KYOCERA mita

KM-1525

SERVICE MANUAL

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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.

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

1-6 Assembly and Disassembly

2-2 Electrical Parts Layout

2-3 Operation of the PCBs

2-4 Appendixes

1-1-1 Specifications

Type	Desktop
Copying system	Indirect electrostatic system
Originals	Sheets and books Maximum size: A3
Original feed system	Fixed
Copy paper	Drawer: Plain paper (64 – 80 g/m^2) Bypass table: Plain paper (60 – 160 g/m^2) Special paper: Transparencies, tracing paper and letterhead Note: Use the bypass table for special paper.
Copying sizes	Maximum: A3 Minimum: A6R/Folio (When the bypass table is used)
Magnification ratios	Manual mode: 50 – 200%, 1% increments
Copy speed	At 100% magnification in copy mode: A4: 15 copies/min. A4R: 10 copies/min. A3: 8 copies/min. B5: 15 copies/min. B5R: 10 copies/min. B4 (257 × 364 mm): 8 copies/min.
First copy time	Within 5.5 seconds (A4, 100% magnification, drawer)
Warm-up time	Within 30 seconds (room temperature 20°C/68°F, 65% RH) In preheat/energy saver mode: Within 30 seconds (room temperature 20°C/68°F, 65% RH) [priorty to power save] In preheat/energy saver mode: Within 15 seconds (room temperature 20°C/68°F, 65% RH) [priorty to recovery]
Paper feed system	Automatic feed Capacity: Drawers: 250 sheets Manual feed Capacity: Bypass: 50 sheets (A4, A4R, B5, B5R, A5R, B6R, A6R) 25 sheets (A3, B4, Folio)
Continuous copying	1 – 250 sheets
Photoconductor	OPC (drum diameter 30 mm)
Charging system	Single positive corona charging
Exposure light source	Semiconductor laser
Exposure scanning system	Polygon mirror
Developing system	Dry, reverse developing (magnetic brush) Developer: 2-component, ferrite carrier and N29T black toner Toner density control: toner sensor Toner replenishing: automatic from a toner cartridge
Transfer system	Transfer roller
Fixing system	Heat roller Heat source: halogen heaters (910 W) Control temperature: 180°C (at normal ambient temperature) Abnormally high temperature protection device: 140°C thermostat Fixing pressure: 49 N
Charge erasing system	Exposure by cleaning lamp
Cleaning system	Cleaning blade
Scanning system	Flat bed scanning by CCD image sensor
Resolution	600 × 600 dpi
Light source	Inert gas lamp
Dimensions	550 (W) × 560 (D) × 455 (H) mm
Weight	Approx. 38 kg
Floor requirements	891 (W) × 560 (D) mm
Functions	Self-diagnostics, preheat, automatic copy density control, enlargement/reduction copy and photo mode
Power source	220 – 240 V AC, 50/60 Hz, 2.8 A
Power consumption	1080W
Option	Total counter

1-1-2 Parts names and their functions

(1) Copier

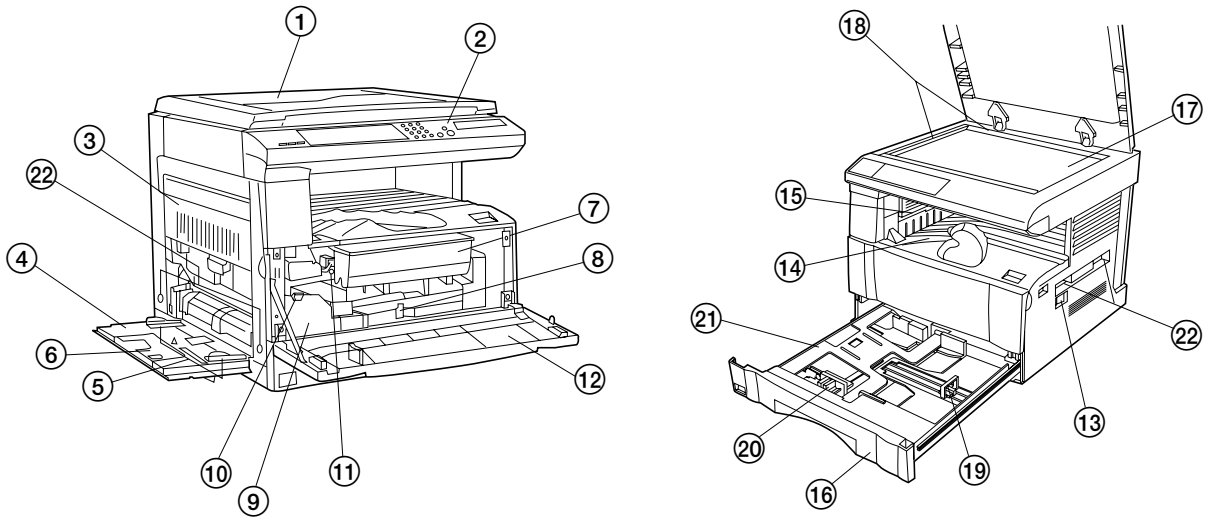


Figure 1-1-1

① Original cover
② Operation panel
③ Paper conveying unit
④ Multi-Bypass
⑤ Insert guides
⑥ Support tray
⑦ Toner cartridge
⑧ Toner cartridge release lever
⑨ Waste toner tank
⑩ Waste toner tank release lever
⑪ Cleaning shaft
⑫ Front cover
⑬ Main switch
⑭ Copy store section
⑮ Ejection section
⑯ Drawer
⑰ Platen
⑱ Original size scales
⑲ Length adjustment plate
⑳ Width adjustment lever
㉑ Drawer lift
㉒ Handles for transport

(2) Operation panel

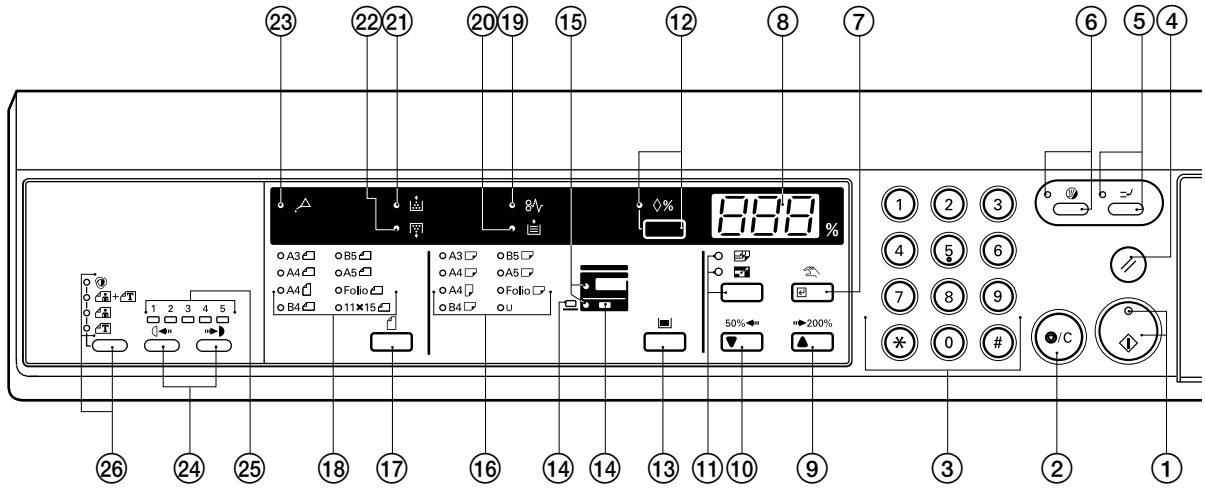


Figure 1-1-2

① Start key (Indicator)
② Stop/Clear key
③ Numeric keys
④ Reset key
⑤ Interrupt key (Indicator)
⑥ Energy Saver (preheat) key (Indicator)
⑦ Manual/Enter key
⑧ Copy quantity/magnification display
⑨ Zoom (+) key
⑩ Zoom (-) key
⑪ Auto mode selection key/APS/AMS indicators
⑫ Recall key (Indicator)
⑬ Paper Select key
⑭ Drawer select indicators
⑮ Misfeed location indicators
⑯ Paper size indicators
⑰ Original key
⑱ Original size indicators
⑲ Misfeed indicator
⑳ Add Paper indicator
㉑ Add Toner indicator
㉒ Toner Disposal indicator
㉓ Maintenance indicator
㉔ Copy exposure adjustment keys
㉕ Copy exposure indicators
㉖ Image mode selection key/Auto Exposure/Text & Photo/Photo/Text indicators

1-1-3 Machine cross section

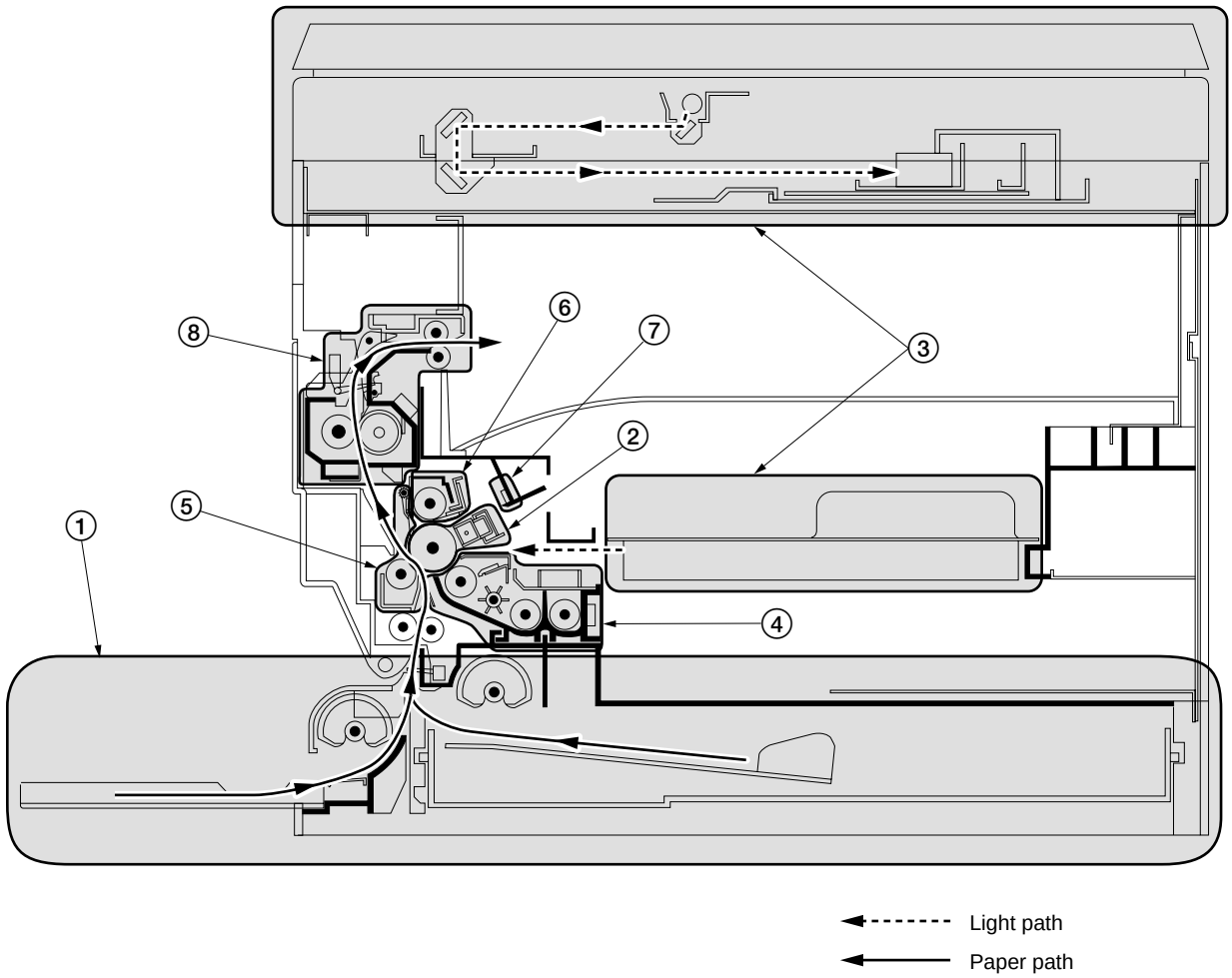
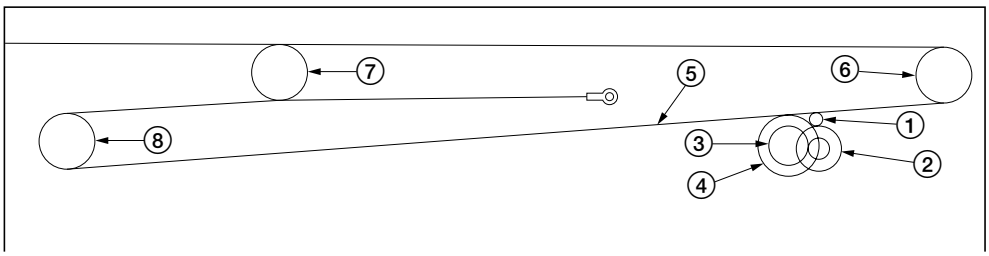


Figure 1-1-3 Machine cross section

① Paper feed section
② Main charging section
③ Optical section
④ Developing section
⑤ Transfer and paper conveying section
⑥ Cleaning section
⑦ Charge erasing section
⑧ Fixing section

1-1-4 Drive system

(1) Drive system 1 (optical section)

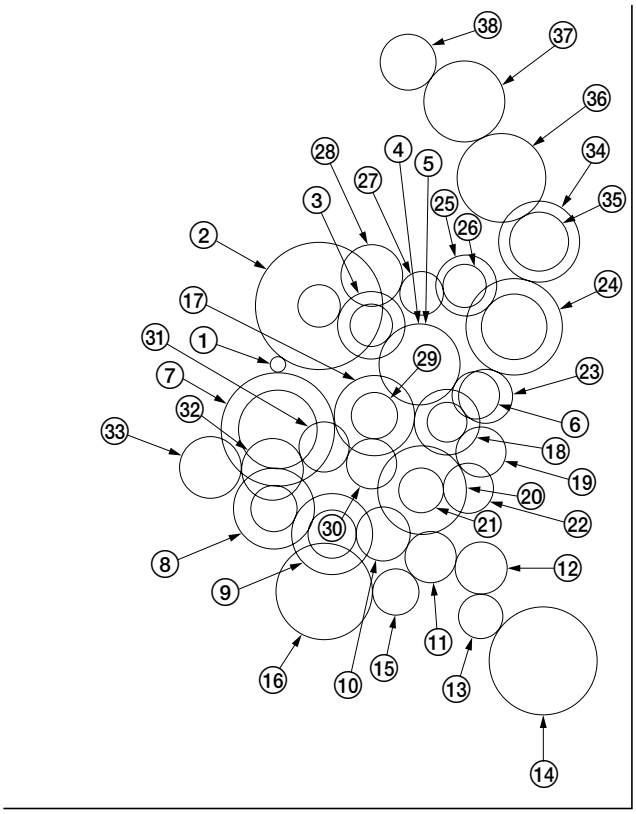


As viewed from machine front

Figure 1-1-4

① Scanner motor gear
② Gear 44/16
③ Gear 26
④ Scanner wire drum
⑤ Scanner wire
⑥ Scanner wire pulley
⑦ Scanner wire pulley
⑧ Scanner wire pulley

(2) Drive system 2 (drive motor drive train)



As viewed from machine rear

Figure 1-1-5

① Drive motor gear
② Gear 58/30
③ Gear 48/27
④ Gear 60
⑤ Drum gear
⑥ Transfer roller gear
⑦ Gear 52/30
⑧ Gear 32/16
⑨ Gear 32/16
⑩ Gear 20
⑪ Gear 20
⑫ Gear 20
⑬ Idle gear 16
⑭ Bypass paper feed clutch gear
⑮ Gear 16
⑯ Upper paper feed clutch gear
⑰ Gear 30
⑱ Gear 26/14
⑲ Gear 20
⑳ Registration clutch gear
㉑ Gear 15
㉒ Gear 18
㉓ Gear 20
㉔ Gear 34/23
㉕ Gear 24
㉖ Gear 15
㉗ Spiral gear 17
㉘ Blade thrust gear 21
㉙ Gear 16
㉚ Idle gear
㉛ Gear 19
㉜ Gear 23
㉝ Gear 23
㉞ Gear 29
㉟ Fixing gear 19
㊱ Heat roller gear 35
㊲ Idle gear
㊳ Gear 21

1-2-1 Drum

Note the following when handling or storing the drum.

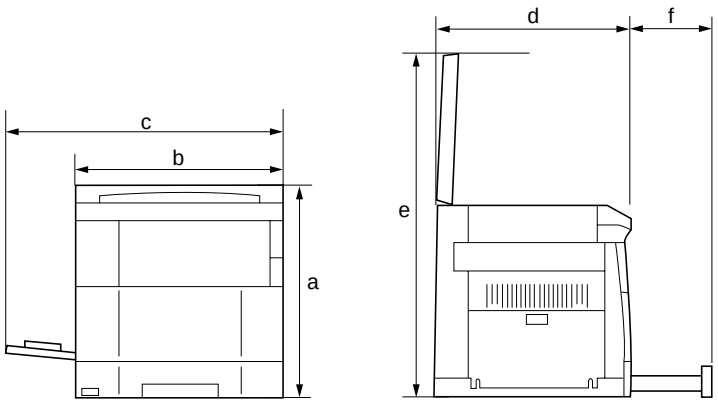
- When removing the image formation unit, never expose the drum surface to strong direct light.
- Keep the drum at an ambient temperature between –20°C/–4°F and 40°C/104°F and at a relative humidity not higher than 85% RH. Avoid abrupt changes in temperature and humidity.
- Avoid exposure to any substance 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.
- If the machine is left open for more than 5 minutes for maintenance, remove the drum and store it in the drum storage bag (Part No. 78369020).

1-2-2 Developer and toner

Store the developer and toner in a cool, dark place. Avoid direct light and high humidity.

1-2-3 Installation environment

1. Temperature: 10 - 35°C/50 - 95°F
2. Humidity: 15 - 85%RH
3. Power supply: 220 - 240 V AC, 2.8 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: 100 mm/4"
   Machine right: 700 mm/27 5/8" Machine left: 600 mm/23 5/8"

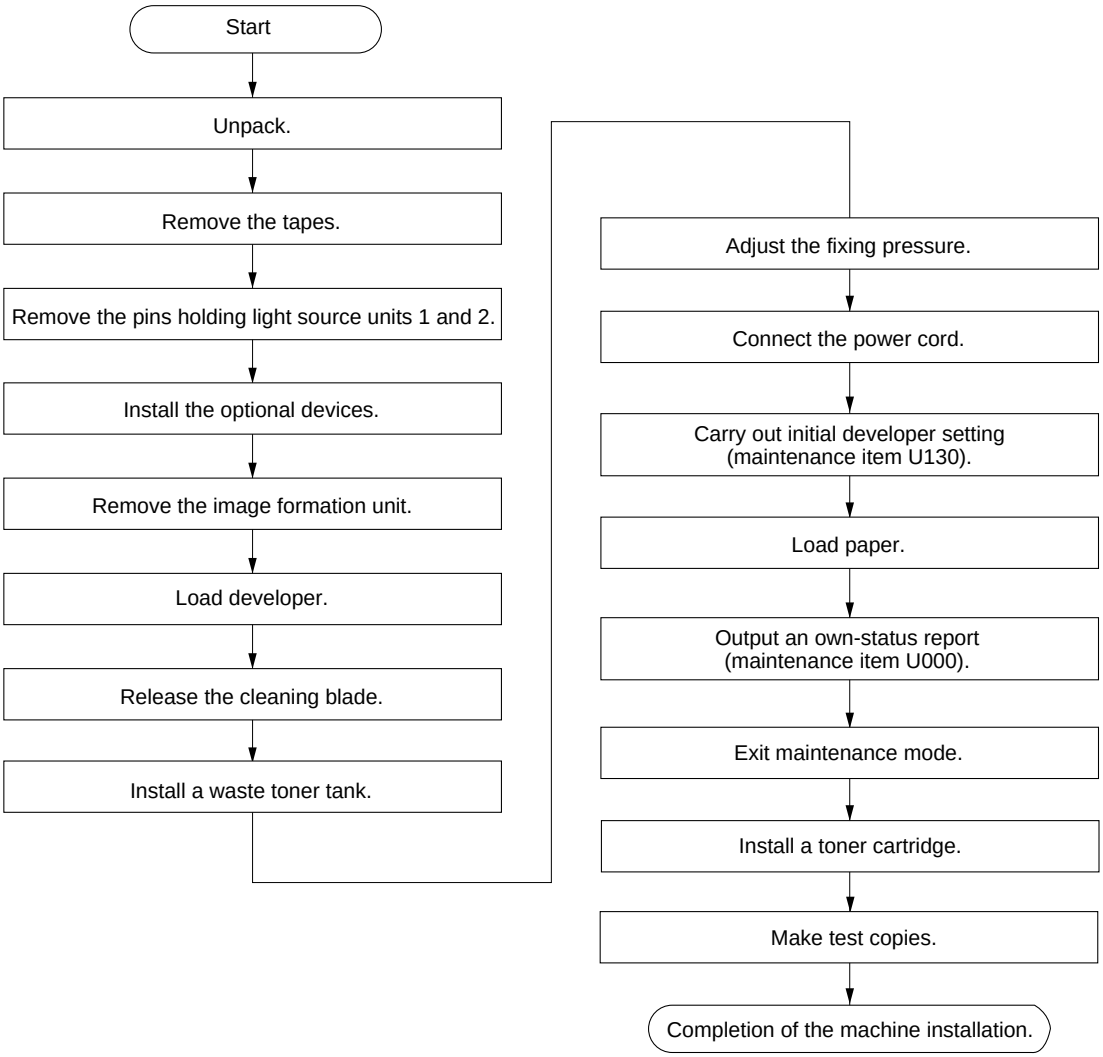


a: 455 mm/17 15/16"
b: 550 mm/21 5/8"
c: 718 mm/28 1/4"
d: 560 mm/22 1/16"
e: 930 mm/36 5/8"
f: 418 mm/16 7/16"

Figure 1-2-1 Installation dimensions

1-3-1 Unpacking and installation

(1) Installation procedure



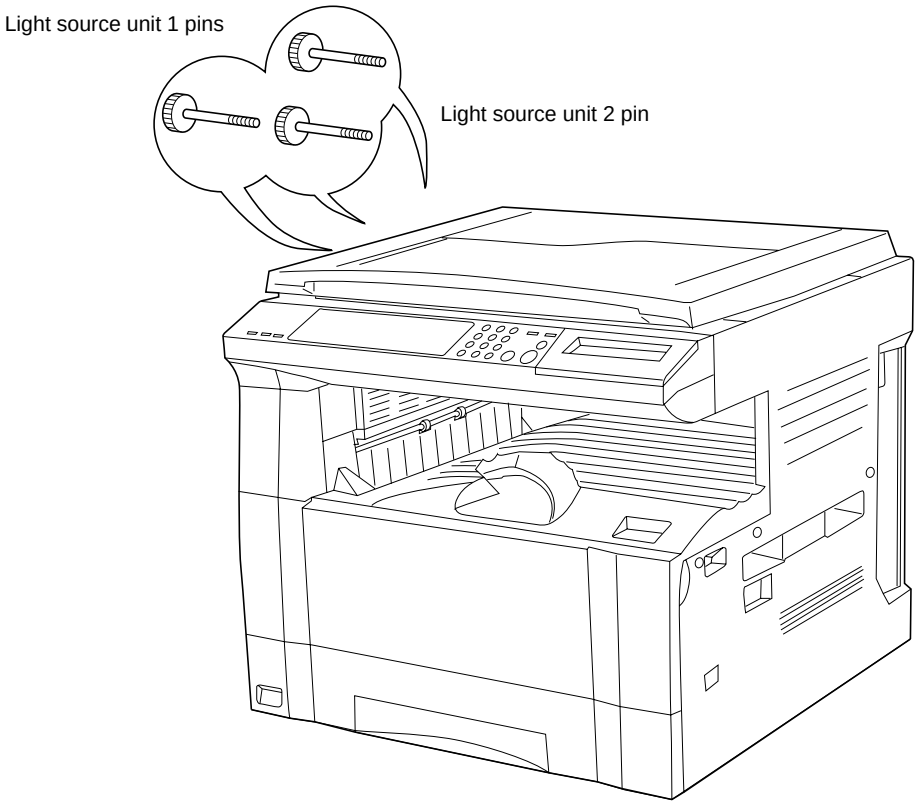


Figure 1-3-1

Unpack.

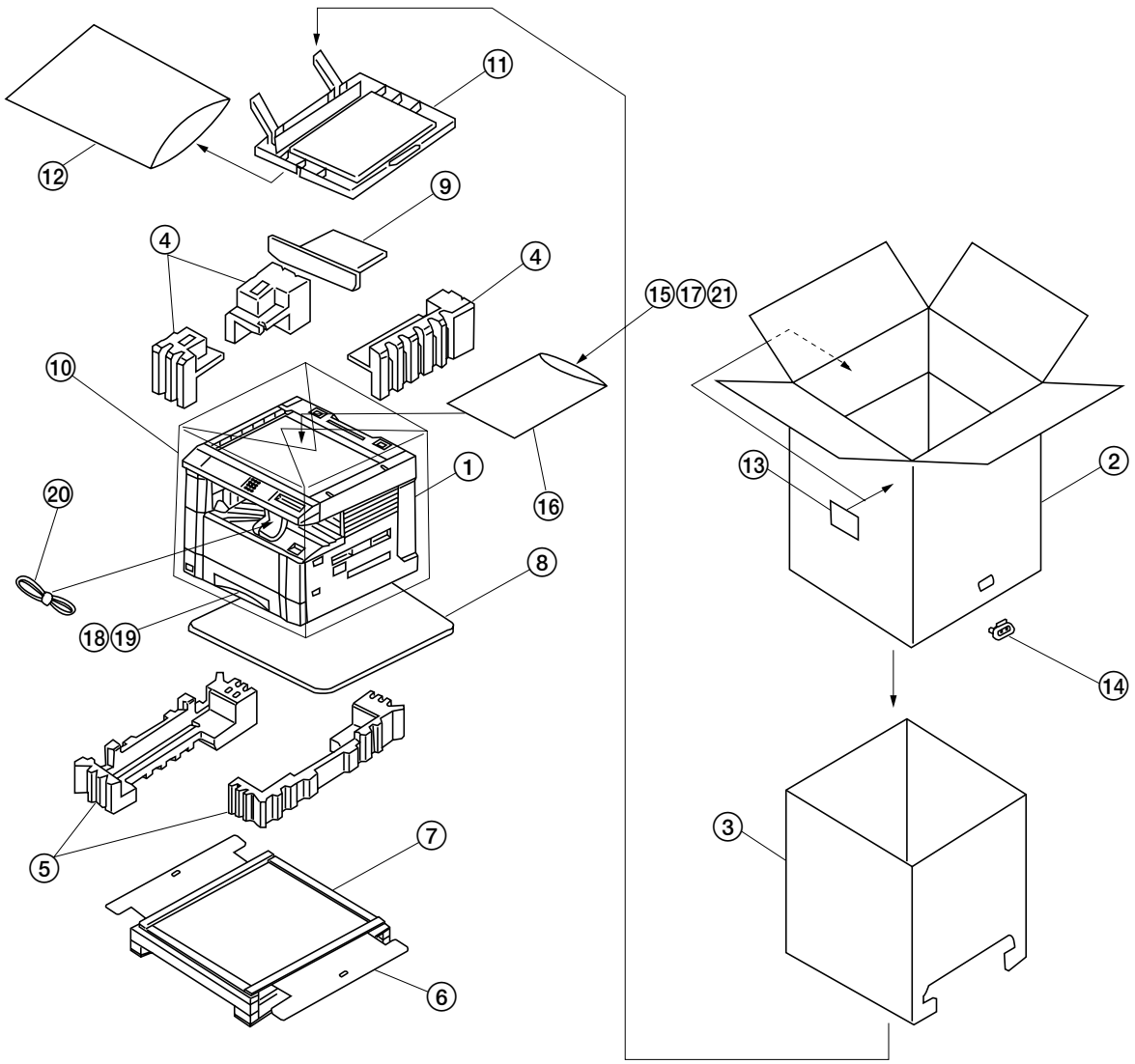


Figure 1-3-2 Unpacking

① Copier
② Outer case
③ Inner frame
④ Upper pads
⑤ Bottom pads
⑥ Bottom case
⑦ Skid
⑧ Bottom plate
⑨ Spacer*1
⑩ Machine cover
⑪ Original cover
⑫ Plastic bag
⑬ Bar code labels
⑭ Hinge joint
⑮ Drawer size sheet
⑯ Plastic bag
⑰ Error code label*2
⑱ Drawer spacers
⑲ Drawer claw spacers
⑳ Power cord
㉑ Paper storage bag

*1: 230 V specifications only.
*2: Asia and Oceania specifications only.

Remove the tapes.

1. Remove the tape holding the front cover and the power cord, and remove the tape binding the power cord.
2. Remove the tape holding the drawer.
3. Remove the two tapes holding the paper conveying unit and bypass tray.
4. Remove the three tapes holding the pins for light source units 1 and 2.

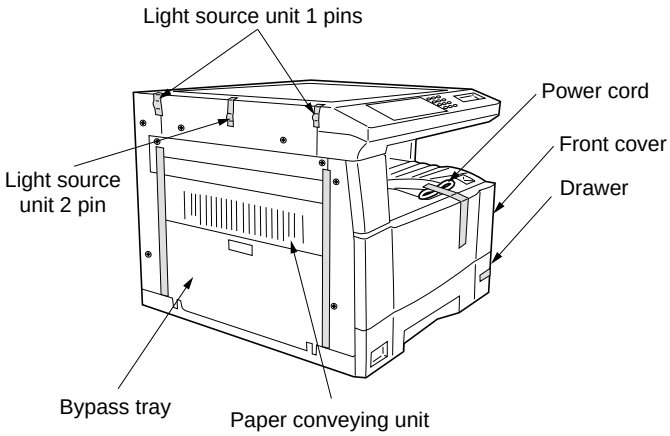


Figure 1-3-3

5. Pull the drawer out and remove the tape holding each of the drawer spacers and then the spacers.
6. Remove the tape holding the fulcrum of the drawer lift inside the drawer.

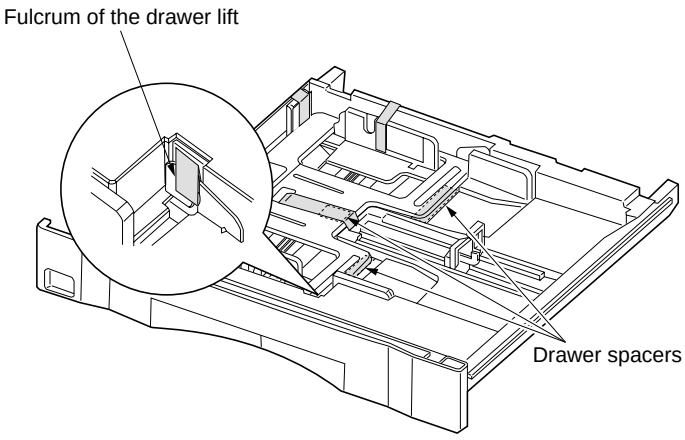


Figure 1-3-4

7. Remove the tape holding each of the front and rear cursors.

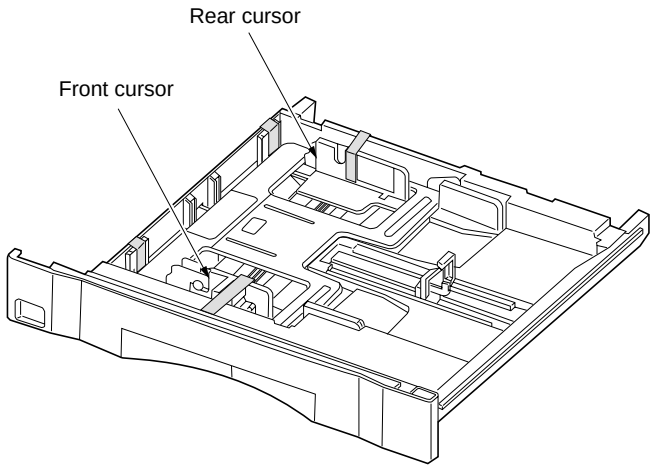


Figure 1-3-5

8. Remove the tape holding each of the drawer claw spacers and then the spacers.
9. Refit the drawer.

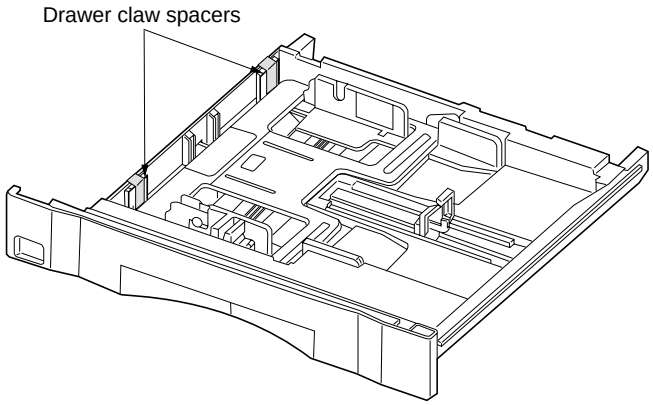


Figure 1-3-6

Remove the pins holding light source units 1 and 2.

1. Remove the two pins for light source unit 1 and the pin for light source unit 2.

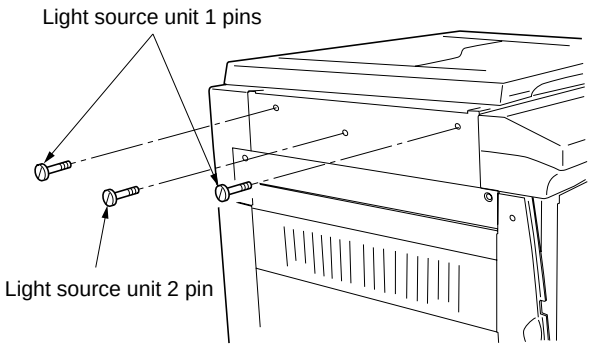


Figure 1-3-7

Remove the image formation unit.

1. Open the front cover, bypass tray and the paper conveying unit.
2. Remove the two screws and disconnect the 12-pin connector. While pressing the hook on the front image formation cover, pull the image formation unit out.

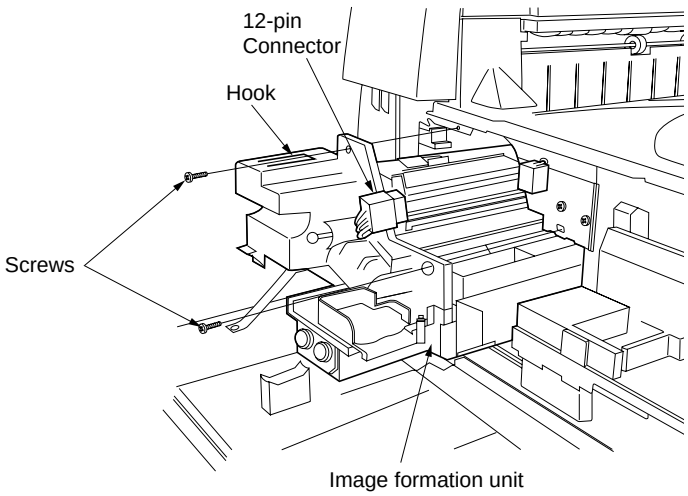


Figure 1-3-8

Load developer.

1. Remove the developing unit upper cover by pushing and lifting it in the direction of the arrow in the diagram.
   Caution: Be sure to place the image formation unit on a level surface when loading developer.

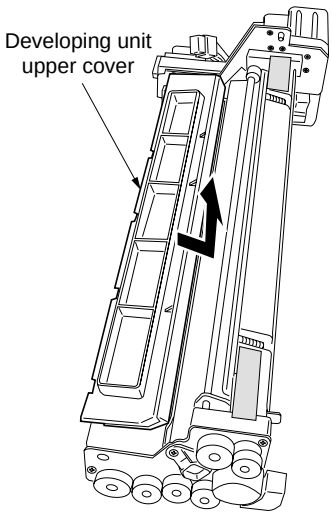


Figure 1-3-9

2. Shake the developer bottle well to agitate the developer.
3. While turning the magnet roller gear in the direction of the arrow in the diagram, uniformly pour developer into the image formation unit.
   Caution: Never turn the magnet roller gear in the reverse direction.

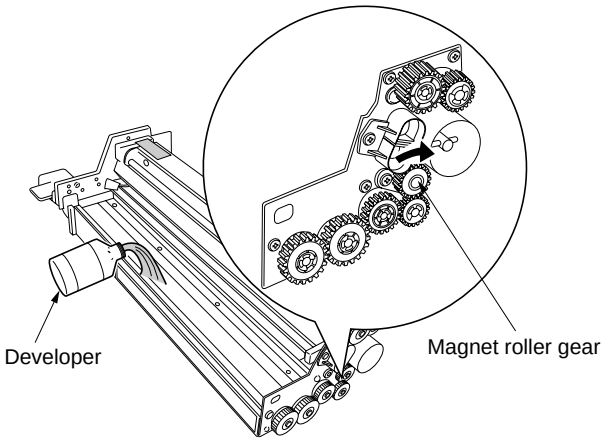


Figure 1-3-10

4. Refit the developing unit upper cover.

Release the cleaning blade.

1. Remove the tape holding each of the two cleaning blade release levers. Apply the cleaning blade to the drum by gently pushing the cleaning blade release levers in the direction of the arrows in the diagram using a screwdriver.
   •The cleaning blade comes into contact with the drum.

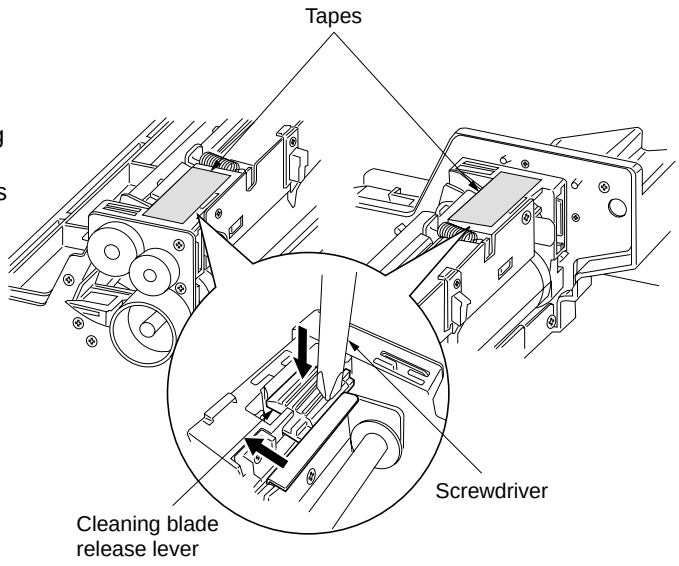


Figure 1-3-11

2. Check that the cleaning shaft is inserted as far as it will go.
3. Refit the image formation unit using the two screws.
4. Connect the 12-pin connector.

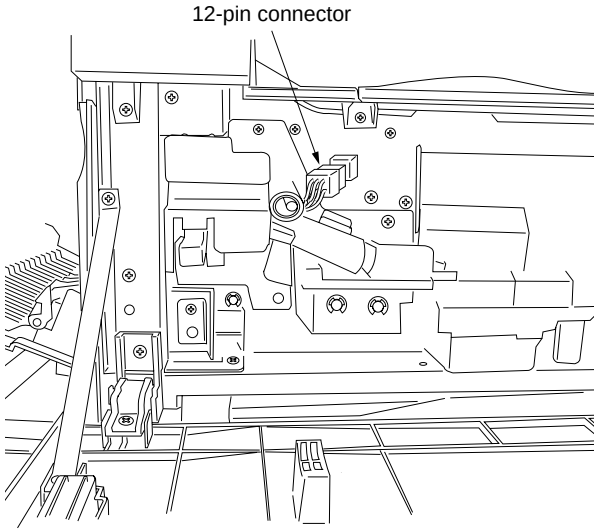


Figure 1-3-12

Install a waste toner tank.

1.While holding the waste toner tank release lever up, fit the waste toner tank in the copier.

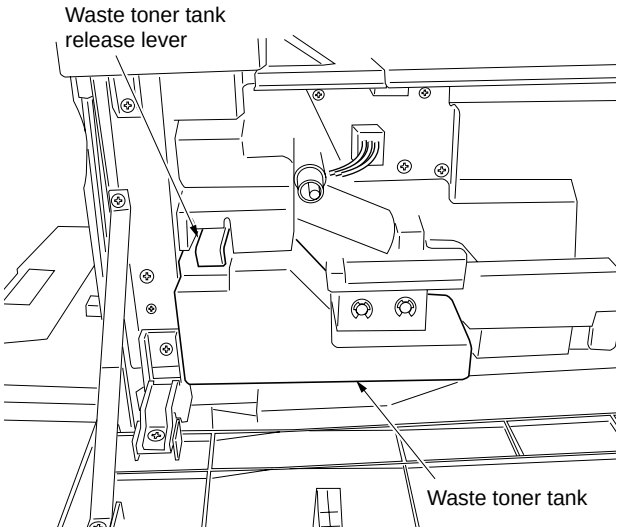


Figure 1-3-13

2. Close the front cover.

Adjust the fixing pressure.

1. Remove the two blue screws.
2. Close the paper conveying unit and the bypass tray.

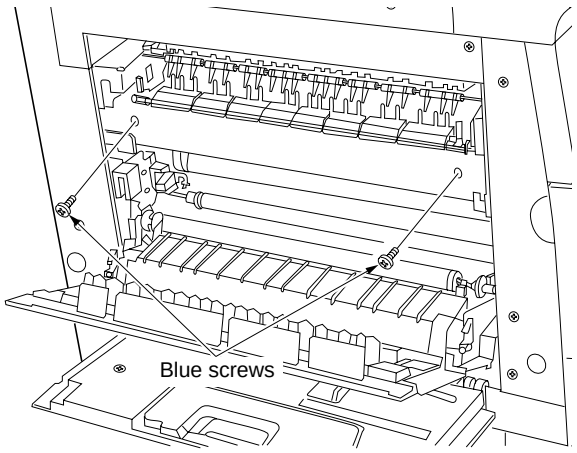


Figure 1-3-14

Connect the power cord.

1. Connect the power cord to the connector on the copier.
2. Insert the power plug into the wall outlet.

Carry out initial developer setting (maintenance item U130).

1. Turn the main switch on and enter the maintenance mode by entering “10871087” using the numeric keys.
2. Enter “130” using the numeric keys and press the start key.
3. Press the start key to execute the maintenance item.
   The drive stops within approximately 4 minutes and the toner feed start level and toner sensor control voltage are automatically set.
   Each time the copy exposure adjustment keys are pressed, the settings for INPUT, CONTROL, TARGET and HUMID are displayed on the copy quantity/magnification display in the order presented.
4. Press the stop/clear key.

Load paper.

1. Load paper in the drawer.
   Caution: Loading paper before turning the main switch on may cause paper jams.

Output an own-status report (maintenance item U000).

1. Enter “000” using the numeric keys and press the start key.
2. Select “d-L” and press the start key to output a list of the current settings of the maintenance items.
3. Press the stop/clear key.

Exit maintenance mode.

1. Enter "001" using the numeric keys and press the start key.
   The machine exits the maintenance mode.

Install a toner cartridge.

1. Open the front cover.
2. Shift the toner cartridge release lever to the right until it stops.

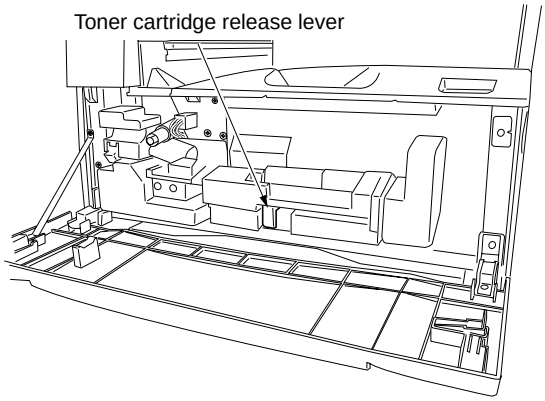


Figure 1-3-15

3. Tap the toner cartridge on the top five or six times and shake it horizontally eight to ten times to agitate the toner.

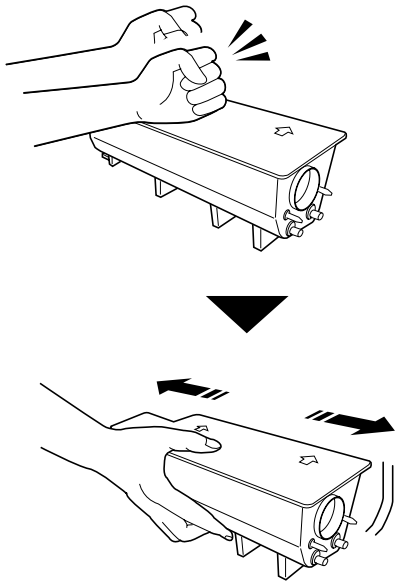
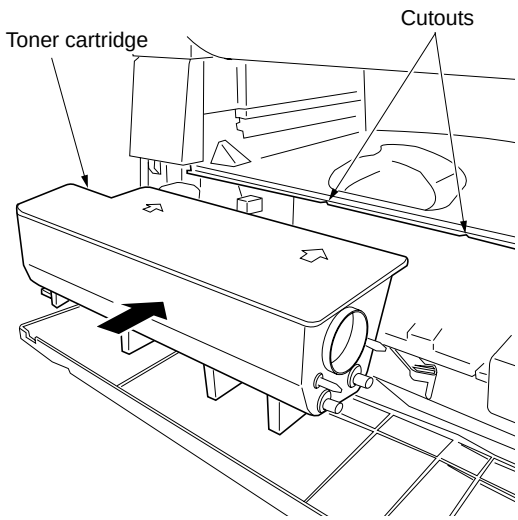


Figure 1-3-16

4. Align the arrows on the top of the toner cartridge with the cutouts in the eject tray and then insert the cartridge into the copier.
5. Secure the toner cartridge by shifting the toner cartridge release lever to the left until it stops.



6. Close the front cover.

Figure 1-3-17

Make test copies.

1. Place an original and make test copies.
   Check if the center lines of the bypass tray and drawer are correct. If not, adjust the center lines.

Completion of machine installation.

1-3-2 Setting initial copy modes

Factory settings are as follows:

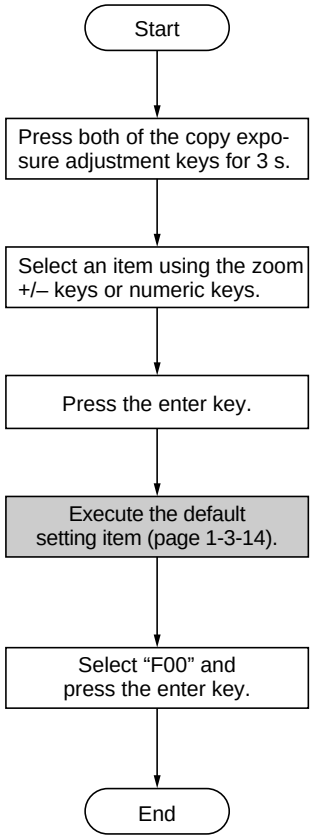
Maintenance item No.	Contents	Factory setting	
		Metric	Inch
U253	Switching between double and single counts	Double count	Double count
U254	Turning auto start function on/off	On	On
U255	Setting auto clear time	90 s	90 s
U256	Turning auto preheat/energy saver function on/off	On	On
U258	Switching copy operation at toner empty detection	Single mode, 70 sheets	Single mode, 70 sheets
U260	Changing the copy count timing	After ejection	After ejection
U342	Setting the ejection restriction	On	On
U344	Setting preheat/energy saver mode	Energy star	Energy star
U348	Setting the copy density adjustment range	Special area	Special area

1-3-3 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, settings such as default settings can be changed.

(1) Using the copier management mode

• Executing a default setting item



(2) Copy default

User status report

Prints the details of the default settings.

1. Select “F01” and press the enter key.
   If A4 paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

Exposure mode

Selects the image mode at power-on.

1. Select “F02” and press the enter key.
2. Select the exposure mode and press the enter key.
   Exposure mode: 1 (auto exposure)/
   2 (text & photo)/3 (photo)/4 (text)

Exposure steps

Sets the number of exposure steps for the manual exposure mode.

1. Select “F03” and press the enter key.
2. Select “5 steps” or “9 steps” and press the enter key.
   Setting range: 1 (5 steps)/2 (9 steps)

Auto exposure adjustment

Adjusts the exposure for the auto exposure mode.

1. Select “F04” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

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 enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

Text original exposure adjustment

Adjusts the exposure to be used when text original is selected for the image mode.

1. Select “F06” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

Photo original exposure adjustment

Adjusts the exposure to be used when photo original is selected for the image mode.

1. Select “F07” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

Paper selection

Sets whether the same sized paper as the original to be copied is automatically selected.

1. Select “F08” and press the enter key.
2. Select “auto” or “manual” and press the enter key.
   Setting range: 1 (auto)/2 (manual)

AMS mode

Selects whether auto magnification selection or 100% magnification is to be given priority when the sizes of the original and copy paper are different.

1. Select “F09” and press the enter key.
2. Select “auto magnification selection” or “same size” and press the enter key.
   Setting range: 1 (auto magnification selection)/
   2 (same size)

Drawer paper size

Sets the paper size for the drawer so that it will be automatically selected.

1. Select “F10” and press the enter key.
2. Select the paper size for the drawer and press the enter key.
   Paper size: 1 (A3)/2 (A4 vertical)/3 (A4)/
   4 (B4)/5 (B5 vertical)/6 (A5 vertical)/7 (folio)

Bypass tray paper size

Sets the paper size for the bypass tray so that it will be automatically selected.

1. Select “F11” and press the enter key.
2. Select the paper size for the bypass tray and press the enter key.
   Paper size: 1 (A3)/2 (A4 vertical)/3 (A4)/
   4 (B4)/5 (B5 vertical)/6 (B5)/7 (folio)/
   8 (no size setting*)
   * Setting of non-standard size paper width for bypass tray

Non-standard size paper width setting for bypass tray

Sets the paper width for the bypass tray to use non-standard size paper.

