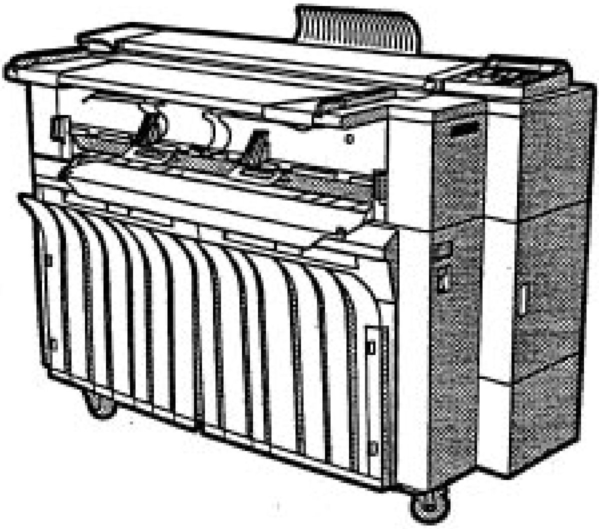
Gestetner® RICOH® savin®



A741

SERVICE MANUAL

RICOH GROUP COMPANIES

PN: RCSM7030

Gestetner®

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PN:RCSM7030

LEGEND

PRODUCT CODE	COMPANY		
	GESTETNER	RICOH	SAVIN
A741	---	FW7030D	---

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
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CAUTION

DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

ATTENTION

IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT INCORRECT DE LA BATTERIE. REMPLACER UNIQUEMENT AVEC UNE BATTERIE DU MÊME TYPE OU D'UN TYPE RECOMMANDÉ PAR LE CONSTRUCTEUR. METTRE AU RÉBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS DU FABRICANT.

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. ....

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I THEORY AND CONSTRUCTION SECTION

II ELECTRICAL SECTION

III SET UP AND ADJUSTMENT SECTION

I

THEORY AND CONSTRUCTION SECTION

CONTENTS

1-1 Specifications

1-1-1 Specifications

Type	Console type
Copying method	Dry indirect electrostatic photocopying
Original type	Sheet
Original feed method	Moving originals
Paper	(1) Plain paper: 64 – 80 g/m^2 (fed from the roll unit or bypass table) (2) Special paper: Tracing paper, film (fed from the roll unit or bypass table)
Roll paper size	Width: 420 – 920 mm/17" – 36" Diameter: 180 mm/$6^{1}/_{4}$" maximum Inner diameter: 76 mm/3" Length: 175 m
Original sizes	Standard: A0 – A4R (64 – 80 g/m^2) 36" × 48" – $8^{1}/_{2}$" × 11" (64 – 80 g/m^2) Maximum: 920 (w) × 5,000 (l) mm (64 – 80 g/m^2) 36" × 197" (64 – 80 g/m^2)
Copy sizes	Standard: A0 – A4R (64 – 80 g/m^2) 36" × 48" – $8^{1}/_{2}$" × 11" (64 – 80 g/m^2) Maximum: 920 (w) × 5,000 (l) mm (64 – 80 g/m^2) 36" × 197" (64 – 80 g/m^2) Effective image width: 920 mm Leading edge margin: 5 ± 4 mm
Copying magnification ratios	Manual mode: 25 – 400% (at intervals of 1% or 0.1%) Auto copy mode: Fixed ratios according to the original and paper sizes Metric: 1:1±0.5%, 1:4.000, 1:2.829, 1:2.000, 1:1.410, 1:0.706, 1:0.500, 1:0.352, 1:0.250 Inch (Architecture): 1:1±0.5%, 1:3.143, 1:2.588, 1:2.000, 1:1.294, 1:0.640, 1:0.500, 1:0.324, 1:0.250 Inch (Engineer): 1:1±0.5%, 1:4.000, 1:2.667, 1:2.000, 1:1.333, 1:0.667, 1:0.500, 1:0.333, 1:0.250
Copying speed	4.8 m/min
First copy time	30 s maximum (A1 standard size copying)
Warmup time	10 min maximum (room temperature 20°C/68°F, 65% RH)
Paper feed system	Automatic feed from the roll unit and manual feed from the bypass table
Consecutive copying	1 – 20 copies (when the original length is 1300 mm or less)

Photoconductor	OPC (Drum diameter: 90 mm)
Charging system	Single plus corona charging Drum surface potential: 870 ± 50 V DC
Exposure system	Moving original scanning
Light source	Fluorescent lamp, 65 W
Developing system	Dry (magnetic brush) Developer: Dual-component (ferrite carrier and black toner: N22T) Toner density control: Toner sensor Toner replenishing: Automatic supply from the toner hopper
Transfer system	Single negative corona charging: –5.3 kV DC
Separation system	Single AC corona charging: 5.6 kV AC
Fixing system	Heat roller Heat source: Halogen heaters 120 V areas: 800 W (main), 400 W (sub) 220 – 240 V areas: 1120 W (main), 480 W (sub) Control temperature: 150°C/302°F (plain paper or film) 145°C/293°F (tracing paper) Abnormal temperature increase-prevention device: Thermostat, 145°C/293°F Fixing pressure: 2.0 N at both ends, 5.9 N at center
Charge erasing system	Exposure by cleaning lamp
Cleaning system	Cleaning blade and cleaning fur brush
Functions	(1) Preheat/energy saving (2) Auto clear (can be set to between 30 and 270 s at intervals of 30 s) (3) Auto shutoff (can be set to between 15 and 120 min at intervals of 15 min) (4) Self-diagnostics (5) Simulation (6) Margin copy (7) Hanging copy (8) Program copy (9) Preview copy (10) Paper cut length setting (11) Same-size/full-size magnification adjustment (12) Fixing temperature adjustment (13) Initial settings change (14) Original size detection (15) Paper size detection
Power requirement	120 V AC, 60 Hz, *13* A 220 – 240 V AC, 50/60 Hz, *8* A
Power consumption	*1500* W (120 V areas) *1900* W (220 – 240 V areas)
Machine dimensions	1355 (w) × 635 (d) × 1107 (h) mm $53^{3}/_{8}$" (w) × 25" (d) × $43^{9}/_{16}$" (h)
Weight	Approx. 268 kg, 590.3 lb. (main unit only)
Floor requirement	1355 (w) × 707 (d) mm, $53^{3}/_{8}$" (w) × $27^{13}/_{16}$" (d)

Accessories	Original reversing guide
Optional accessories	3rd roll unit, roll shaft, carrier sheets (A0, A1, A2), key counter and original support

3rd roll unit (optional)

Type	Built-in type
Paper	Equivalent to the copier to be connected to
Power source	Electrically connected to the copier

CONTENTS

1-2 Handling Precautions

1-2-1 Handling and storage of the drum

Use the following caution when handling the drum.

- When removing the drum from the main unit, make sure not to expose it to direct sunshine or strong lighting.
- Store the drum where the ambient temperature is kept between –20°C/–4°F and 40°C/104°F and humidity around 85%RH. Sudden changes in temperature and humidity even within the permitted ranges should be avoided, too.
- Avoid atmosphere laden with substances that might chemically damage the drum surface.
- Never hit the drum surface with anything hard or pointed. Protect it from bare or gloved hands; if it is accidentally touched, clean by following the proper procedure.

1-2-2 Storage of developer and toner

Store developer and toner in a cool, dark place free from direct sunshine or high humidity.

1-2-3 Handling of the heaters

This copier is equipped with heaters to avoid condensation inside. These heaters are kept powered as long as the copier power cable is connected to a wall outlet with the main switch set off. Never disconnect the power cable if the copier is used in a humid place of 70%RH higher.

If the copier is not going to be used for long periods of time, disconnect the power cable from the wall outlet.

Each roll unit of this copier is equipped with a roll unit heater[*1] which can be individually turned on or off with a switch. If normal plain paper is kept in the roll units and there is a risk of high humidity, keep their heaters on. However, keep the heater off if tracing paper is kept in the roll unit.

1-2-4 Storage of paper

Paper should be stored in a cool, dark place free from high temperature or humidity. If it is not going to be used for a long time, take paper out of the roll unit, put it in the original wrapping paper and seal.

[*1] Optional for 220 – 240 V models.

CONTENTS

1-3 Mechanical Construction

1-3-1 Part names and functions

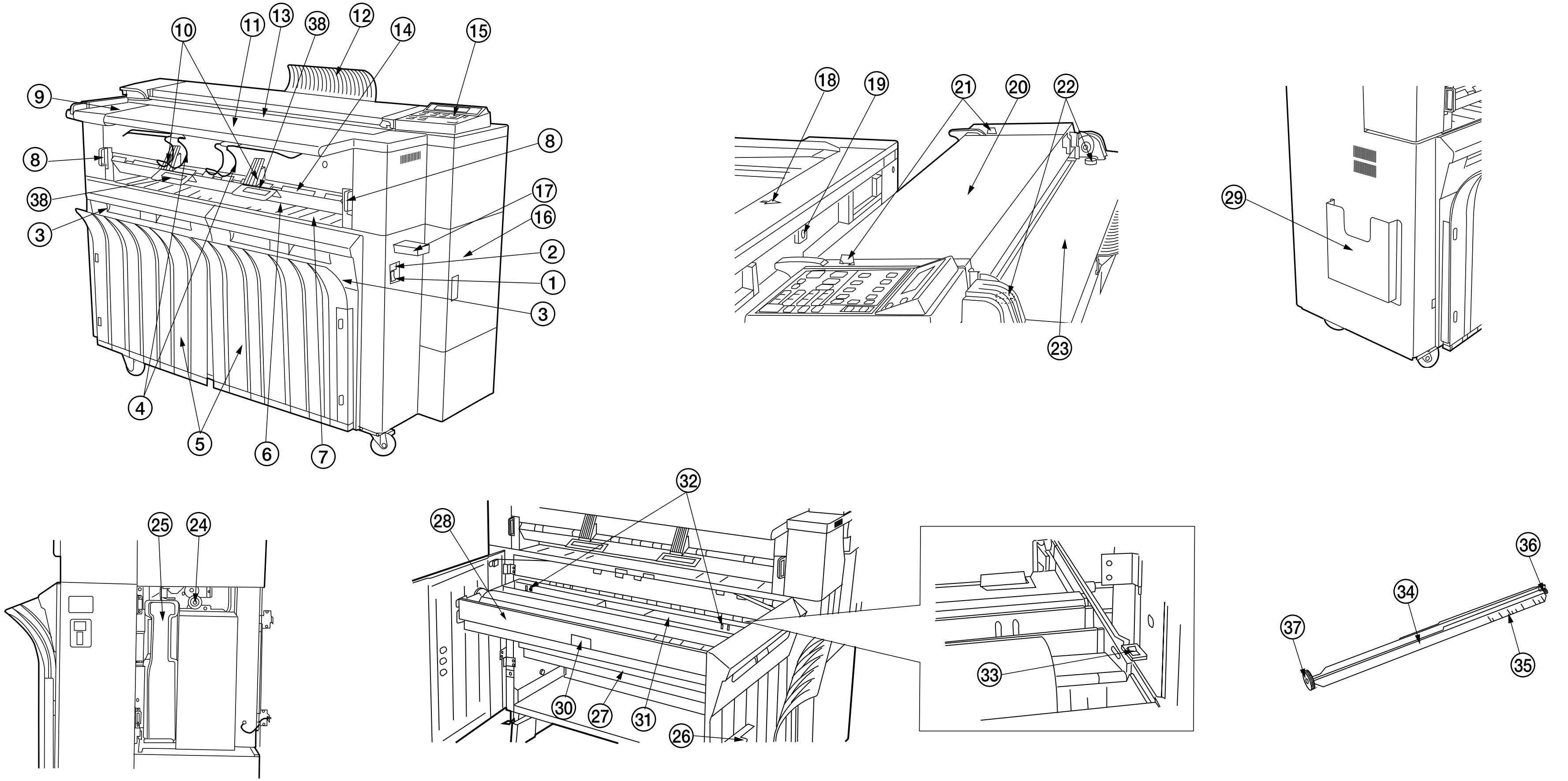


Figure 1-3-1

① Main switch
② Total counter
③ Front covers
④ Carrier sheet guides
⑤ Copy bins
⑥ Bypass slot
⑦ Bypass table
⑧ Main body release levers
⑨ Original guide
⑩ Paper eject guides
⑪ Original table
⑫ Original loop guide
⑬ Original insert slot
⑭ Copy eject slot
⑮ Operation panel
⑯ Right cover
⑰ Key counter[*1]
⑱ Copy ready indicator
(ready lamp)
⑲ Fuser release button
⑳ Original holding section
㉑ Original holder anchor pins
㉒ Upper rear cover screws
㉓ Upper rear cover
㉔ Transport knob
㉕ Waste toner tank
㉖ Copy bin stopper plates
㉗ Second roll unit
㉘ First roll unit
㉙ Instruction handbook box
㉚ Roll unit handle
㉛ Paper roll insertion cover
㉜ Paper roll insertion latches
㉝ Roll unit heater switch[*2]
㉞ Paper roll shaft
㉟ Paper roll size label
㊱ Paper roll release lever
㊲ Paper roll shaft gear
㊳ Copy eject slot guides

*1 Optional.
*2 Optional for 220 – 240 V models.

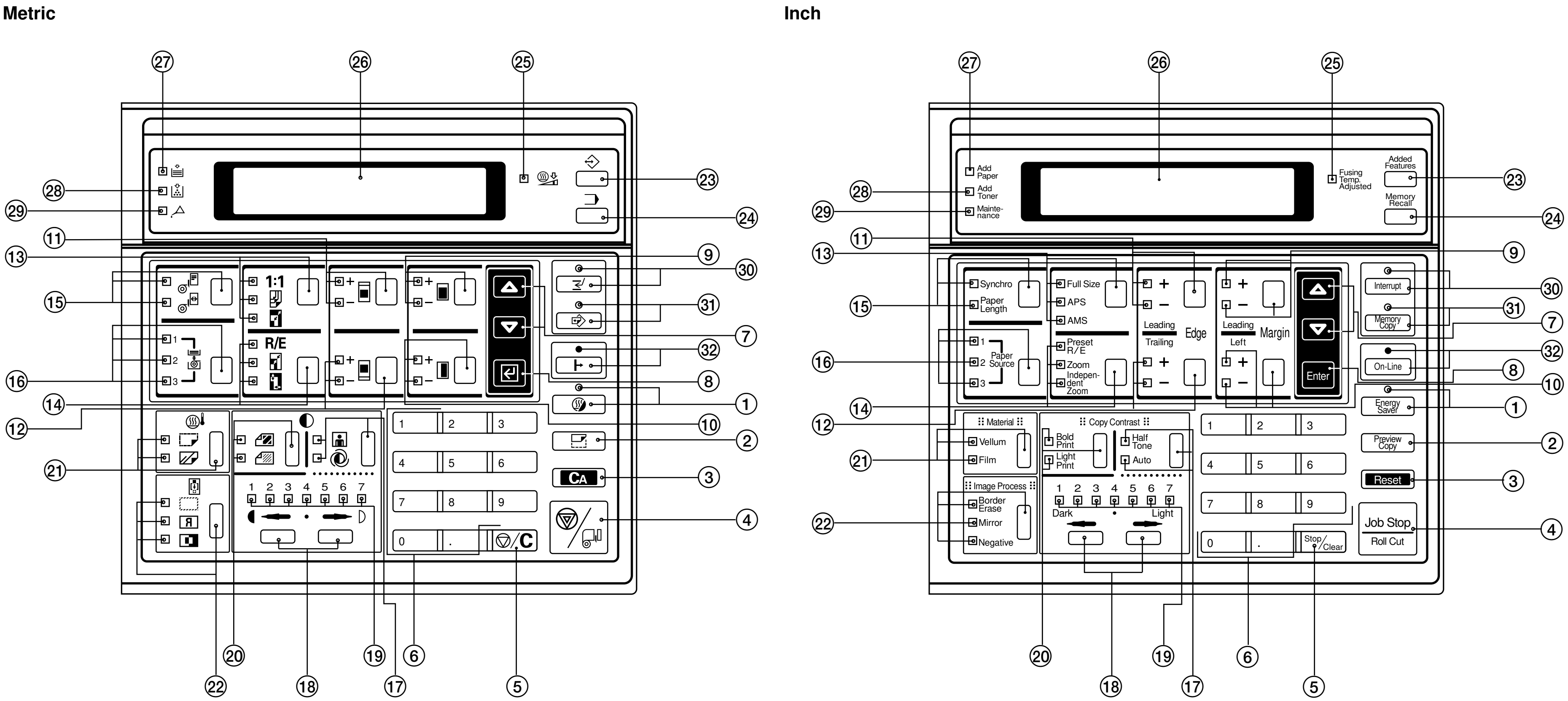
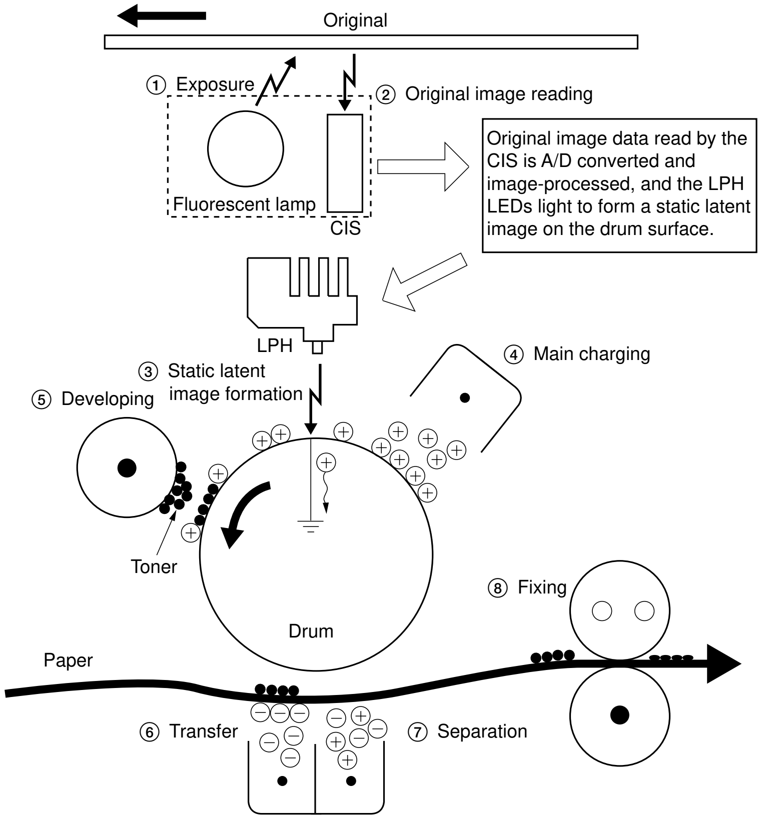


Figure 1-3-2 Operation panel

① Preheat/energy saver key/indicator
② Preview copy key
③ All clear/reset key
④ Job stop/roll cut key
⑤ Stop/clear key
⑥ Numeric keys
⑦ Mode set keys
⑧ Enter key
⑨ *Leading edge margin key/indicators*
⑩ Left margin key/indicators
⑪ Leading edge hanging key/indicators
⑫ Trailing edge hanging key/indicators
⑬ Copy mode select key/indicators
⑭ Zoom mode select key/indicators
⑮ Paper length key/indicators
⑯ Paper source key/indicators
⑰ Auto/manual contrast select key/indicators
⑱ Copy contrast keys
⑲ Copy contrast indicators
⑳ Original contrast key/indicators
㉑ Special paper select key/indicators
㉒ Image process select key/indicators
㉓ Added features key
㉔ Memory recall key
㉕ Fusing temp. adjusted indicator
㉖ Display
㉗ Add paper indicator
㉘ Add toner indicator
㉙ Maintenance indicator
㉚ Interrupt key/indicator
㉛ Memory copy key/indicator
㉜ *On-line key/indicator*

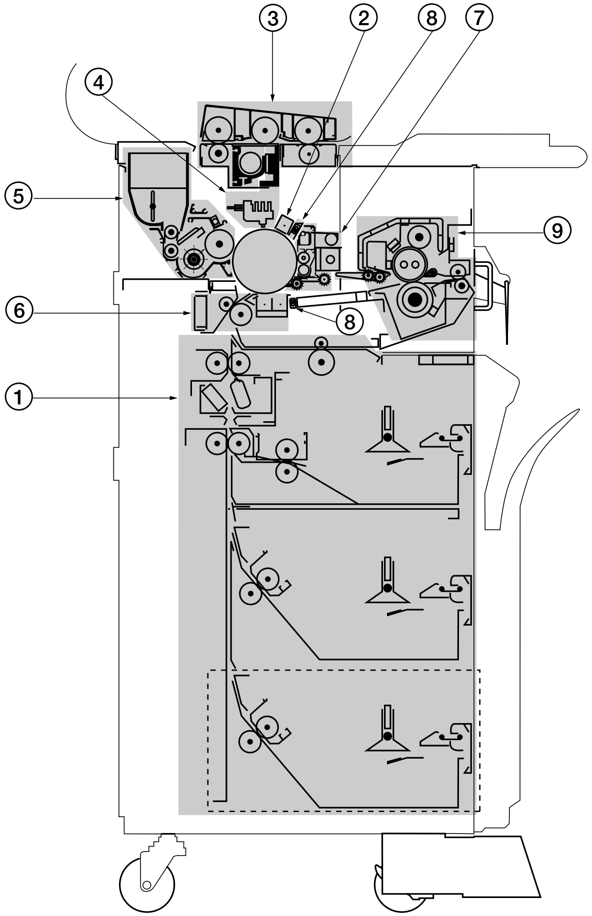
1-3-2 Copy process



Original image data read by the CIS is A/D converted and image-processed, and the LPH LEDs light to form a static latent image on the drum surface.

Figure 1-3-3 Copy process

1-3-3 Machine cross sectional view



*1: The third roll unit is optional.

Figure 1-3-4 Machine cross sectional view

① Paper feed section (page 1-3-8)
② Main charger section (page 1-3-15)
③ Exposure and original feed section (page 1-3-19)
④ CIS and LPH section (page 1-3-22)
⑤ Developing section (page 1-3-28)
⑥ Transfer/separation section (page 1-3-33)
⑦ Cleaning section (page 1-3-36)
⑧ Static eliminator section (page 1-3-39)
⑨ Fixing section (page 1-3-41)

1-3-4 Machine drive system

(1) Drive system 1 (driven by the paper feed motor)

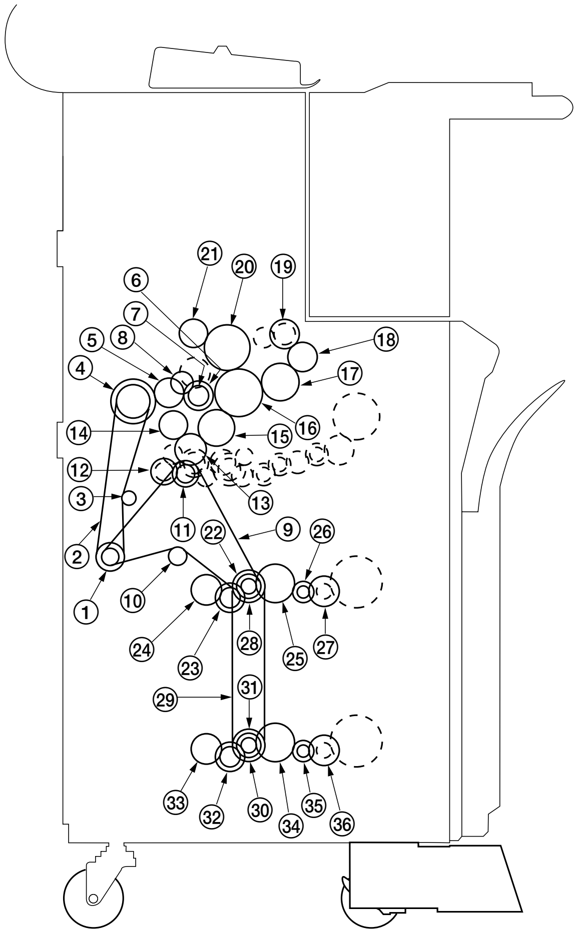


Figure 1-3-5 Drive system 1 (outer side to the left frame)

① Paper feed motor pulley 15/18
② Cutter drive belt
③ Drive tension pulley
④ Cutter drive pulley 20
⑤ SB gear 37
⑥ Cutter clutch gear
⑦ Cutter drive gear 21
⑧ Duplex gear 32
⑨ Paper feed section drive belt 1
⑩ Drive tension pulley
⑪ Paper feed pulley 16
⑫ Pre-transfer drive gear
⑬ Optical section idle gear 46
⑭ Roll paper conveying clutch gear
⑮ Idle gear 45
⑯ Paddle gear
⑰ Optical section idle gear 46
⑱ SB gear 37
⑲ Bypass registration clutch gear
⑳ Gear 50T
㉑ Registration clutch gear
㉒ Paper feed pulley 16
㉓ Idle gear 36/30
㉔ Middle feed clutch gear
㉕ Optical section idle gear 46
㉖ Idle gear 20/26
㉗ Middle roll winding clutch gear
㉘ Pulley 20P5
㉙ Paper feed section drive belt 2^{*1}
㉚ Pulley 20P5^{*1}
㉛ Paper feed pulley 16^{*1}
㉜ Idle gear 36/30^{*1}
㉝ Lower feed clutch gear^{*1}
㉞ Optical section idle gear 46^{*1}
㉟ Idle gear 20/26^{*1}
㊱ Lower roll winding clutch gear^{*1}

*1: Parts 29 to 36 are present when the third roll unit (optional) is installed.

(2) Drive system 2 (driven by the paper feed motor)

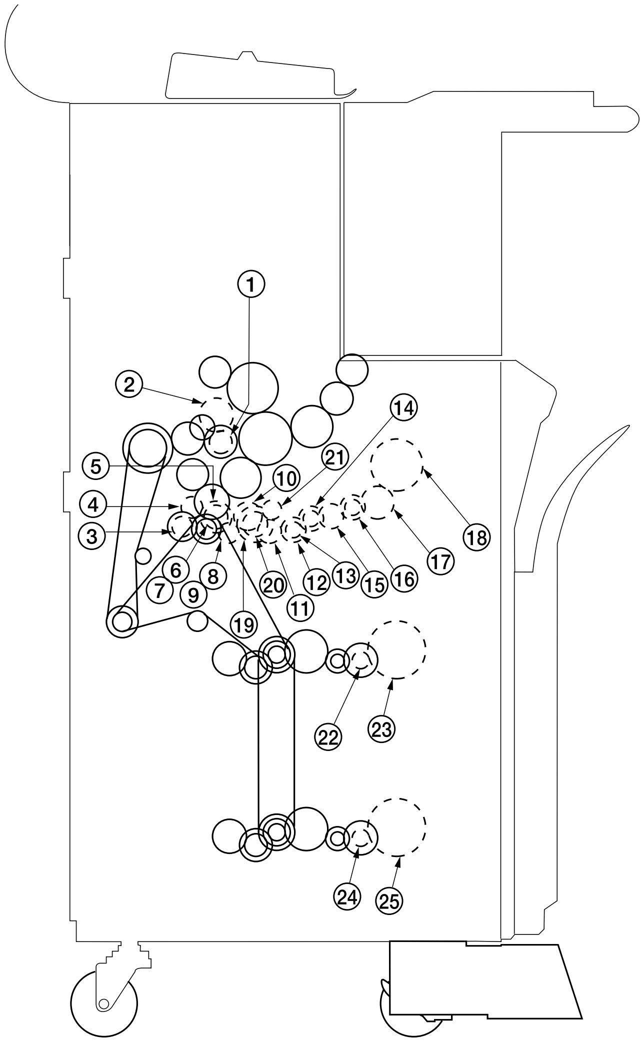


Figure 1-3-6 Drive system 2 (inner side from the left frame)

① Cutter drive gear 21
② Cutter gear 32
③ Eject gear 29
④ Fixing unit idle gear 24T
⑤ Duplex gear 32
⑥ Drive gear 20T
⑦ Drive gear 20T
⑧ Paper feed pulley gear B
⑨ Paper feed pulley gear B
⑩ Idle gear 22
⑪ Paper feed pulley gear B
⑫ Upper roll winding clutch gear
⑬ Drive gear 20T
⑭ Idle gear 16/25
⑮ Duplex gear 32
⑯ Roll idle gear A
⑰ Spiral roller gear 23
⑱ Roll gear 40
⑲ Duplex gear 32
⑳ Upper feed clutch gear
㉑ Drive gear 20T
㉒ Roll drive gear 16
㉓ Roll gear 40
㉔ Roll drive gear 16*1
㉕ Roll gear 40*1

*1: Parts 24 and 25 are present when the third roll unit (optional) is installed.

(3) Drive system 3 (driven by the drum motor and fixing drive motor)

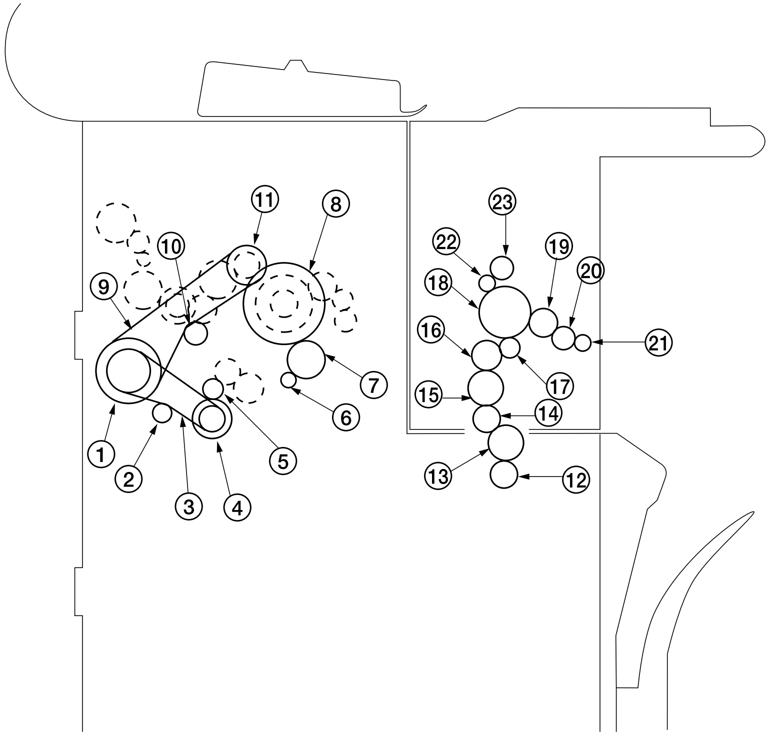


Figure 1-3-7 Drive system 3 (outer side to the left frame)

① Main drive pulley
② Drive tension pulley
③ Pre-transfer drive belt
④ Pre-transfer drive pulley 32
⑤ Developer gear
⑥ Drum motor gear 17
⑦ Drum drive gear 45
⑧ Drum drive gear 60
⑨ Developing unit drive belt
⑩ Tension pulley
⑪ Developing unit drive pulley 16
⑫ Fixing drive motor gear
⑬ Fixing section drive gear
⑭ Developer gear 22
⑮ Idle gear 34
⑯ Idle gear 26
⑰ SB gear 24
⑱ Heat roller gear
⑲ Fixing gear 24
⑳ Idle gear 22
㉑ Sleeve gear 17
㉒ Fixing unit idle gear
㉓ Gear 27T

(4) Drive system 4 (driven by the drive motor and toner feed motor)

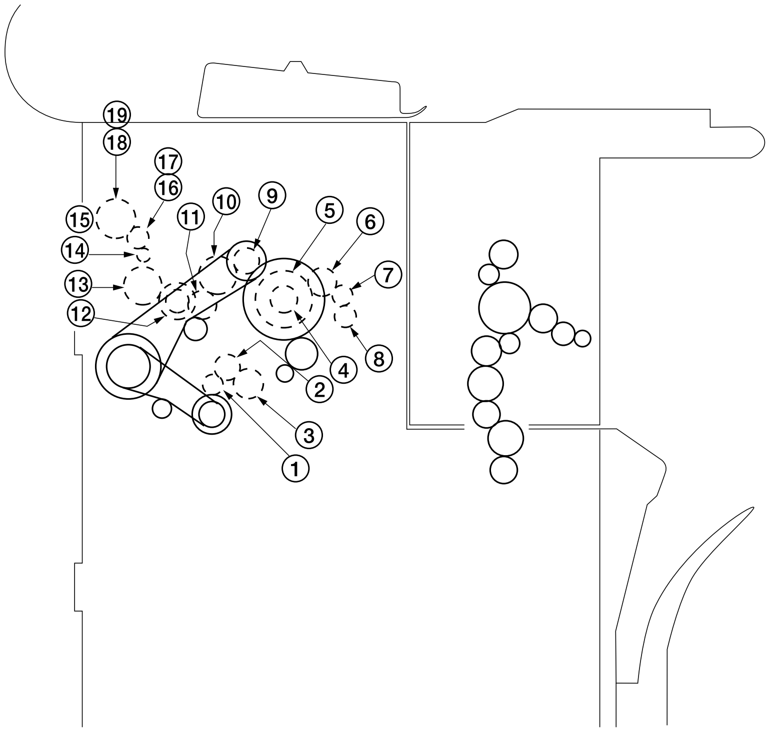


Figure 1-3-8 Drive system 4 (inner side from the left frame)

① Pre-transfer drive gear 22
② Drive gear 20T
③ Pre-transfer gear 30
④ Drum joint
⑤ Left drum flange
⑥ Feed gear 25
⑦ Fur brush gear 17
⑧ Roll unit gear 18
⑨ Developing unit drive gear 20
⑩ Developing roller gear 19
⑪ Developing unit idle gear 17
⑫ Developer paddle gear
⑬ Spiral roller gear 23
⑭ Toner shaft gear
⑮ Toner shaft gear
⑯ Fixing idle gear
(left side of the machine)
⑰ Toner feed motor gear
(right side of the machine)
⑱ Toner gear 34
⑲ Toner gear 34

(5) Drive system 5 (driven by the original feed motor)

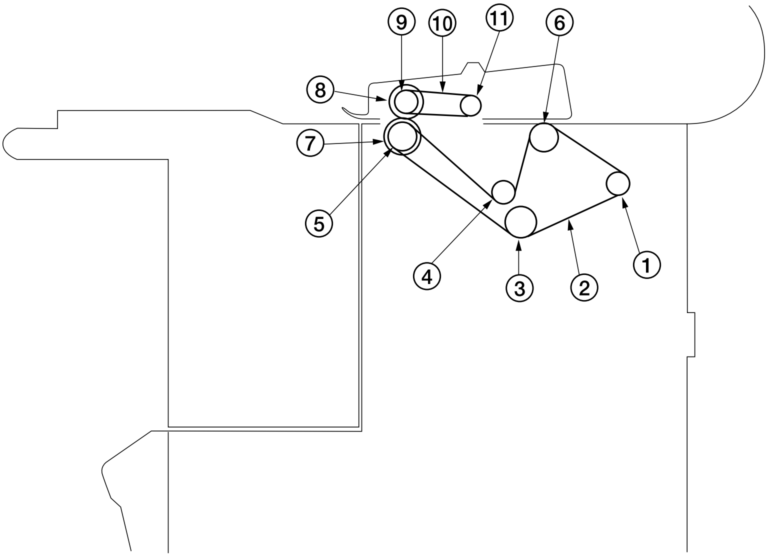


Figure 1-3-9 Drive system 5 (outer side to the right frame)

① Original feed motor pulley	⑦ Front lower original roller
② Original feed drive belt 1	⑧ Front upper original roller
③ Idle pulley 16	⑨ Original feed pulley
④ Tension pulley	⑩ Original feed drive belt 2
⑤ Original feed clutch gear	⑪ Original feed pulley
⑥ Developing unit pulley	

1-3-5 Mechanical construction of each section

(1) Paper feed section

The paper feed section is comprised of the parts shown in Figure 1-3-10. Paper can be fed either manually or automatically from a paper roll.

In the paper feed section, a sheet of paper fed from the roll unit or placed on the bypass table is conveyed to the transfer section in synch with the LED on timing of the LPH section.

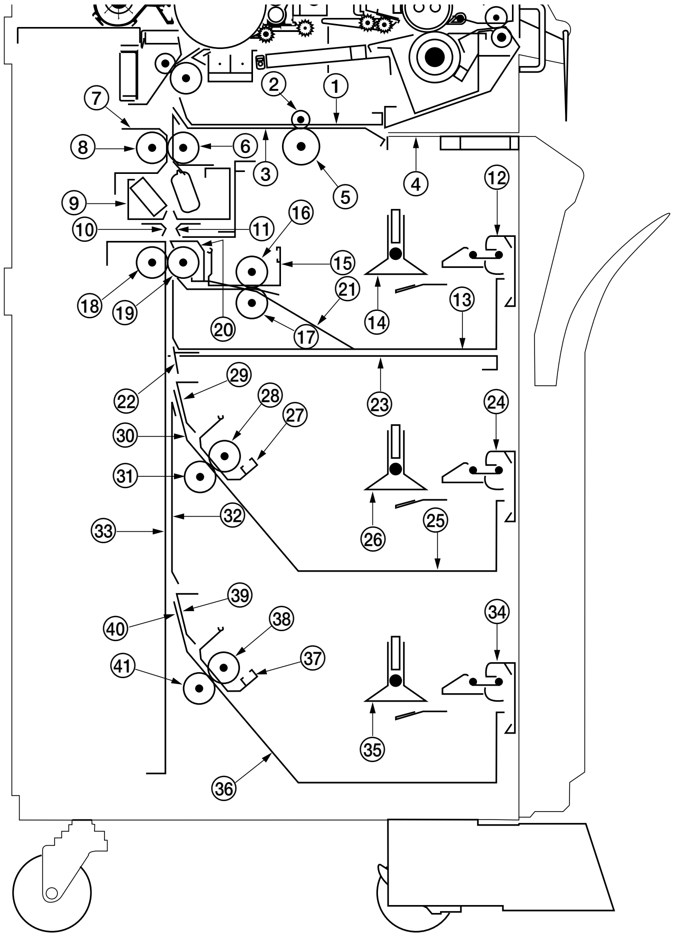


Figure 1-3-10 Paper feed section

① Registration upper guide
② Bypass pulley
③ Registration lower guide
④ Bypass table
⑤ Bypass registration roller
⑥ Registration roller
⑦ Cutter eject rear guide
⑧ Registration pulley
⑨ Cutter unit
⑩ Cutter rear guide
⑪ Cutter front guide
⑫ Roll lever
⑬ Roll base A
⑭ Paper roll shaft
⑮ Roll paper feed upper guide A
⑯ Roll paper feed upper roller
⑰ Roll paper feed lower roller A
⑱ Roll paper conveying rear roller A
⑲ Roll paper conveying front roller
⑳ Roll stay A
㉑ Roll paper feed lower guide A
㉒ Roll paper conveying upper guide
㉓ Center partition
㉔ Roll lever
㉕ Roll base B
㉖ Paper roll shaft
㉗ Roll paper feed upper guide B
㉘ Roll paper feed upper roller
㉙ Roll front guide B
㉚ Roll rear guide B
㉛ Roll paper conveying rear roller B
㉜ Roll paper conveying lower guide
㉝ Roll paper conveying rear guide
㉞ Roll lever*1
㉟ Paper roll shaft*1
㊱ Roll base B*1
㊲ Roll paper feed upper guide B*1
㊳ Roll paper feed upper roller*1
㊴ Roll front guide B*1
㊵ Roll rear guide B*1
㊶ Roll paper conveying rear roller C*1

*1 Parts 34 to 41 are present when the third roll unit (optional) is installed.

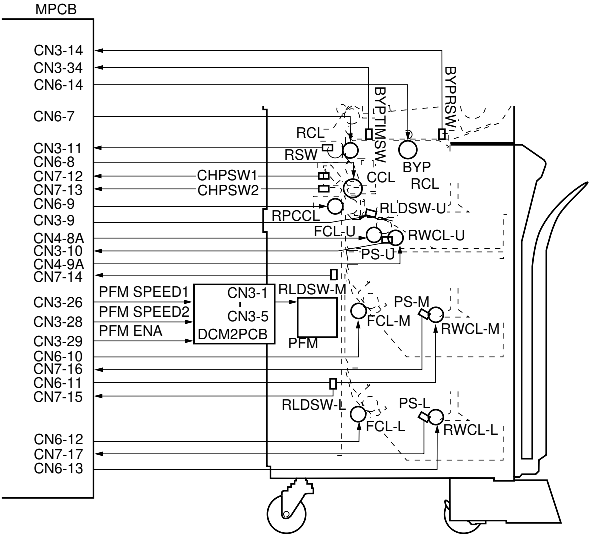


Figure 1-3-11 Block diagram of the paper feed section

Paper Feed Drive

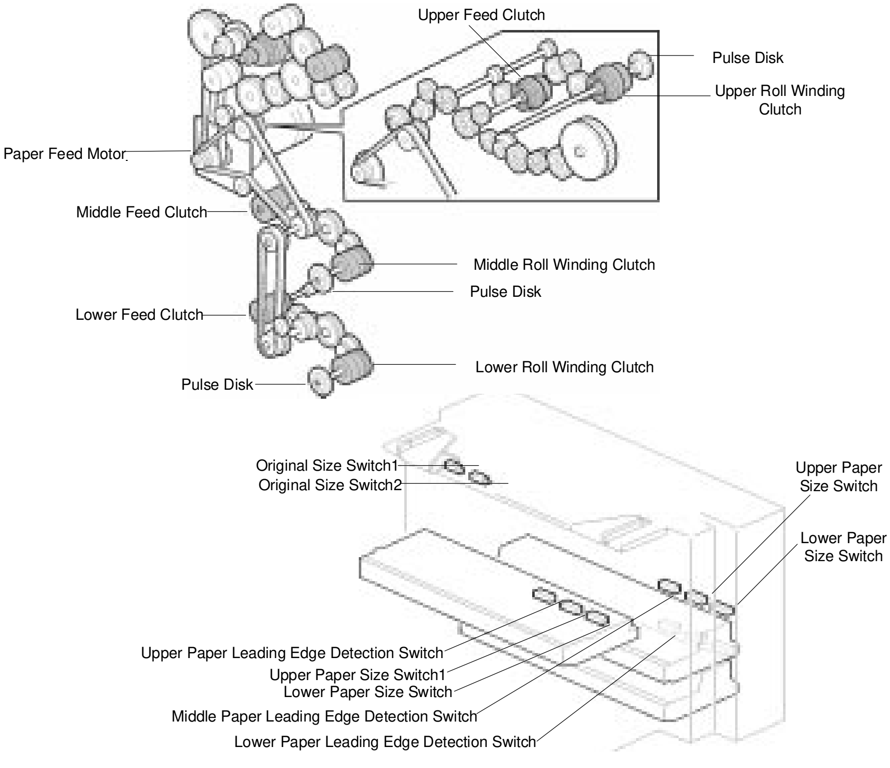
The paper feed motor drives the paper feed rollers through electromagnetic clutches. When the feed clutch is off and the roll winding clutch is on, the paper spool reverses to pull back the roll leading edge the home position.

Paper Roll and Original Width Detection

Two sensors, paper size switches 1 and 2, detect the roll width. The original width is also detected by two sensors, original size switches 1 and 2. Depending on the sensor status and UP setting, the machine can detect the widths of 17.0”, 22.0” 34.0 (Engineering) or 18.0”, 24.0”, 36.0” (Architecture). The paper leading edge switch is used only to detect the leading edge of roll paper.

Roll End

When the pulse disk on the roll winding clutch shaft stops rotation while the paper feed motor is on, the machine detects a roll end condition. If the paper leading edge sensor is on when roll end is detected, the cutter clutch is energized to cut the paper.

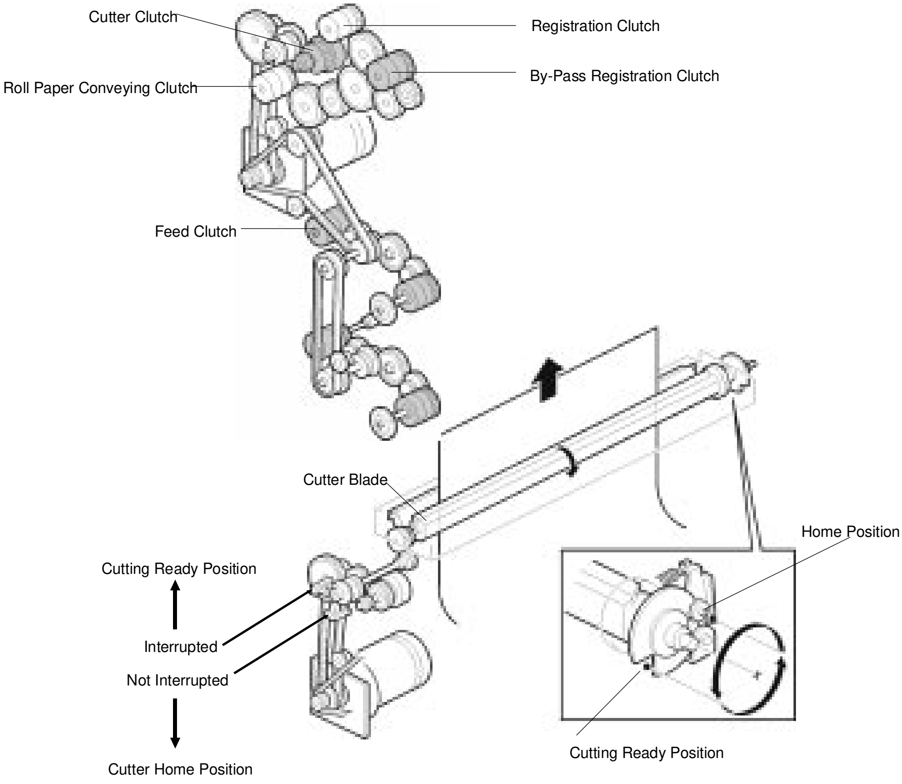


Paper Transport

The by-pass registration clutch and the by-pass registration switch are used to control the paper feed timing.
For roll feeding, the feed clutch, roll paper conveying clutch, registration clutch, and registration switch control the paper feed timing. The paper feed length is measured by the registration sensor on time. Initially, the paper feed motor is slightly faster than the drive motor which drives the pre-transfer drive roller. This is to make a buckle between the registration roller and the pre-transfer drive roller. This buckle absorbs the vibration when the paper is cut, to prevent jitter at the image transfer section. After a buckle is made, the paper feed motor speed becomes the same as the drive motor speed.

Cutter Unit

The paper feed motor drive is transmitted to the cutter clutch through gears and a timing belt. The rotary cutter rotates when the cutter clutch is energized. Initially, the cutter is in the home position, and the cutter functions as a paper guide in this position. After the paper leading edge enters the cutter unit, the cutter moves to the cutting ready position. After the paper is cut, the cutter returns to the home position. Paper transportation does not stop during cutting.



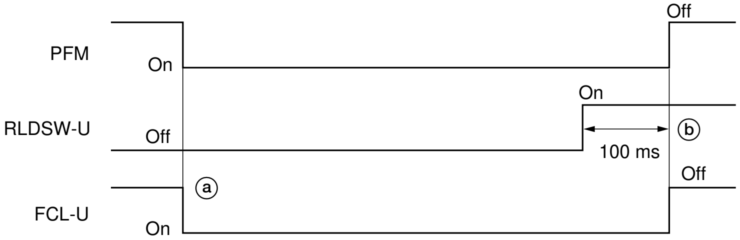
Winding operation of paper roll

The leading edge of the paper in the roll unit is first fed to the home position (copy ready position) by the winding operation, where it is ready for copying.

- After the following operations, if the leading edge of the paper roll is not at the home position, the winding operation for that roll unit will be performed.
  1) After pressing the all clear/reset key.
  2) After performing the auto clear function.
  3) After changing the paper feed position with the paper source key.
  4) One minute after a copy cycle ends and the ready lamp (copy ready indicator) lights. (If any key is pressed after the ready lamp is lit, another minute will be counted after the key press.)
  5) After opening/closing the right cover (cycling safety switch 3), the main body (cycling safety switches 4 and 5), or the upper rear cover (cycling safety switch 6).

- After the following operation, the winding operation for all the roll units will be performed. (Winding starts with the lowest roll unit.)
  1) After opening/closing the front covers (cycling safety switches 1 and 2).

- With the roll paper leading edge detection switch off



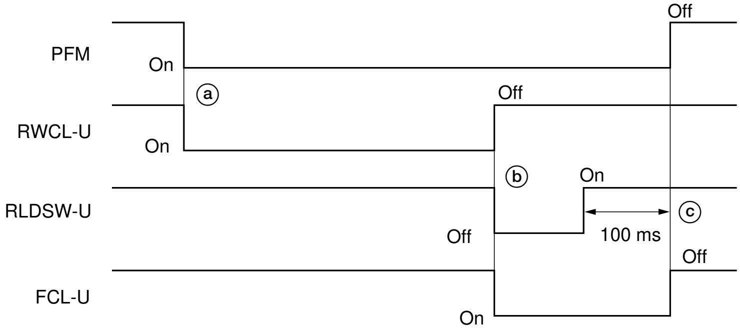
Timing chart 1-3-1 Winding operation for the first roll unit (1)

ⓐ The paper feed motor (PFM) and the upper feed clutch (FCL-U) turn on, and the paper is conveyed in the feed direction.

ⓑ The upper feed clutch (FCL-U) and the paper feed motor (PFM) are turned off 100 ms after the upper roll paper leading edge detection switch (RLDSW-U) is turned on, and the leading edge of the paper stops at the home position (copy ready position).

- Winding operation for the 2nd and 3rd roll units is performed similarly.

- With the roll paper leading edge detection switch on



Timing chart 1-3-2 Winding operation for the first roll unit (2)

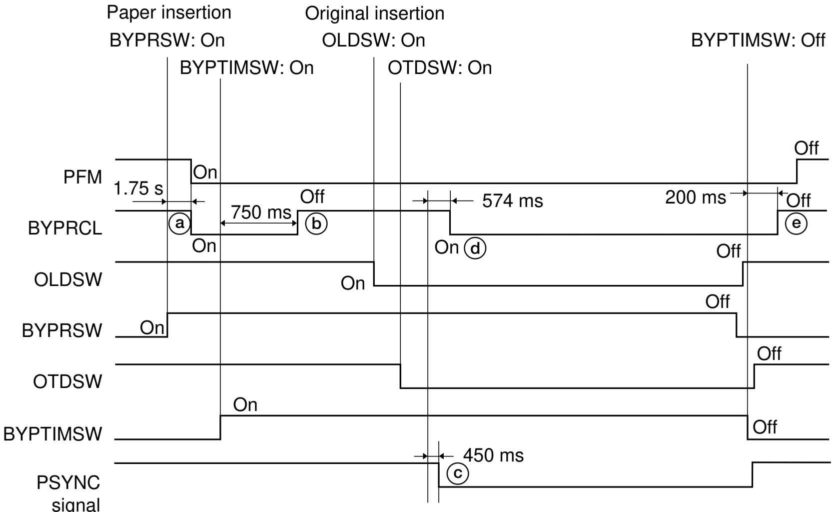
ⓐ The paper feed motor (PFM) and the upper roll winding clutch (RWCL-U) are turned on, and the paper starts to wind.

ⓑ After the upper roll paper leading edge detection switch (RLDSW-U) turns off, the upper roll winding clutch (RWCL-U) turns off and the upper feed clutch (FCL-U) turns on, and the paper is conveyed in the feed direction.

ⓒ 100 ms after the upper roll paper leading edge detection switch (RLDSW-U) turns on, the upper feed clutch (FCL-U) and the paper feed motor (PFM) turn off, and the leading edge of the paper stops at the home position (copy ready position).

- Winding operation for the 2nd and 3rd roll units is performed similarly.

(1-1) Bypass paper feed



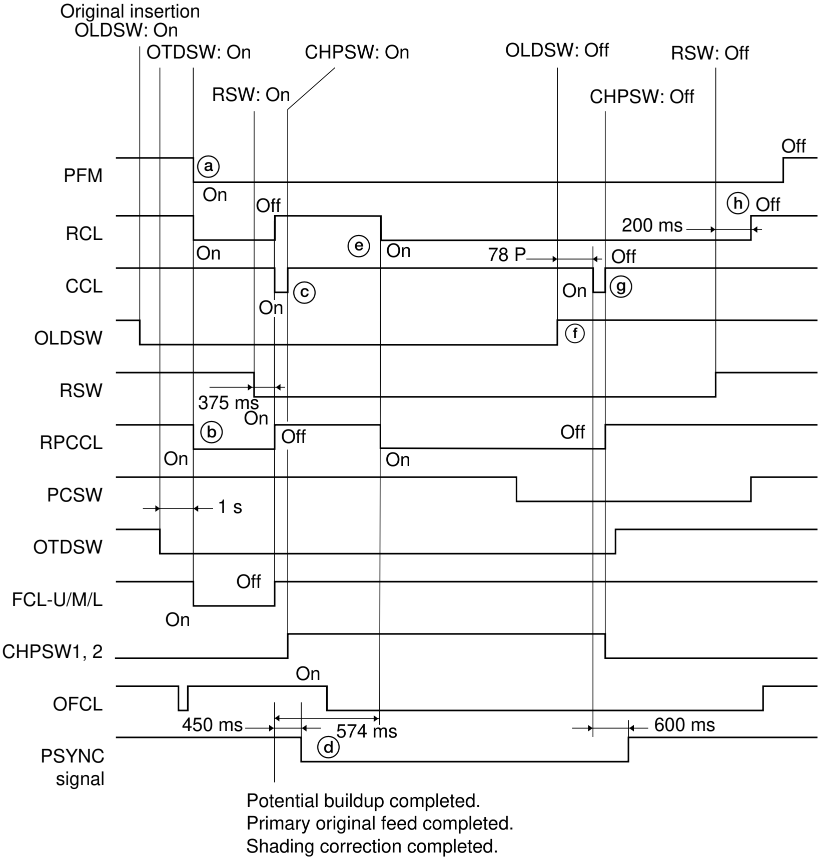
Potential buildup completed.
Primary original feed completed.
Shading correction completed.

With the paper inserted before the original.

Timing chart 1-3-3 Bypass paper feed

ⓐ 1.75 s after the bypass registration switch (BYPRSW) is turned on by inserting paper into the bypass table, the paper feed motor (PFM) and the bypass registration clutch (BYPRCL) turn on, and feeding of the inserted paper starts.
ⓑ 750 ms after the bypass timing switch (BYPTIMSW) turns on, the bypass registration clutch (BYPRCL) turns off, and the paper stops at the copy ready position.
ⓒ Potential buildup, primary original feed and then shading correction are completed. 450 ms after these secondary paper feed start conditions are satisfied, the PSYNC signal turns on.
ⓓ The bypass registration clutch (BYPRCL) turns on to convey the paper to the transfer section.
ⓔ 200 ms after the paper is conveyed to the transfer section and the bypass timing switch (BYPTIMSW) turns off, the bypass registration clutch (BYPRCL) turns off, and the paper feed operation is completed.

(1-2) Roll unit paper feed



Timing chart 1-3-4 Roll unit paper feed

ⓐ 1 s after the original is inserted and the original trailing edge detection switch (OTDSW) is turned on, the paper feed motor (PFM), the paper feed clutch for currently selected roll unit [the upper/middle/lower feed clutches (FCL-U/M/L)], the roll paper conveying clutch (RPCCL), and the registration clutch (RCL) are turned on to start feeding the paper in the selected roll unit.

ⓑ The paper turns the registration switch (RSW) on. After 375 ms, the paper feed clutch [upper/middle/lower feed clutch (FCL-U/M/L)], the roll paper conveying clutch (RPCCL), and the registration clutch (RCL) are turned off and the paper stops. The cutter clutch (CCL) is then turned on and the cutter starts to move to the ready position and primary paper feed is completed.

ⓒ After the cutter home position switches (CHPSW 1 and 2) are turned on, the cutter clutch (CCL) is turned off and the cutter stops at the ready position.

ⓓ Potential buildup, primary original feed and then shading correction are completed. 450 ms after these secondary paper feed start conditions are satisfied, the PSYNC signal is turned on.
ⓔ The roll paper conveying clutch (RPCCL) and registration clutch (RCL) turn on to start secondary paper feed.
ⓕ 78 pulses (PFM FG pulses) after the original leading edge detection switch (OLDSW) turns off, the cutter clutch (CCL) is turned on and the paper is cut.
ⓖ After the cutter home position switches (CHPSW1 and 2) are turned off, the cutter clutch (CCL) is turned off and the cutter stops at the home position. At the same time, the roll paper conveying clutch (RPCCL) turns off.
ⓗ 200 ms after the registration switch (RSW) is turned off, the registration clutch (RCL) is turned off to complete secondary paper feed.

(2) Main charger section

The main charger section is comprised of the drum, the drum potential sensor (DPS), the main charger assembly and the main charger grid as shown in Figure 1-3-12.
The drum is electrically charged uniformly by means of a grid to form a static latent image on the surface.
The drum potential sensor measures the dark potential of the drum surface.

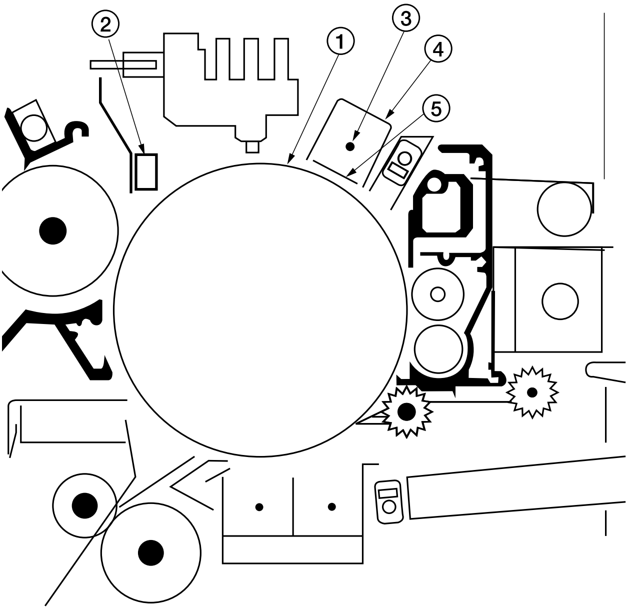


Figure 1-3-12 Main charger section

① Drum	④ Main charger assembly
② Drum potential sensor (DPS)	⑤ Main charger grid
③ Charger wire (tungsten wire)	

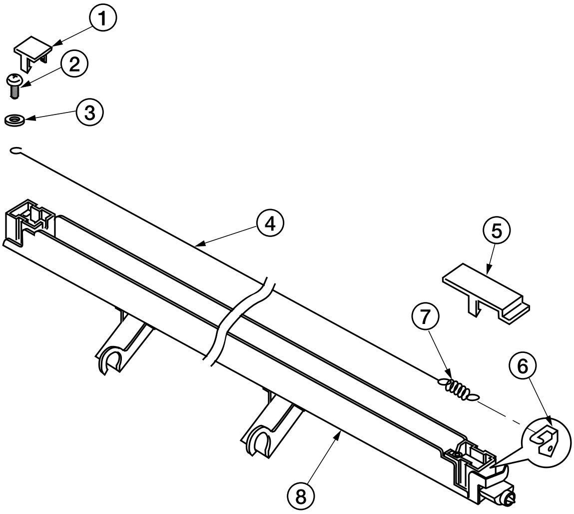


Figure 1-3-13 Main charger section (Main charger assembly)

① Right main charger lid	⑤ Left main charger lid
② Screw	⑥ Main charger terminal
③ Washer	⑦ Charger spring
④ Charger wire (tungsten wire)	⑧ Main charger shield

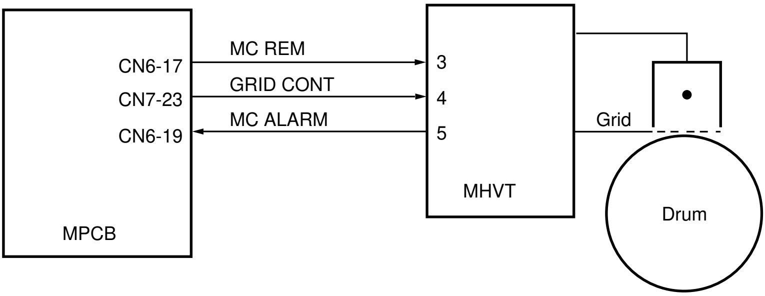


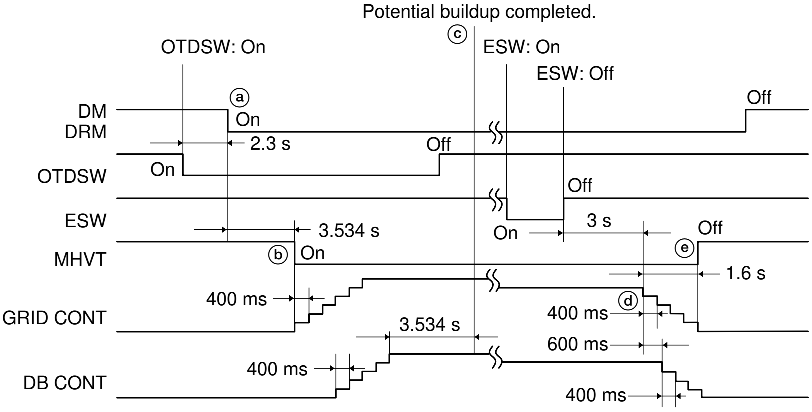
Figure 1-3-14 Block diagram of the main charger section

Block Diagram Description

3.534 seconds after the drum motor starts, MCREM signal turns on and the main high voltage transformer applies approximately 6 kV to the charge corona wire. Grid voltage depends on the pulse width at CN7-2. When a charge corona leak occurs, the MC ALARM signal is sent to the main PCB and SC302 is displayed.

To prevent toner scattering caused by sudden changes in the drum voltage and development bias voltage, voltage is change in steps. The development bias voltage and the grid voltage are increased in several synchronized steps, to minimize the difference in voltage between the drum and the development roller.

After the copy operation is finished, the grid voltage and bias voltage are decreased in several steps.



Timing chart 1-3-5 Operation of the main high-voltage transformer

ⓐ When the original is inserted, the original trailing edge detection switch (OTDSW) is turned on. After 2.3 s, the drive motor (DM) and drum motor (DRM) are turned on.

ⓑ 3.534 s (1 turn of the drum) after the drive motor (DM) and drum motor (DRM) are turned on, the main high-voltage transformer (MHVT) is turned on to start main charging. The grid voltage (GRID CONT) and developing bias voltage (DB CONT) are controlled stepwise to increase the drum potential gradually.

ⓒ The drum potential reaches 870 V DC and the developing bias voltage (DB CONT) step-up control ends. After 3.534 s (1 turn of the drum), potential buildup is completed.

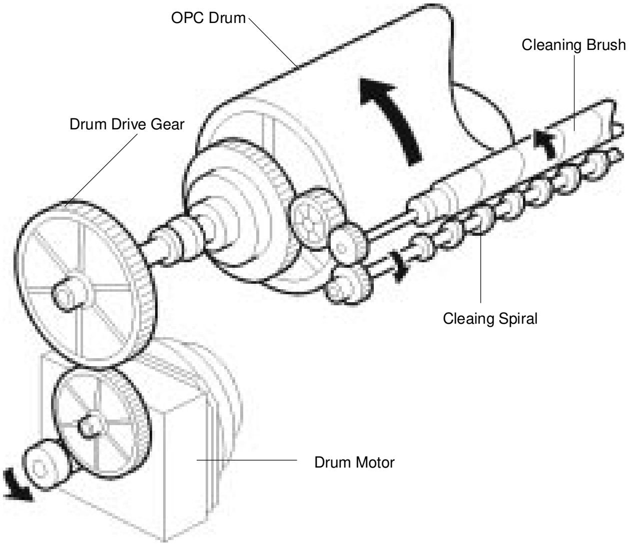
ⓓ 3 s after copying is completed and the eject switch (ESW) is turned off, the grid voltage (GRID CONT) and developing bias voltage (DB CONT) are controlled stepwise to decrease the drum potential gradually.

ⓔ When the grid voltage (GRID CONT) step-down control ends, the main high-voltage transformer (MHVT) is turned off and main charging ends.

Drum Drive Mechanism

The drum is driven by the drum motor through an idle gear. The gear of the drum flange transmits the drum rotation to the cleaning brush and the cleaning spiral. This machine uses an OPC drum of 90mm diameter.

There is an anti-condensation heater under the drum. The heater stays on while the main switch is off.

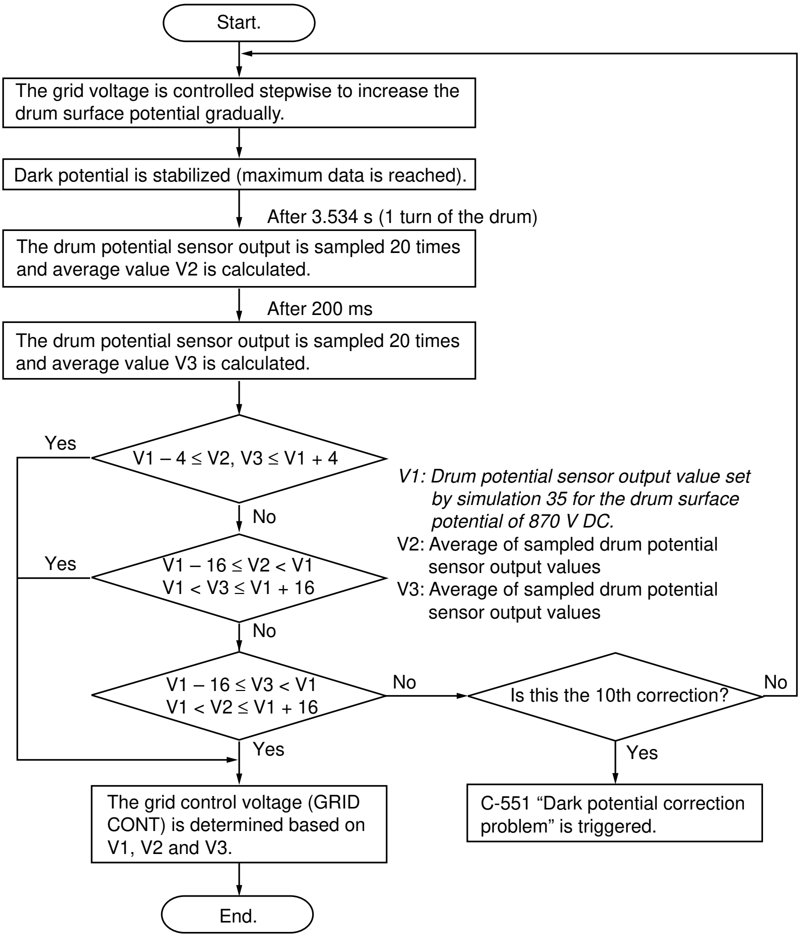


Drum surface potential correction

The grid control voltage (GRID CONT) is determined based on the target value set by simulation 35 to maintain the drum surface potential around the developing section to 870 V DC.

- **Correction timings**
  1) When any of the safety switches are turned off and on.
  2) When the power plug is removed and reinserted.
  3) When the main switch is turned off and on.

- **Drum surface potential correction flow chart**



V1: Drum potential sensor output value set by simulation 35 for the drum surface potential of 870 V DC.

V2: Average of sampled drum potential sensor output values

V3: Average of sampled drum potential sensor output values

(3) Exposure and original feed section

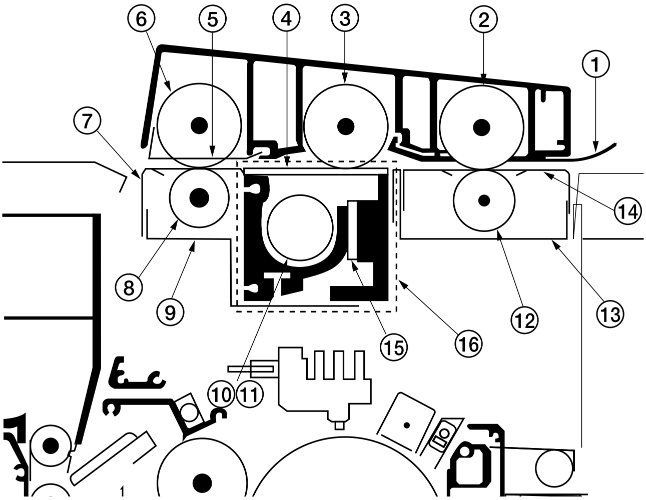


Figure 1-3-15 Exposure and original feed section

① Original insertion guide
② Front upper original roller
③ Middle upper original roller
④ Contact glass
⑤ Original holder rear guide
⑥ Rear upper original roller
⑦ Original feed rear guide
⑧ Rear lower original roller
⑨ Original feed rear light shielding plate
⑩ Fluorescent lamp (FL)
⑪ Fluorescent lamp heater (FLH)
⑫ Front lower original roller
⑬ Original feed front light shielding plate
⑭ Original feed front guide
⑮ SLA (SELFOC lens array)
⑯ CIS (contact image sensor)

Exposure is accomplished by scan exposure method with a moving original. A fluorescent lamp is used as the light source. While being conveyed across the contact glass by the rollers, the original is exposed by the fluorescent light and the exposed image is read by the CIS (contact image sensor).

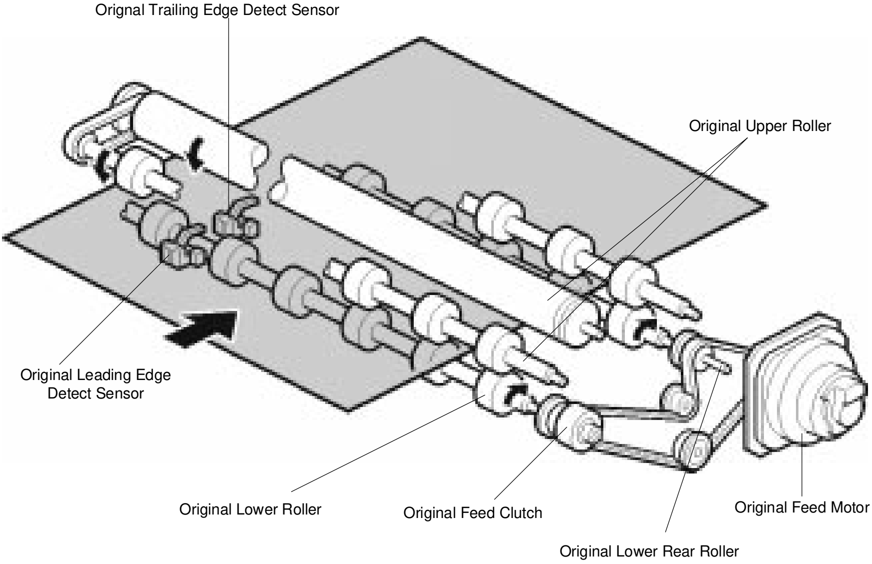
The fluorescent lamp heater (FLH) is installed on the fluorescent lamp (FL) to improve the temperature characteristics which maintains the temperature of the fluorescent lamp to approximately 40°C/104°F. The CIS reads the reflection of the fluorescent lamp (FL) light on the middle upper original roller (white reference) to maintain the intensity constant.

The original is fed by the rotation of the front/middle/rear upper original rollers and the front/ rear lower original rollers. These rollers are controlled by the original leading edge detection switch (OLDSW), the original trailing edge detection switch (OTDSW), and the original feed clutch (OFCL). The original feed motor (OFM) drives the exposure section.

Original Feed Mechanism

Original is fed by original upper rollers and original lower rollers, which are driven by the original feed motor. The original feed clutch controls the rollers movement according to the sensors.

In the syncro-cut function, the length of the original is detected by the original trailing edge detect sensor on time.



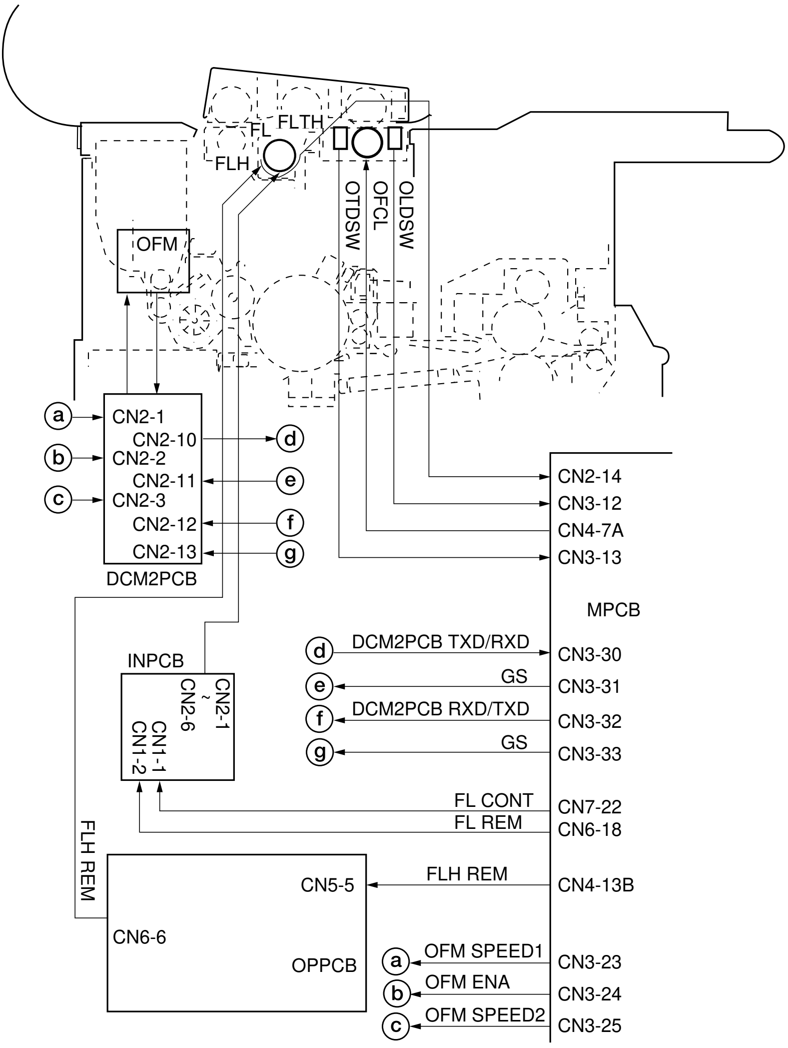
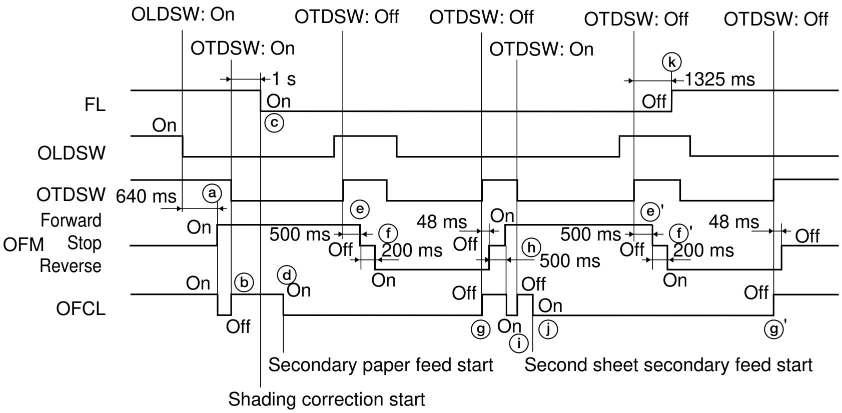


Figure 1-3-16 Block diagram of the exposure and original feed section



Roll unit paper feed, multiple copying (2 sheets).

Timing chart 1-3-6 Operation of the exposure and original feed section

ⓐ 640 ms after the original is inserted and the original leading edge detection switch (OLDSW) is turned on, the original feed motor (OFM) starts to rotate forward and the original feed clutch (OFCL) is turned on to start conveying the original.

ⓑ After the original is conveyed and the original trailing edge detection switch (OTDSW) is turned on, the original feed clutch (OFCL) is turned off and the original stops at the copy ready position.

ⓒ 1 s after the original trailing edge detection switch (OTDSW) is turned on, the CIS (contact image sensor) starts shading correction and the fluorescent lamp (FL) lights.

ⓓ As soon as the secondary paper feed starts, the original feed clutch (OFCL) is turned on and the original is conveyed across the contact glass for exposure.

ⓔ 500 ms after original exposure is completed and the original trailing edge detection switch (OTDSW) is turned off, the original feed motor (OFM) is turned off.

ⓕ 200 ms after the original feed motor (OFM) is turned off, it starts to rotate in reverse to return the original.

ⓖ When the original trailing edge detection switch (OTDSW) is turned off, the original feed clutch (OFCL) is turned off and, after 48 ms, the original feed motor (OFM) is turned off to complete original return operation.

ⓗ 500 ms after original return operation is completed, the original feed motor (OFM) starts to rotate forward for the exposure for the second copy, and the original feed clutch (OFCL) is turned on to convey the original.

ⓘ When the original is conveyed and the original trailing edge detection switch (OTDSW) is turned on, the original feed clutch (OFCL) is turned off and the original stops at the copy ready position.

ⓙ As soon as the secondary feed of the second sheet starts, the original feed clutch (OFCL) is turned on and the original is conveyed across the contact glass for exposure for the second copy. The original feed motor (OFM) and original feed clutch (OFCL) then repeat ⓔ to ⓖ to return the original.

ⓚ 1325 ms after original exposure is completed and the original trailing edge detection switch (OTDSW) is turned off, the fluorescent lamp (FL) is turned off.

(4) CIS and LPH section

In the CIS and LPH section, the CIS reads the original image exposed by the fluorescent lamp (FL) and the drum surface is irradiated by the LPH to form a static latent image on it.

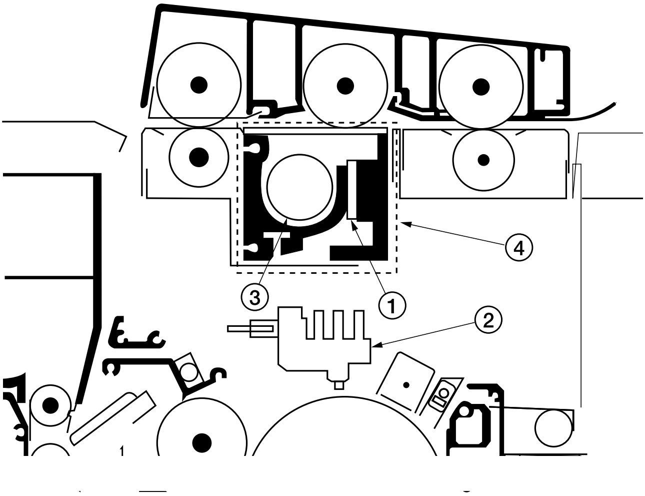


Figure 1-3-17 CIS and LPH section

① SLA (SELFOC lens array)	③ Fluorescent lamp (FL)
② LPH (LED printhead)	④ CIS (contact image sensor) Contains ① and ③.

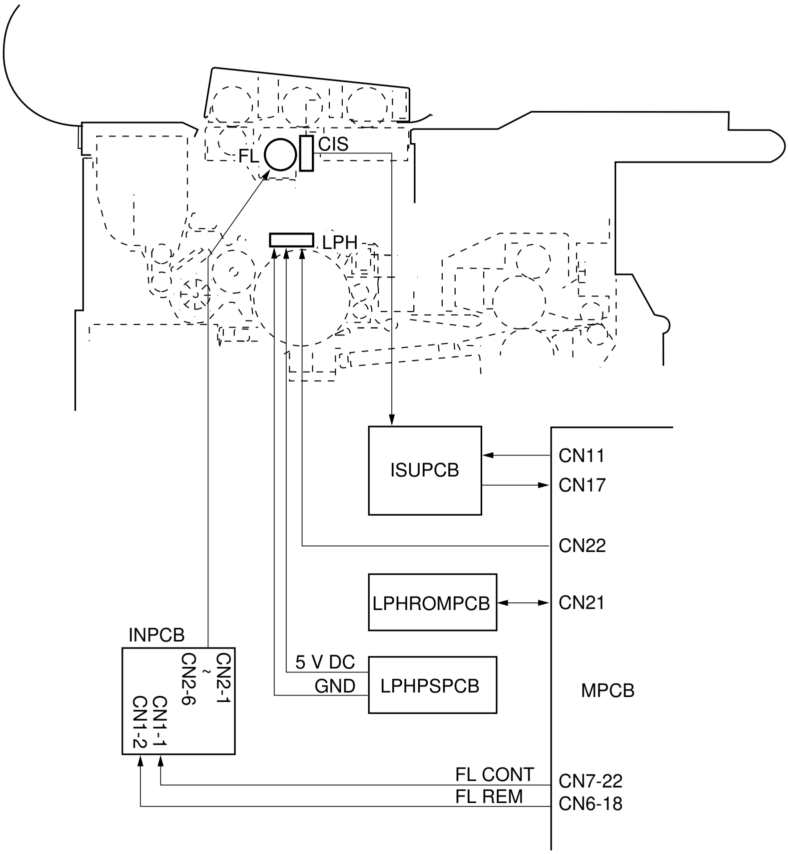


Figure 1-3-18   Block diagram of the CIS and LPH section

Original image reading

The CIS (contact image sensor) consists of four channels of 3712 phototransistors. The original image is read by 14592 phototransistors along a line of the width of A0 (934 mm), and its analog data is sent to the ISU PCB (ISUPCB).

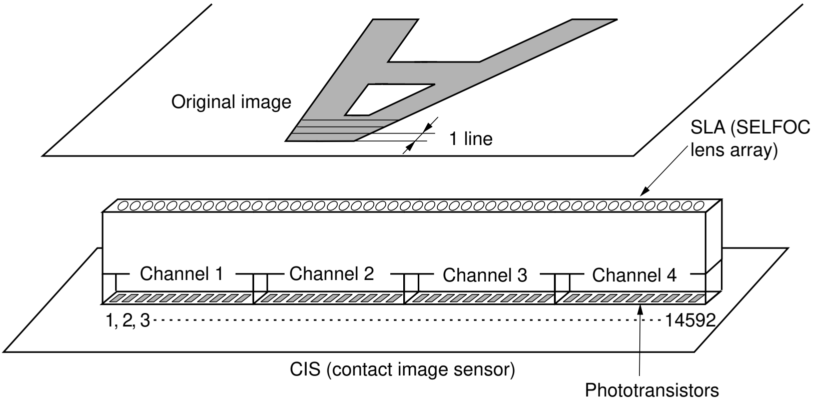


Figure 1-3-19 Original image reading

Static latent image formation

The LPH (LED printhead) consists of 14592 LEDs which are turned on and off based on the image data read by the CIS to form a static latent image on the drum surface line by line. Toner adheres only to the areas irradiated by the lit LEDs, so the image is formed.

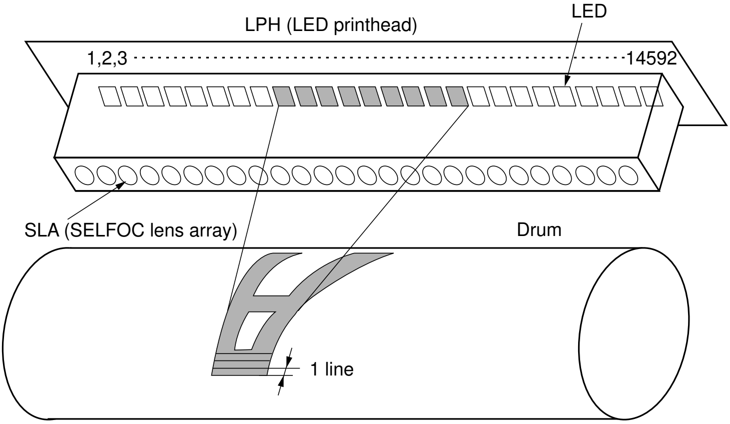
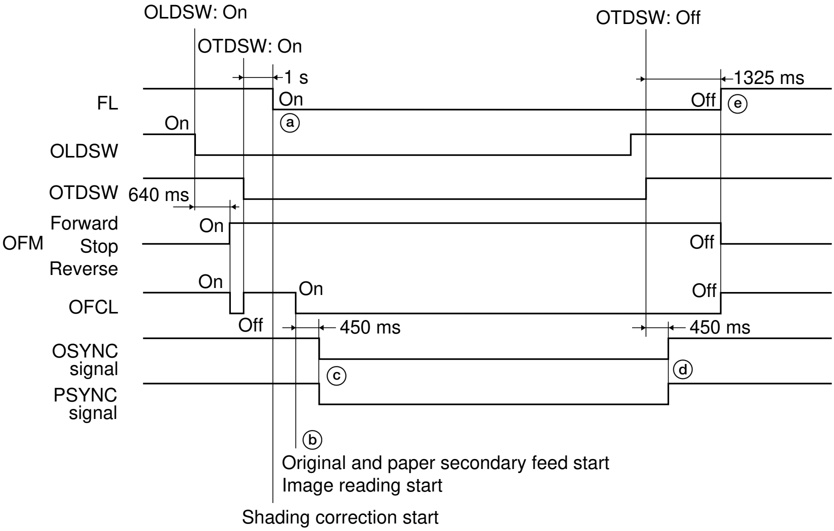


Figure 1-3-20 Static latent image formation



Timing chart 1-3-7 Image reading and formation

ⓐ 1 s after the original is conveyed and the original trailing edge detection switch (OTDSW) is turned on, the CIS (contact image sensor) starts shading correction and the fluorescent lamp (FL) lights.

ⓑ The original feed clutch (OFCL) is turned on to start secondary original feed. At the same time, the fluorescent lamp (FL) starts exposure and the CIS starts to read the original image.

ⓒ 450 ms after the original feed clutch (OFCL) is turned on, the OSYNC and PSYNC signals are turned on and, in synch with these signals, the original image is processed and the LPH forms a static latent image, respectively.
OSYNC signal: original leading edge synchronization signal
PSYNC signal: image formation synchronization signal

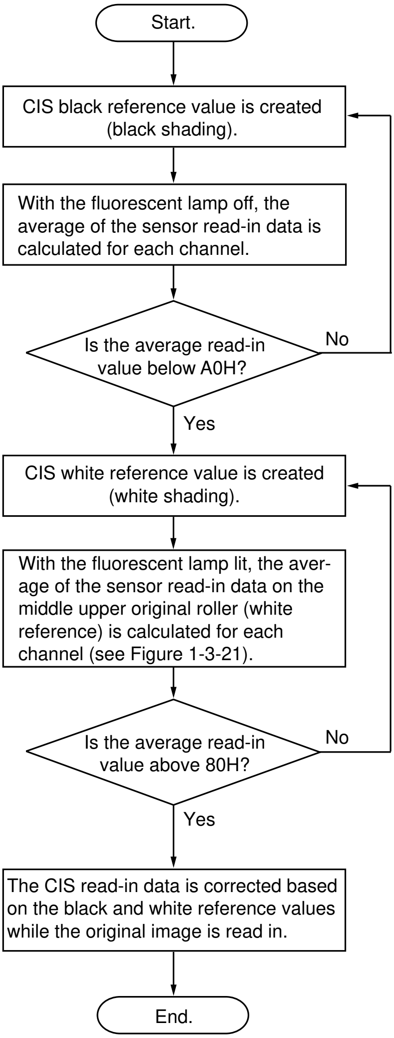
ⓓ 450 ms after the original trailing edge detection switch (OTDSW) is turned off, the OSYNC and PSYNC signals are turned off to end image reading and formation.

ⓔ 1325 ms after original exposure ends and the original trailing edge detection switch (OTDSW) is turned off, the original feed motor (OFM) and original feed clutch (OFCL) are turned off. At the same time, the fluorescent lamp (FL) is turned off.

CIS correction

• Shading correction

Shading correction is carried out to correct the fluctuation in the fluorescent lamp (FL) intensity and variations in the sensitivity between the sensor elements constituting the CIS. If shading correction does not end within 30 s from its start, an original jam (J-05) is indicated. If shading correction fails to end six times successively after the original is reinserted, service call code C-300 is triggered.



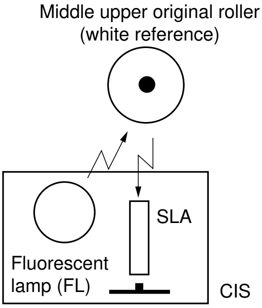


Figure 1-3-21 White shading

• AGC processing (gray level correction)

The tone of the image is reproduced by dividing the CIS image read-in value into 256 levels. If the absolute white level is assumed to be 5.0 V and the absolute black level 0 V, the range of the actual image read-in value is narrower than the range from 0 to 5.0 V, so the tone of the reproduced image is affected. AGC processing (auto gain control) corrects the image read-in value to reproduce gray levels more accurately.

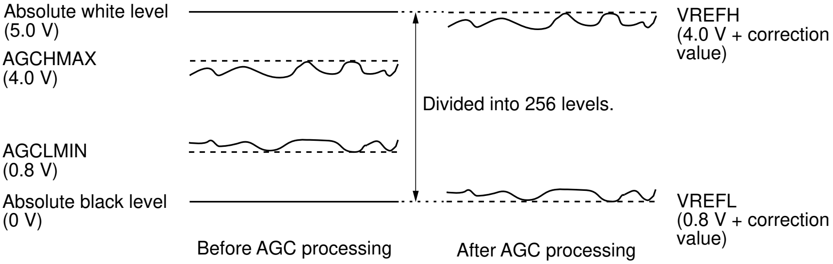


Figure 1-3-22 AGC processing

Example: If the maximum white reference value (AGCHMAX) read by the CIS is 4.0 V and the minimum black reference value (AGCLMIN) is 0.8 V, the range of the image read-in value is narrower than the range between the absolute white level (5.0 V) and absolute black level (0 V). In such a case, the read-in value cannot be divided into 256 levels and the tone of the reproduced image is affected. AGC process corrects VREFH to 4.0 V, VREFL to 0.8 V and the correction value to 0 so that the read-in value can be divided into 256 levels to reproduce the tone of the image more correctly.

• γ (gamma) correction

There are slight differences in the black-level read-in values between the four channels of the CIS. Gamma correction can be made by executing simulation 120 so that an even image output level is obtained.

(5) Developing section

The developing section is comprised of the developing unit assembly and the toner hopper assembly. The developing unit assembly is comprised of the developing roller and doctor blade which form a magnetic brush, and the developer paddle and developer spiral roller which mix the developer. The toner hopper assembly is installed on the top of the developing unit assembly to supply toner to the developing unit assembly and is comprised of the toner feed roller and the toner agitation rod.

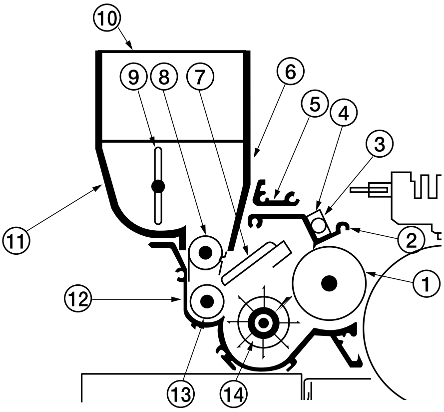


Figure 1-3-23 Developing section

① Developing roller
② Doctor blade
③ Developing unit thermistor (DTH)
④ Toner sensor (TNS)
⑤ Upper developing unit stay
⑥ Front hopper stay
⑦ Developing unit partition
⑧ Toner feed roller
⑨ Toner agitation rod
⑩ Hopper lid
⑪ Rear hopper stay
⑫ Developing unit housing
⑬ Developer spiral roller
⑭ Developer paddle

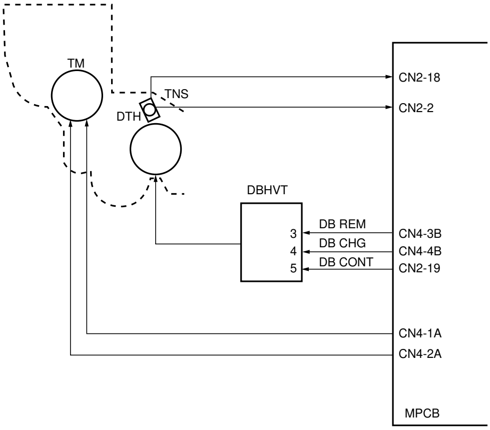
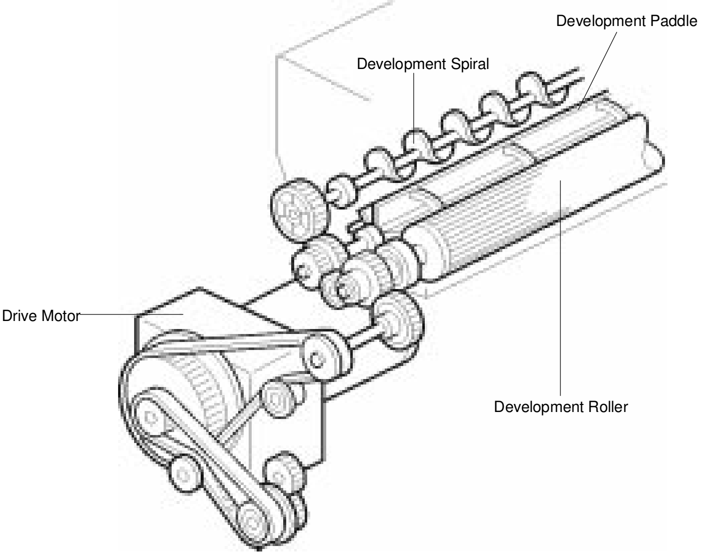


Figure 1-3-24 Block diagram of the developing section

Development Unit Drive

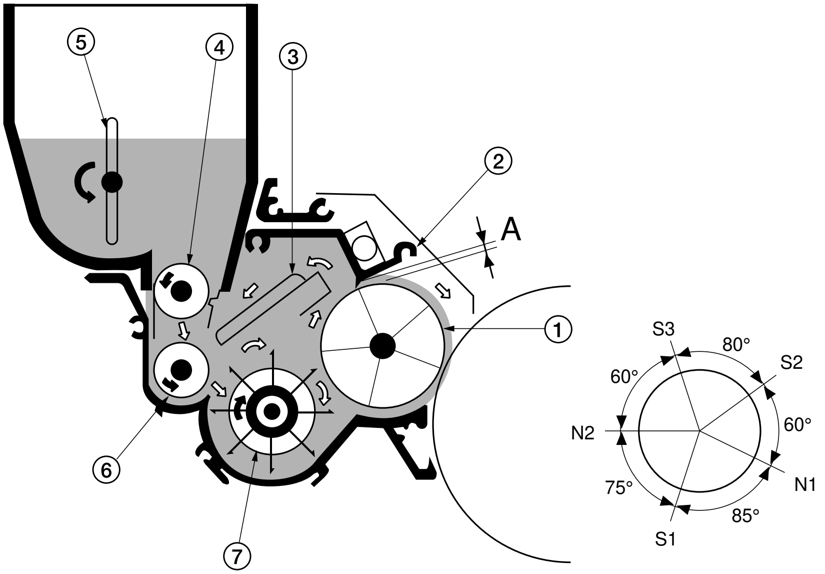
The development unit is driven by the drive motor through a timing belt. The development paddle moves the developer from left to right, and the development spiral moves the developer from right to left (as viewed from the operation side). This distributes the developer evenly in the development unit.

The development thermistor and the toner sensor are located in the center of the development unit.



Forming the magnetic brush

The developer flows by the rotation of the developing roller and the magnetic brush is formed on pole N1. The height of the magnetic brush is set by the gap between the doctor blade and the developing roller. The developing bias voltage (650 V DC) which is output from the developing bias high-voltage transformer (DBHVT) is applied to the developing roller to improve the image contrast. When the drum surface potential reaches 0 V after completion of copying, the developing bias voltage is switched to –100 V DC to prevent toner and carrier from adhering to the drum.



A (gap between doctor blade and developing roller):
0.55 to 0.65 mm around the center
0.7 to 0.75 mm at both ends

N1: $900 \times 10^{-4} \pm 70 \times 10^{-4}$T
N2: $600 \times 10^{-4} \pm 60 \times 10^{-4}$T
S1: $750 \times 10^{-4} \pm 70 \times 10^{-4}$T
S2: $750 \times 10^{-4} \pm 70 \times 10^{-4}$T
S3: $600 \times 10^{-4} \pm 60 \times 10^{-4}$T

Figure 1-3-25 Forming the magnetic brush and agitation of the developer

① Developing roller
② Doctor blade
③ Developing unit partition
④ Toner feed roller
⑤ Toner agitation rod
⑥ Developer spiral roller
⑦ Developer paddle

Temperature compensation of the toner sensor output

Temperature compensation of the toner sensor (TNS) output value is applied by the following formula.
The output values from the toner sensor (TNS) and the developing unit thermistor (DTH) are input to the main PCB (MPCB). The main PCB samples the two input values at 8 ms intervals. If two of three successive sampled input values are the same, this value is used as one input value.

