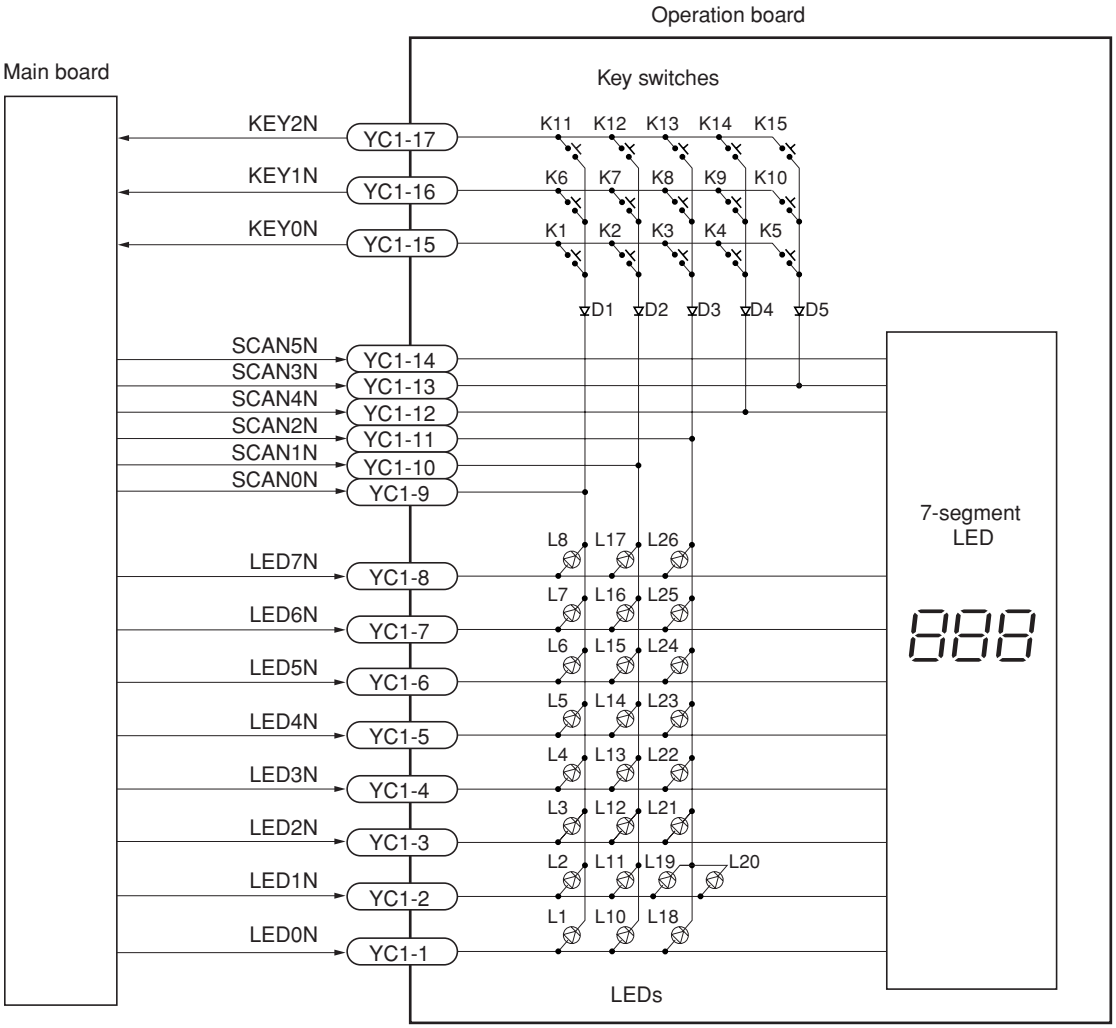


Figure 2-3-12 Operator board circuit block diagram

2-3-8 Scanner board

The scanner board consists of scanner driver circuit Q1 to Q5 and exposure lamp driver circuit U1, relays signals from engine board, main board, operation board, CCD board and optional document processor.