1. Select “F12” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 100 to 297 mm

Copy limit

Sets the number of copies limit for multiple copying.

1. Select “F13” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 1 to 250 copies

Silent mode

Selects whether or not to enter silent mode after copying.

1. Select “F14” and press the enter key.
2. Select “on” or “off” and press the enter key.
   Setting range: 1 (on)/2 (off)

Auto shutoff

Sets whether the auto shutoff function is available.

1. Select “F15” and press the enter key.
2. Select “on” or “off” and press the enter key.
   Setting range: 1 (on)/2 (off)

Auto preheat time

Sets the auto preheat time.

1. Select “F16” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 5 to 45 minutes (in 5-minute increments)
   1 (5 min)/2 (10 min)/3 (15 min)/4 (20 min)/ 5 (25 min)/6 (30 min)/7 (35 min)/8 (40 min)/ 9 45 min)
   Note: Set the auto preheat time to be shorter than the auto shutoff time.

Auto shutoff time

Sets the auto shutoff time.

1. Select “F17” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 15 to 240 minutes (in 15-minute increments)
   1 (15 min)/2 (30 min)/3 (45 min)/4 (60 min)/ 5 (75 min)/6 (90 min)/7 (105 min)/8 (120 min)/ 9 (135 min)/10 (150 min)/11 (165 min)/ 12 (180 min)/13 (195 min)/14 (210 min)/ 15 (225 min)/16 (240 min)

Toner counter report

Prints the report on the toner consumption ratio.

1. Select “F18” and press the enter key.
   If A4 paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

1-3-4 Installing the total counter (option)

Procedure

1. Remove the right cover and eject tray.
2. Remove the Lumirror (polyester film) from the right side of the copier.
3. Check the vertical orientation of the total counter and then insert it into the opening in the copier.
4. Connect the 2-pin connector of the total counter to the 2-pin connector inside the copier. Be sure to pass the cable of the total counter connector through the cutout in the copier inner frame.
5. Refit the removed parts.
6. Turn the main switch on and enter the maintenance mode.
7. Run maintenance item U204 and change the setting to “on”.

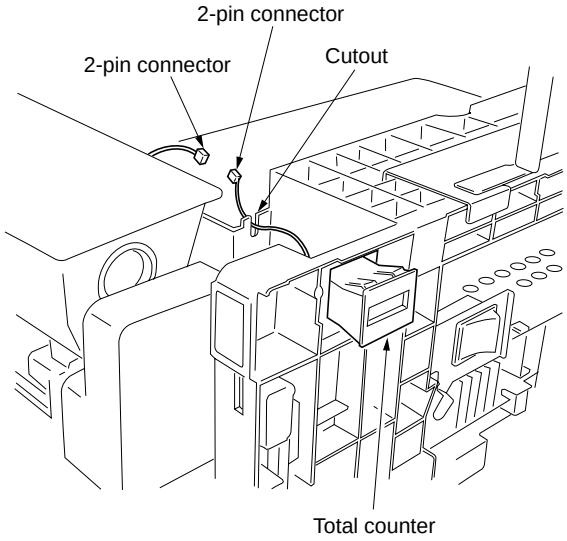
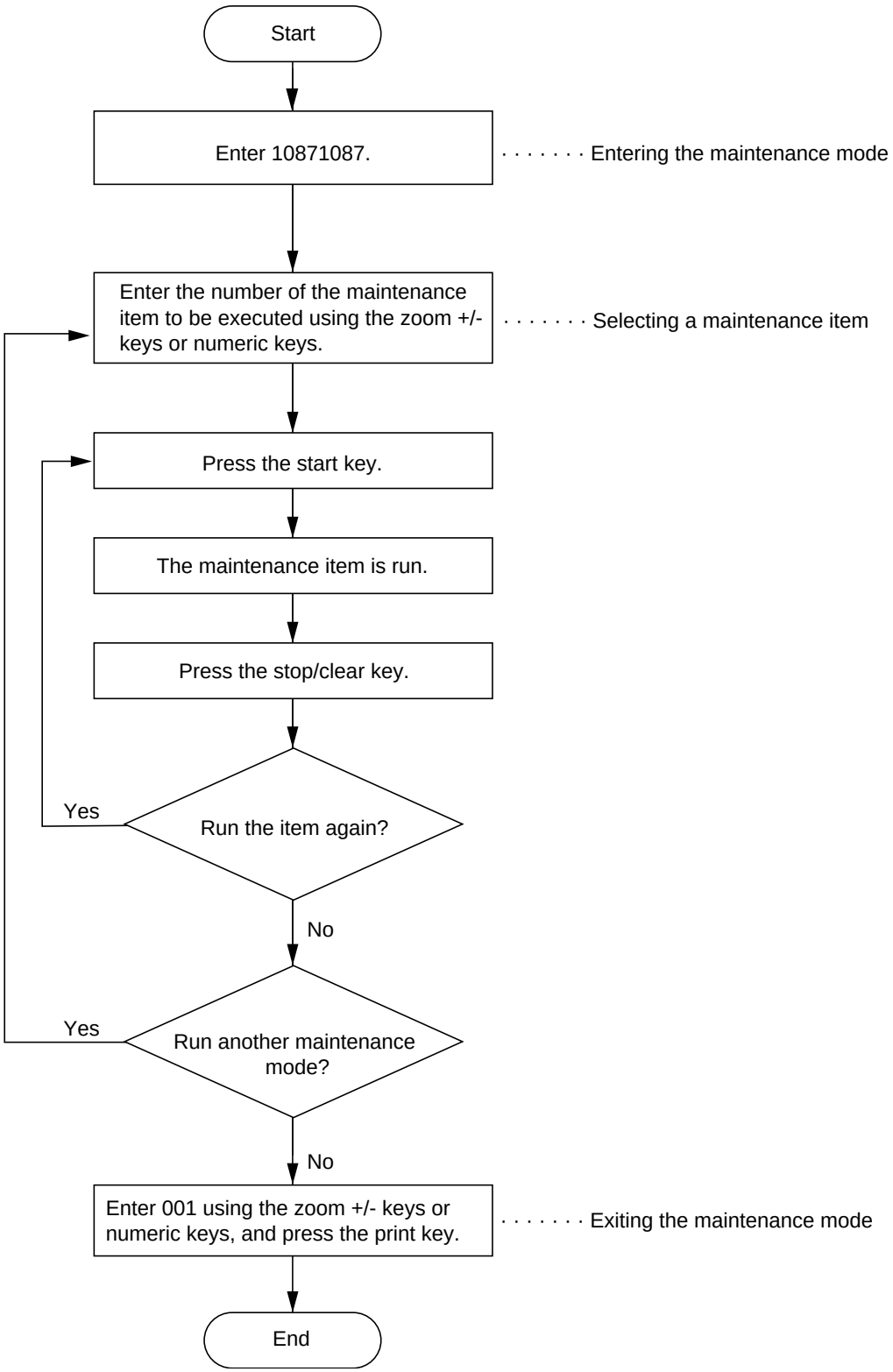


Figure 1-3-18

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	Setting the machine number	—
	U005	Copying without paper	—
Initialization	U020	Initializing all data	—
	U021	Initializing memories	—
	U022	Initializing backup data	—
Drive, paper feed, paper conveying and cooling system	U030	Checking motor operation	—
	U031	Checking switches for paper conveying	—
	U032	Checking clutch operation	—
	U033	Checking solenoid operation	—
	U034	Adjusting the print start timing • Adjusting the leading edge registration • Adjusting the center line	 0 0
	U035	Setting folio size • Length • Width	 330 210
	U051	Adjusting the amount of slack in the paper • Regist data	 0
	U053	Performing fine adjustment of the motor speed • Drive motor • Polygon motor	 0 0
Optical	U060	Adjusting the scanner input properties	12
	U061	Turning the exposure lamp on	—
	U063	Adjusting the shading position	0
	U065	Adjusting the scanner magnification • Main scanning direction/auxiliary scanning direction	 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	0
	U073	Checking scanner operation	—
	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 surface potential	184
	U101	Setting high voltages • Developing bias • Transfer voltage • Transfer voltage output timing	 193/38 115 –176
	U109	Setting the drum type	H
	U110	Checking/clearing the drum count	—
	U111	Checking/clearing the drum drive time	—
Developing	U130	Initial setting for the developer	—
	U131	Setting the toner sensor control voltage	155
	U132	Replenishing toner forcibly	—
	U135	Checking toner feed motor operation	—
	U155	Displaying the toner sensor output	—

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
Developing	U156	Changing the toner control level • Toner feed start level • Toner empty level	 100 44
	U157	Checking/clearing the developing drive time	—
	U158	Checking/clearing the developing count	—
Fixing and cleaning	U161	Setting the fixing control temperature • Primary stabilization fixing temperature • Secondary stabilization fixing temperature • Regular stabilization control temperature • Temperature to be deducted from the regular control temperature when copying onto small-sized paper	 135 160 180 0
	U162	Stabilizing fixing forcibly	—
	U163	Resetting the fixing problem data	—
	U196	Turning the fixing heater on	—
	U199	Checking the fixing temperature	—
Operation panel and support equipment	U200	Turning all LEDs on	—
	U204	Setting the presence or absence of a total counter	—
Mode setting	U250	Setting the maintenance cycle	100
	U251	Checking/clearing the maintenance count	—
	U252	Setting the destination	Japan
	U253	Switching between double and single counts	Double count
	U254	Turning auto start function on/off	On
	U255	Setting auto clear time	120
	U256	Turning auto preheat/energy saver function on/off	On
	U258	Switching copy operation at toner empty detection	Single mode, 70
	U260	Changing the copy count timing	After ejection
	U332	Setting the size conversion factor	—
	U342	Setting the ejection restriction	On
	U344	Setting preheat/energy saver mode	Energy star
	U345	Setting the value for maintenance due indication	0
	U348	Setting the copy density adjustment range	Normal
Image processing	U402	Adjusting margins of image printing	—
	U403	Adjusting margins for scanning an original on the contact glass	—
Others	U901	Checking/clearing copy counts by paper feed locations	—
	U903	Checking/clearing the paper jam counts	—
	U904	Checking/clearing the service call counts	—
	U906	Resetting partial operation control	—
	U910	Clearing the black ratio data	—
	U917	Setting the reading/writing of backup data	Read
	U990	Checking/clearing the time for the exposure lamp to light	—
	U993	Outputting a VTC-PG pattern	—
	U998	Outputting the memory list	—

* 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 interrupt copy mode is entered and a list is output.
When A4/11" × 8¹/₂" 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>
Setting the machine number
Description
Displays and changes the machine number.
Purpose
To check or set the machine number.
Method
Press the start key. The currently set machine number is displayed.
Setting
1. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys.
2. Enter the last six digits of the machine number using the numeric or zoom +/– keys.
Do not enter the first two digits, 3 and 7.
<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</td><td>First 3 digits
Last 3 digits</td><td>000 to 999
000 to 999</td><td>000
000</td></tr>
</table>
3. Press the start key. The machine number 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>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</td><td>Only the copier operates.</td></tr>
</table>
3. Press the interrupt 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 250.
• Copy density
• Keys on the operation panel other than the energy saver (preheat) 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>U020</td><td>
Initializing all data
Description
Initializes all the backup RAM on the main PCB to return to the original settings.
Purpose
Used when replacing the main PCB.
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 Japan specifications are set.
When initialization is complete, the machine automatically returns to the same status as when the main 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>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.
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 main switch is turned on.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U022</td><td>
Initializing backup data
Description
Initializes only the data set for the optical section.
Purpose
To be executed after replacing the scanner unit.
Method
1. Press the start key. “A” appears.
2. Press the start key.
3. 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>
4. Press the start key. The data for the optical section (U060 to 093, U403 and U990) is initialized.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U030</td><td>
Checking motor operation
Description
Drives the drive motor.
Purpose
To check the operation of the drive motor.
Method
1. Press the start key. A selection item appears.
2. Select the motor to be operated using the copy exposure adjustment keys.
3. Press the start key. The selected motor operates.
<table>
<tr><th>Display</th><th>Motor</th></tr>
<tr><td>A</td><td>Drive motor (DM)</td></tr>
</table>
4. To stop operation, press the stop/clear key.
Completion
Press the stop key after 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>U031</td><td>
Checking switches for paper conveying
Description
Displays the on-off status of each paper detection switch on the paper path.
Purpose
To check if the switches for paper conveying operate correctly.
Method
1. Press the start key.
2. Turn each switch on and off manually to check the status.
When the on-status of a switch is detected, the corresponding original size indicator lights.
<table>
<tr><th>Original size indicator</th><th>Switch</th></tr>
<tr><td>A3/11" × 17"
A4/8$^{1}/_{2}$" × 11"</td><td>Eject switch (ESW)
Registration switch (RSW)</td></tr>
</table>
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></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>Paper feed clutch (PFCL)
Bypass paper feed clutch (BYPPFCL)
Registration clutch (RCL)</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>U033</td><td>
Checking solenoid operation
Description
Turns the solenoid on.
Purpose
To check the operation of the solenoid.
Method
1. Press the start key. A selection item appears.
2. Select the desired operation using the copy exposure adjustment keys.
3. Press the start key. The selected operation starts.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>A</td><td>Turning the main switch off</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 1-6-9 and 10.
</td></tr>
<tr><td>U035</td><td>
Setting folio size
Description
Changes the image area for copying onto folio size paper.
Purpose
To prevent the image at the trailing edge, or right or left side of the paper from not being copied by setting the actual size of the folio paper used.
Method
Press the start key.
Setting
1. Select the item 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>Setting</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Exp. 1
Exp. 2</td><td>Length
Width</td><td>330 to 356 mm
200 to 220 mm</td><td>330
210</td></tr>
</table>
3. 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>U051</td><td>
Adjusting the amount of slack in the paper
Adjustment
See page 1-6-12.
</td></tr>
</table>

Maintenance item No.	Description
U053	**Performing fine adjustment of the motor speed** **Description** Performs fine adjustment of the speeds of the motors. **Purpose** Used to adjust the speed of the respective motors when the magnification is not correct. **Method** Press the start key. **Setting** 1. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys. 2. Change the setting using the zoom +/– keys.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	Drive motor speed adjustment	–5.0 to +5.0	0
Exp. 2	Polygon motor speed adjustment	–5.0 to +5.0	0

Drive motor speed adjustment (unit: %)
Increasing the setting makes the image longer in the auxiliary scanning direction, and decreasing it makes the image shorter in the auxiliary scanning direction.
Polygon motor speed adjustment (unit: %)
Increasing the setting makes the image longer in the main scanning direction and shorter in the auxiliary scanning direction; decreasing the setting makes the image shorter in the main scanning direction and longer in the auxiliary scanning direction.

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

Interrupt copy mode
While this maintenance item is being performed, a VTC pattern shown below is output in interrupt copy mode.
Correct values for an A3/11" × 17" output are:
Ⓐ = 300 ± 0.75 mm
Ⓑ = 260 ± 1.3 mm

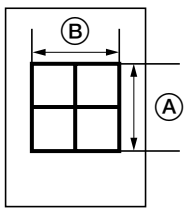


Figure 1-4-1

Adjustment
1. Output an A3/11" × 17" VTC pattern in interrupt mode.
2. Measure Ⓐ and Ⓑ on the VTC pattern (Figure 1-4-1), and perform the following adjustments if they are different from the correct sizes:
   Ⓐ: Drive motor speed adjustment
   Ⓑ: Polygon motor speed adjustment

Completion
Press the stop/clear key at the screen for selecting an item. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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.
Interrupt copy mode
While this maintenance item is being performed, copying from an original can be made in interrupt 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>
<tr><td>U061</td><td>
Turning the exposure lamp on
Description
Turns the exposure lamp on.
Purpose
To check the exposure lamp.
Method
1. Press the start key. “on” appears.
2. Press the start key. The exposure lamp lights.
3. To turn the exposure lamp off, press the stop/clear key.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></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>0.17 mm</td></tr>
</table>
Increasing the setting moves the shading position toward the machine right, and decreasing it moves the position toward the machine left.
3. Press the start key. The value is set.
Interrupt copy mode
While this maintenance item is being performed, copying from an original can be made in interrupt copy mode.
Completion
Press the stop/clear key at the screen for adjustment. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

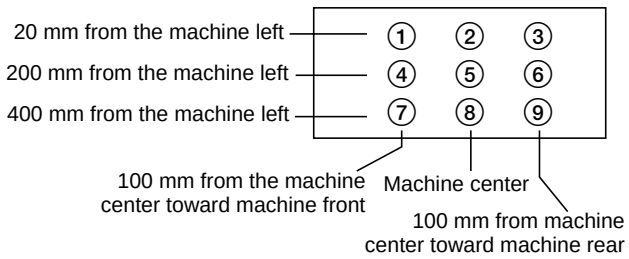
<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U065</td><td>Adjusting the scanner magnification
Adjustment
See pages 1-6-26 and 27.</td></tr>
<tr><td>U066</td><td>Adjusting the leading edge registration for scanning an original on the contact glass
Adjustment
See page 1-6-28.</td></tr>
<tr><td>U067</td><td>Adjusting the center line for scanning an original on the contact glass
Adjustment
See page 1-6-29.</td></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>8
9
36
39</td><td>A4
B5
A3
B4</td><td>40
41
42
47</td><td>A4R
B5R
A5R
Folio</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>
</table>

<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. The selected item is displayed in reverse.
<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-5
180
1-d</td><td>Gray scale
Mono level
1-dot level</td><td>-
0 to 255
-</td><td>-
180
-</td></tr>
</table>
3. Press the size select key. The machine enters the PG pattern output mode.
4. Press the start key. A MIP-PG pattern is output.
Completion
Press the stop/reset 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	Output list
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 1-4-2.



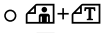
Point	Copy exposure indicator
①	Exp. 1 lights.
②	Exp. 2 lights.
③	Exp. 3 lights.
④	Exp. 4 lights.
⑤	Exp. 5 lights.
⑥	Exp. 1 flashes.
⑦	Exp. 2 flashes.
⑧	Exp. 3 flashes.
⑨	Exp. 4 flashes.

Figure 1-4-2

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U091 (cont.)</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: 2AC68240) 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. 2
Exp. 3
Exp. 4</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 Exposure ○ Text & Photo ○ Photo ● Text	Density in text mode
○  ○  ●  ● 	○ Auto Exposure ○ Text & Photo ● Photo ● Text	Density in text and photo mode
○  ●  ●  ● 	○ Auto Exposure ● Text & Photo ● Photo ● Text	Density in photo mode

○ : Off, ● : On

Maintenance item No.	Description
U093 (cont.)	**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.

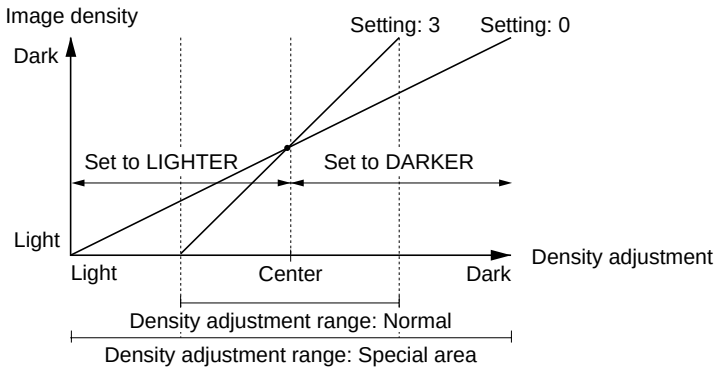


Figure 1-4-3 Exposure density gradient

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

Interrupt copy mode
While this maintenance item is being performed, copying from an original can be made in interrupt copy mode.

Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U100</td><td>
Setting the surface potential
Description
Changes the surface potential by changing the grid control voltage. Also performs main charging.
Purpose
To set the surface potential or check main charging. Also used when reentering data after initializing the set data.
Start
1. Press the start key. A selection item appears.
2. Select the item using the copy exposure adjustment keys.
<table>
<tr><th>Display (copy exposure indicator)</th><th>Description</th></tr>
<tr><td>——— (exp. 1)
on1 (exp. 2)
on2 (exp. 3)</td><td>Changing the grid control voltage
Turning the main charger on
Turning the main charger on and the laser scanner unit on and off</td></tr>
</table>
Method for main charger output
1. Press the start key. The selected operation starts.
2. To stop operation, press the stop/clear key.
Setting the grid control voltage
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>Grid control voltage</td><td>0 to 255</td><td>184</td></tr>
</table>
Increasing the setting makes the surface potential higher, and decreasing it makes the potential lower.
Change in value per step: approximately 3.6 V
2. Press the start key. The value is set.
Interrupt copy mode
While this maintenance item is being performed, copying from an original can be made in interrupt 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>
</table>

Maintenance item No.	Description
U101	**Setting high voltages** **Description** Changes the developing bias voltage and transfer voltage by changing the developing bias control voltage and transfer control voltage. Also checks the transfer output voltage. **Purpose** To check and change high voltages other than the main charger voltage. **Start** 1. Press the start key. A selection item appears. 2. Select the item to be set or checked by lighting image mode LEDs using the image mode selection key.

Image mode LEDs		Description
○ ○ + ○ ●	○ Auto Exposure ○ Text & Photo ○ Photo ● Text	Setting the developing bias
○ ○ + ● ●	○ Auto Exposure ○ Text & Photo ● Photo ● Text	Setting and checking the transfer voltage

○ : Off, ● : On

Setting the developing bias

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

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	Developing bias control voltage during image formation	25 to 255	193
Exp. 2	Developing bias control voltage during no image formation	25 to 255	38

Increasing the setting makes the developing bias higher and the image darker; decreasing it makes the bias lower and the image lighter.

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

Setting the transfer voltage

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

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	Transfer control voltage	0 to 255	115
Exp. 2	Transfer voltage output timing	–250 to +250	–176

Increasing the exp. 1 setting makes the transfer voltage higher, and decreasing it makes the voltage lower. Increasing the exp. 2 setting makes the transfer voltage output timing later and improves paper separation performance.

3. Press the start key. The value is set.
4. To check the transfer voltage output, light the copy exposure indicator exp. 3 using the copy exposure adjustment keys and press the start key. The currently set transfer voltage is output.
5. To stop the transfer voltage output, press the stop/clear key.

Interrupt copy mode

While this maintenance item is being performed, copying from an original can be made in interrupt copy mode.

Completion

Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U109</td><td>
Setting the drum type
Description
Sets the type of the drum installed in the copier.
Purpose
To prevent variations in halftone due to differences in drum sensitivity.
Method
Press the start key.
Setting
1. Select the drum type using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>G
H
J</td><td>Type G
Type H
Type J</td></tr>
</table>
Initial setting: H
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>
<tr><td>U110</td><td>
Checking/clearing the drum count
Description
Displays the drum counts for checking, clearing or changing the figure, which is used as a reference when correcting the main charger potential output.
Purpose
To check the drum status. Also used to clear the count after replacing the drum during regular maintenance. Since the count was cleared before shipping, do not clear it when installing.
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 numeric or zoom +/– keys.
2. Press the start key. The count is set, and the indication for selecting a maintenance item No. appears.
Completion
To exit the maintenance mode without changing the 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>U111</td><td>
Checking/clearing the drum drive time
Description
Displays the drum drive time for checking, clearing or changing a figure, which is used as a reference when correcting the high voltage based on time.
Purpose
To check the drum status. Also used to clear the drive time after replacing the drum.
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 2 digits
Last 3 digits
Clearing the drive time</td><td>00 to 59 (min)
000 to 999 (min)
———</td><td>00
000
———</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 numeric or zoom +/– keys.
2. Press the start key. The time is set, and the indication for selecting a maintenance 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>
<tr><td>U130</td><td>
Initial setting for the developer
Description
Automatically sets the toner sensor control voltage and toner feed start level for the installed developer.
Purpose
To set the initial settings for the developer when installing the machine or replacing the developer.
Method
1. Press the start key.
2. Press the start key. The initial settings for the developer is set, and the result is displayed.
3. Display the setting value for each item 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
Exp. 3
Exp. 4</td><td>Toner sensor output value
Toner sensor control voltage
Toner feed start level
Absolute humidity</td></tr>
</table>
Supplement
The following data is also renewed or cleared by performing this maintenance item:
• Renewing the toner sensor control voltage (U131)
• Renewing the toner feed start level (U156)
• Clearing the developing drive time (U157)
• Clearing the developing count (U158)
• Resetting the toner feed start level and toner empty detection
Completion
After initial setting is complete, 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>U131</td><td>
Setting the toner sensor control voltage
Description
Displays or changes the toner sensor control voltage automatically set in maintenance item U130.
Purpose
To check the automatically set toner sensor control voltage. Also to change the toner density if an image is too dark or light.
Method
Press the start key. The current setting for the toner sensor control voltage 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>Toner sensor control voltage</td><td>0 to 255</td><td>155</td></tr>
</table>
Increasing the setting makes the density higher, and decreasing it makes the density lower.
Increasing the setting too high may result in toner scattering.
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>U132</td><td>
Replenishing toner forcibly
Description
Replenishes toner forcibly until the toner sensor output value reaches the toner feed start level.
Purpose
Used when the toner empty is detected frequently.
Method
1. Press the start key.
2. Press the start key. Operation starts, and the current data is displayed.
Toner is replenished until the toner sensor output value reaches the toner feed start level.
3. Display each data 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
Exp. 3
Exp. 4</td><td>Toner sensor output value after start key is pressed
Current toner feed start level
Current toner sensor control voltage
Absolute humidity</td></tr>
</table>
4. To stop operation, press the stop/clear key.
Completion
Press the stop/clear key when toner replenishment stops. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U135</td><td>
Checking toner feed motor operation
Description
Drives the toner feed motor.
Purpose
To check the operation of the toner feed motor.
Caution
Note that driving the motor unnecessarily long may cause a toner jam, resulting in machine lockup. Be sure to drive the motor for only a few seconds.
Method
1. Press the start key. “on” appears.
2. Press the start key. The toner feed motor turns on.
3. To stop operation, 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>U155</td><td>
Displaying the toner sensor output
Description
Displays the toner sensor output value, and related data.
Purpose
To check the toner sensor output value.
Method
1. Press the start key.
2. Press the start key. Sampling starts.
3. Display each data 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

Exp. 3
Exp. 4</td><td>Toner sensor output value after start key is pressed
Current toner feed level (value corrected based on humidity and drive time)
Current toner sensor control voltage
Absolute humidity</td></tr>
</table>
4. Press the stop/clear key. The sampling operation stops.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U156</td><td>
Changing the toner control level
Description
Changes the toner feed start level set in maintenance item U130 or the toner empty level to be determined by the difference from the toner feed start level.
Purpose
To check the toner feed start level and toner empty level.
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></tr>
<tr><td>Exp. 1
Exp. 2</td><td>Toner feed start level
Difference between the toner feed start level and toner empty level</td></tr>
</table>
Setting for the toner feed start level
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th></tr>
<tr><td>Toner feed start level</td><td>0 to 255</td></tr>
</table>
Increasing the setting makes the toner density lower.
2. Press the start key. The value is set.
Setting for the toner empty level
1. Change the setting using the zoom +/– keys.
<table>
<tr><th>Description</th><th>Setting range</th></tr>
<tr><td>Difference between the toner feed start level and the toner empty level</td><td>0 to 255</td></tr>
</table>
Increasing the setting makes the toner empty level higher: the toner density is lower when the toner empty is detected.
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>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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, which is used as a reference when correcting the toner control. It is automatically cleared when U130 is executed.
Purpose
To check the developing drive time after replacing the developer.
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 2 digits
Last 3 digits
Clearing the drive time</td><td>00 to 59 (min)
000 to 999 (min)
———</td><td>00
000
———</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 numeric or 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>
<tr><td>U158</td><td>
Checking/clearing the developing count
Description
Displays the developing count for checking, clearing or changing a figure, which is used as a reference when correcting the toner control. It is automatically cleared when U130 is executed.
Purpose
To check the developing count after replacing the developer.
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 numeric or zoom +/– keys.
2. Press the start key. The count is cleared, 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>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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
Exp. 2
Exp. 3
Exp. 4</td><td>Primary stabilization fixing temperature
Secondary stabilization fixing temperature
Regular stabilization control temperature
Temperature to be deducted from the regular control temperature when copying onto small-sized paper.</td><td>115 to 145 (°C)
135 to 190 (°C)
145 to 220 (°C)
0 to 50 (°C)</td><td>135
160
180
0</td></tr>
</table>
The temperatures are to be set such that exp. 2 ≥ exp. 1.
3. 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>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
To exit this maintenance item without executing forced fixing stabilization, 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>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U196</td><td>
Turning the fixing heater on
Description
Turns the fixing heater on.
Purpose
To check fixing heater.
Method
1. Press the start key. “on” appears.
2. Press the start key. The fixing heater turns on for 1 s and then turns off.
Completion
Press the stop/clear key when fixing heater is off. 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>U204</td><td>
Setting the presence or absence of a total counter
Description
Sets the presence or absence of the optional total counter.
Purpose
Perform after installing the total counter.
Method
Press the start key.
Setting
1. Select the installation status of the total counter using the zoom +/- keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>oFF
on</td><td>None
The total counter is installed</td></tr>
</table>
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>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 lined up in the same line as the lit indicator are pressed in the order from the top to the bottom, the figure shown on the copy quantity display increases in increments of 1. When all the keys in that line are pressed and if there are any LEDs corresponding to the keys in the line on the immediate right, the top LED in that line 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 checking numeric key 1, the operation cannot be canceled until all the keys are checked.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U250</td><td>
Setting the maintenance cycle
Description
Displays and changes the maintenance cycle.
Purpose
To check and change the maintenance cycle.
Method
Press the start key. The current setting is displayed as follows:
Maintenance cycle (number of copies) = setting × 1000
Setting
1. 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>Maintenance cycle</td><td>0 to 600</td><td>100</td><td>1000 (copies)</td></tr>
</table>
For example, when set to 120, the maintenance cycle is set to 120000.
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>U251</td><td>
Checking/clearing the maintenance count
Description
Displays, clears and changes the maintenance count.
Purpose
To check the maintenance count. Also to clear the count during maintenance service.
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 numeric or 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>U252</td><td>
Setting the destination
Description
Switches the operations and screens of the machine according to the destination.
Purpose
To be executed after replacing the backup RAM on the main PCB or initializing the backup RAM by running maintenance item U020, in order to return the setting to the value before replacement or initialization.
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>JPn
Inc
EUP
ASA</td><td>Metric (Japan) specifications
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.
Supplement
The specified initial settings are provided according to the destinations in the maintenance items below. To change the initial settings in those items, be sure to run maintenance item U021 after changing the destination.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U253</td><td>
Switching between double and single counts
Description
Switches the count system for the total counter and other counters.
Purpose
According to user (copy service provider) request, select if A3/11" × 17" paper is to be counted as one sheet (single count) or two sheets (double count).
Method
Press the start key.
Setting
1. Select double or single count using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>d-C
S-C</td><td>Double count for A3/11" × 17" paper only
Single count for all size paper</td></tr>
</table>
Initial setting: Double count
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>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>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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</td><td>90</td></tr>
</table>
The setting can be changed by 30 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>
<tr><td>U256</td><td>
Turning auto preheat/energy saver function on/off
Description
Selects if the auto preheat/energy saver function is turned on. When set to ON, the time to enter preheat/energy saver mode can be changed in copy management mode.
Purpose
According to user request, to set the preheat time to save energy, or enable copying promptly without the recovery time from preheat mode.
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>Auto preheat/energy saver function on
Auto preheat/energy saver 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.
When the setting is changed from “oFF” to “on”, the auto preheat time is set to the initial setting of 15 minutes.
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>

Maintenance item No.	Description
U258	**Switching copy operation at toner empty detection** **Description** Selects if continuous copying is enabled after toner empty is detected, and sets the number of copies that can be made after the detection. **Method** Press the start key. The current setting is displayed. **Start** 1. Press the start key. A selection item appears. 2. Select the item by lighting image mode LEDs using the image mode selection key.

Image mode LEDs		Description
○  ○  ○  ● 	○ Auto Exposure ○ Text & Photo ○ Photo ● Text	Switching copy operation at toner empty detection between single or continuous copying
○ ○  ●  ● 	○ Auto Exposure ○ Text & Photo ● Photo ● Text	Setting the number of copies after toner empty detection

○ : Off, ● : On

Setting copy operation at toner empty detection between single and continuous copying

1. Select single or continuous copying using the zoom +/– keys.

Display	Description
Sin	Enables only single copying.
Con	Enables single and continuous copying.

Initial setting: Sin

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

Setting the number of copies after toner empty detection

1. Set the number of copies that can be made using the zoom +/– keys.

Description	Setting range	Initial setting
Number of copies after toner empty detection	0 to 200 (copies)	70

The setting can be changed by 5 copies per step.
When set to 0, the number of copies is not limited regardless of the setting for single or continuous copying.

2. Press the start key.

Completion

Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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>

Maintenance item No.	Description
U332	**Setting the size conversion factor**

Description

Sets the factor for converting each paper size into A4/11" × 8 1/2". The black ratio is converted for the A4/11" × 8 1/2" size using the factor set in this maintenance item. Values set are displayed in the user simulation.

Purpose

To set the factor to convert the black ratio of each paper size for A4/11" × 8 1/2" size.

Method

1. Press the start key.
2. Select the paper size to be set by lighting a copy exposure indicator or making one flash using the copy exposure adjustment keys.

Metric specifications

Image mode LEDs	Copy exposure indicator	Paper size	Setting range	Initial setting
Setting for the copier mode ○ ○  ○  ● 	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 4 (lit) Exp. 5 (lit) Exp. 1 (flashing) Exp. 2 (flashing) Exp. 3 (flashing) Exp. 4 (flashing) Exp. 5 (flashing)	A3 B4 A4 B5 A5 B6 A6 Postcard Folio Non-standard	0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0	2.0 1.5 1.0 0.7 0.5 0.5 0.5 0.5 1.5 1.0

○ : Off, ● : On

Inch specifications

Image mode LEDs	Copy exposure indicator	Paper size	Setting range	Initial setting
Setting for the copier mode ○ Auto Exposure ○ Text & Photo ○ Photo ● Text	Exp. 1 (lit) Exp. 2 (lit) Exp. 3 (lit) Exp. 4 (lit) Exp. 5 (lit)	11" × 17" 8 1/2" × 14" 8 1/2" × 11" 5 1/2" × 8 1/2" Non-standard	0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0 0.0 to 3.0	2.0 1.5 1.0 0.5 1.0

○ : Off, ● : On

4. Change the setting using the zoom +/– keys.
5. 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>U344</td><td>
Setting preheat/energy saver mode
Description
Changes the control for preheat/energy saver mode.
Purpose
According to user request, selects which has priority, the recovery time from preheat or energy saver.
Method
Press the start key.
Setting
1. Select control mode using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Control in preheat mode</th></tr>
<tr><td>InS (instant ready)</td><td>Without decreasing the fixing control temperature, the display on the operation panel is turned off.</td></tr>
<tr><td>ESr (energy star)</td><td>The fixing control temperature is set at 70°C/158°F. The copier is forcibly stabilized 30 s after exiting preheat/energy saver mode.</td></tr>
<tr><td>Prh (priority to recovery time)</td><td>The fixing control temperature is set at 130°C/266°F.</td></tr>
</table>
Initial setting: Energy star
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>U345</td><td>
Setting the value for maintenance due indication
Description
Sets when to indicate that the time for maintenance is about to be reached, by setting the number of copies that can be made before the current maintenance cycle ends.
When the difference between the number of copies of the maintenance cycle and that of the maintenance count reaches the set value, the maintenance indicator flashes.
Purpose
To change the time to display the maintenance due indication.
Method
Press the start key. The current setting is displayed.
Setting
1. 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</td><td>First digit
Last 3 digits</td><td>0 to 9
000 to 999</td><td>0
000</td></tr>
</table>
2. Change the setting value using the numeric or zoom +/– keys.
3. 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>U348</td><td>
Setting the copy density adjustment range
Description
Selects the adjustment range for copy density from NORMAL and SPECIAL AREA (for wider range).
Purpose
To change the setting according to user request.
When especially dark or light density is requested, set to SPECIAL AREA.
Method
Press the start key.
Setting
1. Select the density range using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>SPC (special area)
nrL (normal)</td><td>11/15 steps (enlargement mode)
5/9 steps</td></tr>
</table>
Initial setting: Normal
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>U402</td><td>
Adjusting margins of image printing
Adjustment
See page 1-6-11.
</td></tr>
<tr><td>U403</td><td>
Adjusting margins for scanning an original on the contact glass
Adjustment
See page 1-6-30.
</td></tr>
</table>

Maintenance item No.	Description
U901	**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.

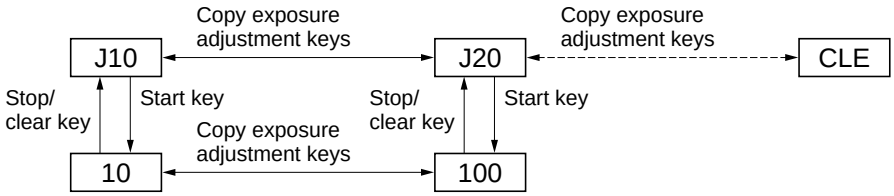
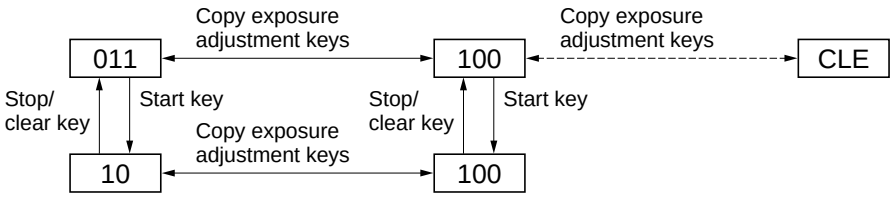
Image mode LED (group No.)			Copy exposure indicator	Copy quantity display (count value)
1	○ Auto Exposure ○ Text & Photo ○ Photo ● Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of bypass copy count Last 3 digits of bypass copy count Clearing the count (CLE)
2	○ Auto Exposure ○ Text & Photo ● Photo ● Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of drawer copy count Last 3 digits of drawer copy count Clearing the count (CLE)
3	○ Auto Exposure ● Text & Photo ● Photo ● Text		Exp. 1	Clearing all counts (CLE)

○ : Off, ● : On

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 3.
2. Press the start key. The counts are cleared.

Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.

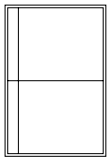
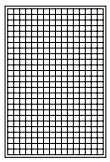
Maintenance item No.	Description
U903	**Checking/clearing the paper jam counts** **Description** Displays or clears the jam counts by jam locations. **Purpose** To check the paper jam status. Also to clear the jam counts after replacing consumable parts. **Method** 1. Press the start key. 2. Display 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 1-4-4** **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 1-4-5** **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>U906</td><td>
Resetting partial operation control
Description
Resets the service call code for partial operation control.
Purpose
To be reset after partial operation is performed due to problems in the drawers or other sections, and the related parts are serviced.
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 resetting
Executing the resetting</td></tr>
</table>
3. Press the start key to reset partial operation control. The maintenance mode is exited, and the machine returns to the same status as when the main switch is turned on.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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>
<tr><td>U917</td><td>
Setting the reading/writing of backup data
Description
Selects whether to read out the backup data on the main PCB to the NVRAM on the memory tool PCB or to write backup data on the NVRAM on the memory tool PCB to the main PCB.
When the memory is initialized (maintenance items U020, U021, U022 and U252), this is set to read out the backup data from the main PCB to the NVRAM on the memory tool PCB. To write the backup data to the main PCB from the NVRAM on the memory tool PCB, change the setting before starting writing.
Purpose
Used when replacing the main PCB.
Method
1. Press the start key.
2. Select “rd” or “rE” using the zoom +/– keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>rd
rE</td><td>Reading out the backup data
Writing the backup data</td></tr>
</table>
3. Press the start key.
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>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>

Maintenance item No.	Description
U993	**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.

Display	PG pattern to be output	Purpose
0		• Center line adjustment
1		• Lateral squareness adjustment • Magnification adjustment
2		• Checking the fixing performance (fixing pressure)

3. Press the interrupt 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.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U998</td><td>
Outputting the memory list
Description
Outputs the list of memory.
Purpose
To output the list as required.
Method
Press the start key.
Entering the address
1. 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></tr>
<tr><td>Exp. 1
Exp. 2
Exp. 3</td><td>Bit 16 to bit 23 of the address
Bit 8 to bit 15 of the address
Bit 0 to bit 7 of the address</td><td>00 to FF
00 to FF
00 to FF</td></tr>
</table>
2. Enter the address in hexadecimal using the numeric keys or the zoom +/– keys.
3. Press the start key. The address is set.
Printing the list
1. Press the interrupt key. The machine enters the list output mode.
2. Press the start key. The list is printed.
Completion
Press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

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 front cover, paper conveying unit or drawer.
Paper misfeed detection can be reset by opening and closing the respective covers to turn safety switch 1 or 2 off and on.

Figure 1-5-1

Jam code	Contents	See pape
10	No paper feed from drawer	P.1-5-3
14	No paper feed from bypass	P.1-5-3
20	Multiple sheets in copier paper feed section	P.1-5-3
22	Multiple sheets in bypass tray	P.1-5-3
30	Misfeed in registration/transfer section	P.1-5-3
40	Misfeed in fixing section	P.1-5-4
50	Misfeed in eject section	P.1-5-4

(2) Paper misfeed detection conditions

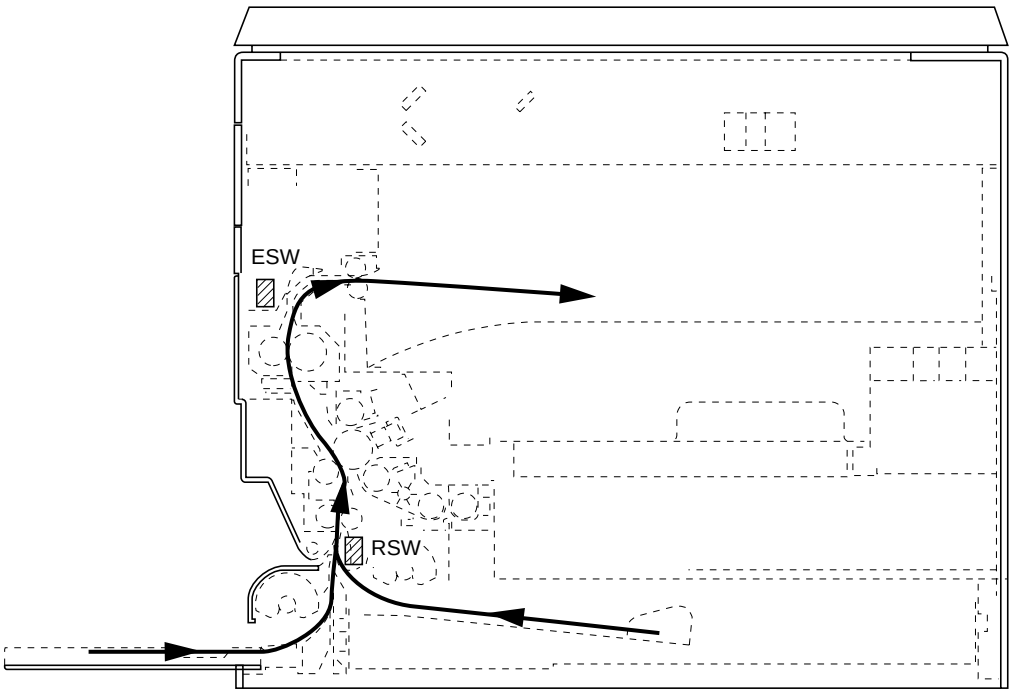


Figure 1-5-2

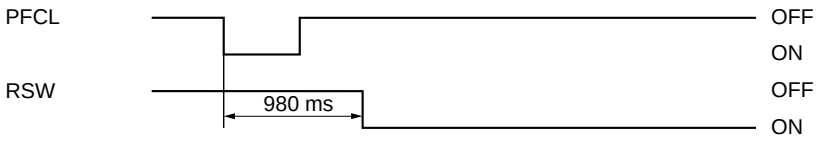
1. Jam at power-on

• One or more of the switches in the paper feed conveying system is on when the main switch is turned on (jam code 00).

2. Paper feed section

• No paper feed from drawer (jam code 10)

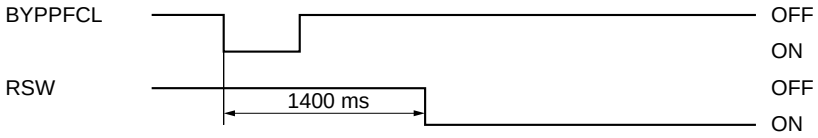
The registration switch (RSW) does not turn on within 980 ms of the paper feed clutch (PFCL) turning on.



Timing chart 1-5-1

• No paper feed from bypass (jam code 14)

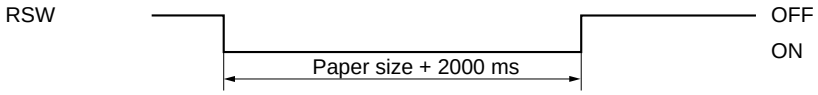
The registration switch (RSW) does not turn on within 1400 ms of the bypass paper feed clutch (BYPPFCL) turning on.



Timing chart 1-5-2

• Multiple sheets in copier paper feed section (jam code 20)

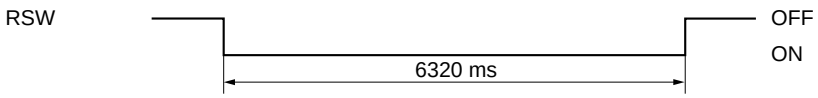
The registration switch (RSW) does not turn off within the time required to convey the length of the used paper size plus 2000 ms of turning on (when paper is fed from the drawer).



Timing chart 1-5-3

• Multiple sheets in bypass tray (jam code 22)

The registration switch (RSW) does not turn off within 6320 ms of turning on (when paper is fed from the bypass tray).

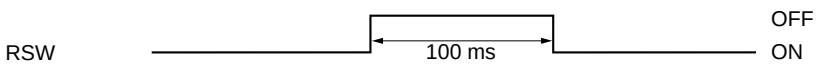


Timing chart 1-5-4

3. Paper conveying section

• Misfeed in registration/transfer section (jam code 30)

The registration switch (RSW) turns on within 100 ms of turning off.

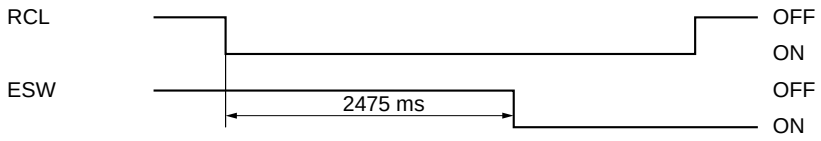


Timing chart 1-5-5

4. Fixing section

• Misfeed in fixing section (jam code 40)

The eject switch (ESW) does not turn off within 2475 ms of the registration clutch (RCL) turning on.

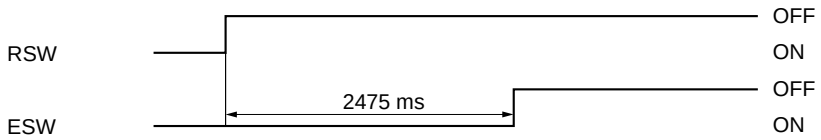


Timing chart 1-5-6

5. Eject section

• Misfeed in eject section (jam code 50)

The eject switch (ESW) does not turn off within 2475 ms of the registration switch (RSW) turning off.



Timing chart 1-5-7

(3) Paper misfeeds

Problem	Causes/check procedures	Corrective measures
(1) A paper jam in the paper feed, conveying, fixing or eject section is indicated as soon as the main switch is turned on.	A piece of paper torn from copy paper is caught around the registration switch or the eject switch.	Check visually and remove any found.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Defective eject switch.	With 5 V DC present at CN12-7 on the main PCB, check if CN12-6 on the main PCB remains low when the eject switch is turned on and off. If it does, replace the eject switch.
(2) A paper jam in the paper feed section is indicated during copying (no paper feed from drawer). Jam code 10	Paper in the drawer is extremely curled.	Change the paper.
	Check if the paper feed pulleys are deformed.	Check visually and replace the pulleys if deformed. (see page 1-6-3).
	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Check if the paper feed clutch malfunctions.	Check and remedy if necessary.
	Electrical problem with the paper feed clutch.	Check (see page 1-5-20).
(3) A paper jam in the paper feed section is indicated during copying (no paper feed from bypass). Jam code 14	Paper in the bypass tray is extremely curled.	Change the paper.
	Check if the bypass paper feed pulleys are deformed.	Check visually and replace the pulleys if deformed (see page 1-6-5).
	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If not, replace the registration switch.
	Check if the bypass paper feed clutch malfunctions.	Check and remedy if necessary.
	Electrical problem with the bypass paper feed clutch.	Check (see page 1-5-20).
(4) A paper jam in the paper feed section is indicated during copying (multiple sheets in paper feed section). Jam code 20	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Check if the right and left registration rollers contact each other.	Check visually and remedy if necessary.

Problem	Causes/check procedures	Corrective measures
(5) A paper jam in the paper feed section is indicated during copying (multiple sheets in bypass). Jam code 22	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Check if the right and left registration rollers contact each other.	Check visually and remedy if necessary.
(6) A paper jam in the paper conveying section is indicated during copying (jam in registration/ transfer section). Jam code 30	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
(7) A paper jam in the fixing section is indicated during copying (jam in fixing section). Jam code 40	Check if the registration clutch malfunctions.	Check and remedy if necessary.
	Electrical problem with the registration clutch.	Check (see page 1-5-20).
	Broken eject switch actuator.	Check visually and replace the eject switch if its actuator is broken.
	Defective eject switch.	With 5 V DC present at CN12-7 on the main PCB, check if CN12-6 on the main PCB remains low when the eject switch is turned on and off. If it does, replace the eject switch.
(8) A paper jam in the eject section is indicated during copying (jam in eject section). Jam code 50	Broken registration switch actuator.	Check visually and replace the registration switch if its actuator is broken.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Broken eject switch actuator.	Check visually and replace the eject switch if its actuator is broken.
	Defective eject switch.	With 5 V DC present at CN12-7 on the main PCB, check if CN12-6 on the main PCB remains low when the eject switch is turned on and off. If it does, replace the eject switch.

