KYOCERA mita

KM-P4845w
KM-P4850w

SERVICE MANUAL

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842BA110

CAUTION

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

CAUTION

Double-pole/neutral fusing.

Safety precautions

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

Safety warnings and precautions

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

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

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

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

Symbols

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

 General warning.

 Warning of risk of electric shock.

 Warning of high temperature.

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

 General prohibited action.

 Disassembly prohibited.

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

 General action required.

 Remove the power plug from the wall outlet.

 Always ground the copier.

1. Installation Precautions

⚠WARNING

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

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

⚠CAUTION:

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

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

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

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

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

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

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

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

2. Precautions for Maintenance

⚠WARNING

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

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

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

- Always use parts having the correct specifications.

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

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

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

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

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

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

⚠CAUTION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Miscellaneous

⚠WARNING

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

CONTENTS

1-6 Assembly and Disassembly

2-2 Electrical Parts Layout

2-3 Operation of the PCBs

2-4 Appendixes

1-1-1 Specification

Type	Console type
Printing system	Indirect electrostatic
Paper	Plain paper: 64 – 80 g/m^2 (fed from the roll unit or bypass table) Special paper: Vellum, film (fed from the roll unit or bypass table) Paper roll width: 210 – 920 mm/17" – 36" Paper roll outer diameter: 180 mm/6$^3/_4$" or less Paper roll inner diameter: 76 mm/3"
Print size	Standard: A0 – A4R (64 – 80 g/m^2) 36" × 48" – 8$^1/_2$" × 11" (64 – 80 g/m^2) Maximum: 920 (W) × 6,000 (L) mm (64 – 80 g/m^2) 36" (W) × 237" (L) (64 – 80 g/m^2) Effective image width: 920 mm/36" Void area: Leading/trailing edge: 10 mm or less, right/left edge: 3 mm or less
Print speed	2.6 ppm printer: 2.6 sheets/minute for A0/36" × 48", 4 sheets/minute for A1/36" × 24" 3 ppm printer: 3 sheets/minute for A0/36" × 48", 6 sheets/minute for A1/36" × 24"
Warm up time	Within 10 minutes (room temperature 20°C/68°F, 65%RH)
Paper feed system	Automatic feed from the roll unit and manual feed from the bypass table
Photoconductor	OPC (Drum diameter: 90 mm)
Charging system	Scorotoron charging
Resolution	600 × 600 dpi
Developing system	Dry (magnetic brush) Developer: dual component (ferrite carrier and black toner: N26T) Toner density control: Toner sensor Toner replenishing: Supply from the bottle cartridge
Transfer system	Single negative corona charging
Separation system	Single AC corona charging
Fixing system	Heat roller Heat source: Halogen heaters (main: 750 W, sub: 350 W) Control temperature: 155°C/311°F (plain paper) 150°C/302°F (film) 175°C/365°F (Vellum) Abnormal temperature increase-prevention device: Thermostat (140°C/284°F) Fixing pressure: 49N
Charge erasing system	Exposure by cleaning lamp
Cleaning system	Cleaning blade and cleaning far brush
Memory for storage of image	2.6 ppm printer: 128 MB as standaed 3 ppm printer: 256 MB as standaed
Machine dimensions	1330 (W) × 704 (D) × 1095 (H) mm 52$^3/_8$" (W) × 27$^{11}/_{16}$" (D) × 43$^1/_8$" (H)
Weight	Approx. 238 kg/523.6 lbs. (main unit only)
Installation dimensions	1366 (W) × 774 (D) mm 53$^3/_4$" (W) × 30$^1/_2$" (D)
Functions	Size adjustment, fixing temperature, energy saver, auto shut-off, self-diagnosis
Power requirement	120 V AC, 60 Hz, 14 A 230 V AC, 50 Hz, 7 A
Rated power consumption	1680 W (120 V specifications) 1610 W (230 V specifications)
Accessories	Flanges, flange handle, bypass guide, and CD-ROM
Options	Roll unit, and scanner unit

<Software Operating Environment>

• **Printer drivers**

		IBM PC-AT or compatible				
OS		Windows 95 (OSR2)	Windows 98	Windows Me	Windows NT 4.0 (with Service Pack 5 or later installed)	Windows 2000
Minimum configuration	CPU	i486DX2 66MHz		Pentium 150MHz	i486DX2 66MHz	Pentium 166MHz
	RAM	8MB	16MB	32MB	16MB	24MB
	Free hard disk space	10MB				
Recommended configuration	CPU	Celeron 266MHz or faster				Pentium II 300MHz or faster
	RAM	128MB or more				
	Free hard disk space	300MB				
CD-ROM drive		One drive				
Printer Port		One 100BASE-T or 10BASE-T port				

		Macintosh
Mac OS		Mac OS 8.6 - 9.1
Minimum configuration	CPU	PowerPC
	RAM	24MB
	Free hard disk space	10MB
Recommended configuration	CPU	PowerPC 604 200MHz or faster
	RAM	64MB or more
	Free hard disk space	10MB
CD-ROM drive		One drive
Printer Port		One 100BASE-T or 10BASE-T port

• **Print Utility (recommended operating environment)**

	IBM PC-AT or compatible				
OS	Windows 95 (OSR2)	Windows 98	Windows Me	Windows NT 4.0 (with Service Pack 5 or later installed)	Windows 2000
CPU	Pentium 200MHz or faster				Pentium II 300MHz or faster
RAM	64MB or more		128MB or more		
Free hard disk space	100MB				
CD-ROM drive	One drive				
Printer Port	One 100BASE-T or 10BASE-T port				

1-1-2 Part names and functions

(1) Main unit

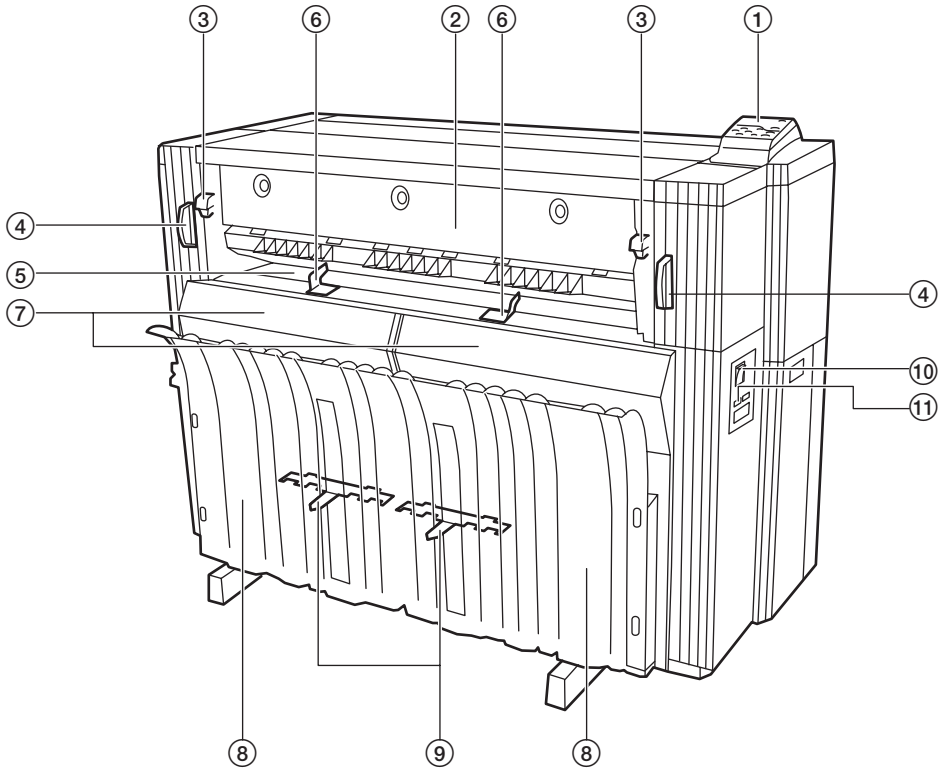


Figure 1-1-1

① Operation panel
② Eject cover
③ Ejection release levers
④ Main unit release levers
⑤ Bypass tables
⑥ Bypass guide
⑦ Front covers
⑧ Paper trays
⑨ Paper tray support plates
⑩ Main switch
⑪ Total counter

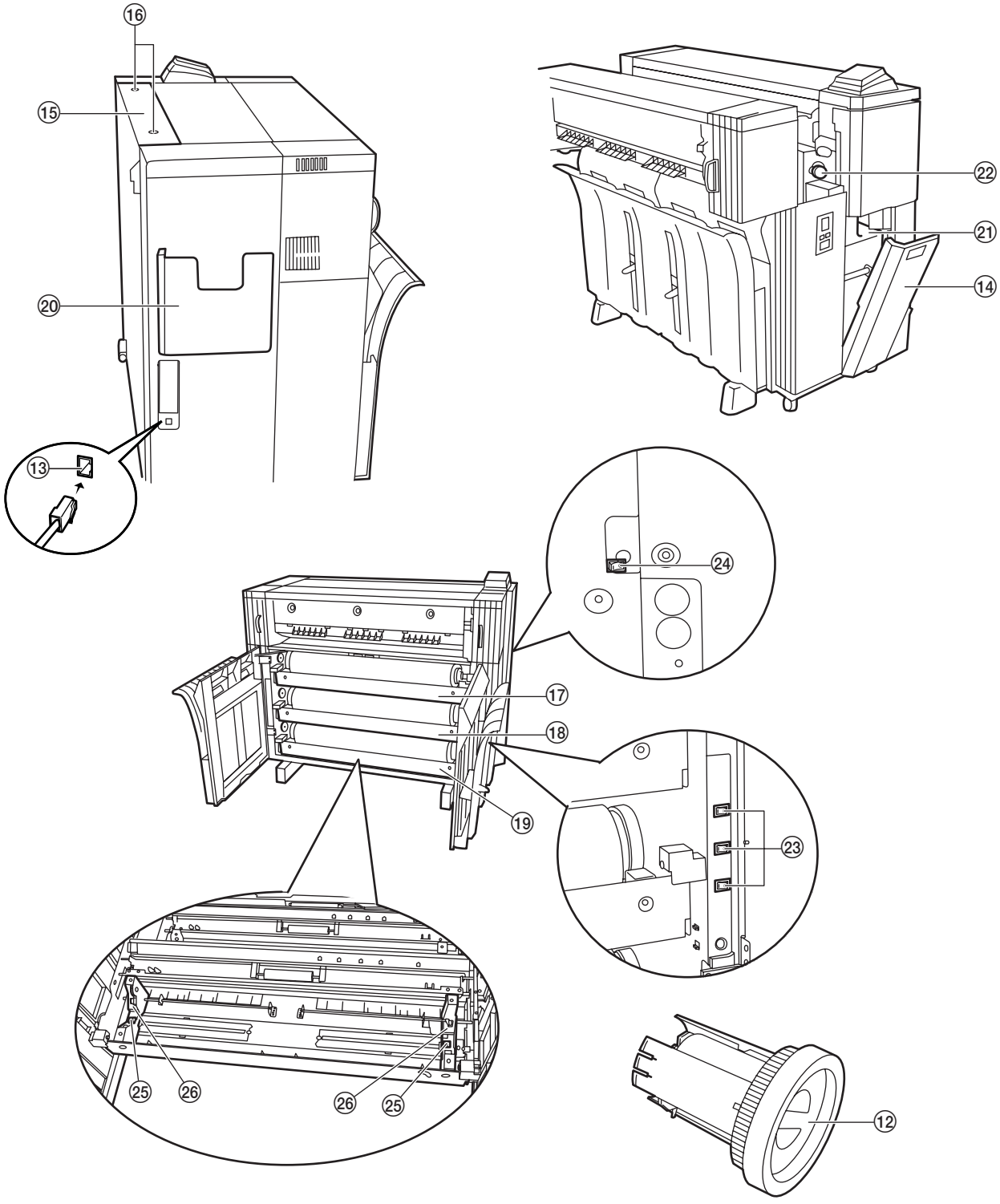


Figure 1-1-2

⑫ Flanges
⑬ Network interface connector
⑭ Right cover
⑮ Toner replenishing slot
⑯ Toner replenishing slot screw
⑰ Upper roll unit*
⑱ Middle roll unit
⑲ Lower roll unit
⑳ Operation Guide box
㉑ Waste toner tank
㉒ Toner replenishing slot screw
㉓ Upper, middle and lower roll unit heater switches
㉔ Main heater switch
㉕ Release levers
㉖ Roll flange guides

* Optional

(2) Operation panel

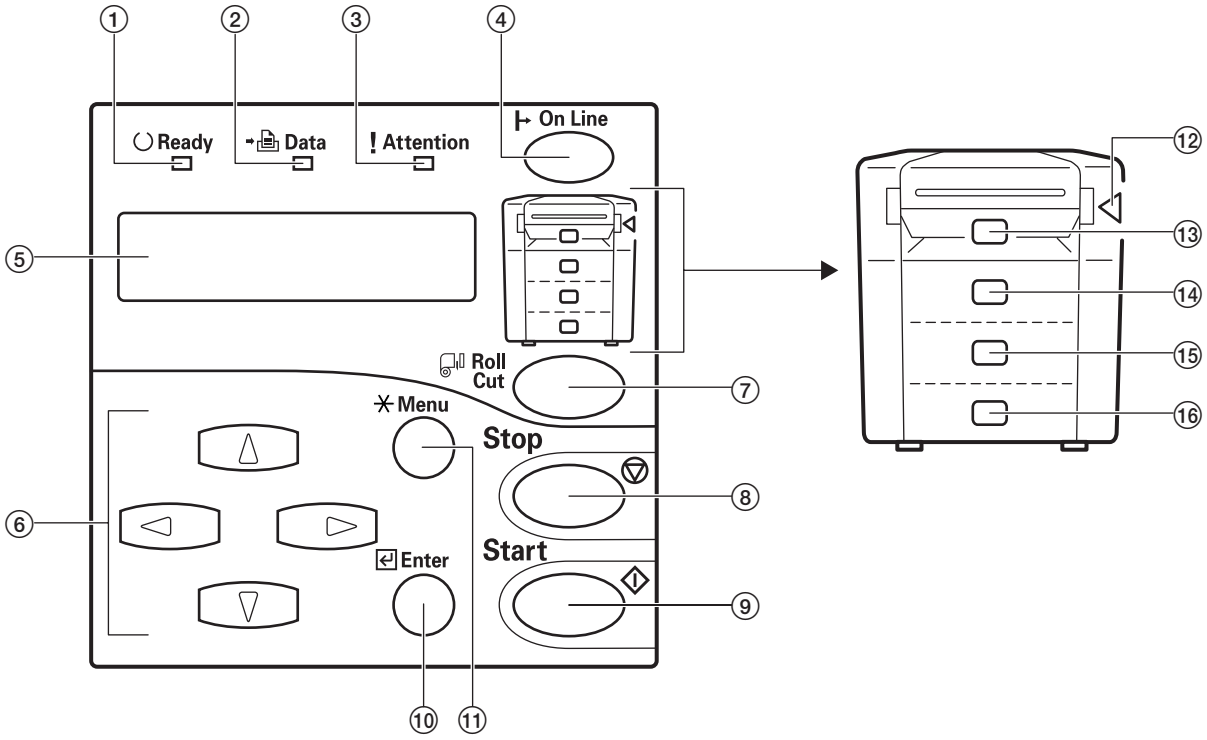


Figure 1-1-3

① Ready indicator
② Data indicator
③ Attention indicator
④ On Line key
⑤ Message display
⑥ Cursor keys
⑦ Roll Cut key
⑧ Stop key
⑨ Start key
⑩ Enter key
⑪ */Menu key
⑫ Internal paper jam indicator
⑬ Manual feed indicator
⑭ Upper roll unit indicator
⑮ Middle roll unit indicator
⑯ Lower roll unit indicator

1-1-3 Print process

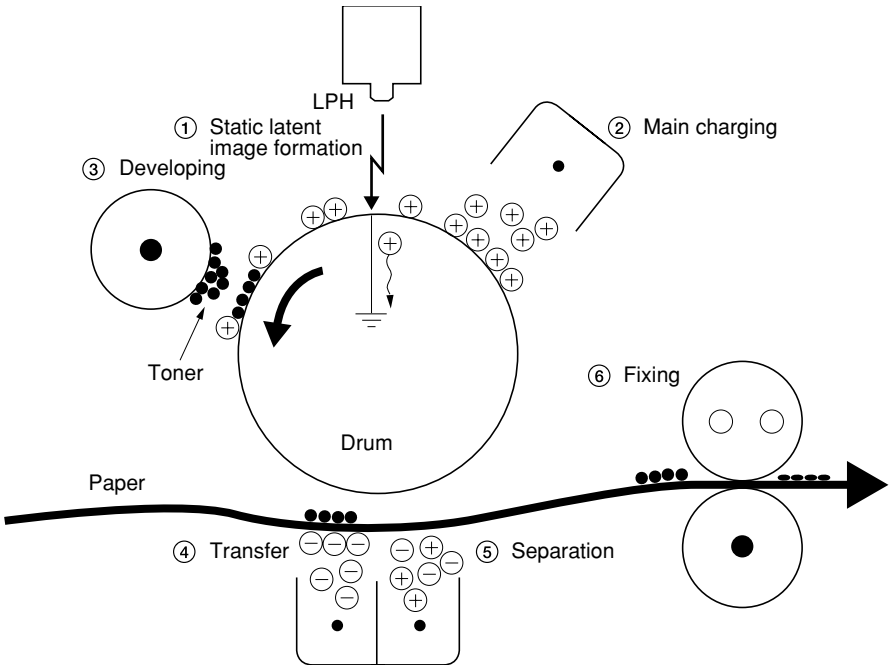


Figure 1-1-4 Print process

1-1-4 Machine cross sectional view

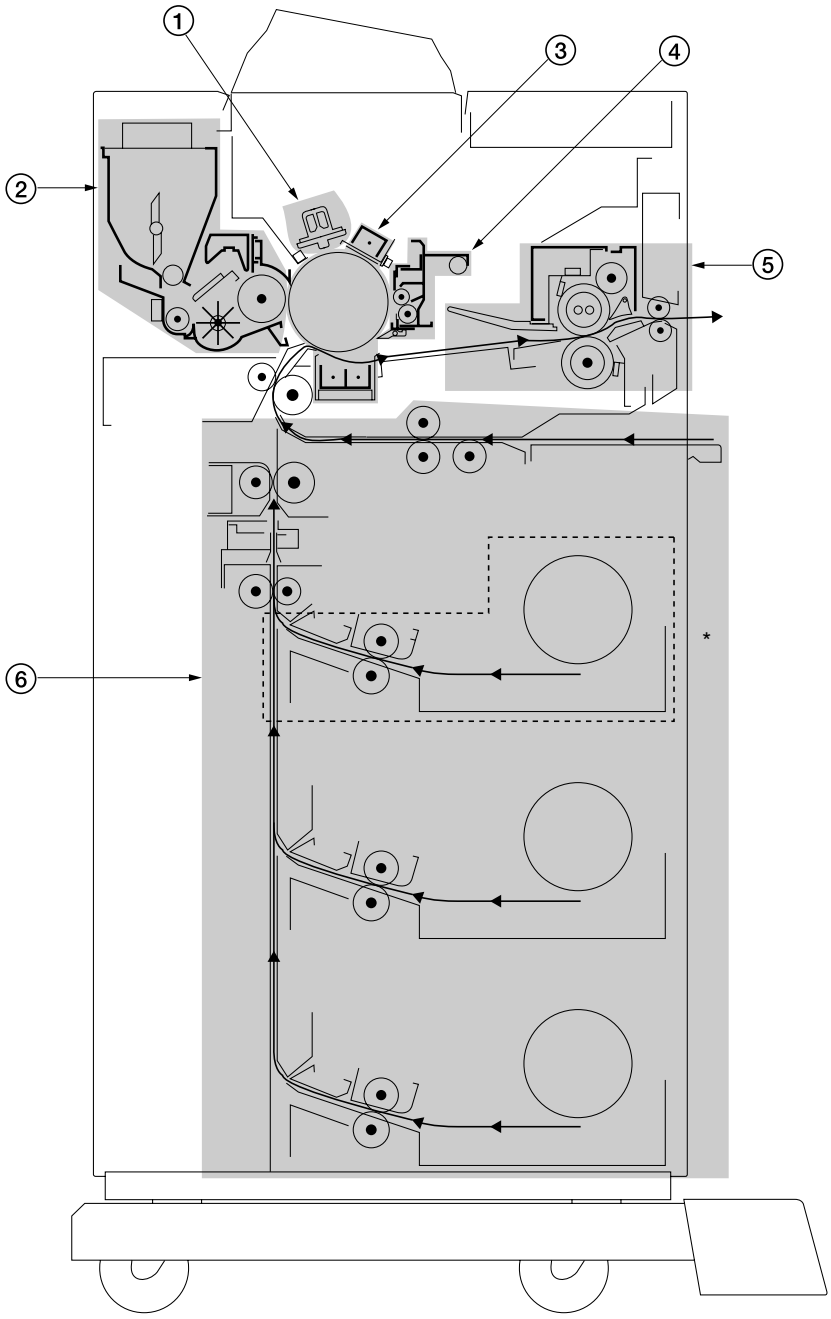


Figure 1-1-5 Machine cross sectional view

① Optical section
② Developing section
③ Image formation section
④ Cleaning section
⑤ Fixing section
⑥ Paper feed/conveying section

1-1-5 Machine drive system

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

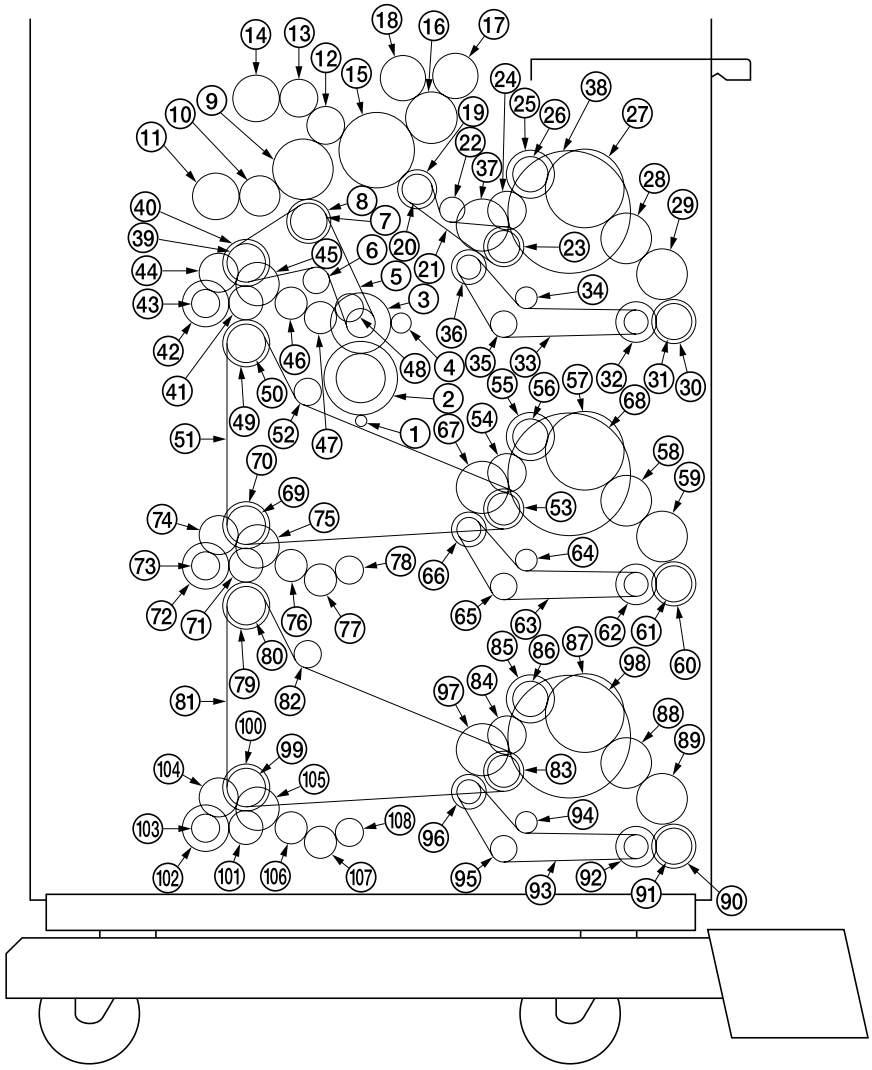


Figure 1-1-6

1 Paper feed motor gear
2 Gear 82/35
3 Idle pulley 25/45
4 Pulse plate gear
5 Paper feed section drive belt
6 Drive tension pulley
7 Flange pulley 36
8 Pre-transfer drive pulley 32
9 Feed gear 47
10 Idle gear 30
11 Roll feed clutch
12 Idle gear 30
13 Idle gear 30
14 Roll registration clutch
15 Cartridge drive idle gear
16 Feed gear 40
17 Bypass feed clutch
18 Bypass registration clutch
19 Pre-transfer drive pulley 32
20 Flange pulley 36
21 Cleaning section drive belt*
22 Drive tension pulley*
23 Idle pulley 32/36*
24 Idle gear 30*
25 Upper roll winding clutch*
26 Roll drive gear 16*
27 Roll drive gear 40*
28 Roll drive gear 26*
29 Roll drive gear 26*
30 Developer spiral roller gear 23*
31 Cleaning section drive gear 25*
32 Roll unit pulley*
33 Roll unit belt*
34 Drum tension pulley*
35 Idle pulley 21*
36 Roll unit pulley*
37 Idle gear 40*
38 Roll flange*
39 Flange pulley 36
40 Pre-transfer drive pulley 32
41 Idle gear 30
42 Upper feed clutch*
43 Developer gear 20
44 Idle gear 30
45 Duplex gear 32
46 Idle gear 25
47 Idle gear 25
48 Drive gear 20T

49 Pre-transfer drive pulley 32
50 Flange pulley 36
51 Roll winding drive belt
52 Drive tension pulley
53 Idle pulley 32/36
54 Idle gear 30
55 Middle roll winding clutch
56 Roll drive gear 16
57 Roll drive gear 40
58 Roll drive gear 26
59 Roll drive gear 26
60 Developer spiral roller gear 23
61 Cleaning section drive gear 25
62 Roll unit pulley
63 Roll unit belt
64 Drum tension pulley
65 Idle pulley 21
66 Roll unit pulley
67 Idle gear 40
68 Roll flange
69 Flange pulley 36
70 Pre-transfer drive pulley 32
71 Idle gear 30
72 Middle feed clutch
73 Developer gear 20
74 Idle gear 30
75 Duplex gear 32
76 Idle gear 25
77 Idle gear 25
78 Drive gear 20T
79 Pre-transfer drive pulley 32
80 Flange pulley 36
81 Roll winding drive belt
82 Drive tension pulley
83 Idle pulley 32/36
84 Idle gear 30
85 Lower roll winding clutch
86 Roll drive gear 16
87 Roll drive gear 40
88 Roll drive gear 26
89 Roll drive gear 26
90 Developer spiral roller gear 23
91 Cleaning section drive gear 25
92 Roll unit pulley
93 Roll unit belt
94 Drum tension pulley
95 Idle pulley 21
96 Roll unit pulley
97 Idle gear 40
98 Roll flange
99 Flange pulley 36
100 Pre-transfer drive pulley 32
101 Idle gear 30
102 Lower feed clutch
103 Developer gear 20
104 Idle gear 30
105 Duplex gear 32
106 Idle gear 25
107 Idle gear 25
108 Drive gear 20T

* 21 to 39 and 42 are present when the upper roll unit (optional) is installed.

(2) Drive system 2 (driven by the drum motor and fixing motor)

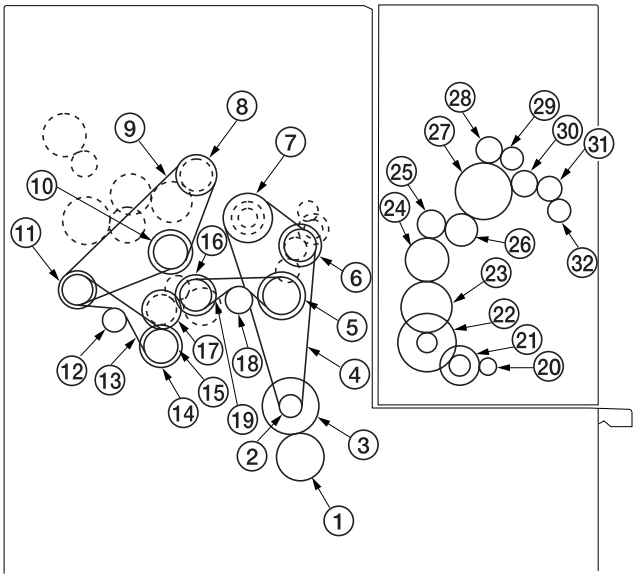
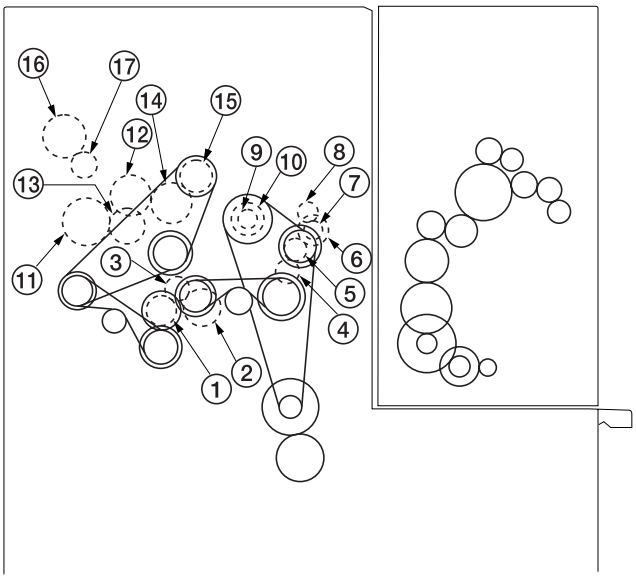


Figure 1-1-7

① Drum motor gear 40
② Drum drive pulley 17
③ Drum drive gear 40
④ Drum drive belt
⑤ Cleaning section drive pulley 36/22
⑥ Idle pulley 32
⑦ Drum drive pulley 40
⑧ Developing unit drive pulley 30
⑨ Developing unit drive belt
⑩ Idle pulley 32
⑪ Main pulley 24/32
⑫ Drive tension pulley
⑬ Pre-transfer drive belt
⑭ Transfer pulley 32
⑮ Transfer gear 30
⑯ Pre-transfer drive pulley 32
⑰ Transfer drive gear 32
⑱ Drive tension pulley
⑲ Cleaning section drive belt
⑳ Fixing motor gear
㉑ Idle gear 21/72
㉒ Idle gear 21/63
㉓ Drum drive gear 40
㉔ Gear 35
㉕ Eject idle gear 20
㉖ Idle gear 24
㉗ Heat roller gear 42
㉘ Idle gear 20
㉙ Oil roller gear 16
㉚ Idle gear 20
㉛ Eject idle gear 20
㉜ Eject roller gear 17

(3) Drive system 3 (driven by the main motor and toner motor)



① Pre-transfer drive gear 22
② Pre-transfer gear 30
③ Idle gear 20
④ Idle gear 20
⑤ Idle gear 20
⑥ Post-developing gear 25
⑦ Gear 18
⑧ Gear 17
⑨ Drum joint
⑩ Drum flange
⑪ Roller mix gear
⑫ Registration gear 31
⑬ Developer paddle gear
⑭ Developer roller gear
⑮ Developing unit drive gear 25
⑯ Toner gear 34
⑰ Toner motor gear 20

Figure 1-1-8

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 not higher than 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 touch the drum surface with any object. Protect it from bare or gloved hands; if it is accidentally touched, or stained with oil, clean it.

1-2-2 Storage of developer and toner

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

1-2-3 Handling of the heaters (for 120 V specifications only)

This copier is equipped with heaters to avoid condensation inside. These heaters can be individually turned on or off with a switch. If plain paper or film is kept in the roll units and there is a risk of high humidity, keep their heaters on.

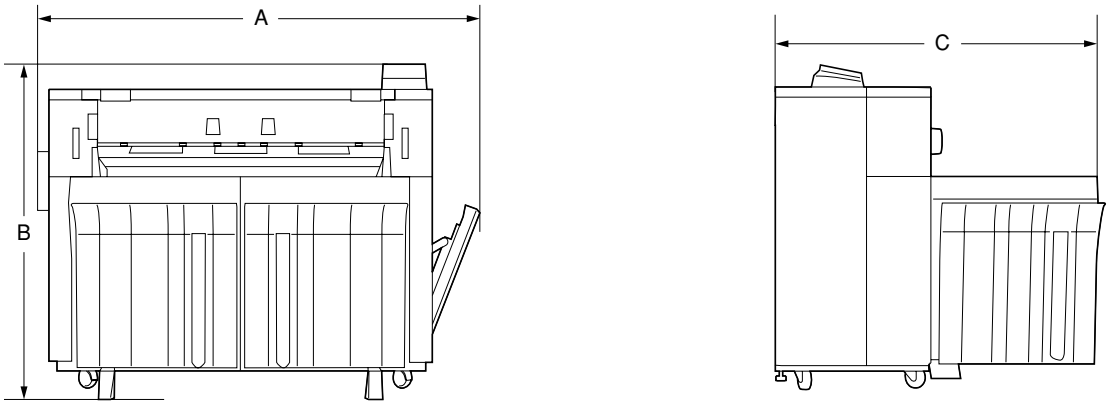
1-2-4 Paper

1. Acceptable paper
   - From the upper roll unit*, middle roll unit and lower roll unit
     Roll of plain paper (64 – 80 g/m^2), vellum and film with a width of 210 – 920 mm, outer diameter of 180 mm maximum and inner diameter of 76 mm.
   - From the bypass table
     Sheet of plain paper (64 – 80 g/m^2), vellum and film of A0 – A4R size (36" × 48" – $8^1/_2$ × 11") or width of 210 – 920 mm and length of 297 – 6000 mm.
     Other types of paper than the above or stapled sheets of paper cannot be used. If paper is creased, folded or torn, cut off that part before using.
     * Optional

2. Storage of paper
   Paper should be stored in a cool, dark place free from direct sunlight, 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. Vellum must be kept in a sealed vinyl bag.

1-2-5 Installation environment

1. Temperature: 10°C – 35°C/50°F – 95°F
2. Humidity: 15% – 85% RH
3. Power source: 120 V AC, 14 A/230 V AC, 7 A
4. Power source frequency stability: 50 Hz ± 0.3%/60 Hz ± 0.3%
5. Installation location
   - Avoid locations with direct sunlight or bright areas such as near windows or with strong lighting. Be sure to avoid letting direct sunlight or strong 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 0.3°).
   - Avoid atmosphere laden with substances that might chemically damage 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.
6. 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.

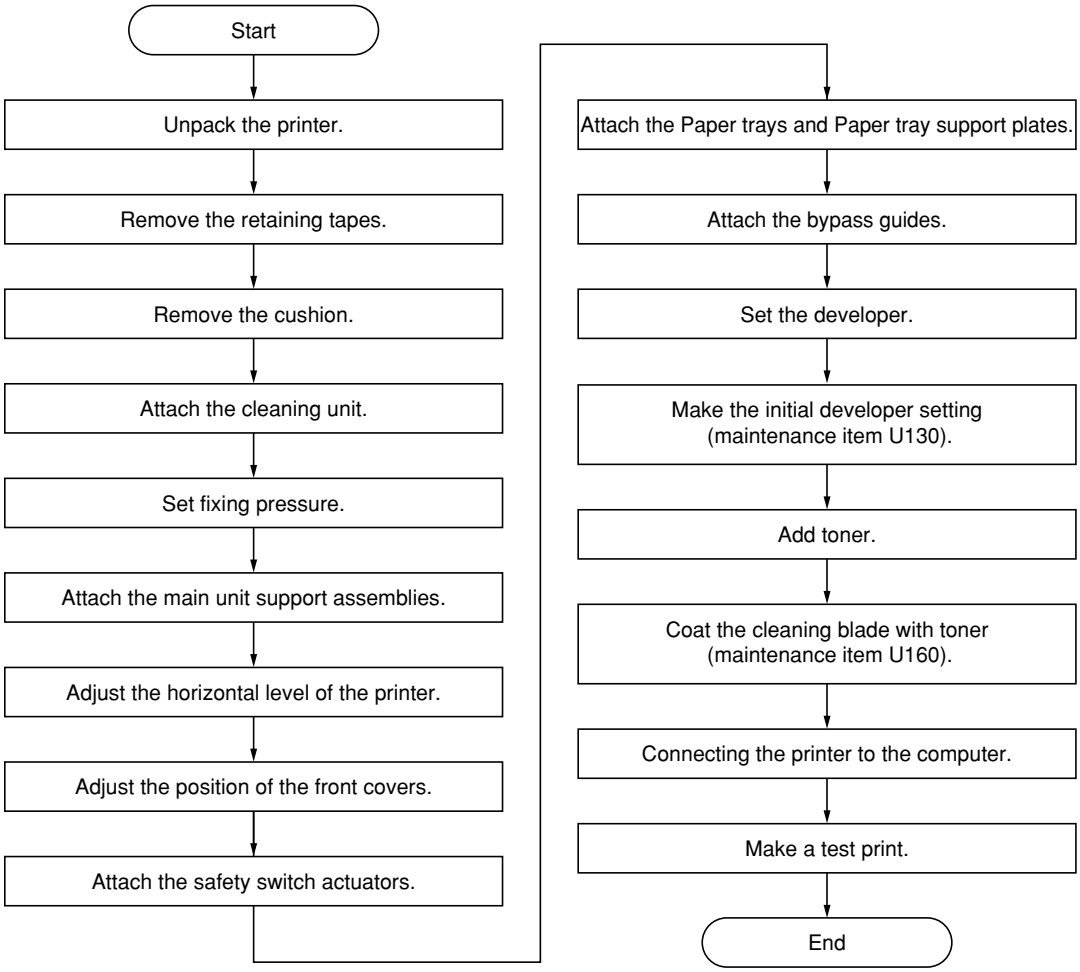


A: 1555 mm/63 1/2"
B: 1095 mm/43 1/8"
C: 1073 mm/43 13/16"

Figure 1-2-1 Installation measurements

1-3-1 Unpacking and installing the printer

(1) Installation procedure



Unpack the printer.

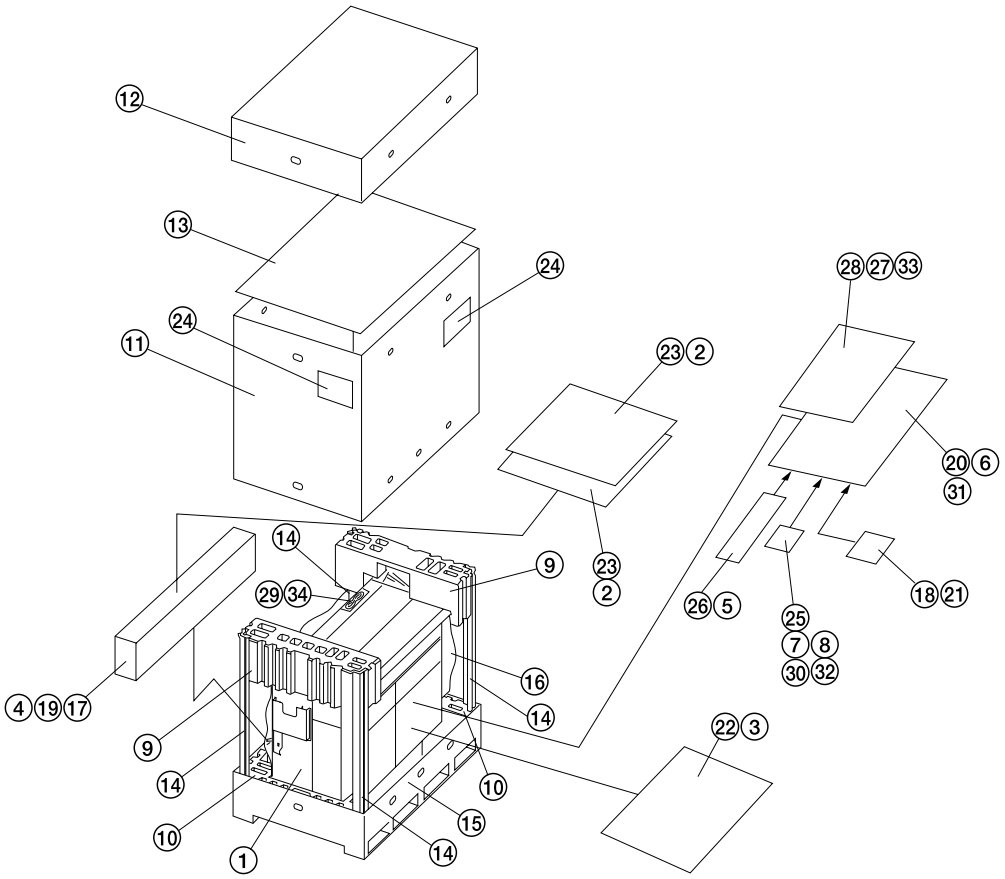


Figure 1-3-1 Printer package

① Machine body
② Paper trays
③ Roll flanges
④ Main unit support assemblies
⑤ Paper tray support plates
⑥ Flange handle
⑦ Hinge joints
⑧ M4 × 08 TP-A chrome screws
⑨ Top pad
⑩ Bottom pad
⑪ Outer case
⑫ Top case
⑬ Top board
⑭ Props
⑮ Skid
⑯ Dust cover
⑰ Accessory case
⑱ Air cap bag
⑲ Air cap bag
⑳ Air cap bag
㉑ Bypass guides
㉒ Air cap bag
㉓ Air cap bag
㉔ Barcode label
㉕ Vinyl bag
㉖ Polyethylene bag
㉗ Operation guide
㉘ Polyethylene bag
㉙ Power cord (230 V)
㉚ Safety switch actuators
㉛ Stopper labels
㉜ BVM3 × 05 cross-head bronze binding screws
㉝ CD-ROM
㉞ Air cap bag

Remove the retaining tapes.

1. Remove the tape retaining the air cap bag.
2. Remove the two tapes retaining the power cord and then the tape binding the cord. (For 120 V specifications only)
3. Remove the retaining tape from each main unit release lever.
4. Remove the four tapes retaining the front covers.
5. Remove the tape retaining the waste toner tank cover.

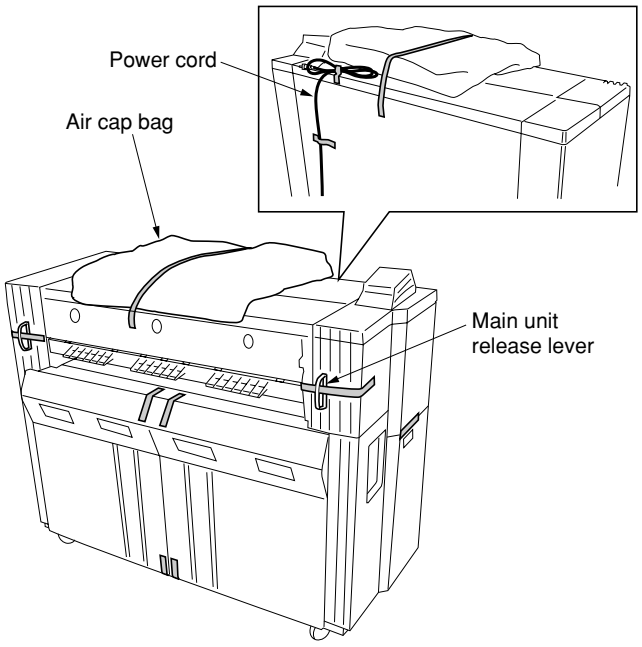


Figure 1-3-2

6. Remove the two tapes retaining the upper rear cover.
7. Pull the main unit release levers and open the detachable unit.
8. Close the detachable unit.
9. Open the front covers and remove the two tapes from each magnet.
10. Pull out the middle roll unit and remove the tape retaining the air cap bag with the original loop guide inside.
11. Pull out the lower roll unit and remove the tape retaining the air cap bag with the roll flange inside.
12. Close the front covers.

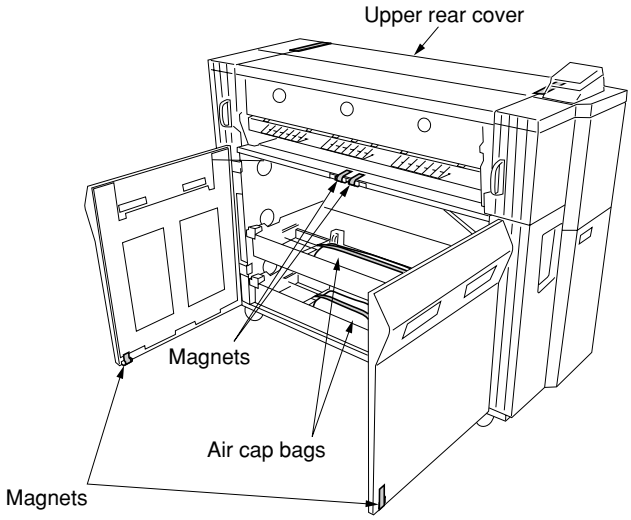


Figure 1-3-3

Remove the cushion.

1. Pull the main unit release levers and open the detachable unit.
2. Remove the cushion attached to the Transfer charger unit.
   * When transporting or moving the machine, be sure to reattach the cushion in advance.

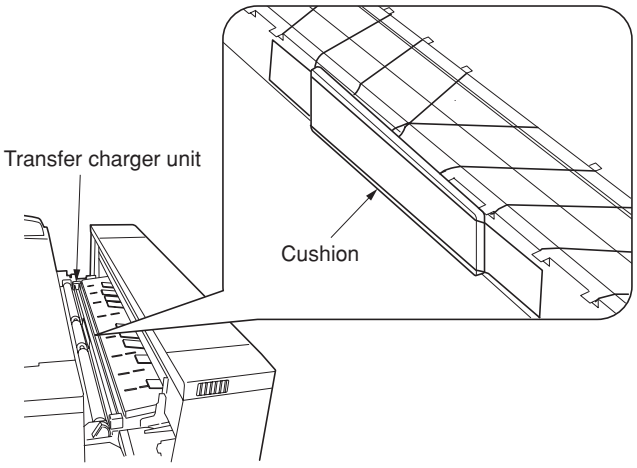


Figure 1-3-4

Attach the cleaning unit.

1. Remove the screw from each of the right and left cleaning unit retention stoppers.
2. Slide the right and left cleaning unit retention stoppers inward and release the cleaning unit.

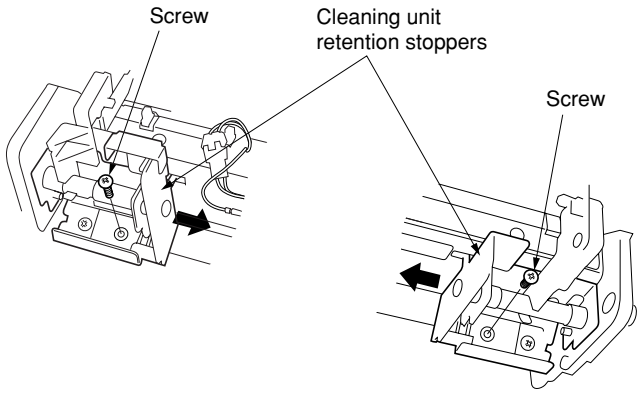


Figure 1-3-5

3. Move the right and left cleaning unit retention stays from hole A to hole B on each of the right and left side plates.
   * When retaining the cleaning unit, take care that your fingers are not caught by the left and right cleaning unit retention stoppers.

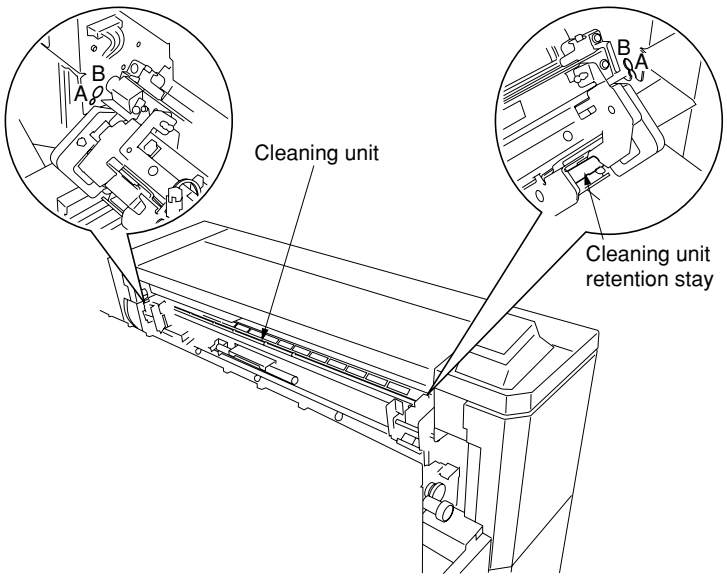


Figure 1-3-6

4. Secure the right and left cleaning unit retention stoppers using one screw removed in step 2 for each stopper.

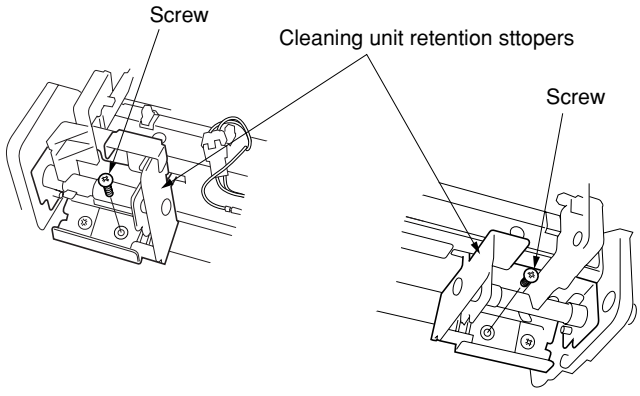


Figure 1-3-7

Set fixing pressure.

1. Set fixing pressure by rotating the fixing pressure adjustment nuts at the front and rear of the fixing unit clockwise until they are tight.

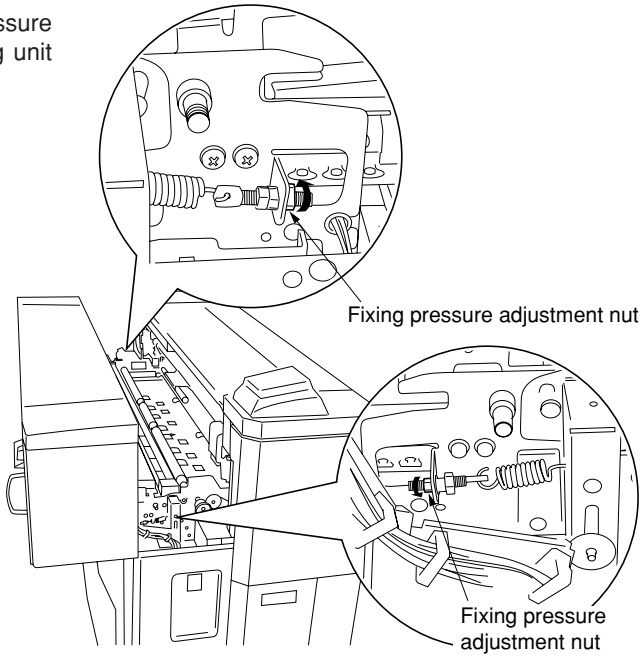


Figure 1-3-8

2. Push in the main unit release levers until closing the detachable unit.

Attach the main unit support assemblies.

1. Open the front covers.
2. Remove the screw retaining the main unit support assembly cover.
3. Attach the main unit support assembly to the lower right of the main unit using the four M4 × 08 TP-A chrome screws.
4. Attach the main unit support assembly to the lower left of the main unit in the same way.
5. Rotate the nuts of the main unit support assemblies and adjust the horizontal level.
   * Adjust the level with the casters of the main unit off the floor.

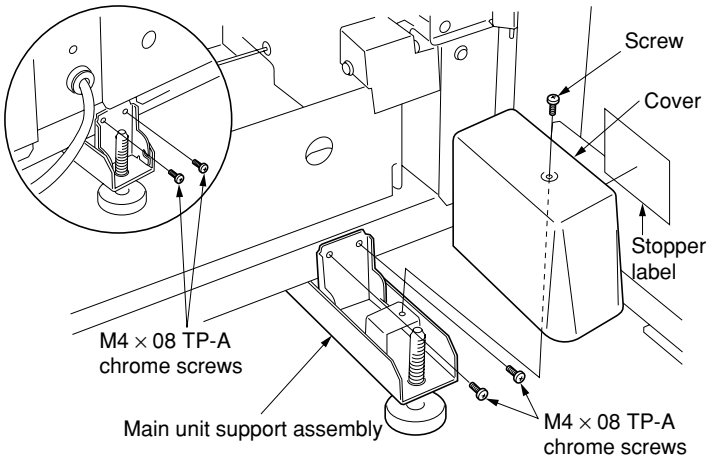


Figure 1-3-9

Adjust the horizontal level of the printer.

