UTAX

SERVICE MANUAL

CD 1015
CD 1020

Published in Oct.'00

842AV110

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

1-7 Requirements on PCB Replacement

2-1 Mechanical construction

2-2 Electrical Parts Layout

2-3 Operation of the PCBs

2-4 Appendixes

1-1-1 Specifications

15 cpm copier

Type ..... Desktop
Copying system ..... Indirect electrostatic system
Originals ..... Sheets and books
Maximum size: A3/11" × 17"
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, colored paper, letterhead and envelopes (when using the printer function only)
Note: Use the bypass table for special paper.
Copying sizes ..... Maximum: A3/11" × 17"
Minimum: A6R /5$^1/_2$" × 8$^1/_2$"/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.
11" × 8$^1/_2$": 15 copies/min.
8$^1/_2$" × 11": 10 copies/min.
11" × 17": 8 copies/min.
8$^1/_2$" × 14": 8 copies/min.
At 100% magnification when the optional memory board is installed:
A4: 18 copies/min.
A4R: 12 copies/min.
A3: 9 copies/min.
B5: 18 copies/min.
B5R: 12 copies/min.
B4 (257 × 364 mm): 10 copies/min.
11" × 8$^1/_2$": 18 copies/min.
8$^1/_2$" × 11": 12 copies/min.
11" × 17": 9 copies/min.
8$^1/_2$" × 14": 10 copies/min.
First copy time ..... From 5 to 6 s (A4/11" × 8$^1/_2$", 100% magnification, upper drawer, ejection to the eject tray)
Warm-up time ..... 30 s or less (room temperature 20°C/68°F, 65% RH)
In preheat/energy saver mode: 30 s or less (room temperature 20°C/68°F, 65% RH) [priorty to power save]
In preheat/energy saver mode: 15 s or less (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, 11" × 8$^1/_2$", 8$^1/_2$" × 11", 5$^1/_2$" × 14")
25 sheets (A3, B4, Folio, 11" × 17", 8$^1/_2$" × 14")
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 (850 W for 120 V specifications/910 W for 220-240 V specifications) Control temperature: 180°C/356°F (at normal ambient temperature) Abnormally high temperature protection device: 140°C/284°F 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 $21\frac{5}{8}$" (W) × $22\frac{1}{16}$" (D) × $17\frac{15}{16}$" (H) 550 (W) × 560 (D) × 498 (H) mm (for Asia and Oceania specifications)
Weight	Approx. 38 kg/83.6 lbs 41 kg/90.2lbs (for Asia and Oceania specifications)
Floor requirements	891 (W) × 560 (D) mm $35\frac{1}{16}$" (W) × $22\frac{1}{16}$" (D)
Functions	Self-diagnostics, preheat, automatic copy density control, original size detection*, automatic paper selection, automatic magnification selection, enlargement/reduction copy, photo mode and department control *Optional original size detection sensor is needed for 220-240 V specifications.
Power source	120 V AC, 60 Hz, 9 A 220 – 240 V AC, 50/60 Hz, 2.8 A
Power consumption	1080 W (120V) 1080W (220 – 240V)
Options	STDF, drawer, job separator, original cover*, key counter, key card**, memory board, printer network board *Standard for Asia and Oceania specifications. **Optional for 120 V specifications only.

20 cpm copier

Type ..... Desktop
Copying system ..... Indirect electrostatic system
Originals ..... Sheets and books
Maximum size: A3/11" × 17"
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, colored paper, letterhead and envelopes (when using the printer function only)
Note: Use the bypass table for special paper.
Copying sizes ..... Maximum: A3/11" × 17"
Minimum: A6R /5$^1/_2$" × 8$^1/_2$"/Folio (When the bypass table is used)
Magnification ratios ..... Manual mode: 50 – 200%, 1% increments
Auto copy mode: fixed ratios
Metric
1:1 ± 1.0%, 1:2.00/1:1.41/1:1.27/1:1.06/1:0.90/1:0.75/1:0.70/1:0.50
Inch
1:1 ± 1.0%, 1:2.00/1:1.54/1:1.29/1:1.21/1:0.78/1:0.77/1:0.64/1:0.50
Copy speed ..... At 100% magnification in memory copy mode:
A4: 20 copies/min.
A4R: 13 copies/min.
A3: 10 copies/min.
B5: 20 copies/min.
B5R: 13 copies/min.
B4 (257 × 364 mm): 11 copies/min.
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Warm-up time ..... 30 s or less (room temperature 20°C/68°F, 65% RH)
In preheat/energy saver mode: 30 s or less (room temperature 20°C/68°F, 65% RH) [priorty to power save]
In preheat/energy saver mode: 15 s or less (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, 11" × 8$^1/_2$", 8$^1/_2$" × 11", 5$^1/_2$" × 14")
25 sheets (A3, B4, Folio, 11" × 17", 8$^1/_2$" × 14")
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 (850 W for 120 V specifications, 910 W for 230-240 V specifications)
Control temperature: 180°C/356°F (at normal ambient temperature)
Abnormally high temperature protection device: 140°C/284°F 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
Bit map memory	17.1 MB (standard)
Image storage memory	46.9 MB (standard)
Resolution	600 × 600 dpi
Light source	Inert gas lamp
Dimensions	550 (W) × 603 (D) × 554 (H) mm $21\frac{5}{8}$" (W) × $23\frac{3}{4}$" (D) × $21\frac{13}{16}$" (H)
Weight	Approx. 46.4 kg/102 lbs
Floor requirements	891 (W) × 603 (D) mm $35\frac{1}{6}$" (W) × $23\frac{3}{4}$" (D)
Functions	Self-diagnostics, preheat, automatic copy density control, original size detection, automatic paper selection, automatic magnification selection, enlargement/reduction copy, fixed ratio selection, photo mode, margin copy, split copy, border erasing, combine copy, sort copy, department control and language selection
Power source	120 V AC, 60 Hz, 9 A 220 – 240 V AC, 50/60 Hz, 2.8 A
Power consumption	1080 W (120V) 1080W (220 – 240V)
Options	STDF, SRDF, drawer, duplex unit, job separator, original cover, finisher, key counter, key card*, printer network board, fax unit, network scanner *Optional for 120 V specifications only.

1-1-2 Parts names and their functions

(1) Copier

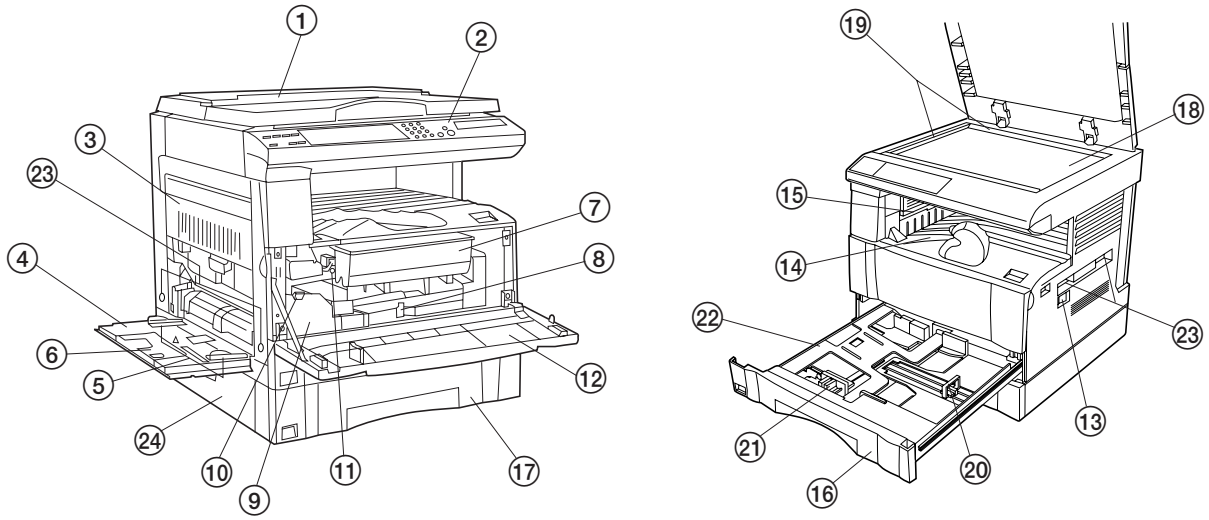


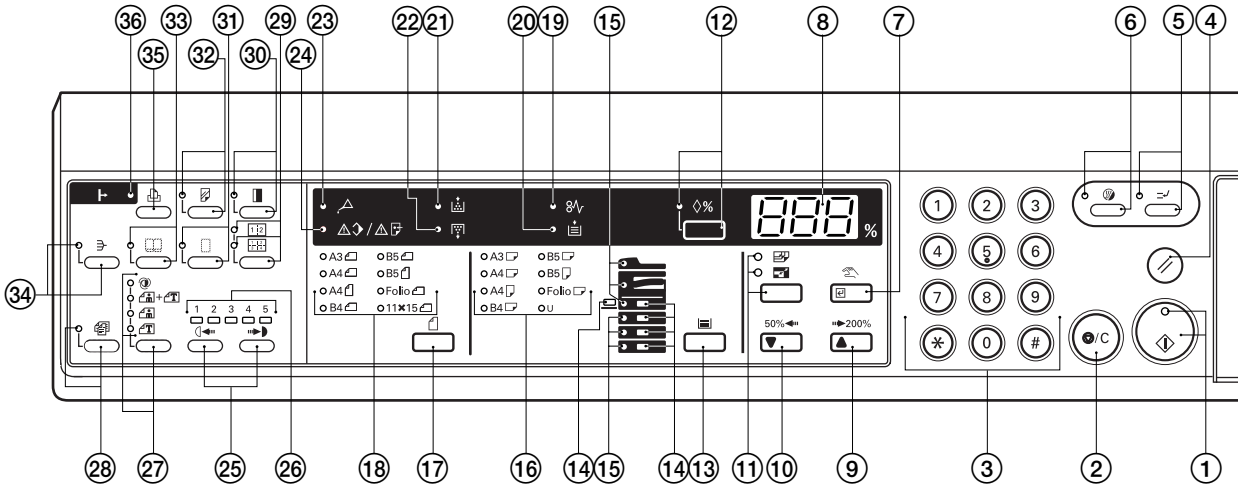
Figure 1-1-1

① Original cover (optional)*1
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 Upper drawer
⑰ Lower drawer*2
⑱ Platen
⑲ Original size scales
⑳ Length adjustment plate
㉑ Width adjustment lever
㉒ Drawer lift
㉓ Handles for transport
㉔ Lower drawer left cover*2

*1: Standard for Asia and Oceania specifications for the 15 cpm copier.
*2: Optional for 15 cpm copier.

(2) Operation panel
15 cpm copier

Metric



Inch

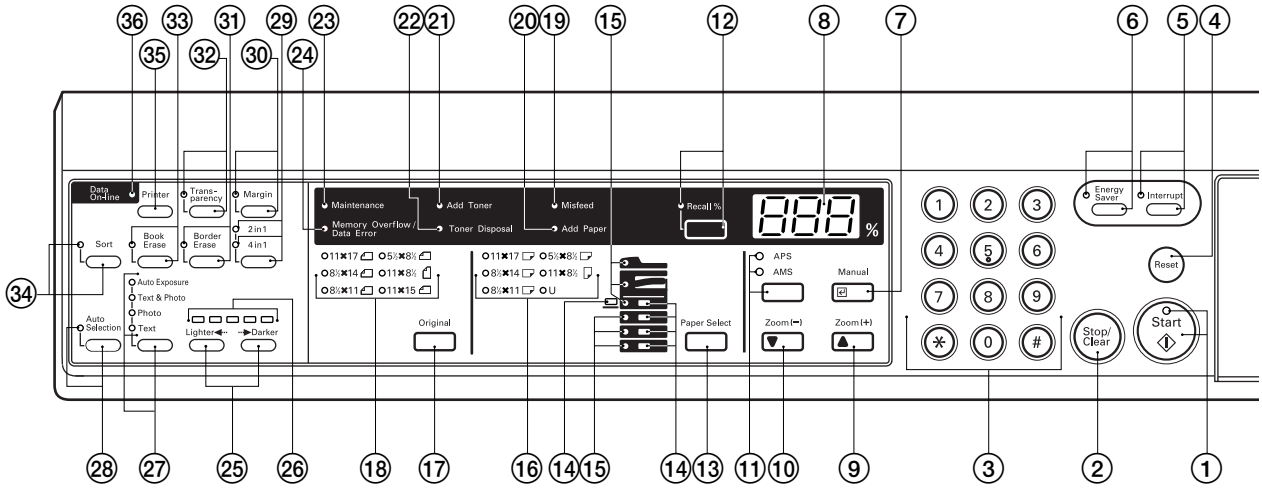
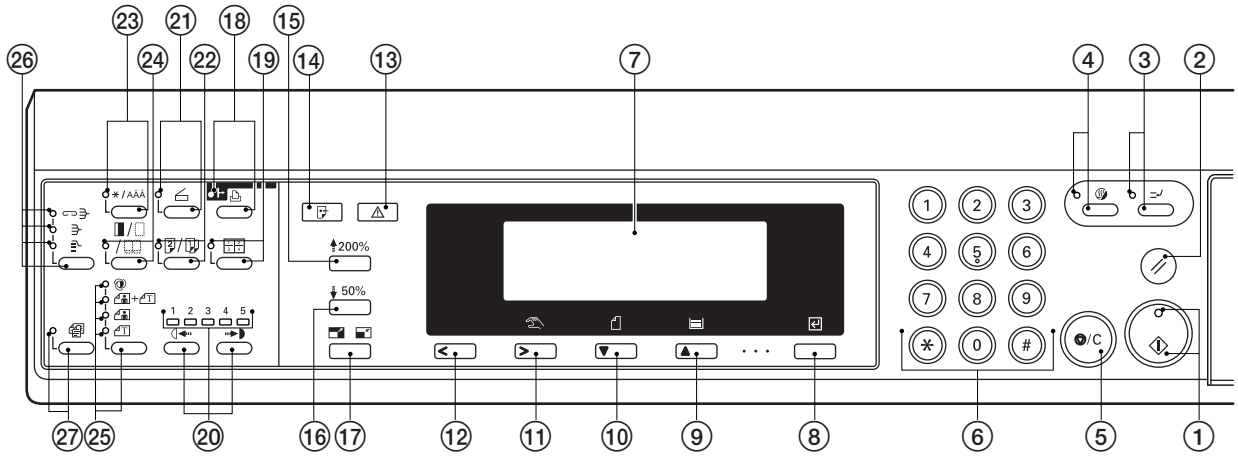


Figure 1-1-2

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
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 Memory Overflow/Data Error indicator
㉕ Copy exposure adjustment keys
㉖ Copy exposure indicators
㉗ Image mode selection key/Auto Exposure/Text & Photo/Photo/Text indicators
㉘ Auto Selection key (Indicator)
㉙ Layout key/2 in 1 indicator/4 in 1 indicator
㉚ Margin key (Indicator)
㉛ Border Erase key (Indicator)
㉜ Transparency key (Indicator)
㉝ Book Erase key (Indicator)
㉞ Sort key (Indicator)
㉟ Printer key
㊱ Data On-line indicator

20 cpm copier

Metric



Inch

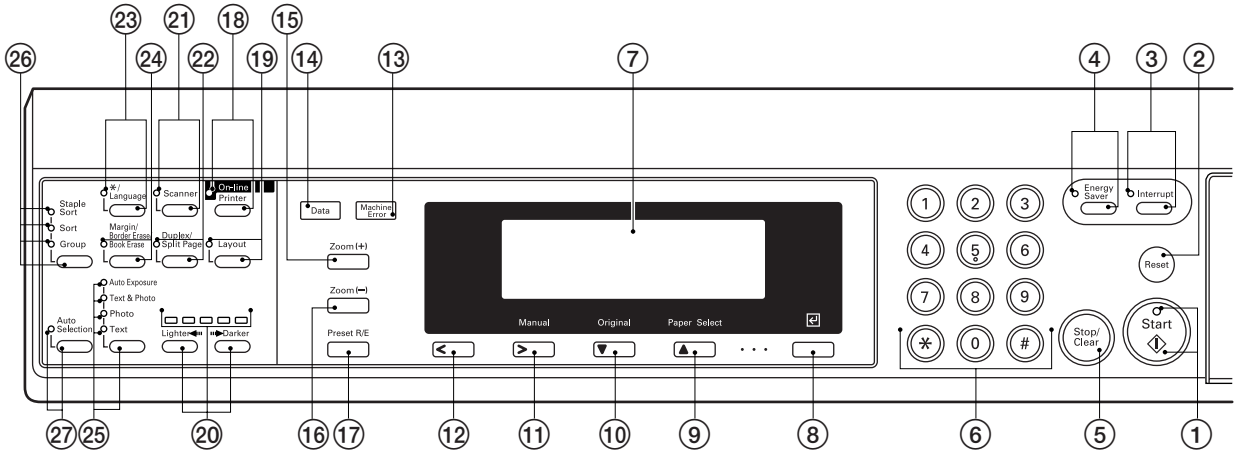


Figure 1-1-3

① Start key (Indicator)
② Reset key
③ Interrupt key (Indicator)
④ Energy Saver (preheat) key (Indicator)
⑤ Stop/Clear key
⑥ Numeric keys
⑦ Message display
⑧ Enter key
⑨ Paper Select/Cursor up key
⑩ Original/Cursor down key
⑪ Manual/Cursor right key
⑫ Cursor left key
⑬ Machine Error indicator
⑭ Data indicator
⑮ Zoom (+) key
⑯ Zoom (–) key
⑰ Preset R/E key
⑱ On-line/Printer key (Indicator)
⑲ Layout key (Indicator)
⑳ Copy exposure adjustment keys/Copy exposure indicators
㉑ Scanner key (Indicator)
㉒ Duplex/Split Page key (Indicator)
㉓ */Language key
㉔ Margin/Border Erase/Book Erase key (Indicator)
㉕ Copy quality selection key/Auto Exposure/Text & Photo/Photo/Text indicators
㉖ Sort mode key/Staple Sort/Sort/Group indicators
㉗ Auto Selection key (Indicator)

1-1-3 Machine cross section

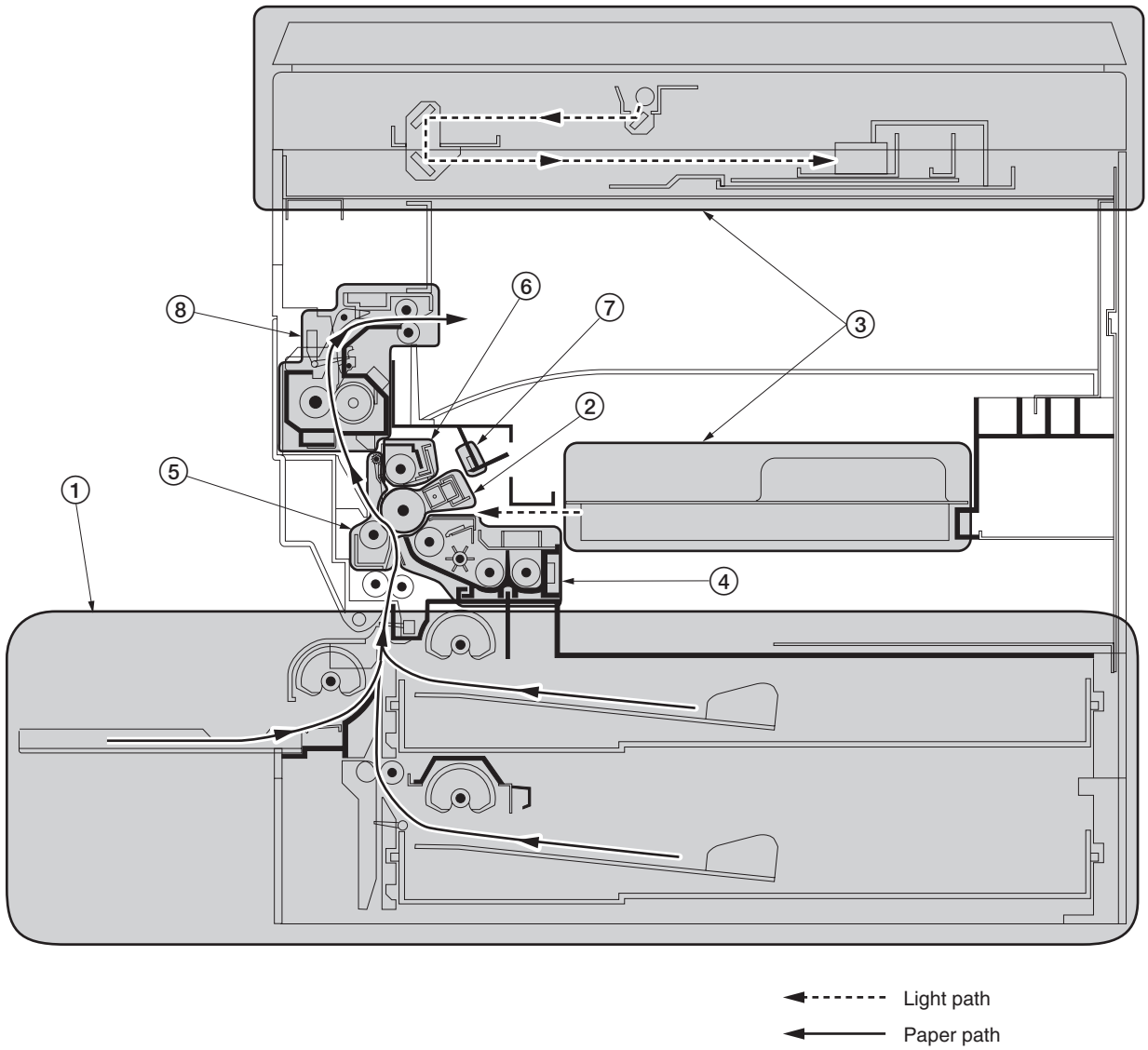
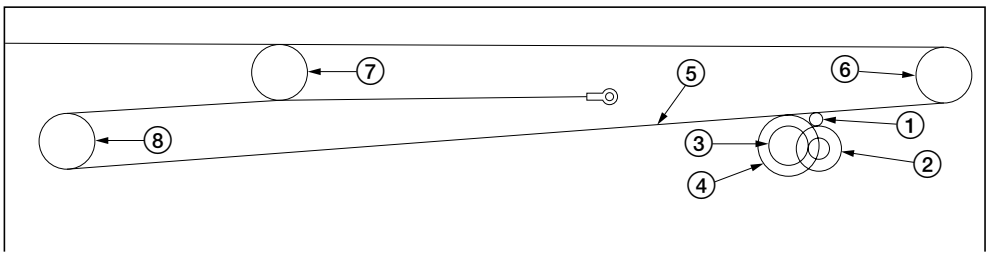


Figure 1-1-4 Machine cross section

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)

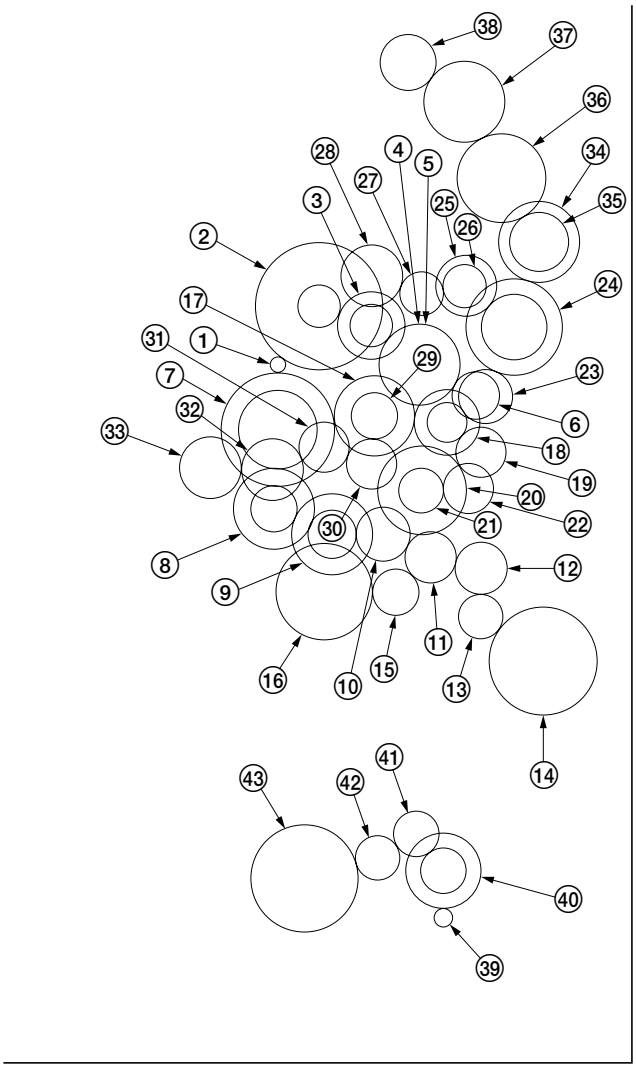


As viewed from machine front

Figure 1-1-5

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

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



As viewed from machine rear

Figure 1-1-6

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
㊴ Drawer drive motor gear*
㊵ Gear 16/52*
㊶ Gear 18*
㊷ Gear 18*
㊸ Lower paper feed clutch gear*

* Optional for the 15 cpm copier/standard for the 20 cpm copier.

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: 120 V AC, 9 A
   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"

• 15 cpm copier

a: 576 mm/22 11/16"
b: 873 mm/34 3/8"
c: 555 mm/21"
d: 718 mm/28 1/4"
e: 560 mm/22 1/16"
f: 1183 mm/46 9/16"
g: 418 mm/7 7/16"

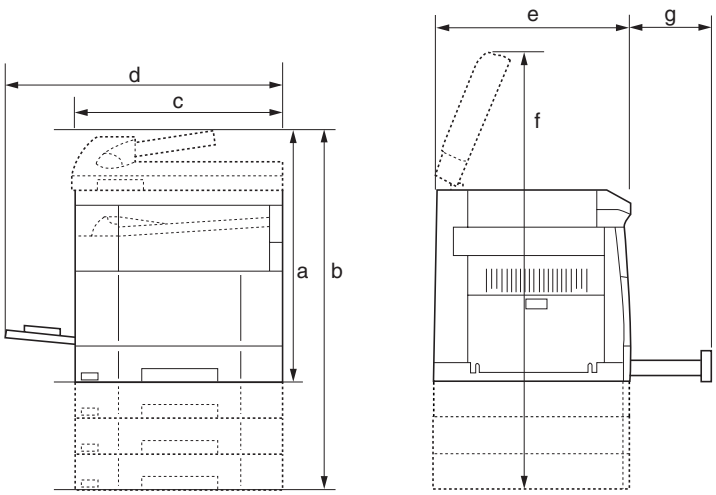


Figure 1-2-1a Installation dimensions

- **20 cpm copier**
  a: 675 mm/26 9/16"
  b: 873 mm/34 3/8"
  c: 555 mm/21"
  d: 718 mm/28 1/4"
  e: 603 mm/23 3/4"
  f: 1218 mm/46 9/16"
  g: 418 mm/16 7/16"
  h: 951 mm/37 7/16"

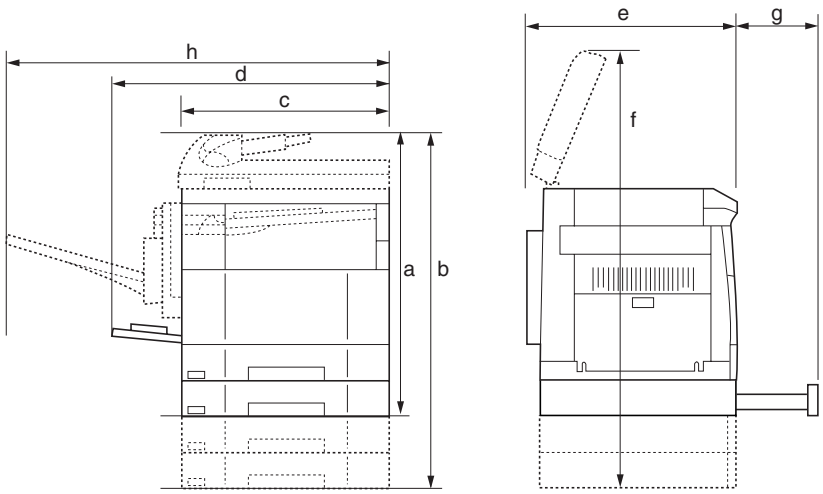
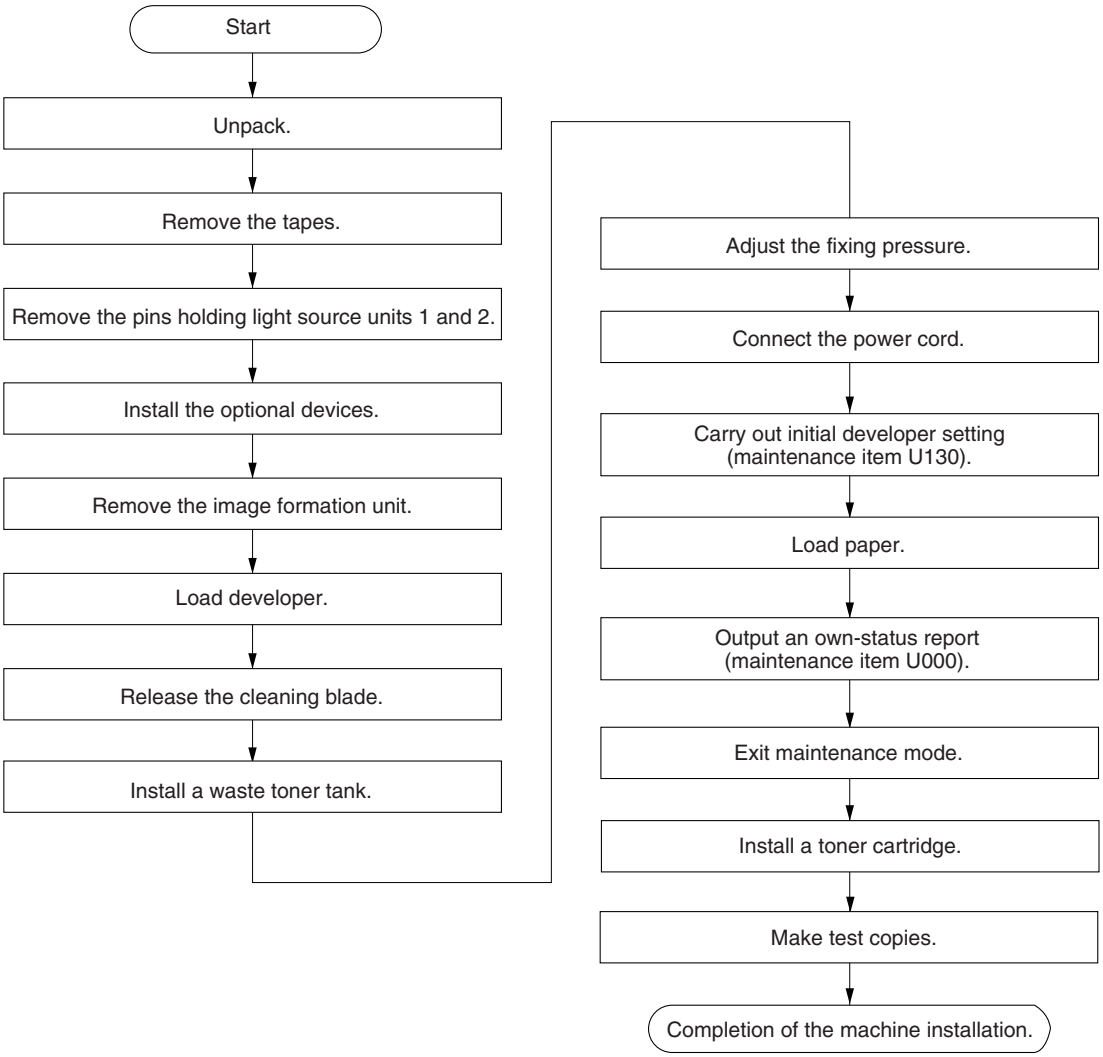
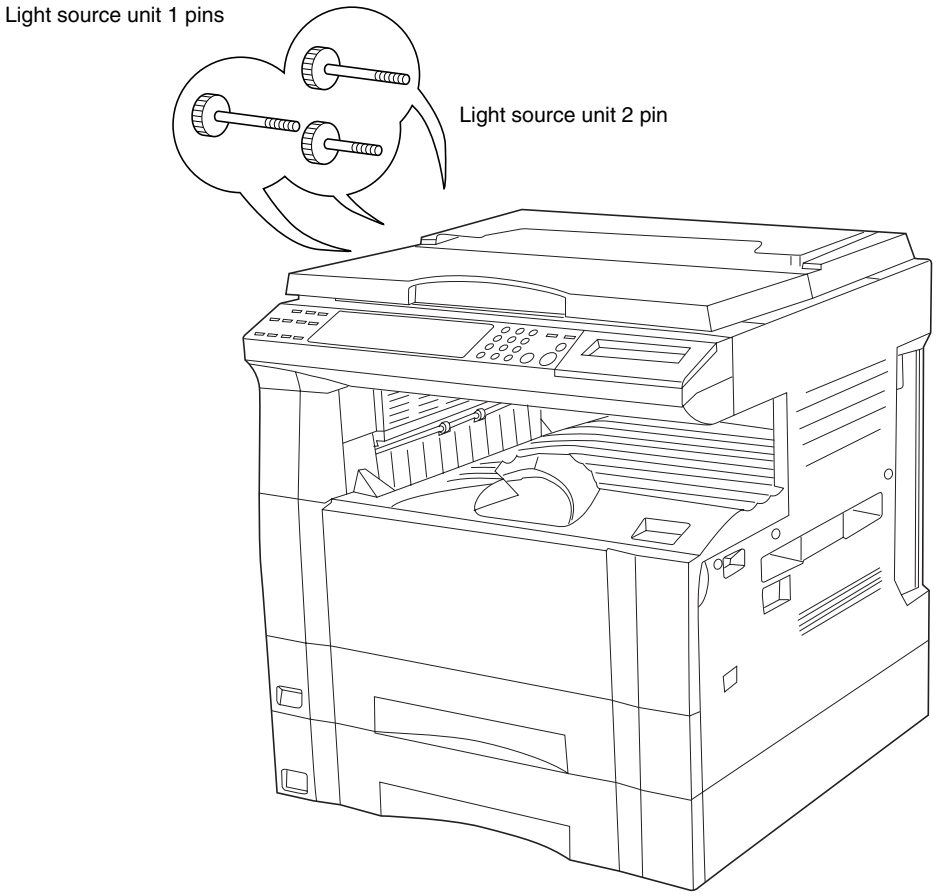


Figure 1-2-1b Installation dimensions

1-3-1 Unpacking and installation

(1) Installation procedure





*The diagram shows the 20 cpm copier.
*The original cover is standard for Asia and Oceania specifications for the 15 cpm copier only.

Figure 1-3-1

Unpack.

• 15 cpm copier

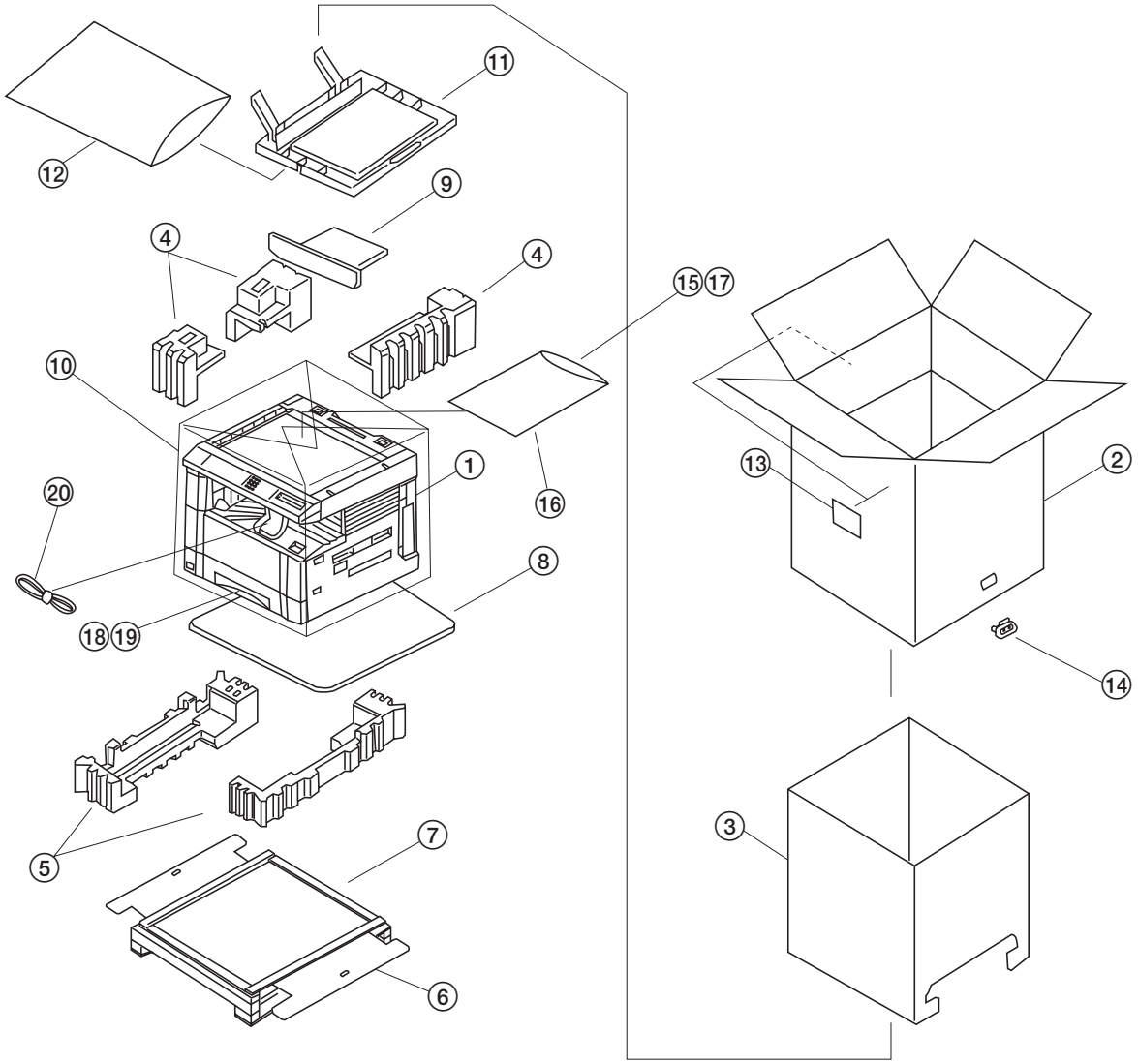


Figure 1-3-2a Unpacking

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*2
⑫ Plastic bag*2
⑬ Bar code labels
⑭ Hinge joint
⑮ Instruction handbook
⑯ Plastic bag
⑰ Business reply mail*3
⑱ Drawer spacers
⑲ Drawer claw spacers
⑳ Power cord

*1: 230 V specifications only.
*2: Asia and Oceania specifications only.
*3: 120 V specifications only.

• 20 cpm copier

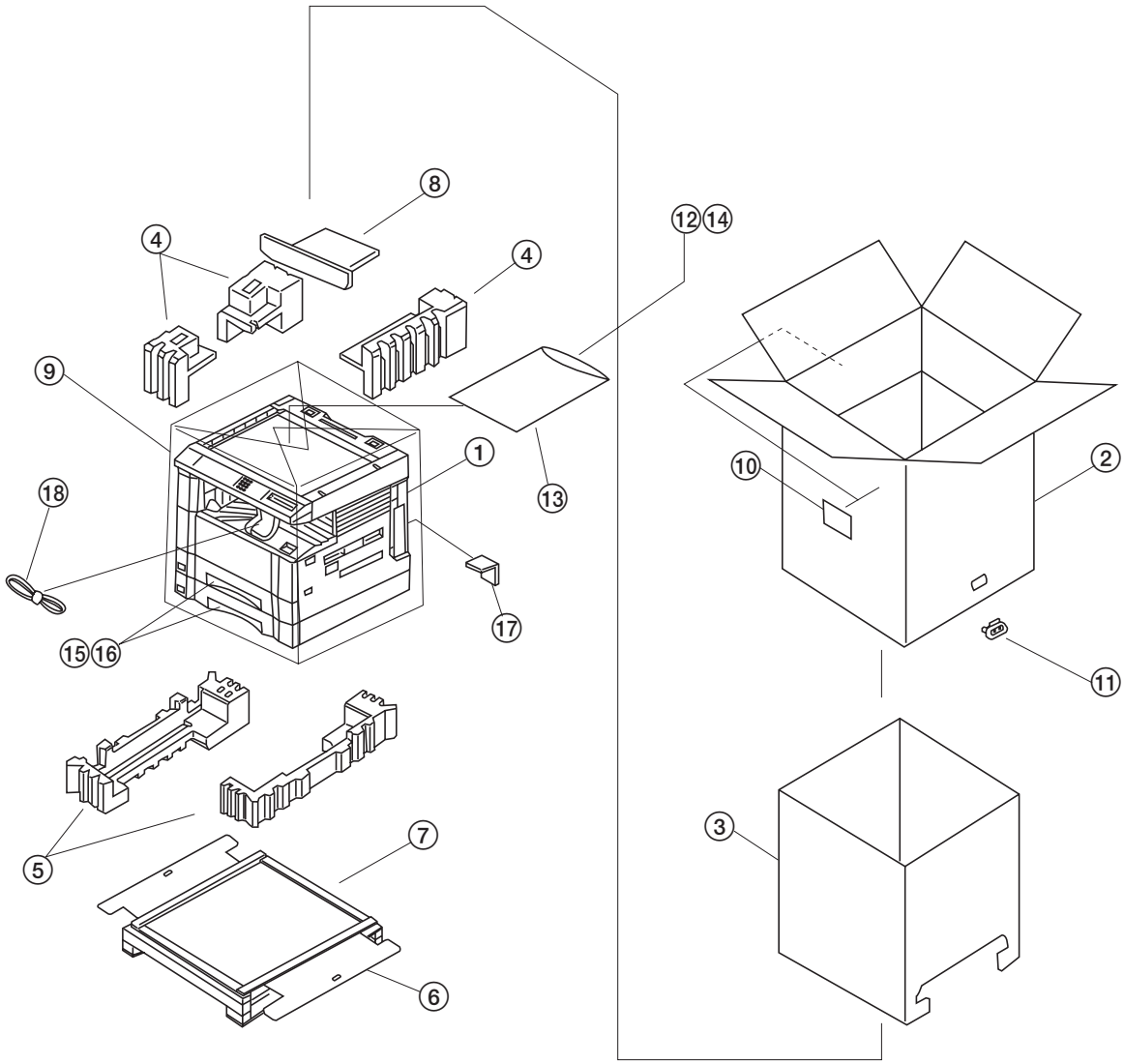


Figure 1-3-2b Unpacking

① Copier
② Outer case
③ Inner frame
④ Upper pads
⑤ Bottom pads
⑥ Bottom case
⑦ Skid
⑧ Spacer*1
⑨ Machine cover
⑩ Bar code labels
⑪ Hinge joint
⑫ Instruction handbook
⑬ Plastic bag
⑭ Business reply mail*2
⑮ Drawer spacers
⑯ Drawer claw spacers
⑰ Rear cover spacer
⑱ Power cord

*1: 230 V specifications only.
*2: 120 V 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.
5. Remove the tape holding the rear cover spacer and then the spacer.*
   *20 cpm copier only.

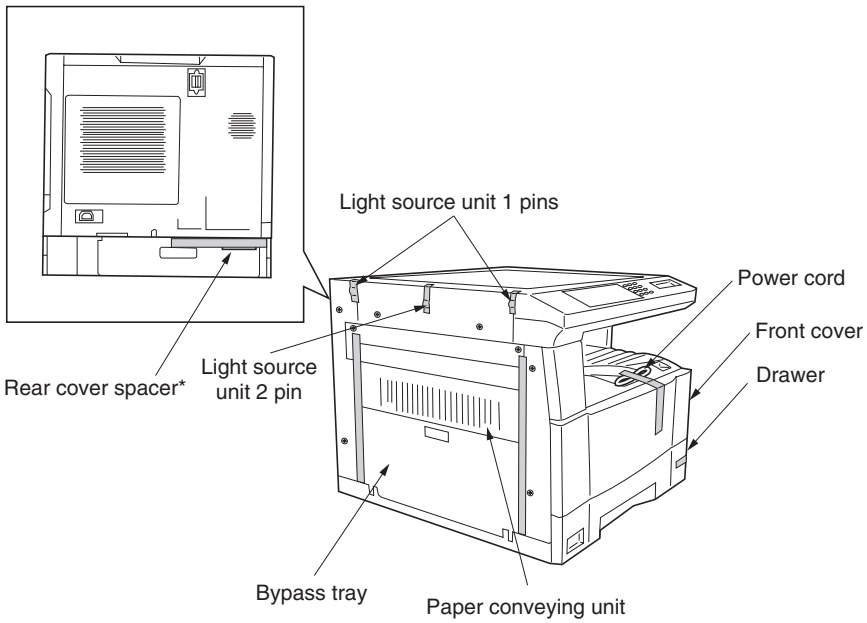


Figure 1-3-3

6. Remove the tape covering the original detection switch.

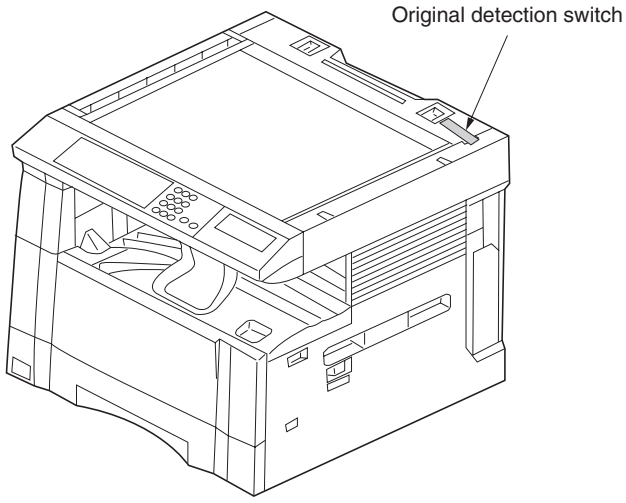


Figure 1-3-4

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

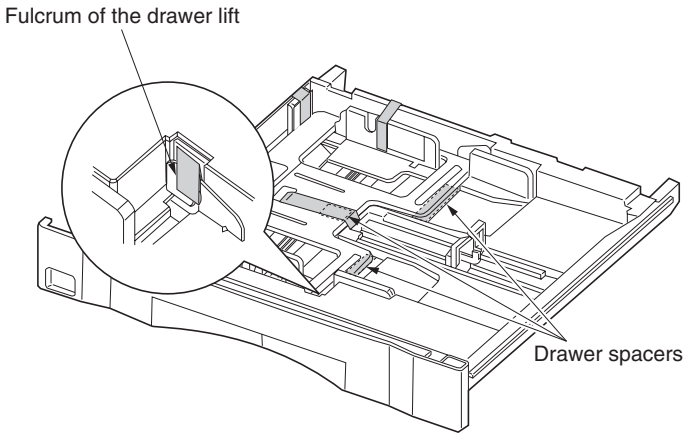


Figure 1-3-5

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

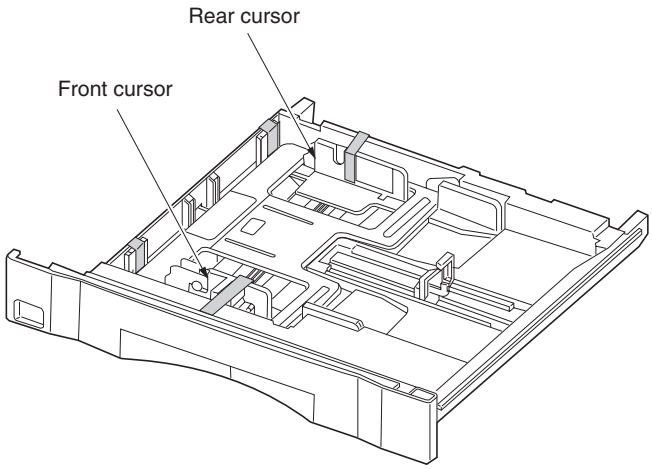


Figure 1-3-6

10. Remove the tape holding each of the drawer claw spacers and then the spacers.

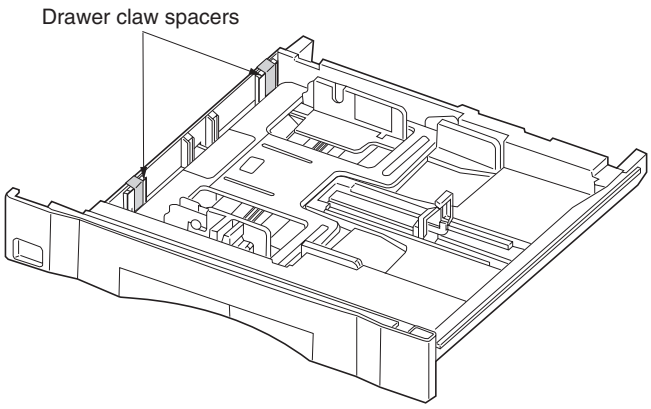


Figure 1-3-7

11. Refit the drawer.

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.

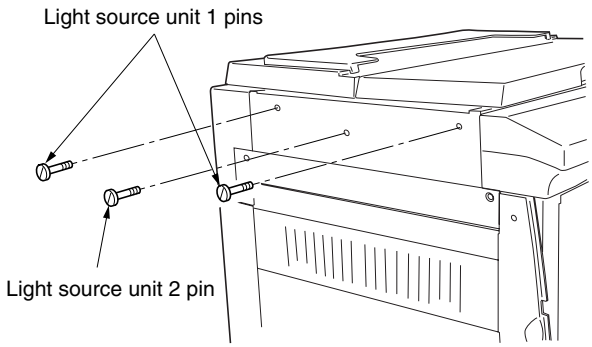


Figure 1-3-8

Install optional devices.

1. Install the optional devices (STDF, SRDF*1, drawer/s, job separator, duplex unit*1, finisher*1 and/or original cover*2) as necessary (see the respective installation manuals or service manuals).
   *1: Optional for 20 cpm copier only.
   *2: Standard for Asia and Oceania specifications of the 15 cpm copier.

Remove the image formation unit.

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

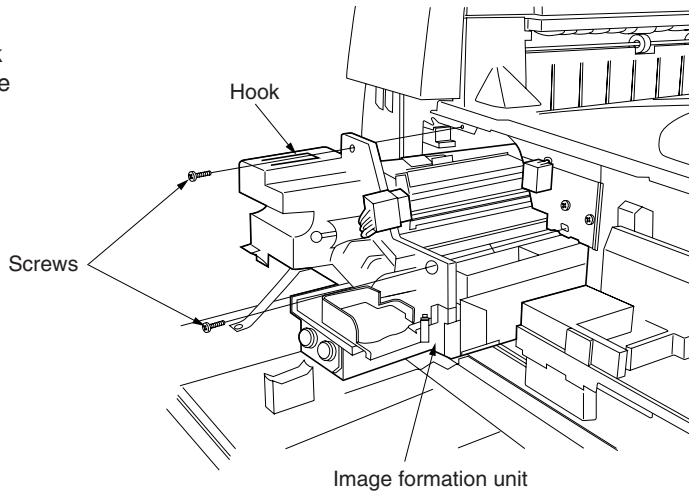


Figure 1-3-9

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.

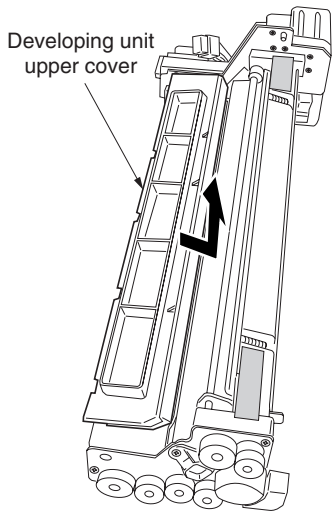


Figure 1-3-10

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.

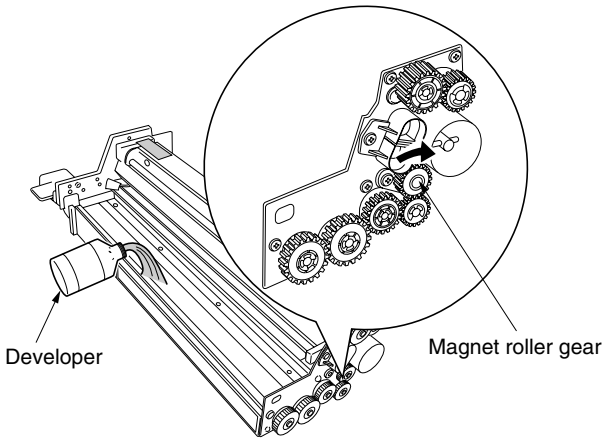


Figure 1-3-11

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.

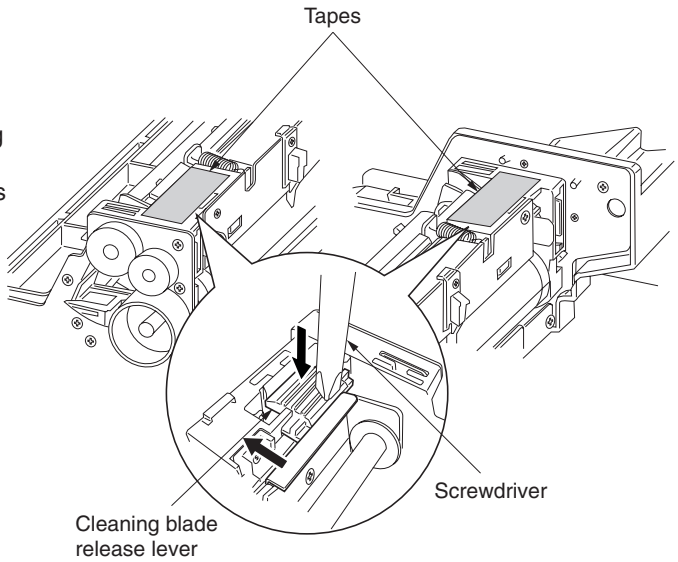


Figure 1-3-12

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.

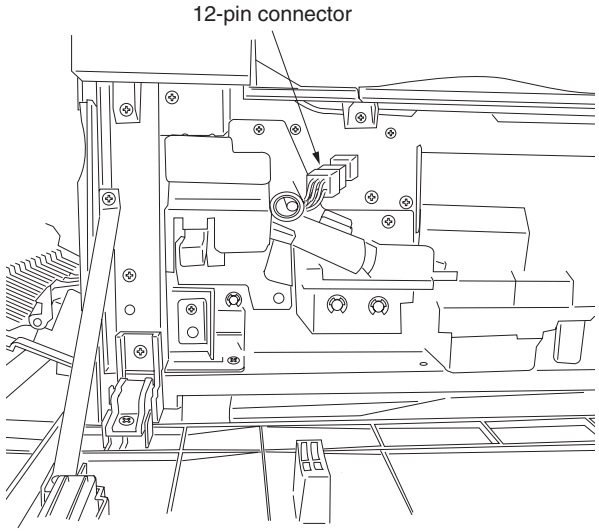


Figure 1-3-13

Install a waste toner tank.

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

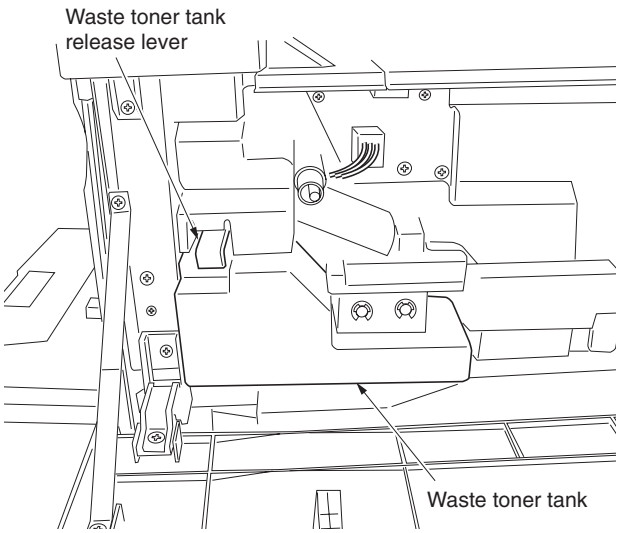


Figure 1-3-14

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.

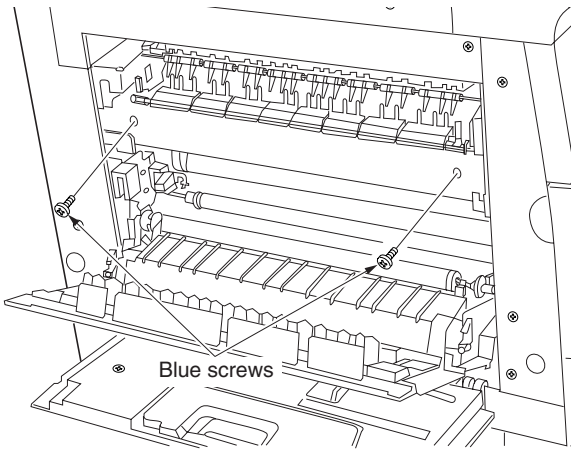


Figure 1-3-15

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.
   • On the 20 cpm copier, the settings are displayed on the message display.
   Display example
   INPUT: 135 (Toner sensor output value)
   CONTROL: 181 (Toner sensor control voltage)
   TARGET: 138 (Toner feed start level)
   HUMID: 57 (Absolute humidity)
   • On the 15 cpm copier, 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 “MAINTENANCE” and press the start key to output a list of the current settings of the maintenance items (20 cpm copier).
   Select “d-L” and press the start key to output a list of the current settings of the maintenance items (15 cpm copier).
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.

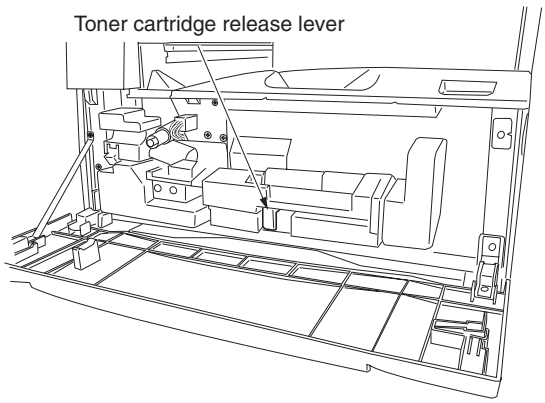


Figure 1-3-16

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

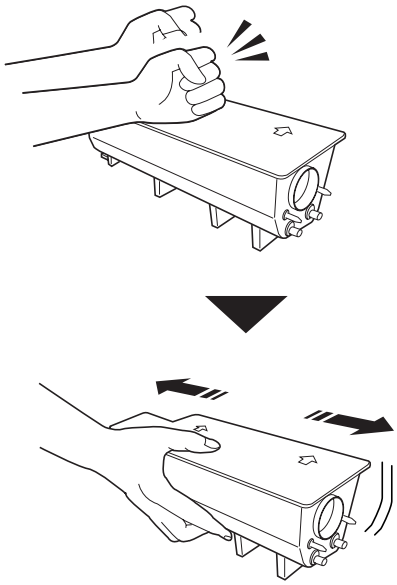


Figure 1-3-17

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.

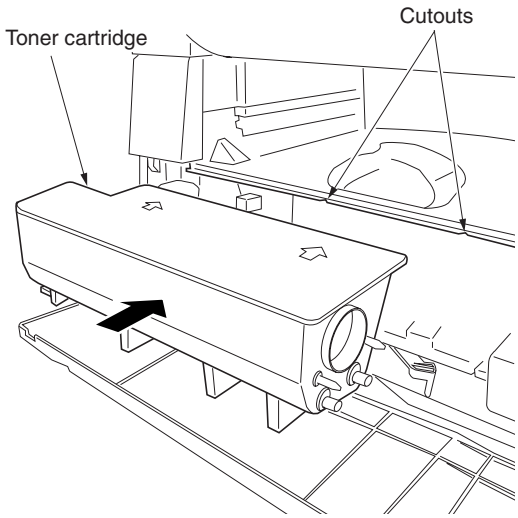


Figure 1-3-18

6. Close the front cover.

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

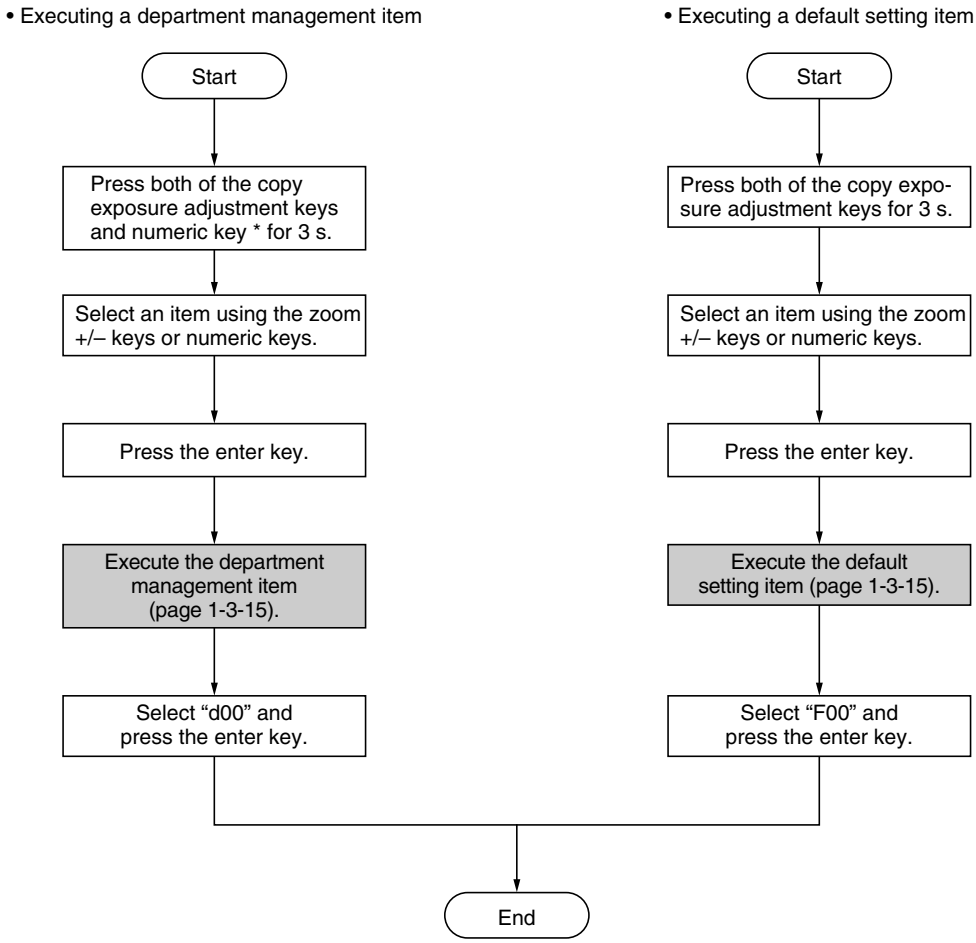
Factory settings are as follows:

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
U343	Switching between duplex/simplex copy mode (20 cpm copier only)	Simplex copy	Simplex copy
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 (15 cpm copier)



(2) Setting department management items

Turning department management on/off

1. Select “d01” and press the enter key.
2. Select “copy management on” or “copy management off” and press the enter key.
   Setting range: 1 (copy management on)/
   2 (copy management off)

Registering a new department code

1. Select “d02” and press the enter key.
2. Enter a department code* using the numeric keys and press the enter key.
   * 4 digits for metric specifications and 7 digits for inch specifications.

Deleting a department code

1. Select “d03” and press the enter key.
2. Enter the department code to be deleted using the numeric keys and press the enter key.

Clearing copy counts

1. Select “d04” and press the enter key.
2. Select “clear” or “do not clear” and press the enter key.
   Setting range: 1 (clear)/2 (do not clear)

Printing management list

1. Select “d05” and press the enter key.
   If A4/11" × 8 1/2" paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

Printer department management setting

Note: This setting item will only be displayed when the optional printer board is installed and the department management is turned on.

(3) Copy default

User status report

Prints the details of the default settings.

1. Select “F01” and press the enter key.
   If A4/11" × 8 1/2" 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)

Default drawer

Sets the drawer to be selected in cases such as after the reset key is pressed.

1. Select “F10” and press the enter key.
2. Select the default drawer and press the enter key.
   Default drawer: 1 (drawer 1)/2 (drawer 2)/
   3 (drawer 3)/4 (drawer 4)
   Note: This setting item will not be displayed if no optional drawer is installed.

Automatic drawer switching

Sets whether the automatic drawer switching function is available.

1. Select “F11” and press the enter key.
2. Select “on” or “off” and press the enter key.
   Setting range: 1 (on)/2 (off)
   Note: This setting item will not be displayed if no optional drawer is installed.

Bypass tray paper size

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

1. Select “F12” and press the enter key.
2. Select the paper size for the bypass tray and press the enter key.
   Paper size: 1 (A3/11" × 17")/2 (A4 vertical/
   $8\frac{1}{2}$" × 14")/3 (A4/$8\frac{1}{2}$" × 11")/
   4 (B4/$5\frac{1}{2}$" × $8\frac{1}{2}$")/5 (B5 vertical/11" × $8\frac{1}{2}$")/
   6 (B5/no size setting*)/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 “F13” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 100 to 297 mm

Output form

Selects whether or not to perform sort copying automatically when the DF is used.

1. Select “F14” and press the enter key.
2. Select “sort on” or “sort off” and press the enter key.
   Setting range: 1 (sort on)/2 (sort off)
   Note: This setting item will not be displayed if the optional memory board is not installed.

Rotate sort

Sets whether or not to perform rotate sorting when the sort mode is selected.

1. Select “F15” and press the enter key.
2. Select “on” or “off” and press the enter key.
   Setting range: 1 (on)/2 (off)
   Note: This setting item will not be displayed if the optional memory board is not installed.

Copy limit

Sets the number of copies limit for multiple copying.

1. Select “F16” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 1 to 250 copies

Margin width

Sets the default setting of the margin width for the margin copying.

1. Select “F17” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: Metric
   1 to 18 mm
   Inch
   1 ($\frac{1}{4}$")/2 ($\frac{3}{8}$")/3 ($\frac{1}{2}$")/4 ($\frac{5}{8}$")/5 ($\frac{3}{4}$")
   Note: This setting item will not be displayed if the optional memory board is not installed.

Border erase width

Sets the default setting of the border erase width for the border erase mode.

1. Select “F18” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 (6 mm/$\frac{1}{4}$")/2 (12 mm/$\frac{1}{2}$")/
   3 (18 mm/$\frac{3}{4}$")
   Note: This setting item will not be displayed if the optional memory board is not installed.

Layout (4 in 1)

Sets whether to place the originals vertically or horizontally for 4 in 1 layout copying.

1. Select “F19” and press the enter key.
2. Select “vertical (Z)” or “horizontal (N)” and press the enter key.
   Setting range: 1 (vertical [Z])/2 (horizontal [N])
   Note: This setting item will not be displayed if the optional memory board is not installed.

Layout (borderline)

Selects the type of borderline for layout copying.

1. Select “F20” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 (none)/2 (solid line)/3 (dotted line)
   Note: This setting item will not be displayed if the optional memory board is not installed.

Transparency mode

Selects the paper type for copying onto transparencies or thick paper using the bypass tray.

1. Select “F21” and press the enter key.
2. Select “transparencies” or “thick paper” and press the enter key.
   Setting range: 1 (transparencies)/
   2 (thick paper)

Silent mode

Selects whether or not to enter silent mode after copying.

1. Select “F22” and press the enter key.
2. Select “on” or “off” and press the enter key.
   Setting range: 1 (on)/2 (off)

Copy eject location setting

Selects whether to eject copies to the internal eject tray or job separator.

1. Select “F23” and press the enter key.
2. Select the copy eject location and press the enter key.
   Setting range: 1 (internal eject tray)/
   2 (job separator)
   Note: This setting item will not be displayed if the optional job separator is not installed.

Auto shutoff

Sets whether the auto shutoff function is available.

1. Select “F24” 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 “F25” 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.