$X = TS - K (TH - D_{26})$

where X: control input (V, toner sensor output value after temperature compensation)
TS: actual toner sensor output (V)
K: temperature compensation coefficient (0.005 V/deg: TH > 26°C/79°F, 0.014 V/deg: TH < 26°C/79°F)
TH: temperature of the developing unit (°C/°F, detected temperature of the developing unit thermistor)
D_{26}: reference temperature (26°C/79°F)

A change in temperature $TH - D_{26}$ based on the reference temperature (26°C/79°F) is multiplied by temperature compensation coefficient K to obtain the temperature compensation value; this is then subtracted from actual toner sensor output TS. Because the rate of increase in the toner sensor output value is high when the temperature of the developing unit is greater than 26°C/79°F, the main PCB compensates the toner sensor output following the above formula, so as to lower the output. Because the rate of decrease in the toner sensor output value is high when the temperature of the developing unit is less than 26°C/79°F, the main PCB compensates to increase the output.

Toner sensor output correction based on the copy count

The toner sensor (TNS) output is corrected by the following formula based on the copy count (copy distance).

X = KM + TS
where X: control input value (V, toner sensor output value after copy count correction)
M: copy distance after execution of simulation 60 (m)
TS: actual toner sensor output (V)
K: distance correction coefficient (0.00021 V/m)

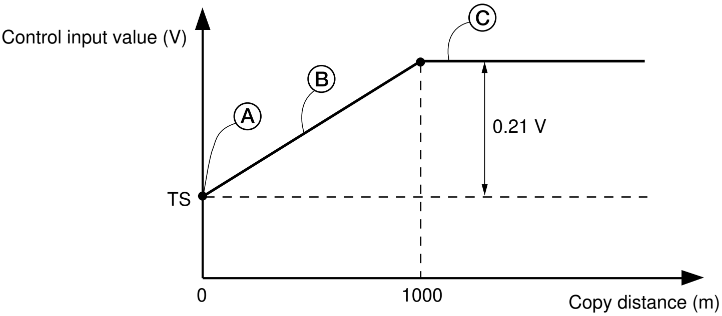


Figure 1-3-26

Ⓐ The copy distance count is cleared during developer setting (simulation 60).
Ⓑ Until the copy distance reaches 1000 m, the actual toner sensor output value is corrected by the formula as the copy distance increases.
Ⓒ When the copy distance exceeds 1000 m, the actual toner sensor output value is corrected with a constant value of +0.21 V.

Toner density control

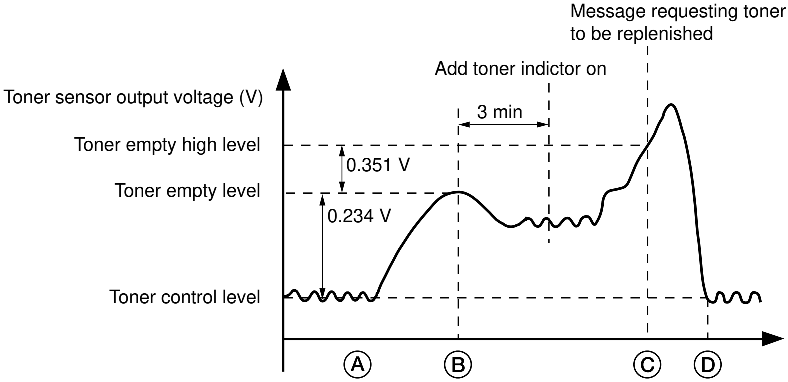


Figure 1-3-27 Toner density control

Ⓐ The value set while simulation 60 (developer setting) is performed is used as the toner control level (initial output value for the toner control sensor). Toner feed motor (TM) on/off control is based on this reference value.
If the temperature- and count-corrected toner sensor output value exceeds the toner control level, the toner feed motor is turned on for 0.5 s to supply toner from the toner hopper to the developing unit assembly. (The toner feed motor can be turned on only when the developing unit assembly is driven, i.e. the drive motor is on.)
If the toner sensor output value does not drop during this 0.5 s period, the toner feed motor is turned on for another 0.5 s, and this operation is repeated until the toner sensor output value becomes lower than the toner control level.

Ⓑ If the toner sensor output value rises further and remains 0.234 V or more above the toner control level for 10 s, the toner empty level is detected and toner feed aging operation is carried out. When the toner sensor output value reaches the toner control level, aging is performed for 3 minutes after toner replenishing ends (toner feed motor off). If the toner sensor output value does not reach the toner control level after 3 minutes of toner feed aging, toner empty condition is detected and the add toner indicator on the operation panel lights.

Ⓒ When the toner sensor output value is 0.351 V or more above the toner empty level, the toner empty high level is detected and the message requesting toner to be replenished is shown on the display, inhibiting copying.

Ⓓ When toner is replenished to the toner hopper and the toner sensor output value reaches the toner control level, aging is performed for 3 minutes and then copying is enabled.

Toner Density Control [cont...]

If solid black copies are made continuously, toner supply from the toner hopper cannot keep up with toner consumption and toner near end will be falsely indicaed. In this case, if “Single” has been selected in SP 67, toner is supplied after every copy job, and the toner density will automatically recover to the normal level (This prevents false toner near end detection, but users need to wait after every copy job). If “Continuation” has been selected in SP67, toner is supplied only after the fusing section, right center door or upper rear cover is opened and closed.

(6) Transfer/separation section

The transfer/separation section is comprised of the transfer charger assembly, the pre-transfer roller, and the separation claws as shown in Figure 1-3-28.

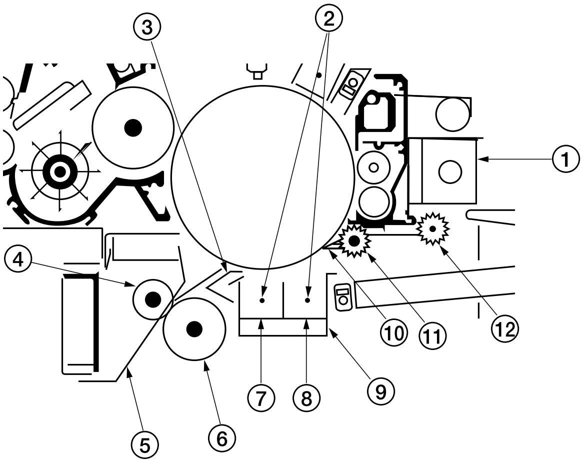


Figure 1-3-28 Transfer/separation section

① Separation claw solenoid (SSOL)
② Tungsten wires
③ Pre-transfer upper inner guide
④ Pre-transfer pulley
⑤ Pre-transfer outer guide
⑥ Pre-transfer roller
⑦ Transfer charger
⑧ Separation charger
⑨ Transfer charger assembly
⑩ Separation claws
⑪ Separation guide
⑫ Separation pulley

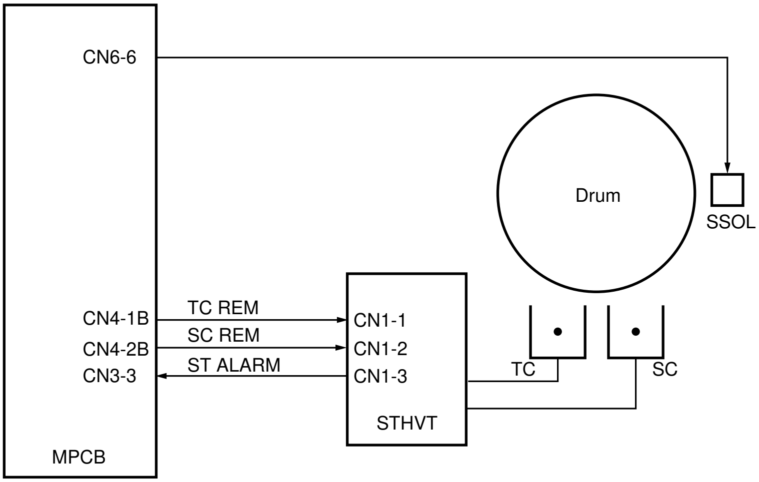


Figure 1-3-29 Block diagram of the transfer section

Block Diagram Description

The transfer & separation high voltage transformer applies the transfer and separation voltages. The transfer and separation triggers are applied from CN4-1B and CN4-2B. The transfer voltage is about dc –5.3 kV and the separation voltage is about ac 5.6 kV and dc 40 V.

When transfer or separation charge leakage occurs, the ST ALARM signal is sent to the main PCB, and SC401 is displayed.

The transfer and separation voltages are constant. The voltages are adjusted in the factory and they should not be changed in the field.

The transfer charger assembly is divided into the transfer charger which transfers the toner image formed on the drum to the paper, and the separation charger which removes the paper from the drum. Transfer charging and separation charging are performed by applying high voltage which is output from the ST high-voltage transformer (STHVT) to both ends of each tungsten transfer charger and separation charger wires. The separation claws are installed to ensure paper separation.

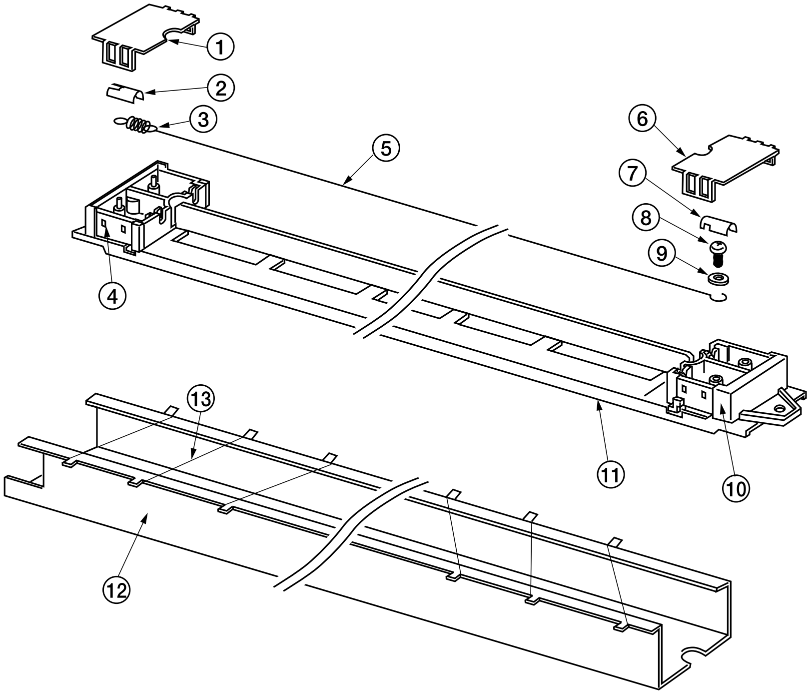


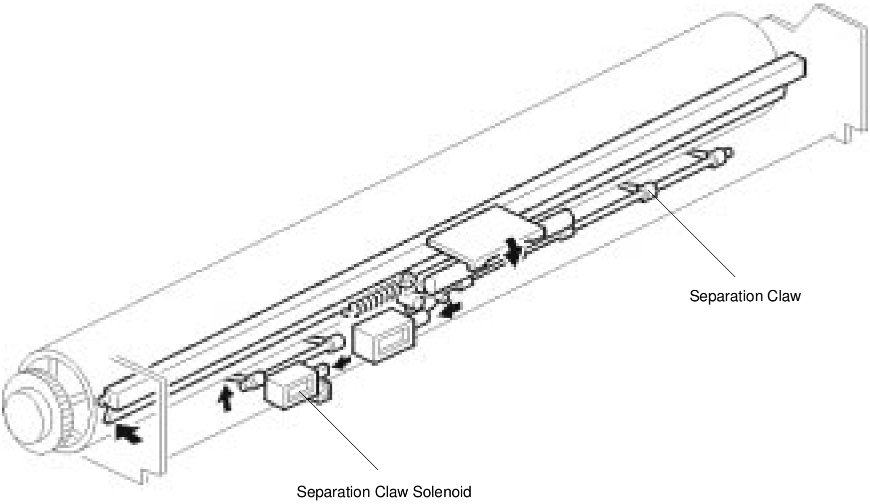
Figure 1-3-30 Transfer charger assembly

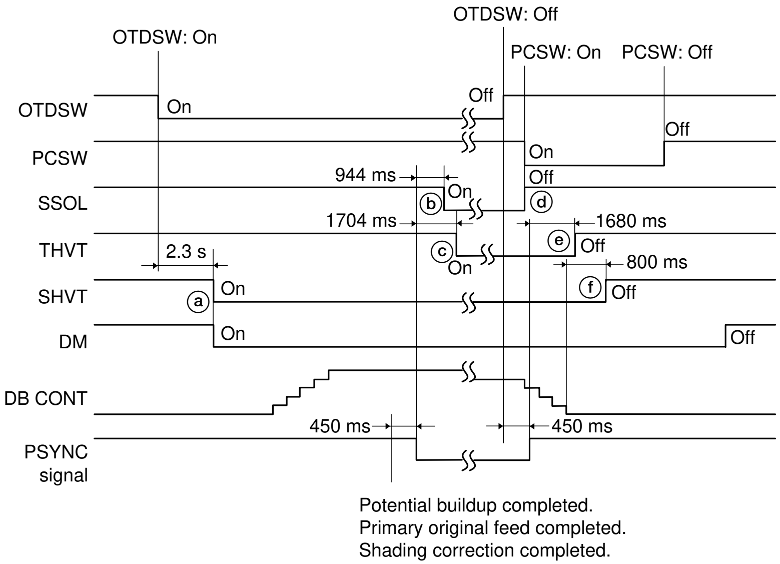
① Left transfer charger lid
② Left transfer seal
③ Charger spring
④ Transfer charger left housing
⑤ Tungsten wire (for transfer and separation charger)
⑥ Right transfer charger lid
⑦ Right transfer seal
⑧ Screw
⑨ Washer
⑩ Transfer charger right housing
⑪ Transfer inner shield
⑫ Transfer outer shield
⑬ Transfer wire

Separation Claw (Pick-off Pawl) Mechanism

During stand-by, the separation claws are not in contact with the drum surface. 450 ms after the drum potential step control is finished, the separation claw solenoid is energized and the claws move up to the drum.

After that, when the paper conveying switch detects the leading edge of paper, the solenoid is de-energized.





Timing chart 1-3-8 Operation of the transfer/separation section

ⓐ 2.3 s after the original is inserted and the original trailing edge detection switch (OTDSW) is turned on, the drive motor (DM) turns on and, at the same time, separation charging (SHVT) starts.
ⓑ 994 ms after the PSYNC signal is turned on, the separation claw solenoid (SSOL) is turned on.
ⓒ 1704 ms after the PSYNC signal is turned on, transfer charging (THVT) starts.
ⓓ The moment the paper conveying switch (PCSW) is turned on, the separation claw solenoid (SSOL) is turned off.
ⓔ 1680 ms after the PSYNC signal is turned off, transfer charging (THVT) ends.
ⓕ 800 ms after the developing bias step-down cotrol is completed, separation charging (SHVT) ends.

(7) Cleaning section

Cleaning is performed by the blade cleaning method and the cleaning fur brush. The cleaning section is comprised of the cleaning blade and the cleaning fur brush which remove the residual toner adhering to the drum after transfer, and the cleaning unit spiral which collects and sends toner to the waste toner tank.

The cleaning fur brush rotates always in contact with the drum surface and prevents the toner scraped off the drum by the cleaning blade from dropping inside of the machine. Other foreign matter such as paper fragments adhering to the surface of the drum are also removed by the brush.

When the waste toner tank becomes full, the overflow sensor (OFS) is turned *off* and a message requesting the waste toner tank to be checked appears on the display on the operation panel, and copying is inhibited.

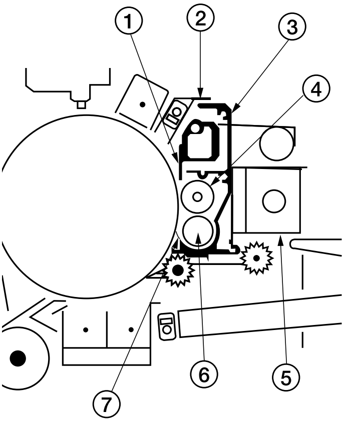


Figure 1-3-31 Cleaning section

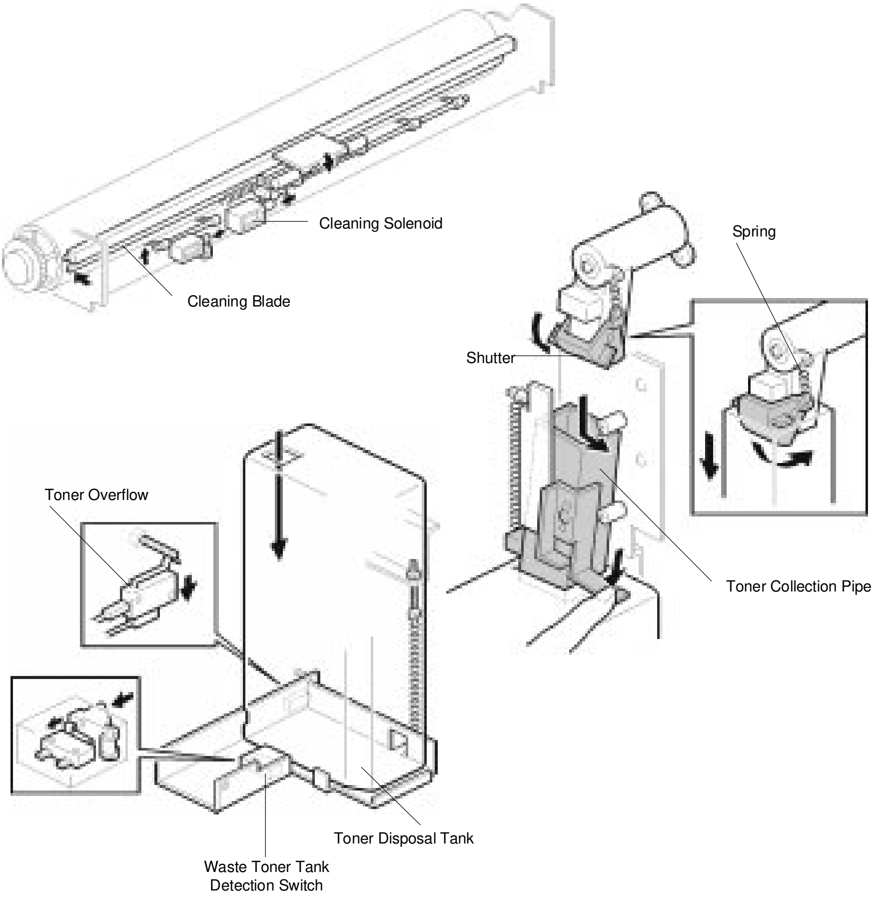
① Cleaning blade
② Cleaning unit cover
③ Cleaning housing
④ Cleaning fur brush
⑤ Cleaning solenoid (CSOL)
⑥ Cleaning unit spiral
⑦ Lower cleaning blade

Toner Collection Mechanism

During stand-by, the cleaning blade is not in contact with the drum surface. During copying, the cleaning solenoid is energized and the cleaning blade is pressed against the drum surface.

When the toner disposal tank becomes full, the toner overflow switch turns off and a message is displayed for the user to replace the tank. The message is displayed when the weight of the used toner becomes about 1,200 g.

The cleaning unit is connected to the toner disposal tank through the toner collection pipe. When the toner pipe is pushed down to disconnect it from the cleaning unit, the shutter is closed by tension from a spring to prevent used toner from falling.



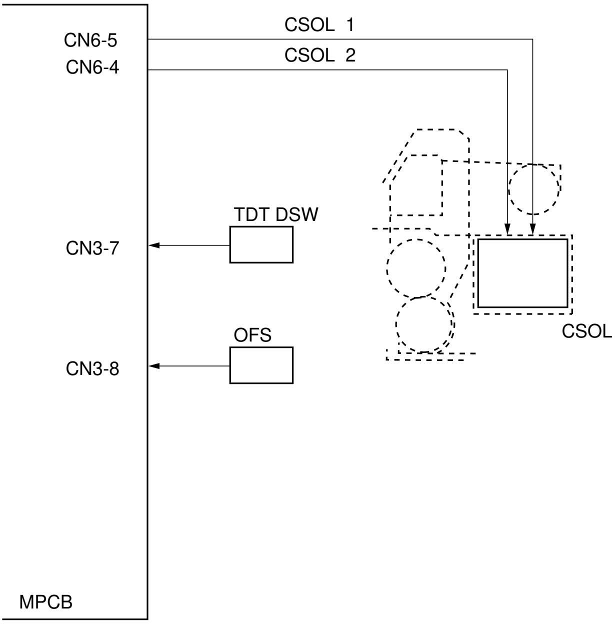
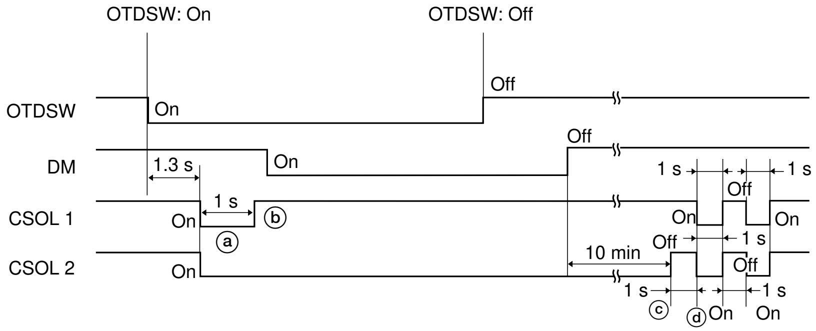


Figure 1-3-32 Block diagram of the cleaning section



Timing chart 1-3-9 Operation of the cleaning solenoid

The cleaning solenoid (CSOL) is controlled by signals CSOL 1 and CSOL 2.

ⓐ 1.3 s after the original is inserted and the original trailing edge detection switch (OTDSW) is turned on, signals CSOL 1 and CSOL 2 are turned on and the cleaning solenoid (CSOL) is turned on.
ⓑ 1 s after the cleaning solenoid (CSOL) is turned on, the CSOL 1 signal is turned off. The cleaning solenoid (CSOL) stays on.
ⓒ 10 minutes after copying is completed and the drive motor (DM) is turned off, the CSOL 2 signal is turned off and the cleaning solenoid (CSOL) is turned off. (If the drive motor is turned back on for the next copy cycle within 10 minutes after it was turned off, a is repeated.)
ⓓ 1 s after the cleaning solenoid (CSOL) is turned off, the CSOL 1 and CSOL 2 signals are turned on and off at intervals of 1 s and the cleaning solenoid (CSOL) is turned on twice.

(8) Static eliminator section

The static eliminator section is comprised of the two cleaning lamps as shown in Figure 1-3-33. The post-transfer lamp (RTL) is to eliminate unnecessary charge, and the pre-charging lamp (PCHL) is to eliminate the residual charge after transfer.

Post-transfer lamp	Since the transfer charger has been turned on before the latent static image on the drum reaches the transfer charger, this lamp eliminates the unnecessary charge generated by the transfer charger and prepares for the next main charging (copy operation).
Pre-charging lamp	Eliminates the residual charge on the drum after the toner is removed in the cleaning section to prepare for the next copy.

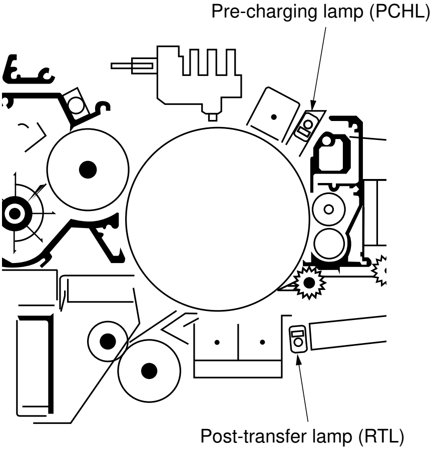


Figure 1-3-33 Static eliminator section

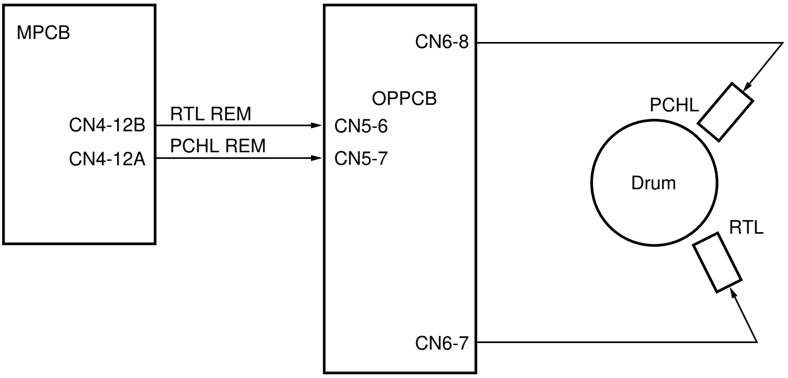
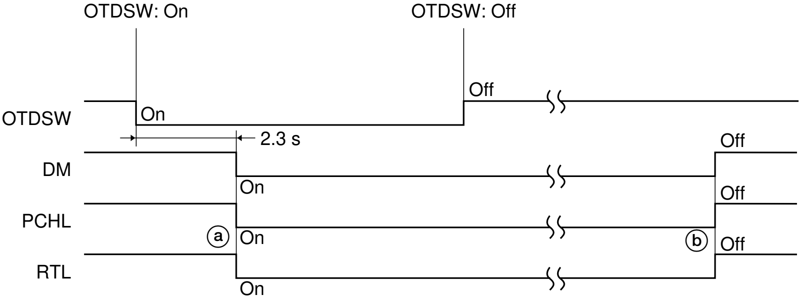


Figure 1-3-34 Block diagram of the static eliminator section



Timing chart 1-3-10 Operation of the static eliminator section

ⓐ After the drive motor (DM) is turned on, the pre-charging lamp (PCHL) and the post-transfer lamp (RTL) are turned on.

ⓑ After copying operation, the drive motor (DM) is turned off. Then the pre-charging lamp (PCHL) and the post-transfer lamp (RTL) are turned off.

(9) Fixing section

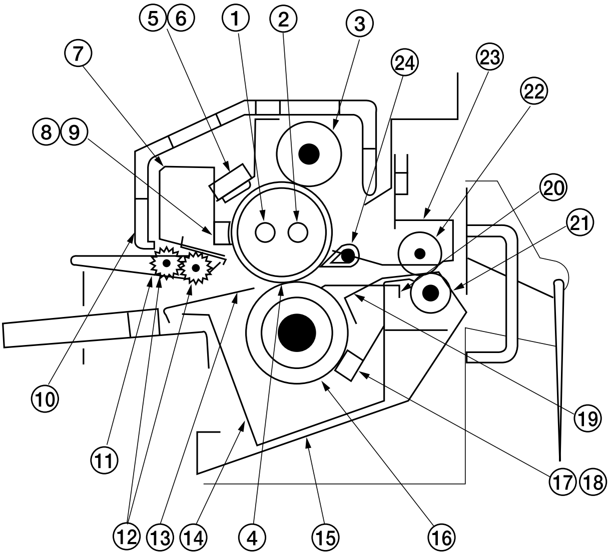


Figure 1-3-35 Fixing section

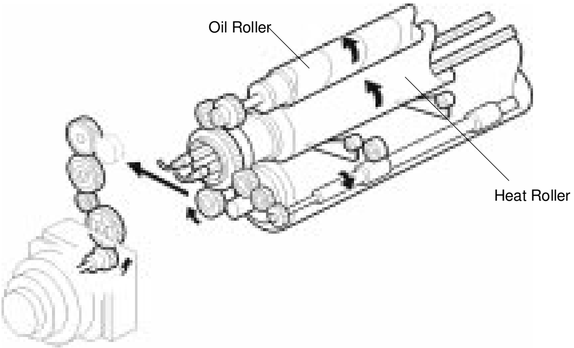
① Fixing heater M (H1)
② Fixing heater S (H2)
③ Oil roller
④ Heat roller
⑤ Fixing unit thermal switch 1 (FTSW1)
⑥ Fixing unit thermal switch 2 (FTSW2)
⑦ Fixing unit upper partition
⑧ Fixing unit thermistor 1 (FTH1: near the center of the heat roller)
⑨ Fixing unit thermistor 2 (FTH2: right end of the heat roller)
⑩ Fixing unit cover
⑪ Fixing unit middle front guide
⑫ Separation pulleys
⑬ Fixing unit front guide
⑭ Fixing unit lower partition
⑮ Front lower removal cover
⑯ Press roller
⑰ Fixing unit thermistor 3 (FTH3: near the center of the press roller)
⑱ Fixing unit thermistor 4 (FTH4: right end of the press roller)
⑲ Lower eject guide
⑳ Press roller separation claw
㉑ Eject roller
㉒ Eject pulley
㉓ Upper eject guide
㉔ Separation claw

Oil Supply Mechanism

The oil roller, which contacts the heat roller applies oil to the heat roller surface. The heat roller gear drive is transmitted to the oil roller gear through an idle gear, and the oil roller rotates in the same direction as the heat roller.

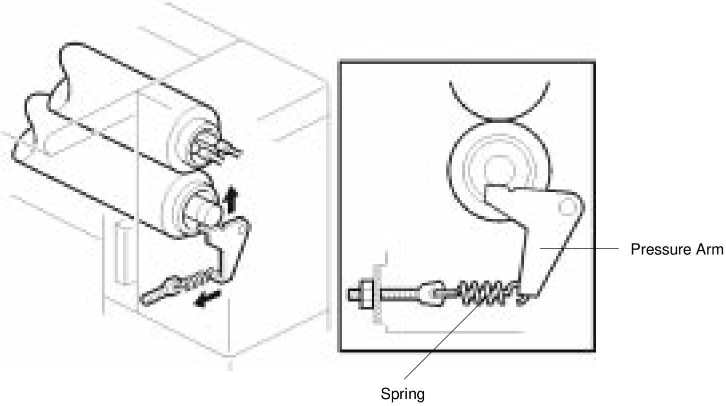
Drive Mechanism

An independent dc motor drives the fusing unit. The drive is transmitted to the heat roller gear, through idle gears. The heat roller gear transmits the drive to the exit roller gear and oil roller gear through idle gears.



Fusing Pressure Mechanism

Two springs apply fusing pressure through the pressure arm.

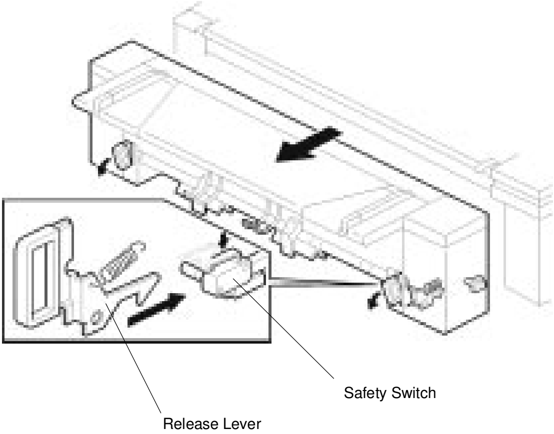


Fixing Unit Release Mechanism

The fixing section can be released from the drum section to remove misfed paper in the fusing section.

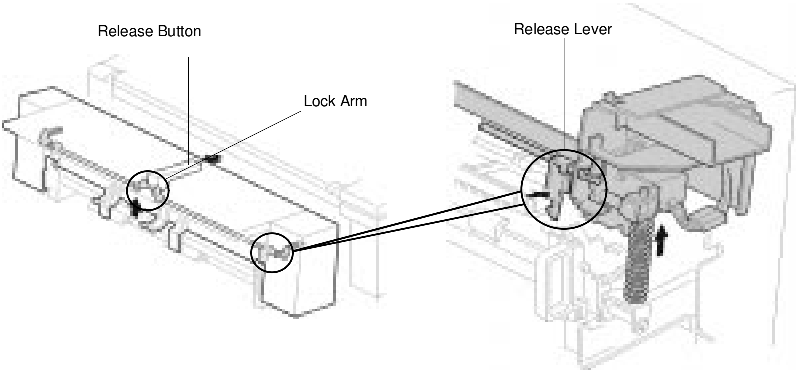
When the left and right levers are pulled, the hooks are released and the fixing unit can be pulled towards the operator’s side.

There are two safety switches in the left and right lock positions. When one of these switches is off, the 24V line is cut and a cover open message is displayed.



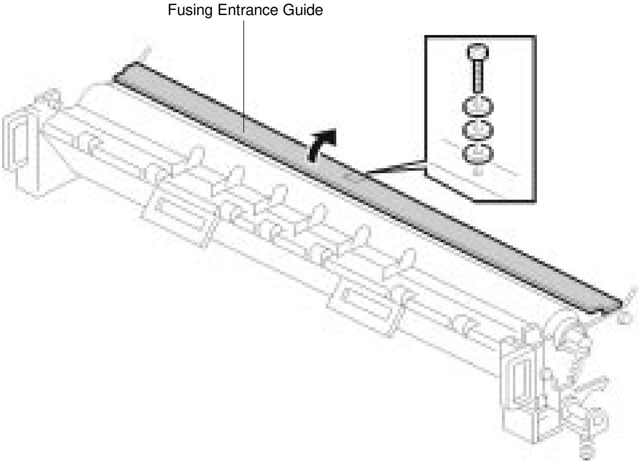
Fixing Unit Open Mechanism

To remove misfed paper between the heat roller and the press roller, the upper part of the fixing unit can be opened. When the release button is pushed, the two lock arms are released and the upper unit opens because of the tension from the spring.



Fixing Entrance Guide

The fixing entrance guide controls the angle of the paper leading edge, so that the paper is fed properly between the heat roller and press roller without creasing or misfeeding. The height of the center of the guide can be changed by changing the number of spacers to suit various types of paper.

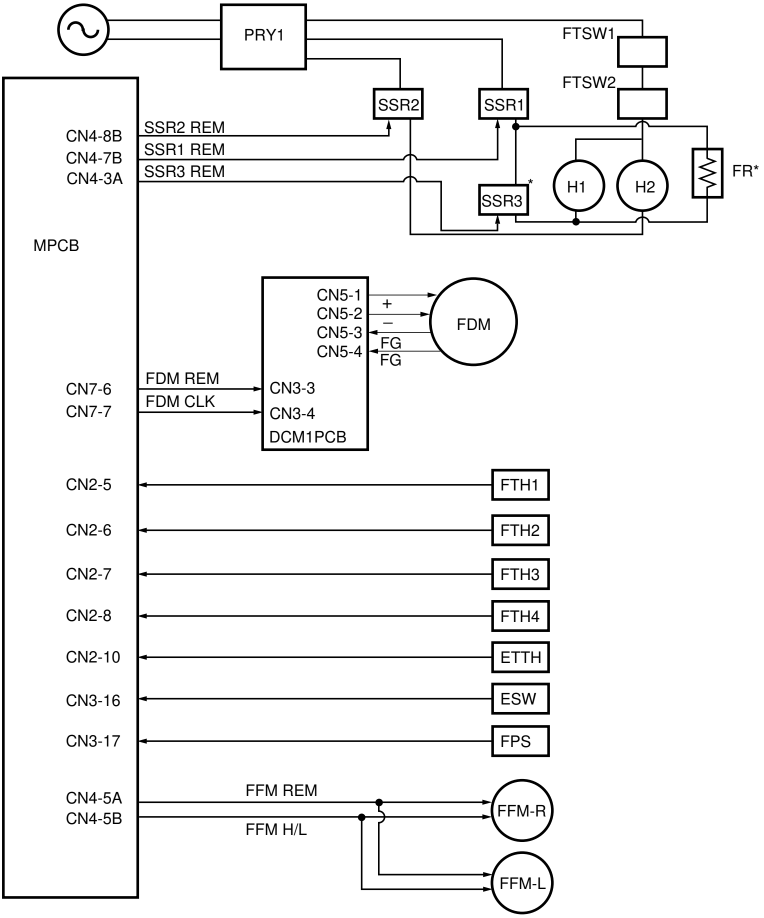


The fixing section is comprised of the parts shown in Figure 1-3-35. After the transfer operation, the paper is conveyed to the fixing section and passes between the heat roller and the press roller. A constant pressure is applied between the heat roller and the press roller by the fixing press spring and the toner transferred is fixed on the paper by the heat and pressure applied from each roller.

Fixing heater M (H1) heats the center of the heat roller and fixing heater S (H2) heats the ends of the heat roller.

The oil roller cleans the surface of the heat roller to prevent the paper from wrapping around the heat roller.

After fixing, the paper is separated from the heat roller by the separation claws and ejected to outside of the machine via the eject roller and the eject pulley.



*For 230 V, 50 Hz models only.

Figure 1-3-36 Block diagram of the fixing section

Heating and temperature control of heat roller and press roller

- **Heat roller temperature control 1**

Fixing unit thermistor 1 (FTH1) detects the surface temperature around the center of the heat roller and fixing unit thermistor 2 (FTH2) detects the surface temperature of the right end of the heat roller.

If the temperature TPRD (surface temperature around the center of the press roller) detected by fixing unit thermistor 3 (FTH3) becomes less than TPTH, fixing heaters M and S (H1 and H2) are turned on to heat the heat roller. Control temperature T is controlled by the following formula.

Control temperature T = THCON + k (TPTH – TPRD)
When (TPTH – TPRD) < 0, T = THCON.

THCON: heat roller control temperature
k: temperature compensation coefficient (standby: 0.33, copying: 1)
TPTH: press roller temperature threshold value
TPRD: fixing unit thermistor 3 (FTH3) temperature (surface temperature around the center of the press roller)

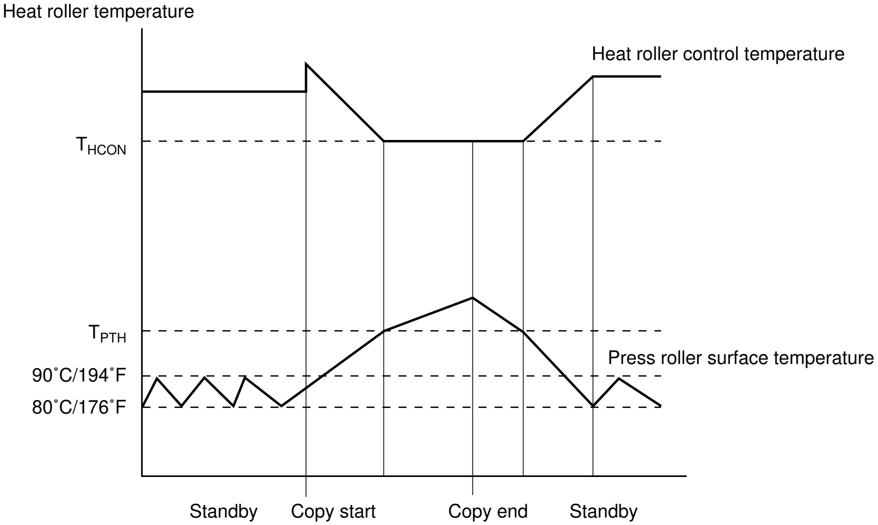


Figure 1-3-37 Fixing temperature control

• Heat roller temperature control 2

When the temperature T_{ETTH} detected by the external temperature thermistor (ETTH) is as in the table, the control temperatures are changed to prevent poor fixing. If the ambient temperature is below 15°C/59°F, fixing is not performed sufficiently, and if greater than 30°C/86°F, the image may be blurred.

External temperature thermistor detection temperature	Primary stabilization temperature	Secondary stabilization temperature
$T_{ETTH} \leq$ 15°C/59°F	145°C/293°F	165°C/329°F
15°C/59°F < T_{ETTH} < 30°C/86°F	165°C/329°F	155°C/311°F
30°C/86°F $\leq T_{ETTH}$	165°C/329°F	155°C/311°F

The heat roller control temperature and the press roller temperature threshold value must be changed as follows depending on the paper used (plain paper, tracing paper, or film) to prevent poor fixing.

External temperature thermistor detection temperature	Heat roller control temperature			Press roller temperature threshold value		
	Plain paper	Tracing paper	Film	Plain paper	Tracing paper	Film
$T_{ETTH} \leq$ 15°C/59°F	155°C/ 311°F	150°C/ 302°F	155°C/ 311°F	105°C/ 221°F	100°C/ 212°F	105°C/ 221°F
15°C/59°F < T_{ETTH} < 30°C/86°F	150°C/ 302°F	145°C/ 293°F	150°C/ 302°F	105°C/ 221°F	100°C/ 212°F	105°C/ 221°F
30°C/86°F $\leq T_{ETTH}$	145°C/ 293°F	140°C/ 284°F	145°C/ 293°F	105°C/ 221°F	100°C/ 212°F	105°C/ 221°F

• Press roller temperature control 1

If the surface temperature of the press roller is less than its minimum value or the surface temperature between the heat roller side and on the opposite side is different, fixing problems may occur. Therefore, the following control is performed to keep the surface temperature of the press roller constant.

In ready status, if the fixing unit thermistor 3 (FTH3) temperature (temperature around the center of the press roller) becomes less than 80°C/176°F, fixing heaters M and S (H1 and H2) are turned on. The fixing drive motor (FDM) is then turned on at low speed to increase the surface temperature of the press roller. When the temperature of fixing unit thermistor 3 (FTH3) reaches 90°C/194°F, fixing heaters M and S (H1 and H2) and the fixing drive motor (FDM) are turned off. By repeating these operations, the surface temperature of the press roller is maintained between 80°C/176°F and 90°C/194°F.

• Press roller temperature control 2

When copies are made with small-size paper, the press roller temperature becomes higher at the ends where no paper passes than around the center where paper passes. This causes the ends of the press roller to swell, reducing the paper conveying force around the center.

After copying is completed, the fixing unit thermistor 3 (FTH3) temperature (temperature around the center of the press roller) is compared to the fixing unit thermistor 4 (FTH4) temperature (temperature at the right end of the press roller), and the fixing drive motor (FDM) speed is corrected in proportion to the temperature difference to prevent the paper conveying speed from decreasing in the fixing unit.

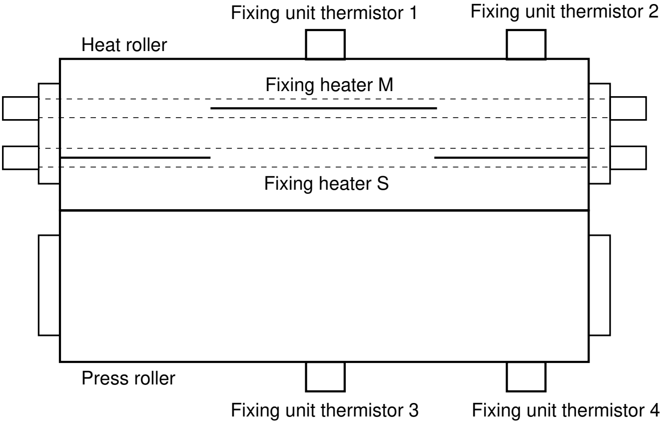
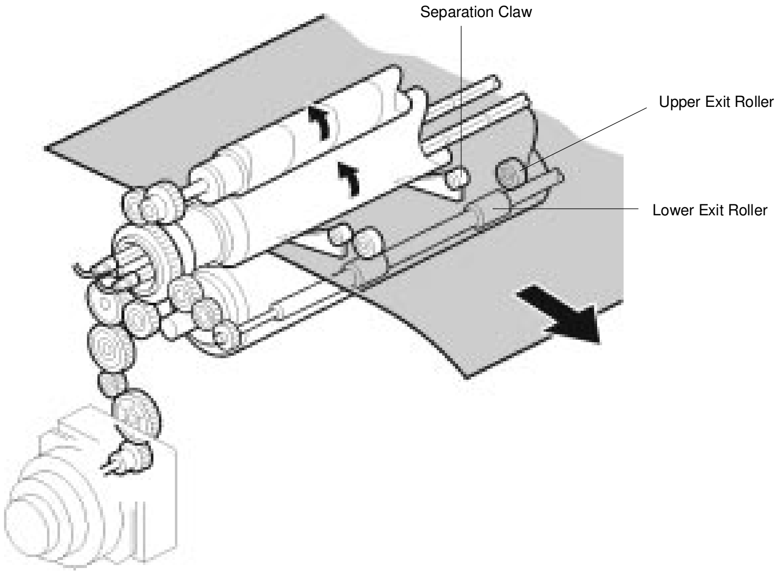


Figure 1-3-38 Heat roller and press roller temperature detection

Paper Exit Mechanism

After the image is fixed, the copy paper is transported to the copy tray by the exit rollers. There are 13 separation claws (hot roller strippers) which help paper to separate from the heat roller.



II

ELECTRICAL SECTION

CONTENTS

2-1 Electrical Parts Layout

2-1-1 Electrical parts layout

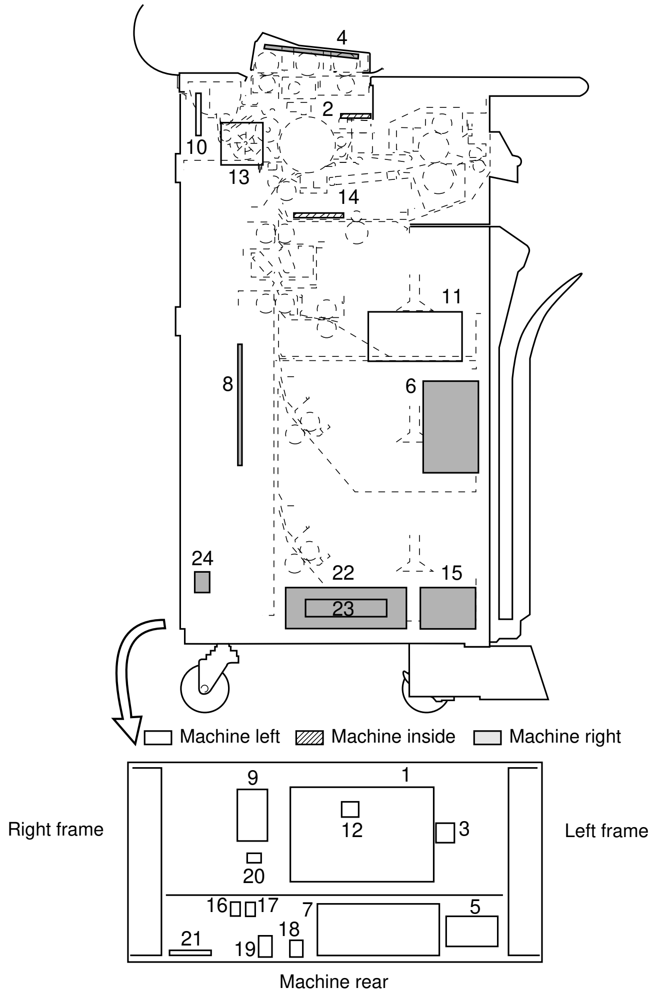


Figure 2-1-1 Printed circuit boards

1. Main PCB (MPCB) .... Output control for image processing and LED printhead (LPH) and control of other electrical components.
2. ISU PCB (ISUPCB)... Digital conversion of data from the contact image sensor (CIS) and data correction.

3. LPHROM PCB (LPHROMPCB)	Stores LPH light intensity correction data.
4. Operation unit PCB (OPCB)	Consists of operation keys, display LEDs and LCD.
5. Servo motor control 1 PCB (DCM1PCB)	Drive control of the drive motor, drum motor and fixing drive motor.
6. Servo motor control 2 PCB (DCM2PCB)	Drive control of the original feed motor and paper feed motor.
7. Power source PCB (PSPCB)	Output of 24 V, 5 V DC and ±12 V DC supplies.
8. LPH power supply PCB (LPHPSPCB)	Converts 24 V DC into 5 V DC and supplies 5 V DC to LPH.
9. Output PCB (OPPCB)	Powers roll unit heaters, dehumidifier, fluorescent lamp heater, pre-charging lamp and post-transfer lamp, and distributes 24 V DC supply to multiple destinations.
10. Drum potential sensor PCB (DPSPCB)	Detection of input to the drum potential sensor.
11. Inverter PCB (INPCB)	Output of DC supply to the fluorescent lamp.
12. Backup PCB (BUPCB)	Stores various setting data.
13. Main high-voltage transformer (MHVT)	Generates a high voltage for main charging.
14. ST high-voltage transformer (STHVT)	Generates a high voltage for transfer and separation charging.
15. Developing bias high-voltage transformer (DBHVT)	Generates a developing bias voltage.
16. Solid state relay 1 (SSR1)	Turns power supply to fixing heater M on and off.
17. Solid state relay 2 (SSR2)	Turns power supply to fixing heater S on and off.
18. Power relay 1 (PRY1)	Turns AC power supply on and off.
19. Power relay 2 (PRY2)	Turns 24 V DC supply on and off.
20. Power relay 3 (PRY3)	Turns 24 V DC supply on and off.
21. Noise filter (NF)	Reduces noise on the power supply line.
22. Dehumidifier PCB (DRPCB)	*Supplies 24 V DC to the dehumidifiers.*
23. Flicker resistor (FR)*	*Regulates surge current flowing into the fixing heater M.*
24. Solid state relay 3 (SSR3)*	*Short-circuits the flicker resistor.*

**For 230 V, 50 Hz models only.*

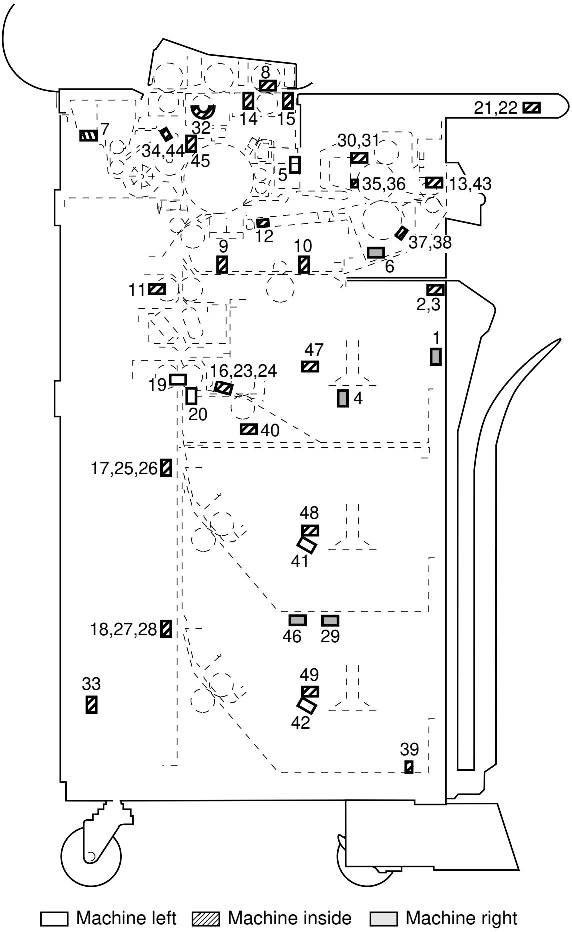


Figure 2-1-2 Switches and sensors (1)

1. Main switch (MSW) .... *Turns AC power supply to the power source PCB on and off.*
2. Safety switch 1 (SSW1) .... Forms a safety circuit when the left front cover is open.
3. Safety switch 2 (SSW2) .... Forms a safety circuit when the right front cover is open.
4. Safety switch 3 (SSW3) .... Forms a safety circuit when the right cover is open.
5. Safety switch 4 (SSW4) .... Forms a safety circuit when the main unit is open.
6. Safety switch 5 (SSW5) .... Forms a safety circuit when the main unit is open.

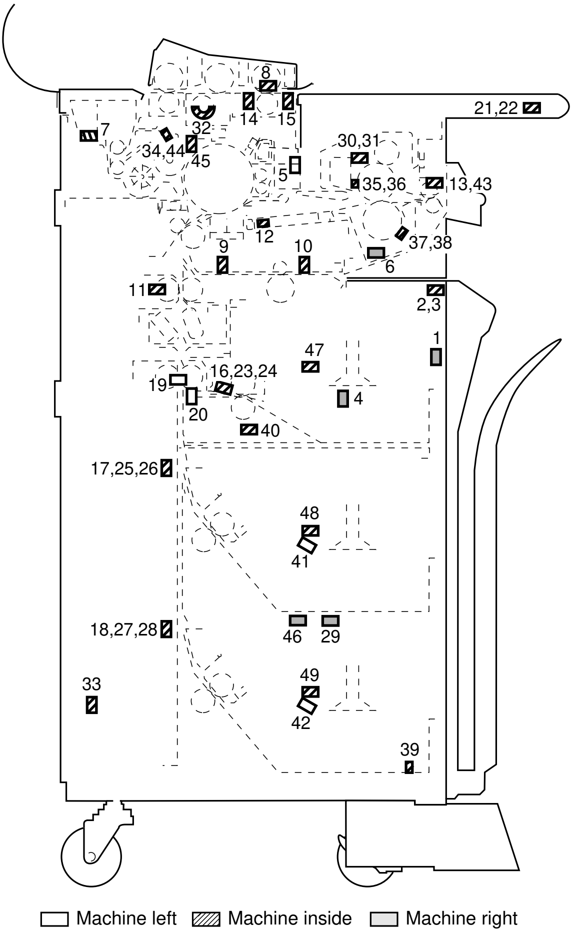


Figure 2-1-3　Switches and sensors (2)

7. Safety switch 6 (SSW6) .... Forms a safety circuit when the upper rear cover is open.
8. Original holding section switch (OHSW) .... Detects that the original holding section is open.
9. Bypass timing switch (BYPTIMSW) .... Control of bypass registration clutch.
10. Bypass registration switch (BYPRSW) .... Detection of leading edge of paper from the bypass table, control of paper feed motor and bypass registration clutch, and detection of paper jams in the bypass feed section.

11. Registration switch (RSW)	Control of paper feed motor, drive motor, fixing drive motor, feed clutch, roll paper conveying clutch and registration clutch and detection of paper jams.
12. Paper conveying switch (PCSW)	Control of separation claw solenoid and detection of paper jams.
13. Eject switch (ESW)	Control of drive motor, fixing drive motor and fixing unit fan motor, and detection of paper jams.
14. Original trailing edge detection switch (OTDSW)	Detection of document passage timing, control of drive motor, fixing drive motor, paper feed motor, paper feed clutch, roll paper conveying clutch, registration clutch, bypass registration clutch and cutter clutch, and detection of original jams.
15. Original leading edge detection switch (OLDSW)	Detection of original insertion and control of original feed motor and original feed clutch.
16. Upper roll paper leading edge detection switch (RLDSW-U)	Detection of paper leading edge home position, control of upper feed clutch and upper roll winding clutch, and detection of paper jams.
17. Middle roll paper leading edge detection switch (RLDSW-M)	Detection of paper leading edge home position, control of middle feed clutch and middle roll winding clutch, and detection of paper jams.
18. Lower roll paper leading edge detection switch (RLDSW-L)*1	Detection of paper leading edge home position, control of lower feed clutch and lower roll winding clutch, and detection of paper jams.
19. Cutter home position switch 1 (CHPSW1)	Detection of cutter home position.
20. Cutter home position switch 2 (CHPSW2)	Detection of cutter home position.
21. Original size switch 1 (OSSW1)	Detection of original size.
22. Original size switch 2 (OSSW2)	Detection of original size.

*1 Optional.

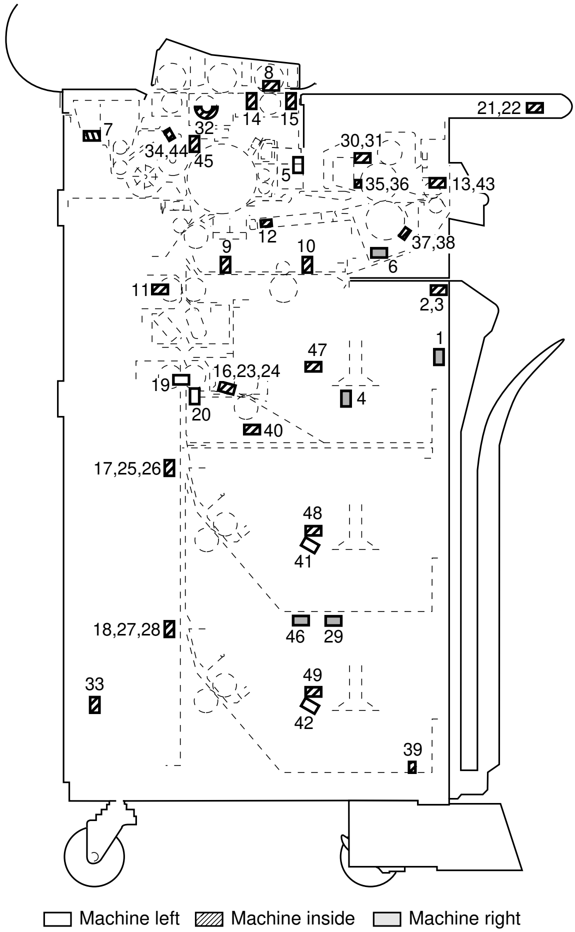


Figure 2-1-4 Switches and sensors (3)

23. Upper paper size switch 1 (PSSW1-U) .... Detection of paper size in the 1st roller unit.
24. Upper paper size switch 2 (PSSW2-U) .... Detection of paper size in the 1st roller unit.
25. Middle paper size switch 1 (PSSW1-M) .... Detection of paper size in the 2nd roller unit.
26. Middle paper size switch 2 (PSSW2-M) .... Detection of paper size in the 2nd roller unit.
27. Lower paper size switch 1 (PSSW1-L)*1 .... Detection of paper size in the 3rd roller unit.

*1 Optional.

28.	Lower paper size switch 2 (PSSW2-L)[*1]	Detection of paper size in the 3rd roller unit.
29.	Waste toner tank detection switch (TDTDSW)	Detects presence of the waste toner tank.
30.	Fixing unit thermal switch 1 (FTSW1)	Forms the fixing heater M and S safety circuits.
31.	Fixing unit thermal switch 2 (FTSW2)	Forms the fixing heater M and S safety circuits.
32.	Fluorescent lamp thermistor (FLTH)	Detection of temperature in vicinity of fluorescent lamp.
33.	*Dehumidifier switch (DRSW)*	*Turns AC power supply to the dehumidifier PCB on and off.*
34.	Developing unit thermistor (DTH)	Detection of temperature in vicinity of developing unit.
35.	Fixing unit thermistor 1 (FTH1)	Detection of temperature of heat roller at the center.
36.	Fixing unit thermistor 2 (FTH2)	Detection of temperature of heat roller at right end.
37.	Fixing unit thermistor 3 (FTH3)	Detection of temperature of press roller at the center.
38.	Fixing unit thermistor 4 (FTH4)	Detection of temperature of press roller at right end.
39.	External temperature thermistor (ETTH)	Detection of external (ambient) temperature.
40.	Upper pulse sensor (PS-U)	Detection of paper-out or paper jam on 1st roller unit.
41.	Middle pulse sensor (PS-M)	Detection of paper-out or paper jam on 2nd roll unit.
42.	Lower pulse sensor (PS-L)[*1]	Detection of paper-out or paper jam on 3rd roller unit (option).
43.	Fixing unit pulse sensor (FPS)	Detection of paper jam in fixing unit.
44.	Toner sensor (TNS)	Detection of toner density in developing unit.
45.	Drum potential sensor (DPS)	Detection of drum surface potential.
46.	Overflow sensor (OFS)	Detection of overflow of toner collected in the waste toner tank.
47.	Upper roll heater switch (RHSW-U)[*2]	Upper roller unit heater in use/not in use.
48.	Middle roll heater switch (RHSW-M)[*2]	Middle roll unit heater in use/not in use.
49.	Lower roll heater switch (RHSW-L)[*1]	Lower roll unit heater in use/not in use.

*1 Optional.

*2 Optional for 220 – 240 V models.

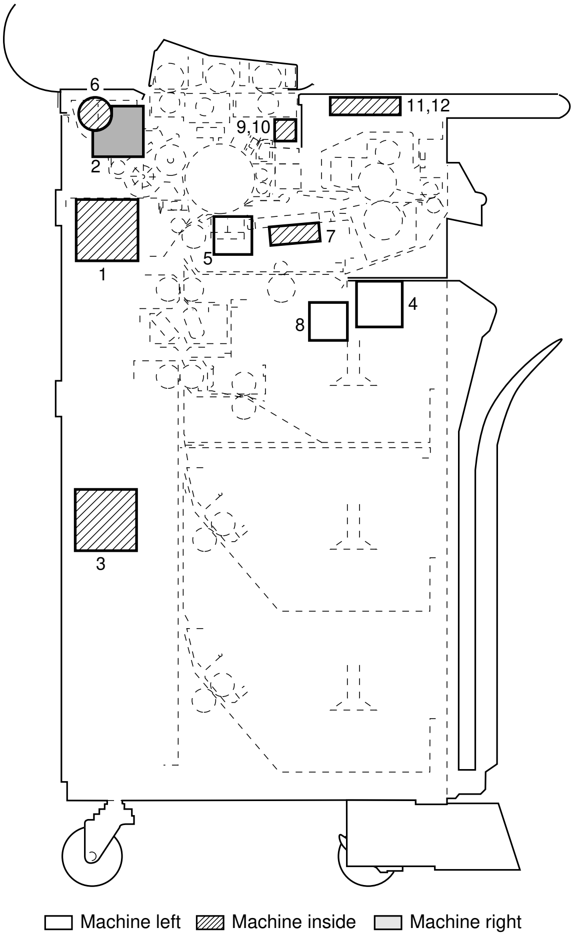


Figure 2-1-5 Motors

1.	Drive motor (DM)	Drives developing unit and transfer unit.
2.	Original feed motor (OFM)	Drives original feed unit.
3.	Paper feed motor (PFM)	Drives paper feed unit.
4.	Fixing drive motor (FDM)	Drives fixing unit.
5.	Drum motor (DRM)	Drives the drum section.
6.	Toner feed motor (TM)	Supplies of toner.
7.	Paper conveying fan motor (PCFM)	Assistance of paper conveying, and heat exhaust.
8.	Cooling fan motor (CFM)	Heat exhaust from unit interior.
9.	LPH fan motor 1 (LPHFM1)	Cools LED printhead (LPH).
10.	LPH fan motor 2 (LPHFM2)	Cools LED printhead (LPH).
11.	Right fixing unit fan motor (FFM-R)	Heat exhaust in fixing unit.
12.	Left fixing unit fan motor (FFM-L)	Heat exhaust in fixing unit.

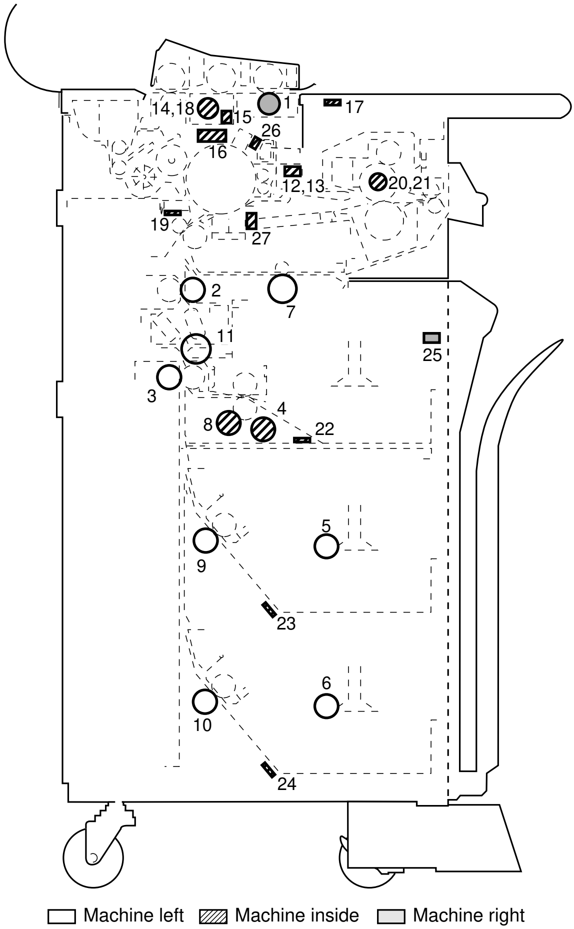


Figure 2-1-6 Others

1. Original feed clutch (OFCL)	Original feed (control of original feed roller rotation).
2. Registration clutch (RCL)	Secondary feed of paper fed from roll unit (control of registration roller rotation).
3. Roll paper conveying clutch (RPCCL)	Conveying paper fed from roll unit (rotation control of front roll paper conveying roller).
4. Upper roll winding clutch (RWCL-U)	Winding of paper roll (control of 1st roll unit paper roll shaft rotation).

5.	Middle roll winding clutch (RWCL-M)	Winding of paper roll (control of 2nd roll unit paper roll shaft rotation).
6.	Lower roll winding clutch (RWCL-L)[*1]	Winding of paper roll (control of 3rd roll unit paper roll shaft rotation).
7.	Bypass registration clutch (BYPRCL)	Secondary paper feed during manual insertion (control of bypass registration roller rotation).
8.	Upper feed clutch (FCL-U)	Primary paper roll feed from 1st roll unit (control of roll paper feed lower roller A rotation).
9.	Middle feed clutch (FCL-M)	Primary paper roll feed from 2nd roll unit (control of roll paper conveying rear roller B rotation).
10.	Lower feed clutch (FCL-L)[*1]	Primary paper feed from 3rd roll unit (option) (control of roll paper conveying rear roller B rotation).
11.	Cutter clutch (CCL)	Cutter operation.
12.	Cleaning solenoid (CSOL)	Cleaning blade operation.
13.	Separation claw solenoid (SSOL)	Operation of separation claws.
14.	Fluorescent lamp (FL)	Exposues of original.
15.	Contact image sensor (CIS)	Converts original data into analog signal and outputs it.
16.	LED printhead (LPH)	Forms an image using the data from the original on drum surface via LED illumination.
17.	Ready lamp (R-Lamp)	Indicates that copying is possible.
18.	Fluorescent lamp heater (FLH)	Maintains temperature of fluorescent lamp.
19.	Dehumidifier (DH)	Prevents condensation on drum.
20.	Fixing heater M (H1)	Heats the center of the heat roller.
21.	Fixing heater S (H2)	Heats both ends of the heat roller.
22.	Upper roll unit heater (RH-U)[*2]	Dehumidifies paper in 1st roll unit.
23.	Middle roll unit heater (RH-M)[*2]	Dehumidifies paper in 2nd roll unit.
24.	Lower roll unit heater (RH-L)[*1]	Dehumidifies paper in 3rd roll unit (optional).
25.	Total counter (TC)	Displays number of copies.
26.	Pre-charging lamp (PCHL)	Improves evenness of charging (main charging).
27.	Post-transfer lamp (RTL)	Removes residual charge on drum.

[*1] Optional.

[*2] Optional for 220 – 240 V models.

CONTENTS

2-2 Detection of Paper Misfeed

2-2-1 Paper misfeed detection

When a paper jam occurs, the copier immediately stops copying and the display on the operation unit shows a code consisting of “J” followed by a number between 01 and 06, indicating the location of the jam.
Paper jam counts sorted by the detecting conditions can be checked by simulation 74.
To remove paper jammed in the copier, open the front covers and take out a roll unit, or open the main unit, fixing unit, or original holding section.
To reset the paper misfeed detection, open and close the front covers, main unit, right cover, upper rear cover or original holding section to turn safety switches 1 & 2, 4 & 5, 3, 6 or the original holding section switch off and on, respectively.

Metric

Paper jam J-02
Open front covers

Inch

PAPER MISFEED J-02
OPEN FRONT COVERS.

J-01: paper feed section (1st roll unit)
J-02: paper feed section (2nd roll unit)
J-03: paper feed section (3rd roll unit*1)
J-04: paper feed section (bypass paper feed section)
J-05: original feed section
J-06: inside the copier main unit

*1 Optional.

Figure 2-2-1 Misfeed indication

2-2-2 Paper misfeed detection conditions

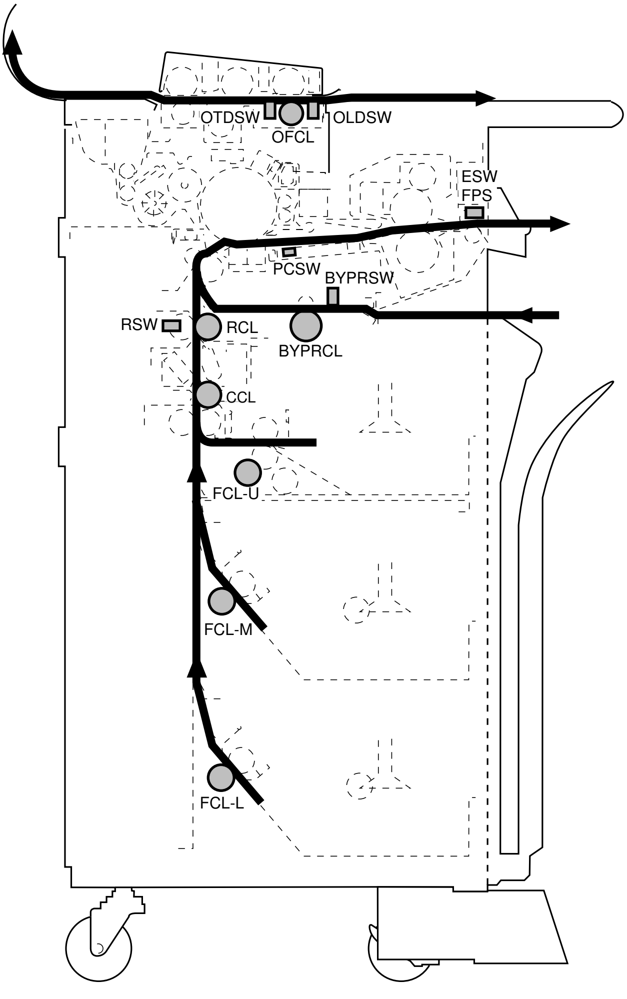
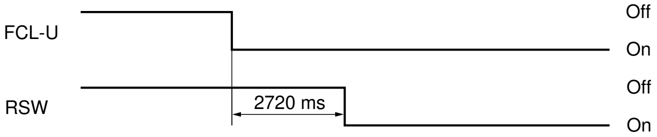


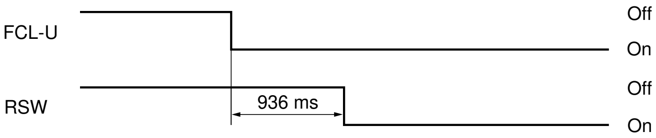
Figure 2-2-2 Misfeed detection

1. **Paper jam in the paper feed section (1st roll unit): J-01**
   When the new paper roll is wound up (first paper feed), the registration switch (RSW) does not turn on within 2720 ms after the upper feed clutch (FCL-U) has turned on.



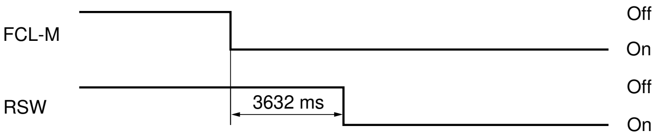
Timing chart 2-2-1

When the paper roll need not be wound up (from the second sheet), the registration switch (RSW) does not turn on within 936 ms after the upper feed clutch (FCL-U) has turned on.



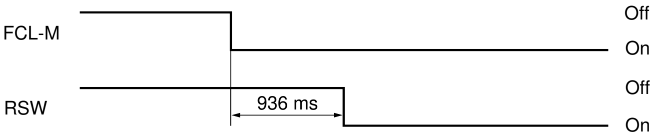
Timing chart 2-2-2

2. **Paper jam in the paper feed section (2nd roll unit): J-02**
   When the new paper roll is wound up (first paper feed), the registration switch (RSW) does not turn on within 3632 ms after the middle feed clutch (FCL-M) has turned on.



Timing chart 2-2-3

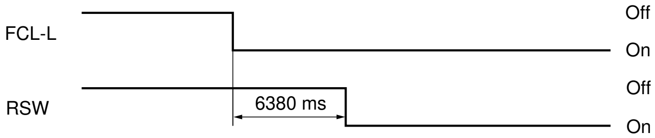
When the paper roll need not be wound up (from the second sheet), the registration switch (RSW) does not turn on within 936 ms after the middle feed clutch (FCL-M) has turned on.



Timing chart 2-2-4

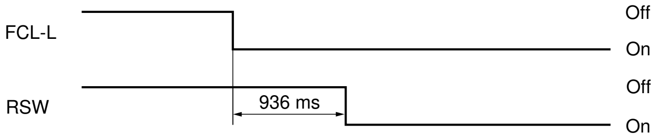
3. Paper jam in the paper feed section (3rd roll unit): J-03

When the new paper roll is wound up (first paper feed), the registration switch (RSW) does not turn on within 6380 ms after the lower feed clutch (FCL-L) has turned on.



Timing chart 2-2-5

When the paper roll need not be wound up (from the second sheet), the registration switch (RSW) does not turn on within 936 ms after the lower feed clutch (FCL-L) has turned on.



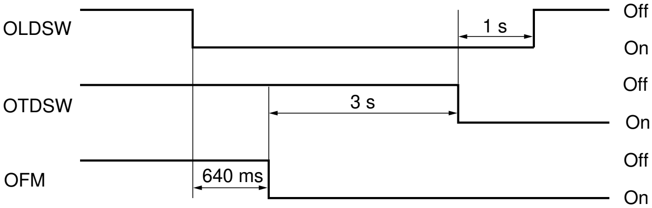
Timing chart 2-2-6

4. Paper jam in the paper feed section (bypass paper feed section): J-04

The bypass registration switch (BYPRSW) is on when the main switch (MSW) is turned on or during ready mode.

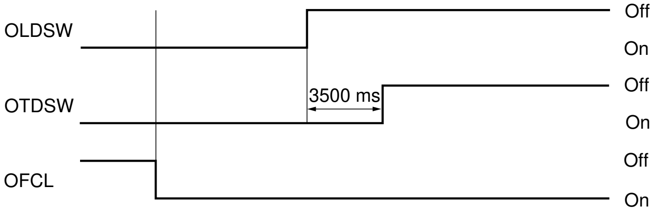
5. Paper jam in the original feed section: J-05

The original trailing edge detection switch (OTDSW) does not turn on within 3 s after the original feed motor (OFM) has turned on to start original feed.
The original leading edge detection switch (OLDSW) stays off 1 s after the original trailing edge detection switch (OTDSW) has turned on.



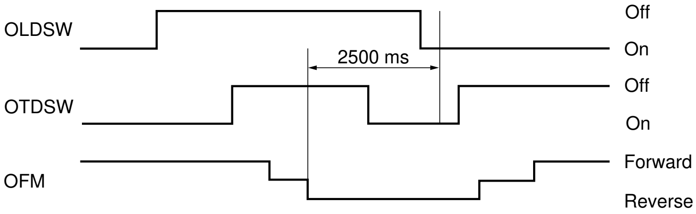
Timing chart 2-2-7

The original trailing edge detection switch (OTDSW) stays off when the original feed clutch (OFCL) turns on during original read-in control.
The original trailing edge detection switch (OTDSW) does not turn off within 3500 ms after the original leading edge detection switch (OLDSW) has turned off during original read-in control.



Timing chart 2-2-8

The original leading edge and trailing edge detection switches (OLDSW and OTDSW) are off 2500 ms after the original feed motor (OFM) has started to reverse during original read-in control.



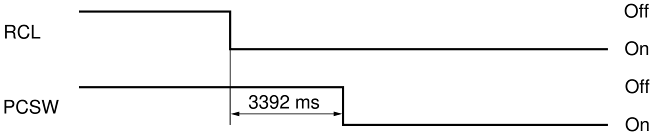
Timing chart 2-2-9

The original trailing edge detection switch (OTDSW) is on when the job stop/roll cut key is pressed.

6. Paper jam inside the copier main unit: J-06

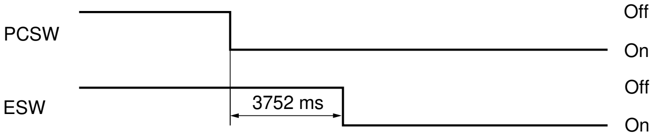
The registration switch (RSW), paper conveying switch (PCSW) or eject switch (ESW) is on when the main switch (MSW) is turned on or during ready mode.

The paper conveying switch (PCSW) does not turn on within 3392 ms after the registration clutch (RCL) has turned on.



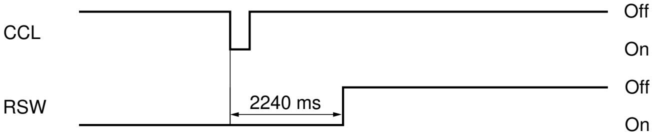
Timing chart 2-2-10

The eject switch (ESW) does not turn on within 3752 ms after the paper conveying switch (PCSW) has turned on.



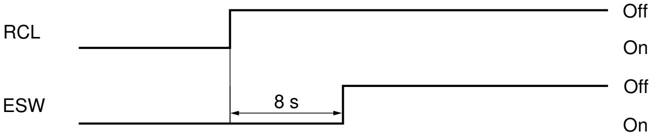
Timing chart 2-2-11

The registration switch (RSW) does not turn *off* within 2240 ms after the cutter clutch (CCL) has turned on.



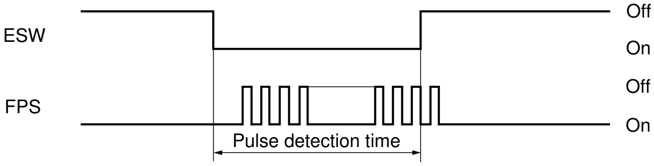
Timing chart 2-2-12

The eject switch (ESW) does not turn off within 8s after the registration clutch (RCL) has turned off.



Timing chart 2-2-13

No pulse signal is detected from the fixing unit pulse sensor (FPS) for 1 s while the eject switch (ESW) is on.



Timing chart 2-2-14

CONTENTS

2-3 Operation of the PCBs

2-3-1 Power source PCB

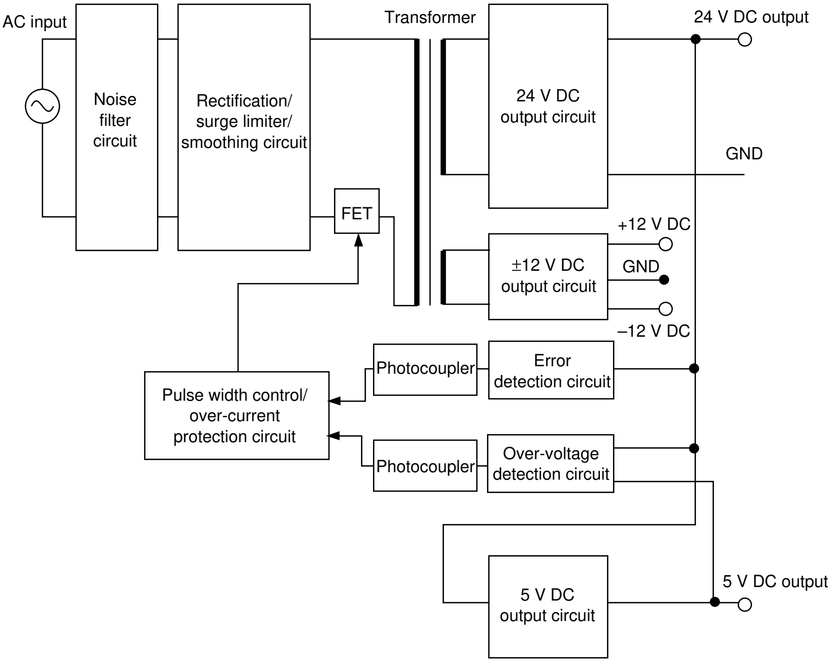


Figure 2-3-1 Power source PCB block diagram

The main components of the power source PCB are the noise filter circuit, rectification/ surge limiter/smoothing circuit, pulse width control circuit, 24 V DC output circuit, 5 V DC output circuit, ±12 V DC output circuit and over-voltage and over-current protection circuits. The power source PCB generates stable 24 V DC, ±12 V DC and 5 V DC from the AC power source.

(1) Noise filter circuit

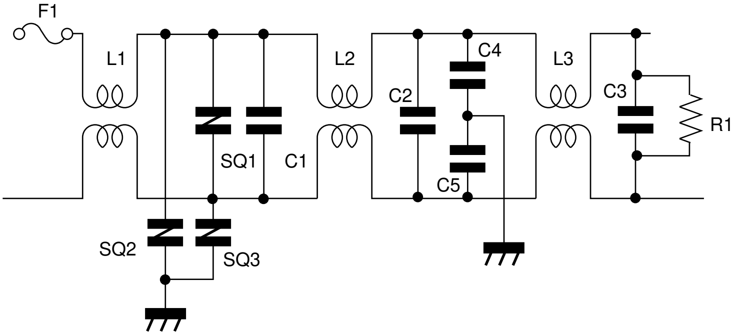


Figure 2-3-2 Noise filter circuit

The noise filter circuit consists of coils L1, L2 and L3 and capacitors C1, C2, C3, C4 and C5. It prevents high-frequency noise from escaping to the outside through the AC input line. It also prevents noise from external devices from entering this copier through the AC input line.

(2) Rectification/surge limiter/smoothing circuit

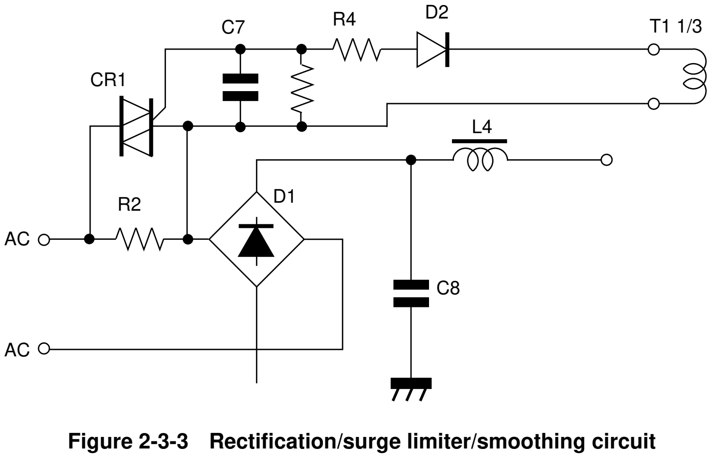


Figure 2-3-3 Rectification/surge limiter/smoothing circuit

The input AC power source is full-wave-rectified by diode bridge D1 on the rectification circuit and smoothed by smoothing capacitor C8 to be converted into the DC power source for the switching circuit. Between the rectification and smoothing circuits, there is a surge limiter circuit to prevent a surge current from damaging the components on the circuit when the AC power is switched on; R2 is connected in series between the noise filter and rectification circuits to limit a surge.

(3) Pulse width control circuit

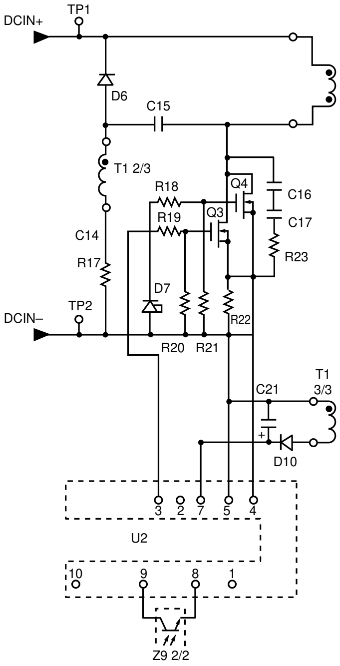


Figure 2-3-4 Pulse width control circuit

In the pulse width control circuit, FETs Q3 and Q4 are switched on and off by the pulse signals from the pulse width control IC U2. The current flowing into the primary side coil of transformer T from the smoothing circuit is switched, and an e.m.f. is generated in the secondary coil. U2 changes the duty ratio for the pulse signals switching the FETs on and off to control the voltage output to the secondary side.

When the secondary side output voltage becomes too large, shunt regulator Z6 in the error detection circuit of the 24 V DC output circuit conducts and photocoupler Z9 turns on. The signal from this photocoupler is fed back to U2 which reduces the duty cycle of the pulse signals, so reducing the output voltage.

(4) 24 V DC output/error detection circuit

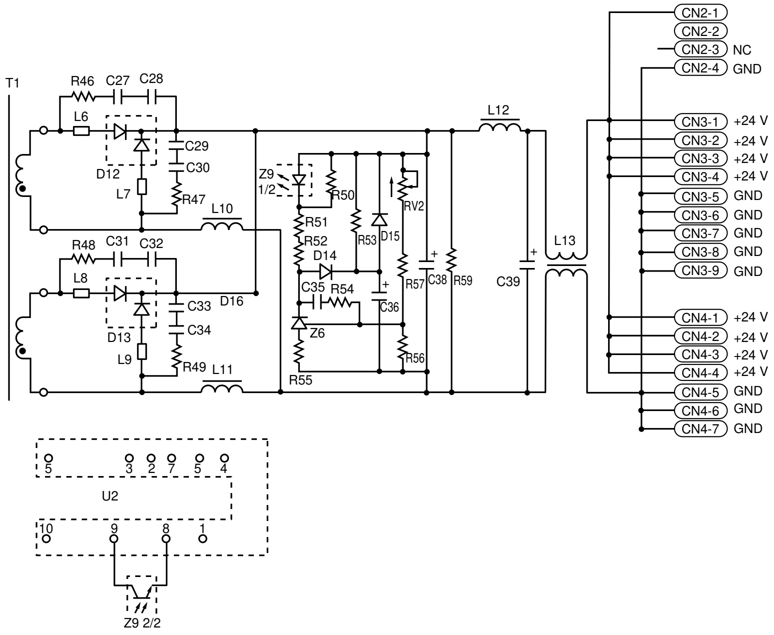


Figure 2-3-5 24 V DC output/error detection circuit

In the 24 V DC output circuit, the voltage generated in the secondary coil of the transformer is rectified by diodes D12 and D13, smoothed by choke coils L10 and L11 and capacitors C38 and C39, and is output as 24 V DC.

The CR elements of the rectification circuit (C27, C28, R46, C29, C30, R47) and (R48, C31, C32, R49, C33, C34) form a CR snapper circuit and absorb a rectification voltage surge. Chokes L6, L7, L8 and L9 connected in series with the diodes form a magnetic spanner and absorb a rectification current surge. These components reduce the high-frequency rectification noise.

In the error detection circuit, a voltage fluctuation in the 24 V DC output is detected by shunt regulator Z6 and the voltage fluctuation is isolated with photocoupler Z9 and fed back to U2 of the pulse width control circuit.

(5) 5 V DC output/5 V DC over-current protection circuit

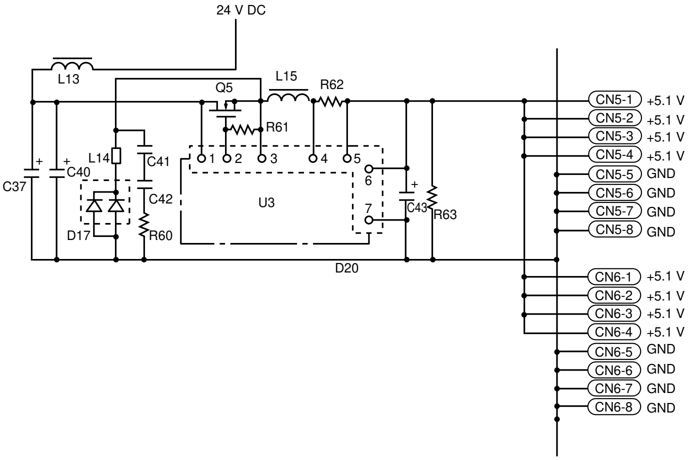


Figure 2-3-6 5 V DC output/5 V DC over-current protection circuit

The 5 V DC output circuit reduces the smoothed 24 V DC from the 24 V DC output circuit to 5 V DC.
The current for the output from the 24 V DC output circuit is stabilized by choke coil L13 and smoothing capacitors C37 and C40, and is fed to the 5 V DC output circuit. In the 5 V DC output circuit, FET Q5 is switched on and off by switching regulator IC U3 so that the output voltage becomes 5 V DC. This output voltage is smoothed by choke coil L15 and smoothing capacitor C43 and is output. U3 also monitors the voltage drop generated across resistor R62 by the current flowing in the 5 V DC output circuit. If the current is too high and the voltage drop across R62 becomes too large, U3 cuts off the 5 V DC output to protect the power source PCB.

(6) Over-voltage protection circuit

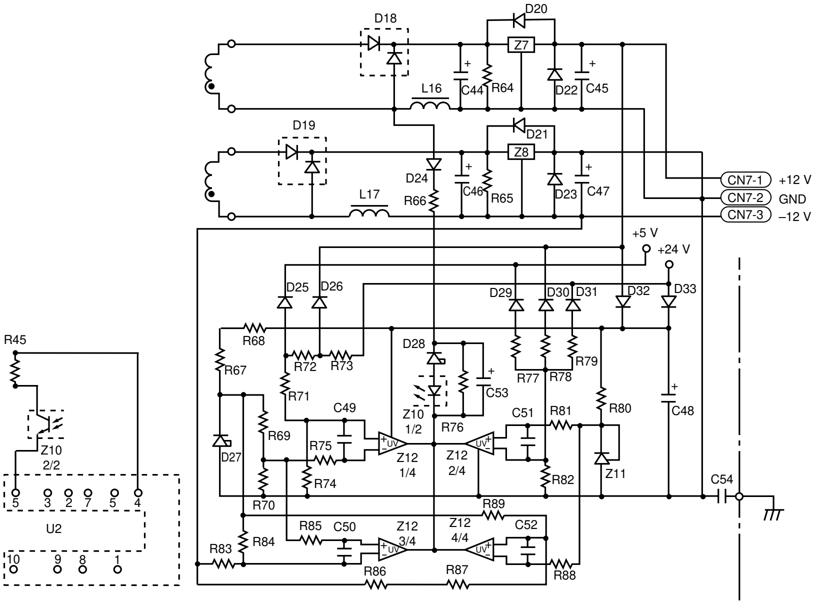


Figure 2-3-7 Over-voltage protection circuit

24 V DC, 5 V DC and ±12 V DC from the respective output circuits are applied to comparator Z12. When any output voltage increases to exceed the reference voltage at Z12, photocoupler Z10 turns on, which causes U2 of the pulse width control circuit to turn the FETs off to protect the circuit from over-voltage.

2-3-2 LPH power supply PCB

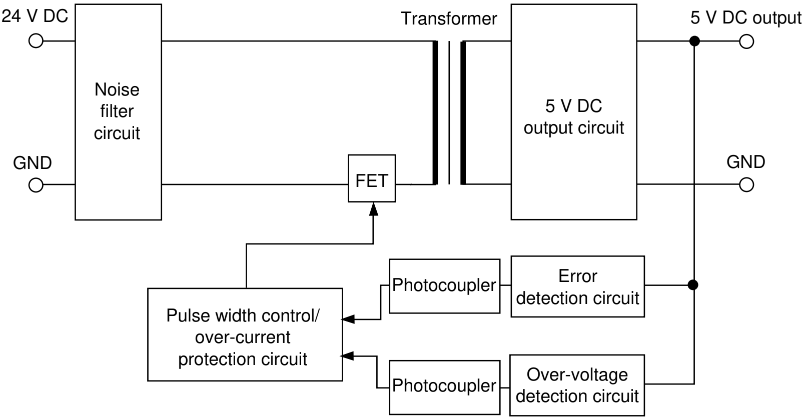


Figure 2-3-8 LPH power supply PCB block diagram

The LPH power supply PCB consists of noise filter, pulse width control, 5 V DC output, over-voltage and over-current protection circuits and generates stable 5 V DC.

.

(1) Noise filter circuit

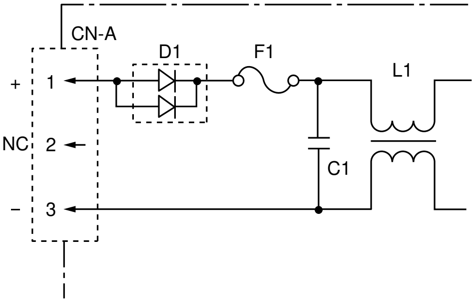


Figure 2-3-9 Noise filter circuit

The noise filter circuit consists of coil L1 and capacitors C1 and C2. It prevents high-frequency noise from escaping to the outside through the AC line. It also prevents noise from external devices from entering this copier through the AC input line.

(2) Pulse width control circuit

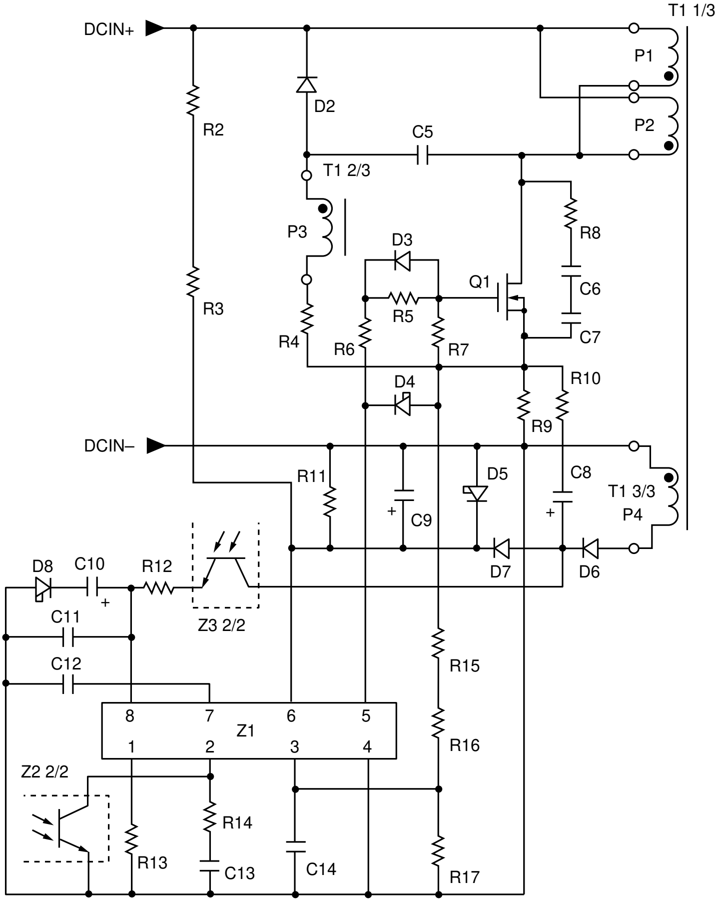


Figure 2-3-10 Pulse width control circuit

In the pulse width control circuit, FET Q1 is switched on and off by the pulse signals from the pulse width control IC Z1. The current flowing into the primary side coil of transformer T from the smoothing circuit is switched, and an e.m.f. is generated in the secondary coil. Z1 changes the duty ratio for the pulse signals switching the FET on and off to control the voltage output to the secondary side.
When the secondary side output voltage becomes too large, shunt regulator Z4 in the error detection circuit on the 5 V DC output circuit conducts and photocoupler Z2 turns on. The signal from this photocoupler is fed back to Z1 which reduces the duty cycle of the pulse signals, so reducing the output voltage.