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 011 and 740 altenates, indicating the nature of the problem.
After removing the problem, the self-diagnostic function can be reset by turning safety switch 1or 2 off and back on.

(2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
C011	**Backup memory data problem** • Data in the specified area of the backup memory does not match the specified values.	Defective main PCB.	Replace the main PCB and check for correct operation.
C100	**Exposure lamp problem** • Check the CCD input value for the lighting status of the exposure lamp 100 ms after the exposure lamp is lit and the carriage is moved to the shading position. If the exposure lamp does not light, turn off the lamp. After 500 ms, light the lamp again and, a further 500 ms later, check the CCD input. The exposure lamp does not light after 5 retries.	Poor contact of the connector terminals.	Check the connection of connectors CN24, CN23, CN22 and CN3 on the main PCB, and the continuity across the connector terminals. Repair or replace if necessary.
		Defective exposure lamp.	Replace the exposure lamp or inverter PCB.
		Defective main PCB.	Replace the main PCB 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 switch.
		CCD PCB output problem.	Replace the ISU.
C104	**Optical system problem** • After AGC, correct input is not obtained at CCD.	Poor contact of the connector terminals.	Check the connection of connectors CN23, CN22 and CN3 on the main PCB, and the continuity across the connector terminals. Repair or replace if necessary.
		CCD PCB output problem.	Replace the ISU.
		Defective main PCB.	Replace the main PCB and check for correct operation.
C200	**Drive motor problem** • LOCK ALM signal remains high for 1 s, 1 s after the drive motor has turned on.	Poor contact of the drive motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.

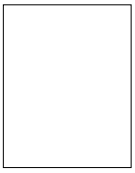
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C200	**Drive motor problem** • LOCK ALM signal remains high for 1 s, 1 s after the drive motor has turned on.	Defective drive motor rotation control circuit.	Replace the drive motor.
		Defective drive transmission system.	Check if the rollers and gears rotate smoothly. If not, grease the bushings and gears. Check for broken gears and replace if any.
C310	**Scanner carriage problem** • The home position is not correct when the power is turned on or at the start of copying using the contact glass.	Poor contact of the connector terminals.	Check the connection of connectors CN28 and CN25 on the main PCB and the continuity across the connector terminals. Remedy or replace if necessary.
		Defective scanner home position switch.	Replace the scanner home position switch.
		Defective main PCB.	Replace the main PCB and check for correct operation.
		Defective scanner motor.	Replace the scanner motor.
C400	**Polygon motor synchronization problem** • The polygon motor does not reach a stable speed within 19 s of the polygon motor remote signal turning on.	Poor contact of the polygon motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
C401	**Polygon motor steady-state problem** • The polygon motor rotation is not stable for 400 ms after the polygon motor rotation has been stabilized.	Poor contact of the polygon motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective power source PCB.	Check if 24 V DC is present at CN3-1 and CN3-2 on the power source PCB. If not, replace the power source PCB.
C420	**BD steady-state problem** • The VTC detects a BD error for 800 ms after the polygon motor rotation has been stabilizad.	Poor contact of the laser scanner unit connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective LSU.	Replace the LSU.
		Defective main PCB.	Replace the main PCB and check for correct operation.
C510	**Main charger problem** • MC ALM signal is detected continuously for 800 ms when MC REM signal is turned on.	Poor contact of the high-voltage transformer PCB connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective high-voltage transformer PCB.	Replace the high-voltage transformer PCB.
		Leakage during main charging.	Check and clean the main charger assembly.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C510	**Main charger problem** • MC ALM signal is detected continuously for 800 ms when MC REM signal is turned on.	Deformed high-voltage transformer PCB terminal spring.	Replace the spring.
C610	**Broken fixing heater wire** • Warm-up does not end within 90 s. • The secondary stabilization fixing temperature drops to 100°C/212°F or below. • The fixing temperature remains below 40˚C/104˚F for 7 s or longer after the fixing heaters have been turned on.	Fixing heater installed incorrectly.	Check and reinstall if necessary.
		Broken fixing heater wire.	Check for continuity. If none, replace fixing heater.
		Poor contact in the fixing unit thermistor connector terminals.	Check the connection of connector CN12 on the main PCB and the continuity across the connector terminals. Remedy or replace if necessary.
		Broken fixing unit thermistor wire.	Measure the resistance. If it is ∞ Ω, replace the fixing unit thermistor.
		Fixing unit thermistor installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermostat triggered.	Check for continuity. If none, replace the fixing unit thermostat. Check the operation of the cooling fan and repair if necessary.
C620	**Abnormally low fixing unit thermistor temperature** • The fixing temperature remains below 100˚C/212˚F for 10 s during copying.	Fixing heater installed incorrectly.	Check and reinstall if necessary.
		Broken fixing heater wire.	Check for continuity. If none, replace fixing heater.
		Poor contact in the fixing unit thermistor connector terminals.	Check the connection of connector CN12 on the main PCB and the continuity across the connector terminals. Remedy or replace if necessary.
		Broken fixing unit thermistor wire.	Measure the resistance. If it is ∞ Ω, replace the fixing unit thermistor.
		Fixing unit thermistor installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermostat triggered.	Check for continuity. If none, replace the fixing unit thermostat. Check the operation of the cooling fan and repair if necessary.
C630	**Abnormally high fixing unit thermistor temperature** • The fixing temperature exceeds 240˚C/464˚F for 10 s.	Shorted fixing unit thermistor.	Measure the resistance. If it is 0 Ω, replace the fixing unit thermistor.
		Broken fixing heater control circuit on the power source PCB.	Replace the power source PCB.

Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
C710	**Toner sensor problem** • The sensor output voltage is outside the range of 0.5 to 4.5 V during toner control. • The toner sensor control voltage cannot be set within the setting range when maintenance item U130 is run.	Defective toner sensor.	Replace the toner sensor.
		Poor contact of the toner sensor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Developer problem.	Replace the developer.
C730	**Broken external temperature thermistor wire** • The input voltage is above 4.5 V.	Poor contact of the humidity sensor PCB connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective external temperature thermistor.	Replace the humidity sensor PCB.
C731	**Short-circuited external temperature thermistor** • The input voltage is below 0.5 V.	Poor contact of the humidity sensor PCB connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective external temperature thermistor.	Replace the humidity sensor PCB.
C740	**Image formation unit connector insertion problem** • Absence of the image formation unit is detected continuously for 1500 ms while there is no error on the copier.	Image formation unit connector inserted incorrectly.	Reinsert the image formation unit connector if necessary.
		Defective image formation unit connector.	Replace the image formation unit.

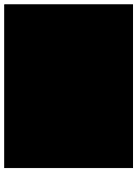
1-5-3 Image formation problems

(1) No image appears (entirely white).



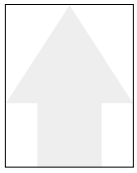
See page 1-5-12

(2) No image appears (entirely black).



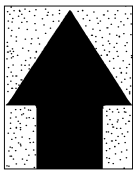
See page 1-5-12

(3) Image is too light.



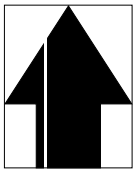
See page 1-5-13

(4) Background is visible.



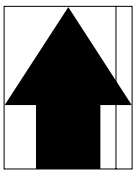
See page 1-5-13

(5) A white line appears longitudinally.



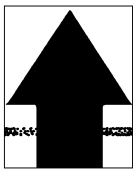
See page 1-5-13

(6) A black line appears longitudinally.



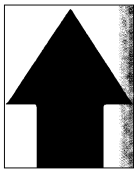
See page 1-5-14

(7) A black line appears laterally.



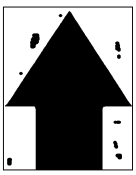
See page 1-5-14

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



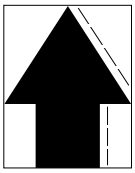
See page 1-5-14

(9) Black dots appear on the image.



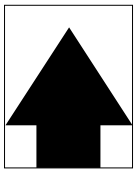
See page 1-5-15

(10) Image is blurred.



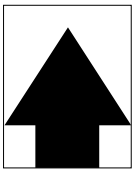
See page 1-5-15

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



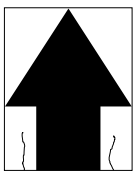
See page 1-5-15

(12) The leading edge of the image is sporadically misaligned with the original.



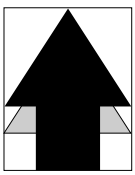
See page 1-5-16

(13) Paper creases.



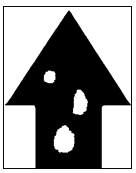
See page 1-5-16

(14) Offset occurs.



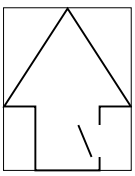
See page 1-5-16

(15) Image is partly missing.



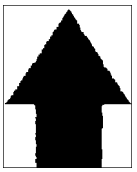
See page 1-5-17

(16) Fixing is poor.



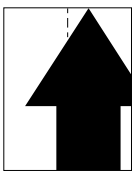
See page 1-5-17

(17) Image is out of focus.



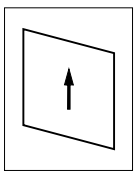
See page 1-5-17

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



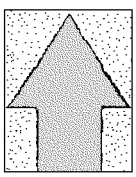
See page 1-5-17

(19) Image is not square.



See page 1-5-18

(20) Image contrast is low (carrier scattering).

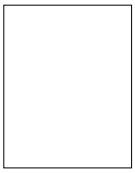


See page 1-5-18

2BV

(1) No image appears (entirely white).

Causes
1. No transfer charging.



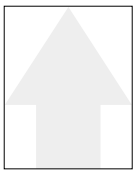
Causes	Check procedures/corrective measures
1. No transfer charging.	
A. Broken transfer wire.	Replace or repair the wire.
B. The connector terminals of the high-voltage transformer PCB make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
C. Defective main PCB	Check if CN4-5 on the main PCB goes low when maintenance item U101 is run. If not, replace the main PCB.
D. Defective high-voltage transformer PCB.	Check if transfer charging takes place when CN1-5 on the high-voltage transformer PCB goes low while maintenance item U101 is run. If not, replace the high-voltage transformer PCB.

(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 wire.
B. Leaking main charger housing.	Clean the main charger wire, grid and shield.
C. The connector terminals of the high-voltage transformer PCB make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
D. Defective main PCB.	Check if CN4-3 on the main PCB goes low when maintenance item U100 is run. If not, replace the main PCB.
E. Defective high-voltage transformer PCB.	Check if main charging takes place when CN1-7 on the high-voltage transformer PCB goes low while maintenance item U100 is run. If not, replace the high-voltage transformer PCB.
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 inverter PCB.	Check if the exposure lamp lights when CN1-5 and 1-6 on the inverter PCB go low while maintenance item U061 is run. If not, replace the inverter PCB.
C. Defective main PCB.	Check if CN24-1 and 24-2 on the main PCB go low when maintenance item U061 is run. If not, replace the main PCB.

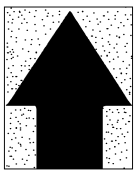
(3) Image is too light.



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

Causes	Check procedures/corrective measures
1. Insufficient toner.	If the display shows the message requesting toner replenishment, replace the cartridge.
2. Deteriorated developer.	Check the number of copies made with the current developer. If it has reached the specified limit, replace the developer.
3. Dirty or deteriorated drum.	Clean the drum or, if the maintenance level has been reached, replace the drum (see page 1-6-34).

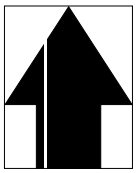
(4) Background is visible.



Causes
1. Deteriorated developer.

Causes	Check procedures/corrective measures
1. Deteriorated developer.	Check the number of copies made with the current developer. If it has reached the specified limit, replace the developer.

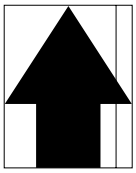
(5) A white line appears longitudinally.



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.	Clean the main charger wire or, if it is flawed, replace it.
2. Foreign matter in the developing section.	Check if the magnetic brush is formed uniformly. If not, replace the developer.
3. Flawed drum.	Replace the drum (see page 1-6-34).
4. Dirty shading plate.	Clean the shading plate.

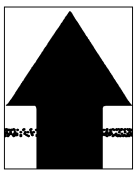
(6) A black line appears longitudinally.



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.	Clean the drum or, if it is flawed, replace it (see page 1-6-34).
3. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-37).
4. Dirty scanner mirror.	Clean the scanner mirror.

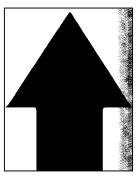
(7) A black line appears laterally.



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

Causes	Check procedures/corrective measures
1. Flawed drum.	Replace the drum (see page 1-6-34).
2. Dirty developing section.	Clean any part contaminated with toner or carrier in the developing section.
3. Leaking main charger housing.	Clean the main charger wire, grid and shield.

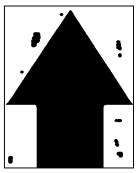
(8) One side of the copy image is darker than the other.



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

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Clean the wire or, if it is extremely dirty, replace it.
2. Defective exposure lamp.	Check if the exposure lamp light is distributed evenly. If not, replace the exposure lamp (see page 1-6-13).

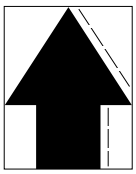
(9) Black dots appear on the image.



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.	Clean the drum or, if it is flawed, replace it (see page 1-6-34).
2. Dirty contact glass.	Clean the contact glass.
3. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-37).

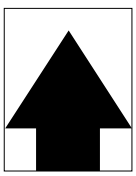
(10) Image is blurred.



Causes
1. Scanner moves erratically.
2. Deformed press roller.
3. Paper conveying section drive problem.

Causes	Check procedures/corrective measures
1. Scanner moves erratically.	Check if there is any foreign matter on the front and rear scanner rails. If any, remove it.
2. Deformed press roller.	Replace the press roller (see page 1-6-44).
3. 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.

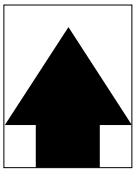


Causes
1. Misadjusted leading edge registration.
2. Misadjusted scanner leading edge registration.

Causes	Check procedures/corrective measures
1. Misadjusted leading edge registration.	Readjust the leading edge registration (see pages 1-6-9).
2. Misadjusted scanner leading edge registration.	Readjust the scanner leading edge registration (see page 1-6-28).

(12) The leading edge of the image is sporadically misaligned with the original.

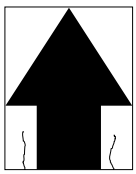
Causes
1. Registration clutch, bypass paper feed clutch or paper feed clutch installed or operating incorrectly.



Causes	Check procedures/corrective measures
1. Registration clutch, bypass paper feed clutch or paper feed clutch installed or operating incorrectly.	Check the installation position and operation of the registration clutch, bypass paper feed clutch and paper feed clutches. If any of them operates incorrectly, replace it.

(13) Paper creases.

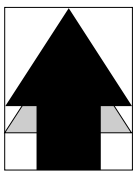
Causes
1. Paper curled.
2. Paper damp.
3. Defective pressure springs.



Causes	Check procedures/corrective measures
1. Paper curled.	Check the paper storage conditions.
2. Paper damp.	Check the paper storage conditions.
3. Defective pressure springs.	Replace the pressure springs.

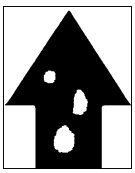
(14) Offset occurs.

Causes
1. Defective cleaning blade.
2. Defective pressure springs.
3. Incorrect fixing temperature.



Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the cleaning blade (see page 1-6-37).
2. Defective pressure springs.	Replace the pressure springs.
3. Incorrect fixing temperature.	Run maintenance item U161 and check the fixing temperature.

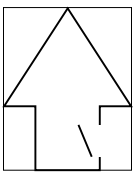
(15) Image is partly missing.



Causes
1. Paper damp.
2. Paper creased.
3. Drum condensation.
4. Flawed drum.

Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions.
2. Paper creased.	Replace the paper.
3. Drum condensation.	Clean the drum.
4. Flawed drum.	Replace the drum (see page 1-6-34).

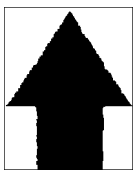
(16) Fixing is poor.



Causes
1. Wrong paper.
2. Defective pressure springs.
3. Flawed press roller.

Causes	Check procedures/corrective measures
1. Wrong paper.	Check if the paper meets specifications.
2. Defective pressure springs.	Replace the pressure springs.
3. Flawed press roller.	Replace the press roller (see page 1-6-44).

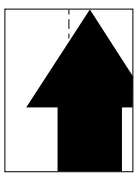
(17) Image is out of focus.



Causes
1. Defective image scanning unit.

Causes	Check procedures/corrective measures
1. Defective image scanning unit.	Replace the image scanning unit (see page 1-6-22).

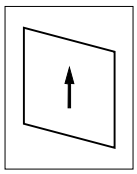
(18) Image center does not align with the original center.



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 1-6-10).
2. Misadjusted scanner center line.	Readjust the scanner center line (see page 1-6-29).
3. Original placed incorrectly.	Place the original correctly.

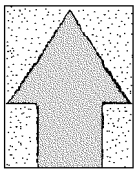
(19) Image is not square.



Causes
1. Laser scanner unit positioned incorrectly.
2. Image scanning unit positioned incorrectly.

Causes	Check procedures/corrective measures
1. Laser scanner unit positioned incorrectly.	Adjust the installation position of the laser scanner unit (see page 1-6-20).
2. Image scanning unit positioned incorrectly.	Adjust the installation position of the image scanning unit (see page 1-6-24).

(20) Image contrast is low (carrier scattering).



Causes
1. No developing bias output.

Causes	Check procedures/corrective measures
1. No developing bias output.	
A. Developing bias wire makes poor contact.	Check the developing bias wire. If there are any problems, replace it.
B. Defective main PCB.	Check if CN4-4 on the main PCB goes low when maintenance item U030 is run. If not, replace the main PCB.
C. Defective high-voltage transformer PCB.	Check if developing bias is output when there is no problem with the main PCB while maintenance item U030 is run. If not, replace the high-voltage transformer PCB.

1-5-4 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate when the main 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 and/or paper conveying unit are/is not closed completely.	Check the front cover and paper conveying unit.
	Broken power cord.	Check for continuity. If none, replace the cord.
	Defective main switch.	Check for continuity across the contacts. If none, replace the main switch.
	Blown fuse in the power source PCB.	Check for continuity. If none, remove the cause of blowing and replace the fuse.
	Defective safety switch 1 or 2.	Check for continuity across the contacts of each switch. If none, replace the switch.
	Defective power source PCB.	With AC present, check for 3.3 V DC at CN3-9 on the power source PCB, 5 V DC at CN3-5 and CN3-6, 12 V DC at CN4-3 and 24 V DC at CN3-1 and CN3-2. If none, replace the power source PCB.
(2) The drive motor does not operate (C200).	Poor contact in the drive motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken drive motor gear.	Check visually and replace the drive motor if necessary.
	Defective drive motor.	Run maintenance item U030 and check if the drive motor operates when CN12-16 on the main PCB goes low. If not, replace the drive motor.
(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) The toner feed motor does not operate.	Broken toner feed motor coil.	Check for continuity across the coil. If none, replace the toner feed motor.
	Poor contact in the toner feed motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
(5) Cooling fan motor 1 does not operate.	Broken cooling fan motor 1 coil.	Check for continuity across the coil. If none, replace cooling fan motor 1.
	Poor contact in the cooling fan motor 1 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
(6) Cooling fan motor 2 does not operate.	Broken cooling fan motor 2 coil.	Check for continuity across the coil. If none, replace cooling fan motor 2.
	Poor contact in the cooling fan motor 2 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.

Problem	Causes	Check procedures/corrective measures
(7) Cooling fan motor 3 does not operate.	Broken cooling fan motor 3 coil.	Check for continuity across the coil. If none, replace cooling fan motor 3.
	Poor contact in the cooling fan motor 3 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
(8) 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.
(9) The paper feed clutch does not operate.	Broken paper feed clutch coil.	Check for continuity across the coil. If none, replace the paper feed clutch.
	Poor contact in the paper feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(10) The bypass paper feed clutch does not operate.	Broken bypass paper feed clutch coil.	Check for continuity across the coil. If none, replace the bypass paper feed clutch.
	Poor contact in the bypass paper feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(11) The cleaning lamp does not turn on.	Poor contact in the cleaning lamp connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective cleaning lamp.	Check for continuity. If none, replace the cleaning lamp.
(12) 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 inverter PCB.	If the exposure lamp does not turn on when CN24-1 and CN24-2 on the inverter PCB are held low, replace the inverter PCB.
(13) The exposure lamp does not turn off.	Defective inverter PCB.	If the exposure lamp does not turn off when CN24-1 and CN24-2 on the inverter PCB are held high, replace the inverter PCB.
(14) The fixing heater does not turn on (C610).	Broken wire in fixing heater.	Check for continuity across the heater. If none, replace the heater.
	Fixing unit thermostat triggered.	Check for continuity across the thermostat. If none, remove the cause and replace the thermostat.
	Broken fixing unit thermistor wire.	Measure the resistance. If it is $\infty\ \Omega$, replace the fixing unit thermistor.
(15) The fixing heater does not turn off.	Dirty sensor part of the fixing unit thermistor.	Check visually and clean the thermistor sensor parts.

Problem	Causes	Check procedures/corrective measures
(16) Main charging is not performed (C510).	Broken main charger wire.	See page 1-5-12.
	Leaking main charger housing.	
	Poor contact in the high-voltage transformer PCB connector terminals.	
	Defective main PCB.	
	Defective high- voltage transformer PCB .	
(17) Transfer charging is not performed.	Poor contact in the high-voltage transformer PCB connector terminals.	See page 1-5-12.
	Defective main PCB.	
	Defective high-voltage transformer PCB .	
(18) No developing bias is output.	Poor contact in the developing bias wire.	Check the developing bias wire. If there is any problem, replace it.
	Poor contact in the high-voltage transformer PCB connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective high-voltage transformer PCB .	Check if the developing bias is output when CN1-3 on the high-voltage transformer PCB goes low while maintenance item U030 is run. If not, replace the high-voltage transformer PCB.
(19) The message requesting paper to be loaded is shown when paper is present in the drawer.	Poor contact in the paper switch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective paper switch.	Check if CN3-10 on the main PCB goes low when the paper switch is turned on with 5 V DC present at CN3-11 on the main PCB. If not, replace the paper switch.
(20) A paper jam in the paper feed, paper conveying or fixing section is indicated when the main switch is turned on.	A piece of paper torn from copy paper is caught around the registration switch or eject switch.	Check and remove if any.
	Defective registration switch.	With 5 V DC present at CN3-6 on the main PCB, check if CN3-7 on the main PCB remains low when the registration switch is turned on and off. If it does, replace the registration switch.
	Defective eject switch.	With 5 V DC present at CN12-7 on the main PCB, check if CN12-6 on the main PCB remains low when the eject switch is turned on and off. If it does, replace the eject switch.

Problem	Causes	Check procedures/corrective measures
(21) The message requesting covers to be closed is displayed when the front cover and paper conveying unit are closed.	Poor contact in the connector terminals of safety switch 1 or 2.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective safety switch 1 or 2.	Check for continuity across the contacts of each switch. If there is no continuity when the switch is on, replace it.
(22) 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

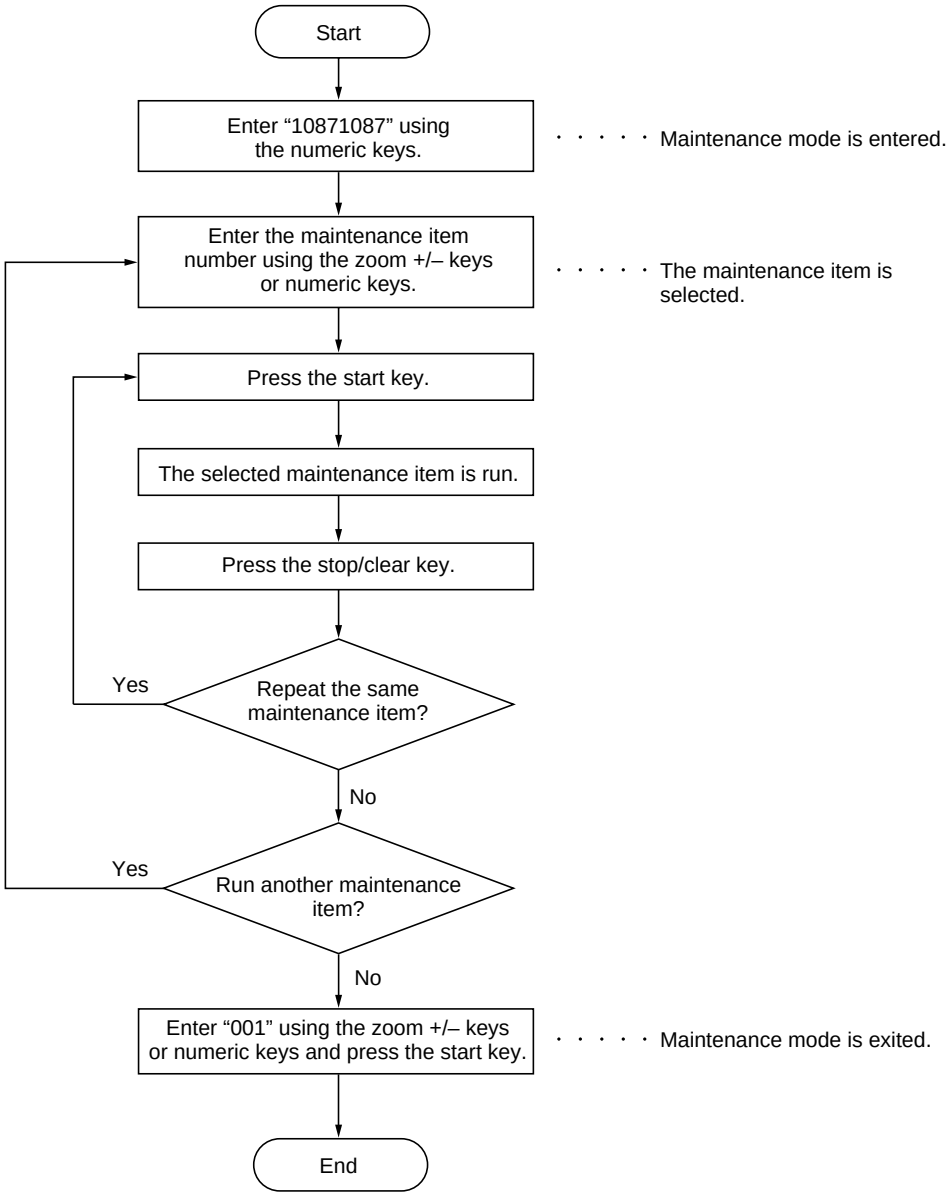
Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the following pulleys are dirty with paper powder: paper feed pulleys and bypass paper feed pulleys.	Clean with isopropyl alcohol.
	Check if the paper feed pulleys are deformed.	Check visually and replace any deformed pulleys (see page 1-6-3).
	Electrical problem with the following electromagnetic clutches: paper feed clutch and bypass paper feed clutch.	See pages 1-5-20.
(2) No secondary paper feed.	Check if the surfaces of the left and right registration rollers are dirty with paper powder.	Clean with isopropyl alcohol.
	Electrical problem with the registration clutch.	See page 1-5-20.
(3) Skewed paper feed.	Width guide in a drawer installed incorrectly.	Check the width guide visually and correct or replace if necessary.
	Deformed width guide in a drawer.	Repair or replace if necessary .
	Check if a pressure spring along the paper conveying path is deformed or out of place.	Repair or replace.
(4) The scanner does not travel.	Check if the scanner wire is loose.	Reinstall the scanner wire (see page 1-6-15).
	The scanner motor malfunctions.	See page 1-5-19.
(5) Multiple sheets of paper are fed at one time.	Deformed drawer claw.	Check the drawer claw visually and correct or replace if necessary.
	Check if the paper is curled.	Change the paper.
(6) Paper jams.	Check if the paper is excessively curled.	Change the paper.
	Deformed guides along the paper conveying path.	Check visually and replace any deformed guides.
	Check if the contact between the right and left registration rollers is correct.	Check visually and remedy if necessary. Replace the pressure spring if it is deformed.
	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) Toner drops on the paper conveying path.	Check if the developing section of the image formation unit is extremely dirty.	Clean the developing section of the image formation unit.
(8) Abnormal noise is heard.	Check if the pulleys, rollers and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic clutches are installed correctly: paper feed clutch and bypass paper feed clutch.	Correct.

1-6-1 Precautions for assembly and disassembly

(1) Precautions

- Be sure to turn the main 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.
- 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)

(2) Running a maintenance item



1-6-2 Paper feed section

(1) Detaching and refitting the paper feed pulleys
Follow the procedure below to replace the paper feed pulleys.

Procedure

1. Open the bypass tray and paper conveying unit and then remove the rear and rear left covers. Pull out the drawer.
2. Remove the screw and then the handle (rear side of the machine).
3. Remove the two screws, release the wires from the clamps and then detach the shaft handle retainer at the machine rear.

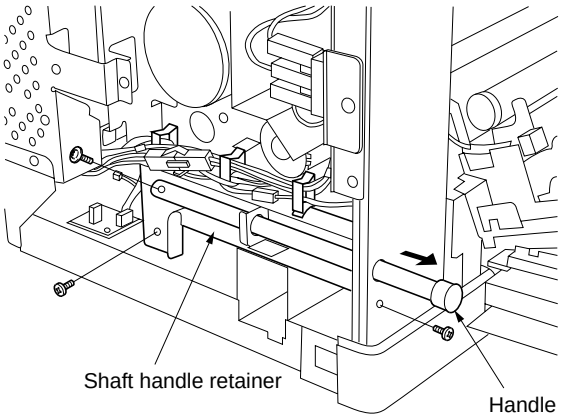


Figure 1-6-1

4. Remove the stop ring and then the paper feed clutch.
   • When refitting, insert the cutout in the paper feed clutch over the stopper on the copier.

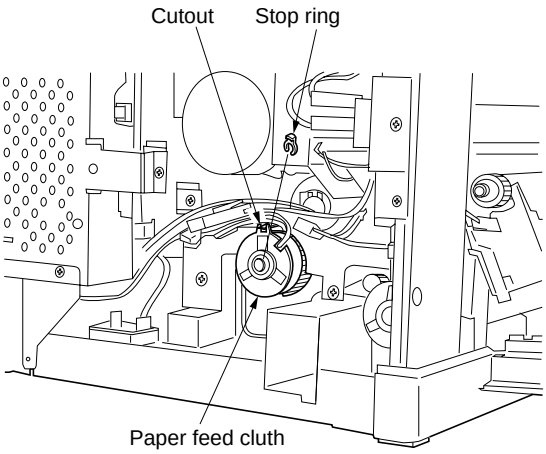


Figure 1-6-2

5. Remove the E ring and bushing from the paper feed shaft unit (machine rear).

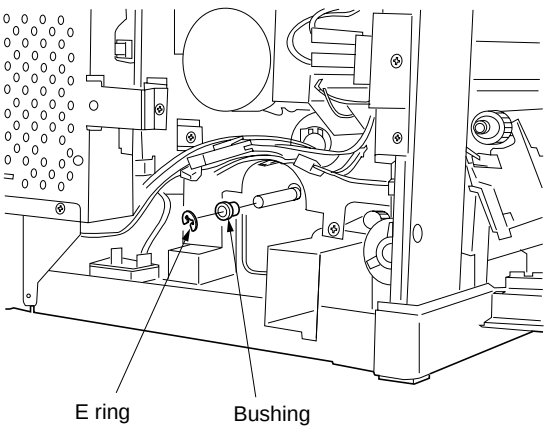


Figure 1-6-3

6. Open the front cover and remove the image formation unit (see page 1-6-31).
7. Remove the stop ring from the paper feed shaft unit (machine front).

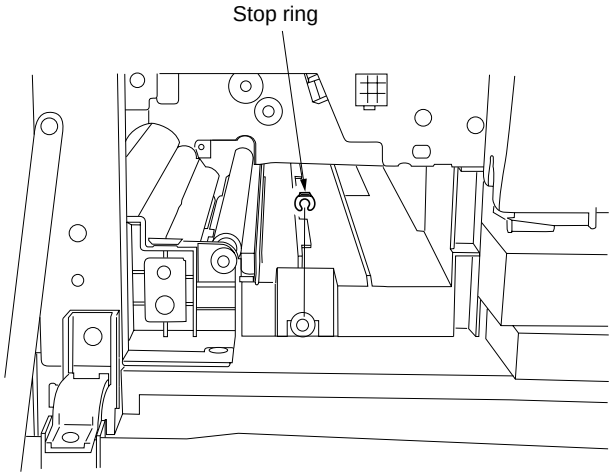


Figure 1-6-4

8. Push the paper feed shaft unit toward the machine rear (in the direction of ①) and remove the unit from the lower front side (in the direction of ②).

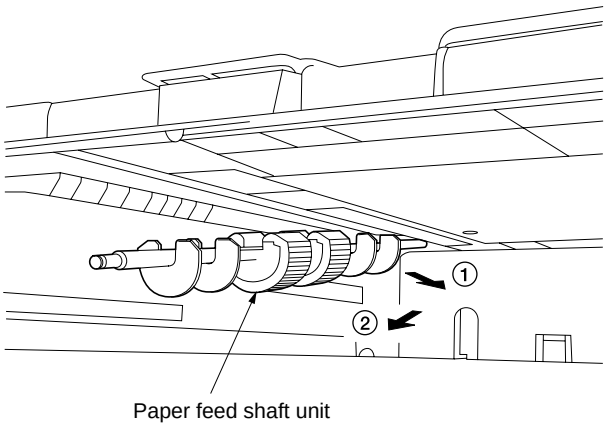


Figure 1-6-5

9. Remove the screw holding each of the paper feed pulleys and then the pulleys.
10. Replace the paper feed pulleys and refit all the removed parts.
    • Before returning the drawer, turn the main switch on and check that the paper feed pulleys are positioned correctly (the semicircular pulleys should be facing downward).

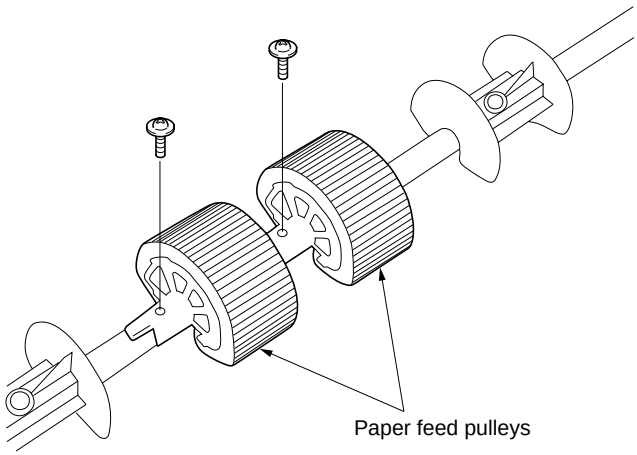


Figure 1-6-6

(2) Detaching and refitting the bypass paper feed pulley

Follow the procedure below to replace the bypass paper feed pulley.

Procedure

1. Open the bypass tray, paper conveying unit and front cover and then remove the image formation unit (see page 1-6-31).
2. Remove the screw and then the fulcrum pin.

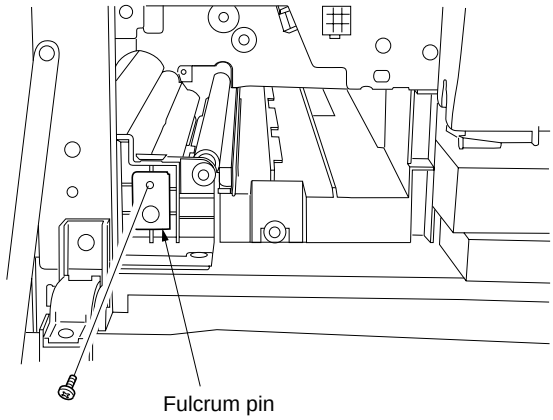


Figure 1-6-7

3. Disconnect the connector and remove the paper conveying unit.

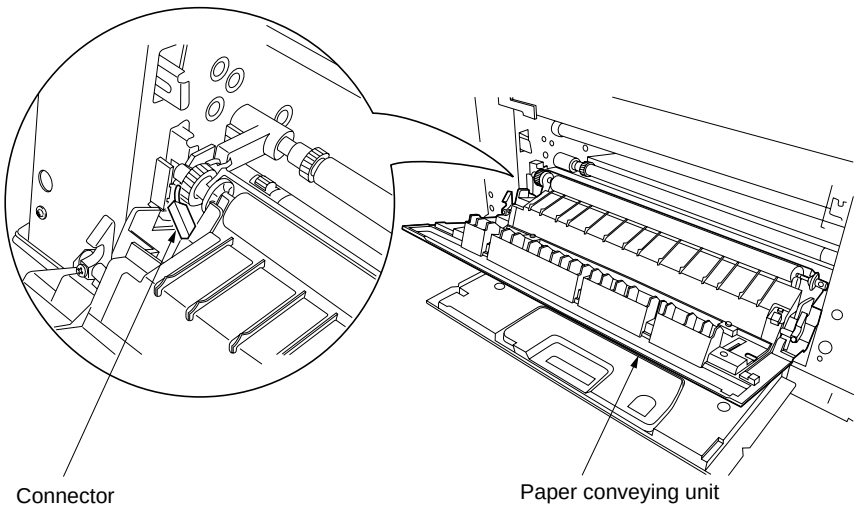


Figure 1-6-8

4. Remove the two screws holding the lower left cover and then the cover.

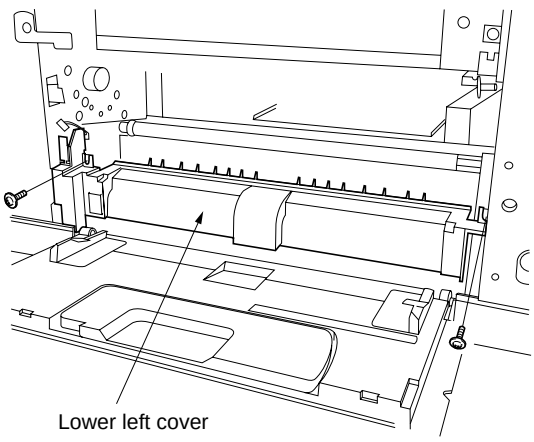


Figure 1-6-9

5. Remove the rear screw of the bypass paper feed pulley and then the pulley.

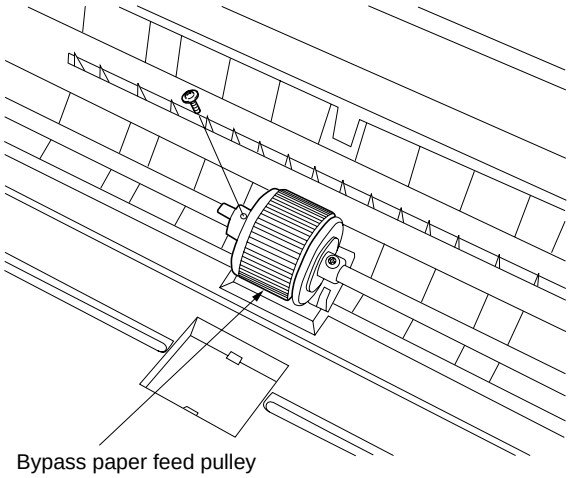


Figure 1-6-10

6. Replace the bypass paper feed pulley and refit all the removed parts.
   • When refitting, check that the cam on the rear of the shaft is correctly positioned (see figure 1-6-11).

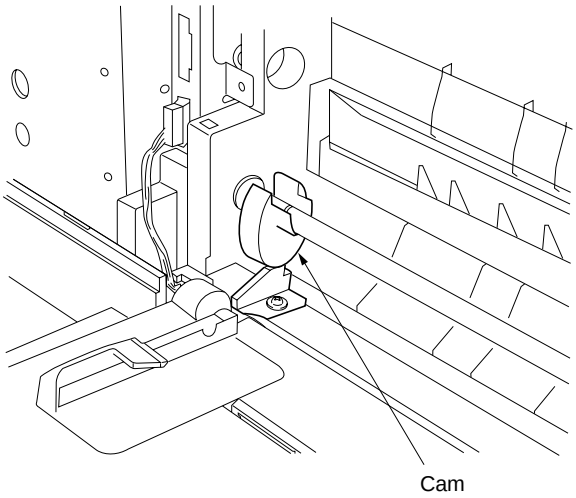


Figure 1-6-11

(3) Detaching and refitting the left registration cleaner assembly

Follow the procedure below to replace the left registration cleaner assembly.

Procedure

1. Open the bypass tray and paper conveying unit.
2. Remove the transfer roller unit (see page 1-6-36).
3. While rotating the left registration roller in the direction of the arrow in the diagram, remove the left registration cleaner assembly.
4. Replace the left registration cleaner assembly and refit all the removed parts.

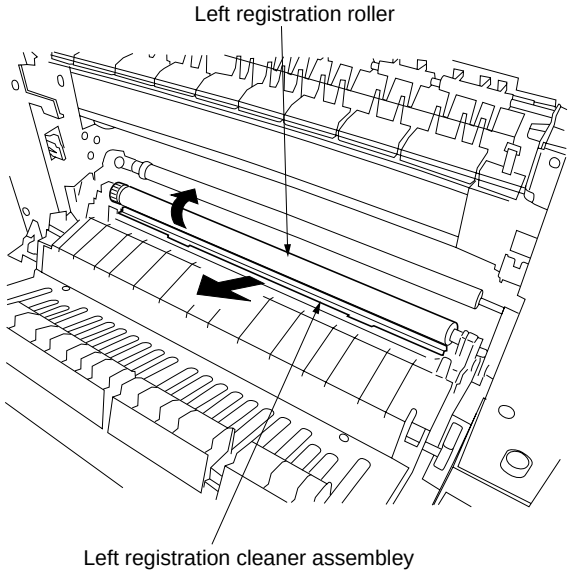


Figure 1-6-12

(4) Detaching and refitting the right registration cleaner assembly

Follow the procedure below to replace the right registration cleaner assembly.

Procedure

1. Open the bypass tray, paper conveying unit and front cover and then remove the image formation unit (see page 1-6-31).
2. Remove the right registration cleaner unit by lifting its front first.
3. Replace the right registration cleaner unit and refit all the removed parts.

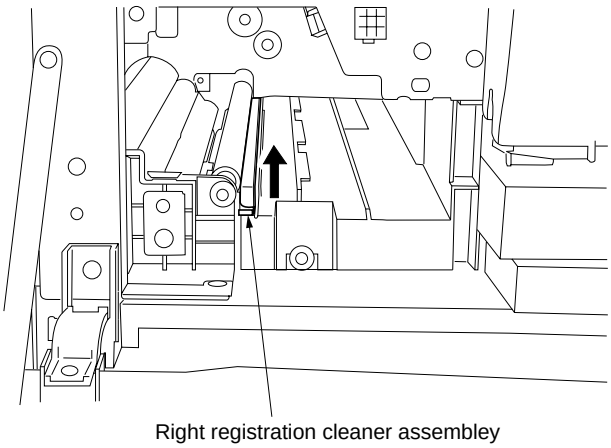


Figure 1-6-13

(5) Detaching and refitting the bypass paper width switch

Follow the procedure below to replace the bypass paper width switch.

Procedure

1. Remove the paper conveying unit and lower left cover (see page 1-6-5).
2. Remove the bypass tray assembly.
3. Remove the two screws and then the upper bypass cover.

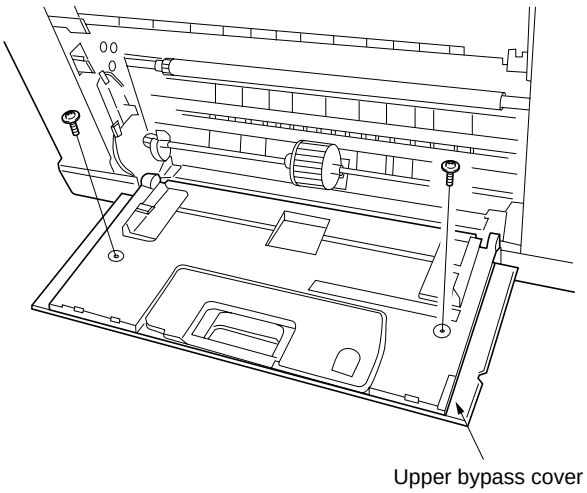


Figure 1-6-14

4. Remove the gear and rack plate and detach the connector and then remove the bypass paper width switch.

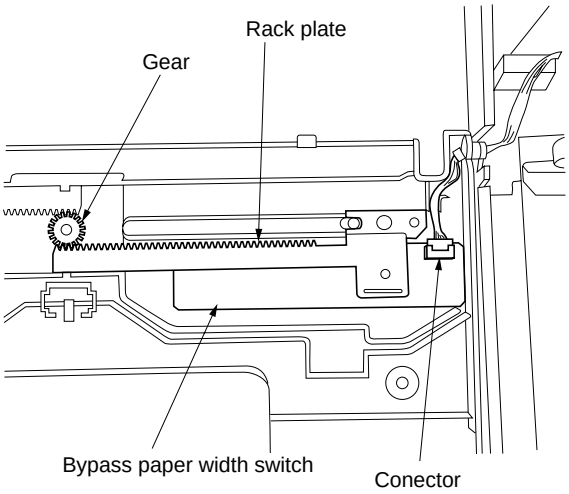


Figure 1-6-15

5. Replace the bypass paper width switch and refit all the removed parts.
   - When replacing, apply the specified grease to the printed surface of the new bypass paper width switch.
   - When refitting the gear, move the front and rear rack plates to their innermost positions.

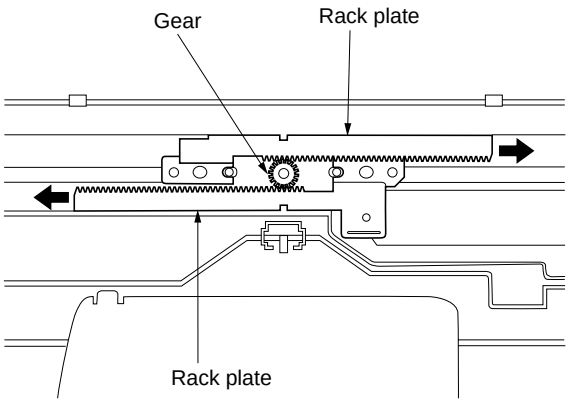
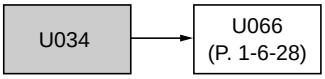


Figure 1-6-16

(6) Adjustment after roller and clutch replacement
Perform the following adjustment after refitting rollers and clutches.