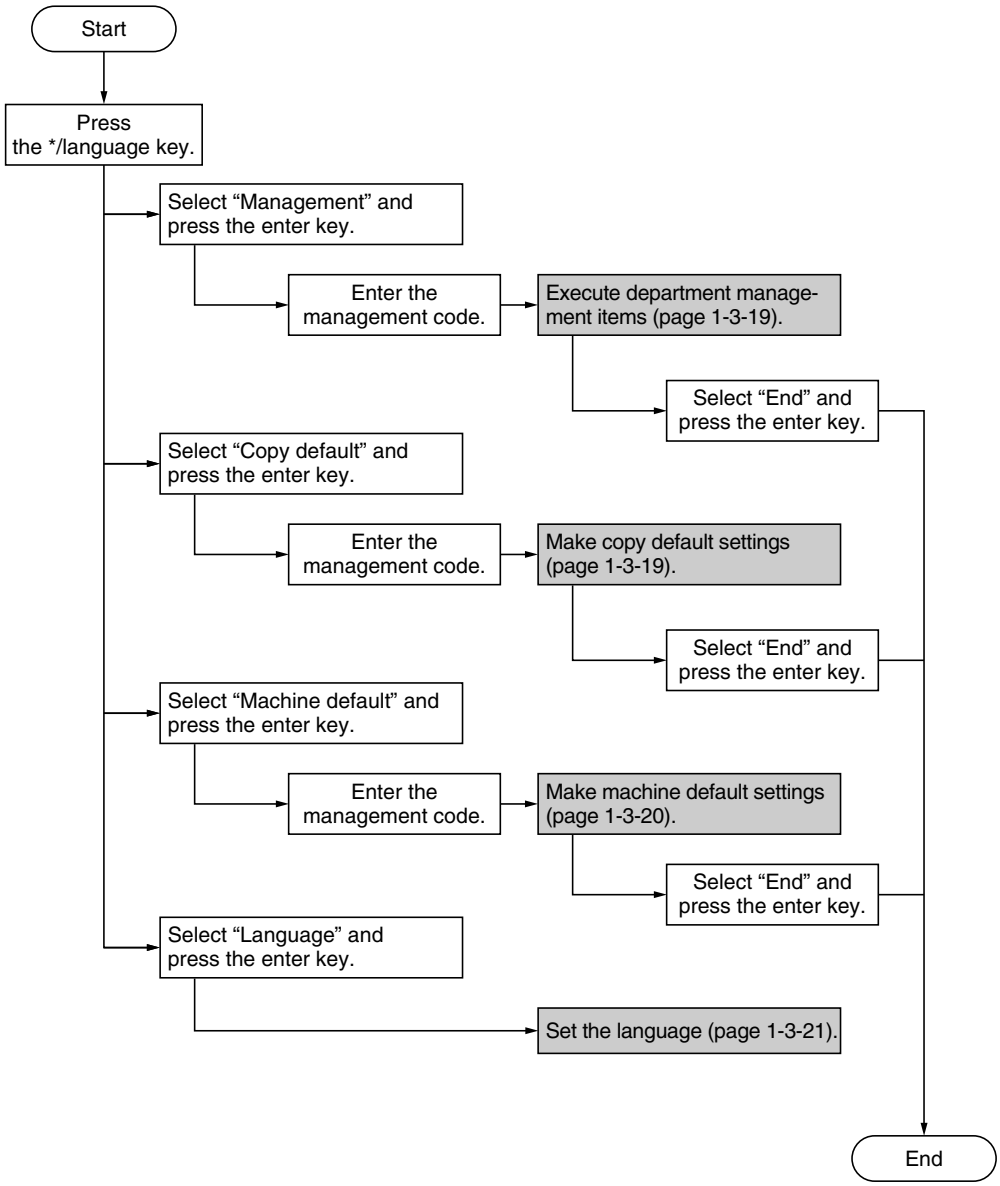
1. Select “F26” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 15 to 240 minutes (in 15-minute increments)
   1 (15 min)/2 (30 min)/3 (45 min)/4 (60 min)/
   5 (75 min)/6 (90 min)/7 (105 min)/8 (120 min)/
   9 (135 min)/10 (150 min)/11 (165 min)/
   12 (180 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 “F27” and press the enter key.
   If A4/11" × $8^1/_2$" paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

(4) Using the copier management mode (20 cpm copier)



(5) Setting department management items

Registering a new department code

Sets a department code and the limit of the number of copies for that department.

1. Select “Management Setting” (“COPY MGMT SETTING”) and press the enter key.
2. Select “Register” and press the enter key.
3. Enter a department code* using the numeric keys and press the enter key.
   * 4 digits for metric specifications and 7 digits for inch specifications.
4. Select “Copy limit”. Enter the number of copies limit using the numeric keys and press the enter key.

Deleting a department code

1. Select “Management Setting” (“COPY MGMT SETTING”) and press the enter key.
2. Select “Code delete” and press the enter key.
3. Select the department code to be deleted and press the enter key.
4. Select “Yes” or “No” and press the enter key.

Altering the copy limit

1. Select “Management Setting” (“COPY MGMT SETTING”) and press the enter key.
2. Select “Copy limit correction” and press the enter key.
3. Select the department code to be altered and press the enter key.
4. Enter the new number of copies limit using the numeric keys.

Clearing copy counts

1. Select “Management Setting” (“COPY MGMT SETTING”) and press the enter key.
2. Select “Count delete” (“COUNTS CLEAR”) and press the enter key.
3. Select “Yes” or “No” and press the enter key.

Viewing copy counts

1. Select “Reference” and press the enter key.
2. Select “All Department total” (“TOTAL: ALL ID-CODES”) and press the enter key.
3. View copy counts using the cursor up/down keys.

Print management list

1. Select “Printer management list” (“PRINT MANAGEMENT LIST”) and press the enter key.
   If A4/11" × 8 1/2" paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

Turning department management on/off

1. Select “Management on/off” (“COPY MANAGEMENT ON/OFF”) and press the enter key.
2. Select “On” or “Off” and press the enter key.

Turning printer department management on/off

Note: This setting item will not be displayed if the optional printer board is not installed.

Turning printer error report function on/off

Note: This setting item will not be displayed if the optional printer board is not installed.

(6) Copy default

Exposure mode

Selects the image mode at power-on.

1. Select “Exposure mode” and press the enter key.
2. Select the exposure mode and press the enter key.
   Exposure mode: Auto mode/Mixed mode/Photo mode/Text mode

Exposure steps

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

1. Select “Exposure steps” and press the enter key.
2. Select “5 steps” or “9 steps” and press the enter key.

Auto exposure adjustment

Adjusts the exposure for the auto exposure mode.

1. Select “Auto exposure adjustment” (“AUTO EXP. LEVEL ADJUST”) and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

Mixed original density

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

1. Select “Mixed original density set” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 1 to 7

Photo original density

Adjusts the exposure to be used when photo original is selected for the image mode.
1. Select “Photo original density set” 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 “Text original density set” 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 “Paper selection” and press the enter key.
2. Select “Auto” or “Manual” and press the enter key.

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 “AMS mode” and press the enter key.
2. Select “AMS” or “100%” and press the enter key.

Copy limit

Sets the number of copies limit for multiple copying.
1. Select “Copy limit” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 1 to 250 copies

Margin width

Sets the default setting of the margin width for the margin copying.
1. Select “Margin width” and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: Metric
   1 to 18 mm
   Inch
   $^1/_4$" to $^3/_4$" (in $^1/_8$" increments)

Border erase width

Sets the default setting of the border erase width for the border erase mode.
1. Select “Border Erase Width” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: Metric
   6/12/18 mm
   Inch
   $^1/_4$"/$^1/_2$"/$^3/_4$"

Default drawer

Sets the drawer to be selected in cases such as after the reset key is pressed.
1. Select “Default drawer” and press the enter key.
2. Select the default drawer and press the enter key.
   Default drawer: 1st pap. (SOURCE 1)/2nd pap. (SOURCE 2)/3rd pap. (SOURCE 3)/4th pap. (SOURCE 4)
   Note: 3rd pap. (SOURCE 3) and 4th pap. (SOURCE 4) are displayed only when the optional drawer is installed.

Output form

Selects whether or not to perform sort copying automatically when the DF is used.
1. Select “Output form” and press the enter key.
2. Select “Sort: ON” or “Sort: OFF” and press the enter key.
   Note: If the DF is not installed, this setting item will be displayed but ineffective.

Rotate sort

Sets whether or not to perform rotate sort copying when the sort mode is selected.
1. Select “Rotate sort” and press the enter key.
2. Select “On” or “Off” and press the enter key.
   Note: This setting item will not be displayed if the optional finisher is installed.

(7) Machine default

Status report

Prints the details of the default settings.
1. Select “Status report” and press the enter key.
   If A4/11" × $8^1/_2$" paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

Auto shutoff

Sets whether the auto shutoff function is available.
1. Select “Auto shut-off” and press the enter key.
2. Select “On” or “Off” and press the enter key.

Special paper

If special paper such as colored paper and recycled paper is loaded, a sign (*) indicating special paper can be shown beside the paper size for the drawer that contains special paper.
1. Select “Special paper” and press the enter key.
2. Select the paper source and press the enter key.
   Paper source: 1st pap. (SOURCE 1)/2nd pap. (SOURCE 2)/3rd pap. (SOURCE 3)/4th pap. (SOURCE 4)
   Note: 3rd pap. (SOURCE 3) and 4th pap. (SOURCE 4) are displayed only when the optional drawer is installed.

APS for special paper

Sets whether to use the paper source with the special paper for auto paper selection and auto drawer switching.

1. Select “APS for special paper” and press the enter key.
2. Select “On” or “Off” and press the enter key.

Paper type (1st to 4th)

Selects the type of paper to be loaded in the drawers.

1. Select “Paper type (1st to 4th)” and press the enter key.
2. Select the paper type and press the enter key.
   Paper type: Plain/Recycled/Letterhead/Color
   Note: “3rd” and “4th” are displayed only when the optional drawer is installed.

Paper type (bypass)

Selects the type of paper to be loaded in the bypass tray.

1. Select “Paper type (bypass)” and press the enter key.
2. Select the paper type and press the enter key.
   Paper type: Plain/Transparency/Labels/Recycled/Rough/Letterhead/Color/Envelope/Cardstock

Copy eject location setting

Selects whether to eject copies to the internal eject tray, finisher or job separator.

1. Select “Select copy eject mode” (“SELECT EJECTOR OF COPY”) and press the enter key.
2. Select the eject location and press the enter key.
   Copy eject location: Copier/Finisher/Job separator
   Note: This setting item will not be displayed if neither the optional finisher nor job separator is installed.

Auto preheat time

Sets the auto preheat time.

1. Select “Auto preheat time” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 5 to 45 minutes (in 5-minute increments)
   Note: Set the auto preheat time to be shorter than the auto shutoff time.

(8) Language

Switches the language to be displayed on the touch screen.

1. Select “Language” and press the enter key.
2. Select the display language and press the enter key.

Auto shutoff time

Sets the auto shutoff time.

1. Select “Auto shut-off time” and press the enter key.
2. Select the setting and press the enter key.
   Setting range: 15 to 240 minutes (in 15-minute increments)

Display contrast adjustment

Adjusts the contrast of the LCD.

1. Select “Display contrast adjustment” (“DISPLAY CONTRAST ADJUST.”) and press the enter key.
2. Enter the setting and press the enter key.
   Setting range: 1 to 7

Management code change

Changes the management code.

1. Select “Management code change” and press the enter key.
2. Enter the 4-digit management code using the numeric keys and press the enter key.

Silent mode

Selects whether or not to enter silent mode after copying.

1. Select “Silent Mode” and press the enter key.
2. Select “On” or “Off” and press the enter key.

Auto drawer switching

Sets whether the auto drawer switching function is available.

1. Select “Automatic drawer switching” and press the enter key.
2. Select “On” or “Off” and press the enter key.

Counter report

Prints the report on the toner consumption ratio.

1. Select “Counter report” and press the enter key.
   If A4/11" $\times$ 8$^1/_2$" paper is present, the list is automatically printed out. Otherwise, select the paper source and press the start key.

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

Key counter installation requires the following parts:
Key counter set (P/N 2A369702)
Contents of the set:
- Key counter cover (P/N 2A360010)
- Key counter retainer (P/N 66060030)
- Key counter cover retainer (P/N 66060022)
- Key counter mount (P/N 66060040)
- Key counter socket assembly (P/N 41529210)
- One (1) M3 × 8 bronze binding screw (P/N B1303080)
- Four (4) M4 × 6 bronze TP-A screws (P/N B4304060)
- Two (2) M4 × 10 bronze TP-A screws (P/N B4304100)
- One (1) M4 × 20 bronze TP-A screws (P/N B4304200)
- One (1) M4 × 6 chrome TP-A screw (P/N B4104060)
- Two (2) M3 × 6 bronze flat-head screws (P/N B2303060)
- One (1) M3 bronze nut (P/N C2303000)

Procedure

1. Fit the key counter socket assembly to the key counter retainer using the two screws and nut.
2. Fit the key counter mount to the key counter cover using the two screws, and attach the key counter retainer to the mount using the two screws.

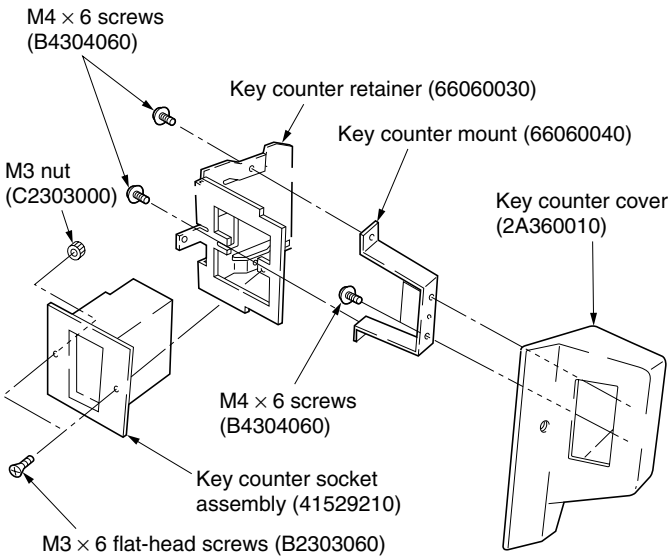


Figure 1-3-19

3. Open the front cover.
4. Remove the screw on the front of the internal eject tray.
5. Remove the five screws. While lifting the internal eject tray, remove the right cover.
6. Cut out the aperture plate on the right cover using a pair of nippers.
7. Pass the 4-pin connector inside the copier through the aperture.

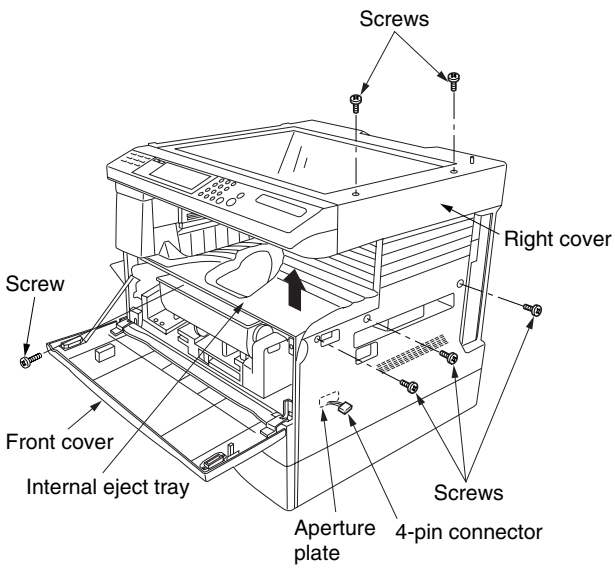


Figure 1-3-20

8. Refit the right cover.
9. Pass the 4-pin connector of the key counter through the aperture in the key counter cover retainer, and insert into the 4-pin connector of the copier.
10. Seat the projection of the key counter cover retainer in the aperture in the right cover, and fasten them both to the copier using three screws.
11. Fit the key counter cover with the key counter socket assembly inserted to the key counter cover retainer on the copier using the screw.

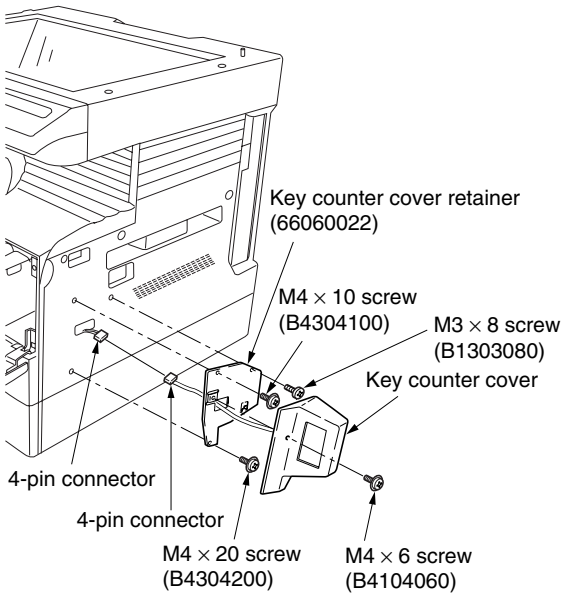


Figure 1-3-21

12. Insert the key counter into the key counter socket assembly.
13. Turn the main switch on and enter the maintenance mode.
14. Run maintenance item U204 and set as follows:
    15 cpm: C-2
    20 cpm: Key counter
15. Exit the maintenance mode.
16. Check that the indication given below is displayed on the operation panel when the key counter is pulled out.
    15 cpm: U1
    20 cpm: Insert key counter.
17. Check that the counter counts up as copies are made.

1-3-5 Installing the original size detection sensor (option for the metric specifications of the 15 cpm copier only)

Original size detection sensor installation requires the following parts:
- Original size detection sensor (P/N 35927290)
- One (1) M3 × 8 bronze binding screw (P/N B1303080)

Procedure

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

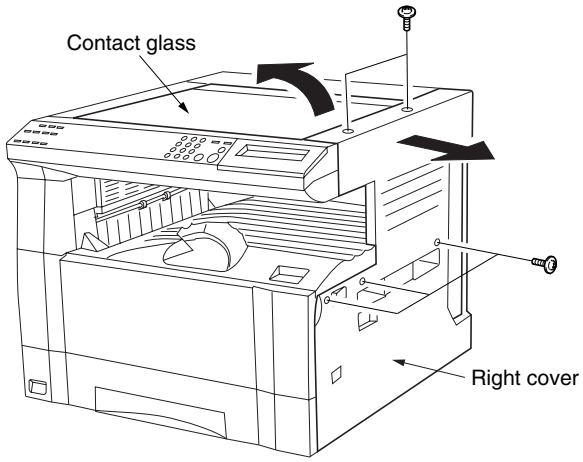


Figure 1-3-22

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

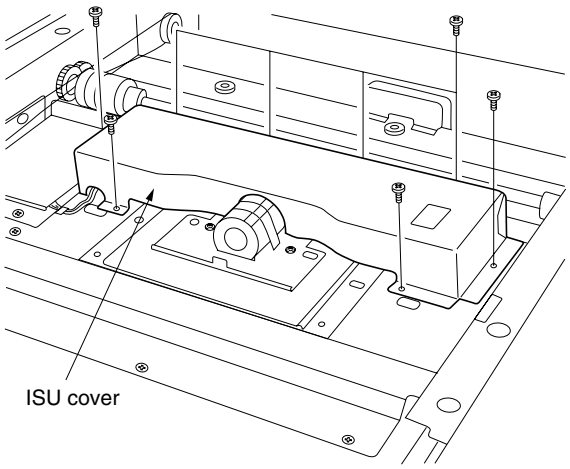


Figure 1-3-23

4. Fit the original size detection sensor using the screw.
5. Connect the 3-pin connector that was contained inside the ISU cover to the original size detection sensor.
6. Refit all the removed parts.
7. Turn the main switch on and enter maintenance mode.
8. Run maintenance item U075 and select “On”.
9. Exit maintenance mode.
10. Check that the automatic original size detection is performed correctly.

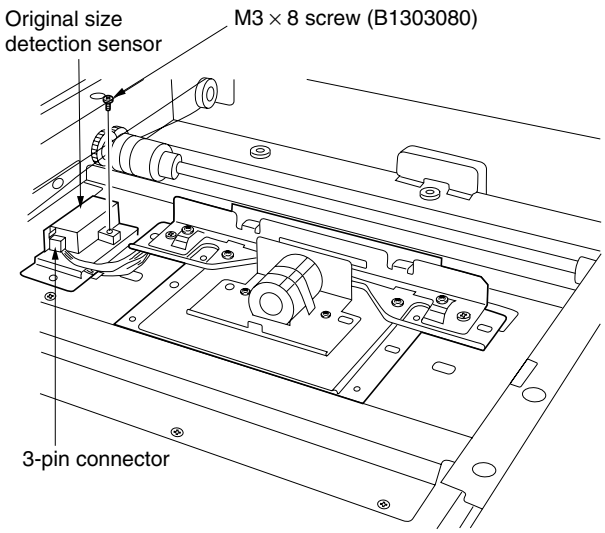


Figure 1-3-24

1-3-6 Installing the drawer heater (option)

Drawer heater installation requires the following parts:
For 120 V specifications
Drawer heater set (P/N 3A569710)
Contents of the set
• One (1) BVM4 × 4 bronze binding screw (P/N B1304040)
• Two (2) BVM4 × 6 bronze binding screws (P/N B1304060)
• Clamp (P/N M2105030)
• Band (P/N M2607010)
• High temperature caution sticker (P/N 20305130)
• Drawer heater wire (P/N 3A568010)
• Drawer heater (P/N 34860030)

For 220-240 V specifications
Drawer heater set (P/N 3A569720)
Contents of the set
• One (1) BVM4 × 4 bronze binding screw (P/N B1304040)
• Two (2) BVM4 × 6 bronze binding screws (P/N B1304060)
• Clamp (P/N M2105030)
• Band (P/N M2607010)
• High temperature caution sticker (P/N 20305130)
• Drawer heater wire (P/N 3A568010)
• Drawer heater (P/N 34860020)

Procedure

1. Remove the two screws holding the rear cover of the optional drawer and then the cover.
2. Pull the drawer out.
3. Pass the connector of the drawer heater through the cable hole in the rear base and fit the drawer heater using the two BVM4 × 06 bronze binding screws.
4. Fasten the drawer heater cable with the clamp using the BVM4 × 04 bronze binding screw.
5. Affix the high temperature caution sticker.

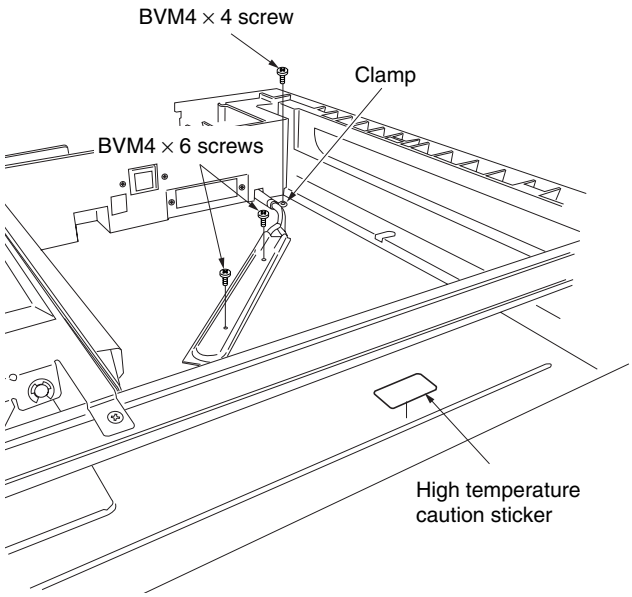


Figure 1-3-25

6. Fold the cable that was passed through the cable hole in three and tidy it up using the band.

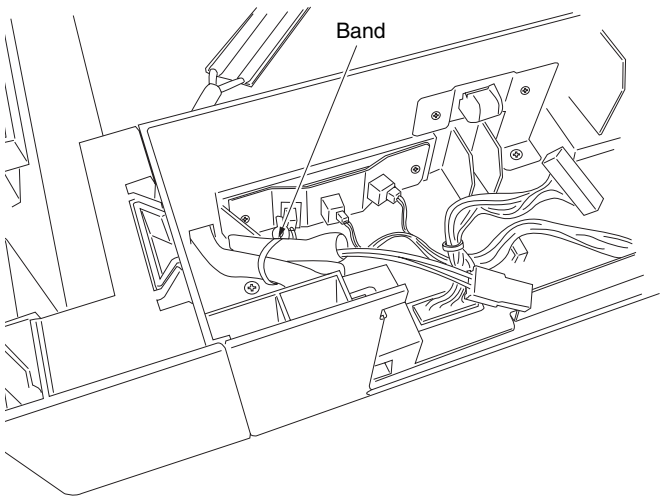


Figure 1-3-26

7. Insert one of the 2-pin receptacles on the heater wire into the opening in the frame and connect the other 2-pin receptacle to the drawer heater cable.

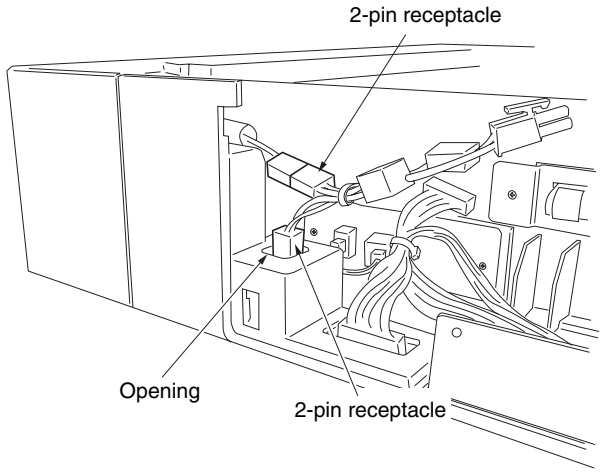


Figure 1-3-27

8. Refit the drawer.
9. Install the optional drawer to the copier.
10. Remove the jumper connector from the heater wire on the copier or the above optional drawer and connect the 2-pin connector on the heater wire in its place.

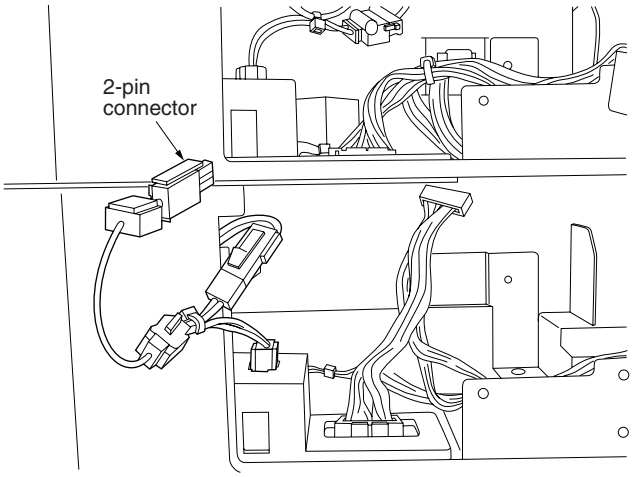


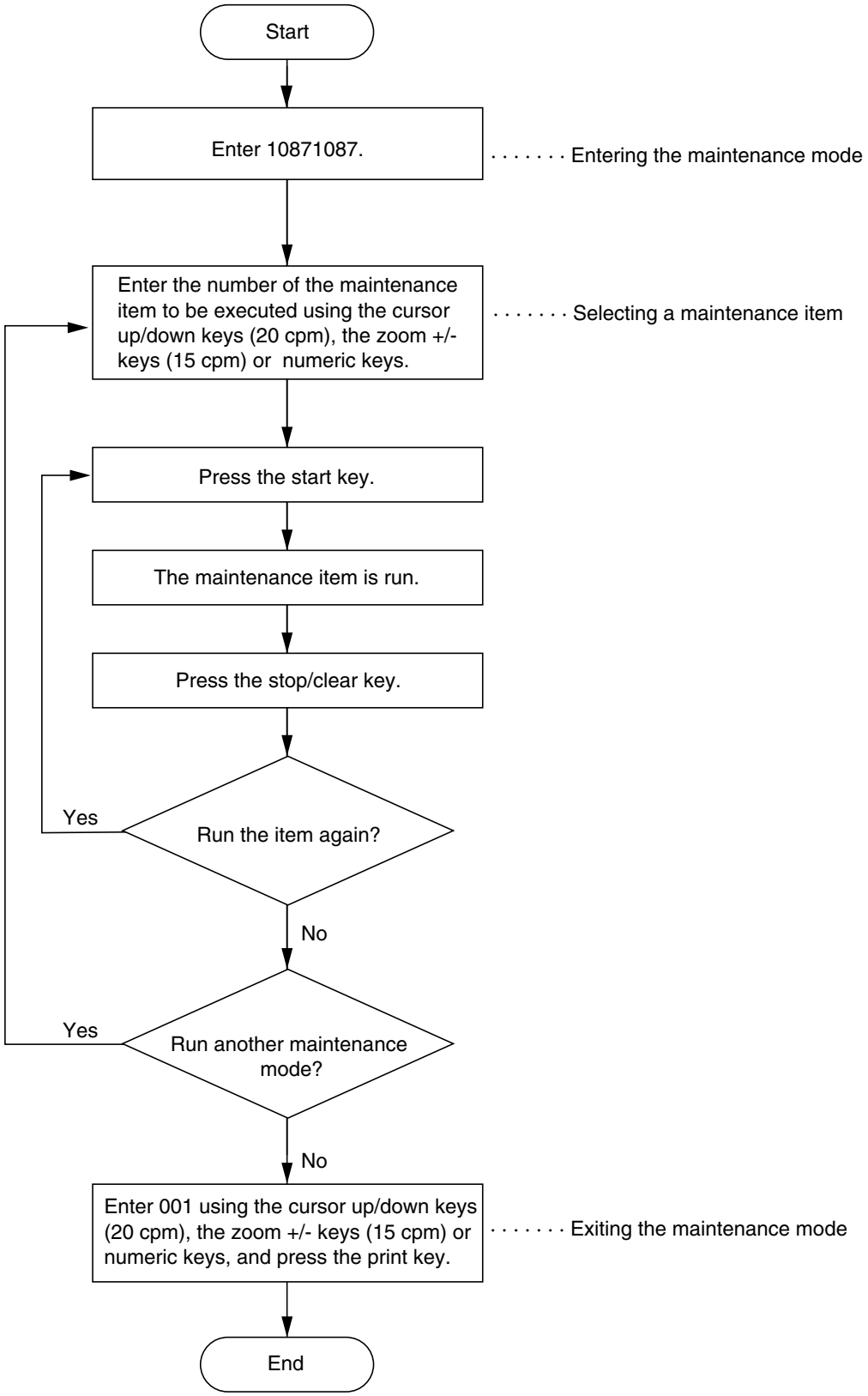
Figure 1-3-28

11. Refit the rear cover of the optional drawer.

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 (for 20 cpm copier)

Section	Item No.	Maintenance item contents	Initial setting*
General	U000	Outputting an own-status report	—
	U001	Exiting the maintenance mode	—
	U003	Setting the service telephone number	**********
	U004	Setting the machine number	0
	U005	Copying without paper	—
	U019	Displaying the ROM version	—
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 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 At the registration roller At the paper feed roller	 0 0
	U053	Performing fine adjustment of the motor speed Drive motor/Polygon motor/Feedshift motor	 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 scannning direction/auxiliary scanning direction	 0/0
	U066	Adjusting the leading edge registration for scanning an original on the contact glass	 0
	U067	Adjusting the center line for scanning an original on the contact glass	0
	U070	Adjusting the DF magnification	0
	U071	Adjusting the DF scanning timing Adjusting the DF leading edge registration Adjusting the DF trailing edge registration	 0 0
	U072	Adjusting the DF center line	0
	U073	Checking scanner operation	—
	U074	Adjusting the DF input light luminosity	1
	U087	Turning the DF scanning position adjust mode on/off	On
	U088	Setting the input filter (moiré reduction mode)	Off
	U091	Checking shading	—
	U092	Adjusting the scanner automatically	—
	U093	Setting the exposure density gradient	0
	U099	Checking the original size detection	—
High voltage	U100	Setting the surface potential	184
	U101	Setting high voltages Developing bias control voltage during image formation Developing bias control voltage during no image formation Transfer control voltage Transfer voltage output timing	 193 38 115 –176
	U109	Setting the drum type	H type
	U110	Checking/clearing the drum count	—

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
High voltage	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	—
	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 Control temperature during copying Temperature to be deducted from the control temperature when copying onto paper with a width of 220 mm or smaller	 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	—
	U203	Operating DF separately	—
	U204	Setting the presence or absence of a key card or key counter	Off
	U207	Checking the operation panel keys	—
	U210	Reversing the LCD	Off
	U211	Setting DF type	SRDF
	U240	Checking the operation of finisher motors and solenoids	—
	U241	Checking the finisher switches	—
	U243	Checking the operation of the DF motors, solenoids and clutch	—
	U244	Checking the DF switches (when installing the optional SRDF) Checking the DF switches (when installing the optional STDF)	— —
	U245	Checking messages	—
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
	U254	Turning auto start function on/off	On
	U255	Setting auto clear time	90
	U256	Turning auto preheat/energy saver function on/off	On
	U258	Switching copy operation at toner empty detection	Single/70
	U260	Changing the copy count timing	Eject
	U265	Setting the destination specifications	0
	U330	Setting the number of sheets to enter stacking mode during sort operation	100
	U332	Setting the size conversion factor	—
	U342	Setting the ejection restriction	On
	U343	Switching between duplex/simplex copy mode	Off
	U344	Setting preheat/energy saver mode	Energy star
	U345	Setting the value for maintenance due indication	0
	U348	Setting the copy density adjustment range	Special
Image processing	U402	Adjusting margins of image printing	—
	U403	Adjusting margins for scanning an original on the contact glass	—

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
Image processing	U404	Adjusting margins for scanning an original from the DF	—
	U407	Adjusting the leading edge registration for memory image printing	—
Others	U901	Checking/clearing copy counts by paper feed locations	—
	U903	Checking/clearing the paper jam counts	—
	U904	Checking/clearing the service call counts	—
	U905	Checking/clearing counts by optional devices	—
	U906	Resetting partial operation control	—
	U908	Changing the total counter value	—
	U910	Clearing the black ratio data	—
	U914	Switching between fax and copier modes	Copier mode
	U917	Setting the reading/writing of backup data	Read
	U990	Checking/clearing the time for the exposure lamp to light	—
	U992	Checking or clearing the printer/fax count	—
	U993	Outputting a VTC-PG pattern	—
	U998	Outptting the memory list	—

* Initial setting for executing maintenance item U020

(3) Contents of maintenance mode items (for 20 cpm copier)

<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 or replacing 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. The screen for selecting an item is displayed.
2. Select the item to be output using the cursor up/down keys. The selected item is displayed in reverse.
<table>
<tr><th>Display</th><th>Output list</th></tr>
<tr><td>MAINTENANCE
JAM
SERVICE CALL</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" × 8 1/2" paper is available, a report of this size is output. If not, specify the paper feed location.
When output is complete, the screen for selecting an item is displayed.
Completion
Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.
</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>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U003</td><td>
Setting the service telephone number
Description
Sets the telephone number to be displayed when a service call code is detected.
Purpose
To set the telephone number to call service when installing the machine.
Method
Press the start key. The currently set telephone number is displayed.
Setting
1. Enter a telephone number (up to 16 digits) using the numeric keys.
Move the cursor using the cursor left/right keys and select a number or symbol using the cursor up/down keys.
To enter symbols, press the keys shown below as required.
<table>
<tr><th>Key</th><th>Symbol</th></tr>
<tr><td>* key</td><td>*</td></tr>
<tr><td># key</td><td>#</td></tr>
<tr><td>Auto mode selection key</td><td>(</td></tr>
<tr><td>Image mode selection key</td><td>)</td></tr>
<tr><td>Copy exposure adjustment key (lighter)</td><td>–</td></tr>
<tr><td>Copy exposure adjustment key (darker)</td><td>(Space)</td></tr>
</table>
2. Press the start key. The phone number is set, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</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. Enter the last six digits of the machine number using the numeric key.
Do not enter the first two digits, 3 and 7.
2. Press the start key. The machine number is set.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</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. The screen for selecting an item is displayed.
2. Select the item to be operated using the cursor up/down keys. The selected item is displayed in reverse.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>PPC
PPC + DF</td><td>Only the copier operates.
Both the copier and SRDF operate (continuous operation).</td></tr>
</table>
3. Press the interrupt key. The copy mode screen is displayed.
4. Set the operation conditions required on the copy mode screen. Changes in the following settings can be made.
• Paper feed locations
• Magnifications
• Simplex or duplex copy mode
• 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 screen for selecting an item is displayed.
7. To stop continuous operation, press the stop/clear key.
Completion
Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U019</td><td>
Displaying the ROM version
Description
Displays the part number of the ROM fitted to each PCB.
Purpose
To check the part number or to decide if the ROM version is new from the last digit of the number.
Method
Press the start key. The last six digits of the part number indicating the ROM version are displayed.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>MAIN
MMI</td><td>Main ROM IC
Operation 1 ROM IC</td></tr>
</table>
Completion
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
U020	**Initializing all data** **Description** Initializes all the backup RAM on the main PCB to return to the original settings. **Purpose** Used when replacing the backup RAM on the main PCB. **Method** 1. Press the start key. The screen for executing is displayed. 2. Select EXECUTE using the cursor up/down keys. It is displayed in reverse. 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 and the display language to the initial setting of English. **Completion** To exit this maintenance item without executing initialization, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U021	**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. The screen for executing is displayed. 2. Select EXECUTE using the cursor up/down keys. It is displayed in reverse. 3. Press the start key. All data other than that for adjustments due to variations between machines is initialized based on the destination setting. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U022	**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. The screen for executing is displayed. 2. Select SCANNER using the cursor up/down keys. 3. Press the start key. 4. Select EXECUTE using the cursor up/down keys. It is displayed in reverse. 5. Press the start key. The data for the optical section (U060 to 099, U403, U404 and U990) is initialized. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U030	**Checking motor operation** **Description** Drives each motor. **Purpose** To check the operation of each motor. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the motor to be operated using the cursor up/down keys. 3. Press the start key. The selected item is displayed in reverse and the operation starts.

Display	Operation
MAIN	Drive motor turns on and developing bias turns on
Tumiki1	Drawer drive motor turns on
Tumiki2	Drawer drive motor (ST) 1* turns on
Tumiki3	Drawer drive motor (ST) 2* turns on
DUP (F, L)	Feedshift motor* rotates forward at low speed
DUP (F, H)	Feedshift motor* rotates forward at high speed
DUP (R, L)	Feedshift motor* rotates in reverse at low speed
DUP (R, H)	Feedshift motor* rotates in reverse at high speed

* Optional.

4. To stop operation, press the stop/clear key.

Completion

Press the stop key after operation stops. The screen for selecting a maintenance item No. is displayed.

U031 **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. A list of the switches, the on-off status of which can be checked, are displayed.
2. Turn each switch on and off manually to check the status.
   When the on-status of a switch is detected, that switch is displayed in reverse.

Display	Switches
T2	Drawer feed switch (DFSW)
T3	Drawer feed switch (ST) 1* (DFSW (ST) 1)
T4	Drawer feed switch (ST) 2* (DFSW (ST) 2)
RES	Registration switch (RSW)
EJE	Eject switch (ESW)
DUP1	Duplex paper conveying switch 1* (DUPPCSW1)
DUP2	Duplex paper conveying switch 2* (DUPPCSW2)
JOB	Job separator eject switch* (JBESW)
DUP SF	Duplex open/close switch* (DUPOCSW)

*Optional.

Completion

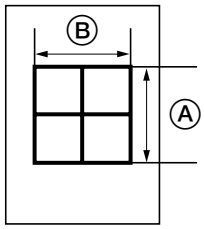
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U032	**Checking clutch operation** **Description** Turns each clutch on. **Purpose** To check the operation of each clutch. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the clutch to be operated using the cursor up/down keys. 3. Press the start key. The selected item is displayed in reverse, and the clutch turns on for 1 s. **Display** / **Clutches** PFHON — Upper paper feed clutch (PFCL-U) PFBYP — Bypass paper feed clutch (BYPPFCL) T1 — Lower paper feed clutch (PFCL-L) T2 — Paper feed clutch (ST) 1* (PFCL (ST) 1) T3 — Paper feed clutch (ST) 2* (PFCL (ST) 2) RES — Registration clutch (RCL) *Optional. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U033	**Checking solenoid operation** **Description** Turns each solenoid on. **Purpose** To check the operation of each solenoid. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the solenoid to be operated using the cursor up/down keys. 3. Press the start key. The selected item is displayed in reverse, and the solenoid turns on for 1 s. **Display** / **Solenoids** BRA_ACT — Feedshift solenoid (FSSOL)*1 latch-on BRA_RET — Feedshift solenoid (FSSOL)*1 release MAIN SW — Main switch turns off DUP_ACT — Feedshift solenoid (FSSOL)*2 latch-on DUP_RET — Feedshift solenoid (FSSOL)*2 release DUP_ACT2 — Duplex feedshift solenoid (DUPFSSOL)*2 latch-on DUP_RET2 — Duplex feedshift solenoid (DUPFSSOL)*2 release *1: Optional finisher. *2: Optional duplex unit. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U034	**Adjusting the print start timing** Adjustment See pages 1-6-10 and 13.

Maintenance item No.	Description
U035	**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. The screen for selecting an item is displayed. **Setting** 1. Select the item to be set using the cursor up/down keys. The selected item is displayed in reverse. 2. Change the setting using the cursor left/right keys. 3. Press the start key. The value is set. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U051	**Adjusting the amount of slack in the paper** **Adjustment** See page 1-6-17.
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. The screen for selecting an item is displayed. **Setting** 1. Select the item to be set using the cursor up/down keys. The selected item is displayed in reverse. 2. Change the setting using the cursor left/right keys. * Optional. MAIN MOTOR 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 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.

Display	Setting	Setting range	Initial setting
LENGTH DATA	Length	330 to 356 mm	330
WIDTH DATA	Width	200 to 220 mm	210

Display	Description	Setting range	Initial setting
MAIN MOTOR	Drive motor speed adjustment	–5 to +5	0
POLYGON MOTOR	Polygon motor speed adjustment	–5 to +5	0
DUP MOTOR	Feedshift motor* speed adjustment	–5 to +5	0

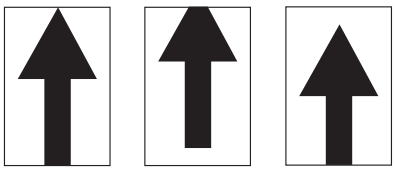
Maintenance item No.	Description
U053	**Interrupt copy mode** While this maintenance item is being performed, a VTC pattern shown below is output in interrupt copy mode. Correct values for an A3/11" × 17" output are: Ⓐ = 300 ± 0.75 mm Ⓑ = 260 ± 1.3 mm  **Figure 1-4-1** **Adjustment** 1. Output an A3/11" × 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 screen for selecting a maintenance item No. is displayed.
U060	**Adjusting the scanner input properties** **Description** Adjusts the image scanning density in text, text and photo, or photo mode. **Purpose** Used when the entire image appears too dark or light. **Method** Press the start key. The screen for selecting an item is displayed. **Setting** 1. Change the setting using the cursor left/right keys. 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 screen for selecting a maintenance item No. is displayed. **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

Display	Setting range	Initial setting
γ ADJ	0 to 23	12

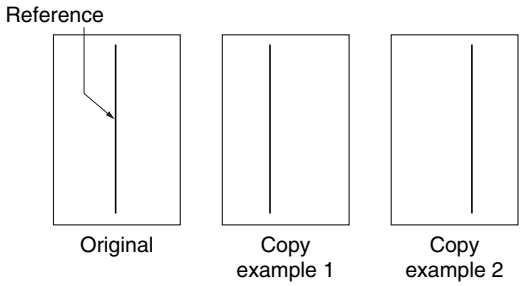
1-4

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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. The screen for executing is displayed.
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 screen for selecting a maintenance item No. is displayed.
</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. The screen for adjustment is displayed.
2. Change the setting using the cursor left/right 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 screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U065</td><td>
Adjusting the scanner magnification
Adjustment
See pages 1-6-32 and 34.
</td></tr>
<tr><td>U066</td><td>
Adjusting the leading edge registration for scanning an original on the contact glass
Adjustment
See page 1-6-36.
</td></tr>
<tr><td>U067</td><td>
Adjusting the center line for scanning an original on the contact glass
Adjustment
See page 1-6-37.
</td></tr>
</table>

Maintenance item No.	Description
U070	**Adjusting the DF magnification** **Description** Adjusts the DF original scanning speed. **Purpose** To be executed if the correct magnification is not obtained in the auxiliary scanning direction when the optional DF is used. **Caution** Before making this adjustment, ensure that the following adjustments have been made in maintenance mode. U053 → U065 → U070 **Method** Press the start key. **Setting** 1. Change the setting using the cursor left/right keys. Display: CONVEY SPEED; Description: Original conveying motor speed; Setting range: –25 to +25; Initial setting: 0; Change in value per step: 0.1% Increasing the setting makes the image longer, and decreasing it makes the image shorter. 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. The screen for selecting a maintenance item No. is displayed.
U071	**Adjusting the DF scanning timing** **Description** Adjusts the DF original scanning timing. **Purpose** To be executed if there is a regular error between the leading or trailing edges of the original and the copy image when the optional DF is used. **Caution** Before making this adjustment, ensure that the following adjustments have been made in maintenance mode. U034 → U066 → U071 **Method** Press the start key. The screen for selecting an item is displayed. **Setting** 1. Select the item to be set using the cursor up/down keys. The selected item is displayed in reverse. 2. Change the setting using the cursor left/right keys. Display: LEAD EDGE ADJ; Description: DF leading edge registration; Setting range: –32 to +32; Initial setting: 0; Change in value per step: 0.17 mm Display: TRAIL EDGE ADJ; Description: DF trailing edge registration; Setting range: –32 to +32; Initial setting: 0; Change in value per step: 0.17 mm Increasing the setting moves the copy image backward, and decreasing it moves the copy image forward. 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.

Maintenance item No.	Description
U071	**Adjustment** 1. In interrupt copy mode, make a copy using the DF. 2. Check the copy image and adjust the registration as follows. For copy example 1, increase the setting of LEAD EDGE ADJ. For copy example 2, decrease the setting of LEAD EDGE ADJ.  Original Copy example 1 Copy example 2 **Figure 1-4-2** **Completion** Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.
U072	**Adjusting the DF center line** **Description** Adjusts the scanning start position for the DF original. **Purpose** To be executed if there is a regular error between the centers of the original and the copy image when the optional DF is used. **Caution** Before making this adjustment, ensure that the following adjustments have been made in maintenance mode. U034 → U067 → U072 **Method** Press the start key. **Setting** 1. Change the setting using the cursor left/right keys. Increasing the setting moves the image to the right, and decreasing it moves the image to the left. 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.

Description	Setting range	Initial setting	Change in value per step
DF center line	–39 to +39	0	0.17 mm

Maintenance item No.	Description
U072	**Adjustment** 1. In interrupt copy mode, make a copy using the DF. 2. Check the copy image and adjust the center line as follows. For copy example 1, increase the setting. For copy example 2, decrease the setting.  **Figure 1-4-3** **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U073	**Checking scanner operation** **Description** Simulates the scanner operation under arbitrary conditions. **Purpose** To check scanner operation. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the item to be changed using the cursor up/down keys. The selected item is displayed in reverse. 3. Change the setting using the cursor left/right keys. **Display** / **Operating conditions** / **Setting range** ZOOM / Magnification / 50 to 200% SIZE / Paper size / See below. LAMP / On and off of the exposure lamp / 0 (off) or 1 (on) Paper sizes for each setting in SIZE **Setting** / **Paper size** / **Setting** / **Paper size** 8 / A4 / 42 / A5R 9 / B5 / 47 / Folio 24 / 11" × 8 1/2" / 52 / 11" × 17" 36 / A3 / 53 / 11" × 15" 39 / B4 / 55 / 8 1/2" × 14" 40 / A4R / 56 / 8 1/2" × 11" 41 / B5R / 58 / 5 1/2" × 8 1/2" 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 screen for selecting a maintenance item No. is displayed.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U074</td><td>
Adjusting the DF input light luminosity
Description
Adjusts the luminosity of the exposure lamp for scanning originals from the optional DF.
Purpose
Used if the exposure amount differs significantly between when scanning an original on the contact glass and when scanning an original from the DF.
Method
Press the start key.
Setting
1. Change the setting using the cursor left/right keys.
<table>
<tr><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>DF input light luminosity</td><td>0 to 8</td><td>1</td></tr>
</table>
Increasing the setting makes the luminosity higher, and decreasing it makes the luminosity lower.
2. Press the start key. The value is set.
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. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U087</td><td>
Turning the DF scanning position adjust mode on/off
Description
Turns on or off the DF scanning position adjust mode, in which the DF original scanning position is adjusted automatically by determining the presence or absence of dust on the slit glass. Also changes the reference data for identifying dust.
Reference
In the DF original scanning position adjust mode, the presence or absence of dust is determined by comparing the scan data of the original trailing edge and that taken after the original is conveyed past the DF original scanning position. If dust is identified, the DF original scanning position is adjusted for the following originals.
Purpose
Used to prevent appearance of black lines due to dust adhering in the original scanning position on the slit glass when the DF is used.
Method
1. Press the start key. The screen for selecting an item is displayed.
2. Select the item to be set using the cursor up/down keys. The screen for the selected item is displayed.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>ON/OFF
DATA</td><td>Setting the mode on/off
Setting the reference data for identifying dust</td></tr>
</table>
Setting the mode on/off
1. Select ON or OFF using the cursor up/down keys. The selected item is displayed in reverse.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>ON
OFF</td><td>DF scanning position adjust mode on
DF scanning position adjust mode off</td></tr>
</table>
Initial setting: ON
2. Press the start key. The setting is set. The screen for selecting an item is displayed.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U087</td><td>
Setting the reference data for identifying dust
Available only when the mode is turned on.
1. Select the item to be set using the cursor up/down keys. The selected item is displayed in reverse.
2. Change the setting using the cursor left/right keys.
<table>
<tr><th>Display</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr>
<tr><td>DENSITY</td><td>Minimum density to be regarded as dust</td><td>10 to 95</td><td>35</td></tr>
</table>
Example
DENSITY: The figure indicates the density in 256 levels of gray (0: white, 255: black). When the setting is 35, data of the level of 35 or higher is regarded as dust and data of lower level is regarded as the background (scan data taken when there is no original).
3. Press the start key. The value is set.
4. Press the stop/clear key. The screen for selecting an item is displayed.
Completion
Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.
</td></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. The screen for selecting an item is displayed.
Setting
1. Select ON or OFF using the cursor up/down 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 screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</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. The screen for selecting an item is displayed.
2. Select the item to be operated using the cursor up/down keys. The selected item is displayed in reverse.

Display	Output list
SHD BEFORE	Performs scanning before shading and displays the result.
SHD AFTER	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.

   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 assumed to be 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.

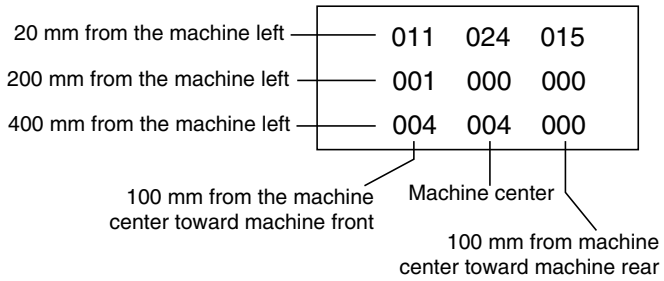


Figure 1-4-4

4. Press the stop/clear key. The screen for selecting an item is displayed.

Completion

Press the stop/clear key. The screen for entering a maintenance item is displayed.

Maintenance item No.	Description
U092	**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. The screen for executing is displayed. 3. Press the start key. Auto adjustment starts. When adjustment is complete, each adjusted value is displayed.

Display	Description
SCAN CENTER	Scanner center line
SCAN TIMING	Scanner leading edge registration
SUB SCAN	Scanner magnification in the auxiliary scanning direction

If a problem occurs during auto adjustment, DATA: XX (XX is replaced by an error code) is displayed and operation stops. Should this happen, 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 screen for selecting a maintenance item No. is displayed.

If the stop/clear key is pressed during auto adjustment, adjustment stops and no settings are changed.

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. The screen for selecting an item is displayed.
2. Select the image mode to be adjusted using the cursor up/down keys.
3. Press the start key. The screen for the selected item is displayed.

Display	Description
TEXT	Density in text mode
MIXED	Density in text and photo mode
PHOTO	Density in photo mode

Setting

1. Select the item to be adjusted using the cursor up/down keys. The selected item is displayed in reverse.
2. Adjust the setting using the cursor left/right keys.

Display	Description	Setting range	Initial setting
DARKER	Change in density when manual density is set dark	0 to 3	0
LIGHTER	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.

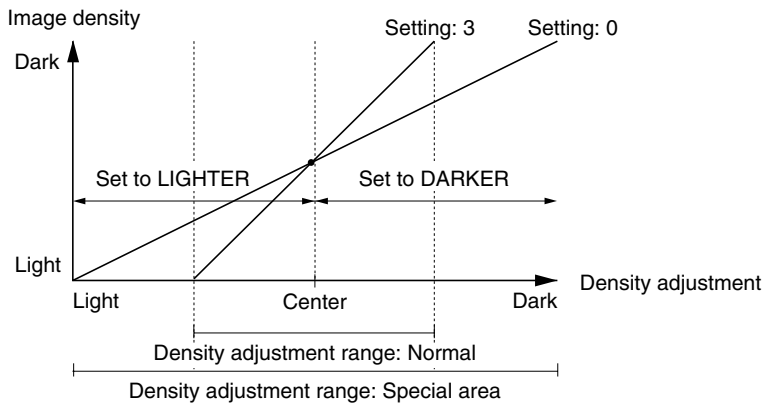


Figure 1-4-5 Exposure density gradient

3. Press the start key. The value is set.
4. To return to the screen for selecting an item, 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 at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U099	**Checking the original size detection**

Description

Displays the original width detection data and sets the original width detection threshold.

Purpose

To check the original width detection. Also to change the original size detection threshold if the size of the original on the contact glass is detected incorrectly.

Start

1. Press the start key. The screen for selecting an item is displayed.
2. Select the item.
3. Press the start key. The screen for executing is displayed.

Display	Description
DATA	Checking the original width detection data
B/W LEVEL	Setting or checking the original width detection threshold

Method to display the original width detection data

1. Place an original on the contact glass and turn the original detection switch on. The exposure lamp turns on and the width of the original is detected. The scanner data taken at the nine points from (1) at the machine rear to (9) at the machine front is displayed on the message display as follows.

   The data is displayed within the range of 000 to 255, 000 indicating white (original present) and 255 indicating black (no original).

(1)	(2)	(3)
(4)	(5)	(6)
(7)	(8)	(9)

Figure 1-4-6

2. To return to the screen for selecting an item, press the stop/clear key.

Method to set or check the original size detection threshold

1. Place an original on the contact glass and turn the original detection switch on. The original size detection starts and detection data is displayed.

Display	Description	Data range	Remarks	Initial setting
LEVEL	Scanner data threshold	0 to 255	Adjustable	170
WAIT TIME	Time between original detection switch turning on and reading-in of scanner data	0 to 100 ms	Adjustable	50
ORIGINAL AREA	Detected original width	0 to 350 mm		
SIZE	Original size detected by scanner data and original size sensor detection data	0 to 63*		
B_DATA	Black (no original) data at the point on the boundary between original area and no original area	0 to 255		
W_DATA	White (original present) data at the point on the boundary between original area and no original area	0 to 255		

* See Paper size in U073 for the paper size for each setting.

2. To change the original size detection threshold, select LEVEL or WAIT TIME using the cursor up/down keys and change the setting using the cursor left/right keys.
3. Press the start key. The value is set.
4. To return to the screen for selecting an item, press the stop/clear key.

Completion

Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U100	**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 replacing the backup RAM or initializing the set data.

Start

Press the start key. The screen for selecting an item is displayed.

Display	Description
MC DATA	Changing the grid control voltage
MC ON	Turning the main charger on
LASER ON/OFF	Turning the main charger on and the laser scanner unit on and off

Method for main charger output

1. Select either MC ON or LASER ON/OFF using the cursor up/down keys.
2. Press the start key. The selected operation starts.
3. To stop operation, press the stop/clear key.

Setting the grid control voltage

1. Select MC DATA using the cursor up/down keys.
2. Change the setting using the cursor left/right keys.

Description	Setting range	Initial setting
Grid control voltage	0 to 255	184

Increasing the setting makes the surface potential higher, and decreasing it makes the potential lower. Change in value per step: approximately 3.6 V

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 selecting an item when main charger output stops. The screen for selecting a maintenance item No. is displayed.

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. The screen for selecting an item is displayed.
2. Select the item to be set or checked using the cursor up/down keys.
3. Press the start key. The screen for the selected item is displayed.

Display	Description
DEV BIAS SET	Setting the developing bias
TC SET	Setting and checking the transfer voltage

Setting the developing bias

1. Select the item to be adjusted using the cursor up/down keys. The selected item is displayed in reverse.
2. Change the setting using the cursor left/right keys.

Display	Description	Setting range	Initial setting
DB DATA	Developing bias control voltage during image formation	25 to 255	193
DB DATA2	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.
4. To return to the screen for selecting an item, press the stop/clear key.

Setting the transfer voltage

1. Select the item to be adjusted using the cursor up/down keys. The selected item is displayed in reverse.
2. Change the TC DATA setting using the cursor left/right keys.

Display	Description	Setting range	Initial setting
TC DATA	Transfer control voltage	0 to 255	115
TC TIMING	Transfer voltage output timing	–250 to +250	–176

   Increasing the TC DATA setting makes the transfer voltage higher, and decreasing it makes the voltage lower.

   Increasing the TC TIMING 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, select TC ON using the cursor up/down 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.
6. To return to the screen for selecting an item, press the stop/clear key after the transfer voltage output is stopped.

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. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U109	**Setting the drum type** **Description** Sets or checks the drum type. **Purpose** To prevent variations in halftones due to differences in drum sensitivity. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the drum type to set or check using the cursor up/down keys. The selected item is displayed in reverse. 3. Press the start key. The type is set. **Completion** Press the stop/clear key at the screen for selectiong an item. The screen for selectiong a maintenance item No. is displayed.
U110	**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** Press the start key. The drum counter count is displayed. **Clearing** 1. Select CLEAR using the cursor up/down keys. 2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed. **Setting** 1. Enter a six-digit count using the numeric keys. 2. Press the start key. The count is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit the maintenance mode without changing the count, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U111	**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** Press the start key. The drum drive time is displayed in minutes. **Clearing** 1. Select CLEAR using the cursor up/down keys. 2. Press the start key. The time is cleared, and the screen for selecting a maintenance item No. is displayed. **Setting** 1. Enter a five-digit drive time (in minutes) using the numeric keys. 2. Press the start key. The time is set, and the screen for selecting a maintenance No. is displayed. **Completion** To exit this maintenance item without changing the time, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U130	**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. **Caution** Before performing the initial setting for the developer, remove the transfer roller (see page 1-6-45). **Method** 1. Press the start key. The screen for executing is displayed. 2. Press the start key. The initial settings for the developer is set, and the result is displayed. **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 screen for selecting a maintenance item No. is displayed.
U131	**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 cursor left/right keys. 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 screen for selecting a maintenance item No. is displayed.

Display	Description
INPUT	Toner sensor output value
CONTROL	Toner sensor control voltage
TARGET	Toner feed start level
HUMID	Absolute humidity

Description	Setting range	Initial setting
Toner sensor control voltage	0 to 255	155

<table>
<tr><th>Maintenance item No.</th><th>Description</th></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. The screen for executing is displayed.
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.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>INPUT</td><td>Toner sensor output value after start key is pressed</td></tr>
<tr><td>TARGET</td><td>Current toner feed start level</td></tr>
<tr><td>CONTROL</td><td>Current toner sensor control voltage</td></tr>
<tr><td>HUMID</td><td>Absolute humidity</td></tr>
</table>
3. To stop operation, press the stop/clear key.
Completion
Press the stop/clear key when toner replenishment stops. The screen for selecting a maintenance item No. is displayed.
</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. The screen for executing is displayed.
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 screen for selecting a maintenance item No. is displayed.
</td></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. The screen for executing is displayed.
2. Press the start key. The current data is displayed.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>INPUT</td><td>Toner sensor output value after start key is pressed</td></tr>
<tr><td>TARGET</td><td>Current toner feed level
(value corrected based on humidity and drive time)</td></tr>
<tr><td>CONTROL</td><td>Current toner sensor control voltage</td></tr>
<tr><td>HUMID</td><td>Absolute humidity</td></tr>
</table>
3. Press the stop/clear key. The sampling operation stops.
Completion
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
U156	**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** Press the start key. The screen for selecting an item is displayed. Display: TARGET — Description: Toner feed start level Display: EMPTY — Description: Difference between the toner feed start level and toner empty level **Setting for the toner feed start level** 1. Select TARGET using the cursor up/down keys. 2. Change the setting using the cursor left/right key. Description: Toner feed start level — Setting range: 0 to 255 — Initial setting: 100 Increasing the setting makes the toner density lower. 3. Press the start key. The value is set. **Setting for the toner empty level** 1. Select EMPTY using the cursor up/down keys. 2. Change the setting using the cursor left/right key. Description: Difference between the toner feed start level and the toner empty level — Setting range: 0 to 255 — Initial setting: 44 Increasing the setting makes the toner empty level higher: the toner density is lower when the toner empty is detected. 3. Press the start key. The value is set. **Completion** Press the stop/clear key. The screen for selecting maintenance item No. is displayed.
U157	**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** Press the start key. The developing drive time is displayed in minutes. **Clearing** 1. Select CLEAR using the cursor up/down keys. 2. Press the start key. The time is cleared, and the screen for selecting a maintenance item No. is displayed. **Setting** 1. Enter a five-digit drive time (in minutes) using the numeric keys. 2. Press the start key. The time is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the time, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U158	**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** Press the start key. The developing count is displayed. **Clearing** 1. Select CLEAR using the cursor up/down keys. 2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed. **Setting** 1. Enter a six-digit count using the numeric keys. 2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the count, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U161	**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 using the cursor up/down keys. The selected item is displayed in reverse. 2. Change the setting using the cursor left/right keys.

Display	Description	Setting range	Initial setting
1ST TEMP	Primary stabilization fixing temperature	115 to 145 (°C)	135
2ND TEMP	Secondary stabilization fixing temperature	135 to 190 (°C)	160
COPY TEMP	Control temperature during copying	145 to 220 (°C)	180
A4R TEMP	Temperature to be deducted from the control temperature when copying onto paper with a width of 220 mm or smaller.	0 to 50 (°C)	0

The respective temperatures are to be set such that 2ND TEMP ≥ 1ST TEMP.

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

Completion

Press the stop/clear key. The screen for selecting maintenance item No. is displayed.

Maintenance item No.	Description
U162	**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. The screen for executing is displayed. 2. Press the start key. The forced stabilization mode is entered, and stabilization operation stops regardless of fixing temperature. The screen for selecting a maintenance item No. is displayed. 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.
U163	**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. The screen for selecting an item is displayed. 2. Select EXECUTE using the cursor up/down keys. 3. Press the start key. The fixing problem data is initialized. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U196	**Turning the fixing heater on** **Description** Turns the fixing heater on. **Purpose** To check fixing heater. **Method** 1. Press the start key. The screen for executing is displayed. 2. Press the start key. The heater turns on for 3 s and then turns off. **Completion** Press the stop/clear key when fixing heater is off. The screen for selecting the maintenance item No. is displayed.
U199	**Checking the fixing temperature** **Description** Displays the fixing temperature and the ambient temperature. **Purpose** To check the fixing temperature and the ambient temperature. **Method** Press the start key. The fixing temperature and ambient temperature are displayed in centigrade (°C). **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U200	**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 screen for selecting a maintenance item No. is displayed.
U203	**Operating DF separately** **Description** Simulates the original conveying operation separately in the optional SRDF. **Purpose** To check the SRDF. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Place an original in the SRDF if running this simulation with paper. 3. Select the item to be operated using the cursor up/down keys. The selected item is displayed in reverse. **Display** / **Operation** ADF — With paper, single-sided original RADF — With paper, double-sided original ADF (NON-P) — Without paper, single-sided original (continuous operation) RADF (NON-P) — Without paper, double-sided original (continuous operation) 4. Press the start key. The operation starts. 5. To stop continuous operation, press the stop/clear key. **Completion** Press the stop/clear key when the operation stops. The screen for selecting a maintenance item No. is displayed.
U204	**Setting the presence or absence of a key card or key counter** **Description** Sets the presence or absence of the optional key card or key counter. **Purpose** It is not necessary to run this maintenance item if a key card is installed on a 120 V specification machine. A key card is not available for 220 – 240 V specifications. **Method** Press the start key. **Setting** 1. Select the optional counter to be installed using the cursor up/down keys. The selected counter is displayed in reverse. **Display** / **Description** KEY CARD — The key card is installed KEY COUNTER — The key counter is installed 2. Press the start key. The setting is set and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U207	**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. The screen for executing is displayed. 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. • If an optional fax unit is installed, proceed with checking the fax keys. Opening the rear panel cover after pressing the last key will light all the LEDs. **Completion** Press the stop/clear key at the screen for executing. The screen for selecting a maintenance item No. is displayed. • After checking numeric key 1, the operation cannot be canceled until all the keys are checked.
U210	**Reversing the LCD** **Description** Sets whether to reverse the message display (LCD) in the operation panel. **Purpose** To reverse the message display. **Method** Press the start key. The screen for selecting an item is displayed. **Setting** 1. Select ON or OFF using the cursor up/down keys. Display: ON / OFF — Description: Reverse / Normal Initial setting: OFF 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U211	**Setting DF type** **Descrioption** Sets the optional DF type (STDF or SRDF). **Purpose** To set DF type when installing. **Method** 1. Press the start key. The screen for selecting an item is displaued. 2. Select DF type using the cursor up/down keys. Display: SADF / SRADF — Description: Single-sided (STDF) / Double-sided (SRDF) 3. Press the start key.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U211</td><td>Completion
Press the stop/clear key at the screen for selectiong an item. The screen for selectiong a maintenance item No. is displayed.</td></tr>
<tr><td>U240</td><td>Checking the operation of finisher motors and solenoids
Description
Turns the motors and solenoids in the optional finisher on.
Purpose
To check the operation of the finisher motors and solenoids.
Method
1. Press the start key. The screen for selecting an item is displaued.
2. Select the item to be operated using the cursor up/down keys.
The selected item is displayed in reverse.
<table><tr><th>Display</th><th>Motors and solenoids</th></tr><tr><td>INITIAL</td><td>Initial operation</td></tr><tr><td>FJM</td><td>Front side registration motor (FSRM)</td></tr><tr><td>RJM</td><td>Rear side registration motor (RSRM)</td></tr><tr><td>RETM</td><td>Trailing edge registration motor (TERM)</td></tr><tr><td>STAPLER</td><td>Stapler motor (STM)</td></tr><tr><td>PUSOL</td><td>Pick up solenoid (PUSOL)</td></tr></table>3. Press the start key. The operation starts.
Completion
Press the stop/clear key when operation stops. The screen for selecting a maintenance item No. is displayed.</td></tr>
<tr><td>U241</td><td>Checking the finisher switches
Description
Displayes the status of respective switches and sensors in the optional finisher.
Purpose
To check if respective switches and sensors in the optional finisher.
Method
1. Press the start key. The screen for selecting an item is displaued.
2. Select the item to be operated using the cursor up/down keys.
<table><tr><th>Display</th><th>Switches and sensors</th></tr><tr><td>MSFSW</td><td>Tray open/close switch (TOCSW)</td></tr><tr><td>LSFSW</td><td>Left cover switch (LCSW)</td></tr><tr><td>FTPS</td><td>Internal tray sensor (ITS)</td></tr><tr><td>FJHS</td><td>Side registration front home position sensor (SRFHPS)</td></tr><tr><td>RJHS</td><td>Side registration rear home position sensor (SRRHPS)</td></tr><tr><td>REHS</td><td>Trailing edge registration home position sensor (TERHPS)</td></tr><tr><td>STP</td><td>Stapler empty sensor (STES)</td></tr></table>3. Press the start key.
Completion
Press the stop/clear key when operation stops. The screen for selecting a maintenance item No. is displayed.</td></tr>
</table>

Maintenance item No.	Description
U243	**Checking the operation of the DF motors, solenoids and clutch** **Description** Turns the motors, solenoids or clutch in the optional SRDF on (when SRDF is installed). Turns the motors in the optional STDF on (when STDF is installed). **Purpose** To check the operation of the SRDF motors, solenoids and clutch (when SRDF is installed). To check the operation of the STDF motors (when STDF is installed). **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the item to be operated using the cursor up/down keys. 3. Press the start key. The operation starts.