(3) 5 V DC output/error detection circuit

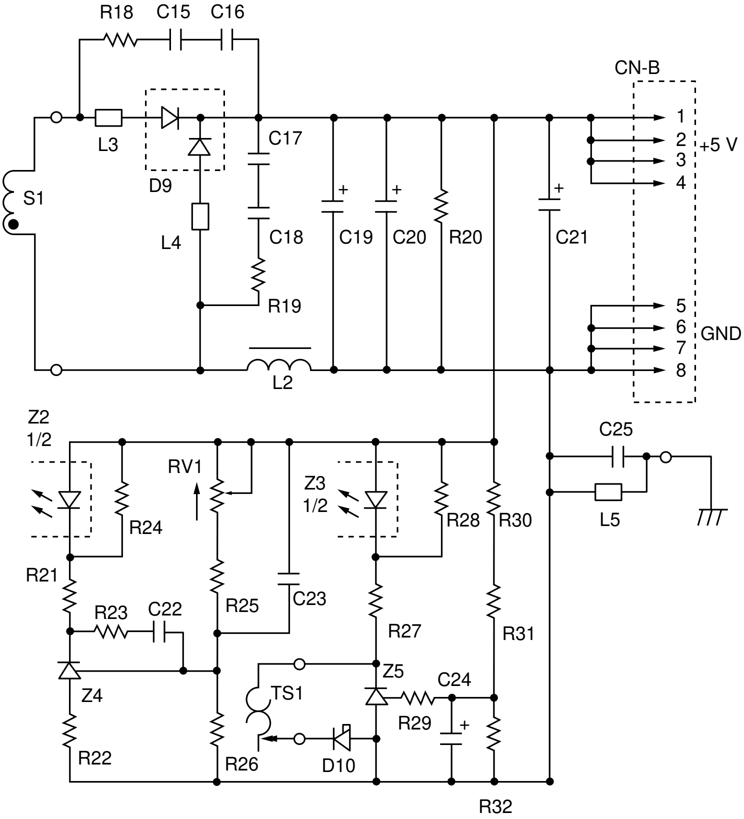


Figure 2-3-11 5 V DC output/error detection circuit

The 5 V DC output circuit rectifies the voltage generated on the transformer secondary coil using diode D9, smoothes it using choke coil L2 and capacitors C19 and C20 and outputs it as 5 V DC.

The CR elements of the rectification circuit (C15, C16, R18, C17, C18, R19) form a CR snapper circuit and absorb a rectification voltage surge. Chokes L3 and L4 connected in series with the diode form a magnetic spanner and absorb a rectification current surge. These components reduce the high-frequency rectification noise.

In the error detection circuit, a voltage fluctuation in the 5 V DC output is detected by shunt regulator Z4 and the voltage fluctuation is isolated with photocoupler Z2 and fed back to Z1 of the pulse width control circuit.

2-3-3 Servo motor control 1 PCB

Servo motor control 1 PCB consists of drive motor control circuit, fixing drive motor control circuit and drum motor control circuit, all independent from each other.

(1) Drive motor control circuit

The drive motor control circuit is composed of the components as shown in Figure 2-3-12 to control the rotation of the drive motor.

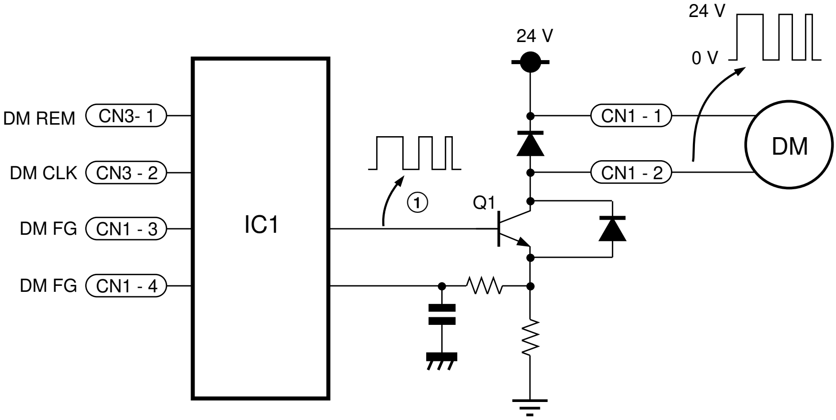


Figure 2-3-12 Drive motor control circuit

- **Signal functions**

DM CLK signal (CN3-2): input signal
Clock pulse which is the reference signal for drive motor control. Output from the main PCB.
DM REM signal (CN3-1): input signal
When low, the drive motor (DM) is on.
DM FG signal (CN1-3), (CN1-4): input signals
Output from the pulse generator in the drive motor, and indicates the speed of the motor.

- **Drive motor control**

IC1 in Figure 2-3-12 compares the DM CLK signal output from the main PCB with the frequency of the DM FG signals output from the drive motor, and outputs signal ①.
If the speed of the drive motor is too high, the frequency of DM FG is higher than that of DM CLK, and the pulse width of signal ① decreases. The width of the 0 V DC signal output from CN1-2 decreases, and the speed of the drive motor drops. If the speed of the drive motor is too low, the frequency of DM FG is less than DM CLK, and the pulse width of signal ① increases. The width of the 0 V DC signal output from CN1-2 increases, and the speed of the drive motor increases. This keeps the motor speed constant as the machine load varies.

(2) Fixing drive motor control circuit

The fixing drive motor control circuit is composed of the components as shown in Figure 2-3-13 to control the rotation of the fixing drive motor.

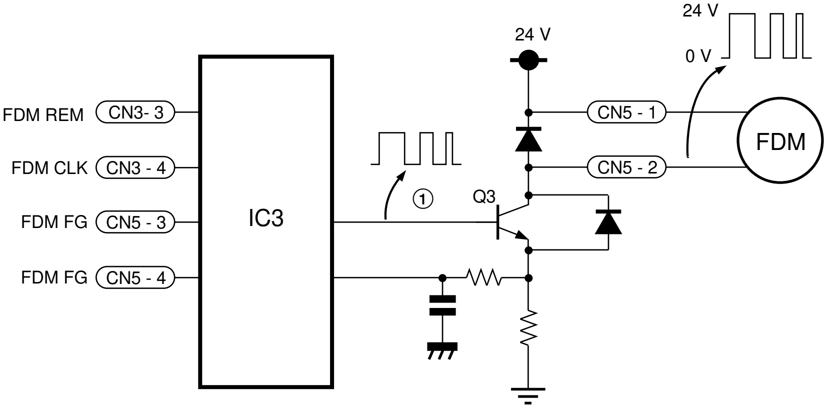


Figure 2-3-13 Fixing drive motor control circuit

- **Signal functions**

FDM CLK signal (CN3-4): input signal
Clock pulse which is the reference signal for drive motor control. Output from the main PCB.
FDM REM signal (CN3-3): input signal
When low, the fixing drive motor (FDM) is on.
FDM FG signal (CN5-3), (CN5-4): input signals
Output from the pulse generator in the fixing drive motor, and indicates the speed of the motor.

- **Fixing drive motor control**

IC3 in Figure 2-3-13 compares the FDM CLK signal output from the main PCB with the frequency of the FDM FG signals output from the fixing drive motor, and outputs signal ①. If the speed of the fixing drive motor is too high, the frequency of FDM FG is higher than that of FDM CLK, and the pulse width of signal ① decreases. The width of the 0 V DC signal output from CN5-2 decreases, and the speed of the fixing drive motor drops. If the speed of the fixing drive motor is too low, the frequency of FDM FG is less than that of FDM CLK, and the pulse width of signal ① increases. The width of the 0 V DC signal output from CN5-2 increases, and the speed of the fixing drive motor increases. This keeps the motor speed constant as the machine load varies.

(3) Drum motor control circuit

The drum motor control circuit is composed of the components as shown in Figure 2-3-14 to control the rotation of the drum motor.

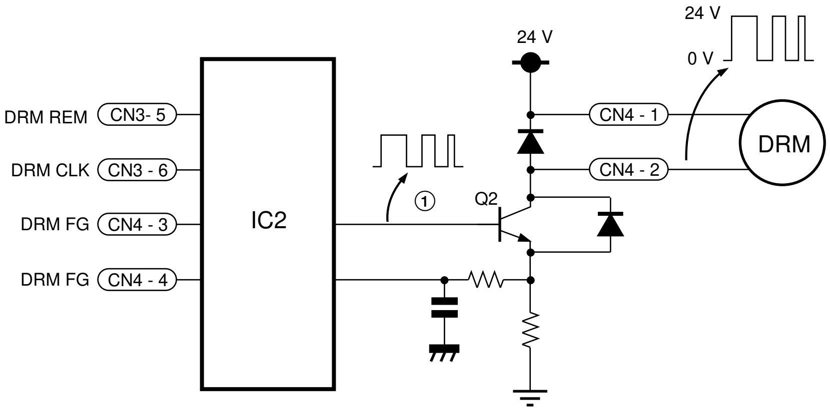


Figure 2-3-14 Drum motor control circuit

- **Signal functions**

DRM CLK signal (CN3-6): input signal

Clock pulse which is the reference signal for drive motor control. Output from the main PCB.

DRM REM signal (CN3-5): input signal

When low, the drum motor (DRM) is on.

DRM FG signal (CN4-3), (CN4-4): input signals

Output from the pulse generator in the drum motor, and indicates the speed of the motor.

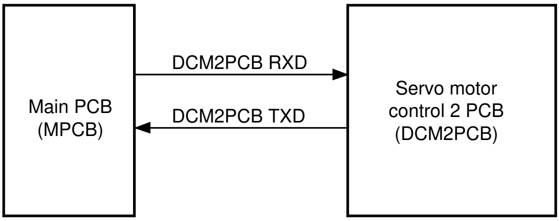
- **Drum motor control**

IC2 in Figure 2-3-14 compares the DRM CLK signal output from the main PCB with the frequency of the DRM FG signals output from the drum motor, and outputs signal ①.

If the speed of the drum motor is too high, the frequency of DRM FG is higher than that of DRM CLK, and the pulse width of signal ① decreases. The width of the 0 V DC signal output from CN4-2 decreases, and the speed of the drum motor drops. If the speed of the drum motor is too low, the frequency of DRM FG is less than that of DRM CLK, and the pulse width of signal ① increases. The width of the 0 V DC signal output from CN4-2 increases, and the speed of the drum motor increases. This keeps the motor speed constant as the machine load varies.

2-3-4 Servo motor control 2 PCB

Servo motor control 2 PCB communicates serially with the main PCB. It receives commands from the main PCB at input terminal DCM2PCB RXD and emits data at output terminal DCM2PCB TXD.



DCM2PCB RXD: signal from main PCB to servo motor control 2 PCB
DCM2PCB TXD: signal from servo motor control 2 PCB to main PCB

Figure 2-3-15 Communication between servo motor control 2 PCB and main PCB

Servo motor control 2 PCB consists of a CPU, external memory (ROM) and an address latch. The CPU and ROM are connected by the address bus used to read in data and the data bus used to transfer data from outside the PCB to the CPU. The arrows in Figure 2-3-16 show signal flow.

The CPU processes input signals in accordance with the program in ROM and outputs control signals.

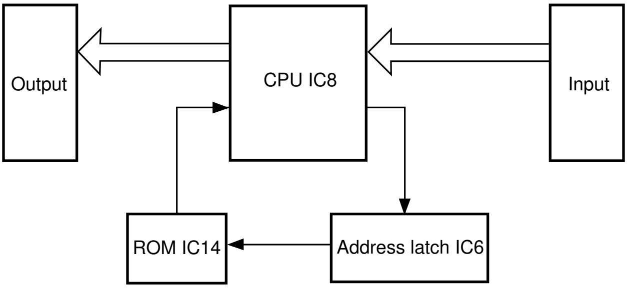


Figure 2-3-16 Servo motor control 2 PCB block diagram

(1) Original feed motor control circuit

The original feed motor control circuit consists of CPU IC8 and four FETs. The FETs turn on to operate the original feed motor in response to the on/off signal (PWM0/P34) and the direction signals (OFM F ON and OFM R ON). The original feed motor turns in the normal direction to move an original into the direction of exposure. The signals control motor action as shown below.

CPU signals			Motor action
OFM F ON	OFM R ON	PWM0/P34	
H	H	H, L	Stops.
L	H	H	Stops.
		L	Turns in normal direction. Current flows from OFM+ to OFM–.
H	L	H	Stops.
		L	Reverses. Current flows from OFM– to OFM+.

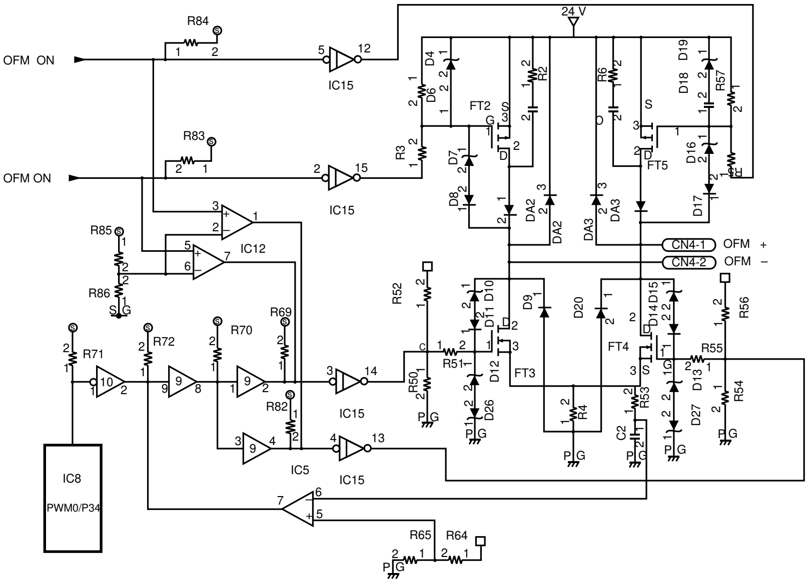


Figure 2-3-17 Original feed motor circuit

(2) Paper feed motor control circuit

The paper feed motor control circuit consists of CPU IC8 and an FET. When signal PWM1/P35 goes low, the FET turns on to drive the motor. When high, the FET turns off and the motor stops.
When the PFM ON signal from the main PCB goes low, the paper feed motor is forced to turn.

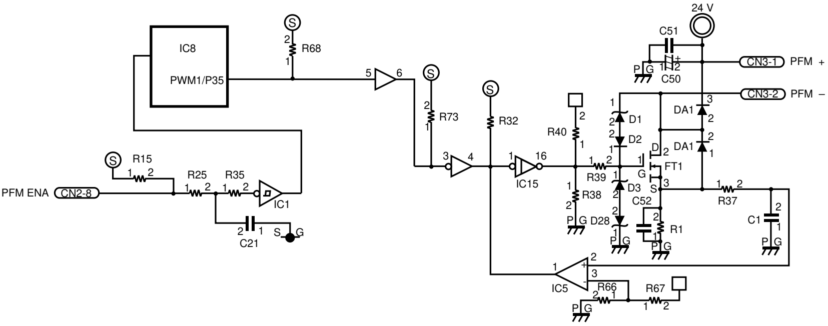


Figure 2-3-18 Paper feed motor control circuit

(3) Reset circuit

When reset signal (DCM2PCB RESET) from the main PCB goes low, or when IC3 detects an abnormal 5 V supply, this circuit resets the CPU to prevent it from malfunctioning or accepting invalid inputs.

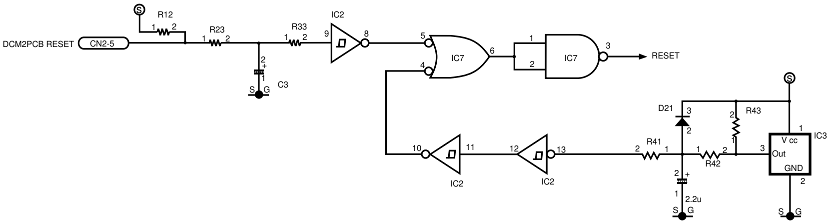


Figure 2-3-19 Reset circuit

2-3-5 Main PCB

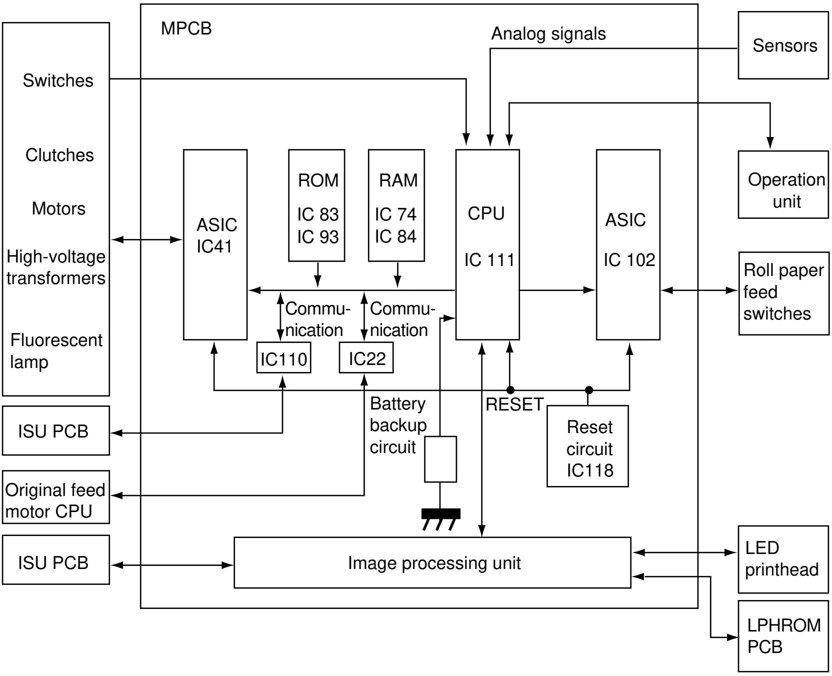


Figure 2-3-20 Main PCB block diagram

This circuit centers on the CPU (IC111) and includes the ROM and RAM, I/O control, analog input/output, output buffer and signal level conversion, reset, communication control and image processing unit circuits.
The CPU controls the entire system based on the data written into the SRAM (IC74, 84) according to the control program in the ROM (IC83, 93). Driving of external electrical parts and input of signals from them are handled by the CPU I/O ports or via the I/O ASICs (IC41, 102) connected to the CPU through the address bus and data bus. The CPU also controls the digital processor for the image processing unit.

(1) Fixing temperature error detection circuit

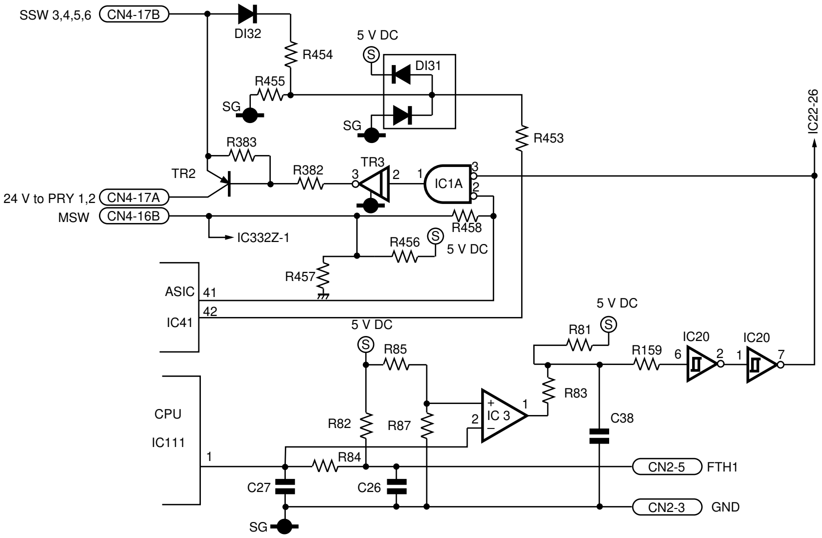


Figure 2-3-21 Fixing temperature error detection circuit

The voltage from fixing thermistor 1 FTH1, which changes with the temperature, is input to terminal 1 of CPU IC111 and converted from analog to digital. This data is compared with the conditions for displaying a service call C641 to determine if there is a fixing temperature error.

The voltage from FTH1 is input to the inverting input terminal of comparator IC3. The reference voltage formed by dividing 5 V DC across resistors R85 and R87 is input to the non-inverting input terminal. Normally, the voltage input from fixing unit thermistor 1 is higher than the reference voltage, so the IC3 output voltage is low. When the temperature of the fixing section is abnormally high, the voltage from FTH1 drops below the reference voltage, so the voltage at the output of IC3 goes high. This high level voltage passes through a 2-stage Schmitt trigger IC20 to be shaped. The output from IC20 is input to terminal 2 of NAND gate IC1A.

The main switch on signal (low level) is constantly input to terminal 2 of the NAND gate and when pin 3 goes high, the high-level voltage is output at terminal 1. This output voltage is converted to 24 V DC by driver IC TR3 and input to the base of power relay drive transistor TR2 to force TR2 off. When TR2 turns off, power feed to the power relays PRY1, 2 is cut to turn them off.

(2) Reset circuit

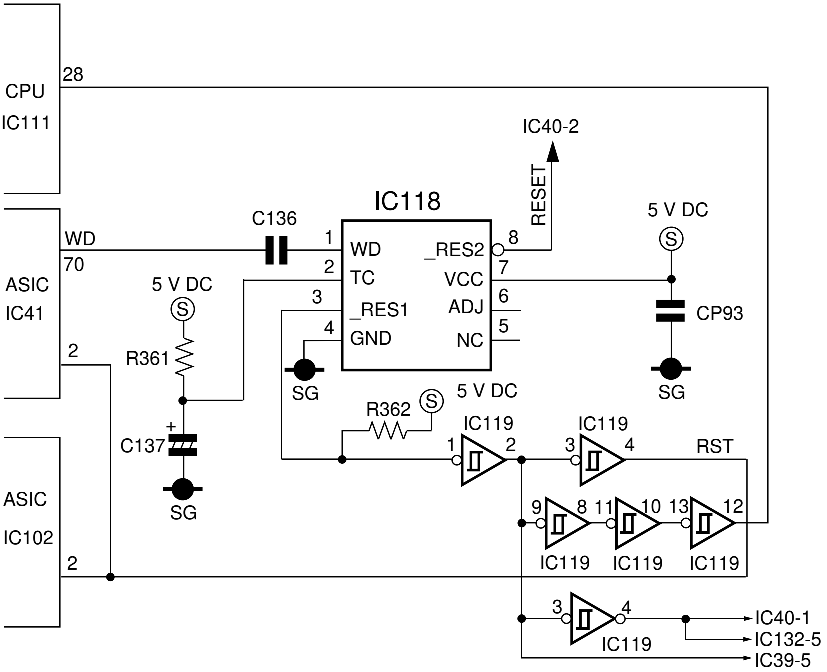


Figure 2-3-22 Reset circuit

The reset circuit is comprised of system reset IC118 and peripheral circuits. When the CPU operates abnormally, when the power is switched on, or when the power source voltage drops, this circuit outputs a reset signal to the CPU to prevent CPU malfunction.

- **System reset IC operation timing**

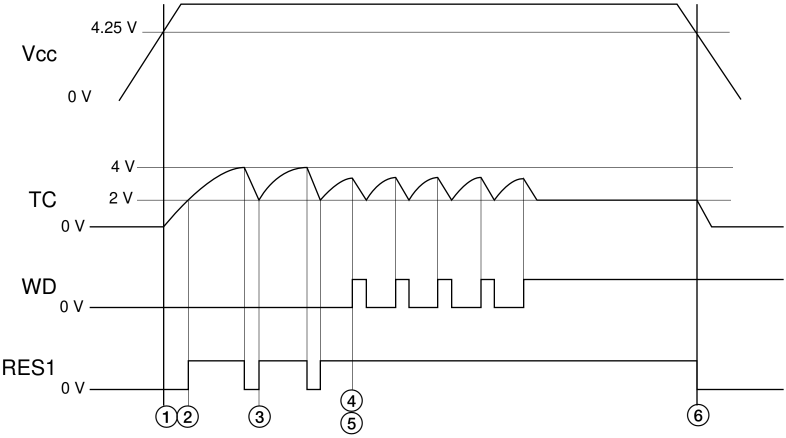


Figure 2-3-23 System reset IC operation timing

① When the power is switched on and the 5-V-DC power source voltage rises to 4.25 V, the potential of capacitor C137 connected to the TC pin of IC118 rises.

② As the charging of C137 continues and the potential of the TC pin rises to 2 V, the output level of the RES1 pin goes high. When the potential reaches 4 V, the pin goes low and C137 is discharged.

③ When the potential of the TC pin has dropped to 2 V as C137 discharges, RES1 goes high again.

④ Until the clock signal is input to the WD pin from the ASIC IC41, IC118 repeats the above operation. When the clock signal is received, C137 is discharged while C118 clock signal is high.

⑤ When the CPU operates normally, the clock signal is always input before the potential of TC reaches 4 V in step ②, so RES1 remains high and is always kept high while the system is operating normally. If the CPU has a problem, and the clock is no longer input with the normal timing, the potential of IC137 rises to 4 V and RES1 goes low. This RES1 signal goes through the 2-stage or 4-stage inverter IC119 and is input to the CPU and ASIC reset pins, resetting the CPU automatically.

⑥ When the 5-V-DC power source voltage drops to 4.25 V, RES1 goes low and the CPU is reset.

(3) Image processing unit

The image processing unit consists of an LSI exclusive for image processing (ASIC IC121, 112, 150, 103, 61, 100, 89 and 99). The IPU circuit receives 8-bit image signal (256 tone levels) digitized in the ISU PCB, edits the data into 5-bit signals (32 levels) and sends them to the LED printhead.

Job control and data setting for each ASIC are assigned by the CPU. Auto exposure control and original size detection that were conducted by employing a halogen lamp with variable light intensity on previous copiers are performed by controlling the digital image signals in the IPU circuit on this machine.

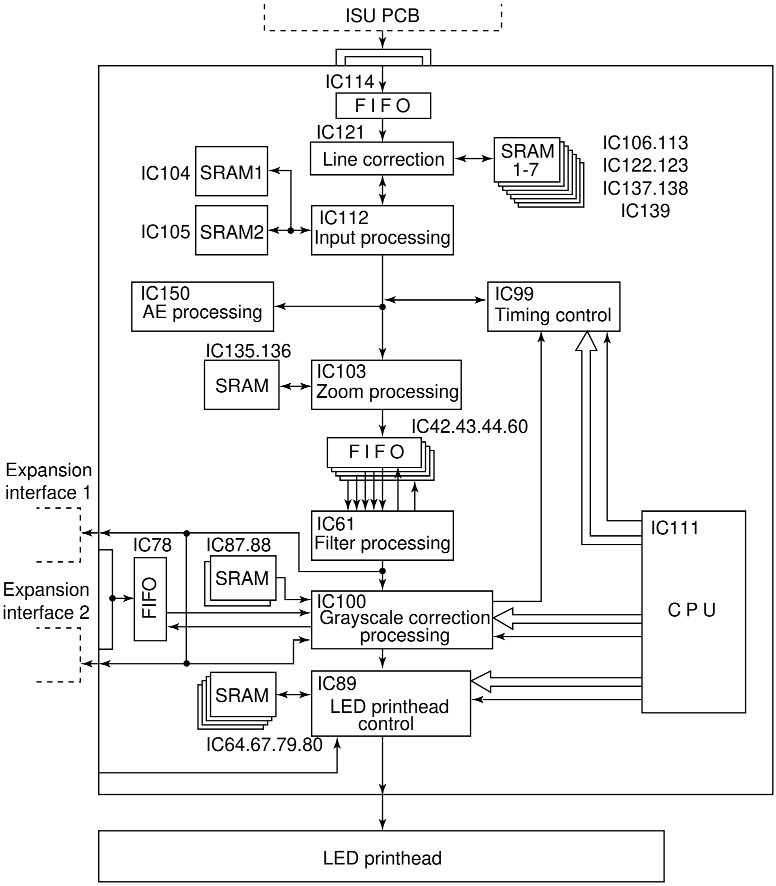


Figure 2-3-24 Image processing unit (IPU) block diagram

- **Input processing unit**

Eight-bit image data from the ISU PCB is read into line FIFO memory (C114) line by line. Holding data of a total of 7 lines via SRAMs (IC106, 113, 122, 123, 137, 138 and 139), IC121 conducts correction of the current line using the data of three lines on each side of it to eliminate any shift of the image in the sub scanning direction. Eight-bit image data is subjected to γ correction and black-and-while reversal at IC112.
After that, the image data is sent to the zoom processing unit.

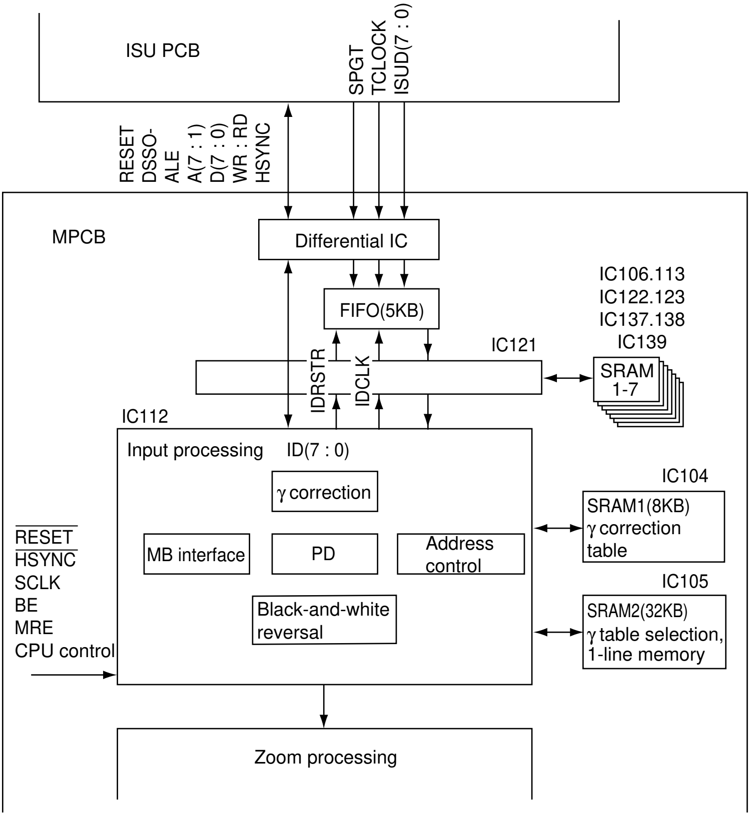


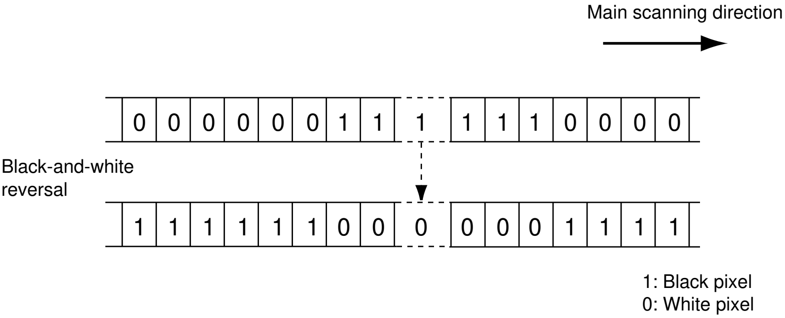
Figure 2-3-25 Input processing unit block diagram

- **γ correction**

8-kbyte SRAM 1 (IC104) is used for γ correction where a γ table is selected for each pixel out of the 32 tables (8k/256). The γ table data is stored in 32-kbyte SRAM 2 (IC105) to be used for selection of the table to be read out of SRAM 1 (IC104).
There are two modes available and can be selected via a register: one where a γ table is selected for every pixel and the other where it is fixed once selected.

- **Black-and-white reversal**

Black-and-white reversal is carried out by converting each 8-bit pixel data between 0 and 1 for each bit.



- **AE processing unit**

Histograms of image data output from the input processing unit (IC112) are generated in the AE processing unit (IC150).
Based on sampled image data for the A4R/11" × $8^{1/2}$" original, a histogram is created by analyzing the data into 20 levels based on the line memory darkness data. The CPU selects the optimum dither matrix data based on this histogram.

- **Zoom processing unit**

Processing for enlargement or reduction in the main scanning direction in zoom mode or processing in the main scanning direction in independent zoom mode is conducted at the zoom processing unit (IC103) based on the magnification ratio data computed by the CPU. Then pixel data is added or deleted at certain intervals to determine the actual enlargement or reduction.

Enlargement or reduction in the sub scanning direction is controlled by changing the original feed motor rotational speed which is done by servo motor control 2 PCB based on the magnification ratio data from the operation unit PCB.

Reduction

Image data from the input processing unit (IC112) is sent to the zoom processing unit (IC103) where a clock is generated by extending the image clock by a certain interval. The image data at IC103 is written line by line into SRAM using this newly created clock. Because of this, the image data in the SRAM has lost pixels at the certain intervals. When the data is read out of the SRAM sequentially using the image clock, line image data seems to be reduced.

Enlargement

Image data from the input processing unit (IC112) is sent to the zoom processing unit (IC103) where a clock is generated by extending the image clock by a certain interval. IC103 then writes this image data into SRAM line by line. The image data is read out of the SRAM in synch with the newly created clock. Because of this clock, some of the pixels of the image data stay on the data bus twice (in case of magnification ratio of 200%) as long as with the image clock.

When this data is sampled in synch with the image clock while being read into the filter processing unit (IC16), they are sampled twice (in case of magnification ratio of 200%) and the line image data is now enlarged in the main scanning direction.

- **Image shifting**

Image is shifted in the main direction by the zoom processing IC103 which changes the image read-out start address or image read-out timing from the line memory based on the image shift data from CPU IC111.

- **Mirror image**

Mirror image processing in the main scanning direction is conducted by IC103 which changes the image read-out start address from the line memory based on the image shift data from CPU IC111 and reversing the read-out order.

- **Filter processing unit**

When a mode is selected on the operation panel, the CPU sets a value corresponding to that mode on the register. This starts image differentiation or integration to make a copy as close to the original as possible by modifying the image continuity in accordance with the type of the original used. For example, when a photograph is used as original, integration is conducted at the filter processing unit. Differentiation is performed for originals with text. Integration and differentiation are conducted by IC61 and FIFO (256 kbytes × 4)(IC42, 43, 44 and 60).

- **Tone processing unit**

The tone processing unit consists of IC100 and SRAM (IC87, 88). The unit applies tone processing to image data sent from the filter processing unit. It also conducts grayscale modification from 256 to 32 levels for darkness control.

2-3-6 Backup PCB

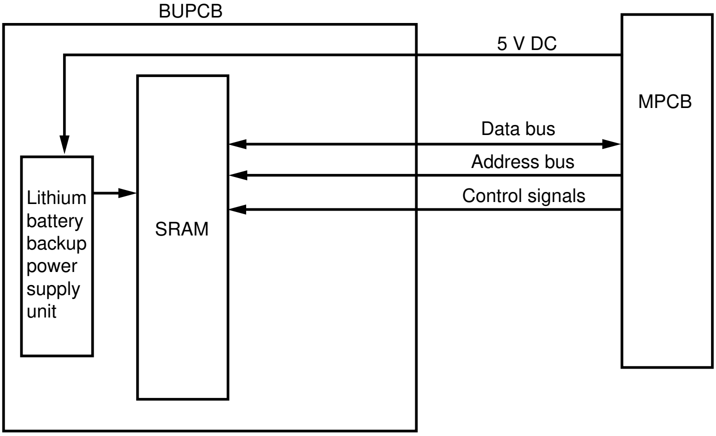


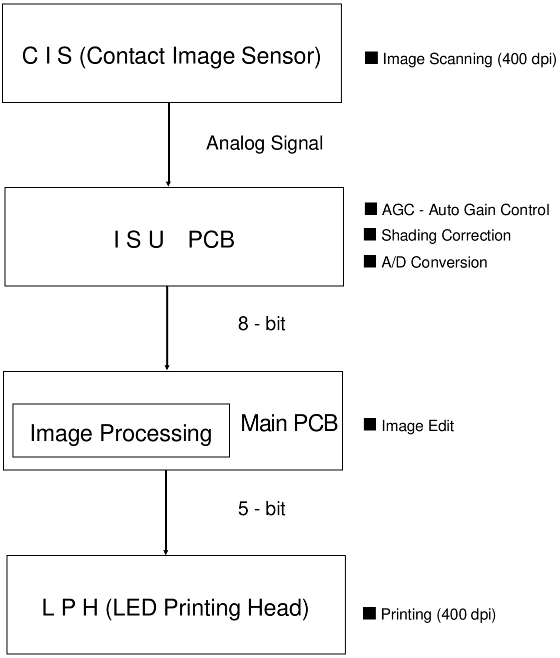
Figure 2-3-26 Backup PCB block diagram

Backup PCB (BUPCB) consists of SRAM, lithium battery BT1 and backup battery power supply unit and is connected to the main PCB with connectors. SRAM is connected to CPU IC111 on the main PCB via address bus, data bus and control signals. Normally the backup PCB is driven by the 5 V DC supplied from the main PCB. Once the power is shut off, or when the backup PCB is disconnected from the main PCB, the lithium battery (BT1) backup supply unit takes over. The SRAM then enters the data hold mode where memory contents are kept for extended periods of time at a power consumption rate of as low as a few µA.

Image Processing Overview

The CIS (Contact Image Sensor) reads one line of the original at 400 dpi resolution. The signal from the CIS is sent to the ISU board.

The analog signal from the CIS is changed into 8-bit digital data after applying AGC (Auto Gain Control) processing and shading correction. The data is edited in the image processing circuit in the main PCB, and finally output as 5-bit data (32 graduations) from the LPH (LED Printing Head).



2-3-7 ISU PCB

The ISU PCB consists of analog processing unit where original image data read by the contact image sensor (CIS) is held for sampling and A-D-converted, shading correction unit, line forming unit where shading-corrected data is turned into line memory and a CPU in charge of data control for the respective ISU blocks.
Image data from CIS is sent to the ISU PCB in synch with the ISU start signal. After being processed there, the data is further sent to the image processing unit on the main PCB. The CPU on the ISU PCB serially communicates with the CPU IC9 on the main PCB via TXD and RXD.

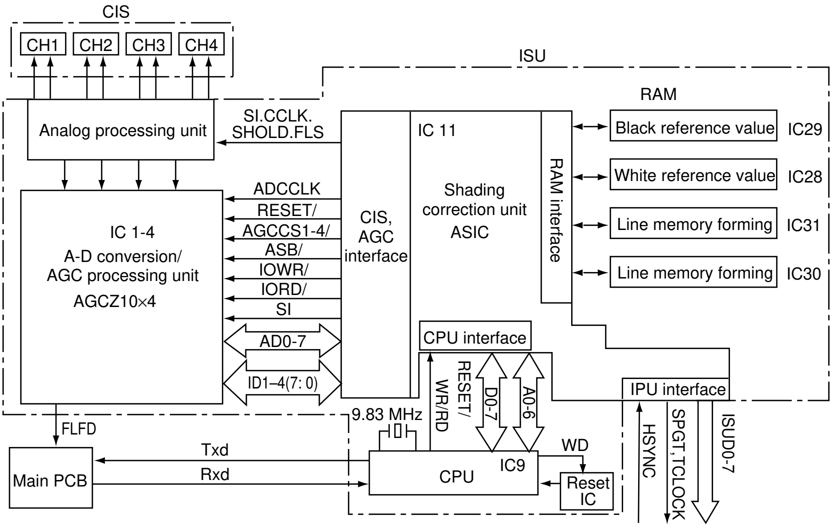


Figure 2-3-27 ISU PCB block diagram

(1) Analog processing unit

Four analog signals from the contact image sensor for one-line image data are output to the buffers of the analog processing unit in synch with start signal SI from the ISU PCB. As each sensor output has a high impedance, it is converted into a low-impedance signal by the buffer (IC42, 36, 34, 32) at the first stage. This signal is then held by the sample hold circuit in synch with the sample hold clock (SHOLD) from IC11 to isolate the image data voltage. The output from the sample hold circuit is non-inverting-amplified by IC*41*, 22, 19 and 16. As the voltage when the fluorescent lamp is on varies from channel to channel, gain adjustment is conducted at 4 V.

FLDA (IC38) prepares data for fluorescent lamp light intensity measurement (sensor output for the status where the contact glass is covered with white tape). This data is fed to the main PCB where it is A-D converted and comprared with the reference voltage.

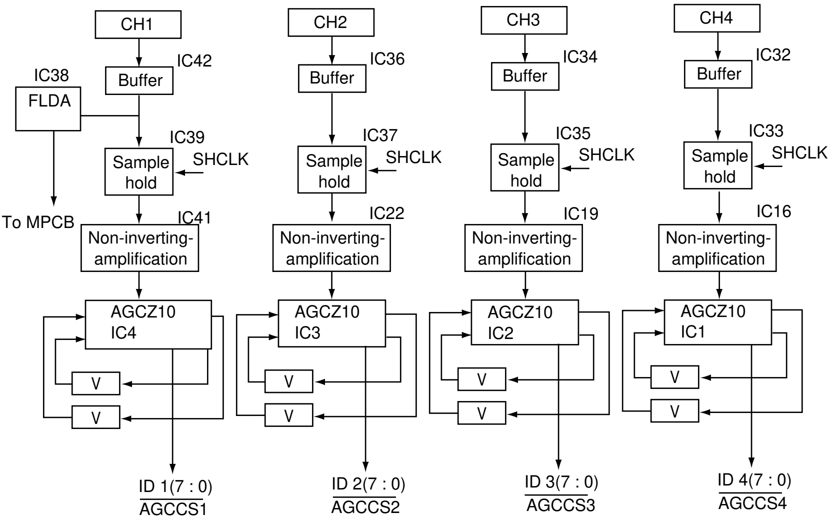


Figure 2-3-28

(2) A-D conversion/AGC processing unit

Image data from the contact image sensor is converted into 8-bit digital data by the A-D conversion circuit IC1. When reference voltages for A-D conversion are set to 5 V and 0 V, the weight of the digital data (ID0 – ID7) is 5-0/256, i.e. about 19.5 mV. However the data obtained using the white reference plate is smaller than 5 V for the absolute white. The black reference data also is larger than 0 V. Therefore the actual range that can be used for grayscale correction is narrow. AGC processing is conducted to expand this range to 0 to 5 V whenever the copier main switch is turned on.

(3) Shading correction circuit

Due to the dispersion in sensitivity of the photosensitive elements of the contact image sensor, uneven fluorescent lamp light distribution and distortion in the lens, there is a significant difference in the output voltage levels of the elements of the CIS. Shading correction is conducted to eliminate this difference every time an original is fed on the copier (or the first original in multiple-original copying).

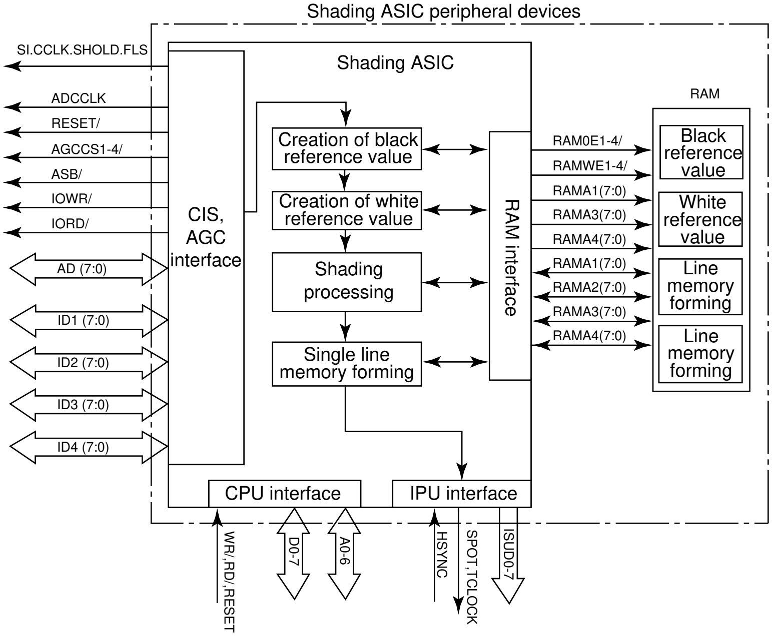


Figure 2-3-29 Shading correction circuit block diagram

2-3-8 Operation unit PCB

The operation unit PCB consists of keyboard input circuit, LED lighting circuit and display section, all controlled by one-chip CPU IC1. This four-bit CPU controls the keyboard inputs, display LED on/off and display on the operation panel according to the programs installed on it.

Data entered on the keyboard and data displayed on the LEDs and display section are processed as serial data and input to CPU IC111 at CN1-2 and output at CN1-4 in synch with clock signal SCL at CN1-6.

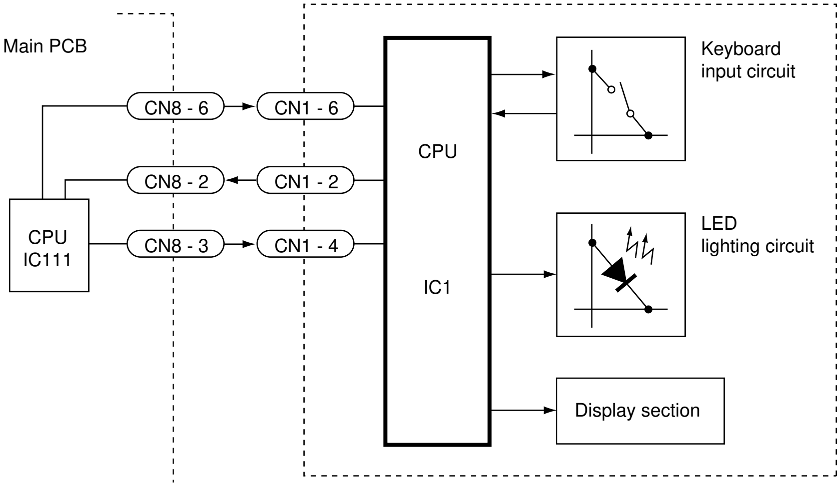


Figure 2-3-30 Operation unit PCB block diagram

2-3-9 Inverter PCB

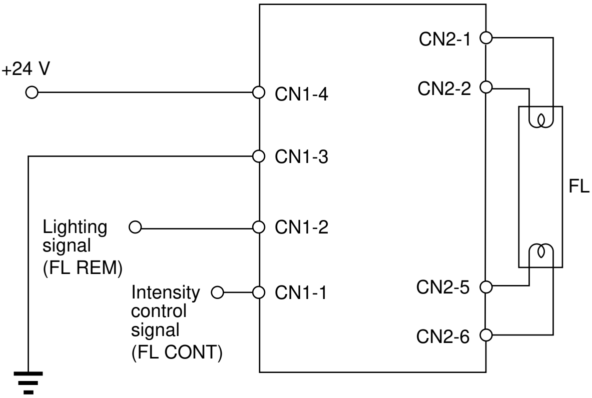


Figure 2-3-31 Inverter PCB block diagram

The inverter PCB consists of the high-frequency pulse generating circuit from which a high-frequency pulse of 37 kHz is emitted to the fluorescent lamp and the preheat circuit for the fluorescent lamp filaments.

- **Functions of signals**

FL REM (CN1-2), FL CONT (CN1-1): input signals
Fluorescent lamp light intensity is controlled via the light intensity control signal (FL CONT) from the main PCB. When lighting signal FL REM is at low, 37-kHz pulse is generated from the high-frequency pulse generating circuit and sent to the fluorescent lamp to turn it on. Then, as the control voltage of the FL CONT is increased, the lamp grows brighter; and as it is decreased, the lamp becomes dimmer (see Figure 2-3-31).

III

SET UP AND ADJUSTMENT SECTION

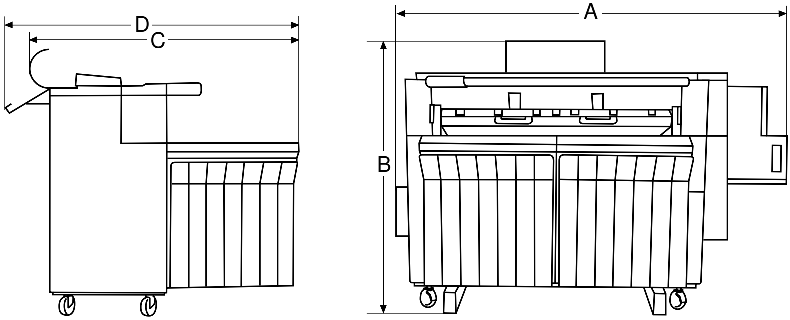
CONTENTS

3-1 Installation

3-1-1 Unpacking and installing the copier

(1) Installation environment

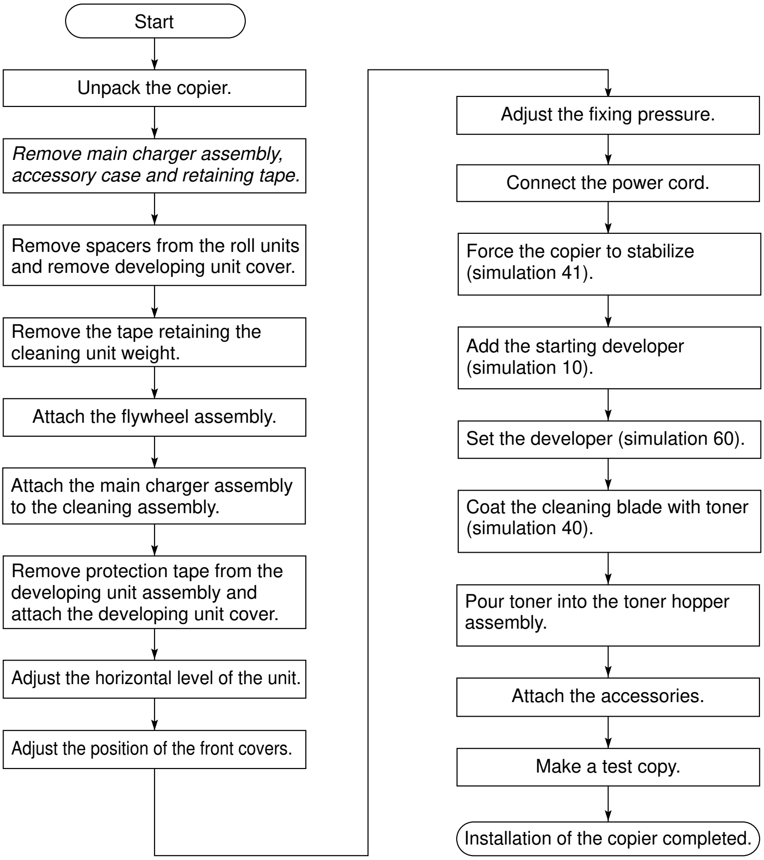
1. Temperature and humidity: 10°C – 35°C/50°F – 95°F, 15% – 85% RH
2. Power source: 120 V AC, *13* A/220 – 240 V AC, *8* A
3. Power source frequency stability: 50 Hz ± 0.3%, 60 Hz ± 0.3%
4. Installation location
   - Avoid locations with direct sunlight or bright areas such as near windows or with bright lighting. Be sure to avoid letting direct sunlight or bright light reach the photoconductor when removing jammed paper.
   - Avoid locations with high temperature or humidity, low temperature or humidity, and areas with sudden changes in temperature. Also avoid areas with hot or cold draughts.
   - Avoid areas with excessive dust or vibration.
   - Be sure that the platform or floor area can support the weight of the equipment.
   - Locate on a flat, horizontal surface (maximum inclination of 1°).
   - Avoid locations containing substances that could cause changes in the equipment or the photoconductor (mercury, alkali or acid vapors, inorganic gases, gases such as NOx and SOx, and chlorine-based organic solvents).
   - Choose a location with adequate ventilation.
5. There should be sufficient space for operation and maintenance of the equipment: 800 mm/$31^{1}/_{2}$" at front, 500 mm/$19^{11}/_{16}$" at right and 300 mm/$11^{13}/_{16}$" at rear and left.



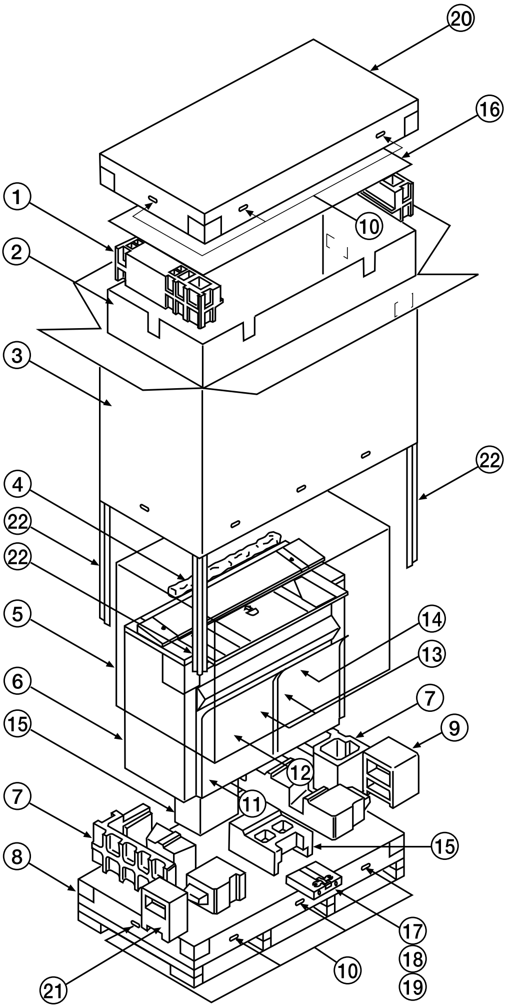
A: 1590 mm/$62^{19}/_{32}$"
B: 1168 mm/46"
C: 1107 mm/$43^{19}/_{32}$"
D: 1563 mm/$61^{17}/_{32}$"

Figure 3-1-1 Installation measurements

(2) Installation procedure



Unpack the copier.



1. Top pad
2. Inner case
3. Outer case
4. Main charger assembly
5. Dust cover
6. Machine body
7. Bottom pads
8. Skid
9. Front right pad
10. Hinge joint
11. Accessory case (see page 3-1-4 and Figure 3-1-3).
12. Spacers (between the upper and lower paper feed guides of the 1st and 2nd roll units).
13. Front cover pads (between each front cover and the copy bin).
14. Developing unit cover (secured with tape inside the 2nd roll unit).
15. *Inner pads*
16. Top board
17. Caster lever (Item No.: 67802210)
18. Flywheel assembly
19. Bronze binding screws, M4 × 8 (3)
20. Top case
21. Front left pad
22. *Props*

Figure 3-1-2 Unpacking

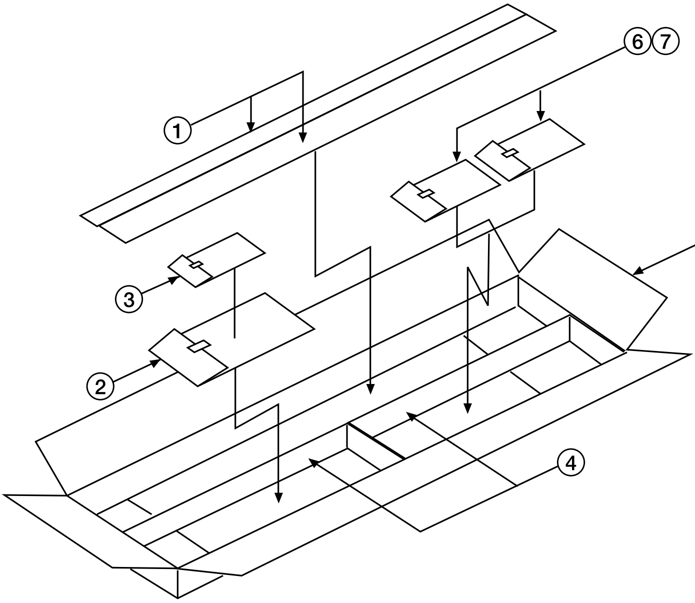


Figure 3-1-3 Accessory case

1. Paper roll shafts	5. Accessory case
2. Original loop guide	6. Main unit support plates (2)
3. Tray stoppers (2)	7. Main unit support covers (2)
4. Accessory spacer	

1. Remove the 14 hinge joints. (Packing case retainers), 6 top, 8 bottom.
2. Remove the top case, outer case, inner case, top board, top pad, four props, front right pad, and dust cover (see Figure 3-1-2).
3. Remove the tape retaining the front covers and copy bin.
4. Open the copy bin and remove the front cover pads (1 each on the right and left side) between the copy bin and the front covers. *Remove the tapes from the front cover magnets.*
5. Remove the front cover retainers (1 each on the right and left side: 4 screws).

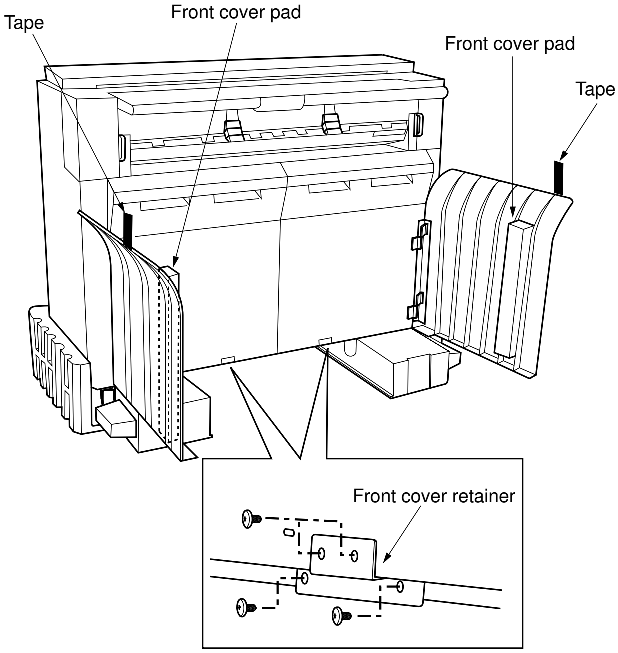


Figure 3-1-4

6. Open the front cover.
7. Remove the two screws on the stopper support plate attached to each front cover and remove a screw on the earth wire.
8. Lift a front cover, and pull out the pin on the front cover from the hinge on the main unit to detach the front cover. Remove the other front cover in the same manner.

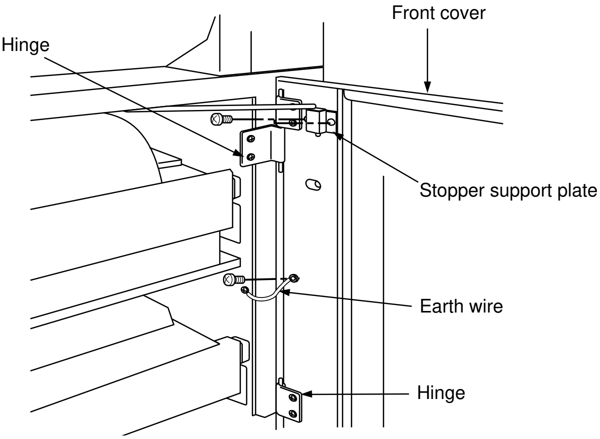


Figure 3-1-5

9. Attach the machine bolts to the holes (2 locations each on the front and rear) in the main unit.
   - Machine bolts are optional. (Item No.: 67868010).

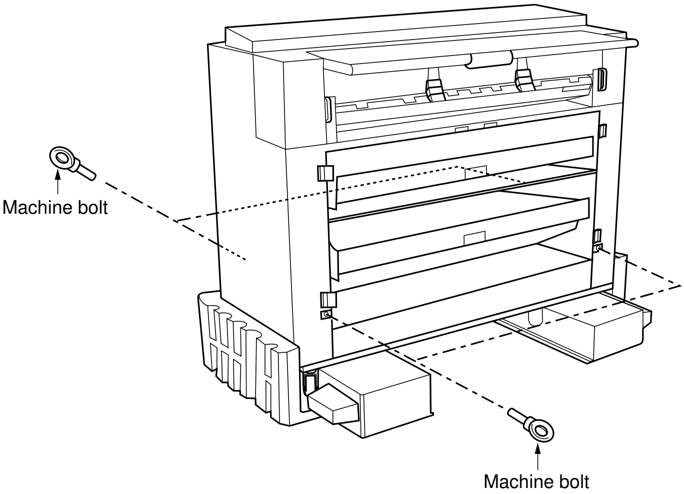


Figure 3-1-6

10. Pass a rope through the machine bolts attached to the front and rear of the right side of the main unit.
11. Lift the right side of the main unit with the rope to remove the bottom pad.
12. Remove the rope.
13. Pass the rope through the machine bolts attached to the front and rear of the left side of the main unit.
14. Lift the left side of the main unit with the rope to remove the bottom pad.
15. Lift the left side of the main unit with the rope again and carefully lower the left side of the main unit from the skid.
    - When removing the main unit from the skid, check that the nuts for adjusting height are completely tightened (with no space between each nut and the bottom base of the main unit). If you attempt to move the main unit when the nuts are not completely tightened, it may cause problems such as bending a bolt on the caster.
16. Remove the rope and pass it through the machine bolts attached to the right side of the unit again. Lift the right side of the main unit and carefully lower the main unit from the skid.
17. Remove the rope.
18. Detach the machine bolts from the main unit.

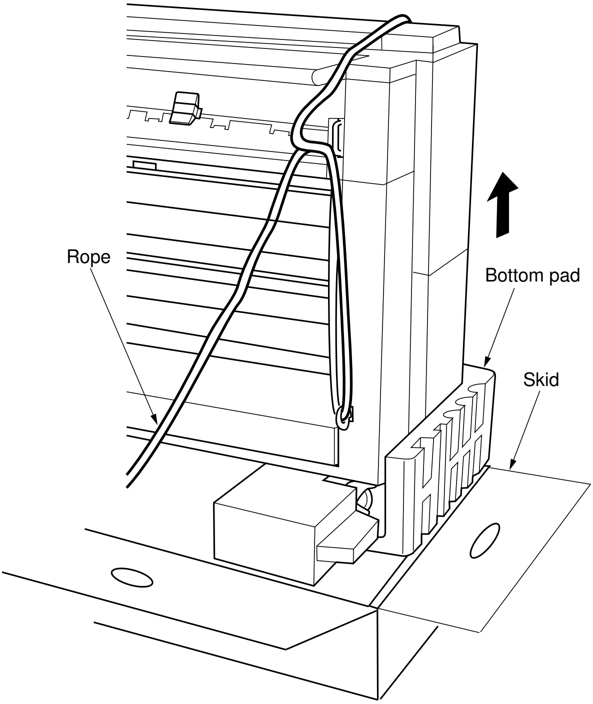


Figure 3-1-7

Remove the main charger assembly, accessory case and retaining tape.

1. Remove the main charger assembly secured to the original holding section with tape.
2. Take out the accessory case placed on the base assembly of the main unit.
3. Remove the tape retaining the original guide.
4. Remove the tape retaining the left and right paper eject guides.
5. Remove the tape retaining the power cord at machine rear.
6. *Remove the two tapes retaining the original holding section.*
7. *Open the original holding section and remove the two pads at the right and left.*

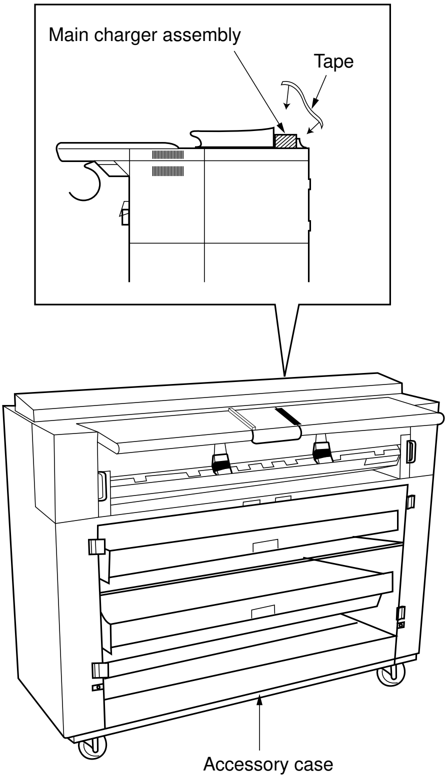


Figure 3-1-8

Remove spacers from the roll units and the developing unit cover.

1. Pull out the 1st roll unit.
2. Release the roll paper upper guide in the direction of the arrow by holding the roll paper insertion knobs.
3. Remove the roll unit spacer retained by tape.
4. Return the roll paper upper guide to the original position.
5. Insert the 1st roll unit back in the original position in the main unit.

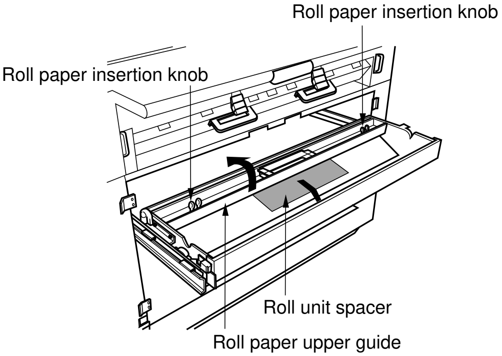


Figure 3-1-9

6. Pull out the 2nd roll unit.
7. Release the roll paper upper guide in the direction of the arrow by holding the roll paper insertion knobs.
8. *Remove the roll unit spacer.*
9. Return the roll paper upper guide to the original position.
10. Remove the developing unit cover attached to the bottom of the 2nd roll unit with tape.
11. Insert the 2nd roll unit back in the original position in the main unit.

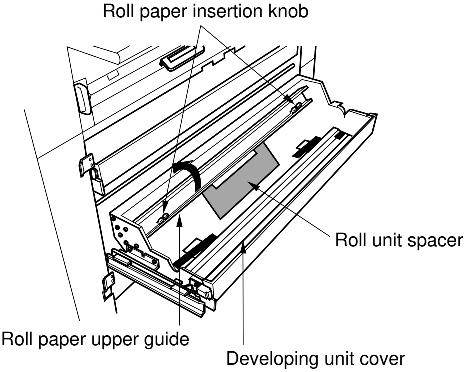


Figure 3-1-10

Remove the tape retaining the cleaning unit weight.

1. Open the original holding section.
2. Pull the main unit release lever to open the main unit.
3. Remove the tape retaining the cleaning unit weight.
4. Close the original holding section.

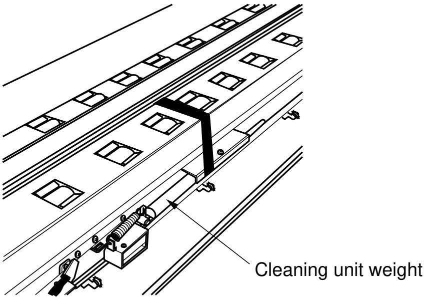


Figure 3-1-11

Attach the flywheel assembly.

1. Remove the screw from the upper right side cover and open the cover.
2. Align the notches in the flywheel assembly with the projections on the flywheel mount, and push the flywheel assembly into the main unit.
3. Align the screw holes in the flywheel assembly and the mount, and insert and tighten 3 M4 × 8 bronze binding screws.

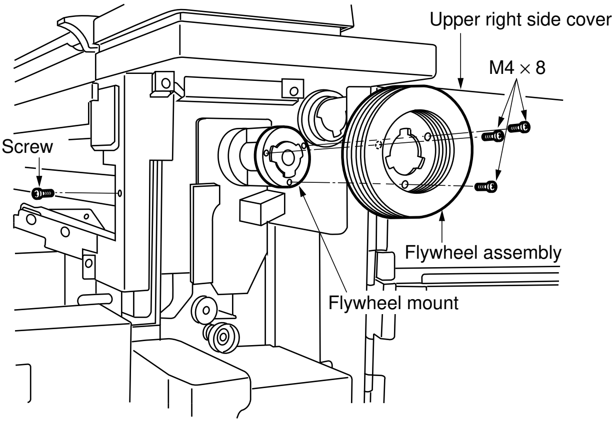


Figure 3-1-12

Attach the main charger assembly.

1. Remove the 9P connector on the cleaning unit assembly.

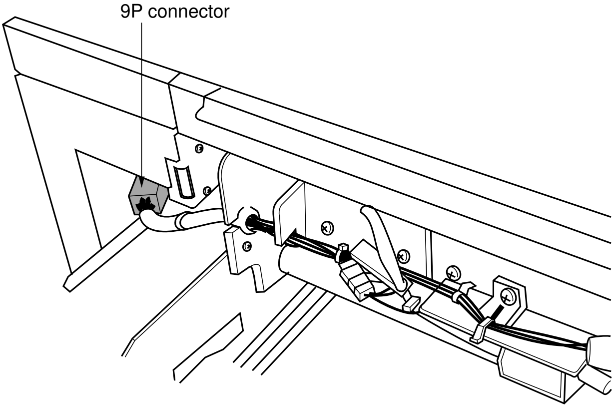


Figure 3-1-13

2. Open the right cover.
3. Push the toner collection pipe downward until it is held by the pin and locked in place.

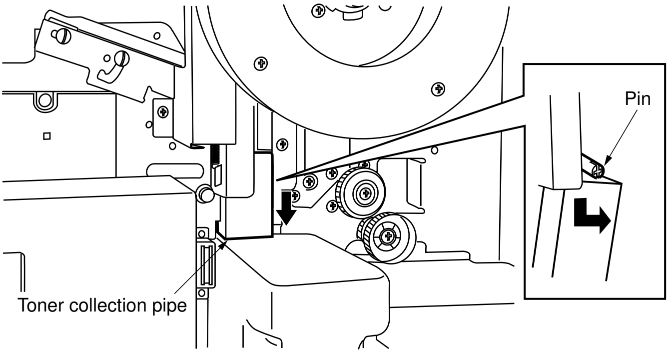


Figure 3-1-14

4. Remove the M3 × 8 screw holding the cleaning unit retention stopper.
5. Slide the cleaning unit retention stopper in the directions of the arrows ① and ② to unlock the stopper plate.
6. Pull the cleaning assembly toward you and remove the cleaning assembly from the main unit.

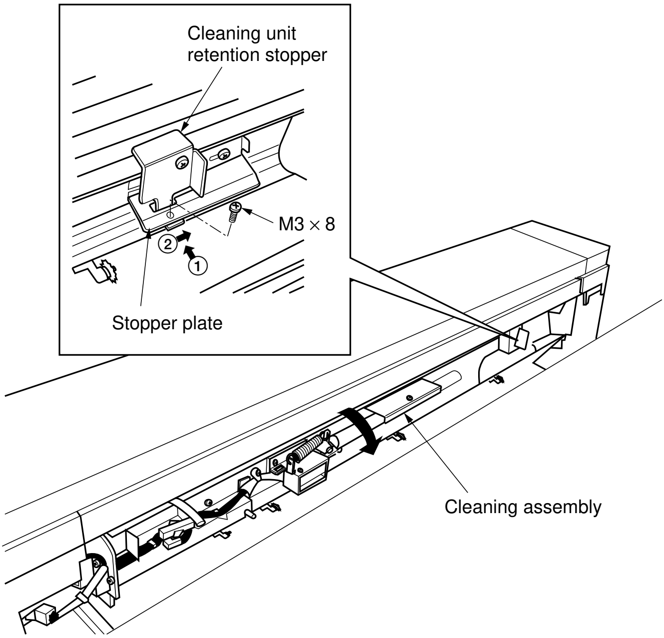


Figure 3-1-15

7. Loosen the two M4 × 8 screws holding the stopper plate, slide the plate all the way to the left and retighten the screws.

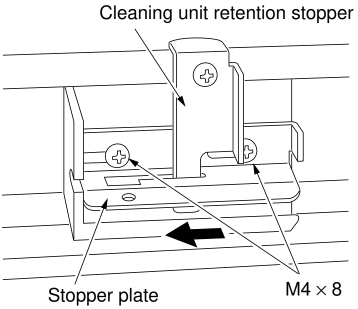


Figure 3-1-16

8. Fit the main charger assembly to the cleaning assembly by engaging the hinge on the main charger assembly with the groove in the cleaning unit retention stay. Then push the main charger assembly in the direction of the arrow.

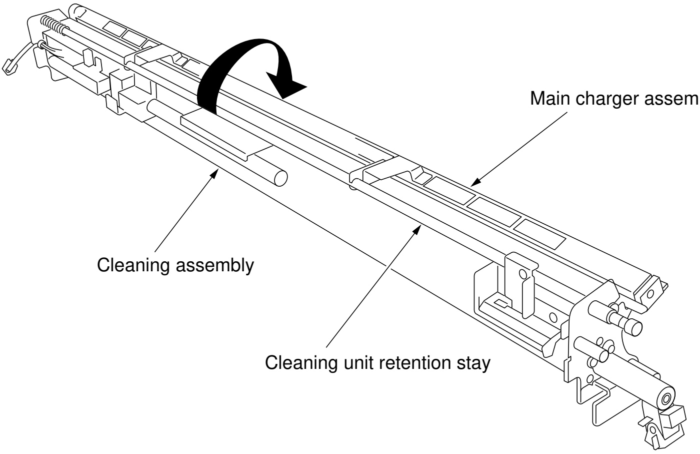


Figure 3-1-17

9. Attach the cleaning assembly to the main unit by inserting the cleaning unit retention stay in the larger hole in the rear of the left side plate of the main unit. (The small hole in front side is for shipment).

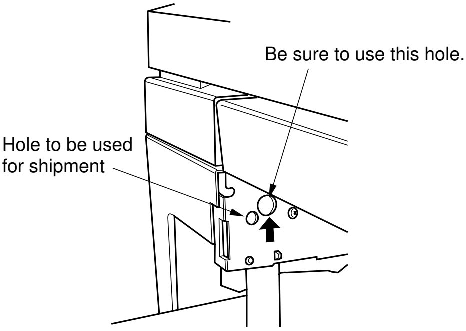


Figure 3-1-18

10. Slide the cleaning unit retention stopper to the left until it is held by the notch in the stopper plate. Tighten the stopper with an M3 × 8 screw.

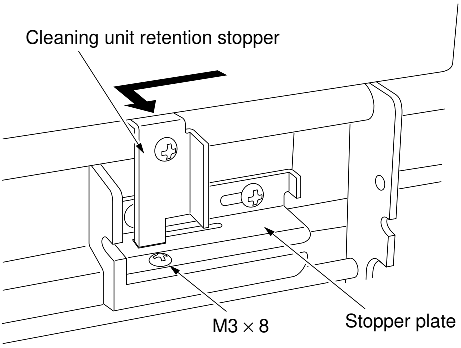


Figure 3-1-19

11. Refit the 9P connector of the cleaning assembly to its original position.
12. Disconnect the 3P connector on the cleaning solenoid.

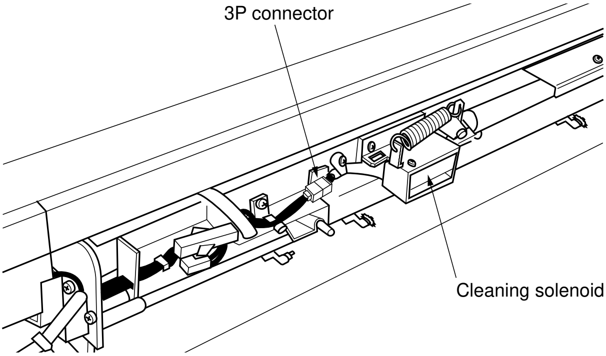


Figure 3-1-20

13. Release the toner collection pipe.

Caution:	Closing the right cover without releasing the toner collection pipe causes a message to be displayed requesting that the waste toner tank be checked; copying is also disabled.

14. *Remove the screw M4 × 6 in position Ⓐ on the collection pipe guide.*
15. *Remove the waste toner tank sponge assembly taped beside the waste toner tank. Secure the assembly in position Ⓑ with the screw M4 × 6 removed in step 14.*

Caution:	To detach the cleaning assembly for maintenance, remove the screw M4 × 6 and push the toner collection pipe down.

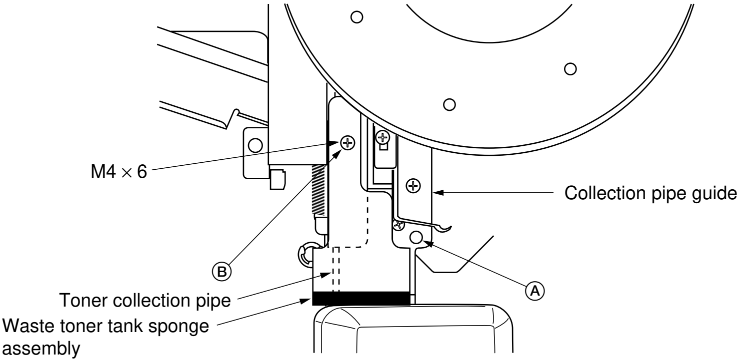


Figure 3-1-21

16. Close the upper right side cover and fix it with the screw.
17. Close the right cover.
18. Close the main unit.

Remove the protection tape from the developing unit assembly.

1. Loosen the two upper rear cover pins and open the upper rear cover.
2. Remove the two screws from the upper rear cover and a screw from the earth wire to remove the upper rear cover from the main unit.

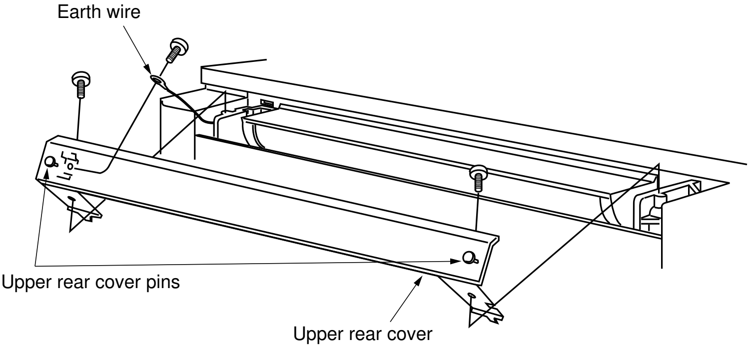


Figure 3-1-22

3. Remove the lower rear cover (four screws).
4. Disconnect the 1P connector and the 7P connector on the developing unit assembly.

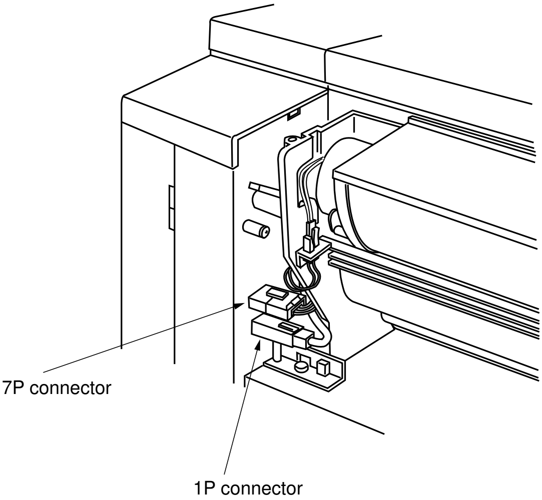


Figure 3-1-23

5. Loosen the screws of the developing unit retention plates attached on the left and right of the developing unit lower partition and rotate the developing unit retention plates toward the front.

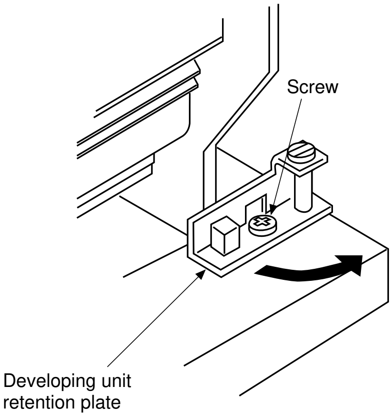


Figure 3-1-24

6. Detach the developing unit assembly from the main unit.
7. Disconnect the 3P connector from the toner feed motor.
8. Detach the toner hopper assembly from the developing unit assembly.
9. Remove the developing unit protection tape from both ends of the magnet roller.

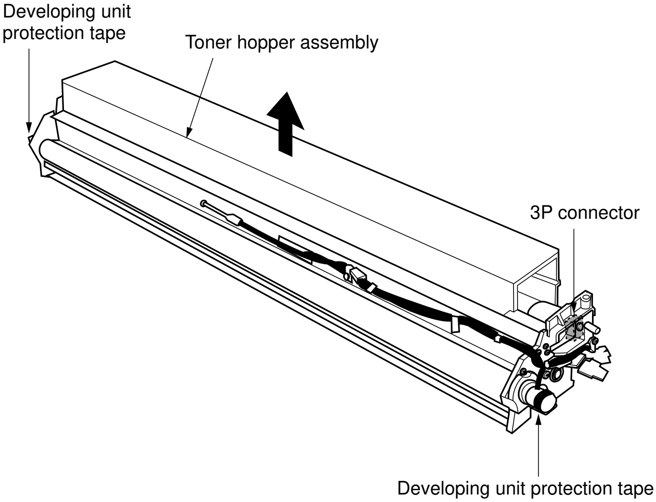


Figure 3-1-25

Attach the developing unit cover to the developing unit assembly.

1. Remove the clamp (1 screw) attached to the right side of the developing unit cover.

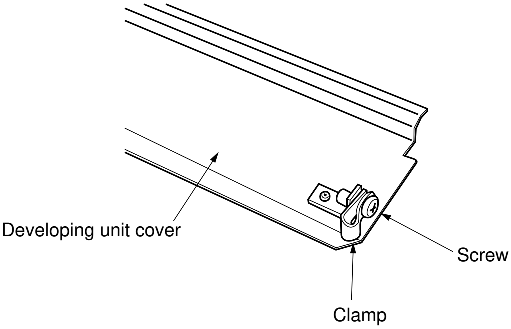


Figure 3-1-26

2. Insert the pin on the left side of the developing unit cover in the hole in the developing unit left plate to attach the cover to the developing unit assembly.
3. Use the clamp removed in step 1 to hold the wires as shown in Figure 3-1-27 and retain with the screw, being careful not to trap the wires. Check that there is no gap between the developing unit cover and the developing unit frame.

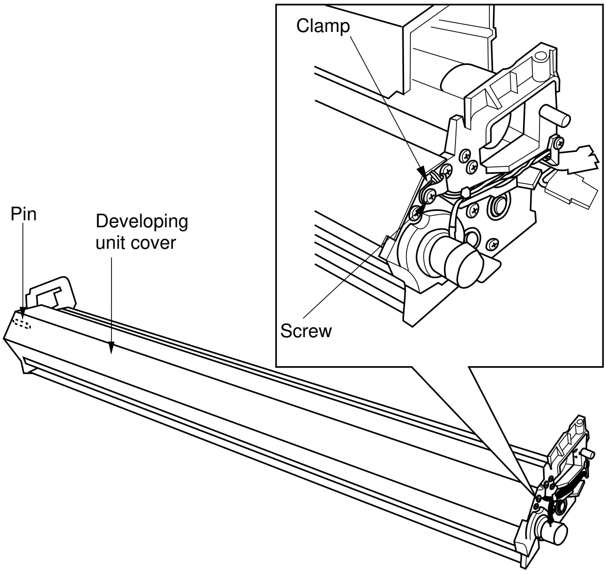


Figure 3-1-27

Adjust the horizontal level of the unit.

1. Place a level on the developing unit lower partition and check that the unit is horizontal in all the directions. If not adjust the adjustment nuts with the caster lever (Item No.: 67802210).
2. Attach the developing unit assembly to the main unit with the assembly pushed all the way to the machine left and secure with the developing unit retention lever.
3. Return the developing unit retention plates to the original positions and tighten their screws to secure. Before tightening the screws, make sure that the developing unit assembly is located all the way to the left of the main unit and the gear of the developing unit assembly meshes well with the gear of the main unit.
4. Connect the 1P connector and 7P connector on the developing unit assembly.

Attach the front covers and adjust the positions.

1. Attach the front covers to the main unit.
2. Open and close the front covers and check that there is no problem.
   * The front cover top edges and the edge of the bypass table should be on the same level.
   The switch contact plate should be securely inserted in the notch on the bypass table.
3. In case of abnormalities, adjust the positions of the front covers in the following procedure:
   - If a front cover is misaligned in the left/right direction
     Loosen the 2 screws A each on the top and bottom hinges, and move the front cover to the left or right to adjust, using the calibration marks engraved on the hinge section (long hole between the screws).
   - If a front cover is misaligned in the up/down direction
     Loosen the 2 screws B each on the top and bottom hinges and move the front cover up or down to adjust, using the calibration marks on the frame.

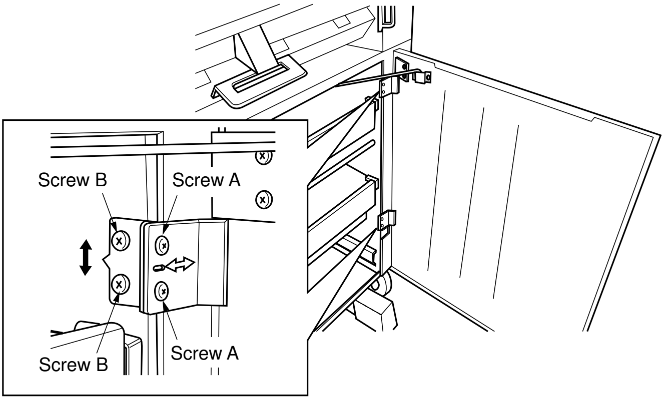


Figure 3-1-28

Adjust the fixing pressure.

1. Pull the main unit release lever to open the main unit.
2. Open the front covers.
3. Detach the front left and right removal covers (1 screw each).
4. Tighten the fixing unit pressure adjustment nuts until they are fast.
5. Reinstall the front left and right removal covers.
6. Remove the left cover (7 screws).
7. Close the main unit.
8. Close the front covers.

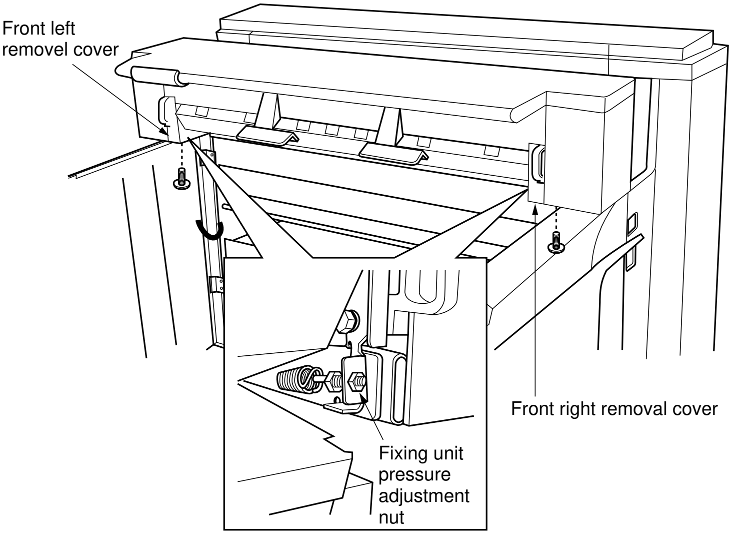


Figure 3-1-29

Connect the power cord.

1. Connect the power cord to a wall outlet.

Force the copier to stabilize (simulation 41) .

1. Force safety switch 6 on.
2. Turn the main switch on.
3. Enter 10871087 with the numeric keys to enter the simulation mode.
4. Enter 041 with the numeric keys.
5. Press the enter key. The copier enters the forced stabilization mode.

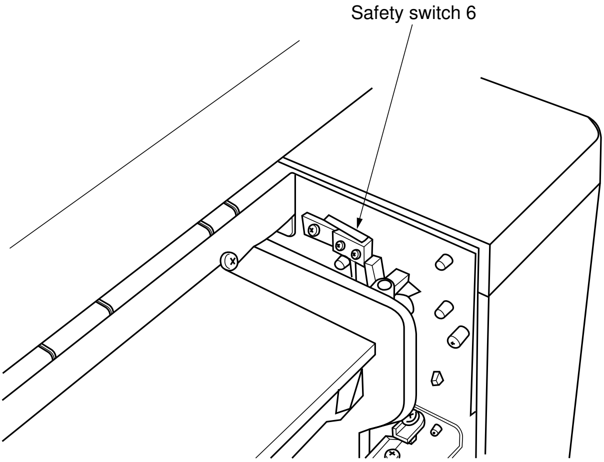


Figure 3-1-30

Add the starting developer (simulation 10).

Caution: Before adding the starting developer, ensure that developing unit assembly is located all the way to the machine left and the gear of the developing unit assembly meshes well with the gear of the main unit.

1. Shake the bottle of starting developer well to mix the developer.
2. Input 010 with the numeric keys.
3. Press the enter key. The unit starts operating.
4. Evenly pour the contents of 1 bottle of starting developer into the developing unit assembly.
5. After pouring, press the stop/clear key. The unit stops operating.

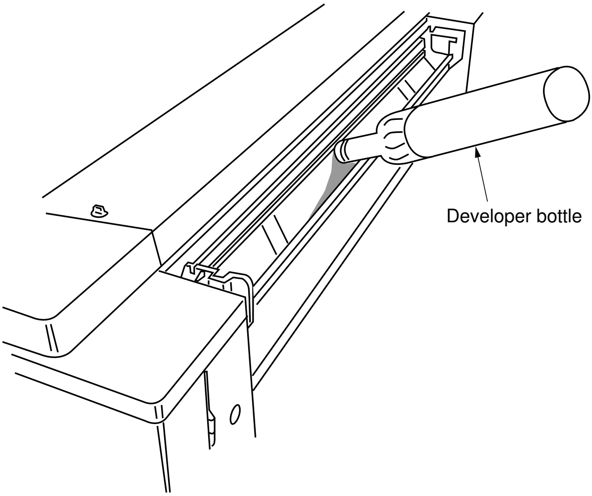


Figure 3-1-31

6. Attach the toner hopper assembly to the developing unit assembly. Do not connect the 3P connector of the toner feed motor yet.
7. Release safety switch 6 to turn it off.
8. Refit the rear upper cover.

Set the developer (simulation 60).

1. Input 060 with the numeric keys.
2. Press the enter key.
   - The unit starts operating. When 3 minutes have elapsed since the start of operation, the toner control voltage is automatically set and the value is shown on the display.
   - Do not apply shock or vibration to the main unit while it is operating.
   - The displayed value should be written on the simulation label.

Coat the cleaning blade with toner (simulation 40).

1. Pull the main unit release lever to open the main unit.
2. Refit the left cover (7 screws).
3. Connect the 3P connector of the cleaning solenoid and close the main unit.
4. Input 040 with the numeric keys.
5. Press the enter key.
   - After approximately 35 seconds have elapsed, the chime sounds and coating of toner on the cleaning blade is finished.
6. Turn the main switch off and on to cancel the forced stabilization mode and exit the simulation mode.

Pour toner into the toner hopper assembly.

1. Fit the 3P connector of the toner feed motor.
2. Shake a toner bottle well from side to side and up and down to mix the contents.
3. Remove the seal from the cap of the toner bottle.

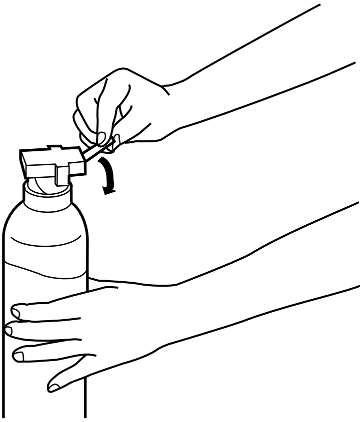


Figure 3-1-32

4. Open the hopper lid. Squeeze the tabs on both sides of the toner bottle cap and place the bottle, upside down, over the cartridge slot in the toner hopper on the machine right (see the figure).

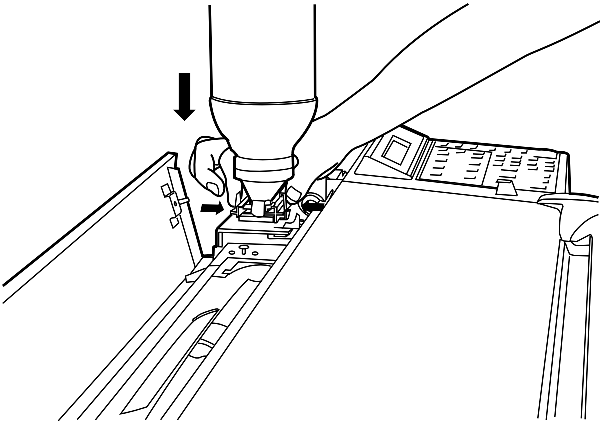


Figure 3-1-33

5. Hold the bottle at the lower part of it with one hand; slide the bottle to the machine center and then back to the original position *four or five times* while tapping the bottom with the other hand.

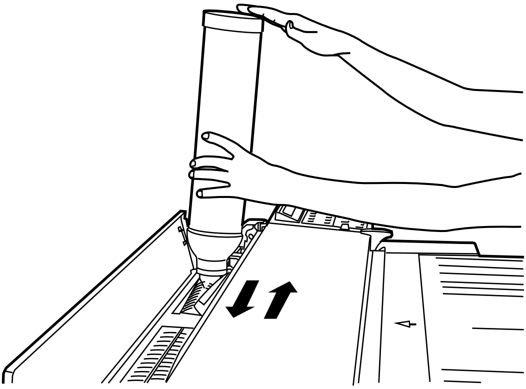


Figure 3-1-34

6. Hold the tabs at both ends of the bottle cap and pull the bottle away from the machine.

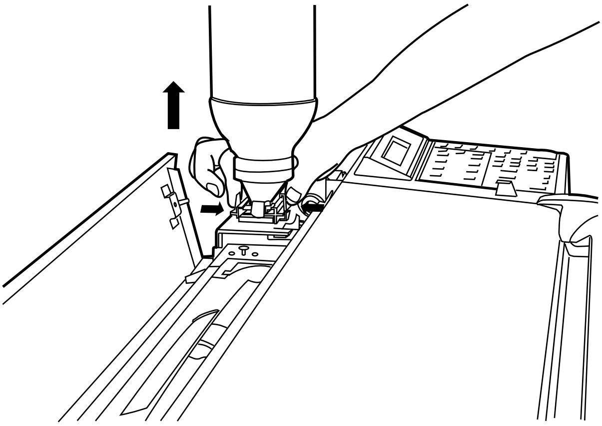


Figure 3-1-35

7. Pour toner into the toner hopper assembly in the same manner for the left side of the machine.
8. Put the hopper lid back in place.
9. Close the upper rear cover and retighten the pins.
10. Reinstall the lower rear cover.

Attach the accessories.

1. Attach the loop guide to the main unit by engaging the grooves in the loop guide with the two pins on the upper rear cover.
2. Open the copy bin and attach the tray stoppers to the left and right front covers by hanging the tray stopper claws in the tray stopper holes matching the desired size.
3. Close the copy bin.
4. Open the front covers.
5. Use the four M4 × 6 binding bronze screws that were used to install the front cover retainers to attach the 2 support assemblies to the main unit.
6. Close the front covers.

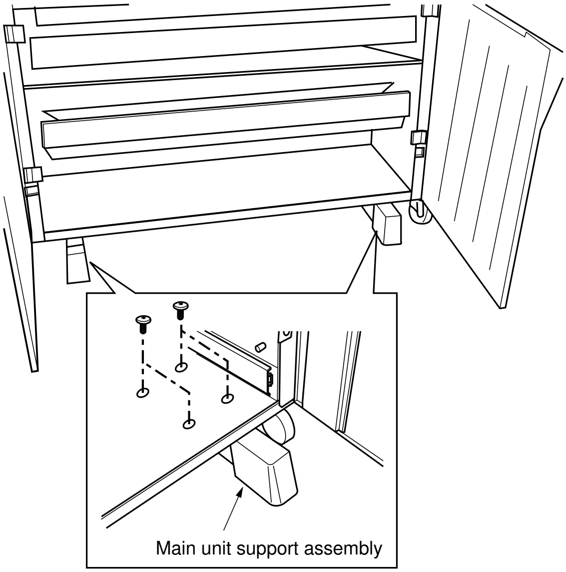


Figure 3-1-36

Make a test copy.

Completion of installation of the copier.

3-1-2 Copy mode initial settings

The factory settings for this machine are as shown below.

- Contents of settings

Sim. No.	Contents	Setting at factory	Settings
84	Exposure steps	13	*1: 13 STEPS*
87	*Auto shutoff function*	*Present*	*1: ON*
89	*Optional roll unit*	*Not installed*	*1: NO CON-NECT*
94	Maximum copy length for multiple copy mode	*1400 mm*	*1400*
95	Maximum copy length for roll/bypass mode	5000 mm	5000
96	*Action after paper empty detection* *Plain paper* *Tracing paper (vellum)* *Film*	 *10 s* *10 s* *1 s*	 *10 s* *10 s* *1 s*
97	*Switching between front and rear ejection of originals* *Single copy* *Continuous copy*	 *Rear ejection* *Front ejection*	 *1. EJECT* *2. RETURN*
98	Copy count timing	During feeding	MODE 1
User setting	Auto clear time	90 s	90
	Auto shutoff function	*Present*	0
	Preheat/energy saving mode	Energy saving mode	1
	Initial size mode	A size	———
	Initial copy mode	Same-size/full-size mode	———

3-1-3 Installing the key counter (optional)

Note that the following part is required in installing a key counter:
Key counter socket assembly *(Part No. 41529210)*

Procedure

1. Open the right cover.
2. Detach the right front cover.
3. Remove the three screws and detach the main switch assembly.
4. Remove the shorting plug from the 4P connector for the main unit key counter.