(6-1) 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

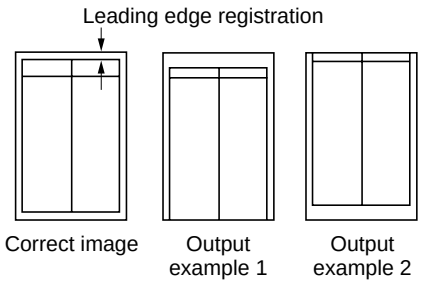
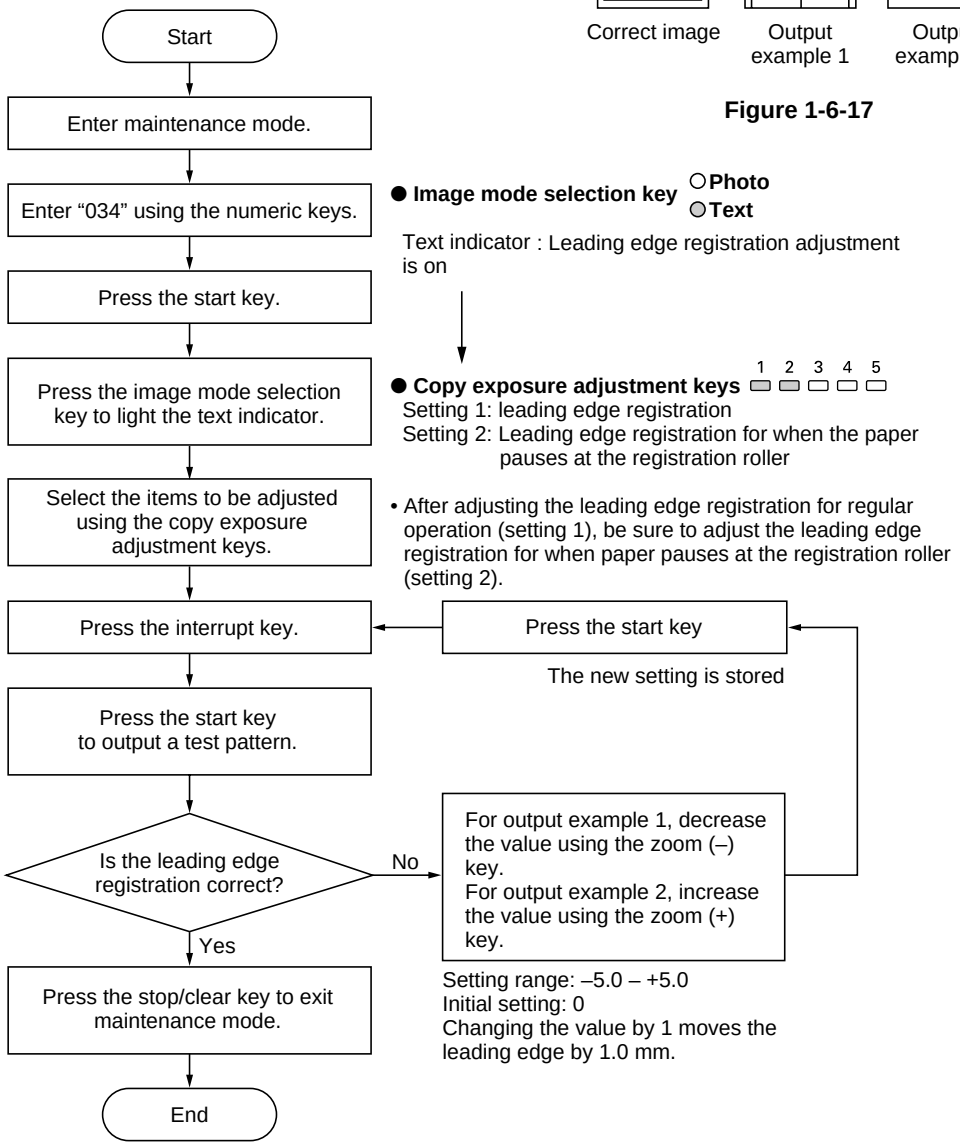
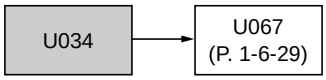


Figure 1-6-17



(6-2) 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

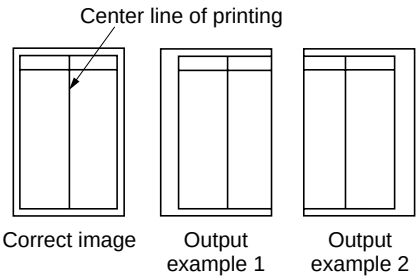
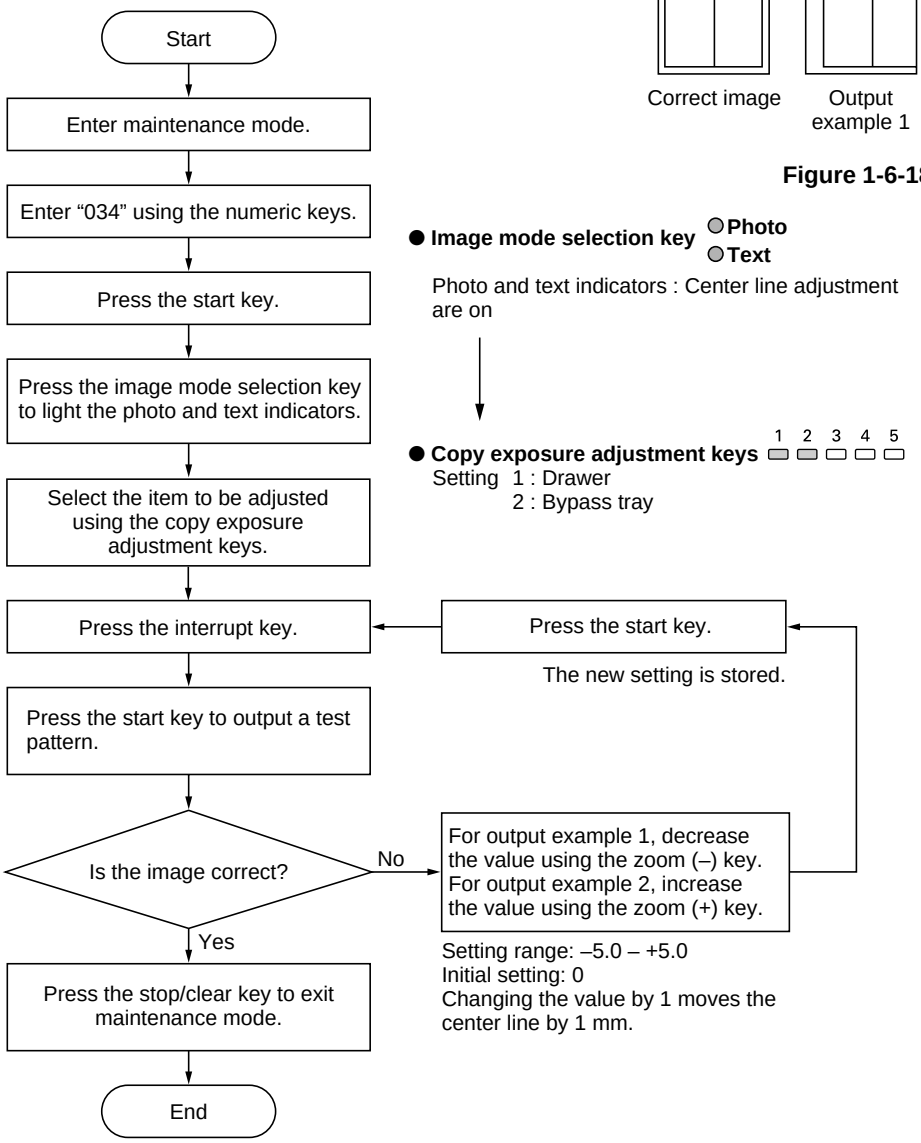


Figure 1-6-18



(6-3) Adjusting the margins for printing

Make the following adjustment if the margins are not correct.

U402 → U403 (P. 1-6-30)

Caution:

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

Procedure

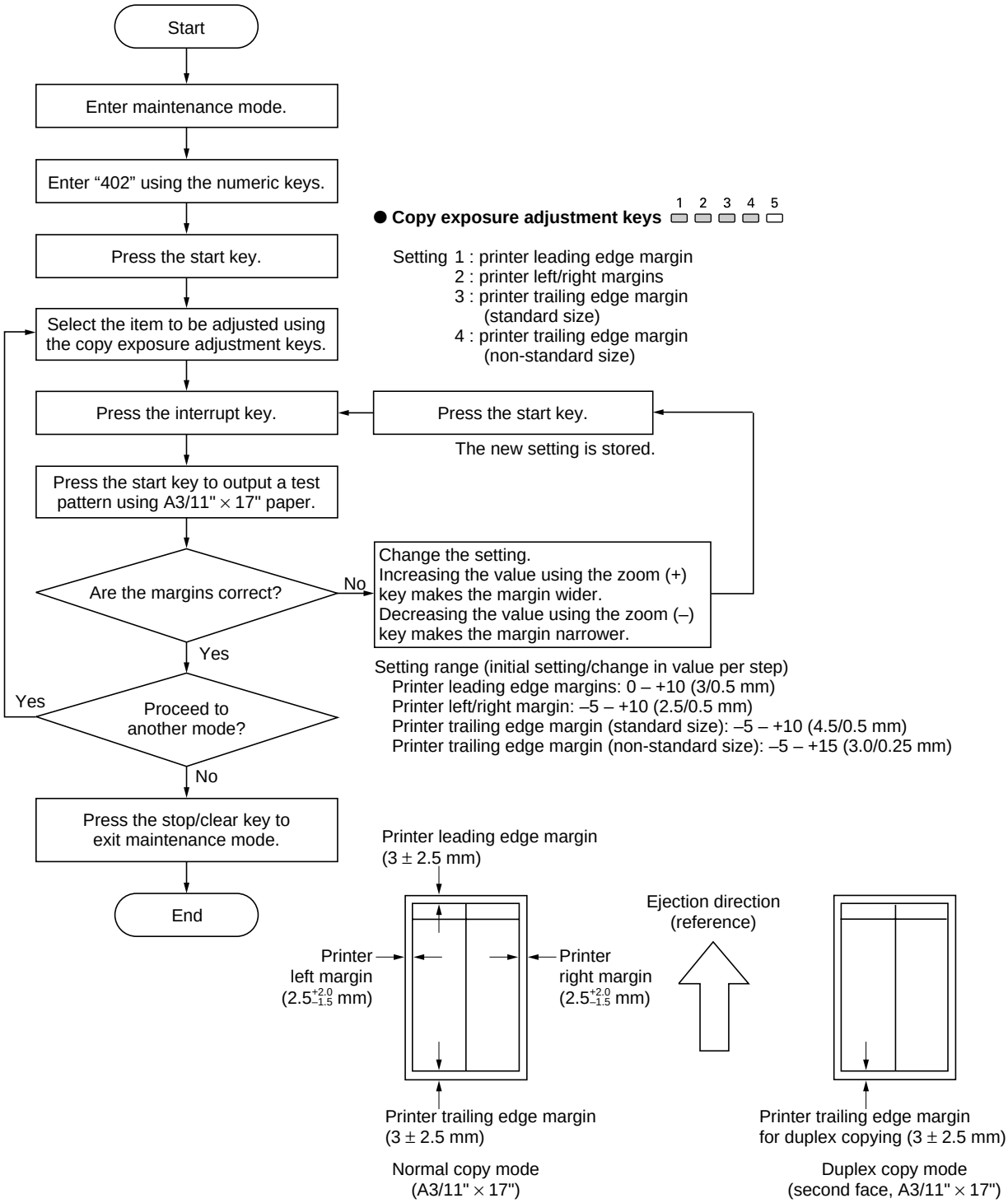


Figure 1-6-19

(6-4) 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

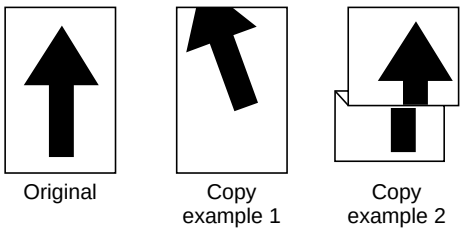
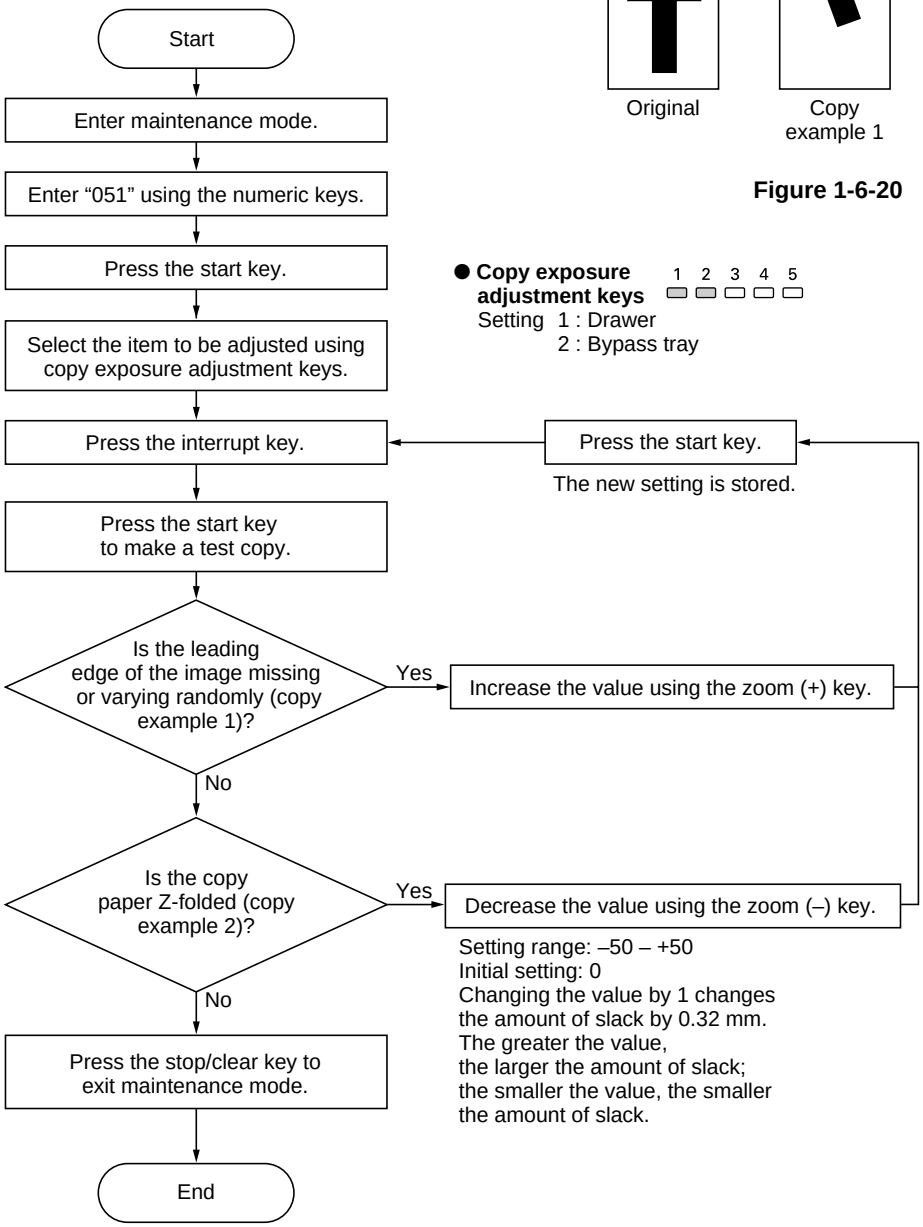


Figure 1-6-20



● **Copy exposure adjustment keys** 1 2 3 4 5

Setting 1 : Drawer
2 : Bypass tray

Setting range: –50 – +50
Initial setting: 0
Changing the value by 1 changes the amount of slack by 0.32 mm.
The greater the value, the larger the amount of slack; the smaller the value, the smaller the amount of slack.

1-6-3 Optical section

(1) Detaching and refitting the exposure lamp
Replace the exposure lamp as follows.

Procedure
1. Remove the original cover.
2. Remove the five screws holding the right cover. While sliding the right cover in the direction of the arrow in the diagram, remove the contact glass.

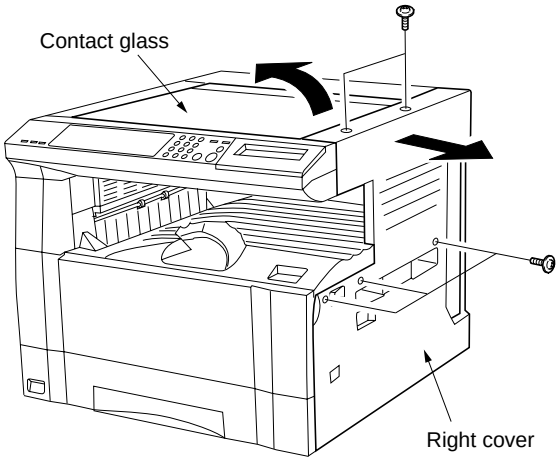


Figure 1-6-21

3. Move the mirror 1 frame to the cutouts of the machine.
   Caution: When moving the mirror 1 frame, do not touch the exposure lamp nor the inverter PCB.
4. Remove the screw holding the metal plate at the machine rear and then the plate.

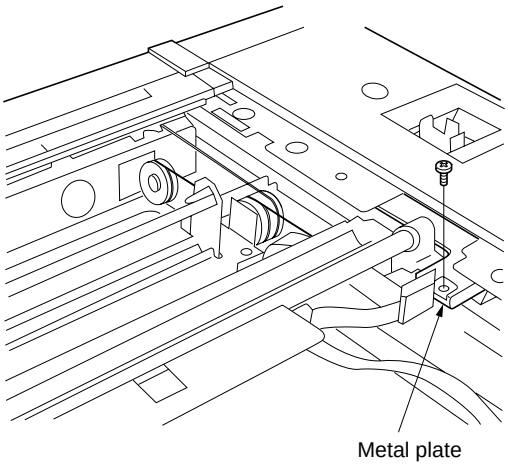


Figure 1-6-22

5. Detach the exposure lamp connector from the inverter PCB.
6. Remove the two screws holding the exposure lamp and then the lamp.
7. Replace the exposure lamp and refit all the removed parts.

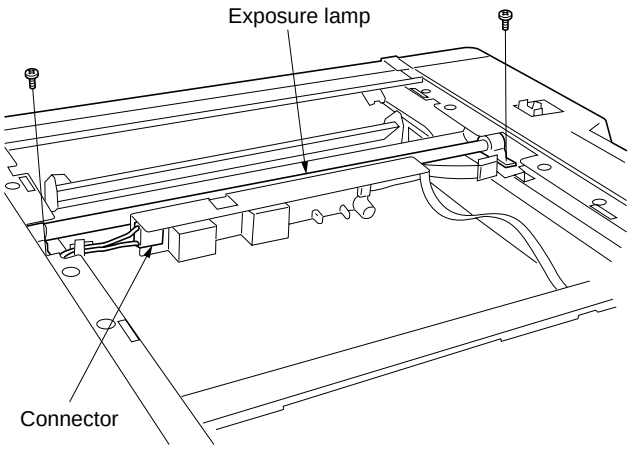


Figure 1-6-23

(2) Detaching and refitting the scanner wires
Take the following procedure when the scanner wires are broken or to be replaced.

Caution:
After replacing the scanner wires, After replacing the scanner wires, make a test copy and check the copy image. If adjustment is required, perform (6) to (12) of the scanner adjustments (see pages 1-6-24 to 30).

(2-1) Detaching the scanner wires

Procedure
1. Remove the exposure lamp (see page 1-6-13).
2. Remove the rear cover, upper rear cover, upper left cover, front left cover, rear left cover, slit glass and operation unit.
3. Remove the inverter wire guide plate and then the wire from the inverter PCB.

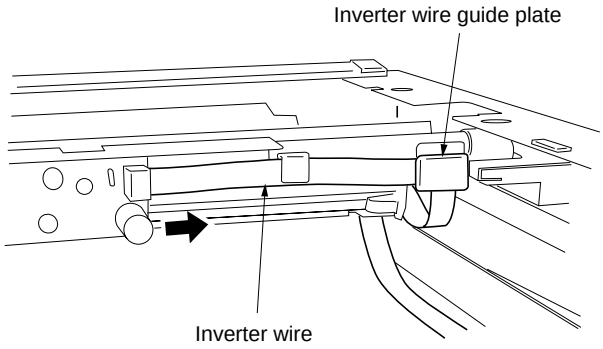


Figure 1-6-24

4. Remove the screw holding each of the front and rear wire retainers and then remove the mirror 1 frame from the scanner unit.

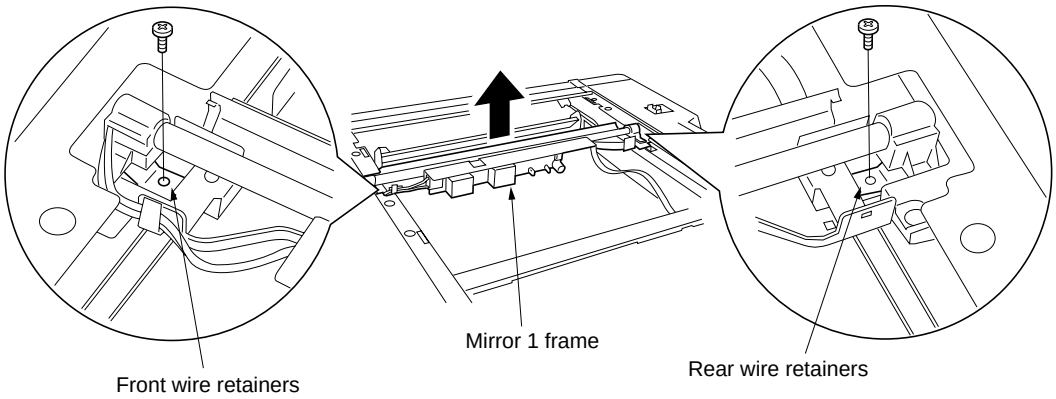


Figure 1-6-25

5. Unhook the round terminal of the scanner wire from the scanner tension spring on the left side of the scanner unit.
6. Remove the scanner wire.

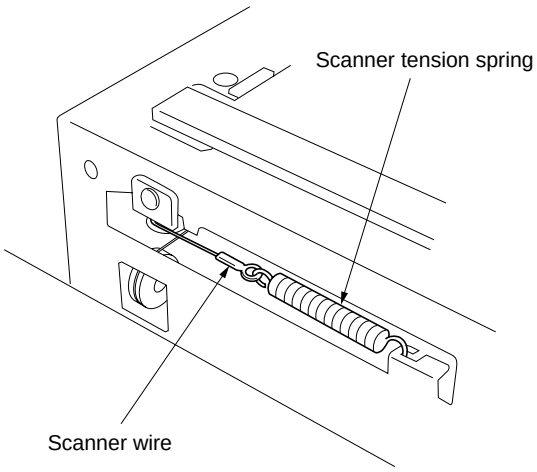


Figure 1-6-26

(2-2) Fitting the scanner wires

Caution:
When fitting the wires, be sure to use those specified below.
Machine front: P/N 2AV1219 (black)
Machine rear: P/N 2AV1220 (gray)

Fitting requires the following tools:
Two frame securing tools (P/N 2AV6808)
Two scanner wire stoppers (P/N 3596811)

Procedure

1. Insert the locating ball on each of the scanner wires into the hole in the respective scanner wire drum and wind the scanner wire three turns inward and four turns outward.
   • With the locating ball as the reference point, wind the shorter end of each of the wires inward.
2. Secure the scanner wires using the scanner wire stoppers.

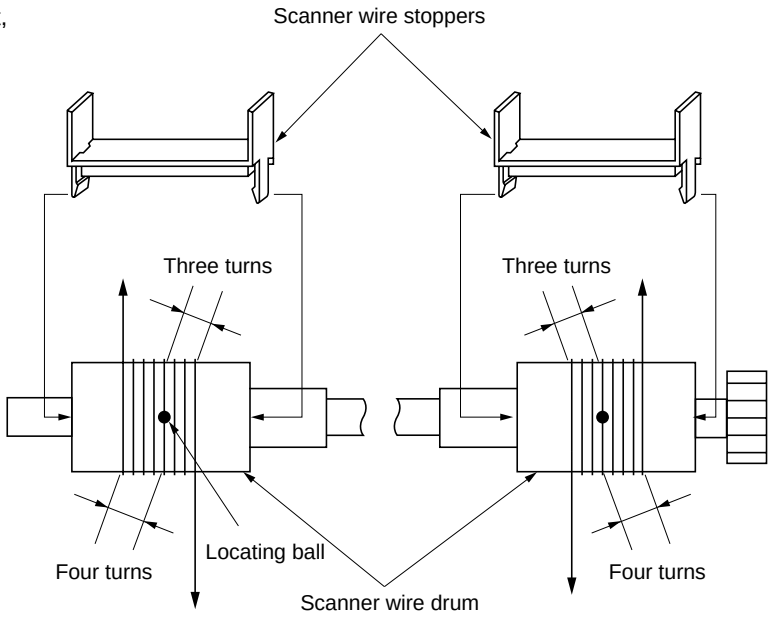


Figure 1-6-27

3. Insert the two frame securing tools into the positioning holes at the front and rear of the scanner unit to pin the mirror 2 frame in position.

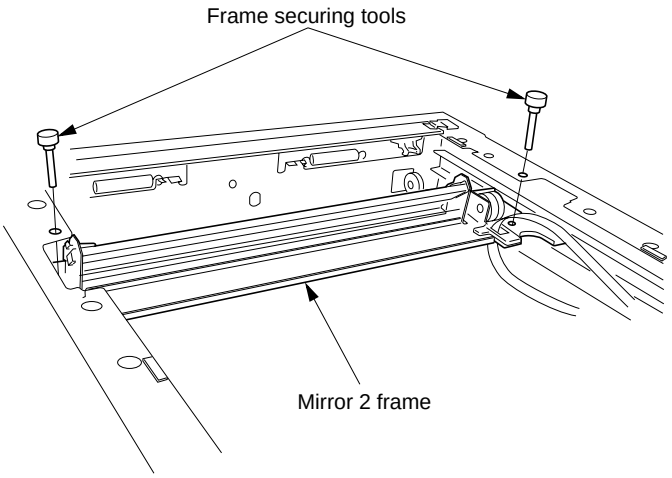


Figure 1-6-28

4. Loop the inner ends of the scanner wires around the grooves in the pulleys at the right of the scanner unit, winding from below to above. ..... ①
5. Loop the scanner wires around the inner grooves in the pulleys on the mirror 2 frame, winding from above to below. ..... ②
6. Hook the round terminals onto the catches inside the scanner unit. ..... ③

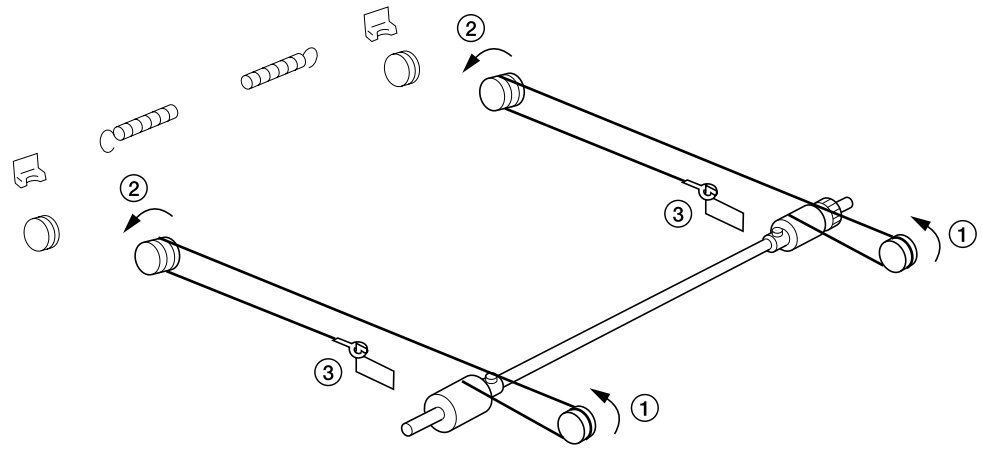


Figure 1-6-29

7. Loop the outer ends of the scanner wires around the grooves in the scanner wire pulleys at the left of the scanner unit, winding from below to above. ..... ④
8. Loop the scanner wires around the outer grooves in the pulleys on the mirror 2 frame, winding from below to above. ..... ⑤
9. Wind the scanner wires around the grooves in the scanner wire guides at the left of the scanner unit. ..... ⑥
10. Hook the round terminals onto the scanner tension springs. ..... ⑦

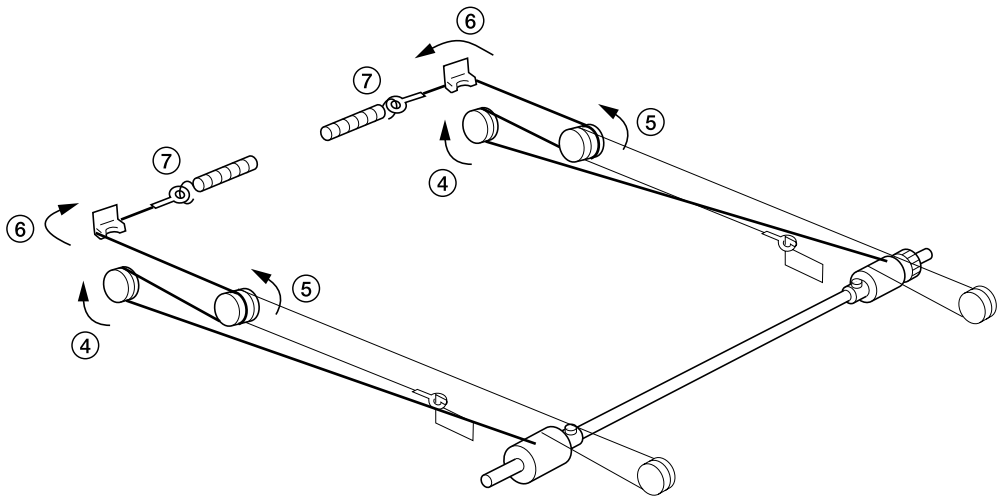


Figure 1-6-30

11. Remove the scanner wire stoppers and frame securing tools.
12. Gather the scanner wires toward the locating balls.
13. Move the mirror 2 frame from side to side to correctly locate the wires in position.

14. Mount the mirror 1 frame on the scanner rails and shift it toward the machine left.
15. Insert the frame securing tools into the positioning holes (leftmost holes) at the front and rear of the scanner unit to secure the mirror 1 frame and mirror 2 frame, and then lock the mirror 1 frame down by screw.
16. Remove the frame securing tools.
17. Refit all the removed parts.

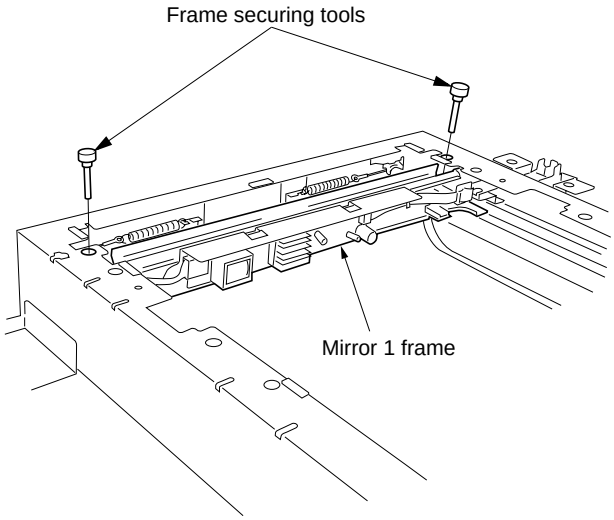


Figure 1-6-31

(3) Detaching and refitting the laser scanner unit

Take the following procedure when the laser scanner unit is to be checked or replaced.

Procedure

1. Open the front cover.
2. Remove the two screws holding the eject tray and then the tray.

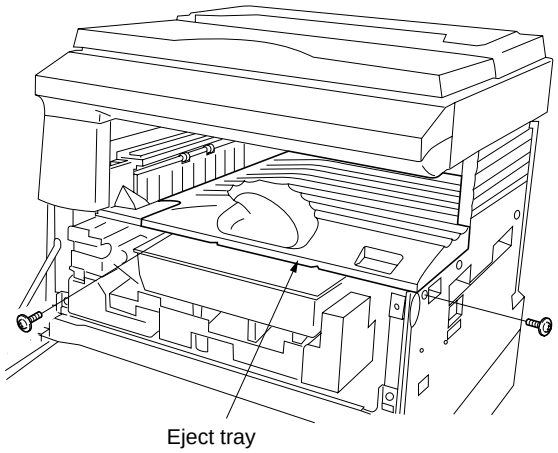


Figure 1-6-32

3. Remove the two screws and detatch the two connectors and then remove the fan duct.

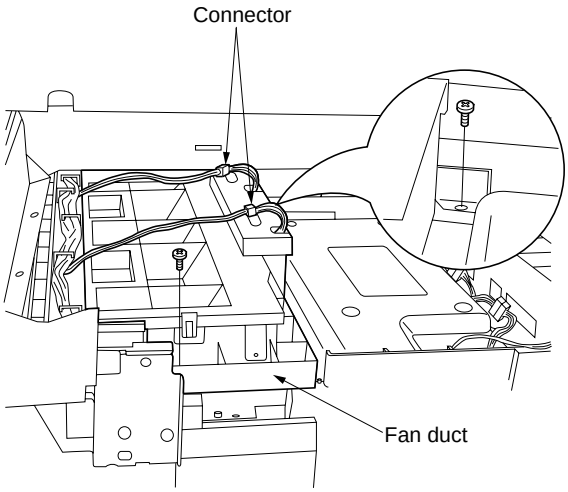


Figure 1-6-33

4. Remove the three screws and detatch the two connectors and then remove the laser scanner unit.

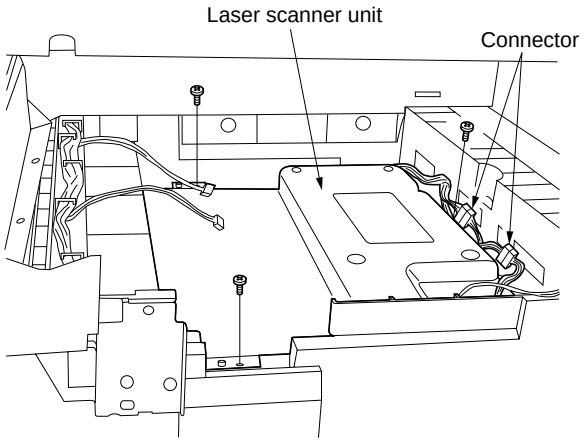


Figure 1-6-34

5. Check or replace the laser scanner unit and refit all the removed parts.
   Caution: Before fitting the new laser scanner unit, fit the LSU front spacer and LSU right spacer by orienting the markings correctly and using the correct layer as specified on the label on the laser scanner unit cover.

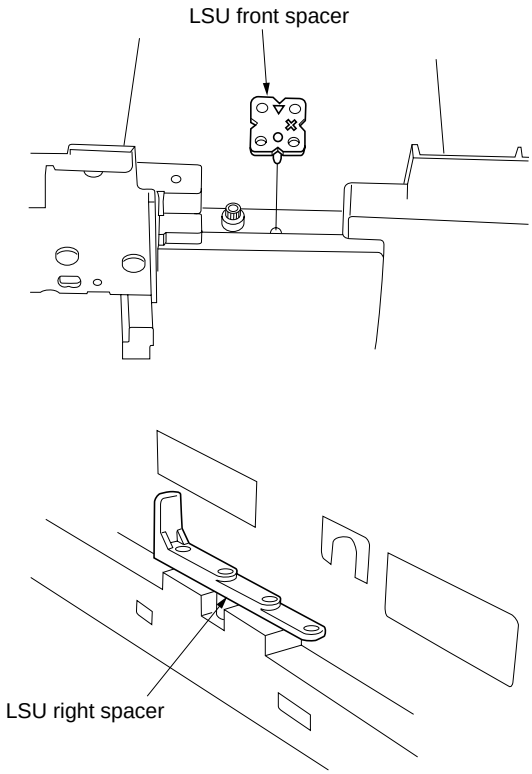


Figure 1-6-35

(4) Adjusting the skew and vertical shifting of the laser scanner unit

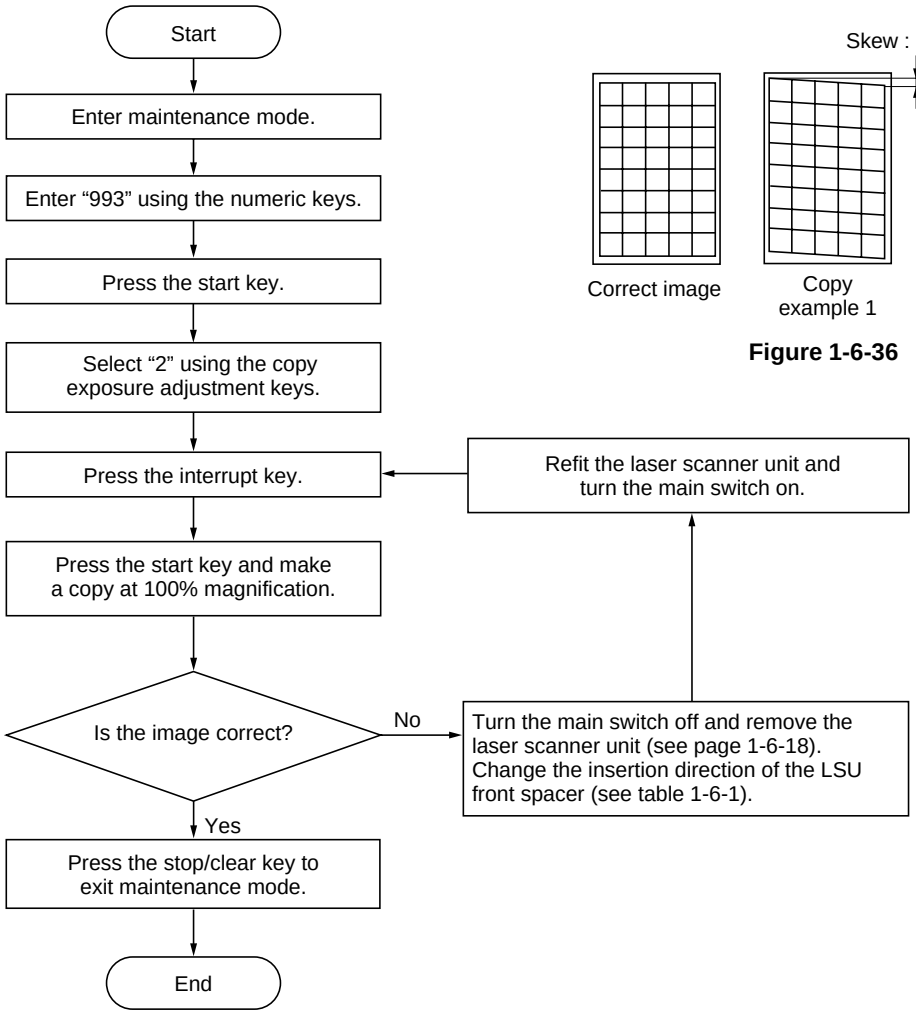
(4-1) Adjusting the skew of the laser scanner unit

Perform the following adjustment if the leading and trailing edges of the copy image are laterally skewed (lateral squareness not obtained).

Caution:

- After adjusting the skew of the laser scanner unit, make a test copy and check the copy image. If lateral squareness is still not obtained, perform "(6) Adjusting the position of the ISU" (see page 1-6-24).

Procedure



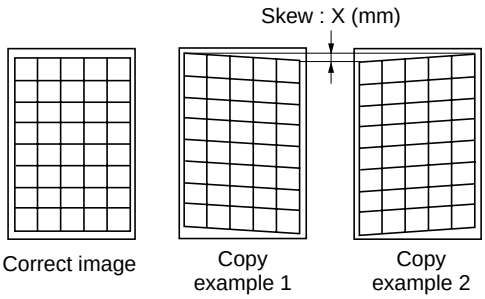
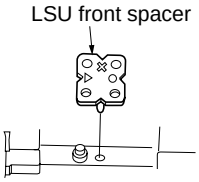
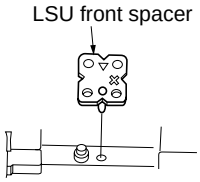
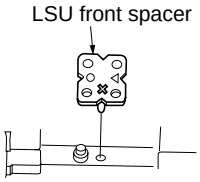


Figure 1-6-36

Skew: X (mm)*	–8 mm ≦ X < –3 mm	–3 mm ≦ X ≦ +3 mm	+3 mm < X ≦ +8
LSU front spacer insertion direction	 No marking (2nd from the bottom)	 O (3rd from the bottom)	 X (4th from the bottom)

* "–" indicates that the beginning of the printing is higher than the ending (copy example 1)
"+" indicates that the beginning of the printing is lower than the ending (copy example 2)

Table 1-6-1

(4-2) Adjusting the vertical shifting of the laser scanner unit

Perform the following adjustment if the copy image shifts vertically due to vertical shifting of the position of the laser scanner unit.

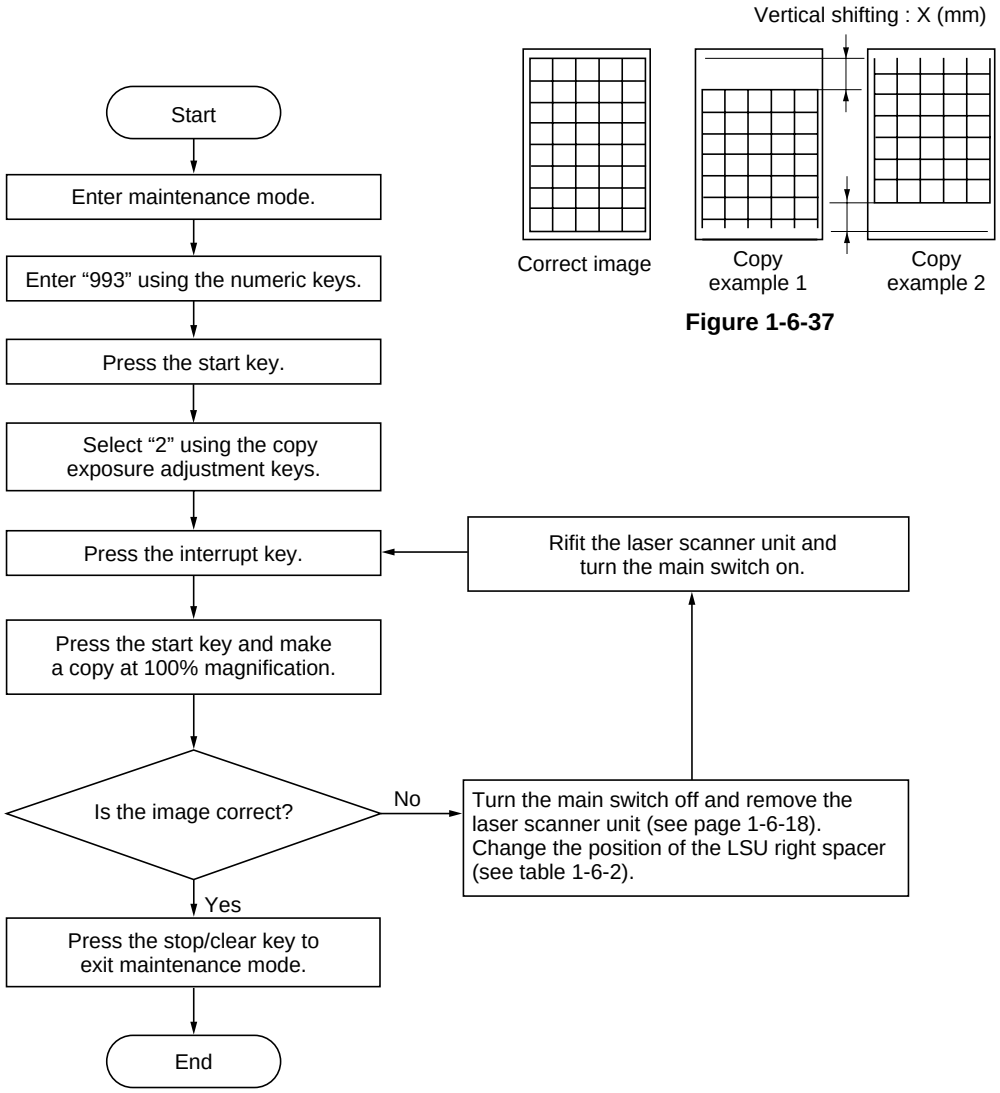
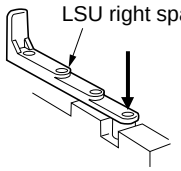
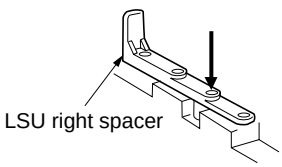
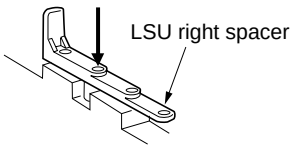


Figure 1-6-37

Vertical shifting: X (mm)*	–1.5 mm ≦ X < –0.5 mm	–0.5 mm ≦ X ≦ +0.5 mm	+0.5 mm < X ≦ +1.5 mm
Position of LSU right spacer	 Top layer	 2nd layer from the top	 3rd layer from the top

* "–" indicates that the copy image shifts toward the bottom (copy example 1)
"+" indicates that the copy image shifts toward the top (copy example 2)

Table 1-6-2

(5) Detaching and refitting the ISU (reference)
Take the following procedure when the ISU is to be checked or replaced.

Caution:
After replacing the scanner wires, After replacing the scanner wires, make a test copy and check the copy image. If adjustment is required, perform (6) to (12) of the scanner adjustments (see pages 1-6-24 to 30).

ISU installation requires the following tools:
Two positioning pins (P/N 1856812)

Procedure
• Detaching the ISU
1. Remove the contact glass (see page 1-6-13).
2. Remove the rear and shield covers and detach connectors CN22 and CN23 on the main PCB.

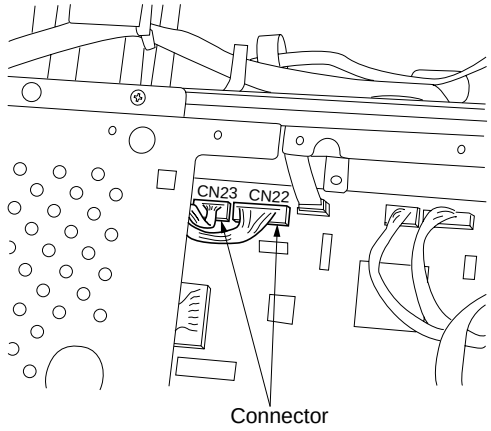


Figure 1-6-38

3. Remove the eight screws holding the ISU cover and then the cover.

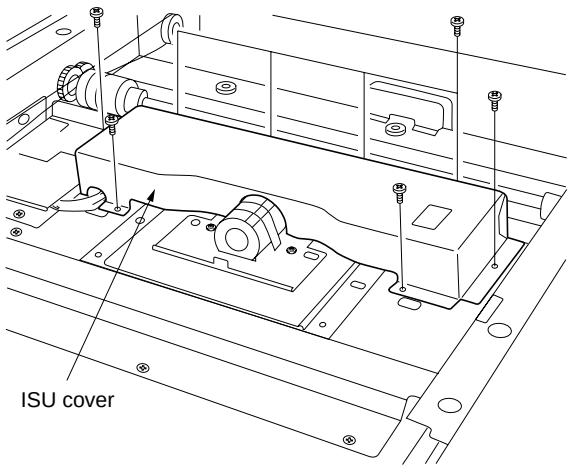


Figure 1-6-39

4. Remove the two screws and then the mount.
5. Remove the four screws holding the ISU and then the ISU.
6. Check or replace the ISU.

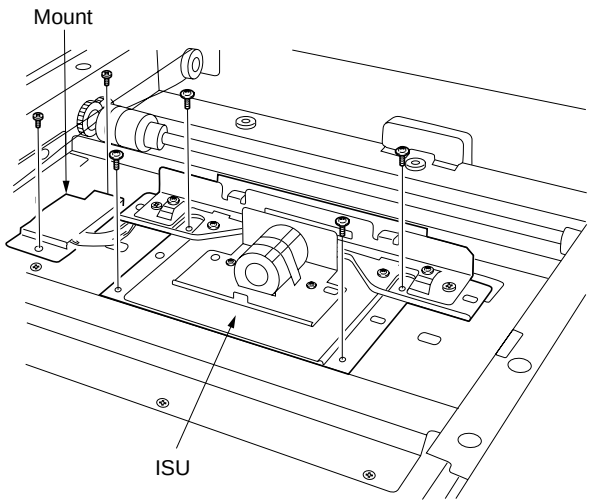


Figure 1-6-40

• Refitting the ISU
1. Fit the ISU using the two positioning pins.
2. Secure the ISU using the four screws.
3. Remove the two positioning pins and refit all the removed parts.

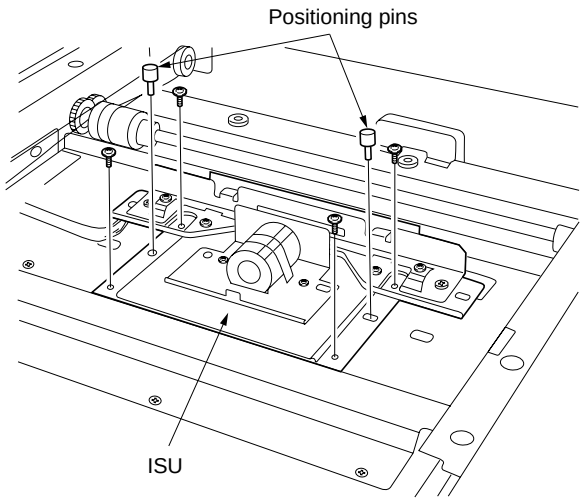


Figure 1-6-41

(6) Adjusting the position of the ISU (reference)
Perform the following adjustment if the leading and trailing edges of the copy image are laterally skewed (lateral squareness not obtained).

Caution:
- Be sure to perform “(4-1) Adjusting the skew of the laser scanner unit” (page 1-6-20) first.
- Before making the following adjustment, output a VTC-PG2 pattern in maintenance item U993 to use as the original for the adjustment.

Procedure

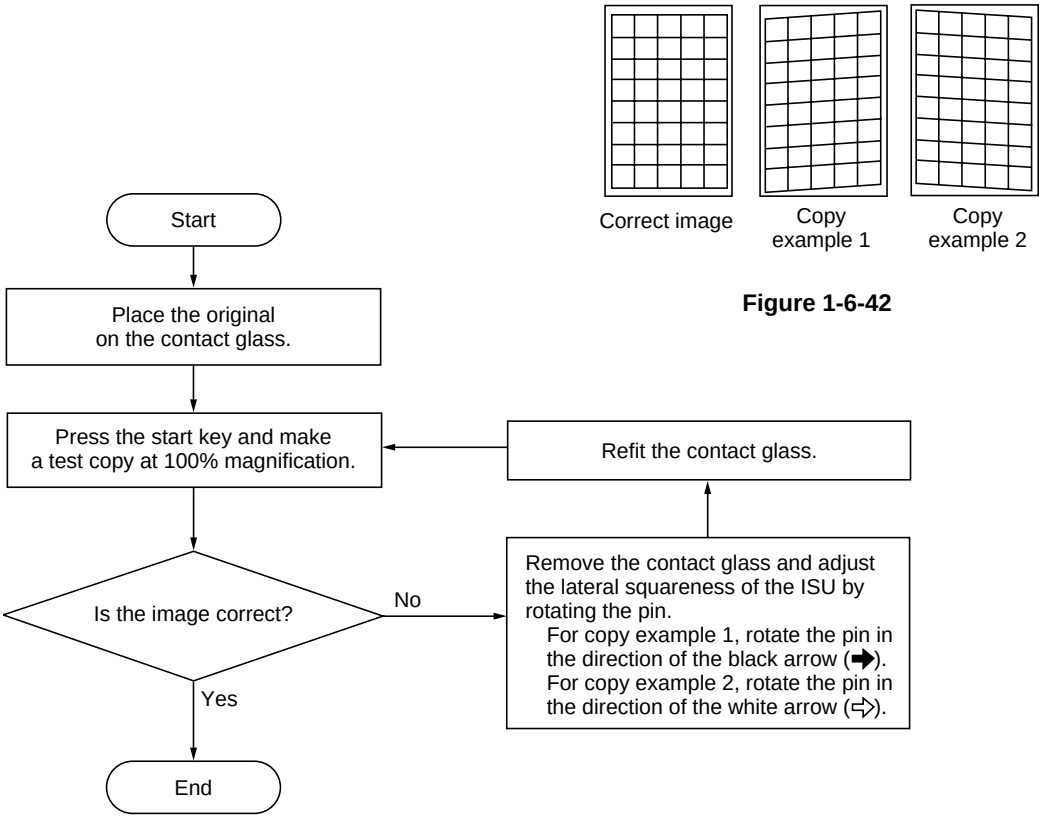


Figure 1-6-42

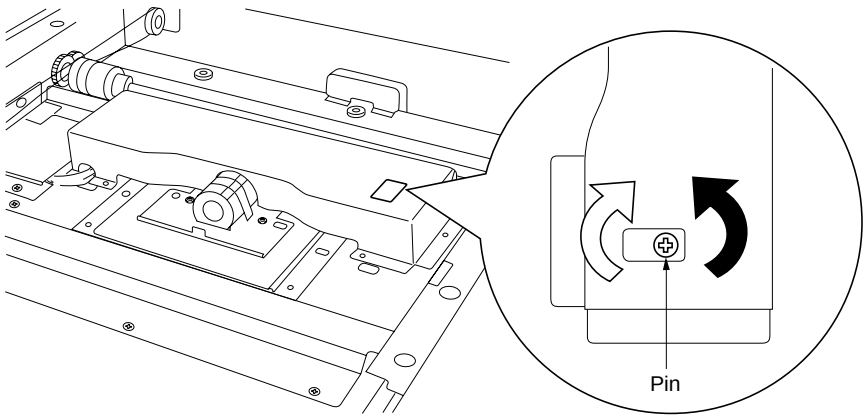


Figure 1-6-43

(7) Adjusting the longitudinal squareness (reference)

Perform the following adjustment if the copy image is longitudinally skewed (longitudinal squareness not obtained).