1. Place three levels on the center, right and left of the machine body and check that the unit is level in all directions.
2. After any leveling adjustments, reattach the main unit support assembly covers using one screw for each cover.
3. Attach the stopper labels to the covers of the right and left main unit support assemblies.

Adjusting the position of the front covers.

1. Open and close the front covers and check that there are no problems.
2. In case of trouble, loosen the two screws on each of the top and bottom hinges, adjust the front cover position and then retighten the screws.

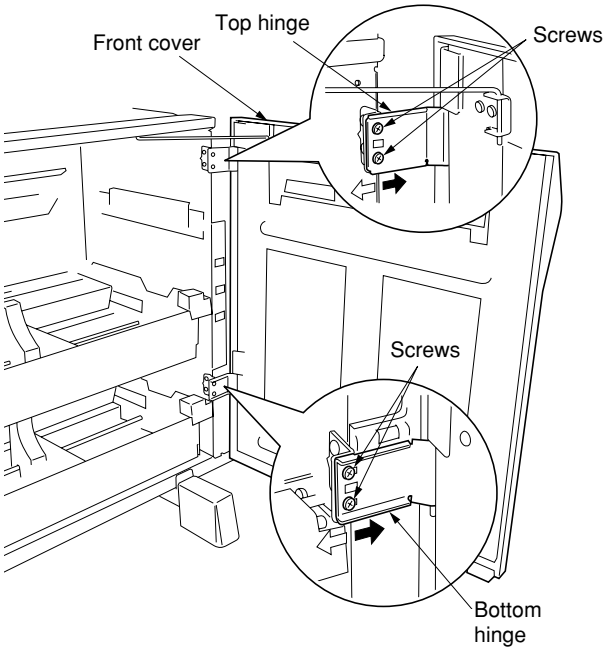


Figure 1-3-10

Attach the safety switch actuators.

1. Temporarily set the safety switch actuator onto the left and right front covers using a BVM3 × 05 cross-head bronze binding screw for each.
2. Adjust the positions of the safety switch actuators so that the switches are turned on upon closing the front covers, and then tighten the screws.

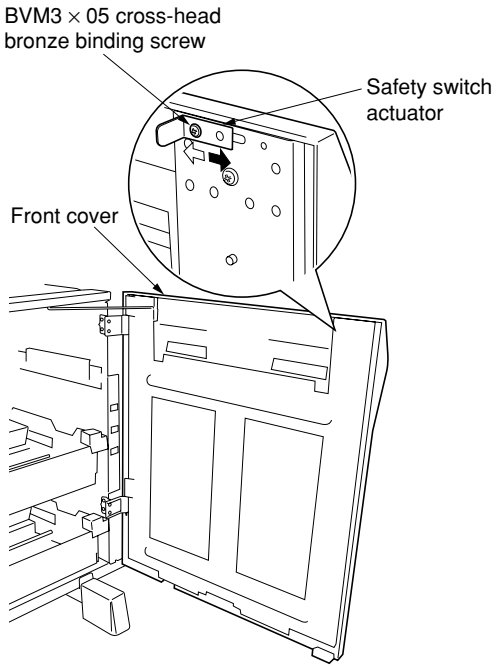


Figure 1-3-11

Attach the paper trays and paper tray support plates.

1. Attach the paper tray support plates to the front covers with the projections on the paper tray support plates fitting into the grooves on the front covers.

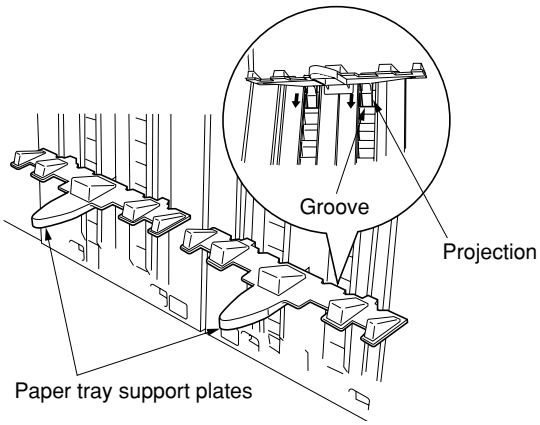


Figure 1-3-12

2. Attach the paper trays to the front covers using the two hinge joints for each tray.

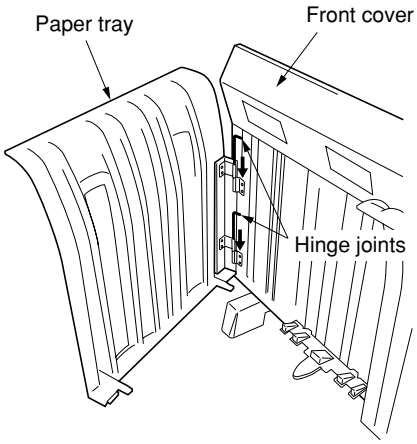


Figure 1-3-13

Attach the bypass guides.

1. Attach the bypass guides to the bypass table.

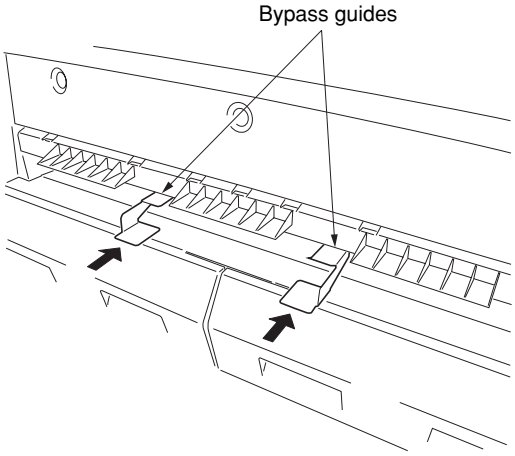


Figure 1-3-14

Set the developer.

1. Open the toner replenishing slot.
2. Remove the screw, the connector protective cover and then the 5-pin connector.
   * Always turn the main switch off before removing and connecting the 5-pin connector.
3. Remove the five screws and then the upper rear cover.

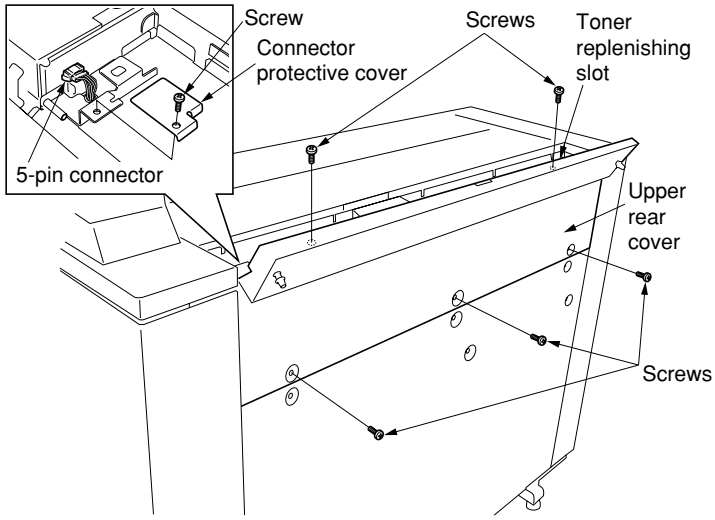


Figure 1-3-15

4. Remove the two blue screws, the right and left connectors and then the developing unit.

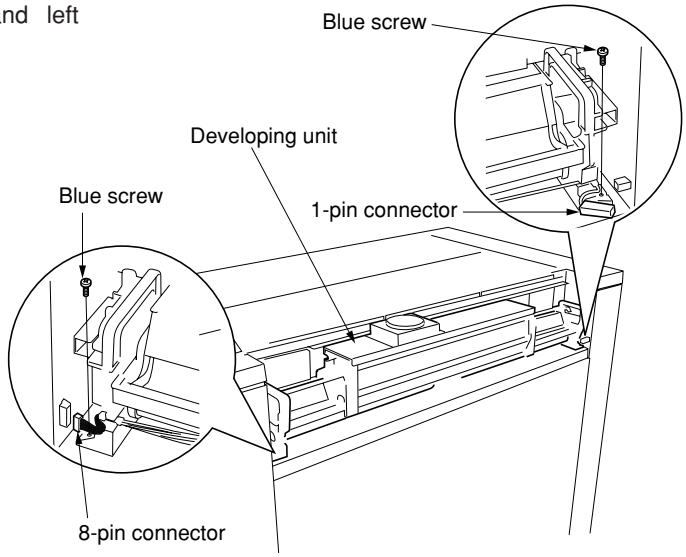


Figure 1-3-16

5. Remove the two pins and 2-pin connector and then the toner hopper unit.

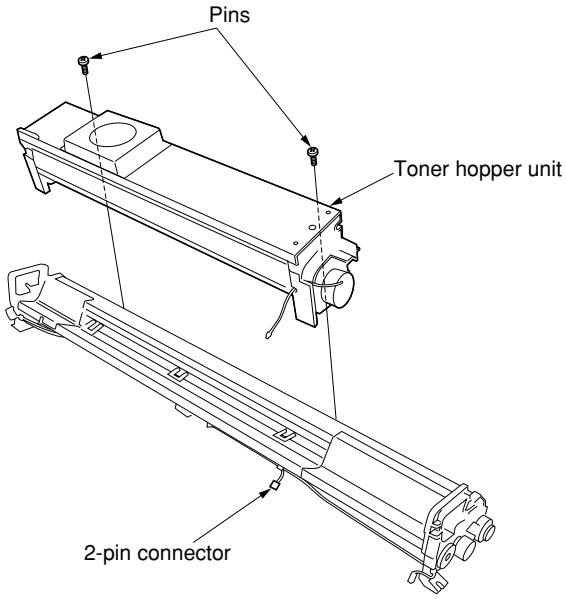


Figure 1-3-17

6. Align the developing unit with the guide and insert into the main unit.
7. Lower the developing unit securing lever until it locks, and connect the right and left connectors.

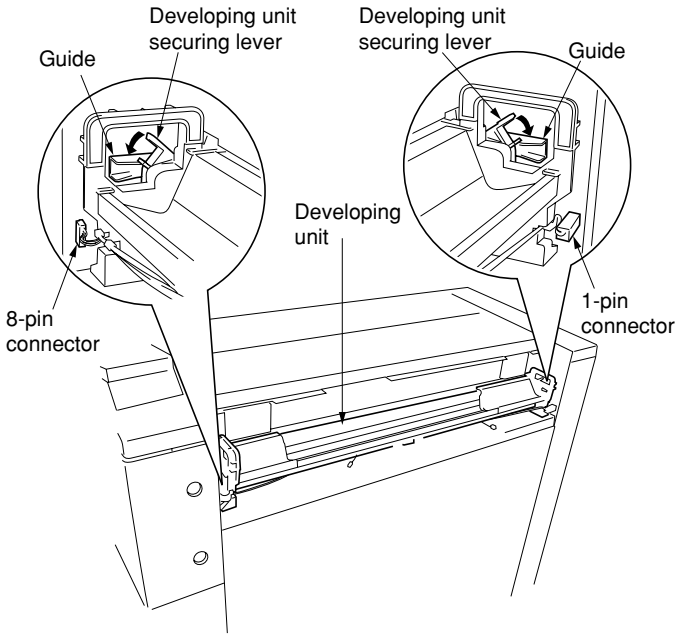


Figure 1-3-18

8. Shake the bottle of the developer well to mix the developer.
9. Connect the power cord to the wall outlet.
10. Turn the main switch on and enter the maintenance mode (see page 1-4-1).
11. Select “030” using the cursor up/down keys and press the Start key.
12. Select “Drive Mot” using the cursor up/down keys and press the Start key.
    * The machine drive starts.
13. Pour two bottles of developer into the developing unit being careful to spread the developer evenly across the unit.

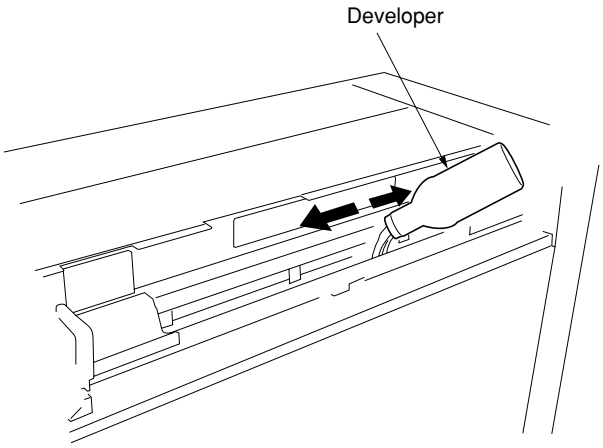


Figure 1-3-19

14. After pouring the developer, press the stop/clear key.
    * The machine drive stops.
15. Turn the main switch off.
16. Remove the right and left connectors from the developing unit.
17. Raise the developing unit securing lever. Release the developing unit and remove from the main unit.
18. Attach the toner hopper unit to the developing unit using the two screws and connect the 2-pin connector.
19. Reattach the upper rear cover.
20. Connect the 5-pin connector and attach the connector protective cover.

Make the initial developer setting (maintenance item U130).

1. Pull the main unit release levers. Turn the main switch on while the detachable unit is open and enter the maintenance mode (see page 1-4-1).
2. Push in the main unit release levers until closing the detachable unit.
3. Select “130” using the cursor up/down keys and press the Start key.
4. Press the Start key.
   * Unit drive will stop in 3 minutes. The toner sensor output and the toner control voltage reference will be displayed.

   Example:

   U130
   95 118 118
   ① ② ③

   ① Toner sensor output value
   ② Toner sensor control voltage
   ③ Automatic setting of the toner sensor control voltage

   Setting range: 105 to 135 (reference)
5. Press the Stop key.

Add toner.

1. Shake the bottle of toner well to mix toner.

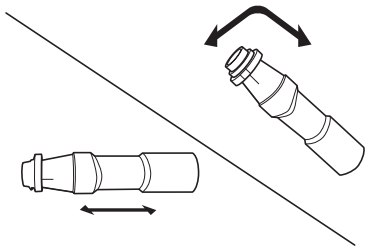


Figure 1-3-20

2. Uncap the toner bottle. Open the toner replenishing slot and place the bottle over the cartridge slot. Then, turn the bottle in the direction in the arrow.
3. Make sure that all of toner has been poured out of the bottle and then pull the bottle away from the machine.
4. Close the toner replenishing slot.

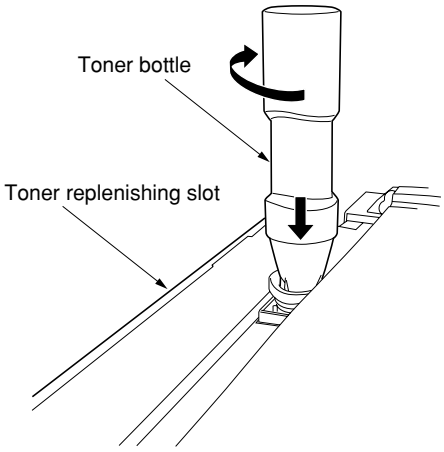


Figure 1-3-21

Coat the cleaning blade with toner (maintenance item U160).

1. Select “160” using the cursor up/down keys and press the Start key.
2. Select “Execute” using the cursor up/down keys and press the Start key.
3. Pull the main unit release levers to open the detachable unit. Loosen the screw retaining the cleaning blade retention stopper, slide the stopper to the left and then retighten the screw.
4. Push in the main unit release levers until closing the detachable unit.
   * The cleaning blade will be coated with toner.
5. After the machine drive stops, press the Stop key. Select “001” using the cursor up/down keys and press the Start key to exit the maintenance mode.

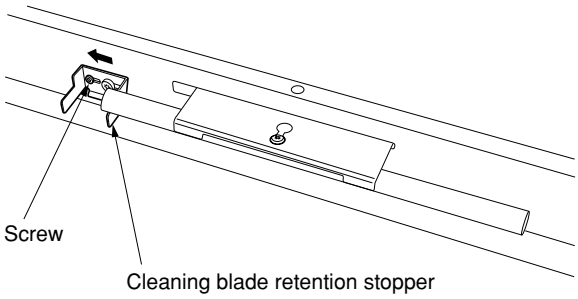


Figure 1-3-22

Connecting the printer to the computer.

1. There are various ways of connecting the printer to the computer.

Make a test print.

1. Load paper and make a test print.

The printer is now installed.

1-3-2 Print mode initial settings

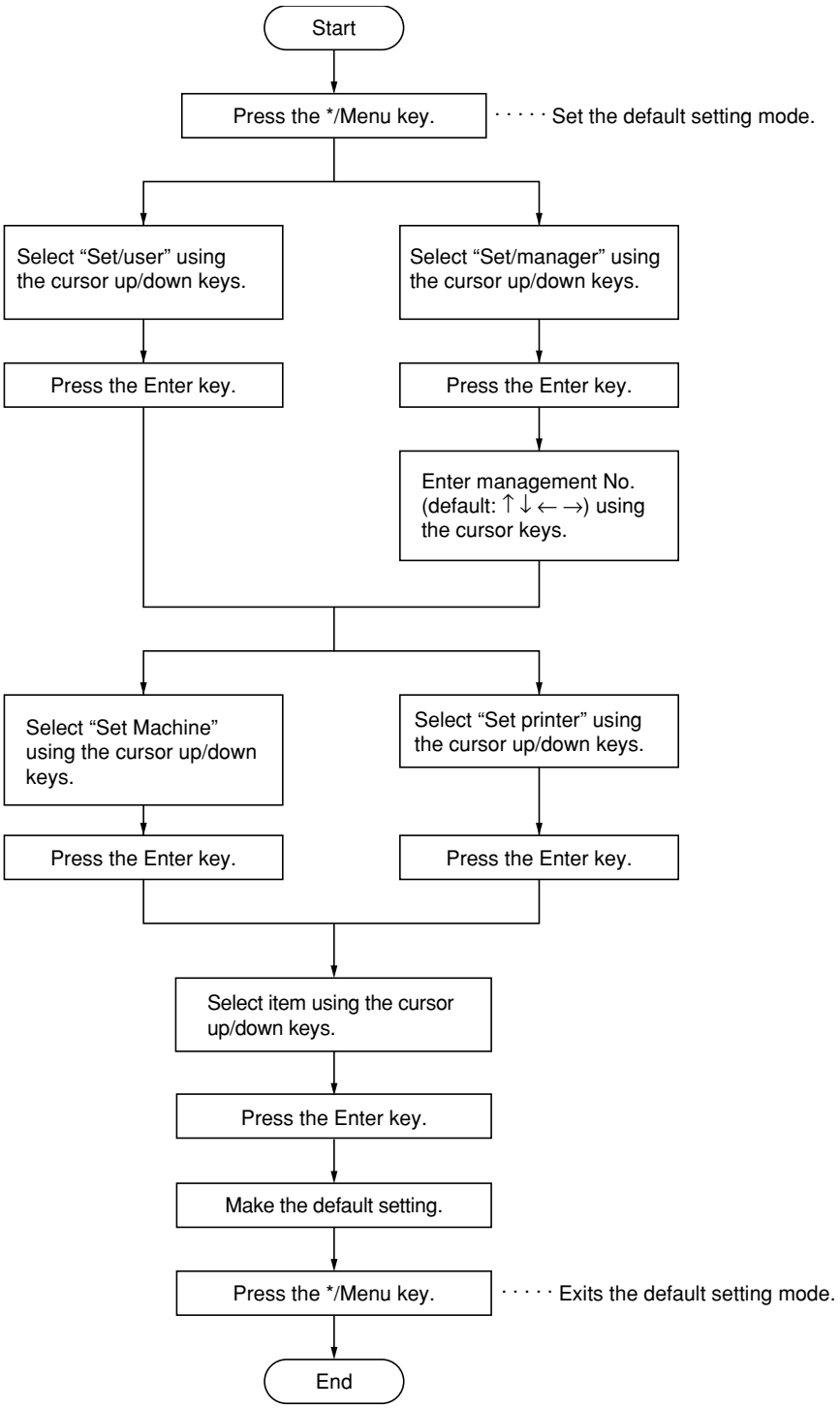
The factory settings for this machine are as shown below.

Maintenance item No.	Contents	Setting at factory
U256	Auto Preheat Time	ON
U267	Adjusting the cutting length for the paper leading edge	Temp Change
U269	Selecting the timing for total counting	During Feed
U271	Setting the unit of counting	Total cnt: 1.0 Key cnt: 0.1
U273	Setting the maximum paper length	6000
U344	Setting the preheat (energy saving) mode	Energy save
User settings	Auto Shutoff	Auto Shut-off
	Auto preheat Time	15 min
	Auto Shutoff Time	90 min
	Size adjustment	0.0%
	Fusing temp.	Bond: 155°C Vellum: 175°C Film: 150°C
	Custom paper	Vellum
	Standard size	Architecture [A sizes]
	Auto roll over	OFF
	Buzzer	ON
	Mgr. code change	↑ ↓ ← →

1-3-3 User Settings

The user can make default settings that determines how the printer acts when the main switch is turned on . Default settings are categorized as “Set Machine” that determine the printer’s basic operations and “Set Printer” which determine operability. Default settings are also divided into “user” and “manager” defaults, this former being available to all users while this latter is restricted to only certain users. To make “manager defaults”, you need to input a management No.

(1) Default settings making procedure



(2) Making default settings

Machine default

Items common to user/manager

Paper width
1. Select a paper source and press the Enter key.
2. Select between “Auto size” and “Input size”, and press the Enter key.
3. If having selected “Input width”, input the width using the numeric keys and press the OK key.

Setting range: 210 to 920 mm (17" to 36")

Media type [Pre-set temp.]
1. Select between “ON” and “OFF”, and press the Enter key.

Paper type [Paper material]
First turn “ON” Paper working.
1. Select a paper source and press the Enter key.
2. Select a paper type and press the Enter key.

Paper type: Plain, Vellum, Film, Custom

Roll end
1. Select a paper type and press the Enter key.
2. Select between “Fixed” and “Unfix”, and press the Enter key.

Items for managers only

Auto Shutoff
1. Select between “Shut off mode” and “OFF”, and press the Enter key.

Timer Set

Auto Preheat Time
1. Select “Auto Preheat Time” and press the Enter key.
2. Select a time and press the Enter key.

Setting range: Any 5 min mark between 5 and 45 min
Set Auto Preheat Time shorter than Auto Shut-off Time.

Auto Shut-off Time
1. Select “Auto Shut-off Timer” and press the Enter key.
2. Select a time and press the Enter key.

Setting range: Any 5 min mark between 15 and 120 min

Size adjustment
1. Select a paper type and press the Enter key.

Paper type: Bond, Vellum, Film, Custom

2. Change the size and press the Enter key.

Setting range: –3.0 to +3.0%

Fusing temp.
1. Select a paper type and press the Enter key.

Paper type: Bond, Vellum, Film, Custom

2. Select a temperature and press the Enter key.

Plain: 145°C, 155°C, 165°C
Vellum: 165°C, 175°C, 185°C
Film: 150°C, 160°C, 170°C
Custom: Select a temperature based on settings in Custom paper adj.

Custom paper
1. Select “Custom” as the paper type and press the Enter key.
2. Select a fixing temperature and press the Enter key.
3. Adjust magnification and press the Enter key.

Standard size
1. Select between “A sizes (Architecture)” and “B sizes (Engineer)”, and press the Enter key.

Auto roll over
1. Select between “ON” and “OFF”, and press the Enter key.

Buzzer
1. Select between “ON” and “OFF”, and press the Enter key.

Mgr. code change
1. Enter a new 4-digit management No. using the cursor keys and press the Enter key.

1-3-4 Installation of the upper roll unit (option)

Procedure

1. Open the front covers and lift up the right and left front cover stoppers to remove them from the front covers.

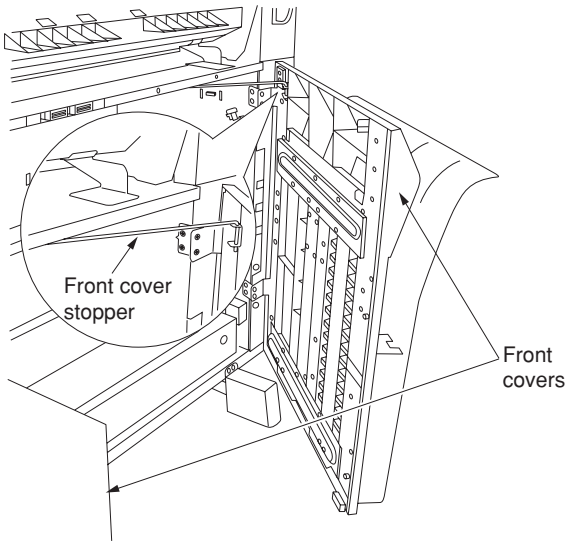


Figure 1-3-23

2. Slide the right and left front cover stoppers to remove them from the main body of the machine.
3. Lift up the front covers to remove them.

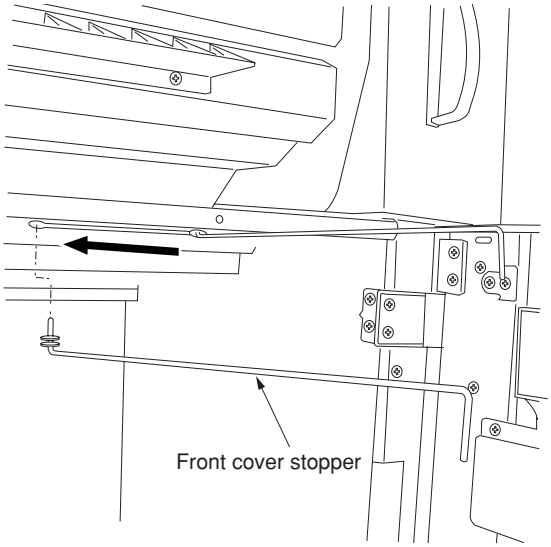


Figure 1-3-24

4. Pull the main unit release levers to open the detachable unit and remove the six screws to remove the left rear cover.

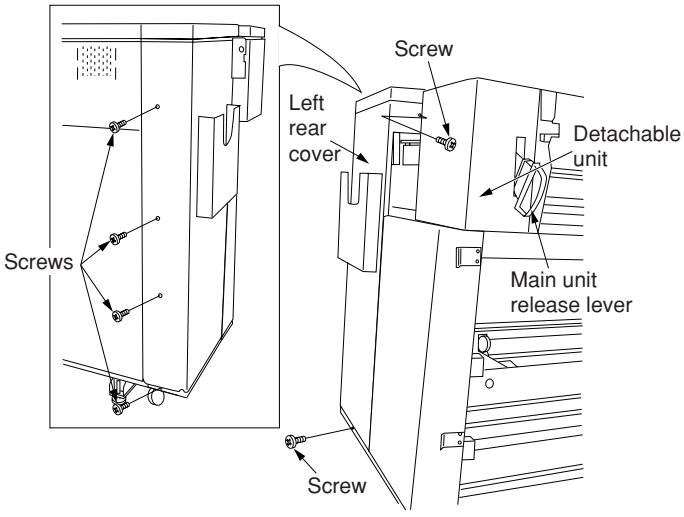


Figure 1-3-25

5. Remove the five screws to remove the left side cover.
6. Close the detachable unit.

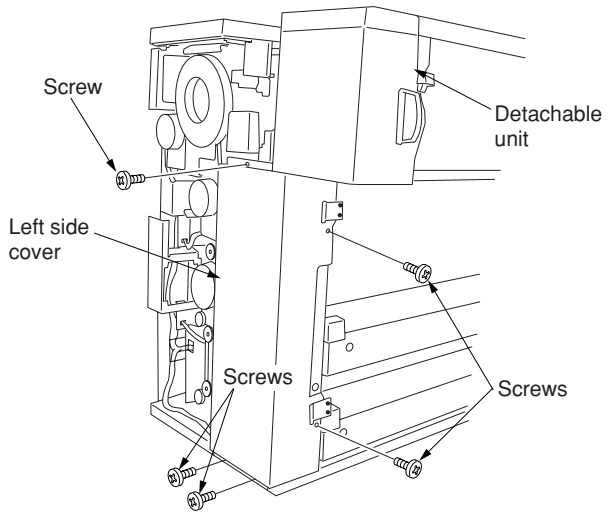


Figure 1-3-26

7. Remove the two screws to remove the roll drive cover.

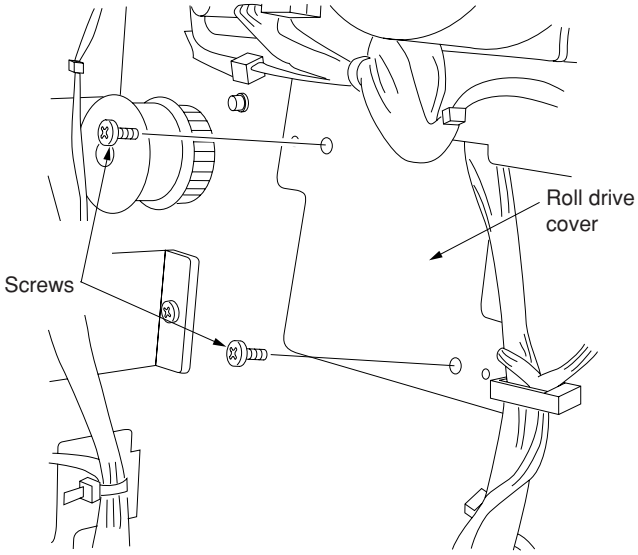


Figure 1-3-27

8. Fit the upper winding drive assembly to the location to which the roll drive cover has been attached using the two screws that have been removed in step 7 while hanging the belt on the pulley.
   * Fit it by pressing it down.

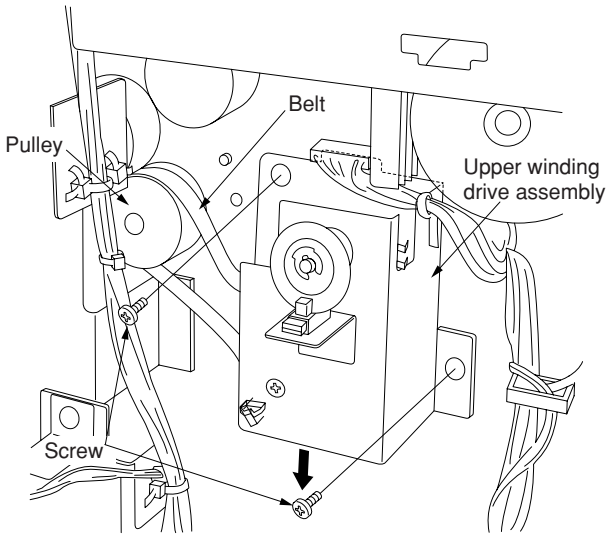


Figure 1-3-28

9. Fit the tension plate paper feed assembly using a drum lift pin.
10. Fit the blade spring to the tension plate paper feed assembly and the drum motor assembly.

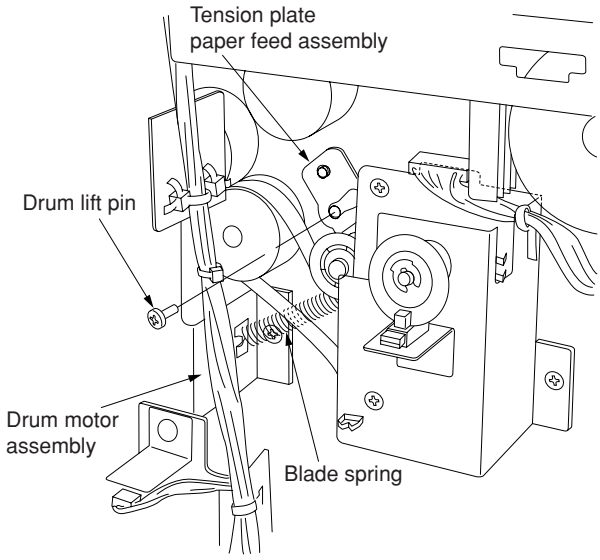


Figure 1-3-29

11. Fit the feed clutch and secure it using the stopper.
12. Connect the 2-pin connector of the feed clutch.

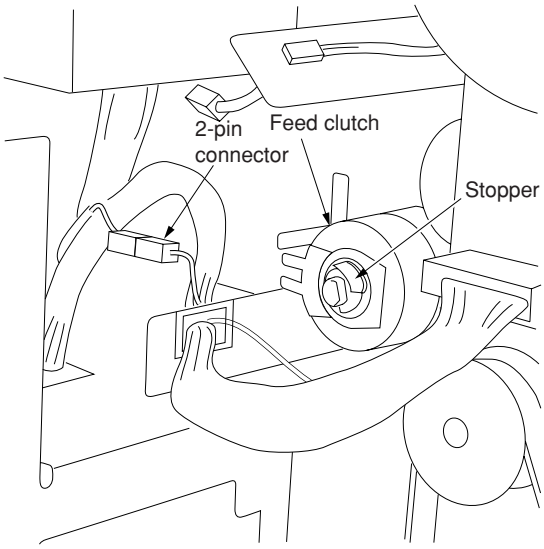


Figure 1-3-30

13. Connect the 3-pin connector and the 2-pin connector of the upper winding drive assembly.

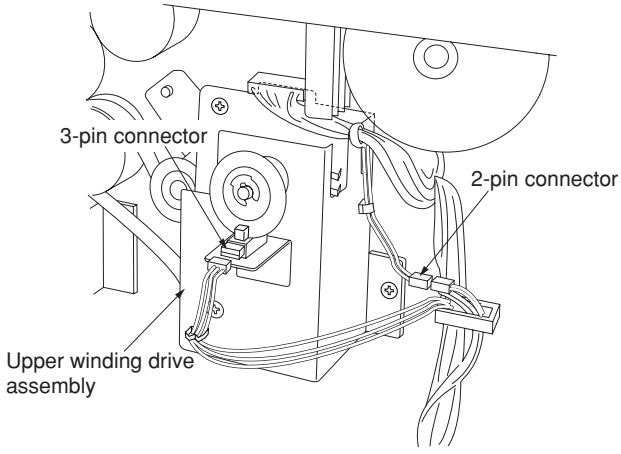


Figure 1-3-31

120V models only

14. Pull out the roll unit of the main body, fit the upper roll unit heater to the roll guide plate from the front of the machine using two M4 × 06 bronze binding screws, insert the two cable ties into the holes of the roll guide plate, and secure them to tie the harness.

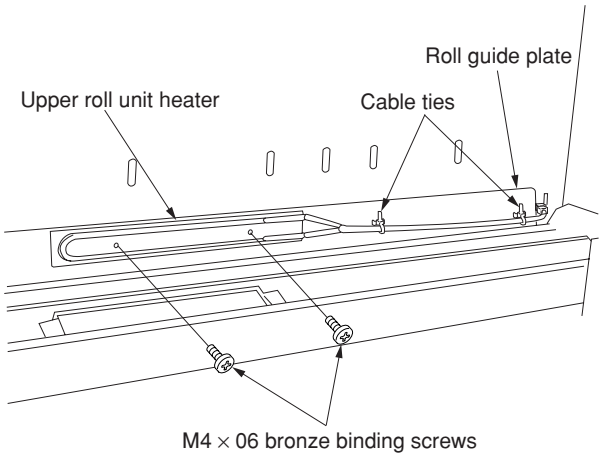


Figure 1-3-32

15. Connect the connector of the upper roll unit heater to the connector of the main body of the machine and fit the heater connector cover using a M4 × 06 bronze binding screw.
16. Paste the high temperature caution label.

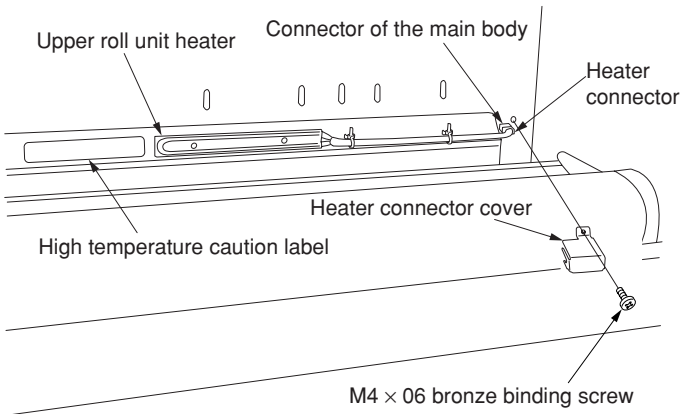


Figure 1-3-33

17. Keeping the right slider assembly and the left slider assembly pulled out, fit them to the side plates at the lower location using two M4 × 06 bronze binding screws respectively.

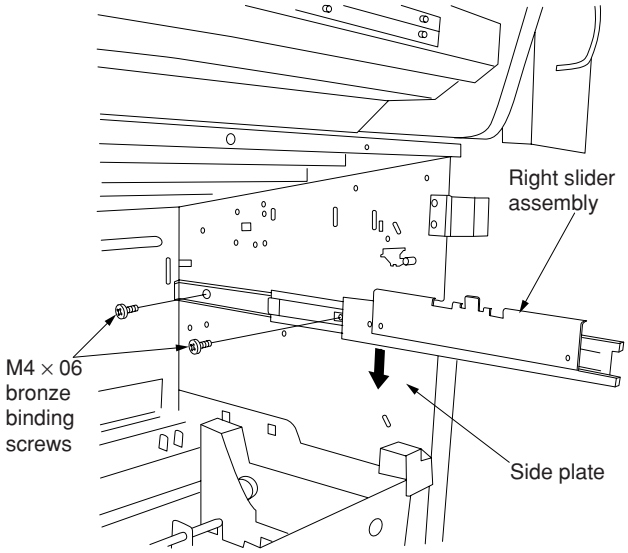


Figure 1-3-34

18. Hang the upper size detection assembly on the two spot sections of the roll guide and secure it using two M4 × 06 bronze binding screws.
19. Connect the connector of the upper size detection assembly.

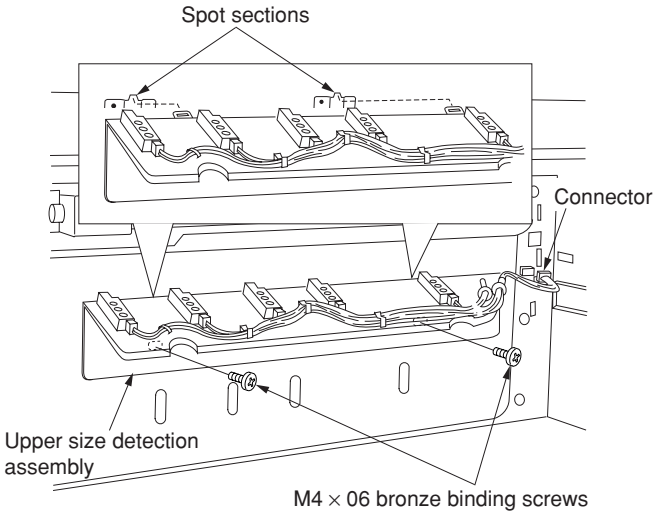


Figure 1-3-35

20. Fit the roll drive gear 40 to the pin located inside the left side plate and secure it using the E ring.

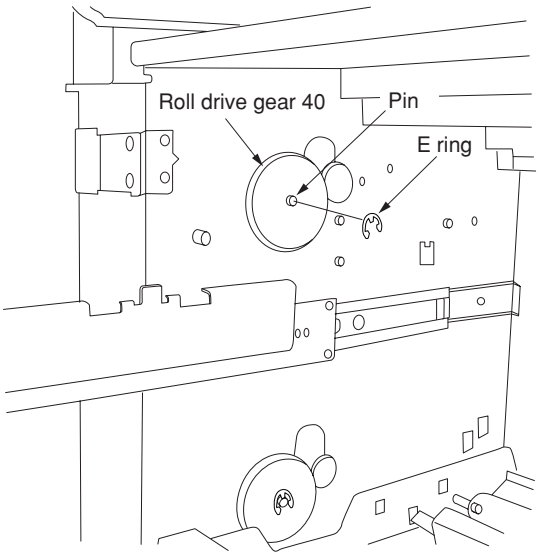


Figure 1-3-36

21. Pull out the right slider assembly and the left slider assembly that have been fitted, place the upper roll unit on the assemblies, and secure it to them from above using two M4 × 06 bronze binding screws respectively.
    * When carrying the upper roll unit, be sure to grasp the lower portions of the right and left side plates. Grasping the guide plate for carrying may cause deformation of the guide plate, resulting in malfunctions.

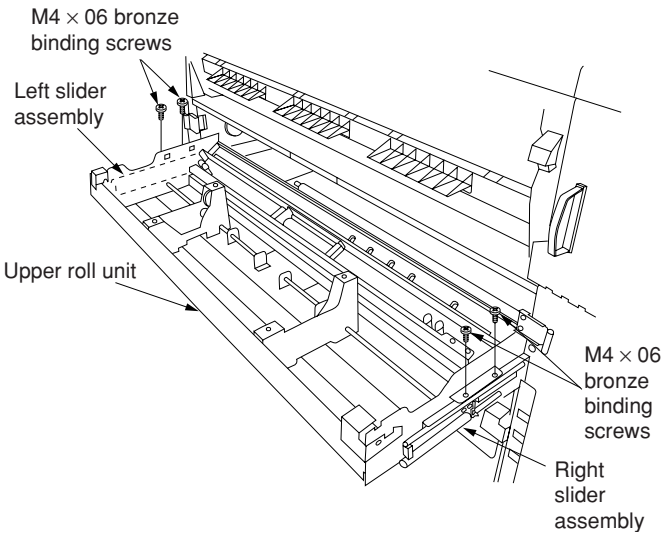


Figure 1-3-37

22. Insert the roll flanges into the right and left portions of the paper and turn the levers of the roll flanges in the direction indicated by the arrow to secure them.
23. Set the paper in the upper roll unit and insert the upper roll unit securely into the main body of the machine.
24. Refit the covers that have been removed to their original positions.

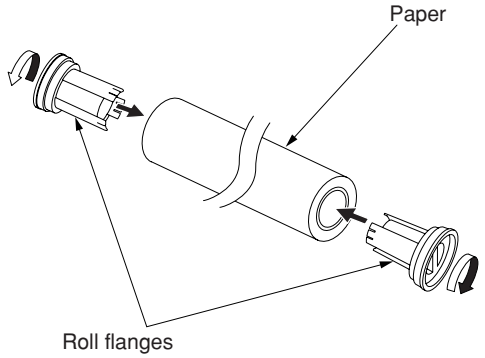


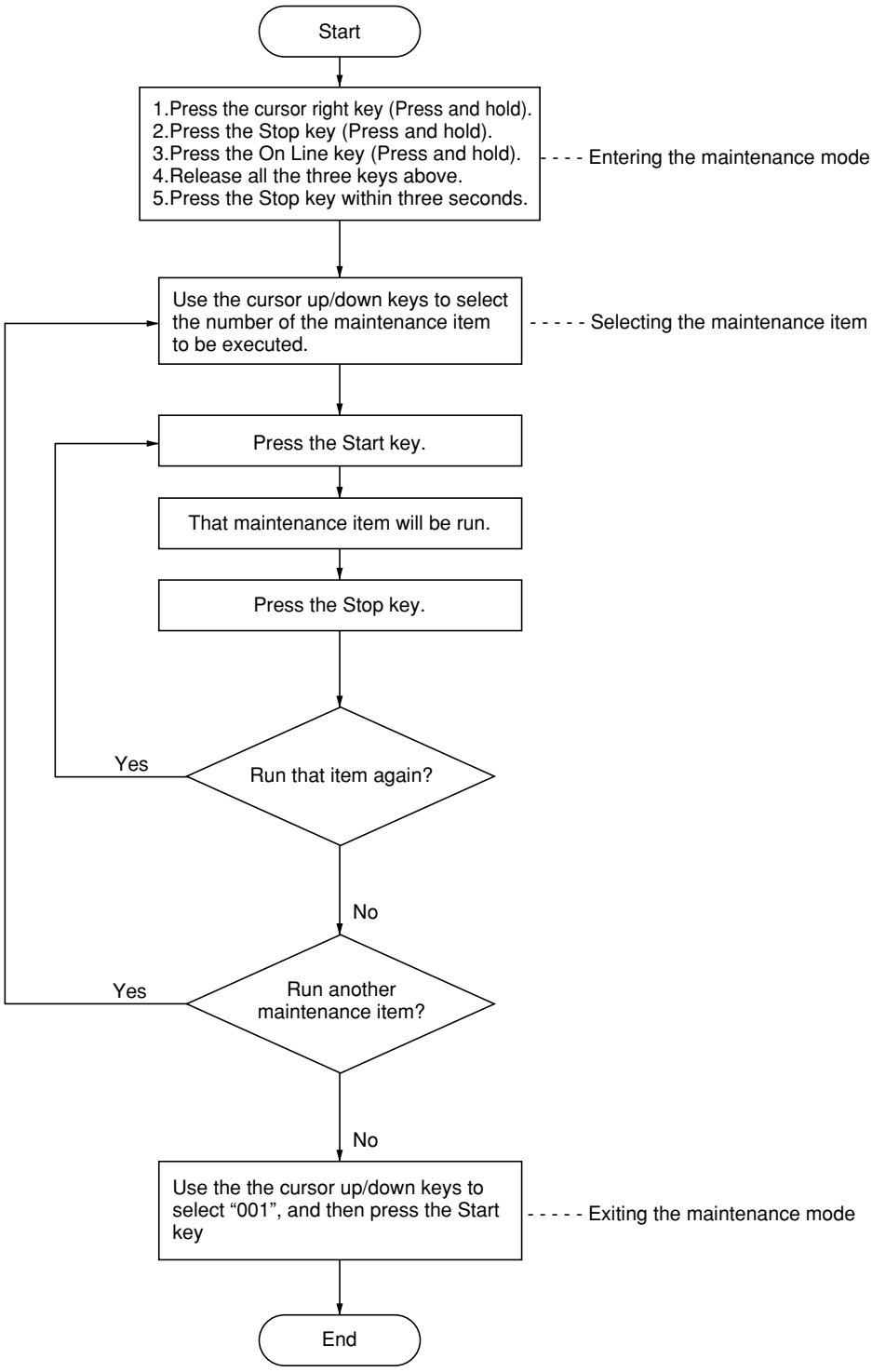
Figure 1-3-38

25. Turn the main switch on and enter the maintenance mode.
26. Run maintenance item U272 and set the optional roll unit setting to “ON”.
27. Exit the maintenance mode.
28. Make a test copy to check the operation.

1-4-1 Maintenance mode

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

(1) Executing a maintenance item



(2) Maintenance mode item list

Section	Item No.	Content of maintenance item	Initial setting*
General	U000	Printing out an own-status report	———
	U001	Exiting the maintenance mode	———
	U003	Setting the service telephone number	———
	U004	Setting the machine model number	———
	U019	Displaying the ROM version	———
Initialization	U020	Initializing all data	———
Drive, paper feed, paper conveying and cooling systems	U030	Checking the operation of the motors	———
	U031	Checking switches for paper conveying	———
	U032	Checking the operation of the clutches	———
	U033	Checking the operation of the solenoids	———
	U034	Adjusting the print start timing	Roll Tim: 0 Byps Tim: 0
	U037	Checking the operation of the fan motors	———
	U038	Checking safety switches	———
	U039	Adjusting printing magnification	Plain main: 0 Plain sub: 0 Vellum main: 0 Vellum sub: 0 Film main: 0 Film sub: 0
	U041	Adjusting the standard cut length	Plain-R1-S: 0 Plain-R1-M: 0 Plain-R1-L: 0 Plain-R2-S: 0 Plain-R2-M: 0 Plain-R2-L: 0 Plain-R3-S: 0 Plain-R3-M: 0 Plain-R3-L: 0 Vellum-R1-S: 0 Vellum-R1-M: 0 Vellum-R1-L: 0 Vellum-R2-S: 0 Vellum-R2-M: 0 Vellum-R2-L: 0 Vellum-R3-S: 0 Vellum-R3-M: 0 Vellum-R3-L: 0 Film-R1-S: 0 Film-R1-M: 0 Film-R1-L: 0 Film-R2-S: 0 Film-R2-M: 0 Film-R2-L: 0 Film-R3-S: 0 Film-R3-M: 0 Film-R3-L: 0
	U045	Checking paper size switches	———

* Initial setting when executing maintenance item U020.

Section	Item No.	Content of maintenance item	Initial setting*
High voltage	U100	Setting the drum surface potential	Setting Grid: 158 Setting Target: 200 Setting LPH: 7
	U101	Turning the transfer/separation charger on	———
	U105	Forcing the cleaning lamps to be turned on	———
	U111	Checking/Clearing the drum drive time	0
	U129	Turning potential correction on/off	ON
Developing	U130	Initial setting for the developer	———
	U131	Changing the initial setting for the developer	120
	U132	Forcing toner to be replenished	———
	U135	Checking the operation of the toner feed motor	———
	U139	Displaying thermistor temperatures	———
	U140	Adjusting the developing bias	———
	U155	Displaying the toner sensor output	———
	U156	Changing the toner density control data	Offset: 0
	U157	Checking/Clearing the developing section drive time	0
	U158	Checking/Clearing the developing count	0
Fixing and cleaning	U160	Coating the cleaning blade with toner	———
	U162	Forced stabilization	———
	U163	Releasing the fixing section error state	———
	U196	Checking the operation of the fixing heater	———
	U199	Displaying the fixing unit thermistor temperatures	———
Operation panel/Optional units	U200	Turning all LEDs on	———
	U213	Checking the operation of the counters	———
	U214	Checking the upper roll unit	———
	U245	Checking messages	———
Mode setting	U250	Setting the maintenance cycle	3000 m
	U251	Checking/Clearing the maintenance count	0
	U252	Setting the region of use	Japan Metric
	U256	Turning the auto preheat function on/off	ON
	U262	Ignoring a call for service detection	———
	U267	Adjusting the cutting length for the paper leading edge	Temp Change
	U269	Selecting the timing for total counting	During Feed
	U271	Setting the unit of counting	Total cnt: 1.0 Key cnt: 0.1
	U272	Turning the upper roll unit option on/off	OFF
	U273	Setting the maximum paper length	6000 m
	U344	Setting the preheat (energy saving) mode	Energy save
Image processing	U450	Selecting the PG mode	———
	U451	PG gray printout	———
	U452	PG 16-level grayscale printout	———
	U461	Adjusting the focus and measuring the solid-black density	———
	U462	Printing PG to check LPH operation	

* Initial setting when executing maintenance item U020.

Section	Item No.	Content of maintenance item	Initial setting*
Other	U901	Checking/Clearing total print counts by paper feed location	0
	U903	Checking/Clearing the paper jam counts	0
	U904	Checking/Clearing the call for service counts	0
	U908	Checking/Clearing the total count	0
	U916	Clearing all counts	———

* Initial setting when executing maintenance item U020.

(3) Contents of maintenance mode items

Item No.	Description and Procedure
U000	**Printing out an own-status report** **Description** Prints out a list of the current settings of all maintenance items, and occurrences of paper jams and service calls. **Purpose** To check the current setting of the maintenance items, or the occurrences of paper jams and service calls. Before initializing or replacing the backup ROM, print out a list of the current settings of the maintenance items so that you can reenter the same settings after initialization or replacement. **Method** 1. Press the Start key. The screen that allows you to select the desired item will be displayed. 2. Use the cursor up/down keys to select the item that you want to print out.

Display	List to be printed out
Maintenance	List of the current settings of all maintenance items
JAM	List of paper jams
Service call	List of service calls
User default	List of current user settings

3. Press the On Line key. The test print screen will be displayed.
4. Press the Start key. The selected list will be printed out.