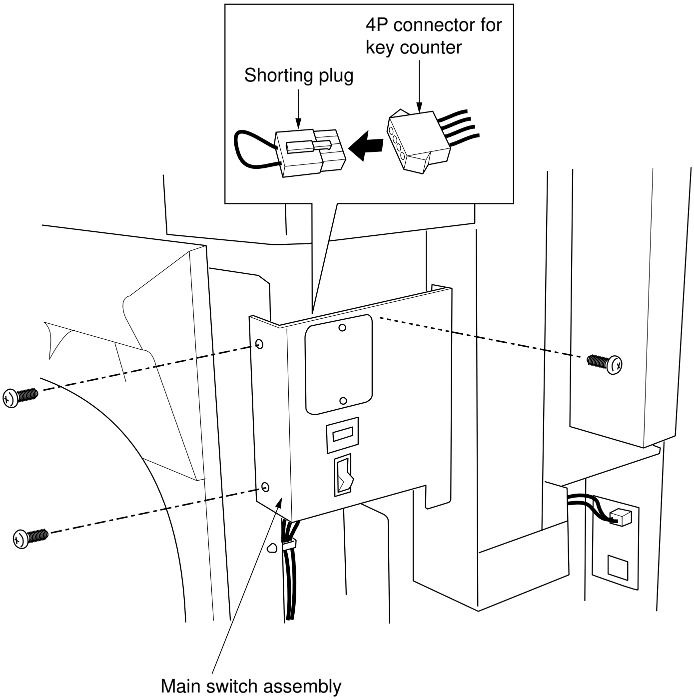
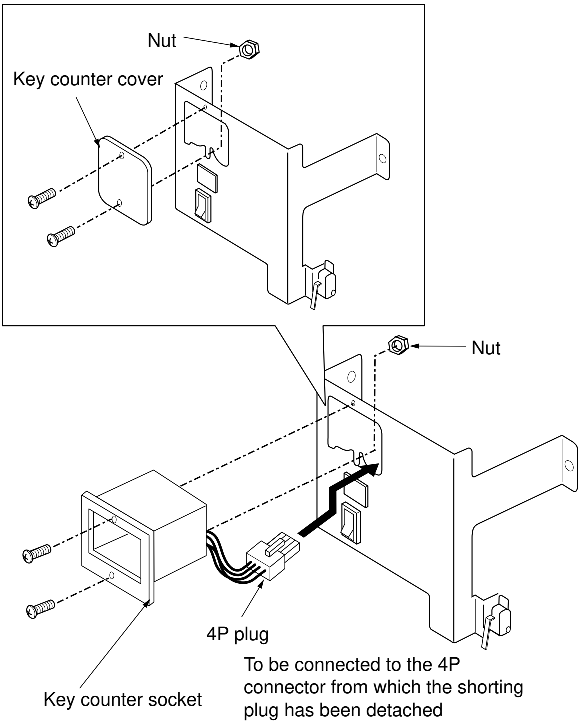


Figure 3-1-37

5. Remove the two screws (the lower one is fastened with a nut from the rear side) and detach the key counter cover.
6. Using the two screws removed in step 5, attach the key counter socket to the main switch assembly. Secure the lower screw from the rear with the nut.
7. Connect the 4P plug for the key counter socket to the key counter 4P connector on the main unit.



To be connected to the 4P connector from which the shorting plug has been detached

Figure 3-1-38

8. Reattach the main switch assembly to the main unit.
9. Refit the right front cover on the main unit.
10. Close the right cover.
11. Plug the power cord to a wall outlet then turn the main switch on.
12. Run simulation 82 and set KEY-CARD to 0.
13. Check that when the key counter is removed, “Insert key counter” is shown on the display.
14. Insert the key counter, make a test copy and check that the number of copies is counted correctly.

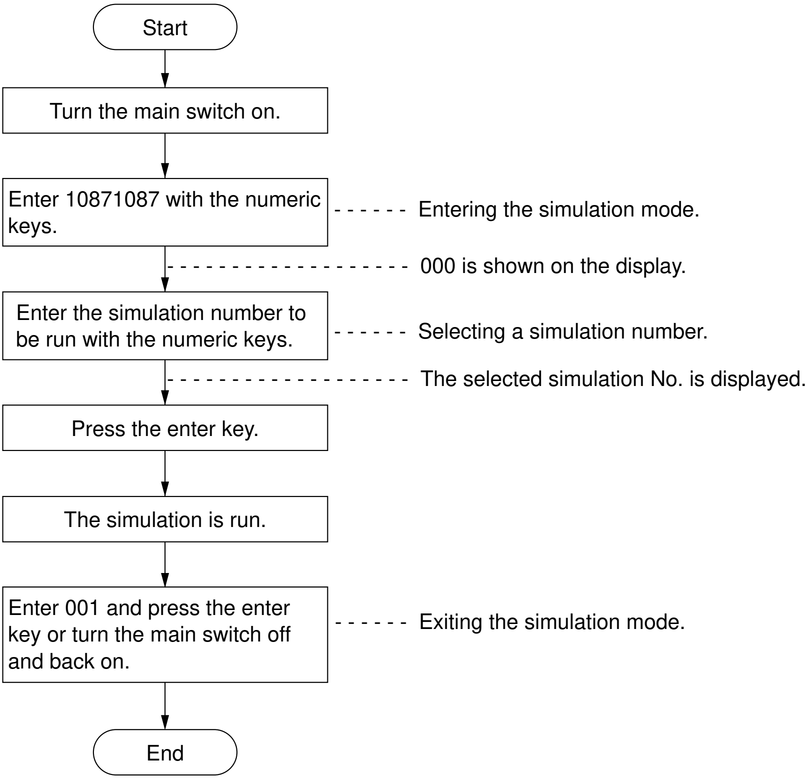
CONTENTS

3-2 Simulation

3-2-1 Simulation function

This copier is equipped with a simulation function which can be used to check the operation and allow adjustment of the electrical components.

(1) Running a simulation



(2) Simulation list

Section	Sim. No.	Simulation contents	Default
All	01	Exiting simulation mode	———
	03	Copying with original but no paper	———
Paper feed/ conveying	04	Checking paper feed clutch operation	———
		Names of clutches and order of activation: 1. Upper feed clutch 2. Middle feed clutch 3. Lower feed clutch (optional)	
	05	Checking winding clutch operation	———
		Names of clutches and order of activation: 1. Upper roll winding clutch 2. Middle roll winding clutch 3. Lower roll winding clutch (optional)	
	06	Checking roll paper conveying/registration clutch operation	———
		Names of clutches and order of activation: 1. Roll conveying clutch 2. Registration clutch	
	07	Checking cutter clutch operation	———
	08	Checking bypass clutch operation	———
		Name of clutch: Bypass registration clutch	

Section	Sim. No.	Simulation contents		Default
Paper feed/ conveying (cont.)	09	Checking switch operation		———
		Display	Switch	
		S0	Bypass registration switch	
		S1	Bypass timing switch	
		S2	Upper roll paper leading edge detection switch	
		S3	Middle roll paper leading edge detection switch	
		S4	Lower roll paper leading edge detection switch (optional)	
		S5	Registration switch	
		S6	Paper conveying switch	
		S7	Eject switch	
		PE	Fixing unit pulse sensor	
		P2	Upper pulse sensor	
		P3	Middle pulse sensor	
		P4	Lower pulse sensor (optional)	
	10	Checking drive motor operation		———
		Names of motors: 1. Drive motor 2. Fixing motor		
	11	Checking paper feed motor operation		———
	12	Checking counter operation		———
	17	Checking the lower roller unit (when the optional 3rd roll unit is installed)		———
	18	Checking fan motor operation		———
		Names of motors: LPH fan motor 1 LPH fan motor 2 Paper conveying fan motor Cooling fan motor Right fixing fan motor Left fixing fan motor		
	25	Adjustment for prescan in reduction copy mode		———
	26	Setting delay before original feed start		———

<table>
<tr><th>Section</th><th>Sim. No.</th><th colspan="2">Simulation contents</th><th>Default</th></tr>
<tr><td rowspan="7">Paper feed/ conveying (cont.)</td><td>53</td><td colspan="2">Adjusting 100% magnification</td><td>———</td></tr>
<tr><td>54</td><td colspan="2">Adjusting leading edge registration</td><td>———</td></tr>
<tr><td>55</td><td colspan="2">Adjusting synchrocut length (297 mm)</td><td>———</td></tr>
<tr><td>56</td><td colspan="2">Adjusting synchrocut length (1189 mm)</td><td>———</td></tr>
<tr><td>57</td><td colspan="2">Adjusting the leading edge margin</td><td>———</td></tr>
<tr><td>58</td><td colspan="2">Adjusting the trailing edge margin/displayed synchrocut length</td><td>———</td></tr>
<tr><td>59</td><td colspan="2">Adjusting the paper cut position for specified length cut mode</td><td>———</td></tr>
<tr><td rowspan="12">Optical</td><td rowspan="6">21</td><td colspan="2">Checking original size detection operation</td><td rowspan="6">———</td></tr>
<tr><td>Display</td><td>Original size</td></tr>
<tr><td>ORG SIZE L</td><td>B2/24" or larger</td></tr>
<tr><td>ORG SIZE M</td><td>B2 – B3/24" – 22"</td></tr>
<tr><td>ORG SIZE S</td><td>A3/18" or smaller</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td rowspan="5">22</td><td colspan="2">Checking original detection switch operation</td><td rowspan="5">———</td></tr>
<tr><td>Display</td><td>Switch</td></tr>
<tr><td>S1</td><td>Original leading edge detection switch</td></tr>
<tr><td>S2</td><td>Original trailing edge detection switch</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>24</td><td colspan="2">Checking original feed motor operation</td><td>———</td></tr>
<tr><td rowspan="6">Charging</td><td>31</td><td colspan="2">Ignoring developing control</td><td>———</td></tr>
<tr><td>33</td><td colspan="2">Turning the transfer charger on</td><td>———</td></tr>
<tr><td>34</td><td colspan="2">Turning the separation charger on</td><td>———</td></tr>
<tr><td>35</td><td colspan="2">Entering drum surface potential data for black & white mode</td><td>TRGT: 224
LPH_ON: 18</td></tr>
<tr><td>36</td><td colspan="2">Entering drum surface potential data for half-tone mode</td><td>TRGT:191
LPH: 9</td></tr>
<tr><td>39</td><td colspan="2">Displaying the thermistor outputs</td><td>———</td></tr>
<tr><td rowspan="3">Cleaning</td><td>40</td><td colspan="2">Coating the cleaning blade with toner</td><td>———</td></tr>
<tr><td>45</td><td colspan="2">Checking cleaning solenoid operation</td><td>———</td></tr>
<tr><td>48</td><td colspan="2">Checking separation claw solenoid operation</td><td>———</td></tr>
</table>

Section	Sim. No.	Simulation contents	Default
Charge erasing	44	Turning the cleaning lamps on	———
Fixing	41	Forced stabilization	———
	42	Displaying the fixing unit thermistor detection temperatures	———
	46	Setting fixing stabilization at low speed	———
	47	Checking fixing heater operation	———
Operation panel	50	Turning all the operation unit LEDs on	———
Developing	60	Loading developer	———
	61	Turning developing bias on	———
	63	Checking/changing toner control voltage	———
	64	Checking toner feed motor operation	———
	65	Displaying toner sensor output	———
		Display description: Toner sensor output value Toner sensor output value after temperature compensation Temperature detected by the developing unit thermistor	
	66	Entering toner sensor control level/copy count	———
	67	Selecting operation under the empty toner condition	———
Memory initialize	70	Initializing backup memory 1(Caution: Clears all RAM)	———
Counts			
	73	Displaying/clearing total paper feed count	———
			———
	75	Entering the service telephone No.	———
			———
Counts			———
	78	Displaying set data	———
	79	Specifying addresses/displaying data	———

Section	Sim. No.	Simulation contents	Default
Copy modes	80	Switching the counter counting units	———
	81	Selecting the language	———
	83	Selecting between metric/inch	———
	84	Selecting the No. of exposure steps	1: 13 STEPS
	85	Initializing backup memory 2	———
	86	Switching the fixing temperature	2: OTHERS
	87	Disabling cancellation of the auto shutoff function	1: ON
	89	Setting optional roll unit	1: NO CONNECT
	92	Setting potential correction intervals	3: 20 m
	94	Setting the maximum copy length for multiple copy mode	ORG MAX: 1400
	95	Setting the maximum copy length for roll/bypass mode	PAPER MAX: 5000
	96	Selecting the action after paper empty detection Plain paper Film Tracing paper	 10 s 1 s 10 s
	97	Switching between front and rear ejection of originals Single copy Continuous copy	 1: EJECT 2: RETURN
	98	Selecting the copy count timing	MODE: 1
	99	Displaying the ROM versions	———
	109	Setting the controller type	1. TYPE A
CIS	110	Checking fluorescent lamp operation	———
	111	Checking shading compensation operation	———
	112	Checking AGC processing operation	———
	113	Setting the shading mode	———
	120	Adjusting γ correction	———
	121	Adjusting gain	———
Image position alignment	132	Adjusting optical axis	0 mm
	133	Adjusting the image width in the main scanning direction	0 mm

Section	Sim. No.	Simulation contents	Default
Image quality	140	Adjusting exposure amount	———
	141	Adjusting half-tone image quality	———
	142	Adjusting AE optimum level	———
	143	Switching filter modes	———
	144	Adjusting filter gain	———
	145	Setting AE fine adjustment intervals	3
LPH	102	Gray output	———
	103	32-gradation output	———
	104	32-gradation output (without compensation)	———
	153	Selecting current correction value	———
	158	Adjusting focus	———
	159	Solid black test pattern output	———
Interface controller	115	Selecting the connection to the interface controller	———
	116	Setting the time to return from the offline condition	———
	117	Adjusting the leading edge registration (when connected to the interface controller)	———
Memory unit	160	Adjusting base 4 output density	———
	161	Adjusting thresholds (central exposure level)	———
	162	Adjusting base 4 thresholds simultaneously	———
	163	Adjusting Exp. 1.0 threshold	———
	164	Adjusting Exp. 7.0 threshold	———
	165	Setting the memory unit connection	———
	166	Selecting display of the “Output?” screen after restart	———
	167	Setting the AE scan	———
	168	Setting the maximum number of continuous copies	———
	170	Checking the memory unit DRAM	———
	172	Checking the memory unit HDD page management area	———
	173	Formatting the memory unit HDD	———
	174	Clearing programs 6 to 10	———
	175	Restoring programs 6 to 10	———
	176	Memory unit problem history	———
	177	Clearing the memory unit problem history	———
	178	Selecting memory output mode	———
	179	Checking the memory unit connection	———

(3) Contents of simulations

Sim. No.	Description
01	**Exiting simulation mode** **Description** Exits simulation mode and returns to normal mode. **Purpose** Used when closing simulation mode. **Method** Press the enter key. The copier returns to the normal mode.
03	**Copying with original but no paper** **Description** Makes copies without feeding paper. **Purpose** To check general machine operation. **Method** 1. Remove the paper, if any, from the paper source device that was used before starting this simulation. 2. Press the enter key. The copier waits for an original to be placed in position. 3. Put an original in place. The machine scans the original and displays the original length. Continuous simulated copying of the original then starts. **Completion** Press the stop/clear key. Copying stops when the original return step is completed for the current cycle.

Sim. No.	Description
04	**Checking paper feed clutch operation** **Description** Operates the upper, middle and lower feed clutches individually. **Purpose** To check the operation of the paper feed clutches when the primary paper feed fails. **Method** Press the enter key. The feed clutches are activated one by one in the following order and each remains on for 4 seconds. The paper feed motor also turns on. Upper feed clutch Middle feed clutch Lower feed clutch (optional) • To interrupt the simulation, press the stop/clear key. **Completion** Press the stop/clear key.
05	**Checking winding clutch operation** **Description** Operates the upper, middle and lower roll winding clutches individually. **Purpose** To check operation of the roll winding clutches when a problem arises while winding roll paper. **Method** Press the enter key. The roll winding clutches are activated one by one in the following order and each remains on for 4 seconds. The paper feed motor also turns on. Upper roll winding clutch Middle roll winding clutch Lower roll winding clutch (optional) • To interrupt the simulation, press the stop/clear key. **Completion** Press the stop/clear key.

Sim. No.	Description
06	**Checking roll paper conveying/registration clutch operation** **Description** Operates the roll paper conveying and registration clutches individually. **Purpose** To check the operation of the roll paper conveying clutch and registration clutch when the secondary paper feed fails. **Method** Press the enter key. The following clutches are activated one by one in the following order and each remains on for 4 seconds. The paper feed motor also turns on. Roll conveying clutch Registration clutch • To interrupt the simulation, press the stop/clear key. **Completion** Press the stop/clear key.
07	**Checking cutter clutch operation** **Description** Operates the cutter clutch. **Purpose** To check the cutting operation of rolled paper. **Method** Press the enter key. The cutter clutch is turned on. The paper feed motor also turns on. • After the cutter clutch has turned once, the related components turn off. **Completion** Press the stop/clear key.
08	**Checking bypass clutch operation** **Description** Operates the bypass registration clutch. **Purpose** To check operation of the bypass registration clutch when the bypass feed fails. **Method** Press the enter key. The bypass registration clutch is turned on. The paper feed motor also turns on. **Completion** Press the stop/clear key.

Sim. No.	Description
09	**Checking switch operation** **Description** Checks the actions of the switches on the paper path by feeding paper. **Purpose** To check switches when paper jams. **Method** 1. Press the enter key. 2. Select the paper source by pressing the paper source key. 3. Press the enter key. Paper feed starts and the actions of the switches can be checked. “*” is shown, starting at the extreme left; it moves toward the right as each switch is turned on. Bypass mode: S0 S1 S6 S7 PE 1st roll unit (LED1): S2 S5 S6 S7 P2 PE 2nd roll unit (LED2): S3 S5 S6 S7 P3 PE 3rd roll unit (LED3): S4 S5 S6 S7 P4 PE The actions of the following switches are checked. S0: Bypass registration switch S1: Bypass timing switch S2: Upper roll paper leading edge detection switch S3: Middle roll paper leading edge detection switch S4: Lower roll paper leading edge detection switch (optional) S5: Registration switch S6: Paper conveying switch S7: Eject switch PE: Fixing unit pulse sensor P2: Upper pulse sensor P3: Middle pulse sensor P4: Lower pulse sensor (optional) **Completion** Press the stop/clear key.
10	**Checking drive motor operation** **Description** Operates the drive motor. This simulation can be run after machine stabilization. To run this simulation before machine stabilization, run simulation 41 first. **Purpose** Used when loading the developer to drive the developing section. **Method** Press the enter key. The drive motor, the fixing motor, developing bias and pre-charging lamp turn on. **Completion** Press the stop/clear key to stop the components.

Sim. No.	Description
11	**Checking paper feed motor operation** **Description** Operates the paper feed motor. **Purpose** To check the drive in the paper feed section. **Method** Press the enter key. The paper feed motor starts to rotate. **Completion** Press the stop/clear key to stop the motor.
12	**Checking counter operation** **Description** Increments the counts on the total counter and the key counter without making copies. **Purpose** To check the operation of the total counter and the optional key counter. **Method** Press the enter key. Each time the enter key is pressed, the counts on the total counter and the key counter are incremented and the values are shown on the display. **Completion** Press the stop/clear key.
17	**Checking the lower roller unit** **Description** Checks the installation of the optional 3rd roll unit. **Purpose** Used when installing the 3rd roll unit. **Method** Press the enter key. The correct installation of the 3rd roll unit can be checked as “PULSE ∗” is displayed. **Completion** Press the stop/clear key to stop the unit.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>18</td><td>
Checking fan motor operation
Description
Operates the fan motors individually.
Purpose
To check operation of the fan motors.
Method
Press the enter key. A step number is shown on the display.
Selection
Press the leading edge margin key to change the step number.
STEP1: LPH fan motors 1, 2 on
STEP2: LPH fan motors 1, 2 half-speed
STEP3: Cooling fan motor full-speed
STEP4: Cooling fan motor half-speed, Right/left fixing fan motors half-speed
STEP5: Right/left fixing fan motors full-speed
STEP6: Right/left fixing fan motors off, paper conveying fan motor half-speed
STEP7: Paper conveying fan motor full-speed
STEP8: Paper conveying fan motor off
Completion
Press the stop/clear key.
</td></tr>
<tr><td>21</td><td>
Checking original size detection operation
Description
Displays original size detection action.
Purpose
To check operation of original size switches 1 and 2 when the original size is not detected correctly.
Method
1. Press the enter key.
2. Slide the original guides according to the original size. Check that the indication on the display is correct by referring to the table below.
<table>
<tr><th>Original size</th><th>Display</th></tr>
<tr><td>B2/24" or larger</td><td>ORG SIZE L</td></tr>
<tr><td>B2 – B3/24" – 22"</td><td>ORG SIZE M</td></tr>
<tr><td>A3/18" or smaller</td><td>ORG SIZE S</td></tr>
</table>
Completion
Press the stop/clear key.
</td></tr>
</table>

Sim. No.	Description
22	**Checking original detection switch operation** **Description** Displays the actions of the original leading/trailing edge detection switches. **Purpose** To check the original leading/trailing edge detection switches when the original feed fails. **Method** 1. Open the original holding section. 2. Press the enter key. “S1 S2” is shown on the display. 3. Turn the original leading edge detection switch on. An asterisk is shown against S1 on the display. 4. Turn the original trailing edge detection switch on. An asterisk is shown against S2 on the display. **Completion** Press the stop/clear key.
24	**Checking original feed motor operation** **Description** Operates the original feed motor. **Purpose** To check the operation of the original conveying system. **Method** Press the enter key. The following operations take place every 4 seconds. Original feed motor rotates forward Original feed motor reverses Original feed motor off **Completion** Press the stop/clear key.
25	**Adjustment for prescan in reduction copy mode** **Adjustment** See page 3-3-30-11.

Sim. No.	Description
26	**Setting delay before original feed start** **Description** Sets the time to turn the original feed clutch on after the original leading edge detection switch is turned on. **Purpose** To facilitate copying for unaccustomed users by extending the time to start primary original feed after the insertion of original. **Method** Press the enter key. **Setting** Select the setting with the mode set keys. Setting description: time from original leading edge detection switch ‘on’ to original feed clutch ‘on’ 1: 0.64 sec 2: 2 sec 3: 3 sec 4: 4 sec 5: 5 sec **Completion** Press the stop/clear key.

Sim. No.	Description
31	**Ignoring developing control** **Description** Sets whether developing control is ignored or not. **Purpose** To operate the machine with the developing section removed. **Method** Press the enter key. **Setting** Choose a setting with the mode set keys. Display: 1: CANCEL OFF — Setting description: Developing control used Display: 2: CANCEL ON — Setting description: Developing control ignored **Completion** Press the stop/clear key.
33	**Turning the transfer charger on** **Description** Performs transfer charging. **Purpose** To check if transfer charging is performed correctly when a transfer problem occurs. **Method** Press the enter key. Transfer charging starts. **Completion** Press the stop/clear key. Transfer charging ends.
34	**Turning the separation charger on** **Description** Performs separation charging. **Purpose** To check if separation charging is performed correctly when a separation problem occurs. **Method** Press the enter key. Separation charging starts. **Completion** Press the stop/clear key. Separation charging ends.

Sim. 31 setting table:

Display	Setting description
1: CANCEL OFF	Developing control used
2: CANCEL ON	Developing control ignored

Sim. No.	Description
35	**Entering drum surface potential data for black & white mode**

Description
Sets the drum surface potential in black & white (character) mode.

Purpose
To enter the value written on the simulation label after replacing the backup PCB or simulation 70 has been run.

Method
Press the enter key.

Selection
Select the setting with the leading edge margin key or left margin key. The current setting value is shown on the display.

Setting
Change the setting value with the mode set or numeric keys.

Display	Setting description	Setting range	Default
TRGT	Drum surface potential in black & white (character) mode	0 – 255	224
LPH ON	LPH output in black & white (character) mode	0 – 255	18

Completion
Press the stop/clear key.

Sim. No.	Description
36	**Entering drum surface potential data for half-tone mode**

Description
Sets the drum surface potential in half-tone mode.

Purpose
To enter the value written on the simulation label after replacing the backup PCB or simulation 70 has been run.

Method
Press the enter key.

Selection
Select the setting with the leading edge margin key or left margin key. The current setting value is shown on the display.

Setting
Change the setting value with the mode set or numeric keys.

Display	Setting description	Setting range	Default
TRGT HLF	Drum surface potential in half-tone mode	0 – 255	191
LPH ON HLF	LPH output in half-tone mode	0 – 255	9

Completion
Press the stop/clear key.

<table>
<tr><th>Sim.
No.</th><th>Description</th></tr>
<tr><td>39</td><td>
<p>Displaying the thermistor outputs</p>
<p>Description
Displays the detected temperatures of the thermistors.</p>
<p>Purpose
To check the temperatures inside and outside the machine and near the fluorescent lamp.</p>
<p>Method
Press the enter key. The detected temperatures (°C) of the following thermistors are shown on the display.</p>
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>DTH</td><td>Dehumidifier thermistor (temperature inside the machine)</td></tr>
<tr><td>ATMO</td><td>External temperature thermistor (temperature outside the machine)</td></tr>
<tr><td>LTH</td><td>Fluorescent lamp thermistor (temperature near the fluorescent lamp)</td></tr>
</table>
<p>Completion
Press the stop/clear key.</p>
</td></tr>
</table>

Sim. No.	Description
40	**Coating the cleaning blade with toner** **Description** Applies toner to the cleaning blade by coating the drum with toner. This simulation can be run after machine stabilization. To run this simulation before machine stabilization, run simulation 41 first. **Purpose** Used when replacing the cleaning blade or drum or installing the copier. **Method** Press the enter key. The following operations take place: Cleaning solenoid turns off. 0.1 s later ↓ Developing bias (600 V DC) and drive motor turn on. (Toner is applied to the drum.) 4.5 s later ↓ Drive motor turns off 0.5 s later ↓ Cleaning solenoid turns on 0.5 s later ↓ Drive motor turns on (The blade cleans the toner off the drum, so coating the blade.) 29.5 s later ↓ Drive motor, developing bias and cleaning solenoid turn off. **Completion** Press the stop/clear key.
41	**Forced stabilization** **Description** The copier enters the forced stabilization mode before the fixing section is heated to the stabilization temperature level. **Purpose** Used when setting the initial value of the developer. **Method** Press the enter key. The copier enters the forced stabilization mode and the ready lamp lights. **Completion** Turn the main switch off and on to exit the forced stabilization mode.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>42</td><td>

Displaying the fixing unit thermistor detection temperatures

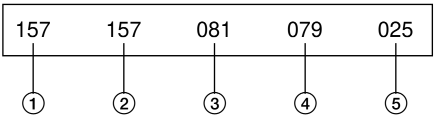
Description
Displays detected temperatures of fixing unit thermistors 1 to 4 and the external temperature thermistor.

Purpose
To check the fixing temperature when a fixing problem occurs.

Method

1. Press the enter key. The current temperatures detected by fixing unit thermistors 1 to 4 and the external temperature thermistor are shown on the display in °C.
2. Press the special paper select key to choose the paper type. The fixing temperature control changes according to the paper type and the current thermistor detection temperatures are displayed.

Display example



<table>
<tr><th>Data No.</th><th>Detection temperature</th></tr>
<tr><td>①</td><td>Temperature detected by fixing unit thermistor 1
(the temperature around the center of the heat roller)</td></tr>
<tr><td>②</td><td>Temperature detected by fixing unit thermistor 2
(the temperature at the end of the heat roller)</td></tr>
<tr><td>③</td><td>Temperature detected by fixing unit thermistor 3
(the temperature around the center of the press roller)</td></tr>
<tr><td>④</td><td>Temperature detected by fixing unit thermistor 4
(the temperature at the end of the press roller)</td></tr>
<tr><td>⑤</td><td>Temperature detected by external thermistor
(temperature outside the machine)</td></tr>
</table>

Completion
Press the stop/clear key.

</td></tr>
</table>

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>44</td><td>

Turning the cleaning lamps on

Description
Turns the pre-charging and post-transfer lamps on.

Purpose
To check the operation of the lamps when an offset occurs.

Method
Press the enter key. The pre-charging and post-transfer lamps turn on.

Completion
Press the stop/clear key. All the components are turned off.

</td></tr>
<tr><td>45</td><td>

Checking cleaning solenoid operation

Description
Operates the cleaning solenoid.

Purpose
To check cleaning solenoid operation when an offset occurs.

Method
Press the enter key. The cleaning solenoid turns on.

Completion
Press the stop/clear key. The cleaning solenoid turns off.

</td></tr>
<tr><td>46</td><td>

Setting fixing stabilization at low speed

Description
Sets the fixing motor control when the fixing temperature falls to 80°C/176°F or below.

Purpose
To heat the press roller evenly when copy paper is wrinkled.

Method
Press the enter key. The current temperature is shown on the display.

Setting
Change the setting with the mode set keys.

<table>
<tr><th>Display</th><th>Setting description</th></tr>
<tr><td>1 OFF</td><td>The fixing motor does not start rotating at low speed.</td></tr>
<tr><td>2 ON</td><td>The fixing motor rotates at low speed when the fixing temperature falls to 80°C/176°F or below.</td></tr>
</table>

Caution: When 1 is selected, copying is possible even if the surface temperature is not correct. However, copying in this condition may lead to image problems. We cannot guarantee the performance since problems may be caused by such operation.

Completion
Press the stop/clear key.

</td></tr>
</table>

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>47</td><td>Checking fixing heater operation
Description
Turns fixing heaters M and S on.
Purpose
To check the operation of fixing heaters M and S.
Method
Press the enter key. Fixing heaters M and S turn off.
Selection
Select a heater to be turned on with the leading edge margin key or left margin key and then press the enter key. The selected heater turns on.
<table>
<tr><th>Display</th><th>Operation description</th></tr>
<tr><td>HEAT1 DARK</td><td>Fixing heater M on</td></tr>
<tr><td>HEAT1 LIGHT</td><td>Fixing heater M on</td></tr>
<tr><td>HEAT2 DARK</td><td>Fixing heater S on</td></tr>
<tr><td>HEAT2 LIGHT</td><td>Fixing heater S on</td></tr>
</table>
Completion
Press the stop/clear key to turn the heater off.</td></tr>
<tr><td>48</td><td>Checking separation claw solenoid operation
Description
Operates the separation claw solenoid.
Purpose
To check the operation of the separation claw solenoid when a separation problem occurs.
Method
Press the enter key. The separation claw solenoid turns on.
Completion
Press the stop/clear key. The separation claw solenoid turns off.</td></tr>
</table>

Sim. No.	Description
49	Turning the drum heater on Description Turns on the drum heater. Purpose To check drum heater operation Method Press the enter Key, Fixing heater turns off and drum heater turns on for 20 seconds. Completion This mode automatically stops after 20 seconds.

Sim. No.	Description
50	**Turning all the operation unit LEDs on** **Description** Turns LEDs on the operation panel on. **Purpose** To check the indicators and ready-lamp on the operation panel. **Method** Press the enter key. All the indicators and the ready lamp on the operation panel turn on. **Completion** Press the stop/clear key. All the indicators and the ready lamp turn off.
53	**Adjusting 100% magnification** **Adjustment** See page 3-3-22.
54	**Adjusting leading edge registration** **Adjustment** See page 3-3-23.
55	**Adjusting synchrocut length (297 mm)** **Adjustment** See page 3-3-6.
56	**Adjusting synchrocut length (1189 mm)** **Adjustment** See page 3-3-3.
57	**Adjusting the leading edge margin** **Adjustment** See page 3-3-5.
58	**Adjusting the trailing edge margin/displayed synchrocut length** **Adjustment** See page 3-3-9, 17.
59	**Adjusting the paper cut position for specified length cut mode** **Adjustment** See page 3-3-7.

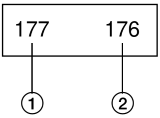
Sim. No.	Description
60	**Loading developer**

Description
Determines the toner control voltage automatically.

Purpose
Used at machine setup and after replacing the developing assembly or developer.

Method
Press the enter key. The drive motor turns on to conduct aging for three minutes. After the completion of aging, the toner control voltage is automatically determined and shown on the display. The toner control voltage adjusted value set in simulation 63 is reset to zero.

Display example



Data No.	Display description
①	Toner sensor output value
②	Toner control voltage

- Pressing the stop/clear key during aging stops the drive motor and interrupts developer setting.
- Write down the value on the simulation label.

Completion
Press the stop/clear key.

Sim. No.	Description
61	**Turning developing bias on** **Description** Outputs the developing bias. **Purpose** To check if the developing bias is output correctly when image contrast is poor. **Method** Press the enter key. **Selection** Select the bias mode with the mode set keys. The developing bias turns on at the value corresponding to the selected bias mode.

Bias mode	Developing bias value
BIAS1	–100 V DC
BIAS2	0 V DC
BIAS3	150 V DC
BIAS4	300 V DC
BIAS5	450 V DC
BIAS6	600 V DC
BIAS7	650 V DC

Completion

Press the stop/clear key to turn the developing bias off.

Sim. No.	Description
63	**Checking/changing toner control voltage** **Description** Checks/sets the toner control voltage value determined automatically in simulation 60. **Purpose** Used after replacing the backup PCB. **Method** Press the enter key. **Selection** Change the setting by pressing leading edge margin key or left margin key. Indication 1 S: Toner control voltage value (the same value as simulation 60) ON: Level where the toner feed motor is turned on OFF: Level where the toner feed motor is turned off Indication 2 TE: Toner empty level TEHI: Copying impossible level Indication 3 Adjusted value of the toner control voltage (The toner control voltage set in simulation 60 can be changed.) **Setting** Change the value of indication 3 using the mode set keys. • Setting range: ±128 (as long as the data remains above 0) Default: 0 • The values for indications 1 and 2 automatically change corresponding to the value for indication 3. However, the value for S in indication 1 does not change. • The value for indication 3 is reset to zero after simulation 60 is run. **Completion** Press the stop/clear key.

Sim. No.	Description

64

Checking toner feed motor operation

Description
Carries out toner replenishment.

Purpose
To check the toner feed motor operation when a toner replenishment problem occurs.

Method
Press the enter key. The toner feed motor turns on for 5 s and toner is fed.

- To interrupt the toner feed motor, press the stop/clear key.

Completion
Press the stop/clear key.

65

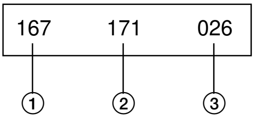
Displaying toner sensor output

Description
Displays the toner sensor output and temperature detected by the developing unit thermistor.

Purpose
To check the temperature compensation of the toner sensor output.

Method
Press the enter key. The following data is shown on the display.

Display example



Data No.	Display description
①	Toner sensor output value
②	Toner sensor output value after temperature compensation
③	Temperature detected by the developing unit thermistor (°C)

Note: The toner sensor output value is displayed as a decimal. Multiplying it by 0.02 gives the toner sensor output voltage.

e.g. Toner sensor output value is displayed as 185:
Toner sensor output voltage = 185 × 0.02 = 3.7 (V)

Completion
Press the stop/clear key.

Sim. No.	Description
66	**Entering toner sensor control level/copy count** **Description** Checks/sets the toner control voltage and copy count which are determined automatically in simulation 60. **Purpose** To set the toner sensor control level and copy count to the values set automatically in simulation 60 after the backup PCB has been replaced and simulation 70 has been run. **Method** Press the enter key. **Selection** Select the setting with the leading edge margin key or left margin key. The current setting value is shown on the display.

Display	Setting	Setting range
1: START	Toner control voltage	0 – 255
2: COUNTER	Copy count	0 – 12000 (m)

Setting
Change the setting value with the mode set keys or numeric keys.

Completion
Press the stop/clear key.

Sim. No.	Description
67	**Selecting operation under the empty toner condition** **Description** Sets whether to enable continuous copying after toner empty is detected. **Purpose** Set according to user request. **Method** Press the enter key. The current setting value is shown on the display. **Selection** Select the setting value with the mode set keys.

Display	Setting description
1: SINGLE	Single copying only
2: CONTINUATION	Continuous copying available

Completion
Press the stop/clear key.

Sim. No.	Description
70	**Initializing backup memory 1 Caution: Clears all RAM Memory**

Description
Initializes the contents of the backup memory.

Purpose
Used after replacing the backup PCB.

Method

1. Press the enter key. The display changes from “INITIALIZING ON” to “INITIALIZING OK”.
2. Turn the main switch off and on. The contents of the following items have now been initialized.

Sim No.	Contents	Default
25	Adjustment for prescan in reduction copy mode	0
26	Setting delay before original feed start	1: 0.64 sec
31	Ignoring developing control	1: CANCEL OFF
35	Entering drum surface potential data for black & white mode	
	TRGT	224
	LPH ON	18
36	Entering drum surface potential data for half-tone mode	
	TRGT HLF	191
	LPH ON HLF	9
46	Setting fixing stabilization at low speed	2: ON
53	Adjusting 100% magnification	0
54	Adjusting leading edge registration	0
55	Adjusting synchrocut length (297 mm)	0
56	Adjusting synchrocut length (1189 mm)	
	Conveying speed at the 1st roll unit (plain paper)	0
	Conveying speed at the 1st roll unit (tracing paper)	0
	Conveying speed at the 1st roll unit (film)	0
	Conveying speed at the 3rd roll unit (plain paper)	0
	Conveying speed at the 3rd roll unit (tracing paper)	0
	Conveying speed at the 3rd roll unit (film)	0
57	Adjusting the leading edge margin	
	Roll unit	0
	Bypass table	0

Sim. No.	Description		
	Sim No.	Contents	Default
70 (cont.)	58	Adjusting the trailing edge margin/displayed synchrocut length	
		Trailing edge margin	0
		Displayed synchrocut length	0
	59	Adjusting the paper cut position for specified length cut mode	
		Short, 1st roll unit (plain paper)	0
		Short, 1st roll unit (tracing paper)	0
		Short, 1st roll unit (film)	0
		Short, 3rd roll unit (plain paper)	0
		Short, 3rd roll unit (tracing paper)	0
		Short, 3rd roll unit (film)	0
		Long, 1st roll unit (plain paper)	0
		Long, 1st roll unit (tracing paper)	0
		Long, 1st roll unit (film)	0
		Long, 3rd roll unit (plain paper)	0
		Long, 3rd roll unit (tracing paper)	0
		Long, 3rd roll unit (film)	0
	63	Checking/changing toner control voltage	
		Adjusted value of the toner control voltage	0
	66	Entering toner sensor control level/copy count	
		START	155
		COUNTER	0
	67	Selecting operations under empty toner condition	1: SINGLE
	71	Selecting the maintenance cycle	1: OFF
	75	Entering the service telephone No.	Cleared
	80	Switching the counter counting units	2: 1 m
	81	Selecting the language	1: JAPANESE
	82	Selecting between key counter/card	KEY-CARD: 0
	83	Selecting between metric/inch	1: CENCH
	84	Selecting the No. of exposure steps	1: 13 STEPS
	86	Switching the fixing temperature	1: JPN
	87	Disabling cancellation of auto shutoff function	1: ON
	89	Setting optional roll unit	1: NO CONNECT
	92	Setting potential correction intervals	3: ON (20 m)
	94	Setting the maximum copy length for multiple copy mode	ORG MAX: 1400
	95	Setting the maximum copy length for roll/bypass mode	PAPER MAX: 5000

Sim. No.	**Description**		
	Sim No.	Contents	Default
70 (cont.)	96	Selecting the action after paper empty detection	
		Plain paper	10 s
		Tracing paper	10 s
		Film	1 s
	97	Switching between front and rear ejection of originals	
		ORG PSTN (S)	1: EJECT
		ORG PSTN (C)	2: RETURN
	98	Selecting the copy count timing	MODE 1
	115	Selecting the connection to the interface controller	1
	116	Setting the time to return from the offline condition	5
	117	Adjusting the leading edge registration (when connected to the interface controller)	0
	132	Adjusting optical axis	0
	133	Adjusting the image width in the main scanning direction	0
	140	Adjusting exposure amount	
		EXP (PLAIN)	4
		EXP (DARK)	4
		EXP (LIGHT)	4
		EXP (HALF PLAIN)	4
		EXP (HALF DARK)	4
		EXP (HALF LIGHT BD)	4
		EXP (HALF LIGHT BL)	5
	141	Half-tone image quality (dark/light)	
		HALF D	0
		HALF L BD	3
	142	Adjusting AE optimum level	
		POINT (PLAIN)	4
		POINT (DARK)	1
		POINT (LIGHT)	8
		MAX (PLAIN)	12
		MAX (DARK)	12
		MAX (LIGHT)	18
	143	Switching filter modes	MODE 1

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>70 (cont.)</td><td>
<table>
<tr><th>Sim No.</th><th>Contents</th><th>Default</th></tr>
<tr><td>144</td><td>Adjusting filter gain</td><td></td></tr>
<tr><td></td><td>CHARACTER</td><td>1.0</td></tr>
<tr><td></td><td>HALF LIGHT BD</td><td>0.5</td></tr>
<tr><td></td><td>HALF LIGHT BL</td><td>0.6</td></tr>
<tr><td>145</td><td>Setting AE fine adjustment intervals</td><td>3</td></tr>
<tr><td>153</td><td>Selecting current correction value</td><td>MODE: 00</td></tr>
<tr><td>160</td><td>Adjusting base 4 output density</td><td></td></tr>
<tr><td></td><td>DENSITY 2</td><td>0</td></tr>
<tr><td></td><td>DENSITY 3</td><td>0</td></tr>
<tr><td>161</td><td>Adjusting thresholds (central exposure level)</td><td></td></tr>
<tr><td></td><td>THLD BW</td><td>0</td></tr>
<tr><td></td><td>THLD HLF 1</td><td>0</td></tr>
<tr><td></td><td>THLD HLF 2</td><td>0</td></tr>
<tr><td></td><td>THLD HLF 3</td><td>0</td></tr>
<tr><td>163</td><td>Adjusting Exp. 1.0 threshold</td><td></td></tr>
<tr><td></td><td>THLD BW (1.0)</td><td>0</td></tr>
<tr><td></td><td>THLD HLF (1.0)</td><td>0</td></tr>
<tr><td>164</td><td>Adjusting Exp. 7.0 threshold</td><td></td></tr>
<tr><td></td><td>THLD BW (7.0)</td><td>0</td></tr>
<tr><td></td><td>THLD HLF (7.0)</td><td>0</td></tr>
<tr><td>165</td><td>Setting the memory unit connection</td><td>1: NO CONNECT</td></tr>
<tr><td>166</td><td>Selecting display of the “Output?” screen after restart</td><td>1: DISP ON</td></tr>
<tr><td>167</td><td>Setting the AE scan</td><td>0</td></tr>
<tr><td>168</td><td>Setting the maximum number of continuous copies</td><td>1</td></tr>
<tr><td>178</td><td>Selecting memory output mode</td><td>2</td></tr>
</table>

Completion
Press the stop/clear key.

Important
Do NOT forget to run simulation 120 after simulation 70.
</td></tr>
</table>

Sim. No.	Description
	Intentionally Left Blank
	Intentionally Left Blank

Sim. No.	Description
73	**Displaying/clearing total paper feed count** **Description** Checks/resets the total paper feed count. **Purpose** To check the replacement time of the maintenance parts. **Method** Press the enter key. The number of copies made since the last count setting to the present is shown on the display. Display example TOTAL 1580 **Completion** Press the stop/clear key.

Sim. No.	Description
	Intentionally Left Blank

Sim. No.	Description
75	**Entering the service telephone No.**

Description
Sets the telephone number to be shown on the service call code display.

Purpose
Used after replacing the backup PCB.

Method
Press the enter key.

Setting

1. Enter the telephone number with the following keys.

Keys to be pressed	Characters and symbols
Numeric keys	0 – 9
Special paper select key	—
Image process select key	/
Original contrast key	(
Auto/manual contrast select key	)
Copy contrast key (dark)	*
Copy contrast key (light)	#
Decimal point	Space

2. Press the enter key.

Completion
Press the stop/clear key.

Sim. No.	Description
	Intentionally Left Blank

Sim. No.	Description
	Intentionally Left Blank

Sim. No.	Description
78	**Displaying set data**

Description
Displays data settings of the simulation items.

Purpose
To check data settings.

Method
Press the enter key.

Selection

1. Select the simulation No. to be checked with the leading edge margin key and left margin key.
2. Select the type of data to be checked with the mode set keys.

The following data can be checked by this simulation.

Sim. No.	Data
30*	Setting drum surface potential 1
32*	Setting drum surface potential 2
53	Adjusting 100% magnification
54	Adjusting leading edge registration
55	Adjusting synchrocut length (297 mm)
56	Adjusting synchrocut length (1189 mm)
57	Adjusting the leading edge margin
58	Adjusting the trailing edge margin/displayed synchrocut length
59	Adjusting the paper cut position for specified length cut mode
60	Loading developer
140	Adjusting exposure amount
141	Half-tone image quality (dark/light)
142	Adjusting AE optimum level
153	Selecting current correction value

*Simulations 30 and 32 are for line use only.

Completion
Press the stop/clear key.

Sim. No.	Description
79	**Specifying addresses/displaying data** **Description** Displaying internal data. **Purpose** No need to run this simulation during maintenance. **Method** Press the enter key. The address No. for internal data is shown as six binary digits and the contents are displayed in hexadecimal. Display example `000000 00C0` **Specifying address** Enter the address by pressing numeric keys 1 to 6. **Completion** Press the stop/clear key.
80	**Switching the counter counting units** **Description** Changes the units used by the total counter and key counter. **Purpose** To change the counter counting units according to the paper consumption. **Method** Press the enter key. **Setting** Change the counting units with the mode set keys. 1: 0.1 m 2: 1 m With the setting at 1, the total counter and key counter count up every 0.1 m of paper; with the setting at 2, they count up every 1 m. **Completion** Press the stop/clear key.

Sim. No.	Description
81	**Selecting the language** **Description** Changes the language of the messages. **Purpose** To be set according to user request. **Method** Press the enter key. The current language is shown on the display. **Selection** Select one of the following languages with the mode set keys:

1	Japanese
2	English (UK)
3	German
4	French
5	Spanish
6	Dutch
7	Italian
8	English (USA)

Completion
Press the stop/clear key.

Sim. No.	Description
83	**Selecting between metric/inch** **Description** Sets the specification of the copier to metric or inch. **Purpose** Used after replacing the backup PCB. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys. Setting description 1: CENCH 2: INCH **Completion** Press the stop/clear key.
84	**Selecting the No. of exposure steps** **Description** Sets the number of exposure steps. **Purpose** To be set according to user request. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys. Setting description 1: 13 STEPS 2: 7 STEPS **Completion** Press the stop/clear key.

Sim. No.	Description
85	**Initializing backup memory 2**

Description
Initializes the backup memory according to the destination.

Purpose
Used after replacing the backup PCB.

Method
Press the enter key.

Selection
Select the destination with the mode set keys.

Display	Destination
1. JPN	Specification for Japan
2. OTHERS	Specifications for other countries

Initialization

1. Press the enter key. The display changes from “INITIALIZING ON” to “INITIALIZING OK”.
2. Turn the main switch off and on. The following items and the user-set contents are initialized to the values corresponding to the destination:

Sim. No.	Contents	Defaults	
		JPN	OTHERS
94	Setting the maximum copy length for multiple copy mode	1400 mm	1400 mm
95	Setting the maximum copy length for roll/bypass mode	5000 mm	5000 mm
96	Selecting the action after paper empty detection	10 s for plain paper	1 s for plain paper

Completion
Press the stop/clear key.

Sim. No.	Description
86	**Switching the fixing temperature** **Description** Sets the secondary fixing temperature according to the destination. **Purpose** Used after replacing the backup PCB. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys. Setting description 1: JPN (100 V areas) 2: OTHERS (120 V, 200 V areas) **Completion** Press the stop/clear key.
87	**Disabling cancellation of auto shutoff function** **Description** Sets whether the auto shutoff function is used. **Purpose** To be set according to user request. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys. Display / Setting description: 1: ON – Auto shutoff function used 2: OFF – Auto shutoff function not used Default 1: ON To cancel the auto shutoff function, change the setting to OFF and select “– – –” for the time setting. **Completion** Press the stop/clear key.

Display	Setting description
1: ON	Auto shutoff function used
2: OFF	Auto shutoff function not used

Sim. No.	Description
89	**Setting optional roll unit** **Description** Sets the installation of the 3rd roll unit. **Purpose** To be set after the optional 3rd roll unit is installed. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys.

Display	Setting description
1: NO CONNECT	3rd roll unit not installed
2: CONNECT	3rd roll unit installed

Sim. No.	Description
89	Default 1: NO CONNECT **Completion** Press the stop/clear key.
92	**Setting potential correction intervals** **Description** Sets the interval for the drum potential correction. **Purpose** To set the intervals so that the drum potential is corrected whenever the background becomes visible due to the decline in drum quality. **Method** Press the enter key. The current setting is shown on the display. **Setting** Change the setting with the mode set keys.

Display	Setting description
1: OFF	Correct potential during stabilization only
2: ON	Correct potential every copy
3: ON (20 m)	Correct potential every 20 m

Sim. No.	Description
92	Default 3: ON (20 m) **Completion** Press the stop/clear key.

Sim. No.	Description
94	**Setting the maximum copy length for multiple copy mode** **Description** Sets the maximum copy length for multiple copy mode. **Purpose** To be set according to user request. **Method** Press the enter key. The maximum copy length for multiple copy mode is shown on the display. Display example ORG MAX: 1500 **Setting** Change the setting with the mode set keys. The setting can be changed in steps of 100 mm between 1400 and 5000 mm. **Completion** Press the stop/clear key.
95	**Setting the maximum copy length for roll/bypass mode** **Description** Sets the maximum copy length for roll/bypass mode. **Purpose** To be set according to user request. **Method** Press the enter key. The maximum copy length for roll/bypass mode is shown on the display. Display example PAPER MAX: 1500 **Setting** Change the setting with the mode set keys. The setting can be changed in steps of 100 mm between 5000 and 9900 mm. **Completion** Press the stop/clear key.

Sim. No.	Description
96	**Selecting the action after paper empty detection**

Description
Sets the time before the paper empty detection function is activated.

Purpose
To be set depending on the type of roll paper in each paper source.

Method
Press the enter key.

Selection
Select the type of paper to be set with the leading edge margin key or left margin key. The setting value for the selected paper is shown on the display.

Display	Type of roll paper
1: NORMAL	Plain paper
2: VELLUM	Tracing paper
3: FILM	Film

Setting
Change the setting value with the mode set keys.

Setting value	Setting description
10 s	With roll paper whose end is glued to the core
1 s	With roll paper whose end is not glued to the core

Completion
Press the stop/clear key.

Sim. No.	Description
97	**Switching between front and rear ejection of originals** **Description** Switches the ejection direction of originals after copying. **Purpose** To be set according to user request. **Method** Press the enter key. **Selection** Select the copy mode to be set with the leading edge margin key and left margin key. The setting value of the selected mode is shown on the display. ORG PSTN (S): Single copy mode ORG PSTN (C): Continuous copy mode **Setting** Change the settings with the mode set keys. Setting / Setting description 1: EJECT / The original is ejected to the rear 2: RETURN / The original returns to the front **Completion** Press the stop/clear key.
98	**Selecting the copy count timing** **Description** Changes the counting timing of the total counter. **Purpose** Set to MODE 1 if paper jams should be included in the total count. **Method** Press the enter key. The current counting timing mode is shown on the display. **Setting** Change the setting with the mode set keys. Display / Setting description MODE 1 / During paper feed MODE 2 / After paper ejection **Completion** Press the stop/clear key.

Sim. 97 setting table:

Setting	Setting description
1: EJECT	The original is ejected to the rear
2: RETURN	The original returns to the front

Sim. 98 setting table:

Display	Setting description
MODE 1	During paper feed
MODE 2	After paper ejection

<table>
<tr><th>Sim.
No.</th><th>Description</th></tr>
<tr><td>99</td><td>

Displaying the ROM versions

Description
Displays the versions of the currently installed ROMs.

Purpose
To check the ROM versions.

Method
Press the enter key. The ROM versions are shown on the display.

Selection
Change the display of the ROM versions with the mode set keys.

<table>
<tr><td>Display</td><td>Type of ROM</td></tr>
<tr><td>MR1</td><td>Main control ROM 1</td></tr>
<tr><td>MR2</td><td>Main control ROM 2</td></tr>
<tr><td>ISU</td><td>ISU CPU</td></tr>
<tr><td>MEM</td><td>Memory unit</td></tr>
</table>

Completion
Press the stop/clear key.

</td></tr>
<tr><td>102</td><td>

Gray output

Description
Outputs a gray test pattern.

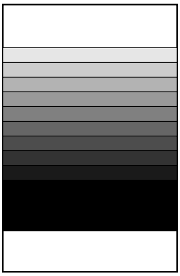
Purpose
To check for a main PCB or LPH problem, dirty main charger wire, grid or housing or drum problem.

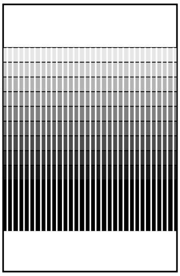
Method
Press the enter key. A test pattern copy 594 mm long is ejected at gray level 8.

Figure 3-2-1

Completion
Press the stop/clear key.

</td></tr>
</table>

Sim. No.	Description
103	**32-gradation output** **Description** Outputs a 32-gradation test pattern with the LPH current corrected. **Purpose** To check for an LPH problem, dirty main charger wire, grid or housing or drum problem. See page 3-3-18. **Method** Press the enter key. A test pattern copy in 32 gradation levels is ejected.  **Figure 3-2-2** **Interruption** Press the job stop/roll cut key. The paper being printed is cut at the midpoint, ending the operation. **Completion** Press the stop/clear key.

Sim. No.	Description
104	**32-gradation output (without compensation)** **Description** Outputs a 32-gradation test pattern without correcting the LPH current. **Purpose** To check if the LPH current correction ROM is correctly installed to the main PCB. **Method** Press the enter key. A test pattern copy in 32 gradation levels is ejected as in simulation 103.  **Figure 3-2-3** • When white stripes appear at 8-mm intervals in simulation 104 as shown above while the correct image is obtained during simulation 103, the LPH current correction ROM is judged to be correctly installed. **Completion** Press the stop/clear key.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>109</td><td>
Setting the controller type
Description
Sets the type of CAD controller to be used.
Purpose
To be set after installation of the interface controller.
Method
Press the enter key.
Selection
Select the type of CAD controller with the mode set keys.
<table>
<tr><th>Display</th><th>Setting description</th></tr>
<tr><td>1. TYPE A</td><td>A controller other than OEM 1 is used with the copier. (The copier automatically enters on-line mode when the auto clear time passes after the completion of copying.)</td></tr>
<tr><td>2. TYPE B1</td><td>An OEM 1 controller is used with the copier. (The copier automatically enters on-line mode when the auto clear time minus 10 s passes after the completion of copying.)</td></tr>
<tr><td>3. TYPE B2</td><td>An OEM 1 controller is used with an OEM 1 copier (The copier automatically enters on-line mode 5 s after the completion of copying.)</td></tr>
</table>
Default 1. TYPE A
Completion
Press the stop/clear key.
</td></tr>
</table>

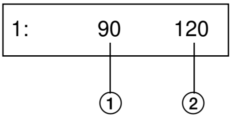
Sim. No.	Description
110	**Checking fluorescent lamp operation**

Description
Lights the fluorescent lamp.

Purpose
To check the fluorescent lamp operation.

Method
Press the enter key. The fluorescent lamp lights and the display shows the following data.

Display example



Data No.	Contents
①	Standard fluorescent lamp light amount
②	Current fluorescent lamp light amount

Completion
Press the stop/clear key.

Sim. No.	Description
111	**Checking shading compensation operation**

Description
Performs shading compensation and shows CIS channel data.

Purpose
To check respective channel data when solid black areas are too thin or white stripes appear on the copy image.

Method
Press the enter key. After shading compensation is completed, channel data is shown on the display.

Selection
Channel data is displayed three channels at a time. To see the next three, press the leading edge margin key or the left margin key.

Display example

```
1: 0        2: 1        3: 1
           ↓  ↑
4: 0        5: 200      6: 199
           ↓  ↑
7: 204      8: 203
```

The following contents are shown:

Data for sensors ch1 to ch4 with lamp off	1: 2: 3: 4:
Data for sensors ch1 to ch4 with lamp on	5: 6: 7: 8:

- When the data with the lamp off is around 0 and that with the lamp on is around 200, shading compensation is judged to be normal.

Completion
Press the stop/clear key.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>112</td><td>
Checking AGC processing operation
Description
Performs AGC processing and shows data of the CIS channels.
Purpose
To check for an AGC error during A-D conversion.
Method
Press the enter key. After AGC processing is completed, the display shows the mean values for individual channels.
Selection
Channel data is displayed three channels at a time. To see the next three, press the leading edge margin key or the left margin key.
Display example
1: 0 2: 1 3: 1
↓ ↑
4: 0 5: 200 6: 199
↓ ↑
7: 204 8: 203
The following contents are shown:
<table>
<tr><td>Data for sensors ch1 to ch4 with lamp off</td><td>1: 3: 5: 7:</td></tr>
<tr><td>Data for sensors ch1 to ch4 with lamp on</td><td>2: 4: 6: 8:</td></tr>
</table>
• When the data with the lamp off is around 0 and that with the lamp on is around 200, AGC processing is judged to be normal.
Completion
Press the stop/clear key.
</td></tr>
<tr><td>113</td><td>
Setting the shading mode
Adjustment
See page 3-3-30-12.
</td></tr>
</table>

Sim. No.	Description
115	**Selecting the connection to the interface controller** **Description** Selects the connection to the interface controller. **Purpose** To be run after an interface controller is installed. **Method** Press the enter key. The current setting is shown on the display. **Selection** Change the setting with the mode set keys. 1: Interface controller not connected 2: Interface controller connected **Completion** Press the stop/clear key.
116	**Setting the time to return from the offline condition** **Description** Sets the time to automatically return to on-line mode after the completion of copying (completion of key operation on the operation panel). **Purpose** To be set according to user request. **Method** Press the enter key. The current setting is shown on the display. **Selection** Change the setting with the mode set keys. 1: 5 s 2: 10 s 3: 30 s **Completion** Press the stop/clear key.
117	**Adjusting the leading edge registration (when connected to the interface controller)** **Adjustment** See page 3-3-30-13.

Sim. No. | **Description**

120

Adjusting γ correction

Description
Performs γ correction.

Purpose
Used after replacing the backup PCB, ISU PCB or CIS, or after running simulation 70 or 121. Be sure to clean the contact glass and the middle upper original rollers before running this simulation.

Method
Press the enter key. The following operations are carried out.

DATA TRANSFERING: data transfer
AGC ON: AGC processing
SHADING: shading compensation
DATA PROCESSING: data processing

121

Adjusting gain

Description
Adjusts the analog voltage for A-D conversion during original scanning.

Purpose
Used after replacing the ISU PCB. Always run simulation 120 after this simulation.

Method
Press enter key. The mean gain after shading compensation is shown for each channel.

Display example

```
1: 187     2: 211     3: 196     4: 200
```

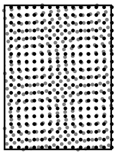
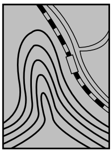
After replacing the ISU PCB, adjust VR1, VR3, VR4 and VR5 on the new ISU PCB to set the values to 205 ± 20, ensuring that the difference between the maximum and minimum values is 20 or less.

- Setting examples

Channel	ch1 (VR3)	ch2 (VR1)	ch3 (VR5)	ch4 (VR4)
Good example	200	205	210	215
Bad example	190	200	230	220

Completion
Press the stop/clear key.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>132</td><td>Adjusting optical axis
Adjustment
See page 3-3-30-9.</td></tr>
<tr><td>133</td><td>Adjusting the image width in the main scanning direction
Adjustment
See page 3-3-30-10.</td></tr>
<tr><td>140</td><td>Adjusting exposure amount
Description
Sets the exposure amounts for the respective original modes.
Purpose
Used after cleaning or replacing the fluorescent lamp or contact glass.
Adjustment
See page 3-3-24.
Method
Press the enter key. The current exposure setting is shown on the display.
• The following data (data No., original and exposure setting) can be shown by pressing the original contrast key or auto/manual contrast select key.
<table>
<tr><th>Data No.</th><th>Original</th><th>Exposure setting</th></tr>
<tr><td>1</td><td>EXP (PLAIN)</td><td>For a normal original</td></tr>
<tr><td>2</td><td>EXP (DARK)</td><td>For a dark original</td></tr>
<tr><td>3</td><td>EXP (LIGHT)</td><td>For a light original</td></tr>
<tr><td>4</td><td>EXP (HALF PLAIN)</td><td>For a normal original in half-tone mode</td></tr>
<tr><td>5</td><td>EXP (HALF DARK)</td><td>For a dark original in half-tone mode</td></tr>
<tr><td>6</td><td>EXP (HALF LIGHT BD)
EXP (HALF LIGHT BL)</td><td>For a light original (making background darker)
For a light original (making background lighter)</td></tr>
</table>
Setting
Change the exposure setting with the mode set keys.
Completion
Press the stop/clear key.</td></tr>
</table>

Sim. No.	Description
141	**Adjusting half-tone image quality** **Adjustment** See page 3-3-26.
142	**Adjusting AE optimum level** **Adjustment** See page 3-3-25.
143	**Switching filter modes** **Description** Switches the contrast for copying letters. **Purpose** To be set according to user request. **Adjustment** See page 3-3-27. **Method** Press the enter key. The current filter mode is shown on the display. **Selection** Change the setting with the mode set keys. The following modes are available. MODE 1: Normal original (to decrease moiré)  MODE 2: Map original (to copy letters clearly)  **Figure 3-2-4** **Completion** Press the stop/clear key.

Sim. No.	Description
144	**Adjusting filter gain** **Adjustment** See page 3-3-27.
145	**Setting AE fine adjustment intervals** **Adjustment** See page 3-3-25-2.
153	**Selecting current correction value** **Description** Performs current correction so that the currents of individual LEDs constituting the LPH are uniform and the gray output during simulation 102 is even. **Purpose** To be used after the LPH has been replaced. **Method** Press the enter key. The current LPH current correction mode No. is shown on the display. **Setting** 1. Change the setting with the mode set keys in the range 00 to 07. 2. Press the enter key. Current correction is conducted. **Completion** Press the stop/clear key.
158	**Adjusting focus** **Adjustment** See page 3-3-28.

<table>
<tr><th>Sim. No.</th><th>Description</th></tr>
<tr><td>159</td><td>

Solid black test pattern output

Description
Outputs a solid black test pattern.

Purpose
To check for a problem on the main PCB when an image problem occurs.

Method
Press the enter key. A 594-mm-long test pattern for solid black adjustment is produced.

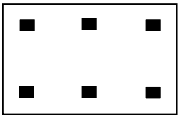


Figure 3-2-5

- If the correct image is output during simulations 102 and 158 but is not output during simulation 159, the main PCB is judged to have a problem.

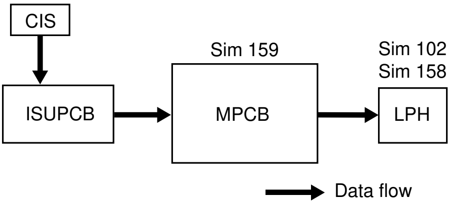


Figure 3-2-6 Problem-detecting simulations

Completion
Press the stop/clear key.

</td></tr>
<tr><td>160</td><td>

Adjusting base 4 output density

See the memory unit service manual.

</td></tr>
<tr><td>161</td><td>

Adjusting thresholds (central exposure level)

See the memory unit service manual.

</td></tr>
<tr><td>162</td><td>

Adjusting base 4 thresholds simultaneously

See the memory unit service manual.

</td></tr>
<tr><td>163</td><td>

Adjusting Exp. 1.0 threshold

See the memory unit service manual.

</td></tr>
</table>

Sim. No.	Description
164	**Adjusting Exp. 7.0 threshold** See the memory unit service manual.
165	**Setting the memory unit connection** See the memory unit service manual.
166	**Selecting display of the “Output?” screen after restart** See the memory unit service manual.
167	**Setting the AE scan** See the memory unit service manual.
168	**Setting the maximum number of continuous copies** See the memory unit service manual.
170	**Checking the memory unit DRAM** See the memory unit service manual.
172	**Checking the memory unit HDD page management area** See the memory unit service manual.
173	**Formatting the memory unit HDD** See the memory unit service manual.
174	**Cleaning programs 6 to 10** See the memory unit service manual.
175	**Restoring programs 6 to 10** See the memory unit service manual.
176	**Memory unit problem history** See the memory unit service manual.
177	**Clearing the memory unit problem history** See the memory unit service manual.
178	**Selecting memory output mode** See the memory unit service manual.
179	**Checking the memory unit connection** See the memory unit service manual.

Sim. No.	Description
194	**PM Cycle copy counter** Description Displays copy count between preventive maintenance cycles.
195	**Displaying/Clearing Jam/SC counters** Description Displays and clears counters for paper jams, original jams and SC's Purpose To check or reset the counters for paper/original jams and SC's. Method Press the enter key. The number of paper jams (total) is displayed. Each counter for jam location (1st roll, 2nd roll, 3rd roll or exit) can be selected using mode set keys. U: 1st roll M: 2nd roll L: 3rd roll Original jam counter (total) or SC counter (total) can be selected using the Image Shift Keys. Each counter can be cleared if the enter key is pressed after selecting a counter. Completion Press the stop/clear key.
196	**Clearing all counters** Description Clears all the counters. Method Press the enter key. Then press the enter key again to clear all the counters. Completion Press the stop/clear key.
197	**Displaying/Clearing counters by size** Descriptions Checks/resets the total count value of the paper feed for each paper size. Method Press the enter key. The paper feed count for currently selected paper size is shown on the display. Select the mode (Size Magnification, Edit, or Other Modes) to be checked by pressing the image shift keys. Each mode has several counters which can be selected using mode set keys. Size Magnification: Enlarge/ Reduce/Full/Independence (Directional Mag.) Edit: Image Mirror/Image Inverse/Image Frame (Erase Border) Other Modes: STD-Size (Preset_/AMS/APS/Synchro-cut Resetting 3. Enter "0" with the numeric key. 4. Press the enter key. Completion Press the stop/clear key.
198	**Displaying/Clearing mode counters** Descriptions Checks/reset the total count value of each mode. Method Press the enter key. The count for currently selected mode is shown on the display. Select the mode (Size Magnification, Edit, or Other Modes) to be checked by pressing the image shift keys. Each mode has several counters which can be selected using mode set keys. Size Magnification: Enlarge/Reduce/Full/Independence (Directional Mag.) Edit: Image Mirror/Image Inverse/Image Frame (Erase Border) Resetting 3. Enter"0" with the numeric key. 4. Press the enter key. Completion Press the stop/clear key.

CONTENTS

3-3 Assembly and Disassembly

3-3-1 Cautions during disassembly and assembly

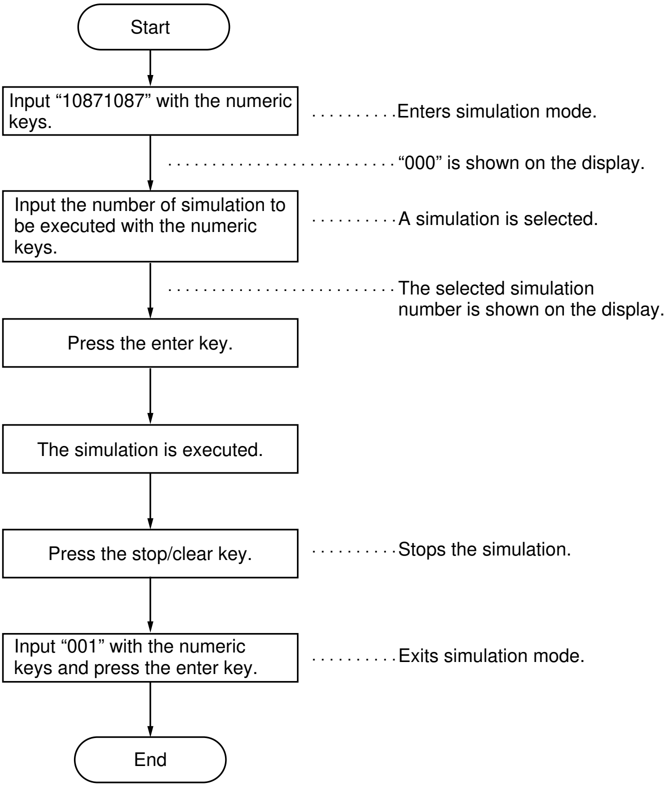
(1) Caution

- When carrying out disassembly, be sure to turn the main switch off and pull out the power cord before starting.
- When handling PCBs avoid touching PCB connectors with the bare hands or scratching equipment.
- When ICs are used on PCBs, do not touch the board with the bare hands or with objects charged with static electricity.
- When replacing the fixing unit thermal switches (thermostats), be sure to use the specified part. If a simple wire is used instead, damage to the machine may occur.
- Use one of the testers shown below when measuring voltage:
    - HIOKI 3200
    - SANWA MD-180C
    - SANWA YX-360TR
    - BECKMAN TECH300
    - BECKMAN 3030: Possible to measure RMS values
    - BECKMAN 330: Possible to measure RMS values
    - BECKMAN DM45
    - BECKMAN DM850: Possible to measure RMS values
    - FLUKE 8060A: Possible to measure RMS values
    - ARLEC DMM1050
    - ARLEC YF1030C

- Originals used.

1. NTC (new test chart)
2. NPTC (newspaper test chart)
3. Blue graph paper

(2) Method of executing simulation

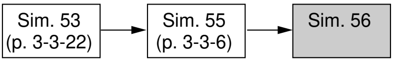


3-3-2 Paper feed section

Note: Follow the running order of simulations for image adjustment where indicated, otherwise the contents of the simulations may be affected and the correct copy image may not be obtained.

(1) Adjustment of 1189 mm synchro cut (adjustment of paper feed motor speed)

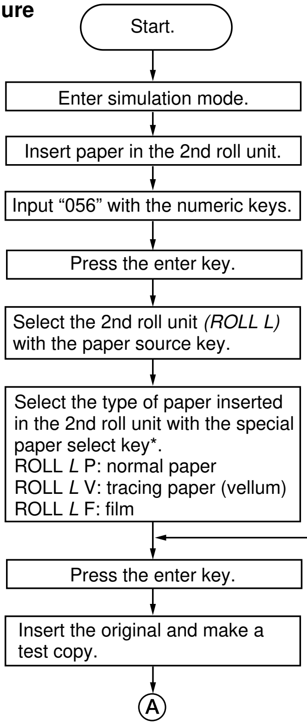
Perform when the paper is not cut to the proper length when paper is A0 (1189 mm) or larger or when the cutting length differs according to the paper used (normal paper, film, tracing paper).

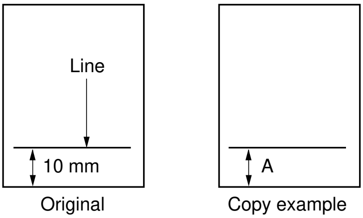


Caution:

- Before starting this adjustment, ensure that all the adjustments in the above simulations are completed.
- Use paper with a length of 1189 mm and draw a line 10 mm from the trailing edge of the document.
- Carry out adjustment for all the types of paper inserted in the copier.
- Select the 2nd roll unit to carry out test copying. The settings for the 1st and 3rd roll units are corrected automatically by adjusting with the 2nd roll unit selected (as standard selection).
- We recommend using paper whose width is 841 mm.

Procedure

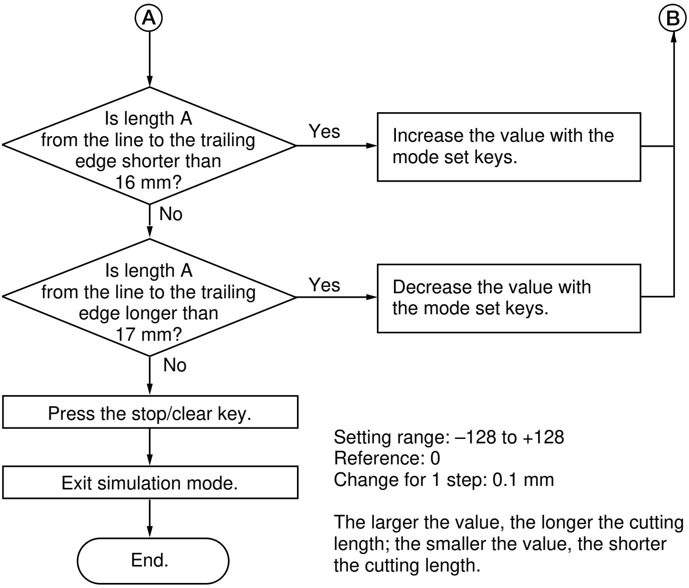




A: Standard value = 10 mm + 6 (to 7) mm

Figure 3-3-1

* Paper type selection is possible only after the machine has stabilized.

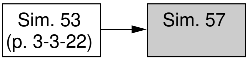


Setting range: –128 to +128
Reference: 0
Change for 1 step: 0.1 mm

The larger the value, the longer the cutting length; the smaller the value, the shorter the cutting length.

(2) Leading edge margin adjustment

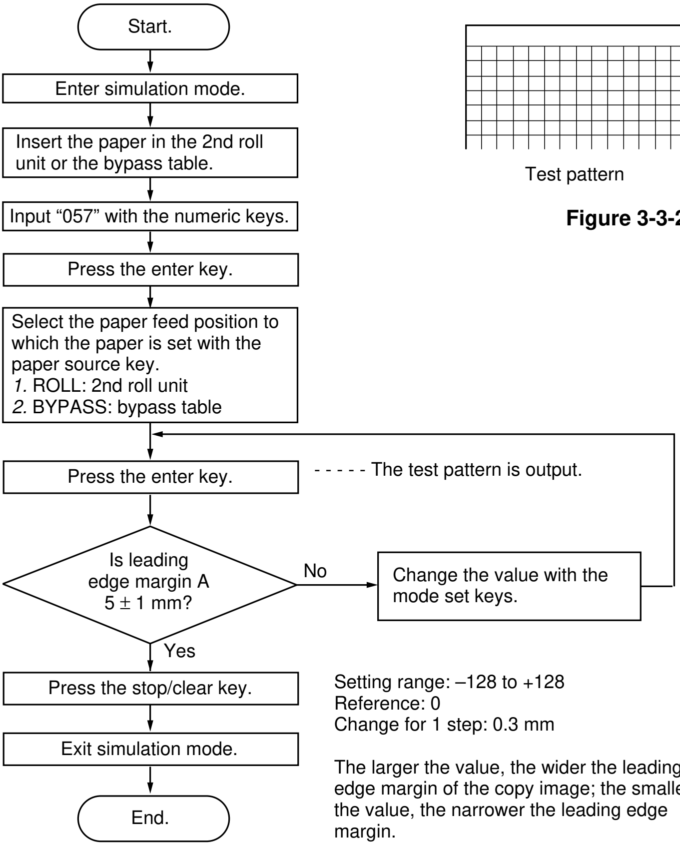
Perform when the leading edge margin of the copy image is not within the specified range.



Caution:

- Before starting this adjustment, ensure that the adjustment in the above simulation is completed.
- Select the 2nd roll unit to carry out test copying for roll paper feed adjustment. The difference in leading edge margin in normal copy operation for each roll unit is minimized by adjusting with the 2nd roll unit selected (as standard selection).

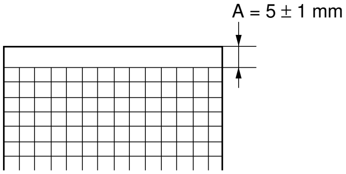
Procedure



- - - - - The test pattern is output.

Setting range: –128 to +128
Reference: 0
Change for 1 step: 0.3 mm

The larger the value, the wider the leading edge margin of the copy image; the smaller the value, the narrower the leading edge margin.

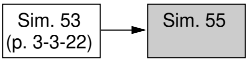


Test pattern

Figure 3-3-2

(3) Adjustment of 297 mm synchro cut

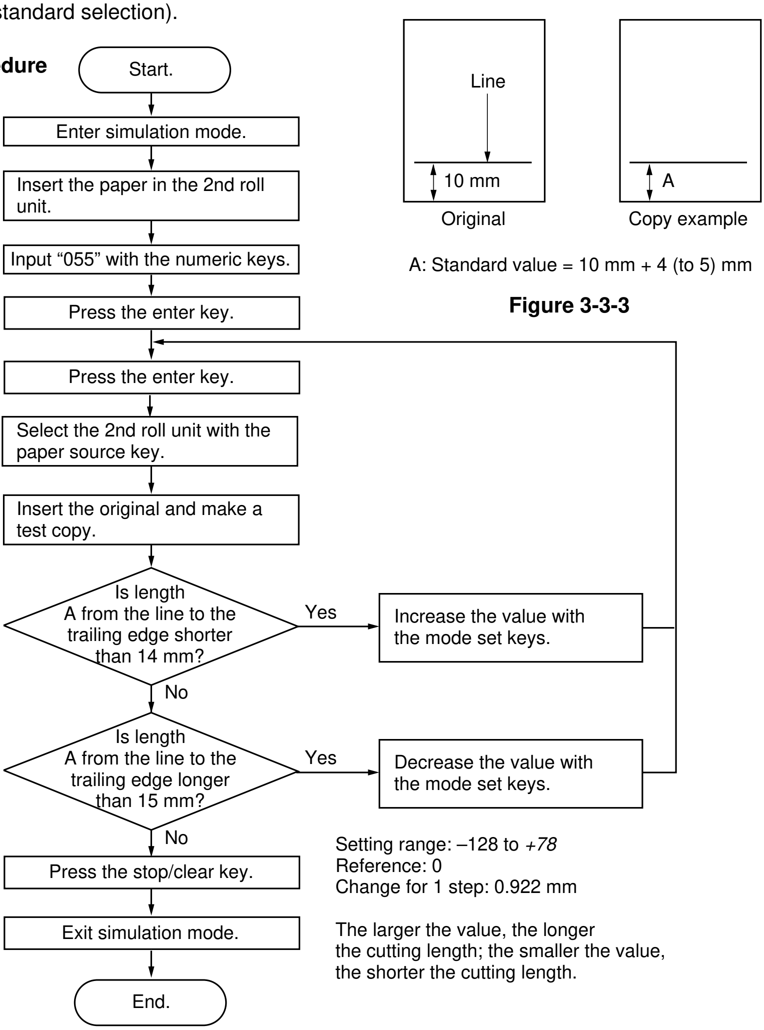
Perform when the paper is not cut to the proper length when carrying out synchro cut copy with a paper less than A0 (1189 mm) size.



Caution:

- Before starting this adjustment, ensure that all the adjustments in the above simulations are completed.
- Use paper with a length of 297 mm and draw a line 10 mm from the trailing edge of the document.
- Select the 2nd roll unit to carry out test copying. The difference in cutting length in normal copy operation for each roll unit is minimized by adjusting with the 2nd roll unit selected (as standard selection).

Procedure



A: Standard value = 10 mm + 4 (to 5) mm

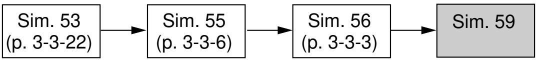
Figure 3-3-3

Setting range: –128 to *+78*
Reference: 0
Change for 1 step: 0.922 mm

The larger the value, the longer the cutting length; the smaller the value, the shorter the cutting length.

(4) Adjustment of paper cutting position when the paper length is specified

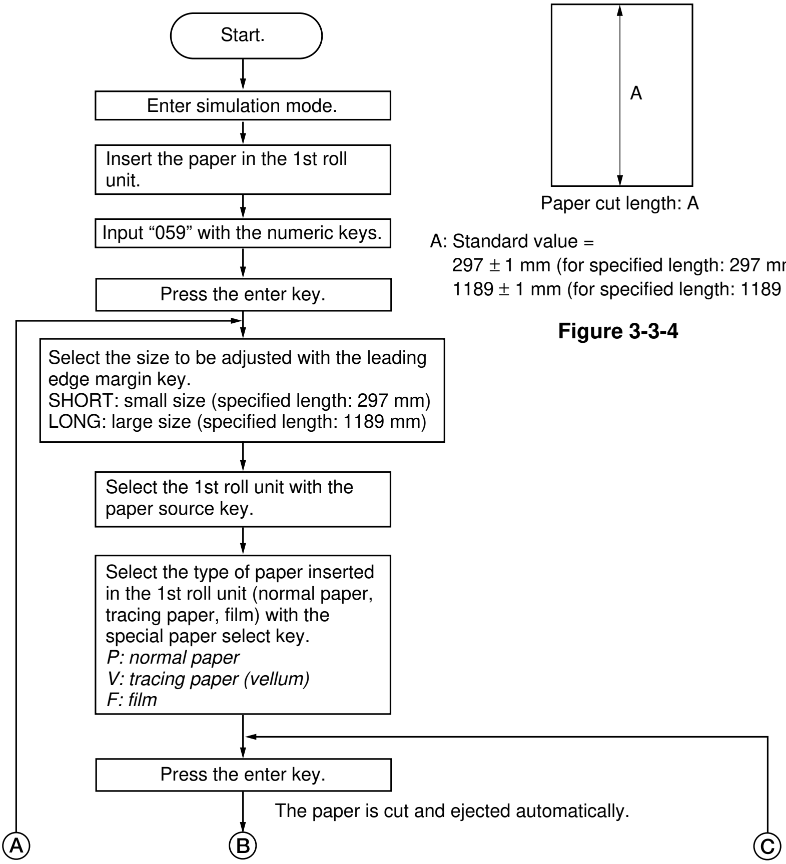
Perform when the paper is not cut to the proper length when executing fixed length copies or when the cutting length differs according to the paper used (normal paper, film, tracing paper).



Caution:

- Before starting this adjustment, ensure that all the adjustments in the above simulations are completed.
- Carry out adjustment for all the types of paper inserted in the copier.
- Select the 1st roll unit to carry out test copying. The settings for the 2nd and 3rd roll units are corrected automatically by adjusting with the 1st roll unit selected (as standard selection).

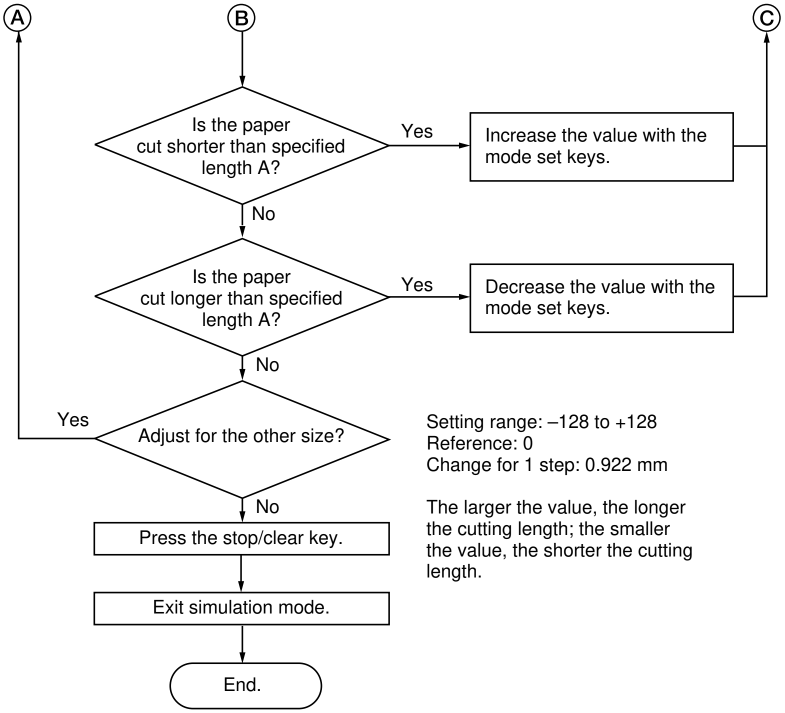
Procedure



Paper cut length: A

A: Standard value =
297 ± 1 mm (for specified length: 297 mm)
1189 ± 1 mm (for specified length: 1189 mm)

Figure 3-3-4

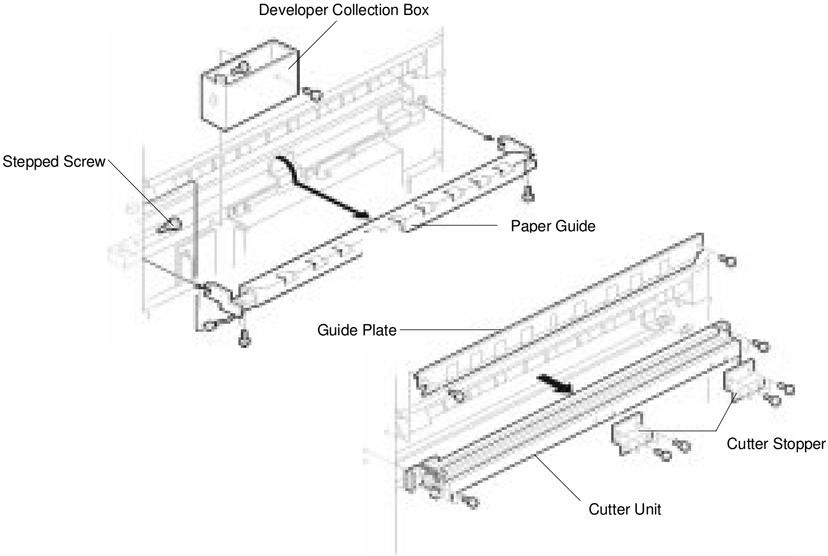


Setting range: –128 to +128
Reference: 0
Change for 1 step: 0.922 mm

The larger the value, the longer the cutting length; the smaller the value, the shorter the cutting length.

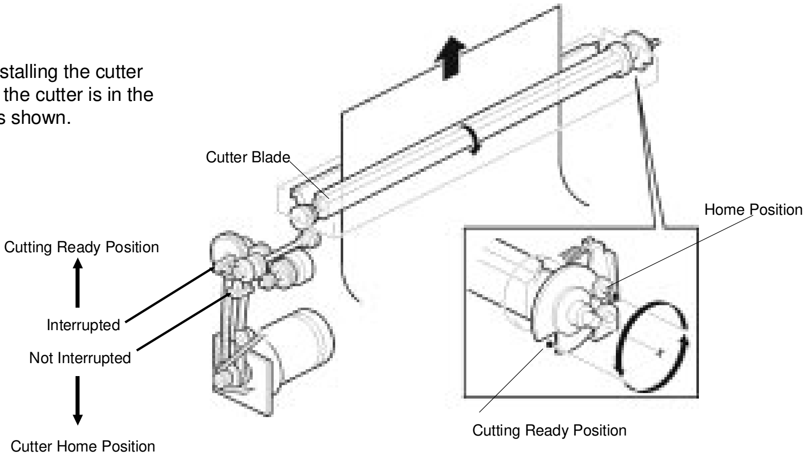
Cutter Unit Removal

1. Remove the lower rear cover and the lower left cover. Secure the cutter home position sensor disk using 1 screw.
2. Remove the developer collection box, and remove the stepped screw.
3. Remove the 4 screws securing the paper guide. Then turn the paper guide to remove it (1 connector).
4. Remove the two cutter stoppers (4 screws each). Then remove the guide plate (2 screws).
5. Remove the cutter unit (4 screws).



Caution: Be careful that the cutter blade does not damage your hand.

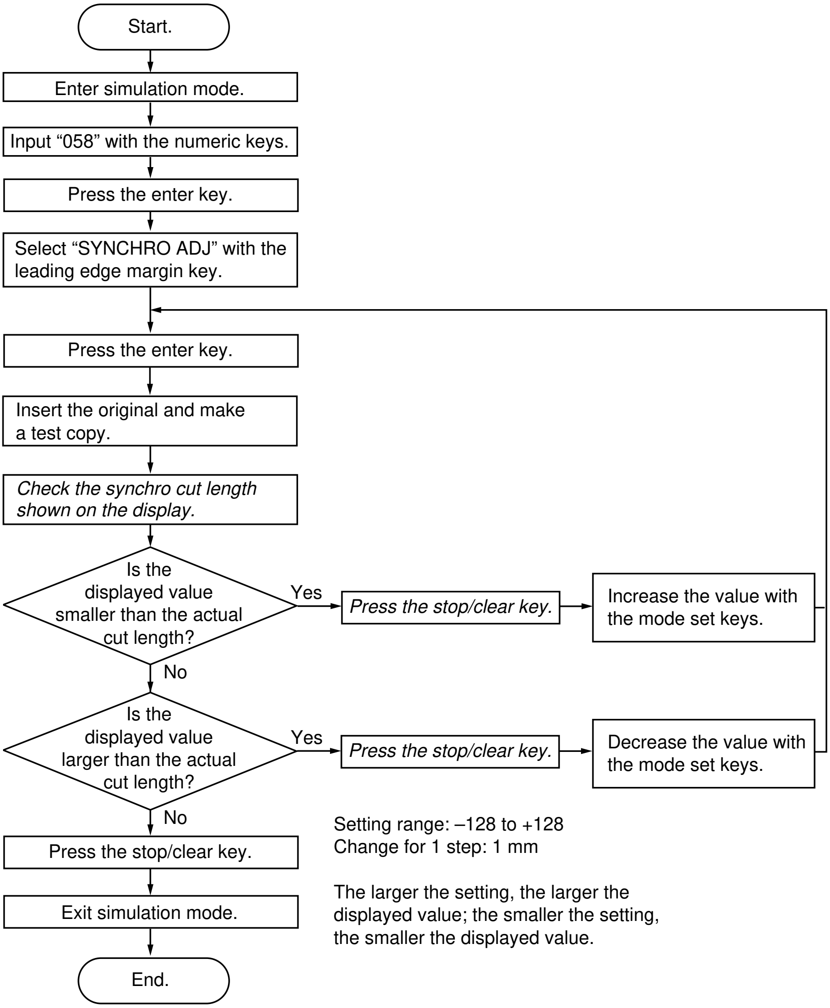
Note: When reinstalling the cutter unit, ensure that the cutter is in the home position as shown.



(5) Adjustment of displayed synchro cut length

Perform when the synchro cut length shown on the display is different from the actual cut length.

Procedure



Setting range: –128 to +128
Change for 1 step: 1 mm

The larger the setting, the larger the displayed value; the smaller the setting, the smaller the displayed value.

(6) Attachment and removal of the roll paper feed lower roller A

Follow the procedure below when cleaning or replacing the roll paper feed lower roller A.

Procedure

1. Remove the front covers.
2. Remove the 1st roll unit from the main unit (two screws on each side).

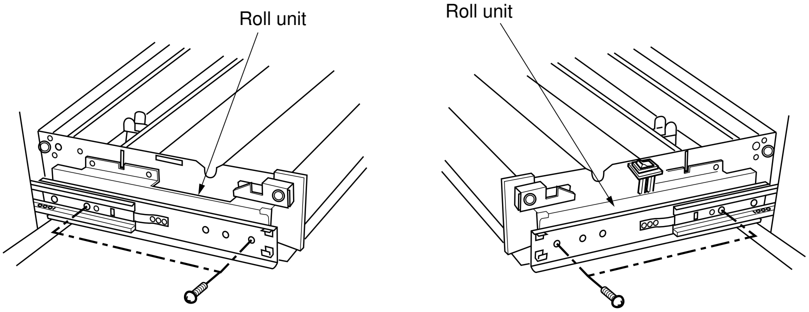


Figure 3-3-4(a)

3. Remove the four screws and the roll paper feed lower guide A.

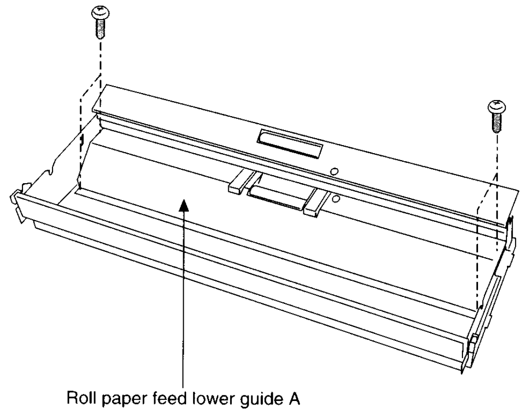


Figure 3-3-4(b)

4. Remove the six screws and spring then the slider right attachment plate.

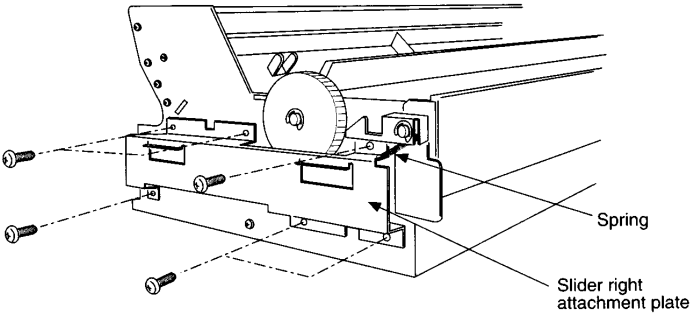


Figure 3-3-4(c)

5. Remove the E-ring, drive gear 20T and pin.
6. Remove the E-ring and bearing.

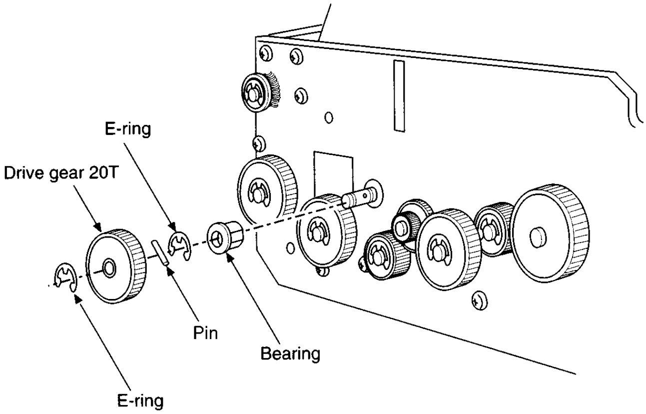


Figure 3-3-4(d)

7. Remove the E-ring on the right side of the roll paper feed lower roller A and remove the bearing.
8. Remove the E-ring and bearing from the hinge section by moving it in the direction of the arrow. Remove the roll paper feed lower roller A from the roll unit.
9. Remove the bearing from the roll paper feed lower roller A.
10. After cleaning or replacement, refit the removed parts to their original positions.

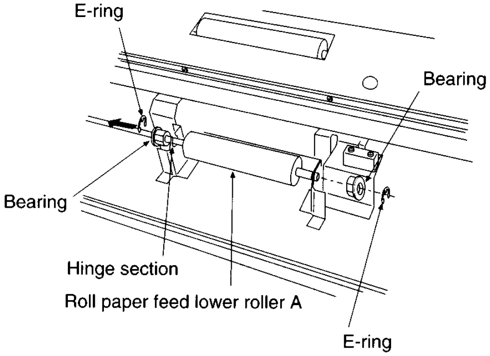


Figure 3-3-4(e)

(7) *Attachment and removal of the roll paper conveying rear roller B (for 2nd roll unit)*

Procedure

1. Remove the front covers, lower left cover and lower right side cover.
2. Remove the 2nd roll unit from the main unit (two screws on each side: see Figure 3-3-4(a), page 3-3-9-1).
3. Remove the middle feed clutch.
4. Remove the E-ring and the bearing retaining the roll paper conveying rear roller B from the outside of the left side plate.

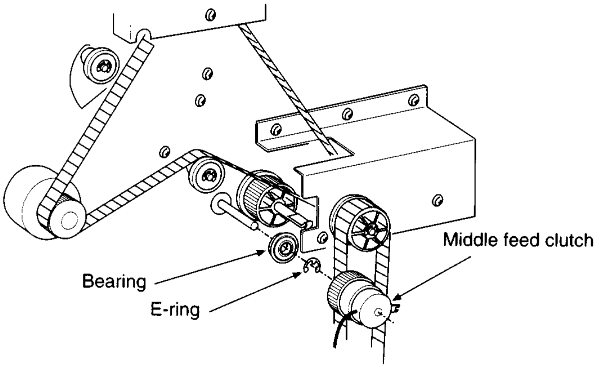


Figure 3-3-4(f)

5. Remove the main PCB (lower right side of equipment).
6. Remove the E-ring and the bearing retaining the roll paper conveying rear roller B from the outside of the right side plate.