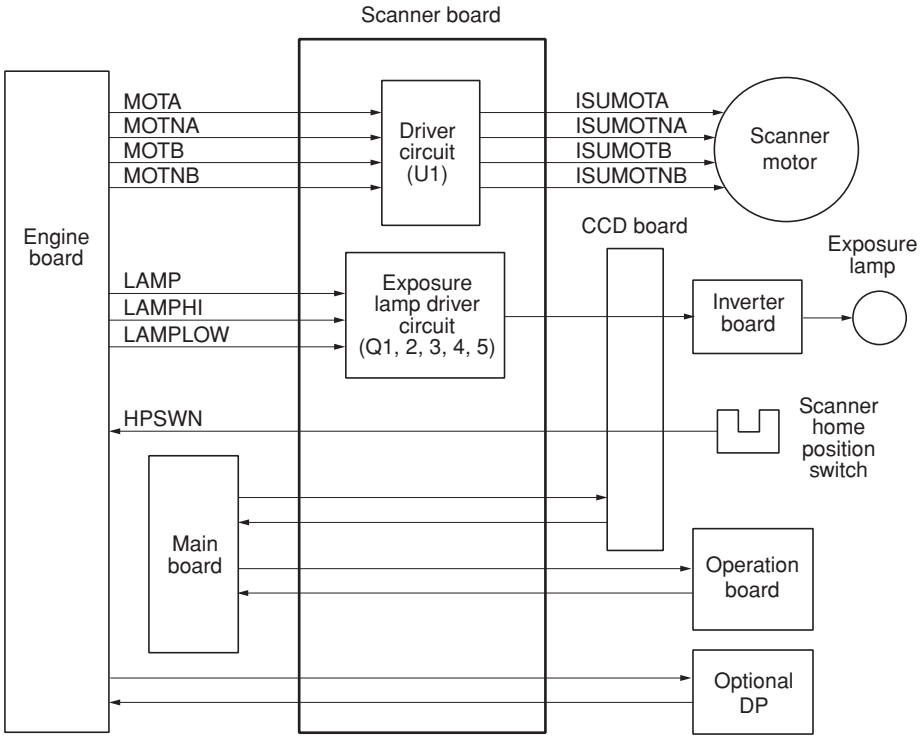
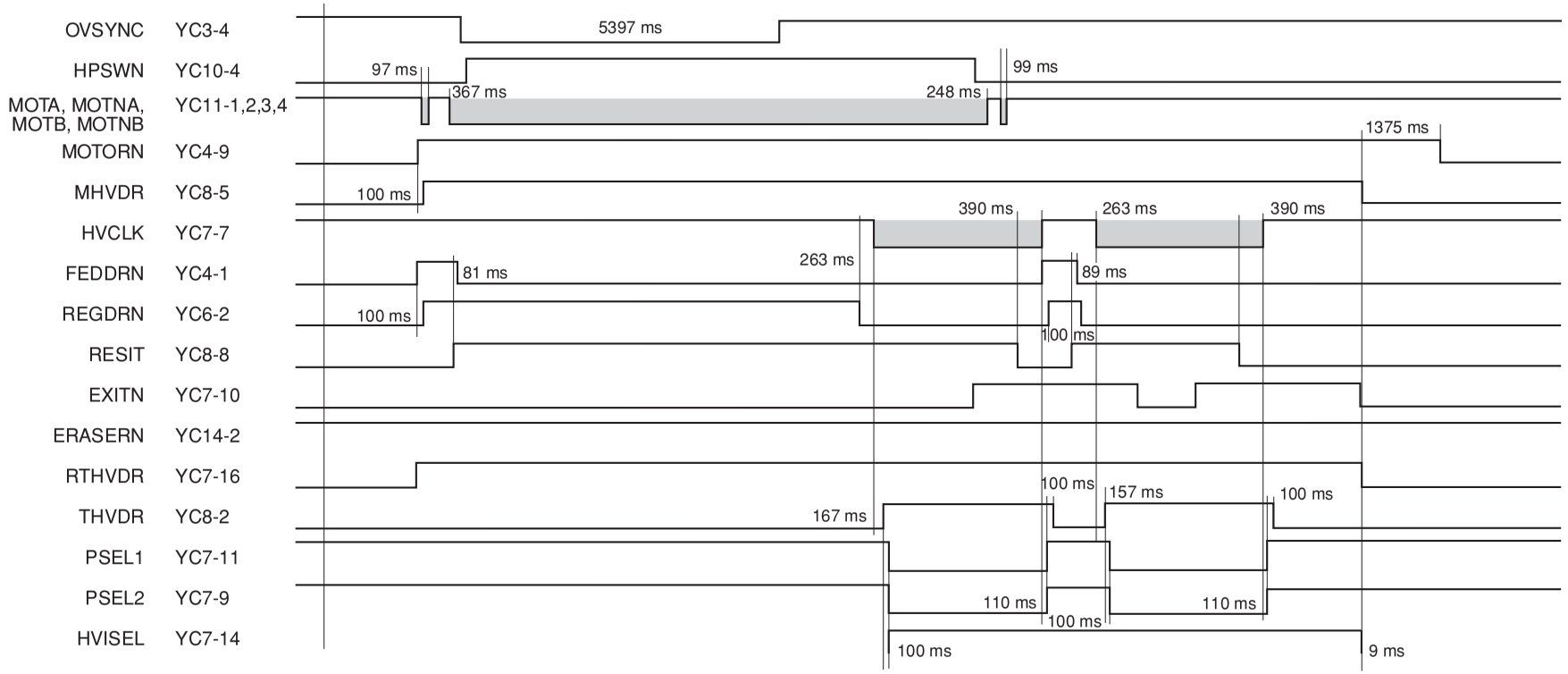