Maintenance

```
    TEMPERATURE                          27
000:SELF STATUS REPORT
001:RETURN TO NORMAL COPY MODE
003:SET TELEPHONE NUMBER
004:MACHINE NUMBER SET            000000
005:COPY WITHOUT PAPER FEED1
019:ROM VERSION   CTRL.E,M,S,F    68050A  68060A  68070A  68080A
        BOOT E,M,S,OPTION FONT    01130A  01150A  01140A  0000
020:INITIALIZE ALL MEMORY
030:DRIVE MOTORS ON
.....................................
.....................................
.....................................
```

JAM

```
J-10: 0000  BYPASS NO FEED
J-11: 0000  PAPER FEED 1 NO FEED
J-12: 0000  PAPER FEED 2 NO FEED
J-13: 0000  PAPER FEED 3 NO FEED
J-30: 0000  BYPASS REGISTRATION
J-31: 0000  ROLL REGISTRATION
J-40: 0000  FIXING UNIT
J-50: 0000  EJECT SECTION
J-70: 0000  ORIGINAL CONVEYING
```

Service Call

```
C0110: 000  BACKUP MEMORY DATA
C0210: 000  S-CPU COMMUNICATION
C0220: 000  E-CPU COMMUNICATION
C0310: 000  H-CPU COMMUNICATION
C0620: 000  MEMORY
C0800: 000  IPU
C0850: 000  BACKUP MEMORY
C1300: 000  CUTTER MOTOR
C2201: 000  DRUM MOTOR
C5100: 000  MAIN CHARGER
.....................................
.....................................
.....................................
```

User default

```
*** MACHINE DEFAULT ***
M- 1 PAPER WIDTH ADJ.[DRAWER1]       ------
                     [DRAWER2]       AUTO
                     [DRAWER3]       AUTO
M- 2 PAPER WORKING                   OFF
M- 3 PAPER MATERIAL  [DRAWER1]       ------
                     [DRAWER2]       PLAIN
                     [DRAWER3]       PLAIN
                      [BYPASS]       PLAIN
M- 4 ROLL END SET      [PLAIN]       NOT SETTLE
                      [VELLUM]       NOT SETTLE
                        [FILM]       SETTLE
                      [CUSTOM]       NOT SETTLE
.....................................................
.....................................
.....................................................
```

Figure 1-4-1 Own-status report

Completion
Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U001</td><td>
Exiting the maintenance mode
Description
Exits the maintenance mode and returns to the normal copy mode.
Purpose
To exit the maintenance mode.
Method
Press the Start key.
• The machine will enter the normal copy mode.
</td></tr>
<tr><td>U003</td><td>
Setting the service telephone number
Description
Sets the telephone number to be displayed when a service call code is detected.
Purpose
To set (during initial set-up of the machine) the telephone number for contacting service.
Method
Press the Start key.
• The currently set telephone number will be displayed.
Setting
1. Use the cursor keys shown below to enter a telephone number (up to 16 digits).
• Use the cursor left/right keys to move the cursor and the cursor up/down keys to select the desired number or symbol.
• The display at the cursor position will scroll through the numbers and symbols shown below each time the cursor up/down keys are pressed.
<table>
<tr><th>Numbers/Symbols</th></tr>
<tr><td>0 to 9
*
#
(<br>)
-
(space)</td></tr>
</table>
2. Press the Start key and set the telephone number. If you want to cancel the telephone number setting, press the Stop key.
</td></tr>
<tr><td>U004</td><td>
Setting the machine model number
Description
Displays and changes the machine model number.
Purpose
To check, as well as to set, the machine model number.
Method
Press the Start key.
• The current machine model number will be displayed.
Setting
1. Use the cursor keys to enter the lowest 6 digits of the machine model number.
• Use the cursor left/right keys to move the cursor and the cursor up/down keys to change the desired number.
• It is not necessary to enter the first 2 digits (“37”) of the machine model number.
2. Press the Start key and set the machine model number.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U019</td><td>
Displaying the ROM version
Description
Displays the part number for the ROM fitted to each PCB.
Purpose
To check the part number or to decide, based on the last digit of the number, if the newest of ROM is installed.
Method
1. Press the Start key.
2. Use the cursor up/down keys to switch between screens and select the ROM that you want to check.
• The part number for the ROM will be displayed.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>E</td><td>Part number for the engine’s ROM</td></tr>
<tr><td>EB</td><td>Part number for the engine boot</td></tr>
<tr><td>H</td><td>Part number for the HDC’s ROM</td></tr>
<tr><td>I</td><td>Part number for the IPU’s ROM*</td></tr>
<tr><td>S</td><td>Part number for the scanner’s ROM*</td></tr>
<tr><td>F</td><td>Part number for the font ROM*</td></tr>
<tr><td>IB</td><td>Part number for the IPU boot*</td></tr>
<tr><td>SB</td><td>Part number for the scanner boot*</td></tr>
</table>
* Optional
Completion
Press the Stop key.
</td></tr>
<tr><td>U020</td><td>
Initializing all data
Description
Initializes the backup ROM on the engine main PCB in order to return to the factory default settings.
Purpose
Use when replacing the engine main PCB.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select “Execute”.
• If you want to cancel the initialization, select “Cancel”.
3. Press the Start key.
• All data in the backup ROM will be initialized and the screen for selecting a maintenance item No. will be displayed again.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U030</td><td>
Checking the operation of the motors
Description
Drives each motor.
Purpose
To check the operation of each motor.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the motor that you want to check.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>Drive Mot</td><td>The main motor (MM), drum motor (DM), and developing bias are turned on.</td></tr>
<tr><td>Fix Unit Mot</td><td>The fixing motor (FM) is turned on.</td></tr>
<tr><td>Feed Mot</td><td>The paper feed motor (PFM) is turned on.</td></tr>
</table>
3. Press the Start key.
• The display will change from “OFF” to “ON” and the selected motor will be turned on.
4. When you want to stop the motor, press the Stop key.
Completion
Press the Stop key.
</td></tr>
<tr><td>U031</td><td>
Checking switches for paper conveying
Description
Displays the on/off status of each paper detection switch on the paper path.
Purpose
To check the operation of the switches for paper conveying.
Method
1. Press the Start key.
2. Use the cursor up/down keys to switch between screens and select the switch that you want to check.
3. Turn each switch on and off manually to check its status.
<table>
<tr><th>Display</th><th>Switch name</th></tr>
<tr><td>P1
P2
P3
PD1
PD2
PD3
RES
EJE</td><td>Upper paper empty switch* (PESW-U)
Middle paper empty switch (PESW-M)
Lower paper empty switch (PESW-L)
Upper paper feed switch (PFSW-U)
Middle paper feed switch (PFSW-M)
Lower paper feed switch (PFSW-L)
Registration switch (RSW)
Eject switch (ESW)</td></tr>
<tr><td>BP1
BP2</td><td>Bypass timing switch (BTSW)
Bypass registration switch (BRSW)</td></tr>
</table>
* Optional
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U032</td><td>
Checking the operation of the clutches
Description
Turns each clutch on.
Purpose
To check the operation of each clutch.
Method
1. Press the Start key.
2. Remove all the paper from the paper source.
3. Use the cursor up/down keys to select the clutch that you want to check.
<table>
<tr><th>Display</th><th>Clutch name</th></tr>
<tr><td>Feed CL1
Feed CL2
Feed CL3
Roll rev CL1
Roll rev CL2
Roll rev CL3
Roll FD CL
Roll RES CL</td><td>Upper feed clutch* (FCL-U)
Middle feed clutch (FCL-M)
Lower feed clutch (FCL-L)
Upper roll winding clutch* (RWCL-U)
Middle roll winding clutch (RWCL-M)
Lower roll winding clutch (RWCL-L)
Roll feed clutch (RFCL)
Roll registration clutch (RRCL)</td></tr>
<tr><td>BP FD CL
BP RES CL</td><td>Bypass feed clutch (BFCL)
Bypass registration clutch (BRCL)</td></tr>
</table>
* Optional
4. Press the Start key.
• The display will change from “OFF” to “ON” and the selected clutch will be turned on and the paper feed motor (PFM) will be turned on as well.
5. When you want to stop the clutch, press the Stop key.
Completion
Press the Stop key.
</td></tr>
<tr><td>U033</td><td>
Checking the operation of the solenoids
Description
Applies current to each solenoid in order to check its on status.
Purpose
To check the operation of each solenoid.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the solenoid that you want to check.
3. Press the Start key.
• The display will change from “OFF” to “ON” and the selected solenoid will be turned on for 1 second.
<table>
<tr><th>Display</th><th>Solenoid name</th></tr>
<tr><td>SEP SOL
MSW SOL</td><td>Separation claw solenoid (SSOL)
(Turns power off)</td></tr>
</table>
• Select “Main switch solenoid” in order to check the operation of the main switch when the auto shut-off function engages.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U034</td><td>Adjusting the print start timing
Method
See page 1-6-40.</td></tr>
<tr><td>U037</td><td>Checking the operation of the fan motors
Description
Drives each fan motor.
Purpose
To check the operation of each fan motor.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the fan motor that you want to check.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>LPH Fan
Fix Fan Fast
Fix Fan Slow
Feed Fan</td><td>The LPH fan motor (LFM) is turned on.
The fixing fan motor (FFM) is turned on at full speed.
The fixing fan motor (FFM) is turned on at half speed.
The paper conveying section fan motor (PCFM) is turned on.</td></tr>
</table>
3. Press the Start key.
• The display will change from “OFF” to “ON” and the selected fan motor will be turned on.
4. When you want to stop the motor, press the Stop key.
Completion
Press the Stop key.</td></tr>
<tr><td>U038</td><td>Checking safety switches
Description
Displays the on/off status of each safety switch.
Purpose
To check the operation of the safety switches.
Method
1. Press the Start key.
2. Open the respective covers to turn each switch on and off to check its status.
• The display will change between “ON” and “OFF” depending on the status of each switch.
<table>
<tr><th>Display</th><th>Switch name</th><th>Opening cover</th></tr>
<tr><td>TBL
FIX
TNK
FRT
HOP</td><td>Safety switches 1 and 2 (SSW1&2)
Safety switch 3 (SSW3)
Safety switch 4 (SSW4)
Safety switches 5 and 6 (SSW5&6)
Toner replenishing slot opening cover switch (OCSW)</td><td>Detachable unit
Eject cover
Right cover
Front covers
Toner replenishing slot</td></tr>
</table>
Completion
Press the Stop key.</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U039</td><td>Adjusting printing magnification
Method
See page 1-6-39.</td></tr>
<tr><td>U041</td><td>Adjusting the standard cut length
Method
See page 1-6-41.</td></tr>
<tr><td>U045</td><td>Checking paper size switches
Description
Displays the on/off status of each paper detection switch in the upper roller unit (optional) or middle/lower roller units.
Purpose
To check the operation of the paper size switches.
Method
1. Press the Start key.
2. Turn each switch on and off manually to check its status.
• When a switch is detected to be in the on position, the display will change from “OFF” to “ON”.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>S11
S12
S13
S14
S21
S22
S23
S24
S25</td><td>Upper paper size switch 1* (PSSW1-U)
Upper paper size switch 2* (PSSW2-U)
Upper paper size switch 3* (PSSW3-U)
Upper paper size switch 4* (PSSW4-U)
Paper size switch 1 (PSSW1)
Paper size switch 2 (PSSW2)
Paper size switch 3 (PSSW3)
Paper size switch 4 (PSSW4)
Paper size switch 5 (PSSW5)</td></tr>
</table>
* Optional
Completion
Press the Stop key.</td></tr>
<tr><td>U100</td><td>Setting the drum surface potential
Method
See page 1-6-14.</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U101</td><td>
Turning the transfer/separation charger on
Description
Performs transfer and separation charging.
Purpose
To check, when a transfer or separation problem occurs, whether charging is being performed correctly or not.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the operation that you want to be performed.
<table>
<tr><th>Display</th><th>Operation</th></tr>
<tr><td>TC
AC
TC H/L</td><td>Transfer charging
Separation charging
Switch between high and low transfer voltage</td></tr>
</table>
3. Use the cursor left/right keys to switch between the off and on display, or switch between on and off for “TC H/L”.
4. Press the Start key.
• The selected charging operation will be performed.
5. When you want to stop the charging operation, press the Stop key.
Completion
Press the Stop key.
</td></tr>
<tr><td>U105</td><td>
Forcing the cleaning lamps to be turned on
Description
Turns the right, middle and left cleaning lamps on.
Purpose
To check, when an offset appears in the image, the operation of the cleaning lamps.
Method
1. Press the Start key.
2. Press the Start key again.
• The right cleaning lamp (CL-R), middle cleaning lamp (CL-M) and the left cleaning lamp (CL-L) will be turned on.
3. To turn the right, middle and left cleaning lamps off, press the Stop key.
Completion
Press the Stop key.
</td></tr>
<tr><td>U111</td><td>
Checking/Clearing the drum drive time
Description
Displays and clears the drum drive time.
Purpose
To check usage conditions of the drum, as well as to clear the drum drive time after replacing the drum during the periodic maintenance service.
Method
Press the Start key.
• The current drum drive time (minute) will be displayed.
Clearing the drive time
1. Use the cursor up/down keys to select “Reset”.
2. Press the Start key to clear the drum drive time.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U129</td><td>
Turning potential correction on/off
Description
Selects whether or not potential correction is to be performed.
Purpose
To turn potential correction off when the drum surface potential sensor (DPS) has been removed for replacement, and to enable the copy operation while ignoring a C5500 (drum surface potential sensor error) detection.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select either “ON” or “OFF”, as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>ON
OFF</td><td>Potential correction
No potential correction</td></tr>
</table>
• The factory default setting is “ON”.
2. Press the Start key and check the setting.
Note
Select “OFF” before removing the drum surface potential sensor for replacement, and select “ON” again after installing the new sensor.
Completion
Press the Stop key.
</td></tr>
<tr><td>U130</td><td>
Initial setting for the developer
Description
Automatically sets the toner sensor control voltage for the installed developer.
Purpose
To set the desired value during initial set-up of the machine or when replacing the developer.
Method
1. Press the Start key.
2. Press the Start key again.
• Aging will be performed for 3 minutes and the value for toner sensor output will be displayed. During this time, neither toner replenishment nor toner empty detection will be performed. After aging is completed, the toner sensor control voltage for the installed developer will automatically be set and the value displayed.
Example
U130
95 118 118
① ② ③
① Toner sensor output value
② Toner sensor control voltage
③ Automatic setting of the toner sensor control voltage
• If you want to stop the machine and return the setting to its previous value without having the toner sensor control voltage set automatically, press the Stop key.
Supplement
The following data is also changed or cleared (set to zero) when this maintenance item is performed:
• Changing the toner sensor control voltage (U131)
• Clearing the toner density control data setting (U156)
• Clearing the developing section drive time (U157)
• Clearing the developing count (U158)
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U131	**Changing the initial setting for the developer** **Description** Displays and changes the toner sensor control voltage that was automatically set in maintenance item U130. **Purpose** To check the automatically set toner sensor control voltage, as well as to change the toner density if the images are too dark or to light. **Method** Press the Start key. • The current toner sensor control voltage will be displayed. **Setting** 1. Use the cursor left/right keys to change the setting as desired. • Raising the toner sensor control voltage will increase toner density while lowering the voltage will decrease the density. Raising the toner sensor control voltage too high may result in toner scattering. • Setting range: 0 to 255 2. Press the Start key to set the selected values. **Completion** Press the Stop key.
U132	**Forcing toner to be replenished** **Description** Forcibly replenishes the toner until the toner sensor output reaches the toner control level. **Purpose** Used when a toner empty state is frequently detected. **Method** 1. Press the Start key. • The following data will be displayed. Example U132 110 122 123 ① ② ③ ① Toner sensor output value ② Toner control level ③ Toner sensor control voltage 2. Press the Start key. • Toner will be replenished until the toner sensor output reaches the toner control level. 3. When you want to stop the operation, press the Stop key. **Completion** Press the Stop key.
U135	**Checking the operation of the toner feed motor** **Description** Drives the toner feed motor. **Purpose** To check the operation of the toner feed motor when the toner is not replenished properly. **Note** Be sure to operate the toner feed motor for only a few seconds as driving it for too long may cause toner to jam which can result in the machine locking up. **Method** 1. Press the Start key. 2. Press the Start key again. • The toner feed motor will be turned on for 5 seconds. If you want to stop the motor while it is running, press the Stop key. **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U139</td><td>
Displaying the thermistor temperatures
Description
Displays the detected temperatures of the thermistors.
Purpose
To check the temperature of the drum as well as that outside the machine.
Method
Press the Start key.
• The detected temperature (°C) of the thermistors shown below will be displayed.
<table>
<tr><th>Display</th><th>Corresponding thermistor</th></tr>
<tr><td>DRUM (°C)
ATM (°C)</td><td>Developing thermistor (temperature around the developing section)
External temperature thermistor (temperature outside the machine)</td></tr>
</table>
Completion
Press the Stop key.
</td></tr>
<tr><td>U140</td><td>
Adjusting the developing bias
Description
Changes the preset value for the developing bias when the image is light or the background appears.
Purpose
The preset value need not be changed in the market.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Change the preset value using the cursor left/right keys.
• Change the value within the preset value 193 ± 20.
• A larger preset value darkens the image and a smaller preset value lightens the image.
• Measure the terminals of the developing bias with a tester and adjust the preset value so that 640 V (reference value) is obtained.
2. Press the Start key to register the selected setting.
Completion
Press the Stop key.
</td></tr>
<tr><td>U155</td><td>
Displaying the toner sensor output
Description
Displays the toner sensor output value and related data.
Purpose
To check the toner sensor output.
Method
1. Press the Start key.
2. Press the Start key again.
• The machine will begin operation without toner replenishment control, and the current data will be displayed.
Example
U155
103 85 32 24
① ② ③ ④
① Toner sensor output value after the Start key is pressed
② Current toner control level
③ Current toner sensor control voltage
(corrected values for temperature and developing count)
④ Current developing thermistor detection temperature (°C)
3. When you want to stop the operation, press the Stop key.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U156</td><td>
Changing the toner density control data
Description
Displays and changes the data used in controlling the toner density.
Purpose
Performed during replacement of the engine main PCB.
Method
Press the Start key.
• The current toner density control data will be displayed.
<table>
<tr><th>Display</th><th>Setting item</th><th>Setting range</th></tr>
<tr><td>Motor on
Motor off
Empty
Forbidden
Offset</td><td>Toner feed motor on level
Toner feed motor off level
Toner empty level
Copy disabling level
All data shift</td><td>———
———
———
———
–30 to +30</td></tr>
</table>
Setting for all data shift
1. Use the cursor up/down keys to select “Offset”.
2. Use the cursor left/right keys to change the setting as desired.
3. Press the Start key to set the selected value.
• The values for all four items will be changed by the amount selected here.
Completion
Press the Stop key.
</td></tr>
<tr><td>U157</td><td>
Checking/Clearing the developing section drive time
Description
Displays and clears the developing section drive time.
Purpose
To check the developing section drive time after replacing the developer.
Method
Press the Start key.
• The current developing section drive time will be displayed.
Changing the drive time
1. Use the Enter key to move the cursor and the cursor left/right keys to change the drive time.
2. Press the Start key to set the selected value.
Clearing the drive time
1. Use the cursor up/down keys to select “Reset”.
2. Press the Start key to clear the developing drive time.
Completion
Press the Stop key.
</td></tr>
<tr><td>U158</td><td>
Checking/Clearing the developing count
Description
Displays and clears the developing count.
Purpose
To check the developing count after replacing the developer.
Method
Press the Start key.
• The current developing count will be displayed.
Changing the count
1. Use the Enter key to move the cursor and the cursor left/right keys to change the count.
2. Press the Start key to set the selected value.
Clearing the count
1. Use the cursor up/down keys to select “Reset”.
2. Press the Start key to clear the developing count.
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U160	**Coating the cleaning blade with toner** **Description** Applies toner to the cleaning blade by coating the drum with toner. This maintenance item can be run after machine stabilization. If you want to run this maintenance item BEFORE machine stabilization, be sure to run maintenance item U162 first. **Purpose** Used when replacing the cleaning blade or the drum, or during initial set-up of the machine. **Method** 1. Press the Start key. 2. Remove the cleaning blade from the drum. 3. Use the cursor up/down keys to select “Execute”. • If you want to cancel the operation, select “Cancel”. 4. Press the Start key. • Drum operation will begin and, after applying toner to the drum at a pre-determined interval, the drum will be stopped. 5. Once the drum is stopped, open the detachable unit, move the cleaning blade back to the drum and stabilize it there. 6. Close the detachable unit. • The drum will turn at a pre-determined interval and will then stop. **Completion** Press the Stop key.
U162	**Forced stabilization** **Description** Cancels the stabilization drive of the fixing section regardless of the fixing temperature. **Purpose** To force the machine into a stable state before the fixing section reaches its stabilization temperature. **Method** 1. Press the Start key. 2. Press the Start key again. • A forced stabilization mode will be entered, the stabilization drive of the fixing section will be canceled regardless of the fixing temperature, and the screen for selecting a maintenance item No. will be displayed again. **Completion** Turn the main switch off and then back on again.
U163	**Releasing the fixing section error state** **Description** Releases the service call state that was generated in the fixing section. **Purpose** To release the service call state after any required repair, service or replacement of related parts whenever a service call code is detected in the fixing section. **Method** 1. Press the Start key. 2. Use the cursor up/down keys to select “Execute”. • If you want to cancel the operation to release the service call state, select “Cancel”. **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U196</td><td>
Checking the operation of the fixing heater
Description
Turns the main or sub fixing heaters on.
Purpose
To check the fixing heaters.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the heater that you want to turn on.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Heater1
Heater2</td><td>Main fixing heater
Sub fixing heater</td></tr>
</table>
3. Press the Start key.
• The display will change from “OFF” to “ON” and the selected heater will be turned on for 3 seconds.
Completion
Press the Stop key.
</td></tr>
<tr><td>U199</td><td>
Displaying the fixing unit thermistor temperatures
Description
Displays the detected temperatures of fixing unit thermistors 1 through 3.
Purpose
To check the fixing temperature when a fixing problem occurs.
Method
1. Press the Start key.
• The detected temperature (°C) of the thermistors shown below will be displayed.
Example
U199
32 30 30 34
① ② ③ ④
① Surface temperature at the center of the heat roller (Fixing unit thermistor 1)
② Surface temperature at the edges of the heat roller (Fixing unit thermistor 2)
③ Surface temperature at the center of the press roller (Fixing unit thermistor 3)
④ Surface temperature at the edges of the press roller (Fixing unit thermistor 4)
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U200</td><td>
Turning all LEDs on
Description
Turns all of the LEDs on the operation panel on.
Purpose
To check the operation of all of the LEDs on the operation panel.
Method
Press the Start key.
• All of the LED on the operation panel will light up. Also the buzzer will sound for two seconds.
Completion
Press the Stop key to turn the LEDs off.
</td></tr>
<tr><td>U213</td><td>
Checking the operation of the counters
Description
Increases the count for each counter without actually making a print.
Purpose
To check the operation of the counters.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the counter for which you want to check operation.
<table>
<tr><th>Display</th><th>Type of counter</th></tr>
<tr><td>Print Counter
Scan Counter
Key Counter
Key Card</td><td>Total counter
Scan counter*
Not set
Not set</td></tr>
</table>
* Optional
3. Press the Start key.
• The count for the selected counter will be increased each time you press the Start key.
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U214	**Checking the upper roll unit** **Description** Checks the operation of the optional upper roll unit. **Purpose** Used to check the operation of the upper roll winding clutch when there are problems with paper feed from the upper roll unit. **Method** 1. Press the Start key. 2. Manually turn the pulse plate for the upper paper empty switch (PESW-U) and check the operation of the upper roll winding clutch (RWCL-U). • If the upper roll winding clutch is on when the upper paper empty switch is on and the upper roll winding clutch is off when the upper paper empty switch is off, the operation of the upper roll winding clutch is judged to be normal. **Completion** Press the Stop key.
U245	**Checking messages** **Description** Displays all messages that appear in the message display. **Purpose** To check displayed messages. **Method** 1. Press the Start key. • A message will be displayed. 2. Use the cursor up/down keys to switch between messages. • If you press the cursor left/right keys, the language will change. **Completion** Press the Stop key.
U250	**Setting the maintenance cycle** **Description** Displays and changes the maintenance cycle. **Purpose** To check and change the maintenance cycle. **Method** Press the Start key. • The currently set maintenance cycle will be highlighted. **Setting** 1. Use the numeric keys to enter the desired maintenance cycle. • Use the cursor left/right keys to move the cursor and the cursor up/down keys to change the setting as desired. • Setting range: 0 – 99999 • Default setting:3000(m) :9842(foot) **Setting example** If you set the maintenance cycle to 1500, a message to inform you that it is time for periodic maintenance will be displayed once the maintenance count reaches 1500 m. If you set the maintenance cycle to 0, the maintenance indication message will not be displayed. 2. Press the Start key to register the selected setting. **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U251</td><td>
Checking/Clearing the maintenance count
Description
Displays and clears or changes the maintenance count.
Purpose
To check, as well as to clear, the maintenance count during the periodic maintenance service.
Method
Press the Start key.
• The current maintenance count will be displayed.
Clearing the count
1. Use the cursor up/down keys to select “Reset”.
2. Press the Start key to clear the maintenance count.
Changing the count
1. Use the Enter key to move the cursor and the cursor left/right keys to change the setting as desired.
2. Press the Start key to set the selected value.
Completion
Press the Stop key.
</td></tr>
<tr><td>U252</td><td>
Setting the region of use
Description
Sets operation procedures and displayed screens according to the region in which the machine will be used.
Purpose
Returns the region of use setting to the value before replacement or initialization when the backup ROM on the engine main PCB has been replaced, or when the backup ROM has been initialize by running maintenance item U020.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select the region of use.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Japan Metric
Inch
Europe Metric
Asia Pacific</td><td>Metric specifications (Japan)
Inch specifications (North America)
Metric specifications (Europe)
Metric specifications (Asia/Oceania)</td></tr>
</table>
2. Press the Start key to activate the selected setting.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U256</td><td>
Turning the auto preheat function on/off
Description
Turns the auto preheat function on or off.
Purpose
Set according to the preference of the user.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select either “ON” or “OFF”, as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>ON
OFF</td><td>Turns the auto preheat function on
Turns the auto preheat function off</td></tr>
</table>
• The factory default setting is “ON”.
• Any time you change the setting from “OFF” to “ON”, the time for the auto preheat function to engage will be set to its default value (15 min).
2. Press the Start key to activate the selected setting.
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U262	**Ignoring a call for service detection** **Description** Enables you to control the machine by ignoring any call for service detection. **Purpose** To ignore any call for service detection in those cases when a call for service might be detected and operation stopped, such as during adjustment of the machine. **Method** Press the Start key. **Setting** • When you want to ignore only a specific type of call for service detection. 1. Use the cursor up/down keys to select the code for the type of call for service detection that you want to ignore. 2. Use the cursor left/right keys to enter the value that corresponds to the desired setting. **Display** / **Setting** 0 — Does NOT ignore a call for service detection 1 — Ignores a call for service detection 3. Press the Start key to register the selected setting. • When you want to ignore all types of call for service detection. 1. Use the cursor up/down keys to select “ALL”. 2. Use the cursor left/right keys to enter the value that corresponds to the desired setting. 3. Press the Start key to register the selected setting. **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U267</td><td>
Adjusting the cutting length for the paper leading edge
Description
Selects whether or not the cutting length for the leading edge of paper will be changed according to the temperature outside the machine when vellum is being used and the roll cut key is pressed. It is also possible to adjust the temperature at which the cutting length is changed.
Purpose
If the user's preference is for the leading edge of paper to be cut at 279 mm regardless of the temperature outside the machine, adjust this setting to "Temp not Change".
Method
Press the Start key.
Setting
1. Use the cursor up/down keys to select either "Temp Change" or "Temp not Change", as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>Temp Change

Temp not Change</td><td>The cutting length for the leading edge of paper will be changed from 279 mm to 800 mm when vellum is being used, the roll cut key is pressed and the temperature outside the machine drops under 15°C.
Regardless of the temperature outside the machine, the cutting length for the leading edge of paper will be set to 279 mm.</td></tr>
</table>
• The factory default setting is "Temp Change".
2. Press the Start key to activate the selected setting.
• If you selected "Temp Change", you will need to perform step 3 below as well.
3. Use the cursor left/right keys to change the activated temperature as desired.
<table>
<tr><th>Setting item</th><th>Setting range</th><th>Default setting</th><th>Allowable setting increment</th></tr>
<tr><td>Temperature</td><td>–5 to +5</td><td>0 (15°C)</td><td>1°C</td></tr>
</table>
Example:
If you select –5°C as this setting, the cutting length for the leading edge of paper will be changed from 279 mm to 800 mm when the temperature outside the machine drops under 10°C.
4. Press the Start key to register the selected setting.
Completion
Press the Stop key.
</td></tr>
<tr><td>U269</td><td>
Selecting the timing for total counting
Description
Sets the timing at which each count will be added to the total counter.
Purpose
Set according to the preference of the user.
If a paper jam occurs at a given location and the count timing is set to a point prior to that, the copy count (and related cost) will go up without the corresponding copy being made. In cases such as this, it is possible to delay the timing of the count.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select either "During Feed" or "After Eject", as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>During Feed
After Eject</td><td>One count will be added during paper feed.
One count will be added after paper is ejected.</td></tr>
</table>
• The factory default setting is "During Feed".
2. Press the Start key to register the selected setting.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U271</td><td>
Setting the unit of counting
Description
Sets the unit of counting for the total counter and the optional key counter.
Purpose
To change the unit of counting to fit the paper usage.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select the item that you want to change the setting for.
<table>
<tr><th>Display</th><th>Setting item</th><th>Default setting</th></tr>
<tr><td>Total cnt (m)
Key cnt (m)</td><td>Total counter
Key counter</td><td>1.0
0.1</td></tr>
</table>
2. Use the cursor left/right keys to select a value of either 0.1 or 1.0, as desired.
• If you set the count value to 0.1, one count will be added to the selected counter for each 0.1 meters. If you set the count value to 1.0, one count will be added for each meter.
3. Press the Start key to register the selected setting.
Completion
Press the Stop key.
</td></tr>
<tr><td>U272</td><td>
Turning the upper roll unit option on/off
Description
Turns the installation setting for the optional upper roll unit on/off.
Purpose
Used when the optional upper roll unit is installed.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select either “ON” or “OFF”, as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>OFF
ON</td><td>The upper roll unit is NOT installed
The upper roll unit is installed</td></tr>
</table>
• The factory default setting is “OFF”.
2. Press the Start key to activate the selected setting.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U273</td><td>
Setting the maximum paper length
Description
Sets the length at which print paper will be cut when making long print.
Purpose
Set according to the preference of the user.
Method
Press the Start key.
• The current setting will be displayed.
<table>
<tr><th>Display</th><th>Setting item</th><th>Setting range</th><th>Default setting</th></tr>
<tr><td>Print (mm)</td><td>Length at which print paper will be cut when making long print</td><td>Metric:
6000 – 9999 (mm)
Inch:
6020 – 10008 (mm)</td><td>
6000

6020</td></tr>
</table>
Setting
1. Use the cursor left/right keys to select the desired value for that setting.
• The setting can be changed to any 100 mm increment with the allowable setting range.
2. Press the Start key to register the selected setting.
Completion
Press the Stop key.
</td></tr>
<tr><td>U344</td><td>
Setting the preheat (energy saving) mode
Description
Changes the control mode for the preheat (energy saving) function.
Purpose
Set according to the preference of the user, and give priority to either the time required to recover from the preheat state or to saving more energy.
Method
Press the Start key.
• The current setting will be displayed.
Setting
1. Use the cursor up/down keys to select either “Energy save” or “Time save”, as desired.
<table>
<tr><th>Display</th><th>Setting</th></tr>
<tr><td>Energy save</td><td>Controls the fixing temperature at 105°C/221°F and stabilizes the machine 210 seconds after releasing the preheat state.</td></tr>
<tr><td>Time save</td><td>Controls the fixing temperature at 140°C/284°F and stabilizes the machine 120 seconds after releasing the preheat state.</td></tr>
</table>
• The factory default setting is “Energy save”.
2. Press the Start key to activate the selected setting.
Completion
Press the Stop key.
</td></tr>
</table>

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U450</td><td>
Selecting the PG mode
Description
Selects and prints out the PG pattern that is to be generated at the printer.
Purpose
Used when performing adjustments related to printing images in order to check the status of other parts of the machine, using a PG pattern.
Method
1. Press the Start key.
<table>
<tr><th>Display</th><th>Setting item</th><th>Setting range</th></tr>
<tr><td>Pattern
Density</td><td>Type of PG pattern
Printout density</td><td>0 to 30
0 to 63</td></tr>
</table>
2. Use the cursor up/down keys to select “Pattern”.
3. Use the cursor left/right keys to change the setting and, thereby, select the desired PG pattern.
4. Use the cursor up/down keys to select “Density”.
5. Use the cursor left/right keys to change the setting and, thereby, select the desired PG density.
• Raising the setting will increase the contrast of the image while lowering it will decrease the contrast.
6. Press the On Line key. The test print screen will be displayed.
7. Press the Start key. The selected PG pattern will be printed out.
Completion
Press the Stop key.
</td></tr>
<tr><td>U451</td><td>
PG gray printout
Description
Prints out a gray test pattern.
Purpose
Used when check for problems with the LPH or the drum, and whether or not the main charger wire, main charger housing or main grid are dirty.
Method
1. Press the Start key.
2. Press the On Line key and the test print screen will be displayed.
3. Press the Start key and the test pattern will be printed out.

Figure 1-4-2 PG gray printout
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U452	**PG 16-level grayscale printout** **Description** Initiates current correction to the LPH and prints out a PG 16-level grayscale. **Purpose** Used when check for problems with the LPH, whether or not the main charger wire, main charger housing or main grid are dirty, or to check the dark potential after replacing the drum. **Method** 1. Press the Start key. 2. Press the On Line key and the test print screen will be displayed. 3. Press the Start key and the test pattern will be printed out. • The test pattern will be printed as a 16-level gradation.  **Figure 1-4-3 PG 16-level grayscale printout** **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U461</td><td>
Adjusting the focus and measuring the solid-black density
Description
Prints out a test pattern for adjusting the focus, as well as for measuring the density of a solid black image.
Purpose
Used to adjust the focus.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the PG test pattern that you want to print out.
<table>
<tr><th>Display</th><th>PG test pattern content</th></tr>
<tr><td>Adjust Focus
Measure Density</td><td>Test pattern for adjusting the focus
Image for adjusting solid black</td></tr>
</table>
3. Press the On Line key. The test print screen will be displayed.
4. Press the Start key and the selected test pattern will be printed out.
Test pattern for adjusting the focus

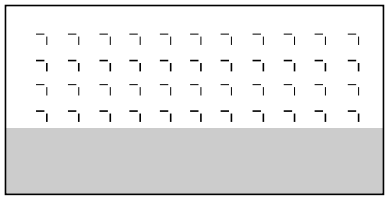



Image for adjusting solid black

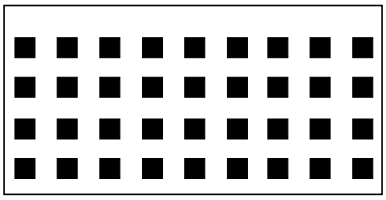



Figure 1-4-4
Completion
Press the Stop key.
</td></tr>
<tr><td>U462</td><td>
Printing PG to check LPH operation
Description
Prints out a test pattern for checking LPH operation.
Purpose
Used when checking for problems with the LPH.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select the PG test pattern.
<table>
<tr><th>Display</th><th>PG test pattern</th></tr>
<tr><td>Pattern1
Pattern2</td><td>Continuous printing of PG for HDC
Gray (half-tone) printing of PG for MIP</td></tr>
</table>
3. Press the On Line key. The test print screen will be displayed.
4. Press the Start key. The test pattern will be printed out.
Completion
Press the Stop key.
</td></tr>
</table>

Item No.	Description and Procedure
U901	**Checking/Clearing total print counts by paper feed location** **Description** Checks the total print count of each paper feed location or resets all of the counts back to zero. **Purpose** Used to check the timing of the standard replacement of maintenance parts, or to clear all print counts after replacement of those parts. **Method** Press the Start key. • The print count will be displayed for each paper feed location.

Display	Paper source
BYPS	Bypass
Roll1	Upper roll unit*
Roll2	Middle roll unit
Roll3	Lower roll unit
ALL	Clear counts for all locations

* Optional

Clearing the count

• To clear the count of each paper feed location individually:
1. Use the cursor up/down keys to select the paper feed location of which the count is to be cleared.
2. Use the cursor right keys to display “Reset”.
3. Press the Start key.
   • The paper count of the selected paper feed location will be reset to zero.

• To clear the counts for all paper feed locations:
1. Use the cursor up/down keys to select “ALL”.
2. Press the Start key.
   • The print counts for all paper feed locations will be returned to zero.

Completion

Press the Stop key.

Item No.	Description and Procedure
U903	**Checking/Clearing the paper jam counts** **Description** Checks the total number of paper jams that have occurred by location and type, or resets all of the counts back to zero. **Purpose** Used to check the occurrence of paper jams, or to clear all counts after replacement of maintenance parts. **Method** 1. Press the Start key. • The paper jam count will be displayed for each paper feed location. 2. Use the cursor up/down keys to switch between screens.

Display	Paper jam location or type
BYPS	Bypass; No paper feed
Roll1	Upper roll unit*; No paper feed
Roll2	Middle roll unit; No paper feed
Roll3	Lower roll unit; No paper feed
Res (BP)	Bypass registration
Res (R)	Roll unit registration
Feed	Paper conveying
Eject	Paper ejection
ALL	Clear all jam counts

* Optional

Clearing the count

1. Use the cursor up/down keys to select “ALL”.
2. Press the Start key.
   • The paper jam counts for all locations and types will be returned to zero.

Completion

Press the Stop key.

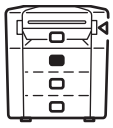
Item No.	Description and Procedure
U904	**Checking/Clearing the call for service counts** **Description** Checks the total number of call for service detections, or resets the count back to zero. **Purpose** Used to check the occurrence of call for service detections, or to clear the count after replacement of maintenance parts. **Method** Press the Start key. • The call for service detection count will be displayed for each code. **Clearing the count** • When you want to clear the count for only a specific call for service code. 1. Use the cursor up/down keys to select the call for service code that you want to clear the count for. 2. Use the cursor right key to display “Reset”. 3. Press the Start key. • The count for the selected call for service code will be returned to zero. • When you want to clear the count for all call for service codes. 1. Use the cursor up/down keys to select “ALL”. 2. Press the Start key. • The count for all call for service codes will be returned to zero. **Completion** Press the Stop key.

<table>
<tr><th>Item No.</th><th>Description and Procedure</th></tr>
<tr><td>U908</td><td>
Checking/Clearing the total count
Description
Displays and clears the total count value.
Purpose
Used to check the timing of the standard replacement of maintenance parts.
Method
Press the Start key.
• The current total count will be displayed.
Clearing the count
1. Use the cursor up/down keys to select “Reset”.
2. Press the Start key to clear the total count.
Completion
Press the Stop key.
</td></tr>
<tr><td>U916</td><td>
Clearing all counts
Description
Clears all related counts.
Purpose
Used during a full maintenance operation.
Method
1. Press the Start key.
2. Use the cursor up/down keys to select “Execute”. If you want to cancel the operation to clear all counts, select “Cancel”.
3. Press the Start key.
• The values for the counts shown below will all be cleared and the screen for selecting a maintenance item No. will be displayed again.
<table>
<tr><th>Maintenance Item No.</th><th>Type of count</th></tr>
<tr><td>U251
U901
U903
U904
U908</td><td>Maintenance count
Total count by paper source
Paper jam count
Call for service count
Total count</td></tr>
</table>
</td></tr>
</table>

1-5-1 Paper misfeed detection

(1) Paper misfeed indication

When a paper jam occurs, the copier immediately stops copying and the operation panel shows a paper misfeed message.
Paper jam counts sorted by the detecting conditions can be checked by maintenance item U903.
To remove paper, open the front covers and take out roll units, or open the detachable unit.
To reset the paper misfeed detection, open and close the front covers, detachable unit, lower right cover or eject cover to turn the safety switches 5 & 6, 1 & 2, 4 or 3 off and on, respectively.

Description	Jam location display
No paper feed from the bypass table	
No paper feed from the upper roll unit*	
No paper feed from the middle roll unit	
No paper feed from the lower roll unit	
Bypass table registration jam	
Roll unit registration jam	
Paper jam in the paper conveying section	
Paper jam in the eject section	

* Optional

(2) Paper misfeed detection conditions

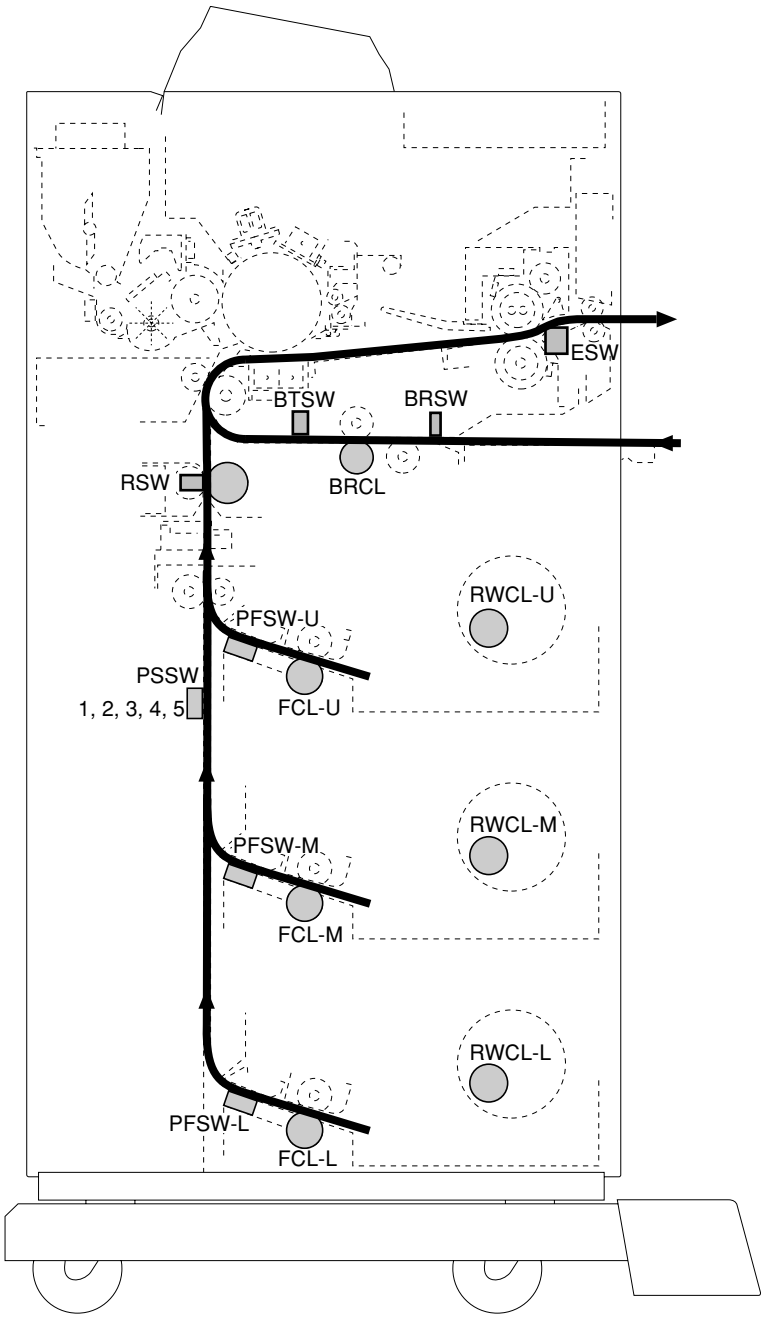
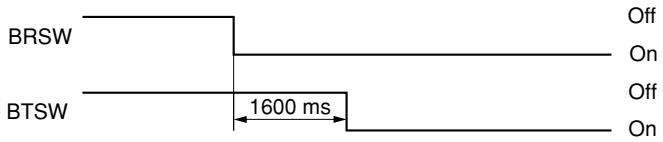


Figure 1-5-1 Paper misfeed detection

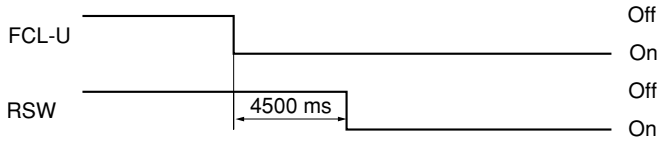
1. No paper feed from the bypass table
When the bypass timing switch (BTSW) does not turn on within 1600 ms of the bypass registration switch (BRSW) turning on.



Timing chart 1-5-1

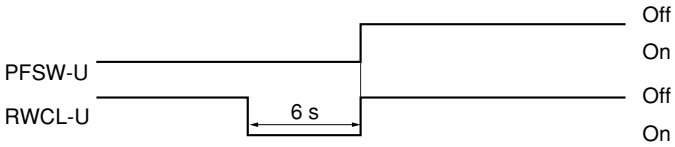
When the bypass registration switch (BRSW) is on at turning on of the main switch or opening/closing of the detachable unit.

2. No paper feed from the upper roll unit
When printing starts, the registration switch (RSW) does not turn on within 4500 ms of the upper feed clutch (FCL-U) turning on (primary paper feed).



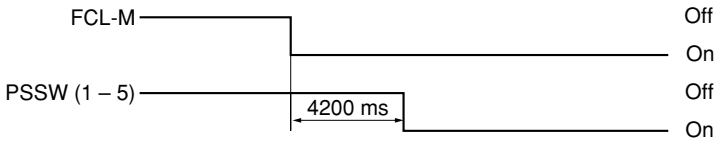
Timing chart 1-5-2

When the upper paper feed switch (PFSW-U) does not turn off within 6 s of the upper roll winding clutch (RWCL-U) turning on.



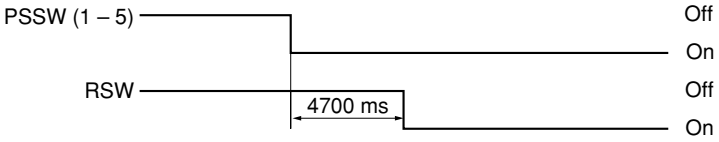
Timing chart 1-5-3

3. No paper feed from the middle roll unit
When printing starts, the paper size switches (PSSW 1 to 5) do not turn on within 4200 ms of the middle feed clutch (FCL-M) turning on (primary paper feed).



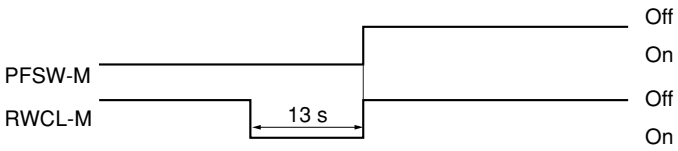
Timing chart 1-5-4

When the registration switch (RSW) does not turn on within 4700 ms of the paper size switches (PSSW 1 to 5) turning on.



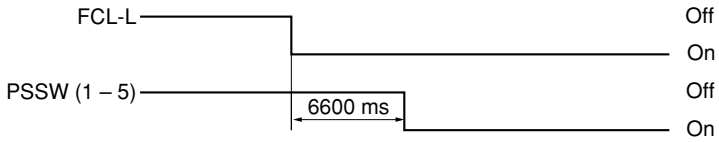
Timing chart 1-5-5

When the middle paper feed switch (PFSW-M) does not turn off within 13 s of the middle roll winding clutch (RWCL-M) turning on.



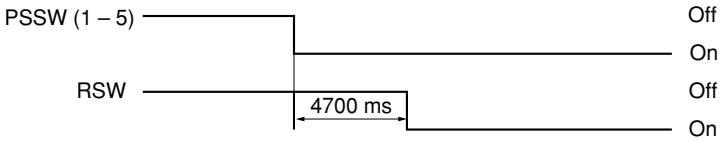
Timing chart 1-5-6

4. No paper feed from the lower paper roll unit
When printing starts, the paper size switches (PSSW 1 to 5) do not turn on within 6600 ms of the lower feed clutch (FCL-U) turning on (primary paper feed).



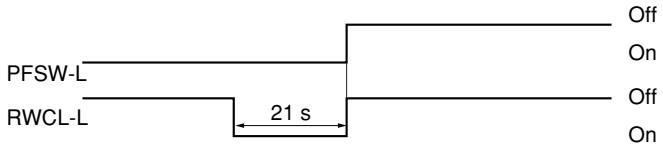
Timing chart 1-5-7

When the registration switch (RSW) does not turn on within 4700 ms of the paper size switches (PSSW 1 to 5) turning on.



Timing chart 1-5-8

When the lower paper feed switch (PFSW-L) does not turn off within 21 s of the lower roll winding clutch (RWCL-L) turning on.

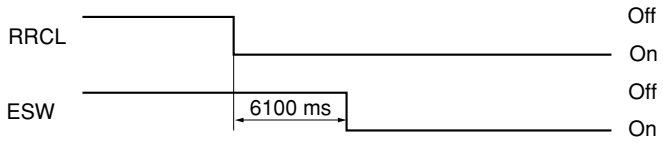


Timing chart 1-5-9

5. Bypass table registration jam
When paper is fed from the bypass table, the bypass timing switch (BTSW) does not turn off when the paper has been fed 300 mm beyond the maximum print length*.
* The maximum length allowed for printing is 6000 mm when the standard size of memory is mounted.

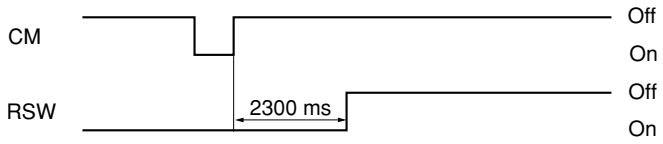
6. Roll unit registration jam
When the roll registration clutch (RRCL) does not turn on within 15 s of the secondary paper feed starting.

7. Paper jam in the paper conveying section
When the eject switch (ESW) does not turn on within 6100 ms of the roll registration clutch (RRCL) turning on (secondary paper feed).



Timing chart 1-5-10

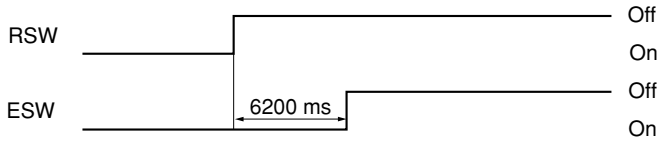
When the registration switch (RSW) does not turn off within 2300 of the cutter motor (CM) turning off.



Timing chart 1-5-11

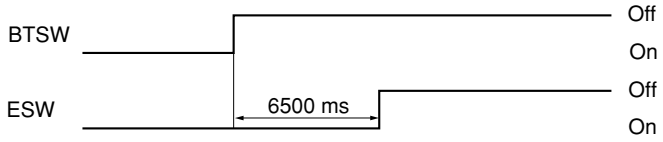
When the cutter stops during cutting operation and cutting has not been successfully completed.

8. Paper jam in the eject section
After the paper has been cut, the eject switch (ESW) does not turn off within 6200 ms of the registration switch (RSW) turning off.



Timing chart 1-5-12

When the eject switch (ESW) does not turn off within 6500 ms of the bypass timing switch (BTSW) turning off.



Timing chart 1-5-13

When the eject switch (ESW) is on at the main switch turning on or opening/closing of the detachable unit.

(3) Paper misfeeds

Problem	Causes/check procedures	Corrective measures
No paper feed from the bypass table	A piece of paper torn from print paper is caught around the bypass feed roller or upper or lower bypass roller.	Check and remove it, if any.
	Defective bypass timing switch.	If CN3-11 on the engine main PCB remains the same when the bypass timing switch is turned on and off, replace the bypass timing switch.
	Defective bypass registration switch.	If CN3-12 on the engine main PCB remains the same when the bypass registration switch is turned on and off, replace the bypass registration switch.
No paper feed from the upper roll unit*	Wrong paper.	Check and if the paper is extremely curled or inappropriate for printing, change it.
	A piece of paper torn from print paper is left along the paper conveying path between the upper roll unit and the roll registration roller.	Check and remove it, if any.
	Guide plates or other components along the paper conveying path between the upper roll unit and the roll registration roller.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the upper 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 upper 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 CN3-7 on the engine main PCB remains the same when the registration switch is turned on and off, replace the registration switch.
	Defective upper paper feed switch*.	If CN16-1 on the engine main PCB remains the same when the upper paper feed switch is turned on and off, replace the upper paper feed switch.
	Electrical problem with the upper roll winding clutch*.	See page 1-5-26.
	Electrical problem with the upper feed clutch*.	See page 1-5-27.
	Electrical problem with the roll registration clutch.	See page 1-5-27.
No paper feed from the middle roll unit	Wrong paper.	Check and if the paper is extremely curled or inappropriate for printing, change it.
	A piece of paper torn from print paper is left along the paper conveying path between the middle roll unit and the roll registration roller.	Check and remove it, if any.

Problem	Causes/check procedures	Corrective measures
No paper feed from the middle roll unit	Guide plates or other components along the paper conveying path between the middle roll unit and the roll registration roller.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the middle 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 middle 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 CN3-7 on the engine main PCB remains the same when the registration switch is turned on and off, replace the registration switch.
	Defective middle paper feed switch.	If CN16-2 on the engine main PCB remains the same when the lower paper feed switch is turned on and off, replace the middle paper feed switch.
	Electrical problem with the middle roll winding clutch.	See page 1-5-26.
	Electrical problem with the middle feed clutch.	See page 1-5-27.
	Electrical problem with the roll registration clutch.	See page 1-5-27.
No paper feed from the lower roll unit	Wrong paper.	Check and if the paper is extremely curled or inappropriate for printing, change it.
	A piece of paper torn from print paper is left along the paper conveying path between the lower roll unit and the roll registration roller.	Check and remove it, if any.
	Guide plates or other components along the paper conveying path between the lower roll unit and the roll registration roller.	Check and remedy or replace any deformed parts.
	The roll paper feed upper roller of the lower 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 lower 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 CN3-7 on the engine main PCB remains the same when the registration switch is turned on and off, replace the registration switch.
	Defective lower paper feed switch.	If CN16-3 on the engine main PCB remains the same when the lower paper feed switch is turned on and off, replace the lower paper feed switch.
	Electrical problem with the lower roll winding clutch.	See page 1-5-27.