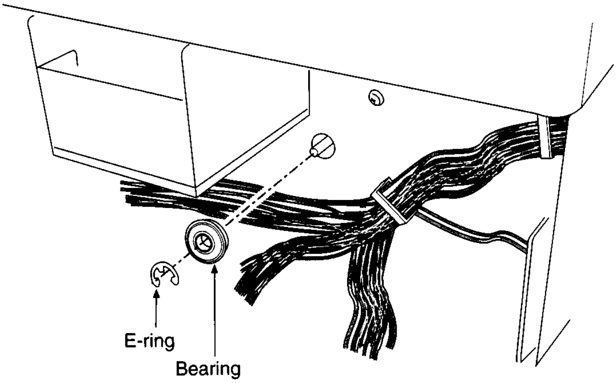


Figure 3-3-4(g)

7. Remove the roll paper conveying rear roller B from the main unit.
   - When attaching, make sure that the longer of the two thin ends of the shaft is positioned on the left as shown in the figure.
8. After cleaning or replacement, refit the removed parts to their original positions.

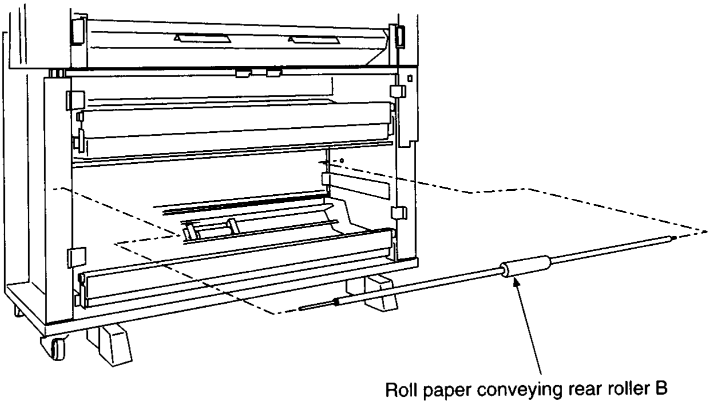


Figure 3-3-4(h)

(8) Attachment and removal of the roll paper conveying rear roller B (for optional 3rd roll unit)

Follow the procedure below when cleaning or replacing roll paper conveying rear roller B (for optional 3rd roll unit).

Procedure

1. Remove the front covers, lower left cover and lower right side cover.
2. Remove the 3rd roll unit from the main unit (two screws on each side: see Figure 3-3-4(a), page 3-3-9-1).
3. Remove the lower feed clutch
4. Remove the E-ring and the bearing retaining the roll paper conveying rear roller B form the outside of the left side plate.

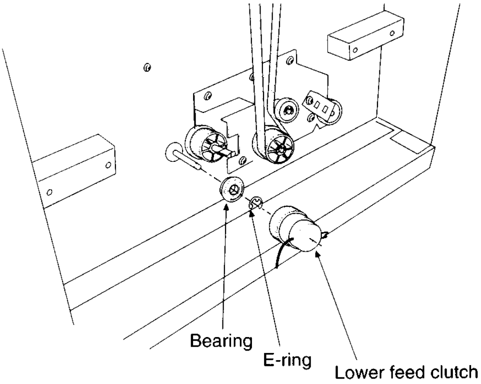


Figure 3-3-4(i)

5. Remove the power source PCB (lower right side of the equipment).
6. Remove the E-ring and the bearing retaining the roll paper conveying rear roller B from the outside of the right side plate.

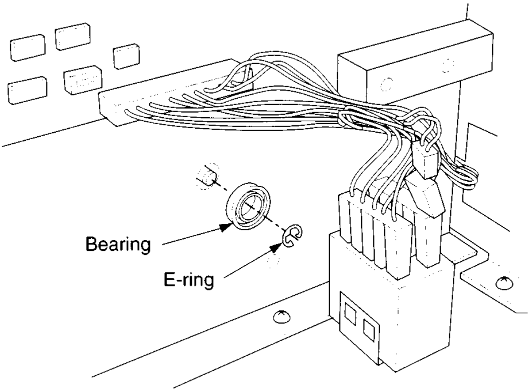


Figure 3-3-4(j)

7. Remove the roll paper conveying rear roller B from the main unit.
   - When attaching, make sure that the longer of the two thin ends of the shaft is positioned on the left as shown in the figure.
8. After cleaning or replacement, refit the removed parts to their original positions.

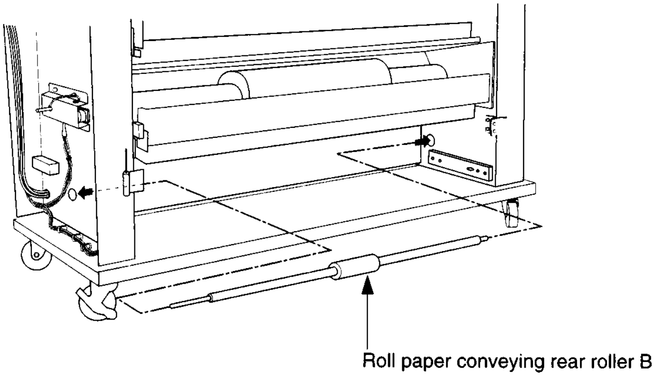


Figure 3-3-4(k)

(9) Attachment and removal of the bypass feed roller

Follow the procedure below when cleaning or replacing the bypass feed roller.

Procedure

1. Remove the front covers and the lower left cover.
2. Remove the 1st roll unit from the main unit (two screws each on the left and right: see Figure 3-3-4(a), page 3-3-9-1).
3. Remove the bypass feed clutch.
4. Remove the bearing retaining the bypass feed roller from the outside of the left side plate.

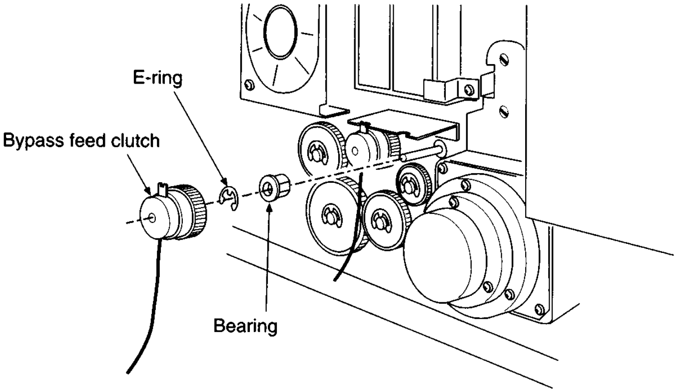


Figure 3-3-4(l)

5. Open the upper right side cover and remove the waste toner tank.
6. Remove the E-ring and the bearing retaining the bypass feed roller from the outside of the right side plate.

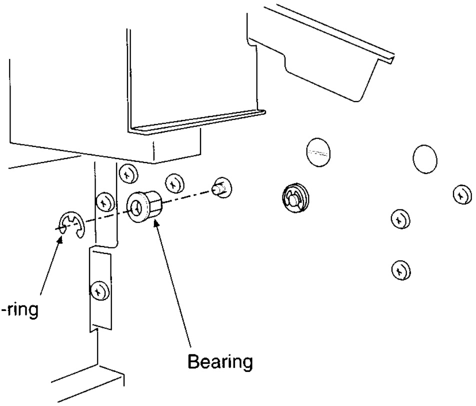


Figure 3-3-4(m)

7. Remove the bypass feed roller from the main unit.
   - When attaching, make sure that the longer of the two thin ends of the shaft is positioned on the left as shown in the figure.
8. After cleaning or replacement, refit the removed parts to their original positions.

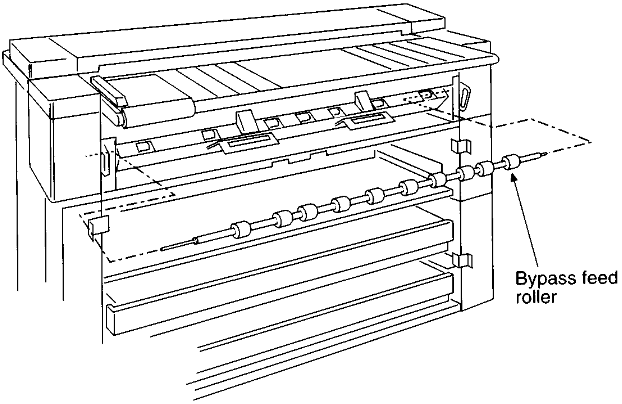


Figure 3-3-4(n)

(10) Attachment and removal of the roll paper conveying rear roller A

Follow the procedure below when cleaning or replacing roll paper conveying rear roller A.

Procedure

1. Remove the lower rear cover and lower left cover.
2. Remove the roller paper conveying clutch.
3. Remove the E-ring and the bearing retaining the roll paper conveying rear roller A from the outside of the left plate.

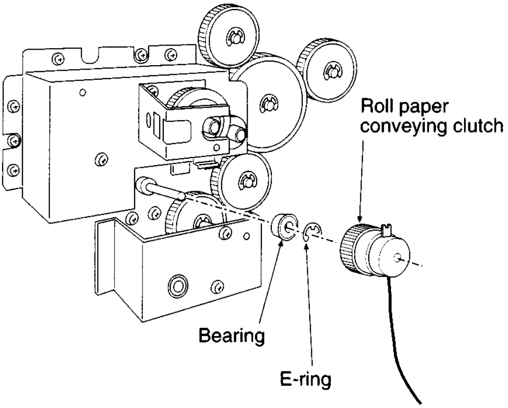


Figure 3-3-4(o)

4. Open the upper right side cover and remove the waste toner tank.
5. Remove the E-ring and the bearing retaining the roll paper conveying rear roller A from the outside of the right side plate.

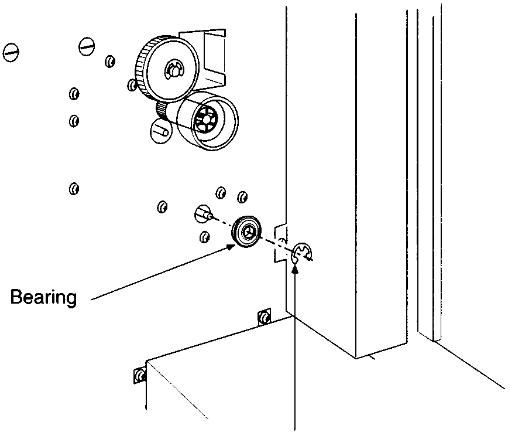


Figure 3-3-4(p)

6. Remove the roll paper conveying rear roller A from the main unit.
   - When attaching, make sure that the longer of the two thin ends of the shaft is positioned on the left as shown in the figure.
7. After cleaning or replacement, refit the removed parts to their original positions.

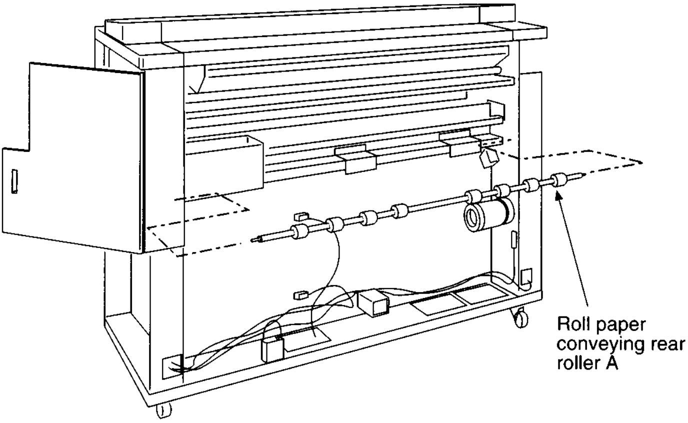


Figure 3-3-4(q)

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3-3-3 Main charger section

(1) Replacing the drum
Replace the drum as follows.

Caution:
After replacing the drum be sure to clean the main charger assembly and check the drum surface potential (see page 3-3-18) after coating the cleaning blade with toner (simulation No. 40).

Procedure
1. Detach the cleaning assembly.
2. Turn the flywheel clockwise to disengage the flywheel joint from the drum flange.
   - When pulling the flywheel, align the screw head on the flywheel shaft with the cutout in the flywheel stopper.
   - When refitting the drum, turn the flywheel clockwise until it clicks to engage the drum flange with the flywheel joint.

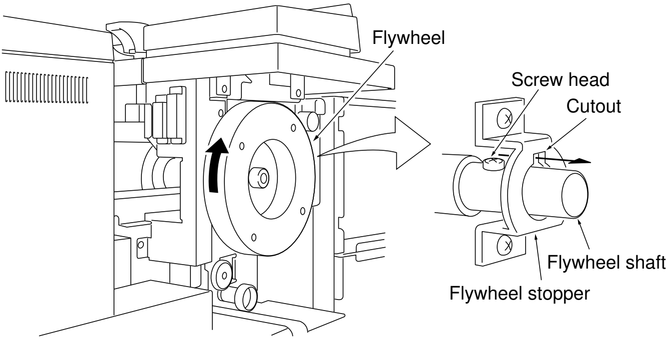


Figure 3-3-5

3. Remove the screw on the drum left rail guide.
4. While holding the drum release plate toward the drum, slide the drum left rail guide toward the machine rear. The drum release plate is locked and the drum flange is unlocked from the drive joint.

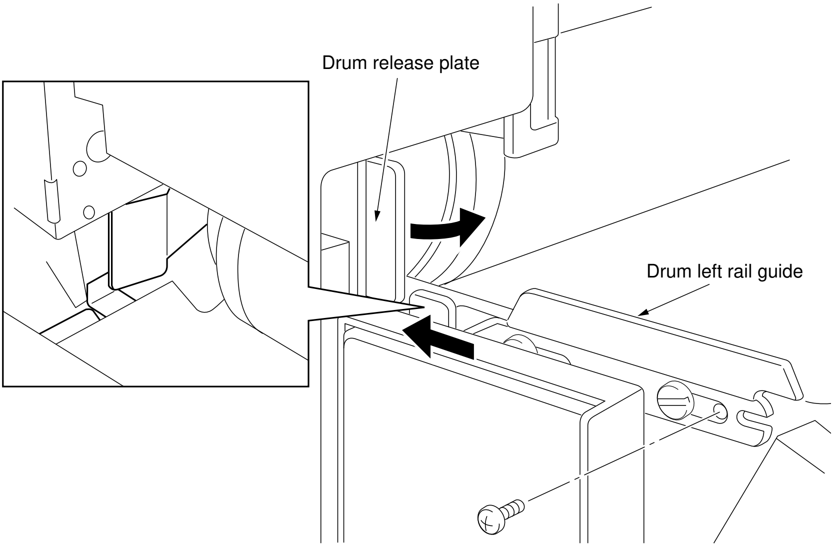


Figure 3-3-6

5. Loosen the two screws of the drum right and left stoppers holding both ends of the drum and unlock the stoppers.

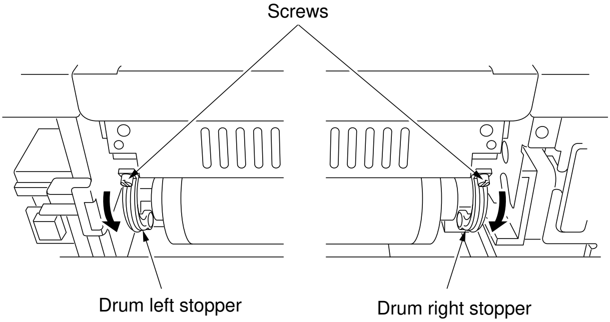


Figure 3-3-7

6. Remove the screw and raise the drum right rail guide.
7. Attach the screw removed in step 6 to part Ⓐ so that the main unit is kept open.
8. Roll the drum toward you along the drum right rail guide.
9. Detach the drum from the main unit.

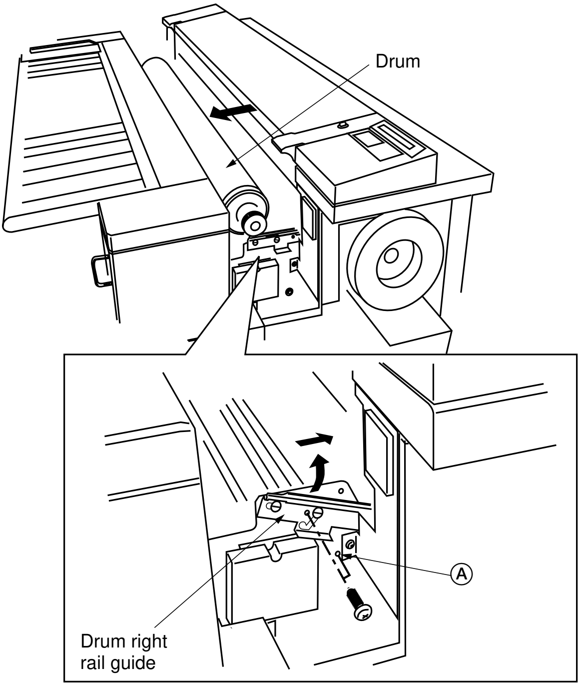


Figure 3-3-8

10. After replacement, return the parts to their original positions.
- *When the drum has been replaced, fit the drum right flange to the end with the label inside of the drum.*

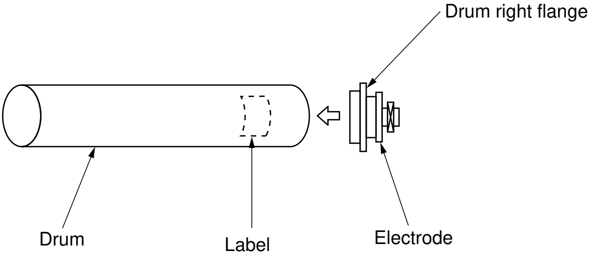


Figure 3-3-8 (a)

(1-1) Cleaning the drum electrodes

Procedure

- *Cleaning the electrode on the drum right flange*

1. *Detach the cleaning assembly.*
2. *Remove the screw on the drum left rail guide (see page 3-3-11).*
3. *While pressing the drum release plate toward the drum, slide the drum left rail guide toward the machine rear. The drum release plate is locked and the drum flange is unlocked from the drive joint (see page 3-3-11).*
4. *Remove the screw and open the right upper side cover.*
5. *While turning the flywheel, clean the outer periphery of the electrode on the drum right flange with alcohol.*

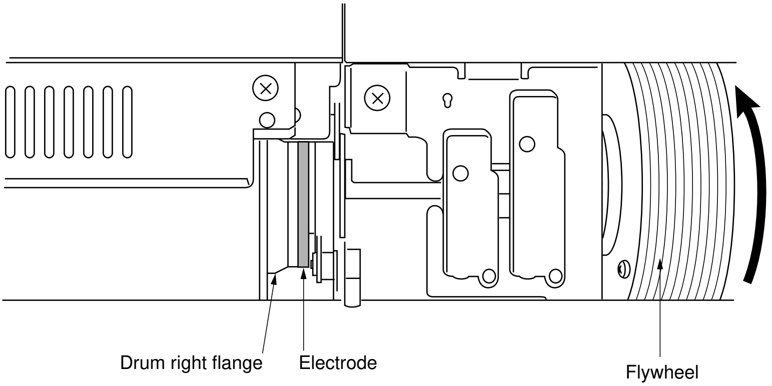


Figure 3-3-8 (b)

- *Cleaning the electrode on the drum right holder*

1. *Detach the drum from the main unit.*
2. *Clean the drum electrode, the part in contact with the electrode on the drum right flange, using alcohol.*

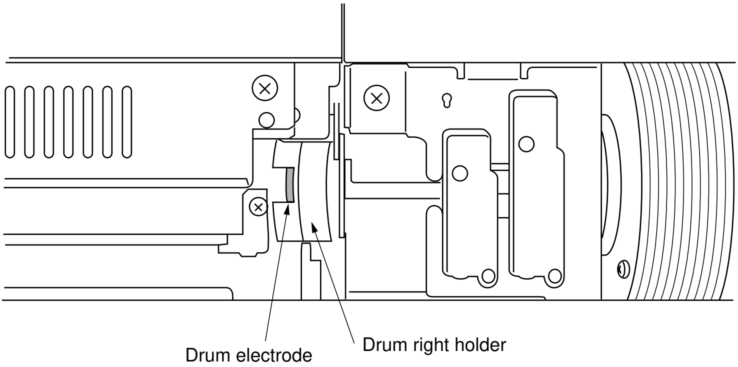


Figure 3-3-8 (c)

(2) Cleaning the drum

Follow the procedure below when image errors occur.

Caution:

- Avoid direct sunlight and strong light when cleaning the drum.
- Dust in the air and from the cleaning pad may damage the drum during operation. Avoid working in dusty place.
- Clean the drum entirely even if it is only dirty locally.
- Do not clean the drum with alcohol, thinner or other organic solvent.

Required supplies

- Toner
- Polishing cloth: specified synthetic cotton

Procedure

1. Detach the drum from the main unit.
2. Apply a polishing cloth to the drum and gently wipe the drum taking care not to damage the surface.
3. Apply toner to another cloth and wipe the drum surface with it in the same manner.
4. Refit the drum and all the removed parts, and let the copier stand for about 30 minutes.
5. Make a test copy and check the image.

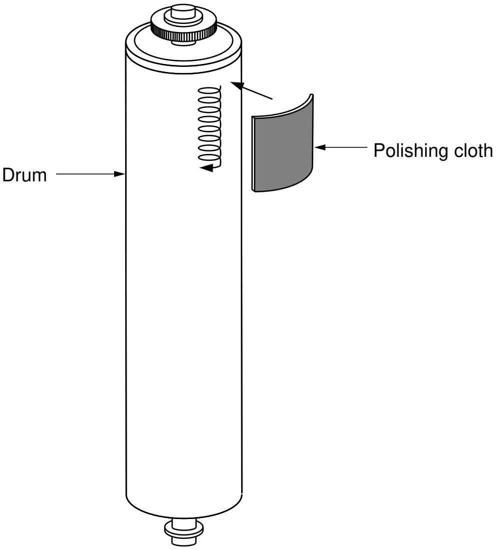


Figure 3-3-9

(3) Changing the charger wire

Follow the procedure below when the charger wire is broken or when replacing the charger wire.

Caution:

- Use the specified tungsten wire for the charger wire. *(Item No. 74716280, Anodized tungsten wire, 0.08 mm)*
- The section wound around the charger spring should not protrude from the main charger housing.
- The end of the charger wire should not protrude from under the screw.
- Be sure to use tungsten wire that is free of soiling or damage.
- Keep the charger wire taut by stretching the charger spring.
- When changing the charger wire, be sure to clean the individual sections of the main charger assembly (inside of charger housing, etc).
  - Do not use organic solvents such as alcohol and thinner to clean the main charger shied.

Procedure

1. Detach the cleaning assembly.
2. Rotate the main charger assembly in the direction shown by the arrow and detach the main charger assembly from the cleaning assembly.

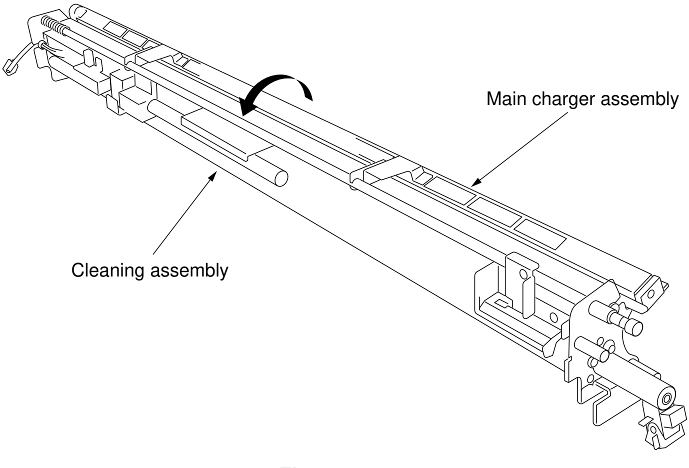


Figure 3-3-10

3. Remove the right and left main charger lids.
4. Remove the charger spring from the main charger terminal and loosen the screw to remove the charger wire.

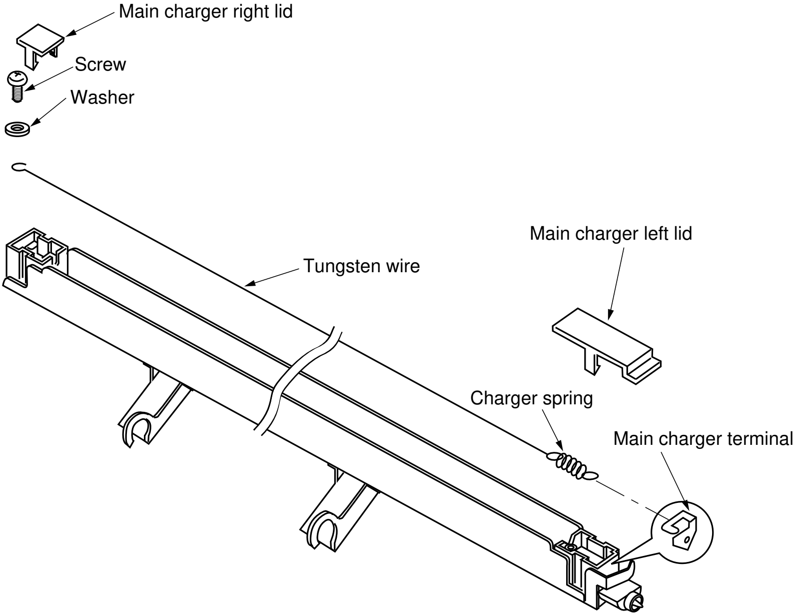


Figure 3-3-11

5. *Wind the tungsten wire five turns around one end of the charger spring, and trim the end of the wire.*
   - *The length of the cut wire must be less than 1 mm.*

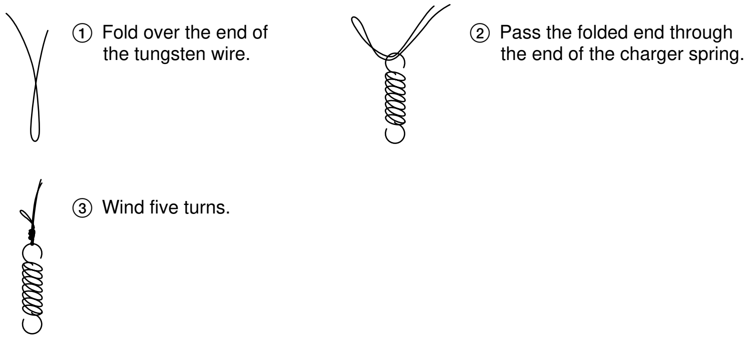


Figure 3-3-11 (a)

6. Hook the charger spring to the main charger terminal and pass the tungsten wire through the opening in the wire adjustment plate.
7. Pass the tungsten wire under the washer and fasten it with the screw keeping the charger wire stretched so that the charger spring is at least 16 mm long.
8. Cut off the excess wire under the washer so less than 2 mm protrudes.

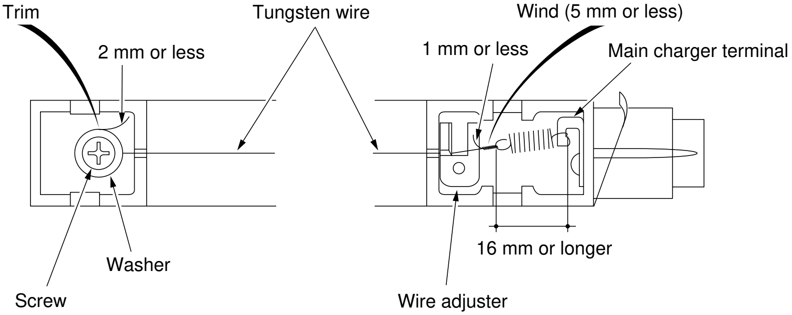


Figure 3-3-12

9. Turn the adjustment screw of the wire adjustment plate until 1.0 ± 0.5 mm of its tip protrudes to adjust the height of the wire adjustment plate.

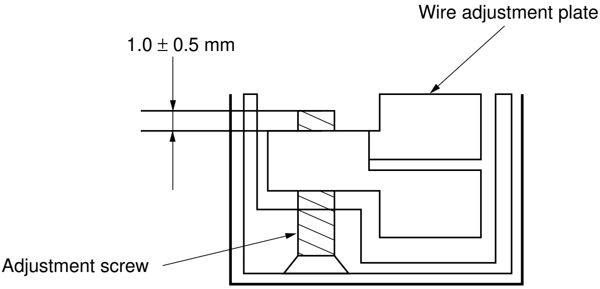
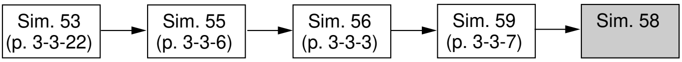


Figure 3-3-13

(4) Adjustment of trailing edge margin

Follow the procedure below when the correct trailing edge margin (border erase width) cannot be obtained in border erase mode.



Caution:

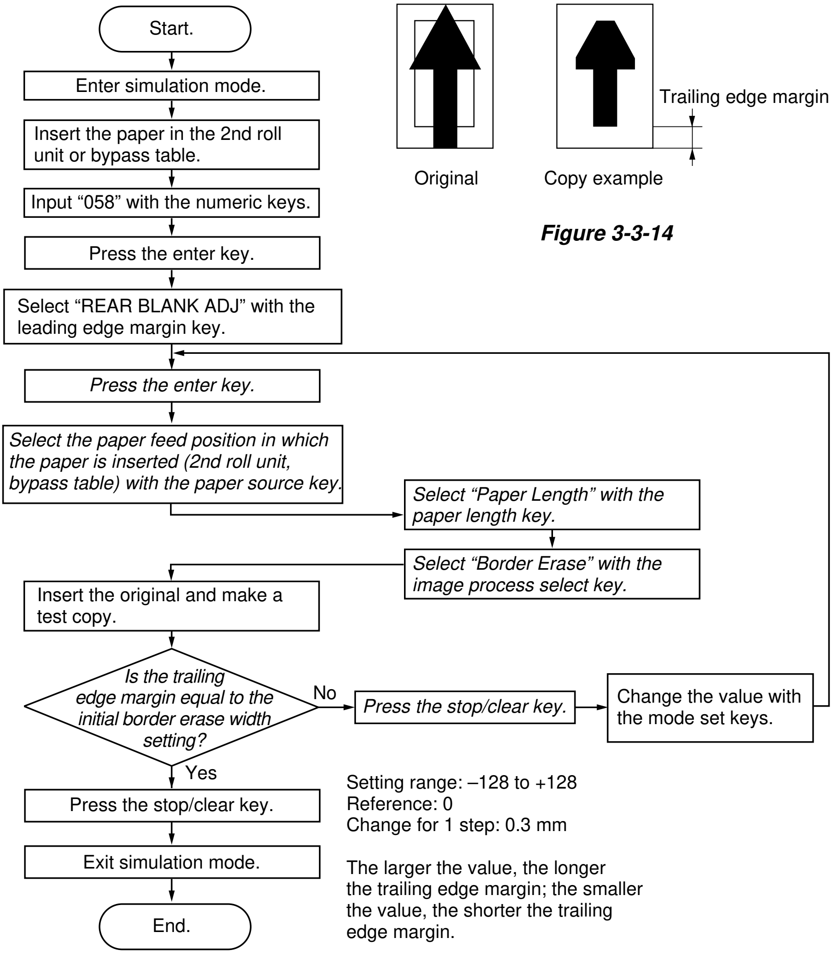
- Before starting this adjustment, ensure that all the adjustments in the above simulations are completed.
- Select the 2nd roll unit to carry out test copying for roll paper feed adjustment. The difference in trailing edge margin in normal copy operation for each roll unit is minimized by adjusting with the 2nd roll unit selected (as standard selection).

Procedure

Original

Copy example

Figure 3-3-14



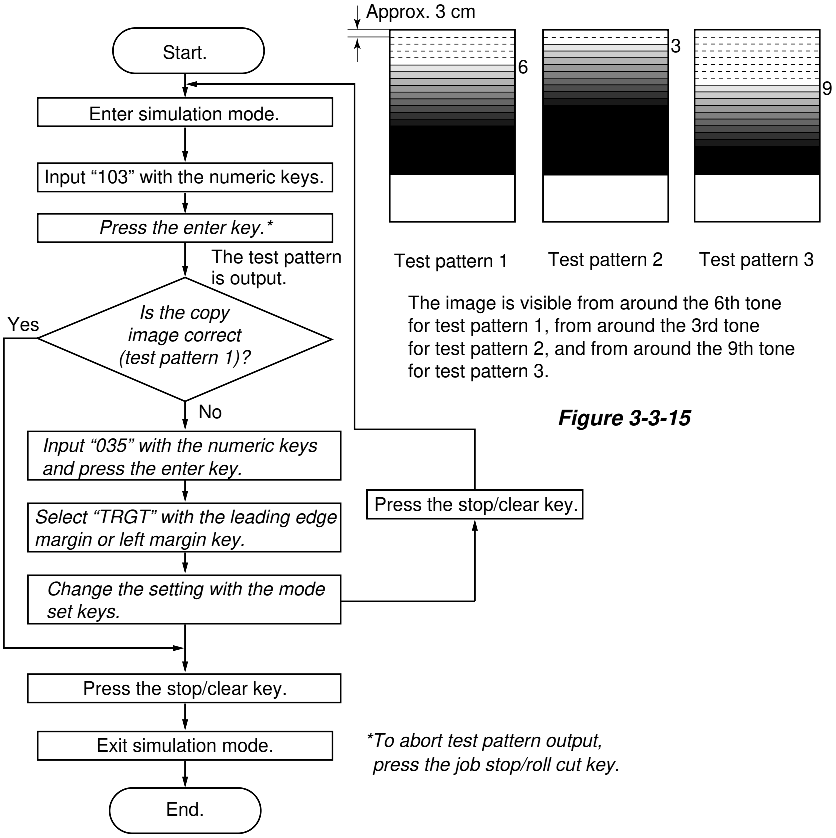
Setting range: –128 to +128
Reference: 0
Change for 1 step: 0.3 mm

The larger the value, the longer the trailing edge margin; the smaller the value, the shorter the trailing edge margin.

(5) Checking drum surface potential

Follow the procedure below after replacing the drum, LPH and drum potential sensor.

Procedure



The image is visible from around the 6th tone for test pattern 1, from around the 3rd tone for test pattern 2, and from around the 9th tone for test pattern 3.

Figure 3-3-15

**To abort test pattern output, press the job stop/roll cut key.*

3-3-4 Exposure and original feed section

(1) Attachment and removal of fluorescent lamp

Follow the procedure below when cleaning or replacing the fluorescent lamp.

Caution:
After cleaning or replacing the fluorescent lamp, select copy contrast indicator 4 and make a test copy to check the image in each original mode.
If an exposure error occurs in the test copy, adjust the exposure amount (see page 3-3-24).

Procedure

1. Open the original holding section.
2. Remove the operation section.
3. Remove the two screws and remove the left and right center original covers.

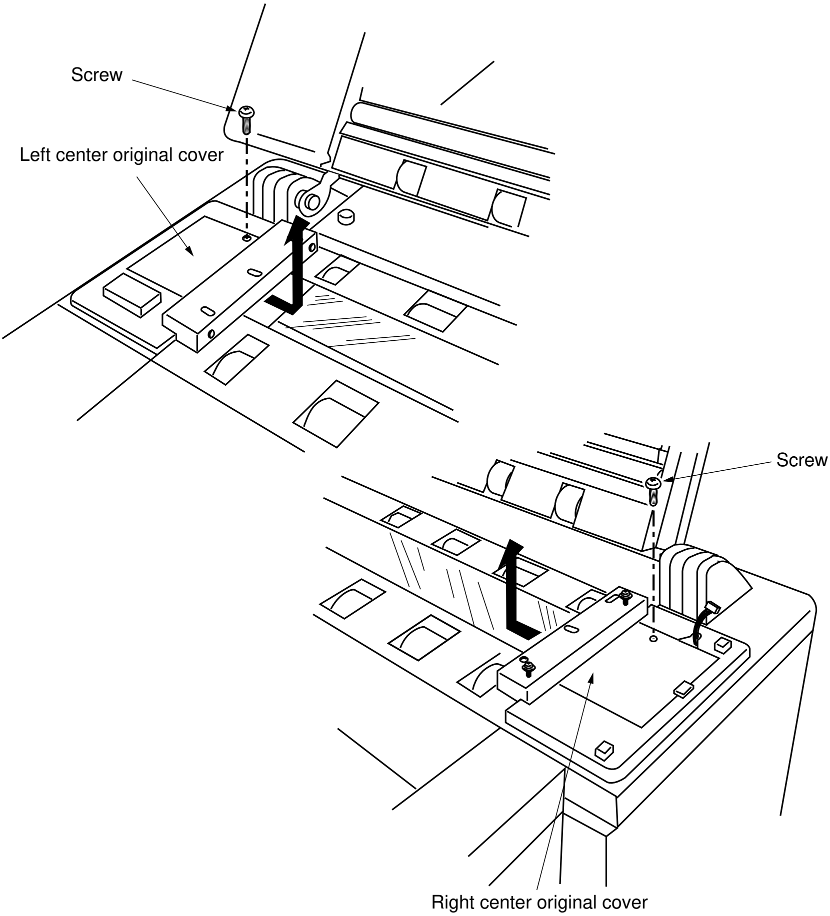


Figure 3-3-16

4. Remove the four screws and the right and left contact glass retainers.
5. Remove the contact glass.
6. *Remove the hinge left cover and upper left cover.*

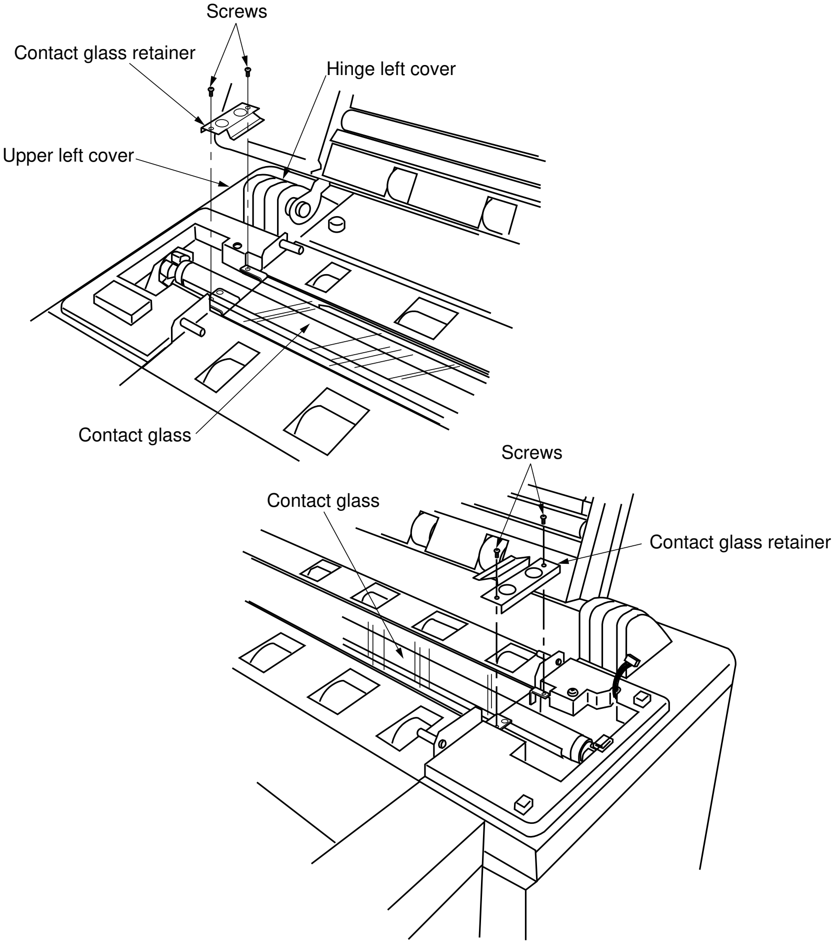


Figure 3-3-17

7. *Remove the two screws securing the fluorescent lamp socket mount at the machine left.*
8. Remove the fluorescent lamp by pulling it out of the fluorescent lamp heater.
   - When reattaching the fluorescent lamp, be sure to orient it with the manufacturer's mark on the right side of the copier.
9. After cleaning or replacing, return the parts to their original positions.

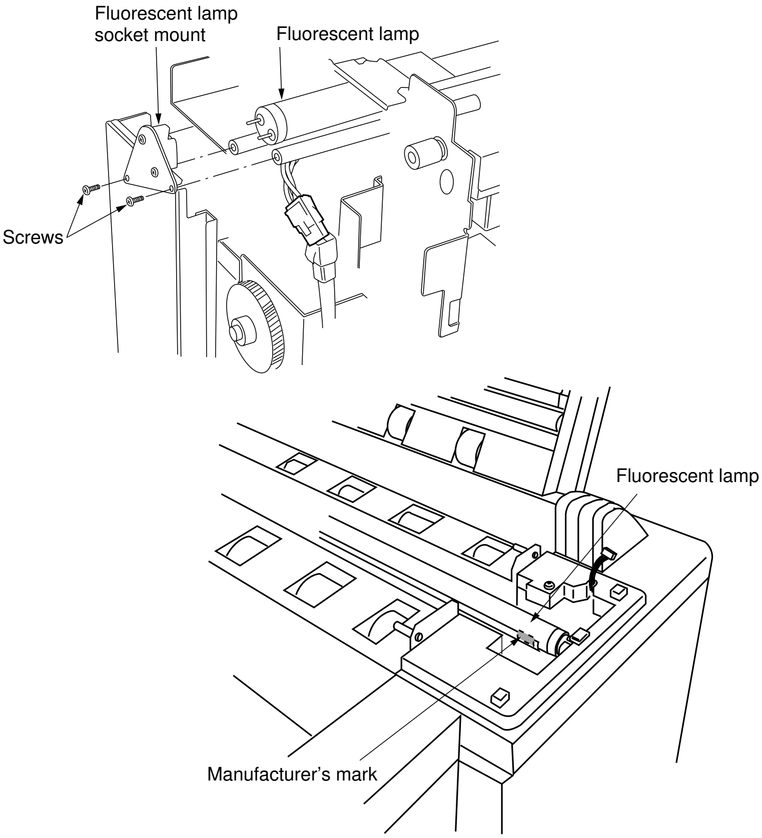


Figure 3-3-18

(2) Adjustment of 100% magnification

Follow the procedure below when the magnification is not obtained.

Caution:

- Select the 2nd roll unit to carry out test copying for roll paper feed adjustment. The difference in magnification in normal copy operation for each roll unit is minimized by adjusting with the 2nd roll unit selected (as standard selection).

Procedure

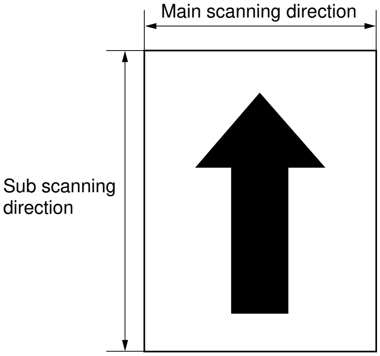
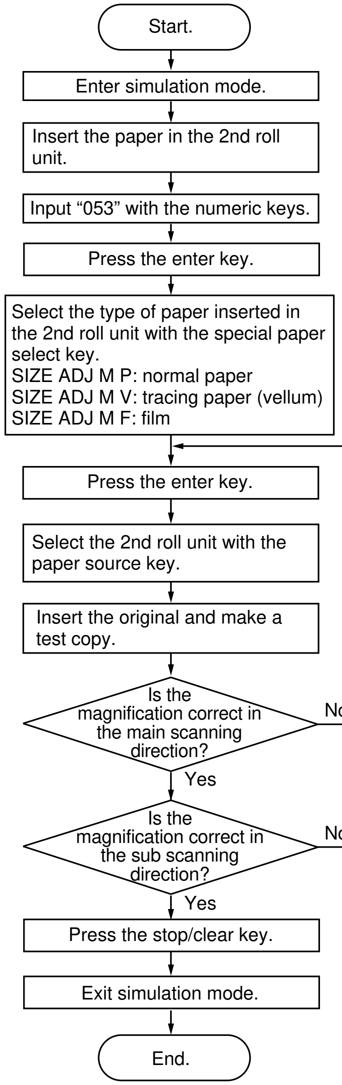
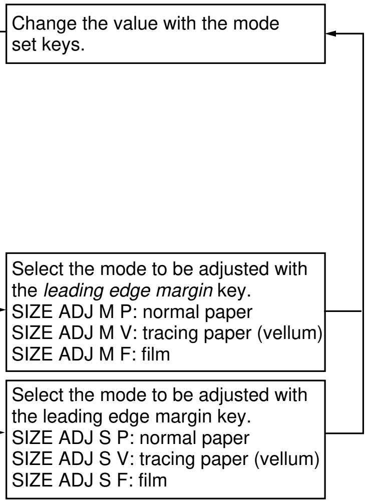


Figure 3-3-19





Setting range: –3.0% to +3.0%
Reference: 0
Change for 1 step: 0.1%

The larger the value, the longer the copy image; the smaller the value, the shorter the copy image.

(3) Adjustment of leading edge registration

Follow the procedure below when there is a regular error between the leading edges of the original and the copy image.

Sim. 53 (p. 3-3-22) → Sim. 57 (p. 3-3-5) → Sim. 54

Caution:

- Before starting this adjustment, ensure that all the adjustments in the above simulations are completed.
- Draw a line 10 mm from the leading edge of the document.

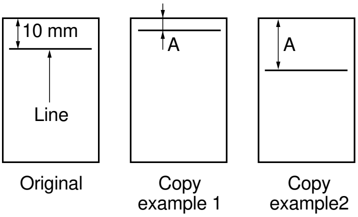
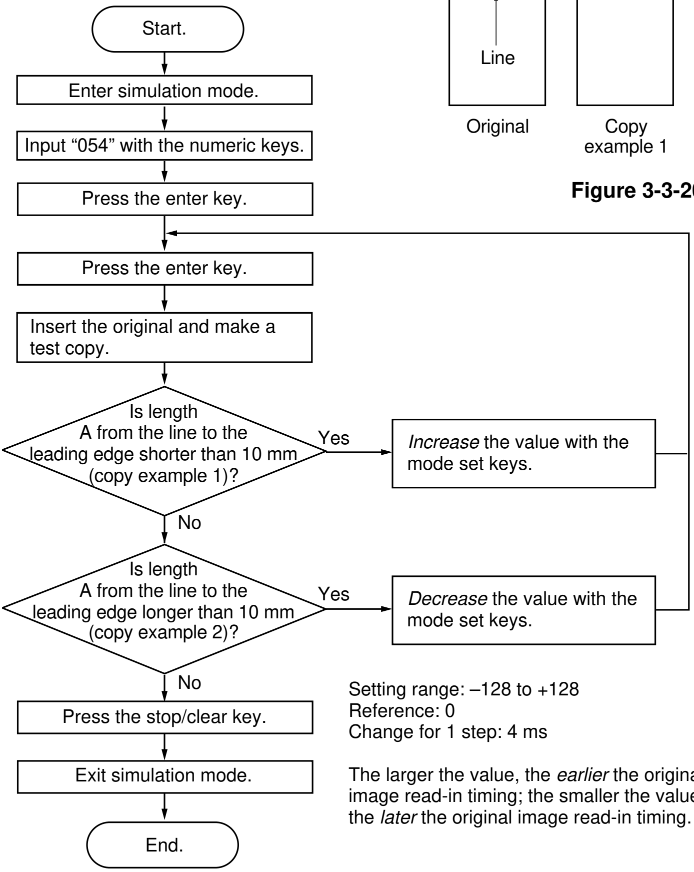


Figure 3-3-20

Procedure



Setting range: –128 to +128
Reference: 0
Change for 1 step: 4 ms

The larger the value, the *earlier* the original image read-in timing; the smaller the value, the *later* the original image read-in timing.

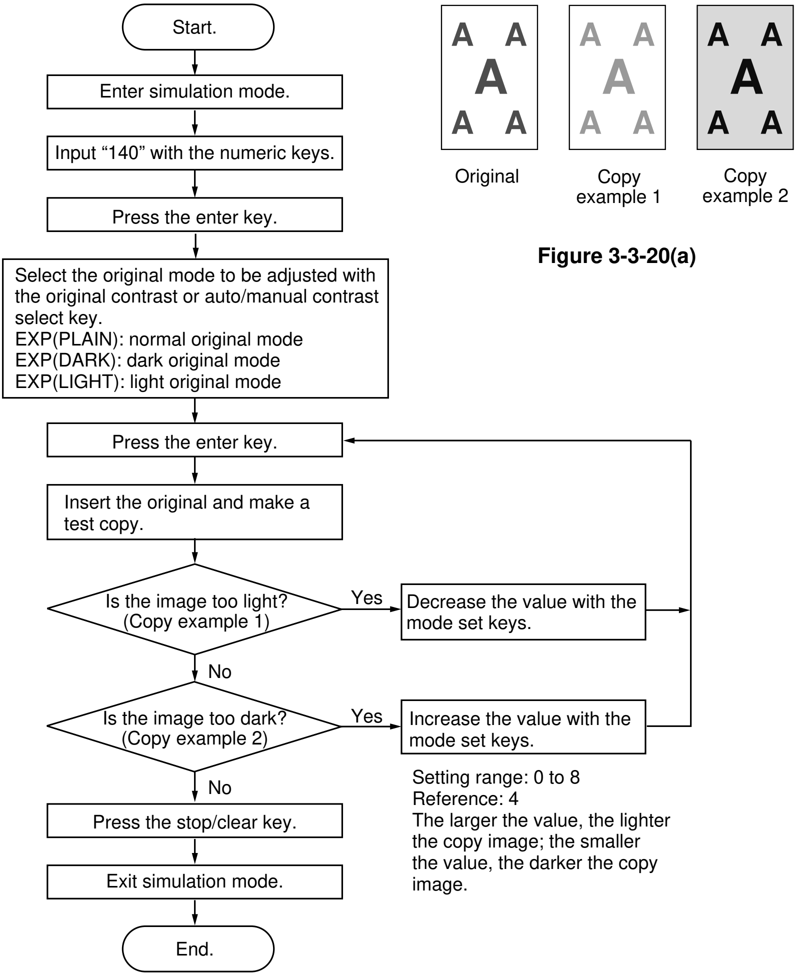
(4) Adjustment of exposure amount

Follow the procedure below when cleaning or replacing the fluorescent lamp and contact glass, or when an image error occurs on test copies.
Also, perform when it is not possible to obtain a good copy image when a correct mode is selected for the original.

- **Adjustment for black & white (character) mode**

  Required originals
  - When adjusting in the normal original mode: Test chart
  - When adjusting in the dark original mode: Newspaper test chart (NPTC)
  - When adjusting in the light original mode: Blue graph paper

Procedure



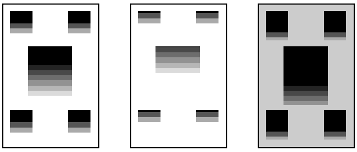
Setting range: 0 to 8
Reference: 4
The larger the value, the lighter the copy image; the smaller the value, the darker the copy image.

Figure 3-3-20(a)

- **Adjustment for half tone mode**

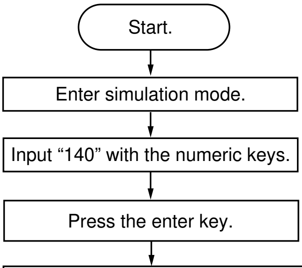
  Required originals
  - When adjusting in the normal original mode: Test chart
  - When adjusting in the dark original mode: Dark poster
  - When adjusting in the light original mode (dark background): Map
  - When adjusting in the light original mode (light background): Test chart

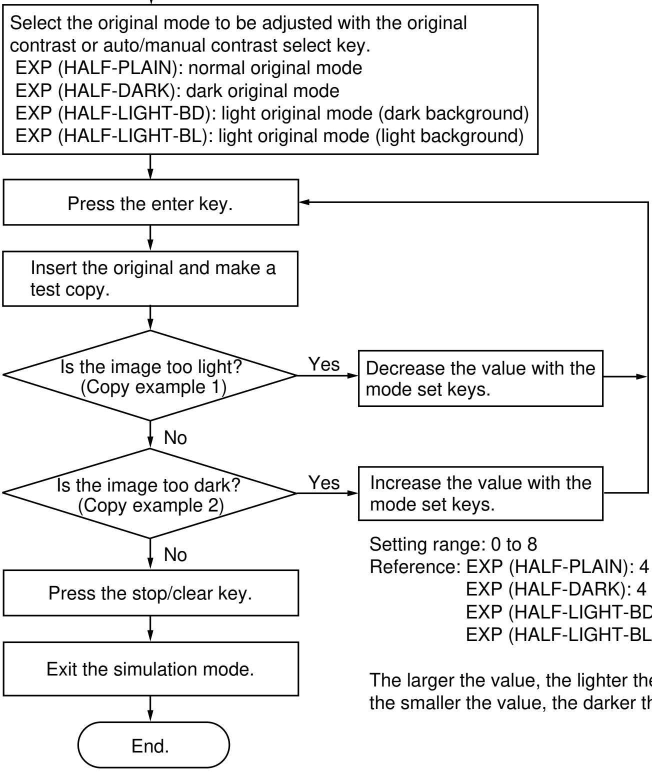
Procedure



Original Copy example 1 Copy example 2

Figure 3-3-20(b)





Setting range: 0 to 8
Reference: EXP (HALF-PLAIN): 4
EXP (HALF-DARK): 4
EXP (HALF-LIGHT-BD): 4
EXP (HALF-LIGHT-BL): 5

The larger the value, the lighter the copy image; the smaller the value, the darker the copy image.

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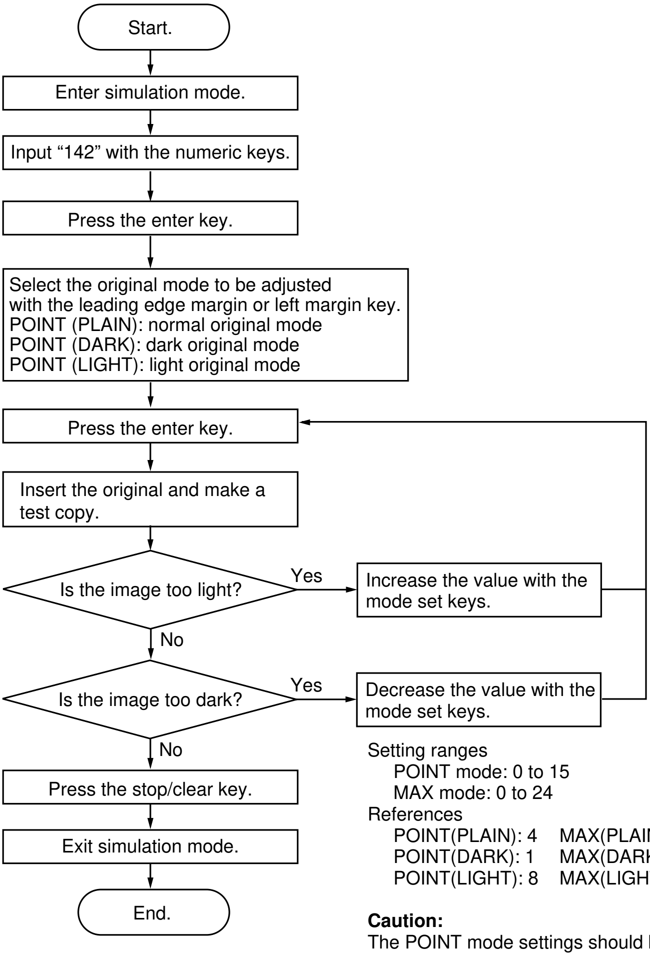
• Adjustment of AE optimum level

Caution:
Do not change the MAX mode settings.

Procedure



Setting ranges
POINT mode: 0 to 15
MAX mode: 0 to 24
References
POINT(PLAIN): 4 MAX(PLAIN): 12
POINT(DARK): 1 MAX(DARK): 12
POINT(LIGHT): 8 MAX(LIGHT): 18

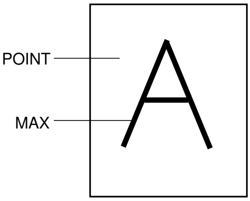
Caution:
The POINT mode settings should be smaller than their corresponding MAX mode values.

The larger the value, the darker the image; the smaller the value, the lighter the image.

Examples of required originals and correct images

Ajustment for normal original mode:

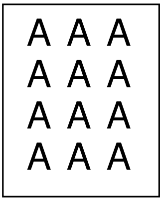
POINT (PLAIN)



- Few black solid areas
- Clear high contrast black lines or characters

Example: Plotter prints

MAX (PLAIN)

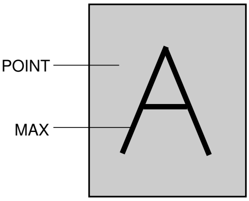


- Comparatively many black solid areas
- High contrast solid black lines or characters

Example: Posters

Ajustment for dark original mode:

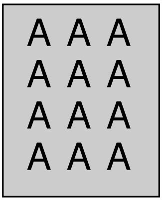
POINT (DARK)



- Few black solid areas
- Clear high contrast black lines or characters
- Visible background

Example: Diazo prints

MAX (DARK)

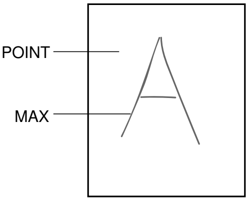


- Comparatively many black solid areas
- Solid black lines or characters
- Visible background

Example: Posters with a photograph/colored background

Ajustment for light original mode:

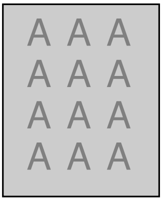
POINT (LIGHT)



- Few black solid areas
- Lower contrast and less solid black lines or characters

Example: Pencil drawings

MAX (LIGHT)



- Characters are not solid black
- Visible background

Example: Posters with a photograph/colored background

Figure 3-3-20(c)

- **Setting AE fine adjustment intervals**

Follow the procedure below when the copy density range is too narrow after the copy density has been adjusted with the copy contrast keys in auto contrast mode.

Required original
- Test chart

Procedure

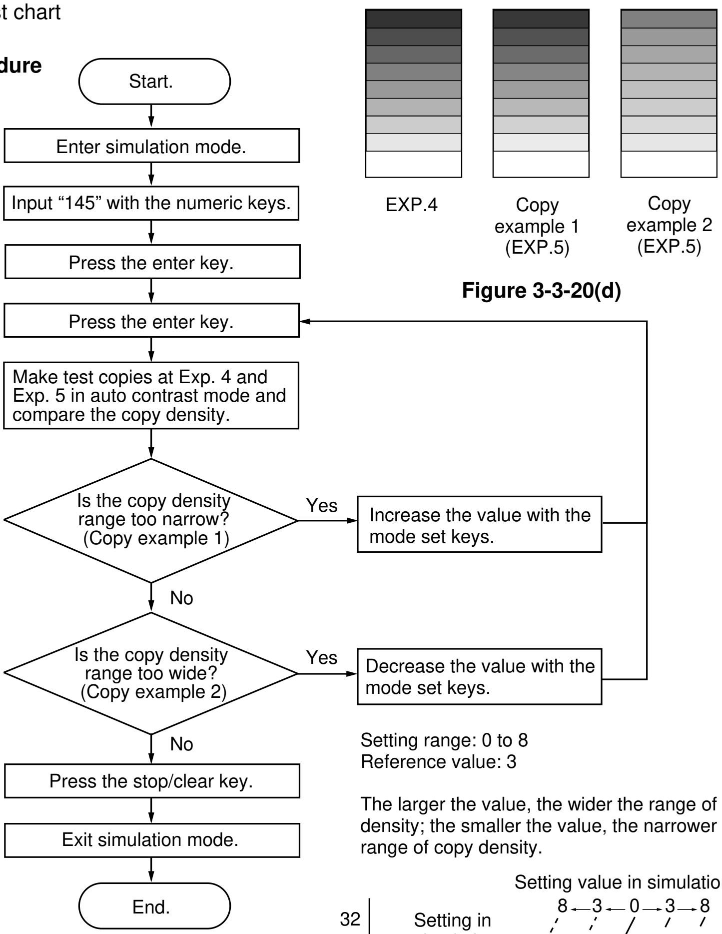


Figure 3-3-20(d)

Setting range: 0 to 8
Reference value: 3

The larger the value, the wider the range of copy density; the smaller the value, the narrower the range of copy density.

The setting in simulation 142 shifts as the value in simulation 145 changes. The copy image becomes lighter or darker based on the LPH output data corresponding to the scanned image data in auto contrast mode.

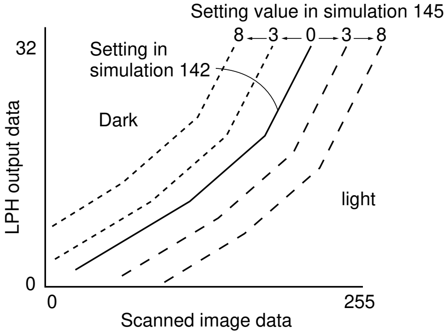


Figure 3-3-20(e)

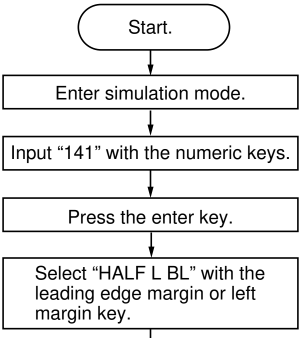
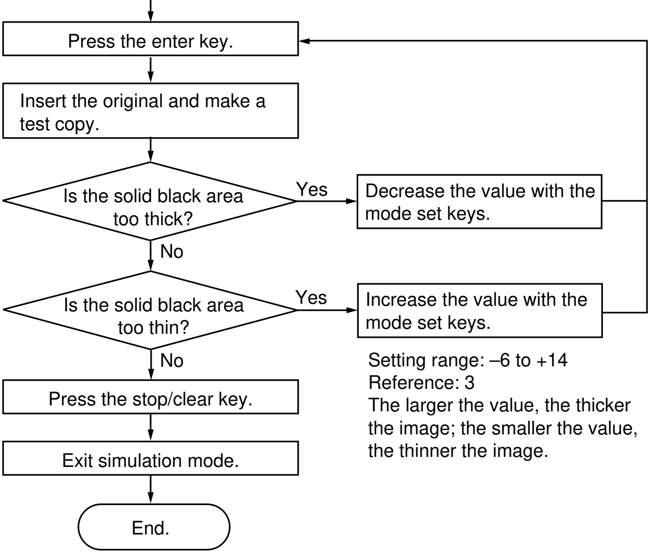
(5) Half tone mode image quality adjustment

Follow the procedure below to adjust the image density to make clear copies of originals with characters and photographs or dark posters in half tone mode.

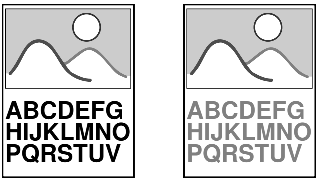
- **Adjusting for half tone light original mode**

  Required original
  - Original with characters and photographs

Procedure

Setting range: –6 to +14
Reference: 3
The larger the value, the thicker the image; the smaller the value, the thinner the image.



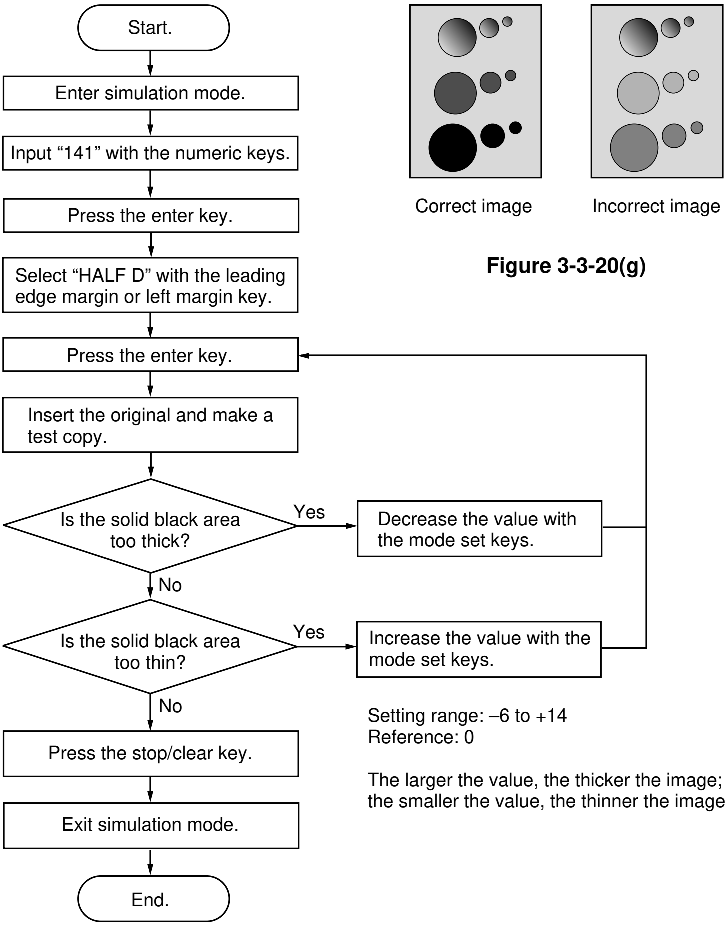
Correct image Incorrect image

Figure 3-3-20(f)

- **Adjusting for half tone dark original mode**

  Required original
  - Dark poster

Procedure



Correct image Incorrect image

Figure 3-3-20(g)

Setting range: –6 to +14
Reference: 0

The larger the value, the thicker the image;
the smaller the value, the thinner the image.

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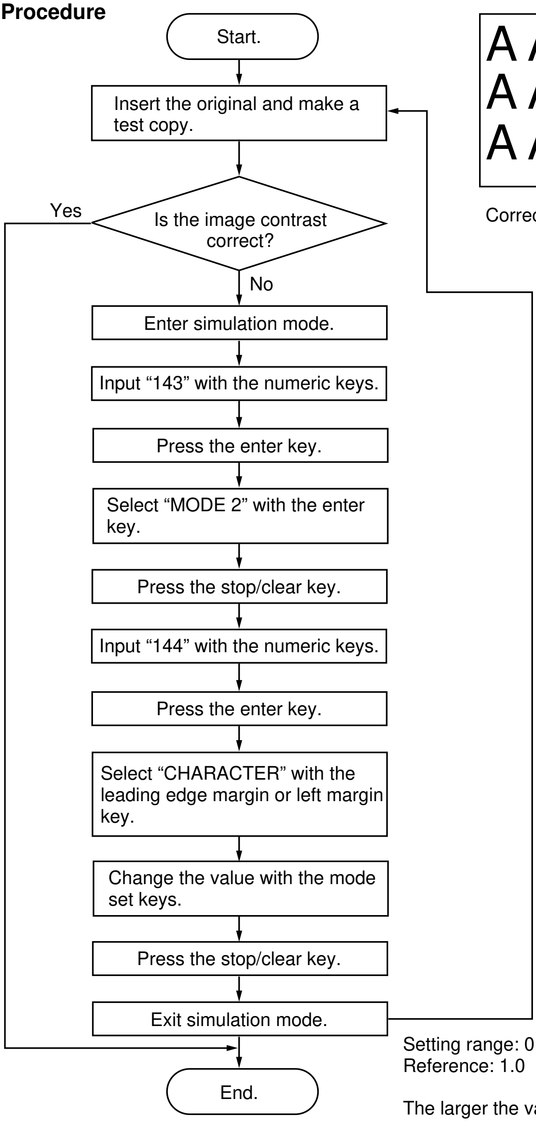
(6) Image contrast adjustment (adjustment of filter gain)

Follow the procedure below to make characters clear.

- **Adjustment for black & white (character) mode**

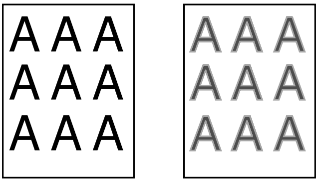
  Required original
  - Test chart

Procedure



Setting range: 0.1 to 1.9
Reference: 1.0

The larger the value, the stronger the image contrast; the smaller the value, the weaker the image contrast.

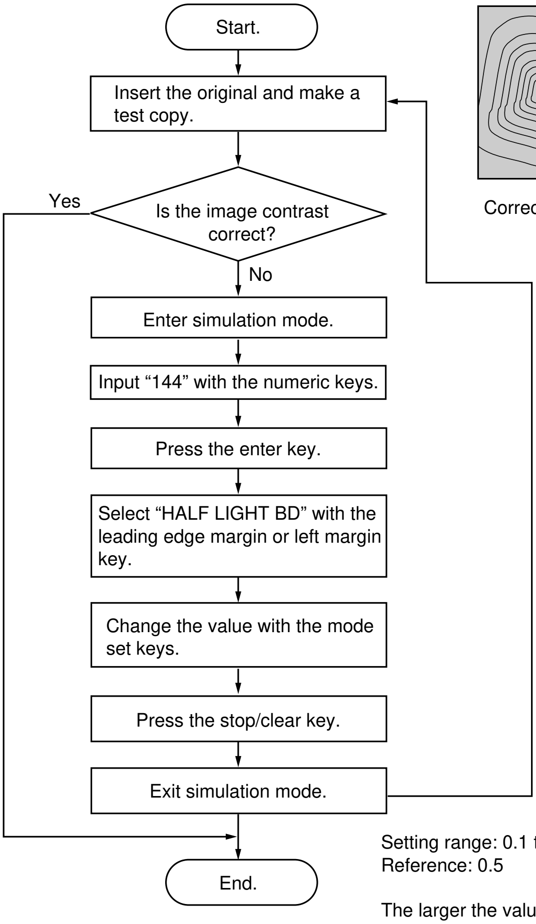


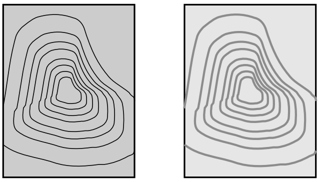
Correct image Incorrect image

Figure 3-3-20(h)

- **Adjustment for half tone light original mode (dark background)**
  Required original
  - Map

Procedure





Correct image

Incorrect image

Figure 3-3-20(i)

Setting range: 0.1 to 1.9
Reference: 0.5

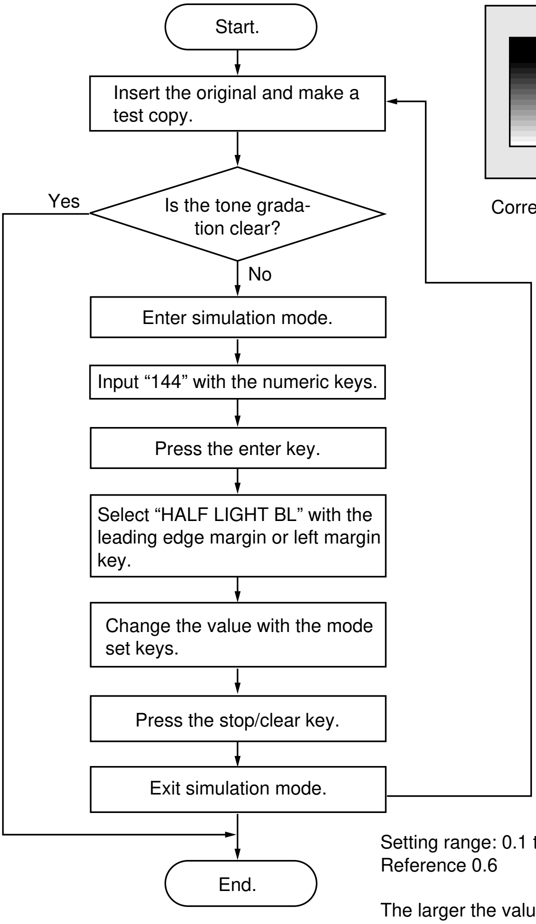
The larger the value, the stronger the image contrast; the smaller the value, the weaker the image contrast.

- **Adjusting for half tone light original mode (light background)**

  Required original

  - Test chart

Procedure



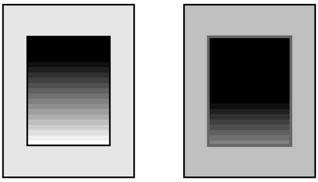


Figure 3-3-20(j)

Setting range: 0.1 to 1.9
Reference 0.6

The larger the value, the stronger the contrast; the smaller the value, the weaker the contrast.

(7) Image focus adjustment (LPH height adjustment)

Perform after replacing the LPH.

Procedure

1. Enter simulation mode.
2. Input “158” with the numeric keys.
3. Press the enter key. A test pattern is printed out.

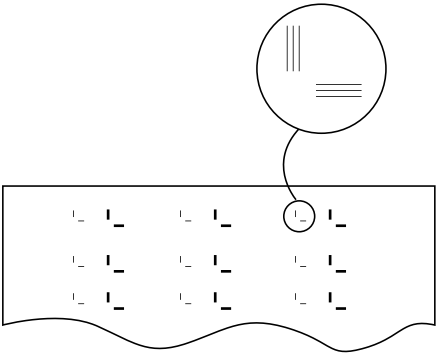


Figure 3-3-21 Test pattern

4. Using a magnifier, check if the lines of the smaller pattern are clearly printed.
5. Detach the developing assembly from the main unit.
6. Remove the three screws and the LPH lower partition.
7. Loosen the six screws holding the LPH.

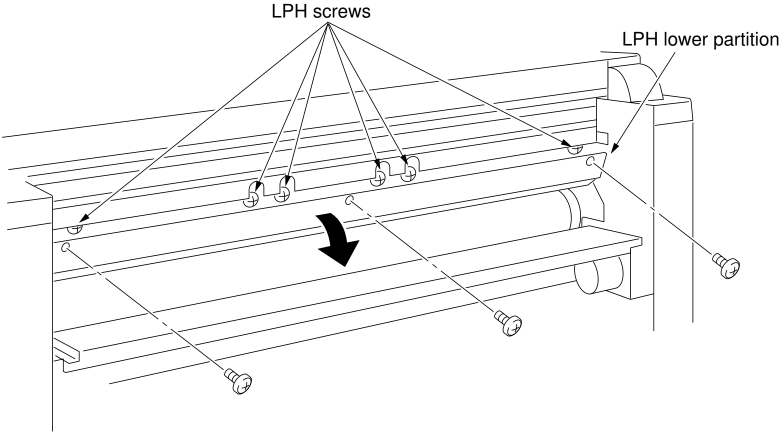


Figure 3-3-22

8. Close the LPH lower partition and retighten the three screws.
9. Refit the developing assembly to the main unit.
10. Press the enter key and check the test pattern printout.
11. Adjust the height of the LPH by turning the adjustment pins on the machine right and left.
    - Turn the adjustment pins clockwise (⇨) to raise the LPH. Turn them counterclockwise (⬅) to lower the LPH.

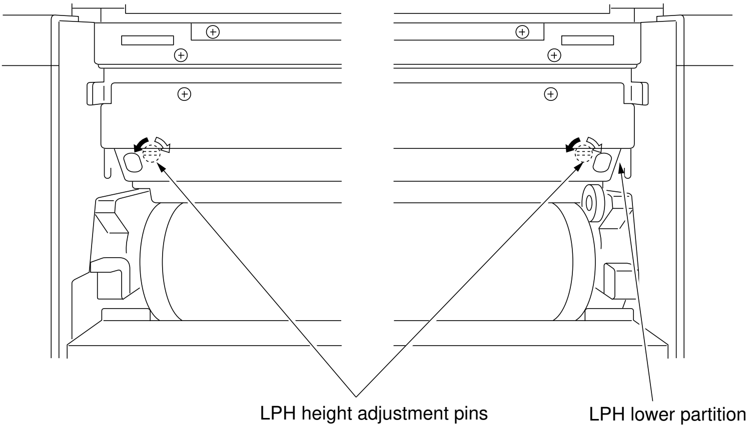


Figure 3-3-23

12. Repeat steps 10 and 11 until the correct test pattern is obtained.
13. Press the stop/clear key.
14. Exit simulation mode.
15. Detach the developing assembly from the main unit.
16. Open the LPH lower partition and tighten the six screws for the LPH.
    - *Fasten one of the two LPH retainers with the lower edges of the pins in contact with the lower edges of the slots, using the two screws. Fasten the other retainer with the upper edges of the pins in contact with the upper edges of the slots.*
17. Close the LPH lower partition and tighten the three screws.
18. Refit the developing assembly to the main unit.

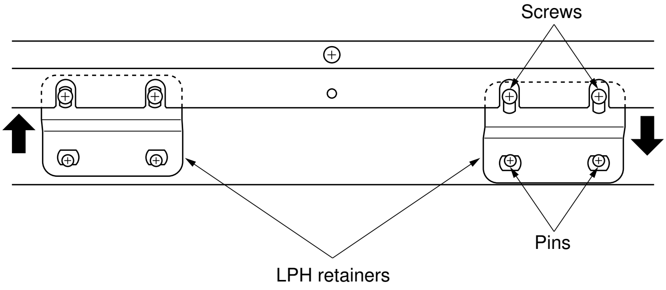


Figure 3-3-23 (a)

(8) Replacement of the ISU PCB

Procedure

1. Open the main unit.
2. Remove the three screws and pull out the ISU mount.
3. Remove all the connectors inserted into the ISU PCB.
4. Remove the four screws and the ISU PCB.

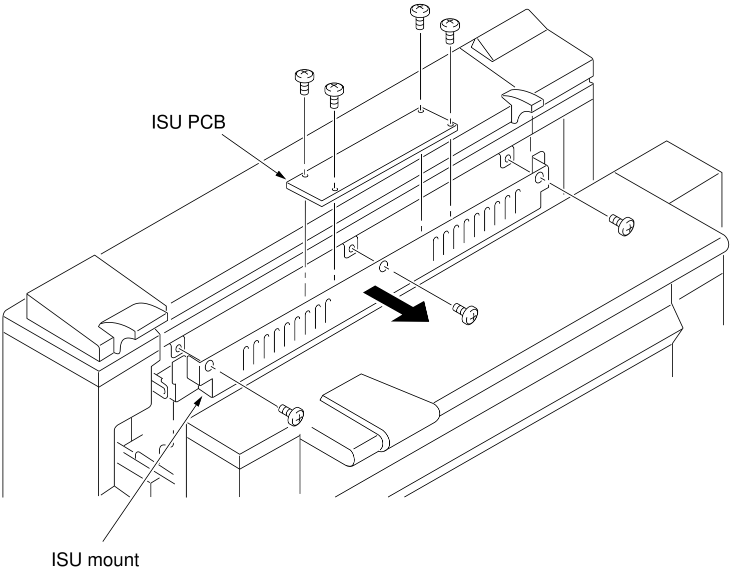


Figure 3-3-24

5. Adjust controls VR1, VR3, VR4 and VR5 on the new ISU PCB to their original positions on the old ISU PCB.

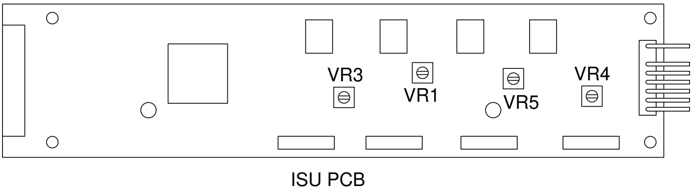


Figure 3-3-25

6. Fit the new ISU PCB to the ISU mount with the four screws.
7. Insert the ISU mount and tighten the three screws.
8. Close the main unit.
9. *Execute simulation No. 121 “Adjusting gain” (see page 3-2-30-1).*
10. *Execute simulation No. 120 “Adjusting γ correction” (see page 3-2-30-1).*

(9) Replacing the LED printhead and LPHROM PCB

Replace the LED printhead as follows.

> ***Caution:***
> *Always replace the LED printhead and LPHROM PCB as a set. After replacing the LED printhead, be sure to adjust the image focus (simulation No. 158: see page 3-3-28).*

Procedure

1. *Remove the lower left cover, lower rear cover, developing assembly, cleaning assembly and drum.*
2. *Remove the 5P connector of the drum potential sensor and pull it out via the opening in the left frame.*

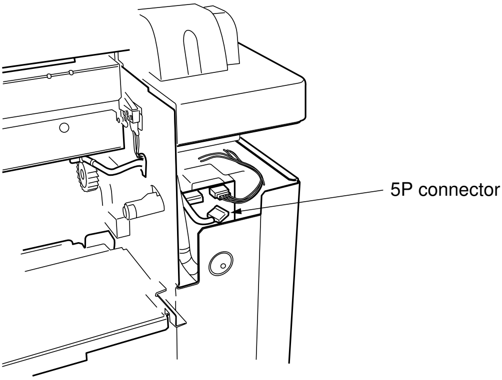


Figure 3-3-25 (a)

3. *Remove the three screws and the LPH lower partition.*
4. *Remove the two screws and the two LPH retainers.*

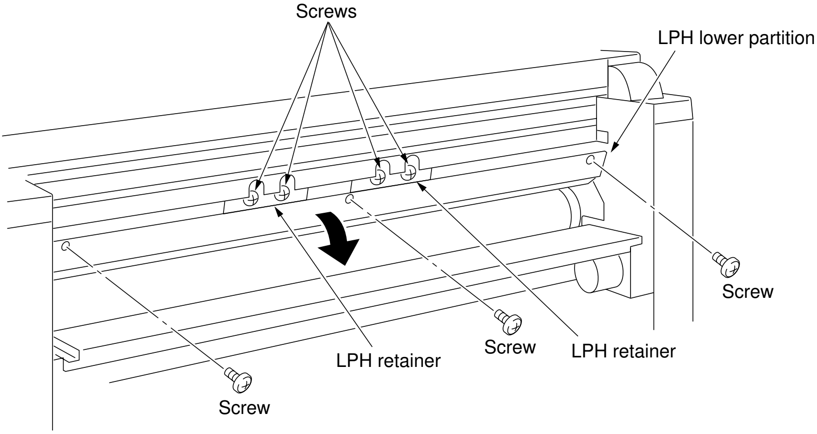


Figure 3-3-25 (b)

5. Remove the two pins.
6. Remove the 8P and 60P connectors.
7. Take out the LED printhead.

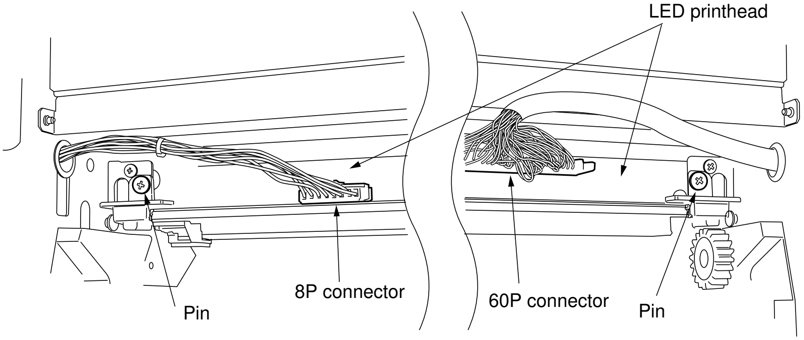


Figure 3-3-25 (c)

8. Remove the seven screws and the main PCB cover.
9. Remove the two screws, and remove the LPHROM PCB connectors from the main PCB.

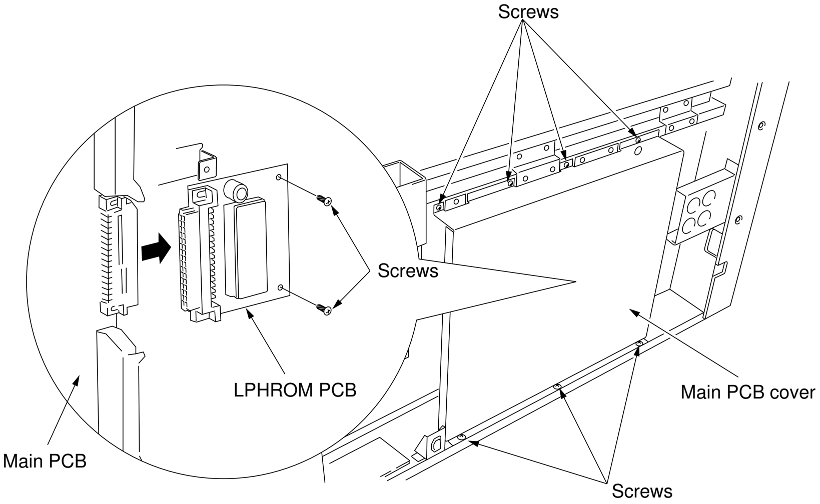


Figure 3-3-25 (d)

10. Remove the four screws and then the LPH right and left positioning plates & LPH cleaning spring plate.
11. Remove the LPH cleaning lever.

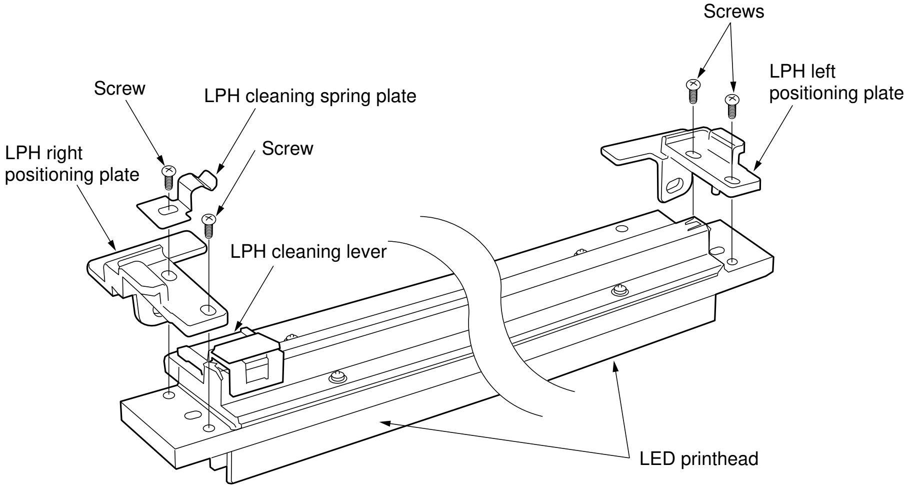


Figure 3-3-25 (e)

12. Refit all the removed parts.

(10) Cleaning the LED printhead

Perform the following cleaning when the copy image is faint or a white line appears longitudinally.

Procedure

1. *Detach the cleaning assembly, drum and developing assembly.*
2. *Remove the three screws and open the LPH lower partition.*
3. *Slide the LPH cleaning lever back and forth once.*

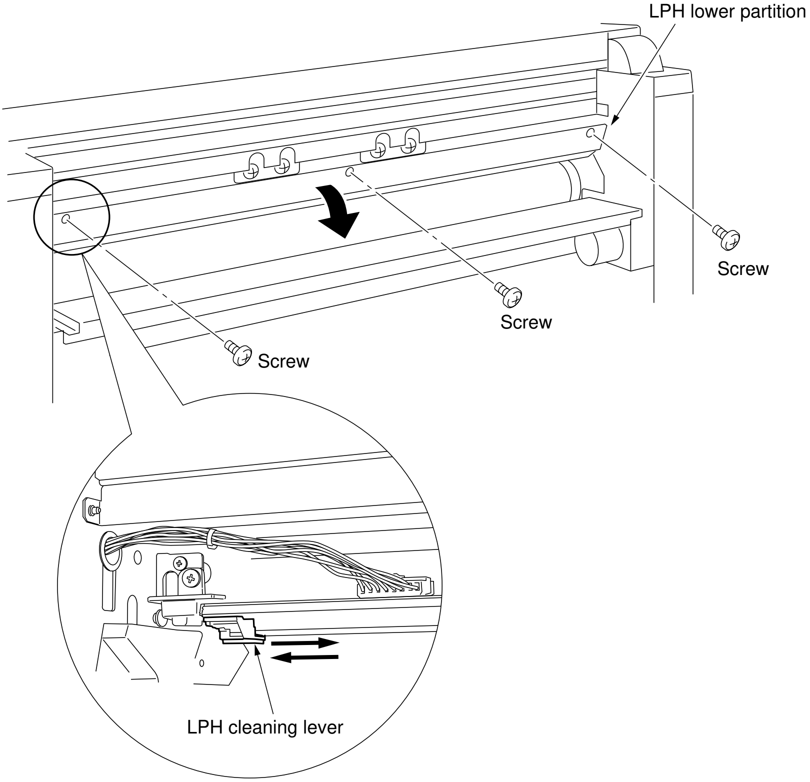


Figure 3-3-25 (f)

4. *Refit all the removed parts.*

(11) Replacement of the contact image sensor

Replace the contact image sensor as follows.

Procedure

1. *Detach the cleaning assembly and drum.*
2. *Open the upper right side cover (one screw) and detach the lower left cover, operation unit, left center original cover, right center original cover, hinge left cover, hinge right cover, upper left cover and upper right cover.*
3. *Remove the 4P connectors of the fluorescent lamp and fluorescent lamp heater.*

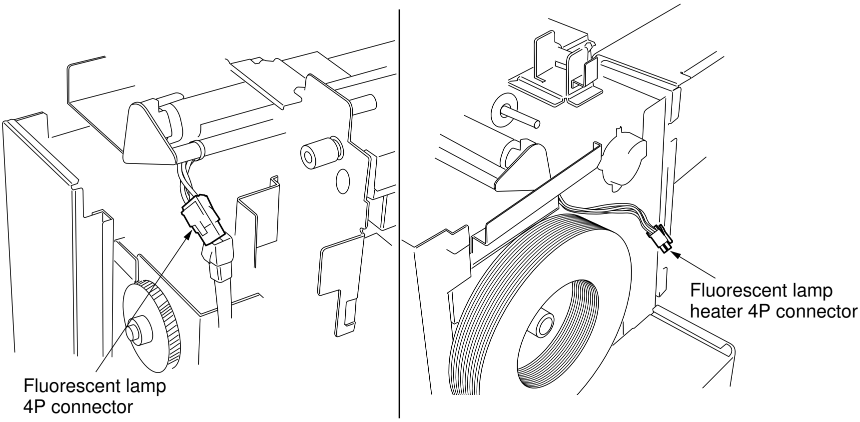


Figure 3-3-25 (g)

4. *Remove the three screws and pull out the ISU mount.*
5. *Remove all the connectors connected to the ISU PCB.*

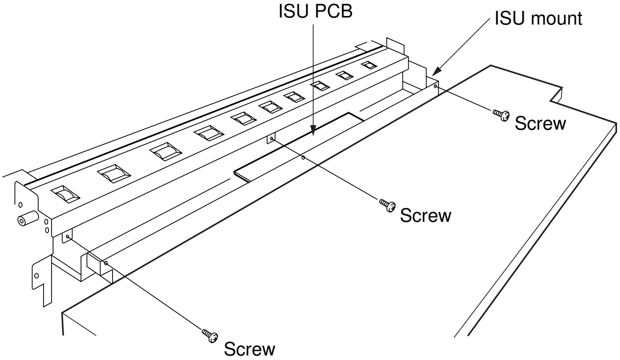


Figure 3-3-25 (h)

6. Remove the two pins and the ISU mount.

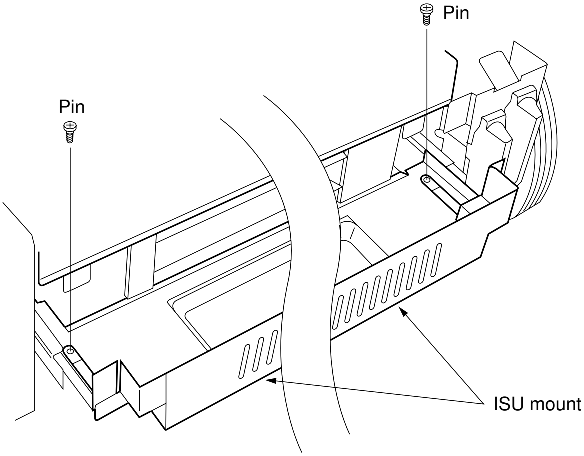


Figure 3-3-25 (i)

7. Remove the four bundles of contact image sensor wires from the five wire retainers.

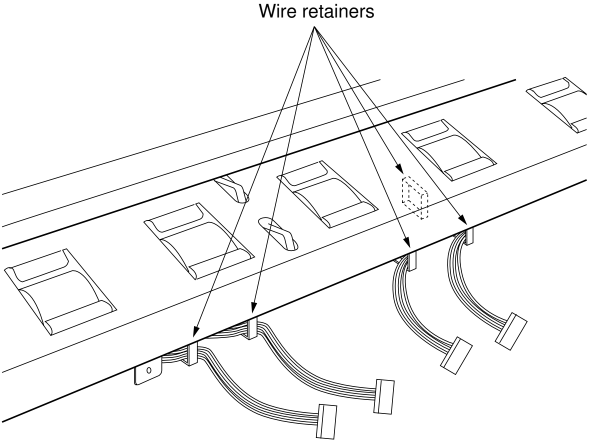


Figure 3-3-25 (j)

8. *Remove the seven screws from the original front guide.*

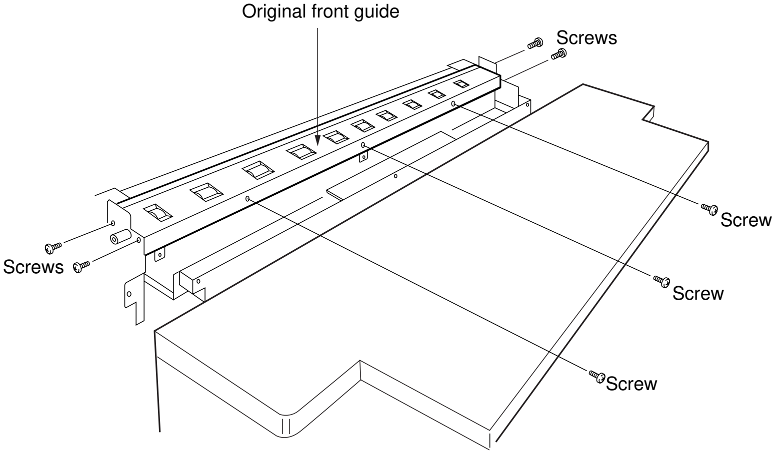


Figure 3-3-25 (k)

9. *Remove the two screws holding the contact image sensor.*

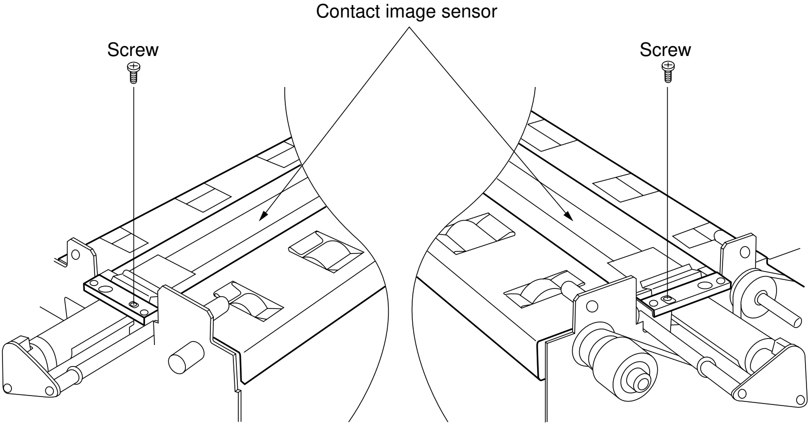


Figure 3-3-25 (l)

10. Detach the contact image sensor from the main unit.

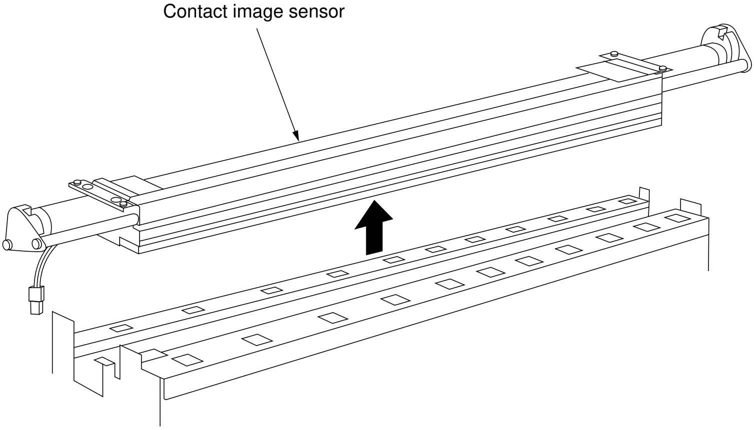


Figure 3-3-25 (m)

11. Refit all the removed parts.

> ***Caution:***
> *Refit the four bundles of contact image sensor wires so that numbers 1 to 4 indicated on the connectors match the connector numbers CN1 to CN4 on the ISU PCB.*

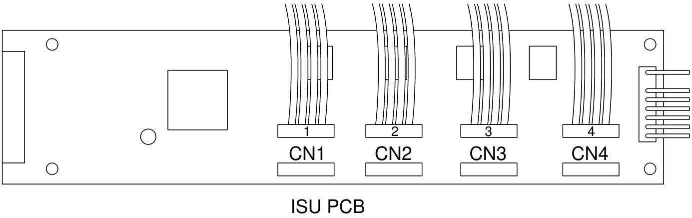


Figure 3-3-25 (n)

12. After replacing the contact image sensor, execute simulation No. 121 "Adjusting gain" (see page 3-2-30-1) and then simulation No. 120 "Adjusting γ correction" (see page 3-2-30-1).