Caution:

- Adjust the amount of slack in the paper (page 1-6-12) first. Check for the longitudinal squareness of the copy image, and if it is not obtained, perform the longitudinal squareness adjustment.
- Before making the following adjustment, output a VTC-PG2 pattern in maintenance item U993 to use as the original for the adjustment.

Procedure

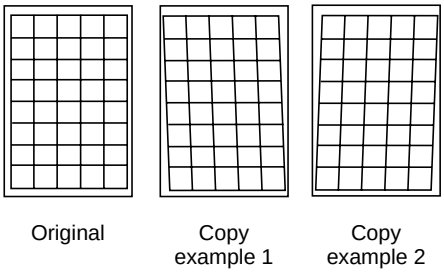
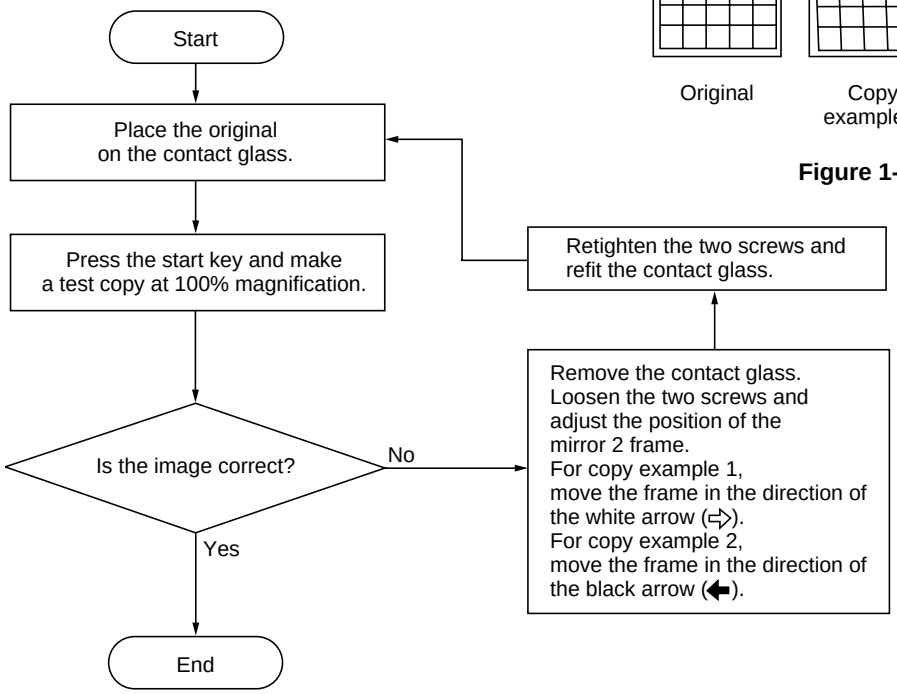


Figure 1-6-44



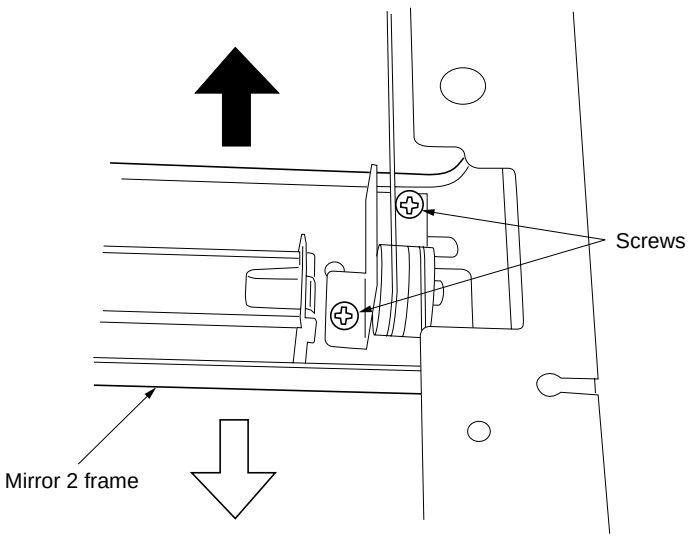
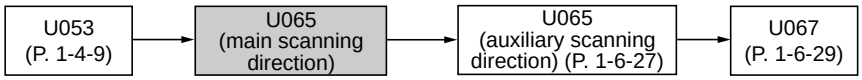


Figure 1-6-45

(8) 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 "(9) Adjusting magnification of the scanner in the auxiliary scanning direction" (page 1-6-27) and "(11) Adjusting the scanner center line" (page 1-6-29) after this adjustment.

Procedure

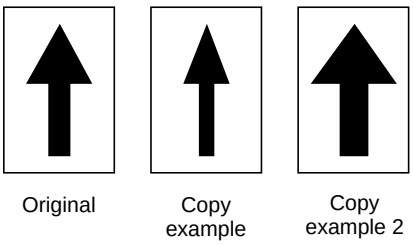
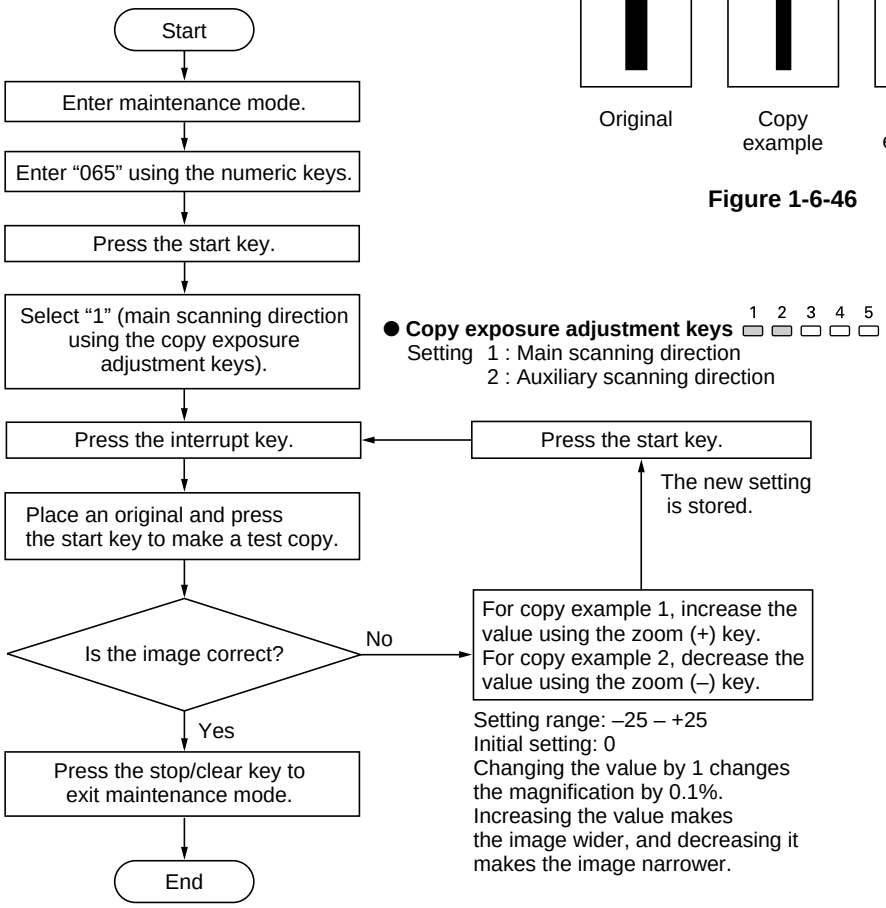
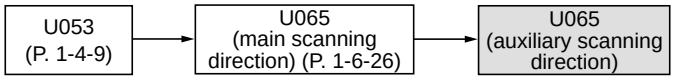


Figure 1-6-46



(9) 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

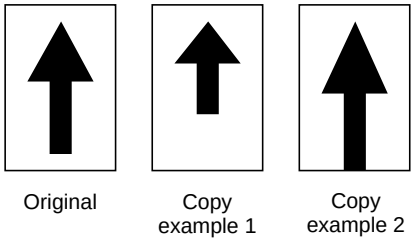
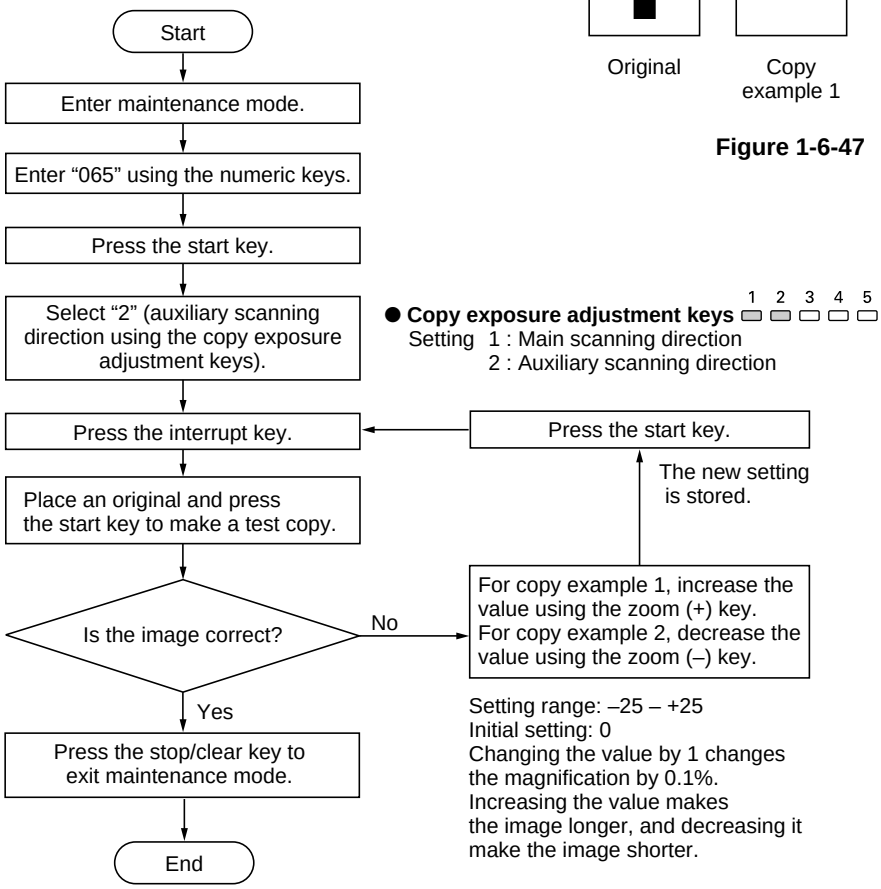
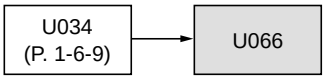


Figure 1-6-47



(10) 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

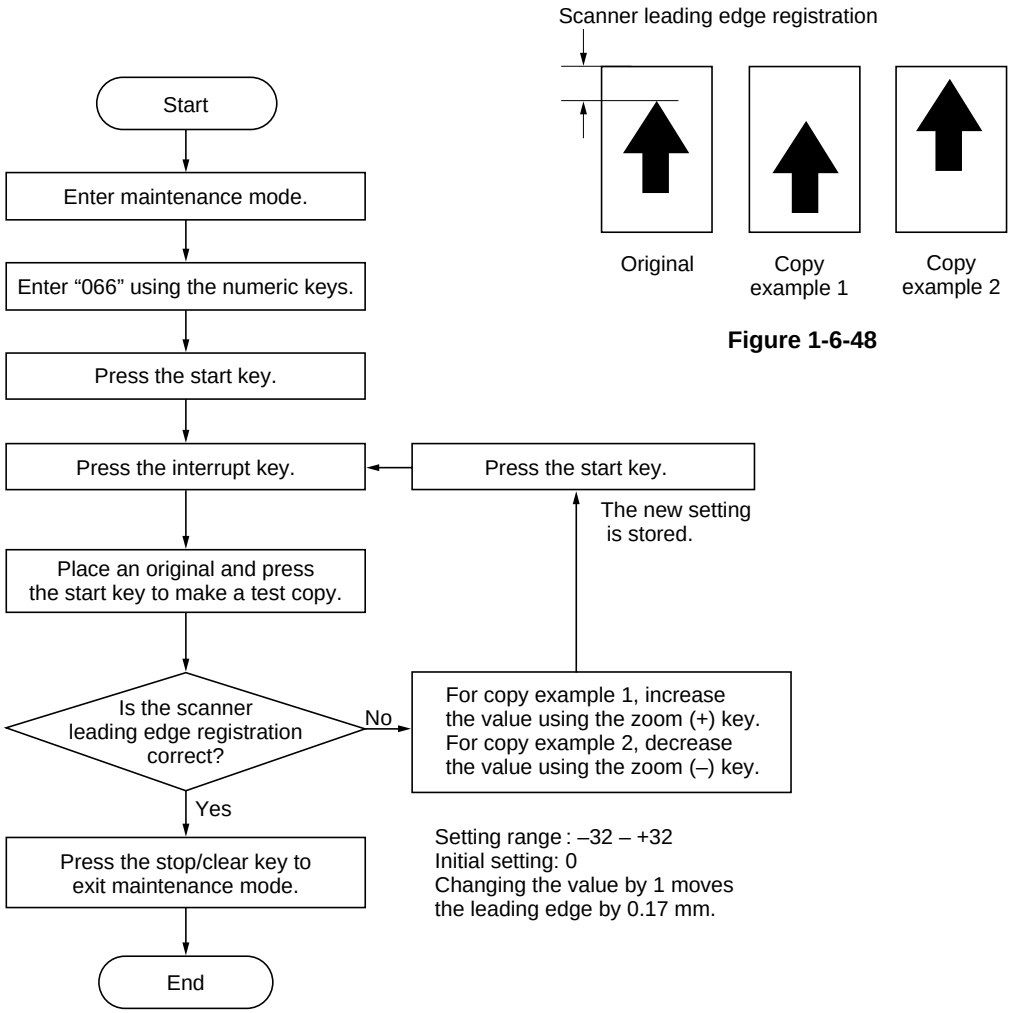
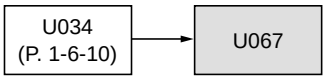


Figure 1-6-48

(11)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

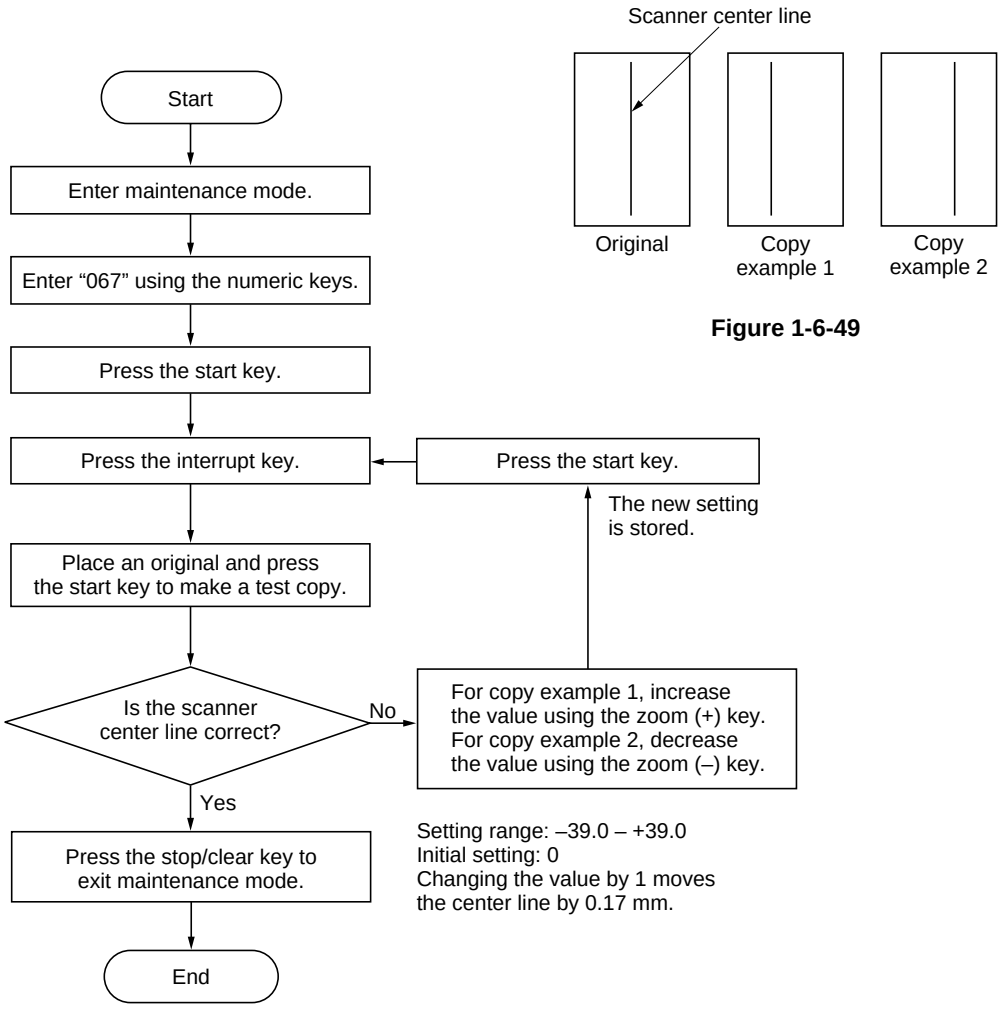


Figure 1-6-49

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

Perform the following adjustment if the margins are not correct.

U402 (P. 1-6-11) → U403

Caution:

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

Procedure

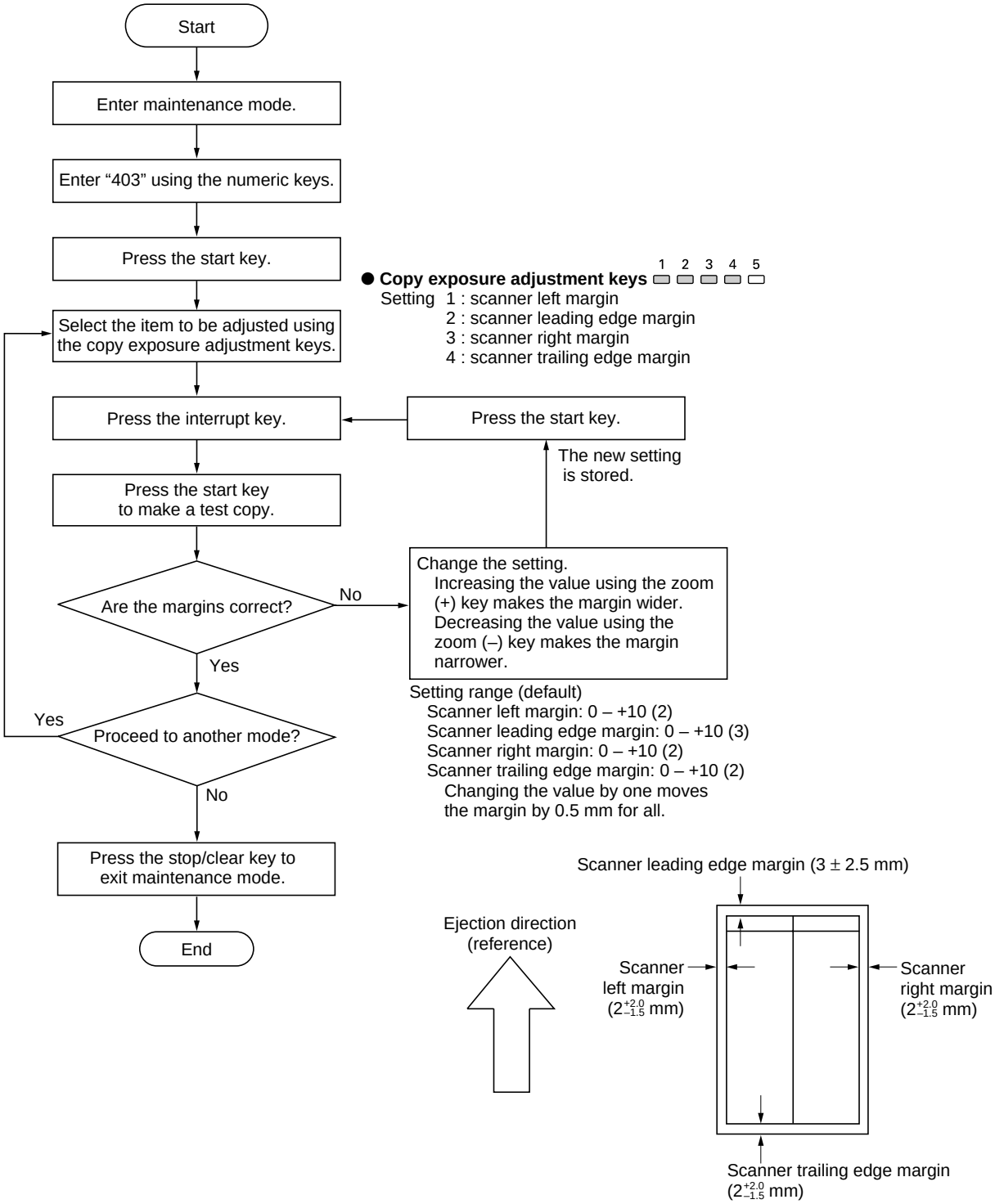


Figure 1-6-50

1-6-4 Main charging section

(1) Detaching and refitting the charger assembly

Follow the procedure below to replace the charger assembly.

Prucedure

1. Open the bypass tray, paper conveying unit and front cover, and then remove the toner cartridge and waste toner tank.
2. Remove the two screws and disconnect the connector. While pressing the hook on the front image formation cover, pull the image formation unit out.

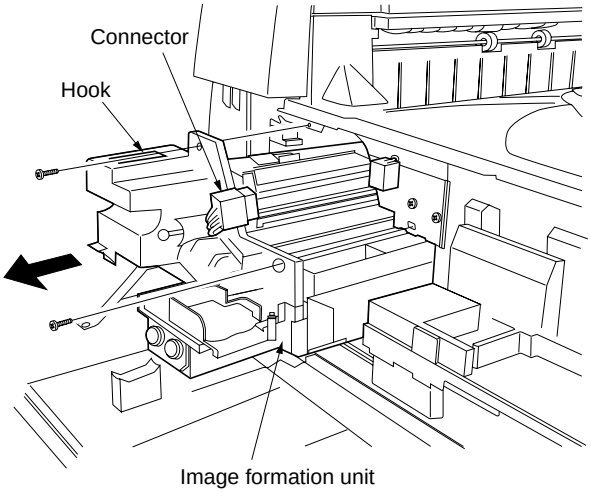


Figure 1-6-51

3. Remove the screw holding the charger assemby and then the assembly.
4. Replace the charger assembly and refit all the removed parts.

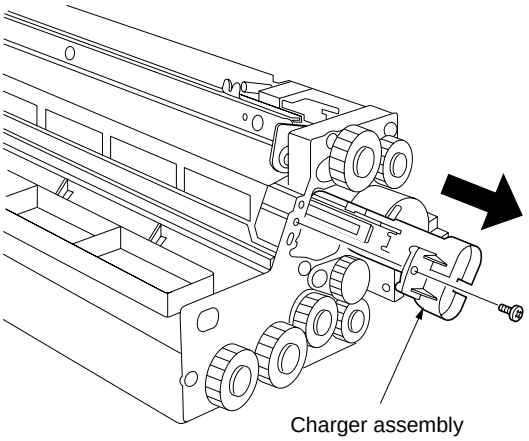


Figure 1-6-52

(2) Replacing the tungsten wire (reference)
Take the following procedure when the tungsten wire is broken or to be replaced.

Precautions
- Use the specified tungsten wire (P/N: 2AR1016).
- The part of the wire wrapped around the charger spring must not protrude over the L-shaped hook in the main charger rear housing.
- Use clean, undamaged tungsten wire.
- Keep the tungsten wire taut by stretching it.
- Clean the shield grid with a wet cloth followed by a dry cloth when replacing the tungsten wire.
- Do not use organic solvents such as alcohol or thinner to clean the shield grid.
- Do not leave dust or dirt after cleaning the shield grid.

Procedure
1. Remove the image formation unit (see page 1-6-31).
2. Remove the charger assembly (see page 1-6-31).
3. Remove the main charger front and rear lids.
4. Remove the shield grid from the front of the charger assembly.
5. Remove the tungsten wire retainer pin and the charger spring from the charger terminal, and then the tungsten wire.

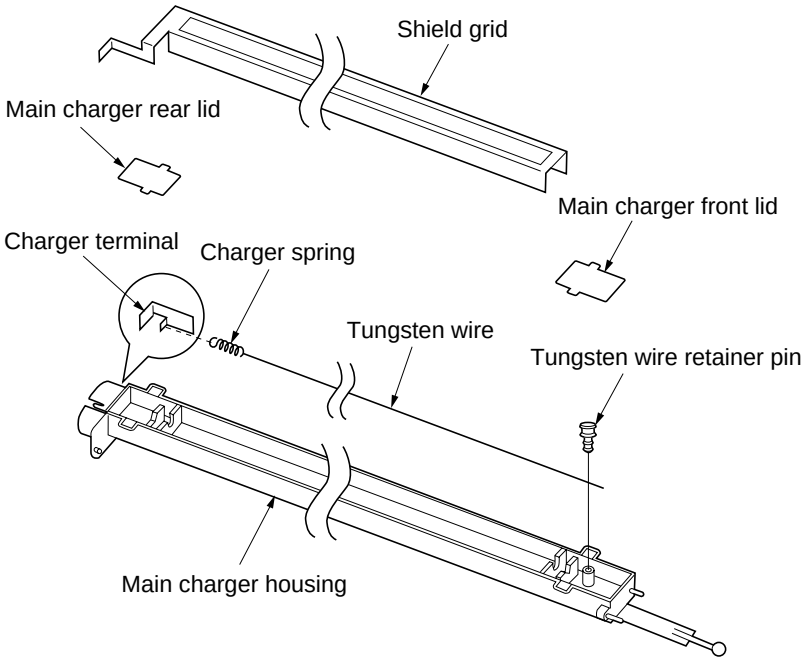


Figure 1-6-53

6. Wind the new tungsten wire six turns around one end of the charger spring and trim the end.
   • The width of the coiled tungsten wire and the cut end must be less than 2 mm.
7. Hook the other end of the charger spring onto the charger terminal of the main charger rear housing.
8. Pass the tungsten wire through the V-shaped notch in the tungsten wire retainer pin and stretch it taut.
   • The tungsten wire must be adjusted so that the distance between the spring end and the rib on the main charger rear housing is 2-4 mm.
9. Insert the tungsten wire retainer pin into the projection on the main charger rear housing to secure the tungsten wire.
10. Cut off the excess wire under the tungsten wire retainer pin.
    • The cut end of the tungsten wire must protrude less than 2 mm.
11. Refit the main charger front and rear lids.
12. Refit all the removed parts.

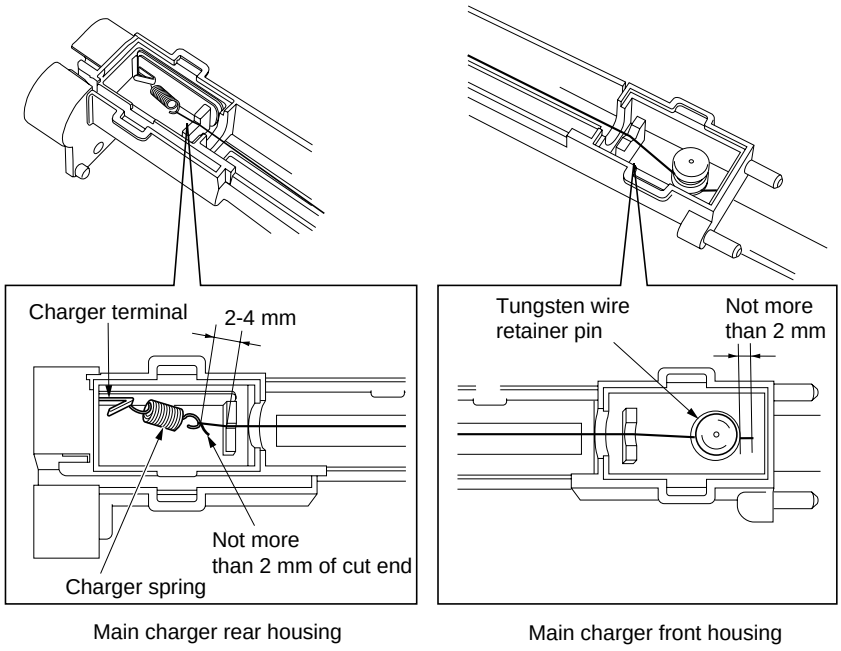


Figure 1-6-54

1-6-5 Drum section

(1) Detaching and refitting the drum
Follow the procedure below to replace the drum.

Cautions:
- Avoid direct sunlight or strong light when detaching and fitting the drum.
- Hold the drum at the ends and never touch the drum surface.
- After removing the drum, keep it in the drum case or storage bag to protect the surface from light.

Procedure
1. Remove the image formation unit (see page 1-6-31).
2. Remove the two screws holding the transfer right guide and then the guide.
3. Remove the screw holding each of the three drum separation claw assemblies and then the assemblies.

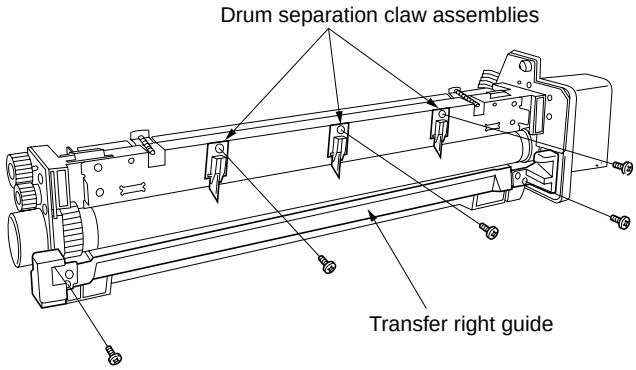


Figure 1-6-55

4. Pull the drum shaft out and replace the drum.
   - Check the letter indicating the drum type (G, H or J) printed on the new drum flange.
   - When fitting the drum, orient it correctly so that the gear is positioned at the machine rear.
   - When fitting the drum shaft, insert it fully.

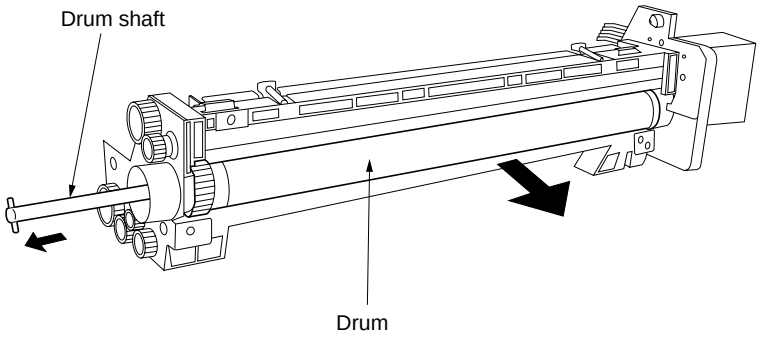


Figure 1-6-56

5. Remove the front image formation unit cover. Rub the contacting surfaces of the drum shaft and drum drive grounding plate with a cloth and then apply the GE-334C conductive grease (P/N A0199040) to the contacting surfaces of the grounding plate. Refit the removed parts.
6. After replacing the drum, run maintenance items below.
   - U109 “Setting the drum type” (set to the drum type printed on the new drum flange)
   - U110 “Checking/clearing the drum count”(clear the drum count)
   - U111 “Checking/clearing the drum drive time” (clear the value)

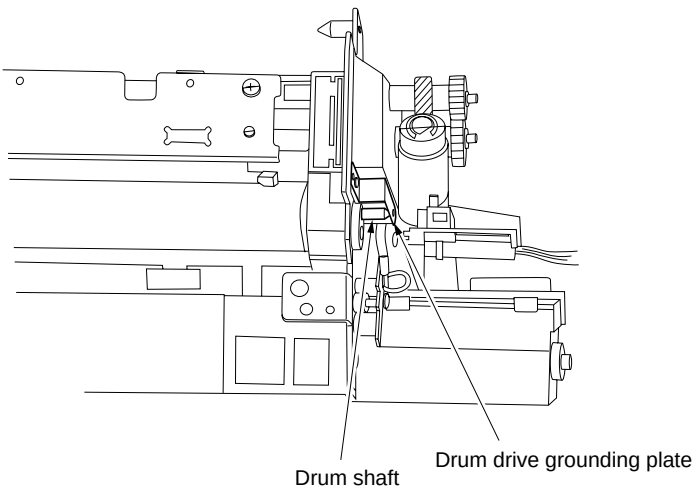


Figure 1-6-57

1-6-6 Developing section

(1) Adjusting the position of the doctor blade (reference)
Perform the following adjustment if carrier or background appears on the copy image.

Procedure

1. Remove the image formation unit (see page 1-6-31).
2. Remove the charger assembly (see page 1-6-31).
3. Remove the screw holding the MC rail and then the rail.

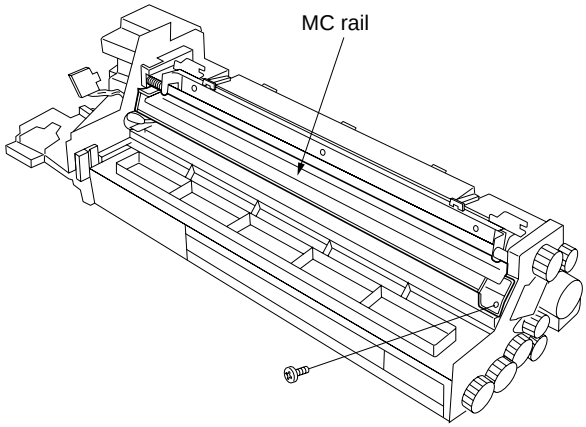


Figure 1-6-58

4. Remove the screw holding the doctor blade cover and then the cover.
   Caution: When refitting the doctor blade cover, be sure to refit the bias wire.

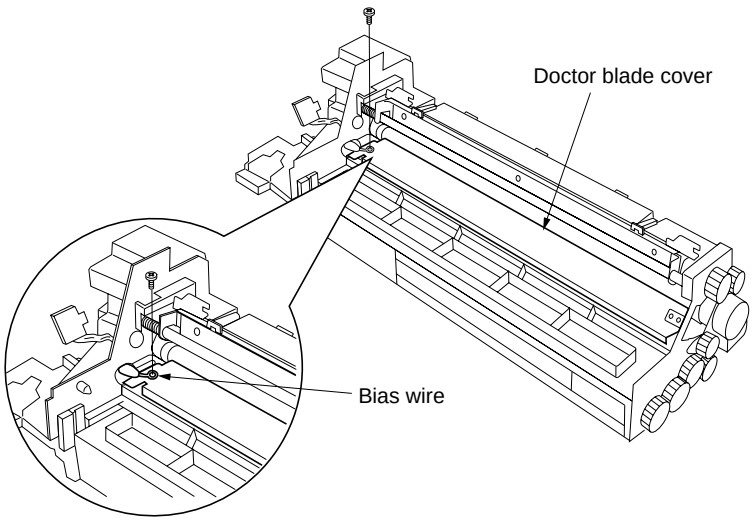


Figure 1-6-59

5. Measure the distance between the doctor blade and the developing roller at the three points indicated by the circles using a thickness gauge. Adjust the distances with the three screws until the correct measurements are obtained; the 0.55 mm gauge should go into the gap and the 0.65 mm one should not.
   Caution: The smaller the distance, the lighter the image; the larger the distance, the darker the image.
6. Refit all the removed parts.

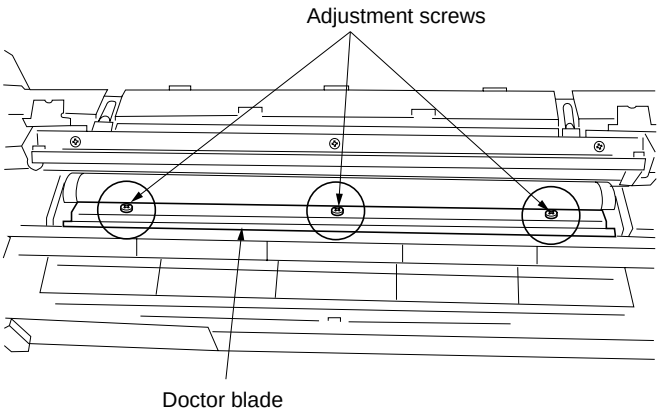


Figure 1-6-60

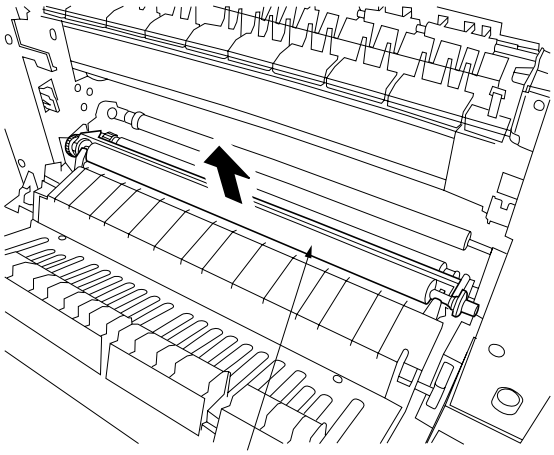
1-6-7 Transfer section

(1) Detaching and refitting the transfer roller assembly

Follow the procedure below to replace the transfer roller assembly.

Procedure

1. Open the bypass tray and paper conveying unit.
2. Remove the transfer roller assembly.
   Caution: Remove the transfer roller assembly carefully to prevent the residual toner in the transfer roller assembly from spilling.
3. Apply grease G501 to the bushings.
4. Replace the transfer roller assembly and refit all the removed parts.



Transfer roller assembly

Figure 1-6-61

1-6-8 Cleaning section

(1) Detaching and refitting the cleaning blade

Follow the procedure below to replace the cleaning blade.

Procedure

1. Remove the image formation unit and the charger assembly (see page 1-6-31).
2. Remove the MC rail (see page 1-6-35).
3. Remove the drum (see page 1-6-34).
4. Remove the three screws holding the cleaning blade and then the blade.
   Caution: When detaching and refitting the cleaning blade, take care not to touch the blade.

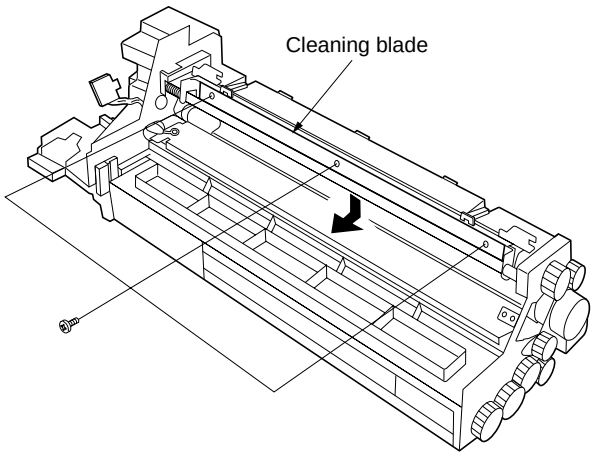


Figure 1-6-62

5. Replace the cleaning blade and refit all the removed parts.
   Caution: When fitting the cleaning blade, position the end of the thrust shaft on the notch in the thrust gear by turning the gear.

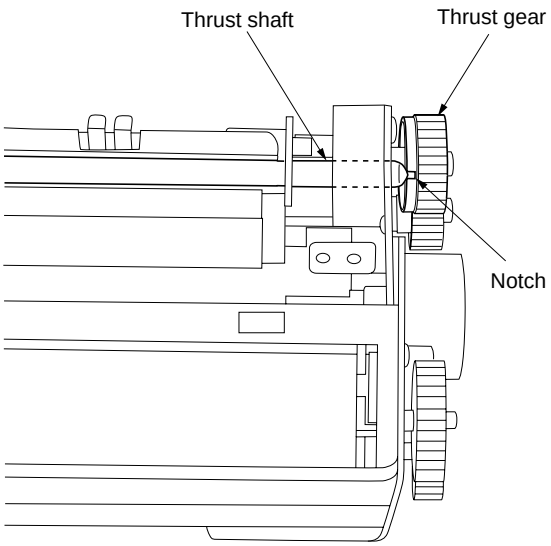


Figure 1-6-63

(2) Detaching and refitting the drum separation claw assemblies

Follow the procedure to replace the drum separation claw assemblies.

Procedure

1. Remove the image formation unit (see page 1-6-31).
2. Remove the screw holding each of the drum separation claw assemblies and then the assemblies.
3. Remove the drum separation claws from the drum separation claw assemblies.
4. Replace the drum separation claws and refit all the removed parts.

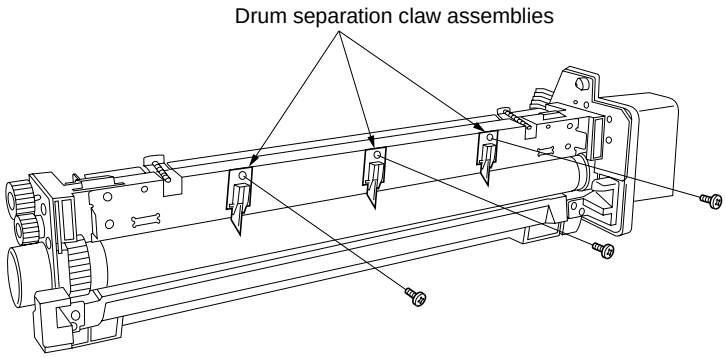


Figure 1-6-64

(3) Detaching and refitting the cleaning lower seal assembly

Follow the procedure below to replace the cleaning lower seal assembly.

Procedure

1. Remove the image formation unit (see page 1-6-31).
2. Remove the drum (see page 1-6-34).
3. Remove the two screws holding the cleaning lower seal assembly and then the assembly.
   Caution: When detaching and refitting the cleaning lower seal assembly, take care not to lose the M3 retainers (P/N 3330208).
4. Replace the cleaning lower seal assembly and refit all the removed parts.

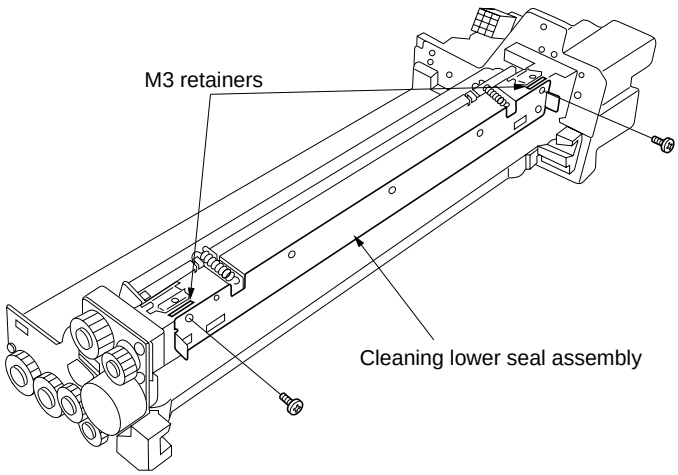


Figure 1-6-65

1-6-9 Fixing section

(1) Detaching and refitting the fixing unit

Follow the procedure below to check or replace the fixing unit.

Procedure

1. Open the bypass tray, paper conveying unit and front cover, and then remove the rear cover, left front cover and left rear cover.
2. Detach the three fixing unit connectors (blue, green and yellow) at the machine rear.

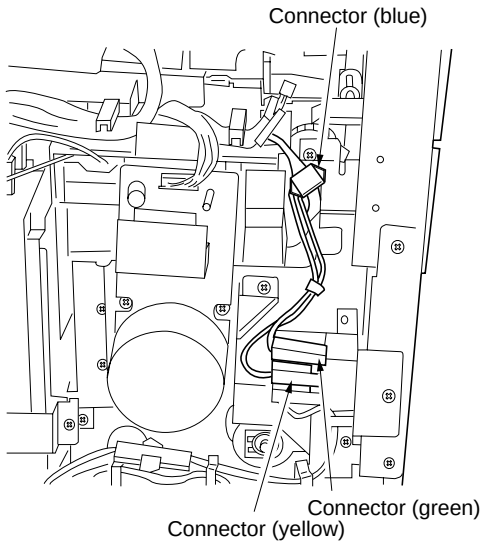


Figure 1-6-66

3. Remove the two screws from the rear and the two pins from the front of the fixing unit and shift the unit toward the machine front. Remove the drive pin on the copier and then remove the fixing unit.
   • When refitting the fixing unit, be sure to return the two pins at the front of the unit to their original positions.

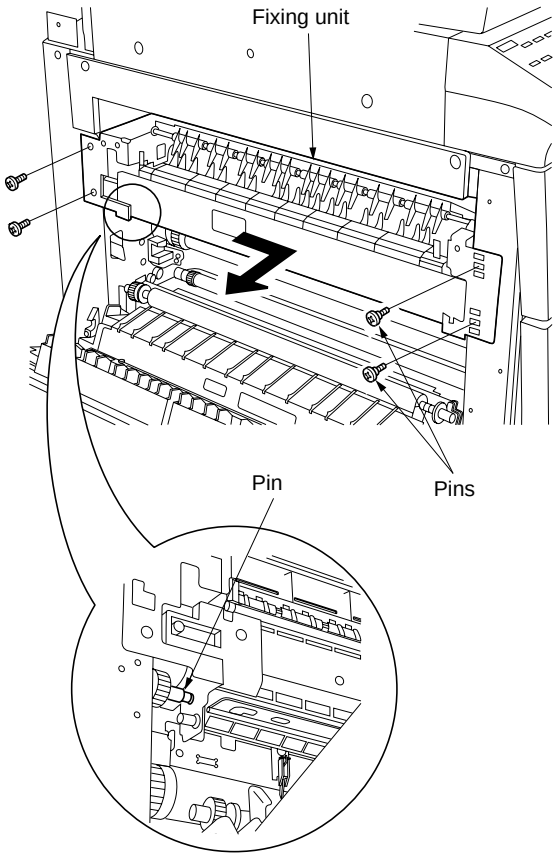


Figure 1-6-67

(2) Detaching and refitting the fixing unit thermistor

Follow the procedure below to replace the fixing unit thermistor.

Procedure

1. Remove the fixing unit (see page 1-6-39).
2. Remove the screw and detach the connector, and then remove the fixing unit thermistor.
3. Replace the fixing unit thermistor and refit all the removed parts.

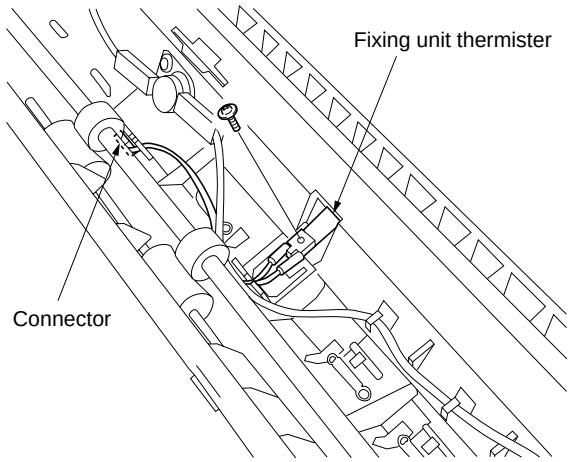


Figure 1-6-68

(3) Detaching and refitting the heat roller separation claws

Follow the procedure below to replace the heat roller separation claws.

Procedure

1. Remove the fixing unit (see page 1-6-39).
2. Remove the spring from each of the five heat roller separation claws and then the claws.
3. Replace the heat roller separation claws and refit all the removed parts.

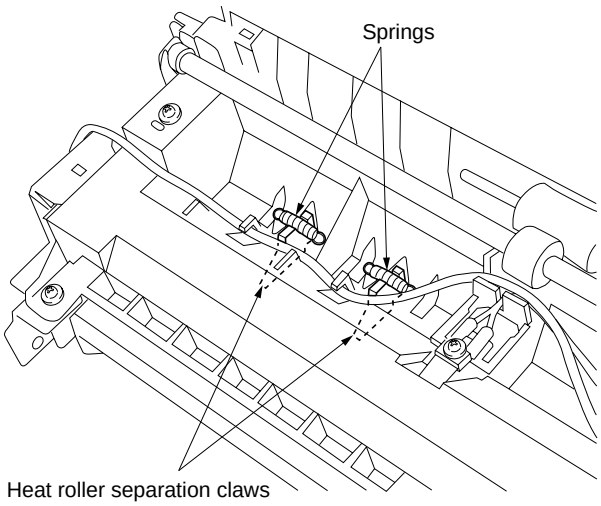


Figure 1-6-69

(4) Detaching and refitting the fixing heater

Follow the procedure below to replace the fixing heater.