Problem	Causes/check procedures	Corrective measures
No paper feed from the lower roll unit	Electrical problem with the lower feed clutch.	See page 1-5-27.
	Electrical problem with the roll registration clutch.	See page 1-5-27.
Bypass table registration jam	A piece of paper torn from print paper is caught around the bypass registration switch.	Check and remove it, if any.
	Defective bypass timing switch.	If CN3-11 on the engine main PCB remains the same when the bypass timing switch is turned on and off, replace the bypass timing switch.
Roll unit registration jam	A piece of paper torn from print paper is caught around the registration switch.	Check and remove it, if any.
	Defective registration switch.	If CN3-7 on the engine main PCB remains the same when the registration switch is turned on and off, replace the registration switch.
Paper jam in the paper conveying section	A piece of paper torn from print paper is left along the paper conveying path between the roll registration roller and the eject roller.	Check and remove it, if any.
	Guide plates or other components along the paper conveying path between the roll registration roller and the eject roller.	Check and remedy or replace any deformed parts.
	Dirty roll registration, pre-transfer or eject rollers.	Check the rollers and, if they are dirty, clean them with isopropyl alcohol.
	Deformed or worn roll registration, pre-transfer or eject rollers.	Check and replace rollers if necessary.
	Extremely dirty press roller separation claws or heat roller.	Check and clean if necessary.
	Deformed press roller separation claws or heat roller.	Check and replace any deformed parts. See pages 1-6-29 and 36.
	Broken separation charger wire.	Check and replace the separation charger wire if it is broken. See page 1-6-17.
	Electrical problem with the roll registration clutch.	See page 1-5-27.
	Defective eject switch.	If CN3-13 on the engine main PCB remains the same when the eject switch is turned on and off, replace the eject switch.
	Broken eject switch actuator.	Check and, if the actuator is broken, replace the actuator.
	Defective separation claw solenoid.	See page 1-5-30.

Problem	Causes/check procedures	Corrective measures
Paper jam in the eject section	Roll paper is left uncut.	Press the Roll Cut key to cut remaining paper and remove it.
	A piece of paper is caught around the eject switch.	Check and remove it, if any.
	Defective eject switch.	If CN3-13 on the engine main PCB remains the same when the eject switch is turned on and off, replace the eject switch.

1-5-2 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 printing and displays a 4-digit self-diagnostic code (0110 to 7200) preceded by “C” 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 detachable unit (SSW1 and 2 turning off and on) or turning the main switch off and back on.

Figure 1-5-2 Service call code display

(2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C0110	**Backup RAM error** • Backup area has been altered.	Problem with a back-up memory data.	Open and close the detachable unit and run maintenance item U020 to format the backup memory data.
		The engine main PCB is defective.	If "C011" is displayed after formatting the backup memory data, replace the engine main PCB.
C0210	**MMI communication error** • Initial communication between IPU PCB* and engine main PCB was still not complete after 50 seconds elapsed. • Retry was conducted 20 times after data was sent but there was still no response.	The engine main PCB or IPU PCB is defective.	Replace the engine main PCB or the IPU PCB and check for correct operation.
C0220	**Engine communication error** • Initial communication between IPU PCB* and engine main PCB is still not complete after a certain amount of time elapsed.	The engine main PCB or IPU PCB is defective.	Replace the engine main PCB or the IPU PCB and check for correct operation.
C0310	**HDC communication error** • Retry was conducted 50 times after data was sent but there was still no response.	The engine main PCB or IPU PCB* is defective.	Replace the engine main PCB or the IPU PCB and check for correct operation.
C0620	**Memory problem** • No DIMM is detected in the memory slot.	DIMM is not installed correctly.	Reinstall the DIMM into CN7, CN8 and CN9 on the IPU PCB*. (Be sure to install the DIMM into CN7 first.)
		The IPU PCB* is defective.	Replace the IPU PCB and check for correct operation.
C0800	**Image processing error** • There has been no change in image processing ASIC status.	The IPU PCB* is defective.	Replace the IPU PCB and check for correct operation.
C0850	**Backup memory error** • Data can not be written normally in backup memory.	The IPU PCB* is defective.	Replace the IPU PCB and check for correct operation.
C1300	**Cutter motor error** • The cutter has not returned to its home position after a certain amount of time (900 ms) when the main switch is turned on or when the detachable unit, eject cover or lower right cover is opened/closed.	The cutter motor connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the cutter unit (see page 1-6-38).
		The cutter motor does not operate correctly.	Replace the cutter unit (see page 1-6-38).
		The left or right cutter home position switch is defective.	Replace the cutter unit (see page 1-6-38).
		The engine main PCB is defective.	Replace the engine main PCB and check for correct operation.

* Optional

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C2201	**Drum motor lock error** • Drum motor lock detection signal to CN7-11 on the engine main PCB remains on after 1 s has elapsed with drum motor REM signal on.	The drum motor connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The drum motor does not operate correctly.	Replace the drum motor and check for correct operation.
		The engine main PCB is defective.	Replace the engine main PCB and check for correct operation.
C5100	**Main high-voltage error** Main grid short detection signal was input to CN6-18 on the engine main PCB when the main high-voltage REM signal was on.	The main charger wire is broken.	Replace the main charger wire (see page 1-6-15).
		The main charger grid is broken.	Replace the main charger grid.
		The main high-voltage transformer connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The main high-voltage transformer is defective.	Replace the main high-voltage transformer and check for correct operation.
C5110	**Transfer high-voltage error** Transfer short detection signal was input to CN3-3 on the engine main PCB when the transfer high-voltage REM signal was on.	The transfer charger wire or separation charger wire is broken.	Replace the transfer charger wire or the separation charger wire (see page 1-6-17).
		A foreign matter is adhering to the transfer charger wire or separation charger wire.	Clean the transfer charger wire or the separation charger wire.
		The ST high-voltage transformer connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The ST high-voltage transformer is defective.	Replace the ST high-voltage transformer and check for correct operation.
C5500	**Drum surface potential sensor error** • Potential sensor input to CN2-5 on the engine main PCB was less than 500 V (3.1 V) (average of 15 inputs) during surface potential correction executed when printing starts or when the detachable unit, eject cover or lower right cover is opened/closed.	The drum surface potential sensor connector terminals make poor contact.	Check for continuity across the connector terminals and remedy if necessary.
		The drum surface potential sensor is defective.	Replace the drum surface potential sensor and the drum surface potential PCB and check for correct operation.
		The drum surface potential PCB is defective.	Replace the drum surface potential sensor and the drum surface potential PCB and check for correct operation.
		The main charger wire is broken.	Replace the main charger wire (see page 1-6-15).
		The main charger grid is broken.	Replace the main charger grid.

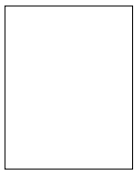
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C5500	**Drum surface potential sensor error** • Potential sensor input to CN2-5 on the engine main PCB was less than 500 V (3.1 V) (average of 15 inputs) during surface potential correction executed when printing starts or when the detachable unit, eject cover or lower right cover is opened/closed.	The main high-voltage transformer connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The main high-voltage transformer is defective.	Replace the main high-voltage transformer and check for correct operation.
		The engine main PCB is defective.	Replace the engine main PCB and check for correct operation.
C5650	**Dark potential error** Surface potential is still not within the effective range for target potential after surface potential correction is executed 10 times.	The drum surface potential sensor connector terminals are loosely connected or make poor contact.	Check for continuity across the connector terminals and remedy if necessary.
		The drum surface potential sensor is defective.	Replace the drum surface potential sensor and the drum surface potential PCB and check for correct operation.
		The drum surface potential PCB is defective.	Replace the drum surface potential sensor and the drum surface potential PCB and check for correct operation.
		The main charger wire is broken.	Replace the main charger wire (see page 1-6-15).
		The main charger grid is broken.	Replace the main charger grid.
		The main high-voltage transformer connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The main high-voltage transformer is defective.	Replace the main high-voltage transformer and check for correct operation.
		The engine main PCB is defective.	Replace the engine main PCB and check for correct operation.
C6000	**Broken main fixing heater connection** • Machine operation still did not become stable after 20 minutes in ambient temperature of 15°C or higher. • Machine operation still did not become stable after 30 minutes in ambient temperature lower than 15°C. • Temperature detected by fixing unit thermistor 1 was lower than 100°C after fixing stabilized.	The main fixing heater is not installed correctly.	Check and reinstall if necessary.
		The main fixing heater has a break.	Check for continuity and if none, replace the main fixing heater (see page 1-6-27).
		Fixing unit thermistor 1 is not installed correctly.	Check and reinstall if necessary.
		Fixing unit thermistor 1 connector terminals are loosely connected.	Check the connection of CN2-15 on the engine main PCB and continuity across the terminals. If there is abnormality, remedy or replace (see page 1-6-32).
		Fixing unit thermistor 1 has a break.	Measure the resistance. If the resistance is $\infty\Omega$, replace fixing unit thermistor 1 (see page 1-6-32).
		The fixing unit thermostat operates.	Check for continuity. If none, replace the fixing unit thermostat (see page 1-6-34).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C6000	**Broken main fixing heater connection** • Machine operation still did not become stable after 20 minutes in ambient temperature of 15°C or higher. • Machine operation still did not become stable after 30 minutes in ambient temperature lower than 15°C. • Temperature detected by fixing unit thermistor 1 was lower than 100°C after fixing stabilized.	The fixing heater control circuit on the power source PCB is broken.	Run maintenance item U196 by selecting "Heater1". If voltage between TB3 and CN2-1 on the power source PCB does not become 120/230 V AC, replace the PCB.
		The engine main PCB or the power source PCB is defective.	Run maintenance item U196 by selecting "Heater1". If CN4-8 on the engine main PCB does not go low, replace the engine main PCB or the power source PCB and check for correct operation.
C6020	**Main fixing heater high temperature error** • Temperature detected by fixing unit thermistor 1 was 195°C or higher.	Fixing unit thermistor 1 has shorted.	Measure the resistance. If the resistance is 0Ω, replace fixing unit thermistor 1 (see page 1-6-32).
		The fixing heater control circuit on the power source PCB is broken.	Replace the power source PCB.
C6200	**Broken sub fixing heater connection** • Temperature detected by fixing unit thermistor 2 was lower than 100°C after fixing stabilized.	The sub fixing heater is not installed correctly.	Check and reinstall if necessary.
		The sub fixing heater has a break.	Check for continuity and if none, replace the sub fixing heater (see page 1-6-27).
		Fixing unit thermistor 2 is not installed correctly.	Check and reinstall if necessary.
		Fixing unit thermistor 2 connector terminals are loosely connected.	Check the connection of CN2-14 on the engine main PCB and continuity across the terminals. If there is abnormality, remedy or replace (see page 1-6-32).
		Fixing unit thermistor 2 has a break.	Measure the resistance. If the resistance is ∞Ω, replace fixing unit thermistor 2 (see page 1-6-32).
		The fixing unit thermostat operates.	Check for continuity. If none, replace the fixing unit thermostat (see page 1-6-34).
		The fixing heater control circuit on the power source PCB is broken.	Run maintenance item U196 by selecting "Heater2". If voltage between TB3 and CN2-2 on the power source PCB does not become 120/230 V AC, replace the PCB.
		The engine main PCB or the power source PCB is defective.	Run maintenance item U196 by selecting "Heater2". If CN4-9 on the engine main PCB does not go low, replace the engine main PCB or the power source PCB and check for correct operation.
C6220	**Sub fixing heater high temperature error** • Temperature detected by fixing unit thermistor 2 was 200°C or higher.	Fixing unit thermistor 2 has shorted.	Measure the resistance. If the resistance is 0Ω, replace fixing unit thermistor 2 (see page 1-6-32).
		The fixing heater control circuit on the power source PCB is broken.	Replace the power source PCB.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C6400	**Zero-cross interruption error** • The zero-cross signal was not input into CN3-1B on the engine main PCB for more than 5 s during fixing phase control.	Connector terminals are loosely connected or are making poor contact.	Check the connection of CN4-7 on the engine main PCB and CN9-1 on the power source PCB and continuity across the terminals. If there is abnormality, remedy or replace.
		The power source PCB is defective.	Check if the zero-cross signal is output from CN9-1 on the power source PCB. If not, replace the PCB.
		The engine main PCB is defective.	Check if the zero-cross signal is input to CN4-7 on the engine main PCB. If not, replace the PCB.
C7101	**Toner sensor error** • Toner sensor input to CN2-9 on the engine main PCB was 4.6 V or higher. • Toner sensor input to CN2-9 on the engine main PCB was 0.8 V or lower.	The toner sensor is defective.	Replace the toner sensor.
		The toner sensor connector terminals are loosely connected or are making poor contact.	Reinsert the connector. Also check for continuity across the terminal wire and if none, remedy or replace the wire.
		The developer is defective.	Replace the developer (see page 1-6-7).
C7200	**Broken developing thermistor connection** • The temperature detected by the developing thermistor was 0°C or lower for 100 ms. • The temperature detected by the developing thermistor was 56°C or higher for 100 ms.	The developing thermistor is not installed correctly.	Check and reinstall if necessary.
		The developing thermistor connector terminals are loosely connected.	Check the connection of CN2-1 on the engine main PCB and continuity across the terminals. If there is abnormality, remedy or replace.
		The developing thermistor has a break.	Measure the resistance. If the resistance is $\infty\Omega$, replace the developing thermistor.
		The developing thermistor has shorted.	Measure the resistance. If the resistance is 0Ω, replace the developing thermistor.

1-5-3 Image formation problems

(1) No image (entirely white).



See page 1-5-17.

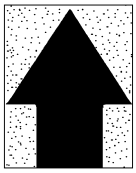
(2) Part or all of the image is solid black.

See page 1-5-17.

(3) Image is too light.

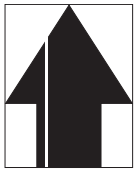
See page 1-5-18.

(4) Background is visible.



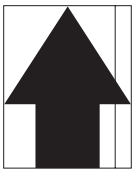
See page 1-5-18.

(5) A white line appears longitudinally.



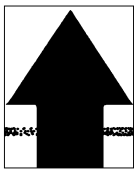
See page 1-5-19.

(6) A black line appears longitudinally.



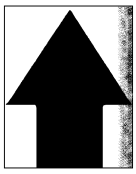
See page 1-5-19.

(7) A black line appears laterally.



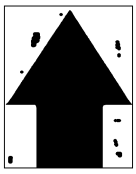
See page 1-5-20.

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



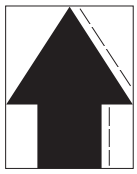
See page 1-5-20.

(9) Black dots appear on the image.



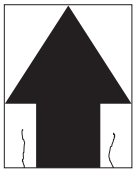
See page 1-5-21.

(10) Image is blurred.



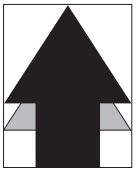
See page 1-5-21.

(11) Paper creases.



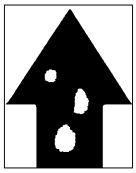
See page 1-5-21.

(12) Offset occurs.



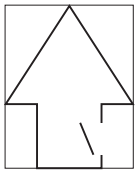
See page 1-5-22.

(13) Image is partly missing.



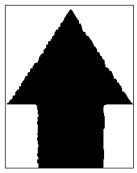
See page 1-5-22.

(14) Fixing is poor.



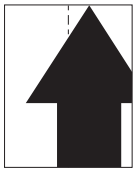
See page 1-5-22.

(15) Image is out of focus.



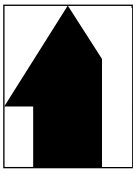
See page 1-5-23.

(16) The center of the image is mis-aligned with the print image.



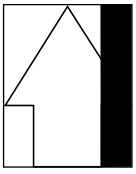
See page 1-5-23.

(17) One forth the A0 width of the image is white.



See page 1-5-24.

(18) One forth the A0 width of the image is black.



See page 1-5-24.

(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.	
Defective engine main PCB.	Run maintenance item U101 by selecting “TC: ON” and check if CN4-3 on the engine main PCB goes low. If not, replace the PCB.
Defective ST high-voltage transformer.	If transfer charging does not take place during maintenance item U101 is executed by selecting “TC: ON” while CN1-2 on the ST high-voltage transformer or CN4-3 on the engine main PCB goes low, replace the ST high-voltage transformer.
2. LPH fails to turn on.	
Defective power source PCB.	Measure voltage of the terminals on the power source PCB that supply power to the LPH. If none, replace the PCB.
Poor contact in the LPH data wire 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.
Defective LPH.	Run maintenance item U451 and if no gray pattern is output, replace the LPH (see page 1-6-3).

(2) Part or all of the image is solid black.

Causes
1. No main charging.
2. Loose LPH data wire connectors.
3. Defective LPH.

Causes	Check procedures/corrective measures
1. No main charging.	
Defective engine main PCB.	If CN6-12 on the engine main PCB does not go low during printing, replace the PCB.
2. Loose LPH data wire connectors.	Run maintenance item U461 by selecting “Measure Density”. If an image for adjusting solid black is not output, check the connection of the LPH data wire connectors and remedy if necessary.
3. Defective LPH.	Run maintenance item U461 by selecting “Measure Density”. If an image for adjusting solid black is not output after the LPH data wire connection, replace the LPH (see page 1-6-3).

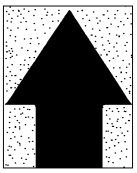
(3) Image is too light.

Causes

1. Insufficient toner.
2. Deteriorated developer.
3. Deteriorated drum.
4. Misadjusted developing section.
5. Misadjusted drum surface potential.
6. Dirty LPH.
7. Defective ST high-voltage transformer.

Causes	Check procedures/corrective measures
1. Insufficient toner.	If the message requesting to add toner is displayed on the operation panel, 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 (see page 1-6-7).
3. Deteriorated drum.	Replace the drum (see page 1-6-11).
4. Misadjusted developing section.	Readjust the position of the magnetic brush or doctor blade (see pages 1-6-9 and 10).
5. Misadjusted drum surface potential.	Run maintenance item U100 and readjust the drum surface potential (see page 1-6-14).
6. Dirty LPH.	Clean the LPH (see page 1-6-3).
7. Defective ST high-voltage transformer.	If transfer charging does not take place during maintenance item U101 is executed by selecting “TC: ON” while CN1-2 on the ST high-voltage transformer or CN4-3 on the engine main PCB goes low, replace the ST high-voltage transformer.

(4) Background is visible.

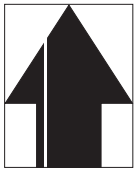


Causes

1. Deteriorated developer.
2. Misadjusted developing section.
3. Misadjusted drum surface potential.
4. Dirty LPH.

Causes	Check procedures/corrective measures
1. Deteriorated developer.	Check the number of prints made with the current developer. If it has reached the specified limit, replace the developer (see page 1-6-7).
2. Misadjusted developing section.	Readjust the doctor blade position (see page 1-6-9).
3. Misadjusted drum surface potential.	Run maintenance item U100 and readjust the drum surface potential (see page 1-6-14).
4. Dirty LPH.	Clean the LPH (see page 1-6-3).

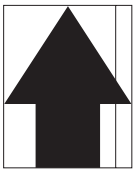
(5) A white line appears longitudinally.



Causes
1. Dirty or flawed main charger wire.
2. Foreign matter in the developing assembly.
3. Flawed drum.
4. Dirty LPH.
5. Defective LPH.

Causes	Check procedures/corrective measures
1. Dirty or flawed main charger wire.	Clean the main charger wire. If the wire is flawed, replace it (see page 1-6-15).
2. Foreign matter in the developing assembly.	Check if the magnetic brush is formed uniformly. If there is a foreign matter, replace the developer (see page 1-6-7).
3. Flawed drum.	Replace the drum (see page 1-6-11).
4. Dirty LPH.	Clean the LPH (see page 1-6-3).
5. Defective LPH	Run maintenance item U451. If no gray pattern is output, replace LPH (see page 1-6-3).

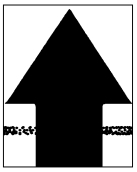
(6) A black line appears longitudinally.



Causes
1. Flawed drum.
2. Deformed or worn cleaning blade.
3. Dirty or flawed main charger wire.
4. Defective LPH.

Causes	Check procedures/corrective measures
1. Flawed drum.	Replace the drum (see page 1-6-11).
2. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-22).
3. Dirty or flawed main charger wire.	Clean the main charger wire. If the wire is flawed, replace it (see page 1-6-15).
4. Defective LPH.	Run maintenance item U461 by selecting “Measure Density”. If an image for adjusting solid black is not output after the LPH data wire connection, replace the LPH (see page 1-6-3).

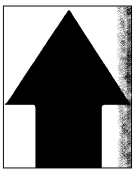
(7) A black line appears laterally.



Causes
1. Flawed drum.
2. Developing bias voltage is not output.
3. Dirty developing section.

Causes	Check procedures/corrective measures
1. Flawed drum.	If the distance between lines is 283 mm, replace the drum (see page 1-6-11).
2. Developing bias voltage is not output.	
Loose connection or poor contact of the main high-voltage transformer connectors.	Check if the main high-voltage transformer connectors are securely connected. If not, remedy. Check for continuity across the terminals. If none, replace them.
Defective main high-voltage transformer.	During printing, if CN1-6 on the main high-voltage transformer goes low but the developing bias voltage is not output, replace the transformer.
Defective engine main PCB.	If CN6-13 on the engine main PCB does not go low during printing, replace the PCB.
3. Dirty developing section.	Clean the developing section.

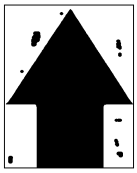
(8) One side of the print image is darker than the other.



Causes
1. Dirty main charger wire.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Clean the main charger wire. If it is extremely dirty, replace it (see page 1-6-15).

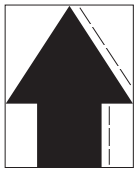
(9) Black dots appear on the image.



Causes
1. Flawed drum.
2. Deformed or worn cleaning blade.
3. Dirty or flawed cleaning fur brush.

Causes	Check procedures/corrective measures
1. Flawed drum.	If the distance between dots is 283 mm, replace the drum (see page 1-6-11).
2. Deformed or worn cleaning blade.	Replace the cleaning blade (see page 1-6-22).
3. Dirty or flawed cleaning fur brush.	Clean the cleaning fur brush. If it is flawed, replace it (see page 1-6-24).

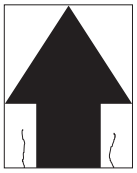
(10) Image is blurred.



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

Causes	Check procedures/corrective measures
1. Deformed press roller.	Replace the press roller (see page 1-6-30).
2. Paper conveying drive system problem.	Check the gears and belts. Grease the gears or readjust the belt tension if necessary.

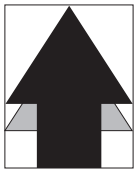
(11) Paper creases.



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 pressure adjustment nuts are tightened correctly and, if not, remedy.

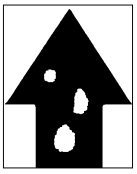
(12) Offset occurs.



Causes
1. Defective cleaning blade.
2. Right, middle or left cleaning lamp fails to light.

Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the cleaning blade (see page 1-6-22).
2. Right, middle or left cleaning lamp fails to light.	Run maintenance item U105. If right, middle or left cleaning lamp is not lit with the connectors securely connected, replace the lamp.

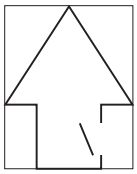
(13) Image is partly missing.



Causes
1. Paper damp.
2. Paper creased.
3. Flawed drum.
4. 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. Flawed drum.	Replace the drum (see page 1-6-11).
4. Deformed pre-transfer inner upper guide.	Remedy or replace.

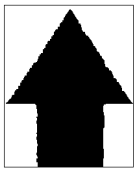
(14) Fixing is poor.



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 pressure adjustment nuts are tightened correctly and, if not, remedy.
3. Misadjusted fixing temperature.	Readjust the fixing temperature in the user default.
4. Flawed press roller.	Replace the press roller (see page 1-6-30).

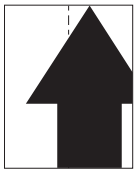
(15) Image is out of focus.



Causes
1. LPH installed incorrectly.
2. Defective LPH.

Causes	Check procedures/corrective measures
1. LPH installed incorrectly.	Run maintenance item U461 by selecting “Adjust Focus” and output the test pattern for image focus adjustment. If the image is not correct, adjust the LPH position (see page 1-6-5).
2. Defective LPH.	After adjusting the LPH position, run maintenance item U461 by selecting “Adjust Focus”. If the test pattern is still not correct, replace the LPH.

(16) The center of the image is misaligned with the print image.

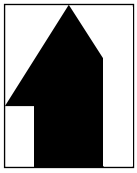


Causes
1. Paper roll is not installed correctly on the roll shaft.
2. Paper is not placed correctly on the bypass table.

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.

(17) One forth the A0 width of the image is white.

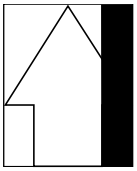
Causes
1. Defective LPH.



Causes	Check procedures/corrective measures
1. Defective LPH.	Run maintenance item U451. If no gray pattern is output, replace the LPH (see page 1-6-3).

(18) One forth the A0 width of the image is black.

Causes
1. Defective LPH.



Causes	Check procedures/corrective measures
1. Defective LPH.	Run maintenance item U451. If no gray pattern is output, replace the LPH (see page 1-6-3).

1-5-4 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 on the power source PCB 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.
	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, 5 V, 3 V, –5 V and 12 V DC are output when AC is supplied. If not, replace the PCB.
(2) The main motor does not operate.	The engine main PCB is defective.	Run maintenance item U030 by selecting “Drive Mot”. If CN7-7 on the engine main PCB does not go low, replace the PCB.
	The main motor is defective.	Run maintenance item U030 by selecting “Drive Mot”. If CN7-7 on the engine main PCB goes low but the main motor does not rotate, replace the motor.
(3) The drum motor does not operate.	The drum motor is defective.	Run maintenance item U030 by selecting “Drive Mot”. If CN7-3 on the engine main PCB goes low but the drum motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U030 by selecting “Drive Mot”. If CN7-3 on the engine main PCB does not go low, replace the PCB.
(4) The fixing motor does not operate.	The fixing motor is defective.	Run maintenance item U030 by selecting “Fix Unit Mot”. If CN7-5 on the engine main PCB goes low but the fixing motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U030 by selecting “Fix Unit Mot”. If CN7-5 on the engine main PCB does not go low, replace the PCB.
(5) The paper feed motor does not operate.	The paper feed motor is defective.	Run maintenance item U030 by selecting “Feed Mot”. If CN7-1 on the engine main PCB goes low but the paper feed motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U030 by selecting “Feed Mot”. If CN7-1 on the engine main PCB does not go low, replace the PCB.

Problem	Causes/check procedures	Corrective measures
(6) The toner feed motor does not operate.	The toner feed motor coil is broken.	Check for continuity across the coil. If none, replace the toner feed motor.
	The engine main PCB is defective.	Run maintenance item U135. If 24 V DC is not output across CN4-1 and CN4-2 on the engine main PCB, replace the PCB.
(7) The paper conveying fan motor does not operate.	The paper conveying fan motor is defective.	Run maintenance item U037 by selecting “Feed Fan”. If CN4-14 on the engine main PCB goes low but the paper conveying fan motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U037 by selecting “Feed Fan”. If CN4-14 on the engine main PCB does not go low, replace the PCB.
(8) The fixing unit fan motor does not operate.	The fixing unit fan motor is defective.	Run maintenance item U037 by selecting “Fix Fan”. If CN4-10 and CN4-12 on the main PCB go low but the fixing unit fan motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U037 by selecting “Fix Fan”. If CN4-10 and CN4-12 on the engine main PCB do not go low, replace the PCB.
(9) LPH fan motor does not operate.	The LPH fan motor coil is broken.	Check for continuity across the coil. If none, replace LPH fan motor.
	LPH fan motor is defective.	Run maintenance item U037 by selecting “LPH Fan”. If CN16-9 on the engine main PCB goes low but LPH fan motor does not rotate, replace the motor.
	The engine main PCB is defective.	Run maintenance item U037 by selecting “LPH Fan”. If CN16-9 on the engine main PCB does not go low, replace the PCB.
	The LPH fan motor is defective.	If the LPH fan motor does not rotate with power relay 1 on, replace the motor.
(10) 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 upper roll winding clutch.
	The connector terminals of the upper roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Roll rev CL1”. If CN6-9 on the engine main PCB does not go low, replace the PCB.
(11) 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 middle roll winding clutch.
	The connector terminals of the middle roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Roll rev CL2”. If CN6-10 on the engine main PCB does not go low, replace the PCB.

* Optional

Problem	Causes/check procedures	Corrective measures
(12) The lower roll winding clutch does not operate.	The lower roll winding clutch coil is broken.	Check for continuity across the coil. If none, replace the lower roll winding clutch.
	The connector terminals of the lower roll winding clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Roll rev CL3”. If CN6-11 on the engine main PCB does not go low, replace the PCB.
(13) The upper feed clutch* does not operate.	The upper feed clutch coil is broken.	Check for continuity across the coil. If none, replace the upper feed clutch.
	The connector terminals of the upper feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Feed CL1”. If CN6-6 on the engine main PCB does not go low, replace the PCB.
(14) The middle feed clutch does not operate.	The middle feed clutch coil is broken.	Check for continuity across the coil. If none, replace the middle feed clutch.
	The connector terminals of the middle feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Feed CL2”. If CN6-7 on the engine main PCB does not go low, replace the PCB.
(15) The lower feed clutch does not operate.	The lower feed clutch coil is broken.	Check for continuity across the coil. If none, replace the lower feed clutch.
	The connector terminals of the lower feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Feed CL3”. If CN6-8 on the engine main PCB does not go low, replace the PCB.
(16) The roll feed clutch does not operate.	The roll feed clutch coil is broken.	Check for continuity across the coil. If none, replace the roll feed clutch.
	The connector terminals of the roll feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Roll FD CL”. If CN6-5 on the engine main PCB does not go low, replace the PCB.
(17) The roll registration clutch does not operate.	The roll registration clutch coil is broken.	Check for continuity across the coil. If none, replace the roll registration clutch.
	The connector terminals of the roll registration clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “Roll RES CL”. If CN6-4 on the engine main PCB does not go low, replace the PCB.

* Optional

Problem	Causes/check procedures	Corrective measures
(18) The bypass registration clutch does not operate.	The bypass registration clutch coil is broken.	Check for continuity across the coil. If none, replace the bypass registration clutch.
	The connector terminals of the bypass registration clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “BP RES CL”. If CN6-1 on the engine main PCB does not go low, replace the PCB.
(19) The bypass feed clutch does not operate.	The bypass feed clutch coil is broken.	Check for continuity across the coil. If none, replace the bypass feed clutch.
	The connector terminals of the bypass feed clutch make poor contact.	Check for continuity across the terminals. If none, replace them.
	The engine main PCB is defective.	Run maintenance item U032 by selecting “BP FD CL”. If CN6-2 on the engine main PCB does not go low, replace the PCB.
(20) The right, middle or left cleaning lamp does not light.	The right, middle or left cleaning lamp has a break.	Check for continuity across the coil. If none, replace the right, middle or left cleaning lamp.
	The engine main PCB is defective.	Run maintenance item U105. If CN6-16 on the engine main PCB does not go low, replace the PCB.
(21) The main fixing heater does not turn on.	The main fixing heater has a break.	Check for continuity across the terminals. If none, replace the main fixing heater (see page 1-6-27).
	Fixing unit thermistor 1 has a break.	Measure the resistance. If it is 0Ω, replace fixing unit thermistor 1 (see page 1-6-32).
	The fixing unit thermostat operates.	Check for continuity across the terminals. If none, replace the fixing unit thermostat (see page 1-6-34).
	The power source PCB is defective.	Run maintenance item U196 by selecting “Heater1”. If CN9-3 on the power source PCB goes low but the main fixing heater does not turn on, replace the PCB.
	The engine main PCB is defective.	Run maintenance item U196 by selecting “Heater1”. If CN4-8 on the engine main PCB does not go low, replace the PCB.
(22) The sub fixing heater does not turn on.	The sub fixing heater has a break.	Check for continuity across the terminals. If none, replace the sub fixing heater (see page 1-6-27).
	Fixing unit thermistor 2 has a break.	Measure the resistance. If it is 0Ω, replace fixing unit thermistor 2 (see page 1-6-32).
	The fixing unit thermostat operates.	Check for continuity across the terminals. If none, replace the fixing unit thermostat (see page 1-6-34).
	The power source PCB is defective.	Run maintenance item U196 by selecting “Heater2”. If CN9-4 on the power source PCB goes low but the sub fixing heater does not turn on, replace the PCB.
	The engine main PCB is defective.	Run maintenance item U196 by selecting “Heater2”. If CN4-9 on the engine main PCB does not go low, replace the PCB.

Problem	Causes/check procedures	Corrective measures
(23) The main fixing heater fails to turn off.	The thermal sensing section of fixing unit thermistor 1 is dirty.	Visually check and clean if necessary.
	Fixing unit thermistor 1 is shorted.	Measure the resistance. If it is ∞Ω, replace fixing unit thermistor 1 (see page 1-6-31).
	The power source PCB is defective.	Check if CN9-3 on the power source PCB remains low constantly. If so, replace the PCB.
	The engine main PCB is defective.	Check if CN4-8 on the engine main PCB remains low constantly. If so, replace the PCB.
(24) The sub fixing heater fails to turn off.	The thermal sensing section of fixing unit thermistor 2 is dirty.	Visually check and clean if necessary.
	Fixing unit thermistor 2 is shorted.	Measure the resistance. If it is ∞Ω, replace fixing unit thermistor 2 (see page 1-6-31).
	The power source PCB is defective.	Check if CN9-4 on the power source PCB remains low constantly. If so, replace the PCB.
	The engine main PCB is defective.	Check if CN4-9 on the engine main PCB remains low constantly. If so, replace the PCB.
(25) No main charging.	The main charger wire is broken.	Replace the main charger wire (see page 1-6-15).
	The main charger unit leaks.	Clean the main charger unit.
	The main high-voltage transformer connectors make poor contact.	Check for continuity across the terminals. If none, replace the terminals.
	The main high-voltage transformer is defective.	During printing, if CN1-3 on the main high-voltage transformer goes low but the main charging is not conducted, replace the transformer.
	The engine main PCB is defective.	If CN6-12 on the engine main PCB does not go low during printing, replace the PCB.
(26) No transfer charging.	The transfer charger wire is broken.	Replace the transfer charger wire (see page 1-6-17).
	The transfer charger unit leaks.	Clean the transfer charger unit.
	The ST high-voltage transformer connectors make poor contact.	Check for continuity across the terminals. If none, replace the terminals.
	The ST high-voltage transformer is defective.	Run maintenance item U101 by selecting “TC: ON”. If CN1-1 on the ST high-voltage transformer or CN4-3 on the engine main PCB goes low but the transfer charging is not conducted, replace the transformer.
	The engine main PCB is defective.	Run maintenance item U101 by selecting “TC: ON”. If CN4-3 on the engine main PCB does not go low, replace the PCB.
(27) No separation charging.	The separation charger wire is broken.	Visually check. Replace the wire if necessary (see page 1-6-17).
	The ST high-voltage transformer connectors make poor contact.	Check if the connectors are securely connected. If not, remedy. Check for continuity across the terminals. If none, replace them.
	The ST high-voltage transformer is defective.	Run maintenance item U101 by selecting “AC: ON”. If CN1-2 on the ST high-voltage transformer CN4-4 on the engine main PCB goes low but the separation charging is not conducted, replace the PCB.
	The engine main PCB is defective.	Run maintenance item U101 by selecting “AC: ON”. If CN4-4 on the engine main PCB does not go low, replace the PCB.

Problem	Causes/check procedures	Corrective measures
(28) No developing bias voltage.	The main high-voltage transformer connectors are loosely connected or are making poor contacts.	Check if the connectors are securely connected. If not, remedy. Check for continuity across the terminals. If none, replace them.
	The main high-voltage transformer is defective.	Run maintenance item U140. If CN1-6 on the main high-voltage transformer goes low but the developing bias voltage is not output, replace the transformer.
	The engine main PCB is defective.	Run maintenance item U140. If CN6-13 on the engine main PCB does not go low, replace the PCB.
(29) The drum heater does not operate.	The drum heater wire is broken.	Measure the resistance across the terminals. If it is $\infty\Omega$, replace the drum heater.
(30) The upper roll unit heater* does not operate.	The upper roll unit heater has a break.	Measure the resistance across the terminals. If it is $\infty\Omega$, replace the upper roll unit heater.
	The upper roll unit heater switch is defective.	Check for continuity across the upper roll unit heater switch. If none with the switch set to on, replace it.
	The power source PCB is defective.	If the upper roll unit heater does not operate with CN9-5 on the power source PCB low, replace the PCB.
	The engine main PCB is defective.	If the upper roll unit heater does not operate with CN4-11 on the engine main PCB low, replace the PCB.
(31) The middle roll unit heater does not operate.	The middle roll unit heater has a break.	Measure the resistance across the terminals. If it is $\infty\Omega$, replace the middle roll unit heater.
	The middle roll unit heater switch is defective.	Check for continuity across the middle roll unit heater switch. If none with the switch set to on, replace it.
	The power source PCB is defective.	If the middle roll unit heater does not operate with CN9-5 on the power source PCB low, replace the PCB.
	The engine main PCB is defective.	If the middle roll unit heater operates with CN4-11 on the engine main PCB low, replace the PCB.
(32) The lower roll unit heater does not operate.	The lower roll unit heater has a break.	Measure the resistance across the terminals. If it is $\infty\Omega$, replace the lower roll unit heater.
	The lower roll unit heater switch is defective.	Check for continuity across the lower roll unit heater switch. If none with the switch set to on, replace it.
	The power source PCB is defective.	If the lower roll unit heater does not operate with CN9-5 on the power source PCB low, replace the PCB.
	The engine main PCB is defective.	If the lower roll unit heater operates with CN4-11 on the engine main PCB low, replace the PCB.
(33) The separation claw solenoid does not operate.	The separation claw solenoid connectors make poor contact.	Check for continuity across the terminals. If none, replace the separation claw solenoid.
	The engine main PCB is defective.	Run maintenance item U033 by selecting “SEP SOL”. If CN6-15 on the engine main PCB does not go low, replace the PCB.

* Optional

1-5-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surface of the roll paper feed upper and lower rollers of the upper roll unit* is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper and lower rollers of the upper roll unit* are deformed or worn.	If it is, replace.
	Check if the surface of the roll paper feed upper and lower rollers of the middle roll unit is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper and lower rollers of the middle roll unit are deformed or worn.	If it is, replace.
	Check if the surface of the roll paper feed upper and lower rollers of the lower roll unit is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the roll paper feed upper and lower rollers of the lower roll unit are deformed or worn.	If it is, replace.
	After inserting the cutter, check if the surface of the rollers is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	After inserting the cutter, check if the rollers are deformed or worn.	If it is, replace.
	Check if the bypass registration switch operates correctly.	If CN3-12 on the engine 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.
	Check if the surface of the bypass paper feed roller, bypass upper roller and bypass lower roller is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the bypass paper feed roller, bypass upper roller and bypass lower roller are deformed or worn.	If it is, replace.
	Check if the upper*, middle and lower feed clutches, roll registration clutch, bypass feed clutch, bypass registration clutch and roll feed clutch are installed correctly.	If not, reinstall.
	Check if the upper*, middle and lower feed clutches, roll registration clutch, bypass feed clutch, bypass registration clutch and roll feed clutch operate correctly.	If not, replace the component.
	Check if paper feed section drive belts 1 and 2 are installed correctly.	If not, reinstall.

* Optional

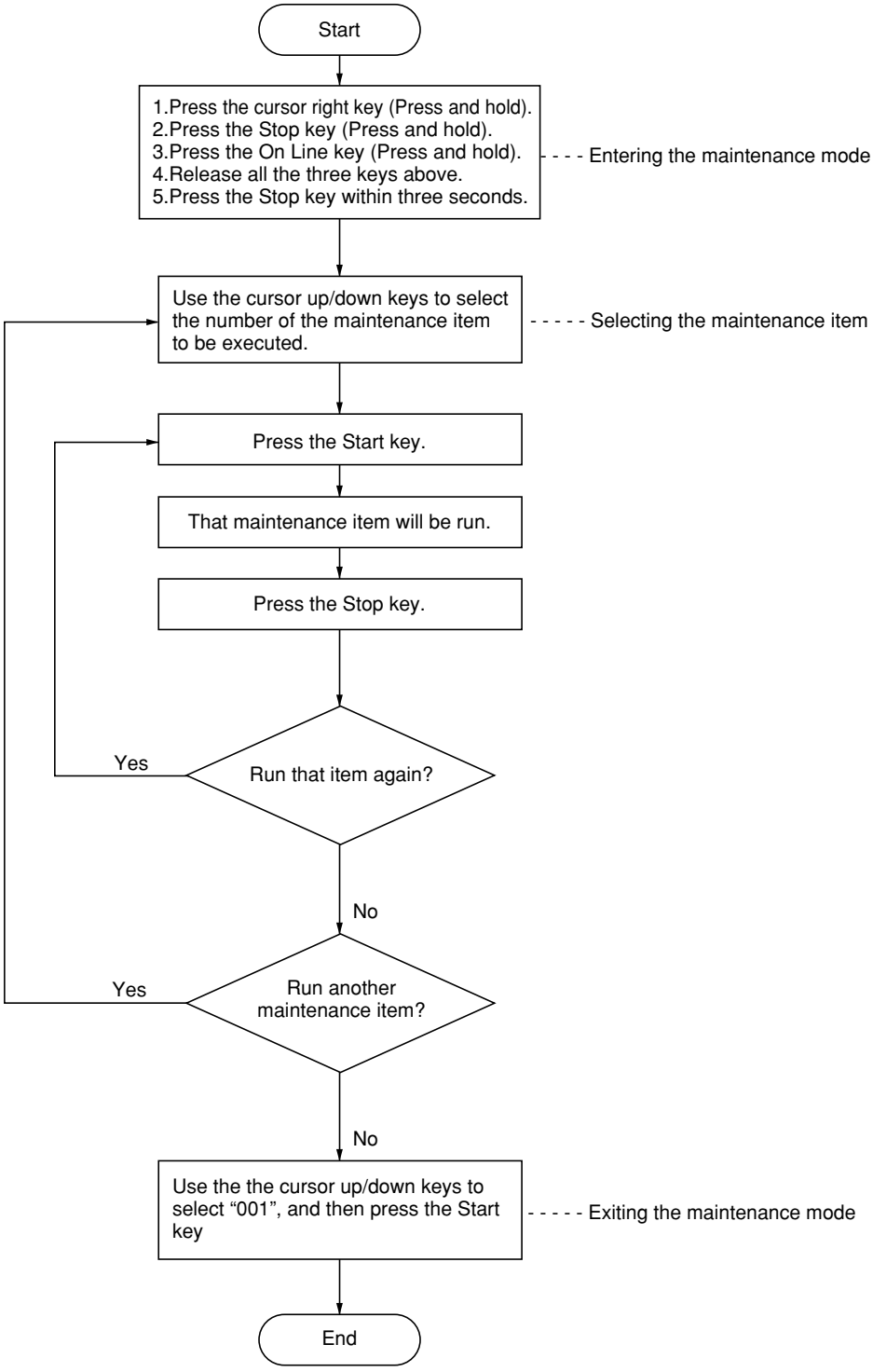
Problem	Causes/check procedures	Corrective measures
(2) No secondary paper feed.	Check if the surfaces of the roll registration roller and roll registration pulley is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the surfaces of the bypass upper roller, bypass lower roller, pre-transfer pulley and pre-transfer roller is dirty with paper powder.	If they are, clean with isopropyl alcohol.
	Check if the roll registration clutch and bypass registration clutch are installed correctly.	If not, reinstall.
	Check if the roll registration clutch and bypass registration clutch operate correctly.	If not, replace.
(3) 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 unit is broken.	If it is, replace (see page 1-6-17).
	Check if the paper conveying fan motor rotates correctly.	If not, replace.
	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 separation claws or the heat roller is extremely dirty.	If it is, clean.
	Check if the press roller separation claw or the heat roller is deformed.	If it is, replace (see pages 1-6-29 and 36).
	Check if the oil roller is extremely dirty.	If it is, replace (see page 1-6-26).
	Check if the separation claw solenoid is defective.	See page 1-5-30.
(4) 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 seal is deformed.	If it is, replace (see page 1-6-23).
(5) 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.

1-6-1 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

(2) Executing a maintenance item



1-6-2 Optical section

(1) Attachment and removal of the LED printhead

Follow the procedure below when cleaning or replacing the LED printhead.

Procedure

1. Detach the developing unit (see page 1-6-7), the cleaning unit (see page 1-6-21), and the drum (see page 1-6-11).
2. Remove the four screws holding the LPH partition. Then remove the 4-pin connector connected to the drum surface potential sensor PCB, and pull upwards in order to detach the LPH partition.

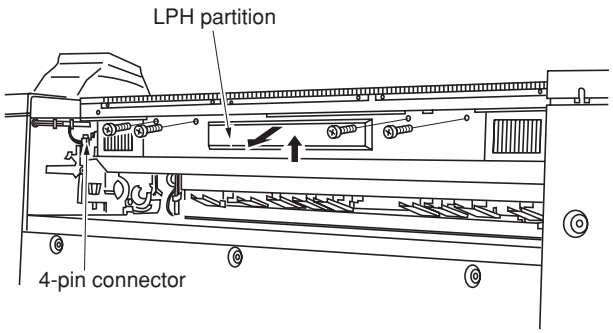


Figure 1-6-1

3. Remove the 4-pin connector, the 9-pin connector, the three 4-pin connectors of the main wires, and the black connector for the LPH data conduit, all connected to the LPH PCB.
4. Loosen the two screws for each of the left and right LPH retainers, raise the retainers and tighten the inside pins to fasten the retainers.
   * When installing the LED printhead, lower the left and right LPH retainers in order to fasten the printhead.
5. Detach the LED printhead from the main unit.

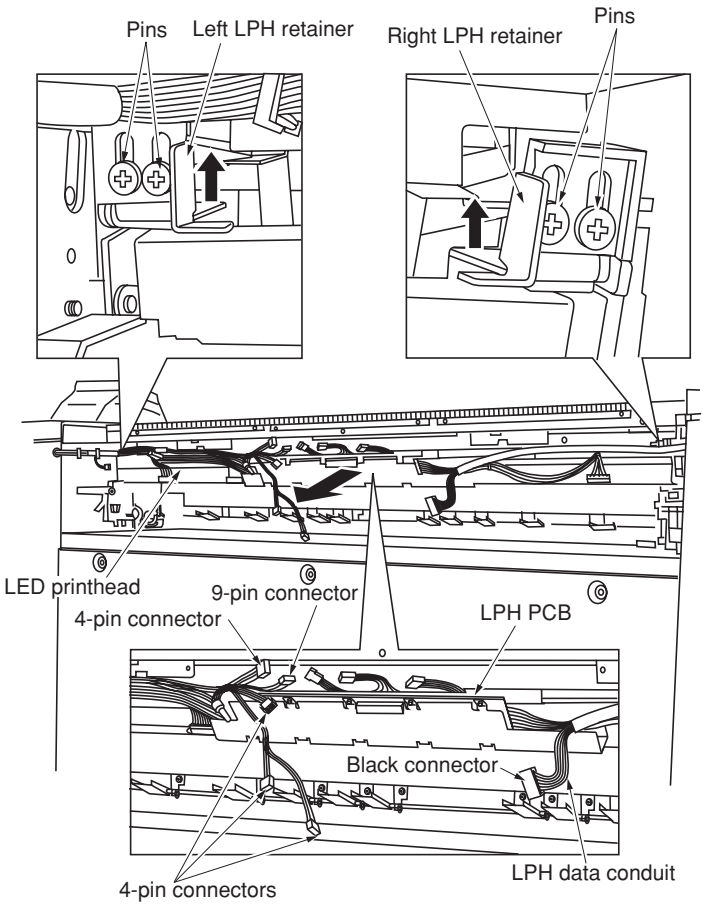


Figure 1-6-2

6. Remove the two screws and slide the LPH circuit mount to the left in order to detach it.
7. Remove the six connectors on the front side of the LED printhead.
   * When installing the LED printhead, connect the connectors for the black wires to the front side of the LED printhead as shown in the figure.

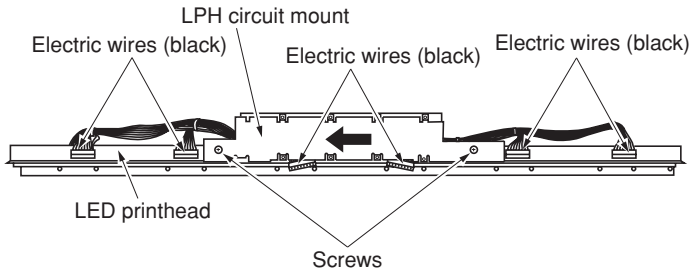


Figure 1-6-3

8. Turn the LED printhead over and remove the six connectors on the back side.
   * When installing the LED printhead, connect the connectors for the pink wires to the right side of the LED printhead and the connectors for the white wires to the left side of the LED printhead as shown in the figure.

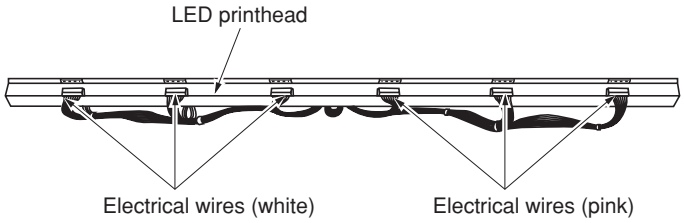


Figure 1-6-4

9. If the LED printhead has been replaced, replace the LPHROM (U12) on the LPH PCB with the LPHROM that is included with the new LED printhead.
   * Always use a PLCC removal tool when detaching the LPHROM from the LPH PCB. Always check whether the serial number of the LPHROM matches the serial number of the LED printhead to be installed.

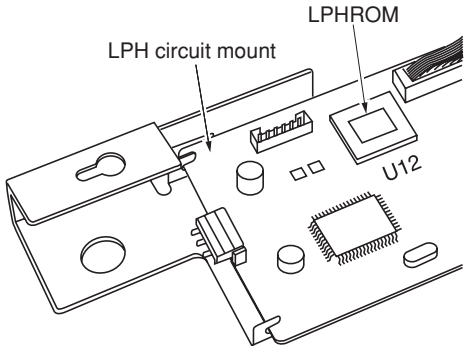


Figure 1-6-5

When replacing the LPH PCB, follow steps 10 to 12.

Replacing the LPH main PCB

10. Remove the six connectors from the LPH main PCB.
11. Remove the eight screws and then detach the LPH PCB from the LPH main circuit mount.
12. Attach the LPHROM (U12) that was mounted on the old LPH PCB onto the new LPH PCB. If the LED printhead has been replaced, install the LPHROM that is included with the new LED printhead.

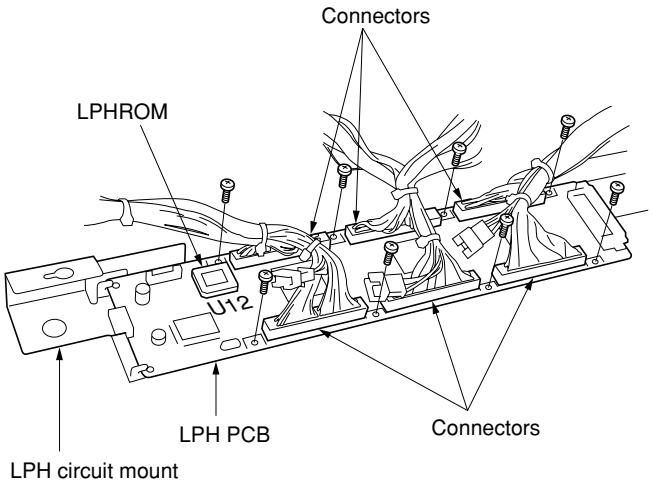


Figure 1-6-6

13. Refit all the removed parts.
14. Perform the adjustment of the image focus (LPH height adjustment) procedure. (See page 1-6-6.)

(2) Adjustment of the image focus (LPH height adjustment)
Perform after replacing the LED printhead.

Procedure

1. Perform adjustment of the image focus adjustment (maintenance item U461) and print out a test pattern.
2. Using a magnifying glass, check whether the lines of the smaller pattern are printed clearly or not.
   If the test pattern obtained is not correct, follow the procedure from step 3.