(12) Adjustment of optical axis

Follow the procedure below if there is a regular error between the centers of the original and the copy image on the paper.

Procedure

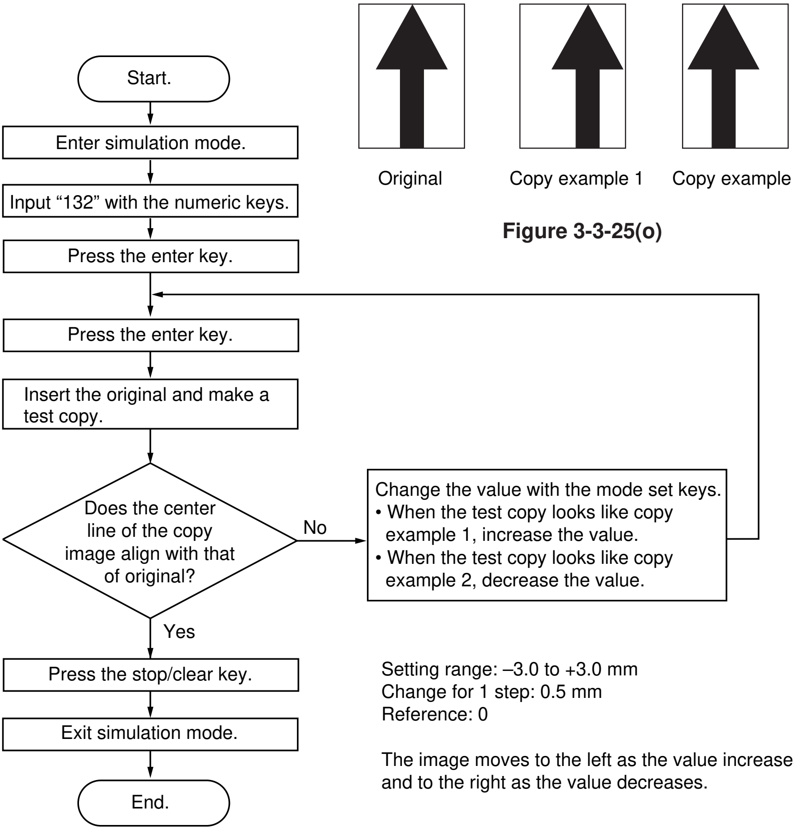


Figure 3-3-25(o)

Setting range: –3.0 to +3.0 mm
Change for 1 step: 0.5 mm
Reference: 0

The image moves to the left as the value increases, and to the right as the value decreases.

(13) Adjustment of the image width in the main scanning direction

Follow the procedure below to widen the maximum print width of LPH when the right or left edge of the copy image is not printed after the optical axis has been adjusted in simulation 132.

Caution:

- Make a test copy on paper of A1 width (841 mm) using an original of A1 width (841 mm) or larger with a lateral line drawn from one end to the other.

Procedure

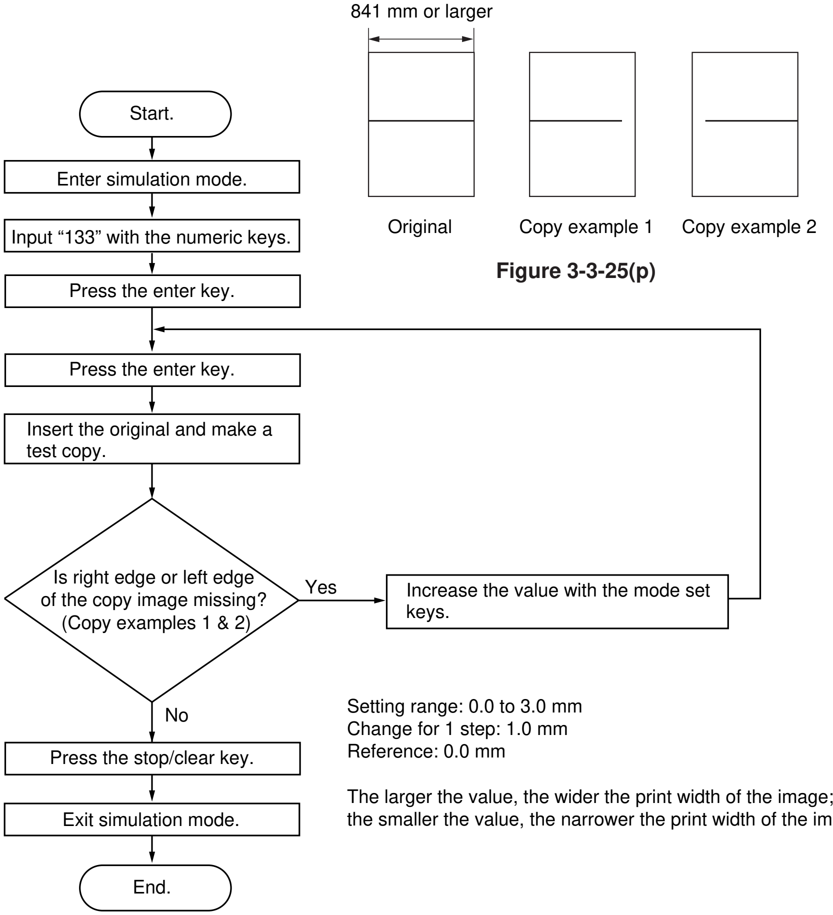


Figure 3-3-25(p)

Setting range: 0.0 to 3.0 mm
Change for 1 step: 1.0 mm
Reference: 0.0 mm

The larger the value, the wider the print width of the image;
the smaller the value, the narrower the print width of the image.

(14) Adjustment for prescan in reduction copy mode

Follow the procedure below if a trailing edge margin appears when carrying out synchro cut copy in reduction copy mode.

Procedure

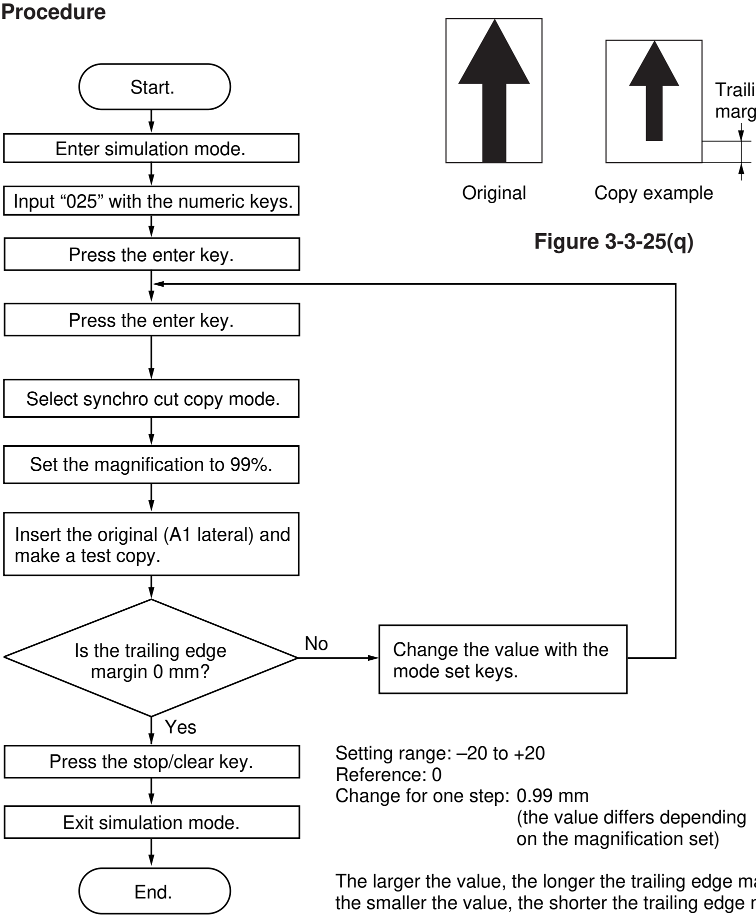


Figure 3-3-25(q)

Setting range: –20 to +20
Reference: 0
Change for one step: 0.99 mm
(the value differs depending on the magnification set)

The larger the value, the longer the trailing edge margin; the smaller the value, the shorter the trailing edge margin.

(15) Setting the shading mode

Follow the procedure below to set the exposure lamp light intensity for shading if soil on the contact glass causes longitudinal lines on the copy image.

Required original
- Test chart

Procedure

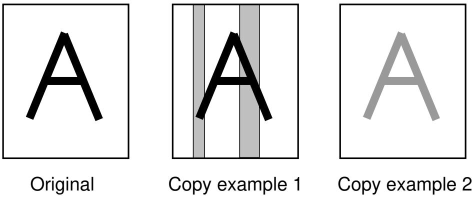
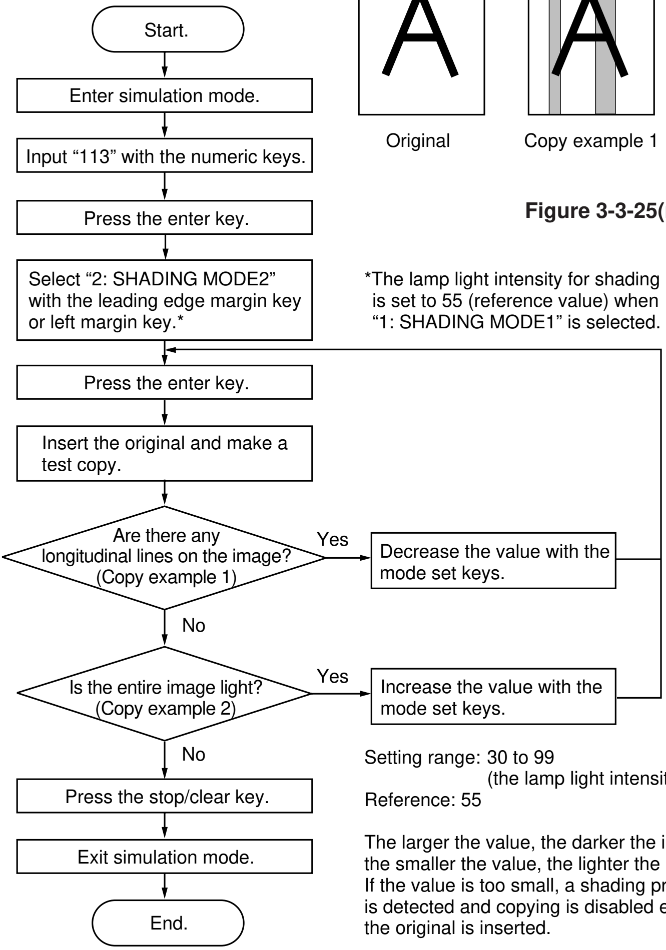


Figure 3-3-25(r)



*The lamp light intensity for shading is set to 55 (reference value) when “1: SHADING MODE1” is selected.

Setting range: 30 to 99
(the lamp light intensity for shading)
Reference: 55

The larger the value, the darker the image; the smaller the value, the lighter the image. If the value is too small, a shading problem is detected and copying is disabled even if the original is inserted.

3-3-5 Developing section

(1) Changing developer

Follow the procedure below when replacing the developer.

Procedure

1. Remove the lower rear cover.
2. Put the plastic bag in the developer collection box.

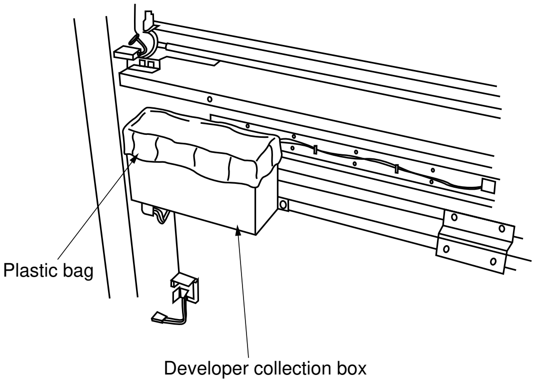


Figure 3-3-26

3. Open the upper right side cover.
4. Remove the screw and remove the developing shutter.

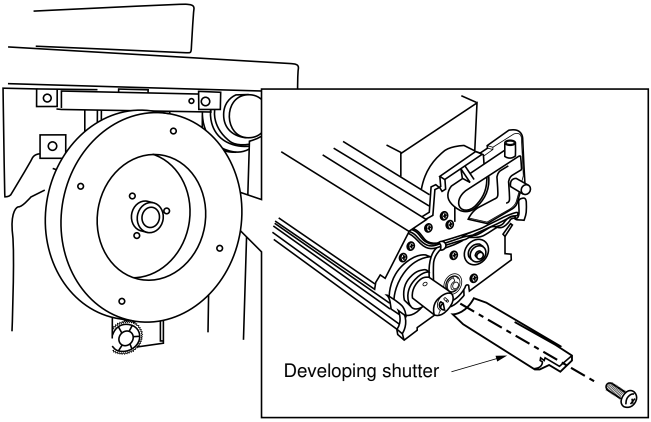


Figure 3-3-27

5. Close the upper right side cover.
6. Remove the 3P connector of the toner feed motor.
7. Enter simulation mode.
8. *Perform simulation "41" (forced stabilization).*
9. Perform simulation "10" (drive motor operational check).
   - The main unit starts operation and the developer is ejected from the developing assembly into the plastic bag in the developer collection box.
10. If no more developer is ejected into the plastic bag after 12 to 15 minutes have elapsed, press the stop/clear key.
    - The main unit stops operating.
11. Attach the developing shutter to the developing assembly.
12. Detach the upper rear cover.
13. Remove the developing assembly from the main unit.
14. Detach the toner hopper assembly from the developing assembly.
15. Remove the developer remaining on the developing roller.
16. Attach the developing assembly to the main unit.
    - Make sure that the developing assembly is attached at very left-end position so the gears of the developing assembly mesh with the gears of the main unit.
17. Set safety switch 6 to the forced ON position.
18. Shake the developer bottle well to mix the developer.
19. Perform simulation "10" (drive motor operational check) and pour the developer evenly into the developing assembly.
20. Press the stop/clear key.
21. Attach the toner hopper assembly to the developing assembly.
    - The 3P connector of the toner feed motor must not be connected.
22. Attach the upper rear cover.
23. Perform simulation "60" (developer setting).
    - After about 3 minutes, the toner control voltage is set automatically and the setting is displayed. Be sure to write the displayed value on the simulation label.
24. *Turn the main switch off and back on to reset forced stabilization. The copier exits the simulation mode.*
25. Connect the 3P connector of the toner feed motor.
26. Remove the plastic bag inserted in the developer collection box.
27. Attach the lower rear cover.

(2) Adjustment of doctor blade: reference

Perform when carrier or dark background appears on copies, or when attaching or removing the doctor blade.

Procedure

1. Remove the developer from the developing assembly. (Follow steps 1 to 14 of changing developer on page 3-3-31.)
2. Detach the screw and the developing unit cover.

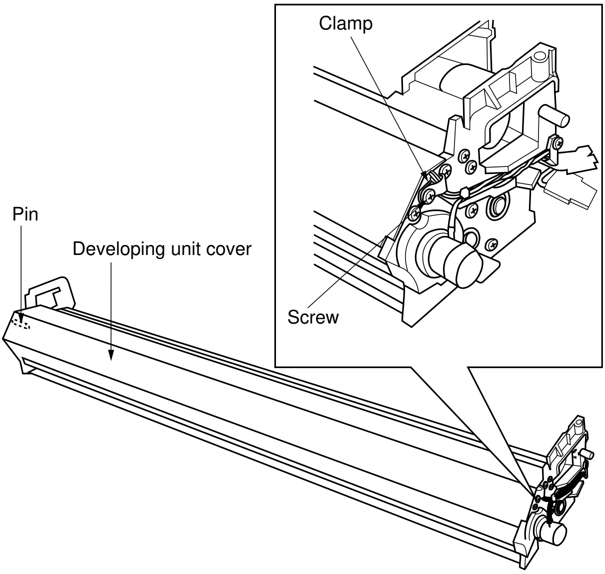


Figure 3-3-28

3. Loosen the four screws (two each on the right and left sides) on the doctor blade.

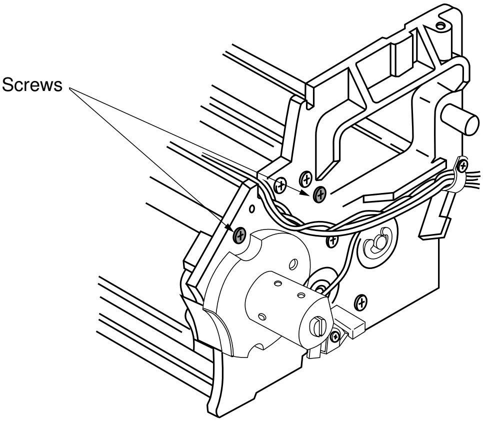


Figure 3-3-29

4. Loosen the six doctor blade adjustment screws on the upper developing unit stay.

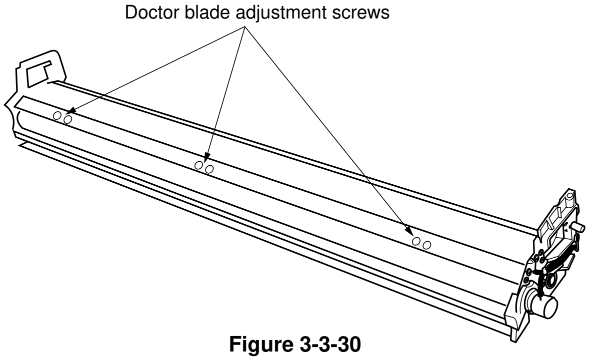
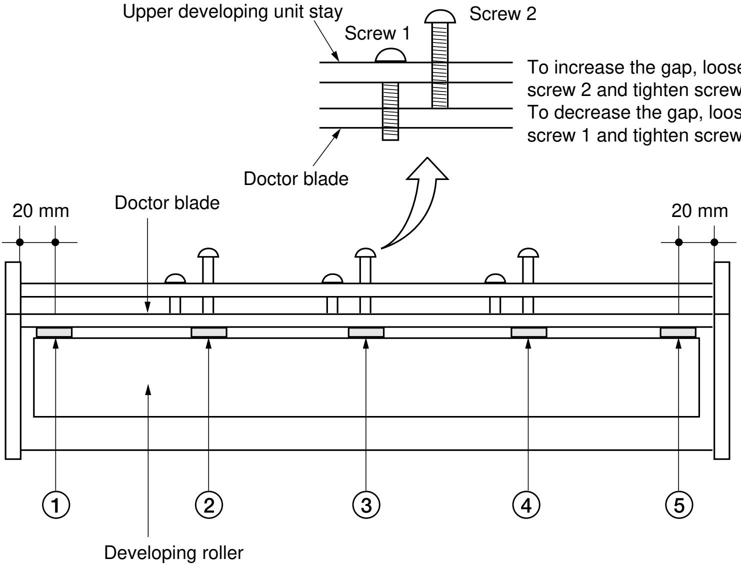


Figure 3-3-30

5. Insert a thickness gauge into the five points indicated in the diagram and adjust the gap between the doctor blade and the developing roller to the individually specified distances by turning adjustment screws 1 and 2.



To increase the gap, loosen screw 2 and tighten screw 1.
To decrease the gap, loosen screw 1 and tighten screw 2.

Distances between the doctor blade and the developing roller:
① ⑤: A 0.7 mm thickness gauge should enter smoothly and a 0.75 mm one should not.
② ④: A 0.65 mm thickness gauge should enter smoothly and a 0.7 mm one should not.
③: A 0.6 mm thickness gauge should enter smoothly and a 0.65 mm one should not.

Figure 3-3-31

6. Insert developer in the developing assembly and carry out initial setting of the developer (follow steps 15 to 26 of changing developer on page 3-3-32).
7. Make a test copy to check the copy image.

(3) Adjustment of position for magnetic brush: reference

Check or adjust when the image is faint.

Caution:

Before adjusting, check that the position of the doctor blade is correct and that there is the right amount of developer.

Procedure

1. Detach the toner hopper assembly from the developing assembly.
2. Loosen the two hex screws on the developing roller shaft and adjust the developer roller bearing so that the distance from the peak of the magnetic brush to the valley of the developing unit housing is 45.2 mm (reference value).
   - If the position of the magnetic brush is smaller than the specified measurement, carrier can stick to copies. If the position is larger, dark background can appear on copies.

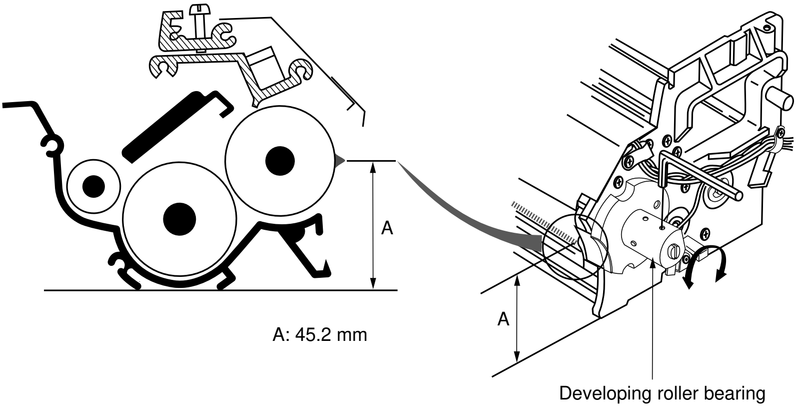


Figure 3-3-32

3. After finishing adjustments, reattach the parts and make a test copy to check the image.

(4) Replacement of the lower developing seal

Replace the lower developing seal as follows.

Procedure

1. Peel the lower developing seal off the developing assembly.
2. Attach the new lower developing seal to the developing assembly using double-sided tape.
   - Ensure the ends of the seal are aligned with the inner edges Ⓐ and Ⓑ of the right and left developing unit frames so the seal does not crease.

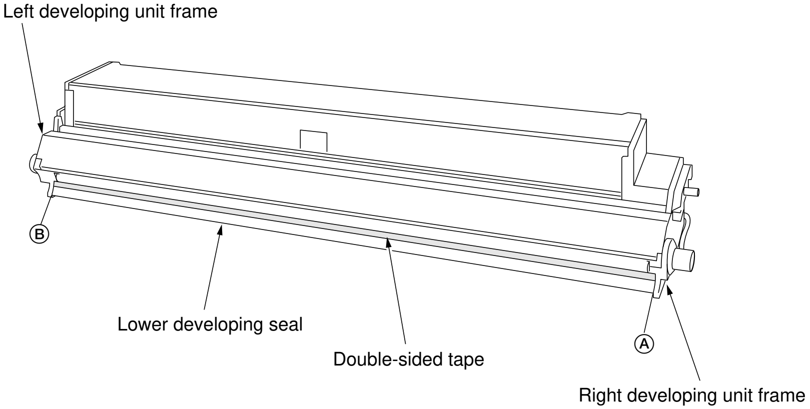


Figure 3-3-33

3-3-6 Transfer/separation section

(1) Replacement of charger wire

Follow the procedure below when the charger wire is broken or when replacing the wire.

Caution:

- Use the specified tungsten wire for the charger wire. *(Item No. 74716280, Anodized tungsten wire, 0.08 mm)*
- The section wound around the charger spring should not protrude from the left transfer charger housing.
- The end of the charger wire should not protrude from under the washer.
- Be sure to use tungsten wire that is free of soiling or damage.
- Keep the charger wire taut by stretching the charger spring.
- When replacing the charger wire be sure to clean the individual sections of the transfer charger assembly (inside of charger housing, etc).

Procedure

1. Open the main unit.
2. Remove the screw and then the transfer charger assembly from the main unit by pulling up in the direction shown by the arrow.

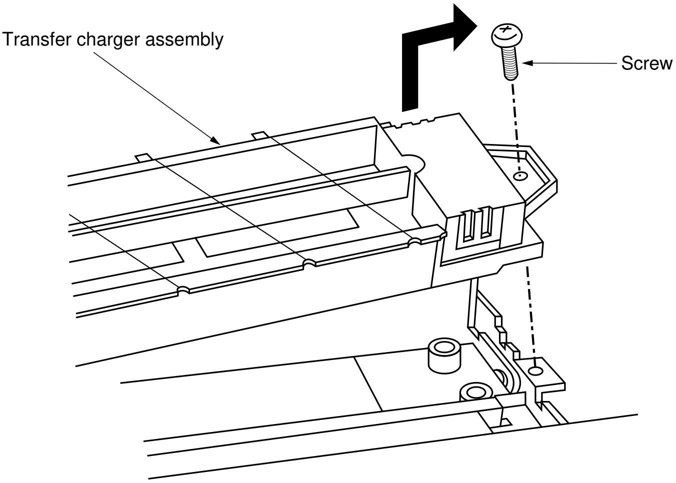


Figure 3-3-34

3. Remove the transfer inner shield from the transfer outer shield.

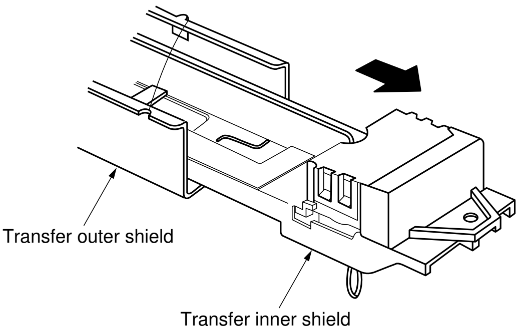


Figure 3-3-35

4. Remove the right and left transfer charger lids and the left and right transfer seals.
5. Remove the charger spring from the pin inside the transfer charger left housing and loosen the screw to remove the charger wire.

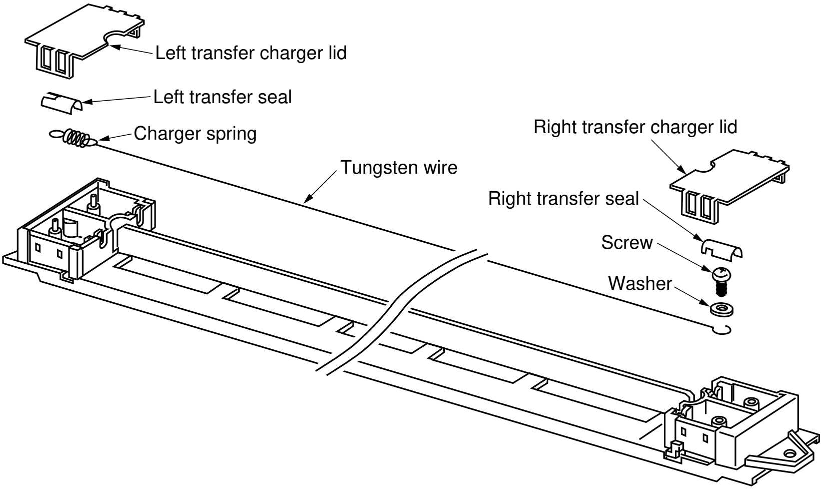


Figure 3-3-36

6. Wind the tungsten wire 4-5 times around one end of the charger spring and hang the charger spring on the protrusion inside the transfer charger left housing.
7. Pass the tungsten wire under the washer and tighten with the screw keeping the charger wire stretched so that the charger spring is at least 16 mm long.

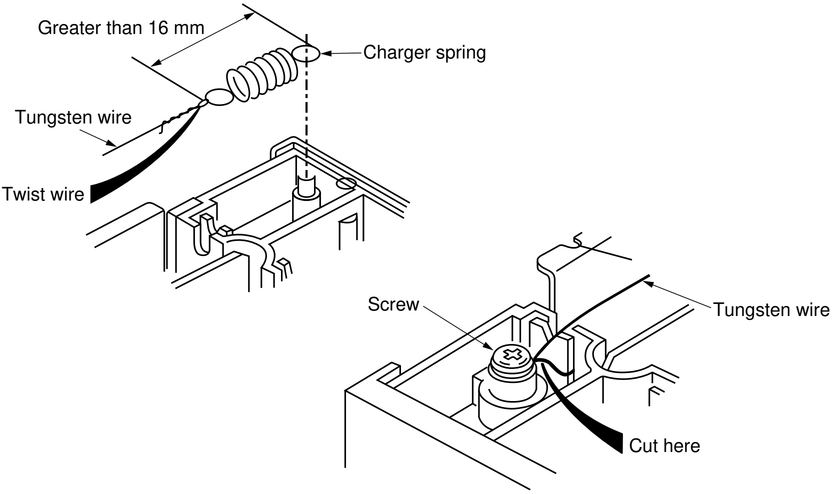


Figure 3-3-37

8. After wiring, return the parts to their original positions.

(2) Replacement of transfer wire

Follow the procedure below when the transfer wire is broken or when replacing the wire.

Caution:

- Approximately 3.0 m of wire is required to replace the transfer wire.
- Use the specified wire (Item No. 74716290).

Procedure

1. Loosen the two screws on the bottom of the transfer outer shield and remove the transfer wire.
2. Remove the insulating tube from the transfer wire.

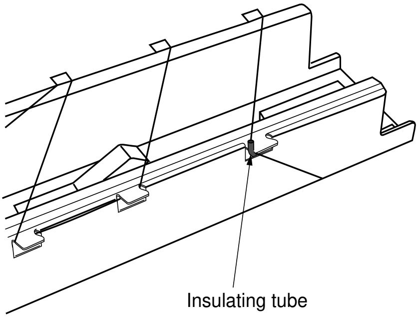


Figure 3-3-38

3. Wind one end of the transfer wire once around the screw on the right side of the bottom of the transfer outer shield and tighten the screw.
   - The transfer wire should be passed under the washer. The end should not protrude more than 5 mm from the washer.

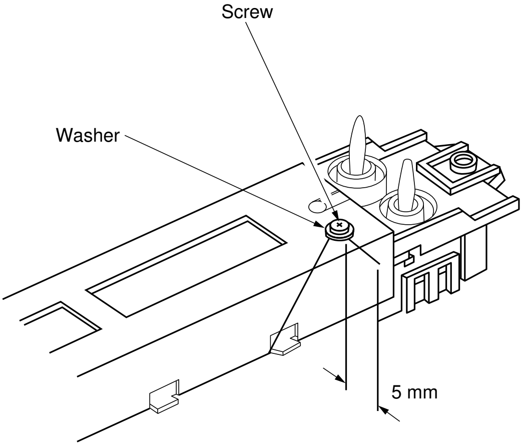


Figure 3-3-39

4. Hook the transfer wire onto the claw and thread it through the grooves of the transfer outer shield. Cross the wire at the 16th pin as shown below and continue to thread the wire.
   - When wiring at the last claw, pass the transfer wire through the insulating tube so that the insulating tube is in the position shown in the figure.

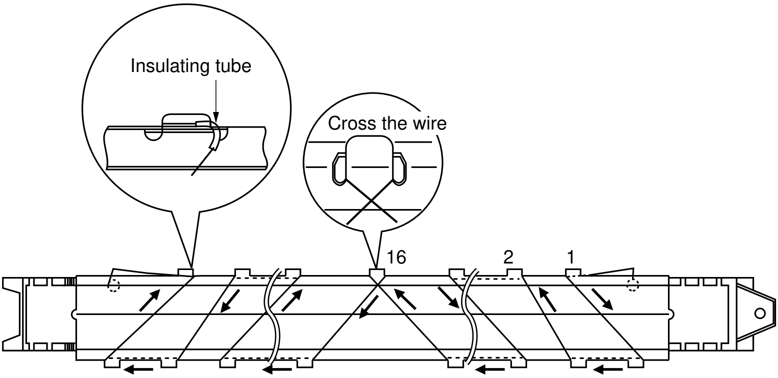


Figure 3-3-40

5. Tighten the transfer wire to remove any slack and wind one end of the transfer wire around the screw once on the left side of the bottom of the transfer outer shield and then tighten the screw.
   - The transfer wire should be passed under the washer. The end of the transfer wire should not protrude more than 5 mm from the washer.

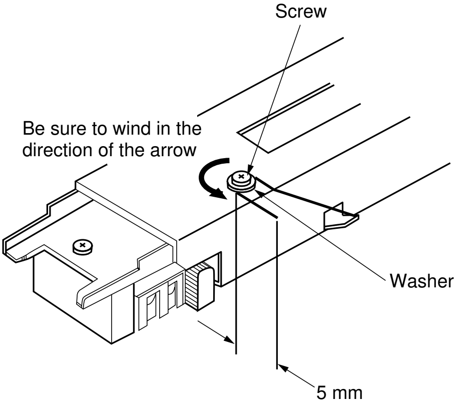


Figure 3-3-41

6. After wiring, return the parts to their original positions.

3-3-7 Cleaning section

(1) Attachment and removal of the cleaning blade

Follow the procedure below when replacing the cleaning blade.

Caution:
Coat the cleaning blade with toner (simulation No. 40) after replacing it.

Procedure

1. Remove the main charger assembly from the cleaning assembly.
2. Loosen the screw and remove the cleaning unit weight.

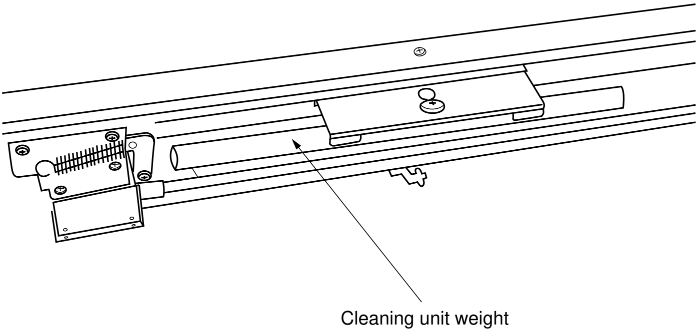


Figure 3-3-42

3. Remove the five screws (2 each on right and left, 1 in the center) and the grid assembly.

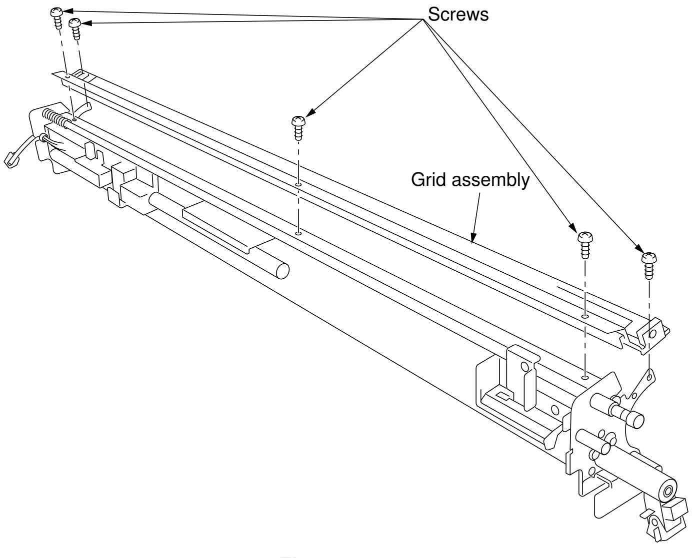


Figure 3-3-43

4. Remove the stop rings on the left and right side and remove the bearings.
5. Remove the screw on the cleaning seal left and right attachment plates.

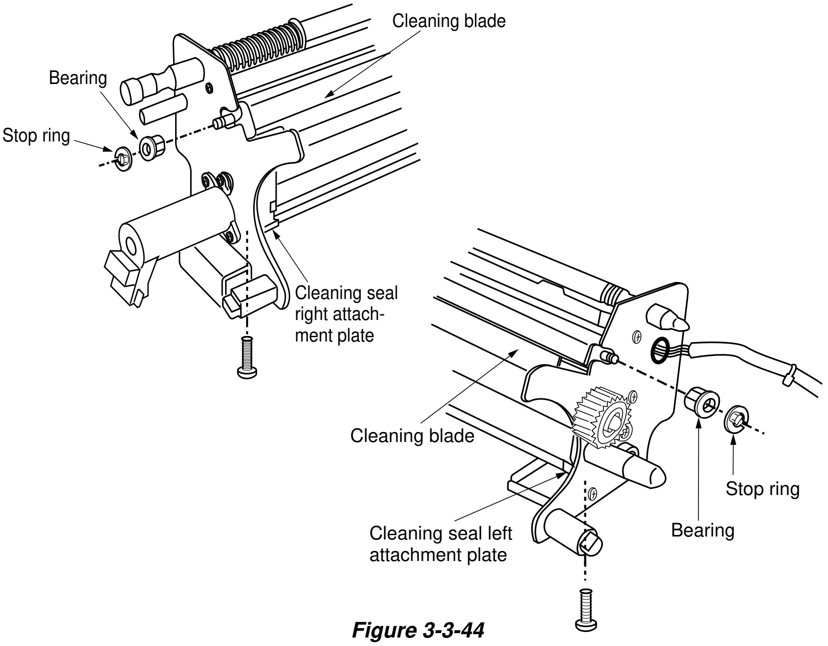


Figure 3-3-44

6. Release the cleaning seal left and right attachment plates in the direction shown by the arrow.
7. Remove the cleaning blade.
8. Remove the cleaning seal left and right attachment plates from the cleaning blade.

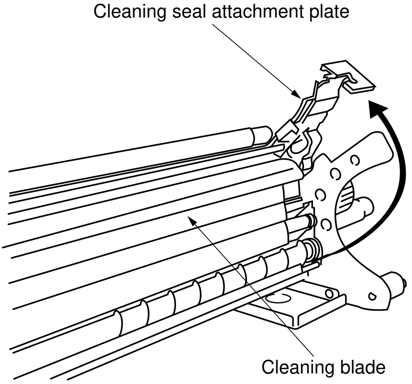


Figure 3-3-45

9. Remove the weight mount (two screws) from the cleaning blade and fit it to the new blade.

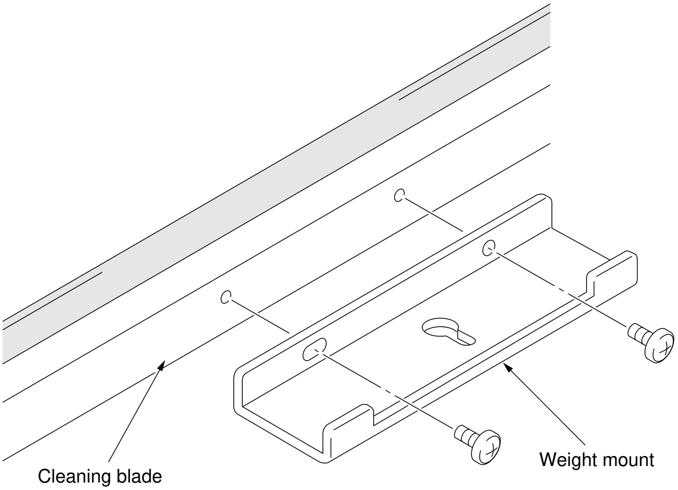


Figure 3-3-46

10. After replacement, return the parts to their original positions.

Caution:

When refitting the cleaning seal right and left attachment plates, ensure the right and left cleaning seals (red) are not overriding the seal parts of the lower cleaning blade.

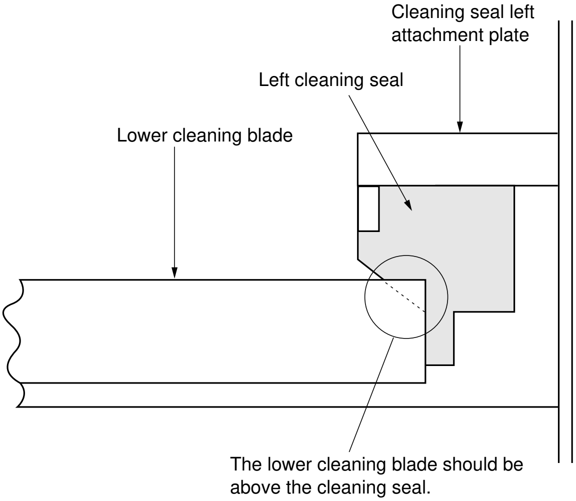


Figure 3-3-47

(2) Attachment and removal of lower cleaning blade

Follow the procedure below when replacing the lower cleaning blade.

Procedure

1. Loosen the four screws (1 each on right and left, 2 in the center) and remove the lower cleaning blade.

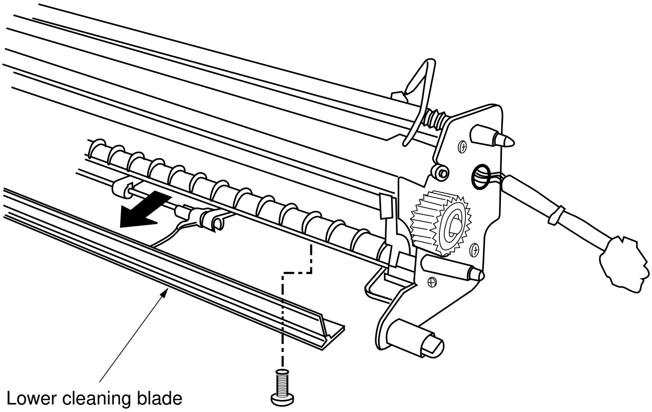


Figure 3-3-48

2. After replacement, return the parts to their original positions.
   - Ensure that the lower cleaning blade is installed all the way toward the machine left.

(3) Attachment and removal of cleaning fur brush

Follow the procedure below when cleaning or replacing the cleaning fur brush.

Procedure

1. Remove the cleaning blade.
2. Remove the stop ring and then remove fur brush gear 17, the shim, pin and the bearing.

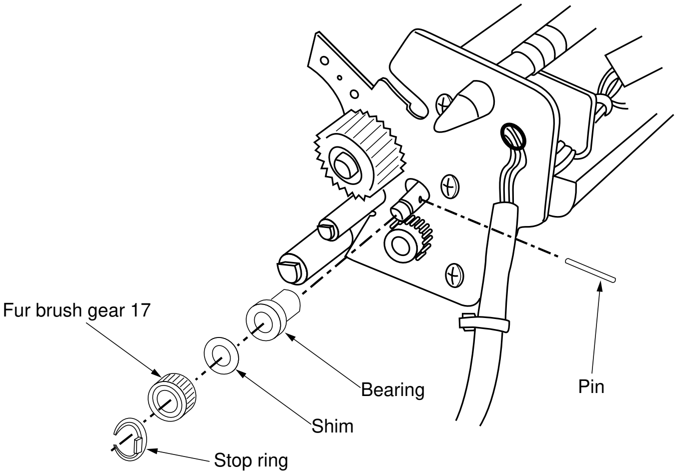


Figure 3-3-49

3. Remove the stop ring and the bearing.
4. Remove the cleaning fur brush.

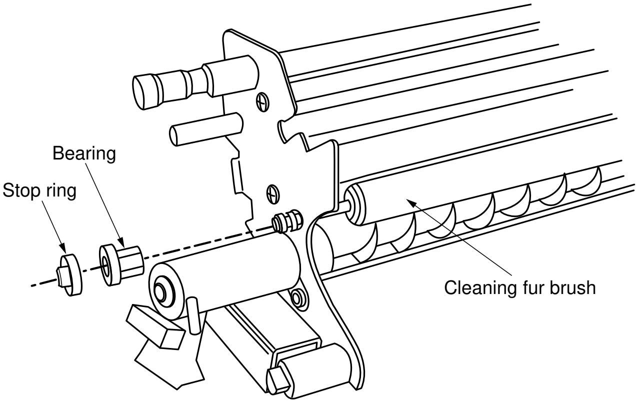


Figure 3-3-50

5. After cleaning or replacement, return the parts to their original positions.

(4) Attachment and removal of separation claw

Follow the procedure below when replacing the separation claw.

Procedure

1. Remove the screws on the separation spring.

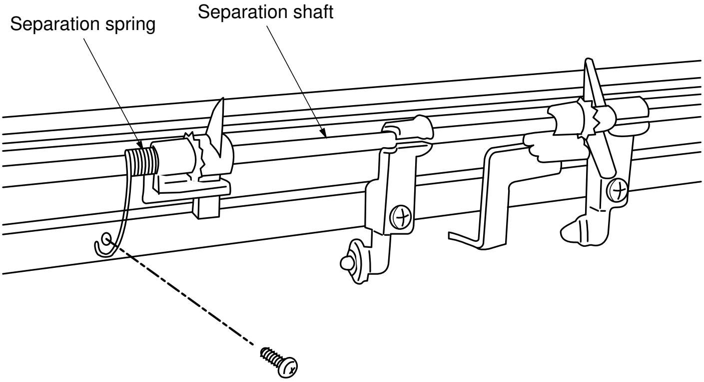


Figure 3-3-51

2. Remove the separation claw guide.
3. Move the separation claw to the D-cut section of the separation shaft and remove the separation claw from the separation shaft.

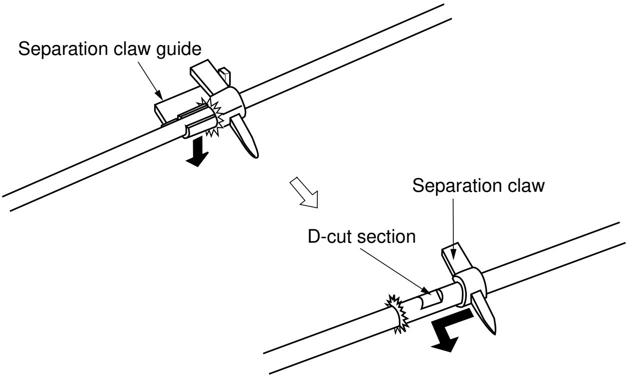


Figure 3-3-52

4. After replacement, return the parts to their original positions.
   • Check that the separation claws move smoothly.

3-3-8 Fixing section

(1) Attachment and removal of fixing heaters M and S

Follow the procedure below when inspecting or replacing fixing heaters M and/or S.

Procedure

1. Detach the upper right removal cover, upper left removal cover, lower right removal cover, and lower left removal cover.
2. Disconnect the 1P connectors from both ends of the fixing heaters.
3. Remove a screw on each side and remove the left and right heater support plates.
4. Remove the fixing heaters by pulling them out of the heat roller.
   - When reattaching the fixing heaters, be sure that the blue 1P connector (for fixing heater S) is on the front of the copier and the white one (for fixing heater M) is on the rear.

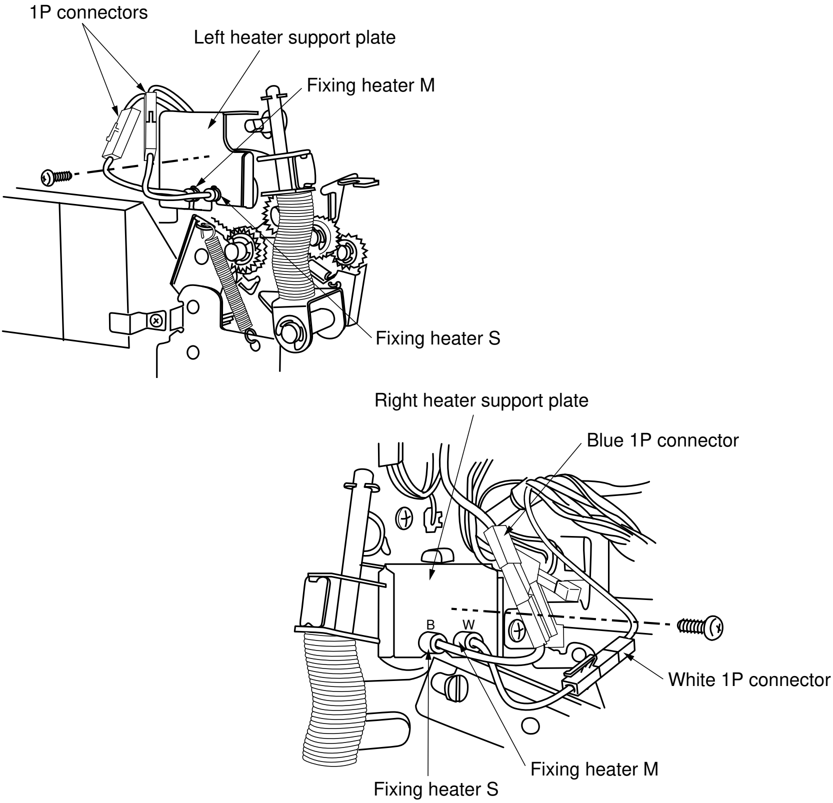


Figure 3-3-53

5. After inspecting or replacing, return the parts to their original positions.

(2) Attachment and removal of heat roller

Follow the procedure below when cleaning or replacing the heat roller.

Procedure

1. Remove fixing heaters M and S (see page 3-3-48).
2. Press the fixing section release lever to open the fixing section.
3. While holding up the fixing section, remove the left and right fixing release sliders from the upper release pivot pin.
4. Open the fixing section all the way.

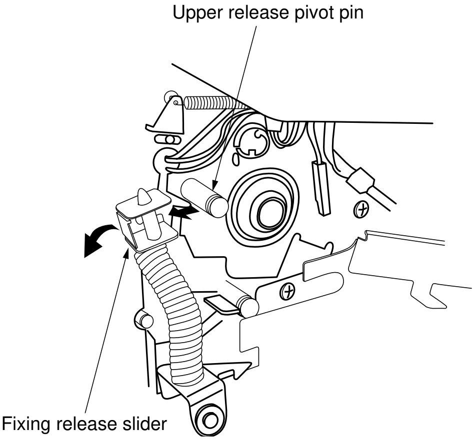


Figure 3-3-54

5. Fasten the right fixing unit frame with the screw to keep the fixing unit open.

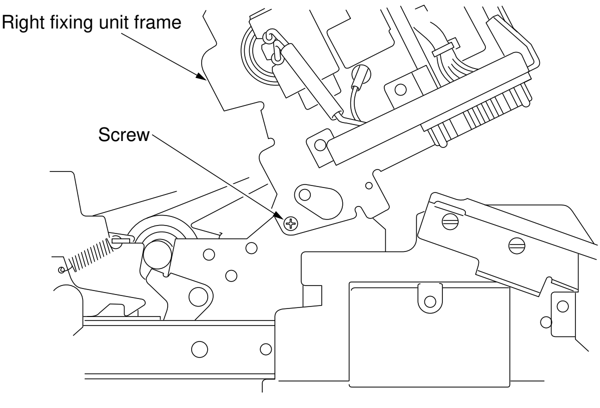


Figure 3-3-55

6. Remove the middle removal cover.
7. Remove the 2P connector of the eject switch, the 3P connector of the fixing unit pulse sensor, the two screws and the upper eject guide.

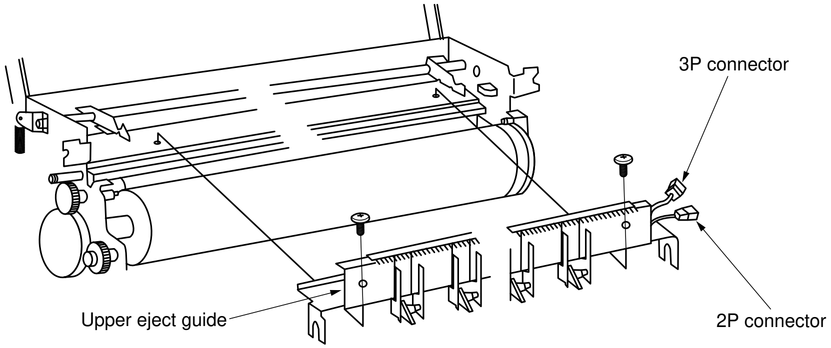


Figure 3-3-56

8. *Remove the C-ring, the heat roller gear, the bearing retainer (two screws), and the heat roller bearing on the heat roller left side.*

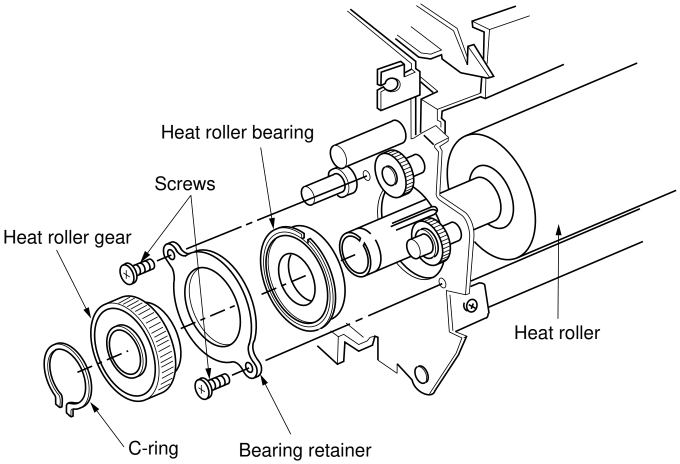


Figure 3-3-57

9. Remove the C-ring, the bearing retainer (two screws) and the heat roller bearing on the heat roller right side.
10. Remove the heat roller.

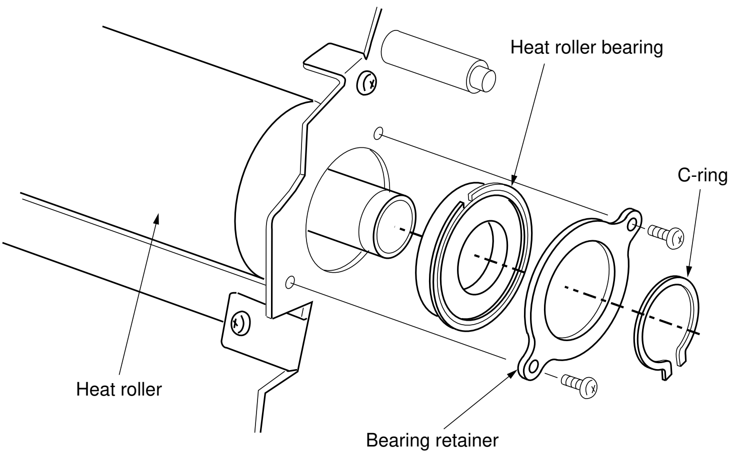


Figure 3-3-58

11. After cleaning or replacement, return the parts to their original positions.

Important: *After replacement of the heat roller, the separation claws may leave lines on solid black copies if sufficient silicon oil is not applied on the roller surface. To preempt this problem, perform simulation 10 for 10 minutes or more after heat roller replacement.*

(3) Attachment and removal of the press roller

Follow the procedure below when cleaning or replacing the press roller.

Procedure

1. Remove the left and right fixing unit release sliders from the upper release pivot pin and open the fixing section all the way (see page 3-3-49).
2. Fasten the right fixing unit frame with the screw to keep the fixing unit open (see page 3-3-49).
3. Remove the screw and pin, and remove the lower eject guide.

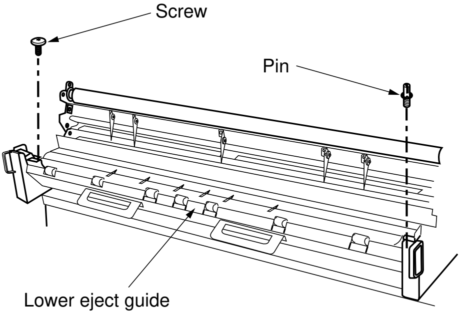


Figure 3-3-59

4. Release the fixing unit front guide by lifting it up in the direction shown by the arrow.
5. Remove the press roller from the main unit.
6. Remove the press roller shaft from the press roller by pulling it out.

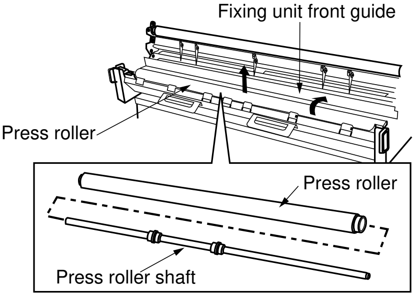


Figure 3-3-60

7. After cleaning or replacement, return the parts to their original positions.
   - Apply a small amount of silicon oil (Item No. 49925515-silicon oil SH200) to the surface of the temperature detection sections of fixing unit thermistors 3 and 4.
8. Make test copies until the silicon oil applied to fixing unit thermistors 3 and 4 no longer shows.

Important: *After replacement of the press roller, the separation claws may leave lines on solid black copies if sufficient silicon oil is not applied on the roller surface. To preempt this problem, perform simulation 10 for 10 minutes or more after press roller replacement.*

(4) Attachment and removal of oil roller

Follow the procedure below when replacing the oil roller.

Procedure

1. Detach the upper right removal cover, upper left removal cover, lower right removal cover, and lower left removal cover.
2. Remove the four screws and the 4P and 5P connectors and then detach the original table assembly.

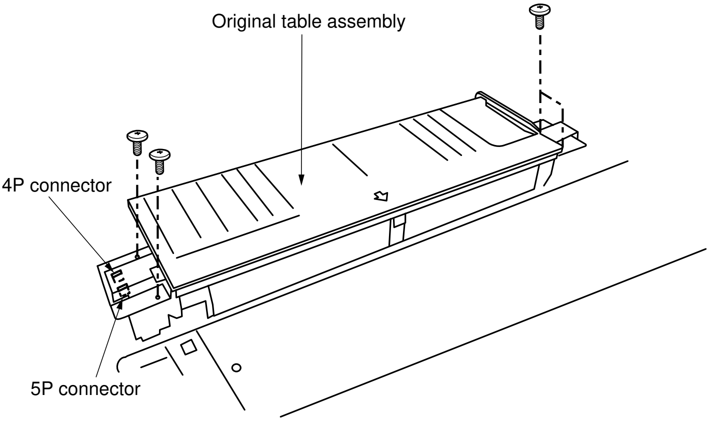


Figure 3-3-61

3. Remove the two screws and detach the fixing unit cover.

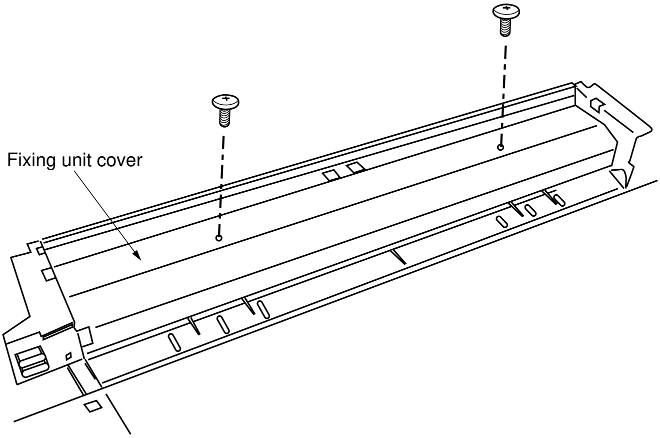


Figure 3-3-62

4. Remove the crimp springs on the right and left of the oil roller.

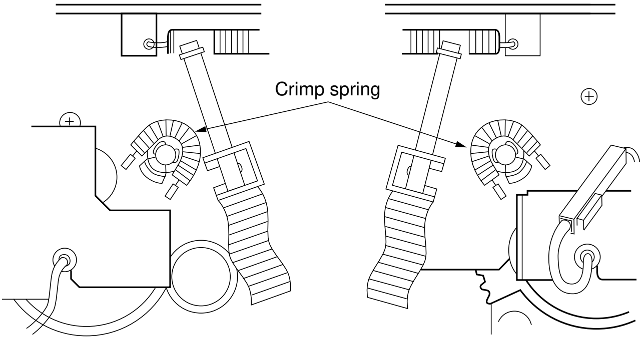


Figure 3-3-63

5. Loosen the hex-socket-head screw and remove gear 27T from the left of the oil roller.
6. Remove the E-rings on the left and right of the oil roller and remove the bearings.

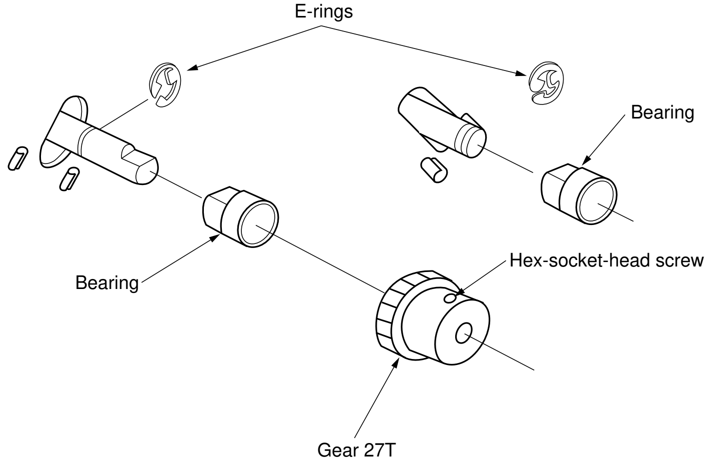


Figure 3-3-64

7. Remove the oil roller.

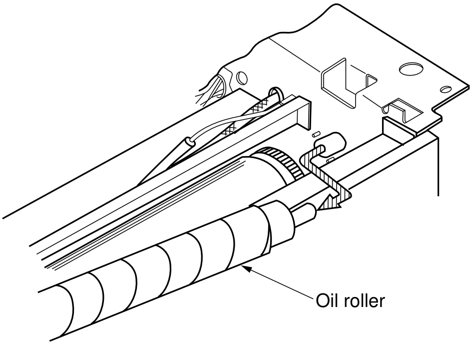


Figure 3-3-65

8. After replacement, return the parts to their original positions.

(5) Attachment and removal of fixing unit thermistors 1 and 2

Follow the procedure below when inspecting or replacing fixing unit thermistors 1 or 2.

Procedure

1. Remove the upper right removal cover, upper left removal cover, lower right removal cover, and lower left removal cover.
2. Remove the original table assembly and the fixing unit cover (see page 3-3-53).
3. Remove the screw and the 2P connector (right side of main unit). Remove fixing unit thermistor 1 or 2.
   - When reattaching fixing unit thermistor 1 or 2, be sure that the surface of the thermistor is in contact with the heat roller. Insert the black 2P connector of fixing unit thermistor 1 into the black 2P plug of the thermistor relay wire, and the white 2P connector of fixing unit thermistor 2 into the white 2P plug.

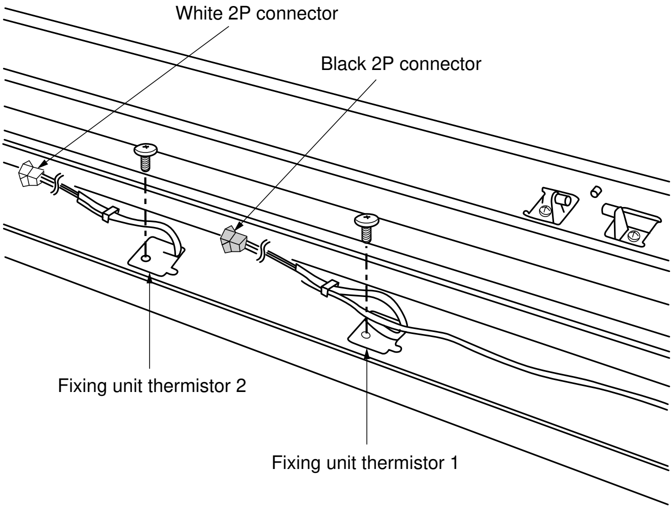


Figure 3-3-66

4. After inspection or replacement, return the parts to their original positions.

(6) Attachment and removal of fixing unit thermal switches 1 and 2

Follow the procedure below when inspecting or replacing fixing unit thermal switches 1 or 2.

Caution:

- When replacing the fixing unit thermal switches (thermostats), be sure to use the specified parts.
- If wires are used instead of the specified fixing unit thermal switches (thermostats), the copier may be seriously damaged.

Procedure

1. Remove the upper right removal cover, upper left removal cover, lower right removal cover, and lower left removal cover.
2. Remove the original table assembly and the fixing unit cover (see page 3-3-53).
3. Remove the two screws and 1P connector of each fixing thermal switch and then the thermal switch relay wire. Detach fixing thermal switch 1 or 2.

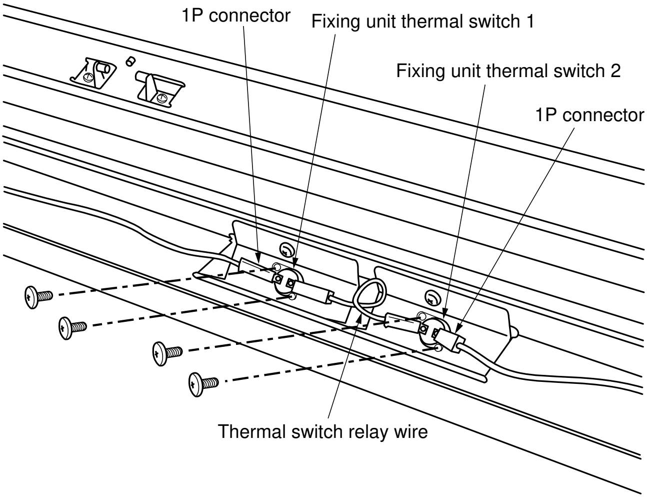


Figure 3-3-67

4. After inspection or replacement, return the parts to their original positions.

(7) Attachment and removal of fixing unit thermistors 3 and 4

Follow the procedure below when inspecting or replacing fixing unit thermistors 3 or 4.

Procedure

1. Remove the left and right fixing unit release sliders from the upper release pivot pin and open the fixing section all the way (see page 3-3-49).
2. Fasten the right fixing unit frame with the screw to keep the fixing unit open (see page 3-3-49).
3. Remove the two screws and remove the lower eject guide. (see page 3-3-52).
4. Remove the screw, the 2P connector and fixing unit thermistor 3 or 4.
   - When reattaching fixing unit thermistor 3 or 4, be sure that the surface of the thermistor is in contact with the press roller while closing the fixing section.

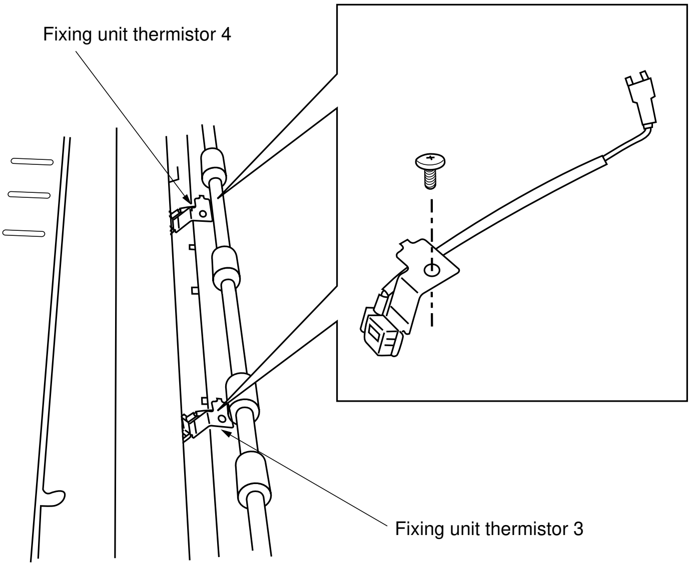


Figure 3-3-68

5. After inspection or replacement, return the parts to their original positions.

(8) Attachment and removal of the external temperature thermistor

Follow the procedure below when inspecting or replacing the external temperature thermistor.

Procedure

1. Remove the lower left cover.
2. Remove the screw and the 2P connector and remove the external temperature thermistor.

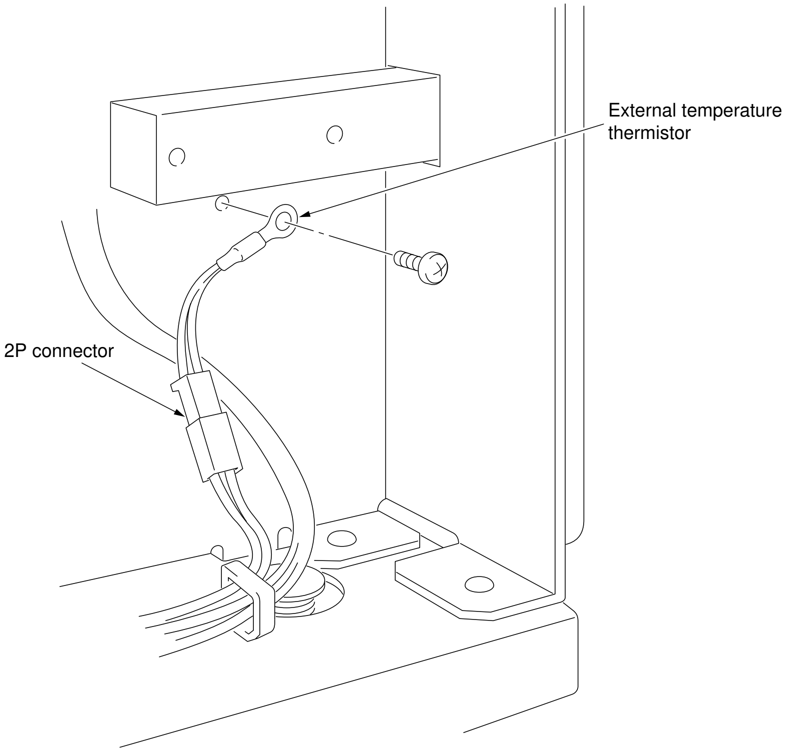


Figure 3-3-69

3. After inspection or replacement, return the parts to their original positions.

3-3-9 Other sections

(1) Adjusting the tension of paper feed section drive belt 1

Follow the procedure below when attaching or removing the paper feed motor or when replacing paper feed section drive belt 1.

Procedure

1. Remove the lower left cover.
2. Loosen the screw on paper feed drive tension plate 1.
3. Tighten the screw so that the edge of the protrusion on paper feed drive tension plate 1 and the center of the screw align.

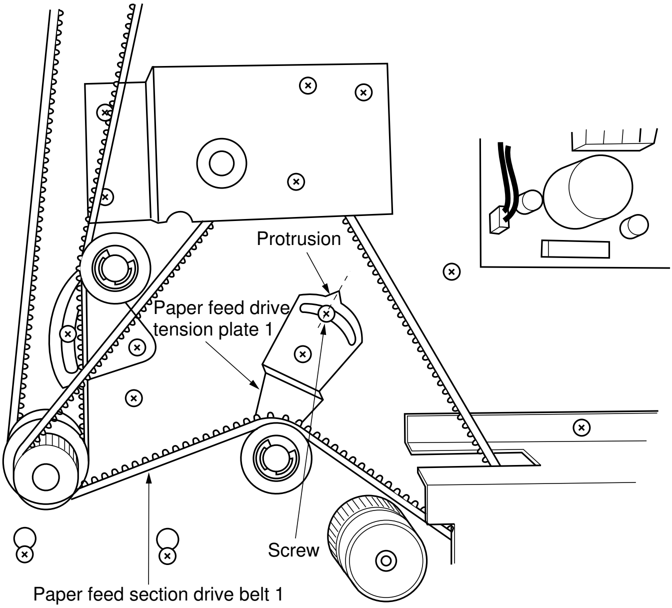


Figure 3-3-70

4. After adjustment, return the parts to their original positions.

(2) Adjusting the tension of paper feed section drive belt 2 [when installing 3rd roll unit (optional) only.]

Follow the procedure below when replacing paper feed section drive belt 2.

Procedure

1. Remove the lower left cover.
2. Loosen the screw on paper feed drive tension plate 2.
3. Tighten the screw so that the end of paper feed drive tension plate 2 is in the center of the hole of roll drive assembly B.

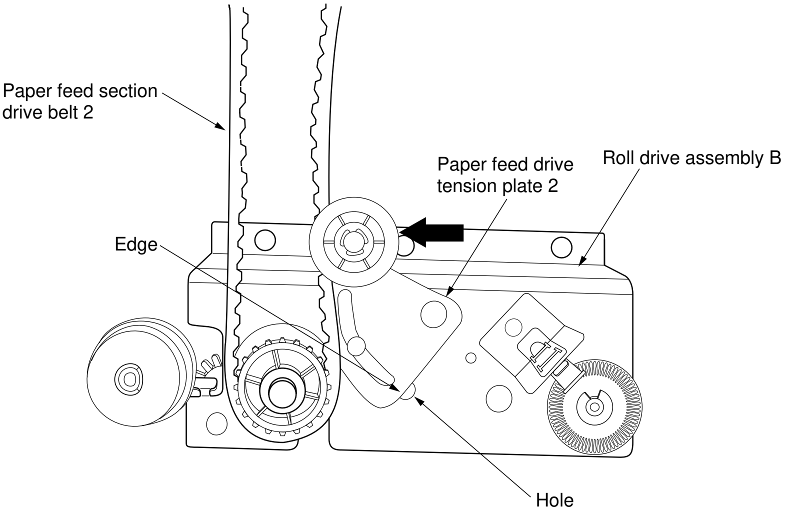


Figure 3-3-71

4. After adjustment, return the parts to their original positions.

(3) Adjusting the tension of the cutter drive belt

Follow the procedure below when attaching or removing the cutter unit or when replacing the cutter drive belt.

Procedure

1. Remove the lower left cover.
2. Loosen the screw on the cutter drive tension plate.
3. Tighten the screw so that the screw is in the center of the long hole of the cutter drive tension plate.

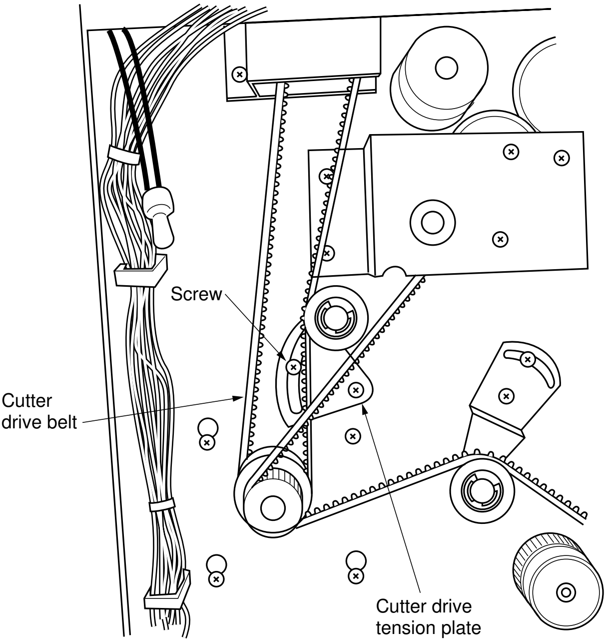


Figure 3-3-72

4. After adjustment, return the parts to their original positions.

(4) Adjusting the tension of original feed drive belt 1

Follow the procedure below when attaching or removing the original feed clutch or when replacing original feed drive belt 1.

Procedure

1. Open the upper right side cover.
2. Loosen the two screws on the original drive tension plate.
3. *Tighten the two screws while the original drive tension plate is pulled by the tension spring.*
   Note: *Do not stretch the tension spring excessively.*

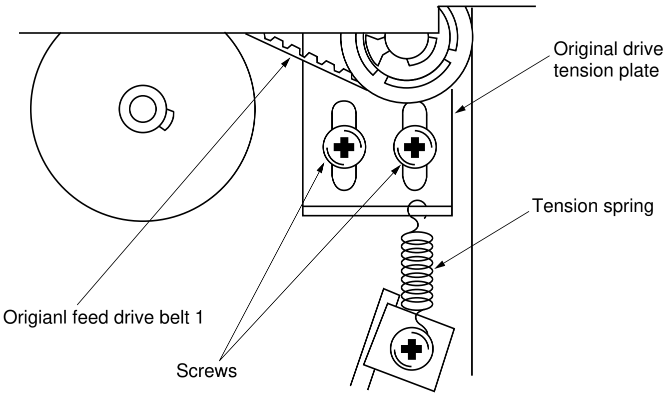


Figure 3-3-73

4. After adjustment, return the parts to their original positions.

(4-1) Adjusting the tension of the developing drive belt

Follow the procedure below when replacing the developing drive belt.

Procedure

1. *Remove the lower left cover.*
2. *Loosen the screw holding the developing drive tension plate.*
3. *Retighten the screw with the edge of the developing drive tension plate aligned with the center of the hole in the developing drive mount.*

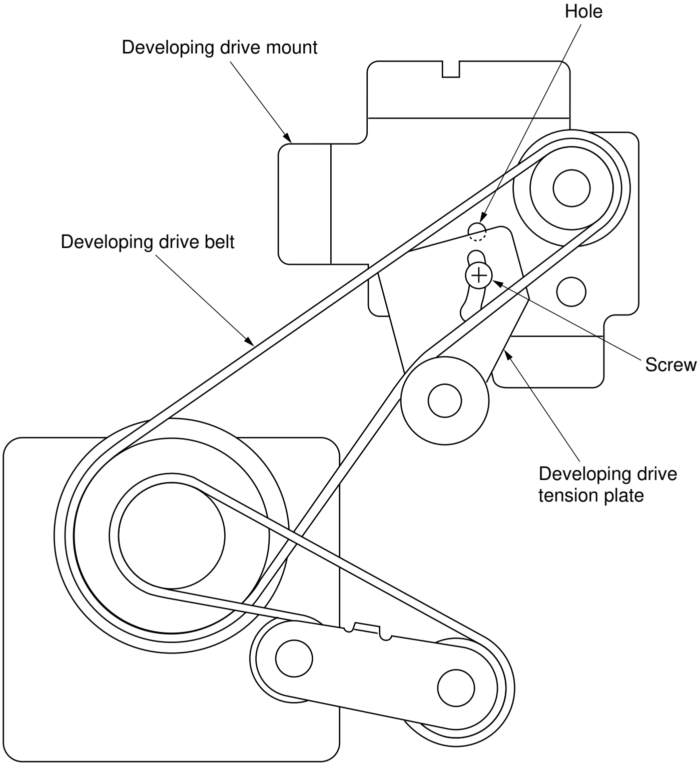


Figure 3-3-73 (a)

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(5) Attachment and removal of ozone filter

Follow the procedure below when replacing the ozone filter.

Procedure

1. Open the main unit.
2. Remove the lower left cover.
3. Remove the screw and then the ozone filter retainer.
4. Remove the screw and the ozone filter.

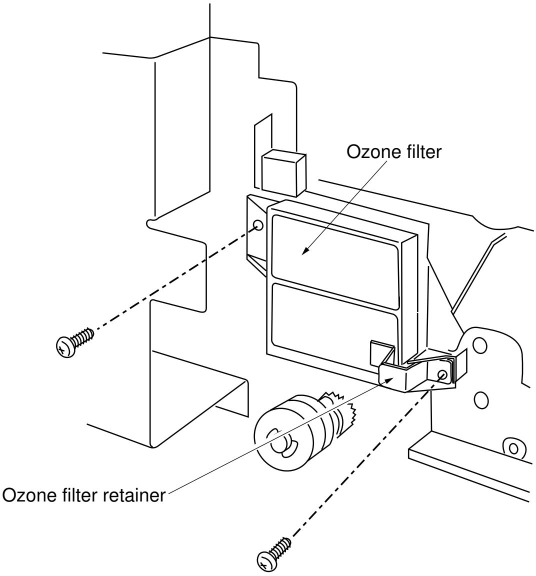

Figure 3-3-74

5. After replacement, return the parts to their original positions.

CONTENTS

3-4 PCB Initial Settings

3-4-1 Main PCB

When replacing the main PCB, simply fit the backup PCB that was attached to the old main PCB to the new main PCB. However, if the backup PCB is going to be replaced, it is necessary to take the following procedure.

Procedure

- With the backup PCB that has been used

1. Record the following data of user-set items.
   - Settings used in program copy mode
   - Initial copy settings
2. Enter the simulation mode.
3. Run the following simulations and record the counts.

Sim. No.	Counts to be recorded
73	Total counter count
195	Dispaly/Clear Jam/SC count
197	Display/Clear Size counters
198	Display/Clear Mode counters

4. Exit the simulation mode.
5. Turn the main switch off and disconnect the power plug.
6. Replace the backup PCB.

- With the new backup PCB

7. Connect the power plug and turn the copier main switch on.
8. Enter the simulation mode.
9. Run simulations 70 and 85.
10. Clean the contact glass and middle upper original roller.
11. Run simulation 120 to conduct γ correction.
12. Run simulation 83 to select between inch and metric specifications.
13. Run the following simulations and enter the data recorded on the simulation label.

Sim. No.	Contents
25	*Adjustment for prescan in reduction copy mode*
26	*Setting delay before original feed start*
31	*Ignoring developing control*
35	*Entering drum surface potential data for black & white mode*
36	*Entering drum surface potential data for half-tone mode*
46	Setting fixing stabilization at low speed
53	Adjusting 100% magnification
54	Adjusting leading edge registration
55	Adjusting synchrocut length (297 mm)
56	Adjusting synchrocut length (1189 mm)
57	Adjusting the leading edge margin
58	Adjusting trailing edge margin/displayed synchrocut length
59	Adjusting the paper cut position for specified length cut mode
63	Checking/changing toner control voltage
66	*Entering toner sensor control level/copy count*
67	*Selecting operation under the empty toner condition*
71	Selecting the maintenance cycle (metric models only)
75	Entering the service telephone No.
80	*Switching the counter counting units*
81	Selecting the language
82	Selecting between key counter/card
84	Selecting the No. of exposure steps
86	Switching the fixing temperature
87	*Disabling cancellation of auto shutoff function*
89	*Setting optional roll unit*
92	*Setting potential correction intervals*
94	Setting the maximum copy length for multiple copy mode
95	Setting the maximum copy length for roll/bypass mode
96	Selecting the action after paper empty detection
97	*Switching between front and rear ejection of originals*
98	Selecting the copy count timing
109	*Setting the controller type*
113	*Setting the shading mode*
115	*Selecting the connection to the interface controller*
116	*Setting the time to return from the offline condition*
117	*Adjusting the leading edge registration (when connected to the interface controller)*
132	*Adjusting optical axis*

Sim. No.	Contents
133	*Adjusting the image width in the main scanning direction*
140	Adjusting exposure amount
141	Adjusting half-tone image quality (dark/light)
142	Adjusting AE optimum level
143	Switching filter modes
144	Adjusting filter gain
145	*Setting AE fine adjustment intervals*
153	Selecting current correction value
160	*Adjusting base 4 output density*
161	*Adjusting thresholds (central exposure level)*
163	*Adjusting Exp. 1.0 threshold*
164	*Adjusting Exp. 7.0 threshold*
165	*Setting the memory unit connection*
166	*Selecting display of the “Output?” screen after restart*
167	*Setting the AE scan*
168	*Setting the maximum number of continuous copies*
178	*Selecting memory output mode*

14. Exit the simulation mode.
15. Enter the data of user-set functions recorded in step 1.

3-4-2 Non-field-adjustable volume controls

Some of the volume controls that have been adjusted at the factory before shipment cannot be readjusted in the field. Handle these controls carefully.
Keep hands away from the non-field-adjustable controls shown below:
- Main high-voltage transformer: VRG, VRMC
- ST high-voltage transformer: VR1, VR11, VR21
- Developing bias high-voltage transformer: VR1
- Drum potential sensor PCB: VR1, VR3
- Power source PCB: RV1, RV2
- LPH power source PCB: RV1

CONTENTS

3-5 Self Diagnostics

3-5-1 Self-diagnostic function

(1) Self-diagnostic display

This unit is equipped with a self-diagnostic function. When it detects a problem with itself, it disables copying and displays a self-diagnostic code (SC-xxx) indicating the nature of the problem together with the message requesting to call for service on the display.
To reset SC302, 340, 355, 401, 601, 690, 900, 921,990 or 991 turn the main switch off then on.
To reset SC307, 308, 344, 542-547, 920 turn main switch off then on & holding Syn, IS,C/S keys.

Metric

Call for service SC-XXX
TEL

Inch

CALL FOR SERVICE SC-XXX
TEL

Figure 3-5-1 Service call code display

Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
920	**Backup RAM problem** Collapse in data pattern of the specified area of the RAM has been found during 20-s-interval detection right after power on.	The SRAM (IC1, IC3) on the backup PCB has a problem.	Run simulation 70 and reset the memory contents.
		The backup PCB or main PCB is defective.	If C-10 persists after resetting the memory contents, replace the backup PCB or main PCB.
921	**Wrong main ROM version** It has been found right after power on that versions of the two ROMs (IC83 and IC93) on the main PCB are different from each other.	Two ROMs that have different versions to each other are installed.	Check the versions and install ROMs of the same version.
601	**Communication problem on servo PCB** Response to the main PCB from servo motor control 2 PCB has not been made within 160 ms after communication start. A checksum error has occurred.	Servo motor control 2 PCB is defective.	Replace servo motor control 2 PCB and check operation.
		The main PCB is defective.	Replace the main PCB and check operation.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
C-33	***Interface controller communication problem*** *Communication between the copier and interface controller is interrupted for 2 s or more in printer mode or scanner mode.*	*Poor contact in the connector terminals of CON3 on the interface PCB.*	*Check the connection of CON3 on the interface PCB and continuity across the connector terminals. If there is any abnormality, remedy or replace.*
		The interface cable is defective.	*Check the connection and continuity of the interface cable. If there is any abnormality, replace the cable.*
		The PROM (IC54) on the interface PCB is defective.	*Replace the PROM (IC54) on the interface PCB and check operation.*
		Poor contact in the connector terminals of CN20 on the copier main PCB.	*Check the connection of CN20 on the copier main PCB and continuity across the connector terminals. If there is any abnormality, remedy or replace.*
		The copier main PCB is defective.	*Replace the copier main PCB and check operation.*
603	**Communication problem with the ISU** Response to the main PCB from the ISU PCB has not been made within 64 ms during operation. Six checksum errors have occurred in succession.	The ISU PCB is defective.	Replace the ISU PCB and check operation.
		The main PCB is defective.	Replace the main PCB and check operation.

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Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
690	**IPC1 problem** Processing request given to communication CPU IC22 fails to be processed within 512 ms.	The main PCB is defective.	Replace the main PCB and check operation.
691	**IPC2 problem** Processing request given to communication CPU IC110 fails to be processed within 512 ms.	The main PCB is defective.	Replace the main PCB and check operation.
990	**ISU sequence problem** Necessary response fails to be emitted from ISU PCB within 2 s after a request. *Jam indication "P"is displayed each time an original is inserted, six times in succession.*	The fluorescent lamp has a break.	Check for continuity across the fluorescent lamp filaments. If none, replace the lamp.
		The fluorescent lamp connector terminals make poor contact.	Check the connector terminals and repair if necessary.
		The ISU PCB is defective.	Replace the ISU PCB and check operation.
991	**Servo PCB hardware error** An error signal has been emitted from servo motor control 2 PCB.	Servo motor control 2 PCB is defective.	Replace servo motor control 2 PCB and check operation.
302	**Main charger leakage** Shorting alarm signal (MC ALARM) is detected for five times in succession at 200-ms intervals while main charger output is being generated.	The main charger leaks.	Check the main charger assembly and clean if dirty.
		The main charger wire is broken.	Check if the main charger wire is broken and replace if necessary.
		The main high-voltage transformer is defective.	Remove the main charger assembly from the machine and check if SC302 is displayed. If it is, replace the main high-voltage transformer.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
401	**Transfer charger leakage** *The shorting alarm signal (ST ALARM) is detected six times in succession while the transfer charger output is generated.*	The transfer charger leaks.	Check the transfer charger assembly and clean if necessary.
		The transfer charger wire is broken.	Check if the transfer charger wire is broken. If it is, replace it.
		Leak occurs to the transfer charger housing.	Remove the transfer charger assembly from the machine and check if SC401 is displayed. If it is, replace the ST high-voltage transformer.
307	**Dark potential correction problem: out of range** The drum potential sensor output remains at less than A0h (650 V) when the grid potential is increased to larger than A0h (650 V) during potential correction.	The drum potential sensor connector terminals make poor contact.	Check the connector terminals and repair them if necessary.
		The drum potential sensor is defective.	Replace the drum potential sensor and check operation.
		The drum potential sensor PCB is defective.	Replace the drum potential sensor PCB and check operation.
		The main PCB is defective.	Replace the main PCB and check operation.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
308	**Dark potential correction problem: No. of corrections expired** Ten corrections cannot achieve normal correction.	The drum potential sensor connector terminals make poor contact.	Check the connector terminals and repair if necessary.
		The drum potential sensor is defective.	Replace the drum potential sensor and check operation.
		The drum potential sensor PCB is defective.	Replace the drum potential sensor PCB and check operation.
		The main PCB is defective.	Replace the main PCB and check operation.
547	**Abnormally low temperature at fixing heater S** Fixing temperature drops to less than 100°C/212°F after reaching the stabilization level once.	Fixing heater S has a break.	Check for continuity. If none, replace fixing heater S.
		Fixing heater S connector terminals make poor contact.	Check the connector terminals and repair if necessary.
		Fixing unit thermistor 2 is installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermal switch 1 or 2 has tripped.	Check for continuity. If none, find and remove the cause of the problem and replace switch 1 or 2.
		Solid state relay 2 is defective.	Measure the resistance and check for continuity. Replace solid state relay 2 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
544	**Abnormally low temperature at fixing heater M** Fixing temperature drops to less than 100°C/212°F after reaching the stabilization level once.	Fixing heater M has a break.	Check for continuity. If none, replace fixing heater M.
		Fixing heater M connector terminals make poor contact.	Check the connectors and repair if necessary.
		Fixing unit thermistor 1 is installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermal switch 1 or 2 has tripped.	Check for continuity. If none, find and remove the cause of the problem and replace fixing unit thermal switch 1 or 2.
		Solid state relay 1 is defective.	Measure the resistance and check for continuity. Replace solid state relay 1 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.
546	**Abnormally high temperature at fixing heater S** Fixing temperature exceeds 195°C/385°F after reaching the stabilization level once.	Fixing unit thermistor 2 has shorted.	Measure the resistance and if 0 Ω, replace the thermistor.
		Solid state relay 2 is defective.	Measure the resistance and check for continuity. Replace solid state relay 2 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
543	**Abnormally high temperature at fixing heater M** Fixing temperature exceeds 195°C/385°F after reaching the stabilization level once.	Fixing unit thermistor 1 has shorted.	Measure the resistance and if 0 Ω, replace the thermistor.
		Solid state relay 1 is defective.	Measure the resistance and check for continuity. Replace solid state relay 1 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.
545	**Abnormally low fixing temperature** Fixing temperature does not reach the stabilization level after *20* minutes.	Fixing heater M or S has a break.	Check for continuity. If none, replace fixing heater M or S.
		The fixing heater M or S connector terminals make poor contact.	Check the connector terminals and repair if necessary.
		Fixing unit thermistor 1 or 2 is installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermal switch 1 or 2 has a break.	Check for continuity. If none, replace switch 1 or 2.
		Solid state relay 1 or 2 is defective.	Measure the resistance and check for continuity. Replace solid state relay 1 or 2 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
542	**Abnormally low fixing temperature** Both fixing heaters M and S remain at less than 80°C/176°F after 6 minutes.	Fixing heater M or S has a break.	Check for continuity. If none, replace fixing heater M or S.
		Fixing heater M or S connector terminals make poor contact.	Check the connector terminals and repair if necessary.
		Fixing unit thermistor 1 or 2 is installed incorrectly.	Check and reinstall if necessary.
		Fixing unit thermal switch 1 or 2 has a break.	Check for continuity. If none, replace switch 1 or 2.
		Solid state relay 1 or 2 is defective.	Measure the resistance and check for continuity. Replace solid state relay 1 or 2 if not as follows: Across 1 and 2: ∞ Ω Across 3 and 4: one-way continuity.
355	**Loose toner sensor connection** Abnormally low value (10h or less) has been detected during 0.5-s sampling of toner sensor output that is started 5 s after the start of developer agitation.	A toner sensor connector is off or the connector terminals make poor contact.	*Check the connectors of the toner sensor and developing assembly wiring, and remedy the connection if necessary.*

Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
356	**Abnormally high toner sensor output** Abnormally high value (F9h or greater) has been detected five times in succession during 0.5-s sampling of toner sensor output that is started 5 s after the start of developer agitation.	The toner sensor is defective.	Replace the toner sensor and check operation.
		The main PCB is defective.	Replace the main PCB and check operation.
340	**Loose developing unit thermistor connection** An abnormal developing thermistor value (2°C/ 35.6°F or less, 55°C/131°F or greater) has been detected for five times in succession during 200-ms interval detection.	The developing unit thermistor connectors are off or connector terminals make poor contact.	Check the connectors of the developing unit thermistor and developing assembly wiring, and remedy the connection if necessary.
C-910	***Controller problem*** ***Interface controller memory problem*** ***Interface controller SCSI controller problem***	*The interface PCB is defective.*	*Turn the power on again.*
			Replace the interface PCB and check operation.

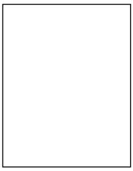
Code	Contents	Remarks	
		Causes	Check procedures/ corrective measures
900	Total Counter Problems	The total counter connectors are OFF or connector terminals make poor contact.	Check the connectors of the total counter and remedy the connection if necessary.

CONTENTS

3-6 Troubleshooting

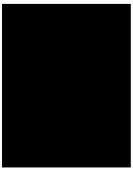
3-6-1 Image formation problems

(1) No image (entirely white).



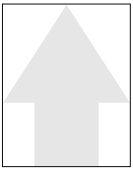
See page 3-6-4.

(2) No image (entirely black).



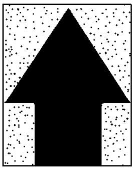
See page 3-6-5.

(3) Image is too light.



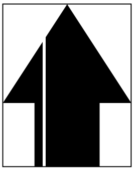
See page 3-6-6.

(4) Background is visible.



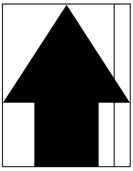
See page 3-6-7.

(5) A white line appears longitudinally.



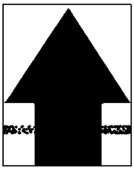
See page 3-6-8.

(6) A black line appears longitudinally.



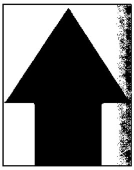
See page 3-6-8.

(7) A black line appears laterally.



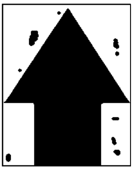
See page 3-6-9.

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



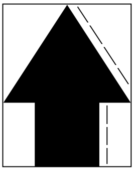
See page 3-6-10.

(9) Black dots appear on the image.



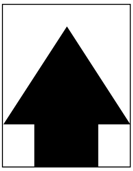
See page 3-6-10.

(10) Image is blurred.



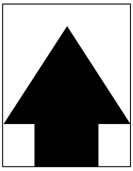
See page 3-6-11.

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



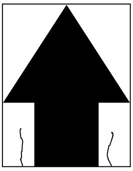
See page 3-6-11.

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



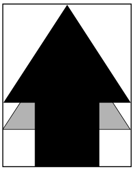
See page 3-6-12.

(13) Paper creases.



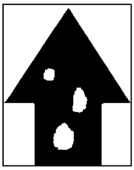
See page 3-6-12.

(14) Offset occurs.



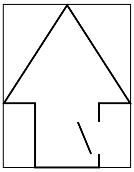
See page 3-6-13.

(15) Image is partly missing.



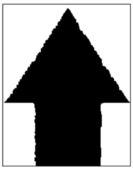
See page 3-6-13.

(16) Fixing is poor.



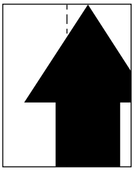
See page 3-6-14.

(17) Image is out of focus.



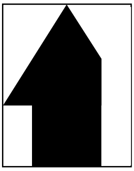
See page 3-6-14.

(18) The center of the image is misaligned with the original.



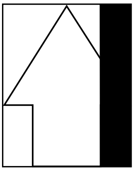
See page 3-6-15.

(19) One forth the A0 width of the image is white.



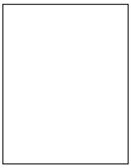
See page 3-6-15.

(20) One forth the A0 width of the image is black.



See page 3-6-16.

(1) No image
(entirely white).