Procedure

1. Remove the fixing unit (see page 1-6-39).
2. Detach the fixing heater connector.

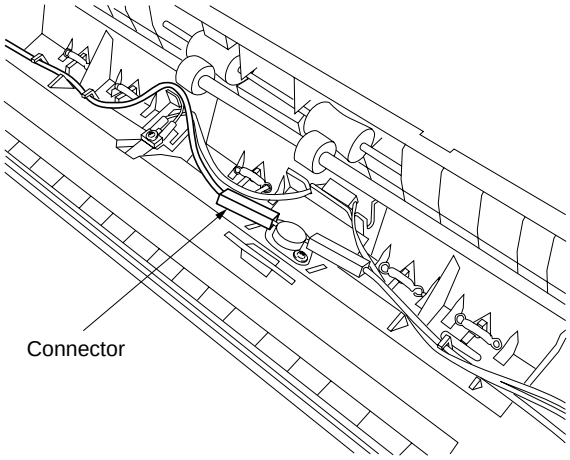


Figure 1-6-70

3. Remove the screw holding each of the fixing heater front and rear retainers and then the retainers.

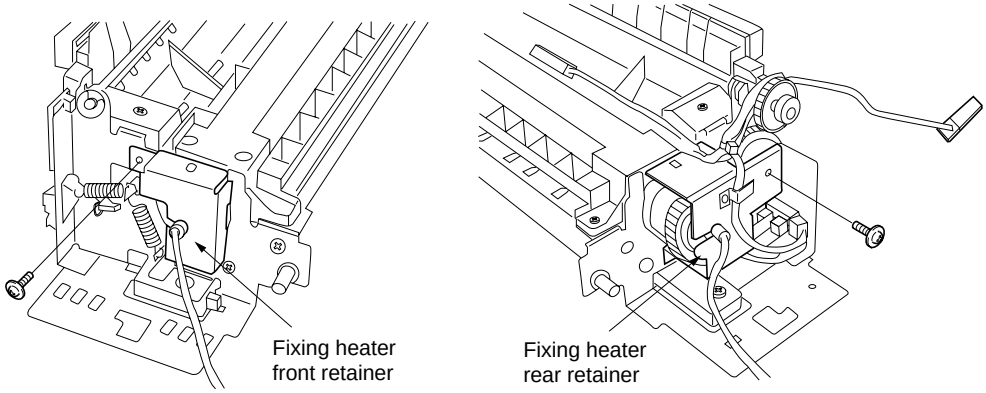


Figure 1-6-71

4. Pull out the fixing heater from the fixing unit.
5. Replace the fixing heater and refit all the removed parts.

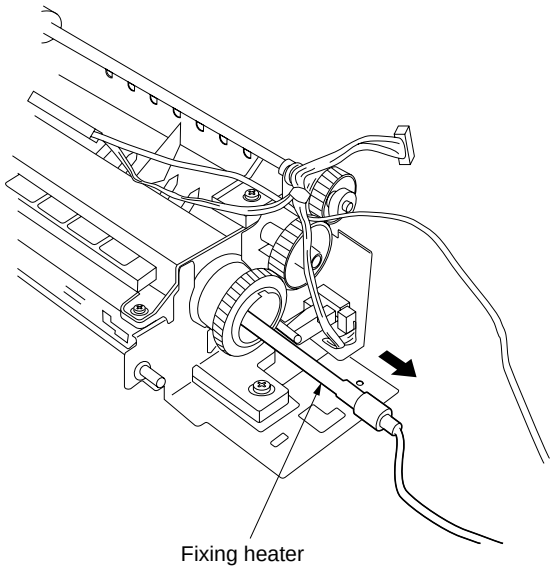


Figure 1-6-72

(5) Detaching and refitting the heat roller

Follow the procedure below to replace the heat roller.

Procedure

1. Remove the fixing unit (see page 1-6-39).
2. Remove the fixing unit thermistor, fixing heater and heat roller separation claw assemblies (see pages 1-6-40 and 41).
3. Remove the two screws holding the eject guide and then the guide.

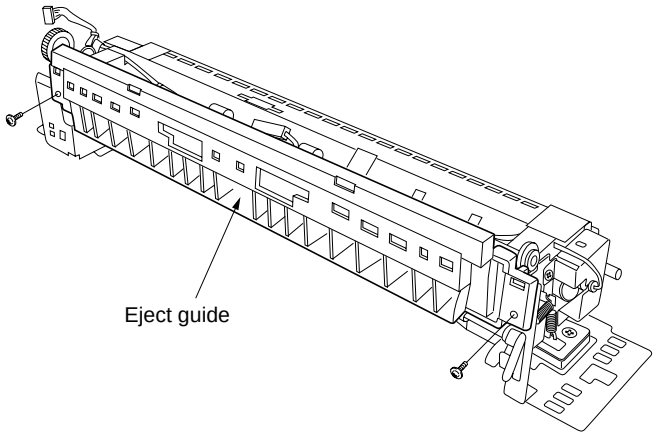


Figure 1-6-73

4. Remove the two stop rings, collar, gear, spring pin and bushing on the rear of the eject roller and then remove the eject roller.

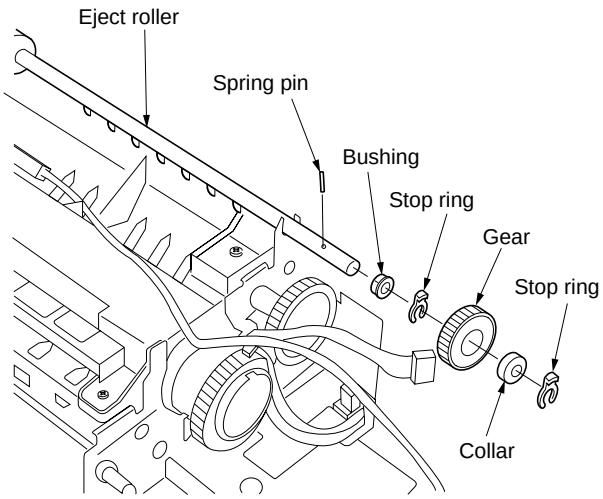


Figure 1-6-74

5. Remove the gear and detach the eject switch connector.

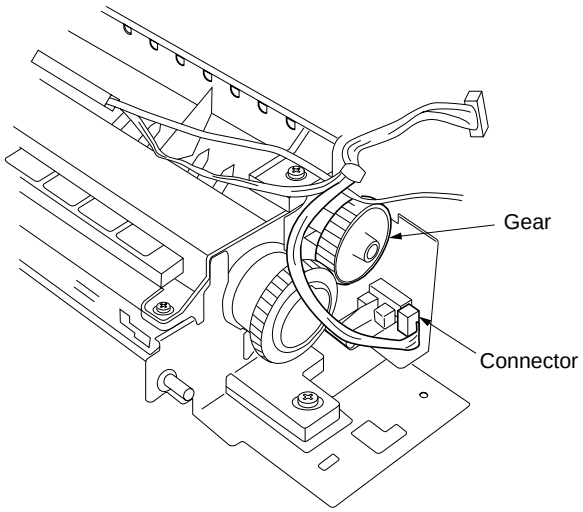


Figure 1-6-75

6. Remove the four screws holding the fixing housing and then the housing.

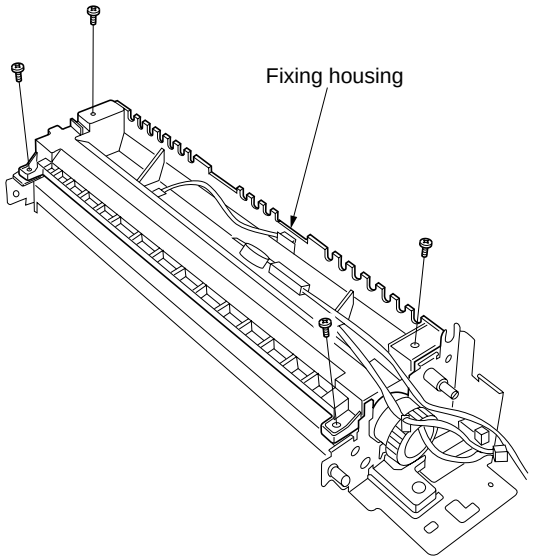


Figure 1-6-76

7. Remove the pressure spring from each of the front and rear ends of the fixing unit.

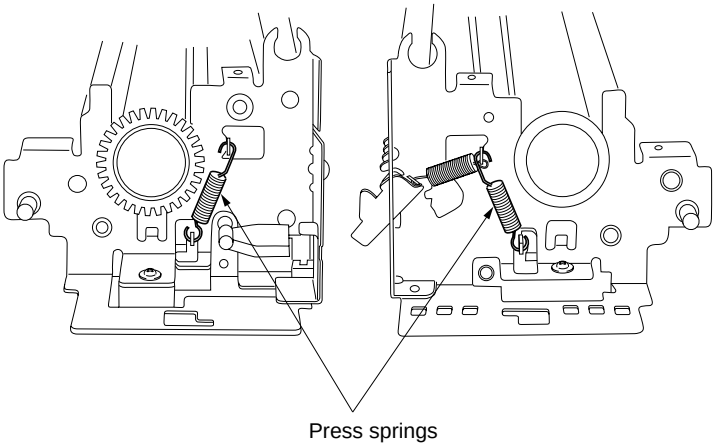


Figure 1-6-77

8. Remove the C ring, gear and bushing on the rear and the C ring and bushing on the front of the heat roller, and then remove the heat roller.
9. Replace the heat roller and refit all the removed parts.

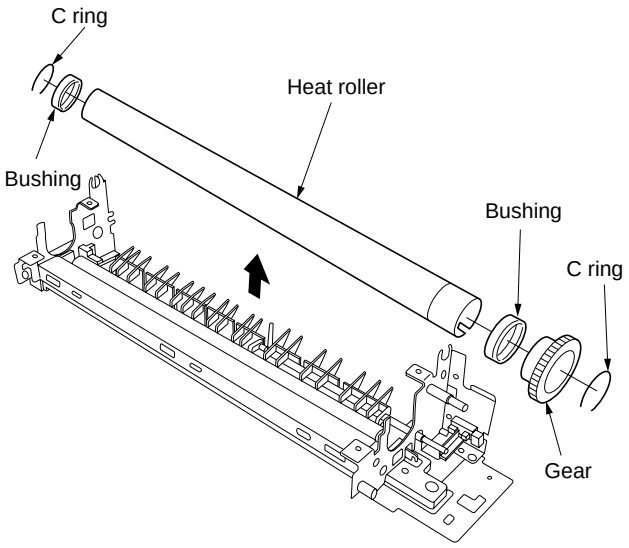


Figure 1-6-78

(6) Detaching and refitting the press roller

Follow the procedure below to replace the press roller.

Procedure

1. Remove the fixing unit (see page 1-6-39).
2. Remove the heat roller (see page 1-6-42).
3. Remove the screw holding the fixing guide plate and then the plate.

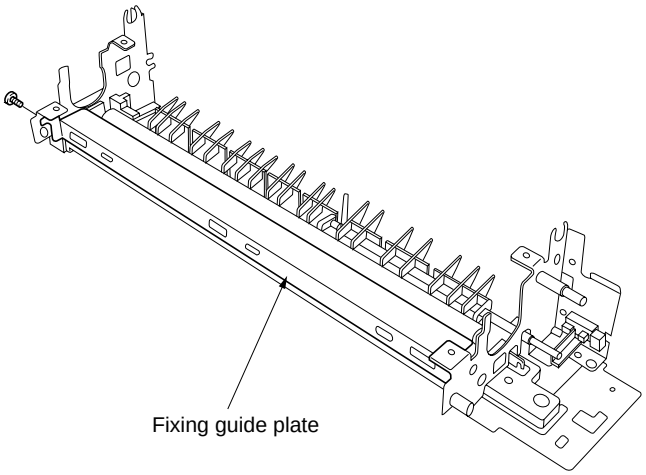


Figure 1-6-79

4. Remove the press roller and two bearings.
5. Replace the press roller and refit all the removed parts.

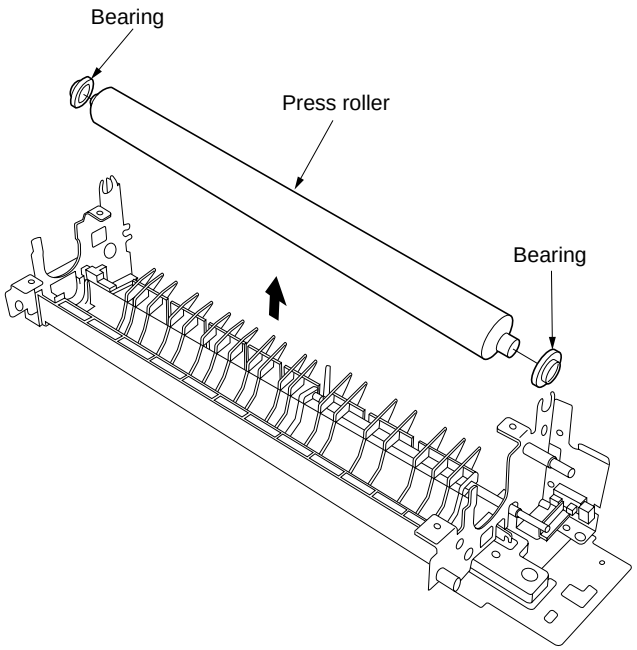


Figure 1-6-80

1-7-1 Replacing the main PCB

Main PCB replacement requires the following tools:
Memory tool PCB (P/N 2AV68030)
NVRAM (P/N NAS09010)

Procedure

• Before replacing the main PCB (backing up the machine data)

1. Turn the main switch off and disconnect the power plug.
2. Remove the four screws holding the shield cover and then the cover.

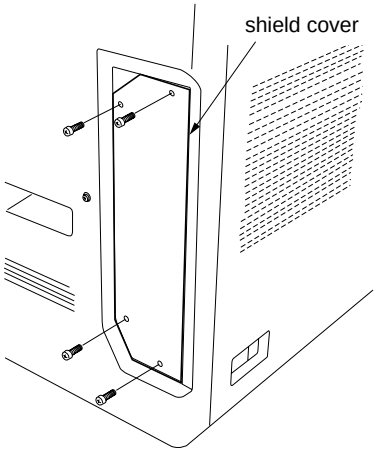


Figure 1-7-1

3. Fit the NVRAM to the memory tool PCB.
   Caution:
   After fitting the NVRAM, do not remove it until the writing of the machine data completes.
4. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
   Note:
   Insert the memory tool PCB along the upper and lower guides.

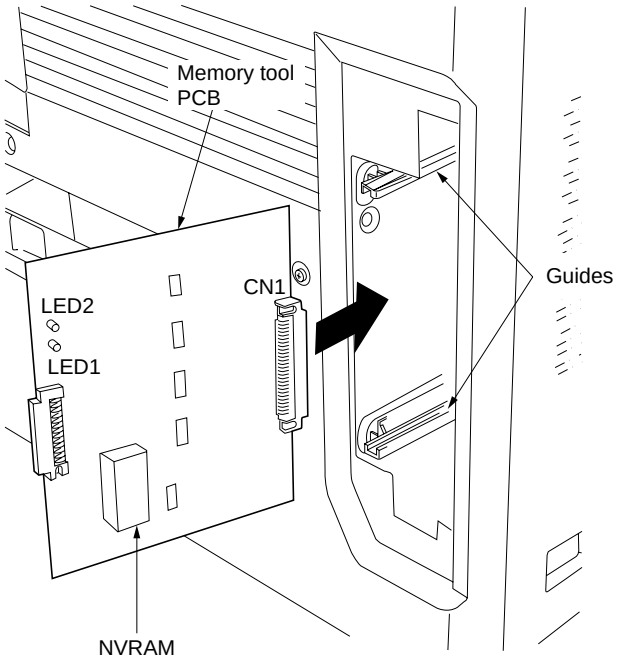


Figure 1-7-2

5. Insert the power plug and turn the main switch on. LED1 (green) on the memory tool PCB flashes (on for 1 s → off for 1 s) for approximately 10 seconds and the machine data on the SRAM of the main PCB will be backed up on the NVRAM.
6. When flashing LED1 (green) on the memory tool PCB remains lit, backing up of machine data is complete.
   If an error occurs while the machine data is being backed up, LED1 (green) flashes and goes off in the patterns given below according to the nature of the error. Remove the memory tool PCB and perform the respective corrective measures and then back up the machine data again.

LED1	Description	Corrective measures
• - • - • - [•: On for 0.25 s -: Off for 0.25 s]	"WRITE" is selected in maintenance item U917.	Run maintenance item U917 and select "READ".
	Since the NVRAM contains data from the previous operation, data cannot be written to it.	Replace the NVRAM on the memory tool PCB and back up the machine data again.
Off	The machine data was not transmitted from the SRAM on the main PCB to the NVRAM correctly.	Turn the main switch off and on and back up the machine data again. If the error persists, replace the NVRAM.

7. Turn the main switch off and disconnect the power plug.
8. Remove the memory tool PCB.
9. Replace the main PCB.

• After replacing the main PCB (writing the machine data)

10. Insert the power plug and turn the main switch on.
11. Turn the main switch on.
12. Enter maintenance mode.
13. Run maintenance item U020.
14. Run maintenance item U252 and set the destination.
15. Run maintenance item U917 and select "WRITE".
16. Exit maintenance mode.
17. Turn the main switch off and disconnect the power plug.
18. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
    Note:
    Insert the memory tool PCB along the upper and lower guides.
19. Insert the power plug and turn the main switch on. LED1 (green) on the memory tool PCB flashes (on for 0.5 s → off for 0.5 s → on for 0.5 s → off for 0.5 s → on for 1 s → off for 0.5 s) for approximately 10 seconds and the machine data on the NVRAM will be written to the SRAM on the main PCB.
20. When flashing LED1 (green) on the memory tool PCB remains lit, writing of the machine data is complete.
    If an error occurs while the machine data is being written, LED1 (green) flashes and goes off in the patterns given below according to the nature of the error. Remove the memory tool PCB and perform the respective corrective measures and then write the machine data again.

LED1	Description	Corrective measures
• - • - • - [•: On for 0.25 s -: Off for 0.25 s]	"READ" is selected in maintenance item U917.	Run maintenance item U917 and select "WRITE".
	An NVRAM with no backup data is used. (LED1 flashes for 10 s in the pattern on for 1 s and off for 1 s, and then flashes in the pattern described on the left.)	Replace the NVRAM on the memory tool PCB and then back up the machine data again.
• - • – • - • – [•: On for 0.25 s -: Off for 0.25 s –: Off for 1 s]	The machine data on the NVRAM may be damaged (checksum error).	Replace the NVRAM on the memory tool PCB and back up the machine data again.
Off	The machine data was not transmitted from the NVRAM to the SRAM on the main PCB correctly (SRAM problem).	Turn the main switch off and on and write the machine data again. If the error persists, replace the main PCB.

21. Remove the memory tool PCB.

1-7-2 Upgrading the firmware on the main PCB

Firmware upgrading requires the following tools:
Flash tool assembly (P/N 35968010)
Memory tool PCB (P/N 2AV68030)
Master ROM
Main ROM 1 IC (P/N 2BV68010)

Procedure

1. Turn the main switch off and disconnect the power plug.
2. Remove the four screws holding the shield cover and then the cover.

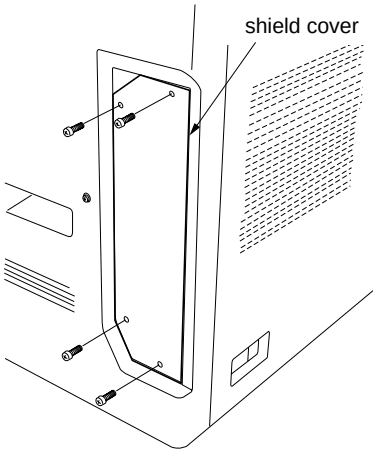


Figure 1-7-3

3. Fit the master ROM into the IC3 socket on the flash tool assembly.
4. Connect CN2 on the flash tool PCB to CN2 on the memory tool PCB.
5. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
   Note:
   Insert the memory tool PCB along the upper and lower guides.
6. Insert the power plug and turn the main switch on. LED2 (green) on the flash tool assembly flashes and upgrading of the master ROM starts.
7. When flashing LED2 (green) remains lit after approximately 30 to 40 seconds, upgrading of the master ROM is complete.
8. Turn the main switch on.
9. Remove the memory tool PCB.
   Important:
   "C021" may be indicated on the operation panel while upgrading the firmware. However, it does not interfere with the upgrading operation.

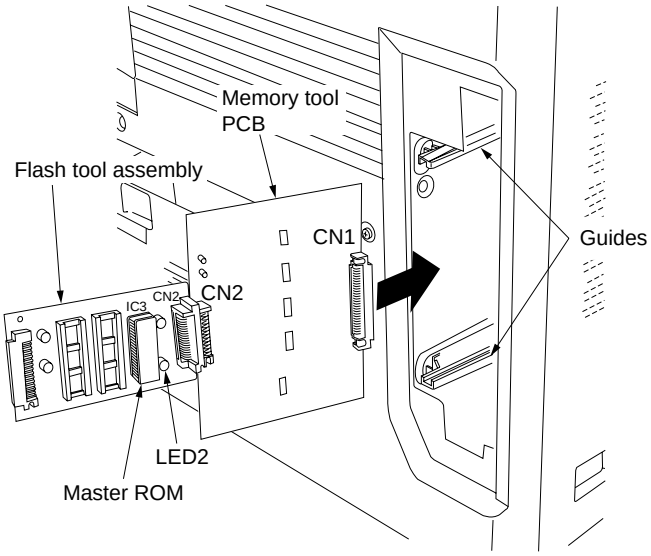


Figure 1-7-4

1-7-3 Adjustment-free variable resistors (VR)

The variable resistors listed below are set at the factory prior to shipping and cannot be adjusted in the field.
- High-voltage transformer PCB: VR101, VR102, VR201, VR301, VR302
- Inverter PCB: VR1, VR2

2-1-1 Paper feed section

The paper feed section consists of the primary feed and secondary feed subsections. Primary feed conveys paper from the drawer or bypass tray to the left and right registration rollers, at which point secondary feed takes place and the paper travels to the transfer section in sync with the printing timing.
The drawer can hold up to 250 sheets of paper. The bypass tray can hold up to 25 sheets of A3, B4 or folio paper, or up to 50 sheets of A4 or smaller paper.
Paper is fed from the drawer by the rotation of the paper feed pulley. Paper is fed from the bypass tray by the rotation of the bypass paper feed pulley.

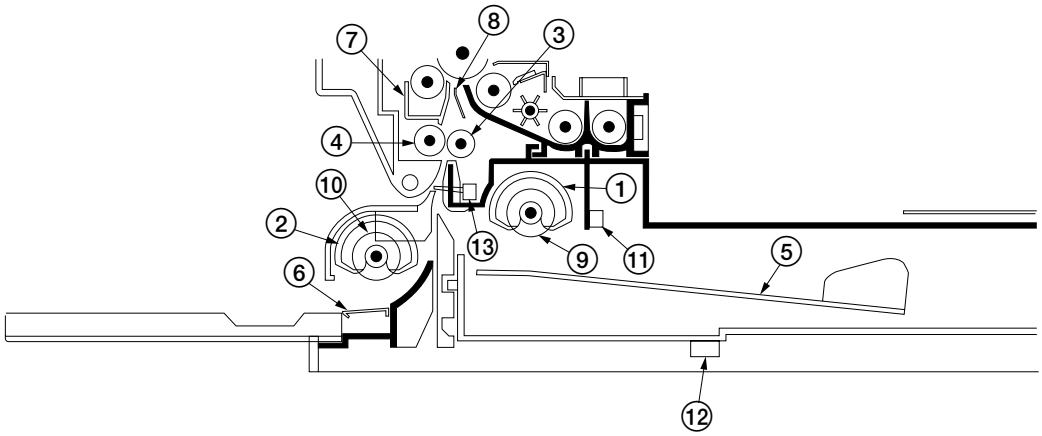


Figure 2-1-1 Paper feed section

① Paper feed pulleys
② Bypass paper feed pulley
③ Right registration roller
④ Left registration roller
⑤ Drawer lift
⑥ Bypass lift
⑦ Transfer guide
⑧ Right transfer guide
⑨ Paper feed clutch (PFCL)
⑩ Bypass paper feed clutch (BYPPFCL)
⑪ Paper switch (PSW)
⑫ Paper size switch (PSSW)
⑬ Registration switch (RSW)

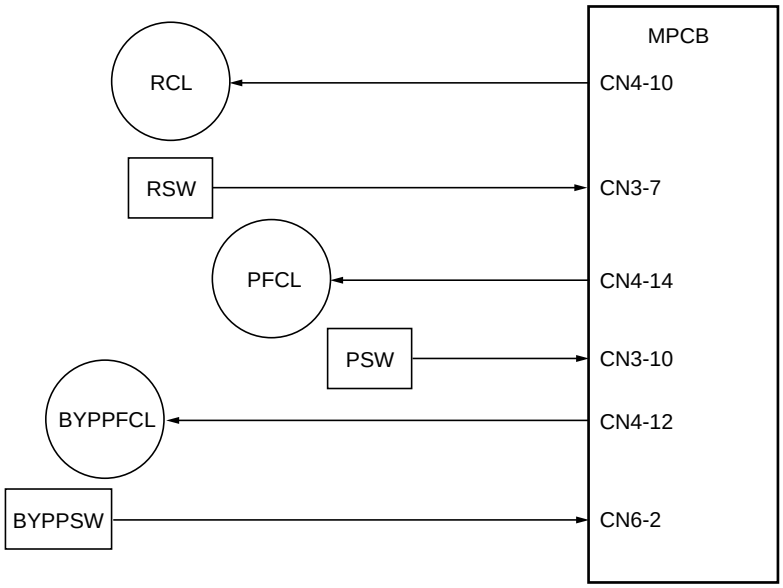
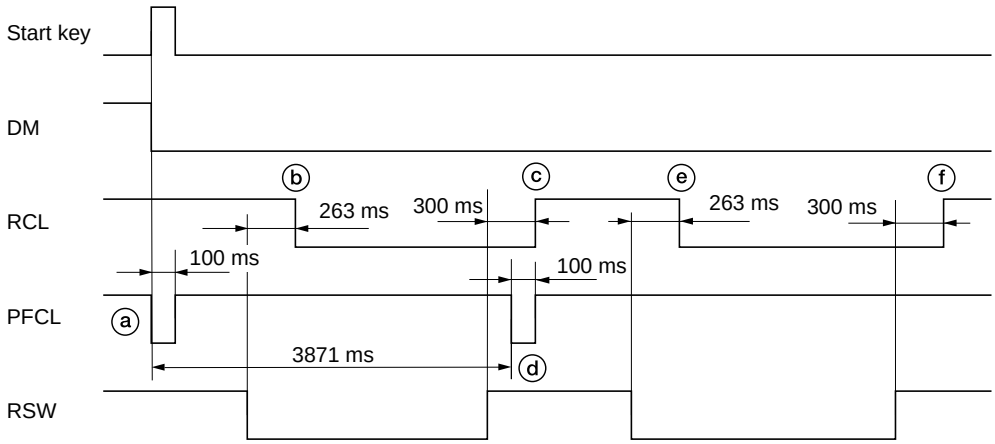


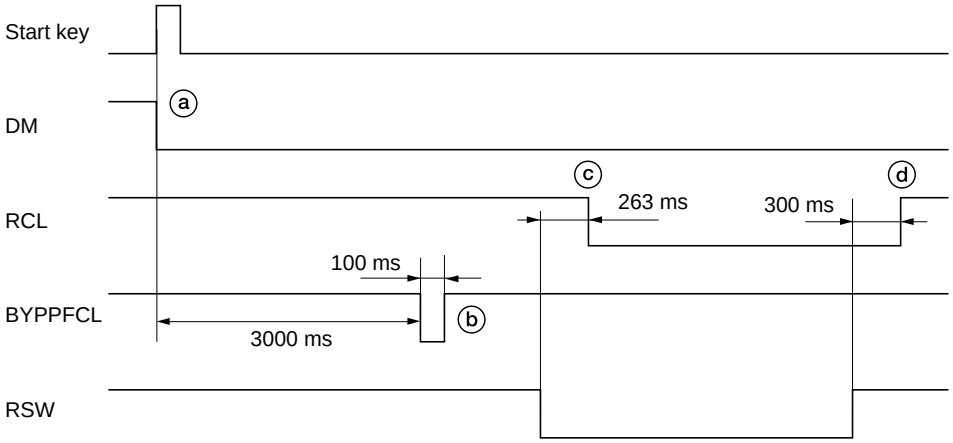
Figure 2-1-2 Paper feed section block diagram



Copy paper: A4/11" × 8$^{1}/_{2}$", magnification ratio 100%, two copies

Timing chart 2-1-1 Paper feed from the drawer

ⓐ: When the start key is pressed, the drive motor (DM) and the paper feed clutch (PFCL) turn on and paper feed pulleys rotate to start primary paper feed.
ⓑ: 263 ms after the leading edge of the first paper turns the registration switch (RSW) on, the registration clutch (RCL) turns on and the right registration roller rotates.
ⓒ: 300 ms after the trailing edge of the first paper turns the registration switch (RSW) off, the registration clutch (RCL) turns off.
ⓓ: 3871 ms after the paper feed clutch (PFCL) turns on, the paper feed clutch (PFCL) turns on again and starts primary paper feed of the second paper.
ⓔ: 263 ms after the leading edge of the second paper turns the registration switch (RSW) on, the registration clutch (RCL) turns on and the right registration roller rotates.
ⓕ: 300 ms after the trailing edge of the second paper turns the registration switch (RSW) off, the registration clutch (RCL) turns off.



Original: A5R, copy paper: A3/11" × 17", magnification ratio 200%

Timing chart 2-1-2 Paper feed from the bypass tray

ⓐ: When the start key is pressed, the drive motor (DM) turns on.
ⓑ: 3000 ms after the drive motor (DM) turns on, the bypass paper feed clutch (BYPPFCL) turns on and the bypass paper feed pulleys rotate to start primary paper feed.
ⓒ: 263 ms after the leading edge of the paper turns the registration switch (RSW) on, the registration clutch (RCL) turns on and the right registration roller rotates.
ⓓ: 300 ms after the trailing edge of the paper turns the registration switch (RSW) off, the registration clutch (RCL) turns off.

2-1-2 Main charging section

The main charging section consists of the drum and main charger assembly. The drum is electrically charged by means of a grid to form a latent image on the surface. The shield grid ensures that the charge is applied uniformly.

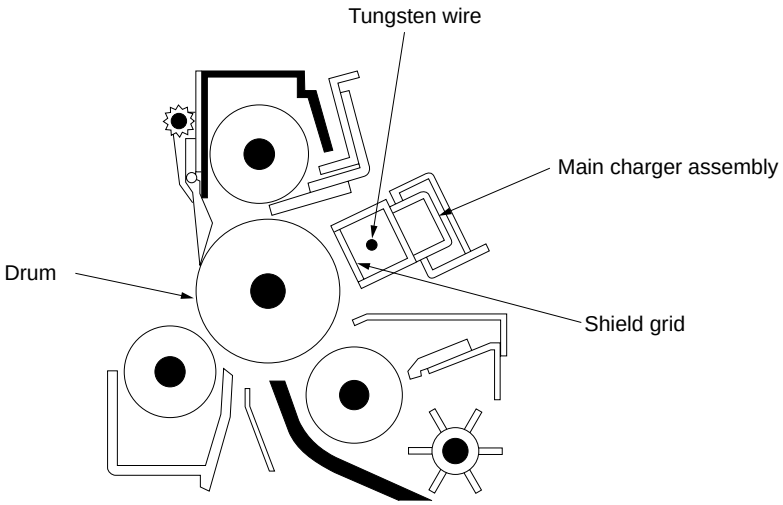
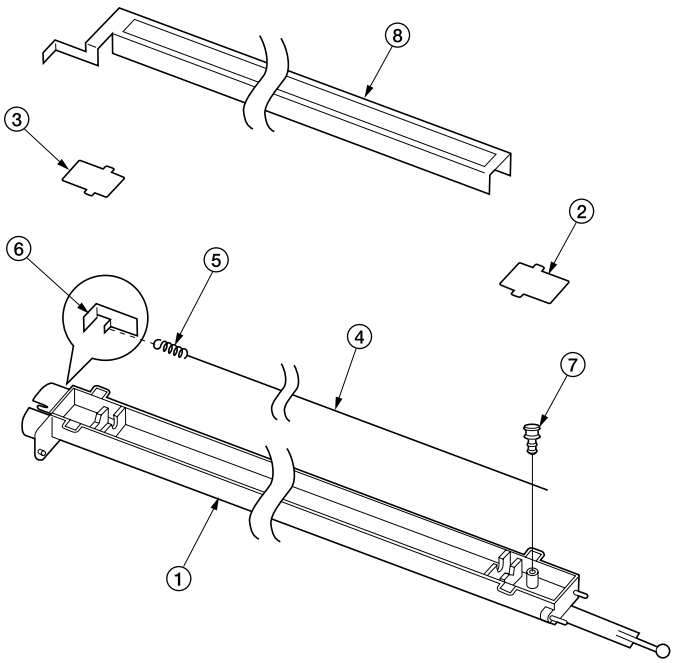


Figure 2-1-3 Main charging section



① Main charger housing
② Main charger front lid
③ Main charger rear lid
④ Tungsten wire
⑤ Charger spring
⑥ Charger terminal
⑦ Charger pin
⑧ Shield grid

Figure 2-1-4 Main charger assembly

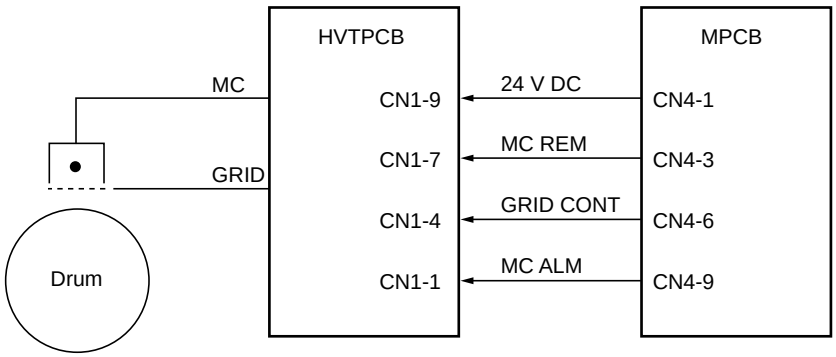
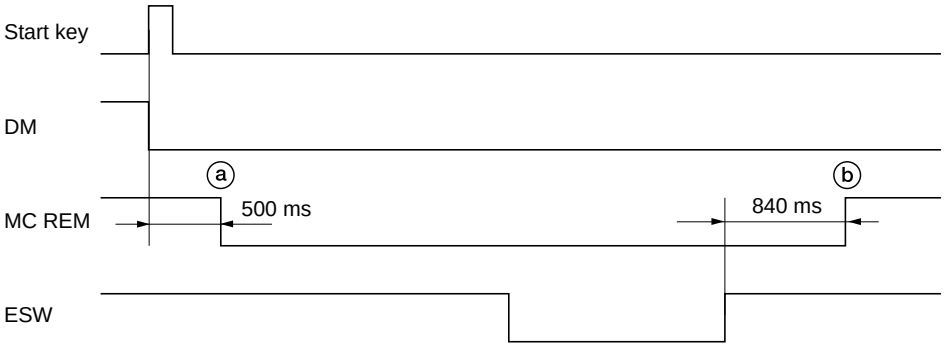


Figure 2-1-5 Main charging section block diagram



Timing chart 2-1-3 Main charging

ⓐ: 500 ms after the start key is pressed, main charging (MC REM) starts.
ⓑ: 840 ms after the trailing edge of the paper turns the eject switch (ESW) off, main charging (MC REM) is completed.

2-1-3 Optical section

The optical section consists of the scanner, mirror frames and the image scanning unit for scanning and the laser scanner unit for printing.

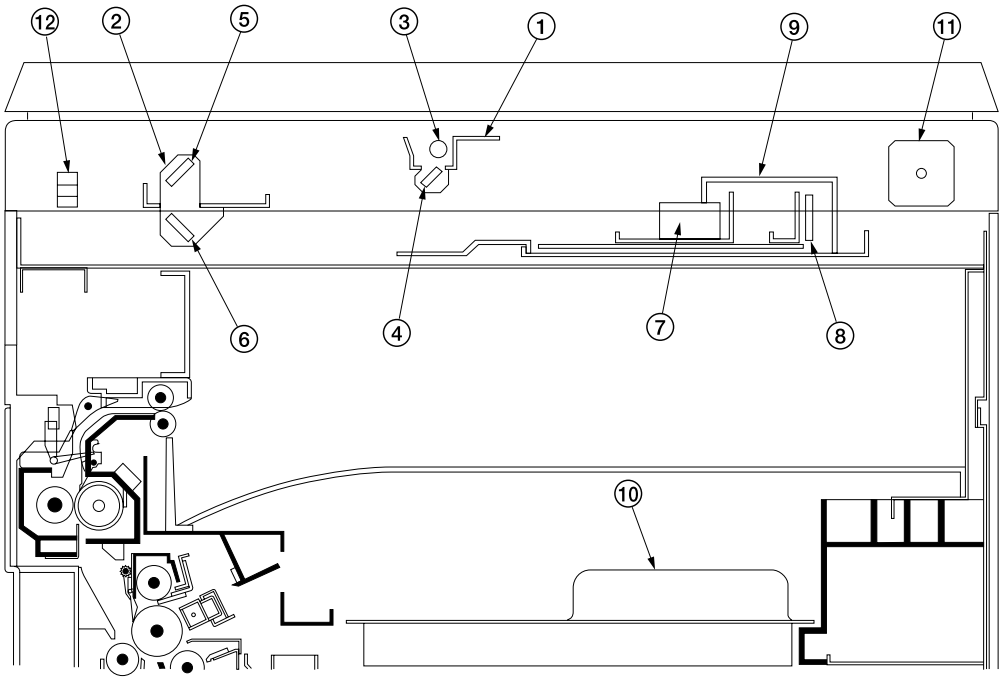


Figure 2-1-6 Optical section

① Mirror 1 frame
② Mirror 2 frame
③ Exposure lamp (EL)
④ Mirror 1
⑤ Mirror 2
⑥ Mirror 3
⑦ Lens
⑧ CCD PCB (CCDPCB)
⑨ Image scanning unit
⑩ Laser scanner unit (LSU)
⑪ Scanner motor (SM)
⑫ Scanner home position switch (SHPSW)

(1) Original scanning

The original image is illuminated by the exposure lamp (EL) and scanned by the CCD PCB (CCDPCB) in the image scanning unit via the three mirrors, the reflected light being converted to an electrical signal.
The scanner and mirror frames travel to scan on the optical rails on the front and rear of the machine to scan from side to side. The speed of the mirror frames is half the speed of the scanner.

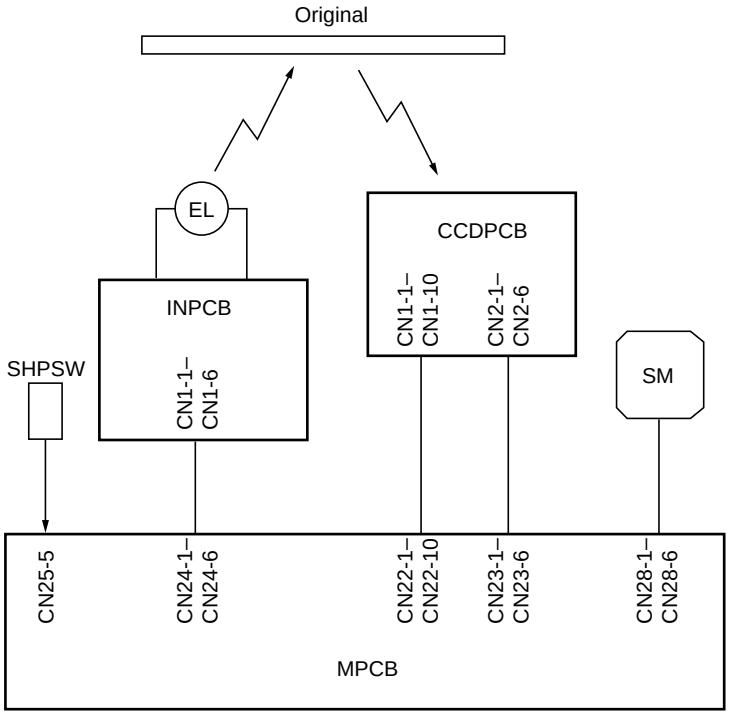
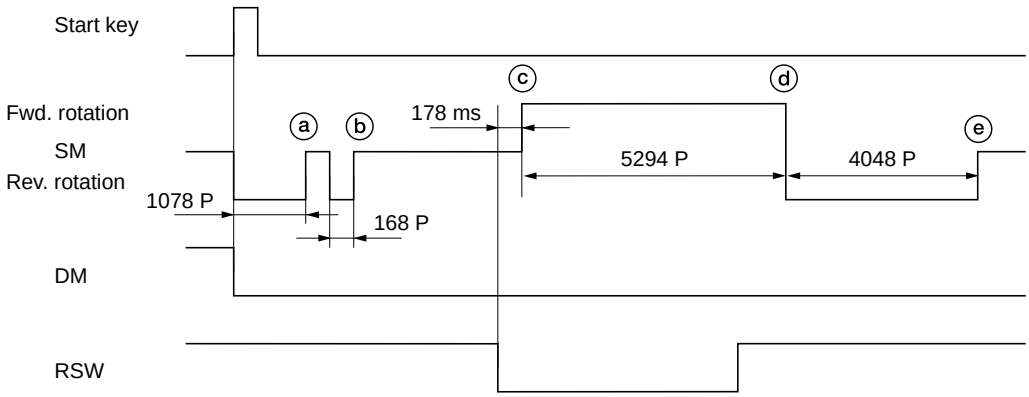


Figure 2-1-7 Optional section block diagram



Copy paper: A4/11" × 8 1/2", magnification ratio 100%

Timing chart 2-1-4 Scanner operation

ⓐ: When the start key is pressed, the scanner motor (SM) reverses for 1078 pulses and then turns off.
ⓑ: 168 pulses after the scanner motor (SM) rotates in the reverse direction again, the scanner motor (SM) turns off.
ⓒ: 178 ms after the leading edge of the paper turns the registration switch (RSW) on, the scanner motor (SM) rotates forward to start original scanning.
ⓓ: The scanner motor (SM) rotates forward for 5294 pulses and then rotates in the reverse direction.
ⓔ: 4048 pulses after the scanner motor (SM) rotates in the reverse direction, the scanner motor (SM) turns off.

(2) Image printing

The image data scanned by the CCD PCB (CCDPCB) is processed on the main PCB (MPCB) and transmitted as image printing data to the laser scanner unit (LSU). By repeatedly turning the laser on and off, the laser scanner unit forms a latent image on the drum surface.

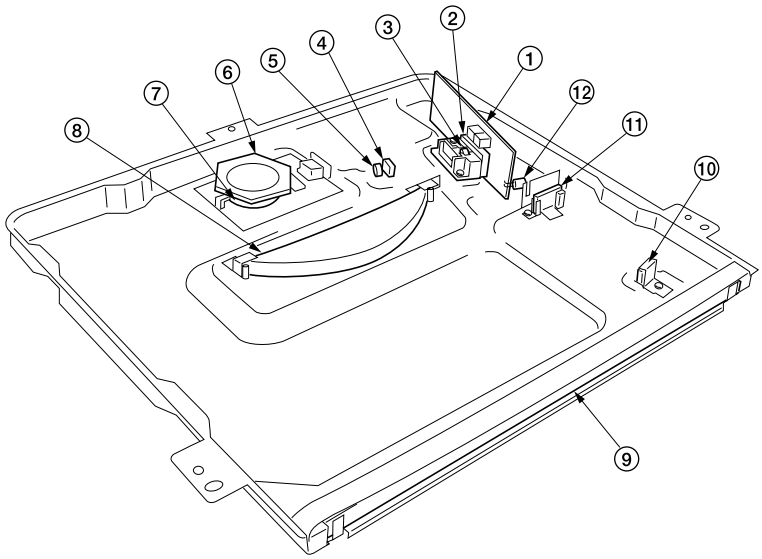


Figure 2-1-8 Laser scanner unit (1)

① Laser diode PCB (LDPCB)
② Laser diode
③ Collimator lens
④ Cylindrical lens
⑤ Lenses
⑥ Polygon mirror
⑦ Polygon motor (PM)
⑧ fθ lens
⑨ fθ lens
⑩ BD sensor mirror
⑪ Cylindrical correcting lens
⑫ BD sensor

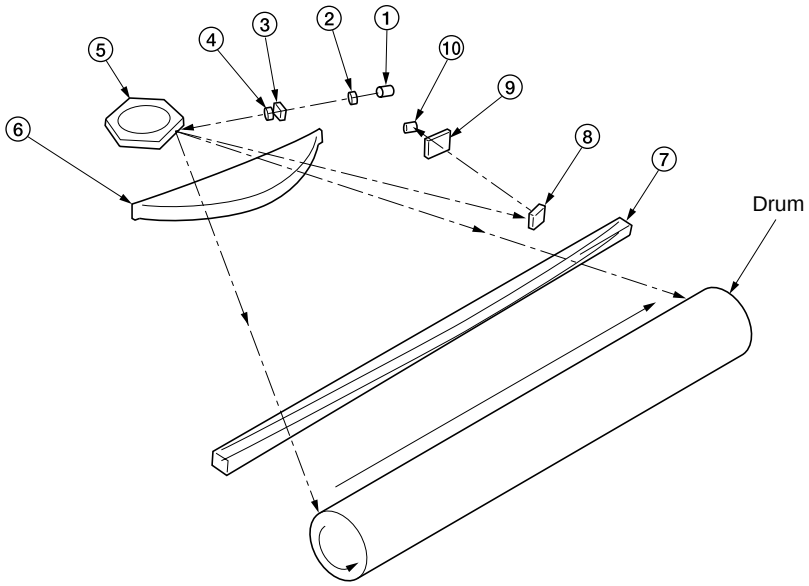


Figure 2-1-9 Laser scanner unit (2)

① Laser diode: Generates the laser beam which forms a latent image on the drum.
② Collimator lens: Collimates the diffused laser beam emitted from the laser diode to convert it into a cylindrical beam.
③ Cylindrical lens: Shapes the collimated laser beam to suit the printing resolution.
④ Lens: Shapes the collimated laser beam to suit the printing resolution.
⑤ Polygon mirror: Six-facet mirror that rotates at approximately 23622 rpm with each face reflecting the laser beam toward the drum for one main-direction scan.
⑥ Fθ lens: Corrects for non-linearity of the laser beam scanning speed on the drum surface, keeps the beam diameter constant and corrects for the vertical alignment of the polygon mirror to ensure that the focal plane of the laser beam is on the drum surface.
⑦ Fθ lens: Corrects for non-linearity of the laser beam scanning speed on the drum surface, keeps the beam diameter constant and corrects for the vertical alignment of the polygon mirror to ensure that the focal plane of the laser beam is on the drum surface.
⑧ BD sensor mirror: Reflects the laser beam to the BD sensor to generate the main-direction (horizontal) sync signal.
⑨ Cylindrical correcting lens: Corrects for the deviation of the laser beam reflected by the BD sensor mirror to the BD sensor.
⑩ BD sensor: Detects the beam reflected by the BD sensor mirror, outputting a signal to the main PCB (MPCB) to provide timing for the main-direction sync signal.

The dimensions of the laser beam are as shown in Figure 2-1-10.
Scanning in the main direction is provided by the rotating polygon mirror, while scanning in the auxiliary direction is provided by the rotating drum, forming a static latent image on the drum.
The static latent image of the letter “A”, for example, is formed on the drum surface as shown in Figure 2-1-11. Electrical charge is dissipated on the area of the drum surface irradiated by the laser.
The focal point of the laser beam is moved line by line, and adjacent lines slightly overlap each other.

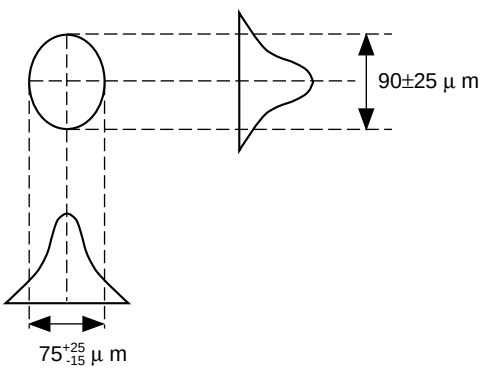


Figure 2-1-10

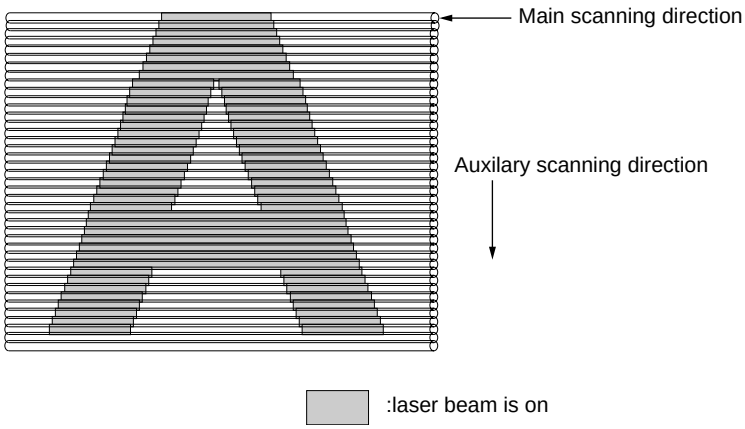


Figure 2-1-11

2-1-4 Developing section

The developing section consists of the developing unit and the toner cartridge.
The developing unit consists of the developing roller where a magnetic brush is formed, the doctor blade and the developing spirals that agitate the developer.
Toner from the toner cartridge and residual toner collected in the cleaning section are conveyed to the waste toner tank.