Display	Motors, solenoids and clutch	Operation
F MOT	Original feed motor (OFM)	In operation
C MOT	Original paper conveying motor (OCM)	In operation
FD CL	Original feed clutch (OFCL)	On for 0.5 s
EJ SL	Eject feedshift solenoid (EFSSOL)	On for 0.5 s
RJ SL	Switchback feedshift solenoid (SBFSSOL)	On for 0.5 s
FD SL	Original feed solenoid (OFSOL)	On and off
RP SL	Switchback pressure solenoid (SBPSOL)	On and off

4. To turn each motor off, press the stop/clear key.

Completion

Press the stop/clear key when operation stops. The screen for selecting a maintenance item No. is displayed.

U244 **Checking the DF switches (when installing the optional SRDF)**

Description

Displays the status of the respective switches in the optional SRDF.

Purpose

To check if respective switches in the optional SRDF operate correctly.

Start

1. Press the start key. The screen for selecting an item is displayed.
2. Select the type of switches (SW or VR) to be checked using the cursor up/down keys.
3. Press the start key. The screen for executing is displayed.

Display	Type of switches
SW	On/off switches
VR	Volume switch

Method for the on/off switches

1. Turn the respective switches on and off manually to check the status.
   If the on-status of a switch is detected, the corresponding switch is displayed in reverse.

Display	Switches
SET SW	Original set switch (OSSW)
FEED SW	Original feed switch (OFSW)
REV SW	Original switchback switch (OSBSW)
TMG SW	DF timing switch (DFTSW)
SZ A SW	Original size length switch (OSLSW)

2. To return to the screen for selecting an item, press the stop/clear key.

Method for the volume switch

1. Move the original insertion guides to check the detection status of the original size width switch.
   The detected original width is displayed as a numerical value with the decimals omitted.

Maintenance item No.	Description
U244	

Numerical value	Original width to be detected	
000 ⋮ 49.664	A5R	$5^1/_2" \times 8^1/_2"$
⋮ 50.176 ⋮ 61.440		
⋮ 61.952 ⋮ 103.936	B5R	$8^1/_2" \times 14"$/ $8^1/_2" \times 11"$
⋮ 104.448 ⋮ 139.264	Folio/A4R	
⋮ 139.776 ⋮ 146.432	B4/B5	
⋮ 146.994 ⋮ 197.120		
⋮ 197.632 ⋮ 197.720	CF (11" × 15")	11" × 17"/ 11" × 15"/ $11" \times 8^1/_2"$
⋮ 223.232 ⋮ 256	A3/A4	

For example, if any value between 105 and 139 is displayed when the original insertion guides are adjusted for A4R paper, it indicates that the original width is detected correctly.

2. To return to the screen for selecting an item, press the stop/clear key.

Completion

Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U244	**Checking the DF switches (when installing the optional STDF)** **Description** Displays the status of the respective switches in the optional STDF. **Purpose** To check if respective switches in the optional STDF operate correctly. **Start** 1. Press the start key. The screen for selecting an item is displayed. 2. Press the start key. The screen for executing is displayed. **Method for the on/off switches** 1. Turn the respective switches on and off manually to check the status. If the on-status of a switch is detected, the corresponding switch is displayed in reverse.

Display	Switches
SET SW	Original set switch (PI5)
SZ B SW	Original size width switch B (PI4)
SZ C SW	Original size width switch C (PI3)
SZ D SW	Original size width switch D (PI2)
SZ E SW	Original size width switch E (PI1)
TMG SW	DF timing switch (DFTSW)
SZ A SW	Original size length switch (OSLSW)
SF SW	DF safty switch 2 (DFSSW2)
COV SW	DF safty switch 1 (DFSSW1)

2. To return to the screen for selecting an item, press the stop/clear key.

Completion

Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

U245 **Checking messages**

Description

Displays a list of messages and graphics to be displayed.

Purpose

To check the messages and graphics to be displayed.

Method

1. Press the start key. The screen for selecting an item is displayed.
2. Select either messages or graphics using the cursor up/down keys.
3. Press the start key. The message display screen or graphic display screen is displayed.
4. Enter the message number or graphic number to be checked using the numeric keys and press the start key. The selected message or graphic is displayed.
5. To check the messages in the listing order, use the cursor up/down keys.
6. To return to the screen for selecting an item, press the stop/clear key.

Completion

Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

<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 cursor left/right 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 screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></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
Press the start key. The maintenance count is displayed.
Clearing
1. Select CLEAR using the cursor up/down keys.
2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed.
Setting
1. Enter a six-digit count using the numeric keys.
2. Press the start key. The count is set, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the count, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
U252	**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. The screen for selecting an item is displayed. **Setting** 1. Select the destination using the cursor up/down keys. The selected item is displayed in reverse. 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 screen for selecting a maintenance item No. is displayed. **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. • Initial setting according to the destinations
U253	**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. The screen for selecting an item is displayed. **Setting** 1. Select double or single count using the cursor up/down keys. Initial setting: DOUBLE COUNT 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Display	Description
JAPAN METRIC	Metric (Japan) specifications
INCH	Inch (North America) specifications
EUROPE METRIC	Metric (Europe) specifications
ASIA PACIFIC	Metric (Asia Pacific) specifications

Maintenance item No.	Title	Japan	Inch	Europe Metric, Asia Pacific
253	Switching between double and single counts	Single	Double	Double
255	Setting auto clear time	120 s	90 s	90 s
348	Setting the copy density adjustment range	Normal	Special area	Special area

Display	Description
DOUBLE COUNT	Double count for A3/11" × 17" paper only
SINGLE COUNT	Single count for all size paper

Maintenance item No.	Description
U254	**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. The screen for selecting an item is displayed. **Setting** 1. Select either ON or OFF using the cursor up/down keys. The selected item is displayed in reverse. Display: ON — Auto start function on Display: OFF — Auto start function off Initial setting: ON 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U255	**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 cursor left/right keys. Auto clear time — Setting range: 0 to 270 — Initial setting: 90 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 screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U256	**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. The screen for selecting an item is displayed. **Setting** 1. Select ON or OFF using the cursor up/down keys. The selected item is displayed in reverse. Display: ON — Auto preheat/energy saver function on Display: OFF — Auto preheat/energy saver function off Initial setting: ON 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. 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 screen for selecting a maintenance item No. is displayed.
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. **Setting** 1. Select single or continuous copying using the cursor up/down keys. The selected item is displayed in reverse. Display: SINGLE MODE — Enables only single copying. Display: CONTINUE MODE — Enables single and continuous copying. Initial setting: SINGLE MODE 2. Set the number of copies that can be made using the cursor left/right keys. Description: Number of copies after toner empty detection — Setting range: 0 to 200 (copies) — Initial setting: 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. 3. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

<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 finisher 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. The screen for selecting an item is displayed.
Setting
1. Select the copy count timing using the cursor up/down keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>COUNT: FEED
COUNT: EJECT</td><td>When secondary paper feed starts
When the paper is ejected</td></tr>
</table>
Initial setting: EJECT
2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U265</td><td>
Setting the destination specifications
Description
Sets whether or not to print the product name on the reports that users print.
Purpose
To be set according to user request.
Method
1. Press the start key. The screen for executing is displayed.
2. Enter “0” or “2” using the numeric or cursor right/left keys.
<table>
<tr><th>Setting</th><th>Description</th></tr>
<tr><td>0
2</td><td>Product name printed
Product name not printed</td></tr>
</table>
3. Press the start key. The setting is set.
Completion
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
U330	**Setting the number of sheets to enter stacking mode during sort operation** **Description** When sort copying is set to perform automatically in the output form setting of the user simulation, sets the number of sheets at which the eject location is switched to the optional finisher (only when the finisher is installed). **Purpose** To be set as required according to the number of copies the user makes. **Method** 1. Press the start key. The screen for executing is displayed. 2. Set the number of sheets (o to 100) using the numeric keys or cursor right/left keys. 3. Press the start key. The setting is set. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
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. The screen for selecting an item is displayed. 2. Select the paper size. 3. Change the setting using the cursor up/down keys. The size conversion factor can be set separately for the copier mode (COPY), the printer mode (PRI) and the fax mode (FAX) at the screen for setting the size conversion factor.

Metric models

Display	Description	Setting range	Initial setting		
			COPY	PRI	FAX
A3	Size conversion factor for A3	0.0 to 3.0	2.0	2.0	2.0
B4	Size conversion factor for B4	0.0 to 3.0	1.5	1.5	1.5
A4	Size conversion factor for A4	0.0 to 3.0	1.0	1.0	1.0
B5	Size conversion factor for B5	0.0 to 3.0	0.7	0.7	0.7
A5	Size conversion factor for A5	0.0 to 3.0	0.5	0.5	0.5
B6	Size conversion factor for B6	0.0 to 3.0	0.5	0.5	0.5
A6	Size conversion factor for A6	0.0 to 3.0	0.5	0.5	0.5
POST	Size conversion factor for postcard	0.0 to 3.0	0.5	0.5	0.5
FOL	Size conversion factor for folio	0.0 to 3.0	1.5	1.5	1.5
ECT	Size conversion factor for non-standard sizes	0.0 to 3.0	1.0	1.0	1.0

Inch models

Display	Description	Setting range	Initial setting		
			COPY	PRI	FAX
11 × 17	Size conversion factor for 11" × 17"	0.0 to 3.0	2.0	2.0	2.0
8.5 × 14	Size conversion factor for 8.5" × 14"	0.0 to 3.0	1.5	1.5	1.5
8.5 × 11	Size conversion factor for 8.5" × 11"	0.0 to 3.0	1.0	1.0	1.0
8.5 × 5.5	Size conversion factor for 8.5" × 5.5"	0.0 to 3.0	0.5	0.5	0.5
ECT	Size conversion factor for non-standard sizes	0.0 to 3.0	1.0	1.0	1.0

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

Completion

To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item is displayed.

Maintenance item No.	Description
U342	**Setting the ejection restriction** **Description** Sets or cancels the restriction on the number of sheets to be ejected continuously when the internal eject tray is selected as the eject location. **Purpose** According to user request, sets or cancels restriction on the number of sheets. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select ON or OFF using the cursor up/down keys. Display: ON — Description: Sets restriction on the number of sheets Display: OFF — Description: Cancels restriction on the number of sheets Details of restriction (number of sheets to be ejected continuously after the start key is pressed) Condition: When no optional ejection device is installed — Number of sheets: 250 Condition: When the job separator or duplex unit is installed — Number of sheets: 150 Condition: When the finisher is installed — Number of sheets: 100 3. Press the start key. **Completion** Press the stop/clear key at the screen for selectiong an item. The screen for selectiong a maintenance item No. is displayed.
U343	**Switching between duplex/simplex copy mode** **Description** Switches the initial setting between duplex and simplex copy. **Purpose** To be set according to frequency of use: set to the more frequently used mode. **Method** Press the start key. The screen for selecting an item is displayed. **Setting** 1. Select ON or OFF using the cursor up/down keys. Display: ON — Description: Duplex copy Display: OFF — Description: Simplex copy Initial setting: OFF 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

Maintenance item No.	Description
U344	**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. The screen for selecting an item is displayed. **Setting** 1. Select control mode using the cursor up/down keys. **Display** / **Control in preheat mode** INSTANT READY — Without decreasing the fixing control temperature, the display on the operation panel is turned off. ENERGY STAR — The fixing control temperature is set at 70°C/158°F. The copier is forcibly stabilized 30 s after exiting preheat/energy saver mode. TIME SERVE — The fixing control temperature is set at 130°C/266°F. Initial setting: ENERGY STAR 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U345	**Setting the value for maintenance due indication** **Description** Sets when to display a message notifying 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 message is displayed. **Purpose** To change the time to display the maintenance due indication. **Method** Press the start key. The current setting is displayed. **Setting** 1. Change the setting using the numeric or cursor left/right keys. **Description** / **Setting range** Display period for the next maintenance (remaining count before the end of the maintenance cycle) — 0 to 9999 Initial setting: 0 2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed. **Completion** To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.

<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. The screen for selecting an item is displayed.
Setting
1. Select the density range using the cursor up/down keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>SPECIAL AREA
NORMAL</td><td>11/15 steps (enlargement mode)
5/9 steps</td></tr>
</table>
Initial setting: SPECIAL AREA
2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U402</td><td>
Adjusting margins of image printing
Adjustment
See page 1-6-15.
</td></tr>
<tr><td>U403</td><td>
Adjusting margins for scanning an original on the contact glass
Adjustment
See page 1-6-38.
</td></tr>
</table>

Maintenance item No.	Description
U404	**Adjusting margins for scanning an original from the DF**

Description

Adjusts margins for scanning the original from the DF.

Purpose

Used if margins are not correct when the optional DF is used.

Caution

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

U402 → U403 → U404

Method

Press the start key. The screen for selecting an item is displayed.

Setting

1. Select the item to be set using the cursor up/down keys. The selected item is displayed in reverse.
2. Change the setting using the cursor left/right keys.

Display	Description	Setting range	Initial setting	Change in value per step
A MGN	Left margin	0 to 10	2	0.5 mm
B MGN	Leading edge margin	0 to 10	3	0.5 mm
C MGN	Right margin	0 to 10	2	0.5 mm
D MGN	Trailing edge margin	0 to 10	2	0.5 mm

Increasing the setting makes the margin wider, and decreasing it makes the margin narrower.

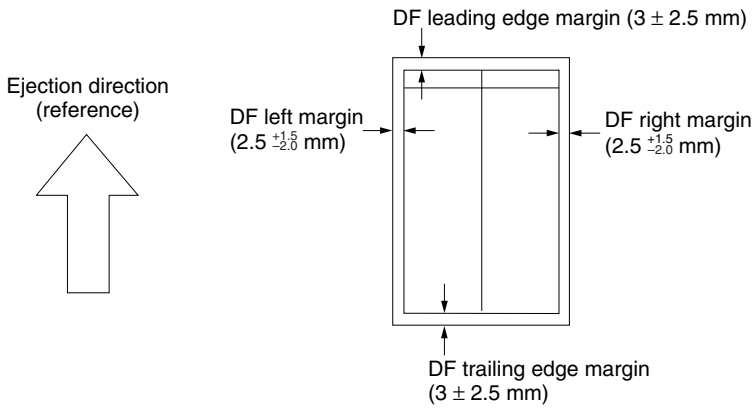


Figure 1-4-7 Correct margin amount

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

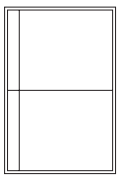
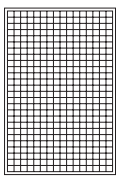
Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U407</td><td>
Adjusting the leading edge registration for memory image printing
Adjustment
See page 1-6-12.
</td></tr>
<tr><td>U901</td><td>
Checking/clearing copy counts by paper feed locations
Description
Displays or clears copy counts by paper feed locations.
Purpose
To check the time to replace consumable parts. Also to clear the counts after replacing the consumable parts.
Method
1. Press the start key. The counts by paper feed locations are displayed.
2. Change the screen using the cursor left/right keys.
<table>
<tr><th>Display</th><th>Paper feed locations</th></tr>
<tr><td>BYPASS</td><td>Bypass tray</td></tr>
<tr><td>FIRST</td><td>Upper drawer</td></tr>
<tr><td>SECOND</td><td>Lower drawer</td></tr>
<tr><td>THIRD</td><td>Optional drawer 1*</td></tr>
<tr><td>FORTH</td><td>Optional drawer 2*</td></tr>
<tr><td>DUPLEX</td><td>Duplex unit*</td></tr>
</table>
*Optional.
When an optional paper feed device is not installed, the corresponding count is not displayed.
Clearing
1. Select the count to be cleared using the cursor up/down keys. The selected item is displayed in reverse. To clear the counts for all paper feed locations, select ALL using the cursor up/down keys.
2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed.
Completion
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U903</td><td>
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. The jam count is displayed by jam codes.
2. Change the screen using the cursor left/right keys.
Clearing
1. Select ALL using the cursor up/down keys. Jam counts cannot be cleared individually.
2. Press the start key. The count is cleared, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
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. The service call count is displayed by service call codes. 2. Change the screen using the cursor left/right keys. **Clearing** 1. Select the count to be cleared using the cursor up/down keys. The selected count is displayed in reverse. To clear all counts, select ALL using the cursor up/down keys. 2. Press the start key. The count is cleared. When all counts are cleared, the screen for selecting a maintenance item No. is displayed. **Completion** Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
U905	**Checking/clearing counts by optional devices** **Description** Displays or clears the counts of the optional SRDF/STDF or finisher. **Purpose** To check the use of the SRDF/STDF and finisher. Also to clear the counts after replacing consumable parts. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Select the device, the count of which is to be checked using the cursor up/down keys. The count of the selected device is displayed. • SRDF/STDF (DF) **Display** / **Description** CHANGE — Original replacement count ADF — No. of single-sided originals that has passed through the DF in ADF mode RADF — No. of double-sided originals that has passed through the DF in RADF mode • Finisher (SORTER) **Display** / **Description** CP CNT — No. of copies that has passed STAPLE — Frequency the stapler has been activated **Clearing** 1. Select the item to be cleared using the cursor up/down keys. The selected item is displayed in reverse. 2. Press the start key. The count is cleared. 3. To return to the screen for selecting an item, press the stop/clear key. **Completion** Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.

<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 EXECUTE using the cursor up/down keys.
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>
<tr><td>U908</td><td>
Changing the total counter value
Description
Displays, clears and changes the total counter value.
Purpose
To check the total counter value.
Method
1. Press the start key. The total counter value is displayed.
Clear
1. Select CANCEL using the cursor up/down keys.
2. Press the start key. The value is cleared.
Setting
1. Enter a six-digit value using the numeric keys.
2. Press the start key. The value is set.
Completion
To exit this maintenance item without changing the current total counter value, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U910</td><td>
Clearing the black ratio data
Description
Clears the accumulated black ratio data for A4 sheets.
Purpose
To clear data as required at times such as during maintenance service.
Method
1. Press the start key. The screen for selecting an item is displayed.
2. Select EXECUTE using the cursor up/down keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>CANCEL
EXECUTE</td><td>Do not clear the black ratio data
Clears the black ratio data</td></tr>
</table>
3. Press the start key. The accumulated black ratio data is cleared, and the screen for selecting a maintenance item is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item is displayed.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U914</td><td>
Switching between fax and copier modes
Description
Selects whether the fax or copier mode is given priority when the optional facsimile kit is installed to use the copier as a fax.
Purpose
To select the mode that is used more frequently by the user.
Method
Press the start key. The screen for selecting an item is displayed.
Setting
1. Select the priority mode (fax mode or copier mode) using the cursor up/down keys.
2. Press the start key. The screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</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. The screen for selecting an item is displayed.
2. Select READ or WRITE using the cursor up/down keys.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>READ
WRITE</td><td>Reading out the backup data
Writing 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 when operation stops. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U990</td><td>
Checking/clearing the time for the exposure lamp to light
Description
Displays, clears or changes 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
Press the start key. The accumulated time of illumination for the exposure lamp is displayed in minutes.
Clearing
1. Select CLEAR using the cursor up/down keys.
2. Press the start key. The accumulated time is cleared, and the screen for selecting a maintenance item No. is displayed.
Setting
1. Enter a six-digit accumulated time using the numeric keys.
2. Press the start key. The time is set, and the screen for selecting a maintenance item No. is displayed.
Completion
To exit this maintenance item without changing the accumulated time, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U992</td><td>
Checking or clearing the printer/fax count
Description
Displays, clears or changes the print count of the printer or fax when the optional printer board or fax unit is installed.
Purpose
To check the frequency of use of the printer or fax.
Method
Press the start key. The print count of the printer and fax are displayed.
Setting
1. Select the count to be cleared using the cursor up/down keys.
2. Enter a six-digit count using the numeric keys.
To clear the counts for both printer and fax, press the reset key.
3. Press the start key.
Completion
Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.
</td></tr>
<tr><td>U993</td><td>
Outputting a VTC-PG pattern
Description
Selects and outputs a VTC-PG pattern created in the copier.
Purpose
When performing respective image printing adjustments, used to check the machine status apart from that of the scanner with a non-scanned output VTC-PG pattern.
Method
1. Press the start key. The screen for selecting an item is displayed.
2. Select the VTC-PG pattern to be output using the cursor up/down keys.
<table>
<tr><th>Display</th><th>PG pattern to be output</th><th>Purpose</th></tr>
<tr><td>VTC-PG1</td><td>  </td><td>• Center line adjustment</td></tr>
<tr><td>VTC-PG2</td><td>  </td><td>• Lateral squareness adjustment
• Magnification adjustment</td></tr>
<tr><td>VTC-PG3</td><td>  </td><td>———————</td></tr>
</table>
3. Press the interrupt key. The copy mode screen is displayed.
4. Press the start key. A VTC-PG pattern is output.
Completion
Press the stop/clear key at the screen for selecting an item. The screen for selecting a maintenance item No. is displayed.
</td></tr>
</table>

Maintenance item No.	Description
U998	**Outptting the memory list** **Description** Outputs the list of memory. **Purpose** To output the list as required. **Method** 1. Press the start key. The screen for selecting an item is displayed. 2. Enter the six digits of address using the numeric keys. To enter alphabets, press the keys shown below as required. 3. Press the interrupt key to output the list. **Completion** Press the stop/clear key. The screen for selectiong a maintenance item No. is displayed.

Key	Symbol
*/Language key	A
Scanner key	B
On-line/Printer key	C
Margin/Border Erase/Book Erase key	D
Duplex/Split Page key	E
Layout key	F

(4) Maintenance mode item list (for 15 cpm copier)

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 • Feed data	 0 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
	U070	Adjusting the DF magnification	0
	U071	Adjusting the DF scanning timing	0
	U072	Adjusting the DF center line	0
	U073	Checking scanner operation	—
	U074	Adjusting the DF input light luminosity	1
	U075	Setting the original size detection	On
	U087	Turning the DF scanning position adjust mode on/off	On
	U088	Setting the input filter (moiré reduction mode)	Off
	U091	Checking shading	—
	U092	Adjusting the scanner automatically	—
	U093	Setting the exposure density gradient • Text/text and photo/photo mode	 0
	U099	Checking the original size detection	—

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
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	—
	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	—
	U203	Operating DF separately	—
	U204	Setting the presence or absence of a key card or key counter	—
	U207	Checking the operation panel keys	—
	U243	Checking the operation of the DF motors	—
	U244	Checking the DF switches	—
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
	U265	Setting the destination specifications	0
	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

* Initial setting for executing maintenance item U020

Section	Item No.	Maintenance item contents	Initial setting*
Image processing	U402	Adjusting margins of image printing	—
	U403	Adjusting margins for scanning an original on the contact glass	—
	U404	Adjusting margins for scanning an original from the DF	—
	U407	Adjusting the leading edge registration for memory image printing	—
Others	U901	Checking/clearing copy counts by paper feed locations	—
	U903	Checking/clearing the paper jam counts	—
	U904	Checking/clearing the service call counts	—
	U905	Checking/clearing counts by optional devices	—
	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	—
	U992	Checking or clearing the printer count	—
	U993	Outputting a VTC-PG pattern	—
	U998	Outputting the memory list	—

* Initial setting for executing maintenance item U020

(5) Contents of maintenance mode items (for 15 cpm copier)

<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" × 8 1/2" paper is available, a report of this size is output. If not, specify the paper feed location.
When output is complete, the selected item appears.
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.
</td></tr>
<tr><td>U001</td><td>
Exiting the maintenance mode
Description
Exits the maintenance mode and returns to the normal copy mode.
Purpose
To exit the maintenance mode.
Method
Press the start key. The normal copy mode is entered.
</td></tr>
<tr><td>U004</td><td>
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
P-d</td><td>Only the copier operates.
Both the copier and DF operate (continuous operation).</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>

Maintenance item No.	Description
U021	**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. Display: ––– / on — Operation: Canceling initialization / Executing initialization 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.
U022	**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. Display: ––– / on — Operation: Canceling initialization / Executing initialization 4. Press the start key. The data for the optical section (U060 to 099, U403, U404 and U990) is initialized. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.
U030	**Checking motor operation** **Description** Drives each motor. **Purpose** To check the operation of each motor. **Method** 1. Press the start key. A selection item appears. 2. Select the motor to be operated using the copy exposure adjustment keys. 3. Press the start key. The selected motor operates. Display: A — Motor: Drive motor (DM) Display: F1 — Motor: Drawer drive motor (DDM)* Display: F2 — Motor: Drawer drive motor (ST) 1 (DDM(ST)1)* Display: F3 — Motor: Drawer drive motor (ST) 2 (DDM(ST)2)* * Optional 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.

Maintenance item No.	Description
U031	**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. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.
U032	**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. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.

Original size indicator	Switch
A3/11" × 17"	Eject switch (ESW)
A4R/8$^1/_2$" × 14"	Job separator eject switch (JBESW)*
A4/8$^1/_2$" × 11"	Registration switch (RSW)
B4/LED below 8$^1/_2$" × 11"	Drawer feed switch (DFSW)*
B5R/5$^1/_2$" × 8$^1/_2$"	Drawer feed switch (ST) (DFSW(ST))*

* Optional.

Display	Clutch
P1	Upper paper feed clutch (PFCL-U)
Pb	Bypass paper feed clutch (BYPPFCL)
F1	Lower paper feed clutch (PFCL-L)*
F2	Paper feed clutch (ST) 1 (PFCL(ST)1)*
F3	Paper feed clutch (ST) 2 (PFCL(ST)2)*
2F	Registration clutch (RCL)

* Optional.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U033</td><td>
Checking solenoid operation
Description
Turns each solenoid on.
Purpose
To check the operation of each 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>b1
b2
A</td><td>Turning the feedshift solenoid (FSSOL)* on
Turning the feedshift solenoid (FSSOL)* off
Turning the main switch off</td></tr>
</table>
* Optional.
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 1-6-10 and 13.
</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 1-6-17.
</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

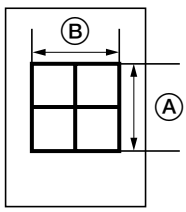


Figure 1-4-8

Adjustment
1. Output an A3/11" × 17" VTC pattern in interrupt mode.
2. Measure Ⓐ and Ⓑ on the VTC pattern (Figure 1-4-8), 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.

Maintenance item No.	Description
U060	**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. Description: Image scanning density; Setting range: 0 to 23; Initial setting: 12 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
U061	**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.
U063	**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. Description: Shading position; Setting range: –5 to +5; Initial setting: 0; Change in value per step: 0.17 mm 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.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U065</td><td>Adjusting the scanner magnification
Adjustment
See pages 1-6-32 and 34.</td></tr>
<tr><td>U066</td><td>Adjusting the leading edge registration for scanning an original on the contact glass
Adjustment
See page 1-6-36.</td></tr>
<tr><td>U067</td><td>Adjusting the center line for scanning an original on the contact glass
Adjustment
See page 1-6-37.</td></tr>
<tr><td>U070</td><td>Adjusting the DF magnification
Description
Adjusts the DF original scanning speed.
Purpose
To be executed if the correct magnification is not obtained in the auxiliary scanning direction when the optional SRDF is used.
Caution
Before making this adjustment, ensure that the following adjustments have been made in maintenance mode.
U053 → U065 → U070
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><th>Change in value per step</th></tr>
<tr><td>Original conveying motor speed</td><td>–25 to +25</td><td>0</td><td>0.1%</td></tr>
</table>
Increasing the setting makes the image longer, and decreasing it makes the image shorter.
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. The indication for selecting a maintenance item No. appears.</td></tr>
</table>

Maintenance item No.	Description
U071	**Adjusting the DF scanning timing**

Description
Adjusts the DF original scanning timing.

Purpose
To be executed if there is a regular error between the leading or trailing edges of the original and the copy image when the optional DF is used.

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

U034 → U066 → U071

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	Change in value per step
Exp. 1	DF leading edge registration	–32 to +32	0	0.19 mm
Exp. 2	DF trailing edge registration	–32 to +32	0	0.19 mm

Increasing the setting moves the copy image backward, and decreasing it moves the copy image forward.

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.

Adjustment
1. In interrupt copy mode, make a copy using the DF.
2. Check the copy image and adjust the registration as follows.
   For copy example 1, increase the setting of exp. 1.
   For copy example 2, decrease the setting of exp. 1.

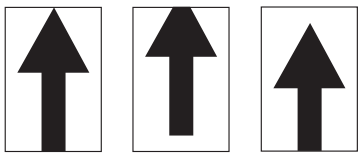


Figure 1-4-9

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

Maintenance item No.	Description
U072	**Adjusting the DF center line** **Description** Adjusts the scanning start position for the DF original. **Purpose** To be executed if there is a regular error between the centers of the original and the copy image when the optional DF is used. **Caution** Before making this adjustment, ensure that the following adjustments have been made in maintenance mode. U034 → U067 → U072 **Method** Press the start key. **Setting** 1. Change the setting using the zoom +/– keys.

Description	Setting range	Initial setting	Change in value per step
DF center line	–39 to +39	0	0.17 mm

Increasing the setting moves the image to the right, and decreasing it moves the image to the left.

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.

Adjustment
1. In interrupt copy mode, make a copy using the DF.
2. Check the copy image and adjust the center line as follows.
   For copy example 1, increase the setting.
   For copy example 2, decrease the setting.

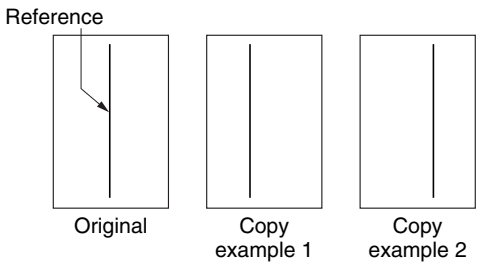


Figure 1-4-10

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

Maintenance item No.	Description
U073	**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.

Copy exposure indicator	Operating conditions	Setting range
Exp. 1 Exp. 2 Exp. 3	Magnification Paper size On and off of the exposure lamp	50 to 200% See below. on or off

Paper size for each setting

Setting	Paper size	Setting	Paper size
8	A4	42	A5R
9	B5	47	Folio
24	11" × 8 1/2"	52	11" × 17"
36	A3	53	11" × 15"
39	B4	55	8 1/2" × 14"
40	A4R	56	8 1/2" × 11"
41	B5R	58	5 1/2" × 8 1/2"

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.

U074	**Adjusting the DF input light luminosity** **Description** Adjusts the luminosity of the exposure lamp for scanning originals from the optional DF. **Purpose** Used if the exposure amount differs significantly between when scanning an original on the contact glass and when scanning an original from the DF. **Method** Press the start key. **Setting** 1. Change the setting using the zoom +/– keys.

Description	Setting range	Initial setting
DF input light luminosity	0 to 8	1

Increasing the setting makes the luminosity higher, and decreasing it makes the luminosity lower.

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. The indication for selecting a maintenance item No. appears.

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U075</td><td>
Setting the original size detection
Description
Sets whether or not to detect the original size automatically using the original size detection sensor (OSDS).
Purpose
On the metric specifications of the European models, set to “on” when an optional original size detection sensor is installed.
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>Original size detected
Original size not detected</td></tr>
</table>
Initial setting: on
2. Press the start key. The setting is set. The indication for selecting a maintenance item No. appears.
Completion
To exit this maintenance item without changing the current setting, press the stop/clear key. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

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

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

Setting the mode on/off

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

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

Initial setting: on

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

Setting the reference data for identifying dust

Available only when the mode is turned on.

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

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

Example

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

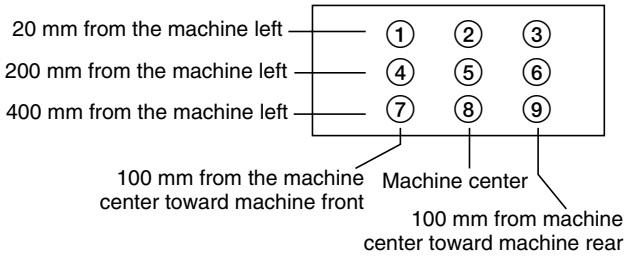
2. Press the start key. The value is set.

Completion

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

<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U088</td><td>
Setting the input filter (moiré reduction mode)
Description
Turns moiré reduction mode on and off by switching the input filter on and off.
Purpose
Used to prevent regular density unevenness (moiré) on halftone image areas of the copy image in text mode and text and photo mode. Such moiré is more likely to appear when an enlargement or reduction copy is made in text mode from an original containing large halftone image areas.
Method
Press the start key.
Setting
1. Select “on” or “oFF” using the zoom +/– keys. 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>U091</td><td>
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.
<table>
<tr><th>Display</th><th>Output list</th></tr>
<tr><td>on
oFF</td><td>Performs scanning before shading and displays the result.
Performs scanning after shading and displays the result.</td></tr>
</table>
</td></tr>
</table>

Maintenance item No.	Description
U091 (cont.)	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 1-4-11.



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 1-4-11

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.

Maintenance item No.	Description
U092	**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.

Copy exposure indicator	Setting value
Exp. 2	Scanner center line
Exp. 3	Scanner leading edge registration
Exp. 4	Scanner magnification in the auxiliary scanning direction

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.

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.

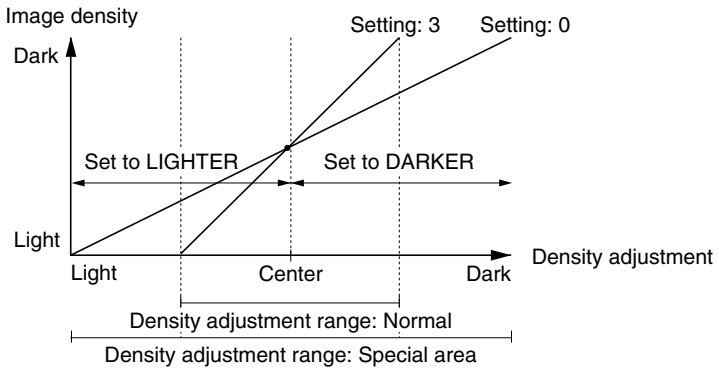


Figure 1-4-12 Exposure density gradient

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.

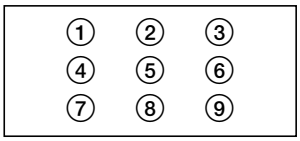
Completion
Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.

Maintenance item No.	Description
U099	**Checking the original size detection** **Description** Displays the original width detection data and sets the original width detection threshold. **Purpose** To check the original width detection. Also to change the original size detection threshold if the size of the original on the contact glass is detected incorrectly. **Start** 1. Press the start key. A selection item appears. 2. Select the item using the image mode selection key. 3. Press the start key. The machine enters the execution mode.

Display	Description
dA	Checking the original width detection data
LE	Setting or checking the original width detection threshold

Method to display the original width detection data

1. Place an original on the contact glass and turn the original detection switch on. The exposure lamp turns on and the width of the original is detected. The scanner data taken at the nine points from (1) at the machine rear to (9) at the machine front is displayed.
   The data is displayed within the range of 000 to 255, 000 indicating white (original present) and 255 indicating black (no original).
2. Change the point to display the detection data by lighting a copy exposure indicator or making one flash using the copy exposure adjustment keys. For the correspondence between the detection point and the copy exposure indicators, see Figure 1-4-13.



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 1-4-13

3. Press the stop/clear key. The selected item appears.

Maintenance item No.	Description
U099 (cont.)	**Method to set or check the original size detection threshold** 1. Place an original on the contact glass and turn the original detection switch on. The original size detection starts and detection data is displayed. 2. Change the detection item by lighting a copy exposure indicator using the copy exposure adjustment keys.

Copy exposure indicator	Description	Data range	Remarks	Initial setting
Exp. 1	Scanner data threshold	0 to 255	Adjustable	170
Exp. 2	Time between original detection switch turning on and reading-in of scanner data	0 to 100 ms	Adjustable	50
Exp. 3	Detected original width	0 to 350 mm		———
Exp. 4	Original size detected by scanner data and original size sensor detection data	0 to 63*		———

* See Paper size in U073 for the paper size for each setting.

3. To change the original size detection threshold, light exp. 1 or 2 and change the setting using the zoom +/– keys.
4. Press the start key. The value is set.
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.

Maintenance item No.	Description
U100	**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.

Display (copy exposure indicator)	Description
——— (exp. 1) on1 (exp. 2) on2 (exp. 3)	Changing the grid control voltage Turning the main charger on Turning the main charger on and the laser scanner unit on and off

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.

Description	Setting range	Initial setting
Grid control voltage	0 to 255	184

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.

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.

Maintenance item No.	Description
U109	**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. Display / Description: G – Type G; H – Type H; J – Type J 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.
U110	**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. Copy exposure indicator / Description / Setting range / Initial setting: Exp. 1 – First 3 digits – 000 to 999 – 000; Exp. 2 – Last 3 digits – 000 to 999 – 000; Exp. 3 – Clearing the count – ——— – ——— **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.

U111 — **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.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First 2 digits	00 to 59 (min)	00
Exp. 2	Last 3 digits	000 to 999 (min)	000
Exp. 3	Clearing the drive time	———	———

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.

U130 — **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.

Copy exposure indicator	Description
Exp. 1	Toner sensor output value
Exp. 2	Toner sensor control voltage
Exp. 3	Toner feed start level
Exp. 4	Absolute humidity

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.

Maintenance item No.	Description
U131	**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. Description: Toner sensor control voltage; Setting range: 0 to 255; Initial setting: 155 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.
U132	**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. Exp. 1: Toner sensor output value after start key is pressed Exp. 2: Current toner feed start level Exp. 3: Current toner sensor control voltage Exp. 4: Absolute humidity 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.
U135	**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.

Maintenance item No.	Description
U155	**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. 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.

Copy exposure indicator	Description
Exp. 1	Toner sensor output value after start key is pressed
Exp. 2	Current toner feed level (value corrected based on humidity and drive time)
Exp. 3	Current toner sensor control voltage
Exp. 4	Absolute humidity

U156 — **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.

Copy exposure indicator	Description
Exp. 1	Toner feed start level
Exp. 2	Difference between the toner feed start level and toner empty level

Setting for the toner feed start level
1. Change the setting using the zoom +/– keys.

Description	Setting range
Toner feed start level	0 to 255

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.

Description	Setting range
Difference between the toner feed start level and the toner empty level	0 to 255

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.

Maintenance item No.	Description
U157	**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.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First 2 digits	00 to 59 (min)	00
Exp. 2	Last 3 digits	000 to 999 (min)	000
Exp. 3	Clearing the drive time	———	———

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.

U158 **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.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First 3 digits	000 to 999	000
Exp. 2	Last 3 digits	000 to 999	000
Exp. 3	Clearing the count	———	———

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.

<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>
<tr><td>U203</td><td>
Operating DF separately
Description
Simulates the original conveying operation separately in the optional DF.
Purpose
To check the DF.
Method
1. Press the start key.
2. Place an original in the DF if running this simulation with paper.
3. Select the item to be operated using the copy exposure adjustment keys.
<table>
<tr><th>Display (copy exposure indicator)</th><th>Operation</th></tr>
<tr><td>d-P (exp. 1)
d-n (exp. 2)</td><td>With paper, single-sided original
Without paper, single-sided original (continuous operation)</td></tr>
</table>
4. Press the start key. The operation starts.
5. To stop continuous operation, press the stop/clear key.
Completion
Press the stop/clear key when the operation stops. The indication for selecting a maintenance item No. appears.
</td></tr>
</table>

Maintenance item No.	Description
U204	**Setting the presence or absence of a key card or key counter** **Description** Sets the presence or absence of the optional key card or key counter. **Purpose** It is not necessary to run this maintenance item if a key card is installed on a 120 V specification machine. A key card is not available for 220 – 240 V specifications. **Method** Press the start key. **Setting** 1. Select the optional counter to be installed using the zoom +/– keys. Display: ––– / C-1 / C-2 — Description: None / The key card is installed / The key counter is installed 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.
U207	**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.
U243	**Checking the operation of the DF motors** **Description** Turns the motors in the optional DF on. **Purpose** To check the operation of the DF motors. **Method** 1. Press the start key. 2. Select the motor to be operated using the copy exposure adjustment keys. 3. Press the start key. The operation starts. Display (copy exposure indicator): F-0 (exp. 1) / C-0 (exp. 2) — Motor: Original feed motor (OFM) / Original paper conveying motor (OCM) 4. To turn each motor off, press the stop/clear key. **Completion** Press the stop/clear key when operation stops. The indication for selecting a maintenance item No. appears.

Maintenance item No.	Description
U244	**Checking the DF switches** **Description** Displays the status of the switches in the optional DF. **Purpose** To check if switches in the optional DF operate correctly. **Method** 1. Press the start key. 2. Manually turn on and off each switch to check the status. When the on-status of a switch is detected, the original size indicator or other LED corresponding to the operated switch on the operation panel lights.

LED	Switch
A3/11" × 17"	Original set switch (PI5)
A4R/8$^1/_2$" × 14"	Original size width switch B (PI4)
A4/8$^1/_2$" × 11"	Original size width switch C (PI3)
B4/LED below 8$^1/_2$" × 11"	Original size width switch D (PI2)
B5R/5$^1/_2$" × 8$^1/_2$"	Original size width switch E (PI1)
B5/11" × 8$^1/_2$"	DF timing switch (DFTSW)
Folio/11" × 15"	Original size length switch (OSLSW)
Maintenance indicator	DF safety switch 2 (DFSSW2)
Memory overflow indicator	DF safety switch 1 (DFSSW1)

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

U250 — **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.

Description	Setting range	Initial setting	Change in value per step
Maintenance cycle	0 to 600	100	1000 (copies)

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.

Maintenance item No.	Description
U251	**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. **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.
U252	**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. 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. • Initial setting according to the destinations

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First 3 digits	000 to 999	000
Exp. 2	Last 3 digits	000 to 999	000
Exp. 3	Clearing the count	———	———

Display	Description
JPn	Metric (Japan) specifications
Inc	Inch (North America) specifications
EUP	Metric (Europe) specifications
ASA	Metric (Asia Pacific) specifications

Maintenance item No.	Title	Japan	Inch	Europe Metric, Asia Pacific
253	Switching between double and single counts	Single	Double	Double
255	Setting auto clear time	120 s	90 s	90 s
348	Setting the copy density adjustment range	Normal	Special area	Special area

Maintenance item No.	Description
U253	**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. Display: d-C — Description: Double count for A3/11" × 17" paper only Display: S-C — Description: Single count for all size paper 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.
U254	**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. Display: on — Description: Auto start function on Display: oFF — Description: Auto start function off 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.

<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 Con	Enables only single copying. 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>
<tr><td>U265</td><td>
Setting the destination specifications
Description
Sets whether or not to print the product name on the reports that users print.
Purpose
To be set according to user request.
Method
Press the start key. The current setting appears.
Setting
1. Enter “0” or “2” using the numeric or zoom +/– keys.
<table>
<tr><th>Setting</th><th>Description</th></tr>
<tr><td>0
2</td><td>Product name printed
Product name not printed</td></tr>
</table>
Initial setting: 0
2. Press the start key. The setting is set.
Completion
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 copier or printer mode by lighting image mode LEDs using the image mode selection key.
3. 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
Setting for the printer 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
Setting for the printer 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.

Maintenance item No.	Description
U342	**Setting the ejection restriction** **Description** Sets or cancels the restriction on the number of sheets to be ejected continuously when the internal eject tray is selected as the eject location. When the restriction is set, the number of sheets that can be ejected continuously to the internal eject tray will be limited as shown below.

	No. of sheets to be ejected to the internal eject tray
When the job separator is not installed	250
When the job separator is installed	150

Purpose
According to user request, sets or cancels restriction on the number of sheets.

Method
Press the start key.

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

Display	**Description**
on	The number of sheets restricted.
oFF	The number of sheets not restricted.

Initial setting: on

2. Press the start key. The setting is set. The indication for selecting a maintenance item No. appears.

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

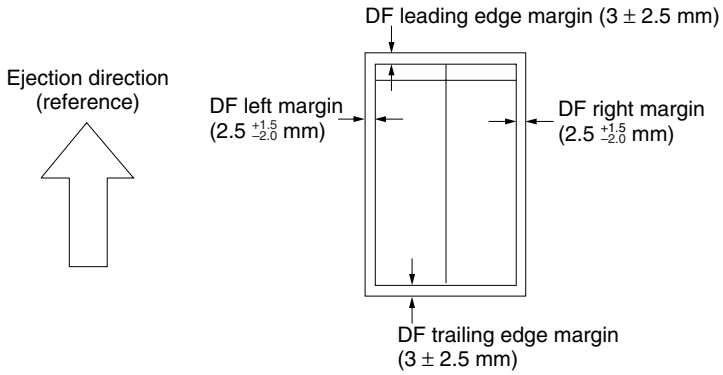
Maintenance item No.	Description
U344	**Setting preheat/energy saver mode** **Description** Changes the control for preheat/energy saver mode. **Purpose** According to user request, selects which has priority, the recovery time from preheat or energy saver. **Method** Press the start key. **Setting** 1. Select control mode using the zoom +/– keys. 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.

Display	Control in preheat mode
InS (instant ready)	Without decreasing the fixing control temperature, the display on the operation panel is turned off.
ESr (energy star)	The fixing control temperature is set at 70°C/158°F. The copier is forcibly stabilized 30 s after exiting preheat/energy saver mode.
Prh (priority to recovery time)	The fixing control temperature is set at 130°C/266°F.

Maintenance item No.	Description
U345	**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. 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.

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First digit	0 to 9	0
Exp. 2	Last 3 digits	000 to 999	000

Maintenance item No.	Description
U348	**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. Display: SPC (special area) / nrL (normal) — Description: 11/15 steps (enlargement mode) / 5/9 steps 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.
U402	**Adjusting margins of image printing** **Adjustment** See page 1-6-15.
U403	**Adjusting margins for scanning an original on the contact glass** **Adjustment** See page 1-6-38.
U404	**Adjusting margins for scanning an original from the DF** **Description** Adjusts margins for scanning the original from the DF. **Purpose** Used if margins are not correct when the optional DF is used. **Caution** Before making this adjustment, ensure that the following adjustments have been made in maintenance mode. U402 → U403 → U404 **Method** Press the start key. The screen for selecting an item is displayed. **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 / Change in value per step: Exp. 1 / Left margin / 0.0 to +10.0 / 2 / 0.5 mm Exp. 2 / Leading edge margin / 0.0 to +10.0 / 3 / 0.5 mm Exp. 3 / Right margin / 0.0 to +10.0 / 2 / 0.5 mm Exp. 4 / Trailing edge margin / 0.0 to +10.0 / 2 / 0.5 mm Increasing the setting makes the margin wider, and decreasing it makes the margin narrower.

Maintenance item No.	Description
U404 (cont.)	 **Figure 1-4-14 Correct margin amount** 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 while a selection item is displayed. The indication for selecting a maintenance item No. appears.
U407	**Adjusting the leading edge registration for memory image printing** **Adjustment** See page 1-6-12.

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 paper source 1 copy count Last 3 digits of paper source 1 copy count Clearing the count (CLE)
3	○ Auto Exposure ● Text & Photo ● Photo ● Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of paper source 2* copy count Last 3 digits of paper source 2* copy count Clearing the count (CLE)
4	● Auto Exposure ● Text & Photo ● Photo ● Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of paper source 3* copy count Last 3 digits of paper source 3* copy count Clearing the count (CLE)
5	● Auto Exposure ● Text & Photo ● Photo ☼ Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of paper source 4* copy count Last 3 digits of paper source 4* copy count Clearing the count (CLE)
6	● Auto Exposure ● Text & Photo ☼ Photo ☼ Text		Exp. 1	Clearing all counts (CLE)

○ : Off, ● : On, ☼: Flashing

* Optional

Note: When no optional paper feed device is installed, the counts corresponding to optional paper feed devices will not appear.

Clearing copy counts by paper feed locations

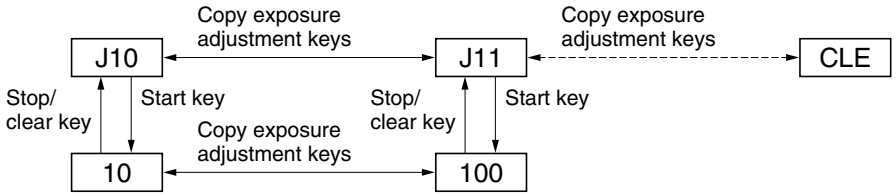
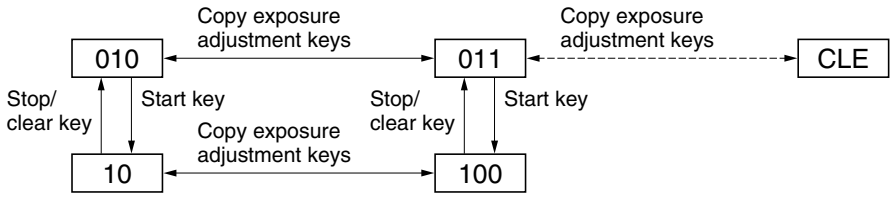
1. Select the paper feed location to clear the count.
2. Light exp. 3 using the copy exposure adjustment key.
3. Press the start key. The count is cleared.

Clearing copy counts for all paper feed locations

1. Select group 6.
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 1-4-15** **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 1-4-16** **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.

Maintenance item No.	Description
U905	**Checking/clearing counts by optional devices** **Description** Displays or clears the counts of the optional DF. **Purpose** To check the use of the DF. Also to clear the counts after replacing consumable parts. **Method** 1. Press the start key. 2. Select the count (group No.) 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 the number of original replacement Last 3 digits of the number of original replacement Clearing the count (CLE)
2	○ Auto Exposure ○ Text & Photo ● Photo ● Text		Exp. 1 Exp. 2 Exp. 3	First 3 digits of the single-sided original feed count Last 3 digits of the single-sided original feed count Clearing the count (CLE)

○ : Off, ● : On

Clearing
1. Select the count to be cleared.
2. Light exp. 3 using the copy exposure adjustment keys.
3. Press the start key. The count is cleared.

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

U906	**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.

Display	Operation
–––	Canceling the resetting
on	Executing the resetting

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.

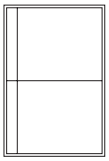
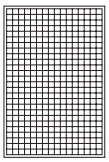
<table>
<tr><th>Maintenance item No.</th><th>Description</th></tr>
<tr><td>U910</td><td>
Clearing the black ratio data
Description
Clears the accumulated black ratio data for A4/11" × 8 1/2" sheets.
Purpose
To clear data as required at times such as during maintenance service.
Method
1. Press the start 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>

Maintenance item No.	Description
U990	**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. **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.
U992	**Checking or clearing the printer count** **Description** Displays, clears or changes the print count of the printer function when the optional printer board is installed. **Purpose** To check the use of the printer function. **Method** 1. Press the start key. 2. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys. **Clearing** 1. Light exp. 3. 2. Press the start key. The value 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 value is set and the indication for selecting a maintenance item No. appears. **Completion** Press the stop/clear key. The indication for selecting a maintenance item No. appears.

Copy exposure indicator	Copy quantity display
Exp. 1	First 3 digits of the lamp-on time (minutes)
Exp. 2	Last 3 digits of the lamp-on time (minutes)
Exp. 3	Clearing the lamp-on time (CLE)

Copy exposure indicator	Description	Setting range	Initial setting
Exp. 1	First 3 digits	000 to 999	000
Exp. 2	Last 3 digits	000 to 999	000
Exp. 3	Clearing the count	———	———

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.

Maintenance item No.	Description
U998	**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.

Copy exposure indicator	Description	Setting range
Exp. 1	Bit 16 to bit 23 of the address	00 to FF
Exp. 2	Bit 8 to bit 15 of the address	00 to FF
Exp. 3	Bit 0 to bit 7 of the address	00 to FF

2. Enter the address in hexadecimal using the keys listed below.

Key	Character
Numeric keys	0 to 9
Printer key	A
Transparency key	B
Margin key	C
Book erase key	D
Border erase key	E
Layout key	F

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

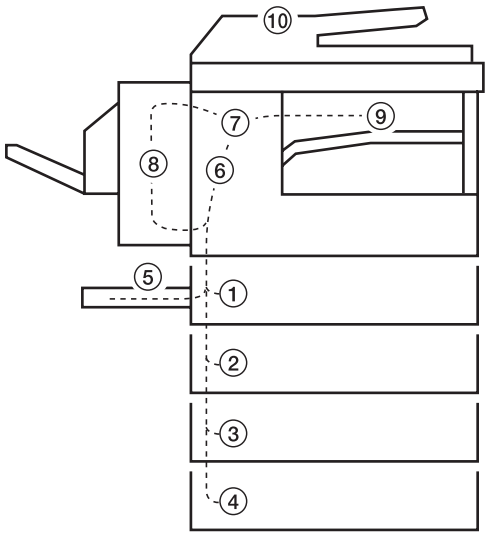
Press the stop/clear key. The indication for selecting a maintenance item No. appears.

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, 2 or 3* off and on.
*Standard for 20 cpm copier/optional for 15 cpm copier.

• 20 cpm copier

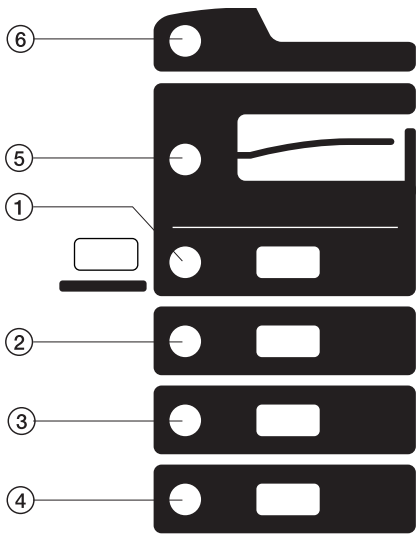


① Upper drawer
② Lower drawer
③ Optional drawer 1*
④ Optional drawer 2*
⑤ Bypass tray
⑥ Paper conveying section
⑦ Feedshift section
⑧ Duplex unit*
⑨ Inner tray
⑩ STDF*/SRDF*

*Optional.

Figure 1-5-1

• 15 cpm copier



① Upper drawer
② Lower drawer*
③ Optional drawer 1*
④ Optional drawer 2*
⑤ Paper conveying section
⑥ STDF*

*Optional.

Figure 1-5-2

Jam code	Contents	See pape
10	No paper feed from copier upper drawer	P.1-5-4
11	No paper feed from copier lower drawer	P.1-5-4
12	No paper feed from first optional drawer	P.1-5-4
13	No paper feed from second optional drawer	P.1-5-4
14	No paper feed from bypass	P.1-5-4
15	Misfeed in copier vertical paper conveying section	P.1-5-5
16	Misfeed in drawer vertical paper conveying section	P.1-5-5
20	Multiple sheets in copier paper feed section	P.1-5-5
21	Multiple sheets in copier vertical paper conveying section	P.1-5-6
22	Multiple sheets in bypass tray	P.1-5-6
30	Misfeed in registration/transfer section	P.1-5-6
40	Misfeed in fixing section	P.1-5-6
50	Misfeed in eject section	P.1-5-7
51	Jam in job separator eject section (job separator)	——
51	Jam in feedshift section (duplex unit/finisher)	——
60	Jam in duplex paper conveying section 1 (duplex unit/finisher)	——
61	Jam in duplex paper conveying section 2 (duplex unit/finisher)	——
70	No original feed (STDF/SRDF)	——
71	An original jam in the original feed and conveying section 1 (SRDF)	——
72	An original jam in the original feed and conveying section 2 (SRDF)	——
73	An original jam in the original feed and conveying section (STDF)	——
73	An original jam in the original conveying section (SRDF)	——
74	An original jam remaining after retries (SRDF)	——
75	An original jam in the switchback section 1 (SRDF)	——
76	An original jam in the switchback section 2 (SRDF)	——
80	Jam between the finisher and copier (finisher)	——
81	Jam during batch ejection stanby (finisher)	——
82	Jam during paper conveying for batch ejection 1 (finisher)	——
83	Jam during paper conveying for batch ejection 2 (finisher)	——

(2) Paper misfeed detection conditions

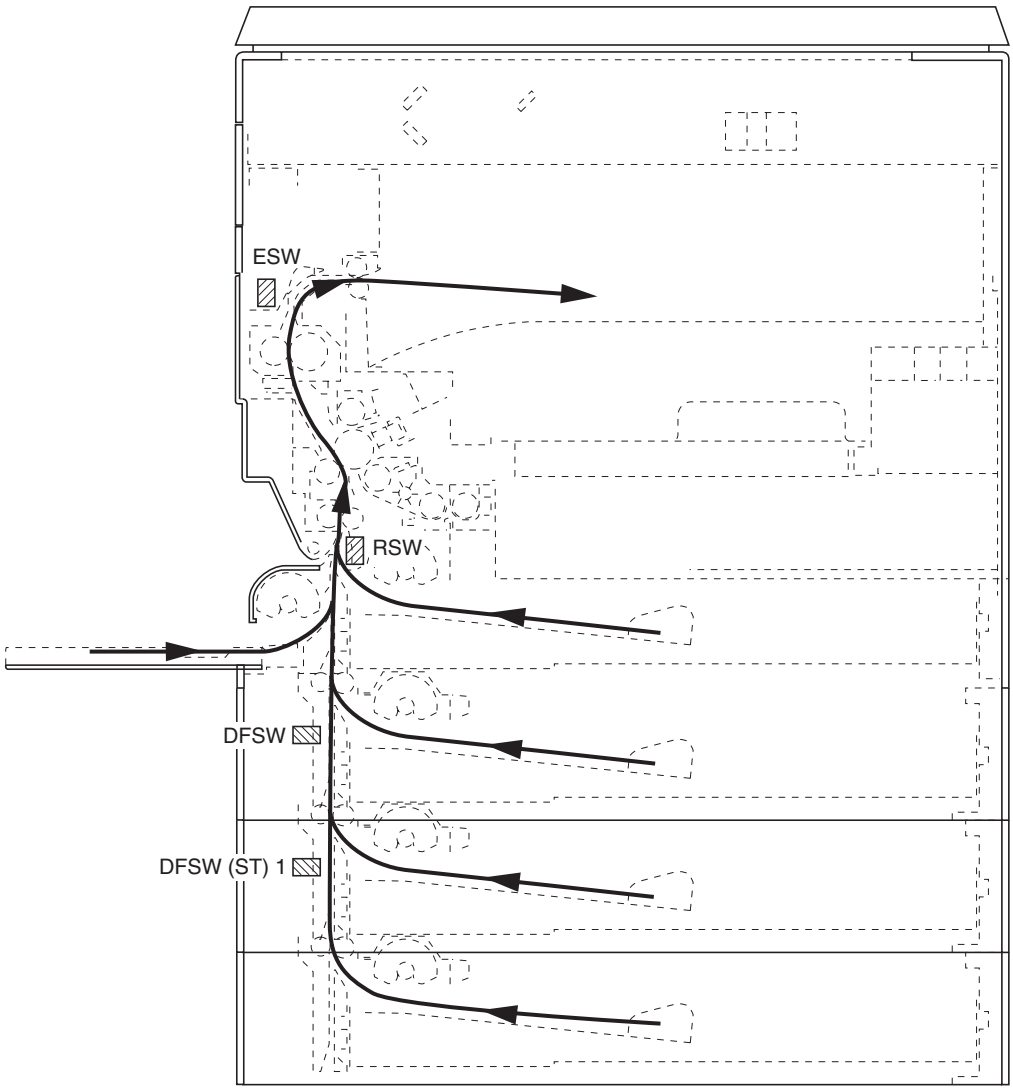


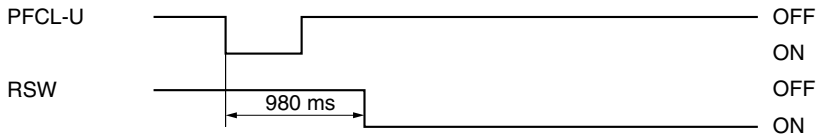
Figure 1-5-3

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).

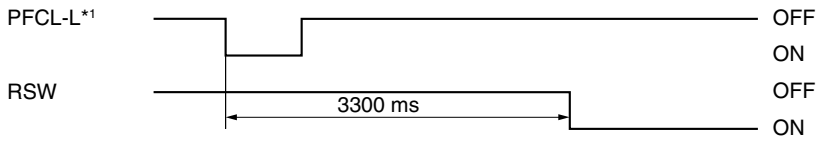
2. Paper feed section

• No paper feed from copier upper drawer (jam code 10)
The registration switch (RSW) does not turn on within 980 ms of the upper paper feed clutch (PFCL-U) turning on.



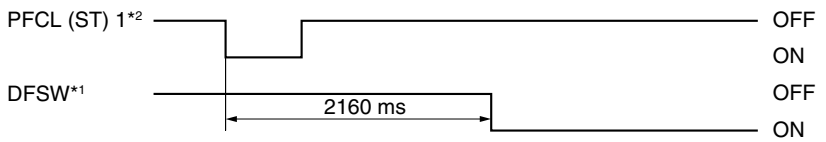
Timing chart 1-5-1

• No paper feed from copier lower drawer*1 (jam code 11)
The registration switch (RSW) does not turn on within 3300 ms of the lower paper feed clutch*1 (PFCL-L) turning on.



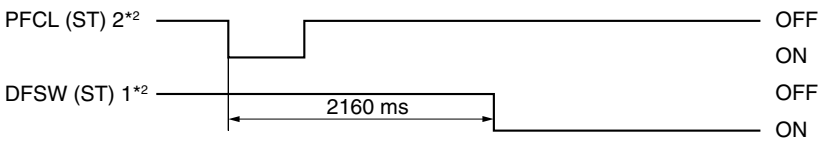
Timing chart 1-5-2

• No paper feed from first optional drawer (jam code 12)
Drawer feed switch*1 (DFSW) does not turn on within 2160 ms of paper feed clutch (ST) 1*2 (PFCL (ST) 1) turning on.



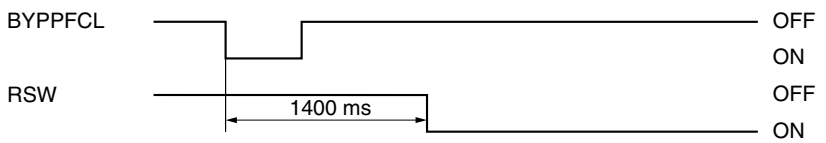
Timing chart 1-5-3

• No paper feed from second optional drawer (jam code 13)
Drawer feed switch (ST) 1*2 (DFSW (ST) 1) does not turn on within 2160 ms of paper feed clutch (ST) 2*2 (PFCL (ST) 2) turning on.



Timing chart 1-5-4

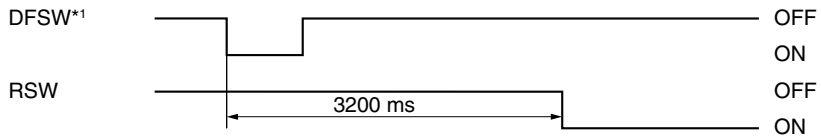
• No paper feed from bypass (jam code 14)
The registration switch (RSW) does not turn on within 1400 ms of the bypass paper feed clutch (BYPPFCL) turning on.



Timing chart 1-5-5

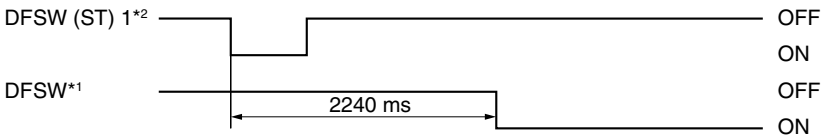
*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

• Misfeed in copier vertical paper conveying section (jam code 15)
The registration switch (RSW) does not turn on within 3200 ms of the drawer feed switch*1 (DFSW) turning on (when paper is fed from optional drawer 1).



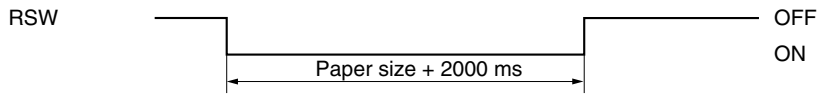
Timing chart 1-5-6

• Misfeed in drawer vertical paper conveying section (jam code 16)
Drawer feed switch*1 (DFSW) does not turn on within 2240 ms of drawer feed switch (ST) 1*2 (DFSW (ST) 1) turning on (when paper is fed from optional drawer 2).



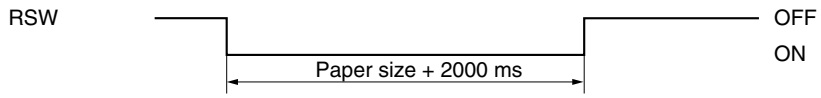
Timing chart 1-5-7

• 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 upper drawer).



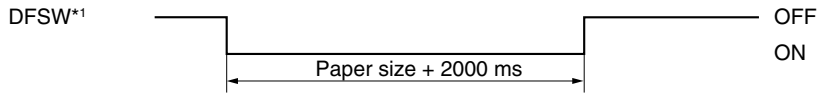
Timing chart 1-5-8

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 lower drawer*1).



Timing chart 1-5-9

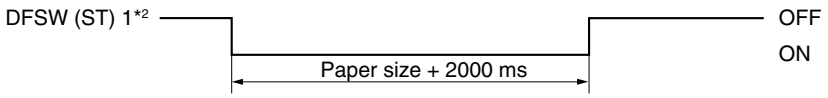
Drawer feed switch*1 (DFSW) does not turn off within the time required to convey the length of the used paper size plus 2000 ms of turning on (when paper is fed from optional drawer 1).



Timing chart 1-5-10

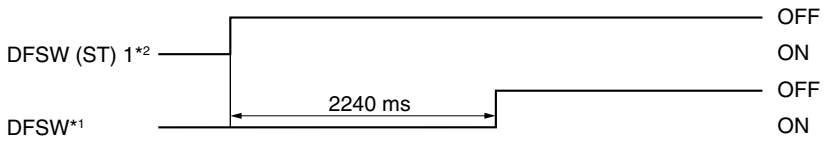
*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

Drawer feed switch (ST) 1*2 (DFSW (ST) 1) 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 optional drawer 2).



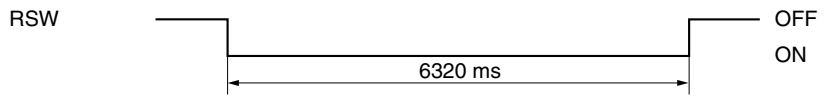
Timing chart 1-5-11

• Multiple sheets in copier vertical paper conveying section (jam code 21)
Drawer feed switch*1 (DFSW) does not turn off within 2240 ms of drawer feed switch (ST) 1*2 (DFSW (ST) 1) turning off (when paper is fed from optional drawer 2).



Timing chart 1-5-12

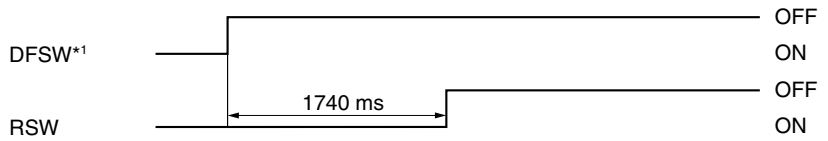
• Multiple sheets in bypass tray (jam code 22)
The registration switch (RSW) does not turn off within 6320 ms of turning on (when paper is fed from the bypass tray).



Timing chart 1-5-13

3. Paper conveying section

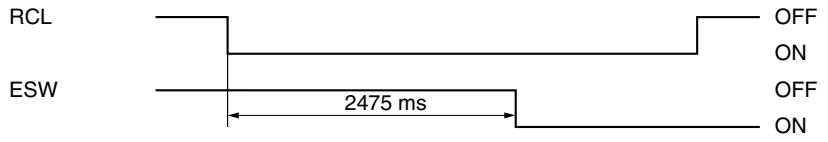
• Misfeed in registration/transfer section (jam code 30)
The registration switch (RSW) does not turn off within 1740 ms of drawer feed switch*1 (DFSW) turning off (when paper is fed from optional drawer 1 or 2).