Causes

1. No transfer charging.
2. LPH fails to turn on.

Causes	Check procedures/corrective measures
1. No transfer charging.	
A. Broken transfer charger wire.	Replace the wire.
B. Leaking transfer charger housing.	Clean the transfer charger housing.
C. The connector terminals of the ST high-voltage transformer make poor contact.	Check for continuity across the terminals. If none, replace them.
D. Defective main PCB.	Run simulation 33 and check if CN4-1B on the main PCB goes low. If not, replace the main PCB.
E. Defective ST high-voltage trans-former.	If transfer charging does not take place during simulation 33 while CN1-1 on the ST high-voltage transformer goes low, replace the ST high-voltage transformer.
2. LPH fails to turn on.	
A. Blown fuse on the LPH power supply PCB.	Remove the cause of blowing and replace the fuse.
B. Defective LPH power supply PCB.	With power relay 2 on, check if 5 V DC is output. If none while 24 V DC is input, replace the LPH power supply PCB.
C. Poor contact in the LPH data or power wire connectors.	Check for loose connectors and poor contact in them, and remedy if necessary. Check for continuity across connector terminals of each wire and, if none, replace them.
D. Defective main PCB or LPH.	Run simulation 102 and if no gray pattern is output, replace the main PCB or LPH.

(2) No image
(entirely black).

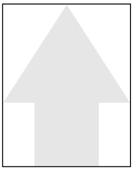
Causes

1. Fluorescent lamp fails to light.
2. No main charging.
3. Loose LPH data wire connectors.
4. Defective main PCB.
5. Defective LPH.
6. Loose ISU data wire connectors.
7. Defective ISU PCB.

Causes	Check procedures/corrective measures
1. Fluorescent lamp fails to light.	
A. Broken fluorescent lamp filament.	Check for continuity across the fluorescent lamp filament. If none, replace the fluorescent lamp (see page 3-3-19).
B. The fluorescent lamp sockets make poor contact.	Check for continuity across the sockets. If none, replace them.
C. Defective inverter PCB.	Run simulation 110 and if the fluorescent lamp does not light while CN1-2 on the inverter PCB goes low, replace the inverter PCB.
D. Defective main PCB.	Run simulation 110 and check if CN6-18 on the main PCB goes low. If not, replace the main PCB.
2. No main charging.	
A. Broken main charger wire.	Replace the wire.
B. Leaking main charger housing.	Clean the main charger housing.
C. The connector terminals of the main high-voltage transformer make poor contact.	Check for continuity across the terminals. If none, replace them.
D. Defective main PCB.	*If CN6-17 on the main PCB does not go low during copying, replace the main PCB.*
E. Defective main high-voltage transformer.	*If main charging does not take place during copying while CN1-3 on the main high-voltage transformer goes low, replace the main high-voltage transformer.*

Causes	Check procedures/corrective measures
3. Loose LPH data wire connectors.	Run simulation 159. If no test pattern is output, check the connection of the LPH data wire connectors and remedy if necessary.
4. Defective main PCB.	Run simulation 159. If no test pattern is output after the LPH data wire connectors have been found to be correctly inserted, replace the main PCB.
5. Defective LPH.	Run simulation 159. If no test pattern is output after the LPH data wire connection and main PCB have been confirmed to be fine, replace the LPH.
6. Loose ISU data wire connectors.	Run simulation 159. If the test pattern is output, run simulation 121. If the value of each channel is 255, check the connection of the ISU data wire connectors and remedy if necessary.
7. Defective ISU PCB.	Run simulation 159. If the test pattern is output, run simulation 121. If the value of each channel is close to 0, replace the ISU PCB (check that the fluorescent lamp is lit).

(3) Image is too light.

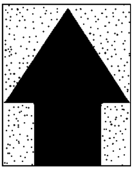


Causes

1. Insufficient toner.
2. Deteriorated developer.
3. Dirty or deteriorated drum.
4. Misadjusted fluorescent lamp intensity.
5. Misadjusted developing section.
6. Misadjusted drum surface potential.
7. Dirty LPH.
8. Dirty main charger grid.

Causes	Check procedures/corrective measures
1. Insufficient toner.	If the add toner indicator is lit, replenish toner.
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 it (see page 3-3-13 or 3-3-10).
4. Misadjusted fluorescent lamp intensity.	*Readjust the exposure amount (see page 3-3-24).*
5. Misadjusted developing section.	Readjust the position of the magnetic brush or doctor blade (see page 3-3-35 or 3-3-33).
6. Misadjusted drum surface potential.	Readjust the drum surface potential (see page 3-3-18).
7. Dirty LPH.	Clean the LPH.
8. Dirty main charger grid.	Clean the main charger grid.

(4) Background is visible.

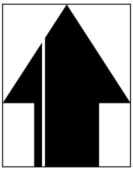


Causes

1. Dirty lens array in the CIS.
2. Deteriorated developer.
3. Misadjusted fluorescent lamp intensity.
4. Misadjusted developing section.
5. Misadjusted drum surface potential.
6. Dirty main charger shield.

Causes	Check procedures/corrective measures
1. Dirty lens array in the CIS.	Clean the lens array in the CIS.
2. Deteriorated developer.	Check the number of copies made with the current developer. If it has reached the specified limit, replace the developer.
3. Misadjusted fluorescent lamp intensity.	*Readjust the exposure amount (see page 3-3-24).*
4. Misadjusted developing section.	Readjust the doctor blade position (see page 3-3-33).
5. Misadjusted drum surface potential.	Readjust the drum surface potential (see page 3-3-18).
6. Dirty main charger shield.	Clean the main charger shield first with a damp cloth and then with a dry cloth.

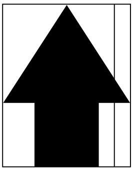
(5) A white line appears longitudinally.



Causes
1. Dirty or flawed main charger grid.
2. Foreign matter in the developing section.
3. Flawed drum.
4. Dirty contact glass.
5. Dirty middle upper original roller.
6. Dirty LPH.

Causes	Check procedures/corrective measures
1. Dirty or flawed main charger grid.	Clean the main charger grid. If the wire is flawed, replace it.
2. Foreign matter in the developing assembly.	Check if the magnetic brush is formed uniformly. If not, replace the developer (see page 3-3-31).
3. Flawed drum.	Replace the drum (see page 3-3-10).
4. Dirty contact glass.	Clean the contact glass.
5. Dirty middle upper original roller.	Clean the middle upper original roller.
6. Dirty LPH.	Clean the LPH.

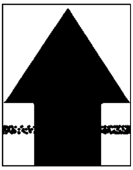
(6) A black line appears longitudinally.



Causes
1. Dirty contact glass.
2. Dirty lens array in the CIS.
3. Dirty or flawed drum.
4. Deformed or worn cleaning blade.
5. Dirty middle upper original roller.
6. Dirty main charger wire.

Causes	Check procedures/corrective measures
1. Dirty contact glass.	Clean the contact glass.
2. Dirty lens array in the CIS.	Clean the lens array in the CIS.
3. Dirty or flawed drum.	Clean the drum or, if it is flawed, replace it (see page 3-3-13 or 3-3-10).
4. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 3-3-42).
5. Dirty middle upper original roller.	Clean the middle upper original roller.
6. Dirty main charger wire.	Clean the main charger wire. If the wire is flawed, replace it (see page 3-3-14).

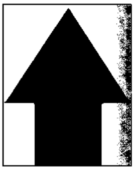
(7) A black line appears laterally.



Causes
1. Flawed drum.
2. Dirty developing section.

Causes	Check procedures/corrective measures
1. Flawed drum.	Replace the drum (see page 3-3-10).
2. Dirty developing section.	Clean the developing section.

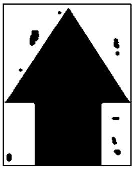
(8) One side of the copy image is darker than the other.



Causes
1. Dirty main charger wire.
2. Dirty lens array in the CIS.
3. Defective fluorescent lamp.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Clean the main charger wire. If it is extremely dirty, replace it (see page 3-3-14).
2. Dirty lens array in the CIS.	Clean the lens array in the CIS.
3. Defective fluorescent lamp.	Run simulation 110 and check the fluorescent lamp. If any problem exists, replace the fluorescent lamp (see page 3-3-19).

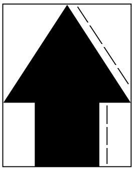
(9) Black dots appear on the image.



Causes
1. Dirty or flawed drum.
2. Deformed or worn cleaning blade.
3. Dirty or flawed cleaning fur brush.

Causes	Check procedures/corrective measures
1. Dirty or flawed drum.	Clean the drum or, if it is flawed, replace it (see page 3-3-13 or 3-3-10).
2. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 3-3-42).
3. Dirty or flawed cleaning fur brush.	Clean the cleaning fur brush or, if it is flawed, replace it (see page 3-3-46).

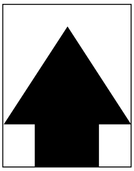
(10) Image is blurred.



Causes
1. Original is conveyed erratically.
2. Deformed press roller.
3. Paper conveying drive system problem.

Causes	Check procedures/corrective measures
1. Original is conveyed erratically.	
A. Dirty or deformed front upper, middle upper, rear upper, front lower or rear lower original roller(s).	Clean or replace any of the front upper, middle upper, rear upper, front lower and rear lower original rollers if necessary.
B. Original conveying drive system problem.	Check the gears and belts. Grease the gears or readjust the belt tension if necessary (see page 3-3-63).
C. Original holding section installed incorrectly.	Reinstall.
2. Deformed press roller.	Check visually and replace (see page 3-3-52).
3. Paper conveying drive system problem.	Check the gears and belts. Grease the gears or readjust the belt tension if necessary (see pages 3-3-60 and 61).

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



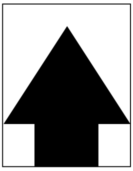
Causes
1. Misadjusted leading edge registration.

Causes	Check procedures/corrective measures
1. Misadjusted leading edge registration.	Readjust the leading edge registration (see page 3-3-23).

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

Causes

1. Registration clutch or bypass registration clutch installed or operating incorrectly.
2. Original feed clutch installed or operating incorrectly.
3. *Loose original feed drive belt 1.*

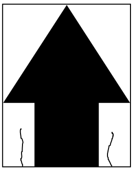


Causes	Check procedures/corrective measures
1. Registration clutch or bypass registration clutch installed or operating incorrectly.	Check the installation position and operation of each clutch; if it has any operation problem, replace it.
2. Original feed clutch installed or operating incorrectly.	Check the installation position and operation of the original feed clutch. If it has any operation problem, replace the clutch.
3. Loose original feed drive belt 1.	*Check original feed drive belt 1 and readjust the belt tension (see page 3-3-63).*

(13) Paper creases.

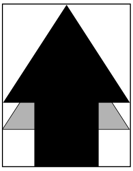
Causes

1. Paper curled.
2. Paper damp.
3. Misadjusted fixing pressure.



Causes	Check procedures/corrective measures
1. Paper curled.	Check the paper storage conditions.
2. Paper damp.	Check the paper storage conditions.
3. Misadjusted fixing pressure.	Check if the fixing unit pressure adjustment nuts are tightened correctly and, if not, remedy.

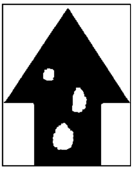
(14) Offset occurs.



Causes
1. Defective cleaning blade.
2. Cleaning solenoid malfunctioning.
3. Post-transfer lamp fails to light.

Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the cleaning blade (see page 3-3-42).
2. Cleaning solenoid malfunctioning.	Run simulation 45 and if the cleaning solenoid does not operate correctly, replace it.
3. Post-transfer lamp fails to light.	Run simulation 44 and if the post-transfer lamp does not light, replace it.

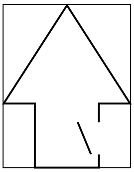
(15) Image is partly missing.



Causes
1. Paper damp.
2. Paper creased.
3. Drum condensation.
4. Flawed drum.
5. Deformed pre-transfer inner upper guide.

Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions.
2. Paper creased.	Change the paper.
3. Drum condensation.	Clean the drum (see page 3-3-13).
4. Flawed drum.	Replace the drum (see page 3-3-10).
5. Deformed pre-transfer inner upper guide.	Remedy or replace.

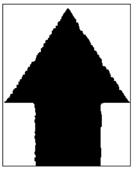
(16) Fixing is poor.



Causes
1. Wrong paper.
2. Misadjusted fixing pressure.
3. Misadjusted fixing temperature.
4. Flawed press roller.

Causes	Check procedures/corrective measures
1. Wrong paper.	Check if the paper meets specifications.
2. Misadjusted fixing pressure.	Check if the fixing unit pressure adjustment nuts are tightened correctly and, if not, remedy.
3. Misadjusted fixing temperature.	Readjust the fixing temperature.
4. Flawed press roller.	Replace the press roller (see page 3-3-52).

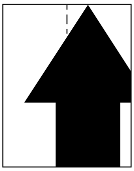
(17) Image is out of focus.



Causes
1. LPH installed incorrectly.
2. Defective LPH.
3. Defective CIS.

Causes	Check procedures/corrective measures
1. LPH installed incorrectly.	Run simulation 158 and obtain the test pattern for image focus adjustment. If the image is not correct, adjust the LPH position (see page 3-3-28).
2. Defective LPH.	After adjusting the LPH position, run simulation 158. If the test pattern is not correct, replace the LPH.
3. Defective CIS.	If the image is still out of focus during normal copying after the correct pattern has been obtained by simulation 158, replace the CIS.

(18) The center of the image is misaligned with the original.

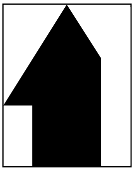


Causes

1. Paper roll is not installed correctly on the roll shaft.
2. Paper is not placed correctly on the bypass table.
3. Original is not placed correctly.

Causes	Check procedures/corrective measures
1. Paper roll is not installed correctly on the roll shaft.	Correct.
2. Paper is not placed correctly on the bypass table.	Correct.
3. Original is not placed correctly.	Correct.

(19) One forth the A0 width of the image is white.



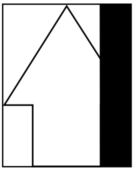
Causes

1. Defective CIS or ISU PCB.
2. Defective LPH.

See *(20) One forth the A0 width of the image is black* for check procedures and corrective measures.

(20) One forth the A0 width of the image is black.

Causes
1. Defective CIS or ISU PCB.
2. Defective LPH.



Causes	Check procedures/corrective measures
1. Defective CIS or ISU PCB.	Change the connections of CN1, CN2, CN3 and CN4 of the CIS and ISU PCB as shown in the following example to locate the problem.
2. Defective LPH.	Run simulation 102. If no gray pattern is output, replace the LPH.

Example
If there is a problem with CH1 (CN1) but CH2 (CN2) to CH4 (CN4) are normal, check by swapping the connections of CN1 and CN2 of the CIS and ISU PCB.
If the image problem area shifts with the location of CN-1, replace the CIS.
If the image problem area doesn't shift, replace the ISU PCB.

3-6-2 Paper misfeeds

Problem	Causes/check procedures	Corrective measures
(1) J-04 appears as soon as the main switch is turned on.	A piece of paper torn from copy paper is caught around the bypass registration roller along the paper conveying path.	Check and remove it, if any.
	Defective bypass registration switch.	If CN3-14 on the main PCB remains low when the bypass registration switch is turned on and off, replace the bypass registration switch.
(2) J-05 appears as soon as the main switch is turned on.	A piece of paper torn from copy paper is caught around the original trailing edge detection switch along the paper conveying path.	Check and remove it, if any.
	Defective original trailing edge detection switch.	If CN3-13 on the main PCB remains low when the original trailing edge detection switch is turned on and off, replace the original trailing edge detection switch.
(3) J-06 appears as soon as the main switch is turned on.	Roll paper is left uncut.	Press the job stop/roll cut key to cut remaining paper and remove it.
	A piece of paper torn from copy paper is caught around the registration switch, paper conveying switch or eject switch along the paper conveying path.	Check and remove it, if any.
	Defective registration switch.	If CN3-11 on the main PCB remains low when the registration switch is turned on and off, replace the registration switch.
	Defective paper conveying switch.	If CN3-15 on the main PCB remains low when the paper conveying switch is turned on and off, replace the paper conveying switch.

Problem	Causes/check procedures	Corrective measures
(3) J-06 appears as soon as the main switch is turned on.	Defective eject switch.	If CN3-16 on the main PCB remains low when the eject switch is turned on and off, replace the eject switch.
(4) Paper jam in the 1st roll unit (J-01) occurs during copying frequently.	Wrong paper.	Check and, if the paper is extremely curled or inappropriate for copying, change it.
	A piece of paper torn from copy paper is left along the paper conveying path between the 1st roll unit and the registration roller.	Check and remove it, if any.
	Guide plates or other components along the paper conveying path between the 1st roll unit and the registration roller are deformed.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the 1st roll unit is dirty with paper powder.	Check the roll paper feed upper roller and, if it is dirty, clean it with isopropyl alcohol.
	The roll paper feed upper roller of the 1st roll unit is deformed or worn.	Check and replace the roll paper feed upper roller if necessary.
	Broken registration switch actuator.	Check and, if the actuator is broken, replace the registration switch.
	Defective registration switch.	If the level of CN3-11 on the main PCB does not change when the registration switch is turned on and off, replace the registration switch.
	Electrical problem with the upper feed clutch.	See page 3-6-42.

Problem	Causes/check procedures	Corrective measures
(5) Paper jam in the 2nd roll unit (J-02) occurs during copying frequently.	Wrong paper.	Check and, if the paper is extremely curled or inappropriate for copying, change it.
	A piece of paper torn from copy paper is left along the paper conveying path between the 2nd roll unit and the registration roller.	Check and remove it, if any.
	Guide plates or other components between the 2nd roll unit and the registration roller are deformed.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the 2nd roll unit is dirty with paper powder.	Check the roll paper feed upper roller and, if it is dirty, clean it with isopropyl alcohol.
	The roll paper feed upper roller of the 2nd roll unit is deformed or worn.	Check and replace the roll paper feed upper roller if necessary.
	Broken registration switch actuator.	Check and, if the actuator is broken, replace the registration switch.
	Defective registration switch.	If the level of CN3-11 on the main PCB does not change when the registration switch is turned on and off, replace the registration switch.
	Electrical problem with the middle feed clutch.	See page 3-6-42.
(6) Paper jam in the 3rd roll unit (optional) (J-03) occurs during copying frequently.	Wrong paper.	Check and, if the paper is extremely curled or inappropriate for copying, change it.
	A piece of paper torn from copy paper is left along the paper conveying path between the 3rd roll unit and the registration roller.	Check and remove it, if any.
	Guide plates or other components between the 3rd roll unit and the registration roller are deformed.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the 3rd roll unit is dirty with paper powder.	Check the roll paper feed upper roller and, if it is dirty, clean it with isopropyl alcohol.

Problem	Causes/check procedures	Corrective measures
(6) Paper jam in the 3rd roll unit (optional) (J-03) occurs during copying frequently.	The roll paper feed upper roller of the 3rd roll unit is deformed or worn.	Check and replace the roll paper feed upper roller if necessary.
	Broken registration switch actuator.	Check and, if the actuator is broken, replace the registration switch.
	Defective registration switch.	If the level of CN3-11 on the main PCB does not change when the registration switch is turned on and off, replace the registration switch.
	Electrical problem with the lower feed clutch.	See page 3-6-43.
(7) Paper jam in the original feed section (J-05) occurs during copying frequently.	Original is extremely curled.	Check and correct if necessary.
	The original is longer than the maximum length.	Use the original whose length meets specifications.
	The surfaces of the front upper, middle upper, rear upper, front lower or rear lower original rollers are dirty with paper powder.	Check and clean any dirty rollers with isopropyl alcohol.
	The front upper, middle upper, rear upper, front lower or rear lower original rollers are deformed or worn.	Check each roller and, if necessary, replace it.
	The original holding section is not closed completely.	Close the original holding section completely.
	Electrical problem with the original feed clutch.	See page 3-6-44.
	Defective original leading edge detection switch.	If CN3-12 on the main PCB does not go low when the original leading edge detection switch is turned on and off, replace the original leading edge detection switch.
	Broken actuator of the original leading or trailing edge detection switch.	Check the actuator of each switch and, if it is broken, replace the switch.

Problem	Causes/check procedures	Corrective measures
(8) Paper jam inside the main unit (J-06) occurs during copying frequently.	A piece of paper torn from copy paper is left along the paper conveying path between the registration roller and eject roller.	Check and remove it, if any.
	Guide plates along the paper conveying path between the registration roller and the eject roller are deformed.	Check and remedy or replace any deformed guide plates.
	Dirty registration, pre-transfer and/or eject rollers.	Check and clean any dirty rollers with the isopropyl alcohol.
	Deformed or worn registration, pre-transfer and/or eject roller.	Check and replace the roller(s) if necessary.
	Extremely dirty press roller or its separation claws.	Check and clean if dirty.
	Deformed press roller or its separation claws.	Check and replace if deformed (see page 3-3-52).
	Broken separation charger wire.	Check and replace the separation charger wire if it is broken (see page 3-3-37).
	Electrical problem with the paper conveying fan motor.	See page 3-6-41.
	Electrical problem with the registration clutch.	See page 3-6-43.
	Electrical problem with the roll paper conveying clutch.	See page 3-6-43.
	Defective paper conveying switch.	If the level of CN3-15 on the main PCB does not change when the paper conveying switch is turned on and off, replace the paper conveying switch.
	Defective eject switch.	If the level of CN3-16 on the main PCB does not change when the eject switch is turned on and off, replace the eject switch.

Problem	Causes/check procedures	Corrective measures
(8) Paper jam inside the main unit (J-06) occurs during copying frequently.	Defective fixing unit pulse sensor.	If the level of CN3-17 on the main PCB does not change when the fixing unit pulse sensor is turned on and off, replace the fixing unit pulse sensor.
	The eject switch actuator or the fixing unit pulse sensor disc is broken.	Check the actuator and, if it is broken, replace the eject switch. Check the disc and, if it is broken, replace the fixing unit pulse sensor.

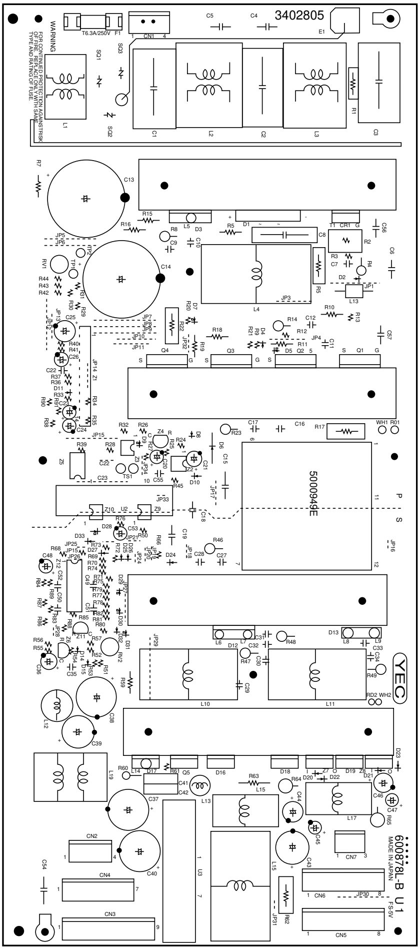
3-6-3 PCB terminal voltages

Precautions

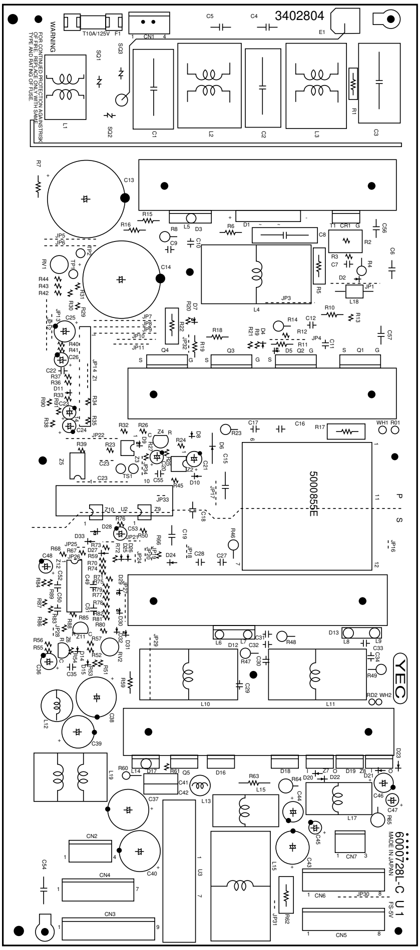
- When handling the circuit boards, do not touch the components wth bare hands.
- ICs can be damaged by static discharges. If a PCB contains ICs, do not touch the ICs, cable connectors or edge connectors.
- Store the circuit boards wrapped in aluminum foil, conductive spoge rubber, or similar material.

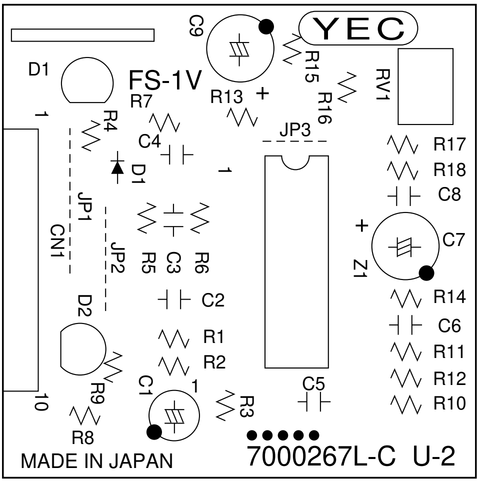
(1) Power source PCB

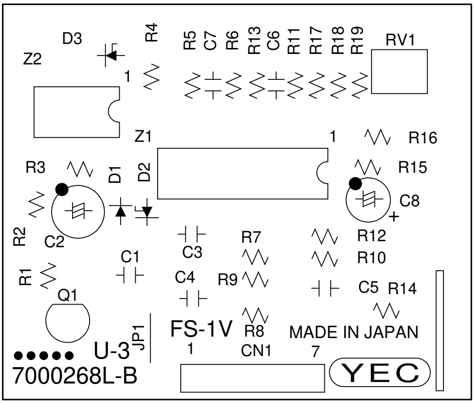
220 – 240 V area



120 V area

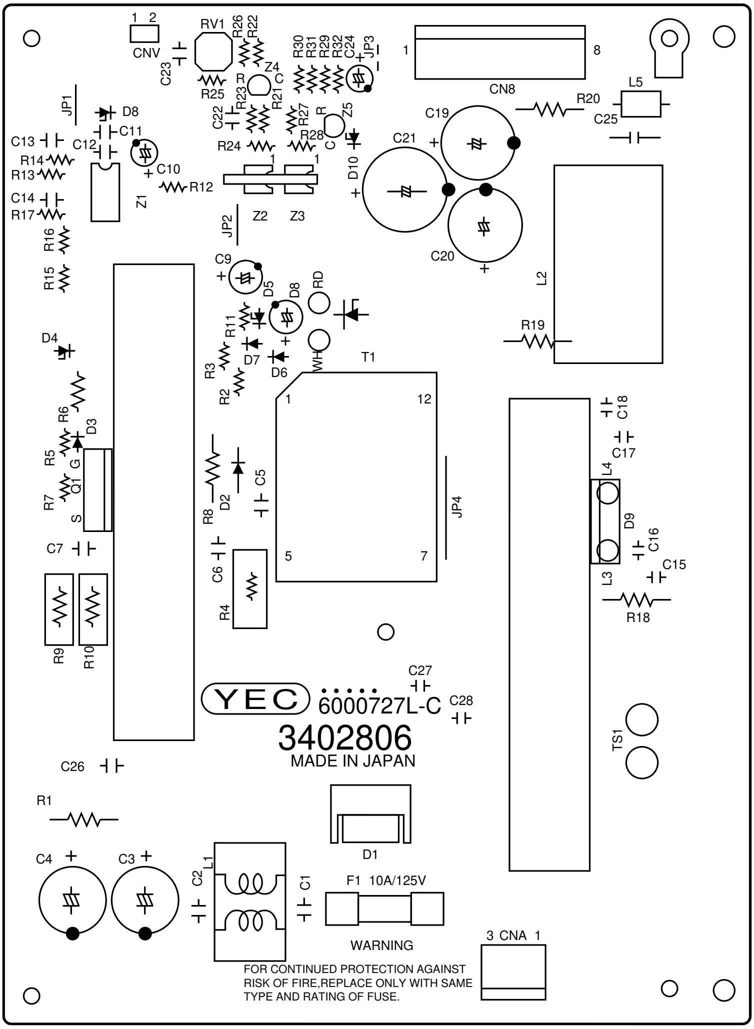






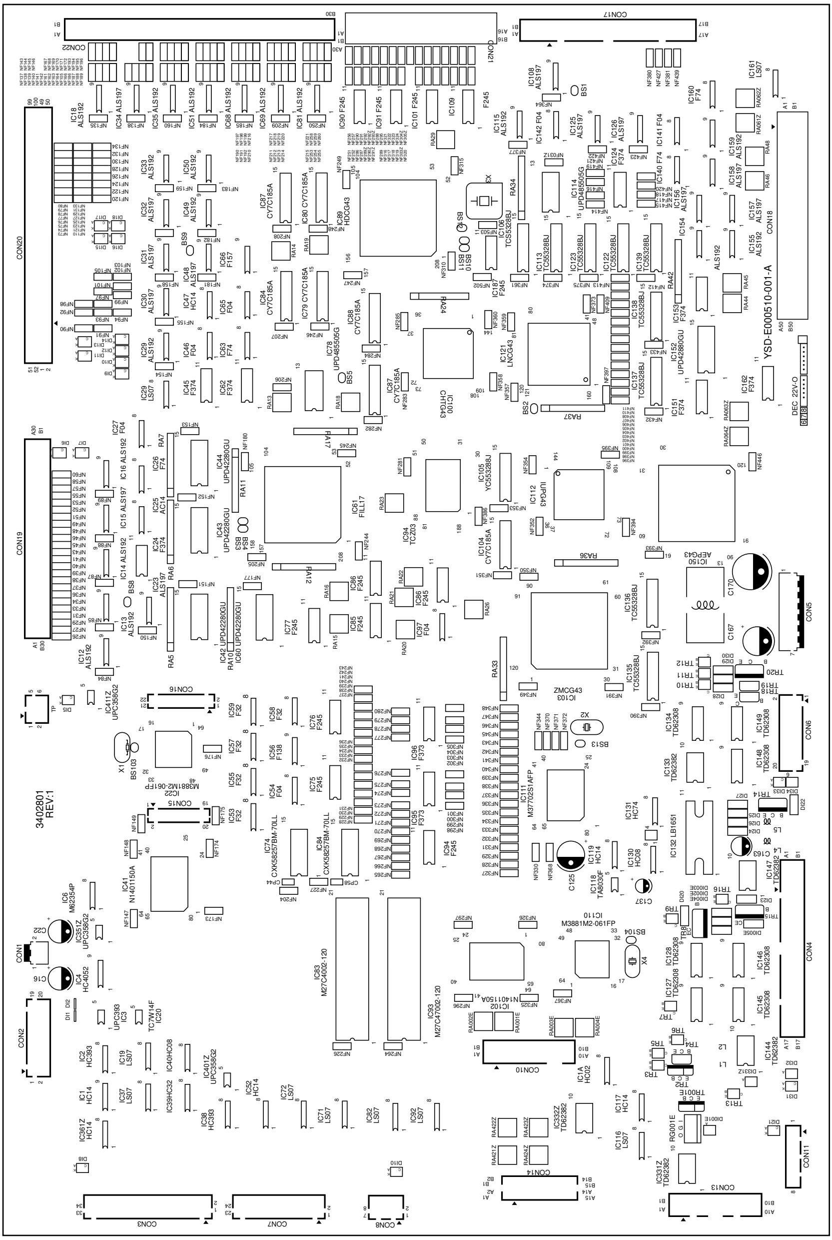
Terminals (CN)		Voltage	Remarks
1-1	1-4	Local voltage	AC supply, input
2-1	2-4	24 V DC	24 V DC supply, output
3-1, 2, 3, 4	3-5, 6, 7, 8	24 V DC	24 V DC supply, output
4-1, 2, 3, 4	4-5, 6	24 V DC	24 V DC supply, output
5-1, 2, 3	5-5, 6, 7	5 V DC	5 V DC supply, output
6-1, 2, 3, 4	6-5, 6, 7, 8	5 V DC	5 V DC supply, output
7-1	7-2	+12 V DC	+12 V DC supply, output
7-3	7-2	–12 V DC	–12 V DC supply, output

(2) LPH power source PCB



Terminals (CN)		Voltage	Remarks
A-1	A-3	24 V DC	24 V DC supply, input
B-1	B-5, 6, 7, 8	5 V DC	5 V DC supply to LPH, output
B-2	B-5, 6, 7, 8	5 V DC	5 V DC supply to LPH, output
B-3	B-5, 6, 7, 8	5 V DC	5 V DC supply to LPH, output
B-4	B-5, 6, 7, 8	5 V DC	5 V DC supply to LPH, output

(3) Main PCB



CON22
CON21
CON17
CON20
CON19
CON18
CON5
CON6
CON4
CON16
CON15
CON1
CON2
CON10
CON14
CON13
CON11
CON3
CON7
CON8
YSD-E000510-001-A
3402801
REV:1
IC89 HDCG43
IC100 CHTG43
IC103 ZMCG43
IC112 IUPG43
IC121 LNCG43
IC61 FILL17
IC94 TCZ03
IC150 AEPG43
IC111 M37702S1AFP
IC110 M3881M2-061FP
IC22 M3881M2-061FP
IC41 N1401150A
IC102 N1401150A
IC83 M27C4002-120
IC93 M27C47002-120
IC74 CXK58257BM-70LL
IC84 CXK58257BM-70LL
IC132 LB1651
IC18 ALS192
IC34 ALS197
IC35 ALS192
IC51 ALS192
IC68 ALS192
IC69 ALS192
IC81 ALS192
IC90 F245
IC91 F245
IC101 F245
IC109
IC108 ALS197
IC161 LS07
IC160 F74
IC159 ALS192
IC158 ALS197
IC157 ALS197
IC155 ALS192
IC6 M62354P
IC4 HC4052
IC3 UPC393
IC20 TC7W14F
IC2 HC393
IC1 HC14
IC361Z HC14
IC38 HC393
IC52 HC14
RA36
RA37
RA33
BS1
BS13
BS103
BS104
X1
X2
X4
DEC 22V-O

Terminals (CN)		Voltage	Remarks
1-1	5-6, 7	+12 V DC	+12 V DC supply, input
1-2	5-6, 7	–12 V DC	–12 V DC supply, input
2-2	2-1		DTH detection, input
2-5	2-3		FTH1 detection, input
2-6	2-3		FTH2 detection, input
2-7	2-4		FTH3 detection, input
2-8	2-4		FTH4 detection, input
2-10	2-9		ETTH detection, input
2-14	2-13		FLTH detection, input
2-16	2-15		DPS detection, input
2-18	2-17		TNS detection, input
2-19	5-6, 7		DB control, output
3-1	5-6, 7	0/5 V DC	KC[*1] connected/not connected detection, input
3-3	5-6, 7	0/5 V DC	Transfer charger shorting detection, input
3-4	5-6, 7	0/5 V DC	1st roll unit installed/not installed detection, input
3-5	5-6, 7	0/5 V DC	2nd roll unit installed/not installed detection, input
3-6	5-6, 7	0/5 V DC	3rd roll unit[*1] installed/not installed detection, input
3-7	5-6, 7	0/5 V DC	TDTDSW waste toner tank set/not set, input
3-8	5-6, 7	5/0 V DC	OFS toner overflow detection, input
3-9	5-6, 7	5/0 V DC	RLDSW-U on/off, input
3-10	5-6, 7	0/5 V DC (pulse)	PS-U on/off, input
3-11	5-6, 7	0/ 5V DC	RSW on/off, input
3-12	5-6, 7	0/5 V DC	OLDSW on/off, input
3-13	5-6, 7	0/5 V DC	OTDSW on/off, input
3-14	5-6, 7	5/0 V DC	BYPRSW on/off, input
3-15	5-6, 7	0/5 V DC	PCSW on/off, input
3-16	5-6, 7	5/0 V DC	ESW on/off, input
3-17	5-6, 7	0/5 V DC (pulse)	FPS on/off, input
3-18	5-6, 7	0/5 V DC (pulse)	PFM FG, input
3-19	5-6, 7	0/5 V DC	PSSW1-U on/off, input
3-20	5-6, 7	0/5 V DC	PSSW2-U on/off, input
3-21	5-6, 7	0/5 V DC	OSSW1 on/off, input

[*1] Optional

Terminals (CN)		Voltage	Remarks
3-22	5-6, 7	0/5 V DC	OSSW2 on/off, input
3-23	5-6, 7	0/5 V DC	OFM SPEED1, output
3-24	5-6, 7	0/5 V DC	OFM ENA, output
3-25	5-6, 7	0/5 V DC	OFM SPEED2, output
3-26	5-6, 7	0/5 V DC	PFM SPEED1, output
3-27	5-6, 7	0/5 V DC	DCM2PCB RESET, output
3-28	5-6, 7	0/5 V DC	PFM SPEED2, output
3-29	5-6, 7	0/5 V DC	PFM ENA, output
3-30	3-31	0/5 V DC (pulse)	DCM2PCB serial communication, input
3-32	3-33	0/5 V DC (pulse)	DCM2PCB serial communication, output
3-34	5-6, 7	0/5 V DC	BYPTIMSW on/off, input
4-1A	4-2A	24/0 V AC	TM on/off, output
4-3A	*5-6, 7*	*0/7.7 V DC*	*SSR3[*1] on/off, output*
4-4A	*5-2, 3*	*0/24 V DC*	*Auto shutoff on/off, output*
4-5A	5-2, 3	0/24 V DC	FFM-R, FFM-L on/off, output
4-6A	5-2, 3	0/24 V DC	PCFM on/off, output
4-7A	5-2, 3	0/24 V DC	OFCL on/off, output
4-8A	5-2, 3	0/24 V DC	FCL-U on/off, output
4-9A	5-2, 3	0/24 V DC	RWCL-U on/off, output
4-10A	5-2, 3	0/24 V DC	KC count on/off, output
4-11A	5-2, 3	0/24 V DC	TC count on/off, output
4-12A	5-2, 3	0/15.5 V DC	PCHL on/off control, output
4-13A	5-2, 3	0/15.5 V DC	DH on/off control, output
4-14A	5-2, 3	0/24 V DC	*RH-U[*2] on/off control, output*
4-15A	5-2, 3	0/24 V DC	*RH-L[*2,3] on/off control, output*
4-16A	5-2, 3	0/2.7 V DC	PRY1, PRY2 on/off, output
4-17A	5-2, 3	24 V DC	24 V DC supply to PRY1, PRY2, output
4-1B	5-2, 3	0/24 V DC	Transfer charger on/off, output
4-2B	5-2, 3	0/24 V DC	Separation charger on/off, output
4-3B	5-2, 3	0/24 V DC	Developing bias on/off, output
4-4B	5-2, 3	0/24 V DC	Developing bias positive/negative polarity switching, output
4-5B	5-2, 3	0/5.5 V DC	FFM-R, FFM-L full-/half-speed, output
4-6B	5-2, 3	0/4.8 V DC	PCFM full-/half-speed, output
4-7B	5-6, 7	0/7.7 V DC	SSR1 on/off, output
4-8B	5-6, 7	0/7.7 V DC	SSR2 on/off, output
4-9B	5-2, 3	0/18.7 V DC	R-Lamp on/off, output

**1 For 230 V, 50 Hz models only.* **2* Optional for 220 – 240 V models.

**3* Optional for 120 V models.

Terminals (CN)		Voltage	Remarks
4-12B	5-2, 3	0/15.5 V DC	RTL on/off control, output
4-13B	5-2, 3	0/15.5 V DC	FLH on/off control, output
4-14B	5-2, 3	0/24 V DC	RH-M[*1] on/off, output
4-17B	5-2, 3	24 V DC	24 V DC supply, input
5-1	5-2, 3	24 V DC	24 V DC supply, input
5-4, 5	5-6, 7	5 V DC	5 V DC supply, input
6-1	5-2, 3	0/5.5 V DC	*LPHFM1 full/half-speed, output*
6-2	5-2, 3	0/2.6 V DC	CFM full-/half-speed, output
6-3	5-2, 3	0/24 V DC	CFM on/off, output
6-4	5-2, 3	0/24 V DC	CSOL hold/off, output
6-5	5-2, 3	0/24 V DC	CSOL pull/off, output
6-6	5-2, 3	0/24 V DC	SSOL on/off, output
6-7	5-2, 3	0/24 V DC	RCL on/off, output
6-8	5-2, 3	0/24 V DC	CCL on/off, output
6-9	5-2, 3	0/24 V DC	RPCCL on/off, output
6-10	5-2, 3	0/24 V DC	FCL-M on/off, output
6-11	5-2, 3	0/24 V DC	RWCL-M on/off, output
6-12	5-2, 3	0/24 V DC	FCL-L[*1, 2] on/off, output
6-13	5-2, 3	0/24 V DC	RWCL-L[*1, 2] on/off, output
6-14	5-2, 3	0/24 V DC	BYPRCL on/off, output
6-15	*5-2, 3*	*0/5.5 V DC*	*LPHFM2 full/half-speed, output*
6-17	5-2, 3	0/24 V DC	Main chager on/off control, output
6-18	5-2, 3	0/24 V DC	FL on/off control, output
6-19	5-6, 7	0/5 V DC	MHVT shorting detection, input
6-20	5-2, 3	24/0 V DC	SSW1, SSW2 on/off, input
7-1	5-6, 7	0/5 V DC	DRM drive/stop control, output
7-2	5-6, 7	0/5 V DC (pulse)	DRM clock, output
7-4	5-6, 7	0/5 V DC	DM drive/stop control, output
7-5	5-6, 7	0/5 V DC (pulse)	DM clock, output
7-6	5-6, 7	0/5 V DC	FDM drive/stop control, output
7-7	5-6, 7	0/5 V DC (pulse)	FDM clock, output
7-8	5-6, 7	0/5 V DC	DRM lock detection, input
7-11	5-6, 7	0/5 V DC	OHSW on/off, input
7-12	5-6, 7	5/0 V DC	CHPSW1 on/off, input
7-13	5-6, 7	5/0 V DC	CHPSW2 on/off, input
7-14	5-6, 7	0/5 V DC	RLDSW-M on/off, input
7-15	5-6, 7	0/5 V DC	RLDSW-L[*1, 2] on/off, input

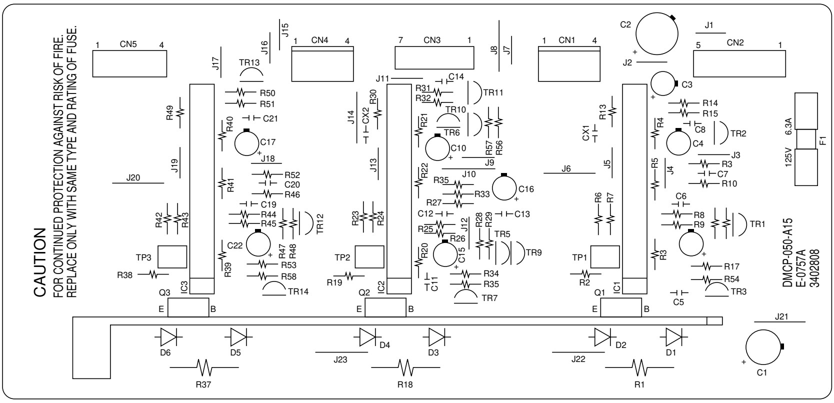
*1 Optional for 220 – 240 V models.
*2 Optional for 120 V models.

Terminals (CN)		**Voltage**	**Remarks**
7-16	5-6, 7	0/5 V DC (pulse)	PS-M detection, input
7-17	5-6, 7	0/5 V DC (pulse)	PS-L[*1, 2] detection, input
7-18	5-6, 7	0/5 V DC	PSSW1-M on/off, input
7-19	5-6, 7	0/5 V DC	PSSW2-M on/off, input
7-20	5-6, 7	0/5 V DC	*PSSW1-L[*3] on/off, input*
7-21	5-6, 7	0/5 V DC	*PSSW2-L[*3] on/off, input*
7-22	5-6, 7		FL light intensity control, output
7-23	5-6, 7		Grid control, output
8-1	5-6, 7	5 V DC	5 V supply to OPCB, output
8-2	8-3	0/5 V DC (pulse)	OPCB serial communication, input
8-4	8-5	0/5 V DC (pulse)	OPCB serial communication, output
8-6	8-7	0/5 V DC (pulse)	OPCB clock, output
8-8	5-6, 7	0/5 V DC	Job stop/roll cut key on/off, input
11-1	11-2	0/5 V DC (pulse)	ISUPCB serial communication, input
11-3	11-4	0/5 V DC (pulse)	ISUPCB serial communication, output
11-5	11-8	0/5 V DC	ISUPCB reset, output
11-6	11-8	0/5 V DC	ISUPCB connected/not connected detection, input
11-7	11-8		FL light intensity feedback control, input

*1 Optional for 220 – 240 V models. *2 Optional for 120 V models.

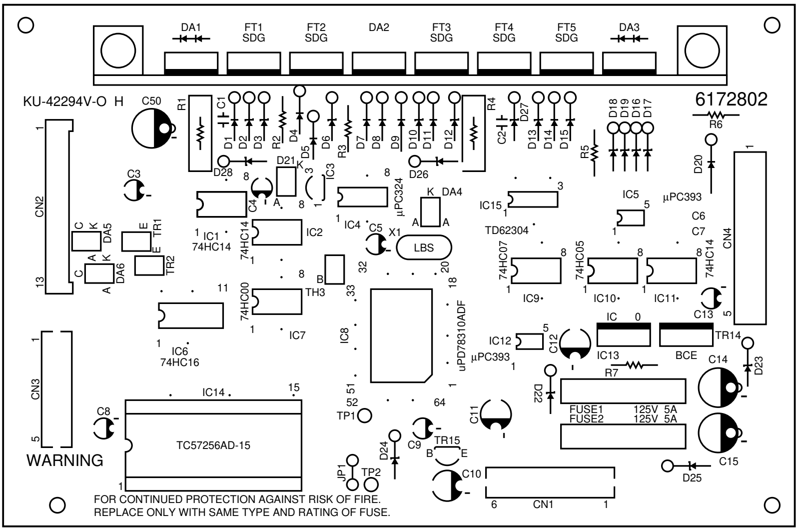
**3* Optional

(4) Servo motor control 1 PCB



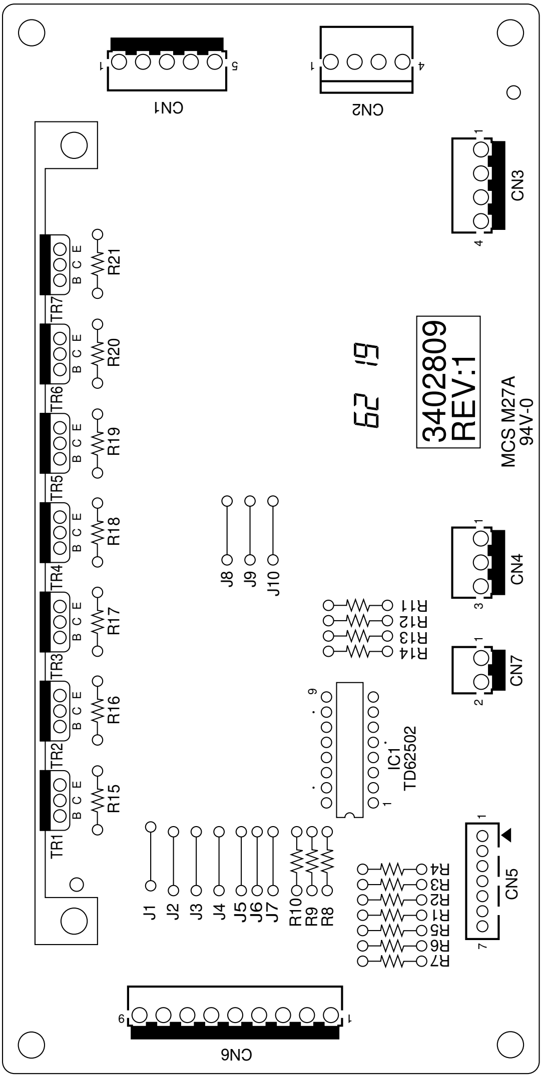
Terminals (CN)		Voltage	Remarks
1-1	1-2	24 V DC	DM drive, output
1-3	1-4	0.5 V AC (sinusoidal)	DM FG, input
2-1	2-2	24 V DC	24 V DC supply, input
2-4	2-5	5 V DC	5 V DC supply, input
3-1	2-5	0/5 V DC	DM drive/stop control, input
3-2	2-5	0/5 V DC (pulse)	DM clock, input
3-3	2-5	0/5 V DC	FDM drive/stop control, input
3-4	2-5	0/5 V DC (pulse)	FDM clock, input
3-5	2-5	0/5 V DC	*DRM drive/stop control, input*
3-6	2-5	0/5 V DC (pulse)	DRM clock, input
3-7	2-5	0/5 V DC	DRM lock detection, output
4-1	4-2	24/0 V DC (pulse)	DRM drive, output
4-3	4-4	0.5 V AC (sinusoidal)	DRM FG, input
5-1	5-2	24/0 V DC (pulse)	FDM drive, output
5-3	5-4	0.5 V AC (sinusoidal)	FDM FG, input

(5) Servo motor control 2 PCB



Terminals (CN)		Voltage	Remarks
1-1	1-4, 5	24 V DC	24 V DC supply, input
1-2	1-4, 5	24 V DC	24 V DC supply, input
1-3	1-6	5 V DC	5 V DC supply, input
2-1	1-6	0/5 V DC	OFM SPEED1, input
2-2	1-6	0/5 V DC	OFM ENA, input
2-3	1-6	0/5 V DC	OFM SPEED2, input
2-4	1-6	0/5 V DC	PFM SPEED1, input
2-5	1-6	0/5 V DC	DCM2PCB RESET, input
2-7	1-6	0/5 V DC	PFM SPEED2, input
2-8	1-6	0/5 V DC	PFM ENA, input
2-10	2-11	0/5 V DC (pulse)	DCM2PCB serial communication, output
2-12	2-13	0/5 V DC (pulse)	DCM2PCB serial communication, input
3-1	3-2	0/24 V DC (pulse)	PFM drive, output
3-3	3-5	5 V DC	5 V DC supply to PFM, output
3-4	3-5	0/5 V DC (pulse)	PFM FG, input
4-1	4-2	0/24 V DC (pulse)	OFM drive, output
4-3	4-6	0/5 V DC (pulse)	OFM FG (A), input
4-4	4-6	0/5 V DC (pulse)	OFM FG (B), input
4-5	4-6	5 V DC	5 V DC supply to OFM, output

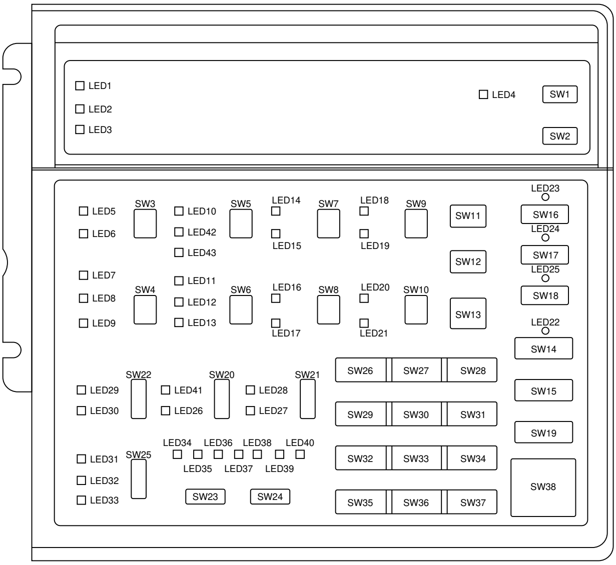
(6) Output PCB


CN1
1
5
CN2
1
4
CN3
1
4
CN4
1
3
CN7
1
2
CN5
1
7
CN6
1
9
TR1
TR2
TR3
TR4
TR5
TR6
TR7
B C E
R15
R16
R17
R18
R19
R20
R21
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
R10
R9
R8
R1
R2
R3
R4
R5
R6
R7
R11
R12
R13
R14
IC1
TD62502
1
9
3402809
REV:1
MCS M27A
94V-0
62 19

Terminals (CN)		Voltage	Remarks
1-1	4-1	24 V DC	24 V DC supply, output
1-2	4-1	24 V DC	24 V DC supply, output
1-3	4-1	24 V DC	24 V DC supply, output
1-4	4-1	24 V DC	24 V DC supply, output
1-5	4-1	24 V DC	24 V DC supply, output
2-1	4-1	24 V DC	24 V DC supply, output
2-2	4-1	24 V DC	24 V DC supply, output
2-3	4-1	24 V DC	24 V DC suppy, output
2-4	4-1	24 V DC	24 V DC supply, output
3-1	4-1	24 V DC	24 V DC supply, input
3-2	4-1	24 V DC	24 V DC supply, input
3-3	4-1	24 V DC	24 V DC supply, input
3-4	4-1	24 V DC	24 V DC supply, output
4-3	4-1	24 V DC	24 V DC supply, input
5-1	6-9	0/24 V DC	RH-L*1, 2 on/off control, input
5-2	6-9	0/24 V DC	RH-M*1 on/off control, input
5-3	6-9	0/24 V DC	RH-U*1 on/off control, input
5-4	6-9	0/15.5 V DC	DH on/off control, input
5-5	6-9	0/15.5 V DC	FLH on/off control,input
5-6	6-9	0/15.5 V DC	RTL on/off control, input
5-7	6-9	0/15.5 V DC	PCHL on/off control, input
6-1	6-9	24 V DC	24 V DC supply, input
6-2	4-1	0/24 V DC	RH-L*1, 2 on/off, output
6-3	4-1	0/24 V DC	RH-M*1 on/off, output
6-4	4-1	0/24 V DC	RH-U*1 on/off, output
6-5	4-1	0/24 V DC	DH on/off, output
6-6	4-1	0/24 V DC	FLH on/off, output
6-7	4-1	0/24 V DC	RTL on/off, output
6-8	4-1	0/24 V DC	PCHL on/off, output
7-1	4-1	24 V DC	24 V DC supply, output
7-2	4-1	24 V DC	24 V DC supply, output

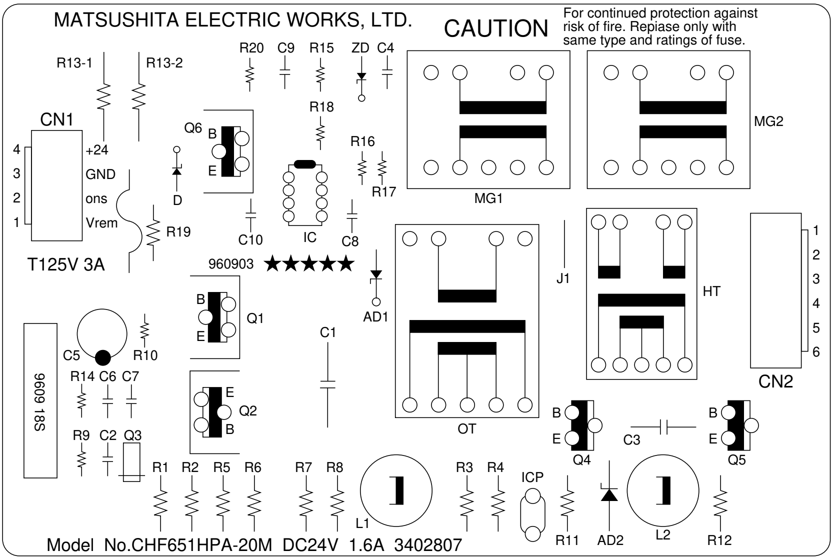
*1 Optional for 220 – 240 V models.
*2 Optional for 120 V models.

(7) Operation unit PCB



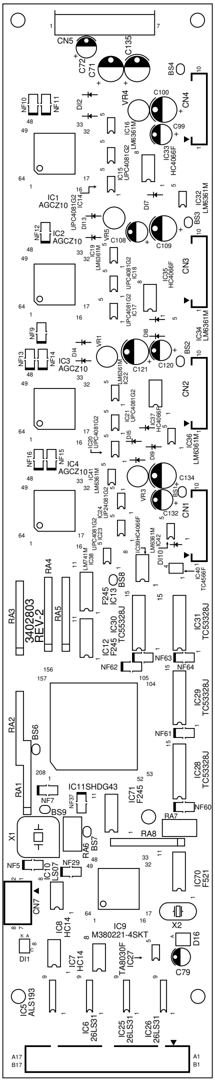
Terminals (CN)		Voltage	Remarks
1-1	1-7	5 V DC	5 V DC supply, input
1-2	1-3	5/0 V DC (pulse)	OPCB serial communication, output
1-4	1-5	5/0 V DC (pulse)	OPCB serial communication, input
1-6	1-7	5/0 V DC (pulse)	OPCB clock, input
1-8	1-7	0/5 V DC	Job stop/roll cut key on/off, output

(8) Inverter PCB



Terminals (CN)		Voltage	Remarks
1-1	1-3		FL light control, input
1-2	1-3	0/24 V DC	FL on/off control, input
1-4	1-3	24 V DC	24 V DC supply, input
2-1	2-2		FL lighting, output
2-5	2-6		FL lighting, output

(9) ISU PCB



Terminals (CN)		Voltage	Remarks
7-1	7-2	5/0 V DC (pulse)	ISUPCB serial communication, output
7-3	7-4	5/0 V DC (pulse)	ISUPCB serial communication, input
7-5	7-8	5/0 V DC	ISUPCB reset, input
7-6	7-8	0/5 V DC	ISUPCB connected/not connected detection, ouptput
7-7	7-8		FL light intensity feedback control, output

3-6-4 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate at all when the main switch is turned on.	There is no power at the wall outlet.	Measure the input voltage.
	The power plug is not connected correctly.	Check that the power cord is firmly connected to the outlet.
	The power cord has a break.	Check for continuity. If none, replace the power cord.
	The noise filter is defective.	Check for continuity across the input and output terminals. If none, replace the filter.
	The main switch is defective.	Check for continuity across the contacts. If none, replace the switch.
	Safety switch 3, 4, 5 or 6 is defective.	Check for continuity across the contacts of each switch. If none, replace the switch.
	The fuse on the power source PCB is blown.	Check for continuity across the fuse. If none, find the cause of fuse blowing and replace it.
	The power source PCB is defective.	Check if 24 V and 5 V DC are output when AC is supplied. If not, replace the PCB.
	Power relay 1 is defective.	Check for continuity across the coil of power relay 1. If none, replace the relay.
		Check if power relay 1 operates when CN4-16A on the main PCB is set to low. If not, replace the relay.
		Check for continuity across power relay 1. If none with the relay on, replace it.
	Power relay 2 is defective.	Check for continuity across the coil of power relay 2. If none, replace the relay.
		Check if power relay 2 operates when CN4-16A on the main PCB is set to low. If not, replace the relay.
		Check for continuity across power relay 2. If none with the relay on, replace it.
	The noise filter breaker has tripped.	Find and remove the cause of the breaker tripping and reset the breaker.

Problem	Causes	Check procedures/corrective measures
(2) The drive motor does not operate.	The drive motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	*Run simulation 10. If no clock pulse is output at CN7-5 on the main PCB with 24 V DC present at CN7-4, replace the PCB.*
	Servo motor control 1 PCB is defective.	Run simulation 10. If CN3-1 on servo motor control 1 PCB goes low but the drive motor does not rotate, replace the PCB.
	The fuse on servo motor control 1 PCB has blown.	Check for continuity. If none, find the cause of fuse blowing and replace it.
(3) The drum motor does not operate.	The drum motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	Run simulation 10. If CN7-1 on the main PCB goes low but no clock pulse is output at CN7-2, replace the PCB.
	Servo motor control 1 PCB is defective.	Run simulation 10. If CN3-5 on servo motor control 1 PCB goes low but the drum motor does not rotate, replace the PCB.
	The fuse on servo motor control 1 PCB has blown.	Check for continuity. If none, find the cause of fuse blowing and replace it.
(4) The fixing drive motor does not operate.	The fixing drive motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	Run simulation 10. If CN7-6 on the main PCB goes low but no clock pulse is output at CN7-7, replace the PCB.
	Servo motor control 1 PCB is defective.	Run simulation 10. If when CN3-3 on servo motor control 1 PCB goes low but the *fixing drive motor* does not rotate, replace the PCB.
	The fuse on servo motor control 1 PCB has blown.	Check for continuity. If none, find the cause of fuse blowing and replace it.

Problem	Causes	Check procedures/corrective measures
(5) The paper feed motor does not operate.	The paper feed motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	Run simulation 11 and check if CN3-29 on the main PCB goes low. If not, replace the PCB.
	Servo motor control 2 PCB is defective.	Run simulation 11. If CN2-8 on servo motor control 2 PCB goes low but the paper feed motor does not rotate, replace the PCB.
	Power relay 3 is defective.	Check for continuity across the coil of power relay 3. If none, replace the relay.
		Check if power relay 3 operates when CN6-20 on the main PCB is set to *high*. If not, replace the relay.
		Check for continuity across power relay 3. If none with the relay on, replace it.
	Safety switch 1 or 2 is defective.	Check for continuity across each safety switch. If none, replace it.
	The fuse on servo motor control 2 PCB has blown.	Check for continuity. If none, find the cause of fuse blowing and replace it.
(6) The original feed motor does not operate.	The original feed motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	Run simulation 24 and check if CN3-24 on the main PCB goes low. If not, replace the PCB.
	Servo motor control 2 PCB is defective.	Run simulation 24. If CN2-2 on servo motor control 2 PCB goes low but the original feed motor does not rotate, replace the PCB.
	The fuse on servo motor control 2 PCB has blown.	Check for continuity. If none, find the cause of fuse blowing and replace it.
(7) The toner feed motor does not operate.	The toner feed motor coil is broken.	Check for continuity across the coil. If none, replace the motor.
	The main PCB is defective.	Run simulation 64. If 24 V AC is not output across CN4-1A and 4-2A on the main PCB, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(8) The paper conveying fan motor does not operate.	The paper conveying fan motor is defective.	Run simulation 18. If CN4-6A on the main PCB goes low but the paper conveying fan motor does not rotate, replace the motor.
	The main PCB is defective.	Run simulation 18. If CN4-6A on the main PCB does not go low, replace the PCB.
(9) The cooling fan motor does not operate.	The cooling fan motor is defective.	Run simulation 18. If CN6-3 on the main PCB goes low but the cooling fan motor does not rotate, replace the motor.
	The main PCB is defective.	Run simulation 18. If CN6-3 on the main PCB does not go low, replace the PCB.
(10) The right or left fixing unit fan motor does not operate.	The right or left fixing unit fan motor is defective.	Run simulation 18. If CN4-5A on the main PCB goes low but the right or left fixing unit fan motor does not rotate, replace that motor.
	The main PCB is defective.	Run simulation 18. If CN4-5A on the main PCB goes low replace the main PCB.
(11) *LPH fan motor 1 does not operate.*	*The coil of LPH fan motor 1 has a break.*	Check for continuity across the coil. *If none, replace LPH fan motor 1.*
	LPH fan motor 1 is defective.	*Run simulation 18. If CN6-1 on the main PCB goes low but LPH fan motor 1 does not rotate, replace the motor.*
	The main PCB is defective.	Run simulation 18. If CN6-1 on the main PCB does not go low, replace the main PCB.
(12) The upper roll winding clutch does not operate.	The upper roll winding clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the upper roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 05. If CN4-9A on the main PCB does not go low, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(13) The middle roll winding clutch does not operate.	The middle roll winding clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the middle roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 05. If CN6-11 on the main PCB does not go low, replace the PCB.
(14) The lower roll winding clutch[*1] does not operate.	The lower roll winding clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the lower roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 05. If CN6-13 on the main PCB does not go low, replace the PCB.
(15) The upper feed clutch does not operate.	The upper feed clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the upper feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 04. If CN4-8A on the main PCB does not go low, replace the PCB.
(16) The middle feed clutch does not operate.	The middle feed clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the middle feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 04. If CN6-10 on the main PCB does not go low, replace the PCB.

[*1] Optional.

Problem	Causes	Check procedures/corrective measures
(17) The lower feed clutch[*1] does not operate.	The lower feed clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the lower feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 04. If CN6-12 on the main PCB does not go low, replace the PCB.
(18) The roll paper conveying clutch does not operate.	The roll paper conveying clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the roll paper conveying clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 06. If CN6-9 on the main PCB does not go low, replace the PCB.
(19) The registration clutch does not operate.	The registration clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the registration clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 06. If CN6-7 on the main PCB does not go low, replace the PCB.
(20) The cutter clutch does not operate.	The cutter clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the cutter clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 06. If CN6-8 on the main PCB does not go low, replace the PCB.

[*1] Optional.

Problem	Causes	Check procedures/corrective measures
(21) The bypass registration clutch does not operate.	The bypass registration clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the bypass registration clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 08. If CN6-14 on the main PCB does not go low, replace the PCB.
(22) The original feed clutch does not operate.	The original feed clutch coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the original feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 24. If CN4-7A on the main PCB does not go low, replace the PCB.
(23) The cleaning solenoid does not operate.	The cleaning solenoid coil is broken.	Check for continuity across the coil. If none, replace the solenoid.
	The connector terminals of the cleaning solenoid make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 45. If CN6-4 and CN6-5 on the main PCB do not go low, replace the PCB.
(24) The separation claw solenoid does not operate.	The separation claw solenoid coil is broken.	Check for continuity across the coil. If none, replace the clutch.
	The connector terminals of the separation claw solenoid make poor contact.	Check for continuity across the terminals. If none, replace them.
	The main PCB is defective.	Run simulation 48. If CN6-6 on the main PCB does not go low, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(25) The fluorescent lamp does not light.	The fluorescent lamp filament is broken.	Check for continuity across the filament. If none, replace the lamp.
	The fluorescent lamp socket makes poor contact.	Check for continuity across the right and left lamp sockets.
	The main PCB is defective.	Run simulation 110. If CN1-2 on the inverter PCB does not go low, replace the PCB.
	The inverter PCB is defective.	Run simulation 110. If CN6-18 on the main PCB goes low but the fluorescent lamp does not light, replace the inverter PCB.
(26) The fluorescent lamp does not go off.	The main PCB is defective.	Check if CN6-18 on the main PCB remains low constantly. If so, replace the main PCB.
	The inverter PCB is defective.	Check if the fluorescent lamp goes off when CN1-2 on the inverter PCB is high. If not, replace the PCB.
		If CN1-2 on the inverter PCB is low with CN6-18 on the main PCB disconnected, replace the inverter PCB.
(27) The pre-charging lamp does not light.	The pre-charging lamp has a break.	Check for continuity across the terminals. If none, replace the lamp.
	The main PCB is defective.	Run simulation 44. If CN4-12A on the main PCB fails to go low, replace the PCB.
	The output PCB is defective.	Run simulation 44. If CN5-7 on the output PCB goes low but CN6-8 does not, replace the PCB.
(28) The post-transfer lamp does not light.	The post-transfer lamp has a break.	Check for continuity across the terminals. If none, replace the lamp.
	The main PCB is defective.	Run simulation 44. If CN4-12B on the main PCB does not go low, replace the PCB.
	The output PCB is defective.	Run simulation 44. If CN5-6 on the output PCB goes low but CN6-7 does not, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(29) Fixing heater M or S does not turn on (C-630, C-631, C-640, C-641, C-650, C-660).	Fixing heater M or S has a break.	Check for continuity across the terminals. If none, replace the heater.
	Fixing unit thermal switch 1 or 2 is tripped.	Check for continuity across the terminals. If none, locate and remove the cause of the problem and replace fixing unit thermal switch 1 or 2.
	Fixing unit thermistor 1 or 2 is shorted.	Measure resistance. If it is 0 Ω, replace fixing unit thermistor 1 or 2.
	Solid state relay 1 or 2 is defective.	Measure resistances across the terminals. If they are other than ∞ Ω across 1 and 2 and continuity in one direction across 3 and 4, replace solid state relay 1 or 2.
	The main PCB is defective.	Run simulation 47. If CN4-7B and CN4-8B on the main PCB do not go low, replace the PCB.
(30) Fixing heater M or S fails to turn off (C-630, C-641, C-650, C-660).	Solid state relay 1 or 2 is defective.	Measure resistances across the terminals. If they are other than ∞ Ω across 1 and 2 and continuity in one direction across 3 and 4, replace solid state relay 1 or 2.
	The thermal sensing section of fixing unit thermistor 1 or 2 is dirty.	Visually check and clean if necessary.
	Fixing unit thermistor 1 or 2 has a break.	Measure the resistance. If it is ∞ Ω, replace that thermistor.
	The main PCB is defective.	Check if CN4-7B and CN4-8B on the main PCB are low constantly. If so, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(31) No main charging.	The main charger wire is broken.	See page 3-6-5.
	The main charger housing leaks.	
	The main high-voltage transformer connectors make poor contact.	
	The main PCB is defective.	
	The main high-voltage transformer is defective.	
(32) No transfer charging.	The transfer charger wire is broken.	See page 3-6-4.
	The transfer charger housing leaks.	
	The ST high-voltage transformer connectors make poor contact.	
	The main PCB is defective.	
	The ST high-voltage transformer is defective.	

Problem	Causes	Check procedures/corrective measures
(33) No separation charging.	The separation charger wire is broken.	Visually check. Replace the wire if necessary.
	The ST high-voltage transformer connectors make poor contact.	Check if the connectors are securely connected. If not, remedy.
		Check for continuity across the connectors. If none, replace them.
	The main PCB is defective.	*Run simulation 34 and, if CN4-2B on the main PCB does not go low, replace the main PCB.*
	The ST high-voltage transformer is defective.	*Run simulation 34.* If separation charging is not conducted with CN4-2B low, replace the ST high-voltage transformer.
(34) No developing bias.	The developing bias high-voltage transformer connectors are not connected correctly or make poor contacts.	See page 3-6-9.
	The developing bias high-voltage transformer is defective.	
	The main PCB is defective.	
(35) The job stop/roll cut key does not operate.	The operation unit PCB is defective.	If CN1-8 on the operation unit PCB fails to go low when the job stop/roll cut key is pressed, replace the PCB.

Problem	Causes	Check procedures/corrective measures
(36) The fluorescent lamp heater does not operate.	The fluorescent lamp heater has a break.	Check the resistance across the terminals. If it is ∞ Ω, replace the heater.
	The main PCB is defective.	If the fluorescent lamp heater operates with CN4-13B on the main PCB low, replace the PCB.
	The output PCB is defective.	If CN6-6 on the output PCB fails to go low with CN5-5 low, replace the PCB.
(37) The dehumidifier does not operate.	The dehumidifier has a break.	Check the resistance across the terminals. If it is ∞ Ω, replace the heater.
	The main PCB is defective.	If the dehumidifier operates with CN4-13A on the main PCB low, replace the PCB.
	The output PCB is defective.	If CN6-5 on the output PCB fails to go low with CN5-4 low, replace the PCB.
(38) The upper roll unit heater[*1] does not operate.	The upper roll unit heater has a break.	Measure the resistance across the terminals. If it is ∞ Ω, replace the heater.
	The upper roll unit heater switch is defective.	Check for continuity across the switch. If none with the switch set to on, replace it.
	The main PCB is defective.	If the upper roll unit heater operates with CN4-14A on the main PCB low, replace the PCB.
	The output PCB is defective.	If CN6-4 on the output PCB fails to go low with CN5-3 low, replace the PCB.
(39) The middle roll unit heater[*1] does not operate.	The middle roll unit heater has a break.	Measure the resistance across the terminals. If it is ∞ Ω, replace the heater.
	The middle roll unit heater switch is defective.	Check for continuity across the switch. If none with the switch set to on, replace it.
	The main PCB is defective.	If the middle roll unit heater operates with CN4-14B on the main PCB low, replace the PCB.
	The output PCB is defective.	If CN6-3 on the output PCB fails to go low with CN5-2 low, replace the PCB.

[*1] Optional for 220 – 240 V models.

Problem	Causes	Check procedures/corrective measures
(40) The lower roller unit heater[*1] does not operate.	The lower roll unit heater has a break.	Measure the resistance across the terminals. If it is ∞ Ω, replace the heater.
	The lower roll unit heater switch is defective.	Check for continuity across the switch. If none with the switch set to on, replace it.
	The main PCB is defective.	If the lower roll unit heater operates with CN4-15A on the main PCB low, replace the PCB.
	The output PCB is defective.	If CN6-2 on the output PCB fails to go low with CN5-1 low, replace the PCB.
(41) *LPH fan motor 2 does not operate.*	*The coil of LPH fan motor 2 has a break.*	*Check for continuity across the coil. If none, replace LPH fan motor 2.*
	LPH fan motor 2 is defective.	*Run simulation 18. If CN6-15 on the main PCB goes low but LPH fan motor 2 does not rotate, replace the motor.*
	The main PCB is defective.	*Run simulation 18. If CN6-15 on the main PCB does not go low, replace the main PCB.*

*1 Optional.

3-6-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surface of the roll paper feed upper roller of the 1st roll unit and that of roll paper feed lower roller A are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper roller of the 1st roll unit and roll paper feed lower roller A are deformed or worn.	Replace if necessary.
	Check if the surface of the roll paper feed upper roller of the 2nd roll unit and that of roll paper feed rear roller B are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper roller of the 2nd roll unit and roll paper feed rear roller B are deformed or worn.	Replace if necessary.
	Check if the surface of the roll paper feed upper roller of the 3rd roll unit (optional) and that of roll paper feed rear roller *C* are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper roller of the 3rd roll unit (optional) and paper feed rear roller *C* are deformed or worn.	Replace if necessary.
	Check if the surface of roll paper conveying rear roller A is dirty with paper dust.	If it is, clean with isopropyl alcohol.
	Check if roll paper conveying rear roller A is deformed or worn.	Replace if necessary.
	Check if the bypass registration switch operates correctly.	If CN3-14 on the main PCB does not change levels when the bypass registration switch is turned on and off, replace the switch.
	Check if the bypass registration switch actuator is broken.	If it is, replace the switch.

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed. (cont.)	Check if the surface of the bypass paper feed roller is dirty with paper dust.	If it is, clean with isopropyl alcohol.
	Check if the bypass paper feed roller is deformed or worn.	If it is, replace the roller.
	Check if the bypass registration clutch, upper feed clutch, middle feed clutch, lower feed clutch (optional), and roll paper conveying clutch are installed correctly.	If not, reinstall.
	Check if the bypass registration clutch, upper feed clutch, middle feed clutch, lower feed clutch (optional) or roll paper conveying clutch operates correctly.	If not, replace the component.
	Check if paper feed section drive belts 1 and 2 are installed correctly.	If not, reinstall (see pages 3-3-60 and 61).
(2) No secondary paper feed.	Check if the surfaces of the registration roller and registration pulley are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the surfaces of the bypass registration roller, bypass pulley and pre-transfer roller are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the registration clutch or bypass registration clutch is installed correctly.	If not, reinstall.
	Check if the registration clutch or bypass registration clutch operates correctly.	If not, replace the clutch.
(3) No original conveying.	Check if the surfaces of the front upper, middle upper, rear upper, front lower and rear lower original rollers are dirty with paper dust.	If they are, clean with isopropyl alcohol.
	Check if the front upper or rear upper original roller is deformed or worn.	If it is, replace.

Problem	Causes/check procedures	Corrective measures
(3) No original conveying. (cont.)	Check if the original leading edge detection switch operates correctly.	If CN3-12 on the main PCB does not change levels when the original leading edge detection switch is turned on and off, replace the switch.
	Check if the actuator of the original leading edge detection switch is broken.	If it is, replace the switch.
	Check if the original feed clutch is installed correctly.	If not, reinstall.
	Check if the original feed clutch operates correctly.	If not, replace the clutch.
	Check if original drive belts 1 and 2 are installed correctly.	If not, reinstall.
(4) Original jam.	Check if the original holding section is installed correctly.	If not, reinstall.
	Check if a guide plate or other component along the original conveying path is deformed.	If it is, correct or replace.
(5) Paper jam.	Check the paper.	If the paper is extremely curled or has other problems, replace.
	Check if the separation charger wire on the transfer charger assembly is broken.	If it is, replace (see page 3-3-37).
	Check if the paper conveying fan motor rotates correctly.	If not, replace the motor.
	Check if a guide plate or other component along the paper conveying path is deformed.	If it is, correct or replace.
	Check if the press roller or the separation claws are extremely dirty.	If so, clean.
	Check if the press roller or a separation claw is deformed.	If so, replace (see page 3-3-52).
	Check if the oil roller is extremely dirty.	If it is, replace (see page 3-3-53).

Problem	Causes/check procedures	Corrective measures
(6) Toner falls onto the paper conveying section.	Check if the developing section is extremely dirty.	If it is, clean the developing section and around that area.
	Check if the lower cleaning blade is deformed.	If it is, replace.
(7) Abnormal noise.	Check if all the rollers and gears rotate smoothly.	If there is a problem, grease the bearings and gears.
	Check if all the drive belts are tensioned correctly.	If not, adjust (see pages 3-3-60, 61, 62 and 63).

CONTENTS

3-7 Appendixes

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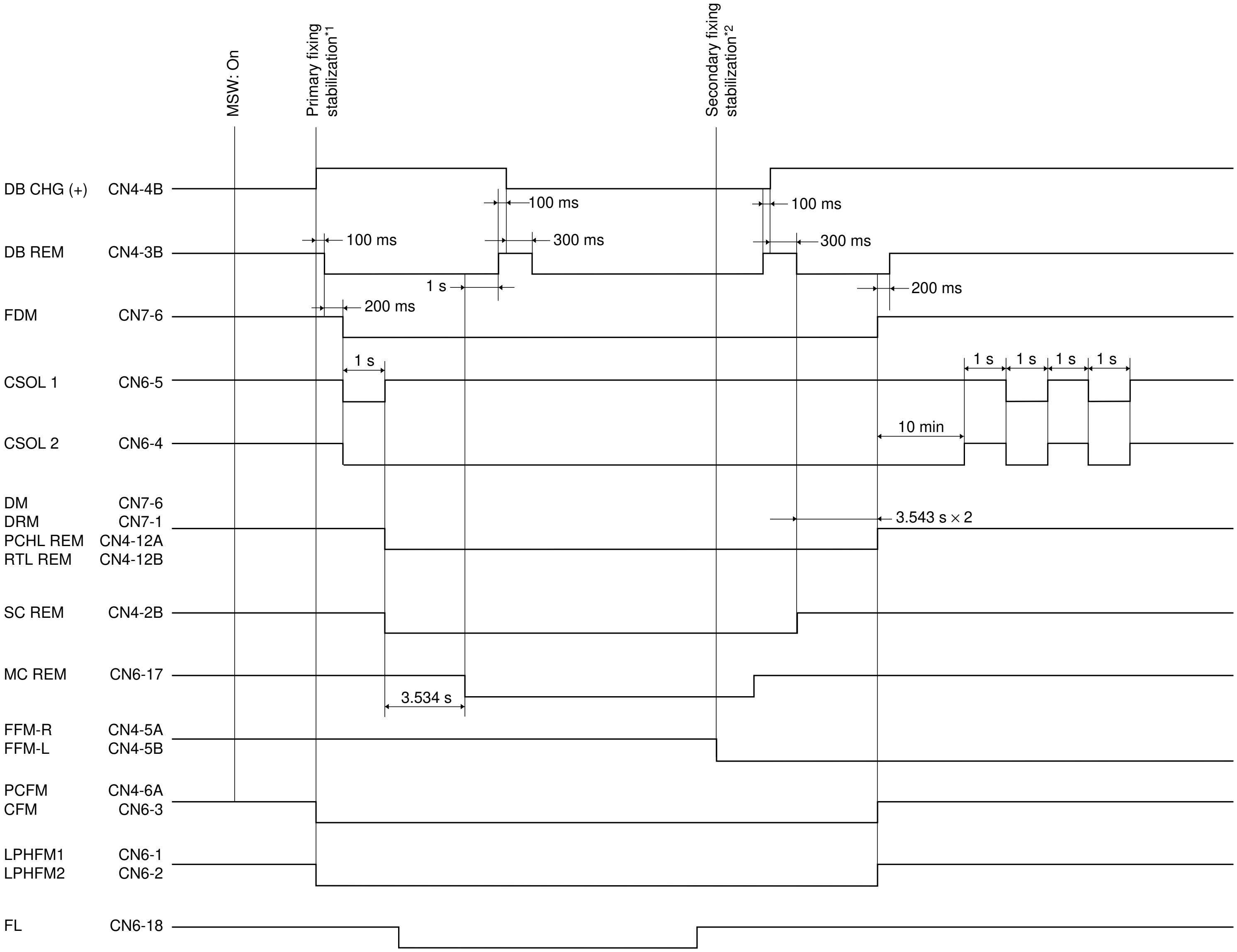
Timing chart No. 1 From the main switch being turned on to copier stabilization

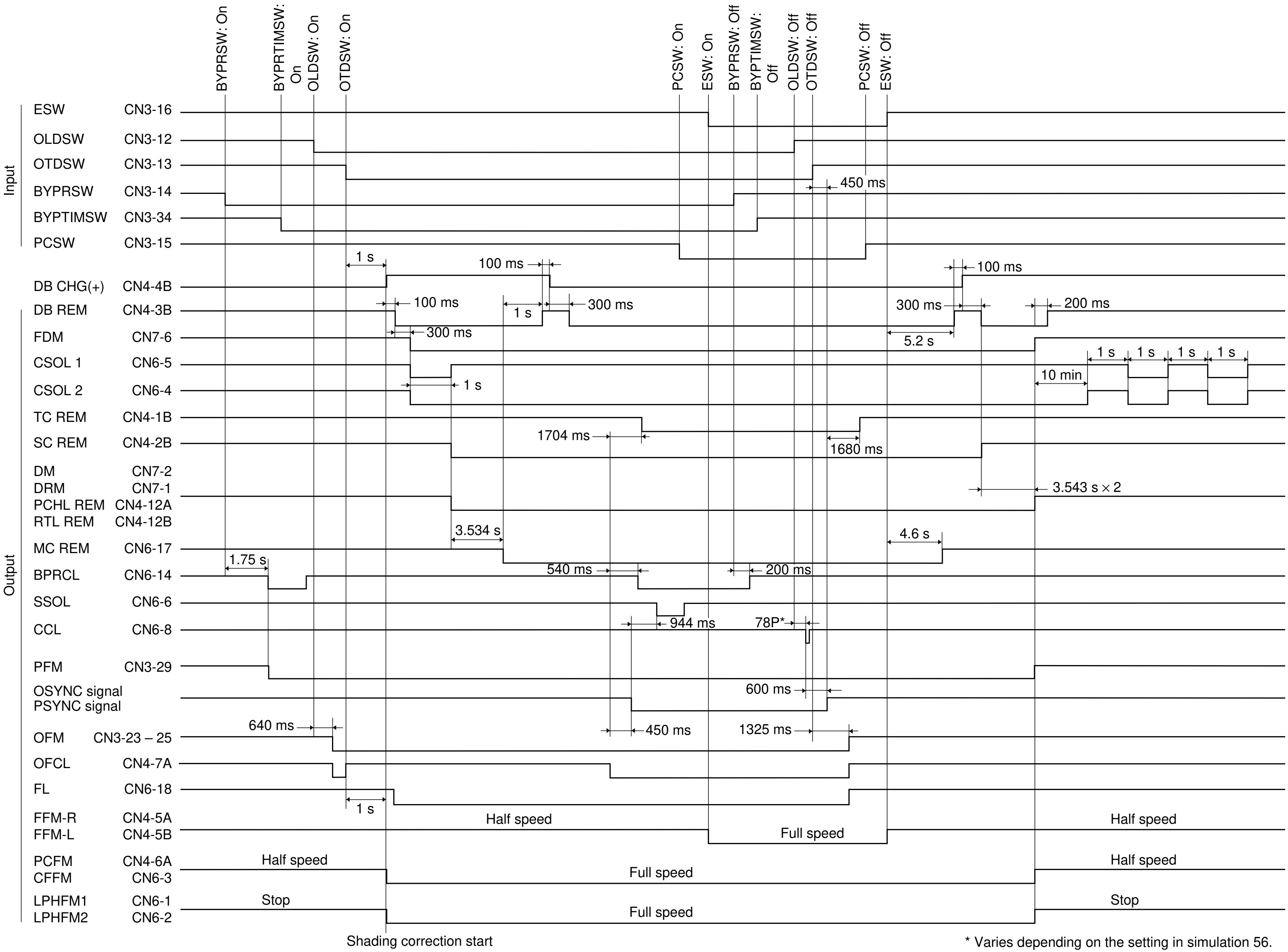


*1
TETTH ≤ 15°C/59°F: 145°C/293°F
15°C/59°F < TETTH < 30°C/86°F: 165°C/329°F
30°C/86°F ≤ TETTH: 165°C/329°F

*2
TETTH ≤ 15°C/59°F: 165°C/329°F
15°C/59°F < TETTH < 30°C/86°F: 155°C/311°F
30°C/86°F ≤ TETTH: 155°C/311°F

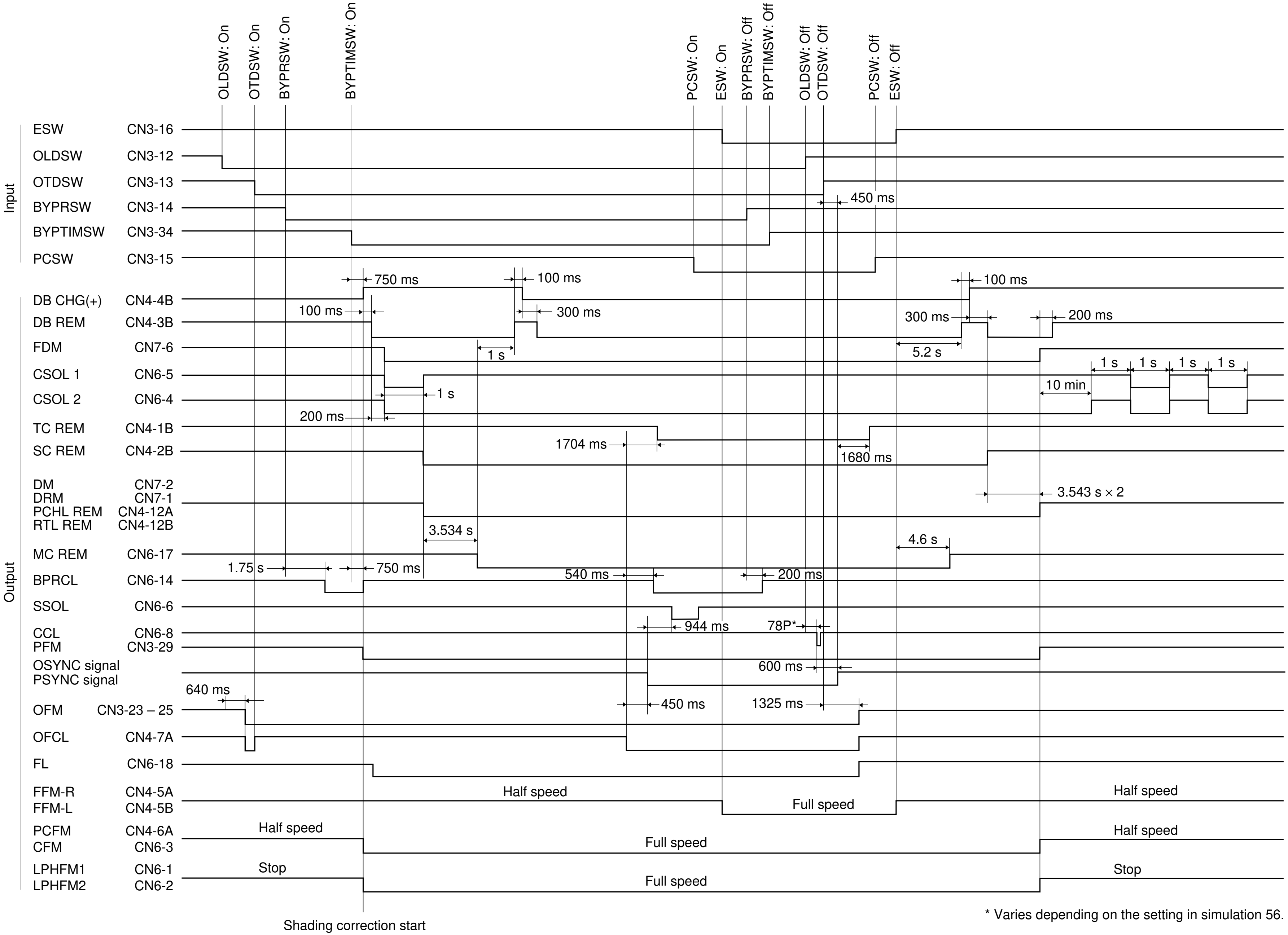
TETTH: external temperature thermistor temperature

Timing chart No. 2 Bypass paper feed, with the paper inserted before the original



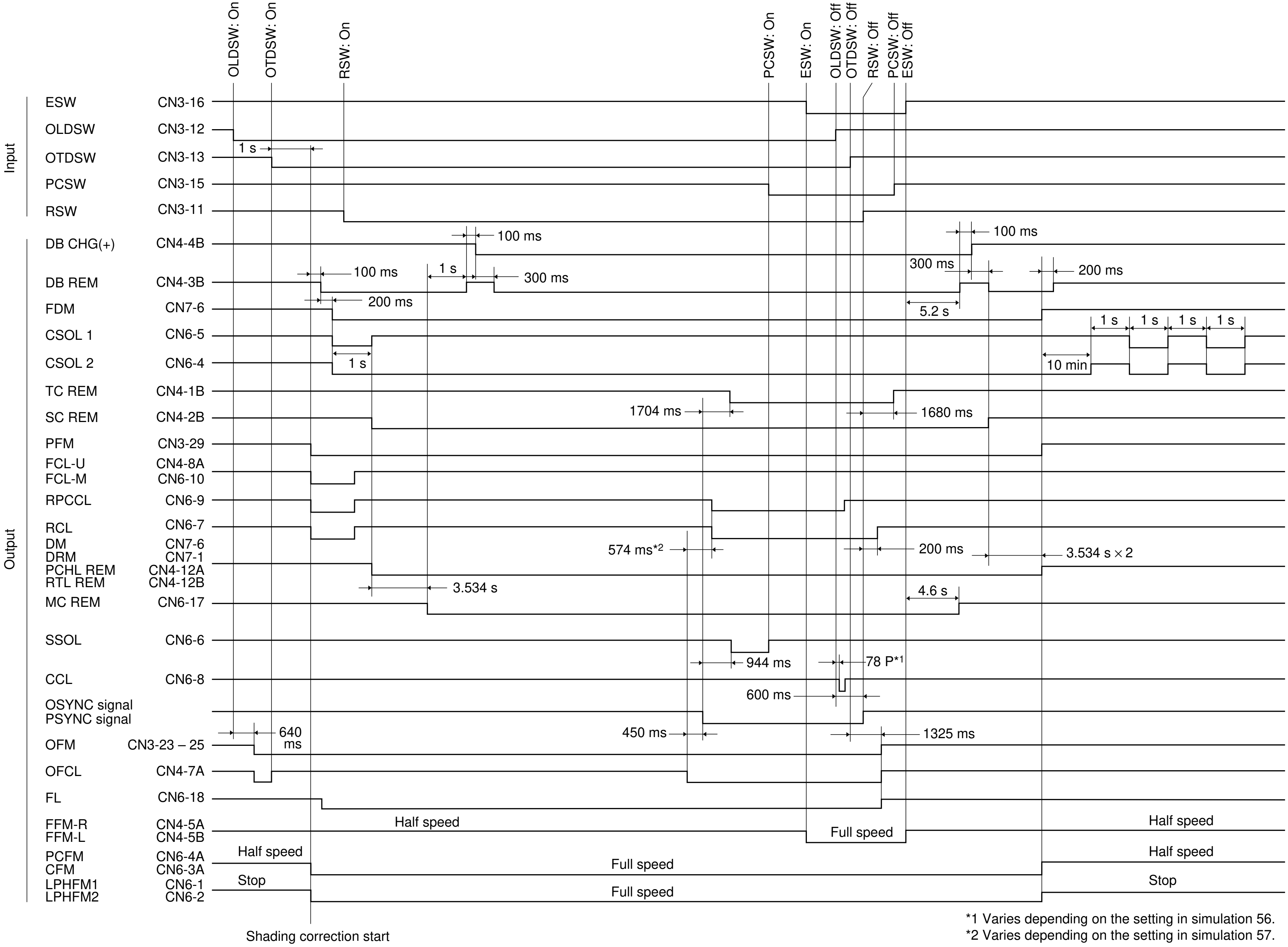
* Varies depending on the setting in simulation 56.

Timing chart No. 3 Bypass paper feed, with the original inserted before the paper



* Varies depending on the setting in simulation 56.

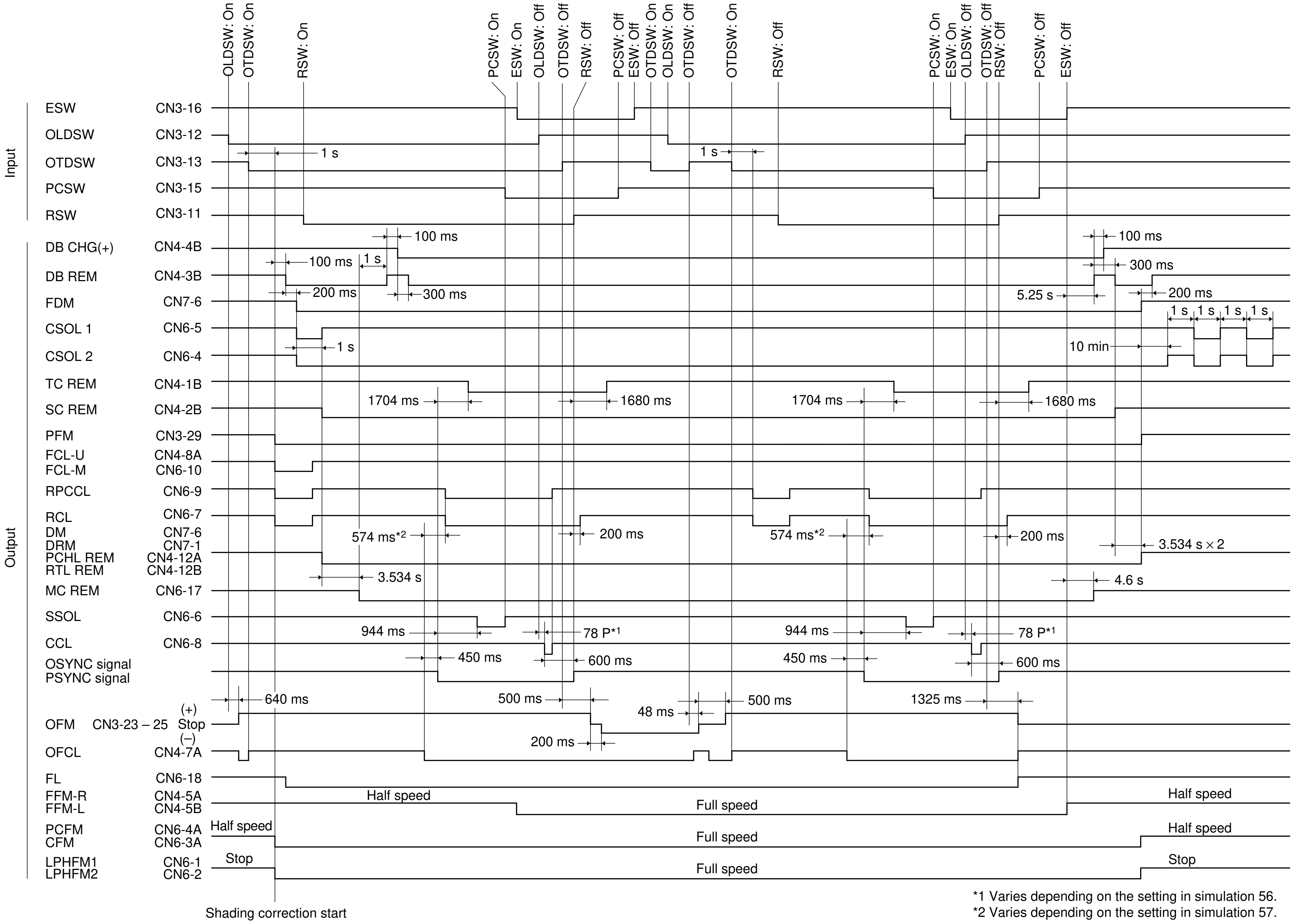
Timing chart No. 4 Roll unit paper feed, single copy



*1 Varies depending on the setting in simulation 56.