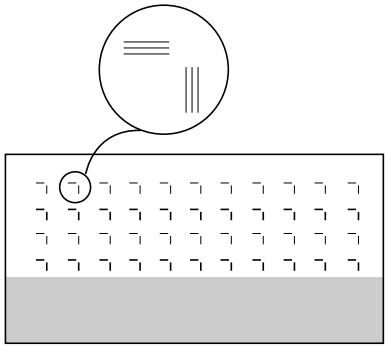


Figure 1-6-7

3. Remove the left upper cover, right upper cover, left lower cover and right center cover.
   * Leave the right upper cover connecter for the operation section connected.
4. Loosen the two screws holding each of the LPH adjustment plates on the left and right sides of the main unit.
5. Adjust the height of the LPH by turning the left and right adjustment pins with a flat-head screw driver.
   * Turn the adjustment pins clockwise to raise the LPH. Turn them counterclockwise to lower the LPH.
6. If a correct test pattern is obtained, refit all the removed parts.

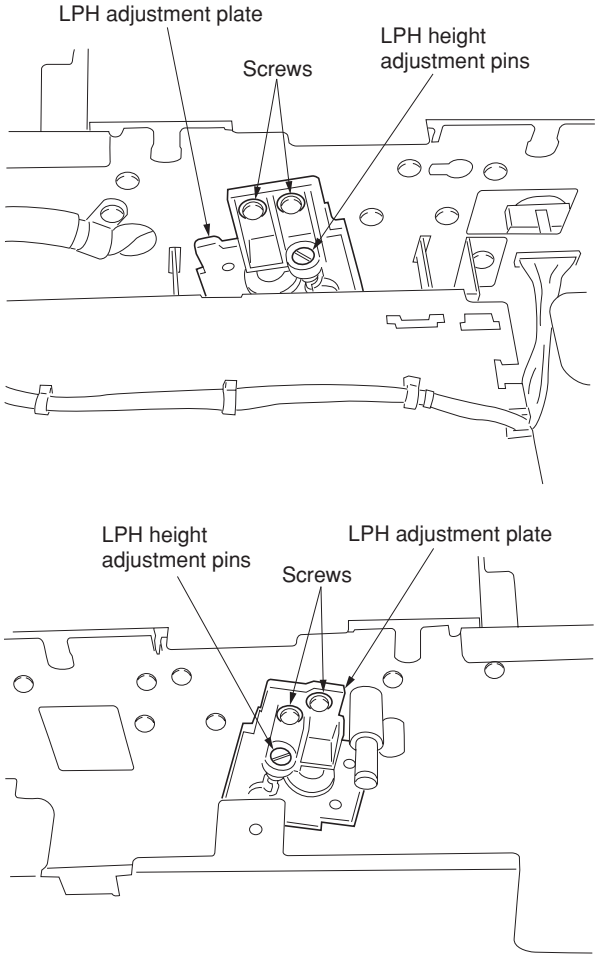


Figure 1-6-8

1-6-3 Developing section

(1) Replacement of developer

Follow the procedure below when replacing developer.

Procedure

1. Open the toner replenishing slot.
2. Remove the screw in order to detach the connector protection plate, and then remove the 5-pin connector.
   * Always turn the main switch off before removing and connecting the 5-pin connector.
3. Remove the five screws and then detach the rear upper cover.

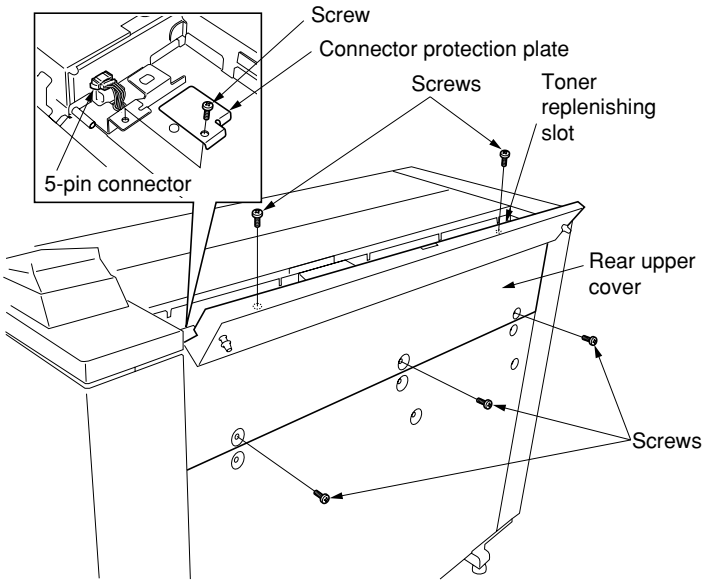


Figure 1-6-9

4. Release the left and right developing unit retaining levers, remove the connector on each of the left and right sides, and then detach the developing unit from the main unit.

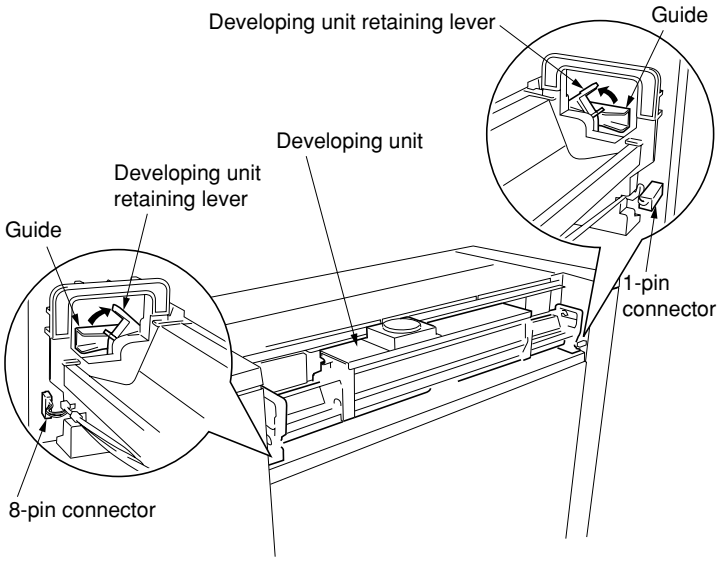


Figure 1-6-10

5. Remove the two pins and the connector on the toner hopper unit and then detach the toner hopper unit from the developing unit.

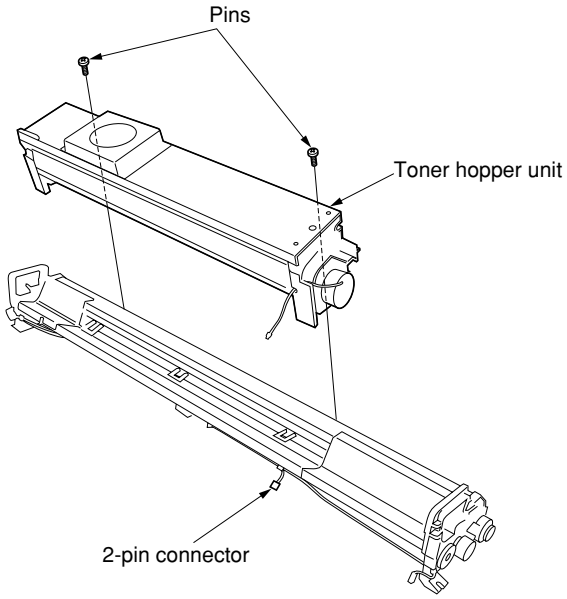


Figure 1-6-11

6. Remove the screw from each of the left and right developing lids and slide the lids inwards in order to detach them.

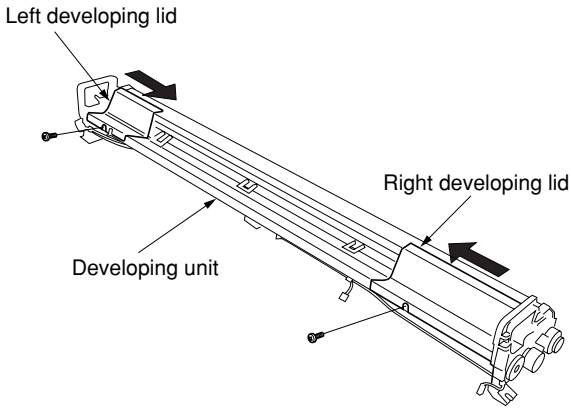


Figure 1-6-12

7. Turn the developing unit upside down and empty the developer out.
8. Turn the gear of the developing roller in order to remove any developer remaining on the developing roller, and then turn the developing unit upside down in order to empty the developer out. (Repeat several times.)
9. Remove any developer remaining on the developing roller using a magnetic screwdriver or vacuum.
10. Pour new developer into the developing unit and perform the initial settings for the developer (see page 1-3-8).
11. Refit all the removed parts.

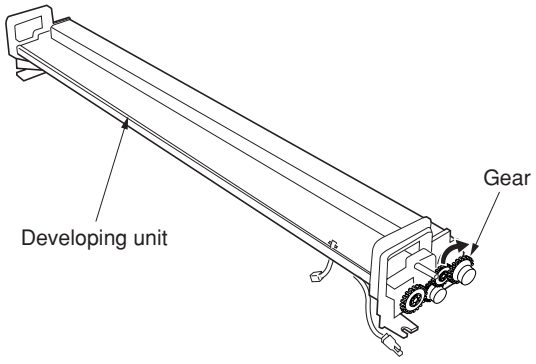


Figure 1-6-13

(2) Adjustment of the doctor blade: reference

Follow the procedure below when carrier appears or a dark background shows up on copies.

Procedure

1. Detach the developing unit and the toner hopper unit, and remove the developer from the developing unit (see page 1-6-7).
2. Remove the two screws holding the upper developing seal, and then detach the upper developing seal from the developing unit.

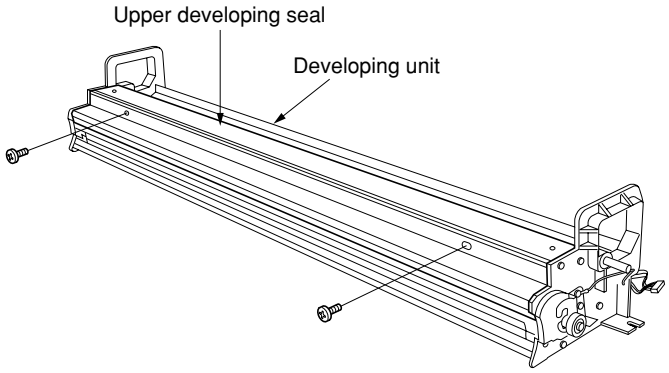


Figure 1-6-14

3. Adjust the gap between the doctor blade and the developing roller to the individually specified distances by loosening the screws at the five points indicated in the figure.
4. Fasten screws ① and ⑤.
5. Fasten screw ③.
6. Fasten screws ② and ④.

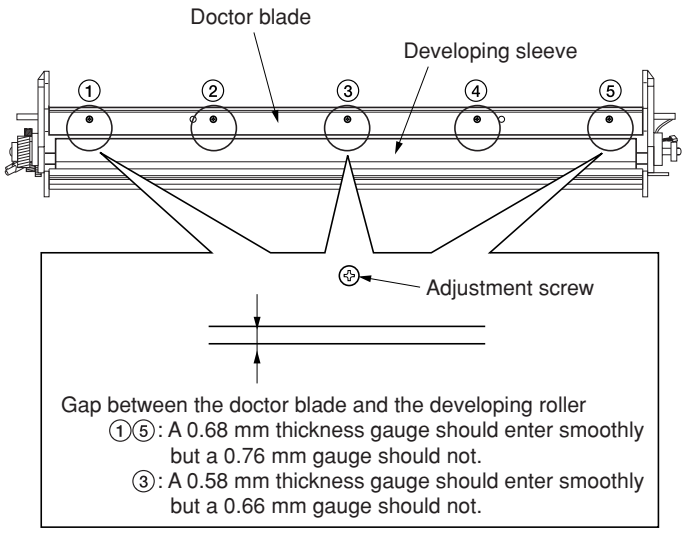


Figure 1-6-15

7. Pour developer into the developing unit and perform the initial settings for the developer (see page 1-3-8).
8. Refit all the removed parts and make a test print in order to check the print image.

(3) Adjustment of position for magnetic brush: reference

Follow the procedure below when carrier appears or a dark background shows up on copies.

Procedure

1. Detach the developing unit and toner hopper unit (see page 1-6-7).
2. Loosen the screws holding the developing bias terminal and carry out adjustment based on the marks inscribed on the developing bias terminal.
   * Adjust within one mark before or after the center mark.
3. Refit all the removed parts and make a test print in order to check the print image.

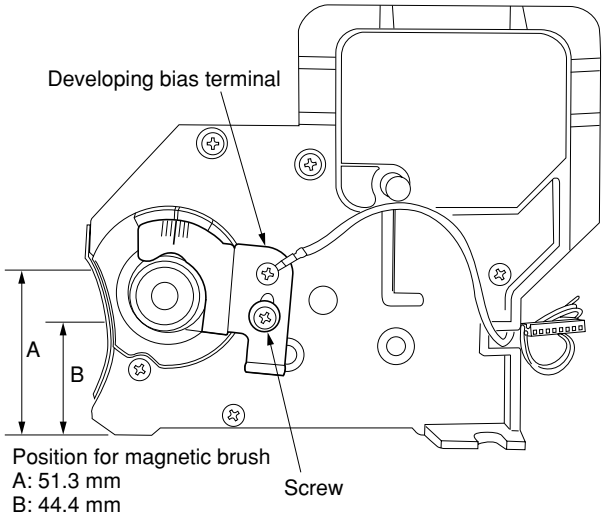


Figure 1-6-16

(4) Replacing the developing drive gear

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Detach the developing unit (see page 1-6-7).
2. Remove the E-ring and remove the developing drive gear.
3. Replace the developing drive gear and refit all the removed parts.

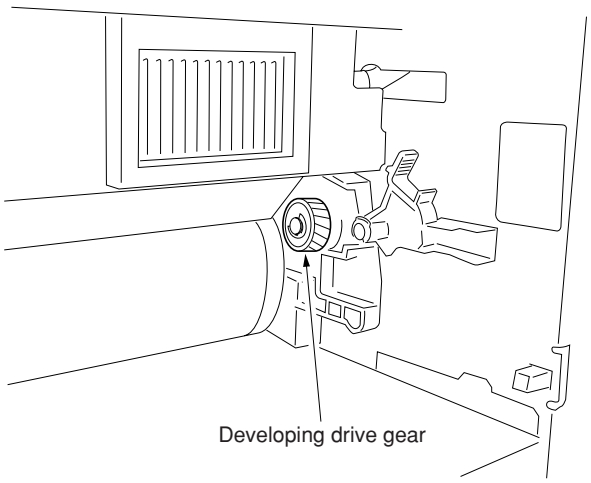


Figure 1-6-17

1-6-4 Image formation section

(1) Replacing the drum

Follow the procedure below when performing drum maintenance.

Caution

After replacing the drum, be sure to clean the main charger unit and check the drum surface potential (see page 1-6-14).

Procedure

1. Detach the cleaning unit (see page 1-6-21).
2. While pushing in on the drum release positioning plate located on the left side of the main unit, push the drum release plate towards the drum in order to disengage the drive joint of the drum flange.

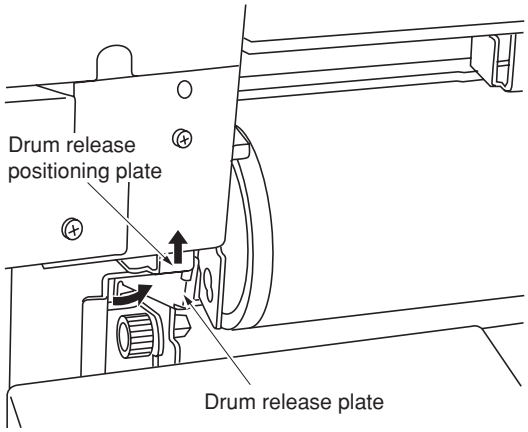


Figure 1-6-18

3. Loosen the screw to each of the left and right drum stoppers and release the stoppers.

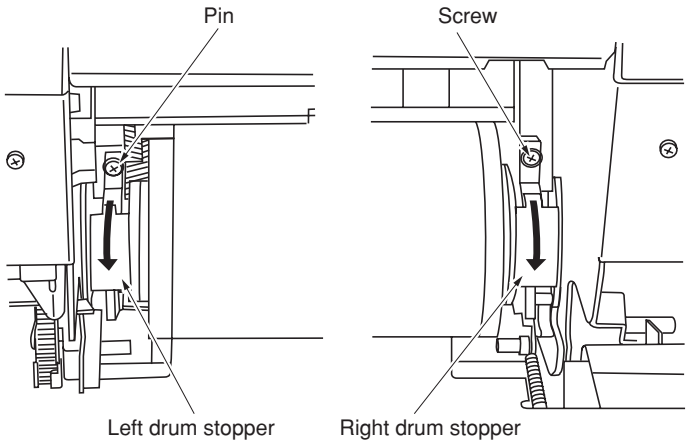


Figure 1-6-19

4. Temporarily set both ends of the drum onto the left and right drum stoppers.

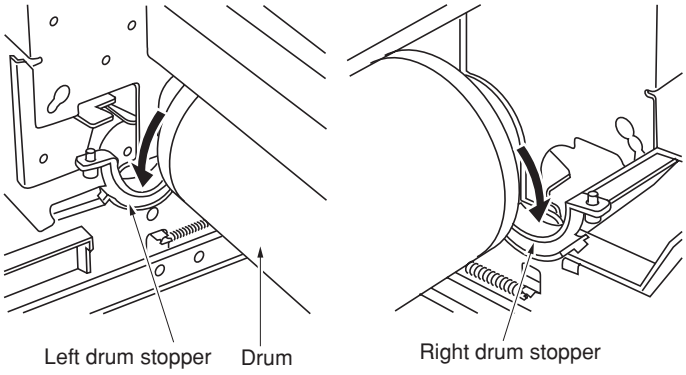


Figure 1-6-20

5. Roll the drum toward you in order to detach it from the main unit.
6. Replace the drum and refit all the removed parts.
   * When installing the drum, fit the drum flange with the lot number label positioned to the right side and be sure to reengage the drive joint of the drum flange.

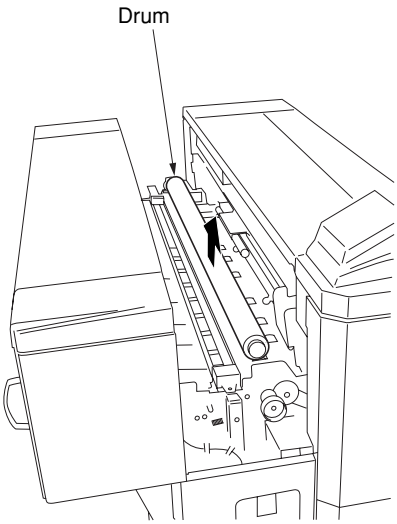


Figure 1-6-21

(2) Cleaning the drum: reference

Follow the procedure below when incorrect images are produced.

Caution

- Do not clean the drum in a location that is exposed to direct sunlight.
- Clean the drum in a location where dust is not apt to collect, as rough pieces of dust contained in the air or foreign matter on the polishing cloth are likely to damage the drum.
- Clean the drum thoroughly even when it is only partially soiled.
- Do not use organic solvents such as alcohol, thinner, etc. to clean the drum.

Preparation

- Polishing toner
- Polishing cloth: specified artificial cotton

Procedure

1. Detach the drum from the main unit. (See page 1-6-11.)
2. Wipe the drum with a dry polishing cloth taking care not to damage the drum surface.
3. Apply toner to the polishing cloth and wipe the drum again.
4. Refit the drum and all removed parts and leave for about 30 minutes.
5. Make a test copy in order to check the copy image.

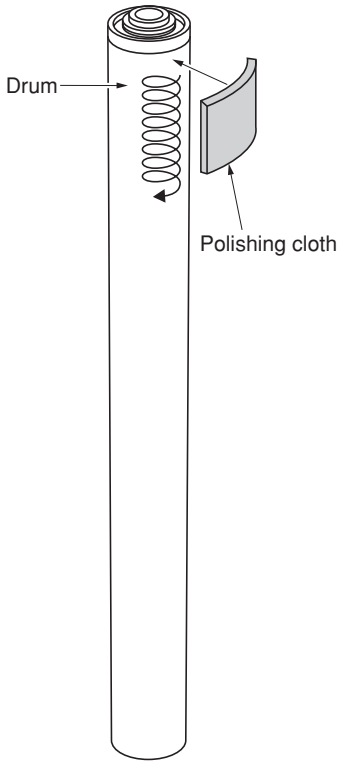


Figure 1-6-22

(3) Checking the drum surface potential

Follow the procedure below when replacing the drum, drum surface potential sensor and LED printhead.

Procedure

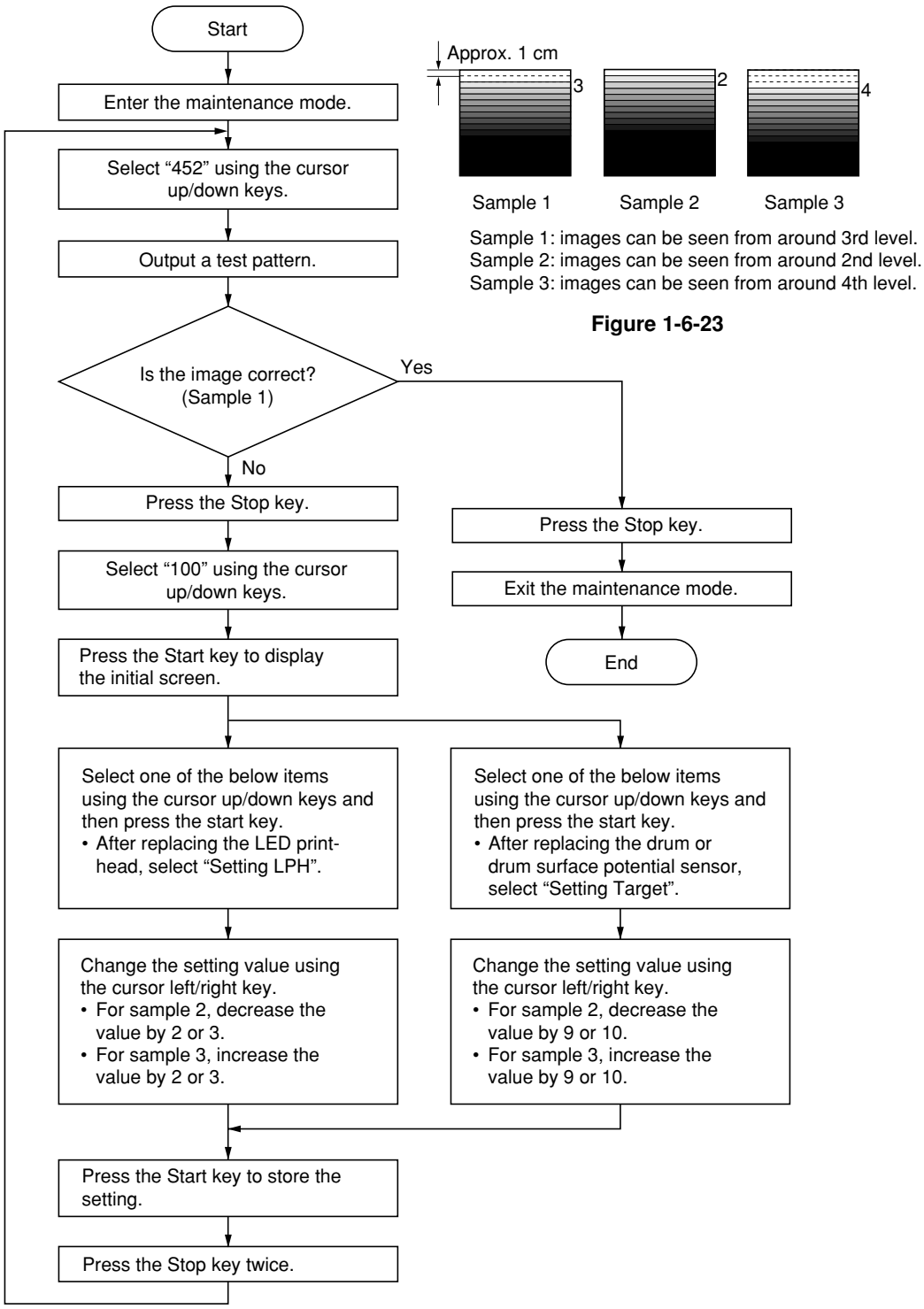


Figure 1-6-23

(4) Replacing the main charger wire

Follow the procedure below when the charger wire is broken or when performing maintenance.

Caution

- Use the specified gilding tungsten oxide wire for the charger wire. (Item No. 2A768020)
- 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 from soiling or damage.
- Keep the charger taut by stretching the charger spring.
- When replacing the charger wire, be sure to clean the individual sections of the main charger unit (main grid, charger housing, etc.).
  * Do not use organic solvents such as alcohol and thinner to clean the main charger shield, and wipe with a dry cloth or a cloth that is damp with water.

Procedure

1. Open the detachable unit.
2. Remove the screw and slide the main charger retainer to the right.
   * When installing the main charger unit, move the main charger retainer to the left side and then fasten it.
3. Move the main charger unit to the right side and rotate in the direction shown by the arrow in order to detach the main charger unit from the cleaning unit.

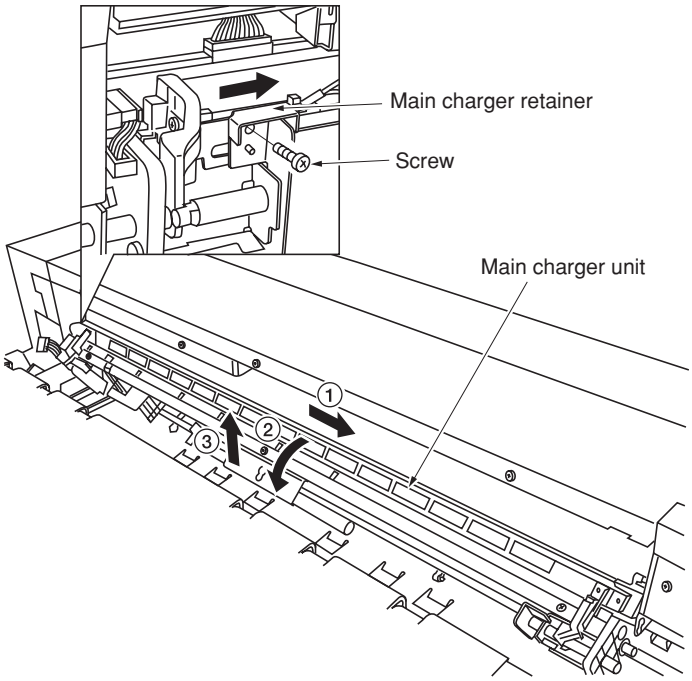


Figure 1-6-24

4. Remove the left and right charger lids.
5. Loosen the screws holding the charger wire, remove the charger spring from the main charger terminal, and remove the charger wire.

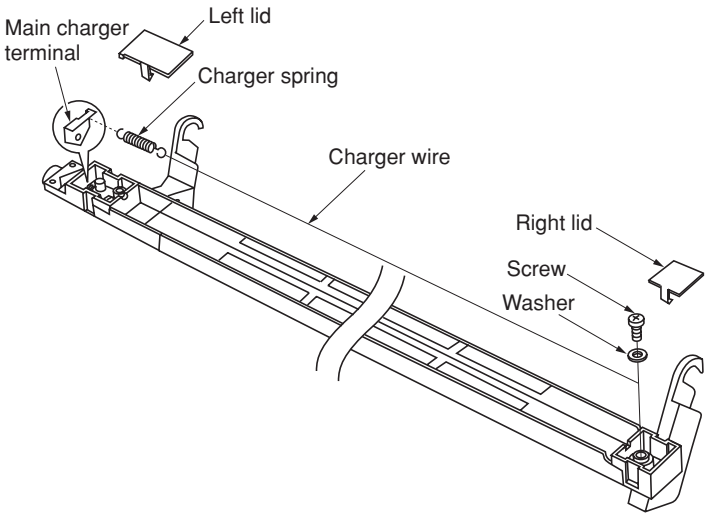


Figure 1-6-25

6. Wind the new tungsten wire five times 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.

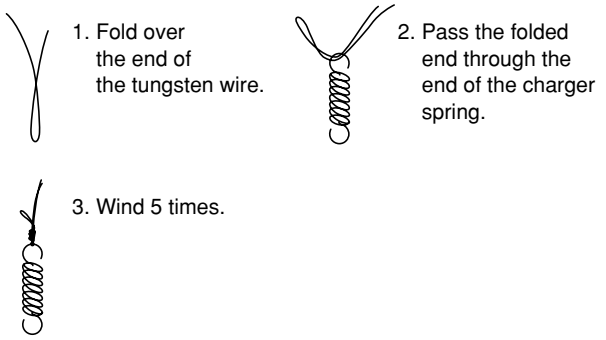


Figure 1-6-26

7. Hook one end of the charger spring to the main charger terminal, pass the other end of the charger spring through the thin metal rod, and insert the rod into the housing notch.
   * The length of the charger spring should be about 16 mm.
8. Pass the other end of the charger wire under the washer, fasten the screw, and cut off the excess wire under the washer.
   * The end of the wire should not protrude more than 2 mm.
   * The charger wire must be set so as to touch the angle of the housing.
9. Remove the metal rod from the charger spring.

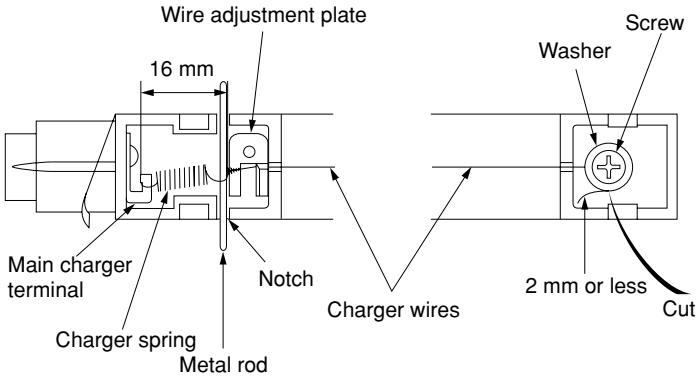


Figure 1-6-27

10. Turn the adjustment screw of the wire adjustment plate until 1.0±0.5 mm of its tip protrudes in order to adjust the height of the wire adjustment plate.
11. Refit all the removed parts.

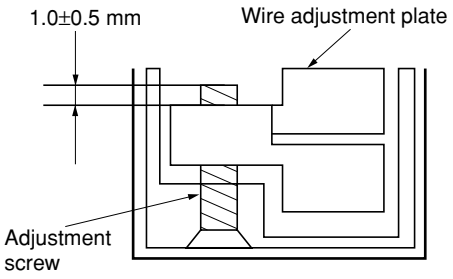


Figure 1-6-28

(5) Replacing the transfer/separation charger wire

Follow the procedure below when the charger wire is broken.

Caution

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

Procedure

1. Open the detachable unit.
2. Remove the screw holding the retainer and then the retainer. Remove the screw on the right side of the transfer charger unit. Detach the transfer charger unit from the main unit by lifting up on the right side of the transfer charger unit and sliding the protrusions that are on the left side out.

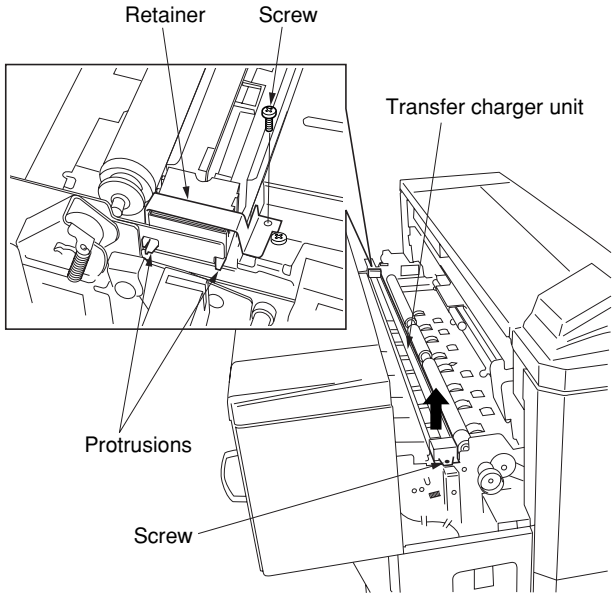


Figure 1-6-29

3. Pull out the transfer inner shield from the transfer outer shield.
   * When pulling out the transfer inner shield, take care that the shield does not contact the transfer wire and cut it.

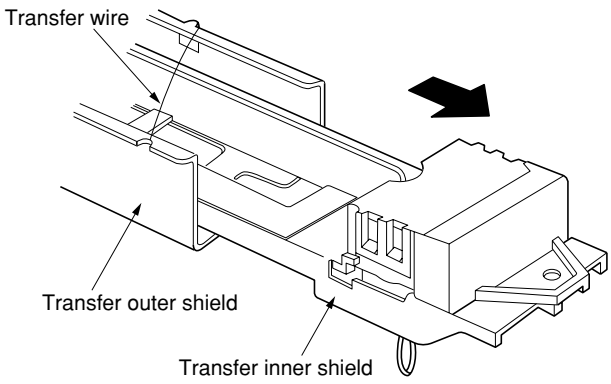


Figure 1-6-30

4. Remove the left and right charger lids from the transfer charger unit.
5. Loosen the screws holding the charger wire, remove the charger spring from the transfer charger terminal, and remove the charger wire.

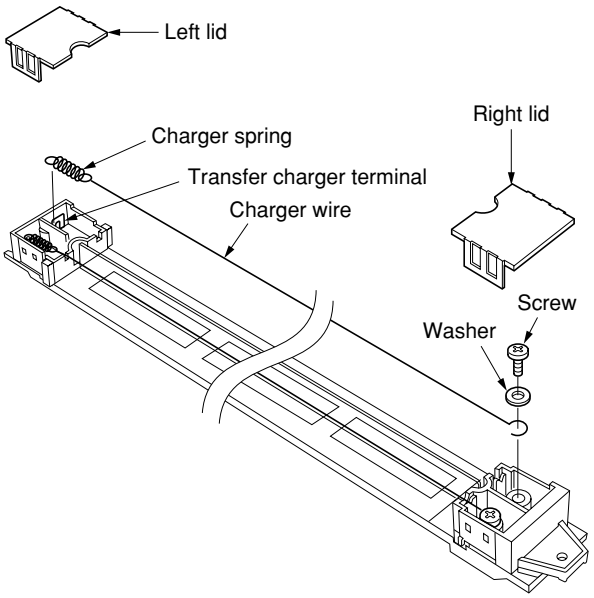


Figure 1-6-31

6. Wind the new tungsten wire five times 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.

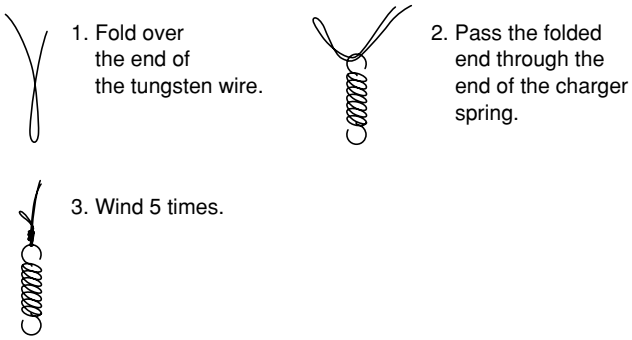


Figure 1-6-32

7. Hook one end of the charger spring to the transfer charger terminal, pass the other end of the charger spring through the thin metal rod, and insert the rod into the housing notch.
   * The length of the charger spring should be about 16 mm.
8. Pass the other end of the charger wire under the washer, fasten the screw, and cut off the excess wire under the washer.
   * The end of the wire should not protrude more than 2 mm.
9. Remove the metal rod from the charger spring.
10. Follow the same procedure to replace the separation charger wire.
11. Refit all the removed parts.

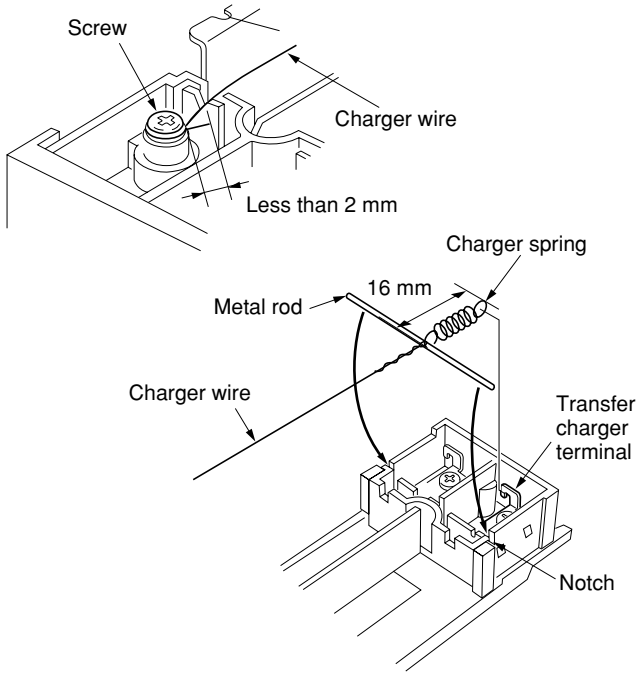


Figure 1-6-33

(6) Replacing the transfer wire

Follow this procedure when the transfer wire is broken.

Caution

Use the specified wire for the transfer wire (Item No. 2A716220).

Procedure

1. Detach the transfer charger unit (see page 1-6-17).
2. Loosen the two screws on the bottom of the transfer outer shield and remove the transfer wire.

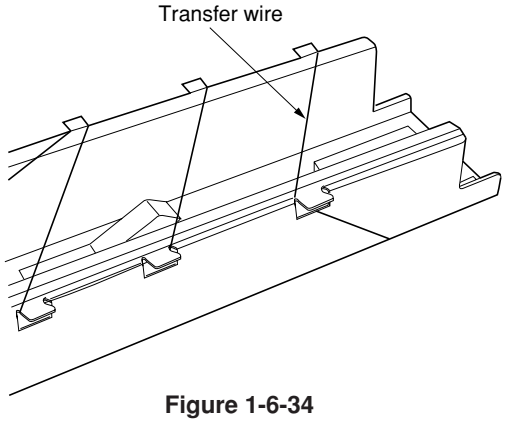


Figure 1-6-34

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

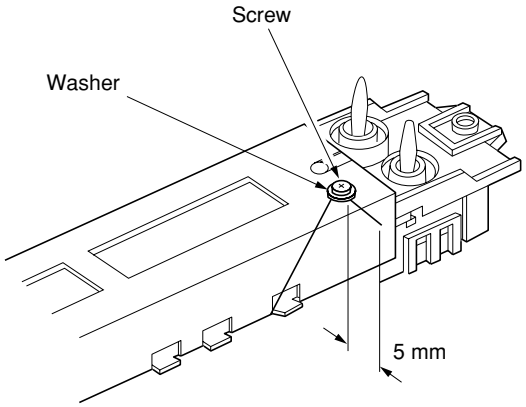


Figure 1-6-35

4. Hook the transfer wire onto the claw and thread it through the grooves of the transfer outer shield as shown in the figure. Cross the wire at the 16th claw and continue to thread the wire.

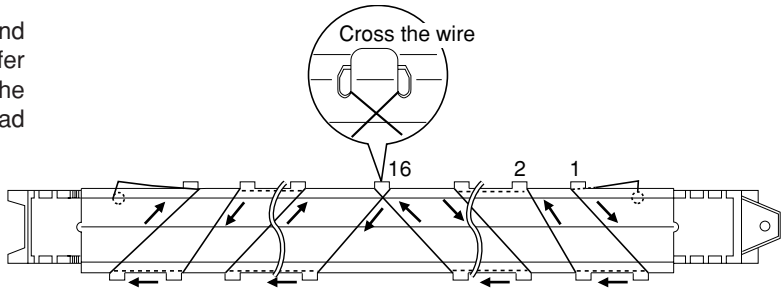


Figure 1-6-36

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

6. Refit all the removed parts.

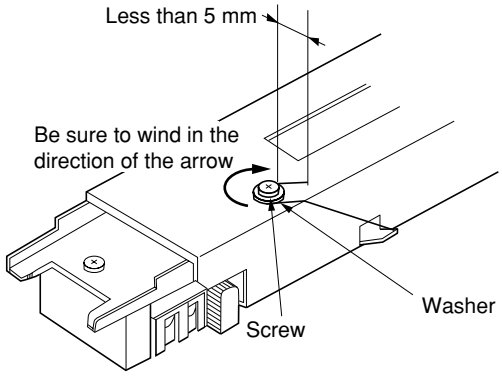


Figure 1-6-37

1-6-5 Cleaning section

(1) Attachment and removal of the cleaning unit

Follow the procedure below when performing maintenance on the cleaning unit, the main charger unit and the drum, and when replacing the LED printhead.

Procedure

• **Removal**

1. Open the detachable unit.
2. Cover the feeding section with paper so that toner does not fall into the main unit.
3. Remove the 9-pin connector on the left side of the machine.
4. Remove the left and right screws holding the cleaning unit stopper, press the retaining levers towards each other, and lower the cleaning unit down toward you.
5. Detach the cleaning unit from the main unit.

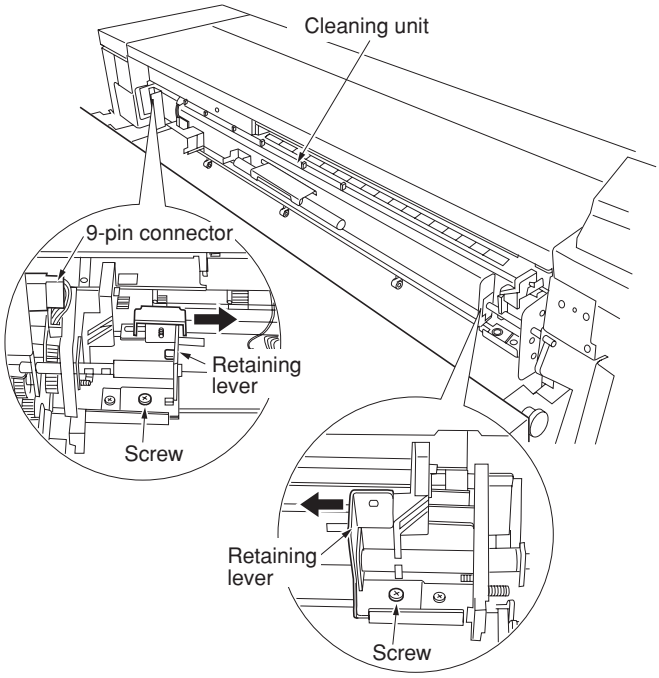


Figure 1-6-38

• **Attachment**

1. Making sure that the ribs of the waste toner nozzle touch the guide of the waste toner duct on the right side of the main unit, refit the cleaning unit into the main unit.
   * The rib will rotate and the aperture of the nozzle will open.
2. Install the cleaning unit inside the main unit by following the procedure for removal in the opposite order.
   * When retaining the cleaning unit, take care that your fingers are not caught by the left and right cleaning unit retention stoppers.

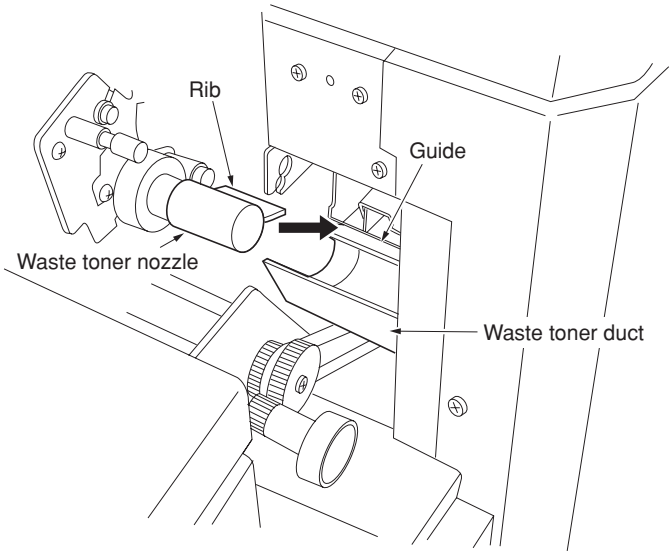


Figure 1-6-39

(2) Attachment and removal of the cleaning blade

Follow the procedure below when performing maintenance on the cleaning blade.

Caution

After replacing the cleaning blade, always perform maintenance item U160 in order to coat the cleaning blade with toner (see page 1-4-17).

Procedure

1. Remove the cleaning unit (see page 1-6-21).
2. Remove the main charger unit (see page 1-6-15).
3. Remove the 2-pin connector and then the earth screw.
4. Remove the three screws holding the main grid, and then detach the main grid.

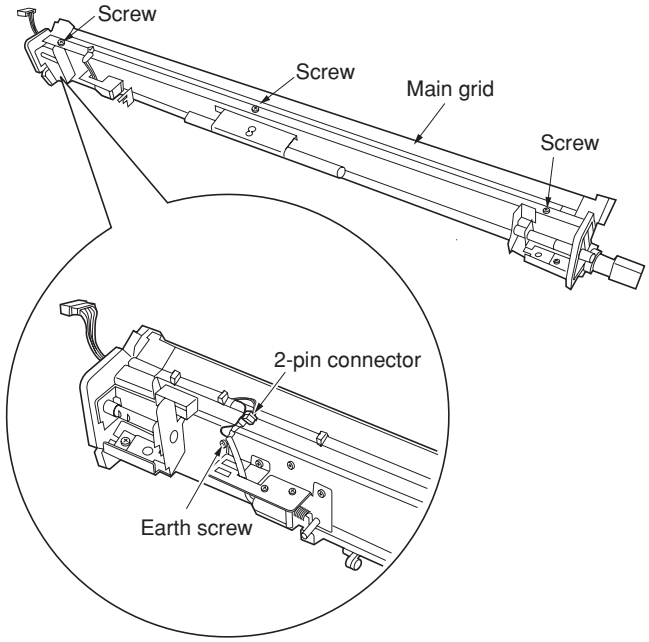


Figure 1-6-40

5. Remove the four screws holding the cleaning blade and then detach the blade.
6. Replace the cleaning blade and refit all the removed parts.

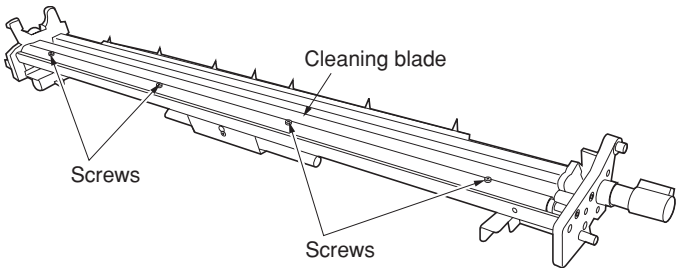


Figure 1-6-41

(3) Attachment and removal of the lower cleaning seal

Follow the procedure below when performing maintenance on the lower cleaning seal.

Procedure

1. Remove the cleaning unit (see page 1-6-21).
2. Remove the main charger unit and the main grid (see pages 1-6-15 and 1-6-22).
3. Loosen the four screws holding the lower cleaning seal and then detach the seal.

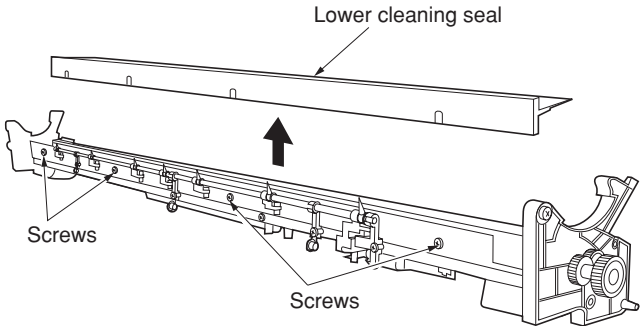


Figure 1-6-42

4. Clean or replace the lower cleaning seal and refit all the removed parts.
   * When installing the lower cleaning seal, place it next to the right seal (red) for the cleaning unit.

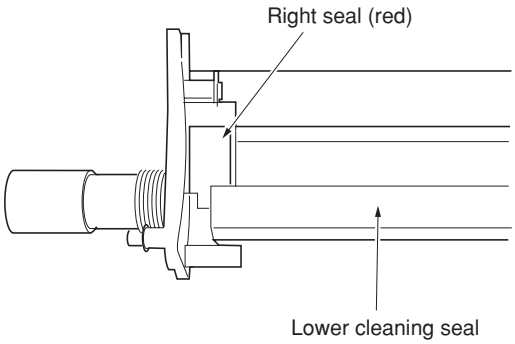


Figure 1-6-43

(4) Attachment and removal of the cleaning fur brush

Follow the procedure below when performing maintenance on the cleaning fur brush.

Procedure

1. Remove the cleaning unit (see page 1-6-21).
2. Remove the main charger unit (see page 1-6-15).
3. Remove the cleaning blade and lower cleaning seal (see pages 1-6-22 and 1-6-23).
4. Remove the stop ring, gear, spring pin and bearing from the cleaning fur brush, and then remove the screw in order to detach the cleaning fur brush retainer.

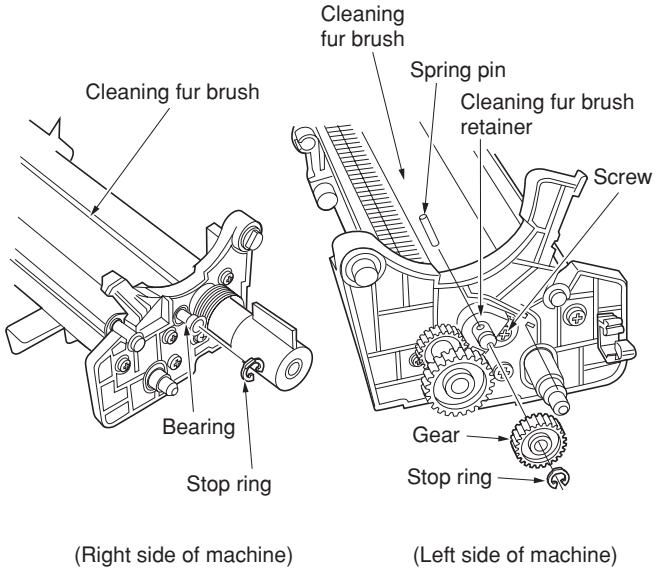


Figure 1-6-44

5. Pull in the direction of the arrow in order to detach the cleaning fur brush.

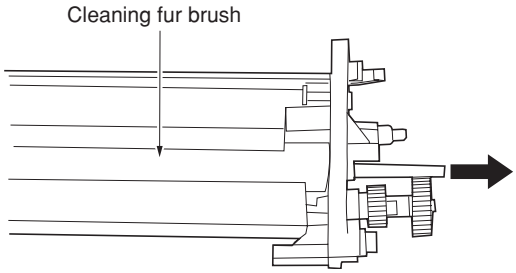


Figure 1-6-45

6. Replace the cleaning fur brush and refit all the removed parts.
   * When installing the cleaning fur brush, first insert the shaft of the cleaning fur brush into the hole on the left side of the machine and then fit the cleaning fur brush in place.

(5) Attachment and removal of the separation claw

Follow the procedure below when performing maintenance on the separation claw.

Procedure

1. Remove the cleaning unit (see page 1-6-21).
2. Remove the holder from the main unit by aligning it along the D-cut section.
3. Clean or replace the drum separation claw and refit all the removed parts.

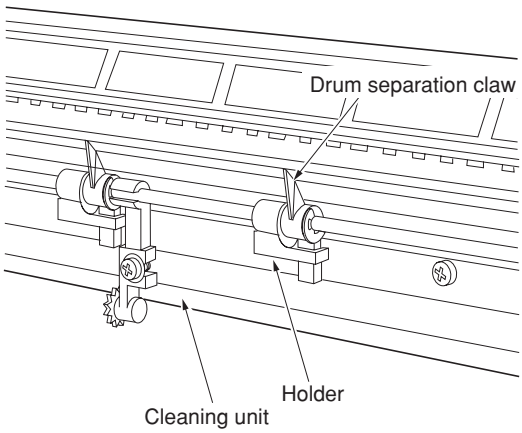


Figure 1-6-46

(6) Attachment and removal of the left/right cleaning seal and left/right cleaning side shield

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Remove the cleaning unit (see page 1-6-21).
2. Take off the right and left cleaning seals and the right and left cleaning side shields from the cleaning unit.
3. Replace the right and left cleaning seals and the right and left cleaning side shields, clean the sticking locations, and then stick them to the specified locations.
   * When sticking the right and left cleaning seals, take care so that the lower cleaning seal is not caught.
4. Refit all the removed parts.