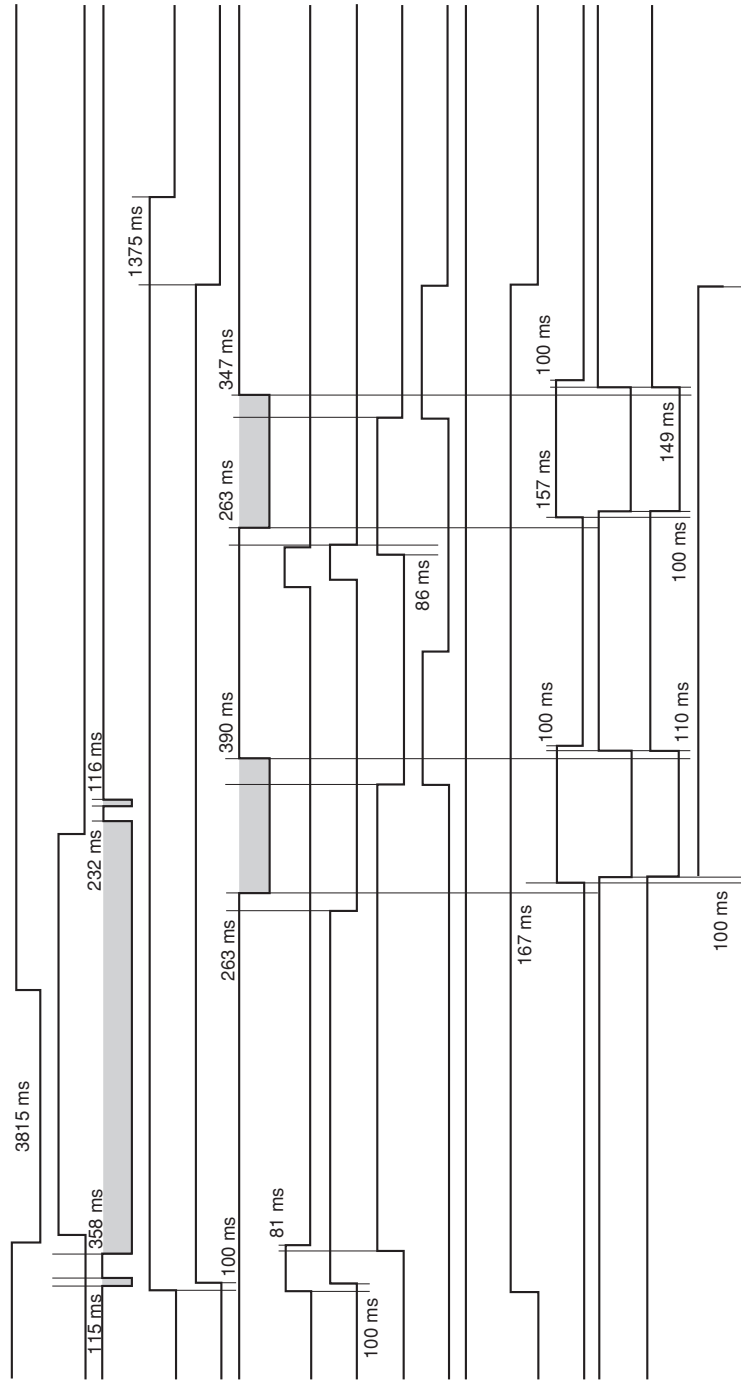