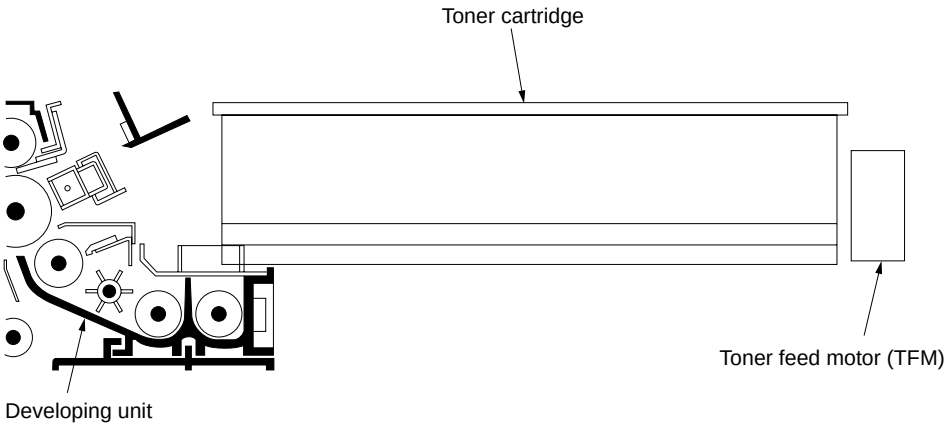


Figure 2-1-12 Developing section

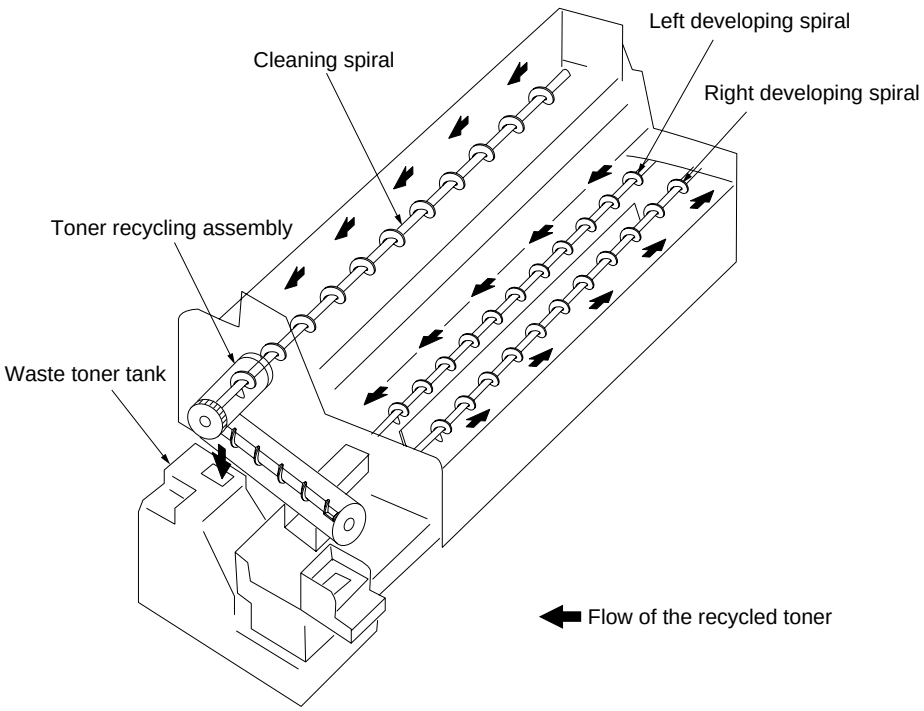
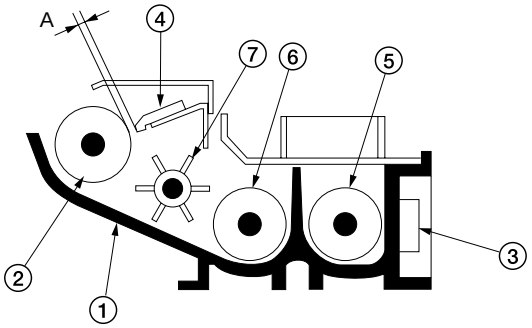


Figure 2-1-13 Toner recycling

(1) Formation of magnetic brush

The developing roller consists of a magnet roller with five poles and a sleeve roller. Rotation of the sleeve roller around the magnet roller entrains developer, which in turn forms a magnetic brush at pole N1 on the magnet roller. The height of the magnetic brush is regulated by the doctor blade; the developing result is affected by the position of the poles on the magnet roller and the position of the doctor blade.
A developing bias voltage generated by the high-voltage transformer PCB (HVTPCB) is applied to the developing roller to provide image contrast.



① Developing unit housing
② Developing roller
③ Toner sensor (TNS)
④ Doctor blade
⑤ Right developing spiral
⑥ Left developing spiral
⑦ Developing paddle

A: Distance between the doctor blade and developing roller: 0.6±0.05 mm

Figure 2-1-14 Forming a magnetic brush

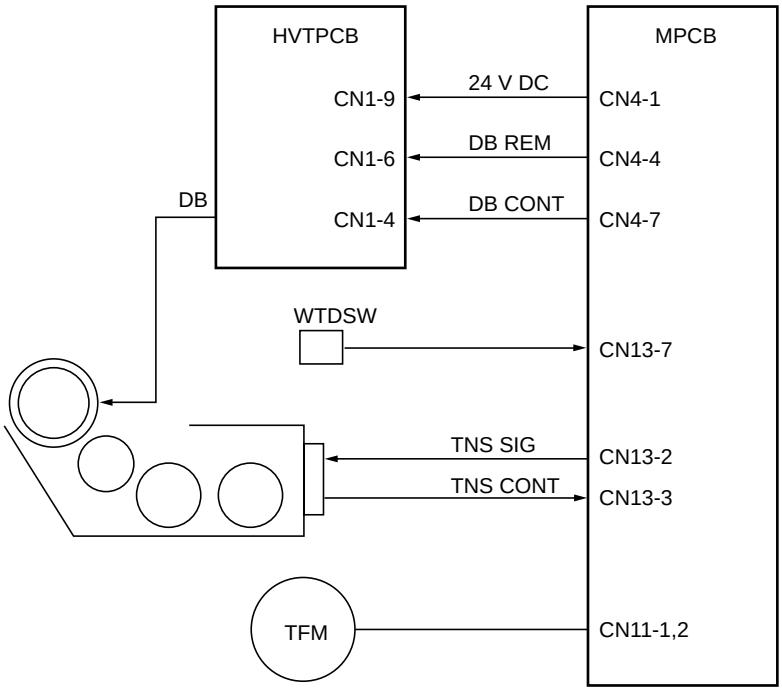


Figure 2-1-15 Developing section block diagram

(2) Toner density detection by the toner sensor

The toner sensor (TNS) detects the toner density. As the developer passes by the sensor section of the toner sensor, the toner sensor detects the ratio of toner to carrier in the developer and converts it into a voltage. When more toner is used, the ratio of toner to carrier decreases and the toner sensor output voltage increases. When the ratio drops below the specified value, the increase in toner sensor output voltage triggers toner replenishing. When toner is added and the ratio of toner to carrier returns to normal, the toner sensor output voltage drops to the point where toner replenishing stops.

(3) Toner density control

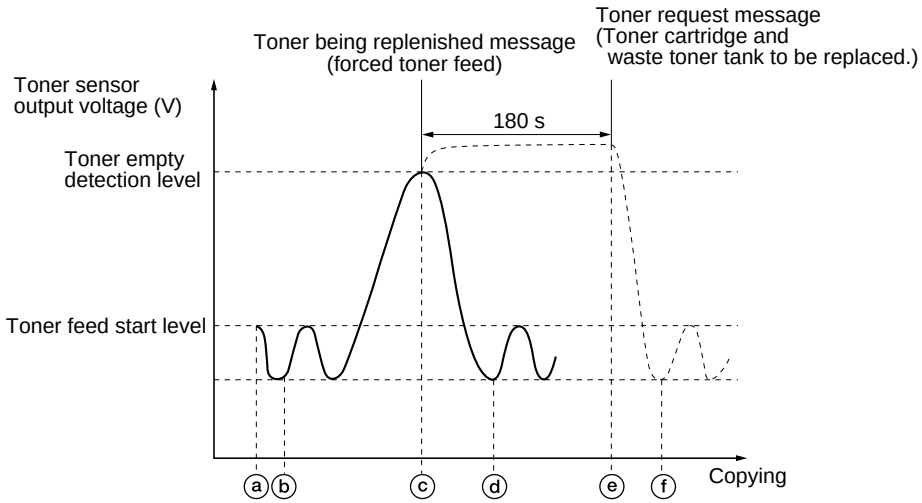


Figure 2-1-16 Toner density control

ⓐ: If the toner sensor output voltage exceeds the toner feed start level 3 s after the drive motor (DM) has turned on (end of toner empty detection inhibit time), the toner feed motor (TFM) turns on to replenish toner.
ⓑ: As toner is replenished, the toner sensor output voltage falls until it drops below the toner feed stop level and replenishing stops.
ⓒ: When the toner sensor output voltage exceeds the toner empty detection level after toner replenishing is carried out, the toner being replenished message appears disabling copying and forced toner feed starts. If the toner sensor output voltage fails to fall to the toner feed stop level within 180 s of the start of forced toner feed, the toner request message appears.
ⓓ: When toner is replenished, the toner sensor output voltage falls until it drops below the toner feed stop level and replenishing stops. After 60 s aging (15 s while copying) the toner being replenished message disappears and copying is enabled.
ⓔ: After replacing the toner cartridge and the waste toner tank, the toner feed motor (TFM) turns on to replenish toner.
ⓕ: When toner is replenished, the toner sensor output voltage falls until it drops to the toner feed stop level. The toner being replenished message disappears and replenishing stops.

(4) Correcting the toner sensor control voltage
The toner sensor control voltage is corrected based on the absolute humidity and the total drive motor time so that the toner density is kept constant regardless of the changes in humidity and the total drive motor time.
Toner sensor control voltage after correction = A + B + C
A: Toner sensor control voltage before correction (value set by maintenance item U131)
B: Correction data based on the absolute humidity
C: Correction data based on the total drive motor time

• Correction based on the absolute humidity

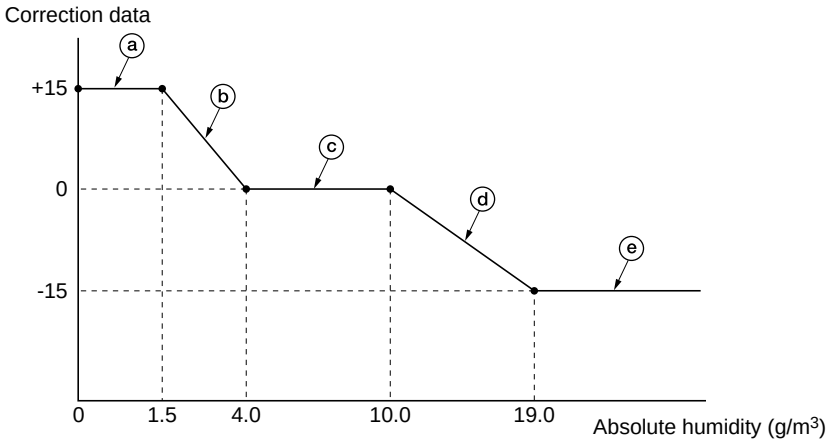


Figure 2-1-17 Correction based on the absolute humidity

ⓐ: When the absolute humidity is between 0 and 1.5 g/m³, a constant value of +15 is added to the toner sensor control voltage.
ⓑ: When the absolute humidity is between 1.5 and 4.0 g/m³, the correction data is reduced according to the rise in absolute humidity.
ⓒ: When the absolute humidity is between 4.0 and 10.0 g/m³, the correction data becomes 0.
ⓓ: When the absolute humidity is between 10.0 and 18.0 g/m³, the correction data is decreased according to the rise in absolute humidity, reducing the toner sensor control voltage.
ⓔ: When the absolute humidity exceeds 18.0 g/m³, the correction data becomes a constant value of –15, decreasing the toner sensor control voltage.

Computing the absolute humidity
The humidity sensor (HUMSENS) converts the relative humidity detected by the humidity sensing element into a voltage and sends it to the main PCB (MPCB). The main PCB (MPCB) computes the absolute humidity based on this HUMSENS signal and the temperature (ETTH signal) detected by the external temperature thermistor (ETTH).

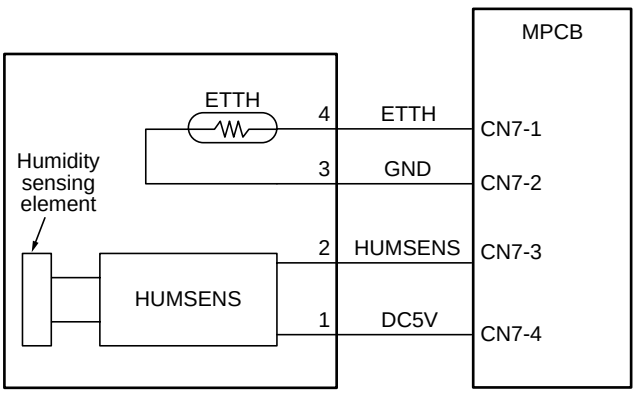
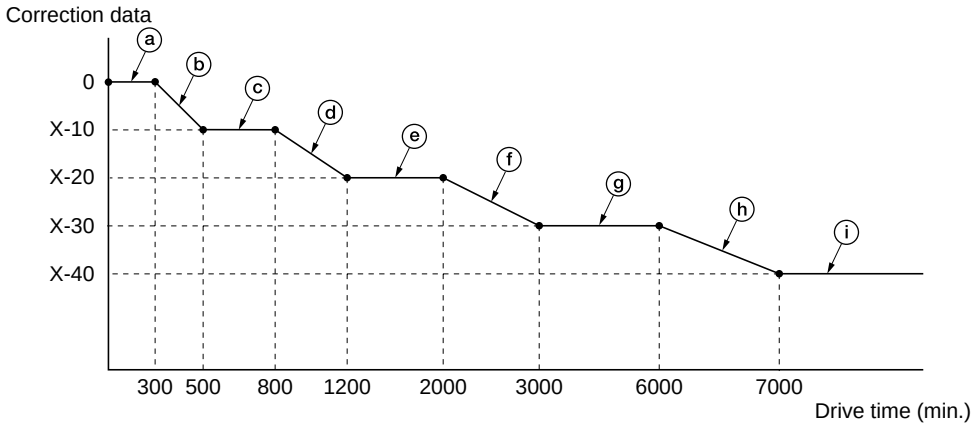


Figure 2-1-18 Absolute humidity computation block diagram

• Correction based on the total drive motor time
The toner sensor control voltage is also corrected based on the total time the drive motor (DM) has been on from execution of maintenance item U130, so that the toner sensor output voltage is regulated properly.



X: Toner sensor control voltage for initial developer setting (the value set in U131 in bits)

Figure 2-1-19 Correction based on the total drive motor time

ⓐ: When maintenance item U130 is run for initial developer setting, the total drive motor time is cleared and the toner sensor control voltage correction data becomes 0.
ⓑ: When the total drive motor time is between 300 and 500 min., the correction data is decreased according to the increase in the total drive motor time.
ⓒ: When the total drive motor time is between 500 and 800 min., the toner sensor control voltage is corrected with a constant value of –10.
ⓓ: When the total drive motor time is between 800 and 1200 min., the correction data is decreased according to the increase in the total drive motor time.
ⓔ: When the total drive motor time is between 1200 and 2000 min., the toner sensor control voltage is corrected with a constant value of –20.
ⓕ: When the total drive motor time is between 2000 and 3000 min., the correction data is decreased according to the increase in the total drive motor time.
ⓖ: When the total drive motor time is between 3000 and 6000 min., the toner sensor control voltage is corrected with a constant value of –30.
ⓗ: When the total drive motor time is between 6000 and 7000 min., the correction data is decreased according to the increase in the total drive motor time.
ⓘ: When the total drive motor time exceeds 7000 min., the toner sensor control voltage is corrected with a constant value of –40.

(5) Correcting toner sensor output voltage
The toner sensor output voltage is corrected according to the absolute humidity at power-on (the main switch turning on), fixing temperature and accumulated drive time.
Toner sensor output voltage after correction = Toner sensor output voltage before correction – Correction data at power-on
Correction data at power-on = A – B
If A – B ≤ 0, the correction data at power-on is 0
A: Correction data based on the absolute humidity and fixing temperature
B: Accumulated drive time from the main switch turning on (total drive motor on-time)

If the fixing temperature at the main switch turning on is 50°C/122°F or below, correction data A is determined as follows:

Condition	Correction data A
The absolute humidity at the last main switch turning off was 50 g/m^3 or below and the absolute humidity at the main switch turning on was 50 g/m^3 or below.	+15
Cases other than above.	+30

If the fixing temperature at the main switch turning on is 50°C/122°F or above, the value of correction data A applied when the main switch was last turned off is used.

2-1-5 Transfer and separation section

The transfer and separation section consists mainly of the transfer roller and drum separation claws.
A high voltage generated by the high-voltage transformer PCB (HVTPCB) is applied to the transfer roller for transfer charging. Toner adhered to the transfer roller is removed by the transfer cleaner.

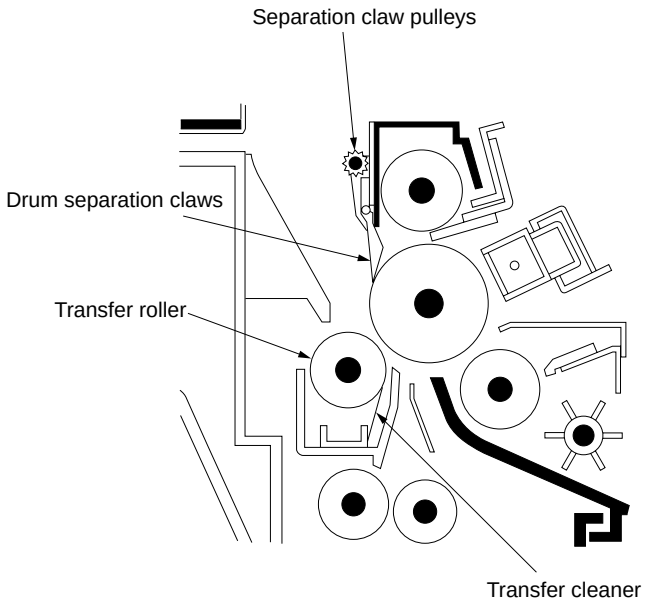


Figure 2-1-20 Transfer and separation section

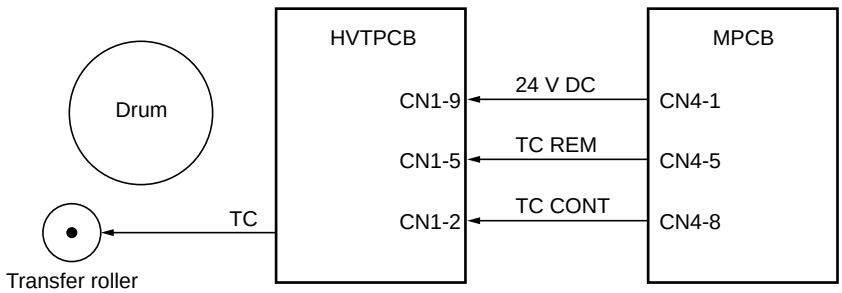
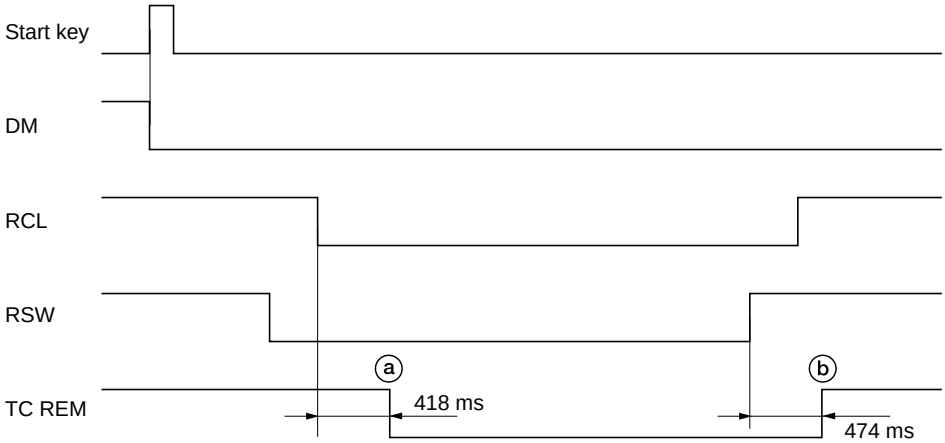


Figure 2-1-21 Transfer and separation section block diagram



Timing chart 2-1-5 Operation of transfer

ⓐ: 418 ms after the registration clutch (RCL) turns on to start secondary paper feed, transfer charging (TC REM) starts.
ⓑ: 474 ms after the trailing edge of the paper turns the registration switch (RSW) off, transfer charging (TC REM) ends.

2-1-6 Cleaning section

The cleaning section consists of the cleaning blade that removes residual toner from the drum surface after the transfer process, and the cleaning spiral that carries the residual toner back to the waste toner tank.

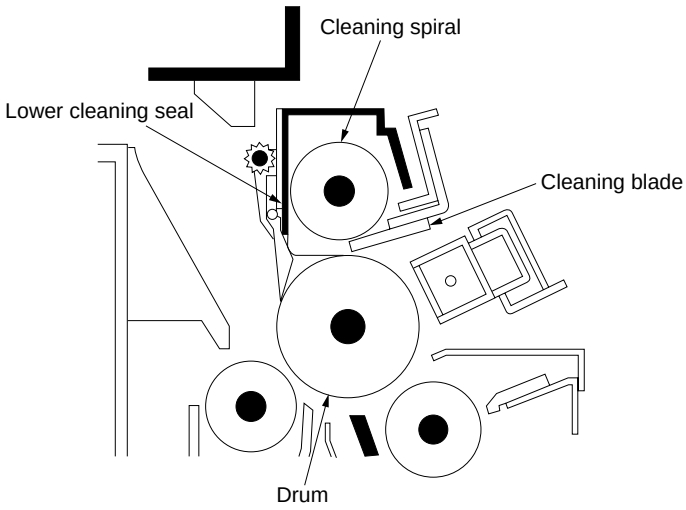


Figure 2-1-22 Cleaning section

2-1-7 Charge erasing section

The cleaning lamp (CL) consists of LEDs which remove residual charge from the drum surface.

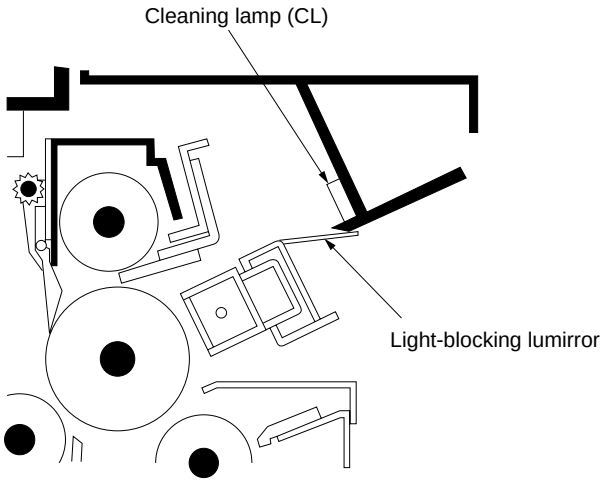


Figure 2-1-23 Charge erasing section

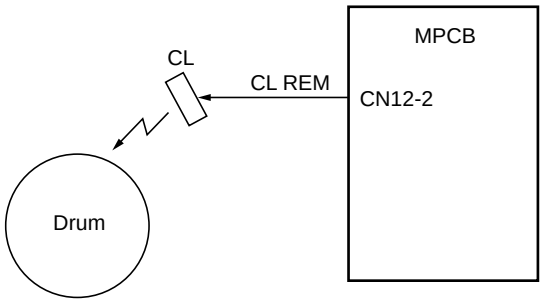
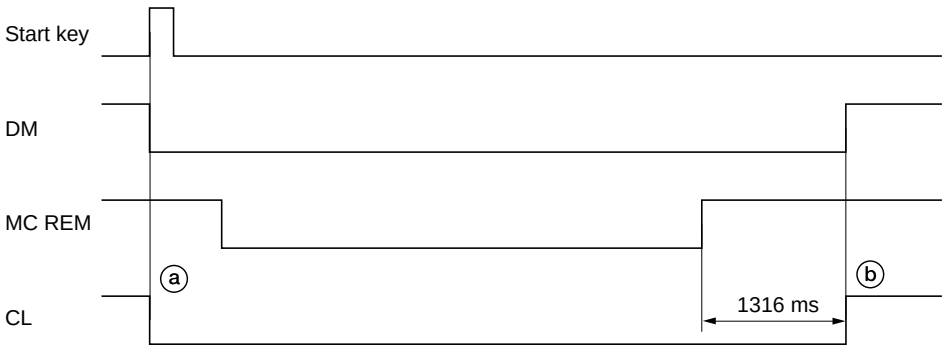


Figure 2-1-24 Charge erasing section block diagram

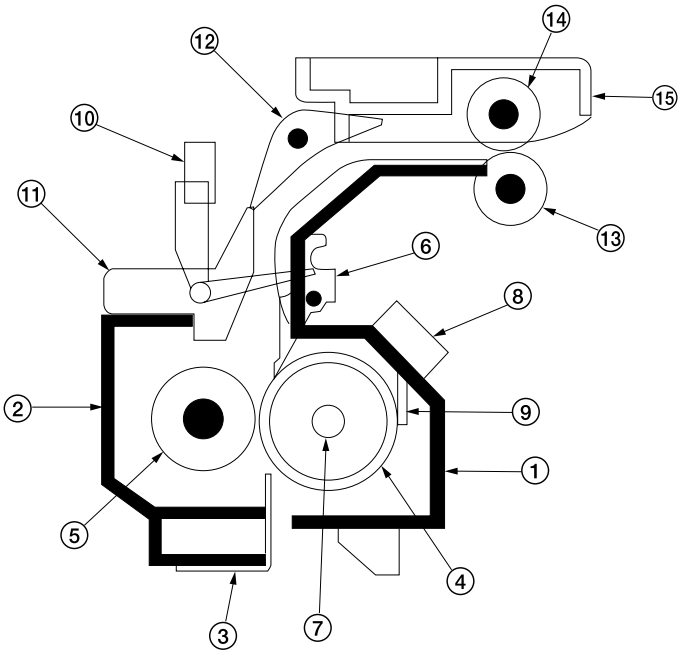


Timing chart 2-1-6 Operation of charge erasing

ⓐ: When the start key is pressed, the drive motor (DM) and cleaning lamp (CL) turn on simultaneously.
ⓑ: 1316 ms after main charging (MC REM) ends, the drive motor (DM) and cleaning lamp (CL) turn off simultaneously.

2-1-8 Fixing section

The fixing section consists of the parts shown in Figure 2-1-25. When paper reaches the fixing section after the transfer process, it passes between the press roller and heat roller, which is heated by the fixing heater (FH). Pressure is applied by the fixing unit pressure springs so that the toner on the paper is melted, fused and fixed onto the paper.
When the fixing process is completed, the paper is separated from the heat roller by heat roller separation claws and is ejected from the fixing section by the rotation of the eject pulley and roller.



① Upper fixing housing
② Lower fixing housing
③ Fixing guide
④ Heat roller
⑤ Press roller
⑥ Heat roller separation claw
⑦ Fixing heater (FH)
⑧ Fixing unit thermostat (FTS)
⑨ Fixing unit thermistor (FTH)
⑩ Eject switch (ESW)
⑪ Left fixing eject guide
⑫ Feedshift guide
⑬ Eject roller
⑭ Eject pulley
⑮ Eject guide

Figure 2-1-25 Fixing section

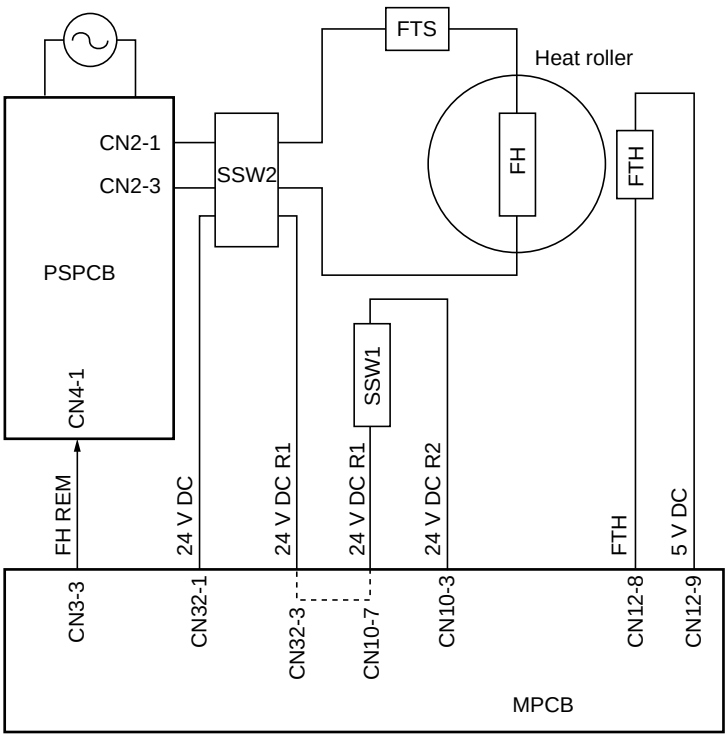
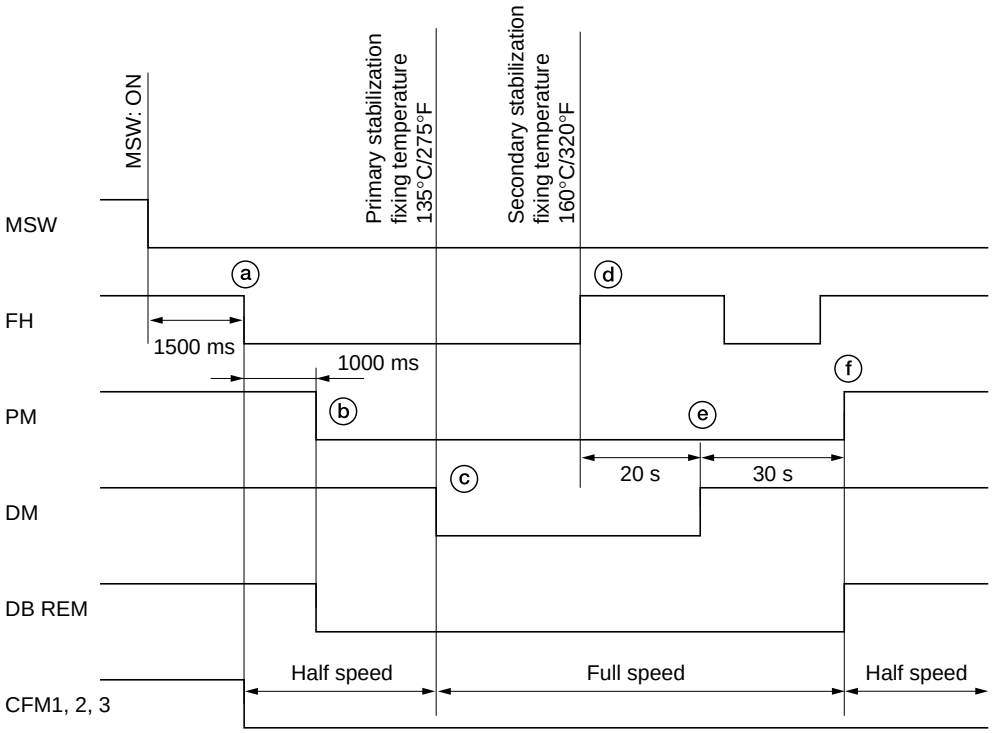


Figure 2-1-26 Fixing section block diagram



Timing chart 2-1-7 Operation of fixing section

ⓐ: 1500 ms after the main switch (MSW) is turned on, the fixing heater (FH) turns on to heat the heat roller. At the same time, cooling fan motors 1, 2 and 3 (CFM1, 2 and 3) rotate at half speed.
ⓑ: 1000 ms after the fixing heater (FH) turns on, the polygon motor (PM) of the laser scanner unit and developing bias (DB REM) turn on.
ⓒ: When the fixing temperature reaches the primary stabilization temperature (135°C/275°F), the drive motor (DM) turns on. Cooling fan motors 1, 2 and 3 (CFM1, 2 and 3) start rotating at full speed.
ⓓ: When the fixing temperature reaches the secondary stabilization temperature (160°C/320°F), the fixing heater (FH) turns on and off to maintain the fixing control temperature at 160°C/320°F and aging starts.
ⓔ: 20 s after the copier enters secondary stabilization, the drive motor (DM) turns off and aging ends.
ⓕ: 30 s after aging ends, the developing bias (DB REM) turns off and cooling fan motors 1, 2 and 3 (CFM1, 2 and 3) start rotating at half speed.

2-2-1 Electrical parts layout

(1) PCBs

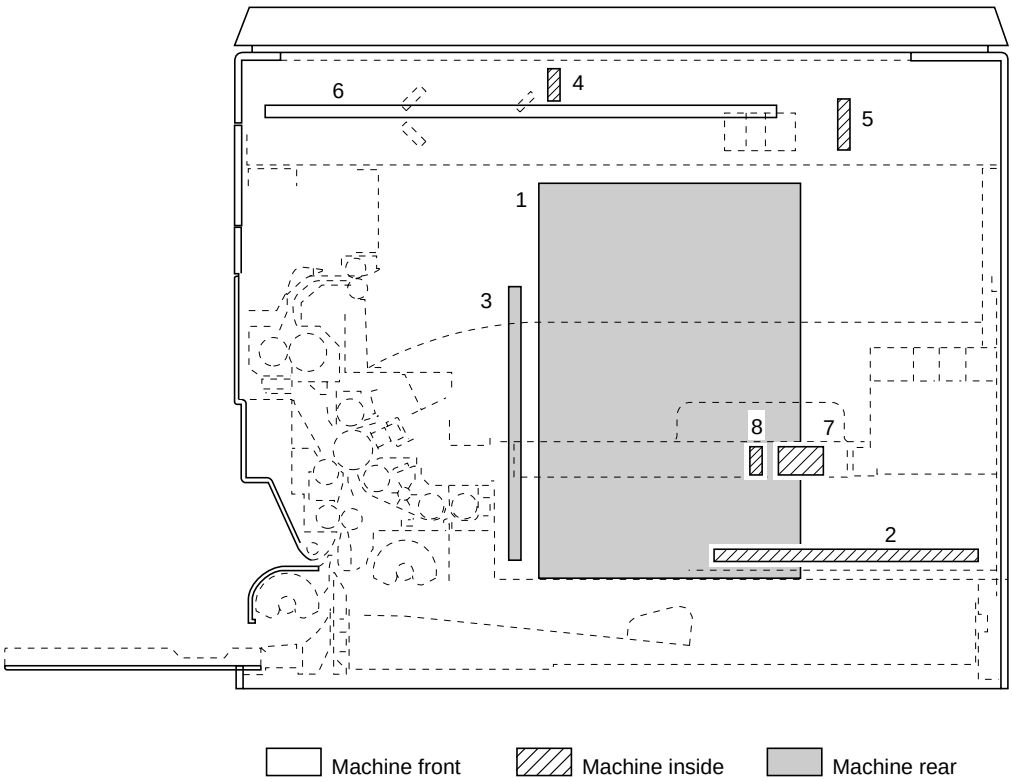


Figure 2-2-1 PCBs

1. Main PCB (MPCB) ..... Controls the other PCBs and electrical components.
2. Power source PCB (PSPCB) ..... Generates 24 V DC, +12 V DC, 5V DC and 3.3 V DC; controls the fixing heater.
3. High-voltage transformer PCB (HVTPCB) ... Main charging. Generates developing bias and high voltages for transfer.
4. Inverter PCB (INPCB) ..... Controls the exposure lamp.
5. CCD PCB (CCDPCB) ..... Reads the image off originals.
6. Operation unit PCB (OPCB) ..... Consists of the operation keys and display LEDs.
7. Laser diode PCB (LDPCB) ..... Generates and controls the laser light.
8. Beam detection PCB (BDPCB) ..... Detects the laser light.

(2) Switches and sensors

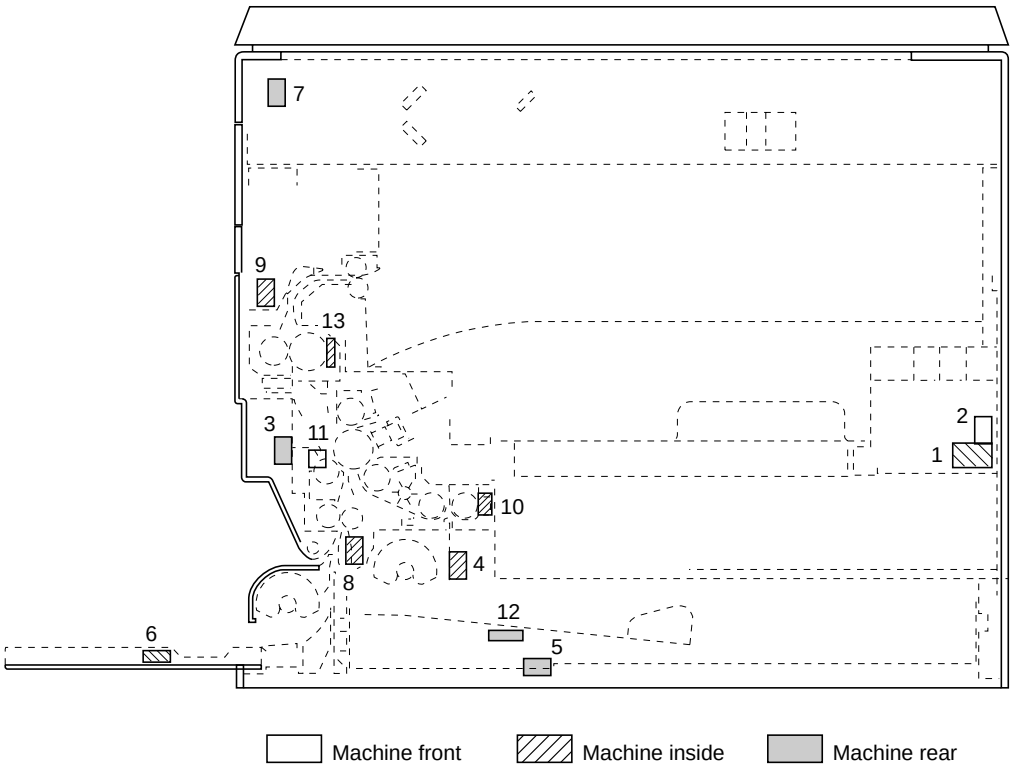


Figure 2-2-2 Switches and sensors

1. Main switch (MSW) ..... Turns the AC power on and off.
2. Safety switch 1 (SSW1) ..... Breaks the safety circuit when the front cover is opened.
3. Safety switch 2 (SSW2) ..... Breaks the safety circuit when the paper conveying unit is opened.
4. Paper switch (PSW) ..... Detects the presence of paper in the drawer.
5. Paper size switch (PSSW) ..... Detects the presence of paper in the drawer.
6. Bypass paper width switch
   (BYPPSW) ..... Detects the width of paper on the bypass tray.
7. Scanner home position switch
   (SHPSW) ..... Detects the optical system in the home position.
8. Registration switch (RSW) ..... Controls the secondary paper feed start timing.
9. Eject switch (ESW) ..... Detects a paper misfeed in the fixing section.
10. Toner sensor (TNS) ..... Detects the toner density in the developing section.
11. Waste toner detection switch (WTDSW) ..... Detects the presence of the waste toner tank.
12. Humidity sensor (HUMSENS) ..... Detects absolute humidity.
13. Fixing unit thermistor (FTH) ..... Detects the heat roller temperature.

(3) Motors

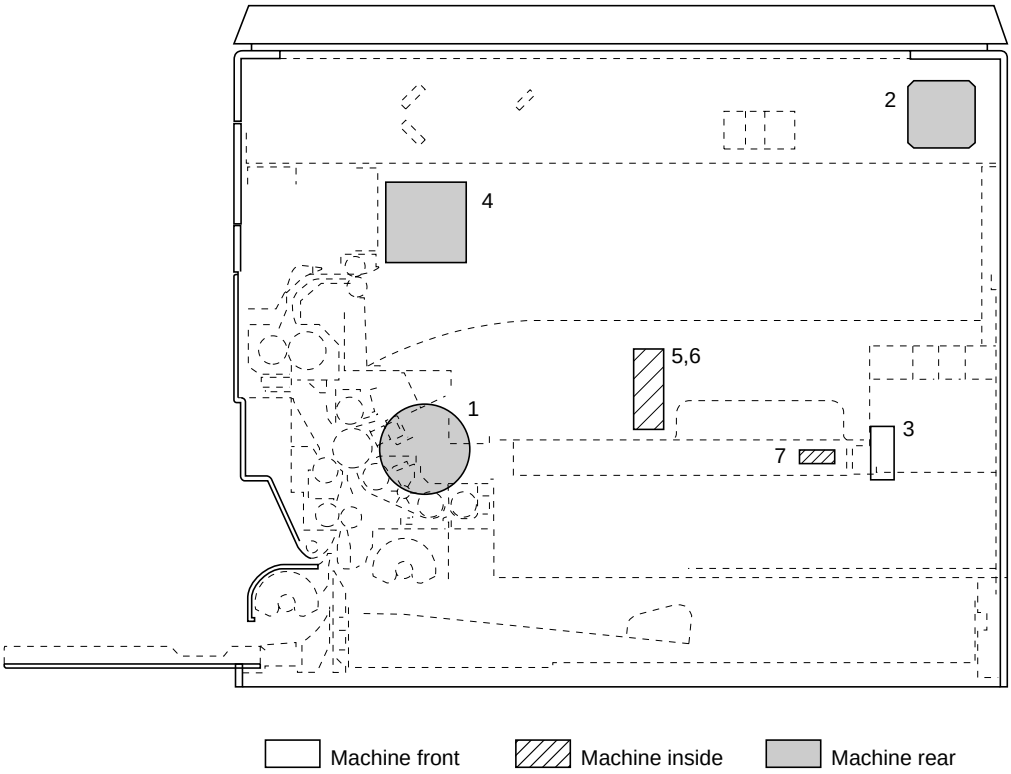


Figure 2-2-3 Motors

1. Drive motor (DM) ..... Drives the machine.
2. Scanner motor (SM) ..... Drives the optical system.
3. Toner feed motor (TFM) ..... Replenishes toner.
4. Cooling fan motor 1 (CFM1) ..... Cools the fixing section.
5. Cooling fan motor 2 (CFM2) ..... Cools the machine interior.
6. Cooling fan motor 3 (CFM3) ..... Cools the machine interior.
7. Polygon motor (PM) ..... Drives the polygon mirror.

(4) Other electrical components

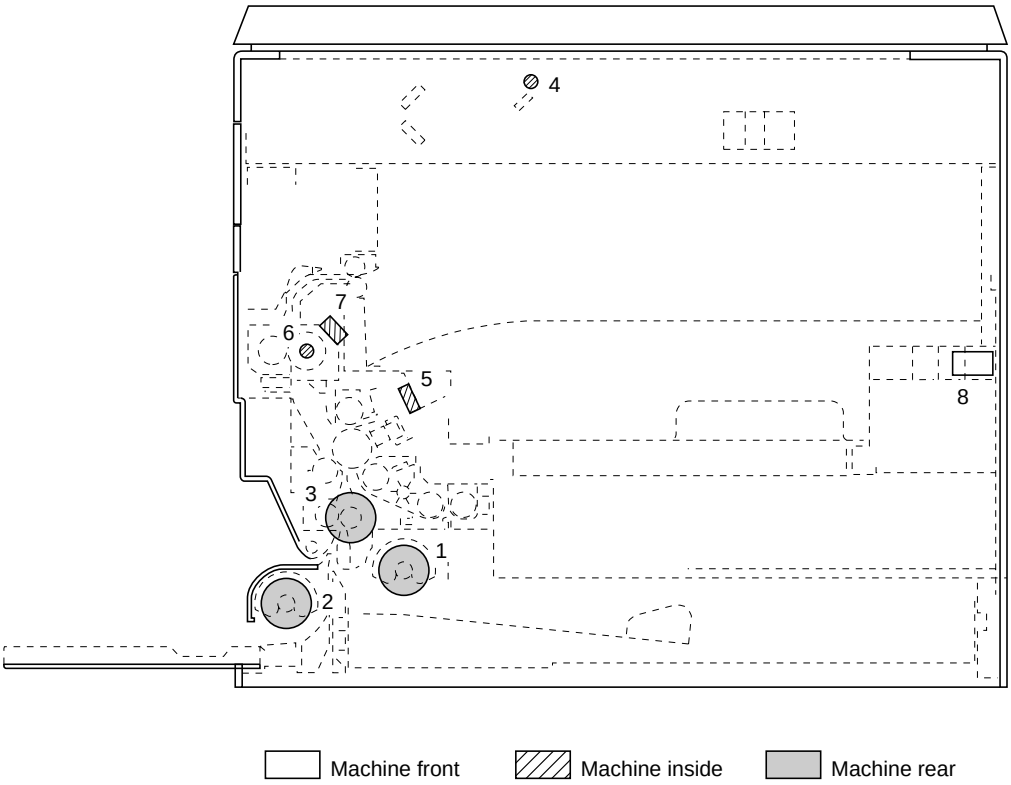


Figure 2-2-4 Other electrical components

1. Paper feed clutch (PFCL) ..... Primary paper feed from the drawer.
2. Bypass paper feed clutch (BYPPFCL) ..... Primary paper feed from the bypass tray.
3. Registration clutch (RCL) ..... Secondary paper feed.
4. Exposure lamp (EL) ..... Exposes originals.
5. Cleaning lamp (CL) ..... Removes residual charge from the drum surface.
6. Fixing heater (FH) ..... Heats the heat roller.
7. Fixing unit thermostat (FTS) ..... Prevents overheating in the fixing section.
8. Total counter* (TC) ..... Displays the total number of copies produced.
9. Drawer heater* (DH) ..... Dehumidifies the drawer section.

*Optional.

2-3-1 Power source PCB

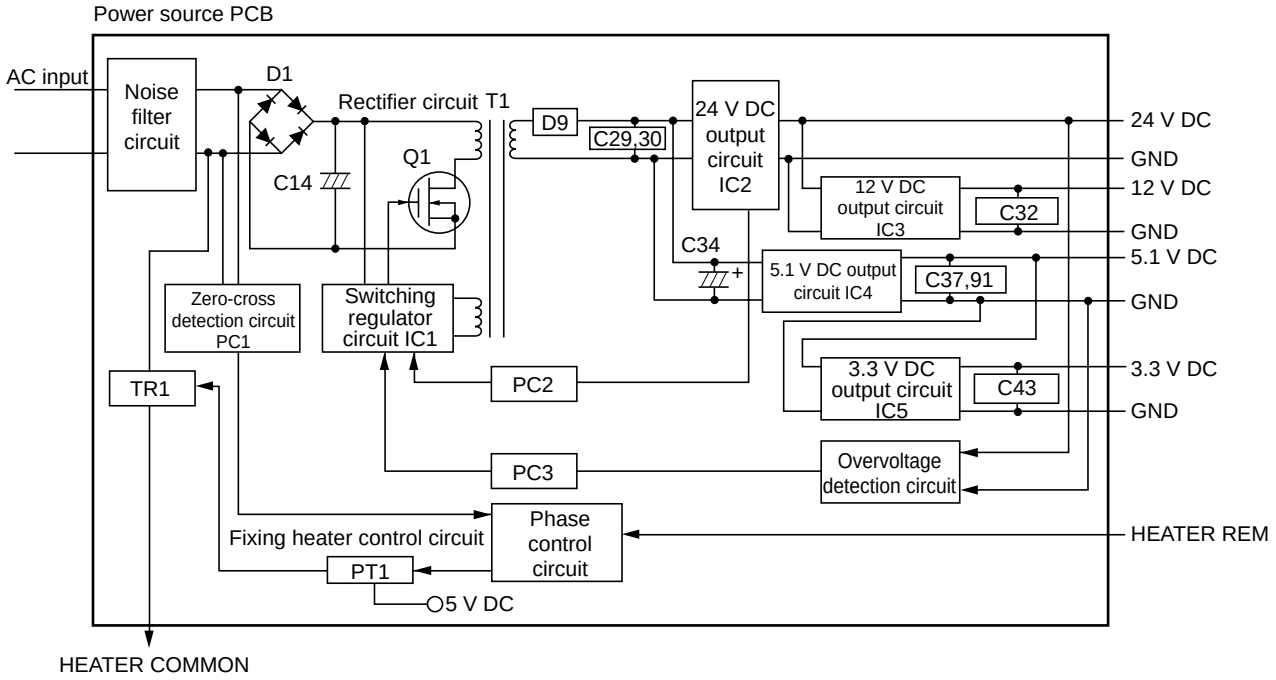


Figure 2-3-1 Power source PCB block diagram

The power source PCB (PSPCB) is a switching regulator that converts an AC input to generate 24 V DC, 5.1 V DC, 3.3 V DC and 12 V DC. It includes a noise filter circuit, a rectifier circuit, a switching regulator circuit, a 24 V DC output circuit, a 5 V DC output circuit, a 3.3 V DC output circuit, a 12 V DC output circuit, a fixing heater control circuit and a phase control circuit.
The noise filter circuit consists mainly of a line filter and capacitors. It reduces external noise from the AC input and prevents switching noise generated by the power source PCB from leaving the machine.
The rectifier circuit full-wave rectifies the AC input that has passed through the noise filter circuit using the diode bridge D1. The smoothing capacitor C14 smoothes out the pulsed current from the diode bridge.
In the switching control circuit, PWM controller IC1 turns the power MOSFET Q1 on and off to switch the current induced in the primary coil of the transformer T1.
The 24 V DC output circuit smoothes the current induced in the secondary coil of the transformer T1 via diode D9 and smoothing capacitors C29 and C30, and outputs a stable 24 V DC by the function of the shunt regulator IC2. It also monitors the 24 V DC output status, which is fed back to PWM controller IC1 in the switching control circuit via photocoupler PC2. PWM controller IC1 controls the switching duty width of the power MOSFET Q1 based on the output voltage status, producing a stable 24 V DC output.
The 5.1 V DC output circuit consists of a step-down chopper circuit that uses IC4 as the control IC. It outputs a stable 5.1 V DC.
The 3.3 V DC output circuit converts the 5 V DC from the 5 V DC output circuit to a stable 3.3 V DC by means of the 4-pin regulator IC5.
The 12 V DC output circuit converts the 24 V DC from the 24 V DC output circuit to a stable 12 V DC by means of the 4-pin regulator IC3.
The phase control circuit and zero-cross detection circuit prevent flicker problems. These circuits modify the fixing heater on signal from the main PCB (MPCB) to prevent abrupt variations in current when turning the fixing heaters on and off, and convey the signal to the fixing heater control circuit.
The fixing heater control circuit is controlled by the fixing heater on signal modified at the phase control circuit. The phototriac PT1 turns on when the fixing heater on signal goes low. When the phototriac PT1 is turned on, current flows through the triac TR1 to turn the fixing heaters on.