Timing chart 1-5-14

4. Fixing section

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



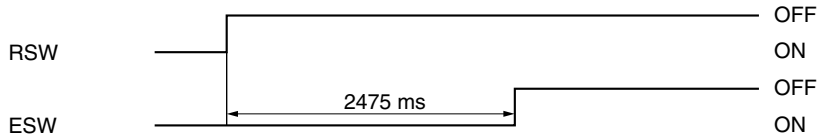
Timing chart 1-5-15

*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

5. Eject section

• Misfeed in eject section

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



Timing chart 1-5-16

(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, the drawer feed switch*1, drawer feed switch (ST) 1*2 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 drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	Defective drawer feed switch (ST) 1*2.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-24 on the main PCB remains low when drawer feed switch (ST) 1*2 is turned on and off. If it does, replace drawer feed switch (ST) 1*2.
	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 copier upper drawer).	Paper in the upper drawer is extremely curled.	Change the paper.
	Check if the upper 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 upper paper feed clutch malfunctions.	Check and remedy if necessary.
	Electrical problem with the upper paper feed clutch.	Check (see page 1-5-26).
(3) A paper jam in the paper feed section is indicated during copying (no paper feed from copier lower drawer*1).	Paper in the lower drawer*1 is extremely curled.	Change the paper.
	Check if the lower paper feed pulleys*1 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 it does, replace the registration switch.
	Check if the lower paper feed clutch*1 malfunctions.	Check and remedy if necessary.
	Electrical problem with the lower paper feed clutch*1.	Check (see page 1-5-26).

*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes/check procedures	Corrective measures
(4) A paper jam in the paper feed section is indicated during copying (no paper feed from optional drawer 1*2).	Paper in optional drawer 1*2 is extremely curled.	Change the paper.
	Check if the paper feed pulleys of optional drawer 1*2 are deformed.	Check visually and replace the pulleys if deformed.
	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	Check if paper feed clutch (ST) 1*2 malfunctions.	Check and remedy if necessary.
	Electrical problem with paper feed clutch (ST) 1*2.	Check (see page 1-5-26).
(5) A paper jam in the paper feed section is indicated during copying (no paper feed from optional drawer 2*2).	Paper in optional drawer 2*2 is extremely curled.	Change the paper.
	Check if the paper feed pulleys of optional drawer 2*2 are deformed.	Check visually and replace the pulleys if deformed.
	Broken drawer feed switch (ST) 1*2 actuator.	Check visually and replace drawer feed switch (ST) 1*2 if its actuator is broken.
	Defective drawer feed switch (ST) 1*2.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-24 on the main PCB remains low when drawer feed switch (ST) 1*2 is turned on and off. If it does, replace drawer feed switch (ST) 1*2.
	Check if paper feed clutch (ST) 2*2 malfunctions.	Check and remedy if necessary.
	Electrical problem with paper feed clutch (ST) 2*2.	Check (see page 1-5-26).
(6) A paper jam in the paper feed section is indicated during copying (no paper feed from bypass).	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 1-6-6).
	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 1-5-26).

*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes/check procedures	Corrective measures
(7) A paper jam in the paper feed section is indicated during copying (jam in copier vertical paper conveying section).	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	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.
(8) A paper jam in the paper feed section is indicated during copying (jam in drawer vertical paper conveying section).	Broken drawer feed switch (ST) 1*2 actuator.	Check visually and replace drawer feed switch (ST) 1*2 if its actuator is broken.
	Defective drawer feed switch (ST) 1*2.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-24 on the main PCB remains low when drawer feed switch (ST) 1*2 is turned on and off. If it does, replace drawer feed switch (ST) 1*2.
	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
(9) A paper jam in the paper feed section is indicated during copying (multiple sheets in paper feed section).	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.
	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	Broken drawer feed switch (ST) 1*2 actuator.	Check visually and replace drawer feed switch (ST) 1*2 if its actuator is broken.
	Defective drawer feed switch (ST) 1*2.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-24 on the main PCB remains low when drawer feed switch (ST) 1*2 is turned on and off. If it does, replace drawer feed switch (ST) 1*2.
(10) A paper jam in the paper feed section is indicated during copying (multiple sheets in vertical paper conveying section).	Broken drawer feed switch (ST) 1*2 actuator.	Check visually and replace drawer feed switch (ST) 1*2 if its actuator is broken.
	Defective drawer feed switch (ST) 1*2.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-24 on the main PCB remains low when drawer feed switch (ST) 1*2 is turned on and off. If it does, replace drawer feed switch (ST) 1*2.

*1: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes/check procedures	Corrective measures
(10) A paper jam in the paper feed section is indicated during copying (multiple sheets in vertical paper conveying section).	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
(11) A paper jam in the paper feed section is indicated during copying (multiple sheets in bypass).	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.
(12) A paper jam in the paper conveying section is indicated during copying (jam in registration/ transfer section).	Broken drawer feed switch*1 actuator.	Check visually and replace the drawer feed switch*1 if its actuator is broken.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	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.
(13) A paper jam in the fixing section is indicated during copying (jam in fixing section).	Check if the registration clutch malfunctions.	Check and remedy if necessary.
	Electrical problem with the registration clutch.	Check (see page 1-5-26).
	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.
(14) A paper jam in the eject section is indicated during copying (jam in eject section).	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: Standard for 20 cpm copier/optional for 15 cpm copier. *2: Optional for both 20 cpm and 15 cpm copiers.

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. On the 20 cpm copier, the problem is displayed as a code consisting of "C" followed by a number between 011 and 821, indicating the nature of the problem. A message is also displayed requesting the user to call for service.
On the 15 cpm copier, "C" and a number between 011 and 821 altenates, indicating the nature of the problem.
After removing the problem, the self-diagnostic function can be reset by turning safety switch 1, 2 or 3* off and back on.
*Optional for the 15 cpm copier.

(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.
C021	**Operation unit PCB communication problem (20 cpm copier only)** • There is no reply after 20 retries at communication.	Defective main PCB.	Replace the main PCB and check for correct operation.
C034	**Finisher* communication problem** • Communication errors from the communication microcomputer on the main PCB: No communication: there is no reply after 3 retries. Abnormal communication: a communication error (parity or checksum error) is detected five times in succession.	Poor contact of the connector terminals.	Check the connection of connectors CN17 and CN18 on the main PCB and the finisher main PCB, and the continuity across the connector terminals. Repair or replace if necessary.
		Defective copier main PCB.	Replace the main PCB and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.
C040	**DIMM* problem** • Information on DIMM cannot be read out correctly at power-on.	Poor contact of the memory board**.	Check the insertion of the memory board**.
C041	**Bitmap problem** • There is a problem with the data or address bus of the bitmap DRAM.	Poor contact of the DIMM.	Check the insertion of the DIMM into connector CN2 on the memory board (for the 15 cpm copier).
			Check the insertion of the DIMM into connector CN34 on the main PCB (for the 20 cpm copier).
C043	**DMA problem** • DMA transmission of compressed, decompressed, rotated, relocated or blanked-out image data does not complete within the specified period of time.	Defective main PCB.	Replace the main PCB and check for correct operation.

*: Optional **: Optional for the 15 cpm copier only.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
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.
		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.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
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.
		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.

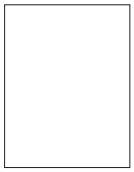
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C620	**Abnormally low fixing unit thermistor temperature** • The fixing temperature remains below 100˚C/212˚F for 10 s during copying.	Fixing heater installed incorrectly.	Check and reinstall if necessary.
		Broken fixing heater wire.	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.
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.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
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.
C817	**Finisher* front side registration motor problem**	A problem is detected with the front side registration motor.	See the finisher service manual.
C818	**Finisher* rear side registration motor problem**	A problem is detected with the rear side registration motor.	See the finisher service manual.
C819	**Finisher* trailing edge registration motor problem**	A problem is detected with the trailing edge registration motor.	See the finisher service manual.
C821	**Finisher* stapler motor problem**	A problem is detected with the stapler motor.	See the finisher service manual.

*: Optional **: Optional for the 15 cpm copier only.

1-5-3 Image formation problems

(1) No image appears (entirely white).

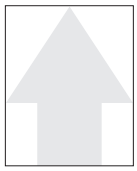


See page 1-5-18

(2) No image appears (entirely black).

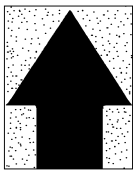
See page 1-5-18

(3) Image is too light.



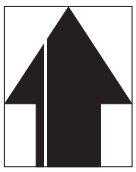
See page 1-5-19

(4) Background is visible.



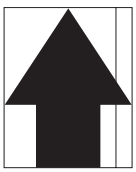
See page 1-5-19

(5) A white line appears longitudinally.



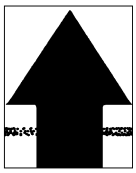
See page 1-5-19

(6) A black line appears longitudinally.



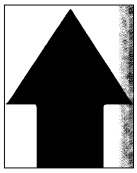
See page 1-5-20

(7) A black line appears laterally.



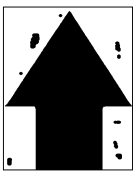
See page 1-5-20

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



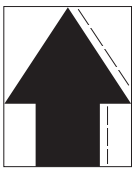
See page 1-5-20

(9) Black dots appear on the image.



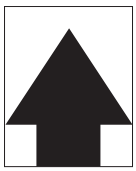
See page 1-5-21

(10) Image is blurred.



See page 1-5-21

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

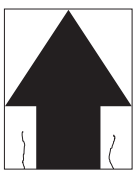


See page 1-5-21

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

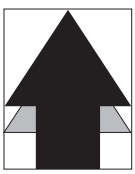
See page 1-5-22

(13) Paper creases.



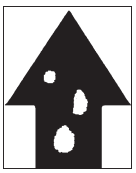
See page 1-5-22

(14) Offset occurs.



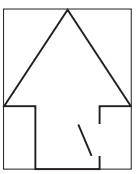
See page 1-5-22

(15) Image is partly missing.



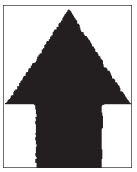
See page 1-5-23

(16) Fixing is poor.



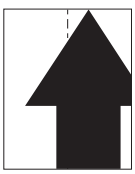
See page 1-5-23

(17) Image is out of focus.



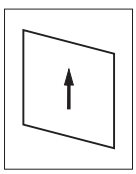
See page 1-5-23

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



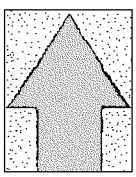
See page 1-5-23

(19) Image is not square.



See page 1-5-24

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



See page 1-5-24

(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.

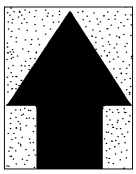
Causes	Check procedures/corrective measures
1. No main charging.	
A. Broken main charger wire.	Replace the wire.
B. Leaking main charger housing.	Clean the main charger wire, grid and shield.
C. The connector terminals of the high-voltage transformer PCB make poor contact.	Reinsert the connector. Also 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 1-6-43).

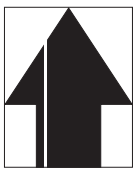
(4) Background is visible.



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.

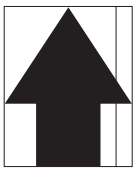
(5) A white line appears longitudinally.



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 1-6-43).
4. Dirty shading plate.	Clean the shading plate.

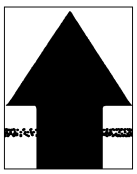
(6) A black line appears longitudinally.



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 1-6-43).
3. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-46).
4. Dirty scanner mirror.	Clean the scanner mirror.

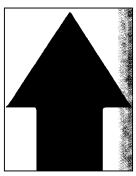
(7) A black line appears laterally.



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 1-6-43).
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.

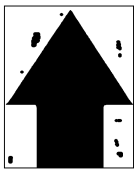
(8) One side of the copy image is darker than the other.



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 1-6-19).

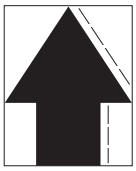
(9) Black dots appear on the image.



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 1-6-43).
2. Dirty contact glass.	Clean the contact glass.
3. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-46).

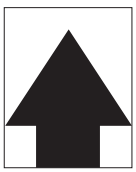
(10) Image is blurred.



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 1-6-53).
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 1-6-12).
2. Misadjusted scanner leading edge registration.	Readjust the scanner leading edge registration (see page 1-6-36).

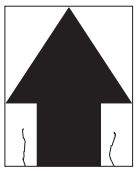
(12) The leading edge of the image is sporadically misaligned with the original.

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.

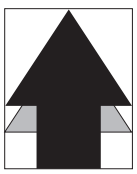
Causes
1. Paper curled.
2. Paper damp.
3. Defective pressure springs.



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.

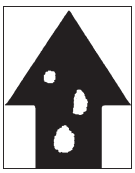
(14) Offset occurs.

Causes
1. Defective cleaning blade.



Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the cleaning blade (see page 1-6-46).

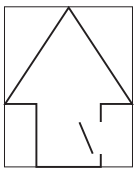
(15) Image is partly missing.



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 1-6-43).

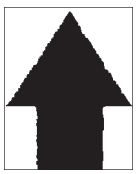
(16) Fixing is poor.



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 1-6-53).

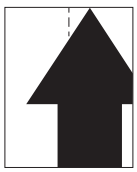
(17) Image is out of focus.



Causes
1. Defective image scanning unit.

Causes	Check procedures/corrective measures
1. Defective image scanning unit.	Replace the image scanning unit (see page 1-6-28).

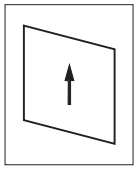
(18) Image center does not align with the original center.



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 1-6-13 and 14).
2. Misadjusted scanner center line.	Readjust the scanner center line (see page 1-6-37).
3. Original placed incorrectly.	Place the original correctly.

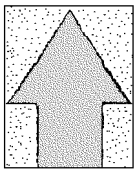
(19) Image is not square.



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 1-6-26).
2. Image scanning unit positioned incorrectly.	Adjust the installation position of the image scanning unit (see page 1-6-30).

(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, paper conveying unit and/or lower drawer left cover*1 are/is not closed completely.	Check the front cover, paper conveying unit and lower drawer left cover*1.
	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, 2 or 3*1.	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.

*1: Optional for 15 cpm copier. *2: For 20 cpm copier only. *3: Optional for 220-240 V specifications of 15 cpm copier.
*4: Optional for both 20 cpm and 15 cpm copiers.

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 drawer drive motor*1 does not operate.	Broken drawer drive motor*1 coil.	Check for continuity across the coil. If none, replace the drawer drive motor*1.
	Poor contact in the drawer drive motor*1 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
(9) 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.
(10) The upper paper feed clutch does not operate.	Broken upper paper feed clutch coil.	Check for continuity across the coil. If none, replace the upper paper feed clutch.
	Poor contact in the upper 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 lower paper feed clutch*1 does not operate.	Broken lower paper feed clutch*1 coil.	Check for continuity across the coil. If none, replace the lower paper feed clutch*1.
	Poor contact in the lower paper feed clutch*1 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(12) Paper feed clutch (ST) 1*4 does not operate.	Broken paper feed clutch (ST) 1*4 coil.	Check for continuity across the coil. If none, replace paper feed clutch (ST) 1*4.
	Poor contact in paper feed clutch (ST) 1*4 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(13) Paper feed clutch (ST) 2*4 does not operate.	Broken paper feed clutch (ST) 2*4 coil.	Check for continuity across the coil. If none, replace paper feed clutch (ST) 2*4.
	Poor contact in paper feed clutch (ST) 2*4 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(14) 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.
(15) 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.

*1: Optional for 15 cpm copier. *2: For 20 cpm copier only. *3: Optional for 220-240 V specifications of 15 cpm copier.
*4: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes	Check procedures/corrective measures
(16) 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.
(17) 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.
(18) 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 ∞ Ω, replace the fixing unit thermistor.
(19) The fixing heater does not turn off.	Dirty sensor part of the fixing unit thermistor.	Check visually and clean the thermistor sensor parts.
(20) Main charging is not performed (C510).	Broken main charger wire.	See page 1-5-18.
	Leaking main charger housing.	
	Poor contact in the high-voltage transformer PCB connector terminals.	
	Defective main PCB.	
	Defective high- voltage transformer PCB .	
(21) Transfer charging is not performed.	Poor contact in the high-voltage transformer PCB connector terminals.	See page 1-5-18.
	Defective main PCB.	
	Defective high-voltage transformer PCB .	
(22) 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.
(23) The original size is not detected.	Defective original detection switch*3.	Check if CN25-2 on the main PCB goes low when the original detection switch*3 is turned on and off. If not, replace the original detection switch*3.

*1: Optional for 15 cpm copier. *2: For 20 cpm copier only. *3: Optional for 220-240 V specifications of 15 cpm copier.
*4: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes	Check procedures/corrective measures
(24) The original size is not detected correctly.	Original is not placed correctly.	Check the original and correct if necessary.
	Poor contact in the original size detection sensor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective original size detection sensor.	Check if the sensor operates correctly. If not, replace it.
(25) The message requesting paper to be loaded is shown when paper is present in the upper drawer.	Poor contact in the upper paper switch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective upper paper switch.	Check if CN3-10 on the main PCB goes low when the upper paper switch is turned on with 5 V DC present at CN3-11 on the main PCB. If not, replace the upper paper switch. Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(26) The message requesting paper to be loaded is shown when paper is present in the lower drawer*1.	Poor contact in the lower paper switch*1 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective lower paper switch*1.	Check if CN8-15 on the main PCB goes low when the lower paper switch* is turned on with 5 V DC present at CN8-21 on the main PCB. If not, replace the lower paper switch*1.
(27) The message requesting paper to be loaded is shown when paper is present on the bypass tray.*3	Poor contact in the bypass paper switch*3 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective bypass paper switch*3 .	Check if CN25-2 on the main PCB goes low when the bypass paper switch*3 is turned on with 5 V DC present at CN25-3 on the main PCB. If not, replace the bypass paper switch*3 .
(28) The size of paper in the upper drawer is not displayed correctly.	Poor contact in upper paper size switch 1 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective upper paper size switch 1.	Check if CN9-2 on the main PCB goes low when upper paper size switch 1 is turned on. If not, replace upper paper size switch 1.
	Poor contact in upper paper size switch 2 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective upper paper size switch 2.	Check if CN9-4 on the main PCB goes low when upper paper size switch 2 is turned on. If not, replace upper paper size switch 2.
	Poor contact in upper paper size switch 3 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective upper paper size switch 3.	Check if CN9-6 on the main PCB goes low when upper paper size switch 3 is turned on. If not, replace upper paper size switch 3.

*1: Optional for 15 cpm copier. *2: For 20 cpm copier only. *3: Optional for 220-240 V specifications of 15 cpm copier.
*4: Optional for both 20 cpm and 15 cpm copiers.

Problem	Causes	Check procedures/corrective measures
(28) The size of paper in the upper drawer is not displayed correctly.	Poor contact in upper paper size switch 4 connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective upper paper size switch 4.	Check if CN9-8 on the main PCB goes low when upper paper size switch 4 is turned on. If not, replace upper paper size switch 4.
(29) The size of paper in the lower drawer*1 is not displayed correctly.	Poor contact in the connector terminals of lower paper size switch 1*1, 2*1, 3*1 or 4*1.	Check for continuity across the connector terminals. If none, replace them.
	Defective lower paper size switch 1*1, 2*1, 3*1 or 4*1.	Check for continuity across each of lower paper size switches 1*1, 2*1, 3*1 and 4*1. If there is no continuity when each switch is on, replace lower paper size switch 1*1, 2*1, 3*1 or 4*1.
(30) The printing width of the paper on the bypass tray is not detected correctly.*2	Poor contact in the bypass size detection PCB connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
	Defective bypass size detection PCB.	Check for continuity between CN6-7 and each of CN6-4, CN6-5 and CN6-6. If the continuity status does not change when the position of the bypass slider is changed, replace the bypass paper size detection PCB.
(31) 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 drawer feed switch*, registration switch or eject switch.	Check and remove if any.
	Defective drawer feed switch*1.	With 5 V DC present at CN8-21 on the main PCB, check if CN8-23 on the main PCB remains low when the drawer feed switch*1 is turned on and off. If it does, replace the drawer feed switch*1.
	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.
(32) The message requesting covers to be closed is displayed when the front cover, paper conveying unit and lower drawer left cover*1 are closed.	Poor contact in the connector terminals of safety switch 1, 2 or 3*1.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective safety switch 1, 2 or 3*1.	Check for continuity across the contacts of each switch. If there is no continuity when the switch is on, replace it.
(33) Others.	Wiring is broken, shorted or makes poor contact.	Check for continuity. If none, repair.
	Noise.	Locate the source of noise and remove.

*1: Optional for 15 cpm copier. *2: For 20 cpm copier only. *3: Optional for 220-240 V specifications of 15 cpm copier.
*4: Optional for both 20 cpm and 15 cpm copiers.

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: upper paper feed pulleys, lower 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: upper paper feed clutch, lower paper feed clutch* and bypass paper feed clutch.	See pages 1-5-26.
(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 1-5-26.
(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 1-6-21).
	The scanner motor malfunctions.	See page 1-5-25.
(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: upper paper feed clutch, lower paper feed clutch* and bypass paper feed clutch.	Correct.

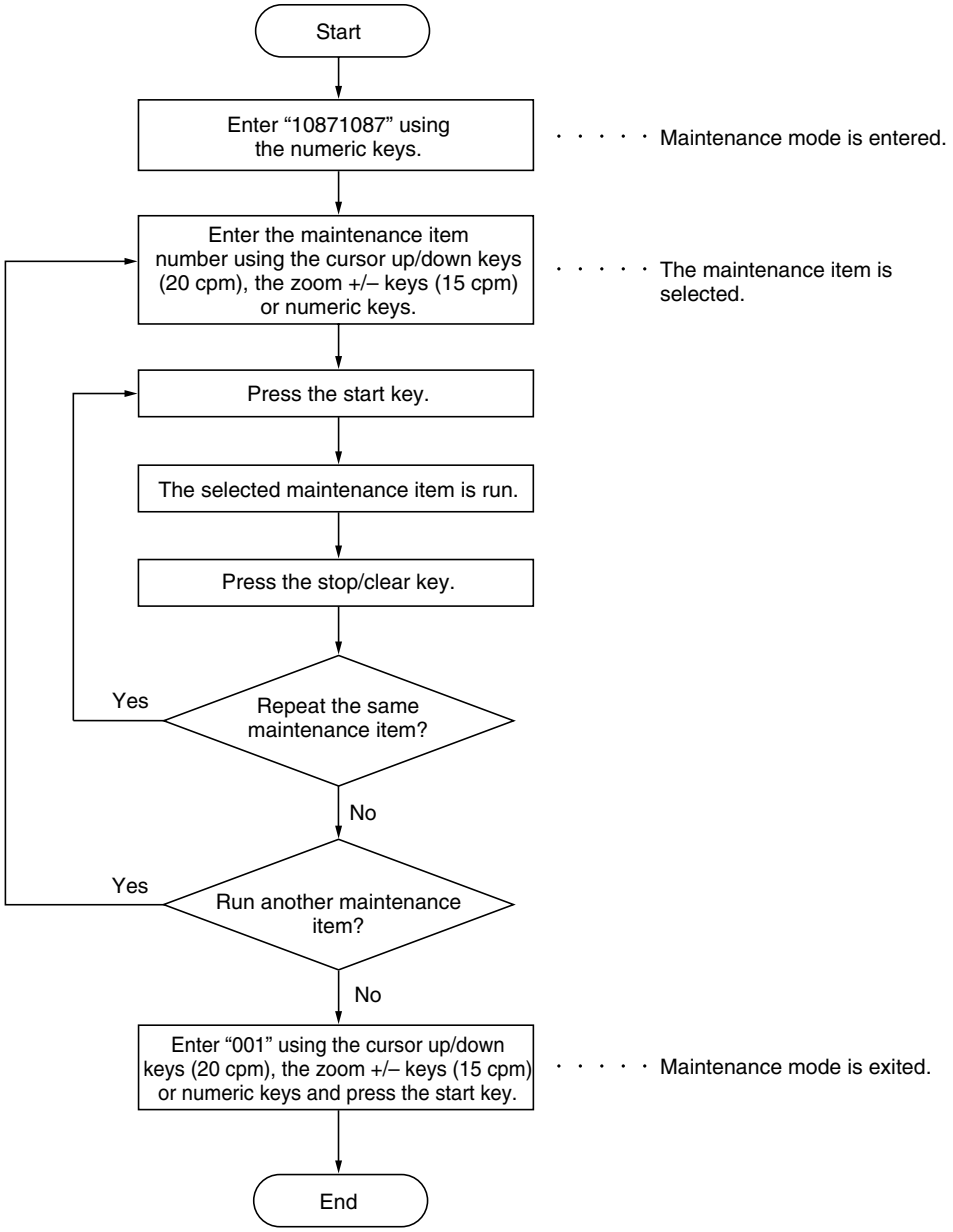
*Optional for 15 cpm copier.

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 upper and lower paper feed pulleys
Follow the procedure below to replace the paper feed pulleys.

Procedure
• Upper paper feed pulleys
1. Open the bypass tray and paper conveying unit and then remove the rear and rear left covers. Pull out the upper 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.

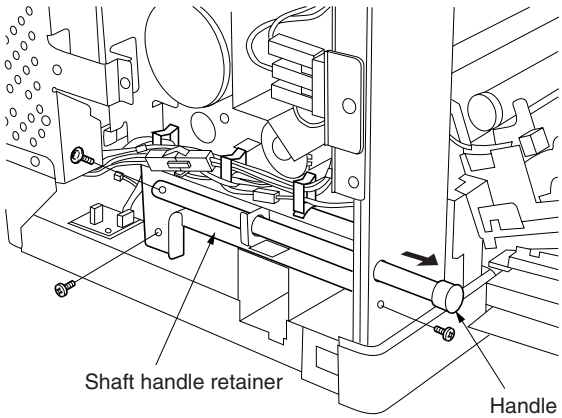


Figure 1-6-1

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.

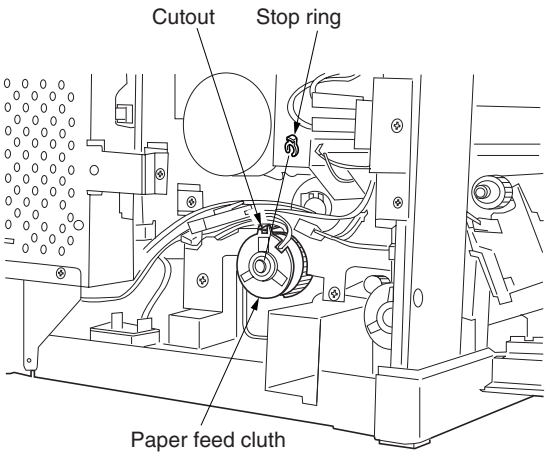


Figure 1-6-2

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

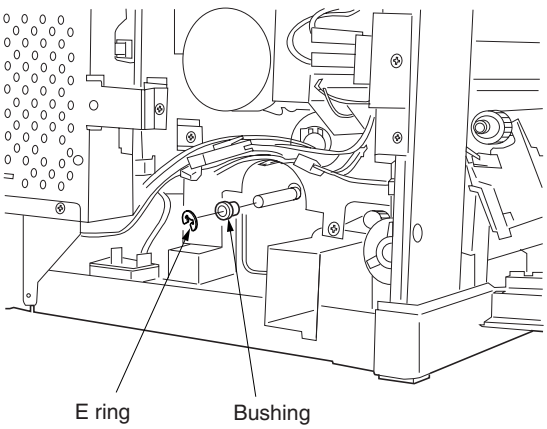


Figure 1-6-3

6. Open the front cover and remove the image formation unit (see page 1-6-40).
7. Remove the stop ring from the paper feed shaft unit (machine front).

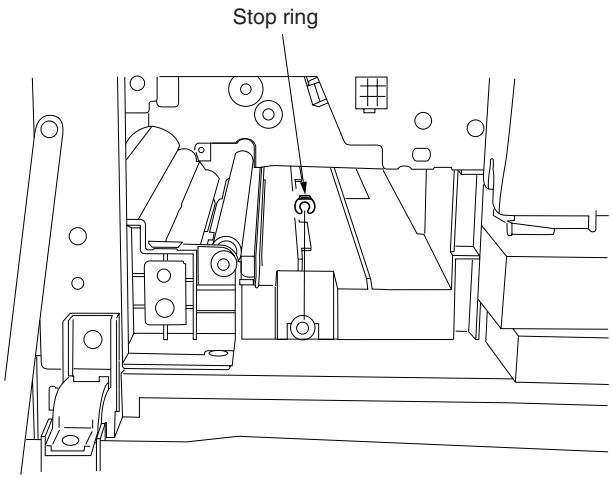


Figure 1-6-4

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).

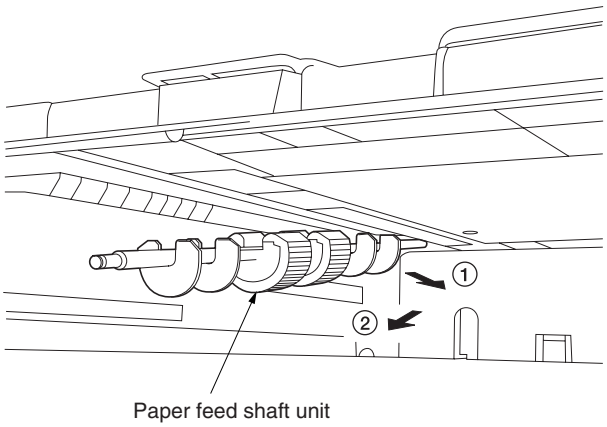


Figure 1-6-5

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

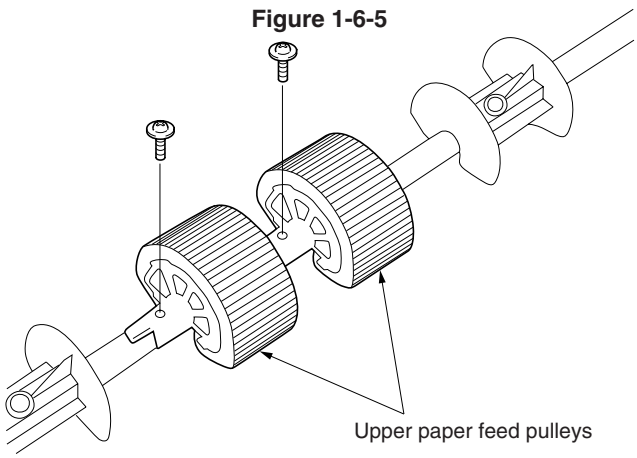


Figure 1-6-6

• Lower peper feed pulleys (optional for the 15 cpm copier)

1. Open the lower drawer left cover and pull the lower drawer out.
2. Remove the two screws holding the rear cover of the lower drawer and then the cover.
3. Turn the drawer drive motor clockwise and rotate the paper feed shaft unit so that the screws holding the lower paper feed pulleys can be seen when the left cover is opened.

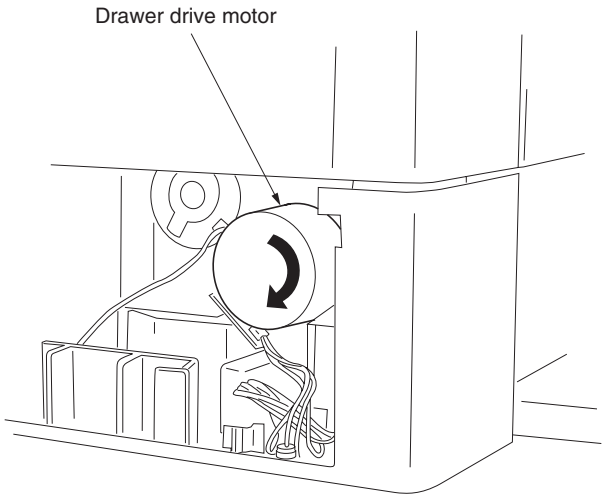


Figure 1-6-7

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

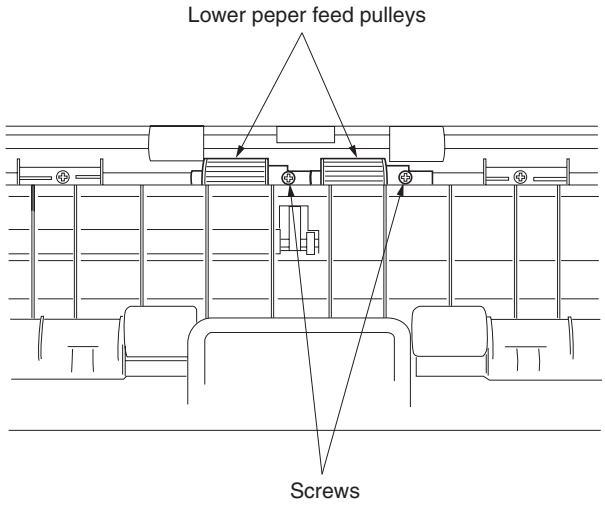


Figure 1-6-8

(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 1-6-40).
2. Remove the screw and then the fulcrum pin.

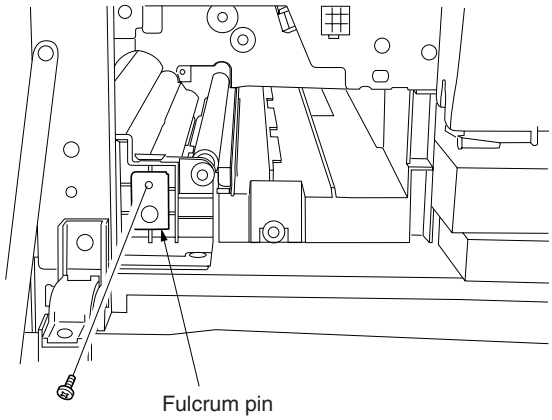


Figure 1-6-9

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

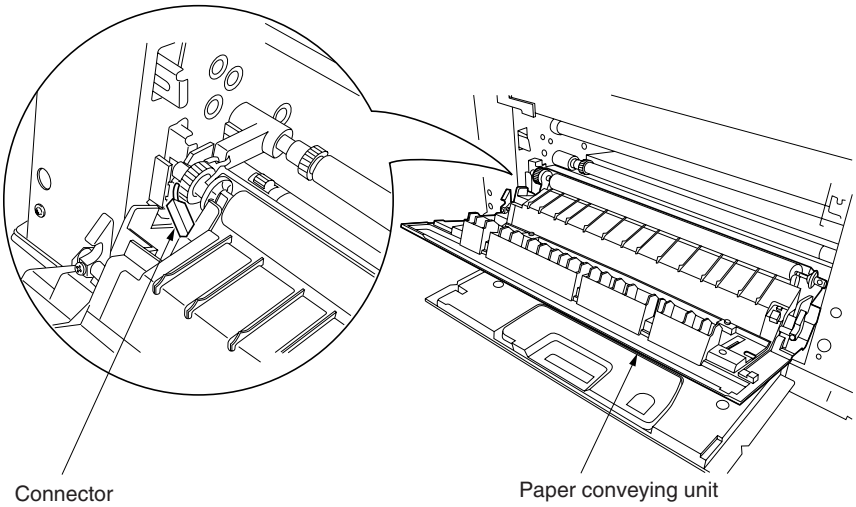


Figure 1-6-10

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

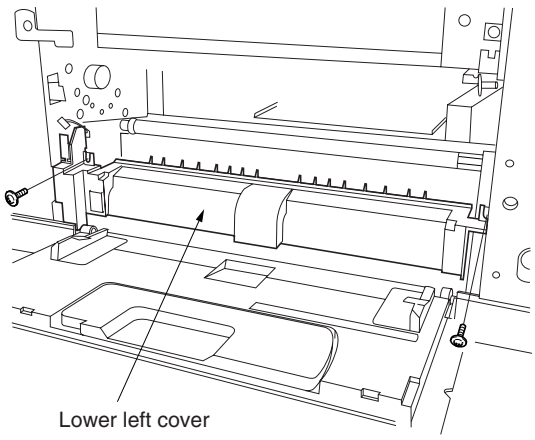


Figure 1-6-11

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

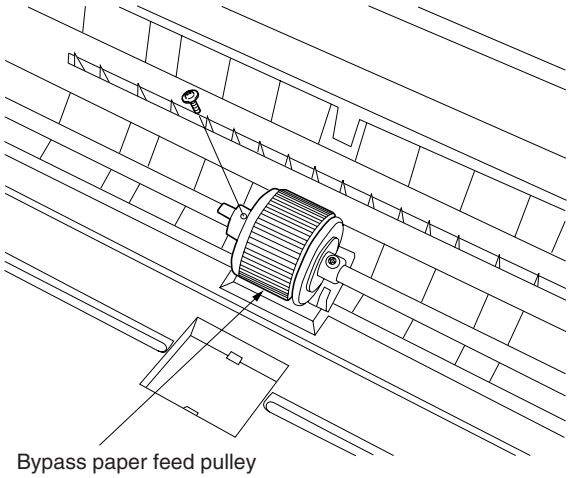


Figure 1-6-12

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 1-6-13).

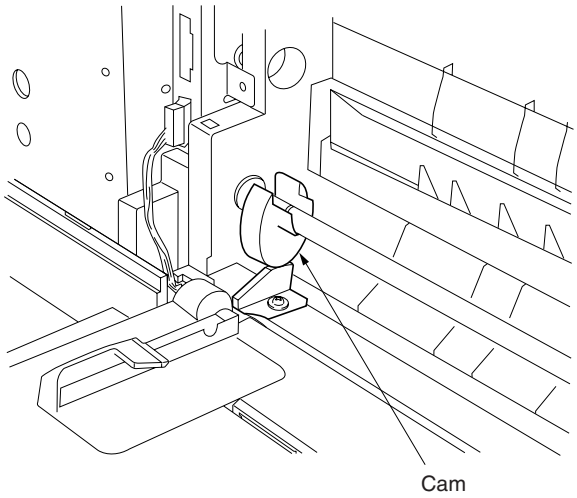


Figure 1-6-13

(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 1-6-47).
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.

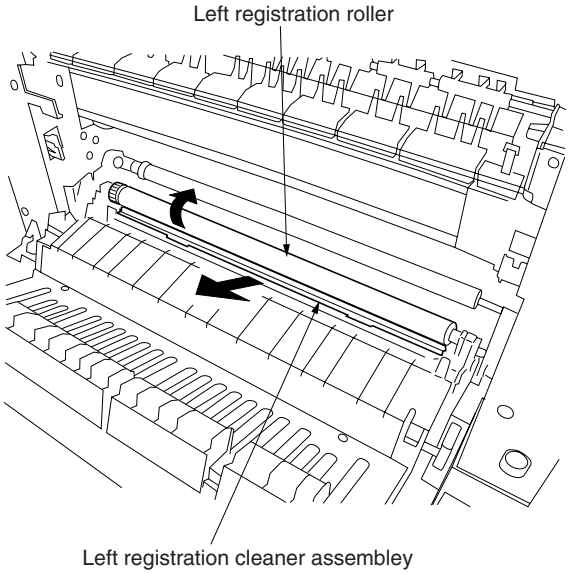


Figure 1-6-14

(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 1-6-40).
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.

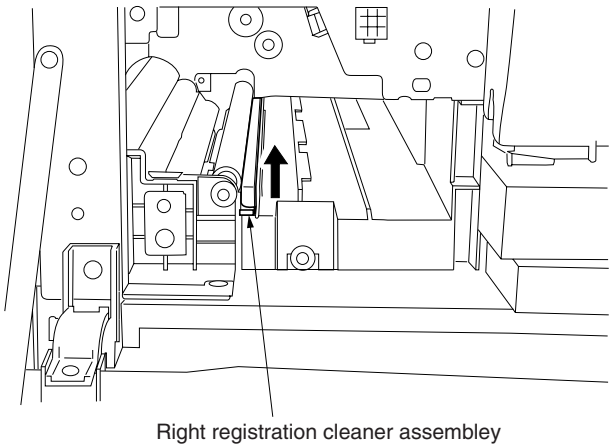


Figure 1-6-15

(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 1-6-6).
2. Remove the bypass tray assembly.
3. Remove the two screws and then the upper bypass cover.

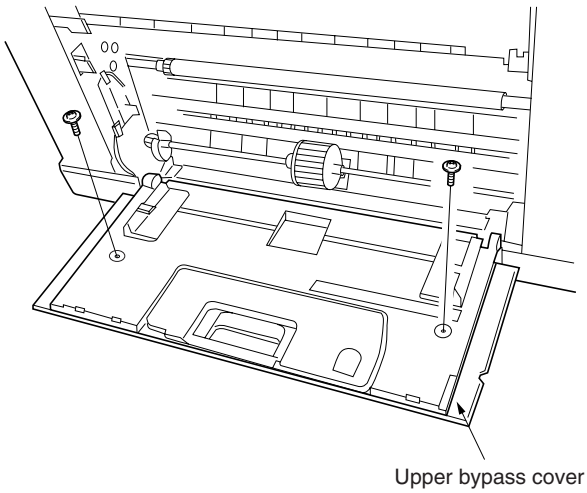


Figure 1-6-16

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

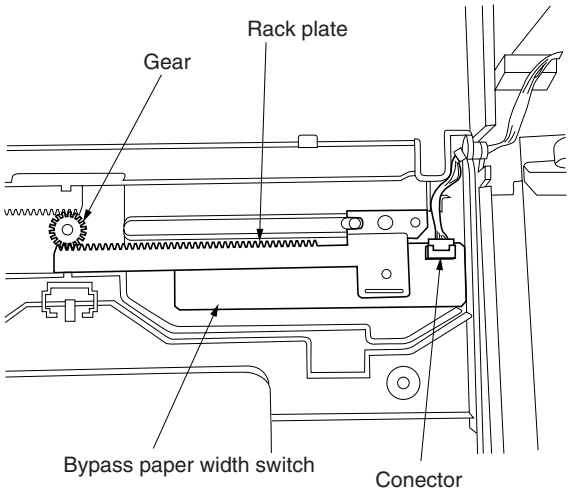


Figure 1-6-17

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.

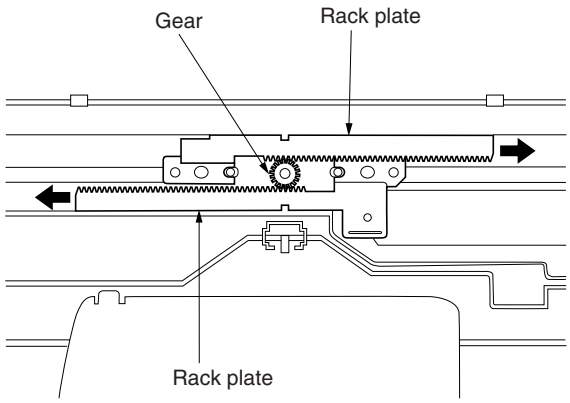
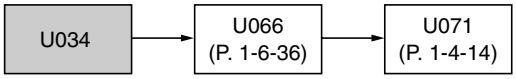


Figure 1-6-18

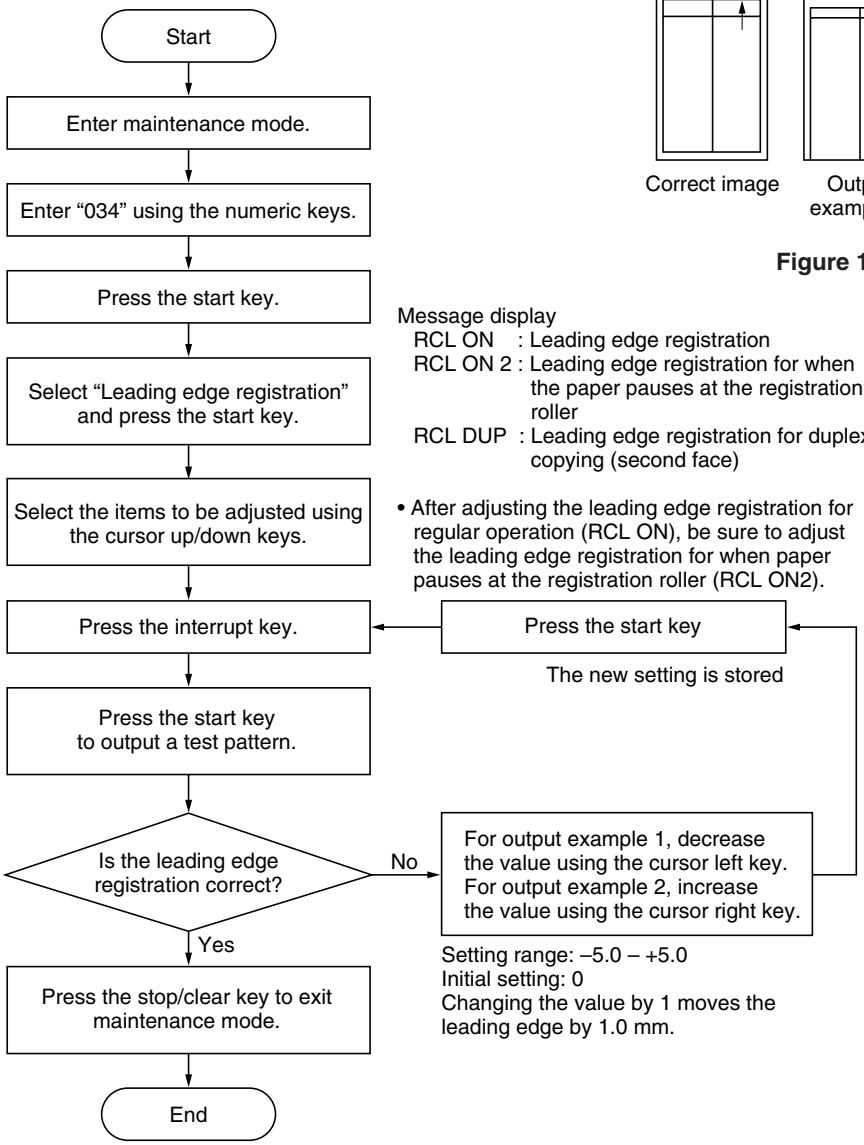
(6) Adjustment after roller and clutch replacement
Perform the following adjustment after refitting rollers and clutches.

(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
• 20 cpm



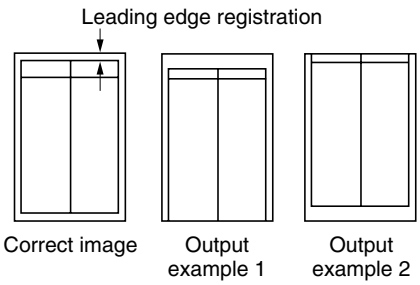


Figure 1-6-19a

• 15 cpm

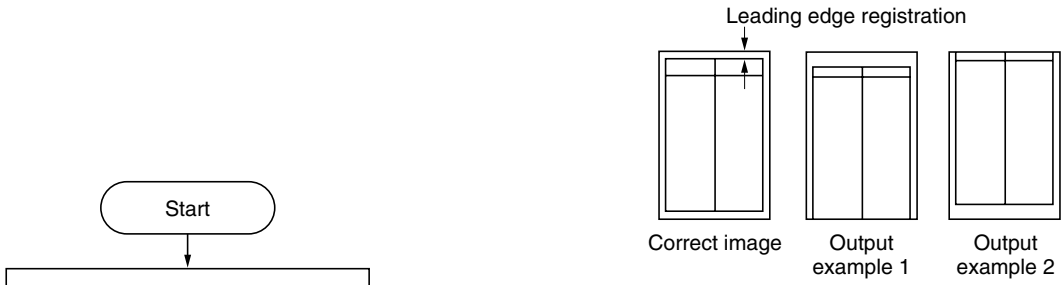
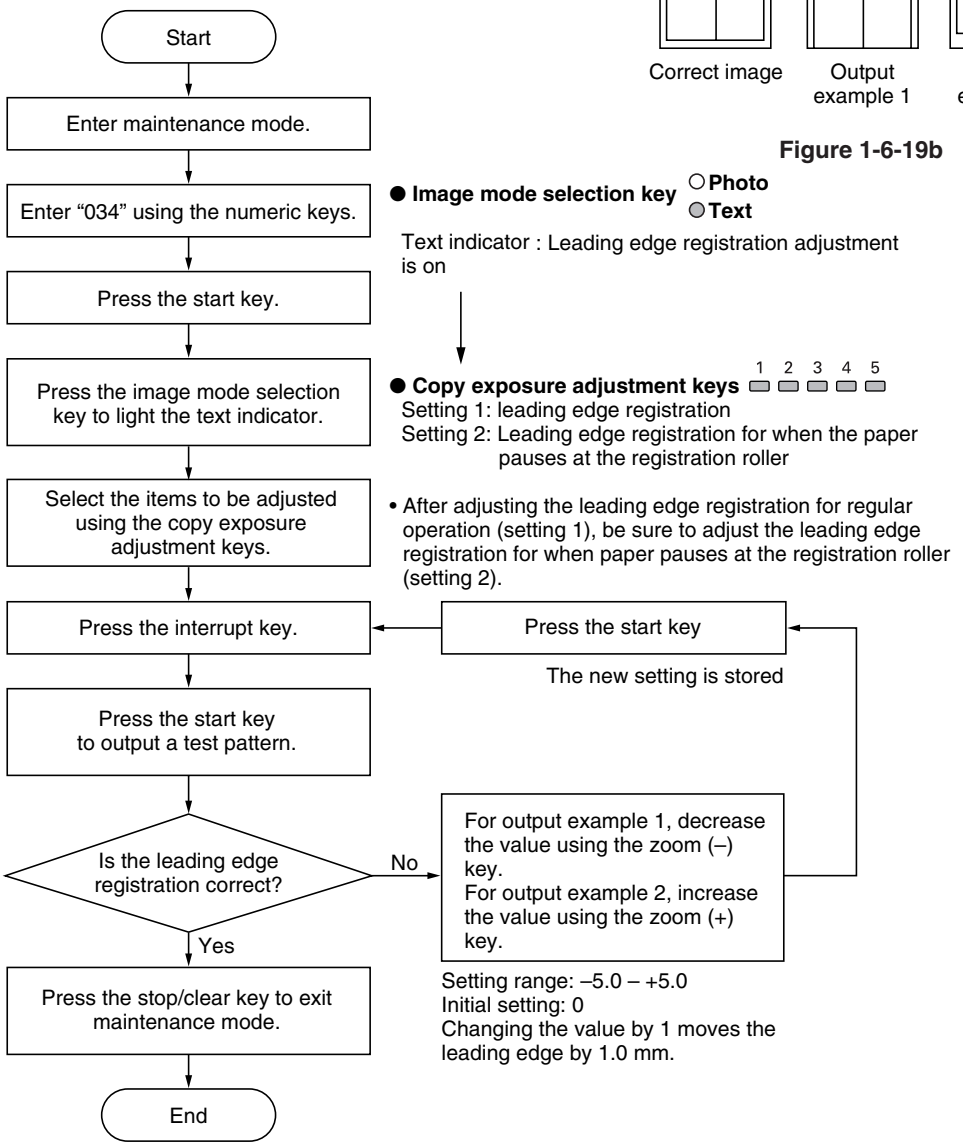
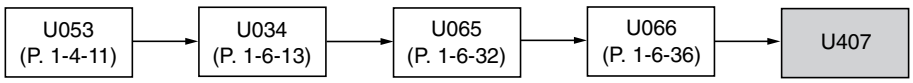


Figure 1-6-19b



(6-2) Adjusting the leading edge registration for memory image printing

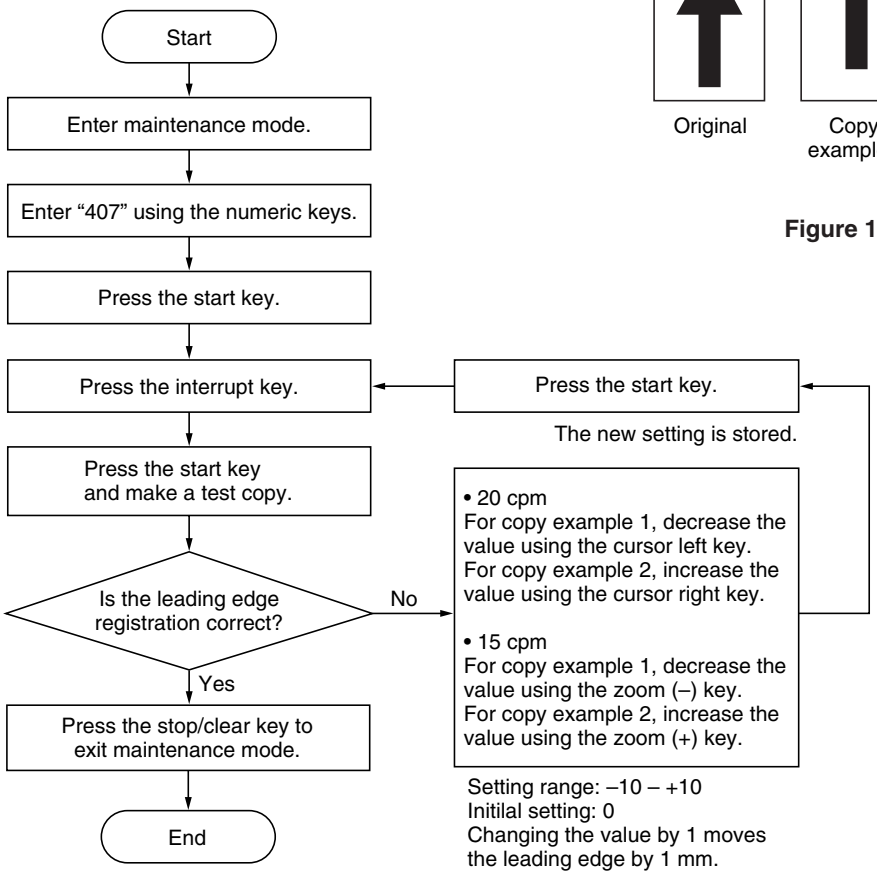
Make the following adjustment if there is a regular error between the leading edge of the copy image and the leading edge of the original during memory copying.



Caution:

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

Procedure



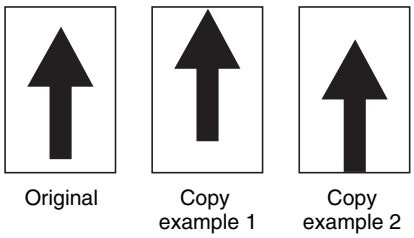
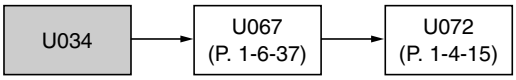


Figure 1-6-20

(6-3) 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

• 20 cpm

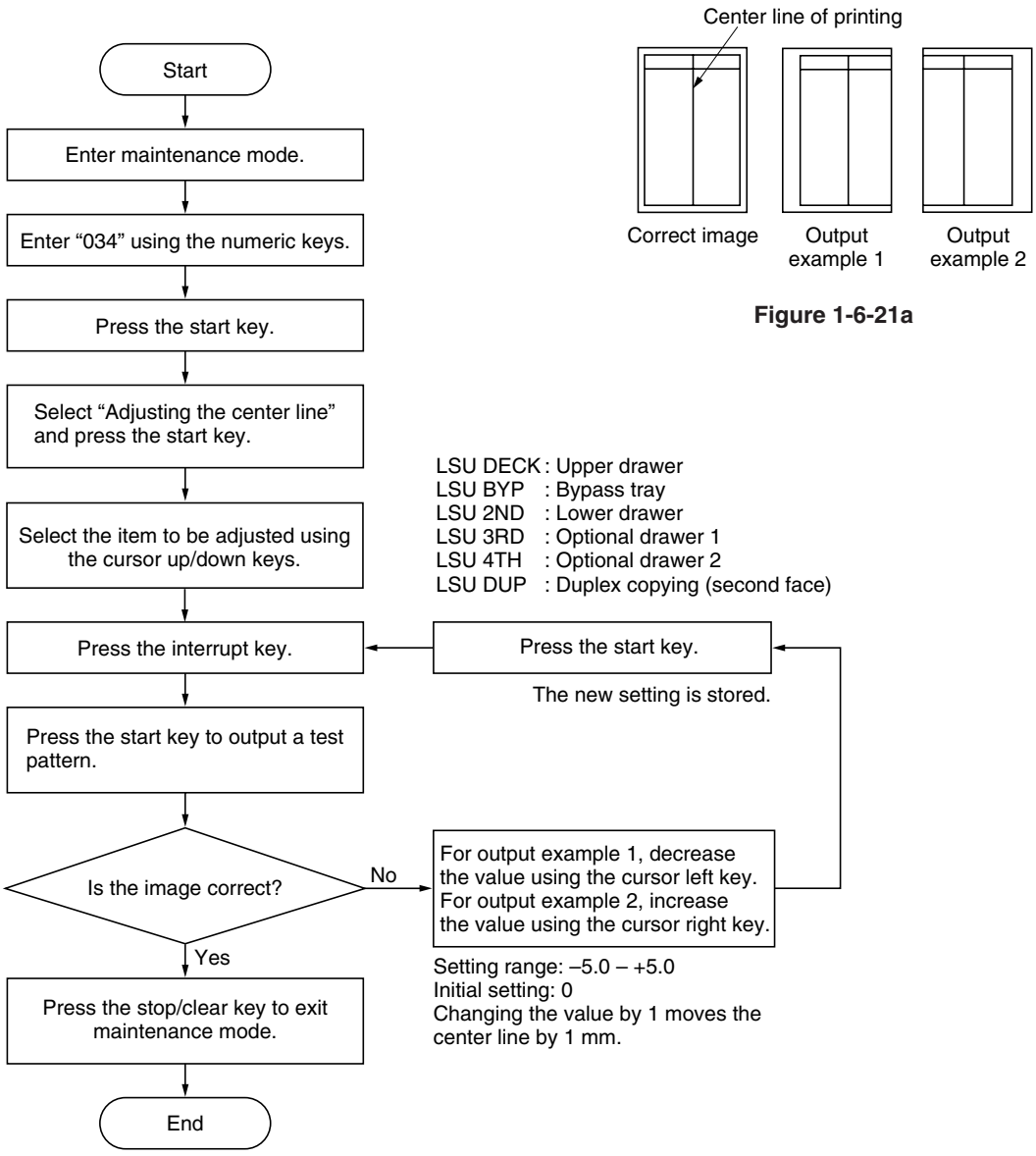


Figure 1-6-21a

• 15 cpm

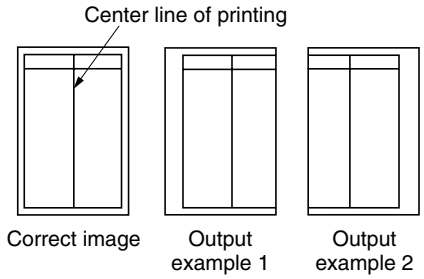
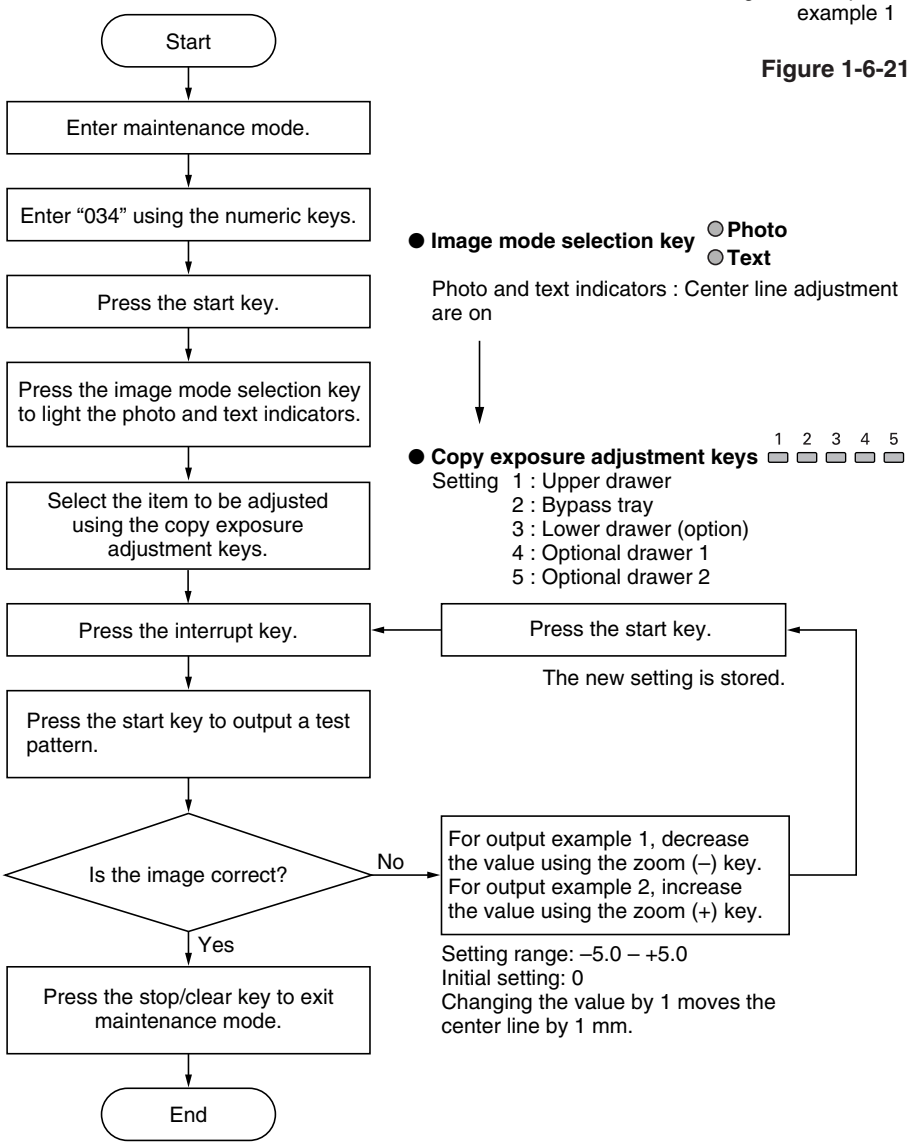


Figure 1-6-21b



(6-4) Adjusting the margins for printing

Make the following adjustment if the margins are not correct.