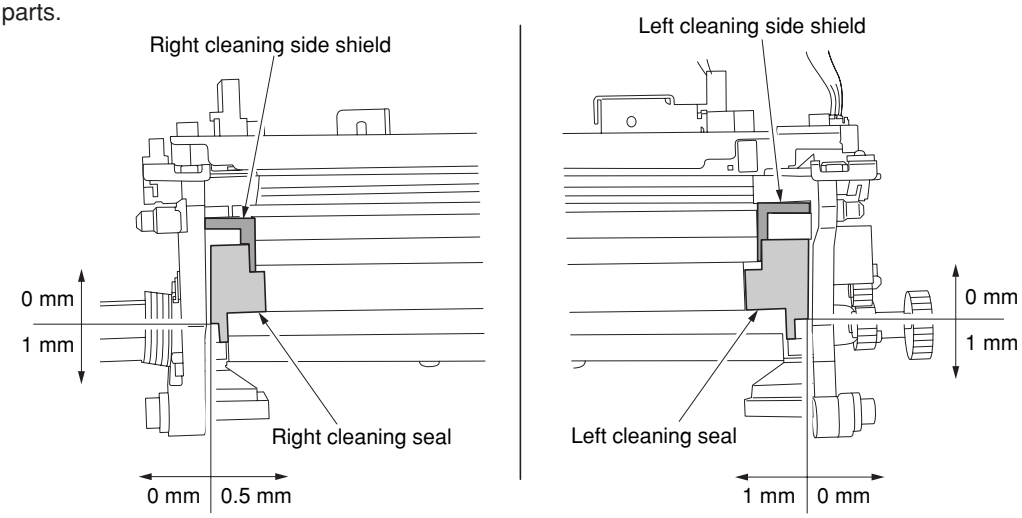


Figure 1-6-47

1-6-6 Fixing section

(1) Attachment and removal of the oil roller

Follow the procedure below when performing maintenance on the oil roller.

Procedure

1. Open the detachable unit and pull out the eject cover.
2. Remove the two screws to the eject cover and open the cover downward.
3. Remove the two screws holding the ejection guide and then detach the guide.

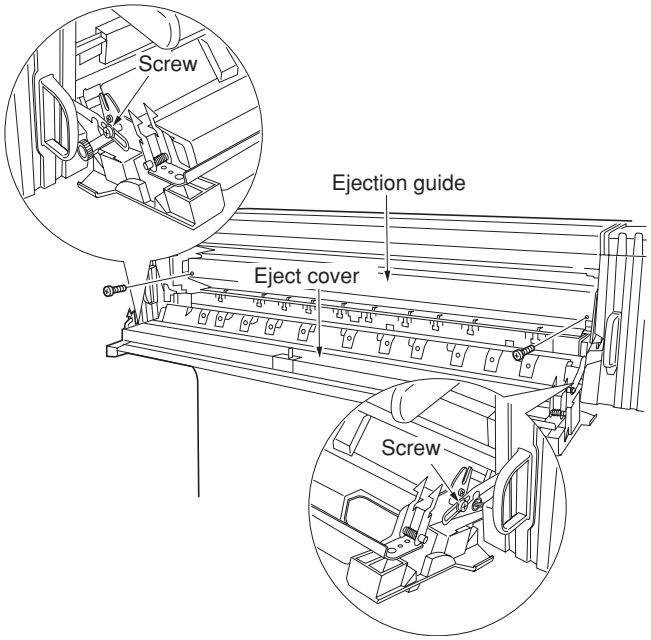


Figure 1-6-48

4. Remove the screws holding each of the left and right oil roller mounting springs and then detach the springs from the main unit.

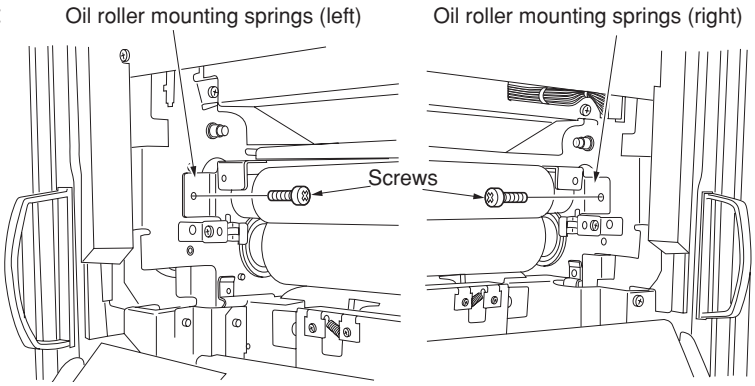


Figure 1-6-49

5. Remove the oil roller from the main unit.
6. Remove the E-ring, the oil roller gear and the left and right bearings from the oil roller.
7. Replace the oil roller and refit all the removed parts.

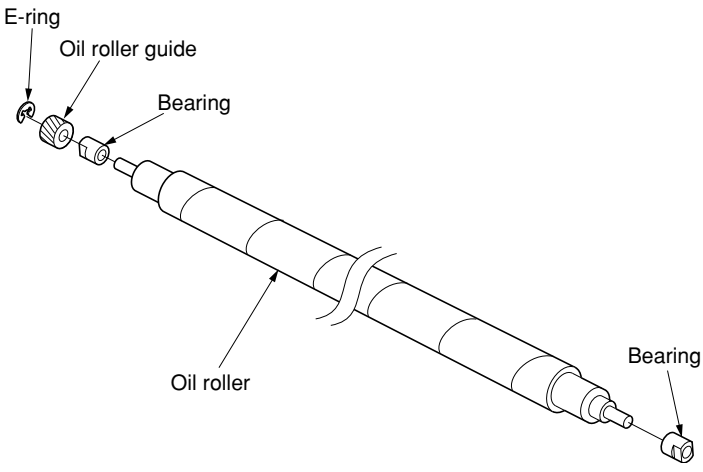


Figure 1-6-50

(2) Attachment and removal of the main and sub fixing heaters

Follow the procedure below when inspecting or replacing the main and sub fixing heaters.

Procedure

1. Open the detachable unit and completely open the eject cover downward (see page 1-6-26).
2. Remove the two screws holding the upper detachable unit cover and the 8-pin connector, open the upper detachable unit cover in the direction indicated by the arrow, and lift and remove it.
3. Detach the left and right upper and lower detachable unit covers.

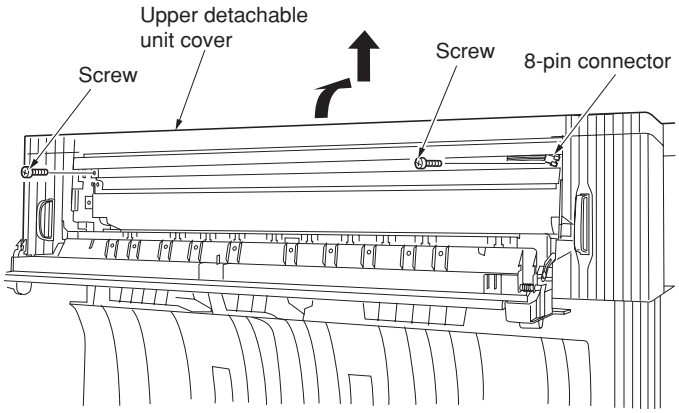


Figure 1-6-51

4. Remove the left and right screws holding the fixing unit and open the fixing unit in the direction of the arrow.

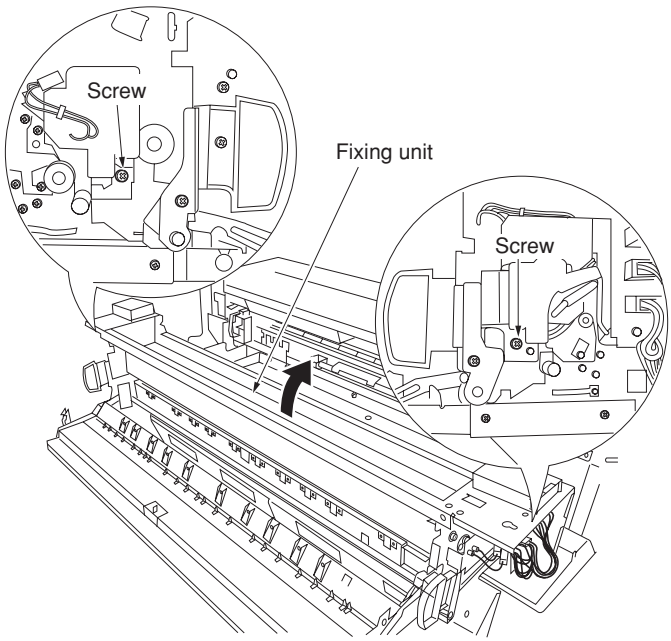


Figure 1-6-52

5. Disconnect the 1-pin connectors from both ends of the main and sub fixing heaters.
6. Remove the two screws holding each of the left and right mounts to the fixing heater and then detach the fixing heater mounts.
7. Remove the main and sub fixing heaters by pulling them together out of the heat roller.

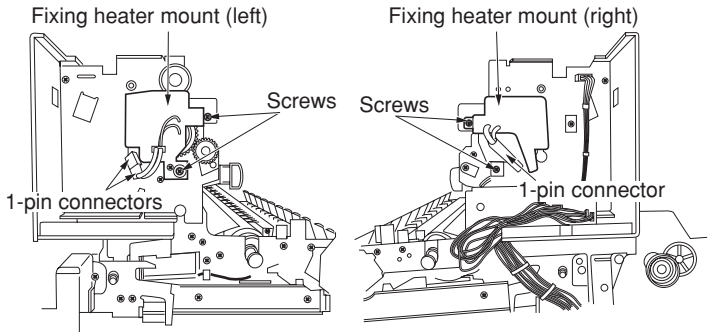


Figure 1-6-53

8. Inspect or replace the main and sub fixing heaters, as required, and refit all the removed parts.
   * When installing the main and sub fixing heaters, be sure that the blue 1-pin connector (for the sub fixing heater) is towards the front of the machine and the white one (for the main fixing heater) is towards the rear as indicated on the corresponding mounts.
   * When installing the main and sub fixing heaters, always be careful of the protrusion on the center part of the fixing heaters.

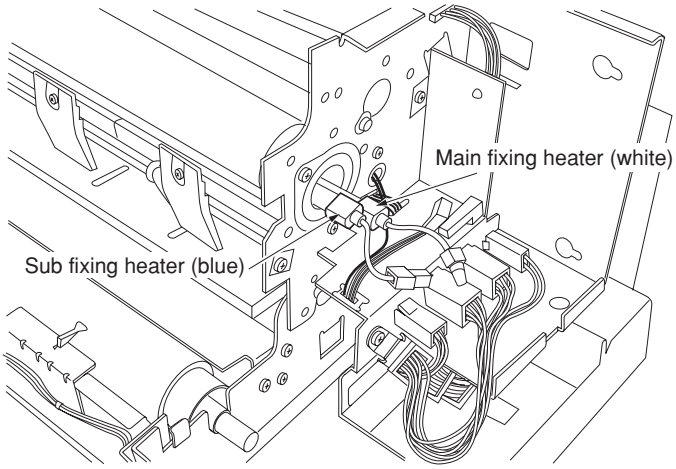


Figure 1-6-54

(3) Attachment and removal of the heat roller and heat roller bearings

Follow the procedure below when performing maintenance on the heat roller and heat roller bearings.

Procedure

1. Remove the oil roller (see page 1-6-26).
2. Remove the main and sub fixing heaters (see page 1-6-27).
3. Remove the retaining ring, the heat roller gear, the bearing retainer (two screws), and the heat roller bearing from the left side of the heat roller.
   * At the periodic maintenance of 60K, replace the right and left heat roller bearings. (3 ppm printer only)
4. Slide the heat roller in the direction of the arrow and remove the heat roller from the main unit.
5. Apply conductive grease (GE334) to both ends of the heat roller.
6. Replace the heat roller and refit all the removed parts.

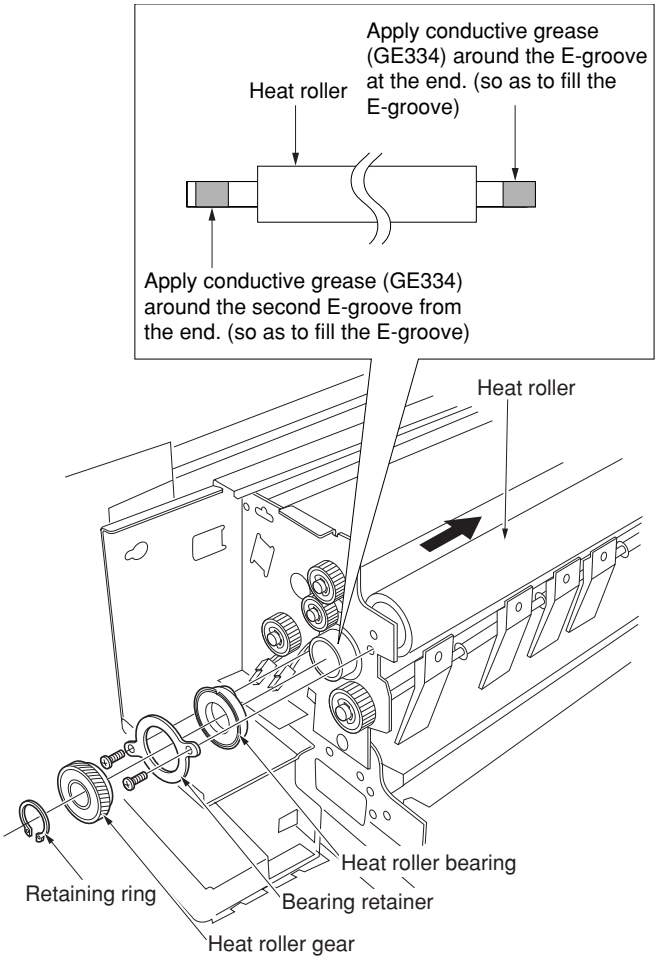


Figure 1-6-55

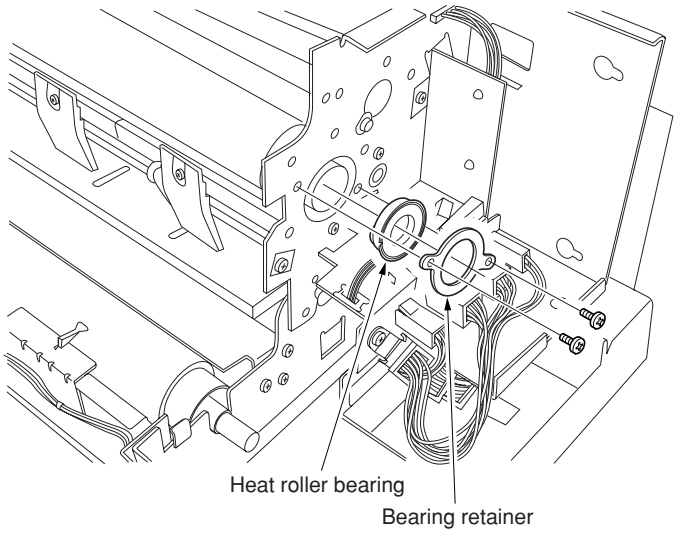


Figure 1-6-56

(4) Attachment and removal of the press roller and press roller bearings

Follow the procedure below when performing maintenance on the press roller and press roller bearings.

Procedure

1. Open the fixing unit (see page 1-6-27).
2. Remove the 4-pin connector and the two screws, and then detach the fixing unit partition.
3. Open the front fixing guide and remove the press roller from the main unit.

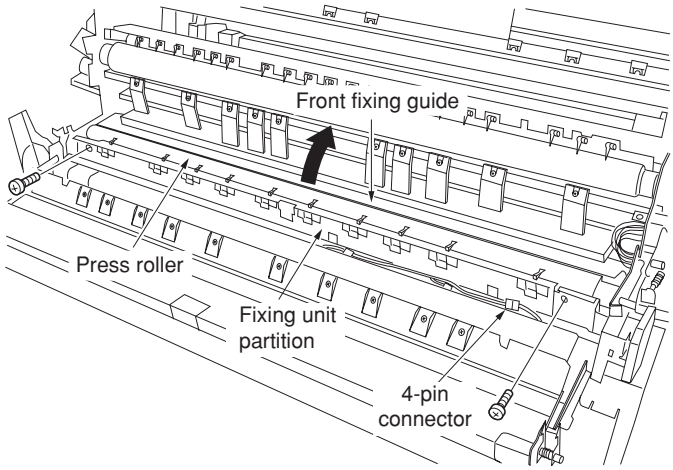


Figure 1-6-57

4. Pull the press roller shaft out from the press roller.
5. Replace the press roller.

- At the periodic maintenance of 60K, carry out steps 6 to 8. (3 ppm printer only)

6. Remove the press roller collars from both sides of the press roller shaft by removing two hexagon screws for each.
7. Remove the press roller bearings from both sides of the press roller shaft.
8. Replace the press roller bearings and refit the press roller collars to their original positions.
   * Apply specified grease to the perimeter of the press roller bearings.
   * Fit the press roller collars so that the gap between a press roller bearing and its corresponding press roller collar is approximately 1 mm.

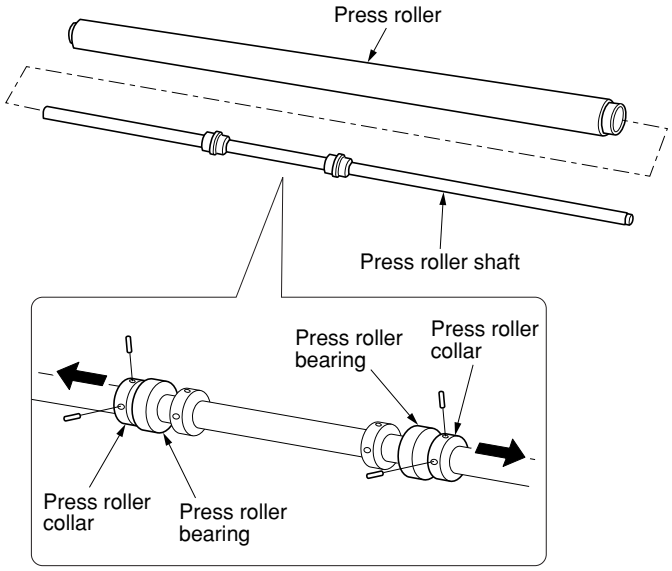


Figure 1-6-58

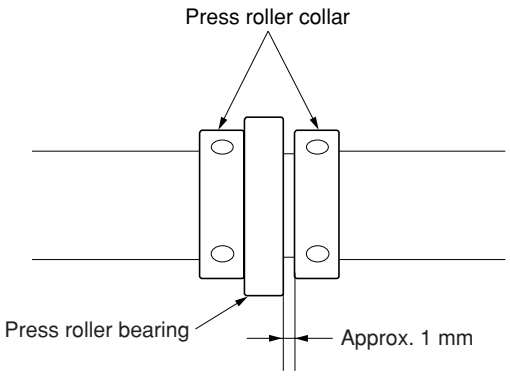


Figure 1-6-59

9. Replace the press roller bearings.
   * Apply specified grease to the U-shaped cutouts on the side plate which hold the press roller shaft.
   * Before returning the press roller to the machine, clean the press roller guides and the press roller bushings located on both sides of the machine by wiping with a dry cloth.
   * Close the fixing unit after replacing the front fixing guide.

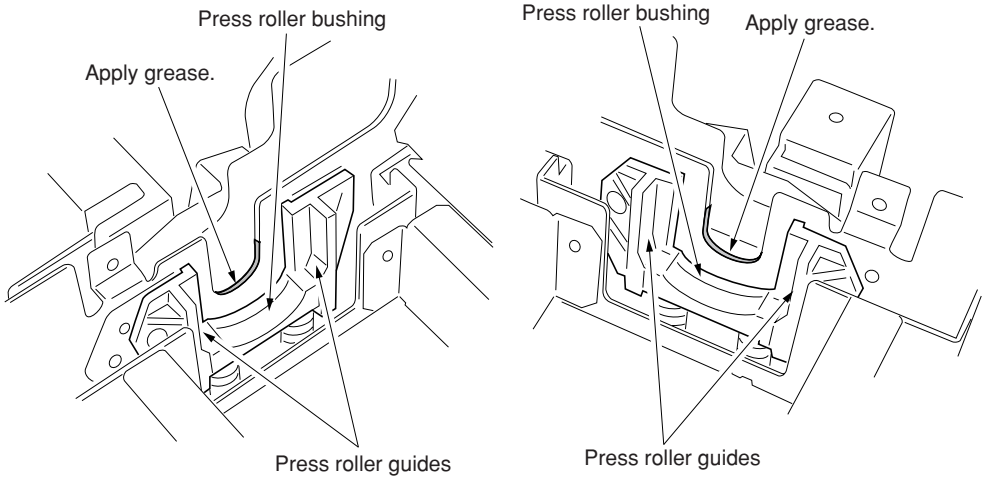


Figure 1-6-60

(5) Attachment and removal of fixing unit thermistors 1 and 2 (for use with the heat roller)
Follow the procedure below when inspecting or replacing fixing unit thermistors 1 and 2.

Procedure

1. Open the detachable unit and completely open the eject cover downward (see page 1-6-26).
2. Remove the upper detachable unit cover (see page 1-6-27).

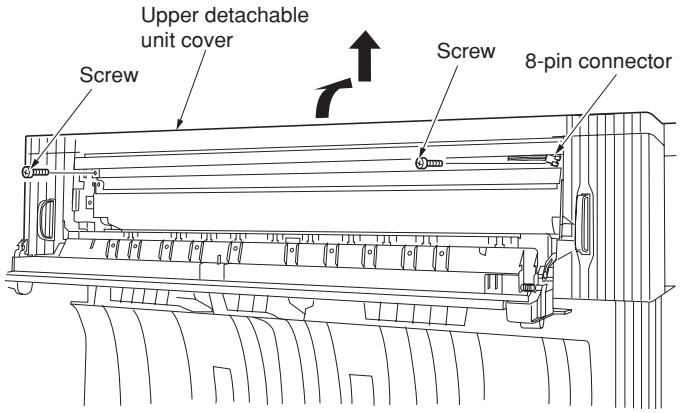


Figure 1-6-61

3. Remove the four screws holding the fixing unit cover and then detach the cover from the fixing unit.

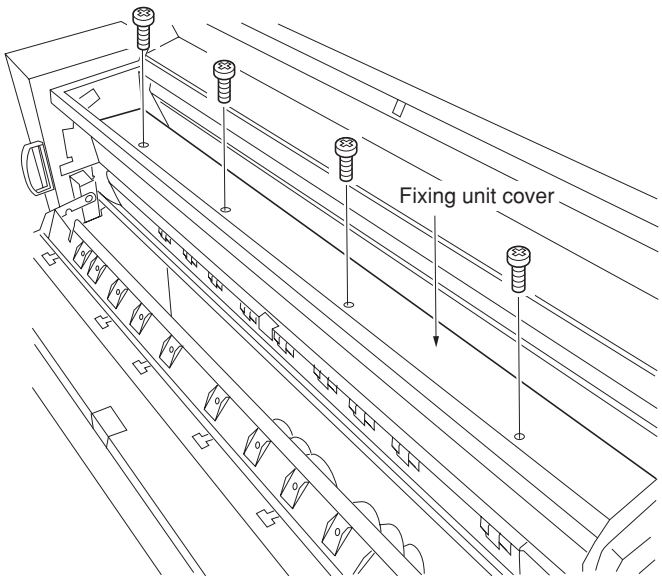


Figure 1-6-62

4. Remover the 2-pin connector from each of the fixing unit thermistors 1 and 2 and the screws holding each fixing unit thermistor retainer, and then detach the retainers.
5. Remove the screws from each of fixing unit thermistors 1 and 2 in order to detach them from their respective retainers.

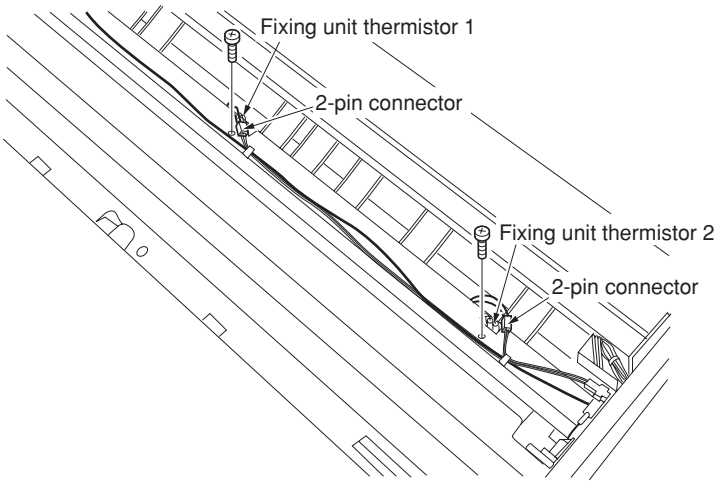


Figure 1-6-63

6. Inspect or replace fixing unit thermistors 1 and 2, as required, and refit all the removed parts.
   * When installing fixing unit thermistors 1 and 2, be sure that the surface of the thermistors is contacting the heat roller.

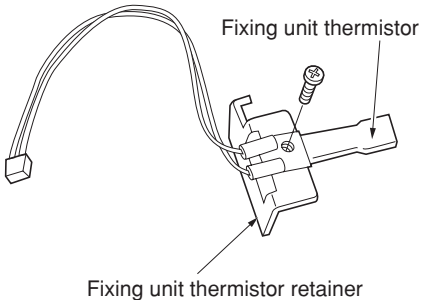


Figure 1-6-64

(6) Attachment and removal of the fixing unit thermostat

Follow the procedure below when inspecting or replacing the fixing unit thermostat.

Procedure

1. Open the detachable unit and completely open the eject cover downward (see page 1-6-26).
2. Remove the fixing unit cover (see page 1-6-32).
3. Remove the two screws holding the fixing unit thermostat as well as the two 1-pin connectors, and then detach the thermostat.
4. Inspect or replace the fixing unit thermostat, as required, and refit all the removed parts.

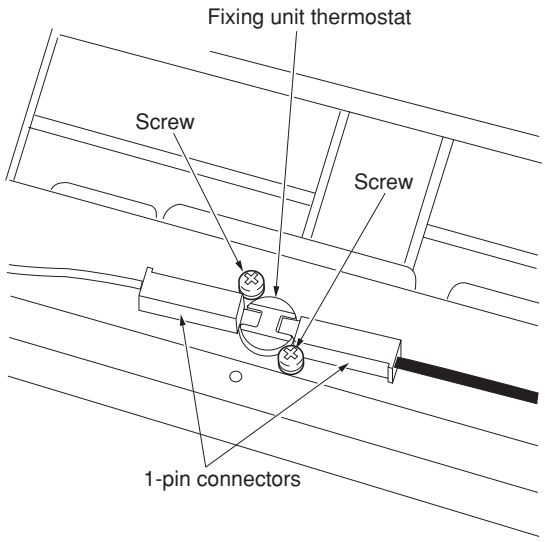


Figure 1-6-65

(7) Attachment and removal of fixing unit thermistors 3 and 4 (for use with the press roller)
Follow the procedure below when inspecting or replacing fixing unit thermistors 3 and 4.

Procedure

1. Open the detachable unit and completely open the eject cover downward (see page 1-6-26).

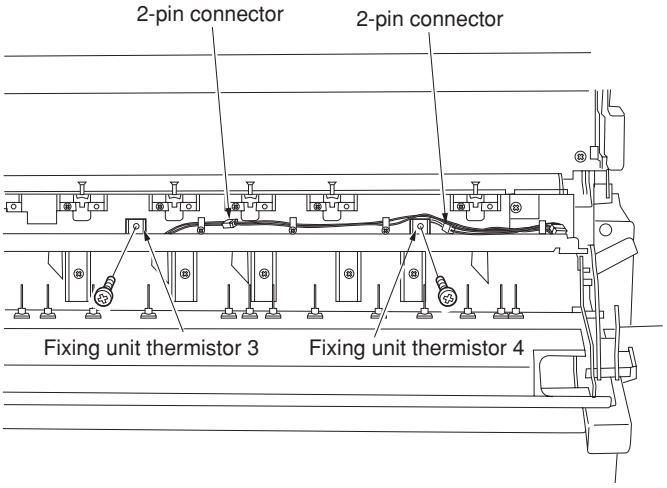


Figure 1-6-66

2. Remover the 2-pin connector from each of the fixing unit thermistors 3 and 4 and the screws holding each thermistor, and then detach fixing unit thermistors 3 and 4.
3. Inspect or replace fixing unit thermistors 3 and 4, as required, and refit all the removed parts.
   * When installing fixing unit thermistors 3 and 4, be sure that the surface of the thermistors is contacting the press roller.

(8) Attachment and removal of the heat roller separation claw

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Remove the ejection guide (see page 1-6-26).
2. Remove the heat roller separation claw from the ejection guide.
3. Replace the heat roller separation claw and refit all the removed parts.

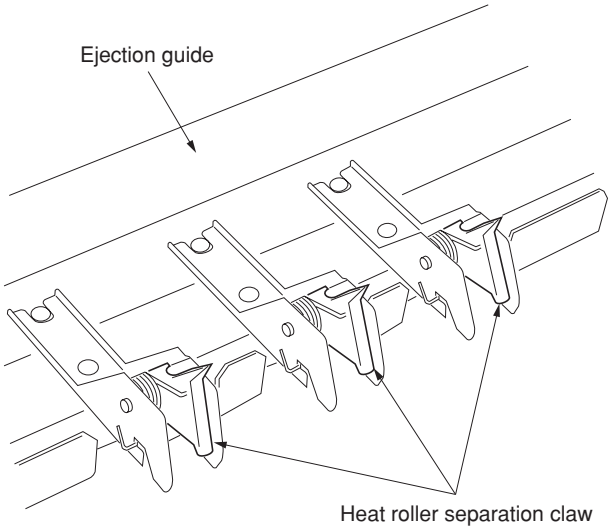


Figure 1-6-67

(9) Attachment and removal of the press roller separation claw

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Remove the fixing unit partition (see page 1-6-30).
2. Remove the press roller separation claw units from the fixing unit partition by removing a screw for each.
3. Remove the press roller separation claws from the press roller separation claw units.
4. Replace the press roller separation claw and refit all the removed parts.

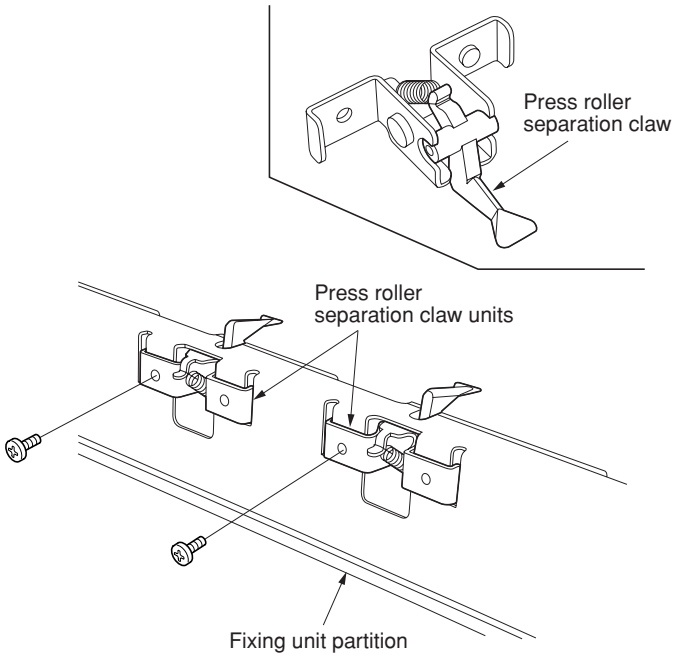


Figure 1-6-68

(10) Attachment and removal of the fixing idle gear

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Open the eject cover downward and detach the left upper and lower detachable unit covers.
2. Remove the E-ring and remove the fixing idle gear.
3. Replace the fixing idle gear and refit all the removed parts.

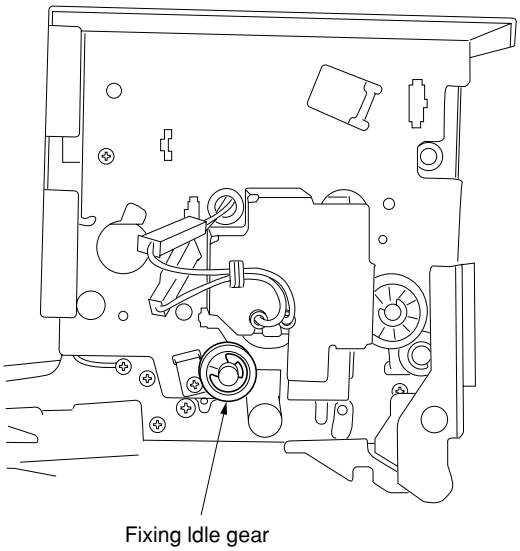


Figure 1-6-69

1-6-7 Paper feed section

(1) Attachment and removal of the cutter unit
Follow the procedure below when replacing the cutter unit.

Procedure

1. Remove the lower rear cover.
2. Remove the four screws and then detach the data partition by pulling it in the direction of the arrow.

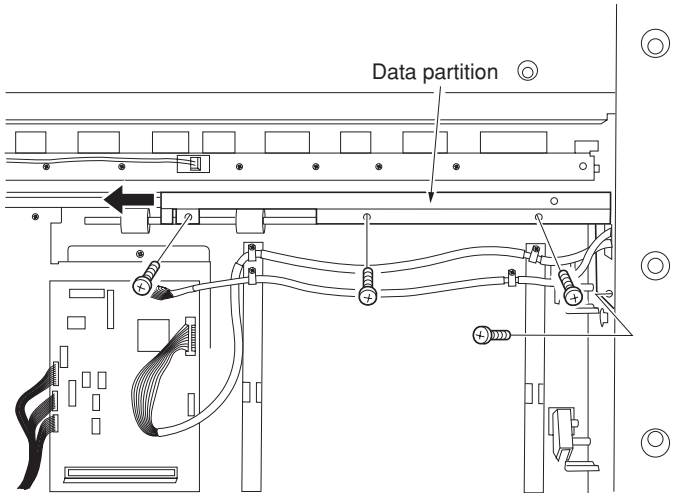


Figure 1-6-70

3. Remove the 2-pin and 4-pin connectors from the cutter unit.
4. Remove the two screws holding the cutter unit and detach the cutter unit from the main unit by sliding it in the direction of the arrow.
5. Replace the cutter unit and refit all the removed parts.
   * At the periodic maintenance of 60K, clean the cutter portion with air blow. (3 ppm printer only)

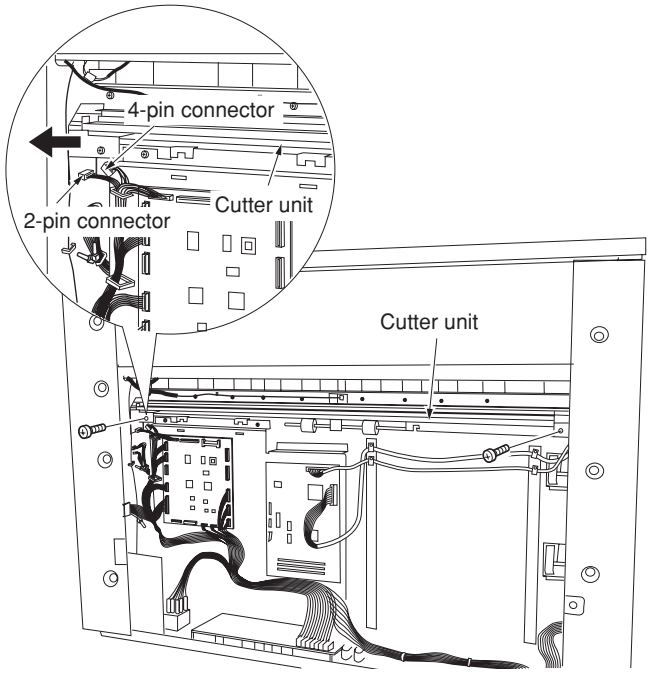


Figure 1-6-71

(2) Adjusting printing magnification

Follow the procedure below when the printing magnification is not correct.

Caution:

Use paper with the width of 841 mm or more.

Procedure

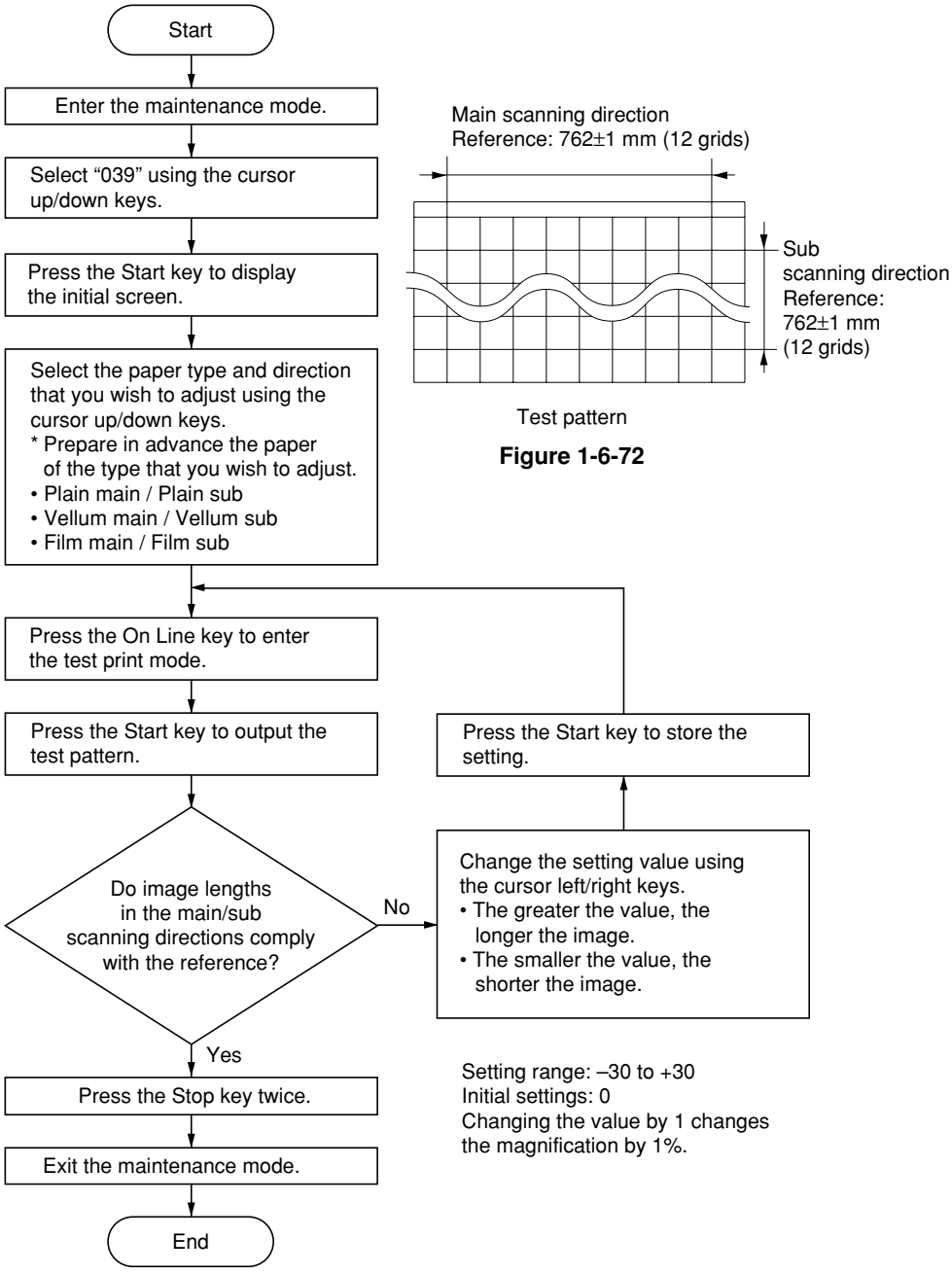


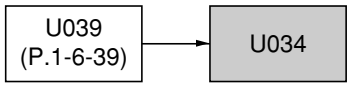
Figure 1-6-72

(3) Adjusting the print start timing

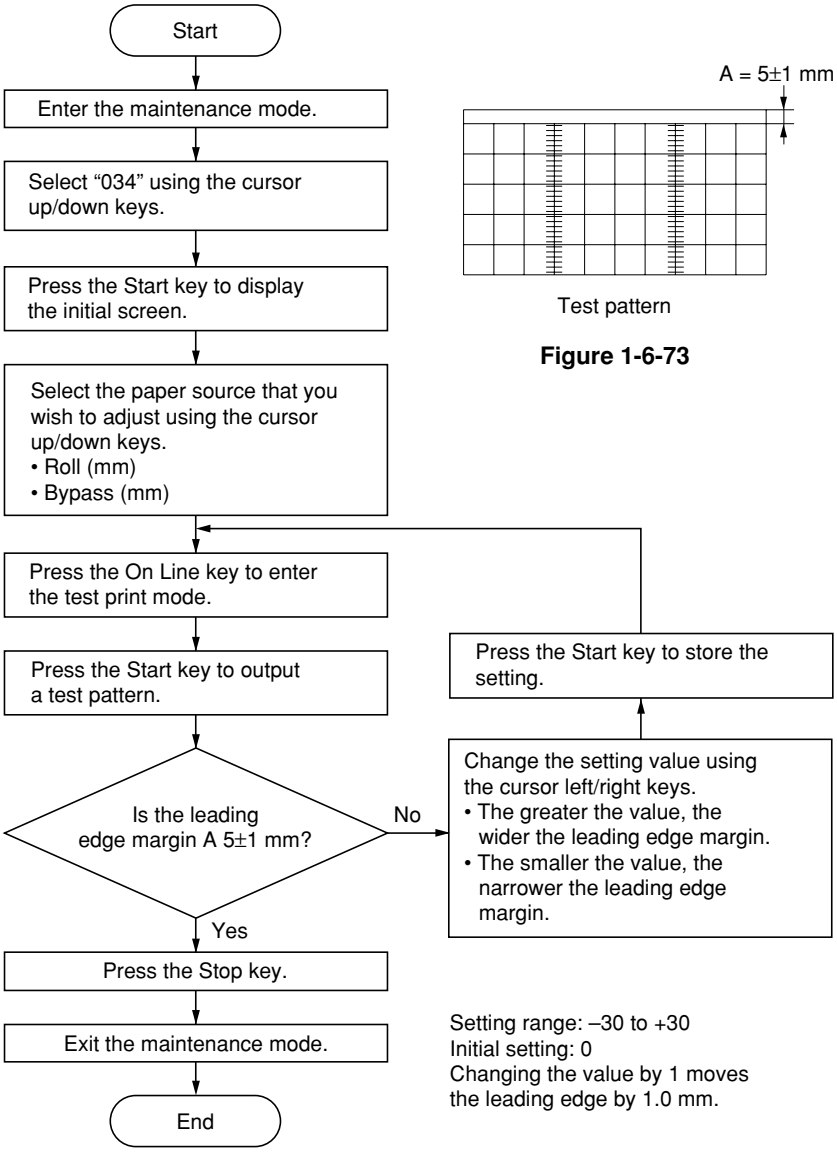
Follow the procedure below when there is a regular error between the leading edges of the print image.

Caution:

Before making the following adjustment, ensure that the below adjustment has been made in the maintenance mode.



Procedure



Test pattern

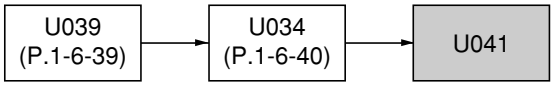
Figure 1-6-73

(4) Adjusting the standard cut length

Follow the procedure below if the paper is not cut correctly in standard cut printing.
Also, perform this adjustment when the paper is set to cut at different lengths according to the paper type (standard paper, vellum or film).

Caution:

Always make this adjustment for lengths S, M and L.
Before making the following adjustment, ensure that the below adjustments have been made in the maintenance mode.



Procedure

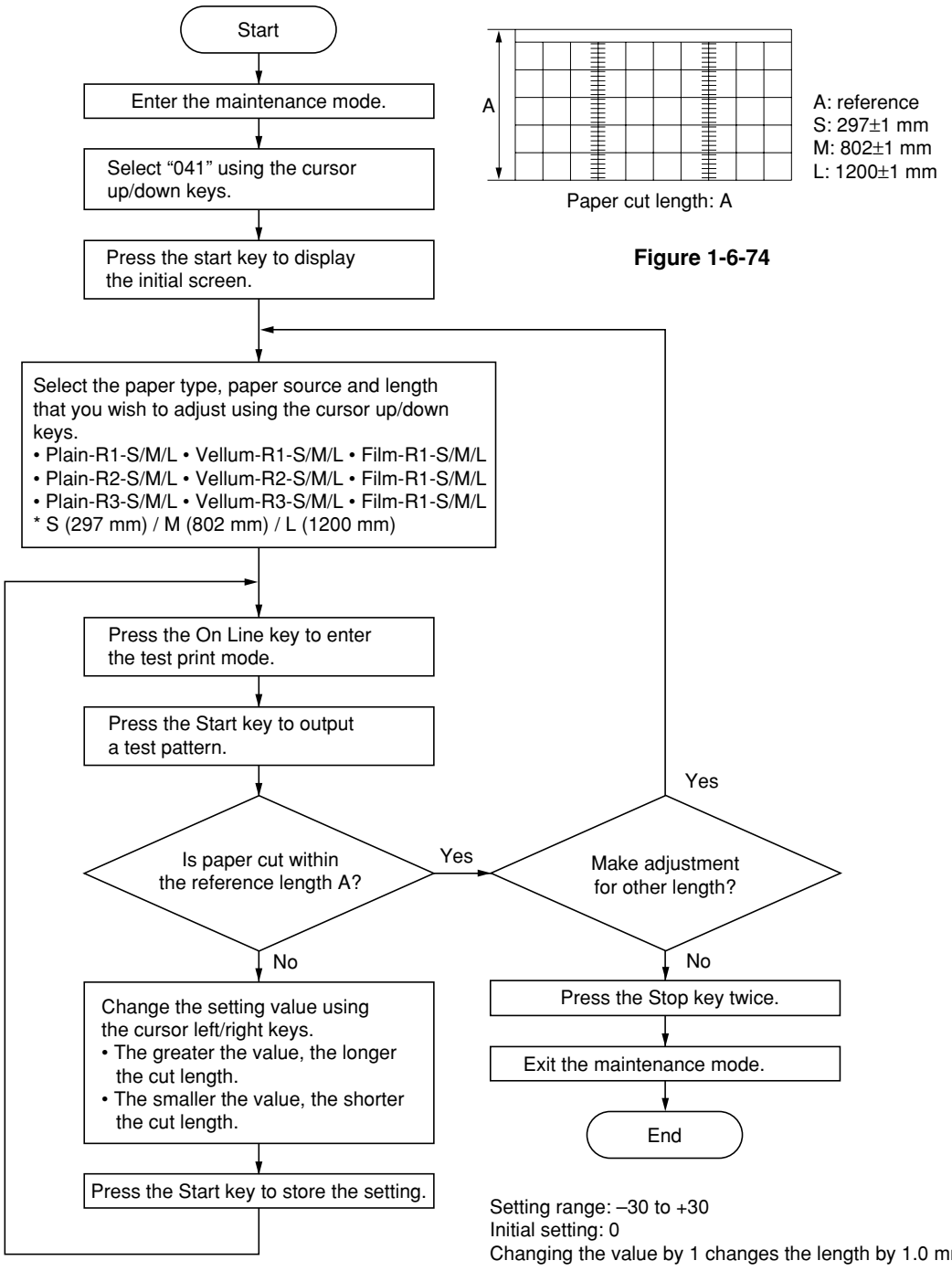


Figure 1-6-74

Setting range: –30 to +30
Initial setting: 0
Changing the value by 1 changes the length by 1.0 mm.

(5) Replacement of paper transport system

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Remove the left lower cover.
2. Remove the middle feed clutch, lower feed clutch, roll feed clutch, and roll registration clutch by removing one stop ring and one connector for each.
3. Replace the middle feed clutch, lower feed clutch, roll feed clutch, and roll registration clutch, and refit all the removed parts.
   * If the machine is equipped with an optional roll unit, replace also the upper feed clutch in the upper portion in a similar way.

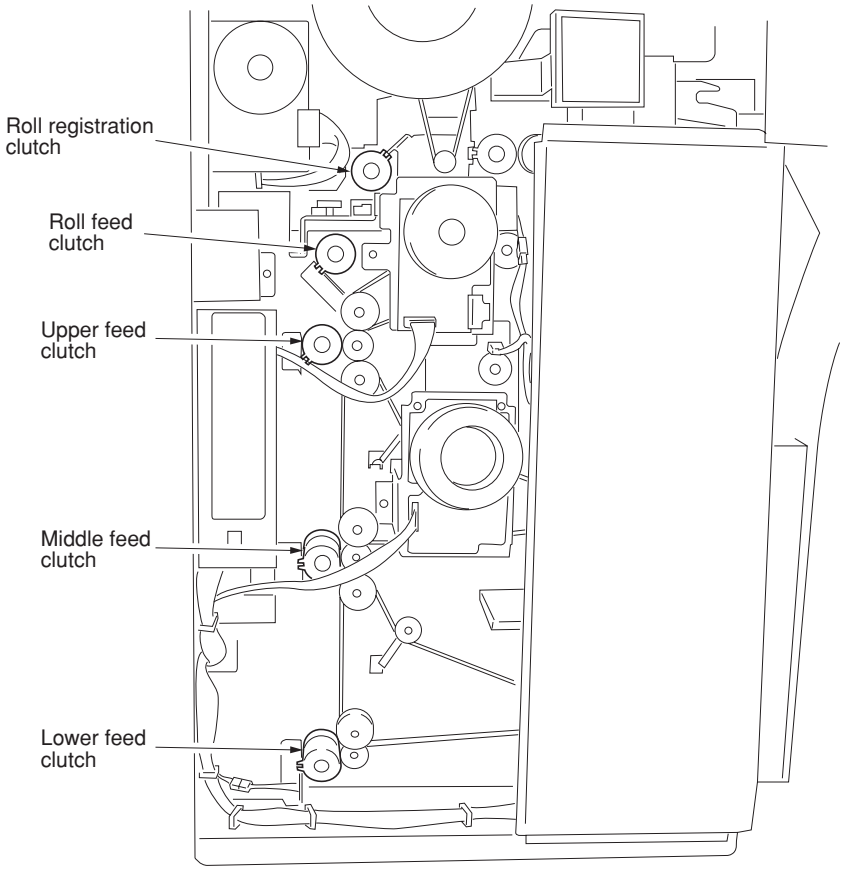


Figure 1-6-75

(6) Cleaning of paper transport system roller

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

(6-1) Cleaning of roll paper feed rollers

Procedure

1. Open the front covers and pull out the roll unit.
2. Open the roll paper feed guide and clean the roll paper feed rollers with alcohol.
   * Clean them in the upper portion (optional), middle portion, and lower portion.