Figure 2-3-13 Scanner board circuit block diagram

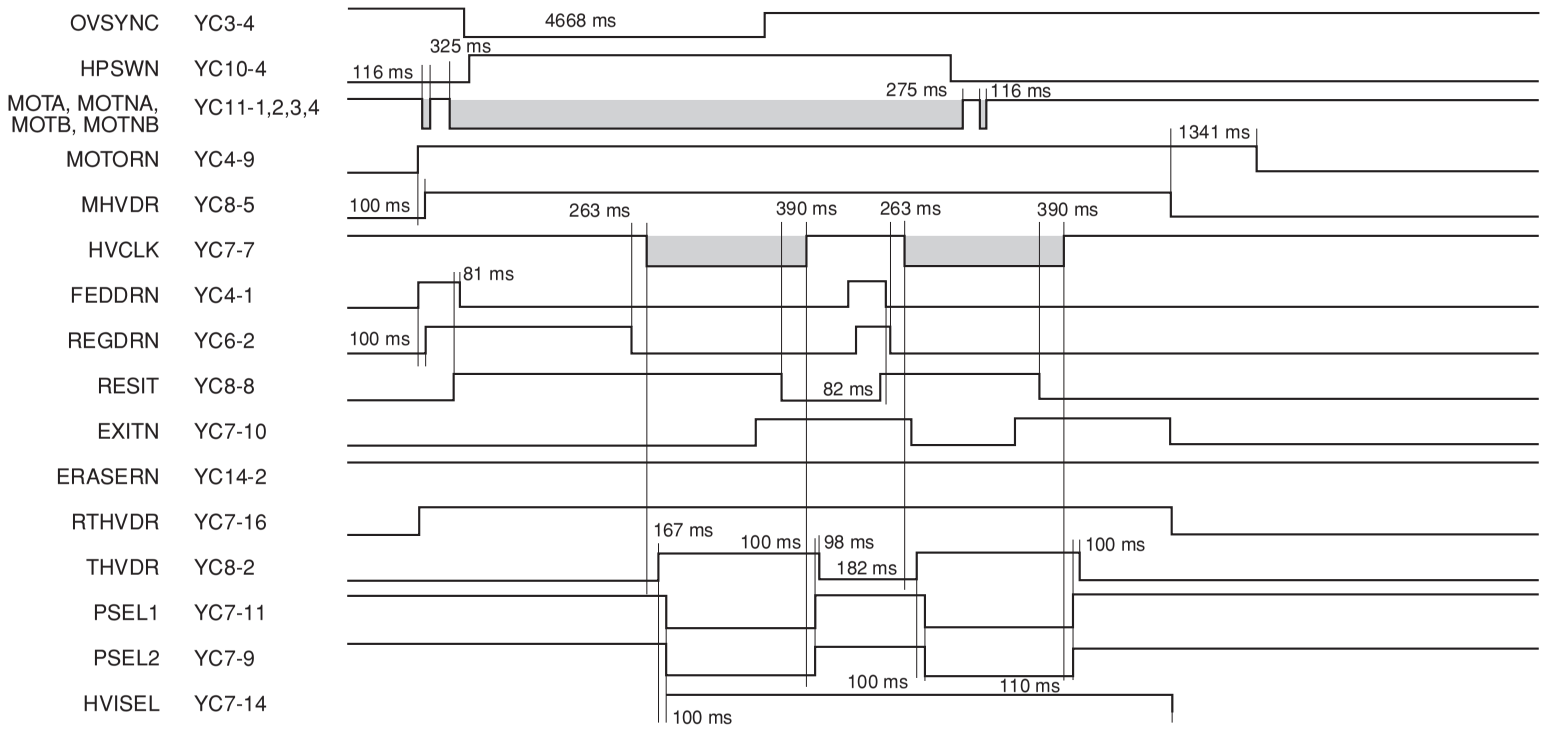
Timing chart No. 1 Continuous copying of an A4R/8$^{1}/_{2}$" × 11" original onto two sheets of A4R/8$^{1}/_{2}$" × 11"R copy paper