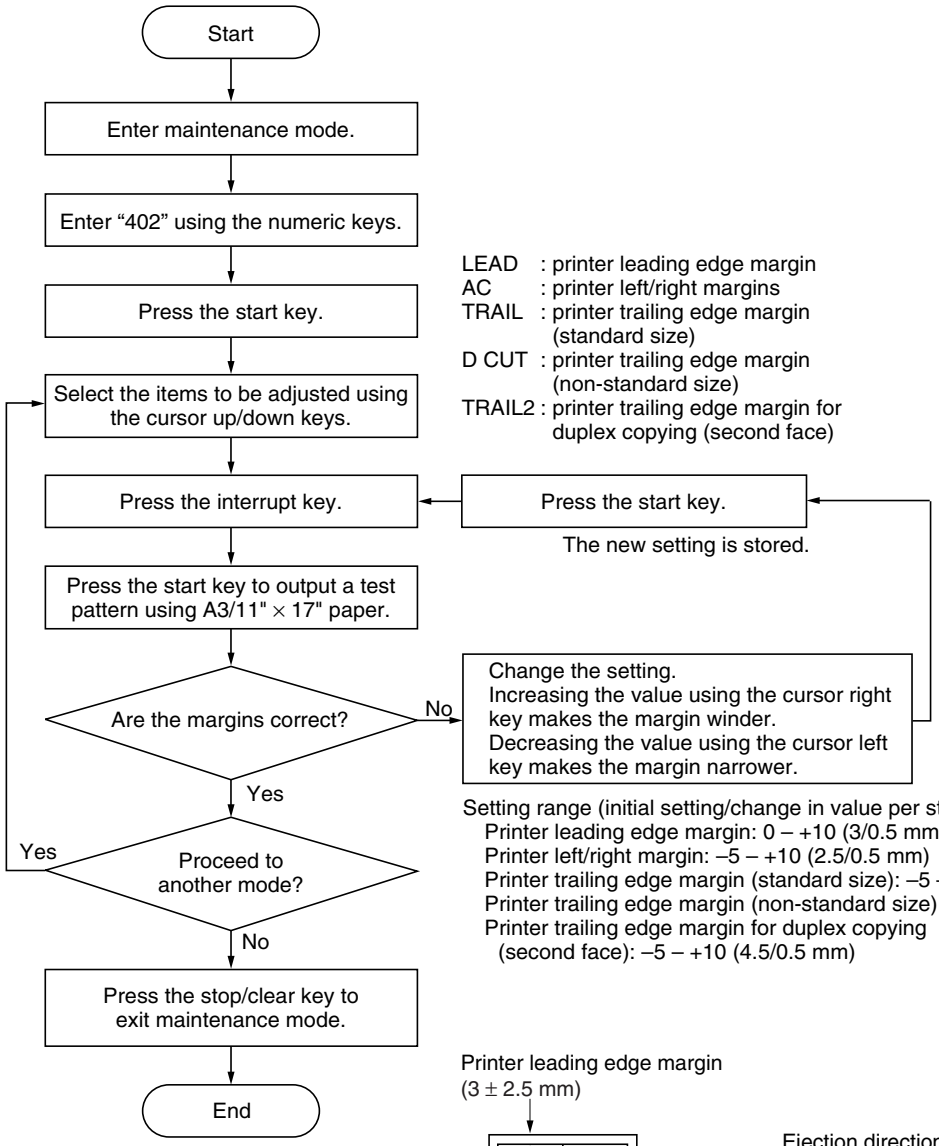
U402 → U403 (P. 1-6-38) → U404 (P. 1-4-46)

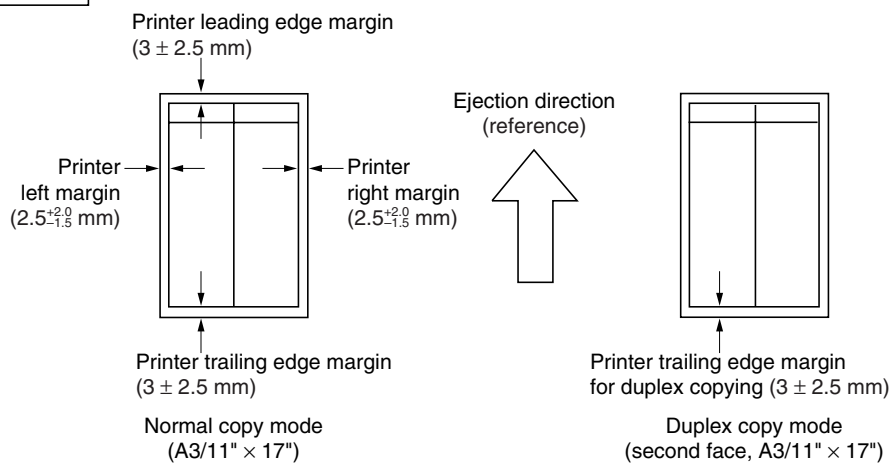
Caution:

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

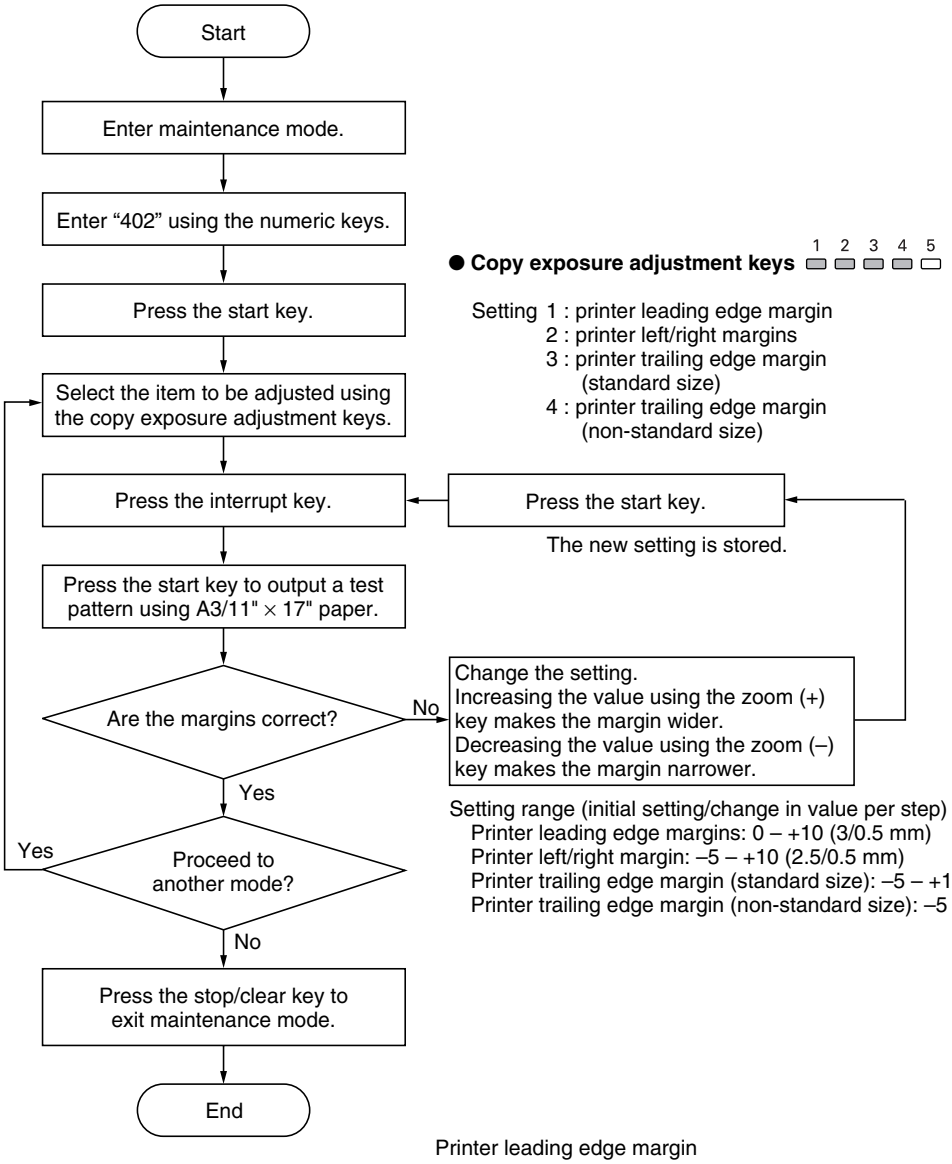
Procedure

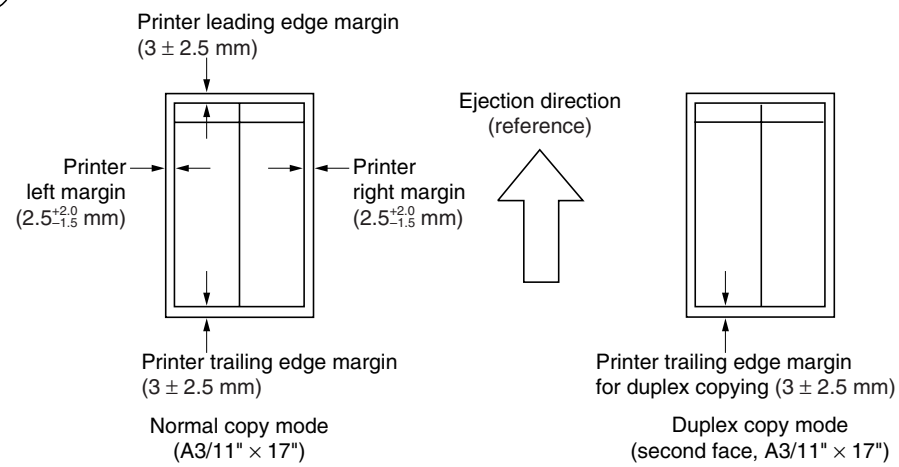
• 20 cpm





• 15 cpm


Start
Enter maintenance mode.
Enter "402" using the numeric keys.
Press the start key.
Select the item to be adjusted using the copy exposure adjustment keys.
Press the interrupt key.
Press the start key to output a test pattern using A3/11" × 17" paper.
Are the margins correct?
No
Yes
Proceed to another mode?
Yes
No
Press the stop/clear key to exit maintenance mode.
End
● Copy exposure adjustment keys 1 2 3 4 5
Setting 1 : printer leading edge margin
2 : printer left/right margins
3 : printer trailing edge margin (standard size)
4 : printer trailing edge margin (non-standard size)
Press the start key.
The new setting is stored.
Change the setting.
Increasing the value using the zoom (+) key makes the margin wider.
Decreasing the value using the zoom (–) key makes the margin narrower.
Setting range (initial setting/change in value per step)
Printer leading edge margins: 0 – +10 (3/0.5 mm)
Printer left/right margin: –5 – +10 (2.5/0.5 mm)
Printer trailing edge margin (standard size): –5 – +10 (4.5/0.5 mm)
Printer trailing edge margin (non-standard size): –5 – +15 (3.0/0.25 mm)


Printer leading edge margin
(3 ± 2.5 mm)
Printer left margin
(2.5 +2.0 −1.5 mm)
Printer right margin
(2.5 +2.0 −1.5 mm)
Ejection direction
(reference)
Printer trailing edge margin
(3 ± 2.5 mm)
Normal copy mode
(A3/11" × 17")
Printer trailing edge margin
for duplex copying (3 ± 2.5 mm)
Duplex copy mode
(second face, A3/11" × 17")

(6-5) 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

• 20 cpm

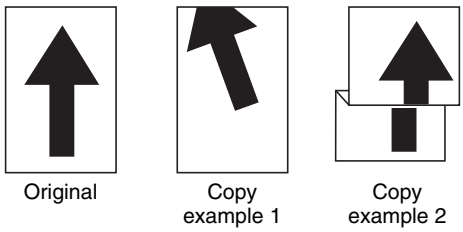
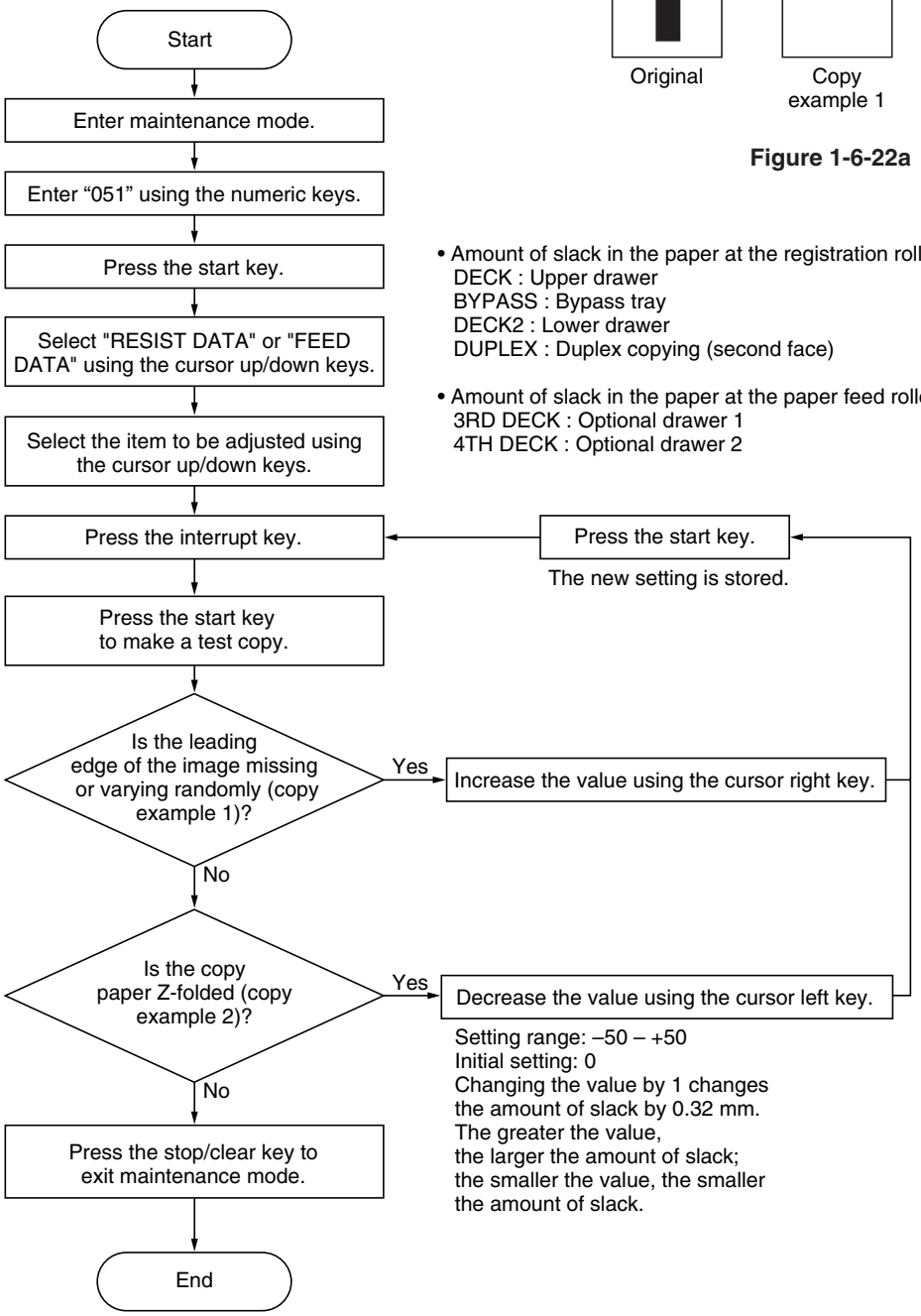


Figure 1-6-22a



• Amount of slack in the paper at the registration roller
DECK : Upper drawer
BYPASS : Bypass tray
DECK2 : Lower drawer
DUPLEX : Duplex copying (second face)

• Amount of slack in the paper at the paper feed roller
3RD DECK : Optional drawer 1
4TH DECK : Optional drawer 2

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.

• 15 cpm

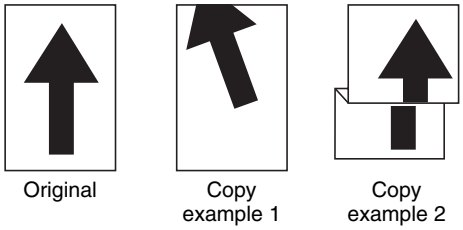
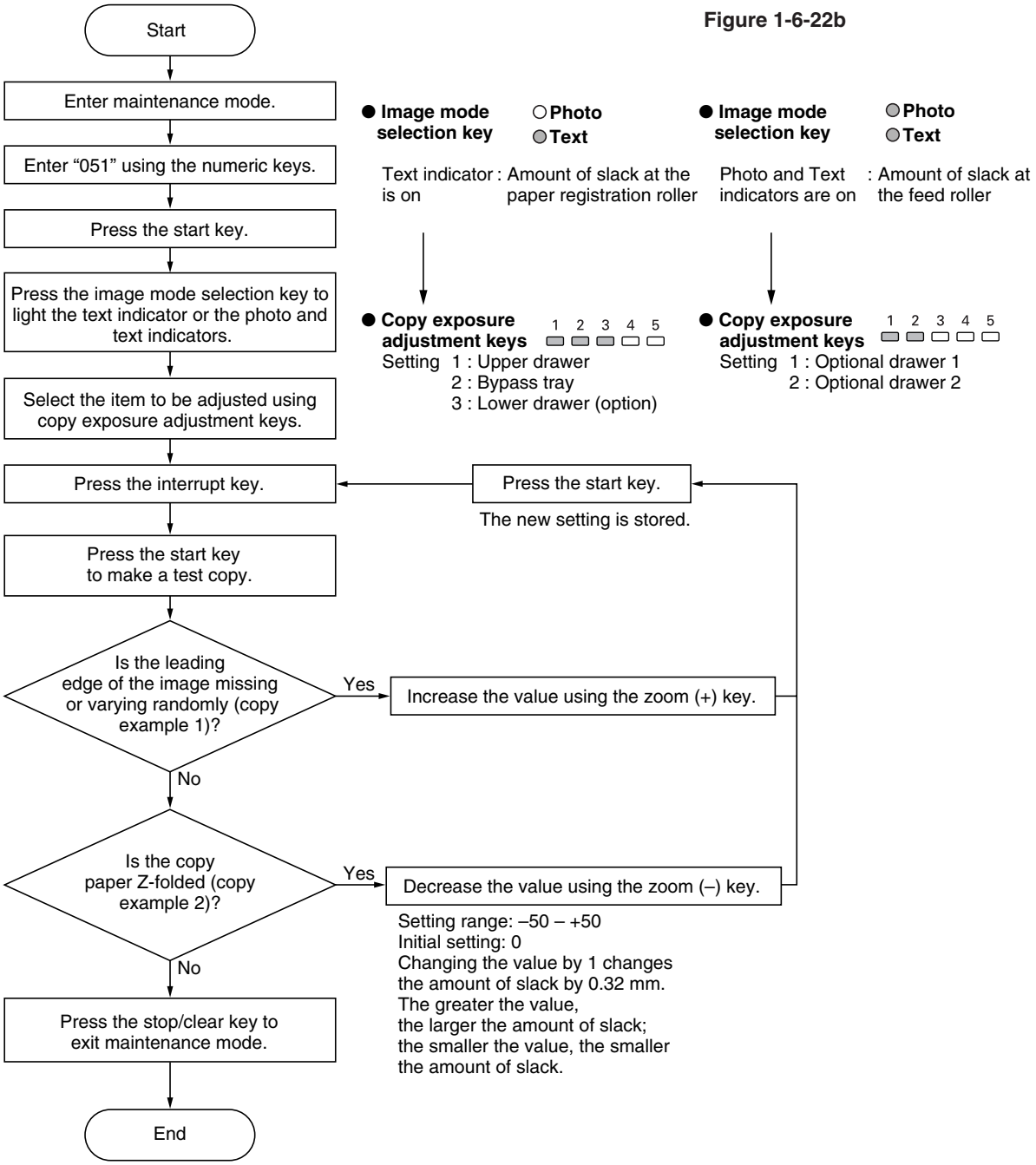


Figure 1-6-22b



1-6-3 Optical section

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

Procedure
1. Remove the original cover or the DF.
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.

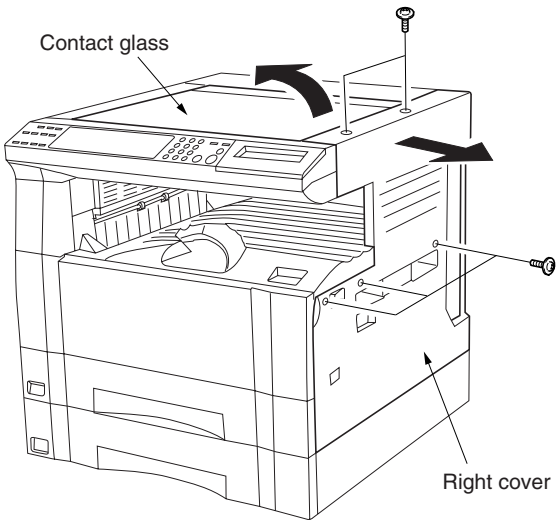


Figure 1-6-23

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.

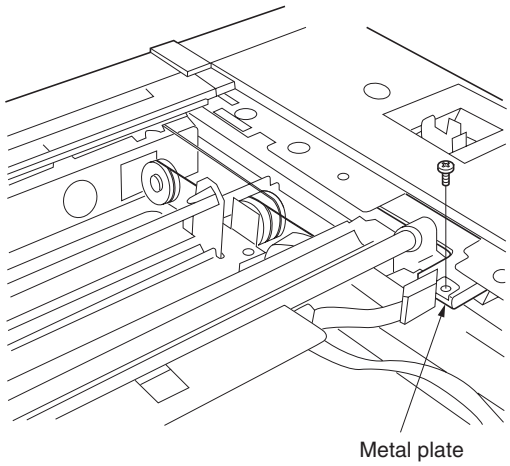


Figure 1-6-24

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.

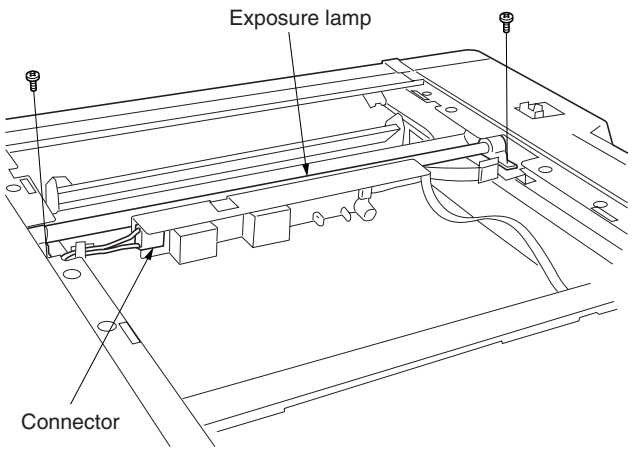


Figure 1-6-25

(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, proceed to (4-1) Adjusting the skew of the laser scanner unit (see page 1-6-26) and (6) Adjusting the position of the ISU (see page 1-6-30).

(2-1) Detaching the scanner wires

Procedure
1. Remove the exposure lamp (see page 1-6-19).
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.

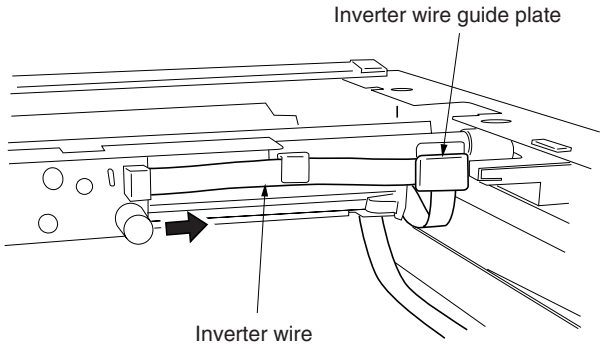


Figure 1-6-26

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

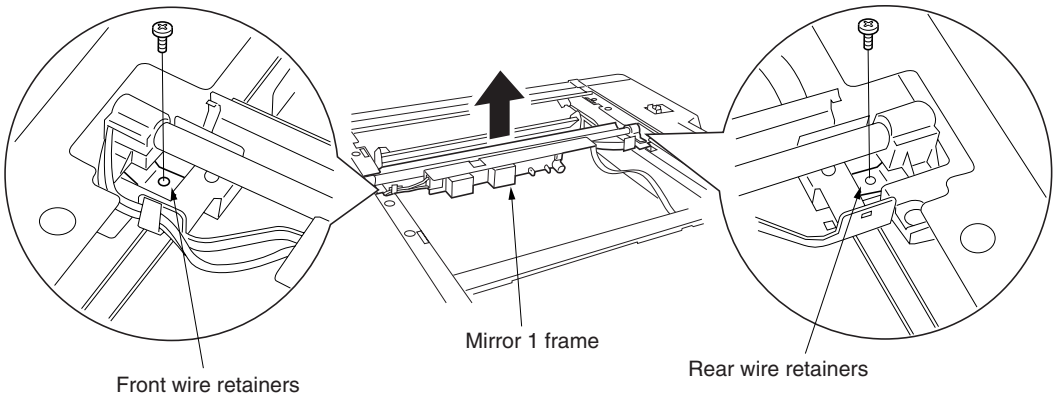


Figure 1-6-27

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.

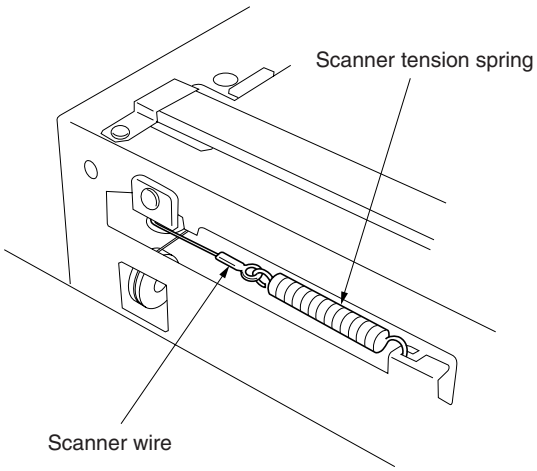


Figure 1-6-28

(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. Remove the three screws and detach the connector and then remove the scanner motor unit.

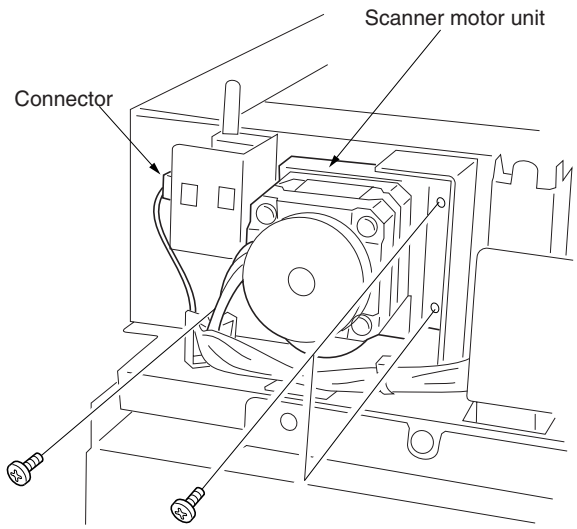


Figure 1-6-29

2. Remove the E ring and bushing from the rear of the scanner wire drum shaft and then remove the E ring, two shims, spring and bushing from the front of the shaft.

3. Remove the scanner wire drum shaft from the scanner unit.

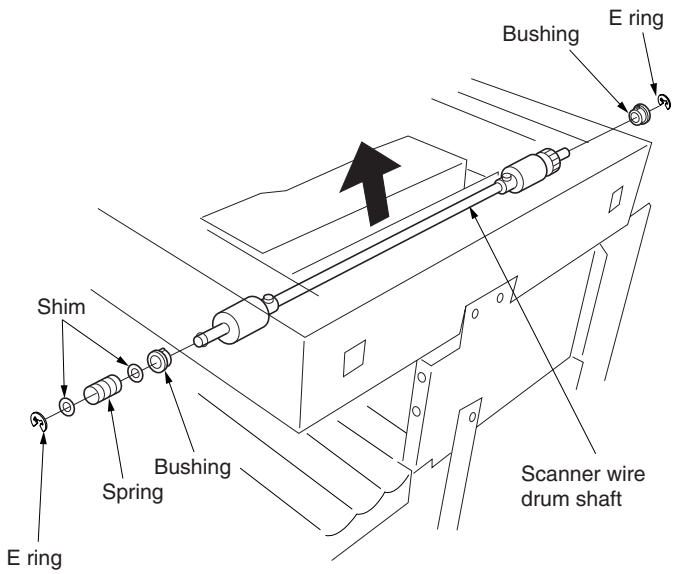


Figure 1-6-30

4. 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.
5. Secure the scanner wires using the scanner wire stoppers.

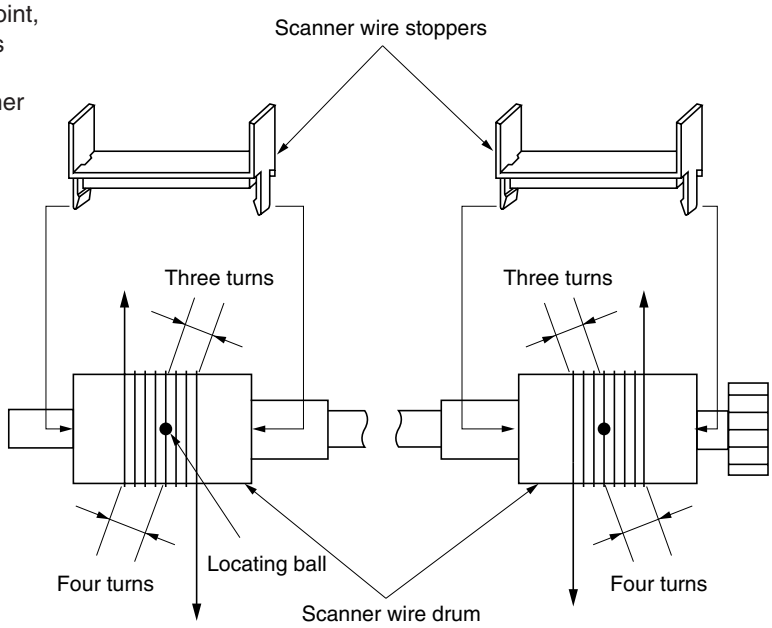


Figure 1-6-31

6. Refit the scanner wire drum shaft to the scanner unit.
7. 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.

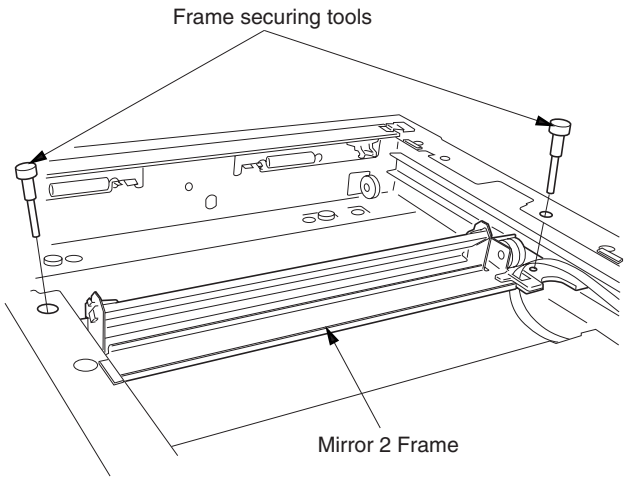


Figure 1-6-32

8. 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
9. Loop the scanner wires around the inner grooves in the pulleys on the mirror 2 frame, winding from above to below. ..... ②
10. Hook the round terminals onto the catches inside the scanner unit. ..... ③

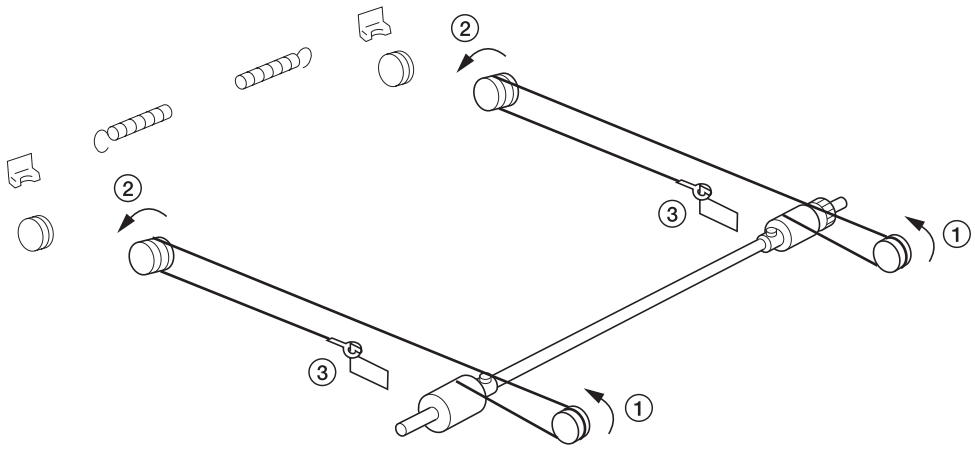


Figure 1-6-33

11. 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
12. Loop the scanner wires around the outer grooves in the pulleys on the mirror 2 frame, winding from below to above. ..... ⑤
13 Wind the scanner wires around the grooves in the scanner wire guides at the left of the scanner unit. ..... ⑥
14. Hook the round terminals onto the scanner tension springs. ..... ⑦

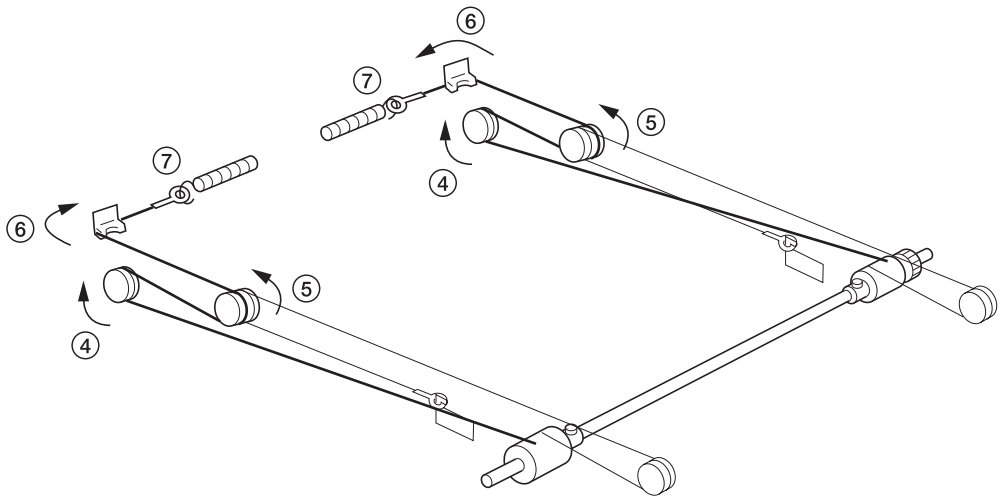


Figure 1-6-34

15. Remove the scanner wire stoppers and frame securing tools.
16. Gather the scanner wires toward the locating balls.
17. Move the mirror 2 frame from side to side to correctly locate the wires in position.
18. Refit all the removed parts.

(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.

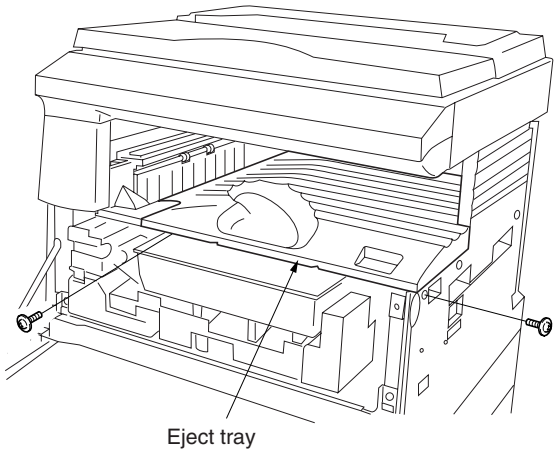


Figure 1-6-35

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

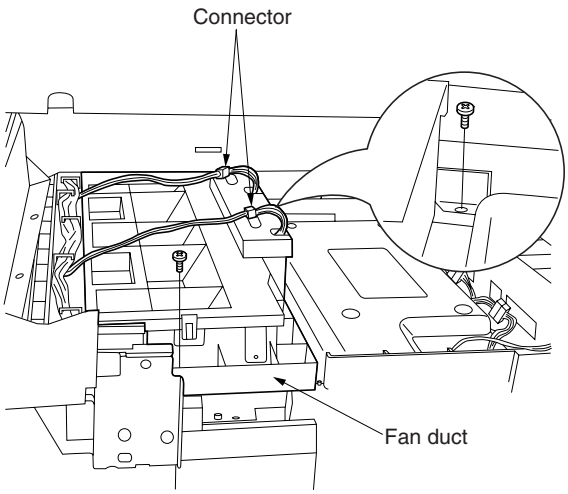


Figure 1-6-36

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

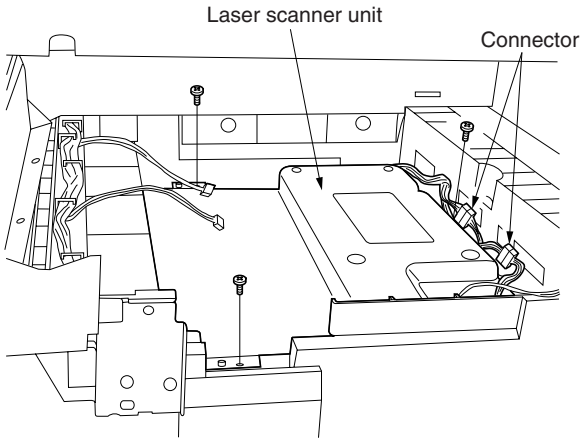


Figure 1-6-37

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.

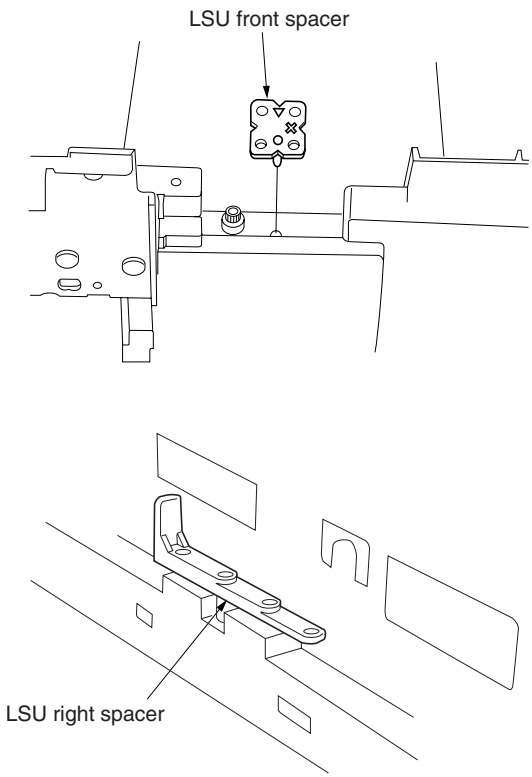


Figure 1-6-38

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

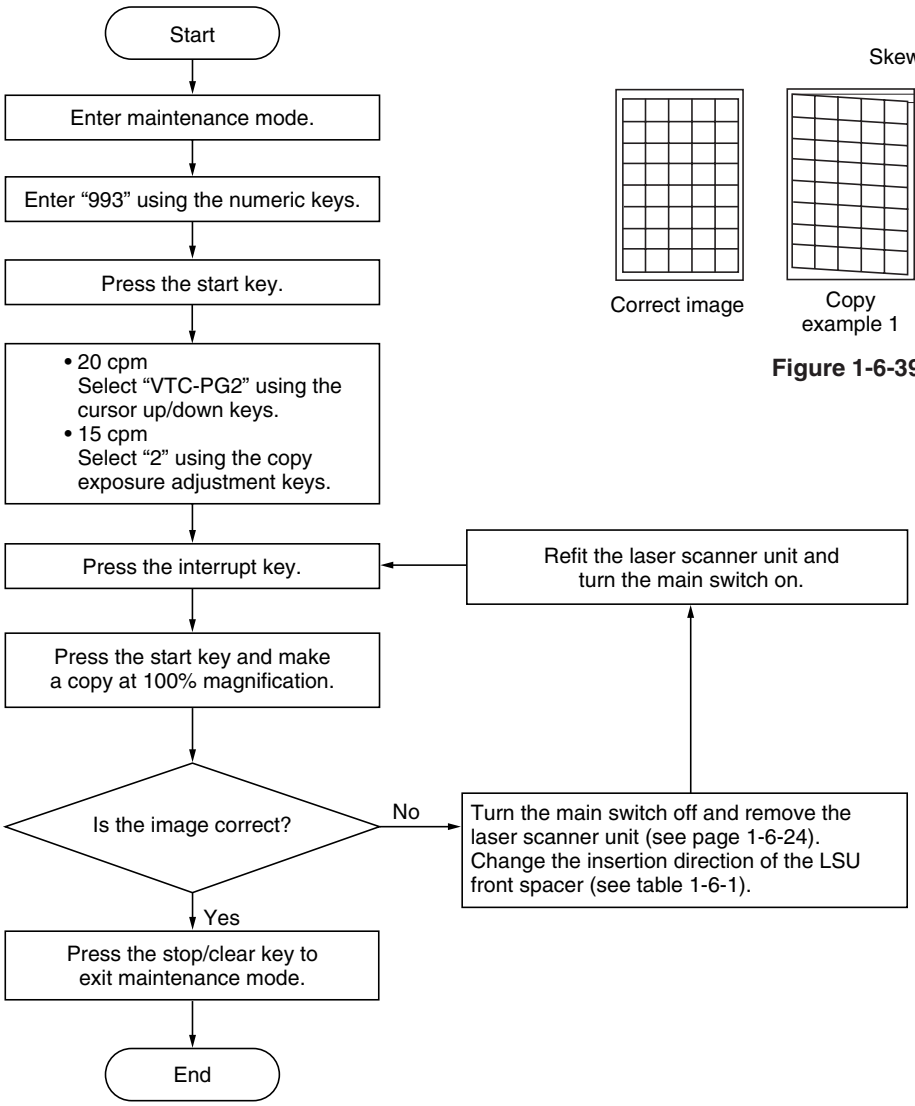
(4-1) Adjusting the skew of the laser scanner unit

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 1-6-30).

Procedure



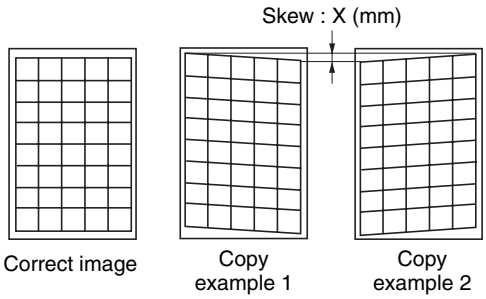
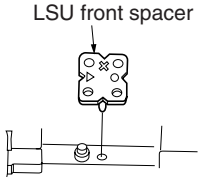
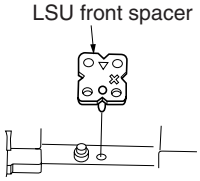
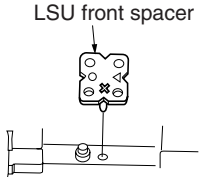


Figure 1-6-39

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.

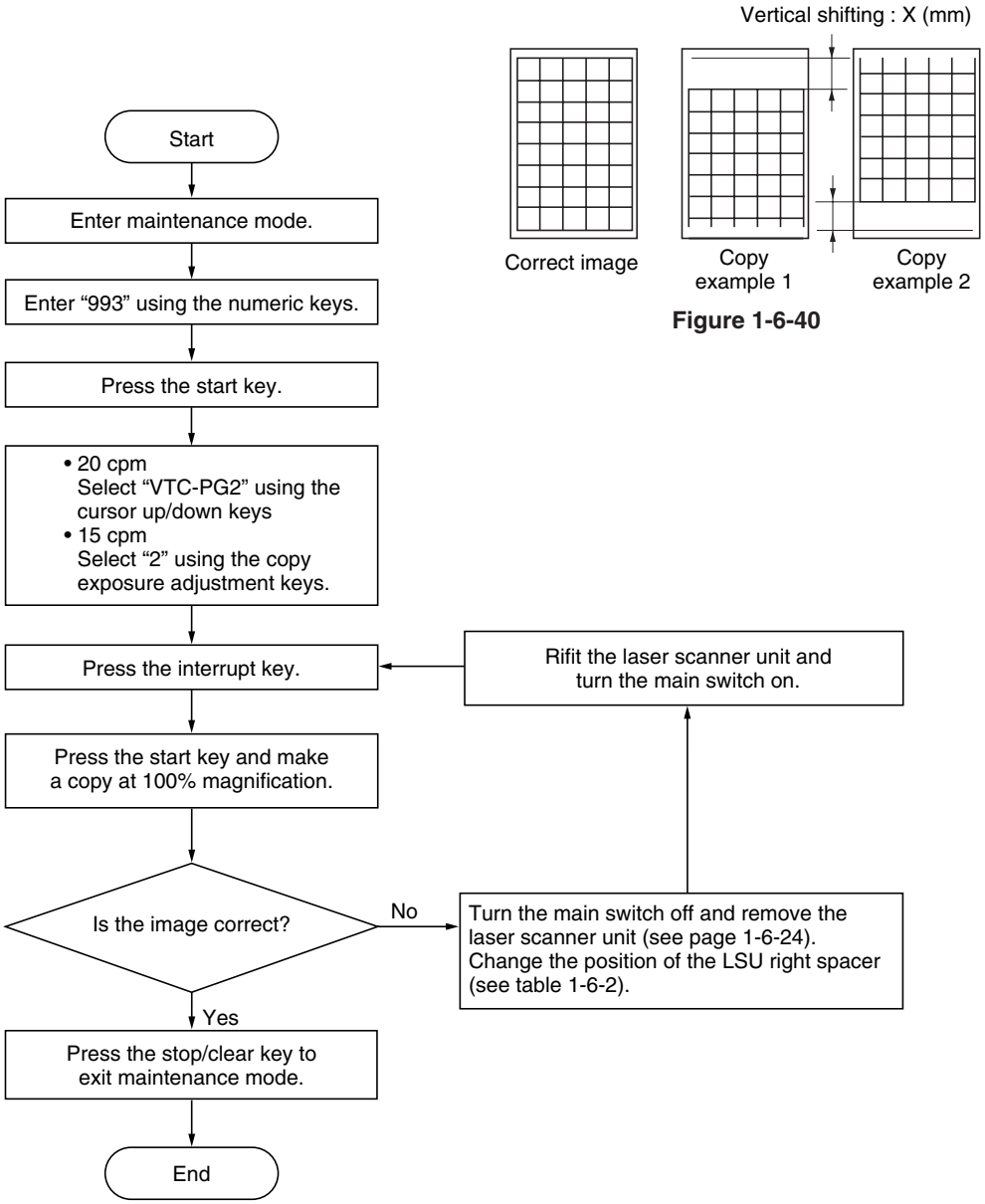
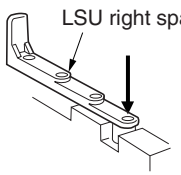
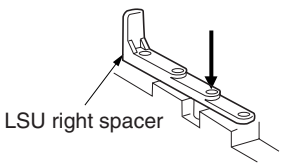
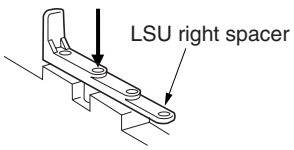


Figure 1-6-40

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 fitting the ISU, proceed to (6) Adjusting the position of the ISU (see page 1-6-30).

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

Procedure
• Detaching the ISU
1. Remove the contact glass (see page 1-6-19).
2. Remove the rear and shield covers and detach connectors CN22 and CN23 on the main PCB.

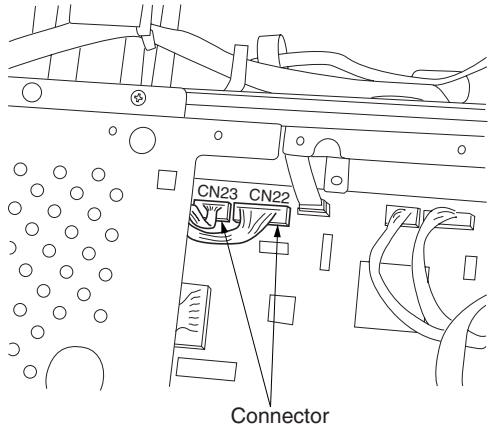


Figure 1-6-41

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

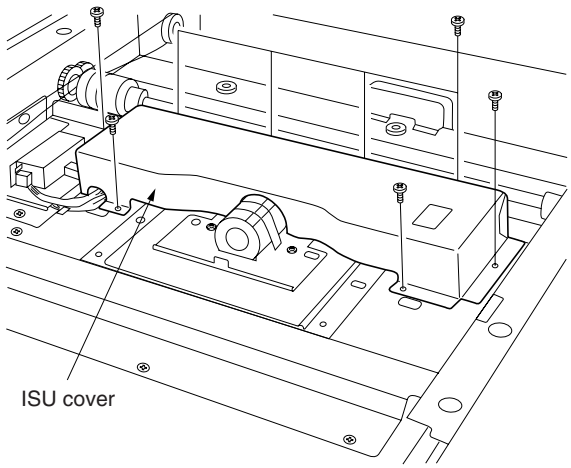


Figure 1-6-42

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

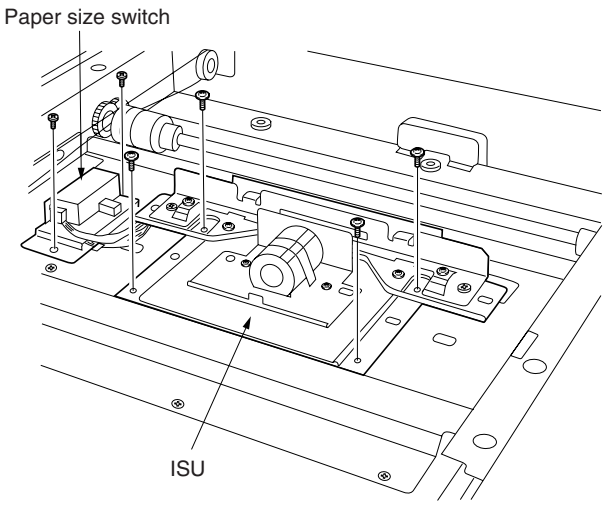


Figure 1-6-43

• 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.

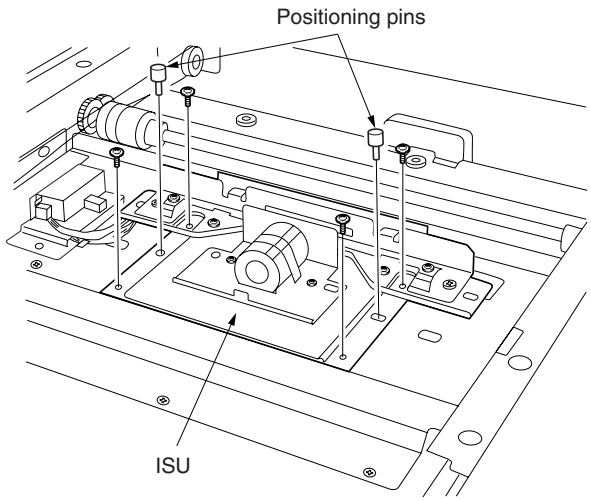


Figure 1-6-44

(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 1-6-26) first.
- Before making the following adjustment, output a VTC-PG2 pattern in maintenance item U993 to use as the original for the adjustment.

Procedure

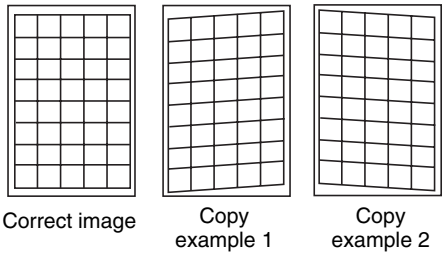
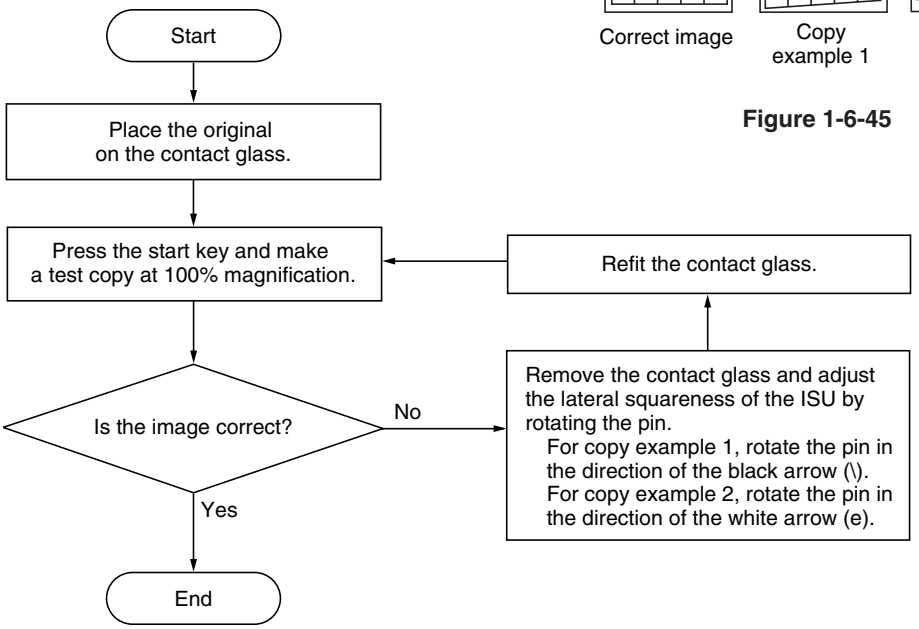


Figure 1-6-45



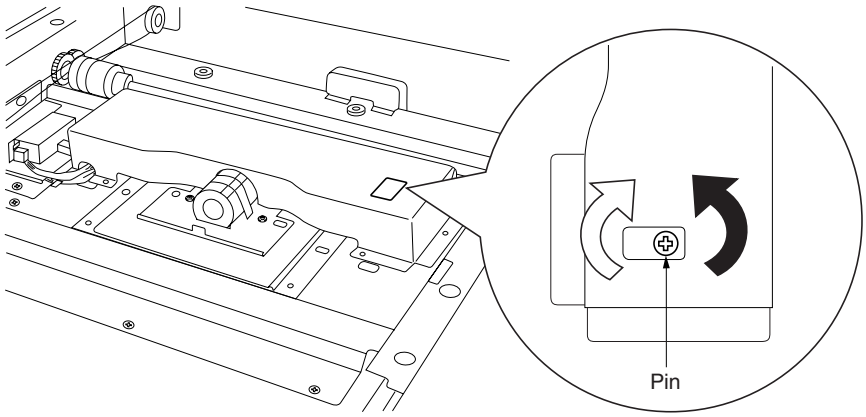


Figure 1-6-46

(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 1-6-17) 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

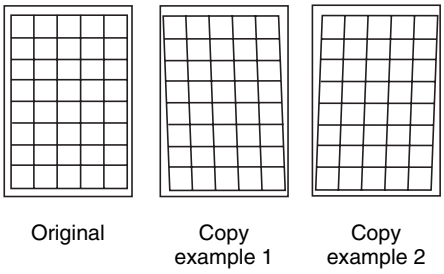
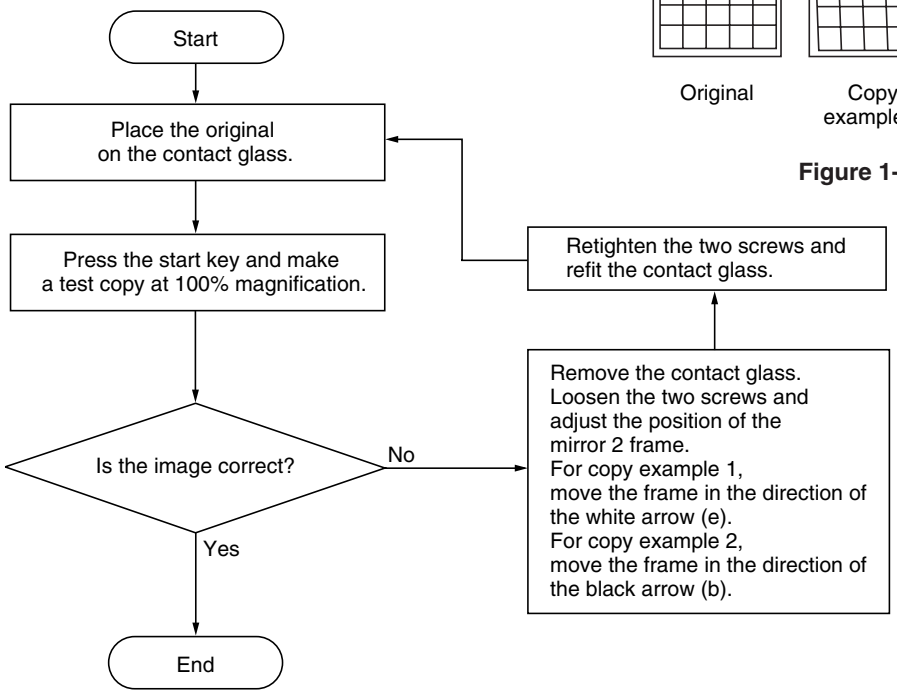


Figure 1-6-47



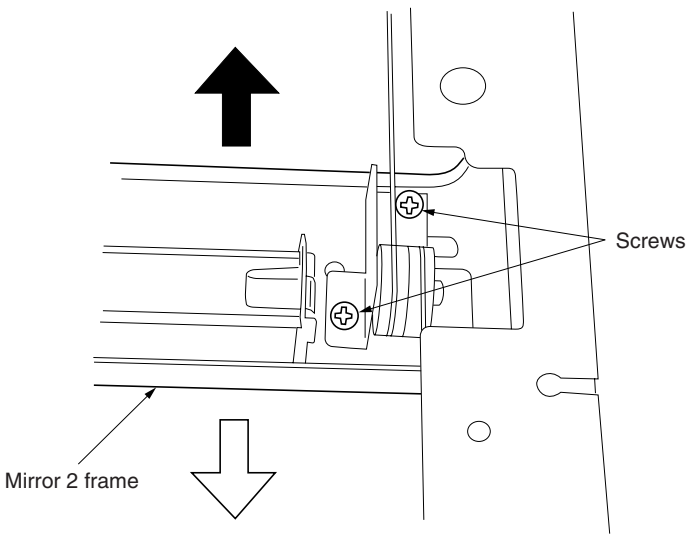
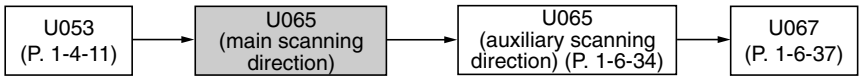


Figure 1-6-48

(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 1-6-34) and "(11) Adjusting the scanner center line" (page 1-6-37) after this adjustment.

Procedure

• 20 cpm

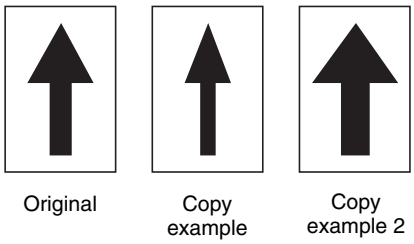
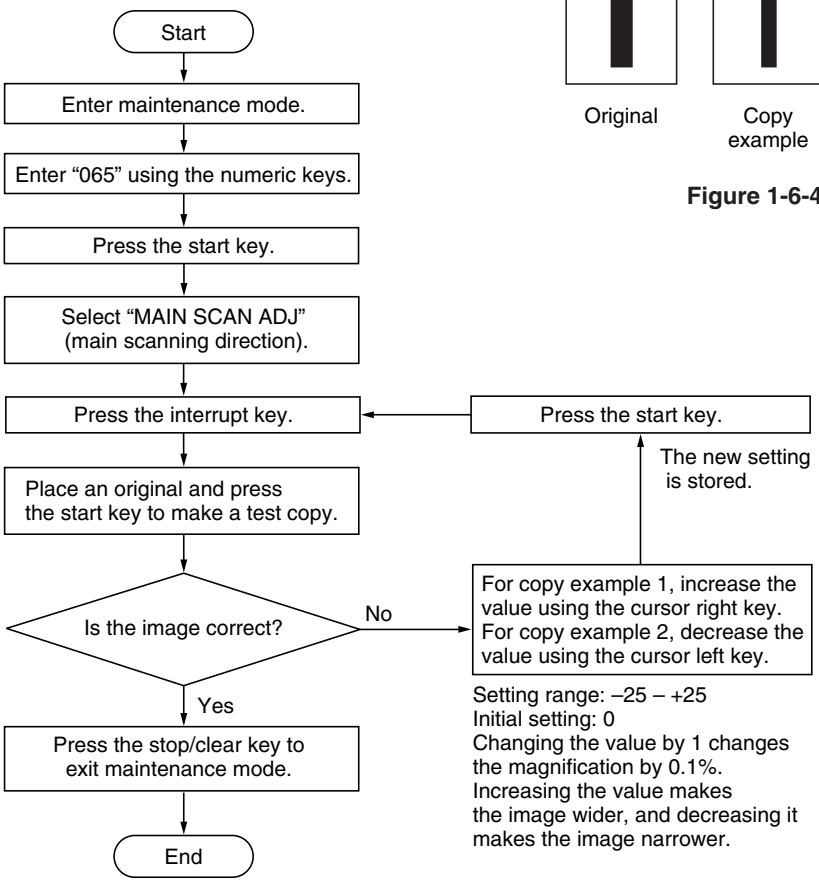


Figure 1-6-49a



• 15 cpm

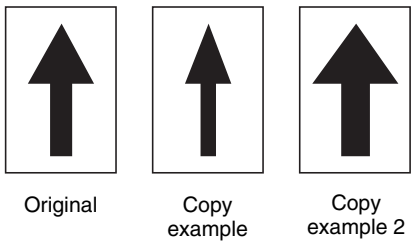
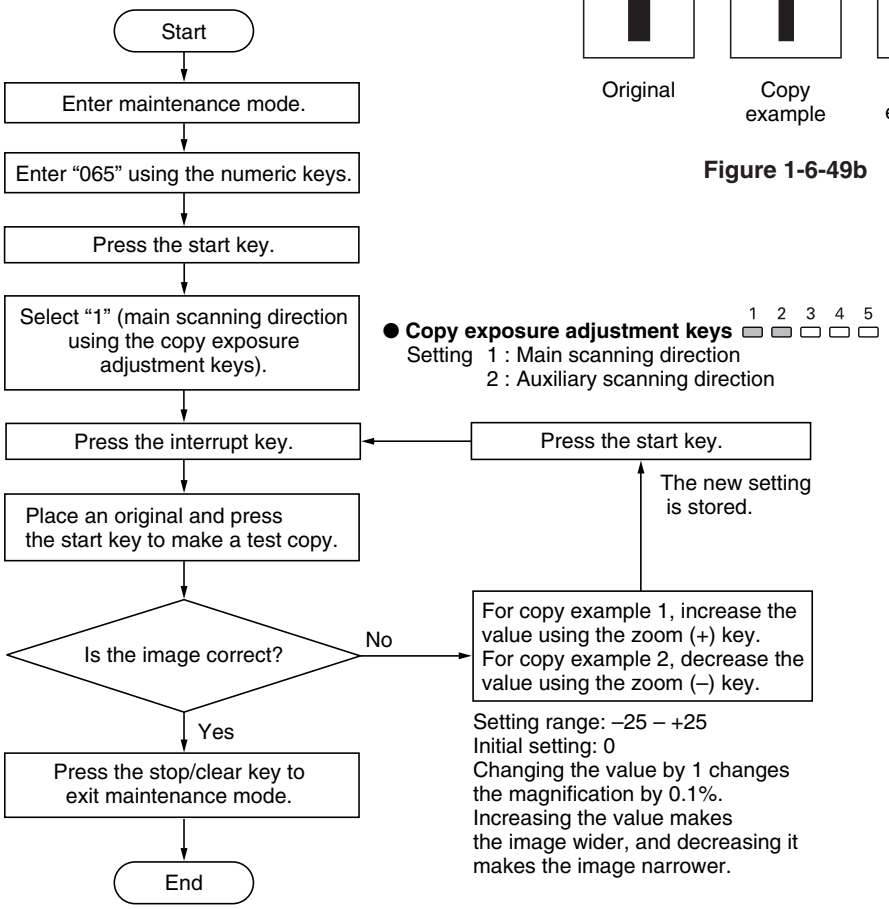
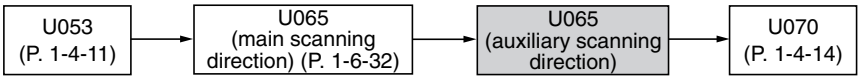


Figure 1-6-49b



(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

• 20 cpm

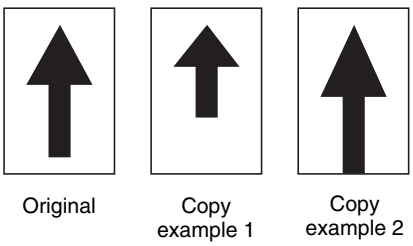
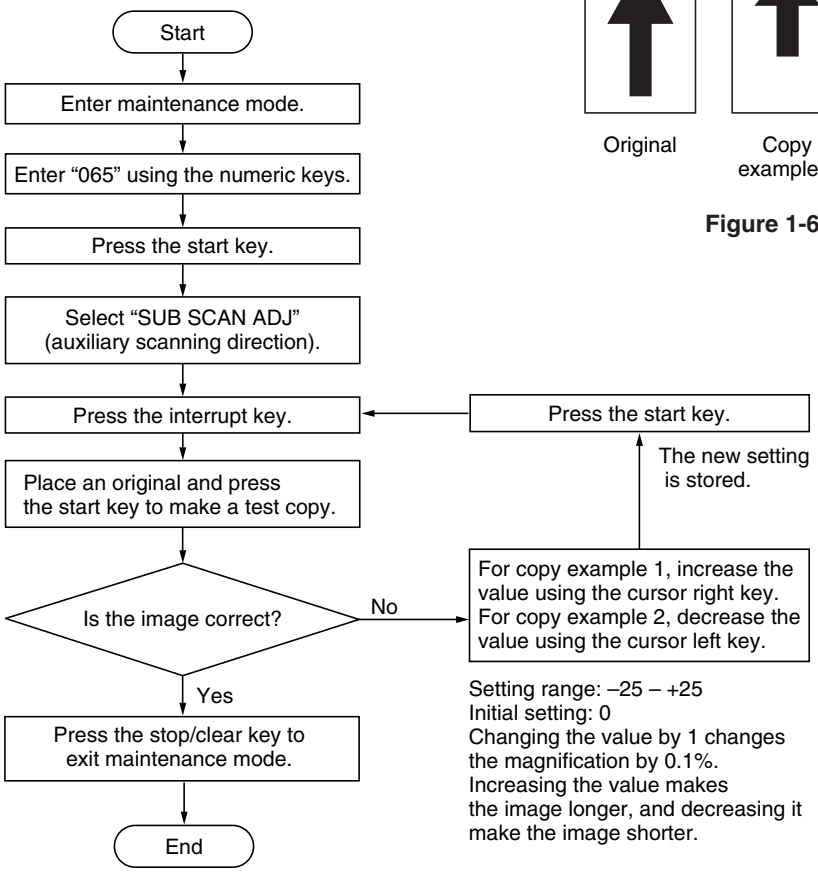


Figure 1-6-50a



• 15 cpm

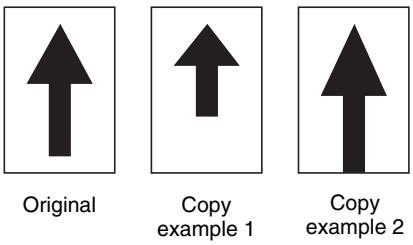
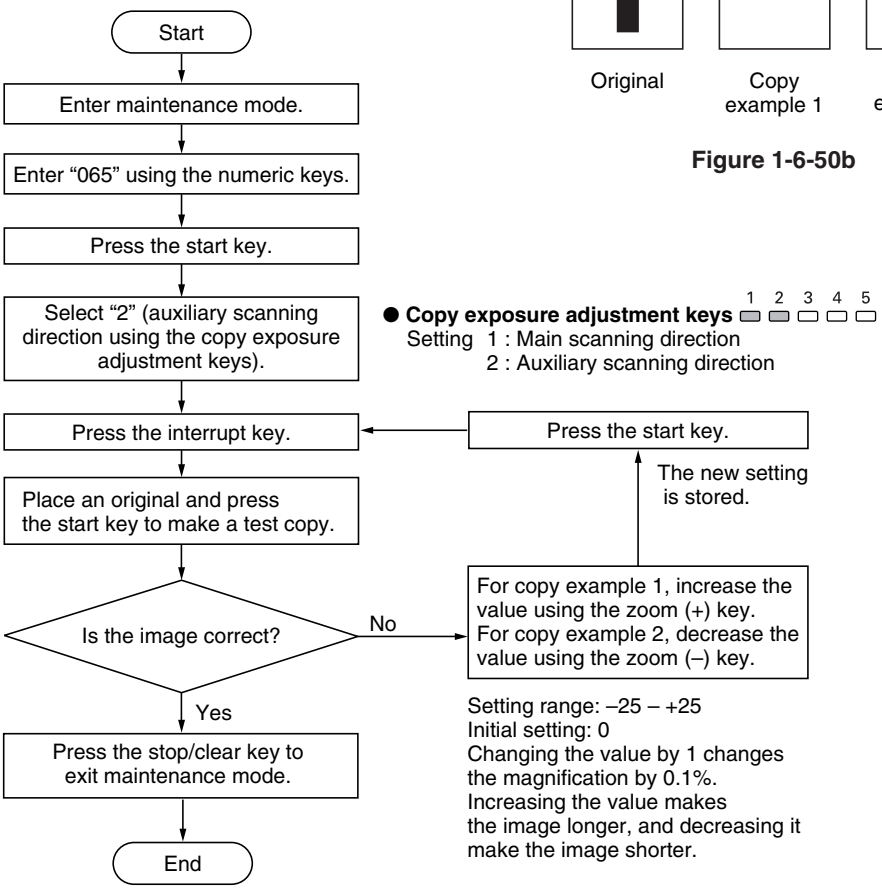
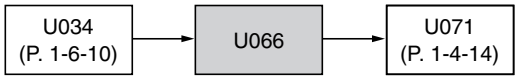


Figure 1-6-50b



(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

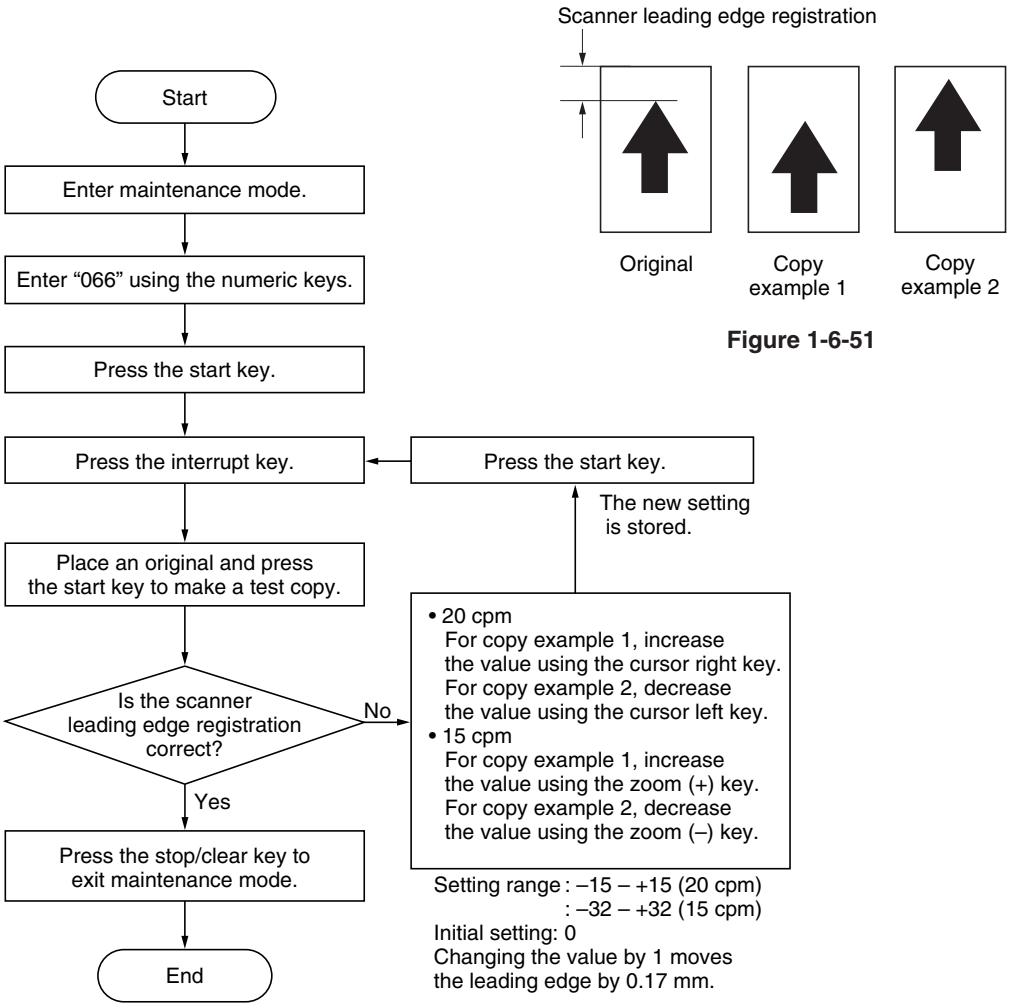
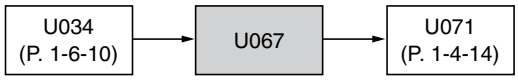


Figure 1-6-51

(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

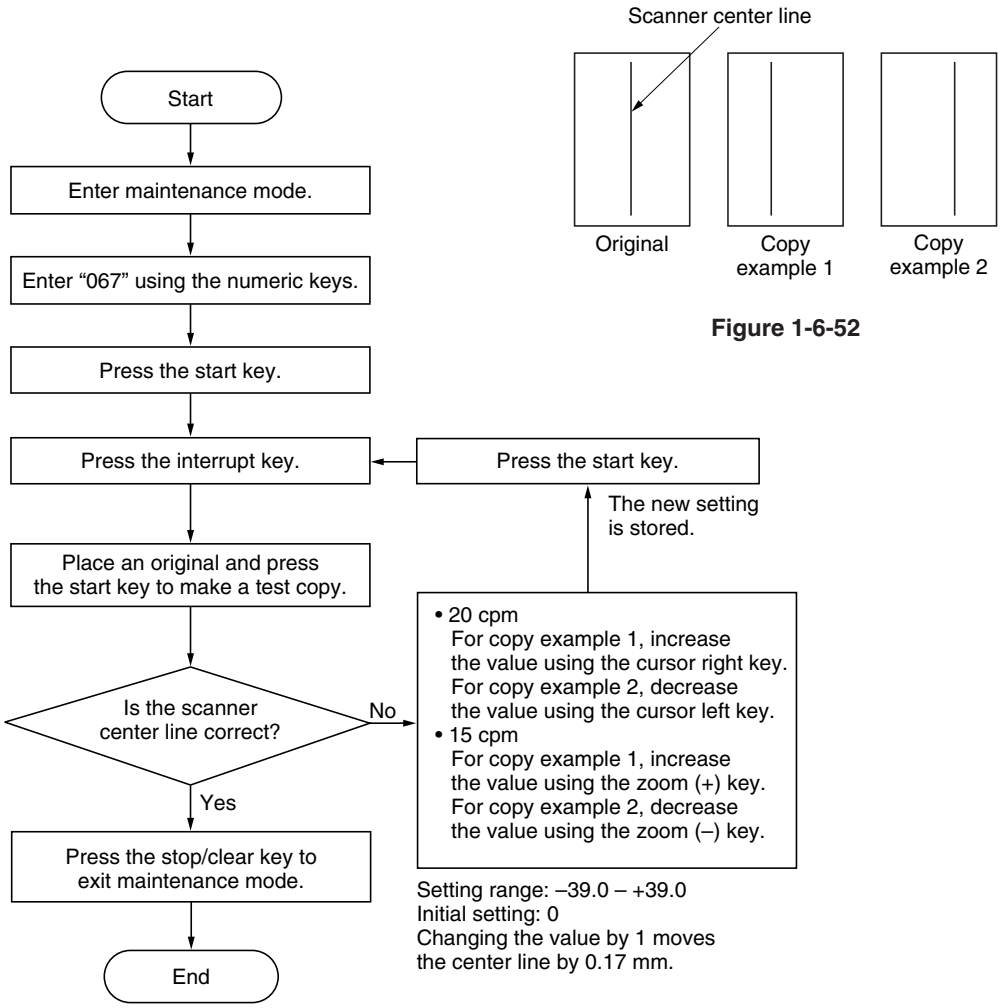


Figure 1-6-52

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

Perform the following adjustment if the margins are not correct.