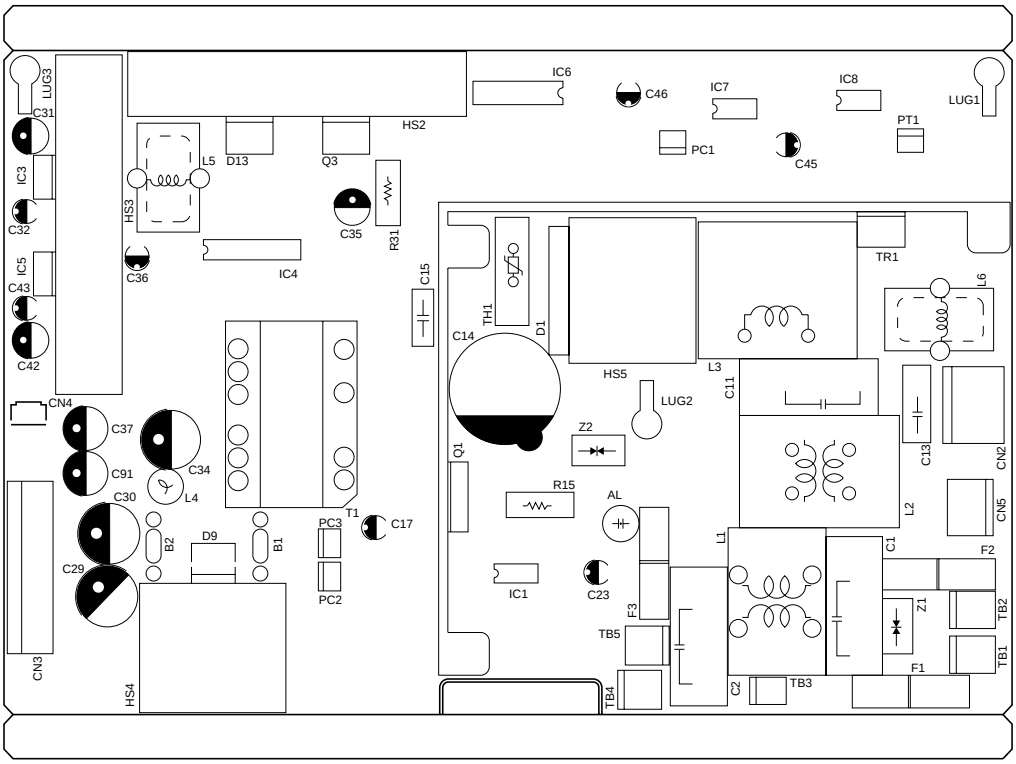


Figure 2-3-2 Power source PCB silk-screen diagram

Terminals (CN)		Voltage	Remarks
TB-1	TB-2	220-240 V AC	220-240 V AC supply, input
TB-4	TB-5	220-240 V AC	220-240 V AC supply for MSW, output
2-3	2-1	220-240 V AC	AC supply for FH, output
3-1, 2	3-3, 4	24 V DC	24 V DC supply for MPCB, output
3-5, 6	3-7, 8	5.1 V DC	5.1 V DC supply for MPCB, output
3-9	3-10	3.3 V DC	3.3 V DC supply for MPCB, output
4-1	3-3	0/5 V DC	FH on/off, input
4-3	4-2	12 V DC	12 V DC supply for MPCB, output
5-2	5-1	220-240 V AC	220-240 V AC supply for drawer heater* (DH), output

*: Optional.

2-3-2 Main PCB

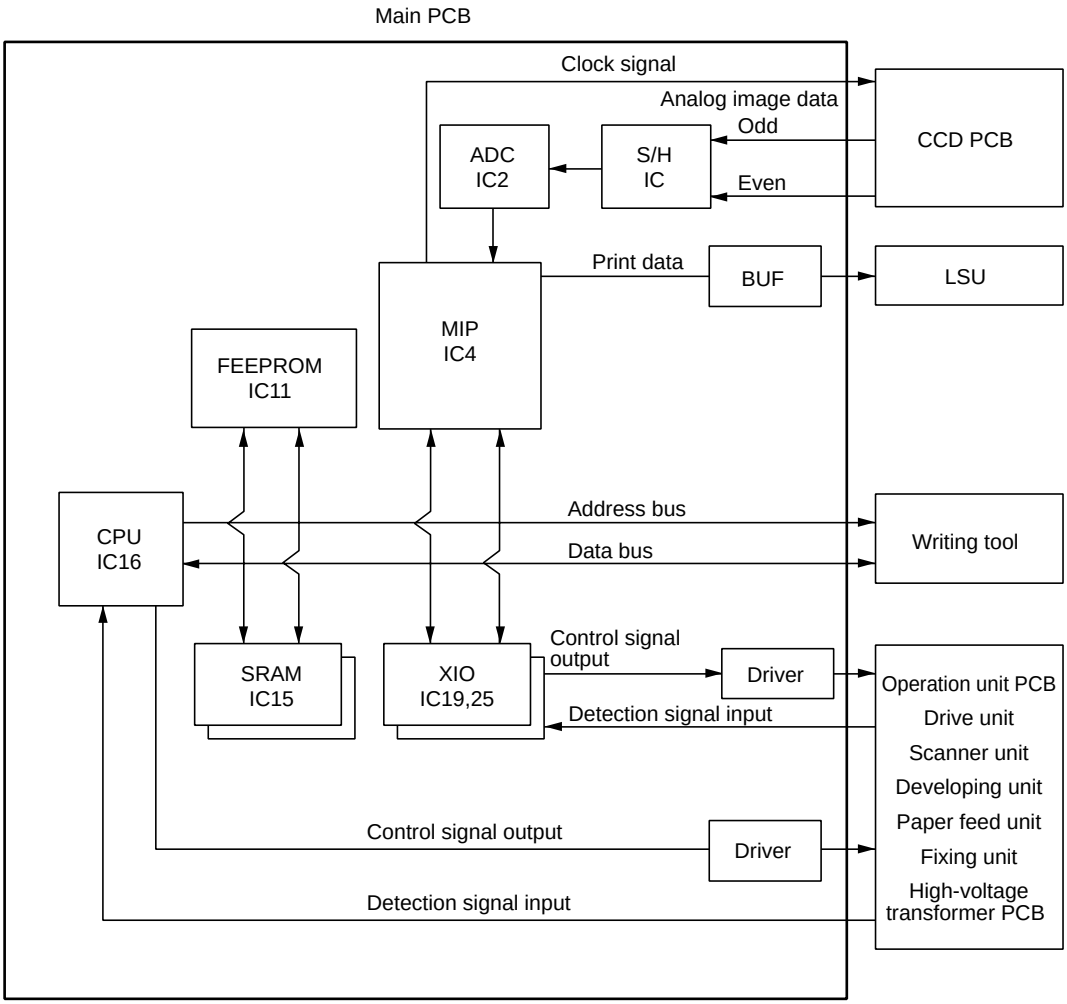


Figure 2-3-3 Main PCB block diagram

The main PCB (MPCB) consists mainly of CPU IC16. It controls the image processing system and engine drive system. CPU IC16 operates on an 8-bit bus. It uses SRAM IC15 as work memory and backup memory. In accordance with the control program in FEEPROM IC11, CPU IC16 controls the CCD PCB (CCDPCB), which is for image input control, and the LSU, which is for image output control, via image processing ASIC MIP IC4. It also drives the operation section and machine, conveys paper and detects abnormalities via XIO IC19 and IC25.

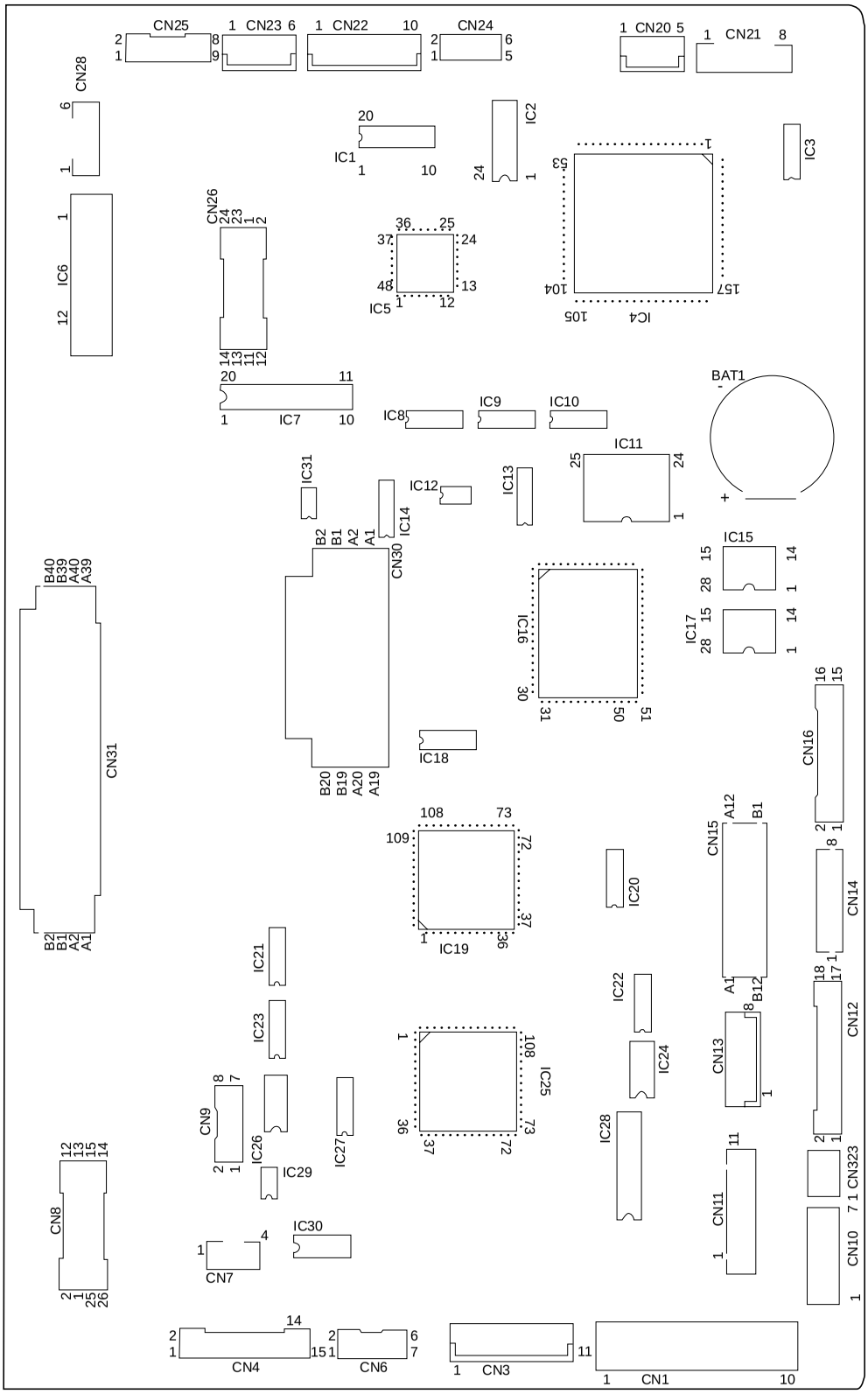


Figure 2-3-4 Main PCB silk-screen diagram

Terminals (CN)		Voltage	Remarks
1-2	1-1	3.3 V DC	3.3 V DC supply from PSPCB, input
1-5, 6	1-3, 4	5 V DC	5 V DC supply from PSPCB, input
1-9, 10	1-7, 8	24 V DC	24 V DC supply from PSPCB, input
3-1	3-2	12 V DC	12 V DC supply from PSPCB, input
3-3	1-3	0/5 V DC	FH on/off, output
3-4	1-7	0/24 V DC	MSW on/off, input
3-5	1-7	24 V DC	24 V DC supply for MSW, output
3-6	3-8	5 V DC	5 V DC supply for RSW, output
3-7	3-8	0/5 V DC	RSW on/off, input
3-10	3-9	0/5 V DC	PSW on/off, input
3-11	3-9	5 V DC	5 V DC supply for PSW, output
4-1	4-2	24 V DC	24 V DC supply for HVTPCB, output
4-3	4-2	0/5 V DC	Main charging on/off, output
4-4	4-2	0/5 V DC	Developing bias on/off, output
4-5	4-2	0/5 V DC	Transfer charging on/off, output
4-6	4-2	0 - 5 V DC	GRID control voltage, output
4-7	4-2	0 - 5 V DC	Developing bias control voltage, output
4-8	4-2	0 - 5 V DC	Transfer charging control voltage, output
4-9	4-2	0/5 V DC	Main charging ALM signal, input
4-10	4-2	0/24 V DC	RCL on/off, output
4-11	4-2	24 V DC	24 V DC supply for RCL, output
4-12	4-2	0/24 V DC	BYPPFCL on/off, output
4-13	4-2	24 V DC	24 V DC supply for BYPPFCL, output
4-14	4-2	0/24 V DC	PFCL-U on/off, output
4-15	4-2	24 V DC	24 V DC supply for PFCL-U, output
6-4	6-7	0/5 V DC	BYPPWSW width detection signal, input
6-5	6-7	0/5 V DC	BYPPWSW width detection signal, input
6-6	6-7	0/5 V DC	BYPPWSW width detection signal, input
7-1	7-2		ETTH detection voltage, input
7-3	7-2		HUMSENS detection voltage, input
7-4	7-2	5 V DC	5 V DC supply for HUMSENS, output
9-8	9-7	0/5 V DC	PSSW on/off, input
10-7	12-12	24 V DC	SSW2 on/off, output
11-1	12-12	24/14 V DC	TFM drive control signal (+), output
11-2	12-12	14/24 V DC	TFM drive control signal (-), output
11-3	12-12	24 V DC	24 V DC supply for CFM1, output
11-4	12-12	12/24 V DC	CFM1 half speed/full speed, output
11-5	12-12	0/24 V DC	CFM1 on/off, output
11-6	12-12	24 V DC	24 V DC supply for CFM2, output
11-7	12-12	12/24 V DC	CFM2 half speed/full speed, output
11-8	12-12	0/24 V DC	CFM2 on/off, output
11-9	12-12	24 V DC	24 V DC supply for CFM3, output
11-10	12-12	12/24 V DC	CFM3 half speed/full speed, output
11-11	12-12	0/24 V DC	CFM3 on/off, output
12-1	12-12	24 V DC	24 V DC supply for CL, output
12-2	12-12	0/24 V DC	CL on/off, output
12-3	12-12	24 V DC	24 V DC supply for total counter*, output
12-4	12-12	0/24 V DC	Total counter* on/off, input
12-6	12-5	0/5 V DC	ESW on/off, input
12-7	12-5	5 V DC	5 V DC supply for ESW, output
12-8	12-5	0 - 5 V DC	FTH detection voltage, input
12-9	12-5	5 V DC	5 V DC supply for FTH, output
12-10	12-12	24 V DC	24 V DC supply for DM, output
12-11	12-12	24 V DC	24 V DC supply for DM, output
12-14	12-12	5 V DC	5 V DC supply for DM, output

*: Optional.

Terminals (CN)		Voltage	Remarks
12-16	12-12	0/5 V DC	DM on/off, output
12-17	12-12	0/5 V DC (pulse)	DM drive clock pulse, output
12-18	12-12	0/5 V DC	DM LOCK signal, input
13-1	13-4	24 V DC	24 V DC supply for TNS, output
13-2	13-4		TNS detection voltage, input
13-3	13-4	0 - 15 V DC	TNS control voltage, output
13-5	13-6	0/5 V DC	Connection detection signal, input
13-7	13-8	0/5 V DC	WTDSW on/off, input
20-1	20-2	24 V DC	24 V DC supply for PM, output
20-3	20-2	0/5 V DC	PM S/S signal, output
20-4	20-2	0/5 V DC	PM READY signal, input
20-5	20-2	0/5 V DC (pulse)	PM drive clock pulse, output
21-1	21-2	0/5 V DC	LDPCB HSYNC signal, input
21-3	21-2	5 V DC	5 V DC supply for LDPCB, output
21-5	21-2	0/5 V DC	LDPCB ENABLE signal, output
21-6	21-2	0/5 V DC	LDPCB VIDEO signal, output
21-7	21-2	0/5 V DC	LDPCB S/H signal, output
22-2	22-1	0/5 V DC	CCDPCB SHIFT signal, output
22-4	22-3	0/5 V DC	CCDPCB CLP signal, output
22-6	22-5	0/5 V DC	CCDPCB RESET signal, output
22-8	22-7	0/5 V DC (pulse)	CCDPCB clock pulse, output
22-10	22-9	0/5 V DC (pulse)	CCDPCB clock pulse, output
23-2	23-1	12 V DC	12 V DC supply for CCDPCB, output
23-4	23-3	0/5 V DC	CCDPCB image signal (EVEN), input
23-6	23-5	0/5 V DC	CCDPCB image signal (ODD), input
24-1	24-5	0/5 V DC	EL on/off, output
24-2	24-5	0/5 V DC	EL on/off, output
24-3	24-5	24 V DC	24 V DC supply for INPCB, output
24-4	24-5	24 V DC	24 V DC supply for INPCB, output
25-5	25-4	0/5 V DC	SHPSW on/off, input
25-6	25-4	5 V DC	5 V DC supply for SHPSW, output
26-1	1-3	0/5 V DC	OPCB LEDON10 signal, output
26-2	1-3	0/5 V DC	OPCB LEDON8 signal, output
26-3	1-3	0/5 V DC	OPCB LEDON6 signal, output
26-4	1-3	0/5 V DC	OPCB LEDON4 signal, output
26-5	1-3	0/5 V DC	OPCB LEDON2 signal, output
26-6	1-3	0/5 V DC	OPCB LEDON0 signal, output
26-7	1-3	0/5 V DC (pulse)	OPCB SCAN1 signal, output
26-8	1-3	0/5 V DC (pulse)	OPCB SCAN3 signal, output
26-9	1-3	0/5 V DC (pulse)	OPCB SCAN5 signal, output
26-10	1-3	0/5 V DC (pulse)	OPCB SCAN7 signal, output
26-11	1-3	0/5 V DC	OPCB KEY3 signal, input
26-12	1-3	0/5 V DC	OPCB KEY1 signal, input
26-13	1-3	0/5 V DC	OPCB LEDON9 signal, output
26-14	1-3	0/5 V DC	OPCB LEDON7 signal, output
26-15	1-3	0/5 V DC	OPCB LEDON5 signal, output
26-16	1-3	0/5 V DC	OPCB LEDON3 signal, output
26-17	1-3	0/5 V DC	OPCB LEDON1 signal, output
26-18	1-3	0/5 V DC (pulse)	OPCB SCAN0 signal, output
26-19	1-3	0/5 V DC (pulse)	OPCB SCAN2 signal, output
26-20	1-3	0/5 V DC (pulse)	OPCB SCAN4 signal, output
26-21	1-3	0/5 V DC (pulse)	OPCB SCAN6 signal, output
26-22	1-3	0/5 V DC	OPCB KEY4 signal, input
26-23	1-3	0/5 V DC	OPCB KEY2 signal, input
26-24	1-3	0/5 V DC	OPCB KEY0 signal, input

Terminals (CN)		Voltage	Remarks
28-1	24-5	0/24 V DC (pulse)	SM coil energization pulse, output (_A)
28-2	24-5	24 V DC	24 V DC supply for SM, output
28-3	24-5	0/24 V DC (pulse)	SM coil energization pulse, output (A)
28-4	24-5	0/24 V DC (pulse)	SM coil energization pulse, output (B)
28-5	24-5	24 V DC	24 V DC supply for SM, output
28-6	24-5	0/24 V DC (pulse)	SM coil energization pulse, output (_B)
32-1	12-12	24 V DC	24 V DC supply for SSW2, output
32-3	12-12	0/24 V DC	SSW2 on/off, input

2-3-3 CCD PCB

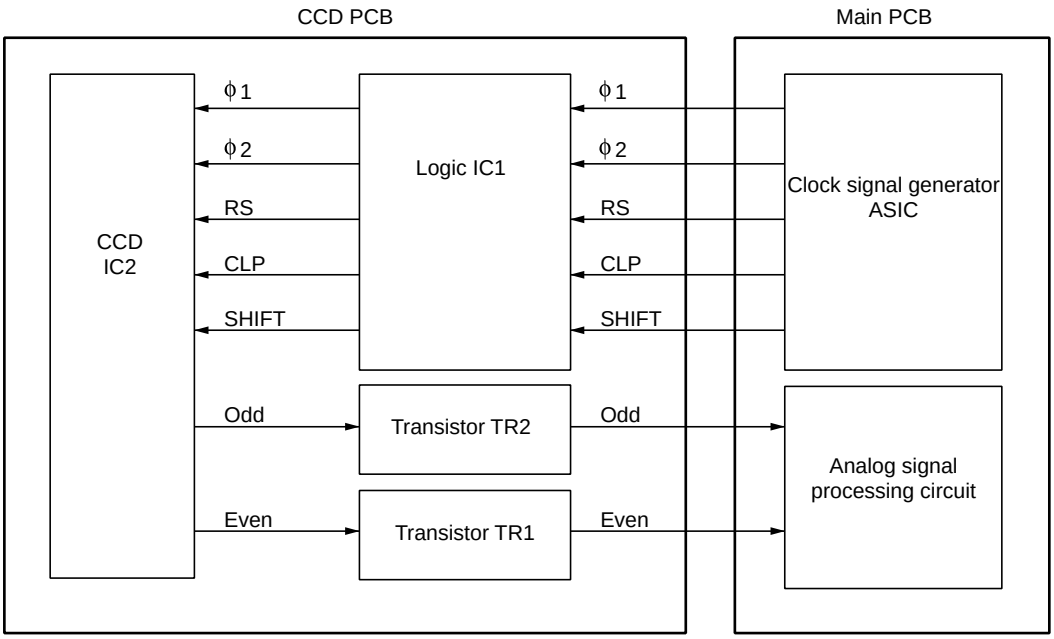


Figure 2-3-5 CCD PCB block diagram

The CCD PCB (CCDPCB) is equipped with a CCD sensor IC2 for original scanning.
The CCD sensor IC2 is controlled by the clock signals ϕ1, ϕ2, RS, CLP and SHIFT for CCD drive from the main PCB (MPCB) via logic IC1.
Image signals are analog signals. Even- and odd-numbered pixels are output separately. These analog image signals are amplified by emitter followers in the transistors TR1 and TR2 and then transmitted to the analog signal processing circuit in the main PCB (MPCB).

Terminals (CN)		Voltage	Remarks
1-1	1-2	0/5 V DC (pulse)	CCDPCB clock pulse, input
1-3	1-4	0/5 V DC (pulse)	CCDPCB clock pulse, input
1-5	1-6	0/5 V DC (pulse)	CCDPCB RESET signal, input
1-7	1-8	0/5 V DC (pulse)	CCDPCB CLP signal, input
1-9	1-10	0/5 V DC (pulse)	CCDPCB SHIFT signal, input
2-1	2-2		CCDPCB image signal (ODD), output
2-3	2-4		CCDPCB image signal (EVEN), output
2-5	2-6	12 V DC	12 V DC supply from MPCB, input

2-3-4 Laser diode PCB

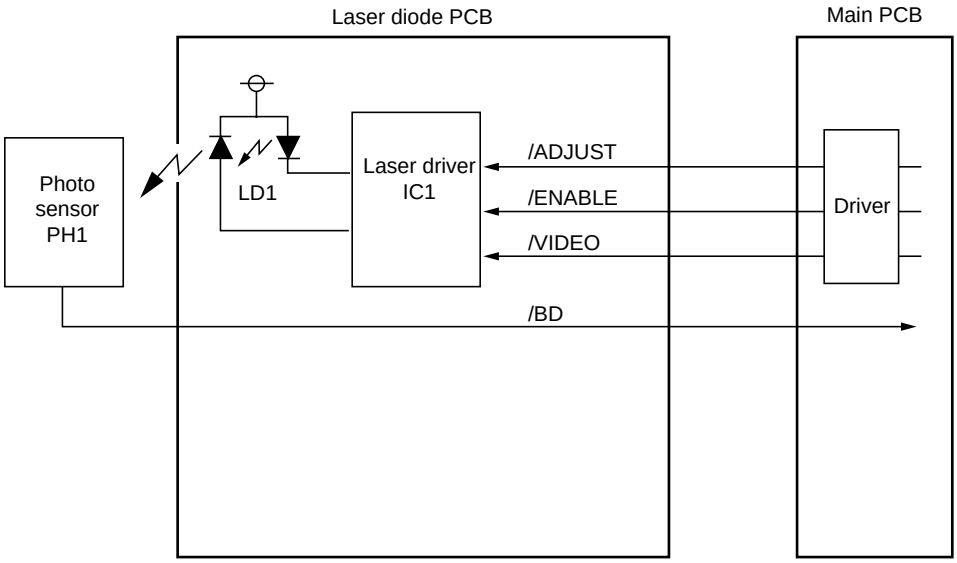
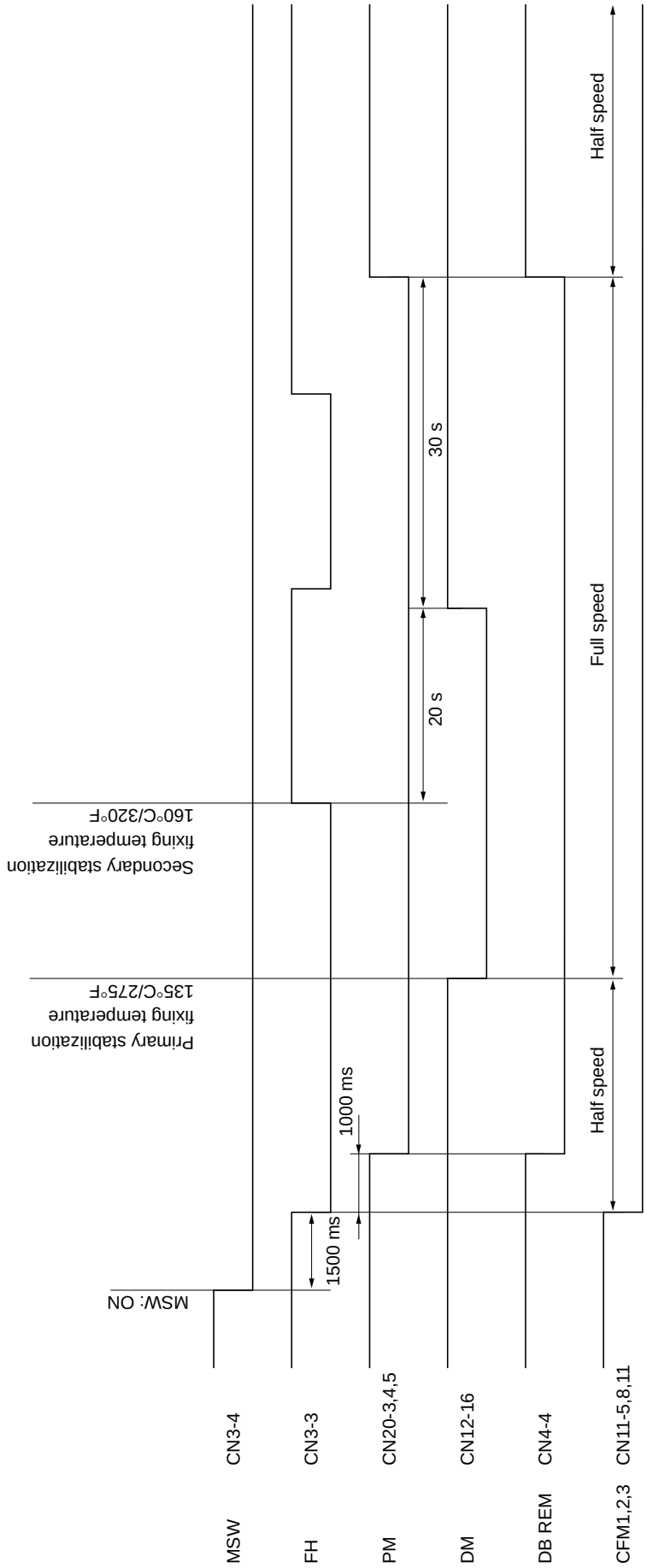


Figure 2-3-6 Laser diode PCB block diagram

The laser diode PCB (LDPCB) consists of the laser diode LD1 and laser driver IC1.
The laser driver IC1 on the laser diode PCB (LDPCB) turns the laser diode LD1 on and off according to the image data received from the main PCB (MPCB). Upon detection of a laser beam from the laser diode LD1, the photo sensor PH1 outputs a horizontal sync signal (/BD) to the main PCB (MPCB).
The laser diode PCB (LDPCB) adjusts the laser diode drive current (APC) for each line scanned outside the image area when /ADJUST is low to keep the laser beam output constant.

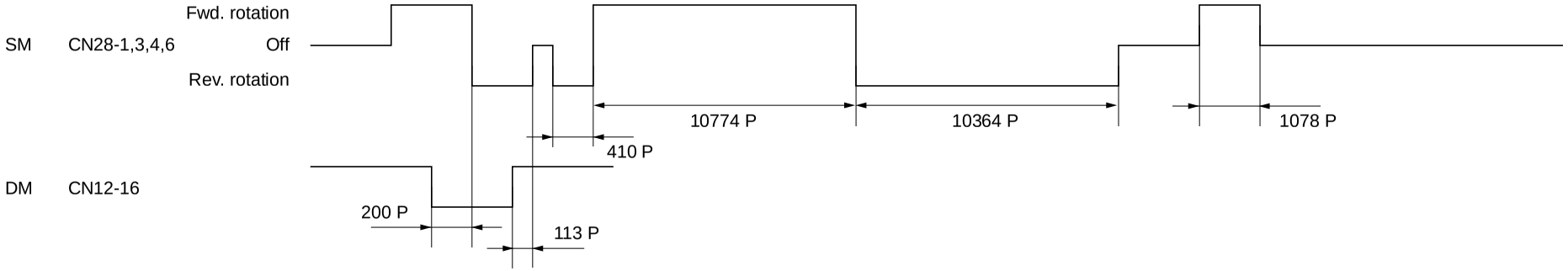
Terminals (CN)		Voltage	Remarks
1-2	1-7	0/5 V DC	LDPCB S/H signal, input
1-3	1-7	0/5 V DC	LDPCB VIDEO signal, input
1-4	1-7	0/5 V DC	LDPCB ENABLE signal, input
1-6	1-7	5 V DC	5 V DC supply for LDPCB, input
1-8	1-7	0/5 V DC	LDPCB HSYNC signal, output

Timing chart No. 1 From the main switch turned on to machine stabilization

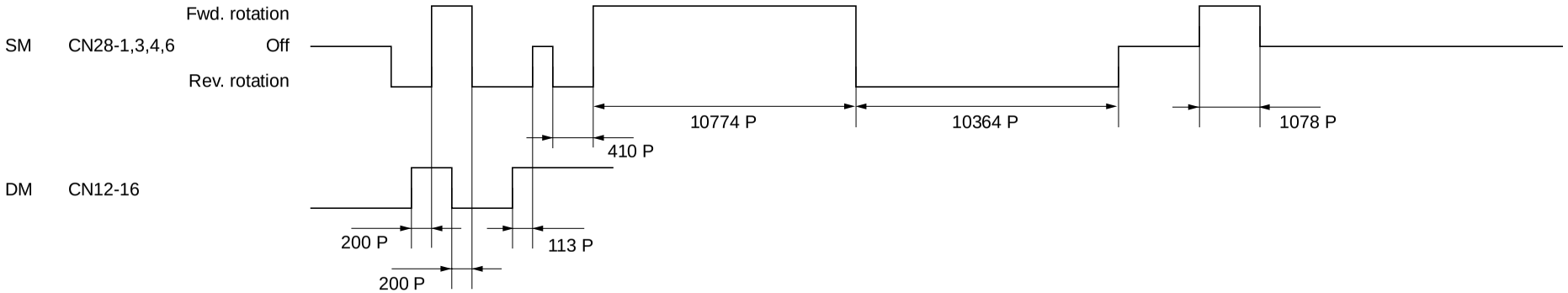


Timing chart No. 2 Scanner initialization

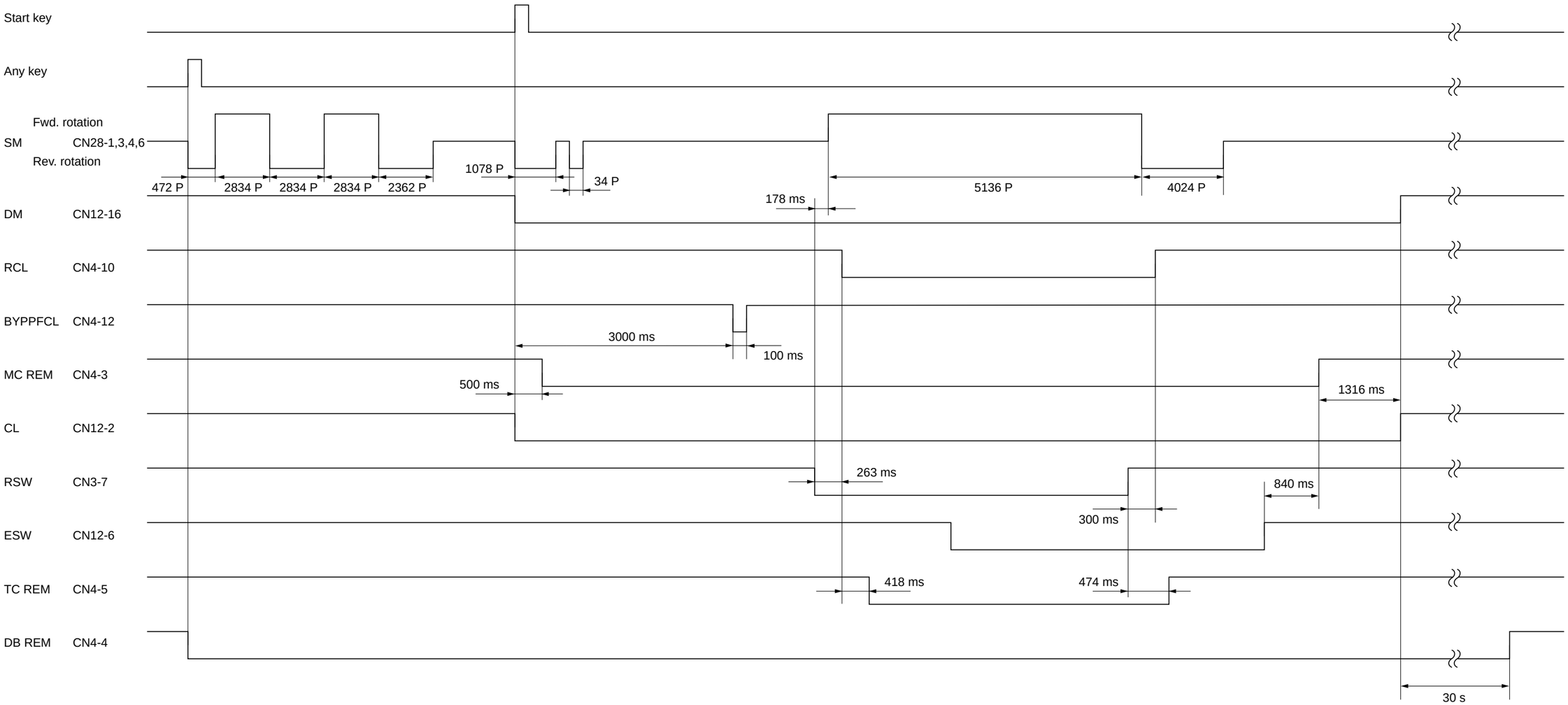
• SHPSW: ON



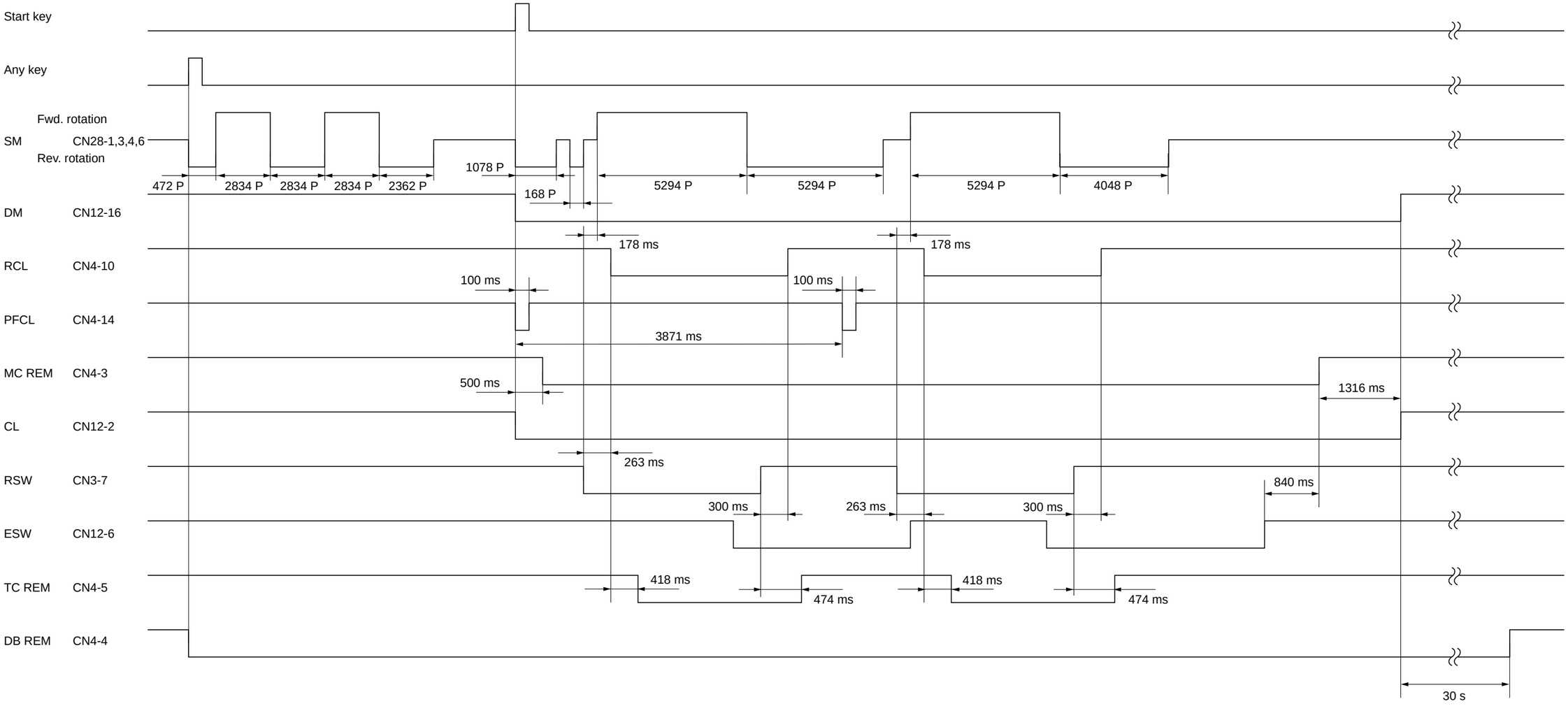
• SHPSW: OFF



Timing chart No. 3 Copying an A5R original onto a sheet of A3 copy paper from the bypass tray, magnification ratio 200%



Timing chart No. 4 Continuous copying of an A4 original onto two sheets of A4 copy paper from the drawer, magnification ratio 100%



Maintenance parts list

Maintenance part name		Part No.	Fig. No.	Ref. No.
Name used in service manual	Name used in parts list			
Right registration roller	RIGHT ROLLER, REGISTRATION	2AV06060	4	8
Left registration roller	LEFT ROLLER, REGISTRATION	2AV06070	5	6
Paper feed pulley	PULLEY, PAPER FEED	2AV06010	4	3
Bypass paper feed pulley	PULLEY, PAPER FEED	2AV06320	4	42
Left registration cleaner assembly	PARTS, ASS'Y LEFT REGISTRATION CLEANER,SP	2AV93010	5	25
Right registration cleaner assembly	PARTS, ASS'Y RIGHT REGISTRATION CLEANER,SP	2AV93020	4	44
Left cover	COVER, CONVEYING	2AV04120	5	2
Contact glass	CONTACT GLASS	35912010	7	46
Mirror 1	MIRROR A	2AV12150	7	9
Mirror 2 and mirror 3	MIRROR B	2AV12160	7	10
Exposure lamp	LAMP, SCANNER	2AV12100	7	4
Cleaning blade	PARTS, BLADE CLEANING(SP)	2AV93060	9	6
Drum separation claw	CLAW, SEPARATION	2AR18240	9	112
Drum shaft	SHAFT, DRUM	2AR08030	9	23
Drum shaft front bushing	FRONT BUSHING, DRUM SHAFT	2AR09230	9	32
Cleaning lower seal A	PARTS, SEAL CLEANING LOWER A(SP)	2AR93410	9	94
Drum	SET, DRUM	2AV82010	9	1
Charger assembly	PARTS, MAIN CHARGER ASS'Y A(SP)	2AR93420	9	12
Cleaning lamp	LAMP, CLEANING LAMP	2AR27031	8	12
Transfer roller assembly	PARTS, ASS'Y TRANSFER ROLLER, SP	2AV93030	5	26
Doctor blade cover	PARTS, COVER A DOCTOR BLADE ASS'Y(SP)	2AR93400	9	70
Heat roller	PARTS, ROLLER HEAT(SP)	2AV93071	10	12
Press roller	PARTS, ROLLER PRESSURE,SP	2AB93040	10	28
Bushing	BUSHING, HEAT ROLLER	35920350	10	41
Bearing	BEARING, PRESSURE	35920130	10	37
Fixing unit thermister	THERMISTOR, FIXING	2AV20250	10	24
Heat roller separation claw	CLAW, SEPARATION	35920150	10	39
Fixing heater	PARTS, HEATER FIXING 230(SP)	2AV93100	10	13
Gear	GEAR 35, HEAT ROLLER	35920240	10	40
Eject roller	ROLLER, EJECT	2AV20150	10	14
Eject pulley	PULLEY, EJECT	2AV20160	10	15

Periodic maintenance procedures

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Test copy and test print	Perform at the maximum copy size	Test copy	Every service		

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Paper feed section	Right registration roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Left registration roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Paper feed pulley	Clean, Check or replace	Every service	Clean with alcohol or a dry cloth. Replace when paper feed problems occur.	1-6-3
	Bypass paper feed pulley	Clean, Check or replace	Every service	Clean with alcohol or a dry cloth. Replace when paper feed problems occur.	1-6-5
	Left registration cleaner assembly	Clean or replace	Every service	Replace after feeding 200,000 sheets. Vacuum.	1-6-7
	Right registration cleaner assembly	Clean or replace	Every service	Replace after feeding 200,000 sheets. Vacuum.	1-6-7
	Upper paper feed clutch	Check	Every service	Check the leading edge registration and paper feed conditions in the registration section, bypass and paper feed section.	
	Rollers	Clean	Every service	Clean with alcohol or a dry cloth.	
	Paper conveying unit	Check and grease	Every service	Check noise. If noise is heard, apply grease TMP-200G to the contacting surfaces of the paper conveying unit and bushing.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Optical section	Slit glass	Clean	Every service	Clean with alcohol and then a dry cloth.	
	Contact glass	Clean	Every service	Clean with alcohol and then a dry cloth.	
	Mirror 1	Clean	Every service	Clean with alcohol and then a dry cloth only if vertical black lines appear on the copy image.	
	Mirror 2 and mirror 3	Clean	Every service	Clean with alcohol and then a dry cloth only if vertical black lines appear on the copy image.	
	Scanner lens	Clean	Every service	Clean with a dry cloth only if vertical black lines appear on the copy image.	
	Reflector	Clean	Every service	Clean with a dry cloth only if vertical black lines appear on the copy image.	
	Exposure lamp	Clean or replace	Every service	Replace if an image problem occurs or after feeding 200,000 sheets.	1-6-13
	Optical rail	Grease	Every service	Check noise and shifting and then apply scanner rail grease PG671.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Developing section	Developer	Replace	Every service		1-3-7
	Drum unit	Replace	Every service	Apply GE-334C conductive grease (P/N A0199040) between the drum shaft and grounding plate.	1-6-34
	Charger assembly	Replace	Every service		1-6-31
	Cleaning lamp	Clean	Every service	Clean with a dry cloth.	
	Transfer roller assembly	Clean	Clean after every 100,000 counts	Vacuum or clean with a dry cloth (take care not to damage the transfer roller).	
		Check and grease	After every 100,000 counts	Check noise. If noise is heard, apply grease G501 to the following locations: • Contacting surfaces of the transfer roller and collar • Contacting surfaces of the transfer roller and front bushing • Contacting surfaces of the gear and collar	
				Check noise. If noise is heard, apply conductive grease GE334 and G501 to the following locations: • Contacting surfaces of the transfer roller, rear bushing and terminal	
		Replace	Every 200,000 counts		1-6-36
	Doctor blade cover	Clean	Clean after every 100,000 counts	Clean with a dry cloth (take care not to damage the doctor blade cover).	
		Replace	Every 200,000 counts		
	Seals	Clean	Every service	Vacuum or clean with a dry cloth.	

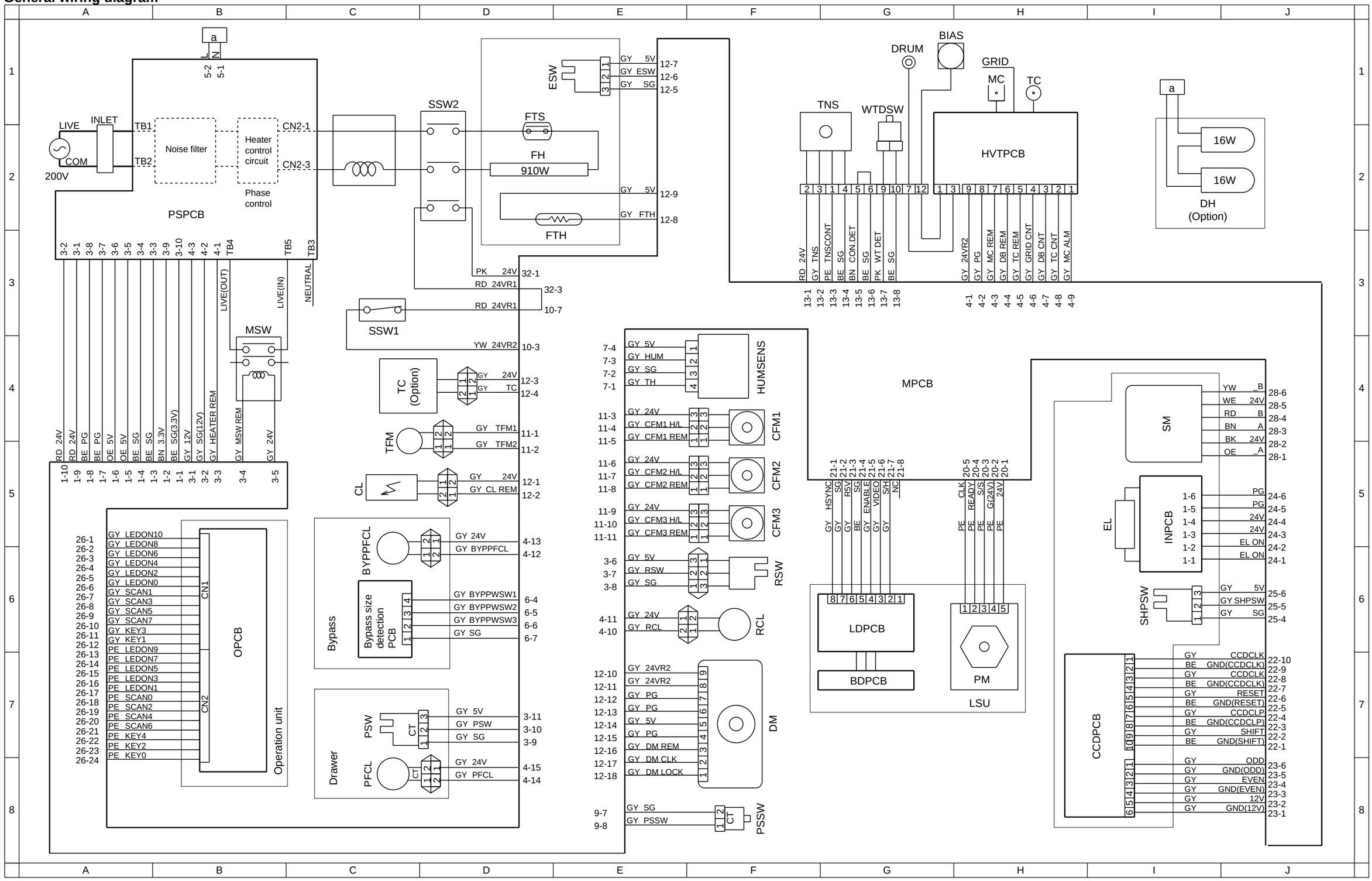
Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Cleaning section	Cleaning blade	Replace	Every service		1-6-37
	Drum separation claw	Check or replace	Every service	Clean with a dry cloth; replace if the tip is deformed.	1-6-34
	Drum shaft	Clean	Every service	Clean with a dry cloth.	
	Front drum bushing	Clean	Every service	Clean with a dry cloth.	
	Rear drum bushing	Clean	Every service	Clean with a dry cloth.	
	Cleaning lower seal	Check or replace	After 200,000 counts	Replace if toner spills due to wavy or deformed edges of the seal.	1-6-38
	Seals	Clean	Every service	Vacuum or clean with a dry cloth.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Fixing/Eject section	Heat roller	Clean or replace	Clean after 100,000 counts; check and replace after 200,000 counts	Clean with alcohol.	1-6-42
	Press roller	Clean or replace	Clean after 100,000 counts; check and replace after 200,000 counts	Clean with alcohol.	1-6-44
	Bushing	Check and replace	After 200,000 counts	Check the installation position and noise.	1-6-42
	Bearing	Check and replace	After 200,000 counts	Check the installation position and noise.	1-6-44
	Fixing unit themistor	Check and clean	After 200,000 counts	Clean with alcohol and check for peeling of the film.	1-6-40
	Heat roller separation claw	Clean or replace	After 200,000 counts	Clean with alcohol.	1-6-40
	Fixing heater	Check and replace	After 200,000 counts	Check if the lamp is dark or not.	1-6-41
	Gear	Check and replace	Every service	Check for chips in the gear.	1-6-42
	Eject roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Eject pulley	Clean	Every service	Clean with alcohol or a dry cloth.	
	Eject roller	Clean and grease	Every service	Check noise. If noise is heard, apply grease TMP1-200G to the contacting surfaces of the eject roller and bushing.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Covers	Covers	Clean	Every service	Clean with alcohol or a dry cloth.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Other	Image quality	Check and adjust	Every service		

General wiring diagram



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