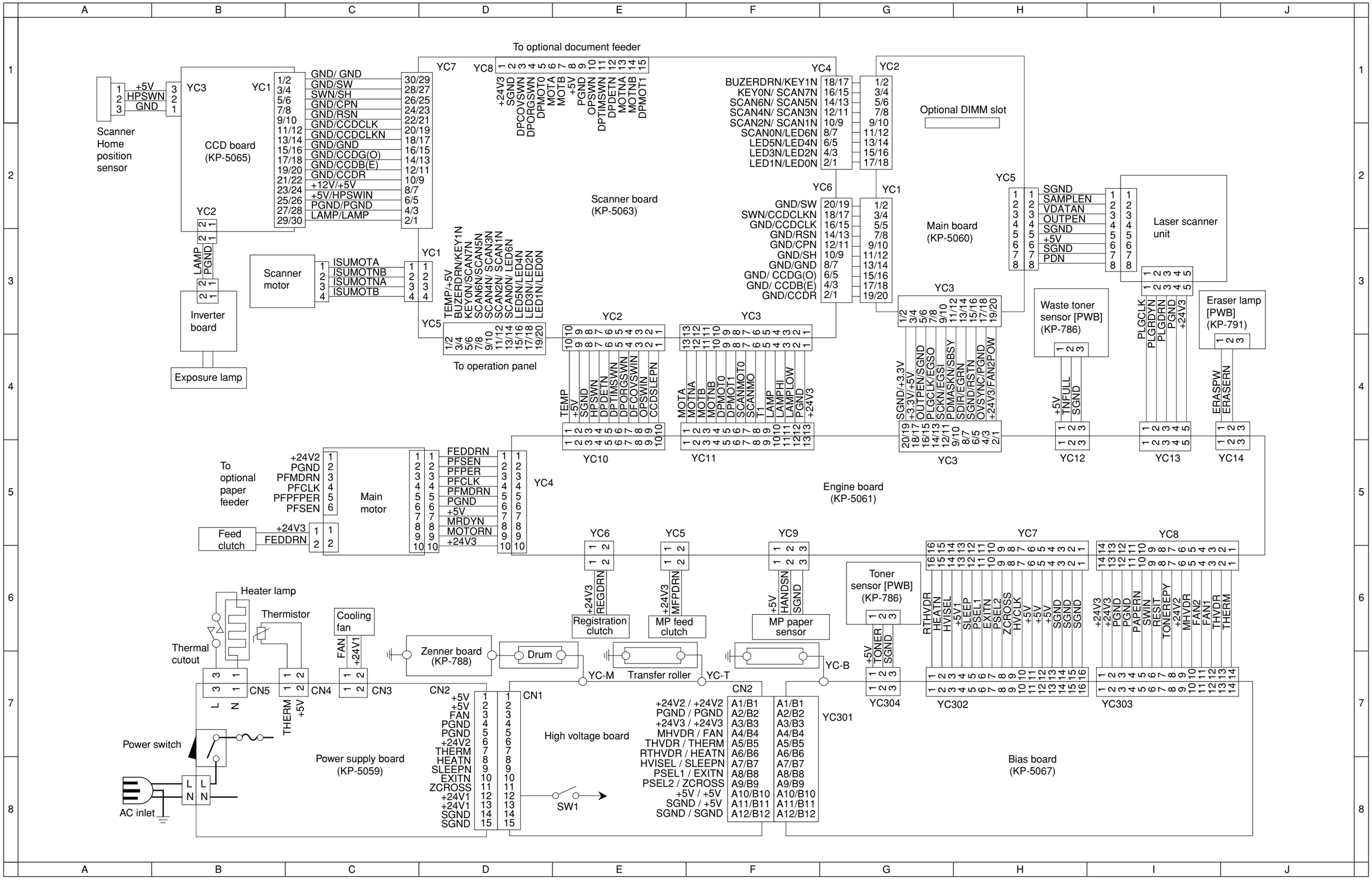
Timing chart No. 2 Continuous copying of an A5R/5$^{1}/_{2}$"×8$^{1}/_{2}$" original onto two sheets of A5R/5$^{1}/_{2}$"×8$^{1}/_{2}$" copy paper



Timing chart No. 3 Continuous copying of an B5R original onto two sheets of B5R copy paper



Wiring diagram



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