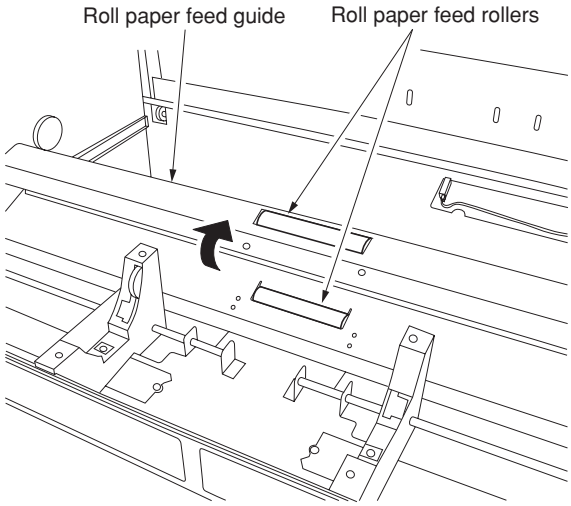


Figure 1-6-76

(6-2) Cleaning of pre-transfer roller

Procedure

1. Open the detachable unit.
2. Clean the pre-transfer roller with alcohol.

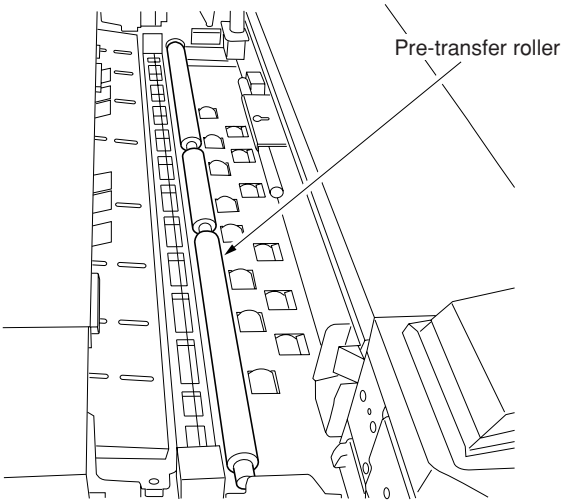


Figure 1-6-77

(6-3) Cleaning of roll registration roller

Procedure

1. Remove the lower rear cover.
2. Remove the rear roll registration unit by removing the two screws and the connector.

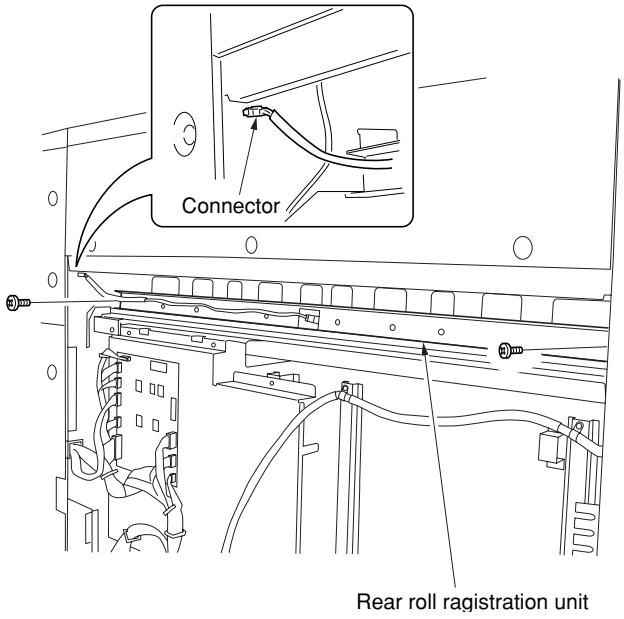


Figure 1-6-78

3. Clean the roll registration roller with alcohol.
4. Refit all the removed parts.

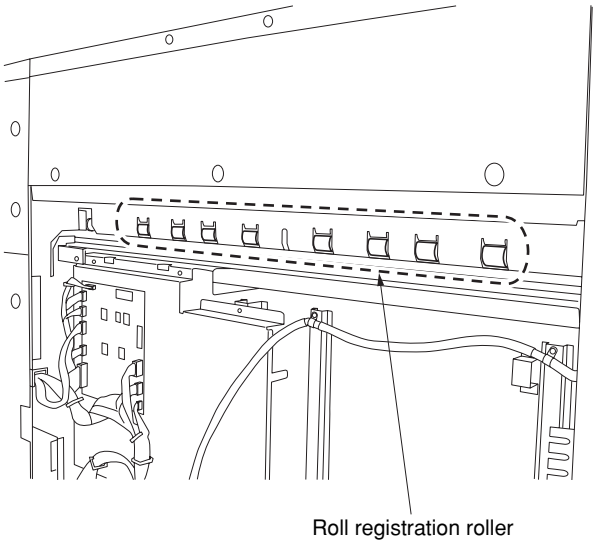


Figure 1-6-79

(6-4) Cleaning of cutter insertion rear roller

Procedure

1. Remove the lower rear cover.
2. Clean the cutter insertion rear roller with alcohol.
3. Refit all the removed parts.

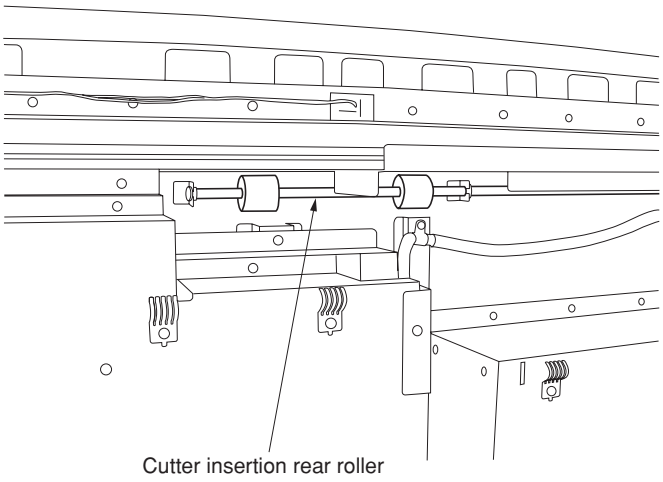


Figure 1-6-80

1-6-8 Others

(1) Attachment and removal of the ozone filter
Follow the procedure below when replacing the ozone filter.

Procedure
1. Open the detachable unit.
2. Remove the screw holding the ozone filter retainer and then detach the retainer.
3. Remove and replace the ozone filter.
4. Refit all the removed parts.

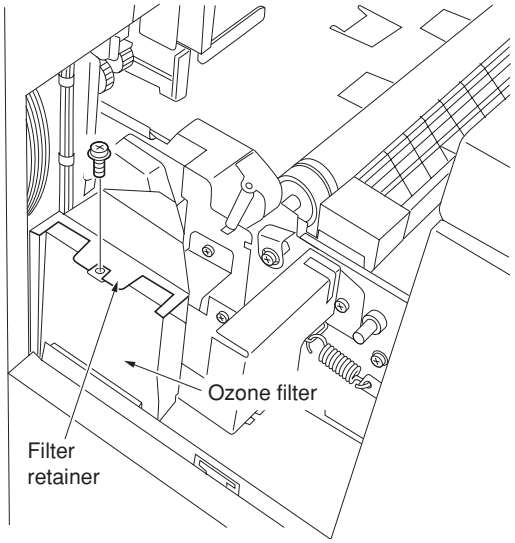


Figure 1-6-81

(2) Attachment and removal of the cooling filter
Follow the procedure below when replacing the cooling filter.

Procedure
1. Open the detachable unit and completely open the eject cover downward (see page 1-6-26).
2. Remove the upper detachable (see page 1-6-27).
3. Remove the right upper cover and the left upper cover.
4. Remove and replace the cooling filter.
5. Refit all the removed parts.

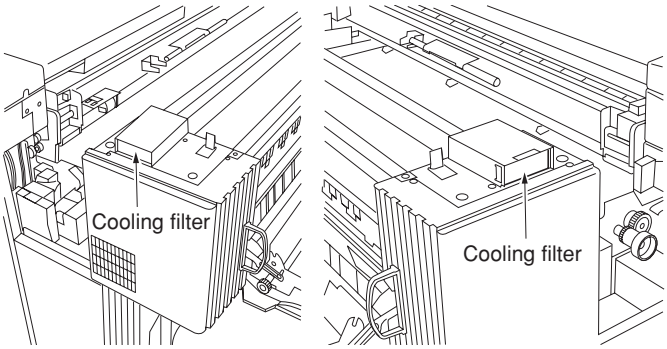


Figure 1-6-82

(3) Greasing of idle gear

This operation must be carried out at the periodic maintenance of 60K. (3 ppm printer only)

Procedure

1. Open the eject cover downward and detach the left upper and lower detachable unit covers.
2. Remove the left lower cover and left lower front cover.
3. Remove the two screws and then remove the duct unit.

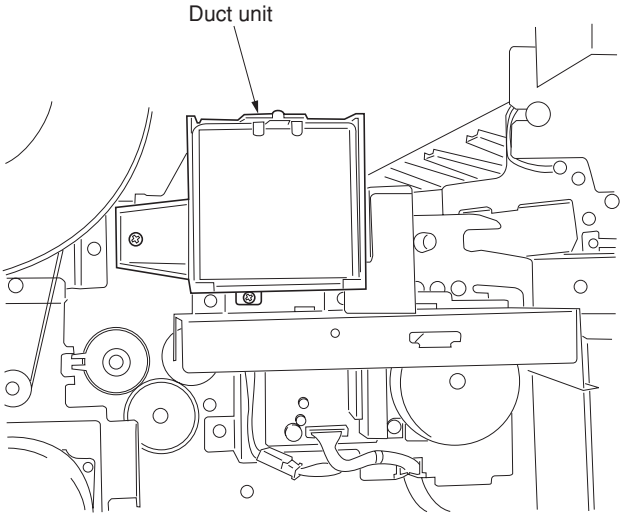


Figure 1-6-83

4. Remove the screw and then remove the interlock switch left cover.

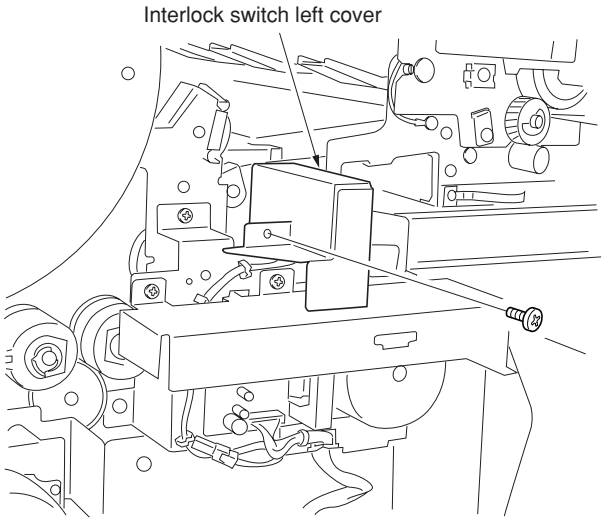


Figure 1-6-84

5. Remove the two screws and then remove the fixing motor cover.

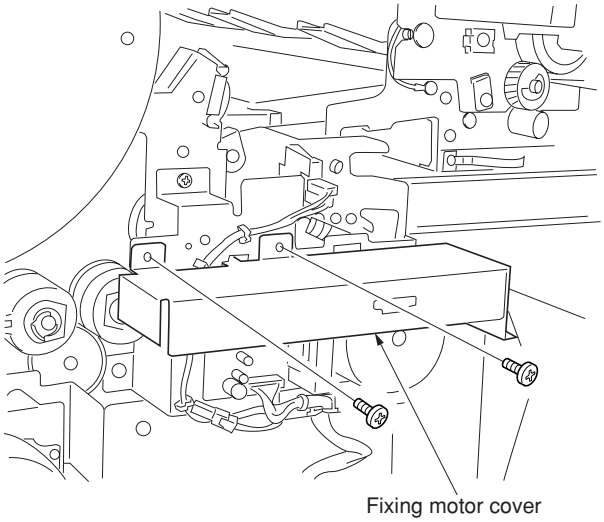


Figure 1-6-85

6. Remove all the connectors from the fixing motor unit and release the wire.
7. Remove the four screws and then remove the fixing motor unit.

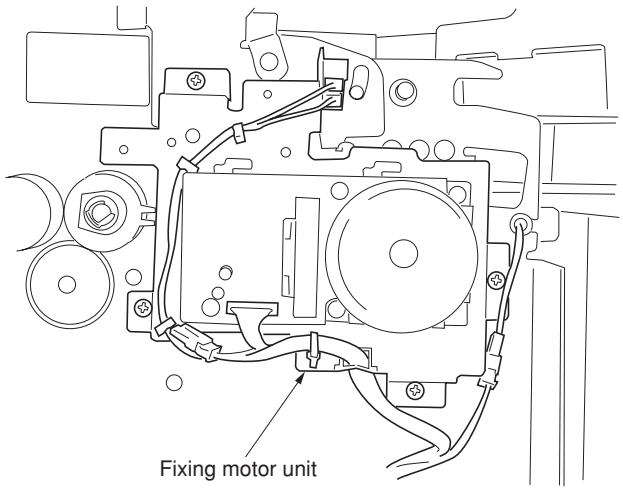


Figure 1-6-86

8. Remove the two idle gears from the fixing motor unit by removing one stop ring for each.
9. Clean the shaft portion and the sliding portion by wiping with a dry cloth and then apply grease to them.
10. Refit all the removed parts.
    * When fitting the fixing motor unit, put it near the rear side of the machine.

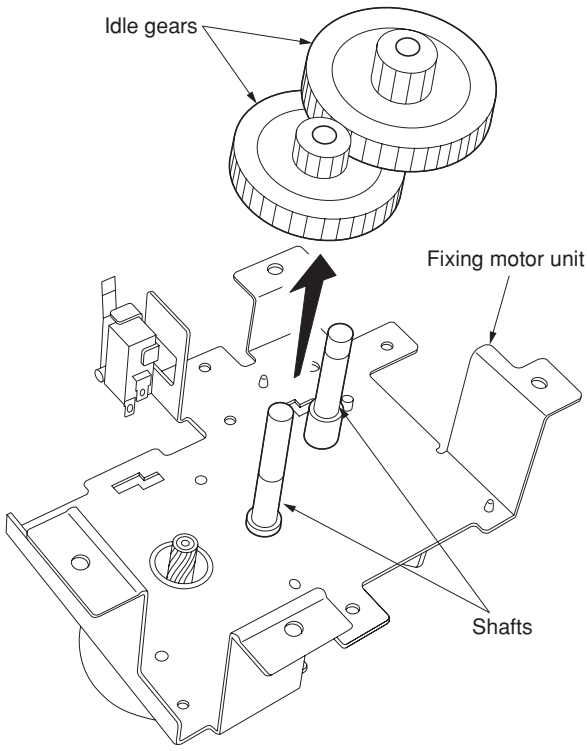


Figure 1-6-87

1-7-1 Replacing the engine main PCB

Procedure

1. Enter the maintenance mode.
2. Run maintenance item U000 to output a list of current settings for the maintenance mode.
3. Exit the maintenance mode.
4. Turn the main switch off and disconnect the power cord.
5. Using the PLCC removal tool, remove the backup ROM from the engine main PCB.
6. Mount the backup ROM on the replacement engine main PCB.
7. Replace the engine main PCB.
8. Insert the CompactFlash memory in CN17 on the engine main PCB.
9. Plug the power cord back in the socket, turn the main switch on, and load the software.
10. When the software is loaded, turn the main switch off and remove the CompactFlash memory.
11. Turn the main switch on and enter the maintenance mode.
12. Run maintenance item U019 to make sure the software has been loaded properly.
13. Run maintenance item U000 to output a list of current settings for the maintenance mode.
14. Compare the lists output in step 2 and step 13. Reset adjustment data that differs to the original setting.
15. Exit the maintenance mode.

1-7-2 Upgrading the version of the flash ROM firmware (engine main PCB)

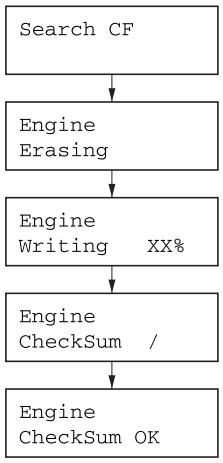
Firmware upgrading requires the following tools:
CompactFlash (Products manufactured by SANDISK are recommended.)

Precautions

- When writing data to a new CompactFlash from a computer, be sure to format it in advance.
  (For formatting, insert a CompactFlash and select a drive.)
  For a desktop computer, connect a CompactFlash card reader/writer to it. For a notebook computer, use a PC card adapter or a connection portion only for CompactFlash.
- Always turn the main switch off before removing and connecting connectors.

Procedure

1. Enter the maintenance mode.
2. Run maintenance item U000 to output a list of current settings for the maintenance mode.
3. Exit the maintenance mode.
4. Turn the main switch off and disconnect the power cord.
5. Remove the lower rear cover and main PCB cover.
6. Insert the CompactFlash memory in CN17 on the engine main PCB.
7. Plug the power cord back in the socket, turn the main switch on, and load the software.
   - Version upgrade begins and a message is displayed (for approx. 2 min).



   - When version upgrade is complete, “Engine OK” is displayed.
8. Turn the main switch off and disconnect the power cord.
9. Remove the CompactFlash memory.
10. Turn the main switch back on.
11. Enter the maintenance mode.
12. Run maintenance item U000 to output a list of current settings for the maintenance mode.
13. Compare the lists output in step 2 and step 12. Reset adjustment data that differs to the original setting.
14. Exit the maintenance mode.

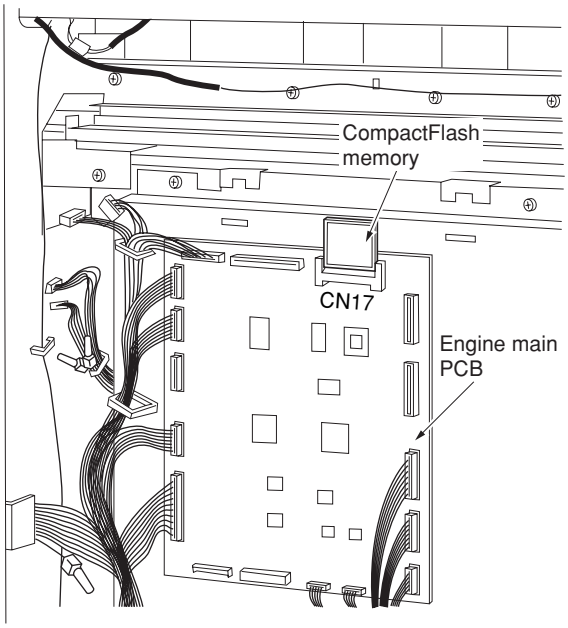


Figure 1-7-1

1-7-3 Fixed variable resistor (VR)

Some of the variable resistors adjusted at the factory cannot be adjusted once they leave the factory.

The following variable resistors cannot be adjusted after being shipped from the factory. Do not attempt to adjust these resistors.
- Main high-voltage transformer: VRF, VRMC, VRG, VRB
- ST high-voltage transformer: VR101, VR102, VR201, VR202, VR203
- Drum surface potential PCB: VR1, VR3

2-1-1 Mechanical construction of each section

(1) Paper feed and conveying section

The paper feed and conveying section is comprised of the parts shown in Figure 2-1-1. Paper can be fed either manually or automatically from a paper roll.

In the paper feed and conveying section, 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.

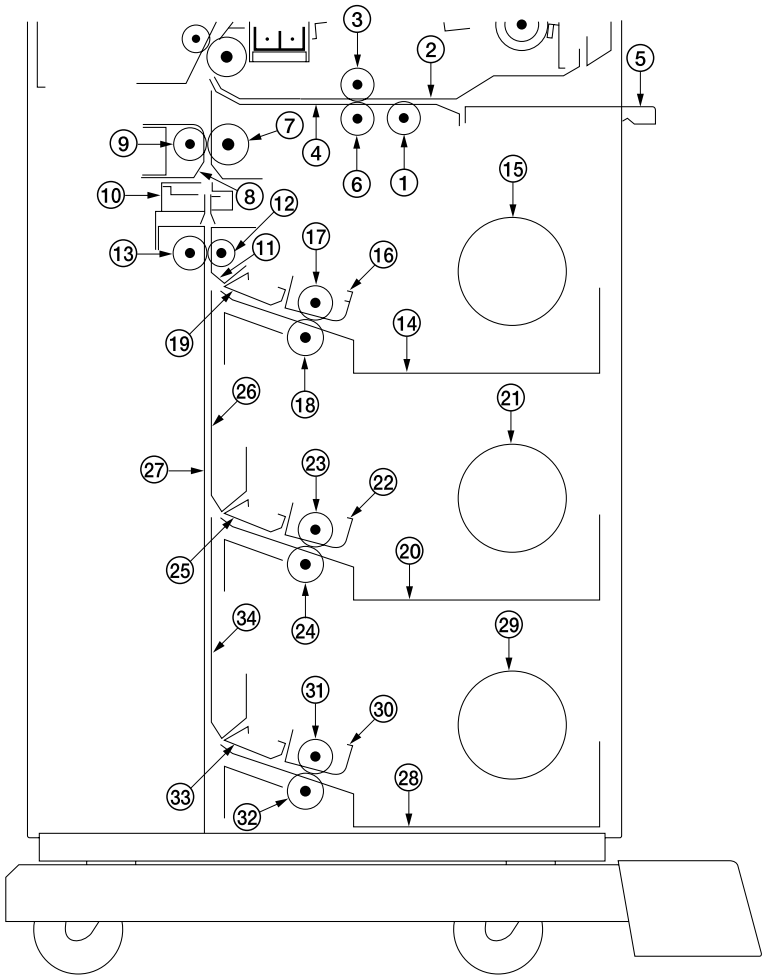


Figure 2-1-1 Paper feed and conveying section

① Bypass feed roller
② Bypass upper guide
③ Bypass upper roller
④ Bypass lower guide
⑤ Bypass table
⑥ Bypass lower roller
⑦ Roll registration roller
⑧ Cutter eject rear guide
⑨ Roll registration pulley
⑩ Cutter unit
⑪ Cutter insertion front guide
⑫ Cutter insertion front roller
⑬ Cutter insertion rear roller
⑭ Roll base*
⑮ Roll flange
⑯ Roll paper feed upper guide*
⑰ Roll paper feed upper roller*
⑱ Roll paper feed lower roller*
⑲ Paper roll front guide*
⑳ Roll base
㉑ Roll flange
㉒ Roll paper feed upper guide
㉓ Roll paper feed upper roller
㉔ Roll paper feed lower roller
㉕ Paper roll front guide
㉖ Roll paper conveying front guide
㉗ Roll paper conveying rear guide
㉘ Roll base
㉙ Roll flange
㉚ Roll paper feed upper guide
㉛ Roll paper feed upper roller
㉜ Roll paper feed lower roller
㉝ Paper roll front guide
㉞ Roll paper conveying front guide

* Parts ⑭ to ⑲ are present when the upper roll unit (optional) is installed.

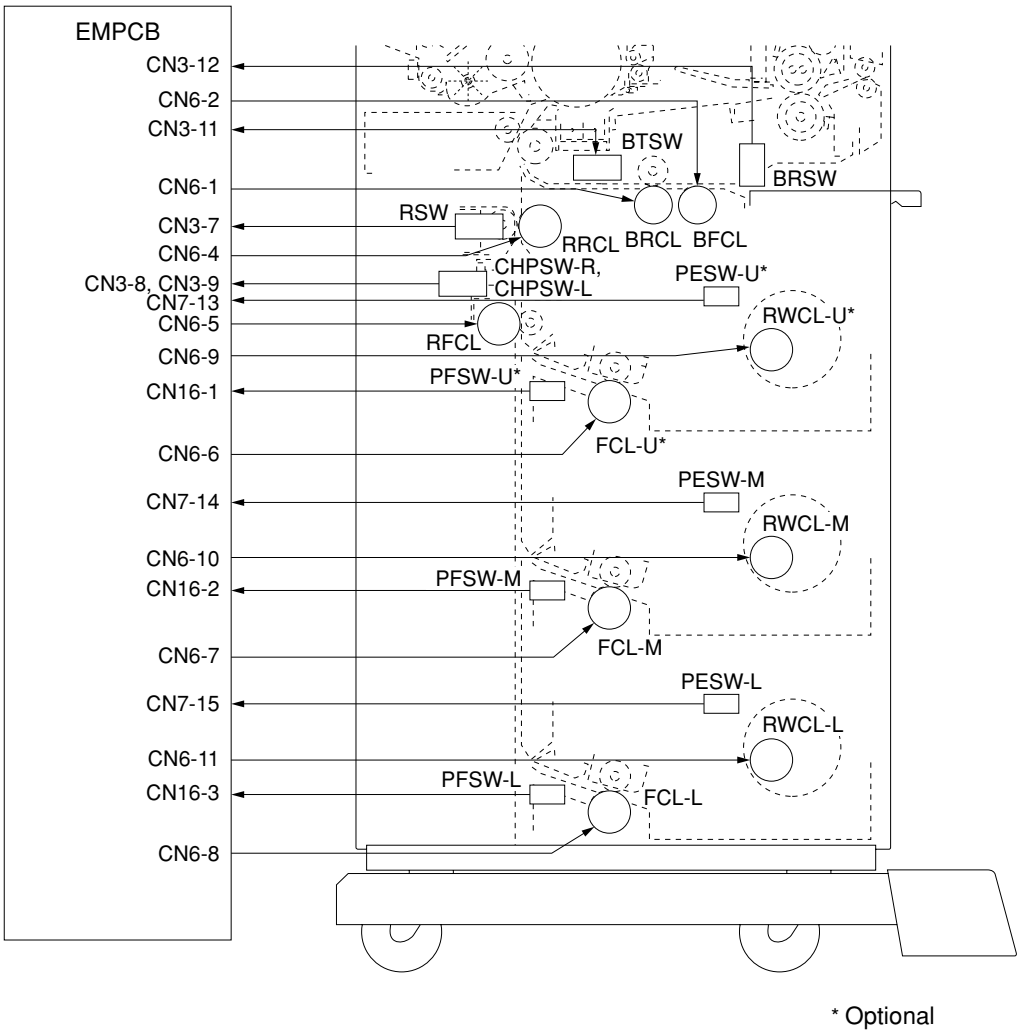


Figure 2-1-2 Block diagram of the paper feed and conveying section

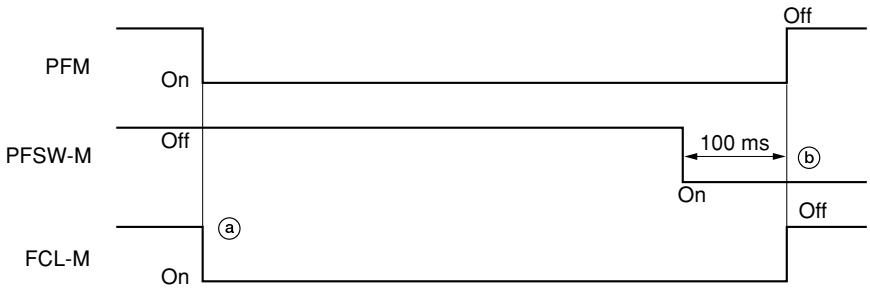
Winding operation of paper roll

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 printing.

A. 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 changing the paper feed position with the paper source key.
   2) One minute after a print cycle ends and the ready lamp (print ready indicator) lights. (If any key is pressed after the ready lamp is lit, another minute will be counted after the key press.)
   3) After opening/closing the detachable unit (cycling safety switches 1 and 2), the eject cover (cycling safety switch 3), the lower right cover (cycling safety switch 4), or the front covers (cycling safety switches 5 and 6).

B. 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 5 and 6).

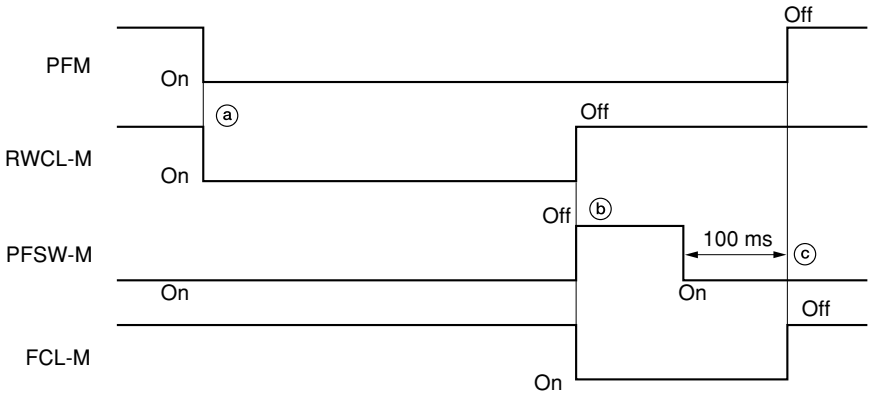
• With the paper feed switch off



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

a: The paper feed motor (PFM) and the middle feed clutch (FCL-M) turn on, and the paper is conveyed in the feed direction.
b: 100 ms after the middle paper feed switch (PFSW-M) is turned on, the middle feed clutch (FCL-M) and the paper feed motor (PFM) turn off and the leading edge of the paper stops at the home position (print ready position).
• Winding operation for the upper and lower roll units is performed similarly.

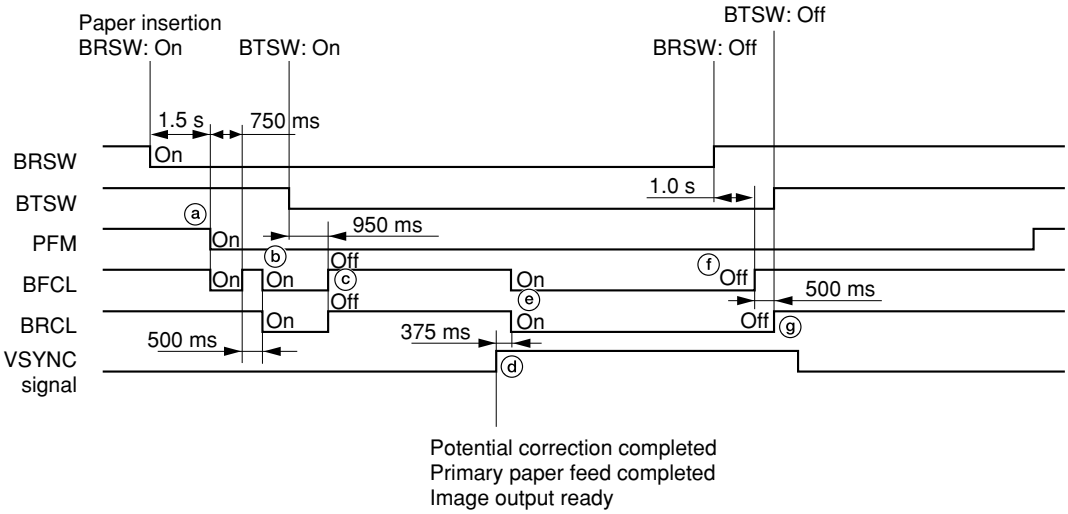
• With the paper feed switch on



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

a: The paper feed motor (PFM) and the middle roll winding clutch (RWCL-M) turn on, and the paper starts to wind.
b: After the middle paper feed switch (PFSW-M) is turned off, the middle roll winding clutch (RWCL-M) turns off and the middle feed clutch (FCL-M) turns on, and the paper is conveyed in the feed direction.
c: 100 ms after the middle paper feed switch (PFSW-M) is turned on, the middle feed clutch (FCL-M) and the paper feed motor (PFM) turn off, and the leading edge of the paper stops at the home position (print ready position).
• Winding operation for the upper and lower roll units is performed similarly.

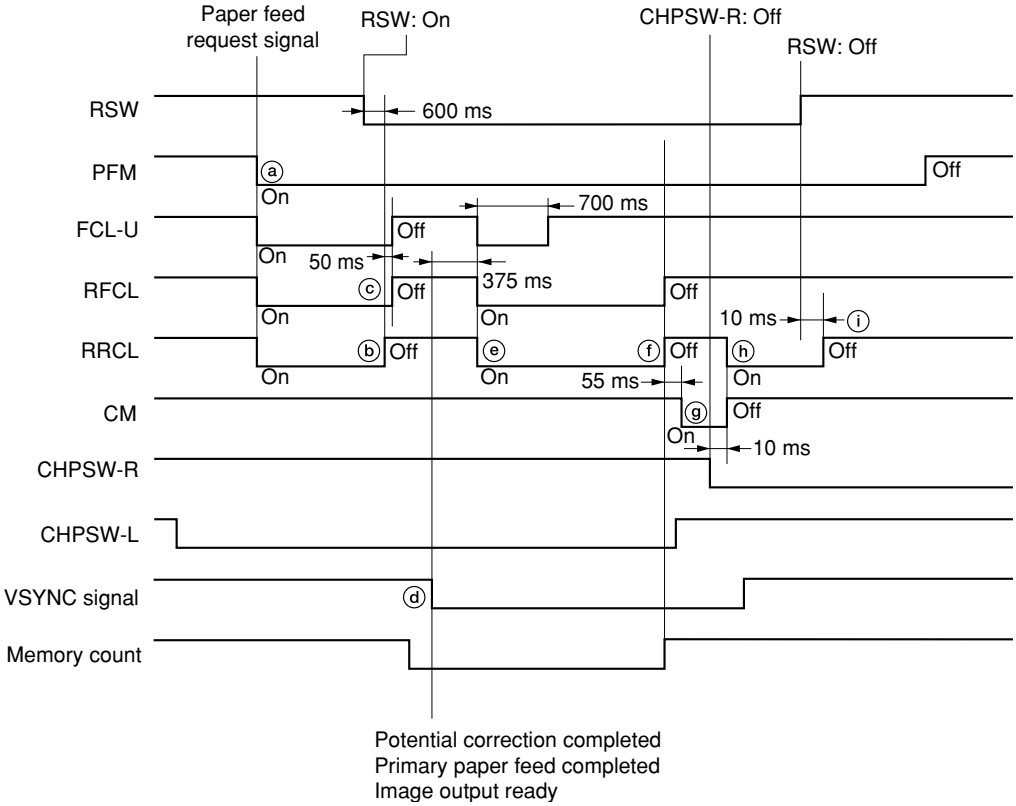
(1-1) Bypass paper feed



Timing chart 2-1-3 Bypass paper feed

a: 1.5 s after the bypass registration switch (BRSW) is turned on by inserting paper into the bypass table, the paper feed motor (PFM) turns on and the bypass feed clutch (BFCL) turns on for 750 ms, and forwarding of the inserted paper starts.
b: 500 ms after the bypass feed clutch (BFCL) turns off, the bypass feed clutch (BFCL) and the bypass registration clutch (BRCL) turn on to start the primary paper feed.
c: 950 ms after the bypass timing switch (BTSW) is turned on, the bypass feed clutch (BFCL) and the bypass registration clutch (BRCL) turn off, and the paper stops at the print ready position.
d: Potential correction and the primary paper feed are completed and image output is ready. After these secondary paper feed start conditions are satisfied, the VSYNC signal is turned on.
e: The bypass feed clutch (BFCL) and the bypass registration clutch (BRCL) turn on to convey the paper to the transfer section.
f: 1.0 s after the bypass registration switch (BRSW) is turned off, the bypass feed clutch (BFCL) turns off.
g: 500 ms after the bypass feed clutch (BFCL) turns off, the bypass registration clutch (BRCL) turns off, and the paper feed operation is completed.

(1-2) Roll unit paper feed



Timing chart 2-1-4 Roll unit paper feed

a: When the paper feed request signal is input, the paper feed motor (PFM), the feed clutch for currently selected roll unit [the upper/middle/lower feed clutches (FCL-U/M/L)], the roll feed clutch (RFCL), and the roll registration clutch (RRCL) turn on to start feeding the paper in the selected roll unit.
b: The paper turns the registration switch (RSW) on. After 600 ms, the roll registration clutch (RRCL) turns off and the paper stops. (Primary paper feed is completed.)
c: 50 ms after the roll registration clutch (RRCL) turns off, the upper/middle/lower feed clutches (FCL-U/M/L) turn off to make paper slack in the lower part of the paper cutting section.
d: Potential correction and the primary paper feed are completed and image output is ready. After these secondary paper feed start conditions are satisfied, the PSYNC signal is turned on.
e: The roll feed clutch (RFCL) and roll registration clutch (RRCL) turn on, and the upper/middle/lower feed clutches (FCL-U/M/L) turn on for 700 ms to start the secondary paper feed.
f: When the paper length reaches the memory count value, the roll feed clutch (RFCL) and roll registration clutch (RRCL) turn off.
g: 55 ms after the paper length reaches the memory count value, the cutter motor (CM) turns on and the paper is cut.
h: 10 ms after the right cutter home position switch (CHPSW-R) is turned off, the cutter motor (CM) turns off and the cutter stops at the home position. At the same time, the roll registration clutch turns off and the cut paper is conveyed.
i: 10 ms after the registration switch (RSW) is turned off, the roll registration clutch (RRCL) turns off to complete secondary paper feed.

(2) Main charger section

The main charger section is comprised of the drum, the drum surface potential sensor (DPS), the main charger unit and the main grid as shown in Figure 2-1-3.
The drum is electrically charged uniformly by means of the main grid to form a static latent image on the surface.
The drum surface potential sensor measures the dark potential of the drum surface.

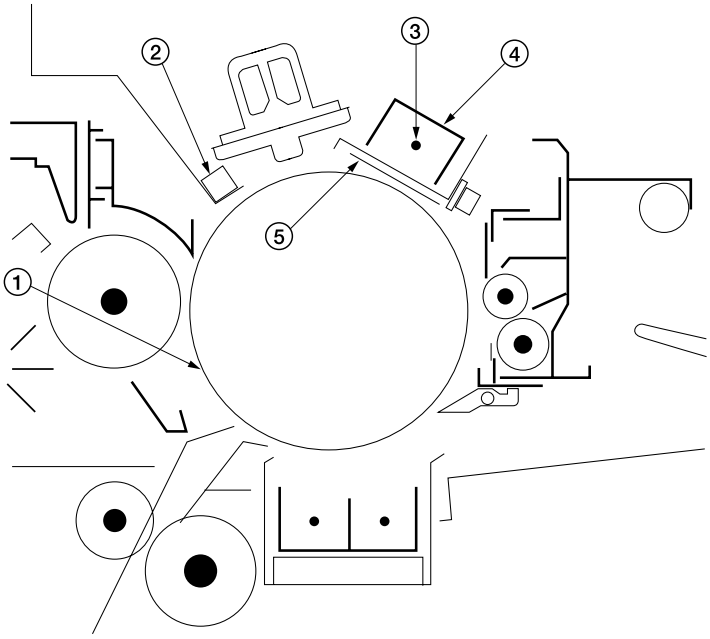


Figure 2-1-3 Main charger section

① Drum
② Drum surface potential sensor (DPS)
③ Charger wire (gilding tungsten oxide wire)
④ Main charger unit
⑤ Main grid

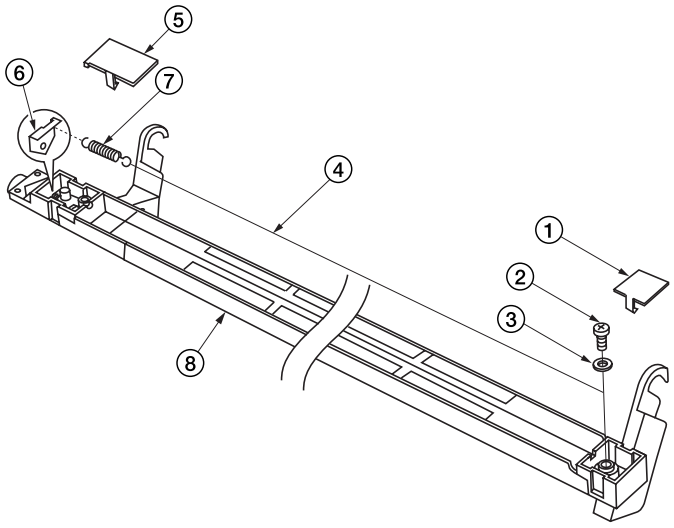


Figure 2-1-4 Main charger unit

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

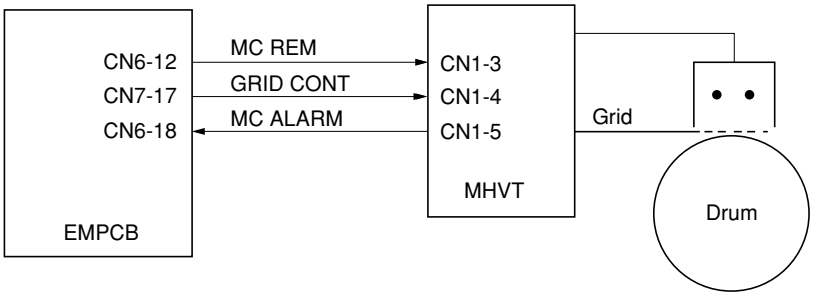
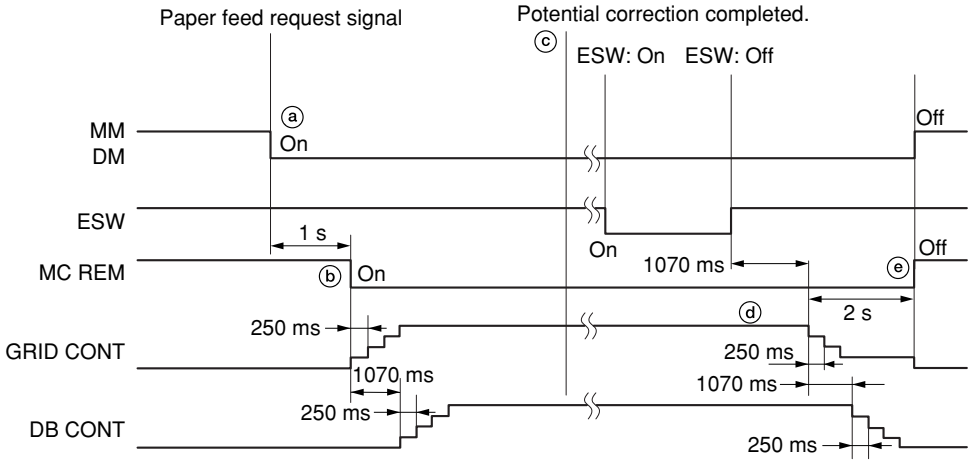


Figure 2-1-5 Block diagram of the main charger section



Timing chart 2-1-5 Operation of the main high-voltage transformer

a: When the paper feed request signal is input, the main motor (MM) and drum motor (DM) turn on.
b: 1 s after the main motor (MM) and drum motor (DM) turn on, main charging (MC REM) starts. The grid voltage (GRID CONT) and developing bias voltage (DB CONT) are controlled stepwise to increase the drum potential gradually.
c: When the drum potential reaches 780 V DC, potential correction is completed.
d: 1070 ms after printing 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 there is no request for toner replenishment, the voltages are controlled stepwise as soon as the eject switch is turned off. If there is a request for toner replenishment, the voltages will be controlled stepwise after toner is replenished.
e: When the grid voltage (GRID CONT) step-down control ends, main charging (MC REM) ends.

(3) LPH section

In the LPH section, the drum surface is irradiated by the LPH to form a static latent image on it.

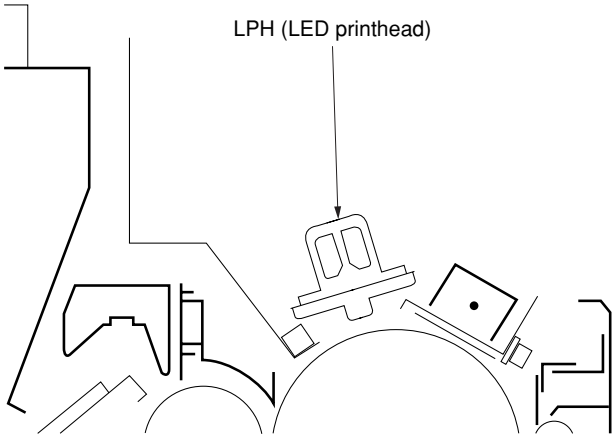


Figure 2-1-6 LPH section

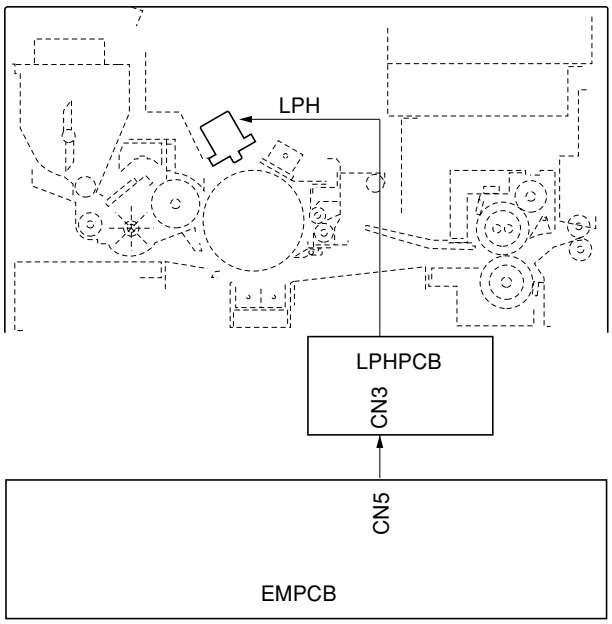


Figure 2-1-7 Block diagram of the LPH section

Static latent image formation

The LPH (LED printhead) consists of 21760 LEDs which are turned on and off based on the image data 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.

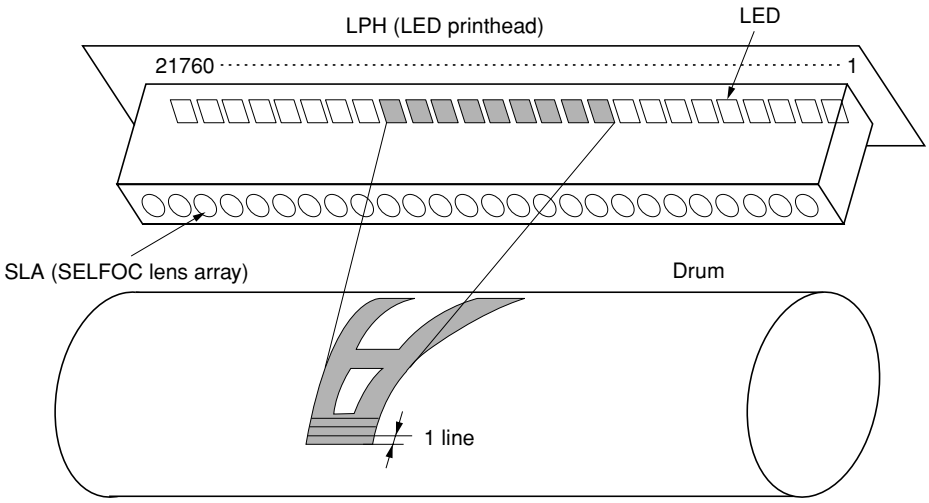


Figure 2-1-8 Static latent image formation

(4) 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.

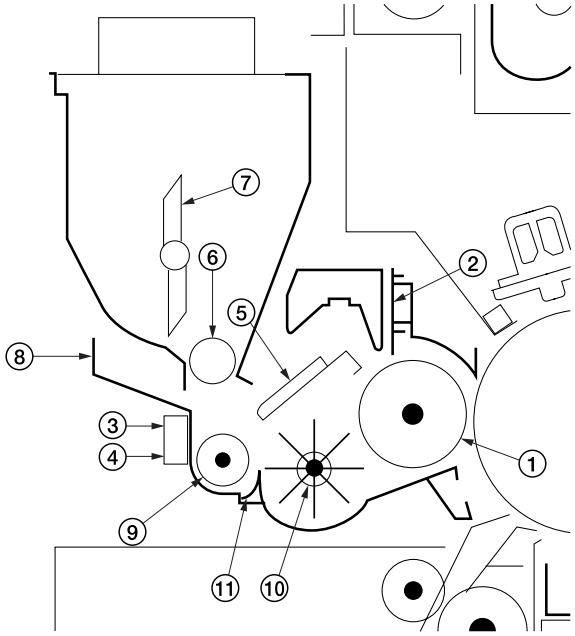


Figure 2-1-9 Developing section

① Developing roller
② Doctor blade
③ Developing unit thermistor (DTH)
④ Toner sensor (TNS)
⑤ Developing unit partition
⑥ Toner feed roller
⑦ Toner agitation rod
⑧ Developing unit housing
⑨ Developer spiral roller
⑩ Developer paddle
⑪ Developing support plate

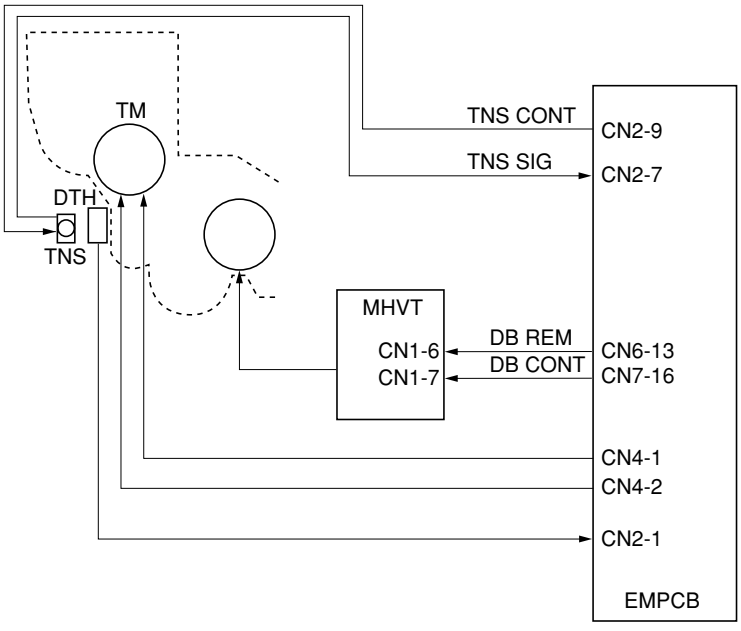
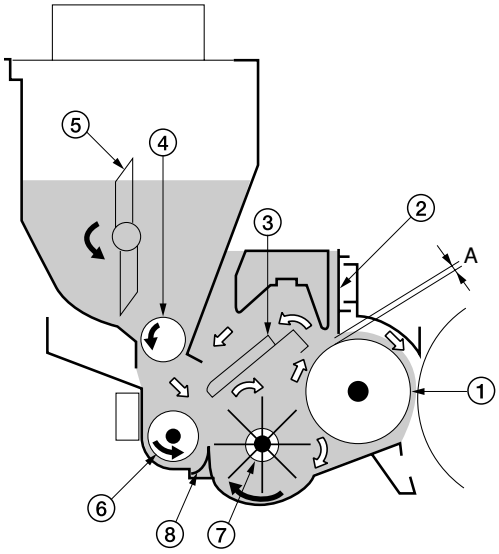


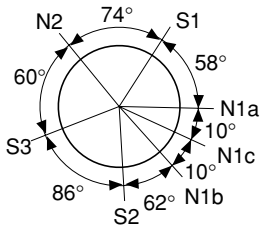
Figure 2-1-10 Block diagram of the developing section

Forming the magnetic brush

The developer flows by the rotation of the developing roller and the magnetic brush is formed on poles N1a, N1b and N1c. The height of the magnetic brush is set by the doctor blade. The developing bias voltage (650 V DC) which is output from the main high-voltage transformer (MHVT) is applied to the developing roller to improve the image contrast. When the drum surface potential reaches 0 V after completion of printing, 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):
0.58 to 0.66 mm around the center
0.68 to 0.76 mm at both ends



N1a: $830 \times 10^{-4} \pm 50 \times 10^{-4}$T
N1b: $1020 \times 10^{-4} \pm 50 \times 10^{-4}$T
N1c: $680 \times 10^{-4} \pm 70 \times 10^{-4}$T
N2: $620 \times 10^{-4} \pm 50 \times 10^{-4}$T
S1: $810 \times 10^{-4} \pm 50 \times 10^{-4}$T
S2: $715 \times 10^{-4} \pm 50 \times 10^{-4}$T
S3: $580 \times 10^{-4} \pm 50 \times 10^{-4}$T

Figure 2-1-11 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
⑧ Developing support plate

Toner density control

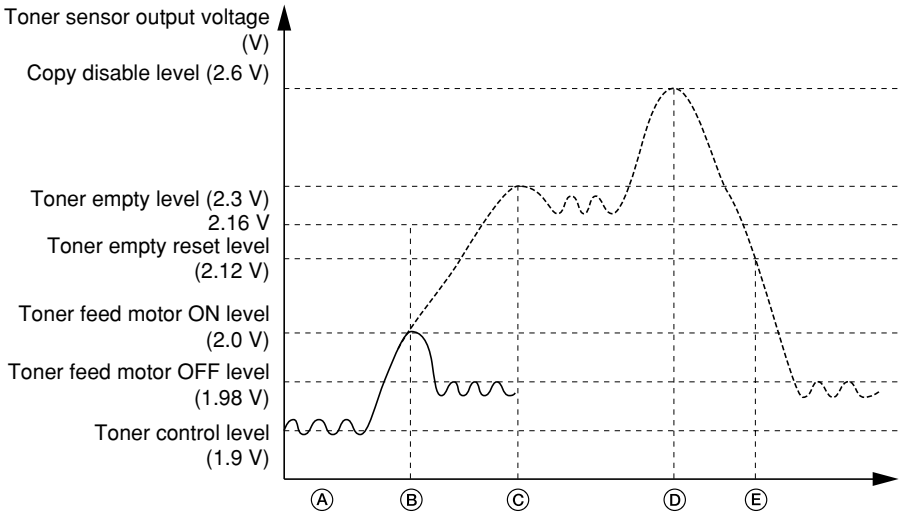


Figure 2-1-12 Toner density control

A: While maintenance item U130 (Initial setting for the developer) is performed, the toner sensor control voltage (TNS CONT) is set so that the toner sensor output voltage becomes the reference value of 1.9 V (toner control level).

B: If the temperature- and developing count-corrected toner sensor output voltage reaches the toner feed motor ON level, the toner feed motor (TM) turns on (for 0.5 s) and off (for 1.0 s) repeatedly only while the main motor (MM) is on, and supply toner from the toner hopper to developing unit assembly. When a dark print image is printed and the toner sensor output voltage exceeds 2.16 V, the toner feed motor (TM) turns on (for 1.0 s) and off (for 1.5 s) repeatedly and supply toner. When the toner sensor output voltage falls until it drops below the toner feed motor OFF level, the toner feed motor (TM) turns off.

C: If the toner sensor output voltage rises further and remains 0.3 V or more above the toner control level for 15 s, the toner empty level is detected and the message requesting toner to be replenished is displayed.

D: If the toner sensor output voltage rises 0.3 V or more above the toner control level, print disable level is detected. The message requesting toner to be replenished is displayed and printing operation is disabled.