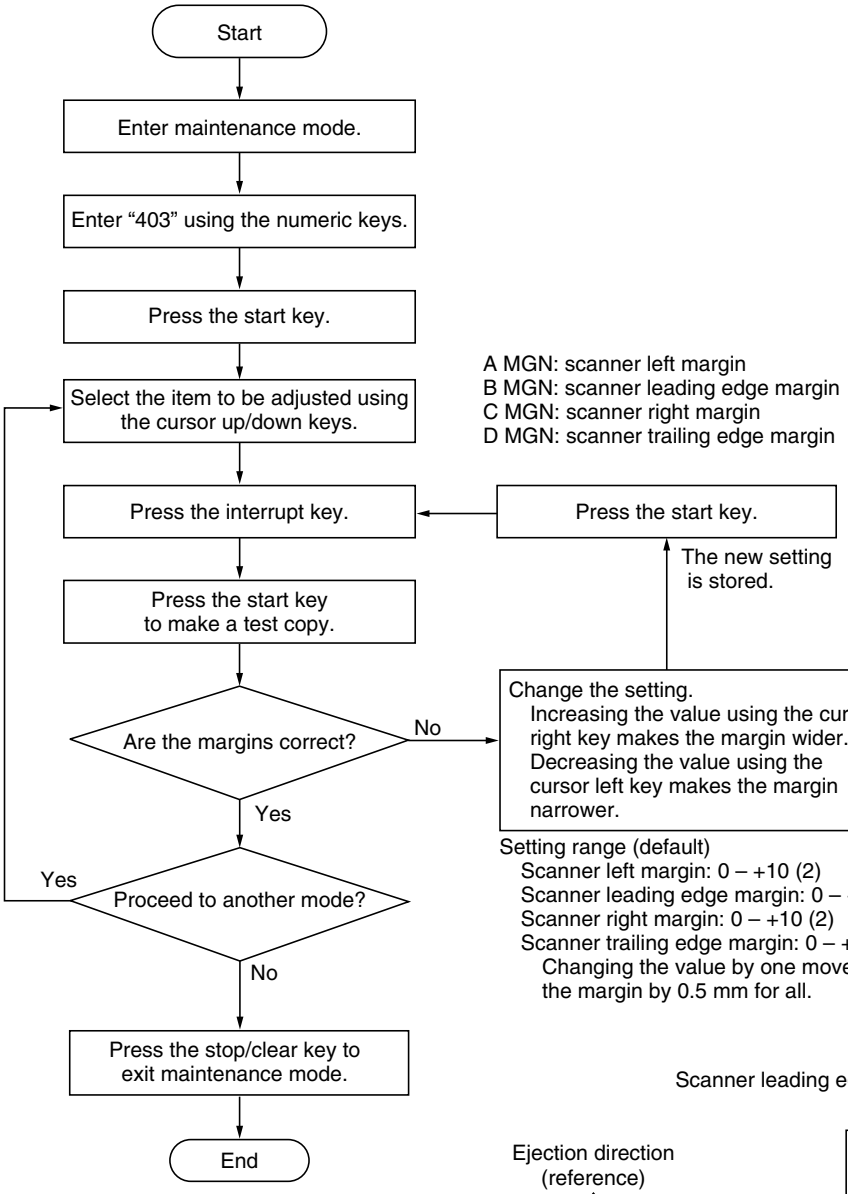
U402 (P. 1-6-15) → U403 → U404 (P. 1-4-46)

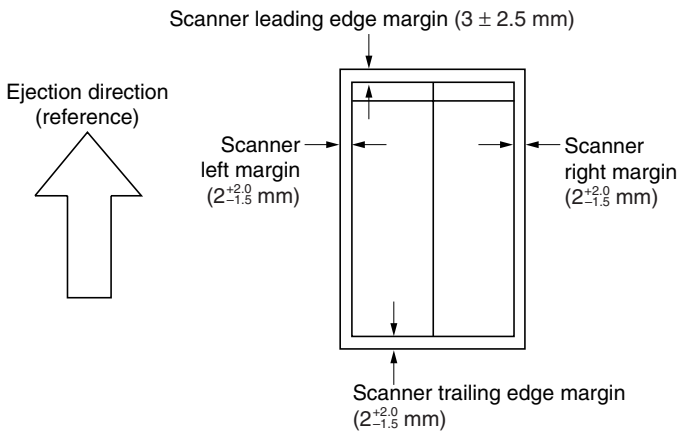
Caution:

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

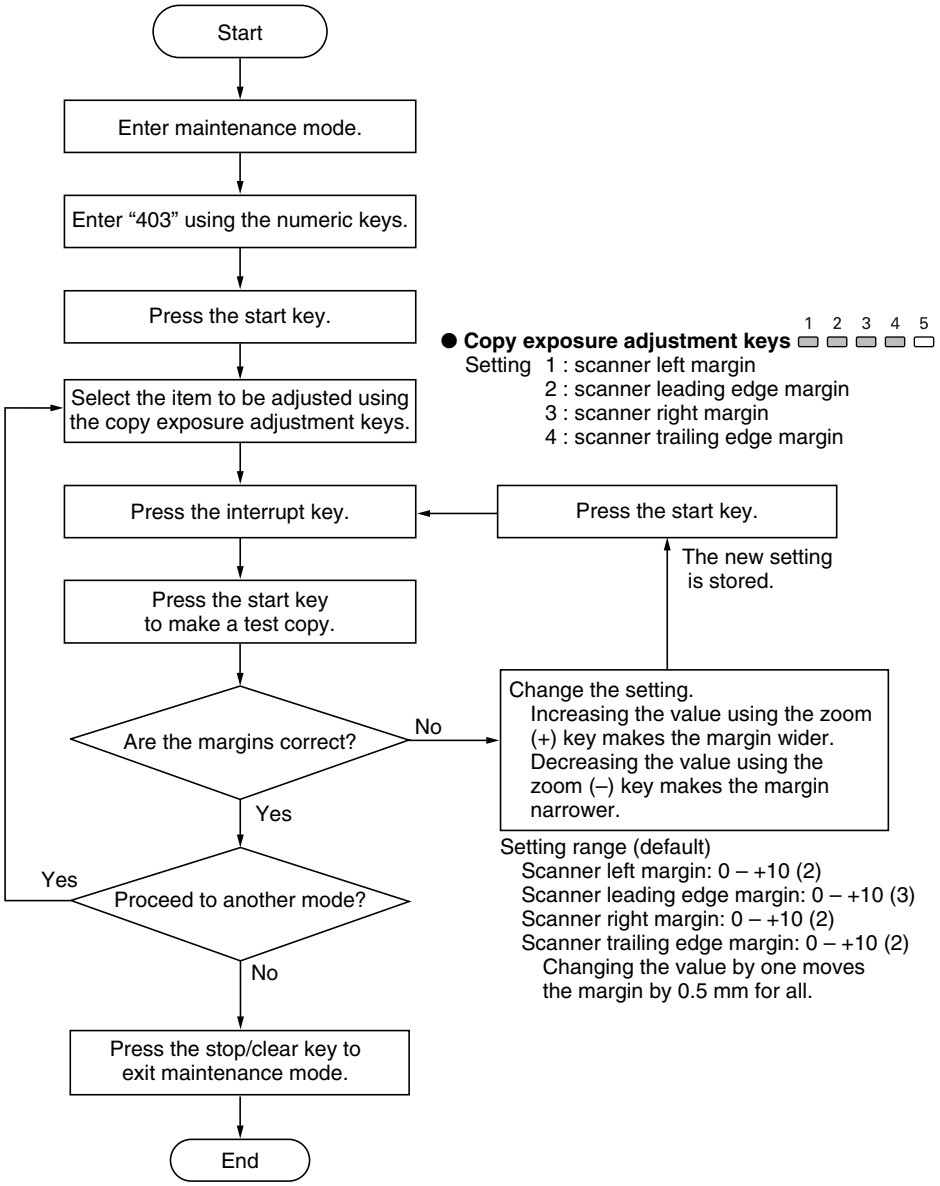
Procedure

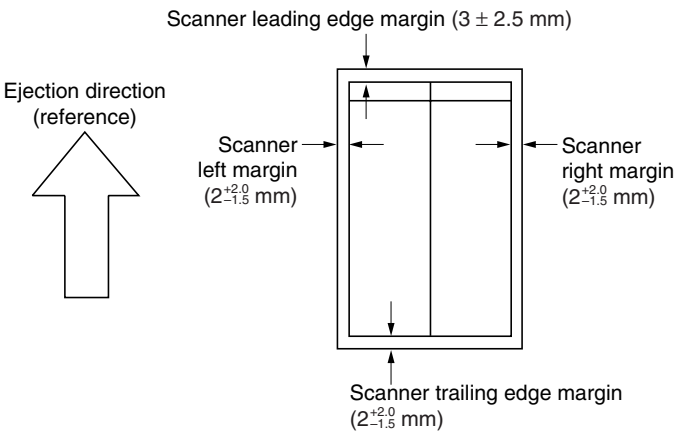
• 20 cpm





• 15 cpm


Start
Enter maintenance mode.
Enter “403” using the numeric keys.
Press the start key.
Select the item to be adjusted using the copy exposure adjustment keys.
Press the interrupt key.
Press the start key.
Press the start key to make a test copy.
Are the margins correct?
No
Yes
Change the setting.
Increasing the value using the zoom (+) key makes the margin wider.
Decreasing the value using the zoom (–) key makes the margin narrower.
The new setting is stored.
Proceed to another mode?
Yes
No
Press the stop/clear key to exit maintenance mode.
End
● Copy exposure adjustment keys 1 2 3 4 5
Setting 1 : scanner left margin
2 : scanner leading edge margin
3 : scanner right margin
4 : scanner trailing edge margin
Setting range (default)
Scanner left margin: 0 – +10 (2)
Scanner leading edge margin: 0 – +10 (3)
Scanner right margin: 0 – +10 (2)
Scanner trailing edge margin: 0 – +10 (2)
Changing the value by one moves the margin by 0.5 mm for all.


Scanner leading edge margin (3 ± 2.5 mm)
Ejection direction (reference)
Scanner left margin ($2^{+2.0}_{-1.5}$ mm)
Scanner right margin ($2^{+2.0}_{-1.5}$ mm)
Scanner trailing edge margin ($2^{+2.0}_{-1.5}$ mm)

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.

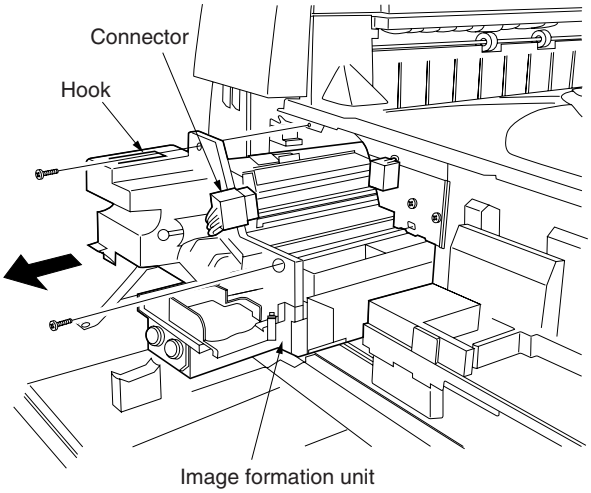


Figure 1-6-53

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

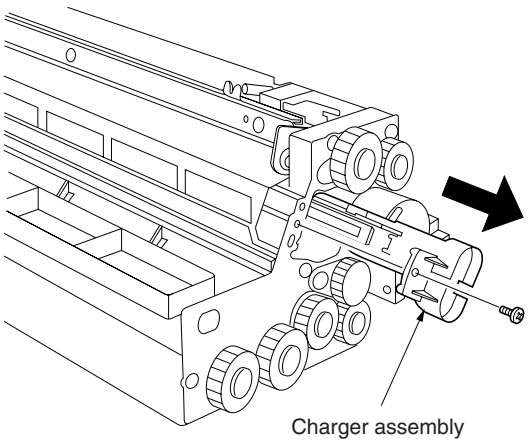


Figure 1-6-54

(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 1-6-40).
2. Remove the charger assembly (see page 1-6-40).
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.

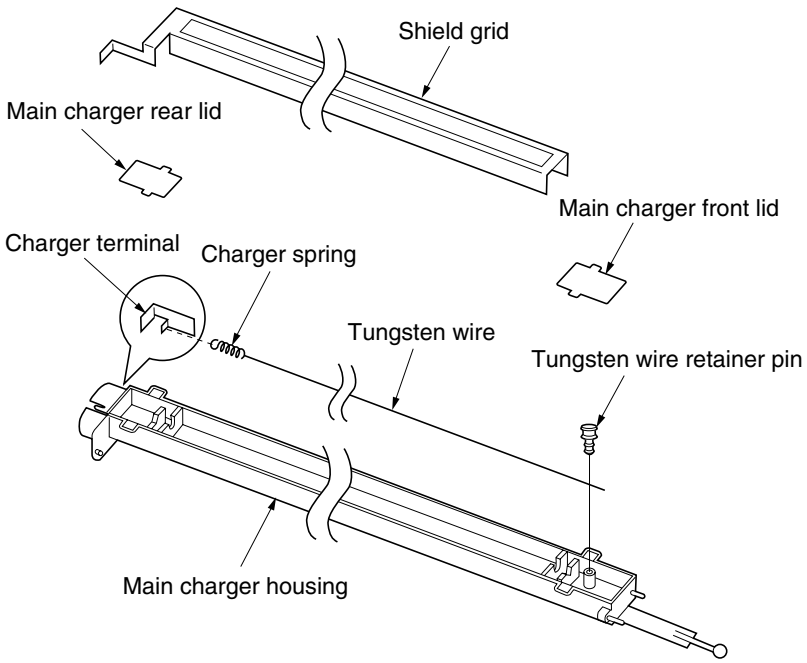


Figure 1-6-55

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.

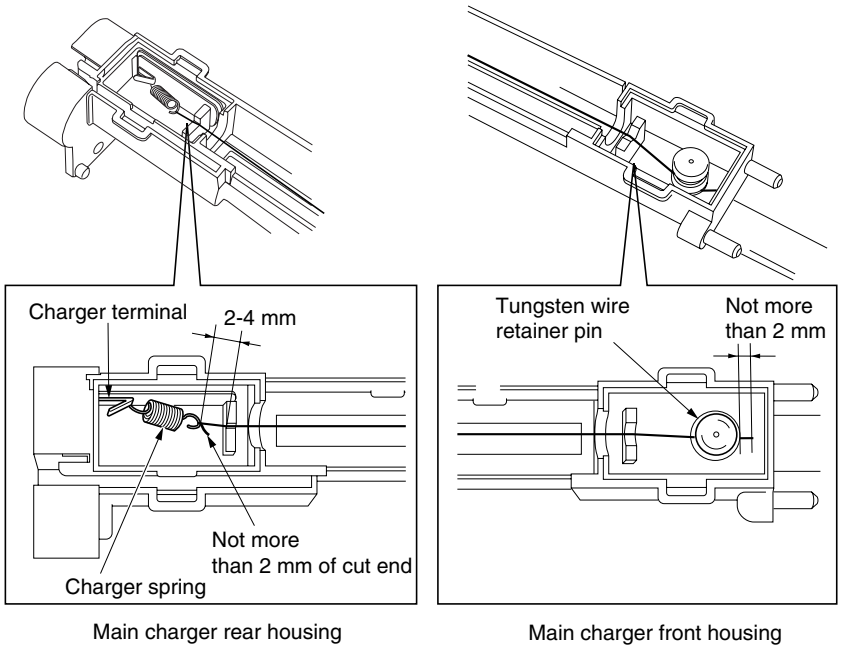


Figure 1-6-56

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 1-6-40).
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.

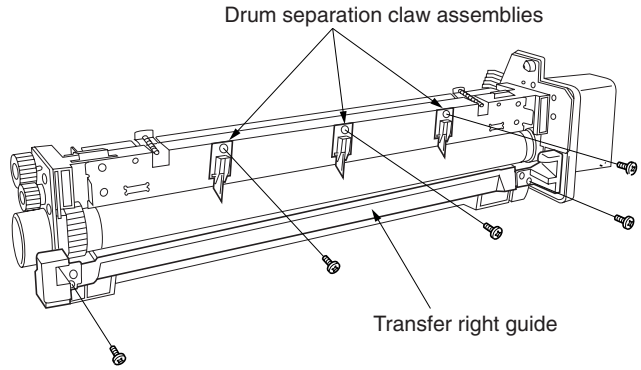


Figure 1-6-57

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.

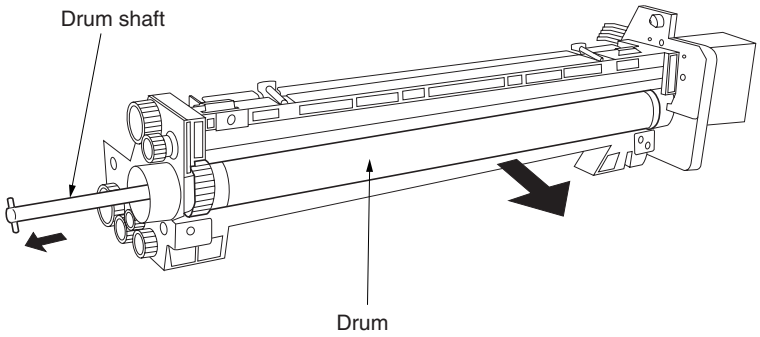


Figure 1-6-58

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)

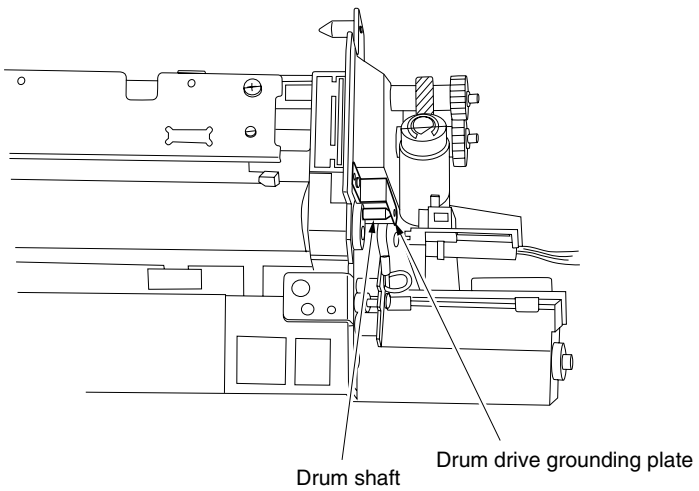


Figure 1-6-59

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 1-6-40).
2. Remove the charger assembly (see page 1-6-40).
3. Remove the screw holding the MC rail and then the rail.

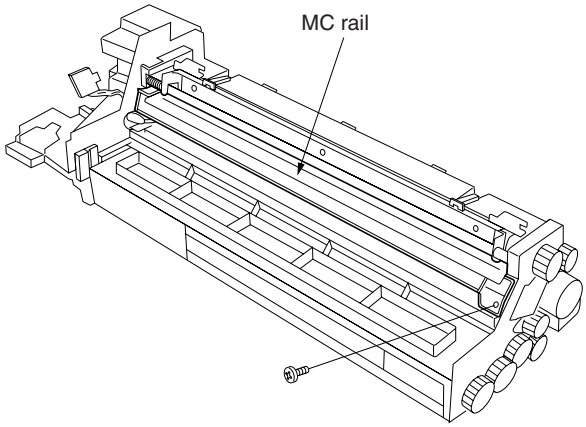


Figure 1-6-60

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.

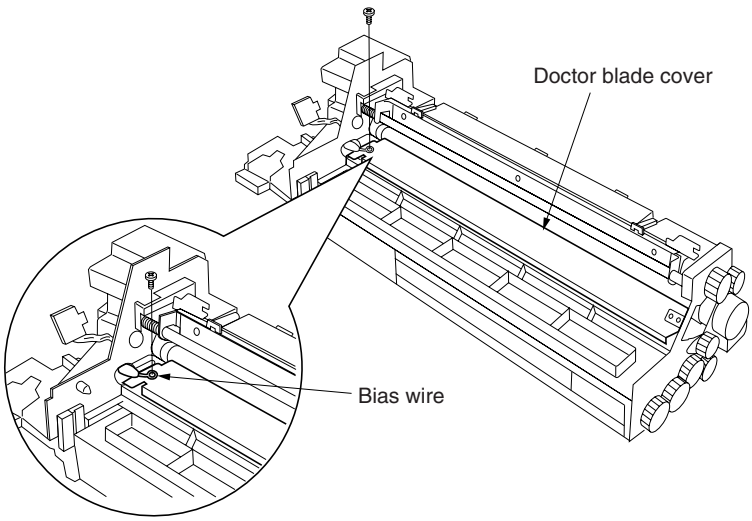


Figure 1-6-61

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.

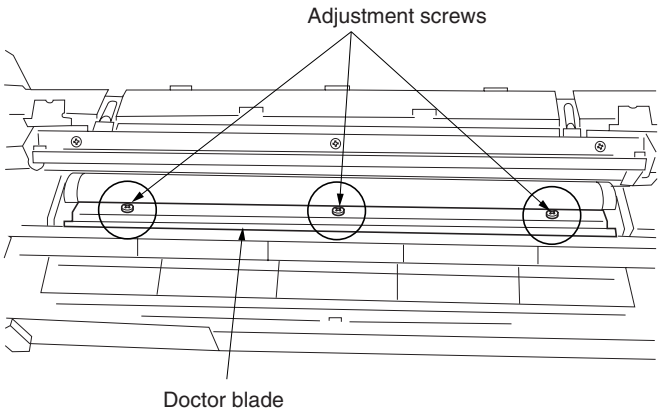


Figure 1-6-62

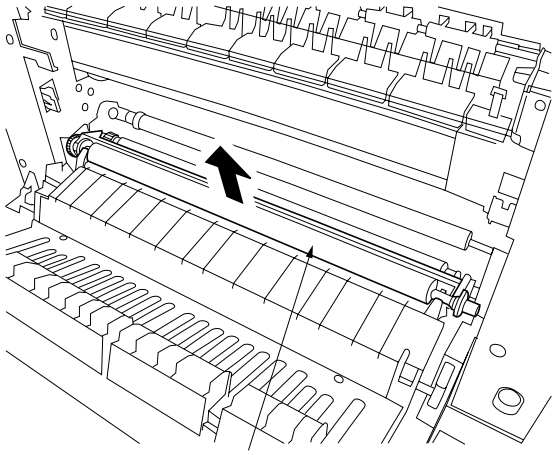
1-6-7 Transfer section

(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. Replace the transfer roller assembly and refit all the removed parts.



Transfer roller assembly

Figure 1-6-63

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 1-6-40).
2. Remove the MC rail (see page 1-6-44).
3. Remove the drum (see page 1-6-43).
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.

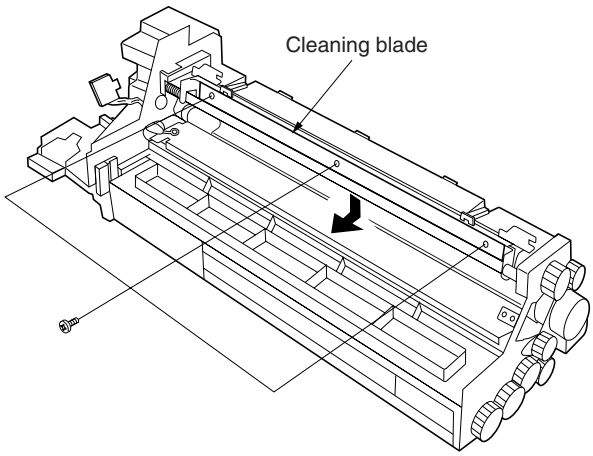


Figure 1-6-64

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.

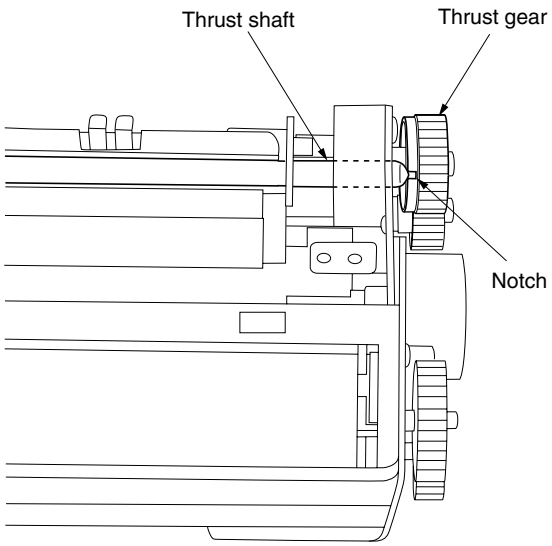


Figure 1-6-65

(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 1-6-40).
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.

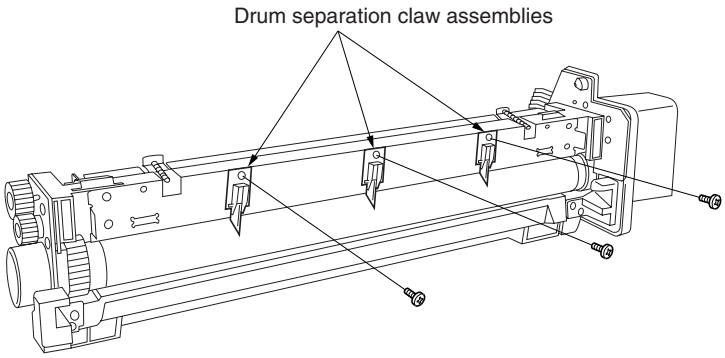


Figure 1-6-66

(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 1-6-40).
2. Remove the drum (see page 1-6-43).
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.

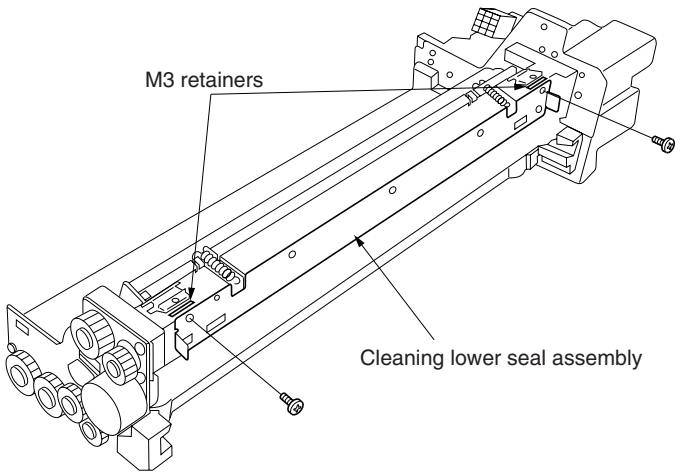


Figure 1-6-67

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.

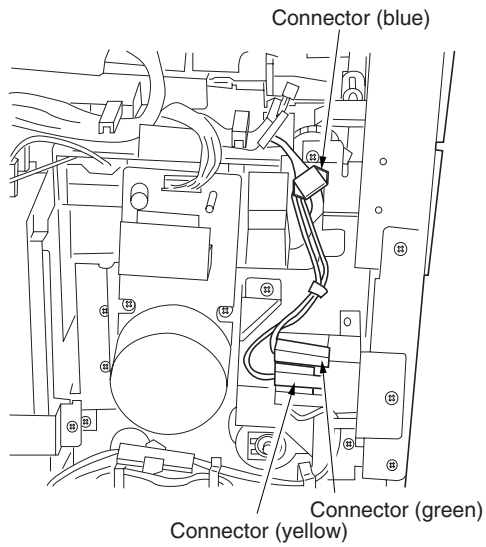


Figure 1-6-68

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.

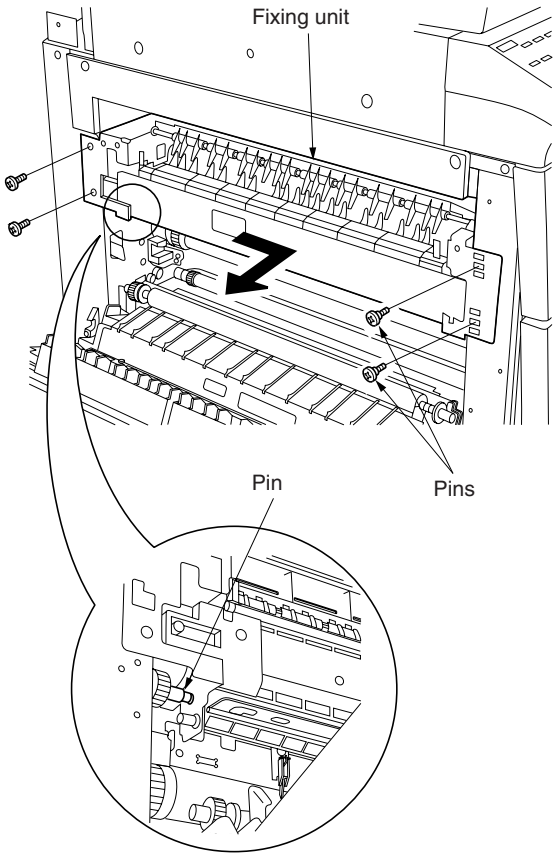


Figure 1-6-69

(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 1-6-48).
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.

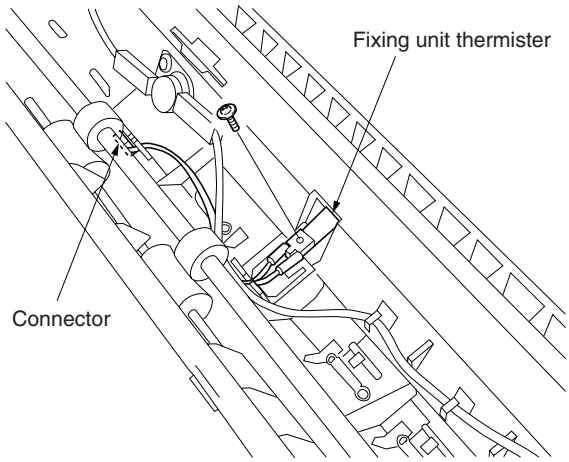


Figure 1-6-70

(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 1-6-48).
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.

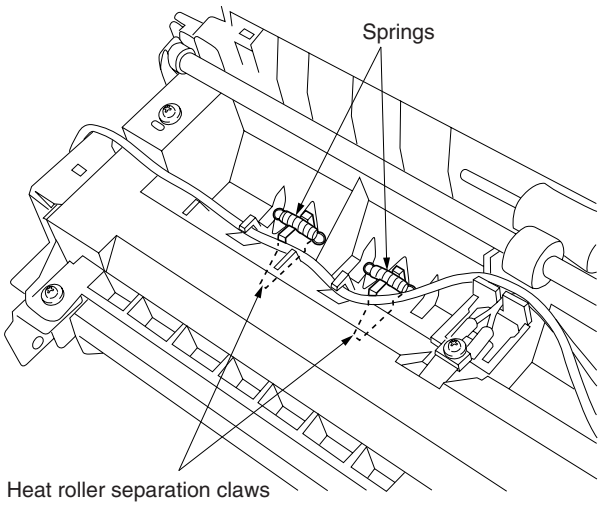


Figure 1-6-71

(4) Detaching and refitting the fixing heater

Follow the procedure below to replace the fixing heater.

Procedure

1. Remove the fixing unit (see page 1-6-48).
2. Detach the fixing heater connector.

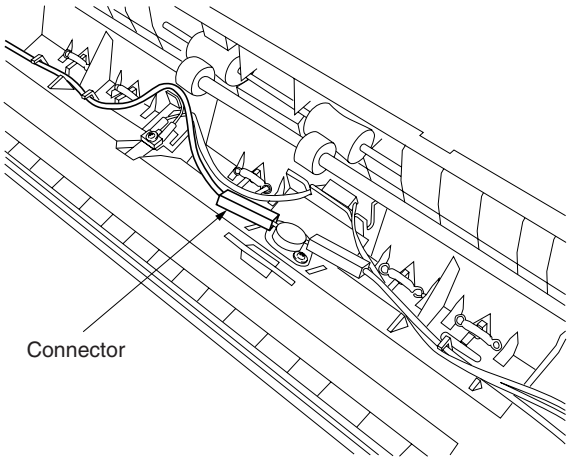


Figure 1-6-72

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

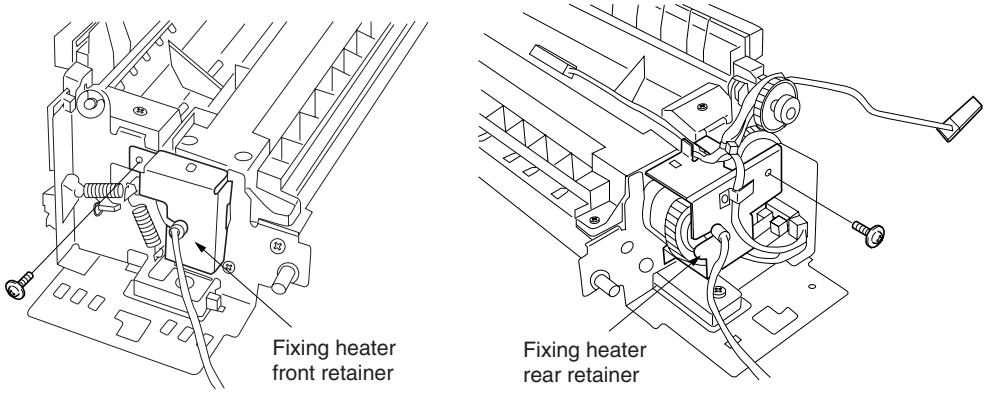


Figure 1-6-73

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

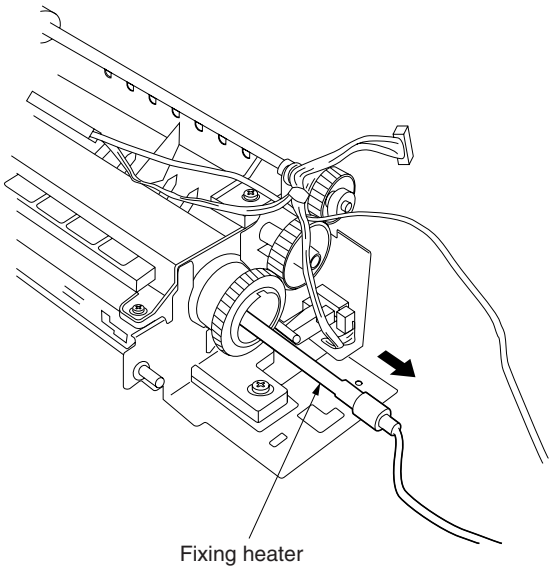


Figure 1-6-74

(5) Detaching and refitting the heat roller

Follow the procedure below to replace the heat roller.

Procedure

1. Remove the fixing unit (see page 1-6-48).
2. Remove the fixing unit thermistor, fixing heater and heat roller separation claw assemblies (see pages 1-6-49 and 50).
3. Remove the two screws holding the eject guide and then the guide.

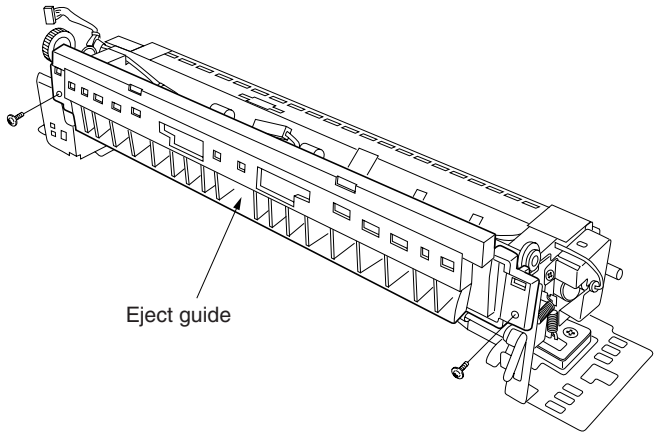


Figure 1-6-75

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.

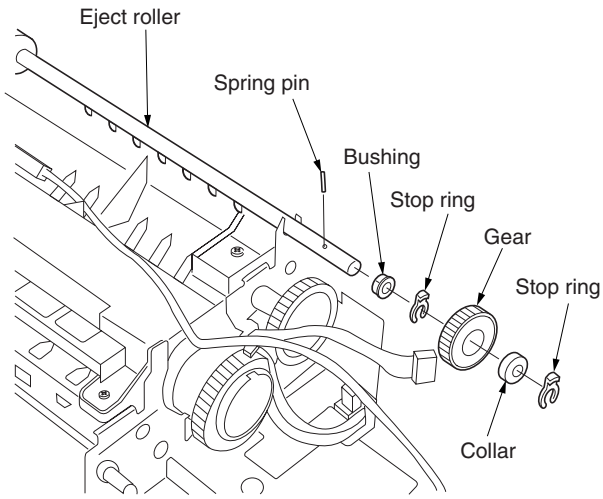


Figure 1-6-76

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

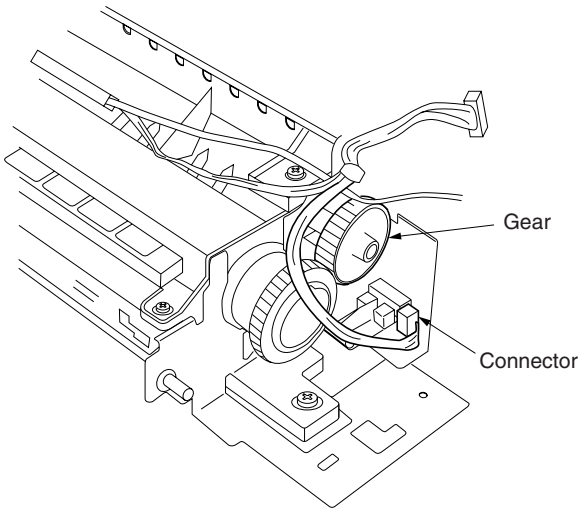


Figure 1-6-77

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

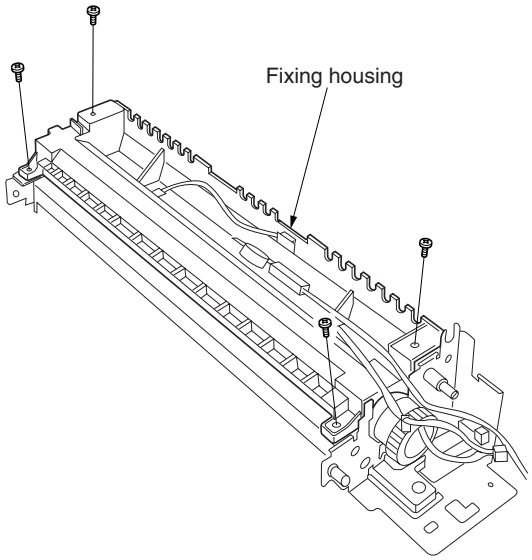


Figure 1-6-78

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

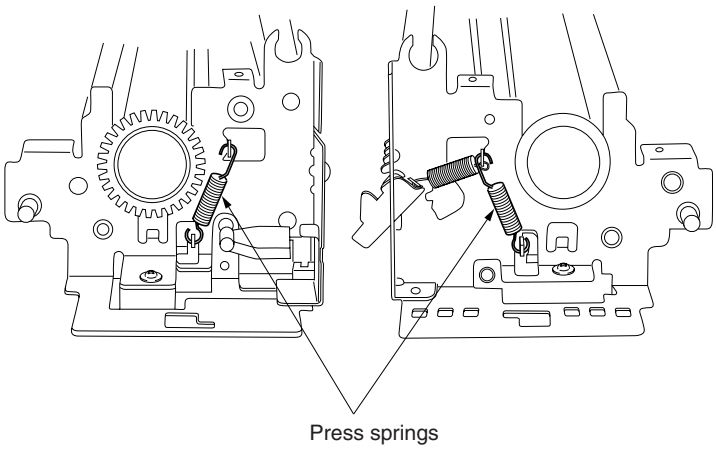


Figure 1-6-79

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.

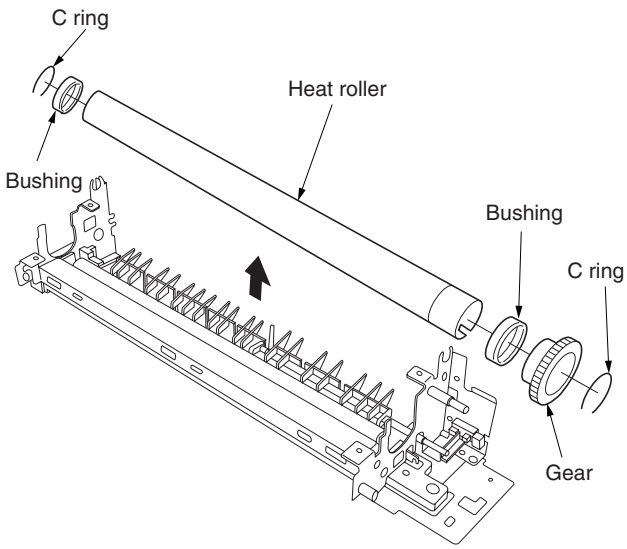


Figure 1-6-80

(6) Detaching and refitting the press roller

Follow the procedure below to replace the press roller.

Procedure

1. Remove the fixing unit (see page 1-6-48).
2. Remove the heat roller (see page 1-6-51).
3. Remove the screw holding the fixing guide plate and then the plate.

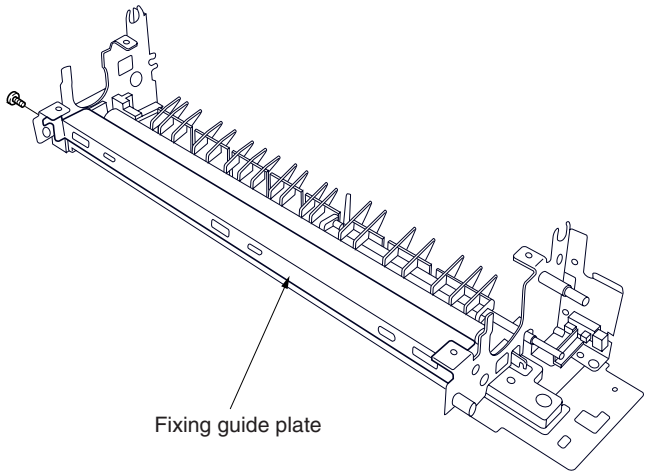


Figure 1-6-81

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

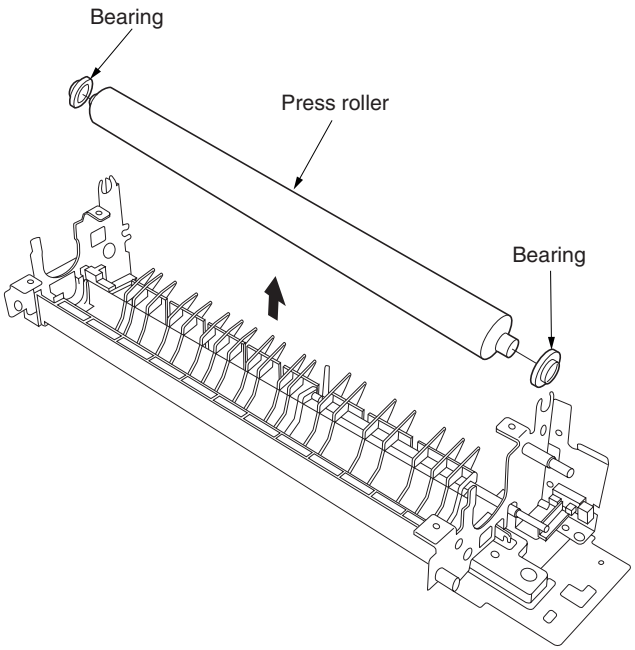


Figure 1-6-82

1-7-1 Replacing the main PCB

Main PCB replacement requires the following tools:
Memory tool PCB (P/N 2AV68030)
NVRAM (P/N NAC06020)

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 two screws holding the upper shield cover and then the cover.
3. If the optional memory board is installed, remove the memory board (15 cpm copier only).

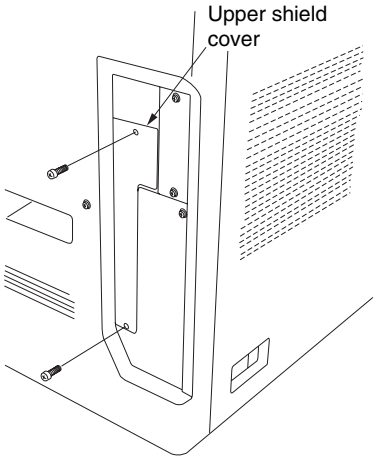


Figure 1-7-1

4. 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.
5. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
   Note:
   On the 15 cpm copier, insert the memory tool PCB along the upper and lower guides.
   On the 20 cpm copier, take care not to allow the memory tool PCB to make contact with the metal components of the copier.

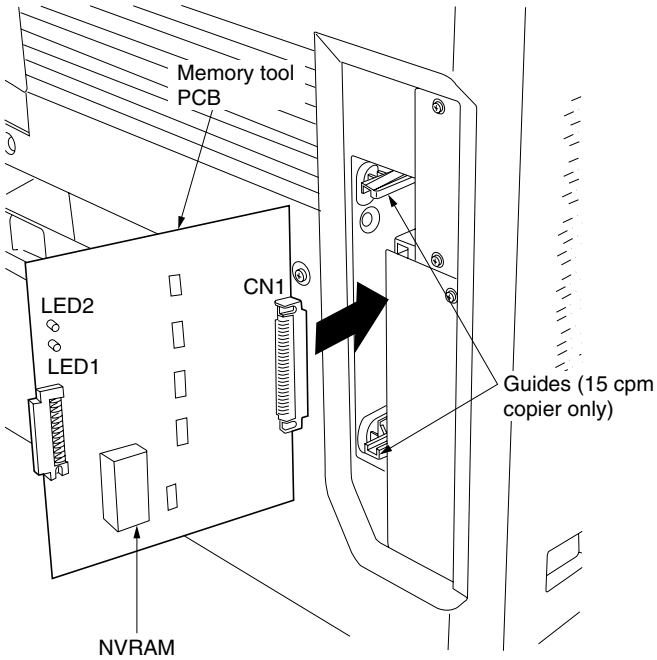


Figure 1-7-2

6. 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.
7. 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.

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

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

11. Insert the power plug and turn the main switch on.
12. Upgrade the firmware on the main PCB and operation unit PCB (20 cpm copier only). See pages 1-7-3 and 5.
13. Turn the main switch on.
14. Enter maintenance mode.
15. Run maintenance item U020.
16. Run maintenance item U252 and set the destination.
17. Run maintenance item U917 and select "WRITE".
18. Exit maintenance mode.
19. Turn the main switch off and disconnect the power plug.
20. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
    Note:
    On the 15 cpm copier, insert the memory tool PCB along the upper and lower guides.
    On the 20 cpm copier, take care not to allow the memory tool PCB to make contact with the metal components of the copier.
21. 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.
22. 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.

23. 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 ROMs
15 cpm: Main ROM 1 IC (P/N 2AV68060)
20 cpm: Main ROM IC (P/N 2AX68010)

Procedure

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

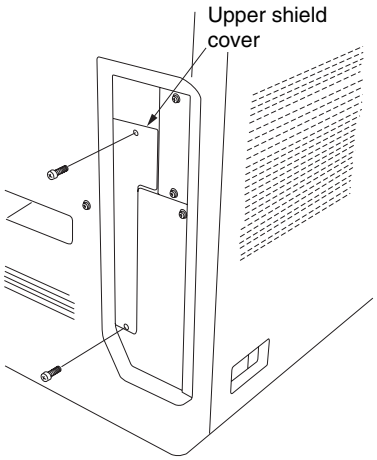


Figure 1-7-3

3. If the optional memory board is installed, remove the memory board (15 cpm copier only).
4. Fit the master ROM into the IC3 socket on the flash tool assembly.
5. Connect CN2 on the flash tool PCB to CN2 on the memory tool PCB.
6. Insert the memory tool PCB into the copier and connect its CN1 to CN31 on the main PCB.
   Note:
   On the 15 cpm copier, insert the memory tool PCB along the upper and lower guides.
   On the 20 cpm copier, take care not to allow the memory tool PCB to make contact with the metal components of the copier.

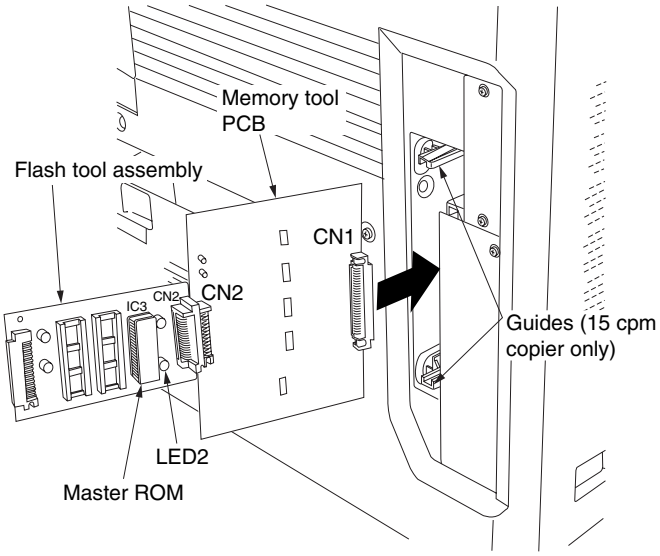


Figure 1-7-4

7. 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.
8. When flashing LED2 (green) remains lit after approximately 30 to 40 seconds, upgrading of the master ROM is complete.
9. Turn the main switch on.
10. 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.

1-7-3 Upgrading the firmware on the operation unit PCB (20 cpm copier only)

Firmware upgrading requires the following tools:
Flash tool assembly (P/N 35968010)
Master ROMs
Inch specifications
Operation unit ROM 1 IC (P/N 2AX68020)
Metric specifications
Operation unit ROM 1 IC (P/N 2AX68040)

Procedure

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

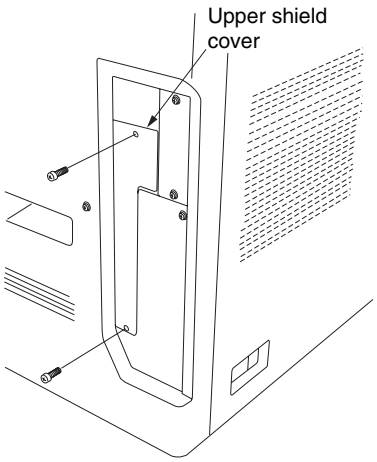


Figure 1-7-5

3. Fit the master ROM into the IC3 socket on the flash tool assembly.
4. Align the flash tool assembly with the cutout and insert into the copier. Connect CN2 on the flash tool assembly to CN33 on the main PCB.

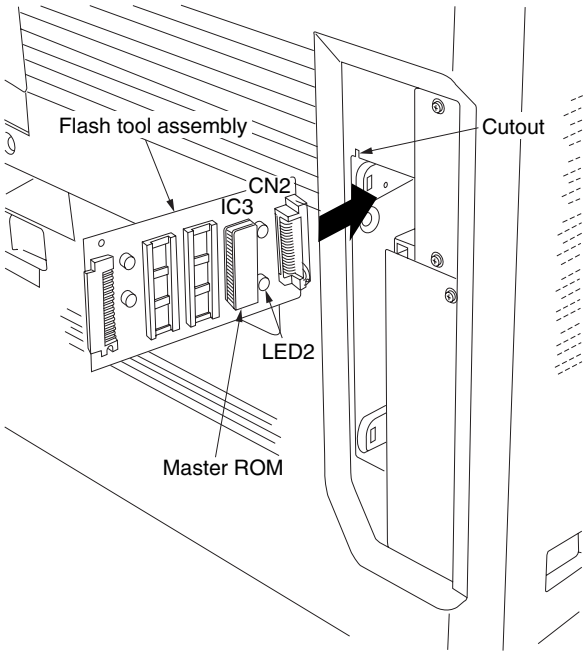


Figure 1-7-6

5. 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.
6. When flashing LED2 (green) remains lit after approximately 2 to 4 minutes, upgrading of the master ROM is complete.
7. Turn the main switch off.
8. Remove the flash tool assembly.

1-7-4 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 upper drawer, lower 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.
Each drawer can hold up to 250 sheets of paper. The bypass tray can hold up to 50 sheets of 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.

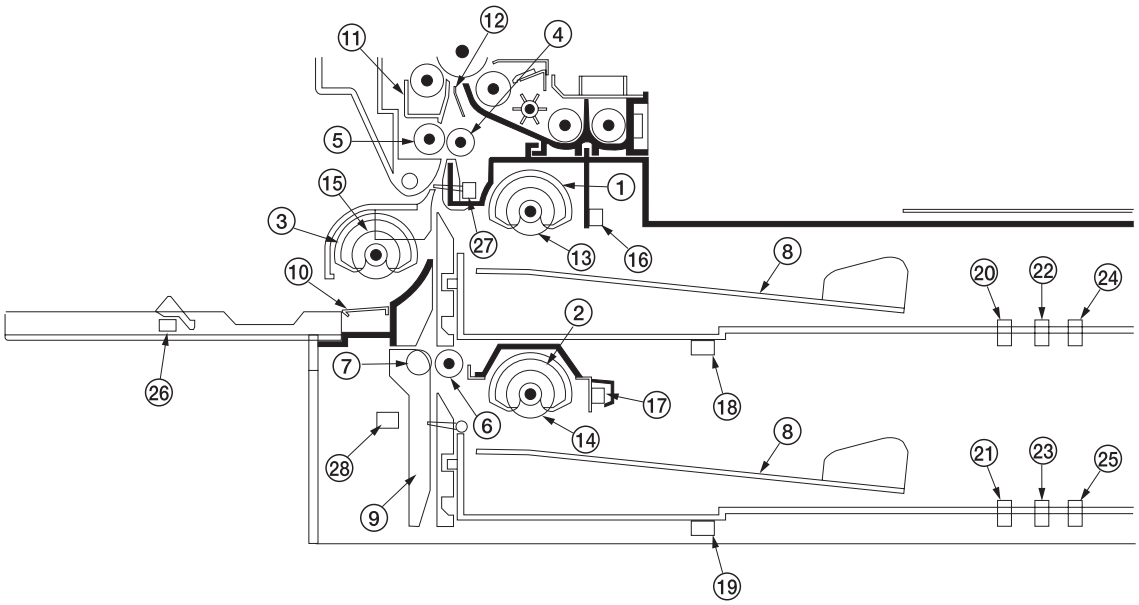
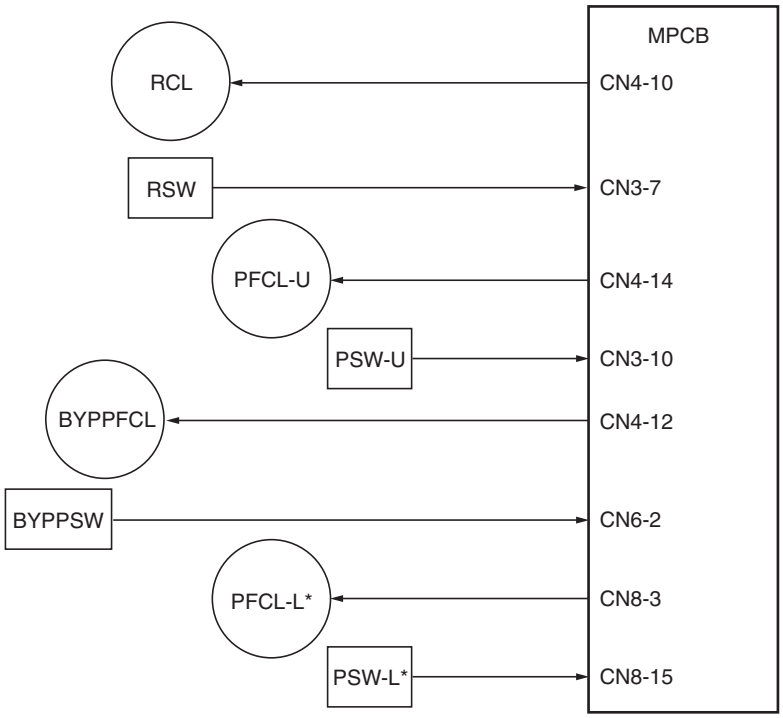


Figure 2-1-1 Paper feed section

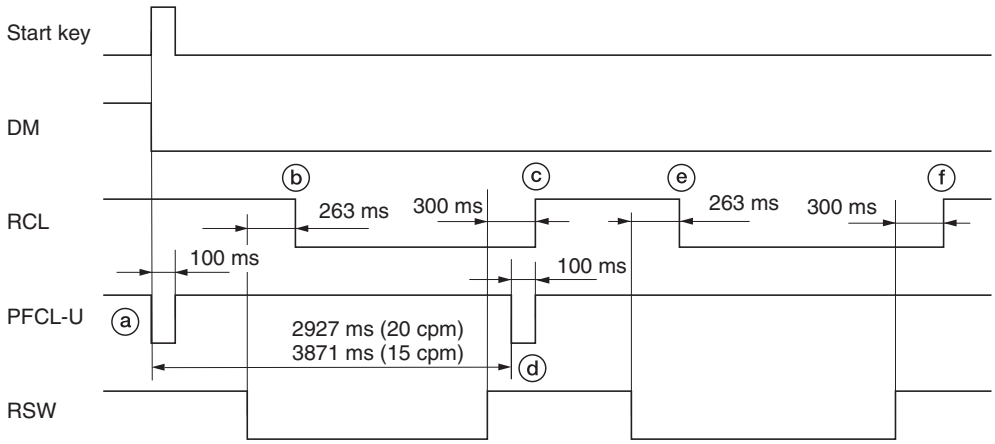
① Upper paper feed pulley
② Lower paper feed pulley*1
③ Bypass paper feed pulley
④ Right registration roller
⑤ Left registration roller
⑥ Paper conveying roller*1
⑦ Paper conveying pulley*1
⑧ Drawer lift
⑨ Paper conveying guide*1
⑩ Bypass lift
⑪ Transfer guide
⑫ Right transfer guide
⑬ Upper paper feed clutch (PFCL-U)
⑭ Lower paper feed clutch*1 (PFCL-L)
⑮ Bypass paper feed clutch (BYPPFCL)
⑯ Upper paper switch (PSW-U)
⑰ Lower paper switch*1 (PSW-L)
⑱ Upper paper size switch 1 (PSSW1-U)
⑲ Lower paper size switch 1*1 (PSSW1-L)
⑳ Upper paper size switch 2 (PSSW2-U)
㉑ Lower paper size switch 2*1 (PSSW2-L)
㉒ Upper paper size switch 3 (PSSW3-U)
㉓ Lower paper size switch 3*1 (PSSW3-L)
㉔ Upper paper size switch 4 (PSSW4-U)
㉕ Lower paper size switch 4*1 (PSSW4-L)
㉖ Bypass paper switch*2 (BYPPSW)
㉗ Registration switch (RSW)
° Drawer feed switch*1 (DFSW)

*1: Standard for the 20 cpm copier/optional for the 15 cpm copier.
*2: For the 20 cpm copier only.



*Optional for the 15 cpm copier.

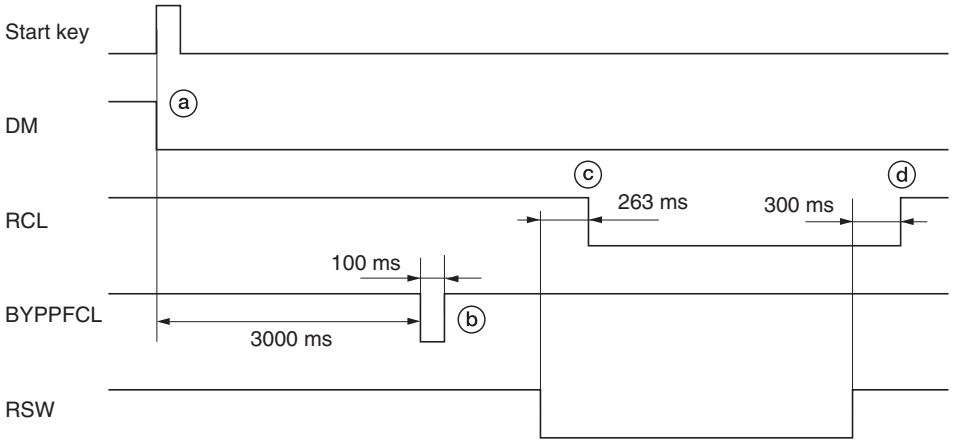
Figure 2-1-2 Paper feed section block diagram



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

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

ⓐ: When the start key is pressed, the drive motor (DM) and the upper paper feed clutch (PFCL-U) turn on and upper 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.
ⓓ: 2927 ms (for the 20 cpm)/3871 ms (for the 15 cpm) after the upper paper feed clutch (PFCL-U) turns on, the upper paper feed clutch (PFCL-U) 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.

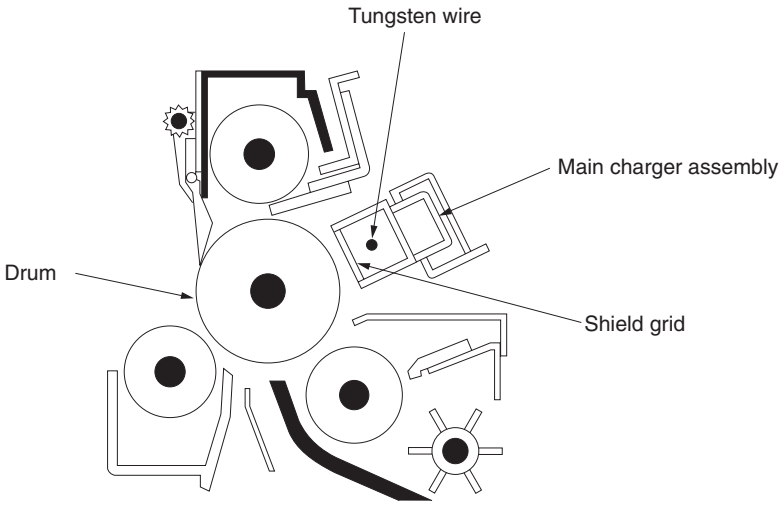
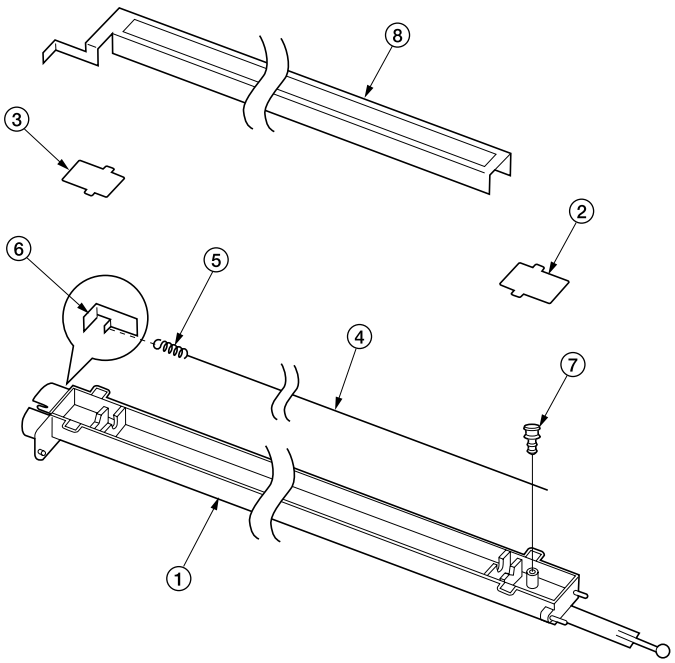


Figure 2-1-3 Main charging section



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

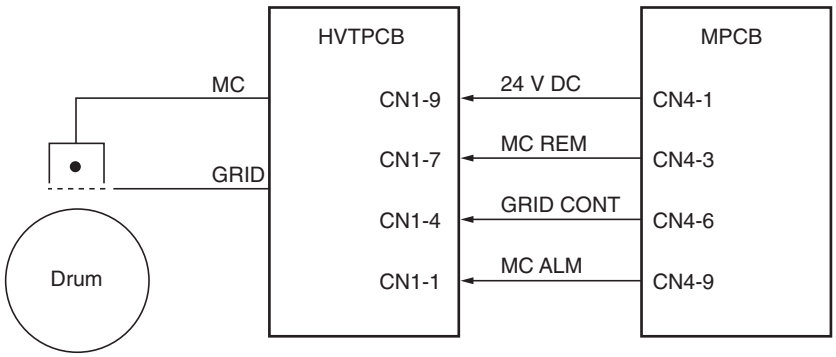
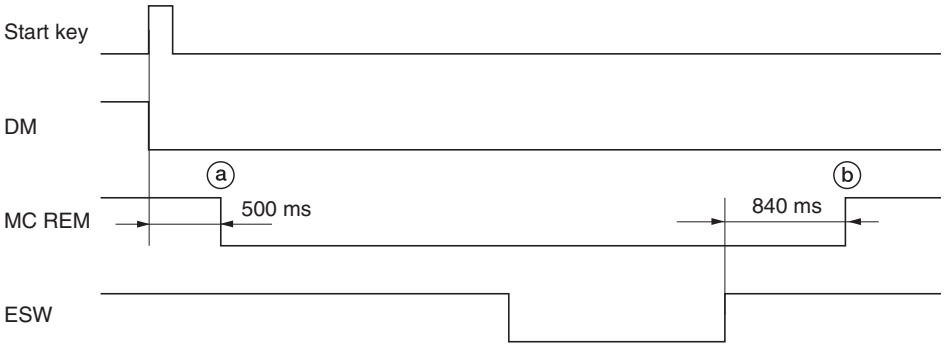


Figure 2-1-5 Main charging section block diagram



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.