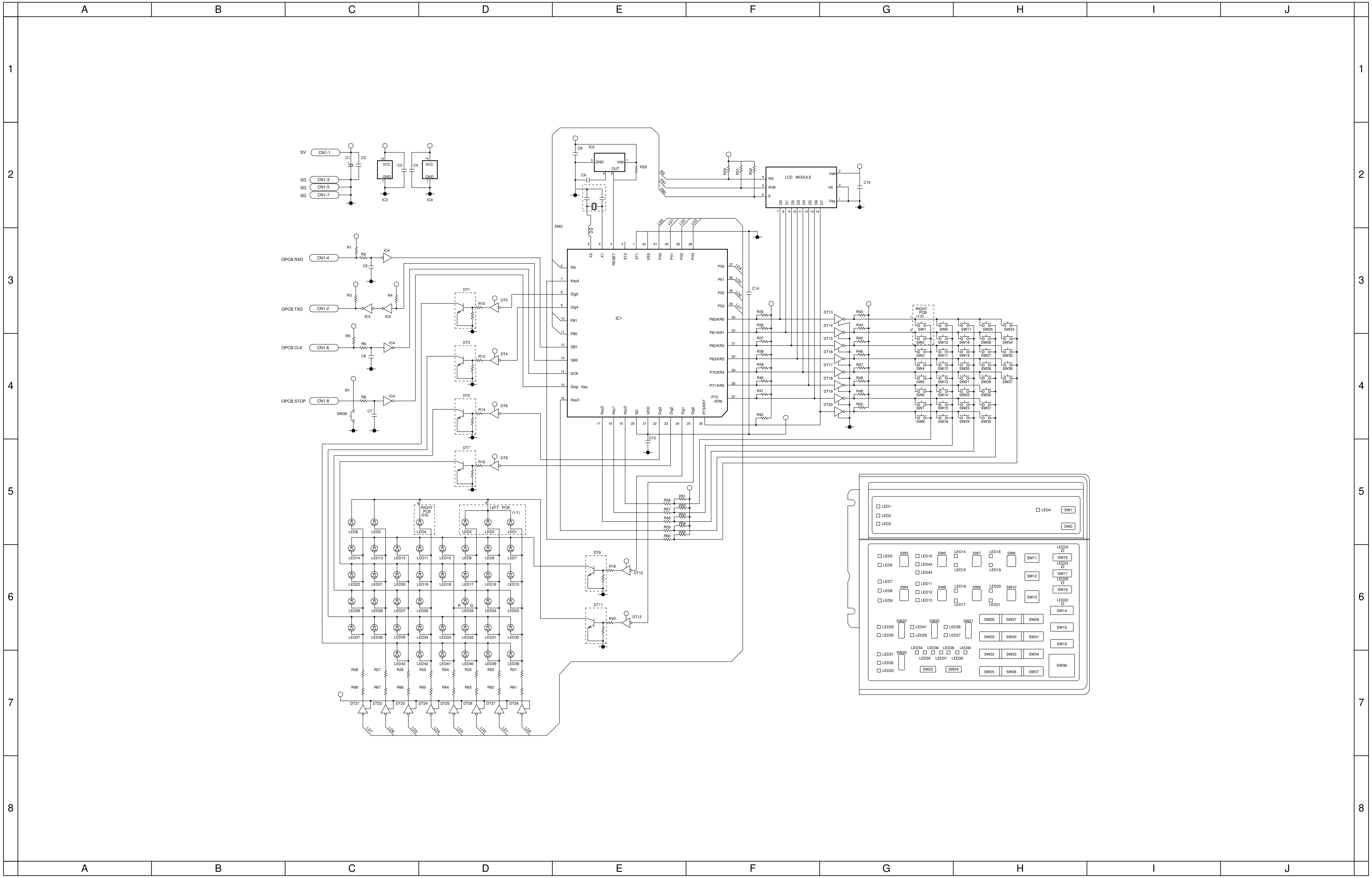
*2 Varies depending on the setting in simulation 57.

Timing chart No. 5 Roll unit paper feed, continuous two copies

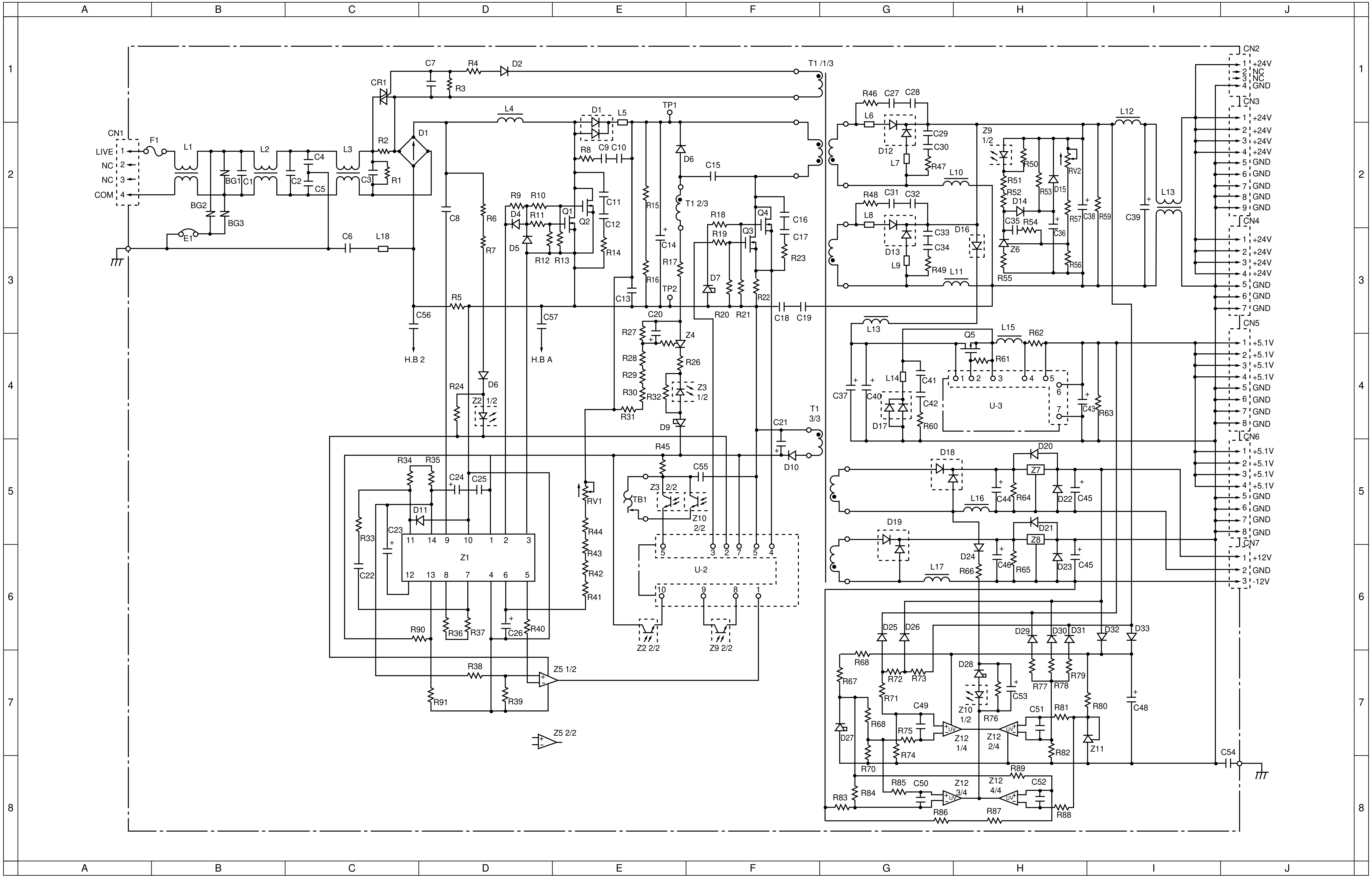


*1 Varies depending on the setting in simulation 56.
*2 Varies depending on the setting in simulation 57.

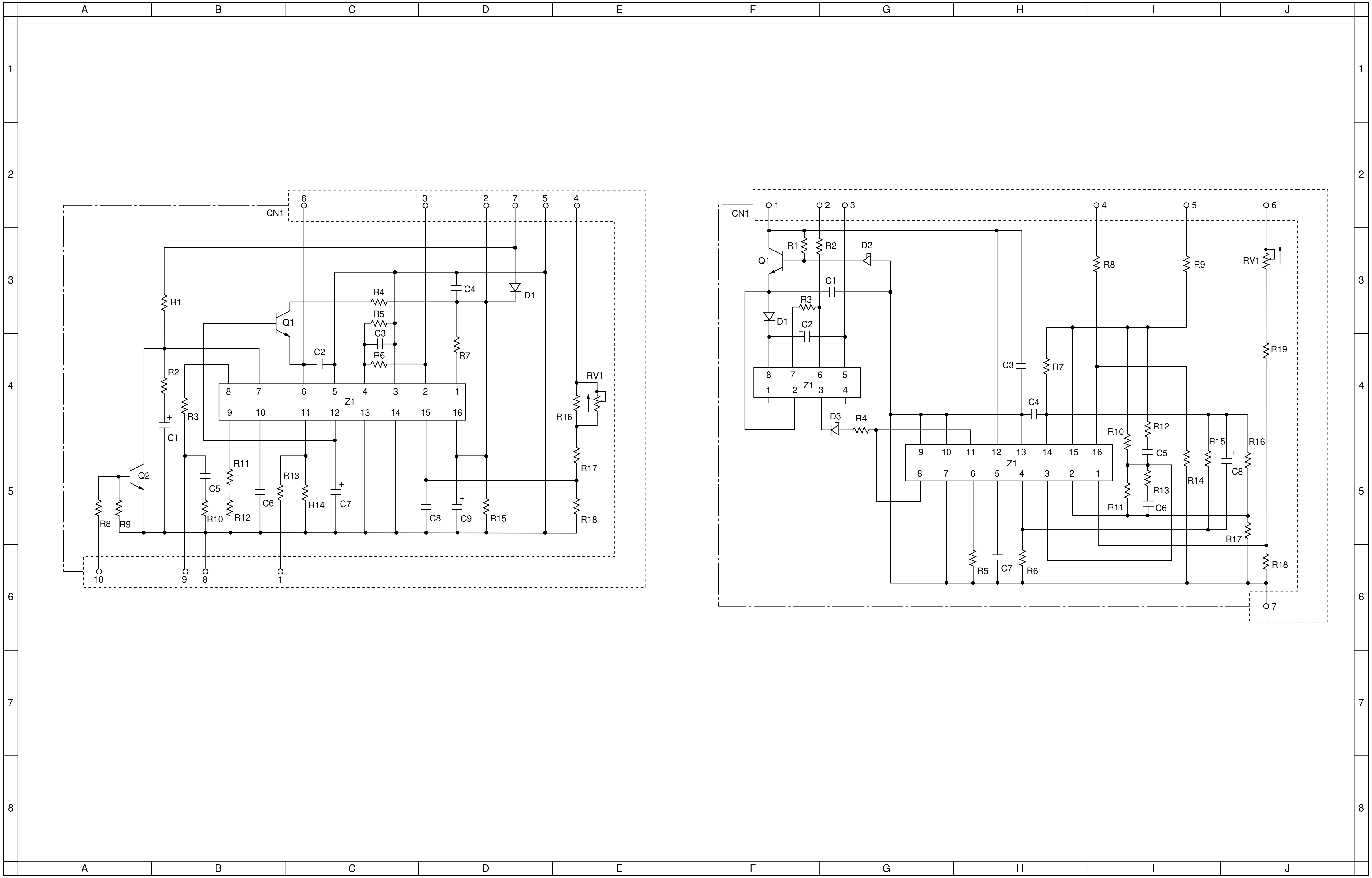
Operation unit PCB



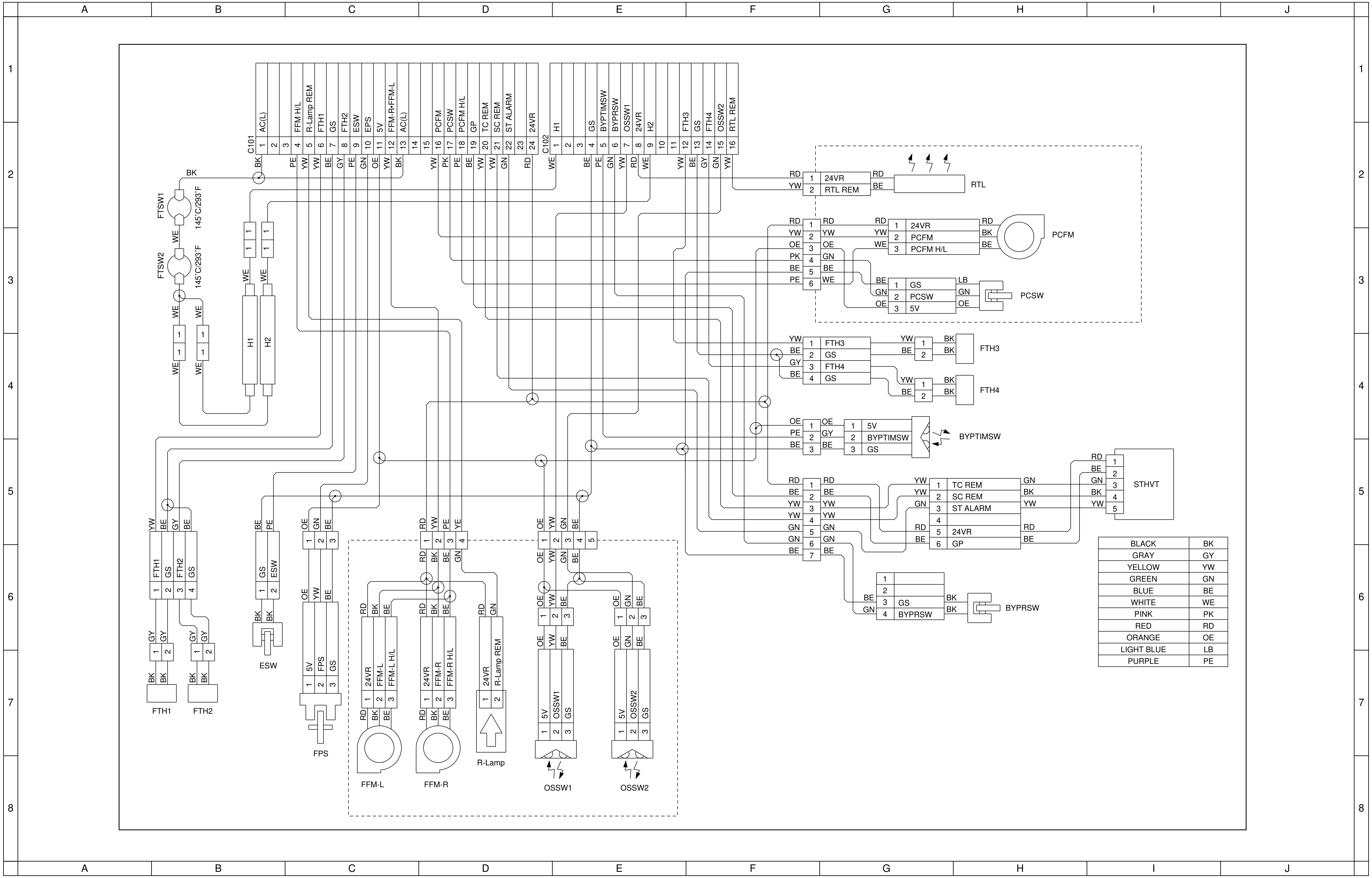
Power source PCB 1/2



Power source PCB $^2/_2$



Detachable unit wiring diagram



BLACK	BK
GRAY	GY
YELLOW	YW
GREEN	GN
BLUE	BE
WHITE	WE
PINK	PK
RED	RD
ORANGE	OE
LIGHT BLUE	LB
PURPLE	PE

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MB-1

SERVICE MANUAL

RICOH GROUP COMPANIES

CONTENTS

I THEORY AND CONSTRUCTION SECTION

II ELECTRICAL SECTION

III SET UP AND ADJUSTMENT SECTION

I

THEORY AND CONSTRUCTION SECTION

I

SPECIFICATIONS

1-1 Specifications

1-1-1 Specifications

Memory	16 MB standard
Options	Addition in units of 16 MB [72-pin, 70 ns SIMM or faster (no parity; parity SIMMs can also be used)]. Maximum memory: 48 MB (3 SIMMs), 64 MB in total. Media: HDD HDD: 1 GB Interface: SCSI2
Gradation processing	Binary (standard) or base 4 (high image quality)
Resolution	400 dpi
Coding system	QM-Coder
Maximum number of pages that can be stored in memory	up to 127 pages
Functions	Group memory copy, sort memory copy, image storage
Time to first print	Standard: 23 s or less (A1/24" × 36" original, 100% magnification) With HDD installed: 26 s or less (A1/24" × 36" original, 100% magnification)
Time to first copy	Standard: 37 s or less (A1/24" × 36" original, 100% magnification) With HDD installed: 54 s or less (A1/24" × 36" original, 100% magnification)
Power supply	External

Functions that are not available in memory copy mode

Photograph mode (half-tone mode)
Light original mode (black & white mode)
Dark original mode (black & white mode)

II

HANDLING PRECAUTIONS

1-2 Handling Precautions

1-2-1 Part names

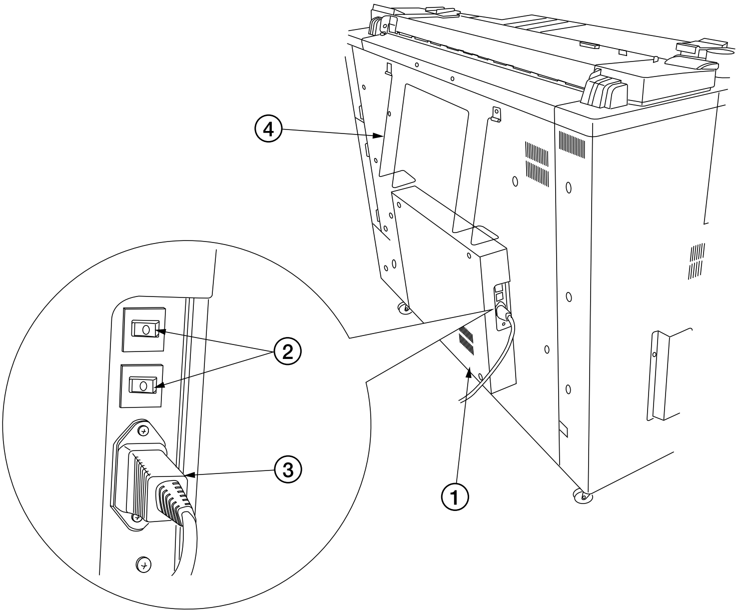


Figure 1-2-1

① Memory unit
② Breakers
③ Power cord
④ Original guide

1-2-2 Mechanical construction of each section

(1) Memory unit

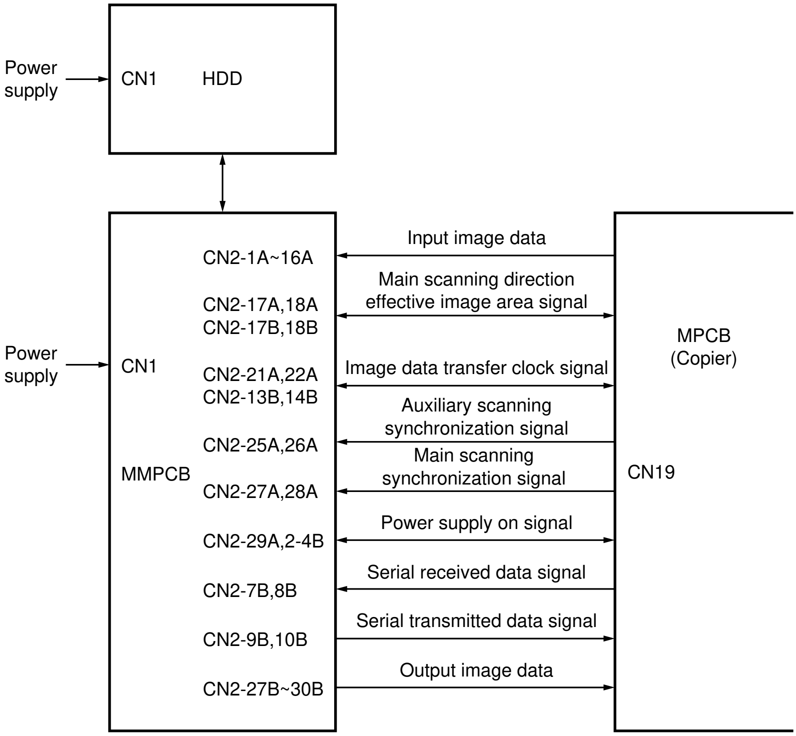


Figure 1-2-2 Memory unit block diagram

II

ELECTRICAL SECTION

I

ELECTRICAL PARTS LAYOUT

2-1 Electrical Parts Layout

2-1-1 Electrical parts layout

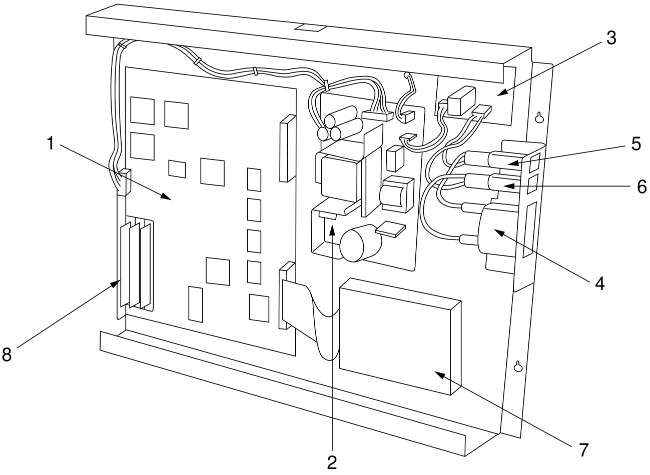


Figure 2-1-1 Electrical parts layout

1. Memory unit main PCB (MMPCB)	Controls the other PCBs and electrical components.
2. Power source PCB (PSPCB)	Generates 24 V DC, ±12 V DC and 5 V DC.
3. Primary PCB (PPCB)	Attenuates noise on the power supply line.
4. Noise filter (NF)	Attenuates noise on the power supply line.
5. Breaker 1 (B1)	Forms a safety circuit.
6. Breaker 2 (B2)	Forms a safety circuit.
7. Hard disk drive (HDD) (option)	Stores image data.
8. Additional memory (option)	Stores image data.

II

OPERATION OF PCB

2-2 Operation of the PCB

2-2-1 Memory unit main PCB

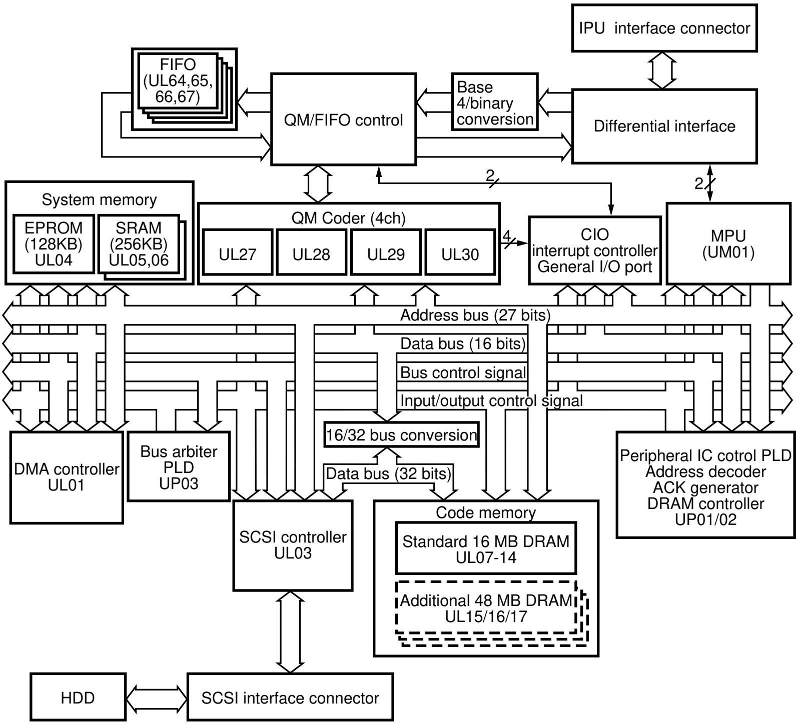


Figure 2-2-1 Memory unit main PCB block diagram

The main PCB writes and reads the large volume of image data to and from the memory (DRAM) and hard disk drive (HDD, option) at high speed.

- MPU (UM01)
  Controls the entire processing of the memory unit, including controlling each IC, managing data memory and interfacing with the copier's control unit.
- QM coder (UL27, 28, 29, and 30)
  Encodes (compresses) and decodes (expands) image data.
- Peripheral IC control PLD (UP01 and 02)
  Controls input and output of image data. Also controls the data bus of the DRAM and SCSI controllers.
- Bus arbiter PLD (UP03)
  Determines which IC may use a bus.
- DMA controller (UL01)
  Controls encoded data as it is input to and output from the QM coder and DRAM.
- SCSI controller (UL03)
  Controls the HDD and the encoded data input to and output from it.

- FIFO (UL64,65,66 and 67)
  Functions as line memory to input data to and output data from the I/O PLD and the QM coder.
- SRAM (UL05 and 06)
  256 KB RAM for the program download and variable areas of the MPU.
- EPROM (UL04)
  128 KB ROM for storing programs executed by the MPU
- DRAM (UL07 to 14)
  16 MB RAM to store standard encoded data.
- DRAM module (UL15, 16, and 17)
  16 MB per module, for a maximum of 48 MB additional memory.
- HDD
  3.5-inch, 1- or 2-GB HDD is used as additional memory.

III

SET UP AND ADJUSTMENT SECTION

I

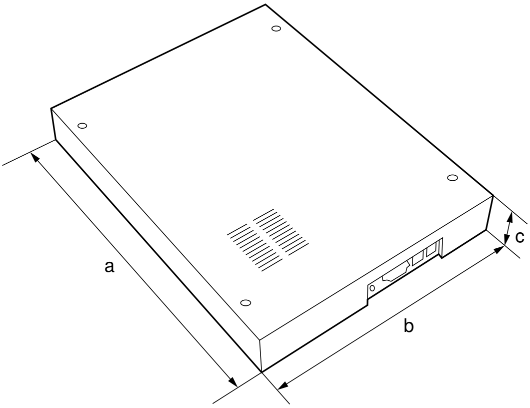
INSTALLATION

3-1 Installation

3-1-1 Unpacking and installation

(1) Installation environment

1. Temperature and humidity: 10°C/50°F to 35°C/95°F, 15 to 85% RH
2. Power source: 120 V AC, 0.45 A/220-240 V AC, 0.3 A
3. Power source frequency stability: 50 Hz ± 0.3%, 60 Hz ± 0.3%
4. Installation location
   Choose a location which meets the same requirements as those for the copier to which this unit is attached.
5. Allow sufficient access for proper operation and maintenance.



a: 542mm/21$^{5}/_{16}$"
b: 402mm/15$^{13}/_{16}$"
c: 77mm/3$^{1}/_{16}$"

Figure 3-1-1 Installation measurements

(2) Installation procedure

Unpack the memory unit.

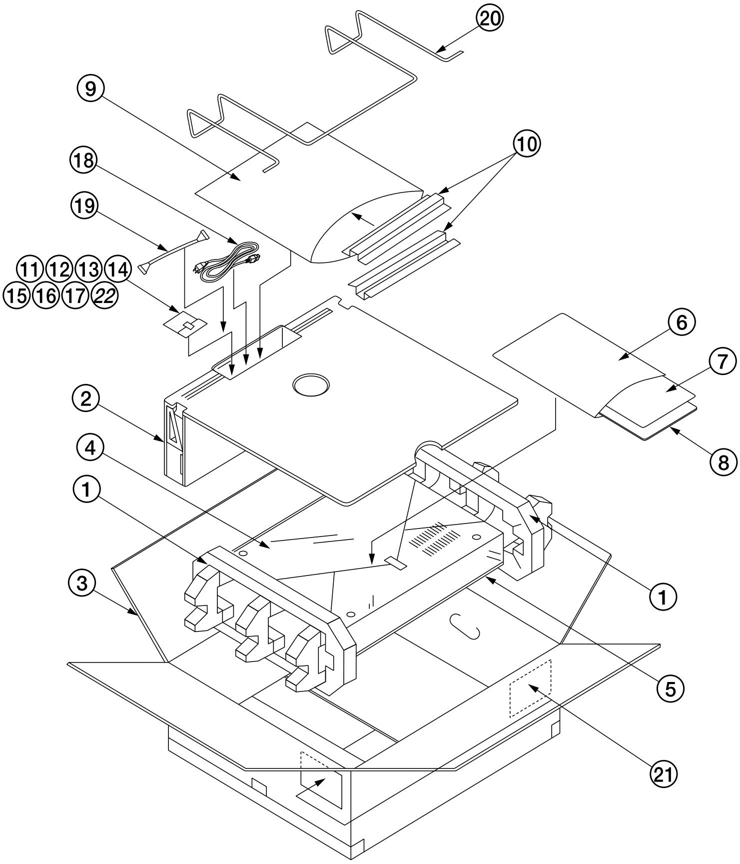


Figure 3-1-2 Unpacking

① Pad
② Spacer
③ Outer case
④ Memory unit
⑤ Plastic sheet
⑥ Plastic bag
⑦ Installation handbook
⑧ Instruction handbook
⑨ Air-padded bag
⑩ Memory unit retainer
⑪ Plastic bag
⑫ Original guide retainer
⑬ Pin
⑭ Bronze binding screw BVM4 × 6
⑮ Bronze binding screw BVM4 × 8
⑯ Bronze cross round head screw 6-32 × 0.25 (inch)
⑰ Clamp
⑱ Power cord
⑲ Cable
⑳ Original guide
㉑ Bar code label
㉒ *Earth plate*

Install the memory unit.

1. Remove the four screws and the copier rear cover.
2. Remove the seven screws and the main PCB cover.

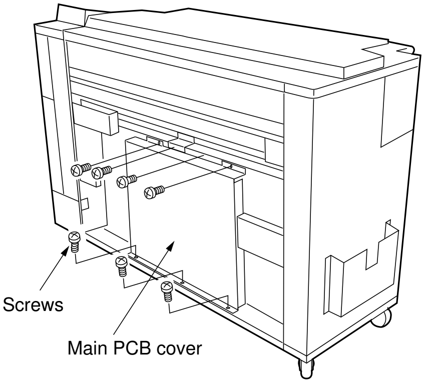


Figure 3-1-3

3. Plug the 60-pin connector (the one with the longer shrink tube) of the cable into CN19 on the copier main PCB.
4. Remove the screw holding the copier main PCB mount.

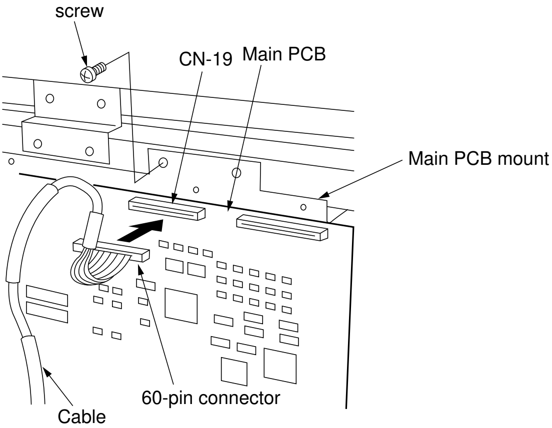


Figure 3-1-4

5. Attach the clamp to the grounding sheath on the cable and fasten it with the M4 × 8 screw provided.
6. Refit the copier main PCB cover with the seven screws.

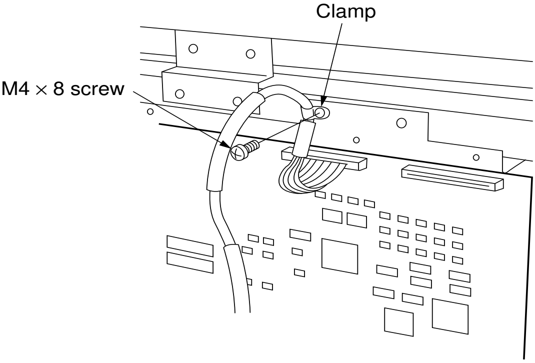


Figure 3-1-5

7. Fasten the two memory unit retainers to the copier main PCB cover with the eight M4 × 6 screws provided.

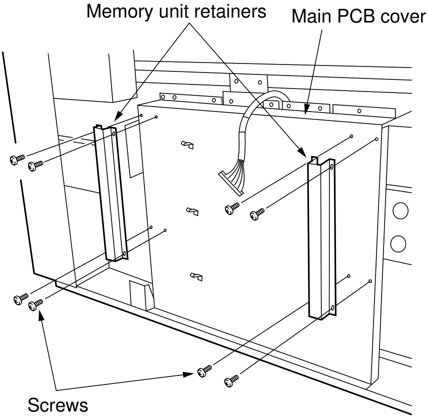


Figure 3-1-6

8. Remove the two screws and the central opening blanking plate on the copier rear cover.
9. Pull out the cable through the central opening in the copier rear cover and fasten the rear cover to the copier with the four screws.

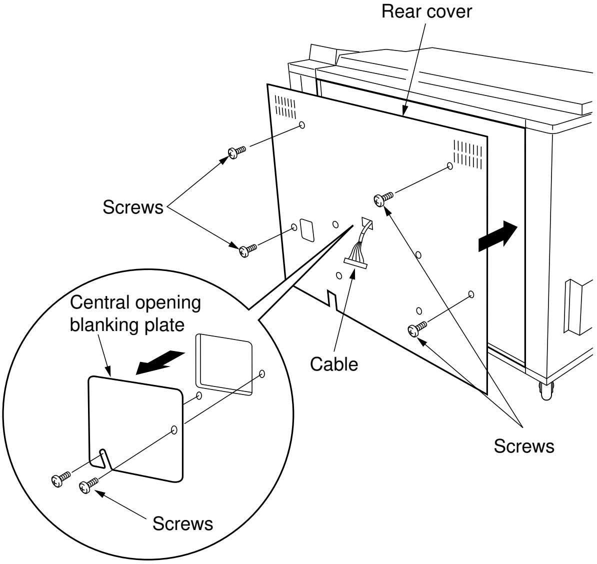


Figure 3-1-7

10. Screw the four M4 × 8 screws provided loosely into the memory unit retainers.

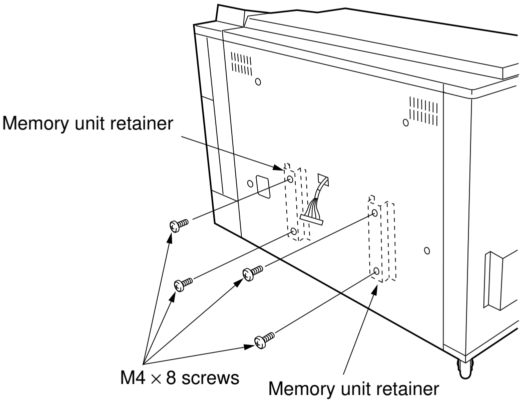


Figure 3-1-8

11. Remove the four screws and the cover of the memory unit.

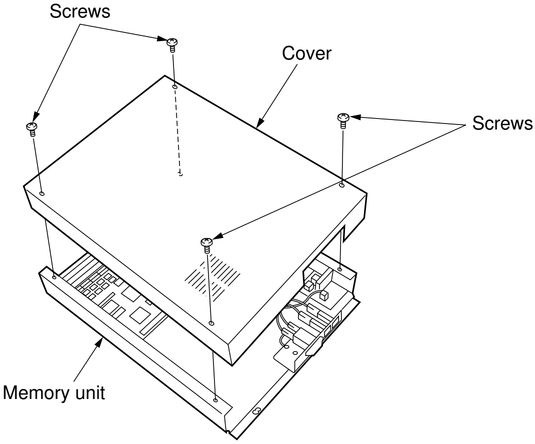


Figure 3-1-9

12. Pull out the cable through the upper opening in the memory unit and attach the memory unit by hanging it on the screws and then tightening them.

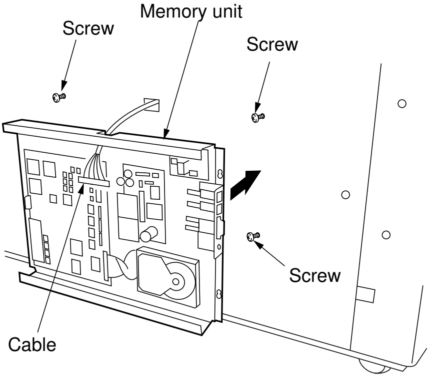


Figure 3-1-10

13. Attach the clamp to the grounding sheath on the cable and fasten it with the M4 × 8 screws provided.
14. Plug the 60-pin connector of the cable into CN2 on the memory unit main PCB.

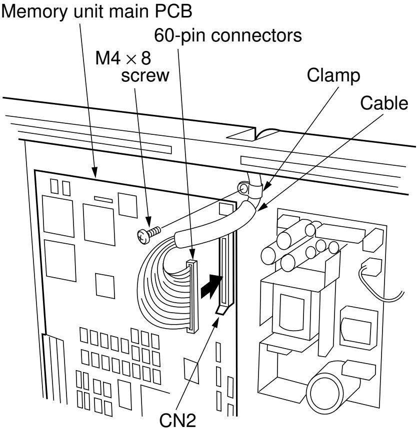


Figure 3-1-11

15. Refit the cover of the main unit with the four screws.
16. Connect the power cord to the memory unit.

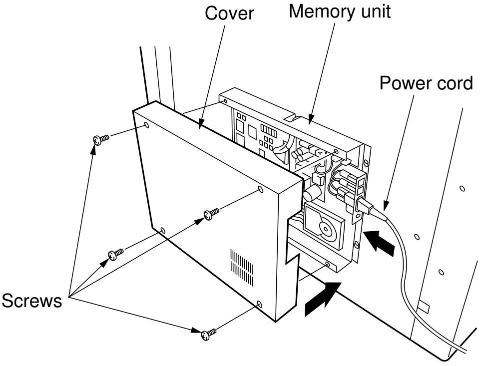


Figure 3-1-12

17. Fasten the original guide retainers with the two pins and insert the ends of the original guide into them.
18. Connect the power plug to the wall outlet.

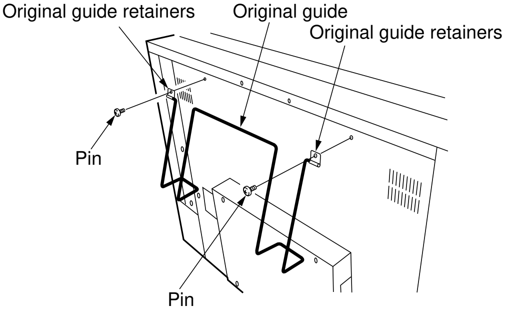


Figure 3-1-13

19. *Remove the four magnets from the copier, fit an earth plate to the underside of each magnet and refit them to their original positions.*

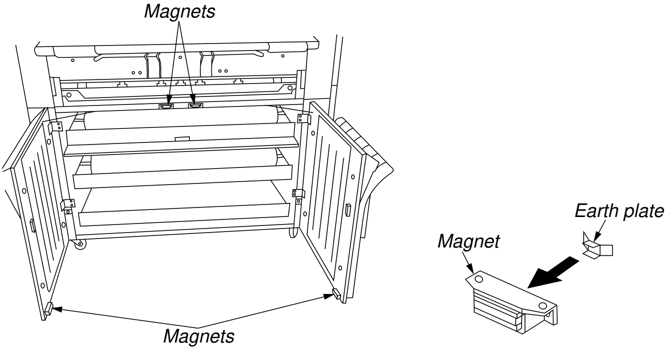


Figure 3-1-13-1

20. *Turn the copier main switch on.*
21. *Enter 10871087 with the numeric keys. The simulation mode is entered.*
22. *Change the setting to 2 and run simulation 165 (setting the memory unit connection).*
23. *Press the stop/clear key.*
24. *Exit the simulation mode.*

Make a test copy.

Completion of installation.

3-1-2 Copy mode initial settings

The factory settings for this unit are as shown below.

- Contents of settings

Sim. No.	Contents	Factory setting	Settings
178	Memory output mode	20 prints	2

3-1-3 Installing the hard disk drive (option)

Procedure

1. *Remove the four screws and the cover of the memory unit.*
2. *Detach the memory unit from the copier.*
3. Fit the hard disk drive with the four inch screws provided with the memory unit.

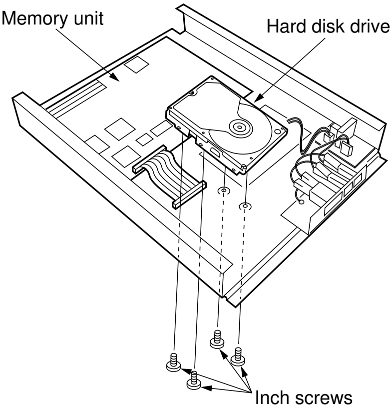


Figure 3-1-14

4. *Plug the 50-pin connector of the main PCB into the hard disk drive.*
5. Plug the 4-pin connector of the power source PCB into the power connector of the hard disk drive.
6. *Refit the memory unit to the copier and then the unit cover.*

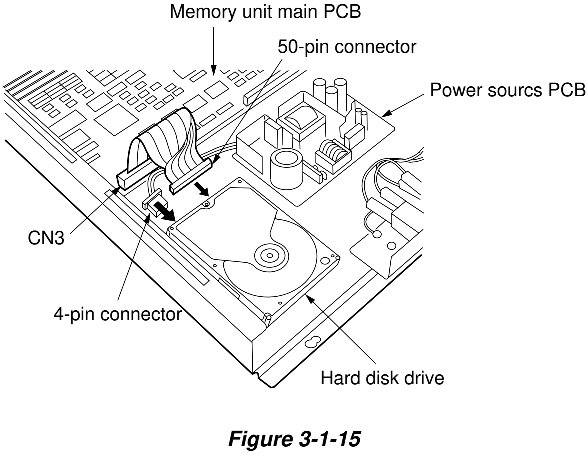


Figure 3-1-15

7. Enter simulation mode.
8. Run simulation 173 to format the hard disk drive.
   Caution: Do not turn the power off during formatting.
   Formatting requires about 32 minutes.

3-1-4 Installing/removing additional memory (option)

Procedure

- Before starting to install or remove additional memory, ensure the whole machine is turned off.
- Install memory in the order of SIMM0, SIMM1 and SIMM2.

Total memory size	○: installed; ×: not installed		
	SIMM0	SIMM1	SIMM2
Standard 16 MB	×	×	×
32 MB	○	×	×
48 MB	○	○	×
64 MB	○	○	○

Table 3-1-1

- **Installation**

1. Remove the four screws and remove the cover of the memory unit.
2. Insert the SIMM into the SIMM socket at an angle.
   Caution: Check the orientation of the memory carefully.

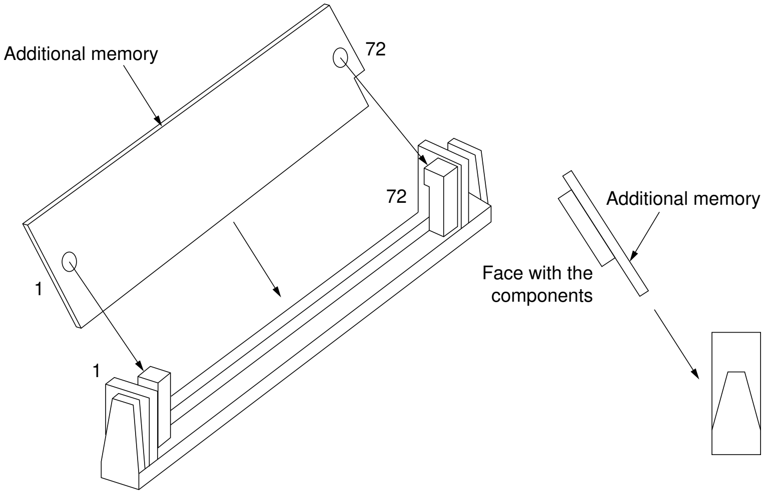


Figure 3-1-16

3. Raise the memory straight up so that the projections at the ends of the SIMM socket sit in the holes in the ends of the memory.
   Caution: Ensure the memory is firmly held by the SIMM socket.
4. Refit the cover of the memory unit with the four screws.

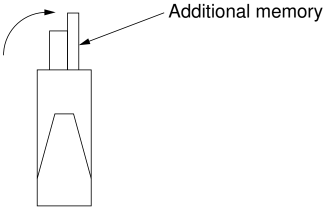


Figure 3-1-17

- **Removal**

1. Remove the four screws and the cover of the memory unit.
2. Lightly holding the claws at the ends of the SIMM socket with tweezers or a similar tool, slant the memory forward and then gently pull it up.
3. Refit the cover of the memory unit with the four screws.

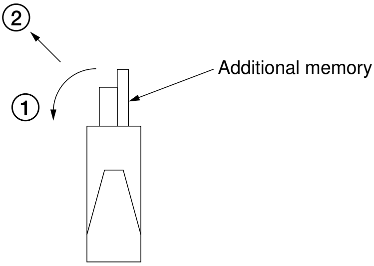


Figure 3-1-18

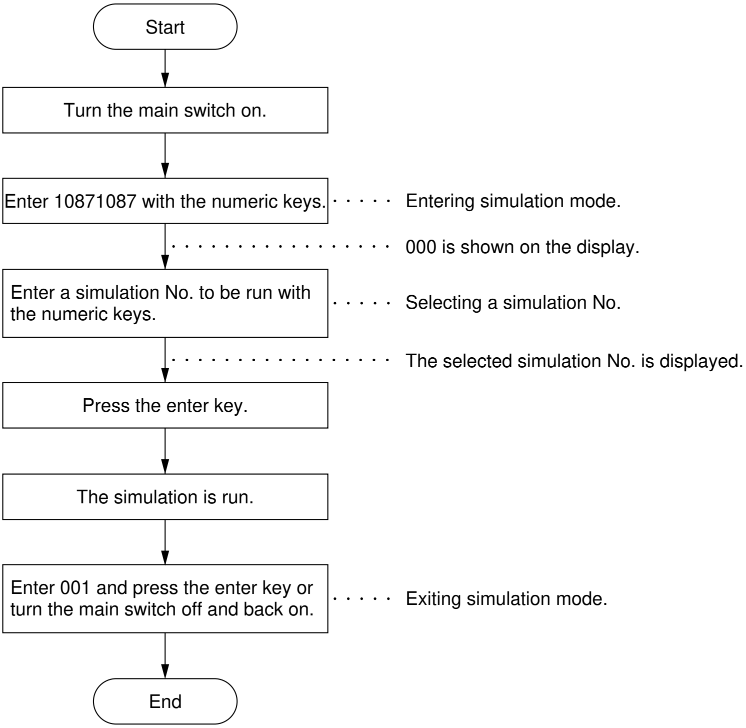
II

SIMULATION

3-2 Simulation

3-2-1 Simulations

(1) Running a simulation



Simulations that cannot be run in memory copy mode

Simulation 95: Setting the maximum copy length for roll/bypass mode
In the memory copy mode the maximum original and copy length is 5 meters, regardless of the setting in simulation 95.

Simulation 97: Switching between front and rear ejection of originals
In the memory copy mode an original is ejected to the machine rear, regardless of the setting in simulation 97.

(2) Contents of simulations

SIM No.	Description	Purpose
160	*Adjusting base 4 output density*	*See page 3-2-5.*
161	*Adjusting thresholds (central exposure level)*	*See page 3-2-6.*
162	*Adjusting base 4 thresholds simultaneously*	*See page 3-2-7.*
163	*Adjusting Exp. 1.0 threshold*	*See page 3-2-8.*
164	*Adjusting Exp. 7.0 threshold*	*See page 3-2-9.*
165	Setting the memory unit connection 1. Enter 165 with the numeric keys. 2. Press the enter key. The current setting is shown on the display. 3. Change the setting with the mode set keys. 1: No memory unit 2: Memory unit attached *Reference: 1* 4. Press the stop/clear key.	
166	Selecting display of the “PRINT, OK?” screen after restart 1. Enter 166 with the numeric keys. 2. Press the enter key. The current setting is shown on the display. 3. Change the setting with the mode set keys. 1: *Selected* 2: *No display* *Reference: 2* 4. Press the stop/clear key.	To be run to change the setting whether to display the “PRINT, OK?” screen after restart.
170	Checking the DRAM 1. Enter 170 with the numeric keys. 2. Press the enter key. Checking starts, showing “DRAM CHECK ∗ ” on the display. “ ∗ ” blinks until the check is completed. The display shows the result upon completion. CN: Connected NC: Not connected OK: Normal NG: Abnormal 3. Press the stop/clear key.	Checks the connection of DRAMs 1 to 4 (1: standard, 2 to 4: optional) and their status.
172	Checking the HDD page management area 1. Enter 172 with the numeric keys. 2. Press the enter key. Check starts, showing “PAGE MANAGER CHECK ∗ ” on the display. “ ∗ ” blinks until the check is completed. The display shows the result upon completion. OK: Normal NG: Abnormal 3. Press the stop/clear key.	Checks the availability of the page management area on the HDD.

SIM No.	Description	Purpose
173	Formatting the HDD 1. Enter 173 with the numeric keys. 2. Press the enter key. Formatting starts, showing "HDD FORMAT ∗ " on the display. The display shows "HDD FORMAT FINISHED" when formatting is completed. It takes about 32 minutes.	Formats the HDD.
174	Clearing programs 6 to 10 1. Enter 174 with the numeric keys. 2. Press the enter key. 3. Select the program No(s). to be cleared with the mode set keys. 1. PROGRAM6 2. PROGRAM7 3. PROGRAM8 4. PROGRAM9 5. PROGRAM10 4. Press the enter key. The selected program(s) is/are cleared. 5. Press the stop/clear key.	To be run when there is a problem with programs 6 to 10 on the HDD.
175	Restoring programs 6 to 10 1. Enter 175 with the numeric keys. 2. Press the enter key. 3. Select the program No(s). to be restored with the mode set keys. 1. PROGRAM6 2. PROGRAM7 3. PROGRAM8 4. PROGRAM9 5. PROGRAM10 6. All 4. Press the enter key. The selected program(s) is/are restored. 5. Press the stop/clear key.	To be run to restore image data which is present on the HDD but has been cleared from the copier main PCB.

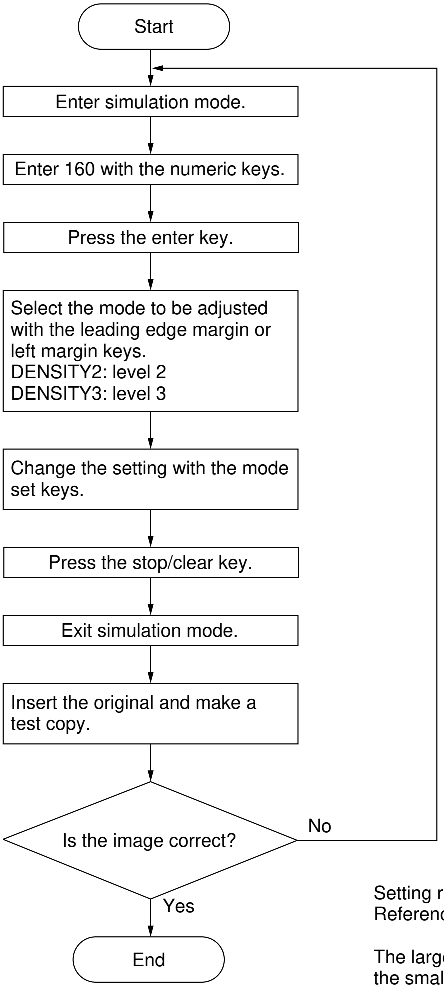
SIM No.	Description	Purpose
176	Memory unit problem history 1. Enter 176 with the numeric keys. 2. Press the enter key. The display shows any problems. 1: FIFO overflow 2: FIFO underflow 4: DMAC interrupt error 10: Reset or power turned off during access to the HDD 3. Press the stop/clear key.	To be run to check the history of problems that have occurred in the memory unit.
177	Clearing the memory unit problem history 1. Enter 177 with the numeric keys. 2. Press the enter key. The problem history is cleared. 3. Press the stop/clear key.	To be run to clear the history of problems that have occurred in the memory unit.
178	Selecting memory output mode 1. Enter 178 with the numeric keys. 2. Press the enter key. The current setting is shown on the display. 3. Change the setting with the mode set keys. 1: Nonstop 2: 20 prints *Reference: 2* 4. Press the stop/clear key.	To be run to change the setting whether to output nonstop or to stop after 20 prints are output.
179	Checking the memory unit connection 1. Enter 179 with the numeric keys. 2. Press the enter key. The status of the memory unit connection is shown on the display. 3. Press the stop/clear key.	To be run to check the memory unit connection.

3-2-2 Adjustment simulations

(1) Adjusting base 4 output density

Adjust the half-tone densities (levels 2 and 3) on base 4 outputs as follows. Level 1 is fixed to white (tone 0) and level 4 to black (tone 31).

Procedure



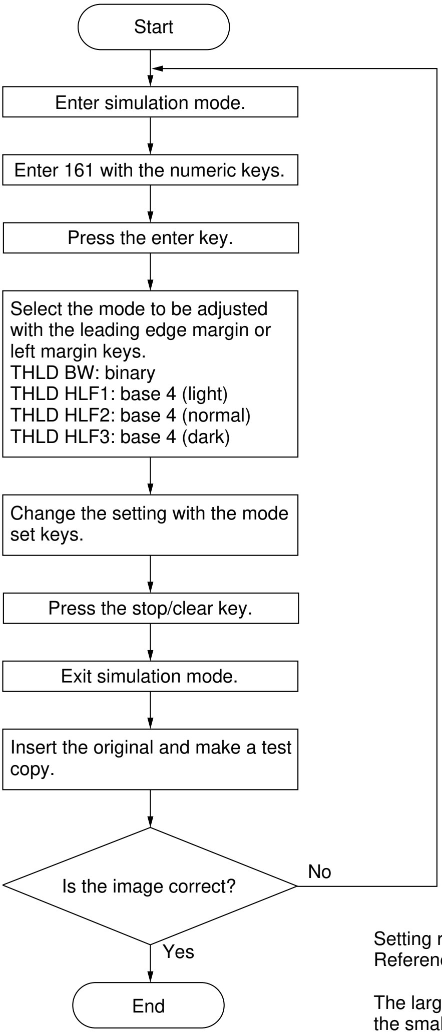
Setting range: –1 to +2
Reference: 0

The larger the value, the darker the image;
the smaller the value, the lighter the image.

(2) Adjusting thresholds (central exposure level)

Adjust the read-in density (threshold) at Exp. 4.

Procedure



Setting range: –10 to +10
Reference: 0

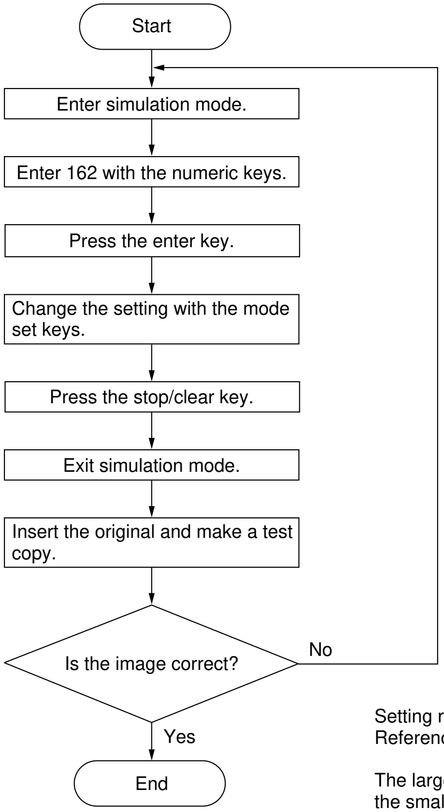
The larger the value, the darker the image;
the smaller the value, the lighter the image.

(3) Adjusting base 4 thresholds simultaneously

Perform the following adjustment to shift the densities (thresholds) on base 4 output simultaneously.

Since the number set in simulation 162 returns to zero after setting, be sure that the four values have been changed accordingly by running simulation 161.

Procedure



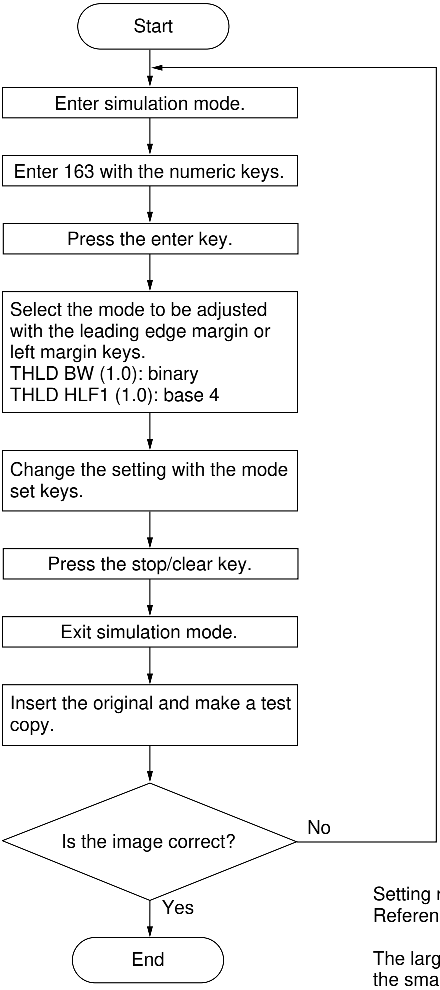
Setting range: –10 to +10
Reference: 0

The larger the value, the darker the image;
the smaller the value, the lighter the image.

(4) Adjusting Exp. 1.0 threshold

Perform the following steps for making the densities (threshold) for Exp. 1.0 higher.

Procedure



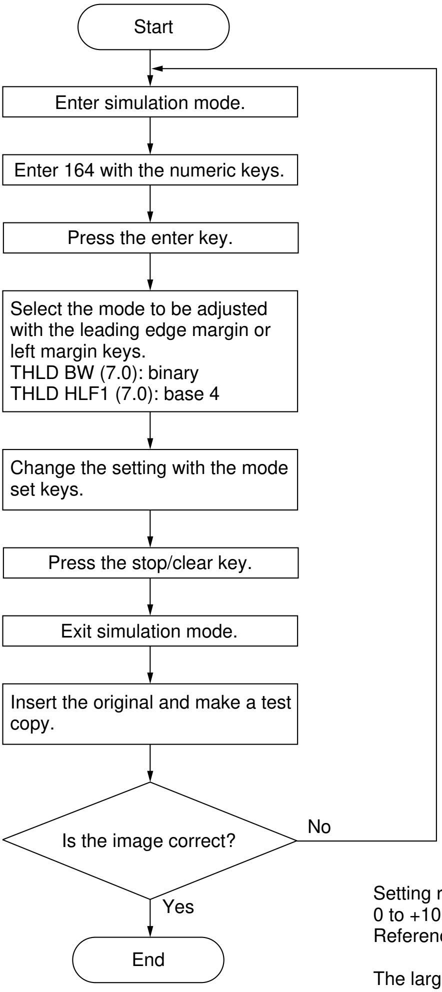
Setting range: –15 to 0
Reference: 0

The larger the value, the lighter the image;
the smaller the value, the darker the image.

(5) Adjusting Exp. 7.0 threshold

Perform the following steps for making the densities (threshold) for Exp. 7.0 lower.

Procedure



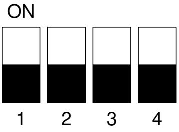
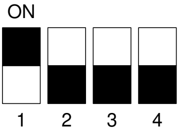
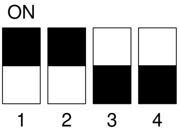
Setting ranges: 0 to +20 for THLD BW
0 to +10 for THLD HLF1
Reference: 0

The larger the value, the lighter the image;
the smaller the value, the darker the image.

3-2-3 Dip switch settings

(1) Contents of the dip switch settings

Turn the power off before changing the dip switch settings.

Dip switch setting	Operation
 1~4: OFF	Operates as a normal memory board. Switches 3 and 4 must be always off.
 1: ON 2: OFF 3: OFF 4: OFF	Performs a memory (DRAM module) check only. LED02 lights during operation and LED05 or 06 lights according to the check result. Checking 64-MB of DRAM takes about 6 minutes. (DRAM check is available in simulation 170.)
 1: ON 2: ON 3: OFF 4: OFF	Performs HDD formatting only, which requires about 32 minutes. LED04 lights during operation and LED05 lights upon completion. When formatting is attempted with no HDD connected, LED06 lights. (HDD formatting is available in simulation 173.)

III

PCB INITIAL SETTING

3-3 PCB Initial Setting

3-3-1 Main PCB

When replacing the backup PCB on the copier with the memory unit attached, take the following procedure.

Procedure

- With the existing backup PCB
  1. Record the following data of user-set items.
     - Settings used in program copy mode
     - Initial copy settings
  2. Enter simulation mode.
  3. Run the following simulations and record the counts.

Sim. No.	Counts to be recorded
66	*Count from the developer loading*
72	Maintenance count
73	Total counter count
74	Jam counts by the paper source
76	Total counts by the paper source

  4. Exit simulation mode.
  5. Turn the copier main switch off and disconnect the power plug.
  6. Replace the backup PCB.

- With the new backup PCB
  7. Connect the power plug and turn the copier main switch on.
  8. Enter simulation mode.
  9. Run simulations 70 and 85.
  10. Clean the contact glass and the middle upper original roller.
  11. Run simulation 120 to conduct gamma correction.
  12. Run simulation 83 to select between inch and metric specifications.
  13. Run simulation 165 to set the memory unit connection.
  14. Run simulation 175 to restore programs 6 to 10 on the HDD.
  15. Run the following simulations and enter the data recorded on the simulation label.

Sim. No.	Contents
35	*Entering drum surface potential data for black & white mode*
36	*Entering drum surface potential data for half-tone mode*
46	Setting fixing stabilization at low speed
53	Adjusting 100% magnification
54	Adjusting leading edge registration
55	Adjusting synchrocut length (297 mm)
56	Adjusting synchrocut length (1189 mm)
57	Adjusting the leading edge margin
58	Adjusting trailing edge margin/displayed synchrocut length
59	Adjusting the paper cut position for specified length cut mode
63	Checking/changing toner control voltage
66	*Entering toner sensor control level/copy count*
67	*Selecting the copying operation under the toner empty condition*
71	Selecting the maintenance cycle
75	Entering the service telephone No.
80	Switching the counter counting unit
81	Selecting the language
82	Selecting between key counter/card
84	Selecting the No. of exposure steps
86	Switching the fixing temperature
87	*Disabling cancellation of auto shutoff function*
89	*Setting optional roll unit*
92	*Setting potential correction intervals*
94	Setting the maximum copy length for multiple copy mode
95	Setting the maximum copy length for roll/bypass mode
96	Selecting the action after paper empty detection
97	*Switching between front and rear ejection of originals*
98	Selecting the copy count timing
132	*Adjusting optical axis*
133	*Adjusting the image width in the main scanning direction*
140	Adjusting exposure amount
141	Adjusting half-tone image quality
142	Adjusting AE optimum level
143	Switching filter modes
144	Adjusting filter gain
145	*Selecting the AE slight adjusting width*
153	Selecting current correct value
160	Adjusting base 4 output density
161	Adjusting thresholds
162	Adjusting base 4 thresholds simultaneously
163	Adjusting Exp. 1.0 threshold
164	Adjusting Exp. 7.0 threshold
166	*Selecting display of the “Begin printing” screen after restart*
176	*Displaying memory unit problem history*
178	*Selecting memory output mode*

  16. Exit simulation mode.
  17. Enter the data of user-set functions recorded in step 1.

IV

SELF DIAGNOSTICS

3-4 Self-diagnostics

3-4-1 Self-diagnostic function

(1) Self-diagnostic display

When the copier detects a problem with itself, it disables copying and displays a self-diagnostic code (C-xxx) indicating the nature of the problem together with a message requesting to call for service on the display.

After removing the problem, the self-diagnostic function can be reset by opening and closing the copier main unit or by turning the main switch off and back on.

Metric

Call for service C-XXX
TEL

Inch

CALL FOR SERVICE C-XXX
TEL

Figure 3-4-1 Service call code display

(Self diagnostic codes)

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C-32	**Communication problem with the memory unit**	Poor contact in connector CN2 on the memory unit main PCB.	Check the connection of CN2 on the memory unit main PCB and repair if necessary. Check for continuity across the connector terminals and replace them if necessary.
		Defective memory unit main PCB.	Replace the memory unit main PCB and check operation.
		Poor contact in connector CN19 on the memory unit main PCB.	Check the connection of CN19 on the memory unit main PCB and repair if necessary. Check for continuity across the connector terminals and replace them if necessary.
		Defective copier main PCB.	Replace the copier main PCB and check operation.
		Defective HDD.	Replace the HDD and check operation.
C-904	**Reset during HDD operation**	Defective memory unit main PCB.	Replace the memory unit main PCB and check operation.
		Defective HDD.	Replace the HDD and check operation.
C-906	**Read error in normally used area**	Defective memory unit main PCB.	Replace the memory unit main PCB and check operation.
		Defective copier main PCB.	Replace the copier main PCB and check operation.
C-907	**Read error in HDD page managing area**	Defective memory unit main PCB.	Replace the memory unit main PCB and check operation.
		Defective HDD.	Replace the HDD and check operation.

(2) Error message

When an error in independent operation of the memory unit is detected, an error message is shown on the message display, and memory copying is disabled.
When a key is pressed after an error is detected, normal copying only is enabled.
When the power to the memory unit is turned off and on, the memory unit error detection is reset.

Code	**Contents**	**Remarks**	
		Causes	***Check procedures/corrective measures***
Error 1	***Communication problem with the memory unit***	*Poor contact in connector CN2 on the memory unit main PCB.*	*Check the connection of CN2 on the memory unit main PCB and repair if necessary. Check for continuity across the connector terminals and replace them if necessary.*
		Defective memory unit main PCB.	*Replace the memory unit main PCB and check operation.*
		Defective HDD.	*Replace the HDD and check operation.*
Error 2	***Additional memory problem***	*Additional memory is incorrectly installed, or inserted in the wrong socket.*	*Check and reinstall the additional memory.*
		Defective additional memory.	*Replace the additional memory and check operation.*
Error 3	***HDD problem***	*Defective memory unit main PCB.*	*Replace the memory unit main PCB and check operation.*
		Defective HDD.	*Replace the HDD and check operation.*
Error 4	***Standard DRAM problem***	*Defective memory unit main PCB.*	*Replace the memory unit main PCB and check operation.*

- *Messeages are indicated to the display as follows.*

Metric
“Memory unit error-# Press any key”

Inch
“MEMORY UNIT ERROR-# PRESS ANY KEY”

(3) Conditions that turn the memory unit main PCB LEDs on

LED02 to LED06 do not light during normal memory copy operation (attached to the copier). Errors are identified by the copier through serial communication.

Name	Color	Description
LED01 (SCSI TERMOFF)	Red	Lights when the circuit protector is triggered.
LED02 (memory)	Yellow	Lights during memory check.
LED03 (HDD)	Yellow	Lights during hard disk check.
LED04 (format)	Yellow	Lights during hard disk formatting.
LED05 (end)	Green	Lights when operation ends normally.
LED06 (error)	Red	Lights when an error occurs. Lights when PCB formatting is attempted with the hard disk disconnected.
LED07 (MPU HALT)	Red	Lights when the MPU stops.
LED08 (RESET)	Red	Lights when reset is triggered.
LED09 (POWER ON)	Green	Lights while power is present.

V

TROUBLESHOOTING

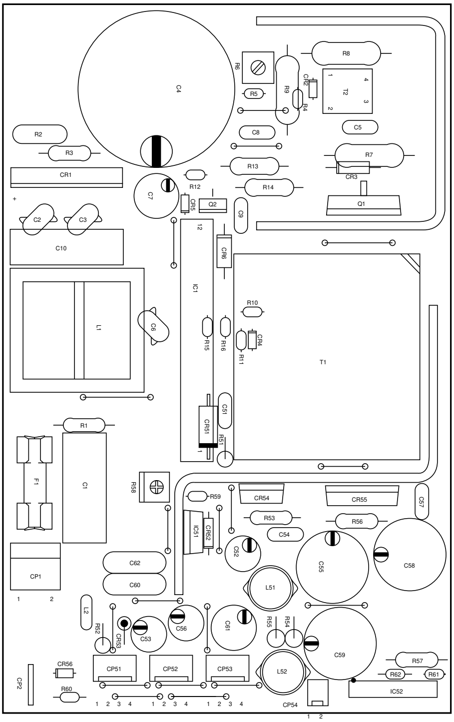
3-5 Troubleshooting

3-5-1 PCB terminal voltages

Precautions

- When handling the circuit boards, do not touch the components with bare hands.
- ICs can be damaged by static discharges. If a PCB contains ICs, do not touch the ICs, cable connectors or edge connectors.
- Store the circuit boards wrapped in aluminum foil, conductive sponge rubber, or similar material.

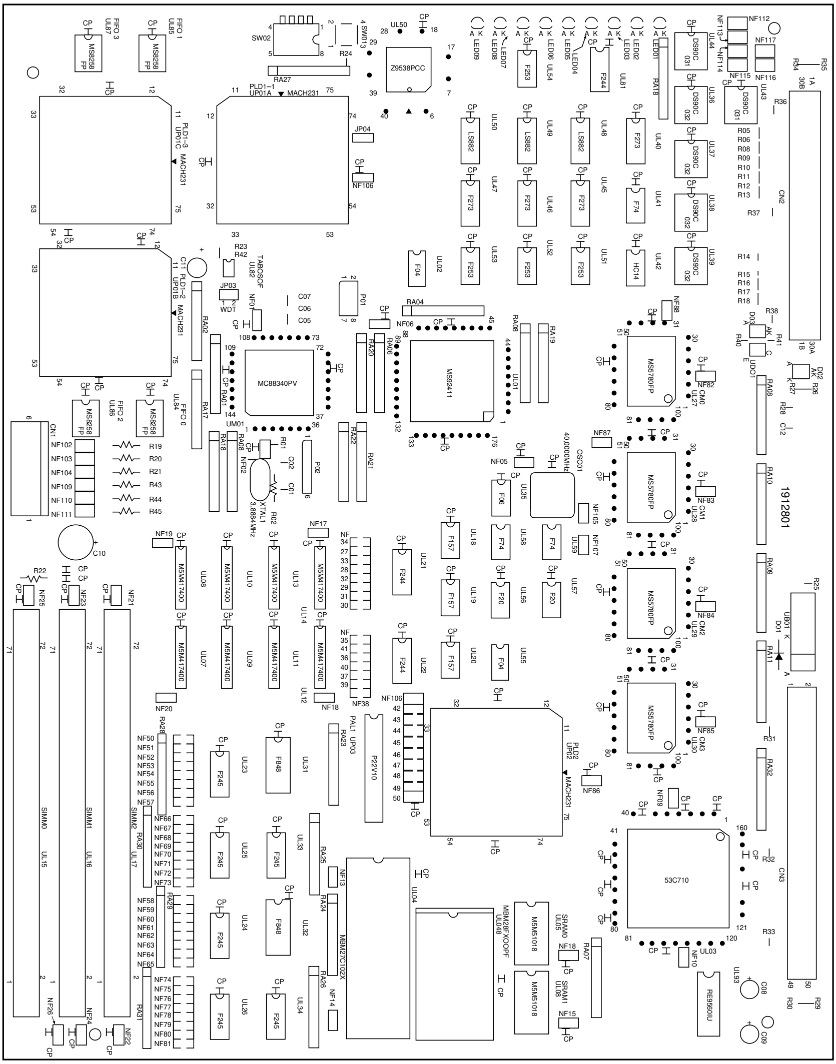
(1) Power source PCB



Terminals (CN)		Voltage	Remarks
1-2	1-1	100 V AC	AC supply, input
2-1	2-2	5 V DC	5 V DC supply to MMPCB, output
3-1	3-2	5 V DC	5 V DC supply to MMPCB, output
4-1	4-2	5 V DC	5 V DC supply to HDD*, output
4-3	4-2	+12 V DC	+12 V DC supply to HDD*, output

* Option.

(2) Memory unit main PCB



Terminals (CN)		Voltage	Remarks
1-1	1-4	5 V DC	5 V DC supply from PSPCB, input
1-2	1-5	5 V DC	5 V DC supply from PSPCB, input
2-1A	2-19A	5/0 V DC (Pulse)	Input image data
2-2A	2-19A	5/0 V DC (Pulse)	Input image data
2-3A	2-19A	5/0 V DC (Pulse)	Input image data
2-4A	2-19A	5/0 V DC (Pulse)	Input image data
2-5A	2-19A	5/0 V DC (Pulse)	Input image data
2-6A	2-19A	5/0 V DC (Pulse)	Input image data
2-7A	2-19A	5/0 V DC (Pulse)	Input image data
2-8A	2-19A	5/0 V DC (Pulse)	Input image data
2-9A	2-19A	5/0 V DC (Pulse)	Input image data
2-10A	2-19A	5/0 V DC (Pulse)	Input image data
2-11A	2-19A	5/0 V DC (Pulse)	Input image data
2-12A	2-19A	5/0 V DC (Pulse)	Input image data
2-13A	2-19A	5/0 V DC (Pulse)	Input image data
2-14A	2-19A	5/0 V DC (Pulse)	Input image data
2-15A	2-19A	5/0 V DC (Pulse)	Input image data
2-16A	2-19A	5/0 V DC (Pulse)	Input image data
2-17A	2-19A	5/0 V DC (Pulse)	Main scanning direction effective image area signal
2-18A	2-19A	5/0 V DC (Pulse)	Main scanning direction effective image area signal
2-21A	2-19A	5/0 V DC (Pulse)	Image data transfer clock signal
2-22A	2-19A	5/0 V DC (Pulse)	Image data transfer clock signal
2-25A	2-19A	5/0 V DC (Pulse)	Auxiliary scanning synchronization signal
2-26A	2-19A	5/0 V DC (Pulse)	Auxiliary scanning synchronization signal
2-27A	2-19A	5/0 V DC (Pulse)	Main scanning synchronization signal
2-28A	2-19A	5/0 V DC (Pulse)	Main scanning synchronization signal
2-29A	2-19A	5/0 V DC (Pulse)	Copier power on signal
2-4B	2-19A	5/0 V DC (Pulse)	Memory unit power on signal
2-7B	2-19A	5/0 V DC (Pulse)	Serial reception data signal
2-8B	2-19A	5/0 V DC (Pulse)	Serial reception data signal
2-9B	2-19A	5/0 V DC (Pulse)	Serial transmission data signal
2-10B	2-19A	5/0 V DC (Pulse)	Serial transmission data signal
2-13B	2-19A	5/0 V DC (Pulse)	Image data transfer clock signal
2-14B	2-19A	5/0 V DC (Pulse)	Image data transfer clock signal
2-17B	2-19A	5/0 V DC (Pulse)	Main scanning direction effective image area signal
2-18B	2-19A	5/0 V DC (Pulse)	Main scanning direction effective image area signal
2-27B	2-19A	5/0 V DC (Pulse)	Output image data
2-28B	2-19A	5/0 V DC (Pulse)	Output image data
2-29B	2-19A	5/0 V DC (Pulse)	Output image data
2-30B	2-19A	5/0 V DC (Pulse)	Output image data
3-1~50	1-4	5/0 V DC (Pulse)	HDD* control signal, input/output

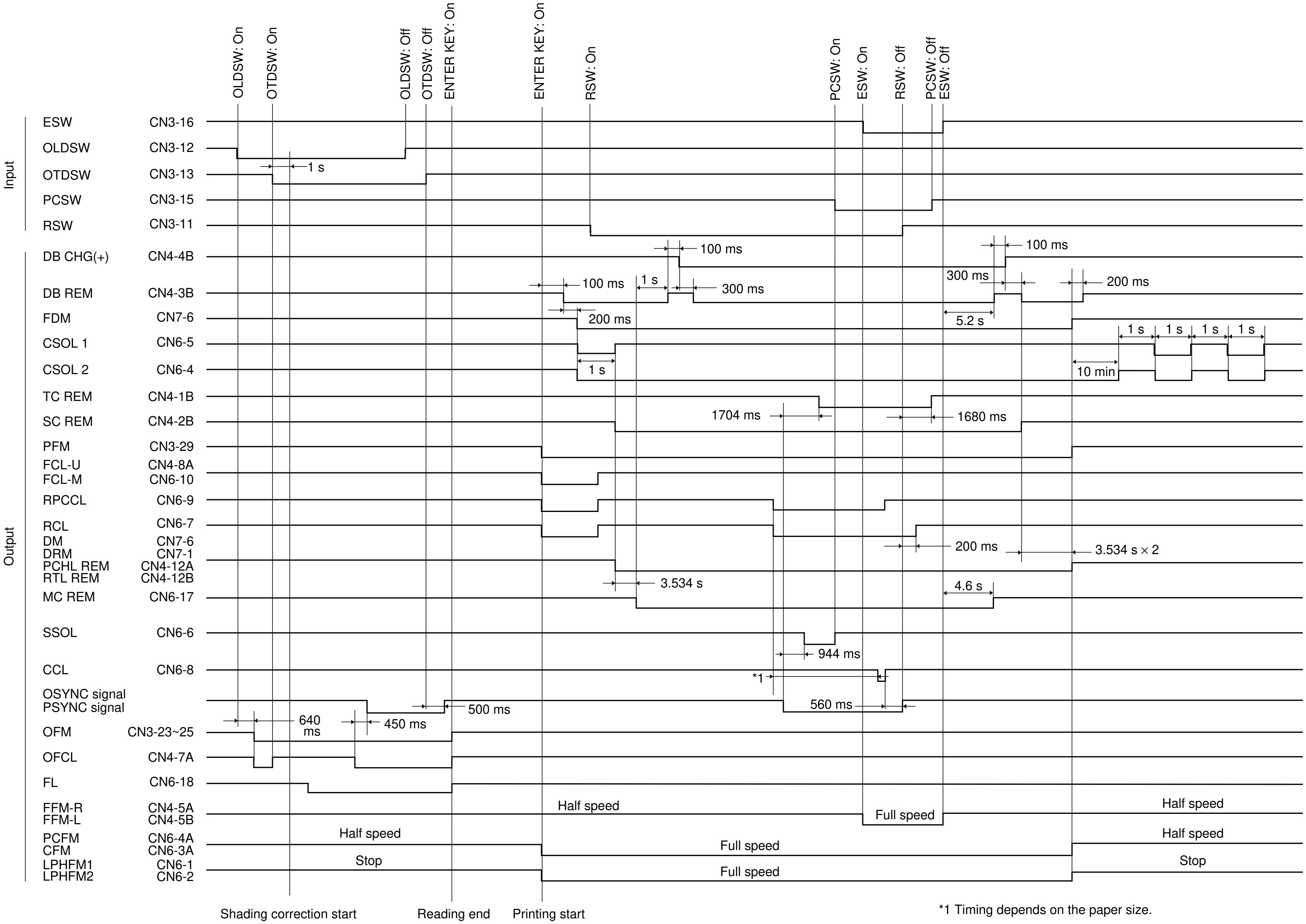
* Option.

VI

APPENDIXES

3-6 Appendixes

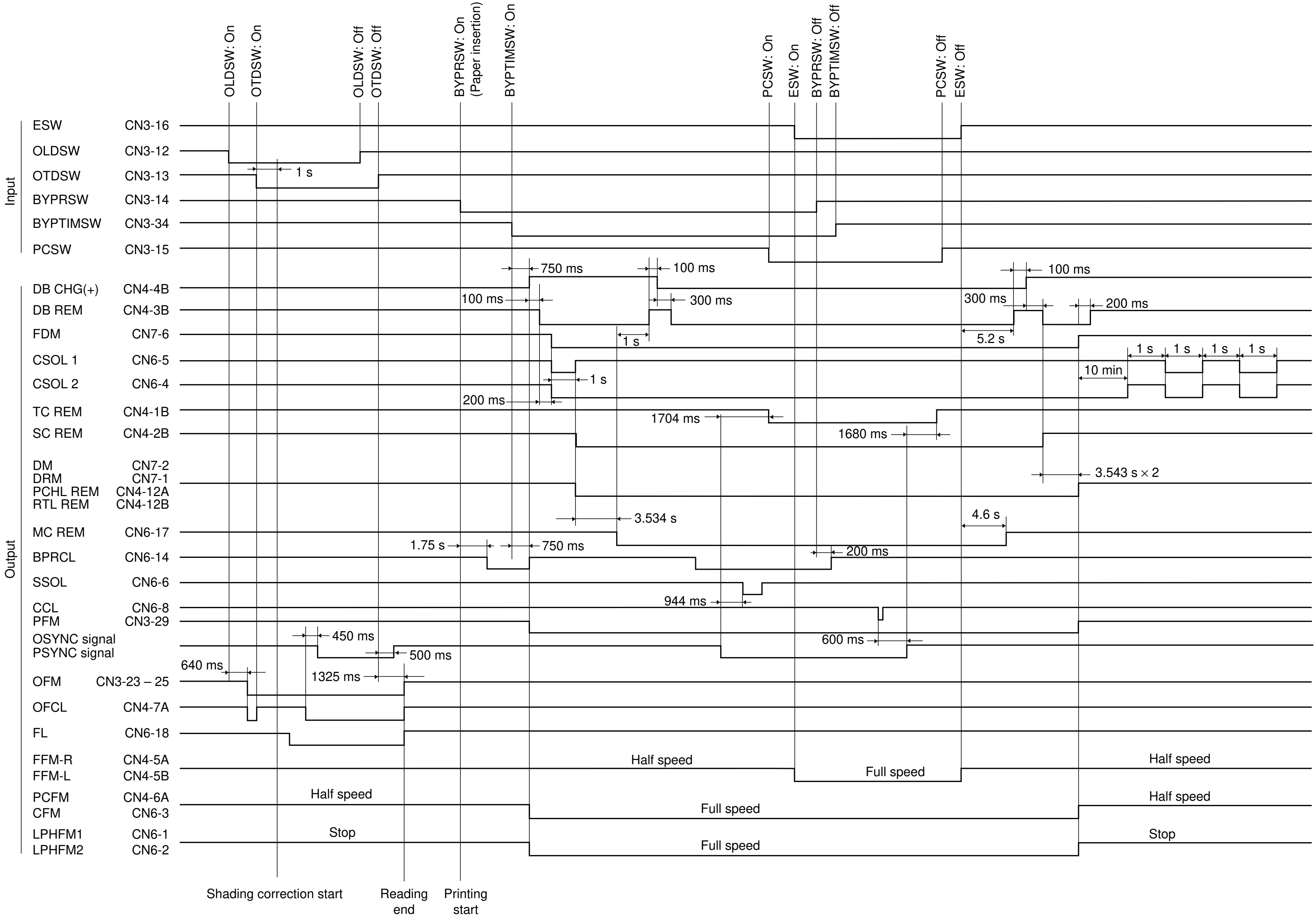
Timing chart No. 1 Memory copy mode, bypass paper feed, with original inserted before the paper



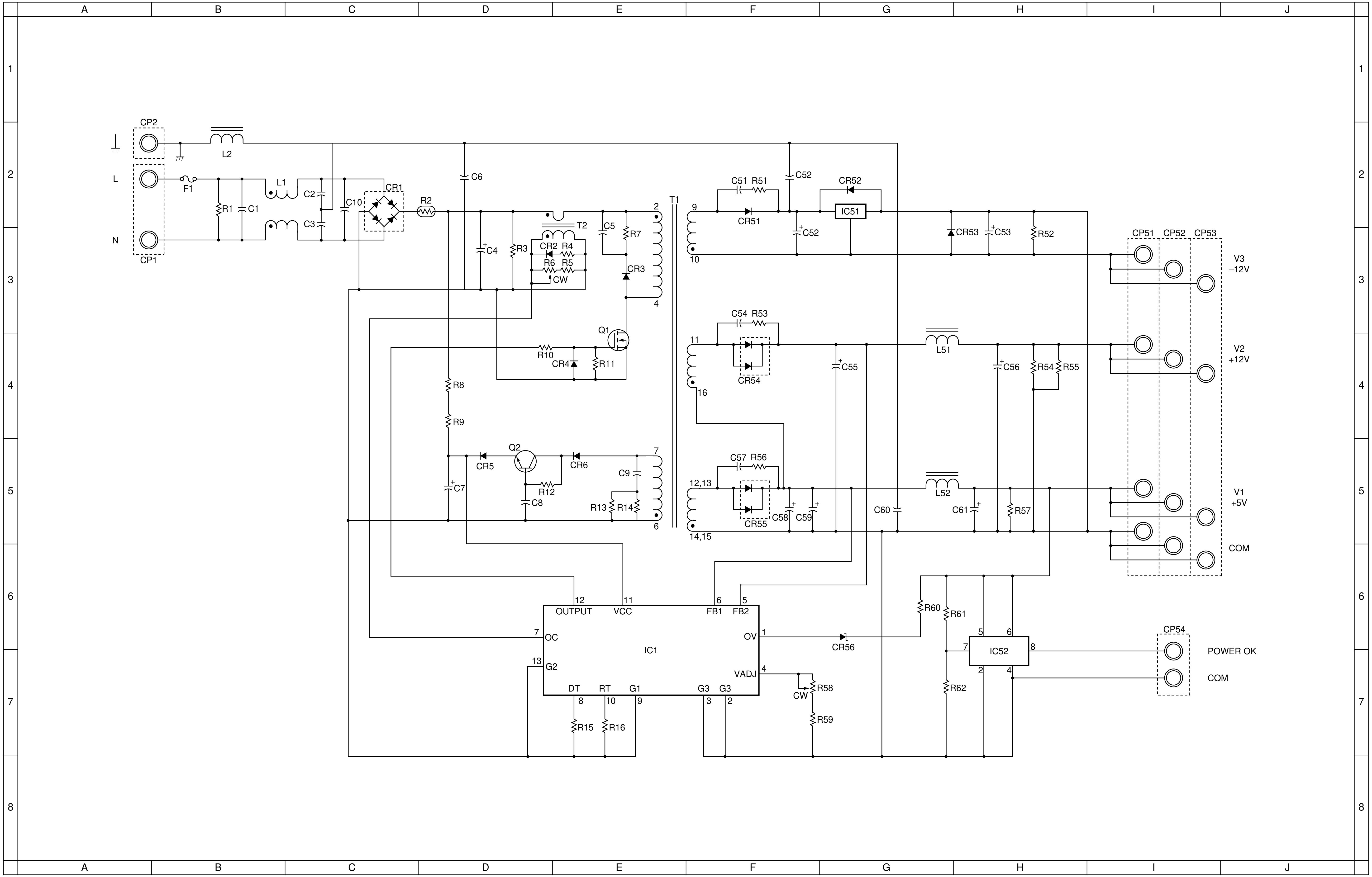
*1 Timing depends on the paper size.

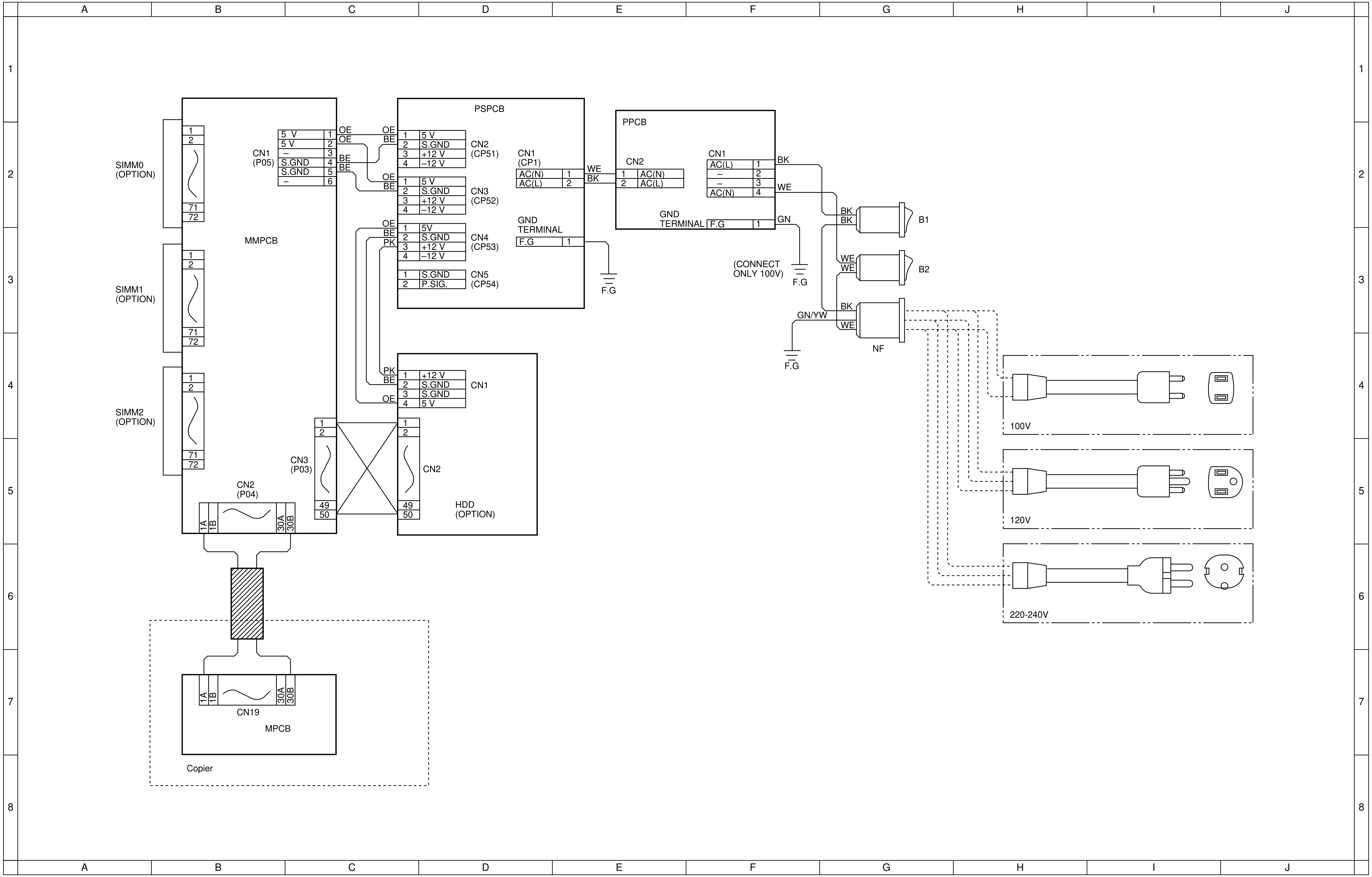
A0/36" × 48"	1420 ms	A2/17" × 22"	680 ms
A1/24" × 36"	980 ms	A3/11" × 17"	460 ms

Timing chart No. 2 Memory copy mode, roll paper feed, single copy

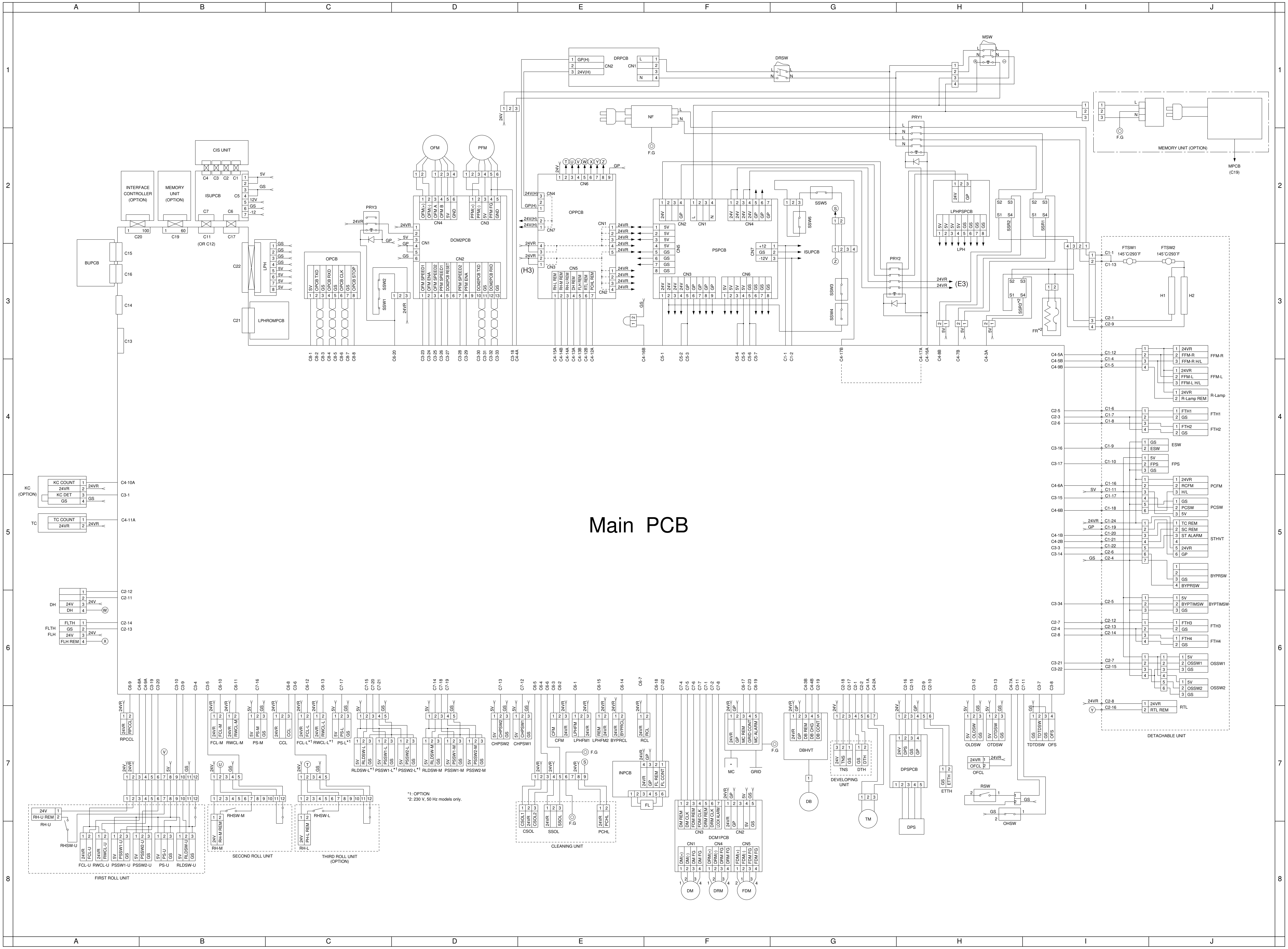


Power source PCB




A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
SIMM0
(OPTION)
SIMM1
(OPTION)
SIMM2
(OPTION)
1
2
71
72
MMPCB
CN1
(P05)
5 V
5 V
–
S.GND
S.GND
–
1
2
3
4
5
6
OE
BE
PK
PSPCB
CN2
(CP51)
CN3
(CP52)
CN4
(CP53)
CN5
(CP54)
+12 V
–12 V
5V
P.SIG.
CN1
(CP1)
AC(N)
AC(L)
GND
TERMINAL
F.G
WE
BK
PPCB
CN2
CN1
GN
(CONNECT
ONLY 100V)
GN/YW
B1
B2
NF
CN3
(P03)
49
50
CN2
HDD
(OPTION)
CN2
(P04)
1A
1B
30A
30B
CN19
MPCB
Copier
100V
120V
220-240V

A741 Point-to-Point Diagram



*1: OPTION
*2: 230 V, 50 Hz models only.

A741

General wiring diagram