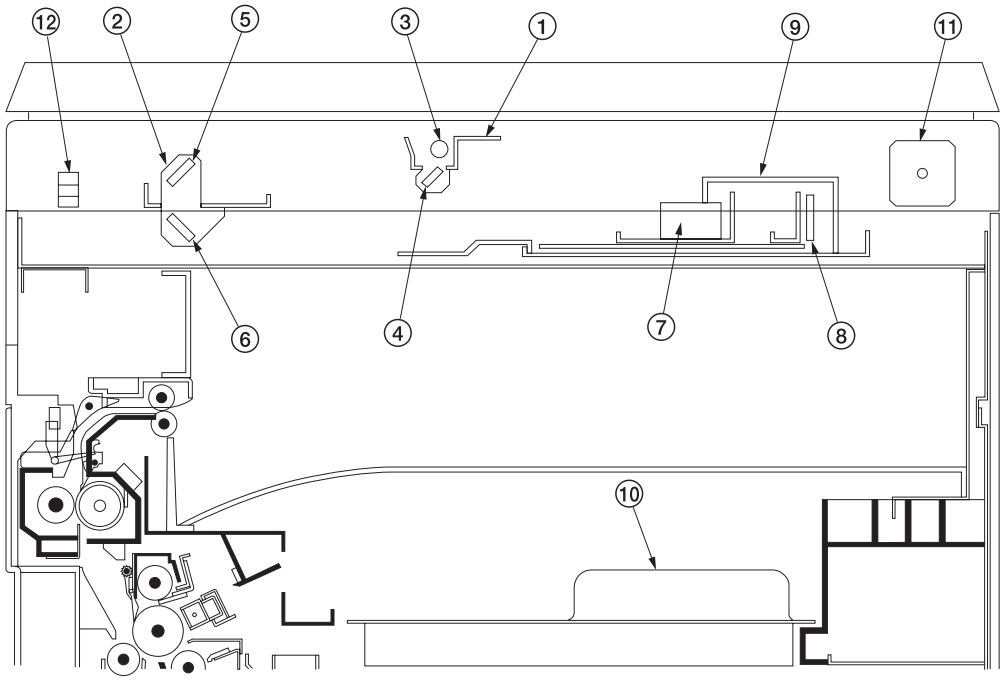


Figure 2-1-6 Optical section

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. When the DF* is used, the scanner and mirror frames stop at the DF original scanning position to start scanning.
* Optional.

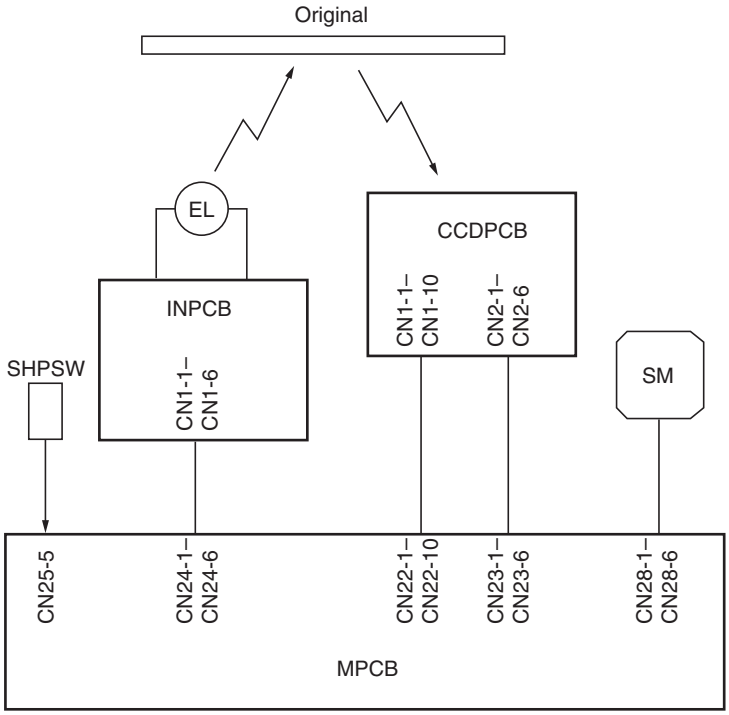
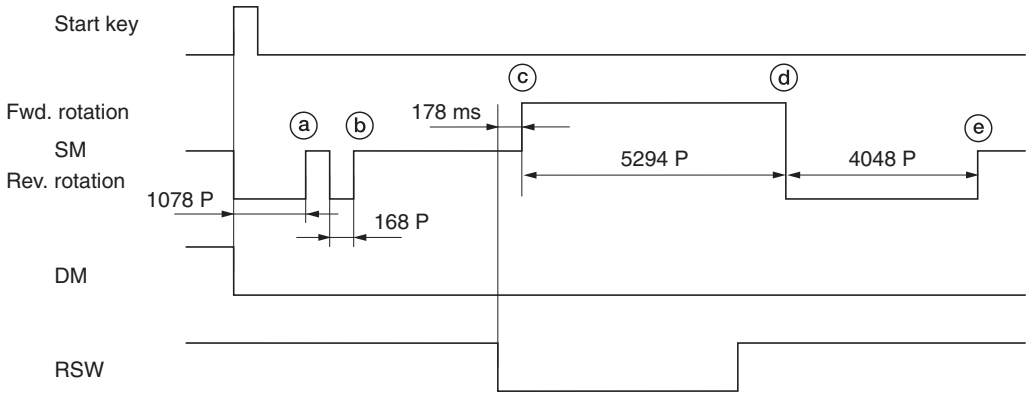


Figure 2-1-7 Optional section block diagram



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.

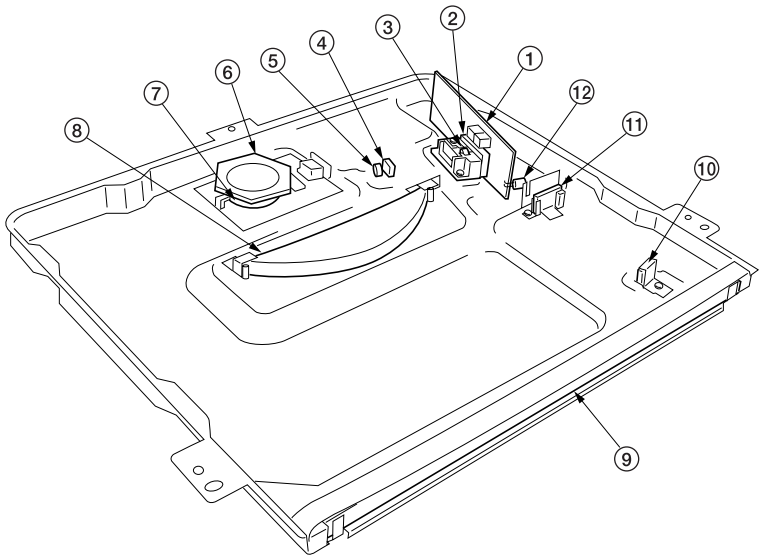


Figure 2-1-8 Laser scanner unit (1)

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

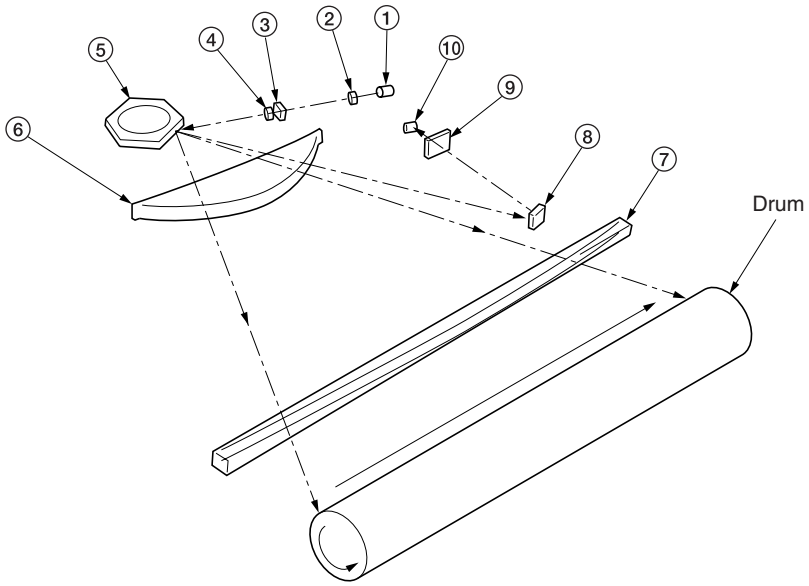


Figure 2-1-9 Laser scanner unit (2)

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.

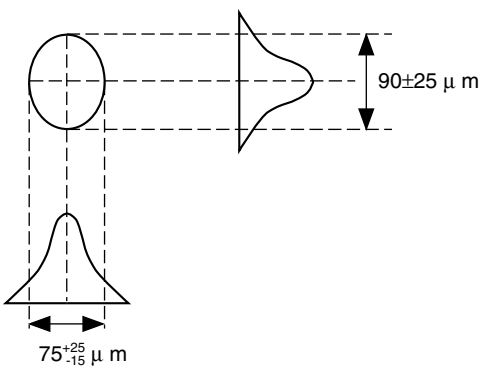


Figure 2-1-10

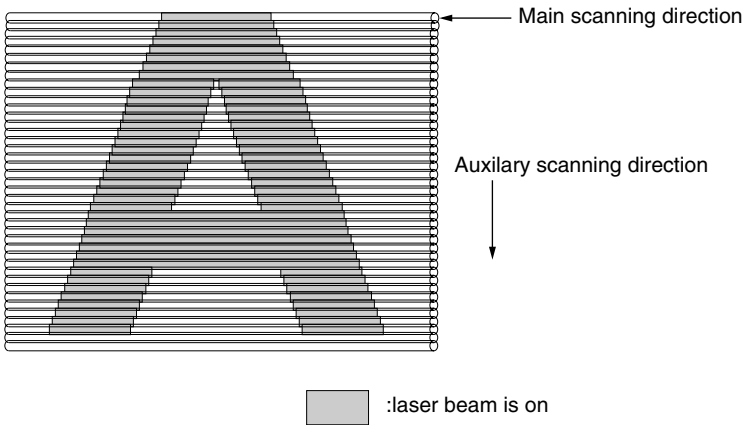


Figure 2-1-11

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.

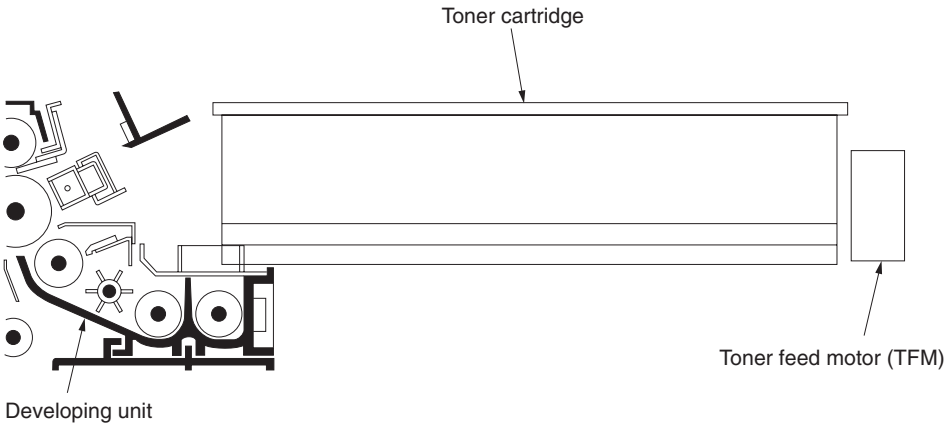


Figure 2-1-12 Developing section

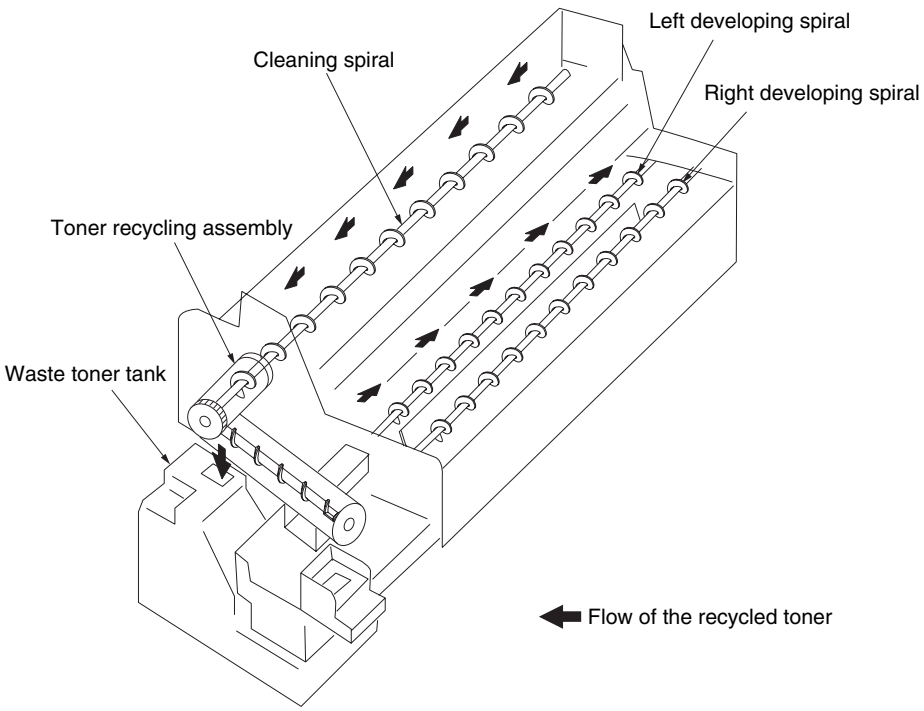
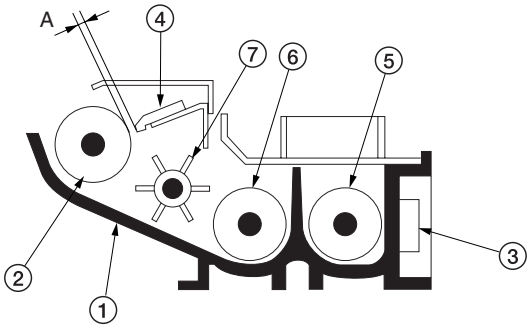


Figure 2-1-13 Toner recycling

(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

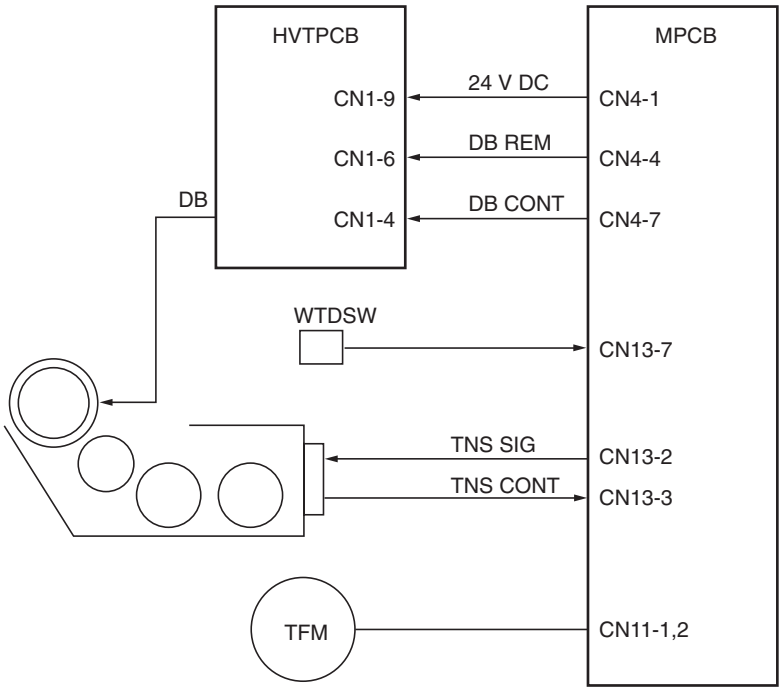


Figure 2-1-15 Developing section block diagram

(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

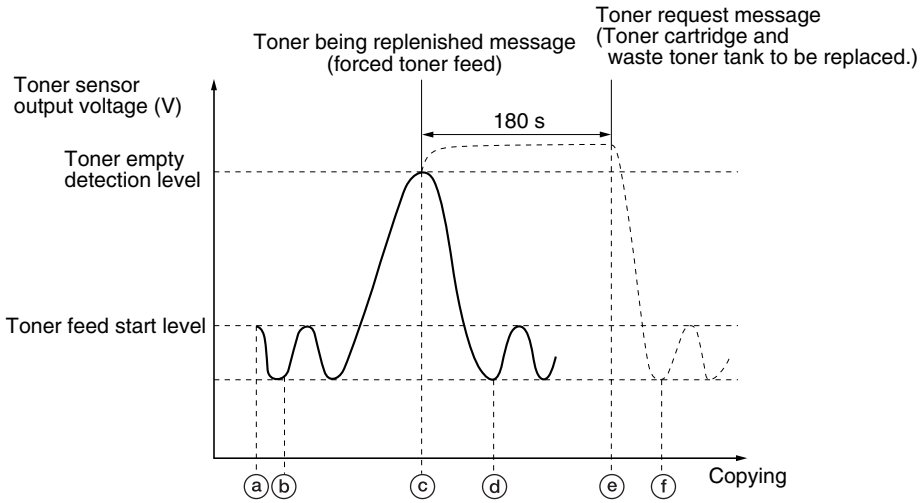


Figure 2-1-16 Toner density control

ⓐ: 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

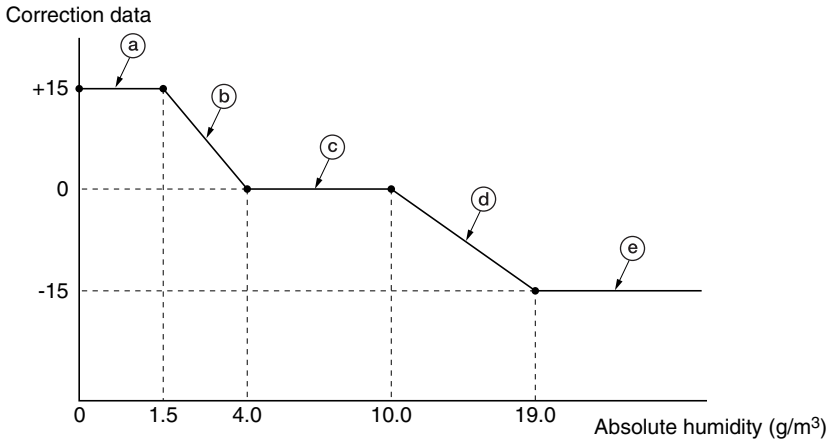


Figure 2-1-17 Correction based on the absolute humidity

ⓐ: When the absolute humidity is between 0 and 1.5 g/m^3, 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/m^3, the correction data is reduced according to the rise in absolute humidity.
ⓒ: When the absolute humidity is between 4.0 and 10.0 g/m^3, the correction data becomes 0.
ⓓ: When the absolute humidity is between 10.0 and 18.0 g/m^3, 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/m^3, 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).

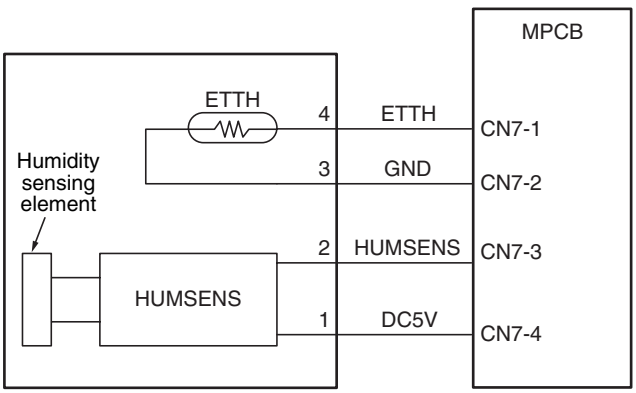
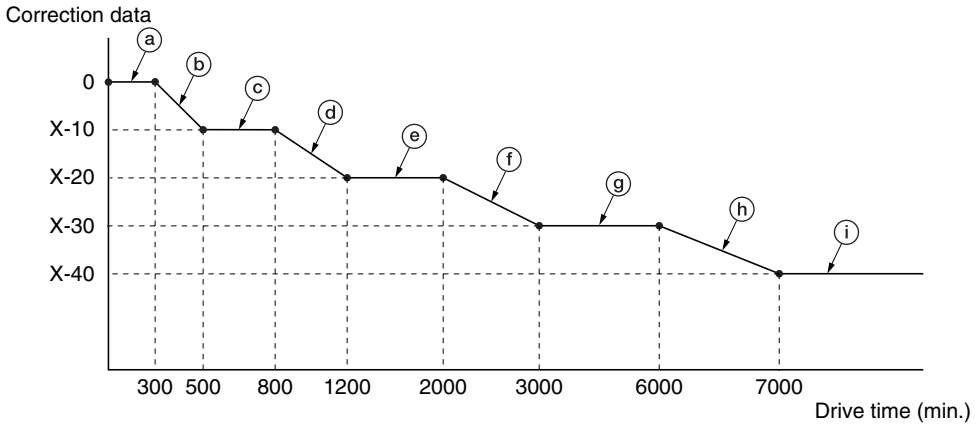


Figure 2-1-18 Absolute humidity computation block diagram

• 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.

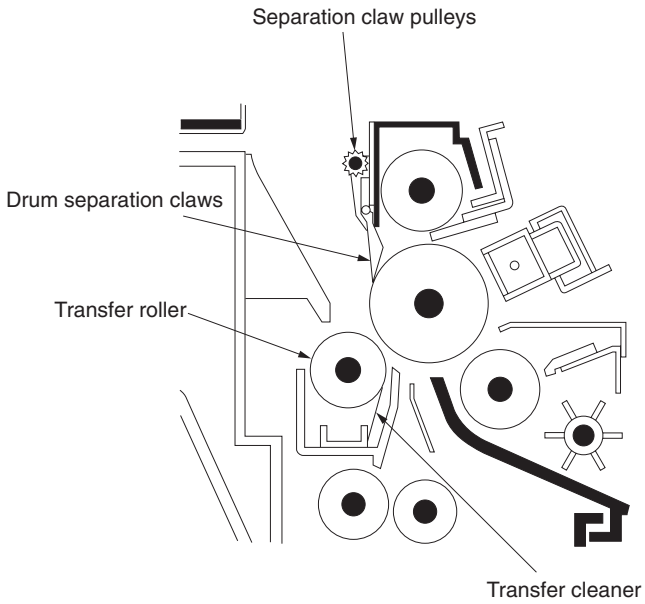


Figure 2-1-20 Transfer and separation section

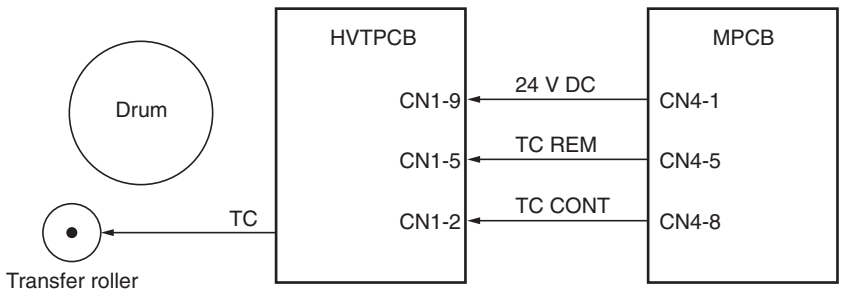
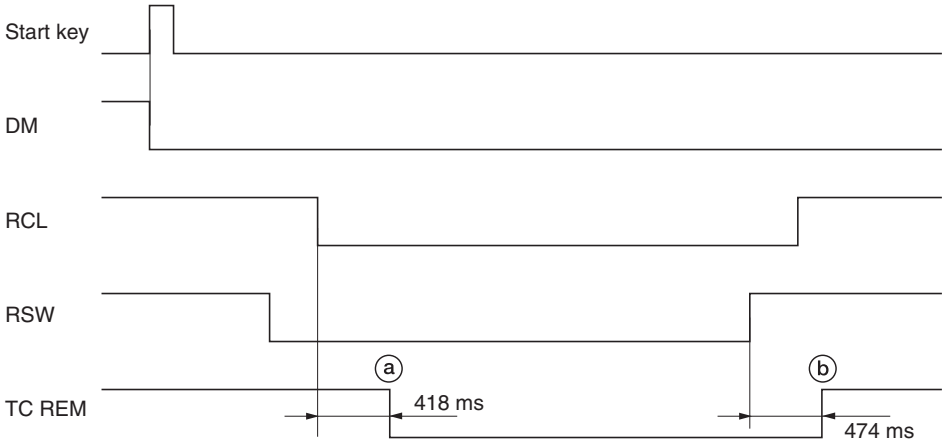


Figure 2-1-21 Transfer and separation section block diagram



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.

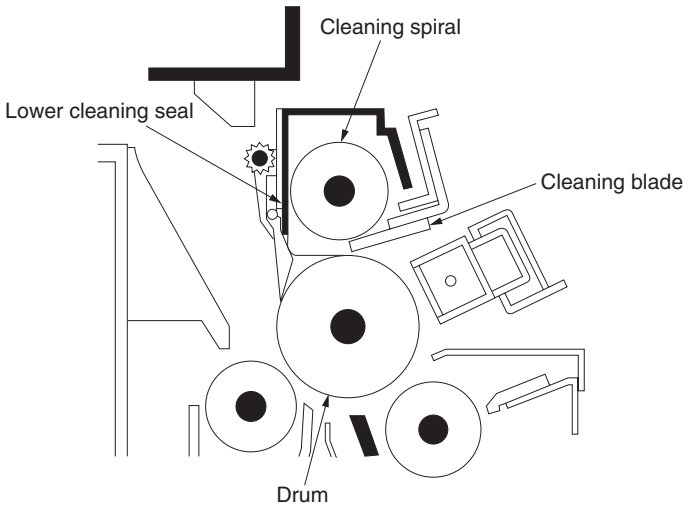


Figure 2-1-22 Cleaning section

2-1-7 Charge erasing section

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

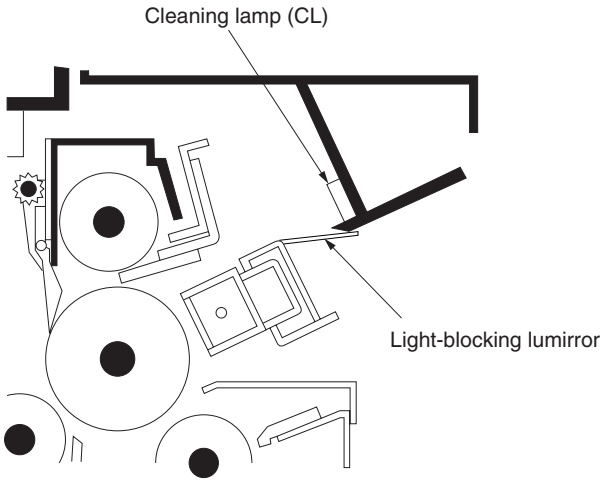


Figure 2-1-23 Charge erasing section

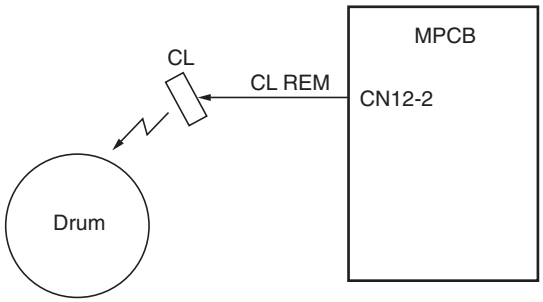


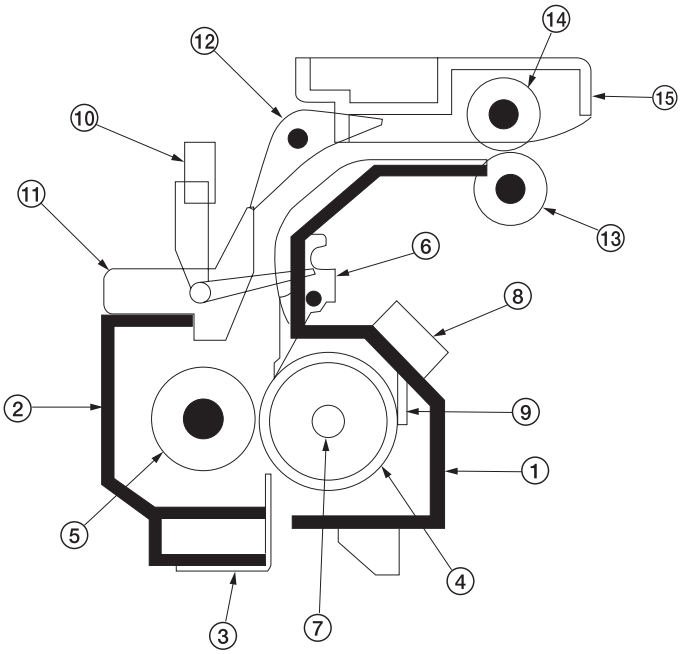
Figure 2-1-24 Charge erasing section block diagram

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

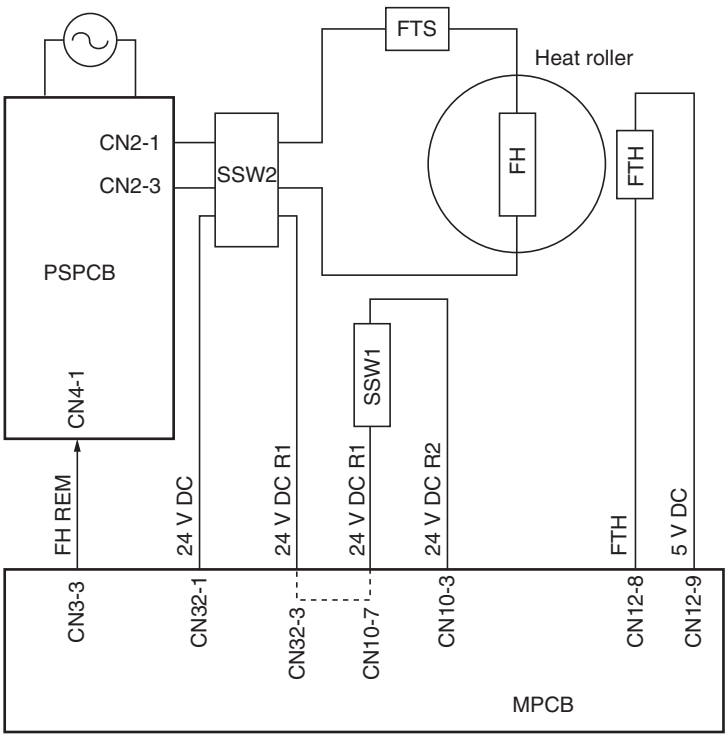
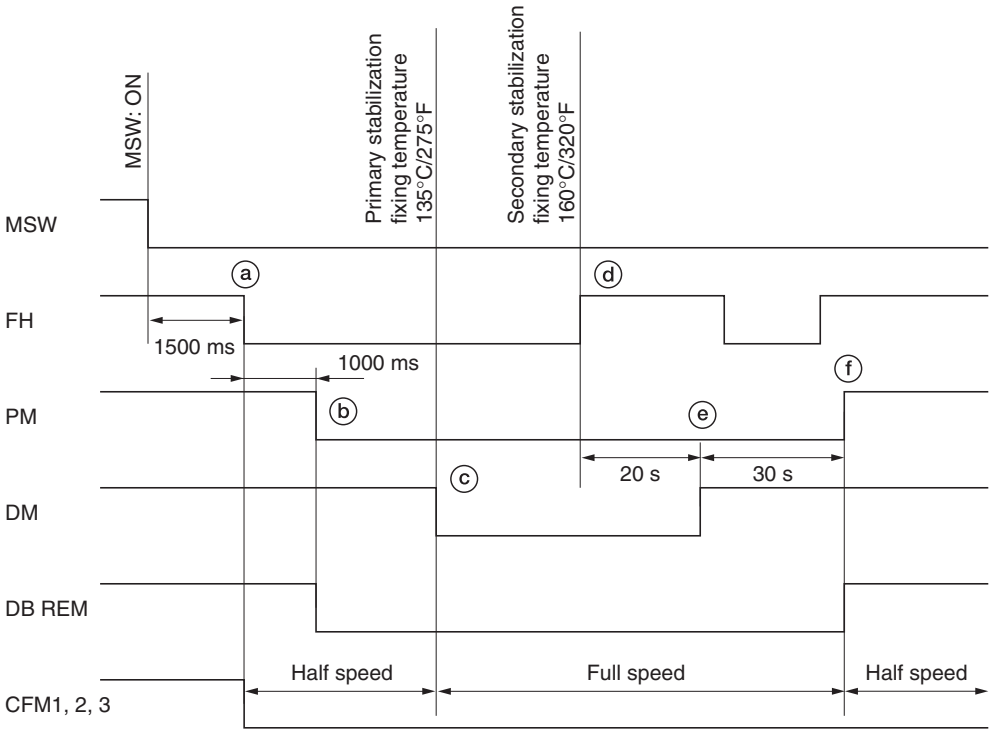


Figure 2-1-26 Fixing section block diagram



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

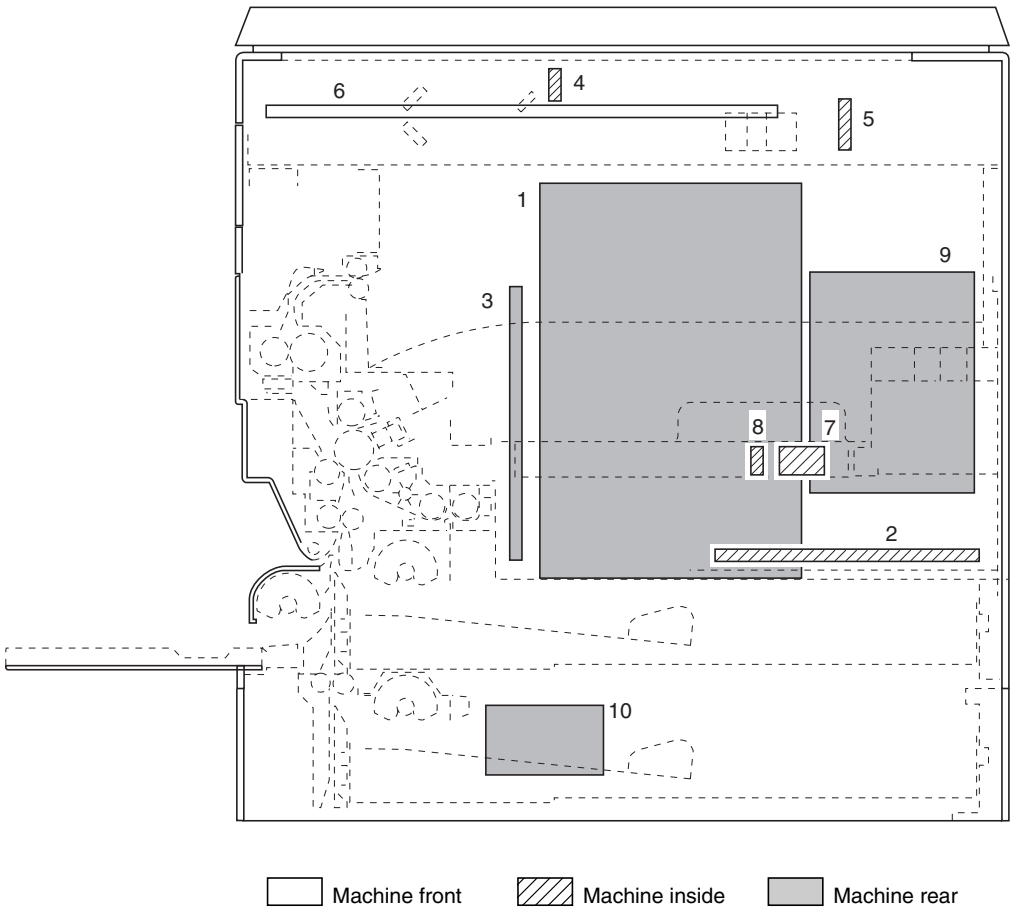


Figure 2-2-1 PCBs

1. Main PCB (MPCB) ..... Controls the other PCBs, electrical components and optional devices.
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.
9. Memory PCB* (MEMPCB) ..... Reads and outputs the image.
10. Drawer drive motor PCB* (DDMPCB) ..... Controls the drawer drive motor in the lower drawer.

*Optional for the 15 cpm copier/standard for the 20 cpm copier (the main PCB and memory PCB are integrated on one PCB).

(2) Switches and sensors

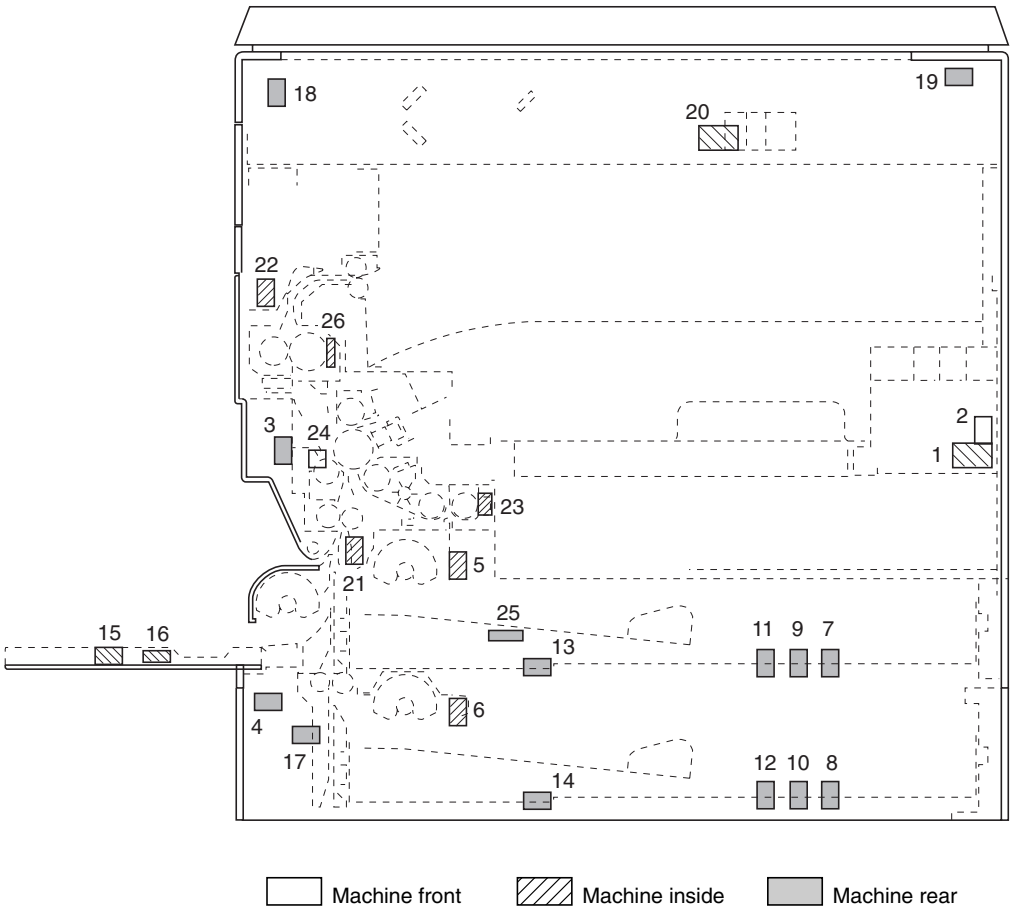


Figure 2-2-2 Switches and sensors

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. Safety switch 3* (SSW3) ..... Breaks the safety circuit when the left cover of the lower drawer is opened.
5. Upper paper switch (PSW-U) ..... Detects the presence of paper in the upper drawer.
6. Lower paper switch* (PSW-L) ..... Detects the presence of paper in the lower drawer.
7. Upper paper size switch 1 (PSSW1-U) ..... Detects the width of paper in the upper drawer.
8. Lower paper size switch 1* (PSSW1-L) ..... Detects the width of paper in the lower drawer.
9. Upper paper size switch 2 (PSSW2-U) ..... Detects the length of paper in the upper drawer.
10. Lower paper size switch 2* (PSSW2-L) ..... Detects the length of paper in the lower drawer.
11. Upper paper size switch 3 (PSSW3-U) ..... Detects the length of paper in the upper drawer.
12. Lower paper size switch 3* (PSSW3-L) ..... Detects the length of paper in the lower drawer.
13. Upper paper size switch 4 (PSSW4-U) ..... Detects the length of paper in the upper drawer.
14. Lower paper size switch 4* (PSSW4-L) ..... Detects the length of paper in the lower drawer.
15. Bypass paper switch** (BYPPSW) ..... Detects the presence of paper on the bypass tray.

16. Bypass paper width switch
    (BYPPSW) ..... Detects the width of paper on the bypass tray.
17. Drawer feed switch* (DFSW) ..... Detects a paper misfeed in the lower drawer.
18. Scanner home position switch
    (SHPSW) ..... Detects the optical system in the home position.
19. Original detection switch (ODSW) ..... Operates the original size detection sensor.
20. Original size detection sensor***
    (OSDS) ..... Detects the size of the original.
21. Registration switch (RSW) ..... Controls the secondary paper feed start timing.
22. Eject switch (ESW) ..... Detects a paper misfeed in the fixing section.
23. Toner sensor (TNS) ..... Detects the toner density in the developing section.
24. Waste toner detection switch (WTDSW) ..... Detects the presence of the waste toner tank.
25. Humidity sensor (HUMSENS) ..... Detects absolute humidity.
26. Fixing unit thermistor (FTH) ..... Detects the heat roller temperature.

*Optional for the 15 cpm copier/standard for the 20 cpm copier.
**For the 20 cpm copier only.
***Optional for 220-240 V specifications of the 20 cpm copier.

(3) Motors

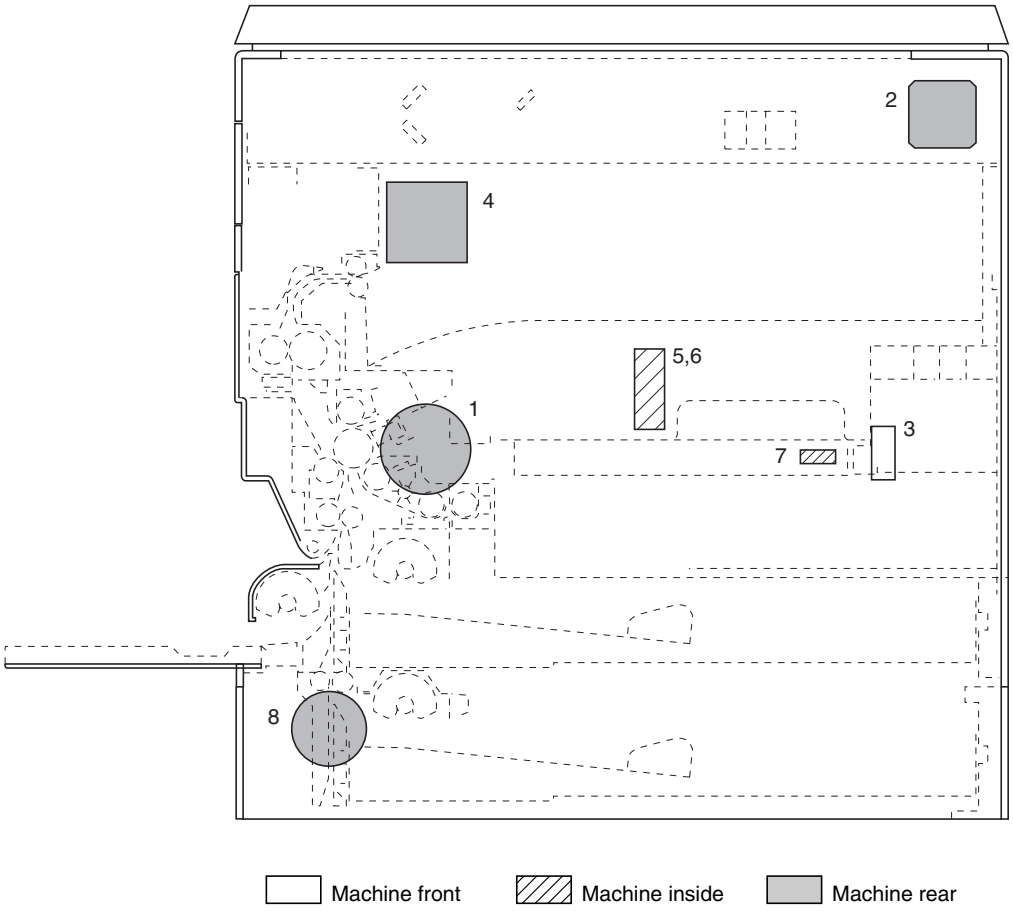


Figure 2-2-3 Motors

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.
8. Drawer drive motor* (DDM) ..... Drives the paper feed system in the lower drawer.

*Optional for the 15 cpm copier/standard for the 20 cpm copier.

(4) Other electrical components

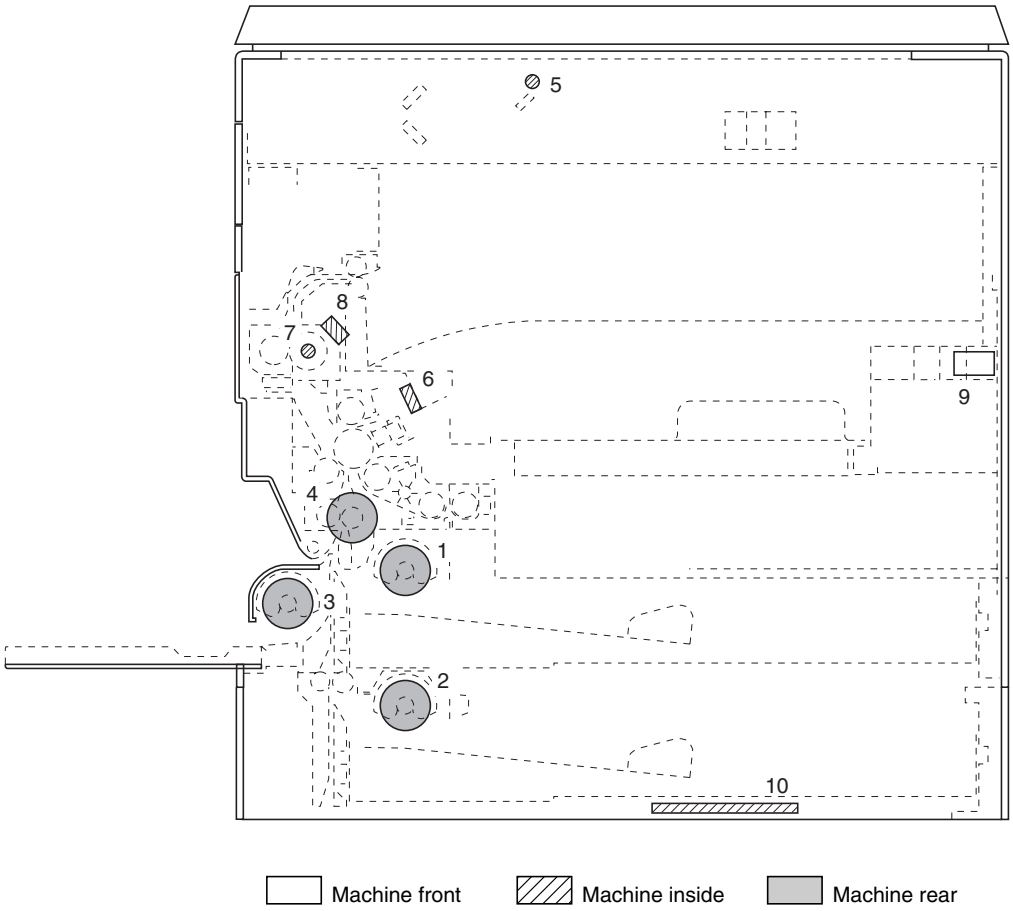


Figure 2-2-4 Other electrical components

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

*Optional for the 15 cpm copier/standard for the 20 cpm copier.
**Optional.

2-3-1 Power source PCB

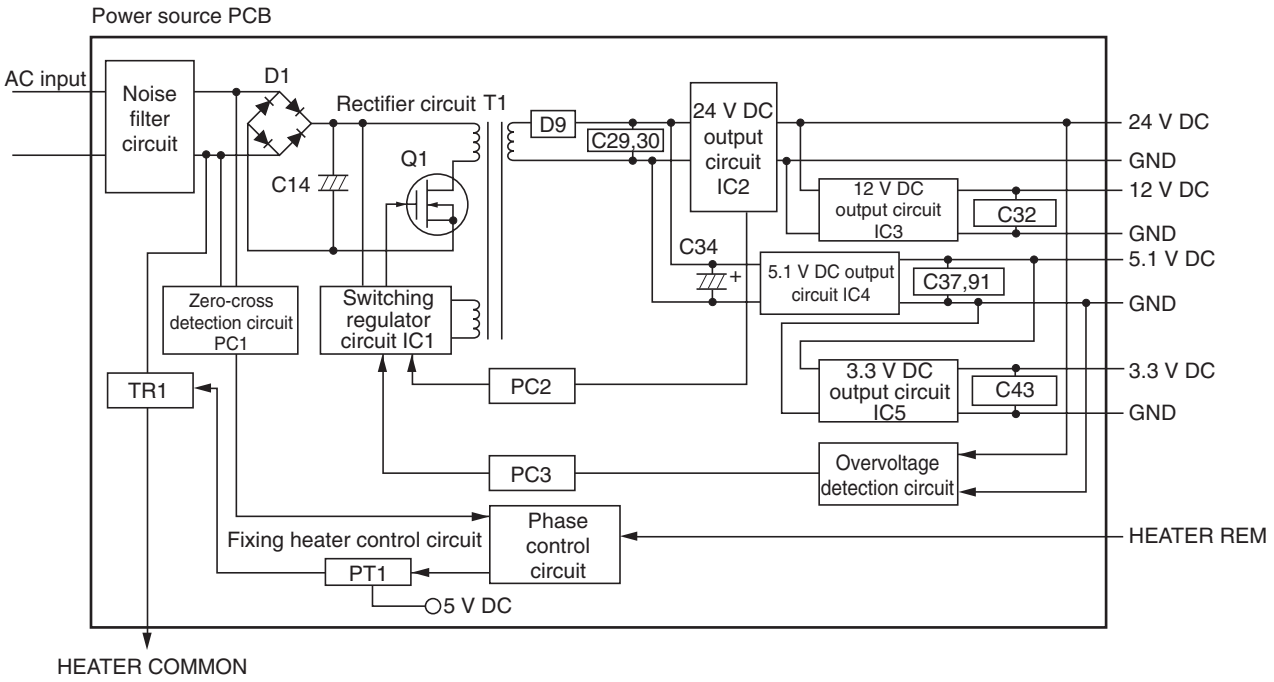
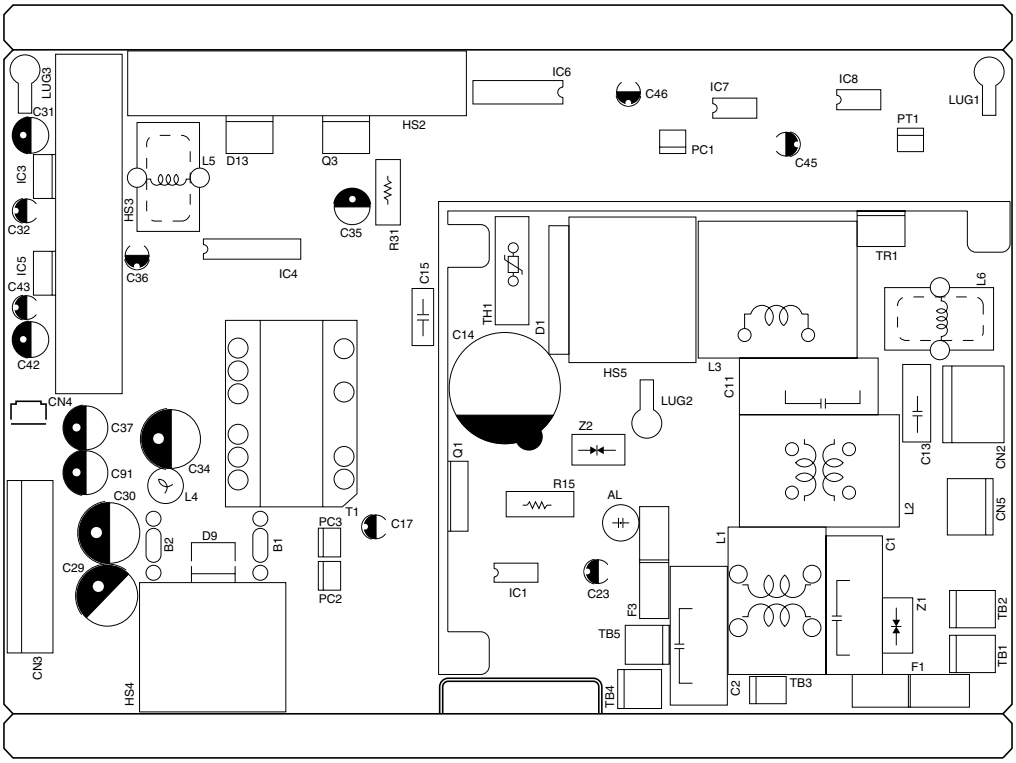


Figure 2-3-1 Power source PCB block diagram

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.

• 100V



• 200V

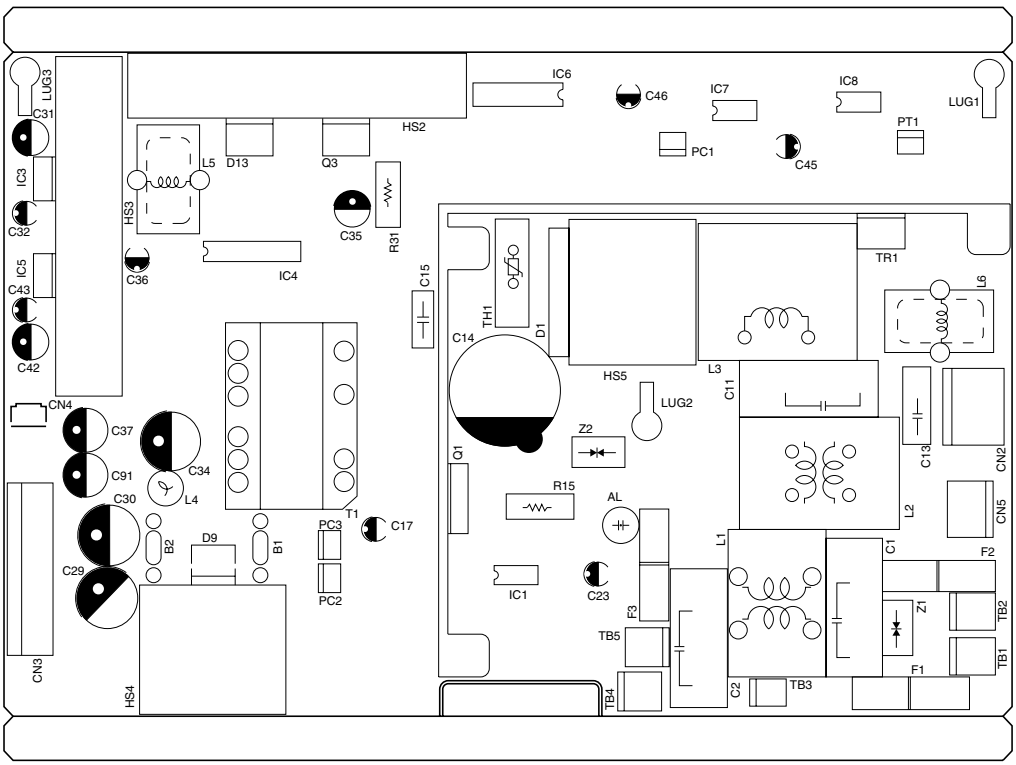


Figure 2-3-2 Power source PCB silk-screen diagram

Terminals (CN)		Voltage	Remarks
TB-1	TB-2	120 V AC	120 V AC supply, input
TB-1	TB-2	220-240 V AC	220-240 V AC supply, input*2
TB-4	TB-5	120 V AC	120 V AC supply for MSW, output
TB-4	TB-5	220-240 V AC	220-240 V AC supply for MSW, output*2
2-3	2-1	120 V AC	AC supply for FH, output
2-3	2-1	220-240 V AC	AC supply for FH, output*2
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	120 V AC	120 V AC supply for drawer heater*1 (DH), output
5-2	5-1	220-240 V AC	220-240 V AC supply for drawer heater*1 (DH), output*2

*1: Optional. *2: For 220-240 V specifications.

2-3-2 Main PCB

• 15 cpm copier

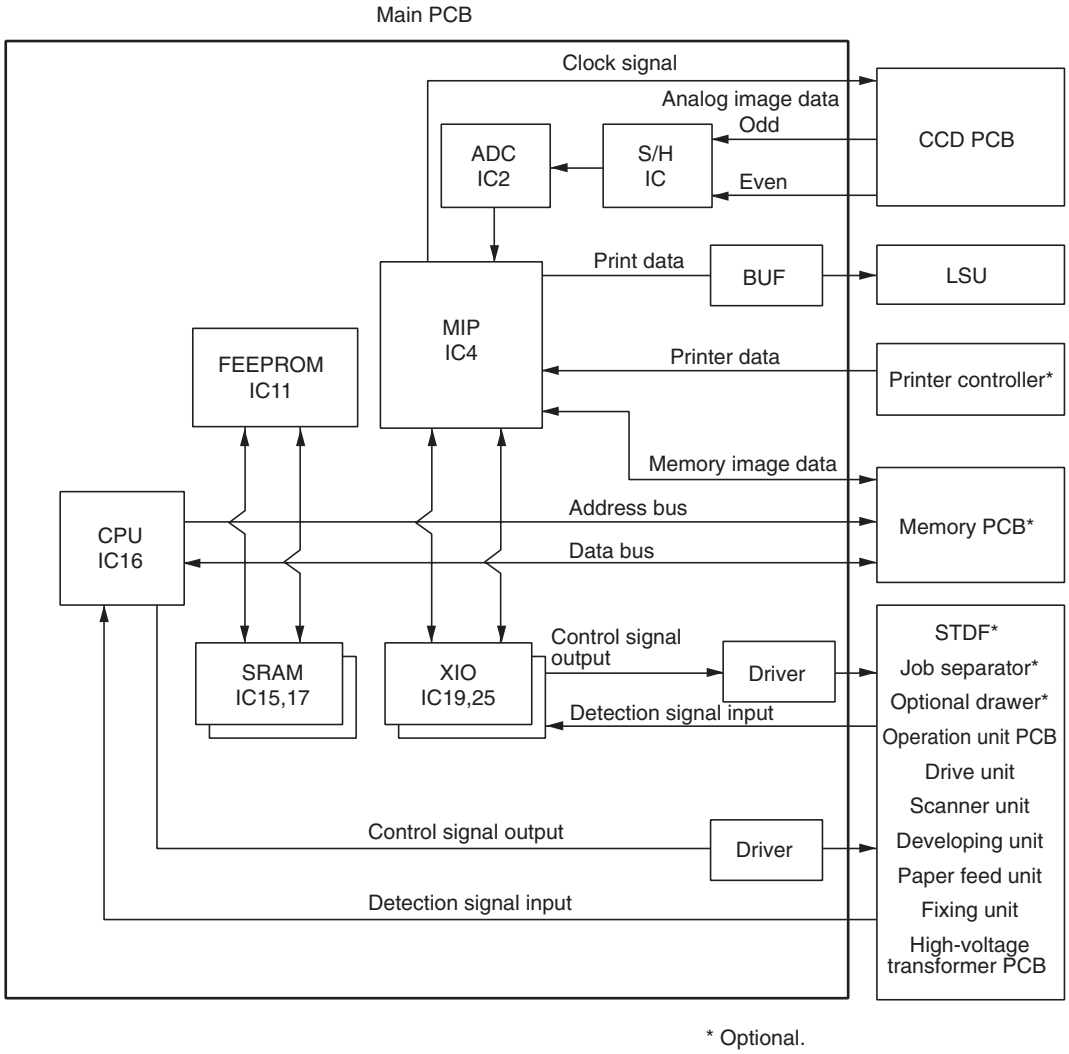


Figure 2-3-3 Main PCB block diagram (15 cpm copier)

The main PCB (MPCB) consists mainly of the CPU IC16. It communicates with the printer controller and controls the memory PCB, image processing system and engine drive system.
The CPU IC16 operates on an 8-bit bus. It uses the SRAM IC15 and IC17 for work memory and backup memory. In accordance with the control program in FEEPROM IC11, the CPU IC16 communicates with the printer controller via the serial communication function in the CPU. The CPU IC16 also controls the CCD PCB (CCDPCB), which is for image input control, and the LSU, which is for image output control, via the image processing ASIC MIP IC4, and drives the operation section and machine, conveys paper and detects abnormalities via XIO IC19 and IC25.

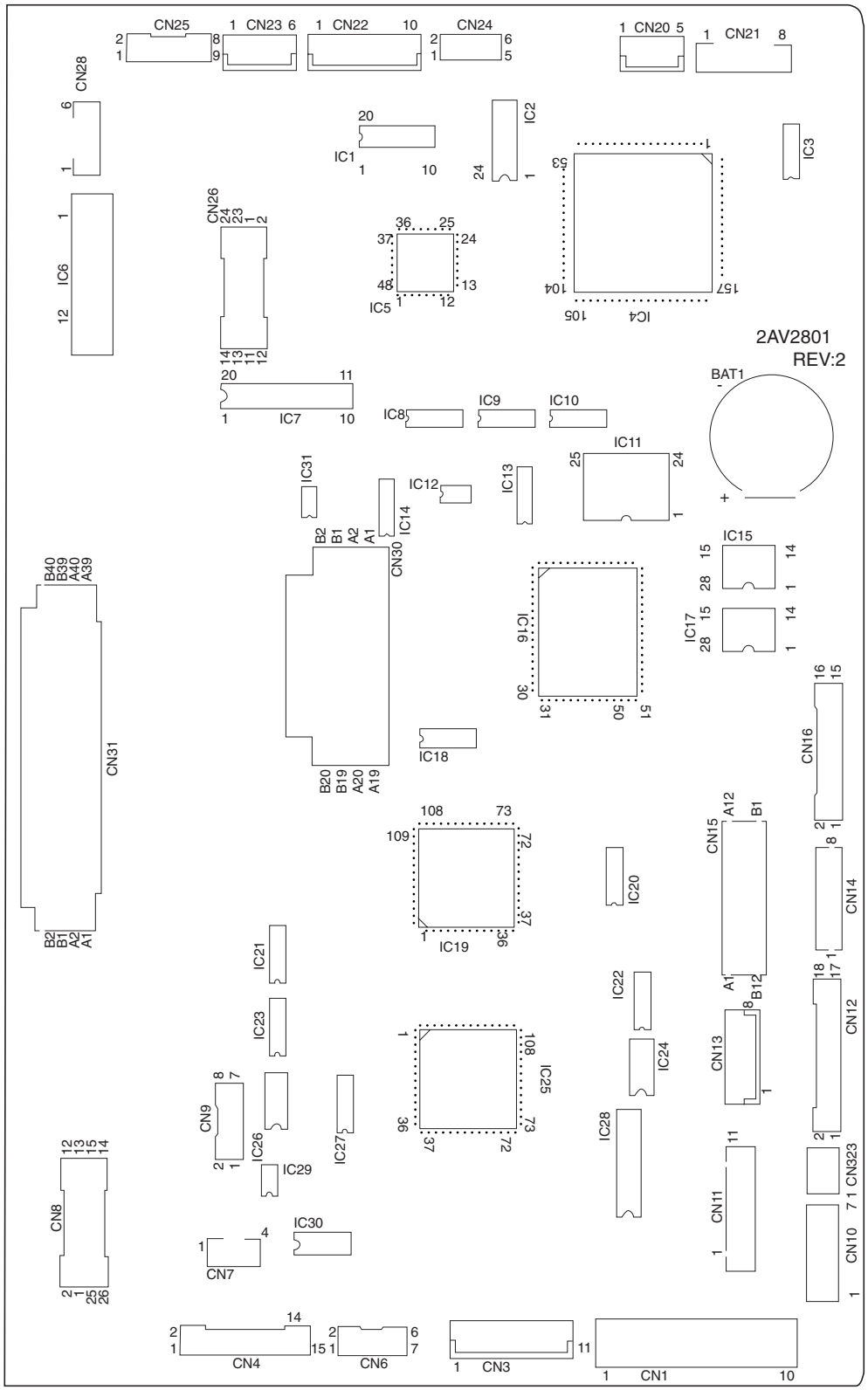


Figure 2-3-4 Main PCB silk-screen diagram (15 cpm copier)

• 20 cpm copier

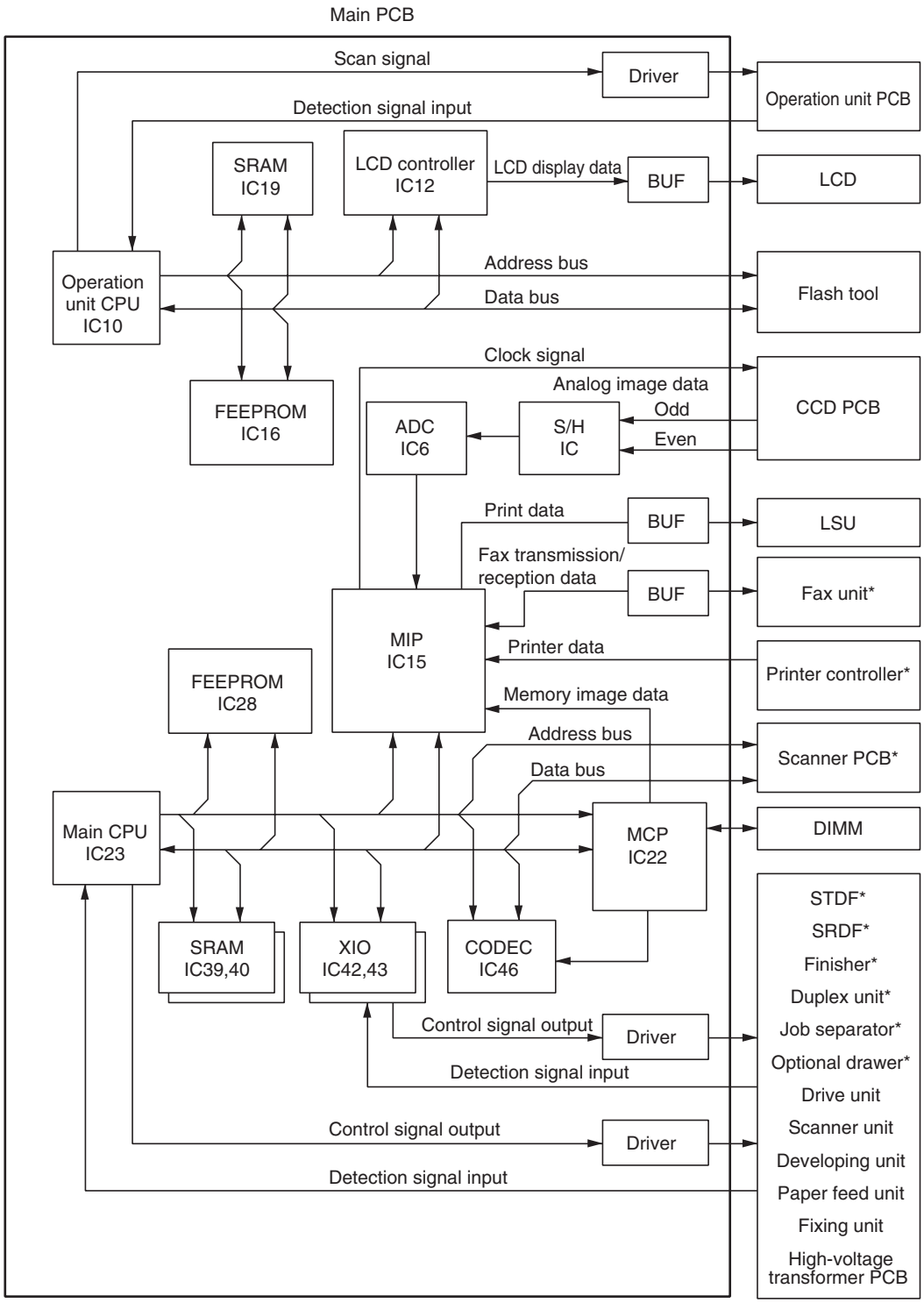


Figure 2-3-5 Main PCB block diagram (20 cpm copier)

The main PCB (MPCB) consists of the main CPU and operation unit CPU. The main CPU IC23 communicates with other PCBs and controls memory copying, the image processing system and the engine drive system. The operation unit CPU IC10 controls the LCD display and the entire operation section.
The main CPU IC23 operates on an 8-bit bus. It uses the SRAM IC39 and IC40 for work memory and backup memory. In accordance with the control program in FEEPROM IC28, the main CPU IC23 communicates with the operation unit CPU, printer controller, fax unit and finisher via the serial communication function in the CPU and XIO IC43 and IC43. The main CPU IC23 controls ASIC MCP IC22 and CODEC IC46 during memory copying for sort and rotation copies. The main CPU IC23 also controls the CCD PCB (CCDPCB), which is for image input control, and the LSU, which is for image output control via the image processing ASIC MIP IC15, and drives the machine, conveys paper and detects abnormalities via XIO IC42 and IC43.
The operation unit CPU IC10 operates on an 8-bit bus. It uses the SRAM IC19 for work memory. In accordance with the control program in FEEPROM IC16, which also contains LCD display fonts, the operation unit CPU IC10 controls key switches and LEDs on the operation unit PCB (OPCB) and controls the LCD display via the LCD controller IC12.

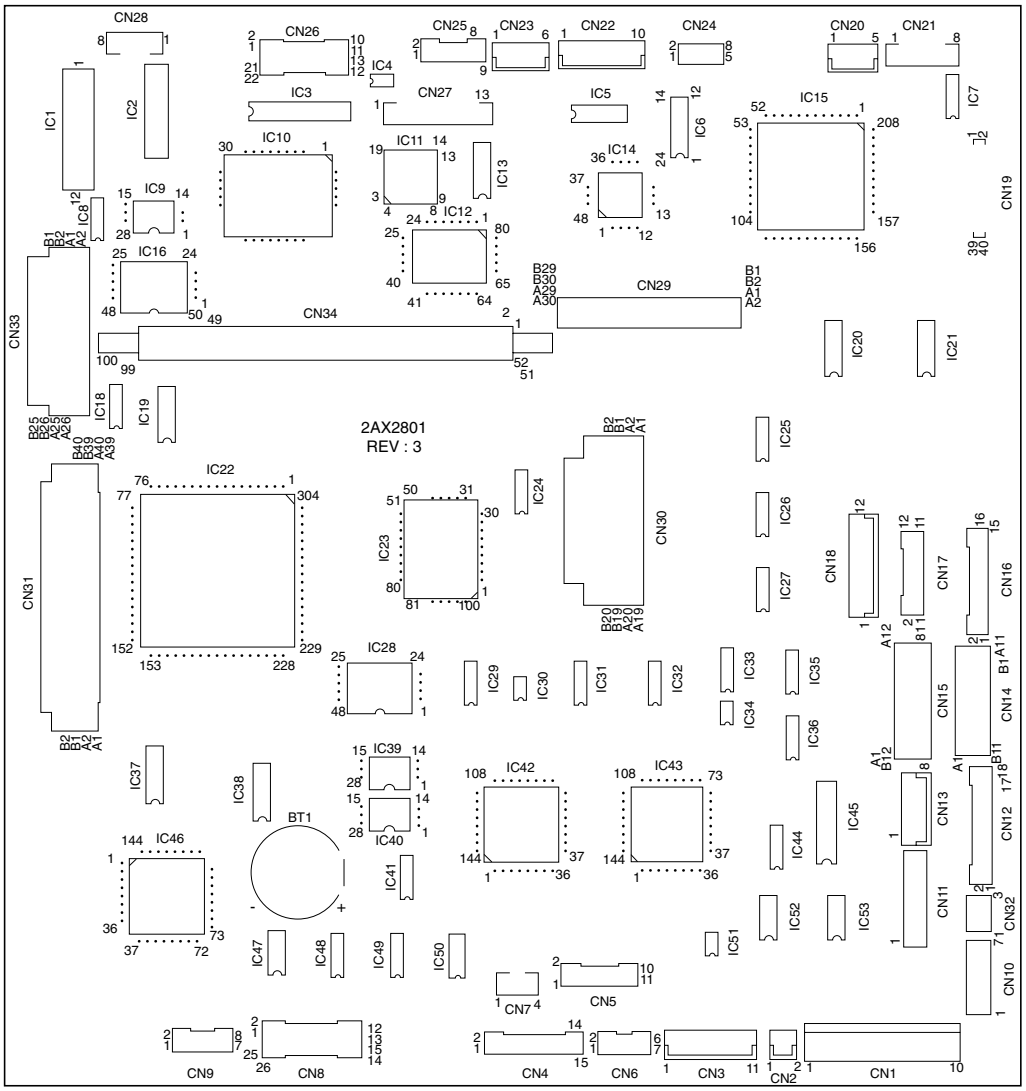


Figure 2-3-6 Main PCB silk-screen diagram (20 cpm copier)

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-U on/off, input
3-11	3-9	5 V DC	5 V DC supply for PSW-U, 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
5-1	5-2	0/5 V DC	Duplex unit*4 detection signal, input
5-3	5-2	0/24 V DC	FSSOL*4 latch-on signal, output
5-4	5-2	0/24 V DC	FSSOL*4 actuate signal, output
5-5	5-2	24 V DC	24 V DC supply for FSSOL*4, output
5-7	5-6	0/5 V DC	DUPPCSW2*4 on/off, input
5-8	5-6	5 V DC	5 V DC supply for DUPPCSW2*4, output
5-10	5-9	0/5 V DC	DUPPCSW1*4 on/off, input
5-11	5-9	5 V DC	5 V DC supply for DUPPCSW1*4, output
6-1	6-3	5 V DC	5 V DC supply for BYPPSW*1, output
6-2	6-3	0/5 V DC	BYPPSW*1 on/off, input
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
8-1	8-22	24 V DC	24 V DC supply for lower drawer*2, optional drawer*3, output
8-2	8-22	24 V DC	24 V DC supply for lower drawer*2, optional drawer*3, output
8-3	8-22	0/24 V DC	PFCL-L*2 on/off, output
8-4	8-22	0/24 V DC	PFCL (ST) 1*3 on/off, output
8-5	8-22	0/24 V DC	PFCL (ST) 2*3 on/off, output
8-6	8-22	5/0 V DC (pulse)	SSW3*2 scan signal, output (SCAN1)
8-7	8-22	5/0 V DC (pulse)	SSW3*2 scan signal, output (SCAN2)
8-8	8-22	5/0 V DC (pulse)	SSW3*2 scan signal, output (SCAN3)
8-9	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS0)
8-10	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS1)
8-11	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS2)
8-12	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS3)
8-13	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS4)
8-14	8-22	5/0 V DC (pulse)	SSW3*2 return signal, input (SENS5)

*1: For 20 cpm copier only. *2: Standard for 20 cpm copier/optional for 15 cpm copier.
*3: Optional for both 20 cpm and 15 cpm copiers. *4: Optional for 20 cpm copier only.

Terminals (CN)		Voltage	Remarks
8-15	8-22	0/5 V DC	PSW-L*2 on/off, input
8-16	8-22	0/5 V DC	PSW (ST) 1*3 on/off, input
8-17	8-22	0/5 V DC	PSW (ST) 2*3 on/off, input
8-18	8-22	0/24 V DC	DDM*2 on/off, output
8-19	8-22	0/24 V DC	DDM (ST) 1*3 on/off, output
8-20	8-22	0/24 V DC	DDM (ST) 2*3 on/off, output
8-21	8-22	5 V DC	5 V DC supply for lower drawer*2, optional drawer*3, output
8-23	8-22	0/5 V DC	DFSW*2 on/off, input
8-24	8-22	0/5 V DC	DFSW (ST) 1*3 on/off, input
8-25	8-22	0/5 V DC	DFSW (ST) 2*3 on/off, input
8-26	8-22	0/5 V DC (pulse)	DDM drive clock pulse, output
9-2	9-1	0/5 V DC	PSSW1-U on/off, input
9-4	9-3	0/5 V DC	PSSW2-U on/off, input
9-6	9-5	0/5 V DC	PSSW3-U on/off, input
9-8	9-7	0/5 V DC	PSSW4-U on/off, input
10-1	10-4	24 V DC	24 V DC supply for key card*3, key counter*3, output
10-3	10-4	0/24 V DC	SSW1 on/off, input
10-5	10-4	0/5 V DC	Key card*3, key counter*3 copy count signal, output
10-6	10-4	0/5 V DC	Key card*3, key counter*3 connection signal, input
10-7	10-4	24 V DC	SSW2 on/off, output
11-1	10-4	24/14 V DC	TFM drive control signal (+), output
11-2	10-4	14/24 V DC	TFM drive control signal (-), output
11-3	10-4	24 V DC	24 V DC supply for CFM1, output
11-4	10-4	12/24 V DC	CFM1 half speed/full speed, output
11-5	10-4	0/24 V DC	CFM1 on/off, output
11-6	10-4	24 V DC	24 V DC supply for CFM2, output
11-7	10-4	12/24 V DC	CFM2 half speed/full speed, output
11-8	10-4	0/24 V DC	CFM2 on/off, output
11-9	10-4	24 V DC	24 V DC supply for CFM3, output
11-10	10-4	12/24 V DC	CFM3 half speed/full speed, output
11-11	10-4	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
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
14-6A	14-4A	5 V DC	5 V DC supply for STDF*3, SRDF*4, output
14-7A	14-4A	5 V DC	5 V DC supply for STDF*3, SRDF*4, output
14-10A	14-8A	24 V DC	24 V DC supply for STDF*3, SRDF*4, output
14-10A	14-8A	24 V DC	24 V DC supply for STDF*3, SRDF*4, output
14-1B	14-4A	0/5 V DC	OSLED*4 (red) on/off, output

*1: For 20 cpm copier only. *2: Standard for 20 cpm copier/optional for 15 cpm copier.
*3: Optional for both 20 cpm and 15 cpm copiers. *4: Optional for 20 cpm copier only.

Terminals (CN)		Voltage	Remarks
14-2B	14-4A	0/5 V DC	OSLED*4 (green) on/off, output
14-3B	14-4A	0/5 V DC	SBPSOL*4 release signal, output
14-4B	14-4A	0/5 V DC	SBPSOL*4 actuate signal, output
14-5B	14-4A	0/5 V DC	OFCL*4 on/off, output
14-6B	14-4A	0/5 V DC	EFSSOL*4 on/off, output
14-8B	14-4A	0/5 V DC	SBFSSOL*4 on/off, output
14-9B	14-4A	0/5 V DC	OFSOL*4 release signal, output
14-10B	14-4A	0/5 V DC	OFSOL*4 actuate signal, output
14-11B	14-4A	0/5 V DC	OFM*4 ENABLE signal, output
15-1A	14-4	0/5 V DC	OFM*3 ENABLE signal, output
15-2A	14-4	0/5 V DC	OSDPCB*3, OSBSW*4 on/off, input
15-3A	14-4	0/5 V DC	OSDPCB*3, OFSW*4 on/off, input
15-4A	14-4	0/5 V DC	OSDPCB*3, OSSW*4 on/off, input
15-5A	14-4	0/5 V DC	OSDPCB*3 on/off, input
15-6A	14-4	0/5 V DC	OSDPCB*3 on/off, input
15-7A	14-4	0/5 V DC	STDF*3, SRDF*4 installed/not installed signal, input
15-8A	14-4	0/5 V DC	OSWSW*4 on/off, input
15-9A	14-4	0/5 V DC	DFSSW2*3 on/off, input
15-10A	14-4	0/5 V DC	DFSSW1*3 on/off, input
15-11A	14-4	0/5 V DC	OSDPCB*3, OSLSW*4 on/off, input
15-12A	14-4	0/5 V DC	DFTSW*3 on/off, input
15-2B	14-4	0/5 V DC	OFM*3 control signal OFM RET, output
15-3B	14-4	0/5 V DC (pulse)	OFM*3 drive clock pulse, output
15-4B	14-4	0/5 V DC	OFM*3 rotational direction switching signal OFM CWB, output
15-5B	14-4	0/5 V DC	OCM*3 ENABLE signal, output
15-6B	14-4	0/5 V DC	OCM*3 control signal OCM RET, output
15-7B	14-4	0/5 V DC (pulse)	OCM*3 drive clock pulse, output
15-8B	14-4	0/5 V DC	OCM*3 rotational direction switching signal OCM CWB, output
15-9B	14-4		OCM*3 current control voltage OCM Vref, output
15-10B	14-4	0/5 V DC	OCM*3 drive control signal OCM M3, output
15-11B	14-4	0/5 V DC	OCM*3 drive control signal OCM M2, output
15-12B	14-4	0/5 V DC	OCM*3 drive control signal OCM M1, output
16-1	16-2	0/5 V DC	Job separator*3, duplex unit*4 connection signal, input
16-3	16-2	24 V DC	24 V DC supply for FSSOL*3, output
16-4	16-2	0/24 V DC	FSSOL*3 actuate signal, output
16-5	16-2	24/0 V DC	FSSOL*3 release signal, output
16-6	16-8	5 V DC	5 V DC supply for JBESW*3, output
16-7	16-8	0/5 V DC	JBESW*3 on/off, input
16-10	16-2	24/0 V DC	SBSOL*4 actuate signal, output
16-11	16-2	24/0 V DC	SBSOL*4 release signal, output
16-13	16-12	0/5 V DC	JOFSW*3 on/off, input
16-14	16-12	5 V DC	5 V DC supply for JOFSW*3, output
16-15	16-12	5 V DC	5 V DC supply for LED*3, output
16-16	16-12	0/5 V DC	LED*3 on/off, output
18-1	18-2	24 V DC	24 V DC supply for MDPCB*4, output
18-3	18-4	5 V DC	5 V DC supply for MDPCB*4, output
18-5	18-4	0/5 V DC (pulse)	FSM*4 drive clock pulse, output
18-6	18-4	0/5 V DC	FSM*4 R/L signal, output
18-7	18-4	0/5 V DC	FSM*4 on/off, output
18-8	18-4	24 V DC	24 V DC supply for DUPOCSW*4, output
18-9	18-4	0/5 V DC	FSM*4 MODE signal, output
18-10	18-4	24 V DC	DUPOCSW*4 on/off, output
18-11	18-4	0/5 V DC	MACHINE TYPE signal, 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

*1: For 20 cpm copier only. *2: Standard for 20 cpm copier/optional for 15 cpm copier.
*3: Optional for both 20 cpm and 15 cpm copiers. *4: Optional for 20 cpm copier only.

Terminals (CN)		Voltage	Remarks
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
25-2	25-1	0/5 V DC	ODSW on/off, input
25-3	25-1	5 V DC	5 V DC supply for ODSW, 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
25-8	25-7	0/5 V DC	5 V DC supply for OSDS, output
25-9	25-7	5 V DC	OSDS on/off, input
26-1	27-12	0/5 V DC	OPCB KEY0 signal, input
26-2	27-12	0/5 V DC	OPCB KEY1 signal, input
26-3	27-12	0/5 V DC	OPCB KEY2 signal, input
26-4	27-12	0/5 V DC	OPCB KEY3 signal, input
26-5	27-12	0/5 V DC	OPCB KEY4 signal, input
26-6	27-12	0/5 V DC	OPCB KEY5 signal, input
26-7	27-12	0/5 V DC	OPCB KEY6 signal, input
26-8	27-12	0/5 V DC	OPCB KEY7 signal, input
26-9	27-12	0/5 V DC	OPCB LEDON0 signal, output
26-10	27-12	0/5 V DC	OPCB LEDON1 signal, output
26-11	27-12	0/5 V DC	OPCB LEDON2 signal, output
26-13	27-12	0/5 V DC	OPCB LEDON4 signal, output
26-14	27-12	0/5 V DC	OPCB LEDON3 signal, output
26-15	27-12	0/5 V DC (pulse)	OPCB SCAN7 signal, output
26-16	27-12	0/5 V DC (pulse)	OPCB SCAN6 signal, output
26-17	27-12	0/5 V DC (pulse)	OPCB SCAN5 signal, output
26-18	27-12	0/5 V DC (pulse)	OPCB SCAN4 signal, output
26-19	27-12	0/5 V DC (pulse)	OPCB SCAN3 signal, output
26-20	27-12	0/5 V DC (pulse)	OPCB SCAN2 signal, output
26-21	27-12	0/5 V DC (pulse)	OPCB SCAN1 signal, output
26-22	27-12	0/5 V DC (pulse)	OPCB SCAN0 signal, output
27-1	27-12	0 - 5 V DC	LCD Vdd signal, output
27-2	27-12	-12-0 V DC	LCD Vee signal, output
27-3	27-12	0/5 V DC (pulse)	LCD UD3 signal, output
27-4	27-12	0/5 V DC (pulse)	LCD UD2 signal, output
27-5	27-12	0/5 V DC (pulse)	LCD UD1 signal, output
27-6	27-12	0/5 V DC (pulse)	LCD UD0 signal, output
27-7	27-12	0/5 V DC (pulse)	LCD CP signal, output
27-8	27-12	0/5 V DC (pulse)	LCD FLM signal, output
27-9	27-12	0/5 V DC	LCD LEDENB signal, output
27-10	27-12	0/5 V DC (pulse)	LCD LP signal, output

Terminals (CN)		Voltage	Remarks
27-11	27-12	-12-0 V DC	LCD Vo signal, output
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	10-4	24 V DC	24 V DC supply for SSW2, output
32-3	10-4	0/24 V DC	SSW2 on/off, input

2-3-3 CCD PCB

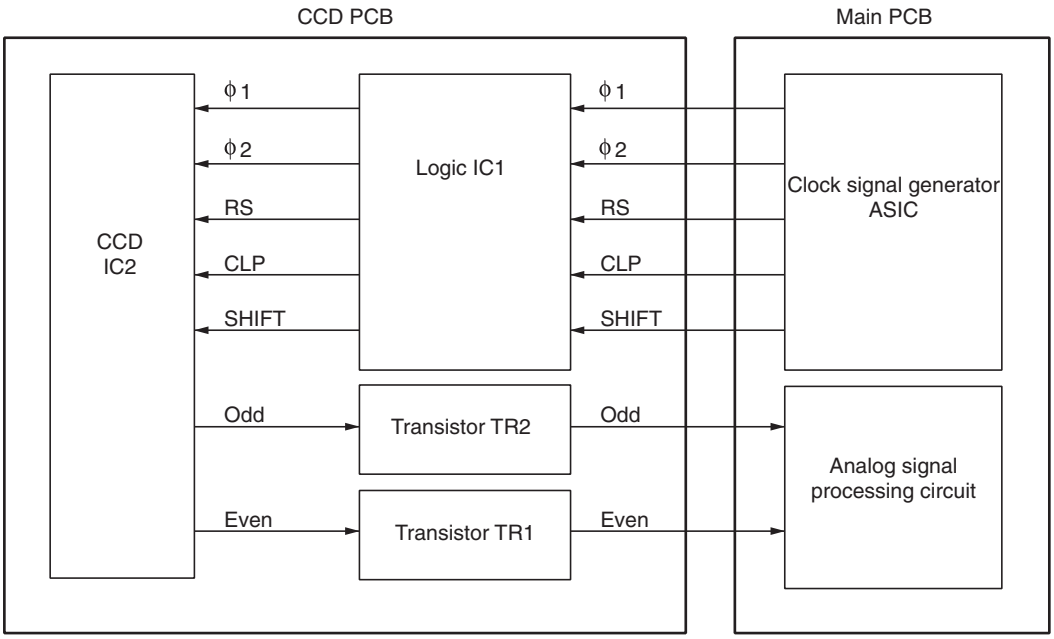


Figure 2-3-7 CCD PCB block diagram

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

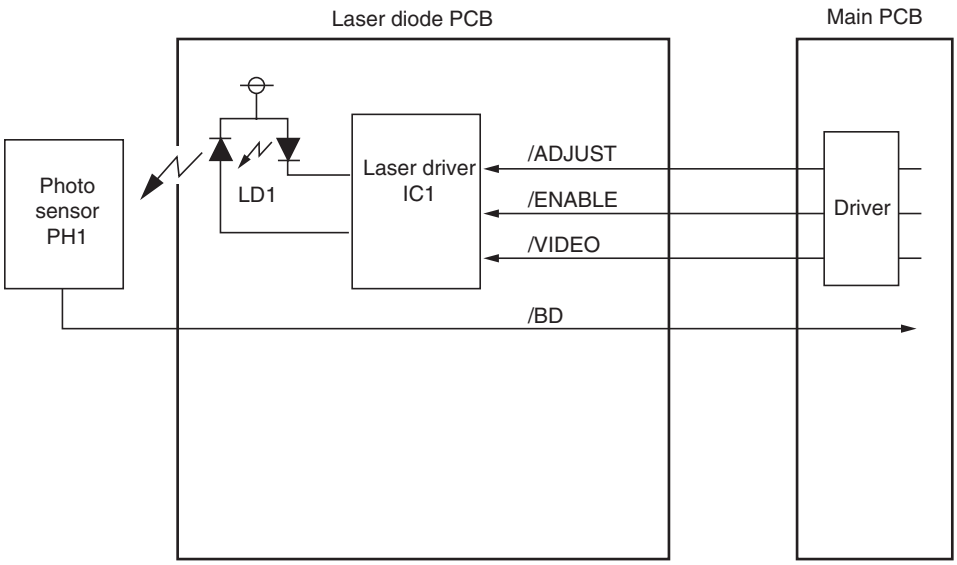
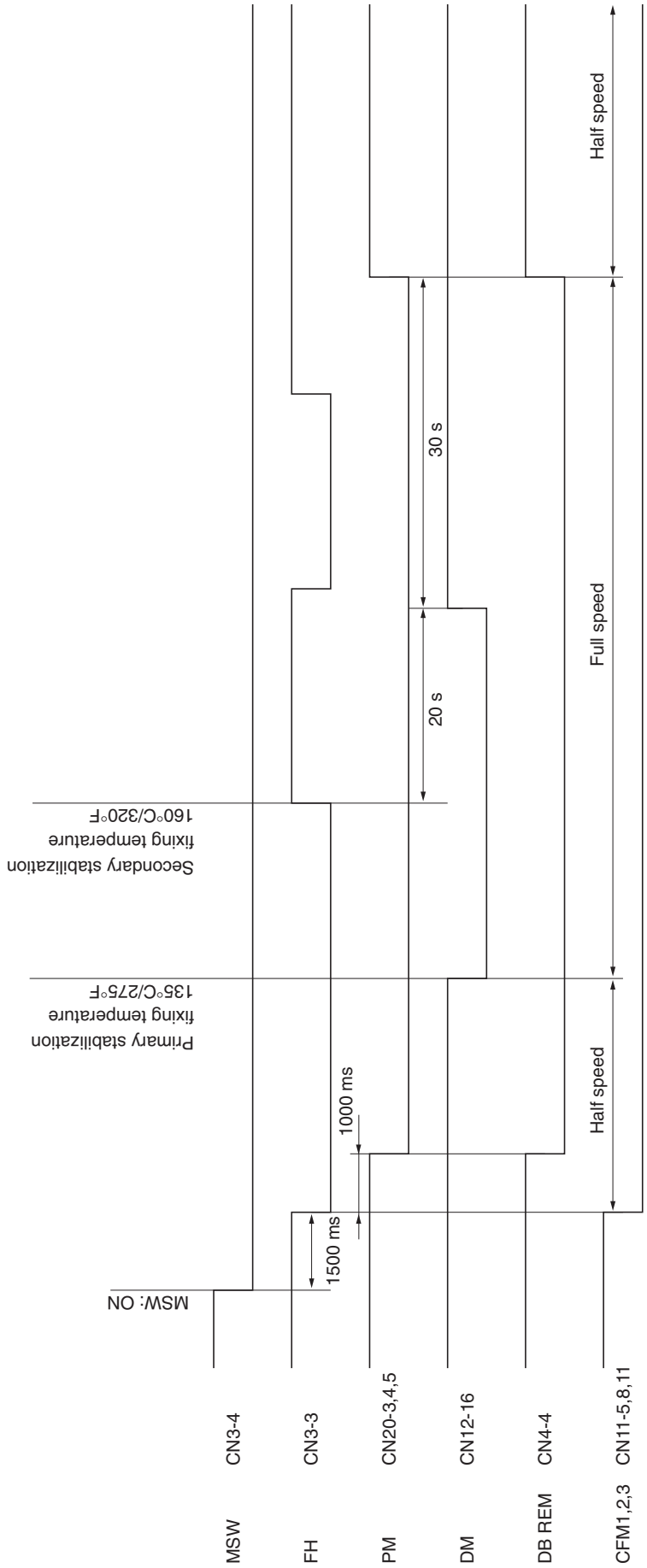


Figure 2-3-8 Laser diode PCB block diagram

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.

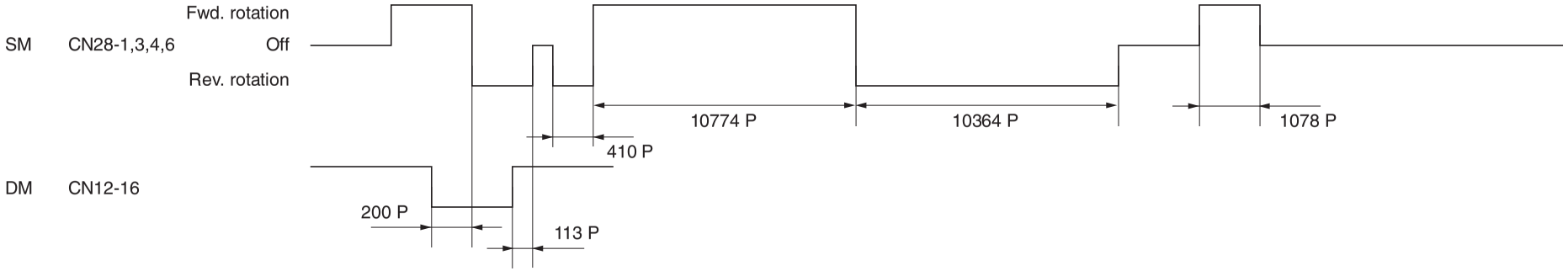
Terminals (CN)		Voltage	Remarks
1-2	1-7	0/5 V DC	LCDPCB S/H signal, input
1-3	1-7	0/5 V DC	LCDPCB VIDEO signal, input
1-4	1-7	0/5 V DC	LCDPCB ENABLE signal, input
1-6	1-7	5 V DC	5 V DC supply for LCDPCB, input
1-8	1-7	0/5 V DC	LCDPCB HSYNC signal, output

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

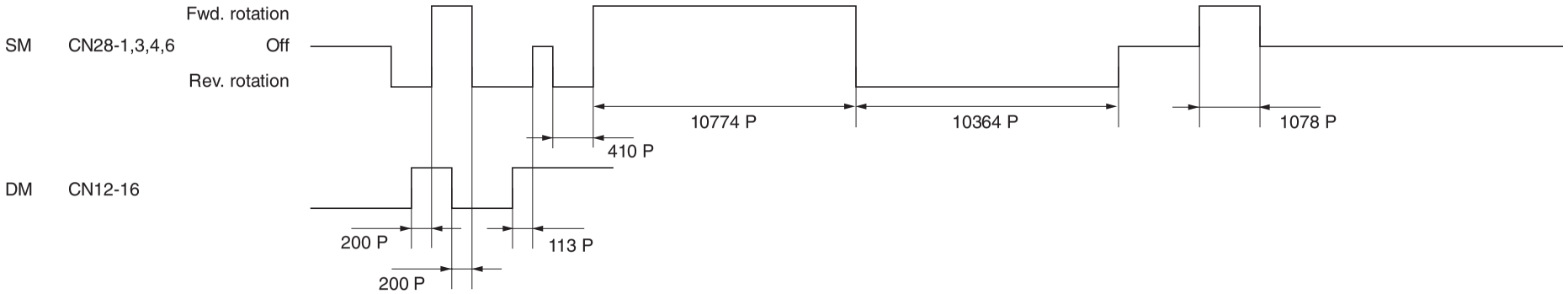


Timing chart No. 2 Scanner initialization

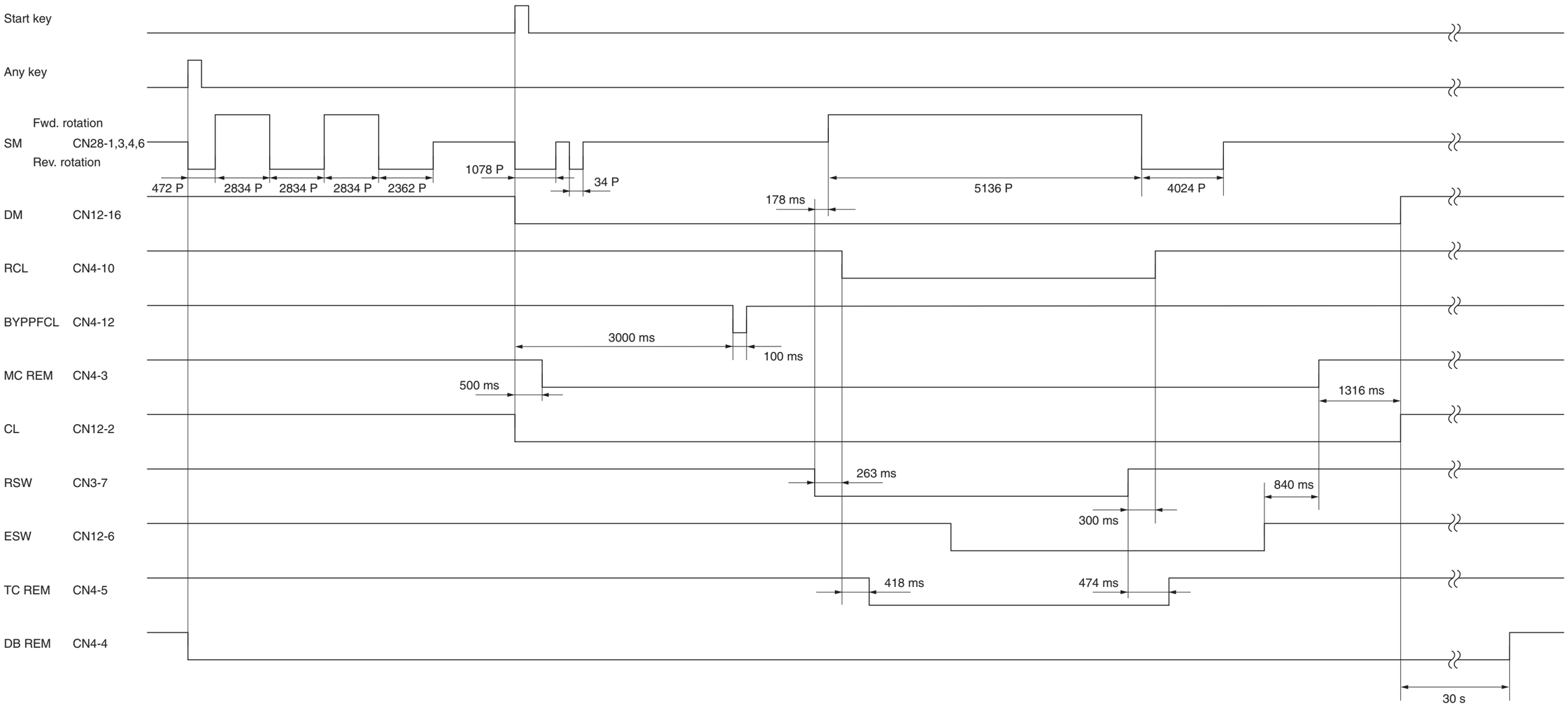
• SHPSW: ON



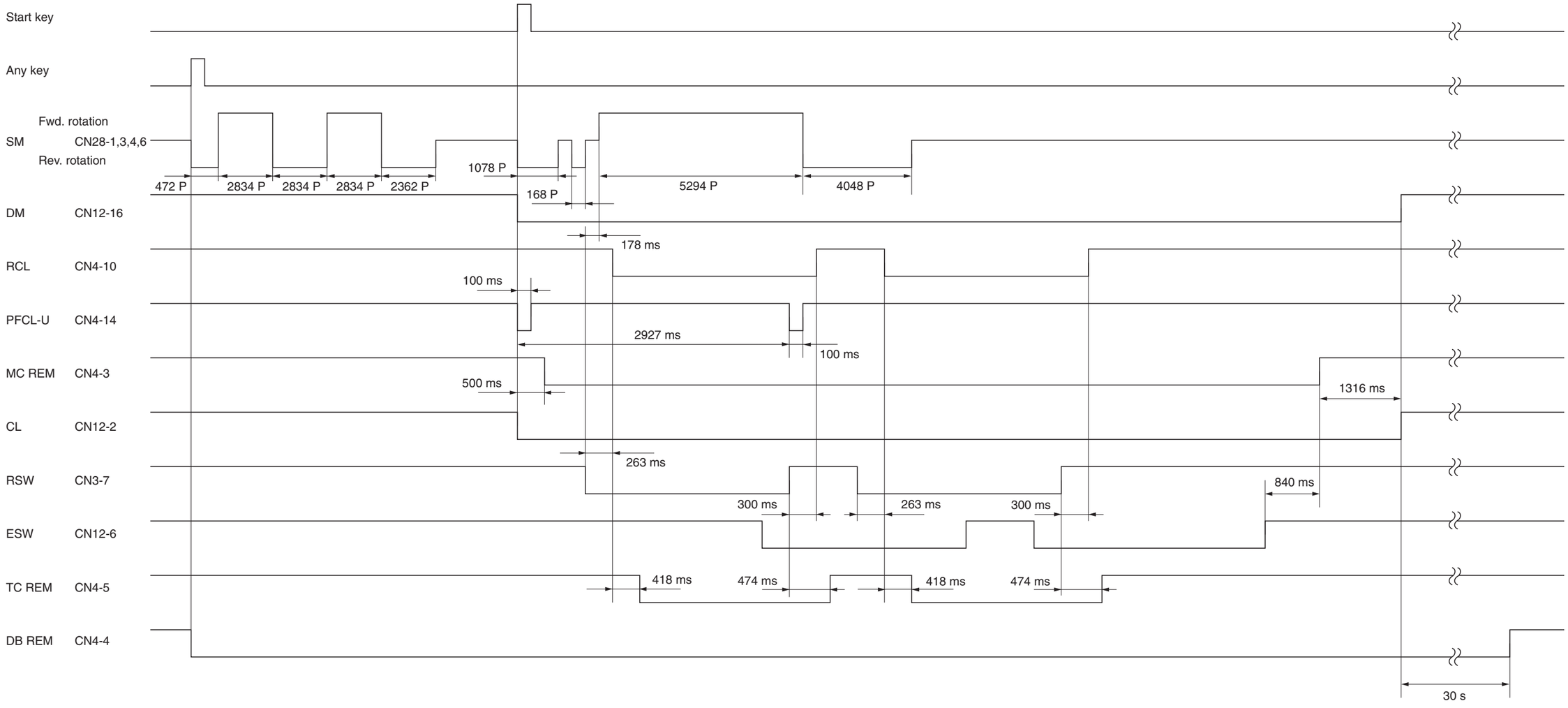
• SHPSW: OFF



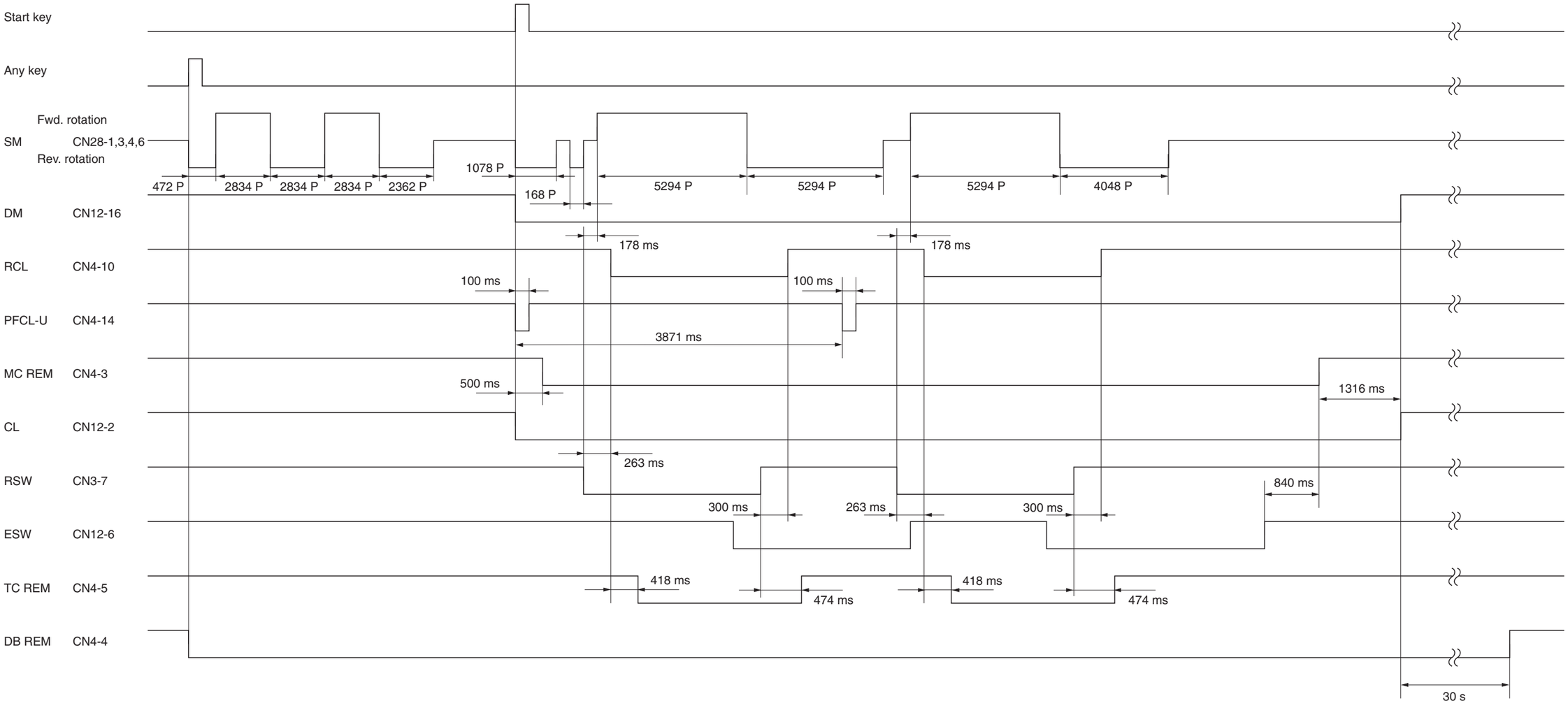
Timing chart No. 3 Copying an A5R/5$^1/_2$" × 8$^1/_2$" original onto a sheet of A3/11" × 17" copy paper from the bypass tray, magnification ratio 200%



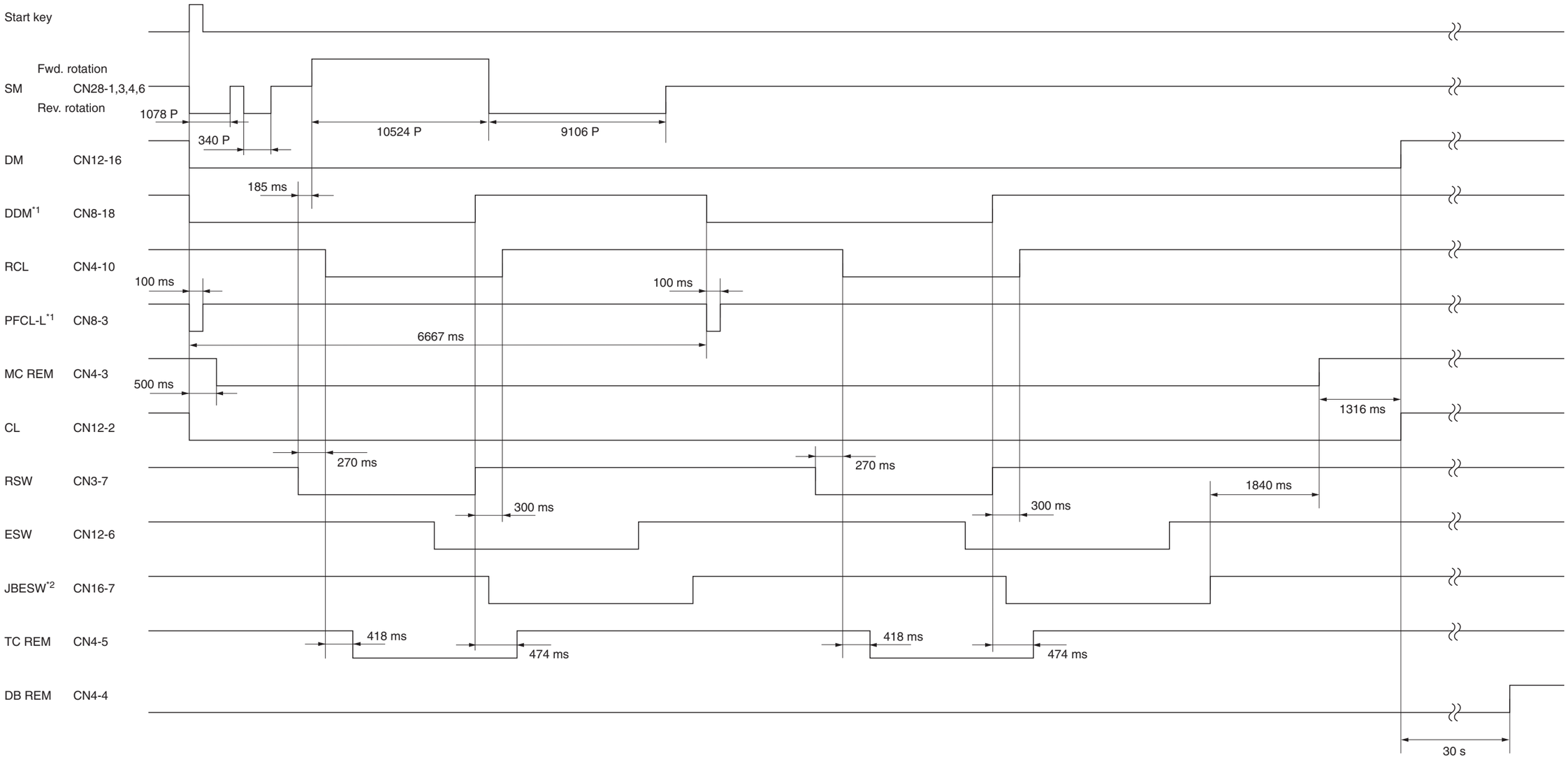
Timing chart No. 4 Continuous copying of an A4/11" × 8½" original onto two sheets of A4/11" × 8½" copy paper from the upper drawer, magnification ratio 100% (20 cpm copier)



Timing chart No. 5 Continuous copying of an A4/11" × 8½" original onto two sheets of A4/11" × 8½" copy paper from the upper drawer, magnification ratio 100% (15 cpm copier)

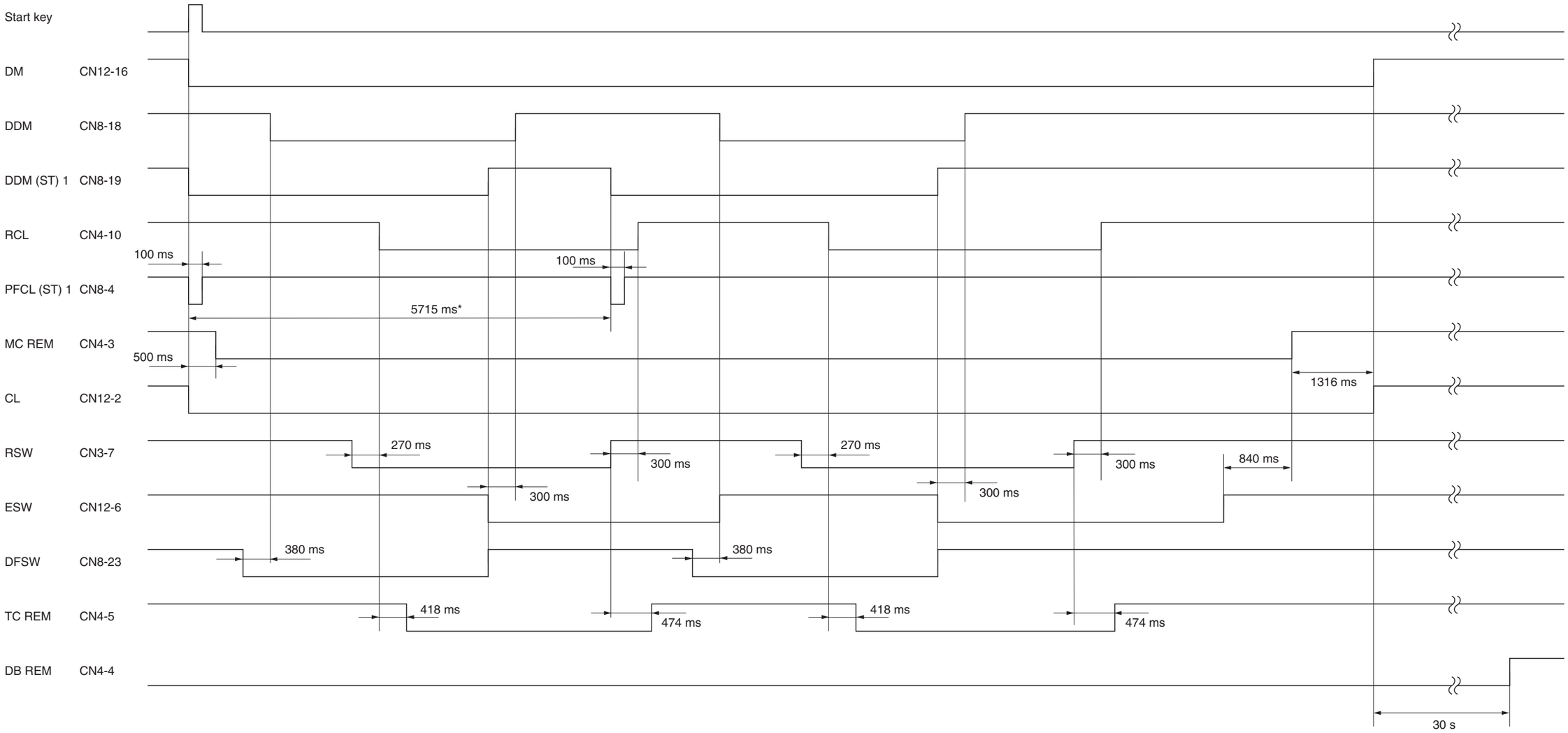


Timing chart No. 6 Continuous copying of an A3/11" × 17" original onto two sheets of A5R/5 1/2" × 8 1/2" copy paper from the lower drawer, magnification ratio 50%, ejection to the job separator



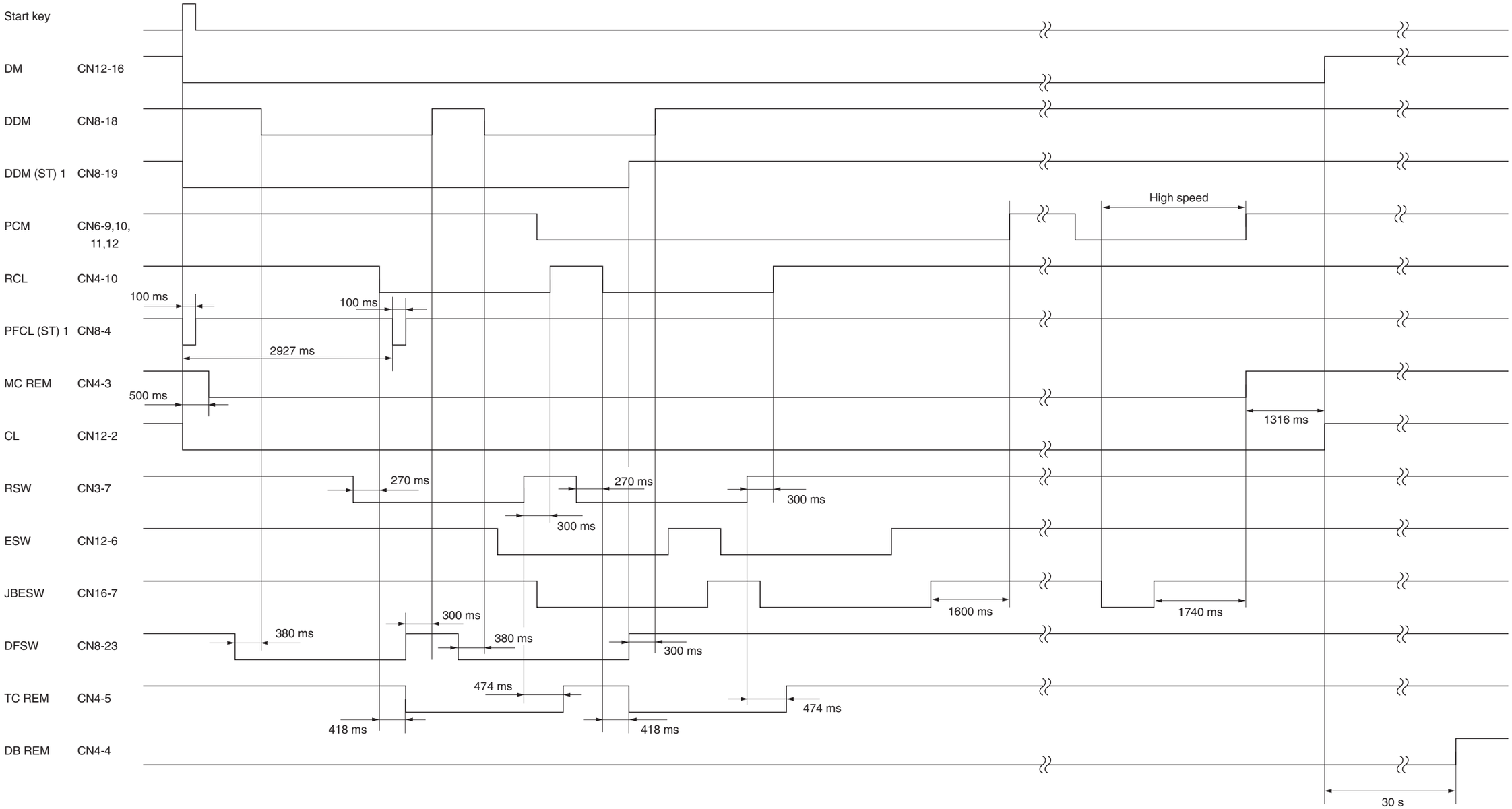
*1: Optional for 15 cpm copier/standard for 20 cpm copier.
*2: Optional for both 15 cpm and 20 cpm copiers.

Timing chart No. 7 Continuous copying of an A4R/8$^1/_2$" × 11" original onto two sheets of A4R/8$^1/_2$" × 11" copy paper from optional drawer 1, magnification ratio 100% (15 cpm copier)

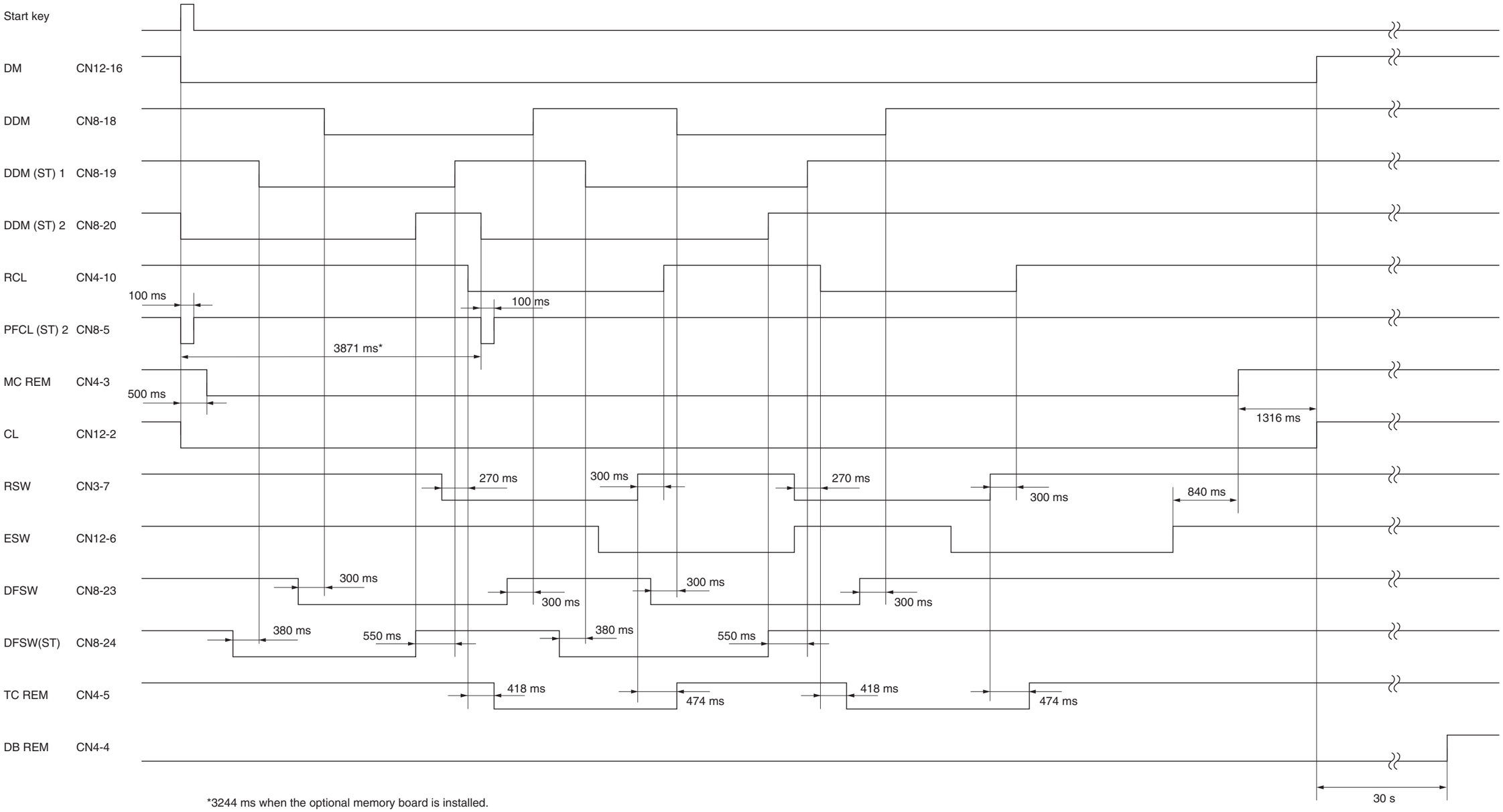


*4800 ms when the optional memory board is installed.

Timing chart No. 8 Continuous copying of an A4/11" × 8½" original onto two sheets of A4/11" × 8½" copy paper from optional drawer 1, magnification ratio 100%, ejection to the finisher (20 cpm copier)



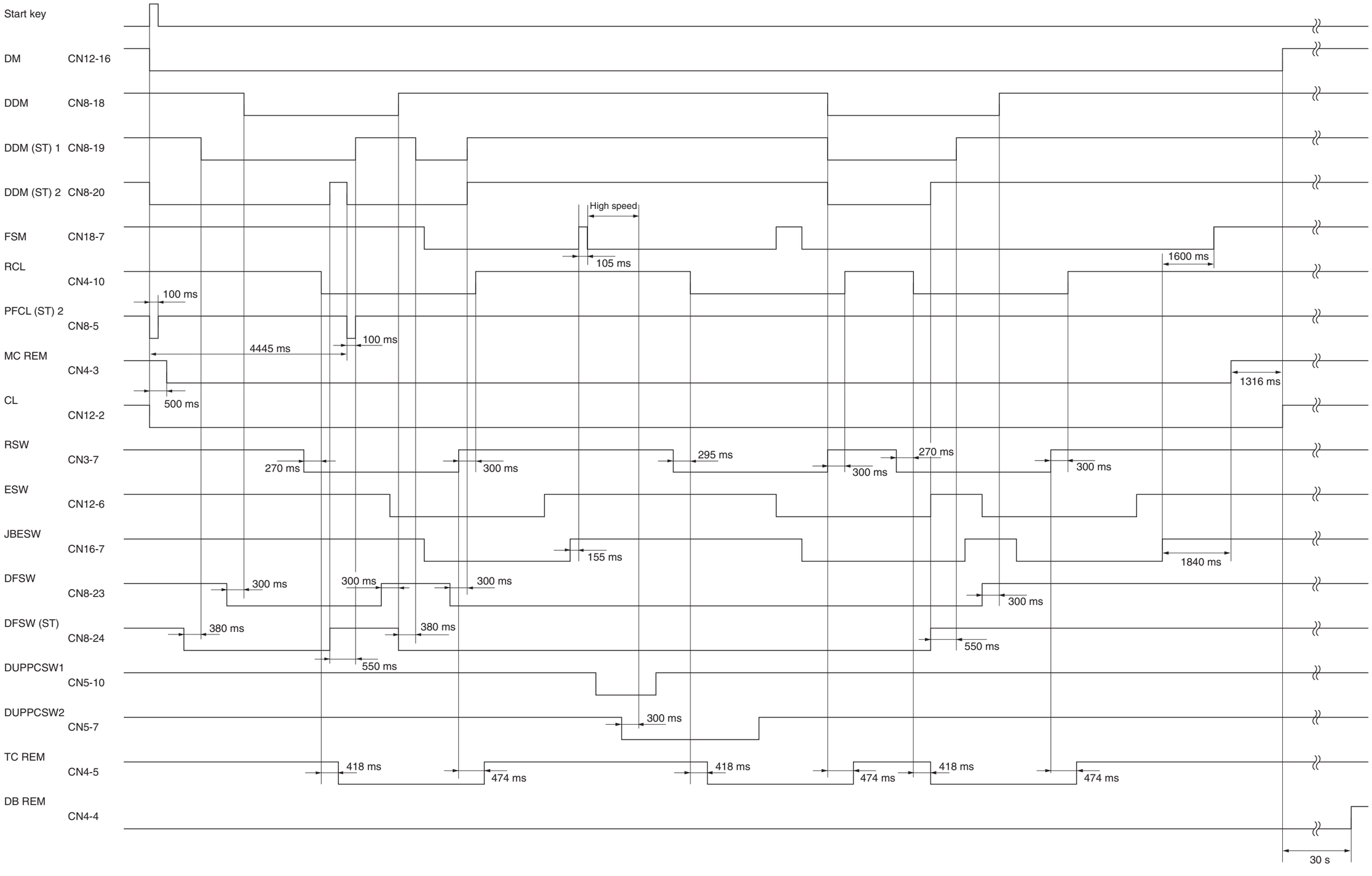
Timing chart No. 9 Continuous copying of an A4/11" × 8½" original onto two sheets of A4R/8½" × 11" copy paper from optional drawer 1, magnification ratio 100%, ejection to the finisher (20 cpm copier)



*3244 ms when the optional memory board is installed.

2-4

Timing chart No. 10 Duplex copying of a single-sided A4R/8$^1/_2$" × 11" original onto a duplex A4R/8$^1/_2$" × 11" copy from optional drawer 2, magnification ratio 100%, ejection to the job separator (20 cpm copier)



Maintenance parts list

• **Copier**

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	6	8
Left registration roller	LEFT ROLLER, REGISTRATION	2AV06070	7	6
Upper paper feed pulley	PULLEY, PAPER FEED	2AV06010	6	3
Lower paper feed pulley	PULLEY, PAPER FEED	2AV06010	5	30
Bypass paper feed pulley	PULLEY, PAPER FEED	2AV06320	6	44
Left registration cleaner assembly	PARTS, ASS'Y LEFT REGISTRATION CLEANER,SP	2AV93010	7	25
Right registration cleaner assembly	PARTS, ASS'Y RIGHT REGISTRATION CLEANER,SP	2AV93020	6	42
Left cover	COVER, CONVEYING	2AV04120	7	2
Contact glass	CONTACT GLASS	35912010	9	46
Slit glass	CONTACT GLASS, ADF	2AV12250	9	19
Mirror 1	MIRROR A	2AV12150	9	9
Mirror 2 and mirror 3	MIRROR B	2AV12160	9	10
Exposure lamp	LAMP, SCANNER	2AV12100	9	4
Original size detection sensor	SENSOR, ORIGINAL DETECTION	35927290	9	53
Cleaning blade	BLADE, CLEANING	2AV18030	11	6
Drum separation claw	CLAW, SEPARATION	2AR18240	11	112
Drum shaft	SHAFT, DRUM	2AR08030	11	23
Drum shaft front bushing	FRONT BUSHING, DRUM SHAFT	2AR09230	11	32
Cleaning lower seal A	LOWER SEAL A, CLEANING	2AR93410	11	94
Drum	SET, DRUM	2AV82010	11	1
Charger assembly	MAIN CHARGER ASS'Y A	2AR93420	11	12
Cleaning lamp	LAMP, CLEANING LAMP	2AR27031	10	12
Transfer roller assembly	PARTS, ASS'Y TRANSFER ROLLER, SP	2AV93030	7	26
Doctor blade cover	COVER A DOCTOR BLADE ASS'Y	2AR68580	11	70
Heat roller	ROLLER, HEAT	2AV20100	12	12
Press roller	PARTS, ROLLER PRESSURE,SP	2AB93040	12	28
Bushing	BUSHING, HEAT ROLLER	35920350	12	41
Bearing	BEARING, PRESSURE	35920130	12	37
Fixing unit thermister	THERMISTOR, FIXING	2AV20250	12	24
Heat roller separation claw	CLAW, SEPARATION	35920150	12	39
Fixing heater	HEATER 120, FIXING	2AV20130	12	13
Fixing heater	HEATER 230, FIXING	2AV20140	12	13
Gear	GEAR 35, HEAT ROLLER	35920240	12	40
Eject roller	ROLLER, EJECT	2AV20150	12	14
Eject pulley	PULLEY, EJECT	2AV20160	12	15

• **Optional drawer**

Maintenance part name		Part No.	Fig. No.	Ref. No.
Name used in service manual	**Name used in parts list**			
Paper feed pulleys	PULLEY, PAPER FEED	2AV06010	2	30
Conveying roller	ROLLER,CONVEYING	3A506060	2	23

Periodic maintenance procedures

• **Copier**

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.	
	Upper paper feed pulley	Clean	Every service	Clean with alcohol or a dry cloth.	1-6-3
	Bypass paper feed pulley	Clean or replace	Every service	Clean with alcohol or a dry cloth.	1-6-6
	Left registration cleaner assembly	Clean or replace	Every service	Replace after feeding 200,000 sheets. Vacuum.	1-6-8
	Right registration cleaner assembly	Clean or replace	Every service	Replace after feeding 200,000 sheets. Vacuum.	1-6-8
	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.	
	Lower paper feed pulley Lower paper feed clutch	Clean Check	Every service Every service	Clean with alcohol or a dry cloth. Check the leading edge registration and paper feed conditions in the registration section, bypass and paper feed section.	1-6-5
	Paper feed roller	Clean	Every service	Clean with alcohol or a dry cloth.	

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.	1-6-19
	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
Optical section (con.)	Original size detection sensor	Clean	Every service	Clean the sensor emitter and receiver with alcohol and then a dry cloth only if there is a problem.	

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Developing section	Developer	Replace	Every service		1-3-8
	Drum unit	Replace	Every service	Apply GE-334C conductive grease (P/N A0199040) between the drum shaft and grounding plate.	1-6-43
	Charger assembly	Replace	Every service		1-6-40
	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 bushing • Contacting surfaces of the gear and collar	
				Check noise. If noise is heard, apply conductive grease GE334 to the following locations: • Contacting surfaces of the transfer roller, bushing and terminal	
		Replace	Every 200,000 counts		1-6-45
	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		1-6-46
	Drum separation claw	Check or replace	Every service	Clean with a dry cloth; replace if the tip is deformed.	1-6-43
	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.	1-6-47
	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.	1-6-51
	Press roller	Clean or replace	Clean after 100,000 counts; check and replace after 200,000 counts	Clean with alcohol.	1-6-53
	Bushing	Check and replace	After 200,000 counts	Check the installation position and noise.	1-6-51
	Bearing	Check and replace	After 200,000 counts	Check the installation position and noise.	1-6-53
	Fixing unit themistor	Check and clean	After 200,000 counts	Clean with alcohol and check for peeling of the film.	1-6-49
	Heat roller separation claw	Clean or replace	After 200,000 counts	Clean with alcohol.	1-6-49
	Fixing heater	Check and replace	After 200,000 counts	Check if the lamp is dark or not.	1-6-50
	Gear	Check and replace	Every service	Check for chips in the gear.	1-6-51
	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.	

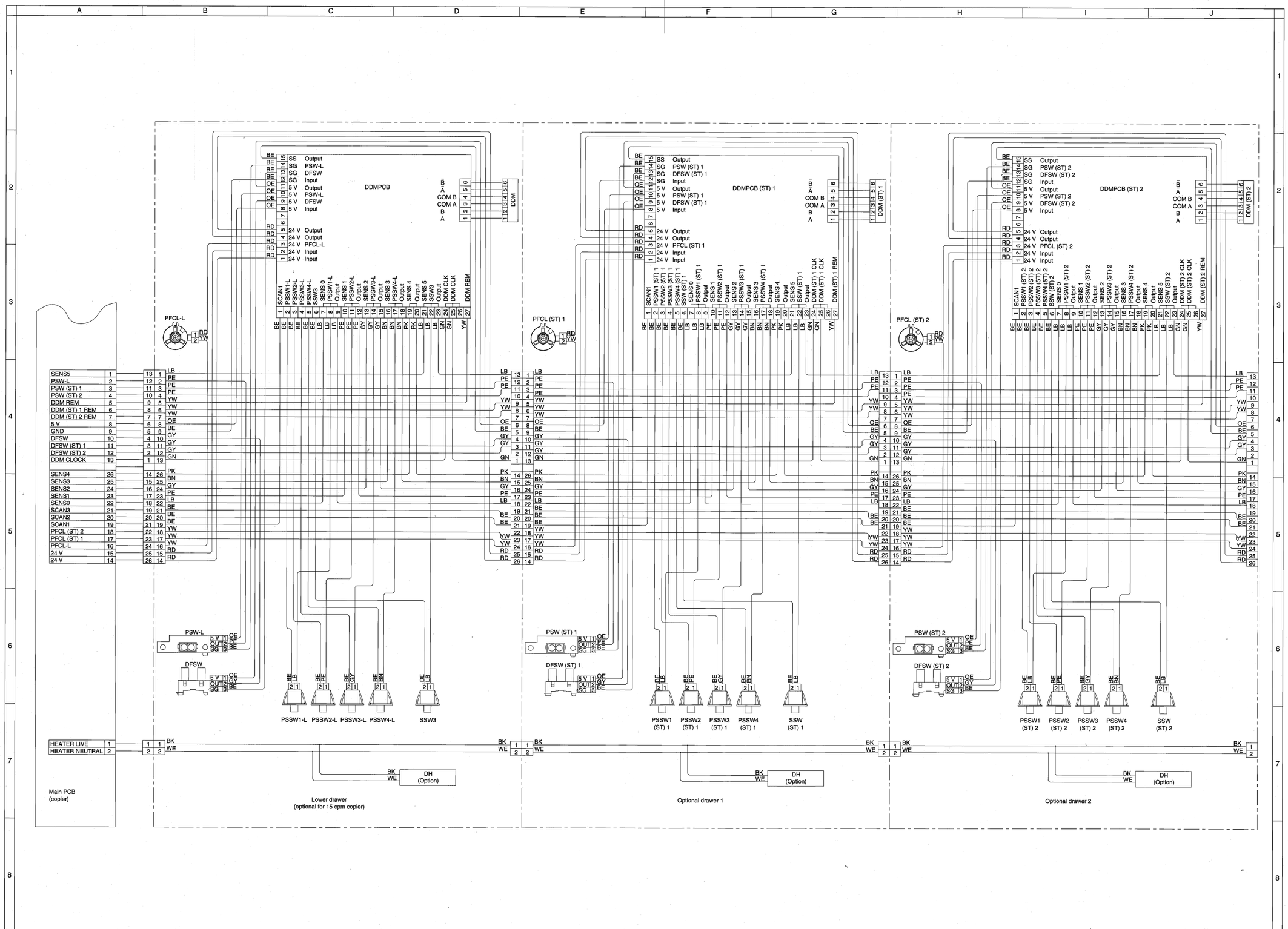
Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Other	Image quality	Check and adjust	Every service		

• Optional drawer

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	Paper feed pulleys	Clean	Every service	Clean with alcohol or a dry cloth.	
		Check	Every service	Check the leading edge registration and paper feed conditions in the registration section, bypass and paper feed section.	
	Paper feed roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Bushings	Check	Every service	Check noise. If noise is heard, apply grease TMP-200G.	

General wiring diagram (1)



General wiring diagram (2)