E: When toner is replenished to the toner hopper and the toner replenishing slot is closed (cycling the toner replenishing slot opening cover switch) or the detachable unit and the lower right cover is opened/closed (cycling safety switches 1, 2 and 4), the toner feed motor (TM) turns on (for 1.0 s) and off (for 1.0 s) repeatedly and toner will be replenished for 6 minutes maximum. While replenishing toner, the message indicating that toner is being replenished appears. When the toner sensor output voltage falls until it drops below the toner empty reset level, aging is performed for 2 minutes with no toner being replenished and printing operation is enabled.

Correcting the toner sensor control voltage

The toner sensor control voltage (TNS CONT) is set while maintenance item U130 (Initial setting for the developer) is performed. It is corrected based on the change of temperature of the developing section and developing count.
Corrected toner sensor control voltage = toner sensor control voltage set by the maintenance item U130 + correction value based on the temperature + correction value based on the developing count

• Toner sensor control voltage corrected based on the temperature
The toner sensor control voltage is corrected as below based on the temperature of the developing section detected by the developing unit thermistor (DTH).

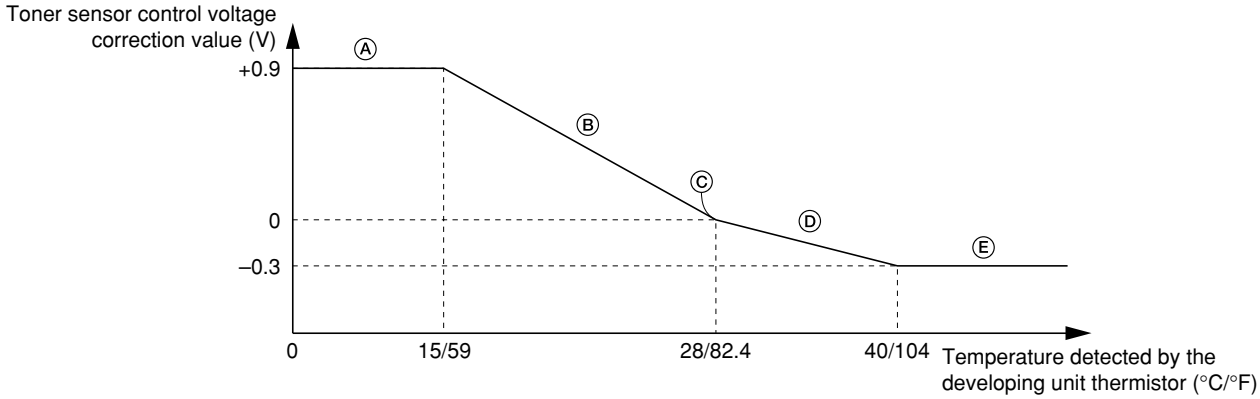


Figure 2-1-13 Toner control level correction based on the temperature

A: When the temperature detected by the developing unit thermistor is below 15°C/59°F, a constant value of +0.9 V is added to toner sensor control voltage.
B: When the temperature detected by the developing unit thermistor is between 15 to 28°C/59 to 82.4°F, the correction value is reduced according to the rise of the temperature.
C: When the temperature detected by the developing unit thermistor becomes 28°C/82.4°F, the correction value becomes 0 and the toner sensor control voltage is not corrected.
D: When the temperature detected by the developing unit thermistor is between 28 to 40°C/82.4 to 104°C, the correction value is below 0 and decreases the toner sensor control voltage according to the rise of the temperature.
E: When the temperature detected by the developing unit thermistor is above 40°C/104°F, the correction value becomes a constant value of –0.3 V, decreasing the toner sensor control voltage.

• Correcting the toner sensor control voltage based on the developing section total drive time
The toner sensor control voltage is corrected as below based on the developing section total drive time (total drive time of the main motor).

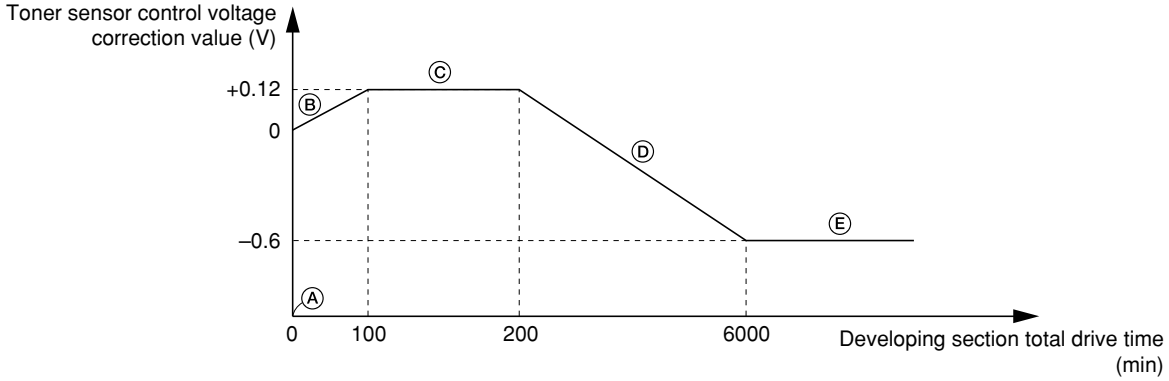


Figure 2-1-14 Toner control level correction based on the developing section total drive time

A: During the initial setting for the developer (maintenance item U130 performed), the developing count is reset to 0.
B: When the developing section total drive time is between 0 to 100 min, the correction value is increased according to the change of the developing count, increasing the toner sensor control voltage to increase the toner density.
C: When the developing section total drive time is between 100 to 200 min, a constant value of +0.12 V is added to the toner sensor control voltage.
D: When the developing section total drive time is between 200 to 6000 min, the correction value is decreased according to the change of the developing count, decreasing the toner sensor control voltage to decrease the toner density.
E: When the developing section total drive time exceeds 6000 min, the correction value becomes a constant value of –0.6 V, decreasing the toner sensor control voltage.

(5) Transfer/separation section

The transfer/separation section is comprised of the transfer charger unit, the pre-transfer roller, and the drum separation claws as shown in Figure 2-1-15.

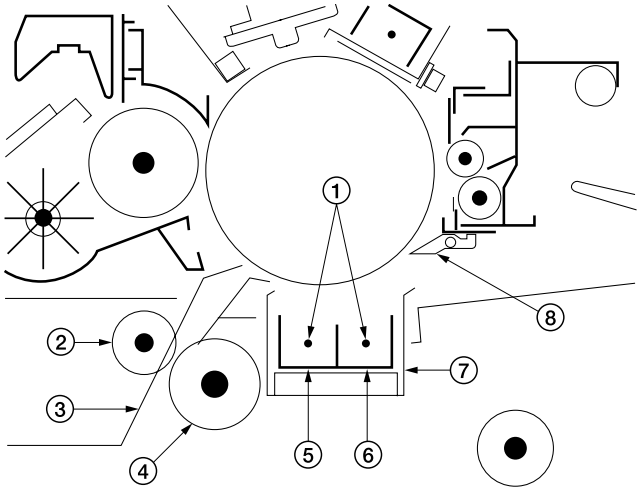


Figure 2-1-15 Transfer/separation section

① Tungsten oxide wires
② Pre-transfer pulley
③ Pre-transfer outer guide
④ Pre-transfer roller
⑤ Transfer charger
⑥ Separation charger
⑦ Transfer charger unit
⑧ Drum separation claws

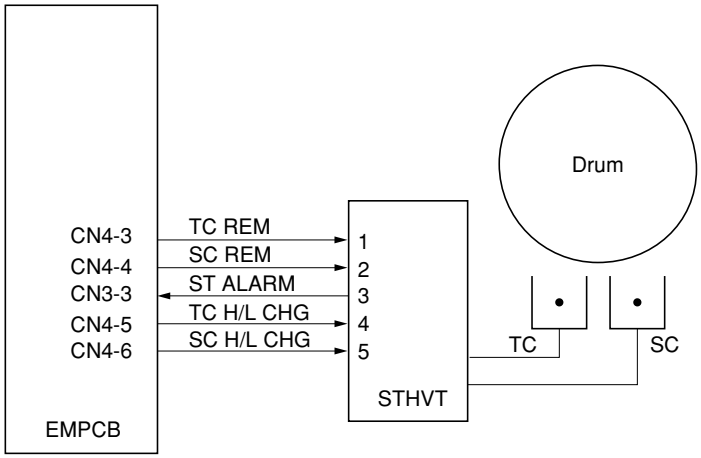


Figure 2-1-16 Block diagram of the transfer section

The transfer charger unit 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 oxide transfer charger and separation charger wires. The drum separation claws are installed to ensure paper separation.

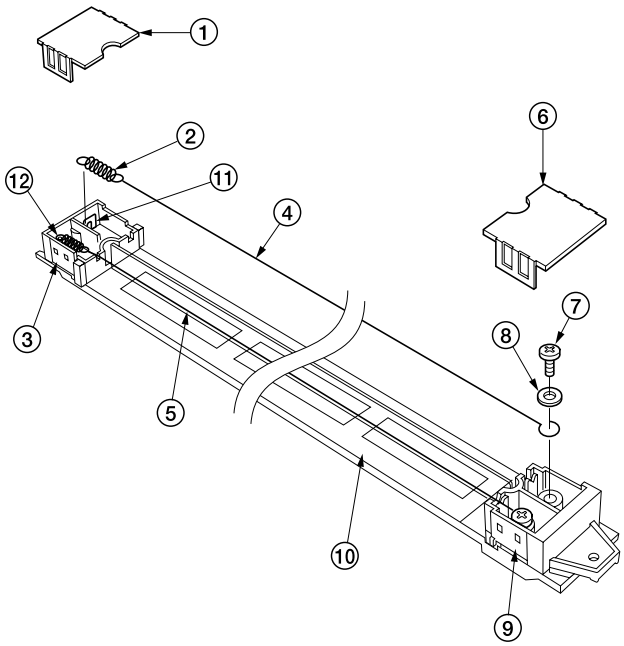
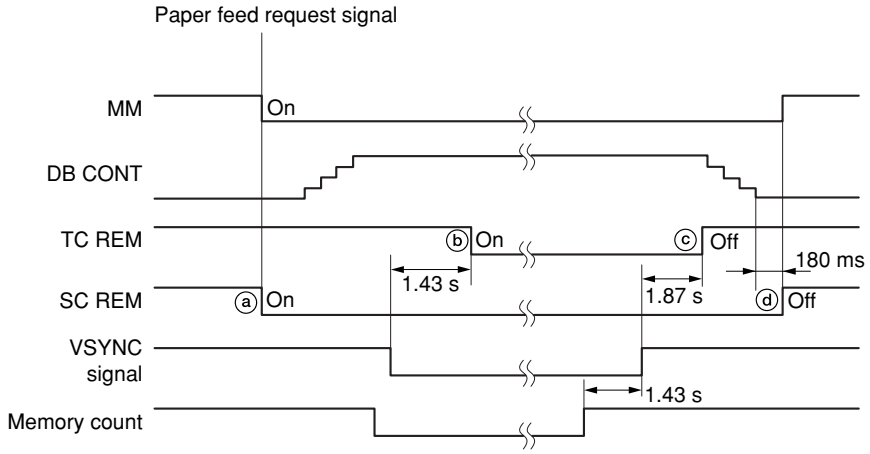


Figure 2-1-17 Transfer charger assembly

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



Timing chart 2-1-6 Operation of the transfer/separation section

a: When the paper feed request signal is input, the main motor (MM) turns on and, at the same time, separation charging (SC REM) starts.
b: 1.43 s after the VSYNC signal is turned on, transfer charging (TC REM) starts.
c: 1.87 s after the VSYNC signal is turned off, transfer charging (TC REM) ends.
d: 180 ms after the developing bias step-down control is completed, separation charging (SC REM) ends.

(6) 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 on and the message requesting the waste toner tank to be checked appears on the display on the operation panel, and printing is disabled.

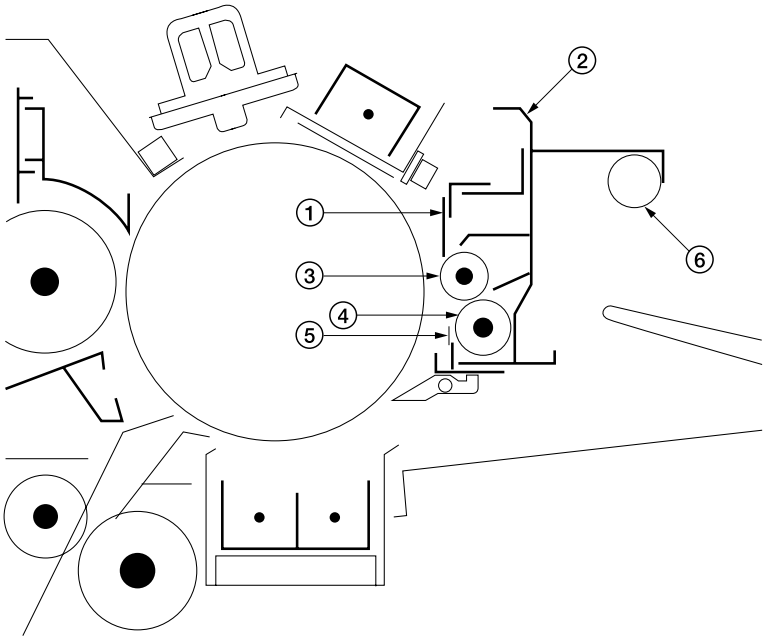


Figure 2-1-18 Cleaning section

① Cleaning blade
② Cleaning housing
③ Cleaning fur brush
④ Cleaning unit spiral
⑤ Lower cleaning seal
⑥ Cleaning weight

(7) Static eliminator section

The static eliminator section is comprised of the right, middle and left cleaning lamps (CL-R/M/L) as shown in Figure 2-1-19 and eliminates the residual charge after transfer.

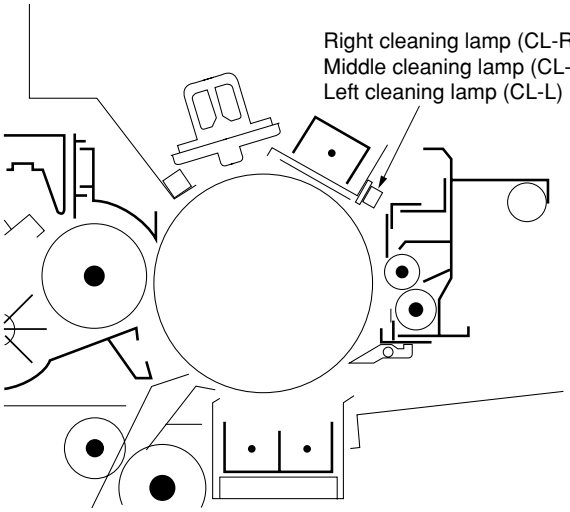


Figure 2-1-19 Static eliminator section

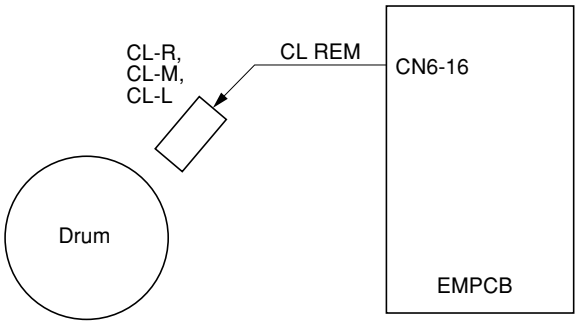
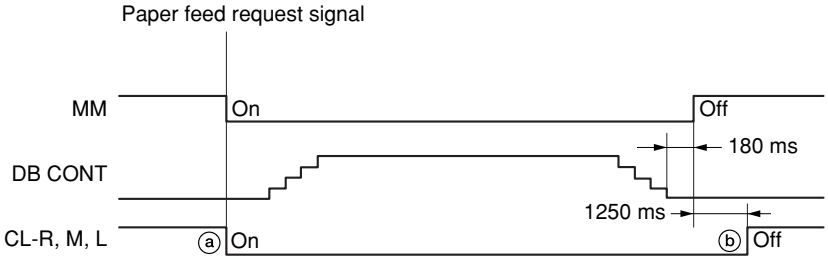


Figure 2-1-20 Block diagram of the static eliminator section



Timing chart 2-1-7 Operation of the static eliminator section

a: When the paper feed request signal is input, the main motor (MM) turns on and, the right, middle and left cleaning lamps (CL-R/M/L) are turned on.

b: 1250 ms after printing operation is completed and the main motor (MM) turns off, the right, middle and left cleaning lamps (CL-R/M/L) are turned off.

(8) Fixing section

The fixing section is comprised of the parts shown in Figure 2-1-21. 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.

The main fixing heater (FH-M) heats the center of the heat roller and sub fixing heater (FH-S) 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 due to melted toner.

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.

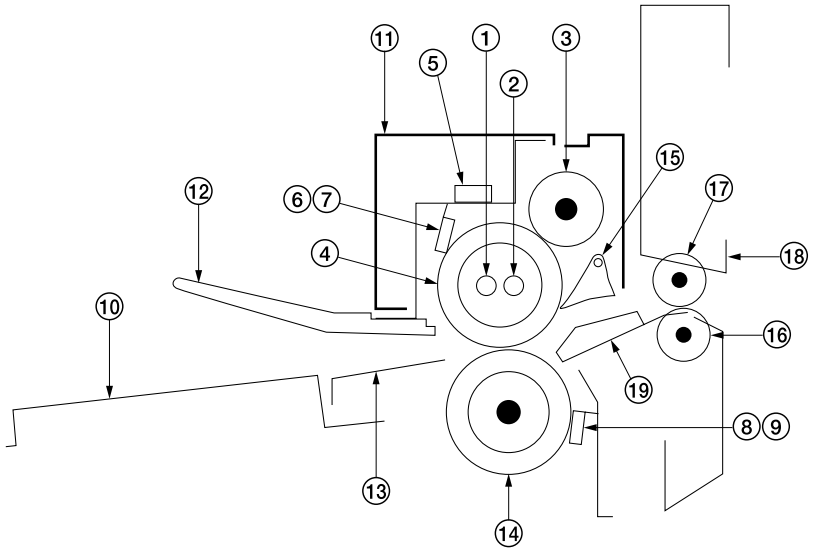


Figure 2-1-21 Fixing section

① Main fixing heater (FH-M)
② Sub fixing heater (FH-S)
③ Oil roller
④ Heat roller
⑤ Fixing unit thermostat (FTS)
⑥ Fixing unit thermistor 1 (FTH1: near the center of the heat roller)
⑦ Fixing unit thermistor 2 (FTH2: right end of the heat roller)
⑧ Fixing unit thermistor 3 (FTH3: near the center of the press roller)
⑨ Fixing unit thermistor 4 (FTH4: right end of the press roller)
⑩ Paper conveying guide
⑪ Fixing unit cover
⑫ Fixing unit front guide
⑬ Fixing unit insertion guide
⑭ Press roller
⑮ Heat roller separation claw
⑯ Eject roller
⑰ Eject pulley
⑱ Upper eject guide
⑲ Lower eject guide

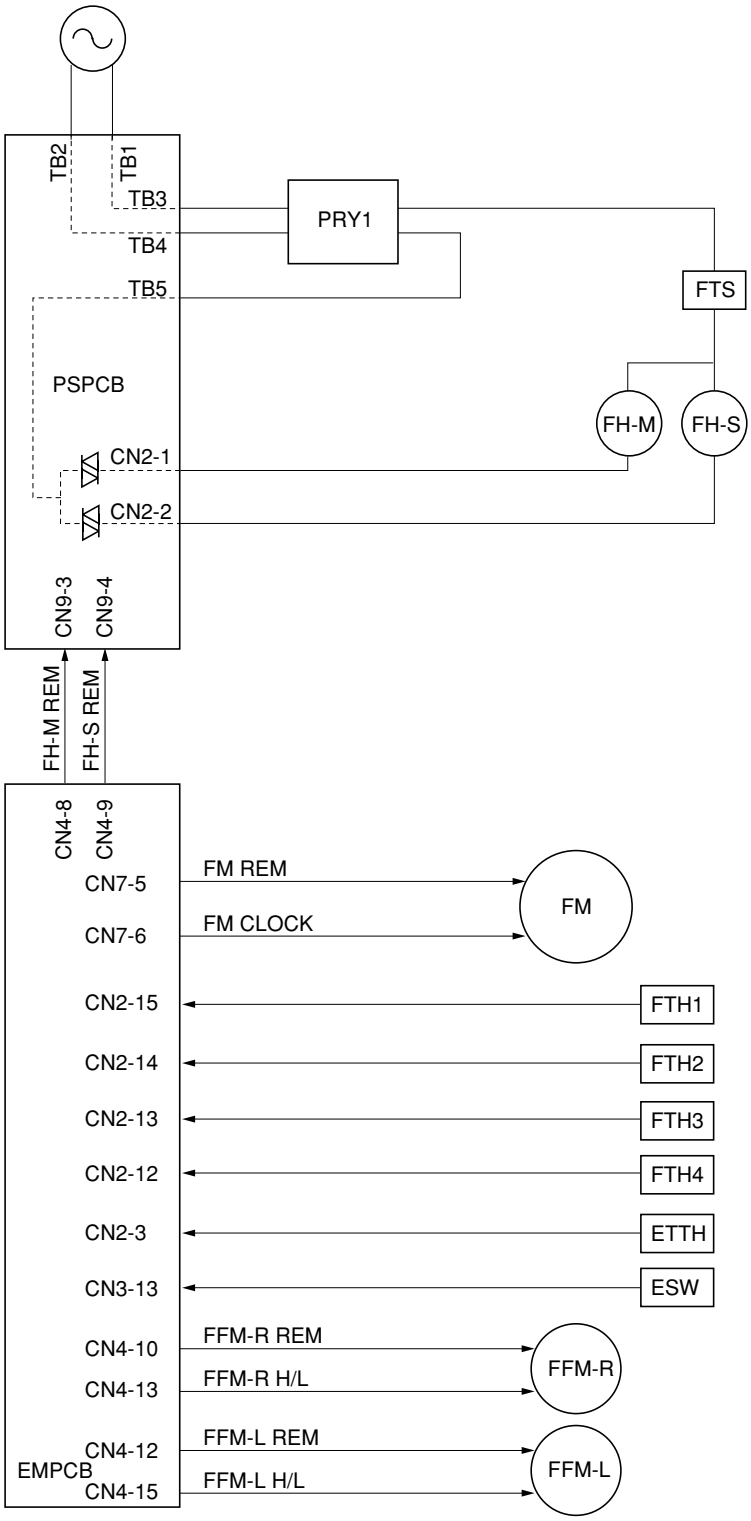


Figure 2-1-22 Block diagram of the fixing section

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 detected by fixing unit thermistors 1 and 2 (FTH1 and 2) becomes less than T (control temperature), the main and sub fixing heaters (FH-M/S) are turned on to heat the heat roller. Control temperature T is controlled by the following formula.

Control temperature $T = T_{HCON} + k (T_{PTH} - T_{PRD})$

When the maximum value obtained from $k (T_{PTH} - T_{PRD})$ is T_{HMAX}.

T_{HCON}: heat roller control temperature
k: temperature compensation coefficient (varies between while standby and copying)
T_{PTH}: press roller temperature threshold value
T_{PRD}: fixing unit thermistor 3 (FTH3) temperature (surface temperature around the center of the press roller)
T_{HMAX}: The maximum value for the heat roller control temperature

• Heat roller temperature control 2

When the ambient temperature T_{ETTH} detected by the external temperature thermistor (ETTH) is as in the table, the control temperatures are changed depending on the paper used 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.

• Plain paper

External temperature thermistor detection temperature	Primary stabilization temperature	Secondary stabilization temperature	Heat roller control temperature	Press roller control temperature
$T_{ETTH} \leq$ 15°C/59°F	180°C/356°F	165°C/329°F	160°C/320°F	85°C/185°F
15°C/59°F < T_{ETTH} < 30°C/86°F	180°C/356°F	170°C/338°F	155°C/311°F	85°C/185°F
30°C/86°F ≤ T_{ETTH}	180°C/356°F	170°C/338°F	150°C/302°F	85°C/185°F

• Vellum

External temperature thermistor detection temperature	Primary stabilization temperature	Secondary stabilization temperature	Heat roller control temperature	Press roller control temperature
$T_{ETTH} \leq$ 15°C/59°F	170°C/338°F	175°C/347°F	175°C/347°F	130°C/266°F
15°C/59°F < T_{ETTH} < 30°C/86°F	170°C/338°F	175°C/347°F	175°C/347°F	130°C/266°F
30°C/86°F ≤ T_{ETTH}	170°C/338°F	175°C/347°F	175°C/347°F	130°C/266°F

• Film

External temperature thermistor detection temperature	Primary stabilization temperature	Secondary stabilization temperature	Heat roller control temperature	Press roller control temperature
$T_{ETTH} \leq$ 15°C/59°F	140°C/284°F	155°C/311°F	155°C/311°F	80°C/176°F
15°C/59°F < T_{ETTH} < 30°C/86°F	165°C/329°F	150°C/302°F	150°C/302°F	80°C/176°F
30°C/86°F ≤ T_{ETTH}	165°C/329°F	145°C/293°F	145°C/293°F	80°C/176°F

• Press roller temperature control

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 fixing unit thermistor 3 (FTH3) detection temperature (temperature around the center of the press roller) becomes less than 85°C/185°F (130°C/266°F for vellum), the fixing motor (FM) turns on at low speed to increase the surface temperature of the press roller. When fixing unit thermistor 3 (FTH3) detection temperature reaches 95°C/203°F (140°C/284°F for vellum), the fixing motor (FM) turns off. By repeating these operations, the surface temperature of the press roller is maintained between 85°C/185°F and 95°C/203°F.

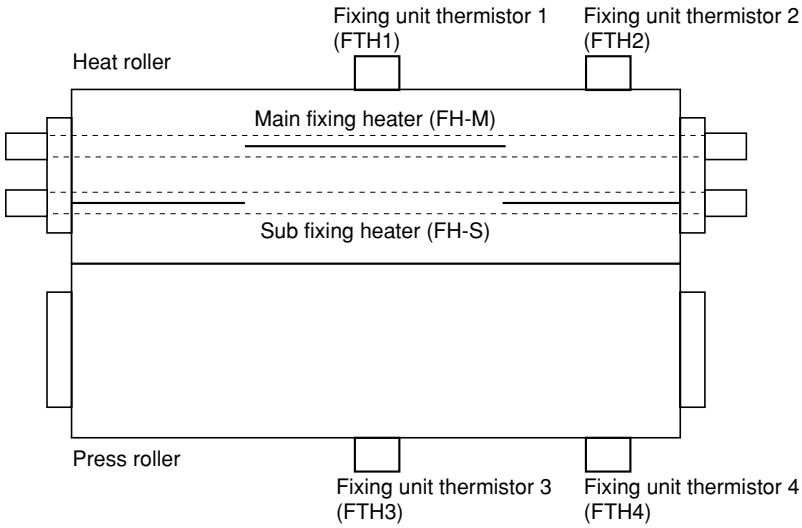


Figure 2-1-23 Heat roller and press roller temperature detection

2-2-1 Electric parts layout

(1) PCBs

Figure 2-2-1 PCBs

1. Engine main PCB (EMPCB) ..... Controls other PCBs and electric components.
2. IPU PCB ..... Controls image processing.
3. Power source PCB (PSPCB) ..... Turns 24 V DC, –12 V DC, ±5 V DC and 3.4 V DC supply on.
4. LPH PBC (LPHPCB) ..... Output control for LPH (LED printhead).
5. Drum surface potential PBC (DPPBC) ..... Detection of the input to the drum surface potential sensor.
6. ST high-voltage transformer (STHVT) ..... Generates a high voltage for transfer and separation charging.
7. Operation unit PCB (OPCB) ..... Consists of operation keys and display LEDs.
8. LCD PCB (LCDPCB) ..... Lights backlight and displays messages.
9. Main high-voltage transformer (MHVT) ..... Generates a high voltage for main charging and developing bias voltage.

(2) Switches and sensors

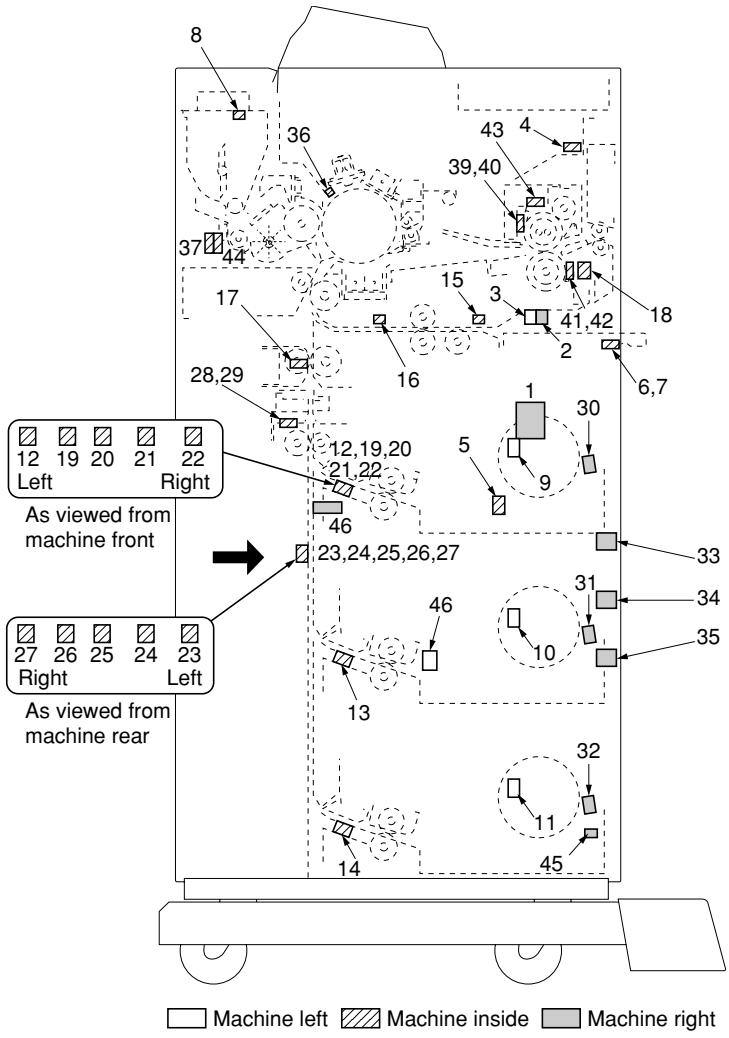


Figure 2-2-2 Switches and sensors

1. Main switch (MSW) ..... Turns AC power supply on and off.
2. Safety switch 1 (SSW1) ..... Forms a safety circuit when the detachable unit is open and closed.
3. Safety switch 2 (SSW2) ..... Forms a safety circuit when the detachable unit is open and closed.
4. Safety switch 3 (SSW3) ..... Forms a safety circuit when the eject cover is opened and closed.
5. Safety switch 4 (SSW4) ..... Forms a safety circuit when the right cover is opened and closed.
6. Safety switch 5 (SSW5) ..... Forms a safety circuit when the front covers are opened and closed.
7. Safety switch 6 (SSW6) ..... Forms a safety circuit when the front covers are opened and closed.
8. Toner replenishing slot opening cover switch (OCSW) ..... Detection of toner replenishing slot opened/closed.
9. Upper paper empty switch* (PESW-U) ..... Detection of paper-out in the upper roll unit.
10. Middle paper empty switch (PESW-M) ..... Detection of paper-out in the middle roll unit.
11. Lower paper empty switch (PESW-L) ..... Detection of paper-out in the lower roll unit.
12. Upper paper feed switch* (PFSW-U) ..... Detection of leading edge home position of paper in the upper roll unit and control of the upper feed clutch and upper roll winding clutch.
13. Middle paper feed switch (PFSW-M) ..... Detection of leading edge home position of paper in the middle roll unit and control of the middle feed clutch and middle roll winding clutch.
14. Lower paper feed switch (PFSW-L) ..... Detection of leading edge home position of paper in the lower roll unit and control of the lower feed clutch and lower roll winding clutch.

* Optional

15. Bypass registration switch (BRSW) ..... Detection of leading edge of paper on the bypass table, control of the bypass feed clutch and bypass registration clutch, and detection of paper jams in the bypass feed section.
16. Bypass timing switch (BTSW) ..... Control of the bypass feed clutch and bypass registration clutch, and detection of paper jams in the bypass feed section.
17. Registration switch (RSW) ..... Control of the feed clutch, roll feed clutch and roll registration clutch, control of rotation speed change of the main motor and fixing motor, and detection of paper jams.
18. Eject switch (ESW) ..... Control of rotation speed change of the main motor and fixing motor, control of the fixing fan motor, and detection of paper jam.
19. Upper paper size switch 1* (PSSW1-U) ..... Detection of paper size in the roll unit. (297 mm)
20. Upper paper size switch 2* (PSSW2-U) ..... Detection of paper size in the roll unit. (420 mm)
21. Upper paper size switch 3* (PSSW3-U) ..... Detection of paper size in the roll unit. (594 mm)
22. Upper paper size switch 4* (PSSW4-U) ..... Detection of paper size in the roll unit. (841 mm)
23. Paper size switch 1 (PSSW1) ..... Detection of paper size in the roll unit. (210 mm)
24. Paper size switch 2 (PSSW2) ..... Detection of paper size in the roll unit. (297 mm)
25. Paper size switch 3 (PSSW3) ..... Detection of paper size in the roll unit. (420 mm)
26. Paper size switch 4 (PSSW4) ..... Detection of paper size in the roll unit. (594 mm)
27. Paper size switch 5 (PSSW5) ..... Detection of paper size in the roll unit. (841 mm)
28. Right cutter home position switch (CHPSW-R) ..... Detection of the cutter home position.
29. Left cutter home position switch (CHPSW-L) ..... Detection of the cutter home position.
30. Upper roll unit switch* (RUSW-U) ..... Detection of the upper roll unit installed or not.
31. Middle roll unit switch (RUSW-M) ..... Detection of the middle roll unit installed or not.
32. Lower roll unit switch (RUSW-L) ..... Detection of the lower roll unit installed or not.
33. Upper roll unit heater switch* (RHSW-U) ..... Upper roll unit heater in use/not in use.
34. Middle roll unit heater switch (RHSW-M) ..... Middle roll unit heater in use/not in use.
35. Lower roll unit heater switch (RHSW-L) ..... Lower roll unit heater in use/not in use.
36. Drum surface potential sensor (DPS) ..... Detection of drum surface potential.
37. Toner sensor (TNS) ..... Detection of toner density in the developing section.
38. Overflow sensor (OFS) ..... Detection of toner overflow collected in the waste toner tank.
39. Fixing unit thermistor 1 (FTH1) ..... Detection of temperature of the heat roller at the center.
40. Fixing unit thermistor 2 (FTH2) ..... Detection of temperature of the heat roller at the right end.
41. Fixing unit thermistor 3 (FTH3) ..... Detection of temperature of the press roller at the center.
42. Fixing unit thermistor 4 (FTH4) ..... Detection of temperature of the press roller at the right end.
43. Fixing unit thermostat (FTS) ..... Forms a safety circuit for the main and sub fixing unit heaters.
44. Developing thermistor (DTH) ..... Detection of temperature in vicinity of developing section.
45. External temperature thermistor (ETTH) ..... Detection of external (ambient) temperature.
46. Main motor FG pulse sensor (MMFGPS) ..... Detection of rotation speed of the main motor.

* Optional

(3) Motors

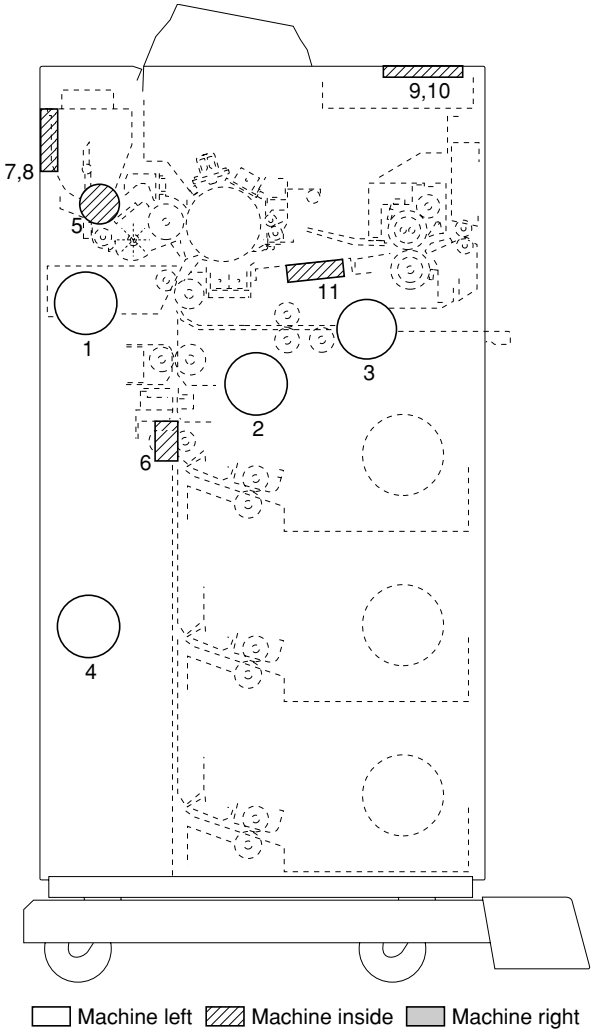


Figure 2-2-3 Motors

1. Main motor (MM) ..... Drives the developing section, transfer section and cleaning section.
2. Drum motor (DM) ..... Drives the drum section.
3. Fixing motor (FM) ..... Drives the fixing section.
4. Paper feed motor (PFM) ..... Drives the paper feed section.
5. Toner feed motor (TM) ..... Supplies toner.
6. Cutter motor (CM) ..... Drives the cutter.
7. LPH right fan motor (LFM-R) ..... Cools the LED printhead.
8. LPH left fan motor (LFM-L) ..... Cools the LED printhead.
9. Fixing unit right fan motor (FFM-R) ..... Heat exhaust in the fixing section.
10. Fixing unit left fan motor (FFM-L) ..... Heat exhaust in the fixing section.
11. Paper conveying section fan motor (PCFM) ..... Ozone exhaust in the paper conveying section.

(4) Clutches and heaters

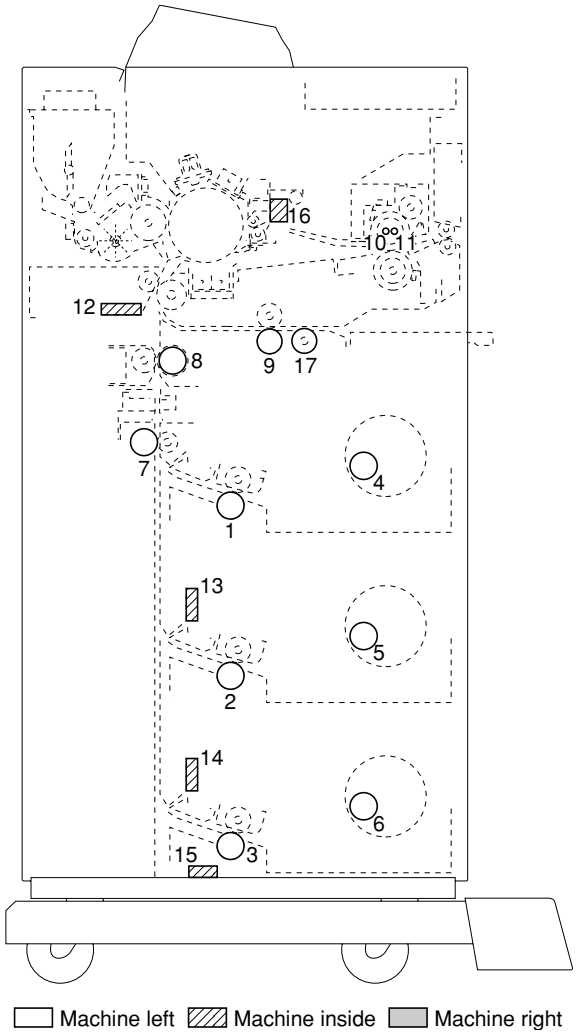


Figure 2-2-4 Clutches and heaters

1. Upper feed clutch*1 (FCL-U) ..... Primary paper roll feed from the upper roll unit.
2. Middle feed clutch (FCL-M) ..... Primary paper roll feed from the middle roll unit.
3. Lower feed clutch (FCL-L) ..... Primary paper roll feed from the lower roll unit.
4. Upper roll winding clutch*1 (RWCL-U) ..... Winding of paper roll in the upper roll unit.
5. Middle roll winding clutch (RWCL-M) ..... Winding of paper roll in the middle roll unit.
6. Lower roll winding clutch (RWCL-L) ..... Winding of paper roll in the lower roll unit.
7. Roll feed clutch (RFCL) ..... Conveys paper from the roll unit.
8. Roll registration clutch (RRCL) ..... Secondary paper roll feed from the roll unit.
9. Bypass registration clutch (BRCL) ..... Primary and secondary paper feed from the bypass table.
10. Main fixing heater (FH-M) ..... Heats the heat roller at the center.
11. Sub fixing heater (FH-S) ..... Heats the heat roller at both ends.
12. Drum heater (DH) ..... Prevents condensation on drum.
13. Upper roll unit heater*2 (RH-U) ..... Dehumidifies paper in the upper roll unit.
14. Middle roll unit heater*2 (RH-M) ..... Dehumidifies paper in the middle roll unit.
15. Lower roll unit heater*2 (RH-L) ..... Dehumidifies paper in the lower roll unit.
16. Separation claw solenoid (SSOL) ..... Operates the separation claws.
17. Bypass feed clutch (BFCL) ..... Primary paper feed from the bypass table.

*1 Optional
*2 For 120 V specifications only.

(5) Others

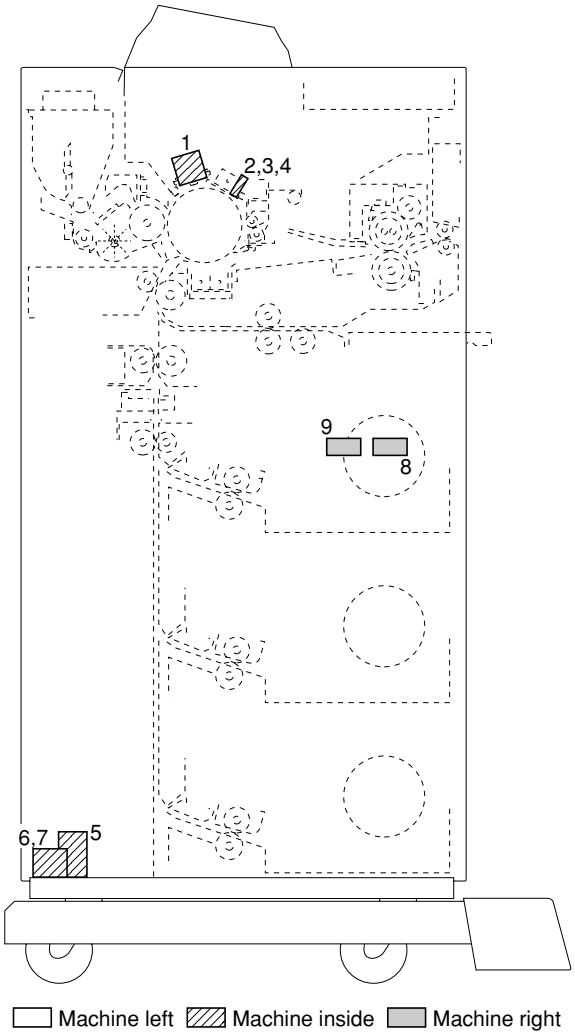


Figure 2-2-5 Others

1. LED printhead (LPH) ..... Forms an image using the data from originals on the drum surface via LED illumination.
2. Right cleaning lump (CL-R) ..... Removes residual charge from the drum surface.
3. Middle cleaning lump (CL-M) ..... Removes residual charge from the drum surface.
4. Left cleaning lump (CL-L) ..... Removes residual charge from the drum surface.
5. Power relay 1 (PRY1) ..... Turns power supply to the main and sub fixing heaters on and off.
6. Power relay 2 (PRY2) ..... Turns 24 V DC supply on and off for the paper feed section drive system.
7. Power relay 3 (PRY3) ..... Turns 24 V DC supply on and off.
8. Total counter (TC) ..... Displays the number of prints.
9. Scanner counter (SC) ..... Displays the number of scanned originals.

2-3-1 Power source PCB

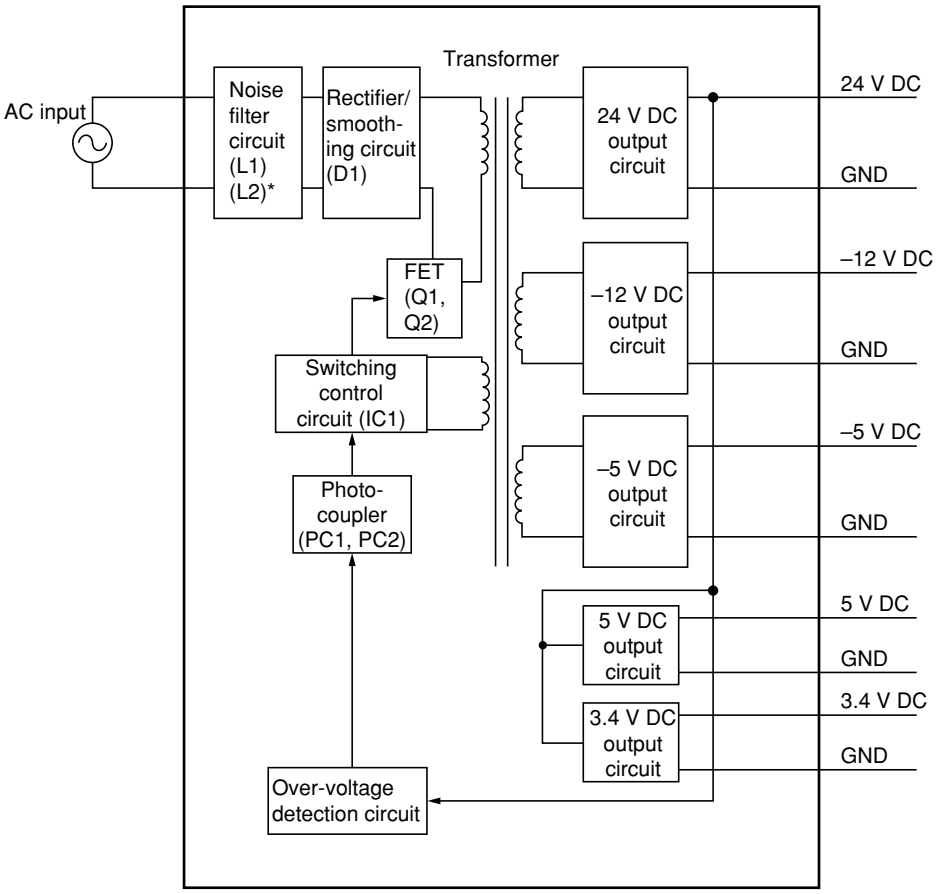


Figure 2-3-1 Power source PCB block diagram

The power source PCB (PSPCB) is a switching regulator which converts an AC input to generate 24 V DC, ±5 V DC, 3.4 V DC and –12 V DC. It consists of a noise filter circuit, rectifier circuit, switching control circuit, 24 V DC output circuit, 5 V DC output circuit, 3.4 V DC output circuit and –12 V DC output circuit.
The noise filter circuit, which centers on line filters L1 and L2* and includes capacitors, attenuates external noise, and prevents the switching noise generated on the power source PCB from leaving the machine via the AC line.
The rectifier circuit full-wave rectifies the AC input which has passed through the noise filter circuit using diode bridge D1. The smoothing capacitor smoothes out the pulsed voltage from the diode bridge.
The switching control circuit turns on/off FETs Q1 and Q2 via controller IC1 to switch the current induced on the secondary coil of the transformer.
The 24 V DC output circuit, +/–5 V DC output circuits, 3.4 V DC output circuit and –12 V DC output circuit smooth out the voltages from the currents induced on the secondary coil of the transformer via a diode and smoothing capacitor, and output stable voltages using a regulator IC.

* For 200 V specifications only.

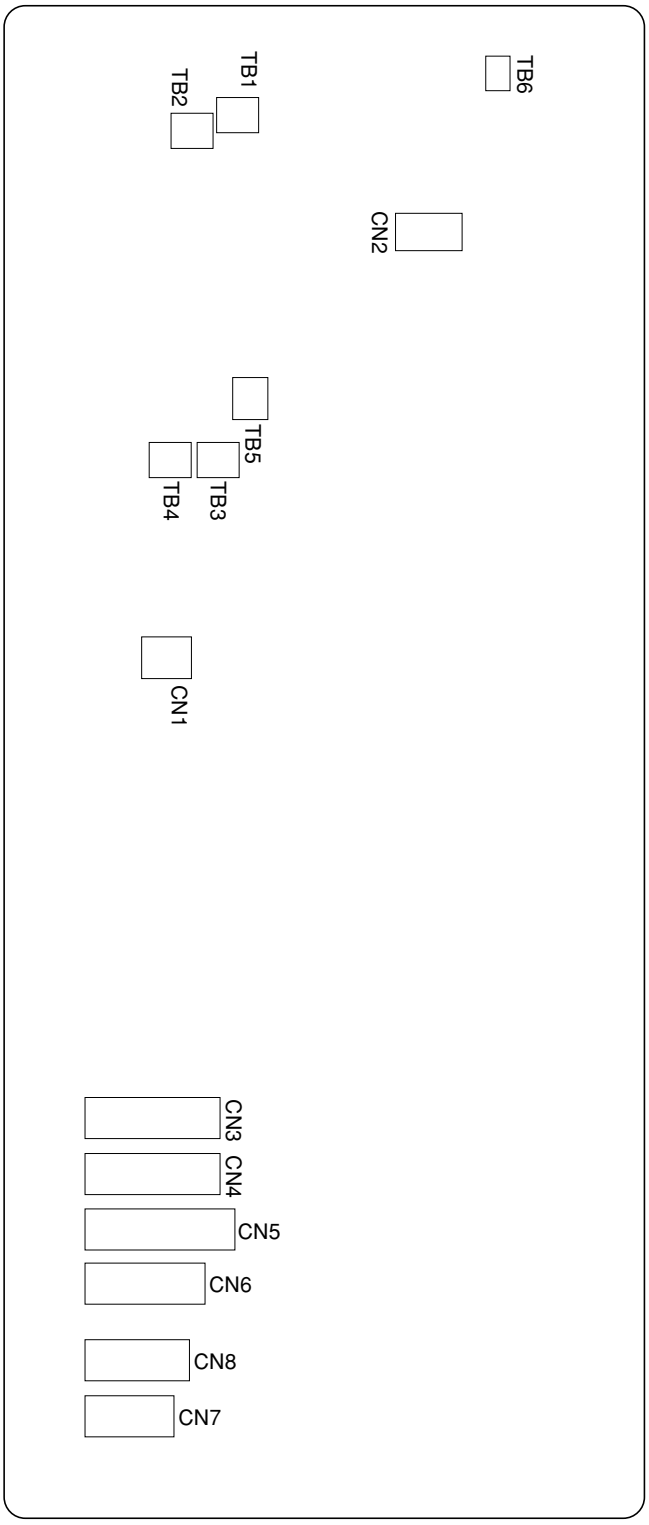


Figure 2-3-2 Power source PCB silkscreen image

Terminals (CN)		Voltage	Remarks
TB-1	TB-2	120 V AC 220 – 240 V AC	AC supply, input
TB-3	TB-4	120 V AC 220 – 240 V AC	AC supply for MSW, output
TB-5	TB-2	120/0 V AC 220 – 240/0 V AC	PRY1 on/off, input
TB-6	TB-2	120/0 V AC 220 – 240/0 V AC	MSW on/off, input
1-1	TB-2	120/0 V AC 220 – 240/0 V AC	MSW on/off, input
1-3	TB-2	120/0 V AC 220 – 240/0 V AC	MSW on/off, input
2-1	TB-2	120 V AC 220 – 240 V AC	AC supply for FH-M, output
2-2	TB-2	120 V AC 220 – 240 V AC	AC supply for FH-S, output
3-1	3-6	24 V DC	24 V DC supply, output
3-2	3-7	24 V DC	24 V DC supply, output
3-3	3-8	24 V DC	24 V DC supply, output
3-4	3-9	24 V DC	24 V DC supply, output
3-5	3-9	24 V DC	24 V DC supply, output
4-1	4-6	24 V DC	24 V DC supply, output
4-2	4-7	24 V DC	24 V DC supply, output
4-3	4-8	24 V DC	24 V DC supply, output
4-4	4-9	24 V DC	24 V DC supply, output
4-5	4-9	24 V DC	24 V DC supply, output
5-1	5-6	5 V DC	5 V DC supply, output
5-2	5-7	5 V DC	5 V DC supply, output
5-3	5-8	5 V DC	5 V DC supply, output
5-4	5-9	5 V DC	5 V DC supply, output
5-5	5-10	5 V DC	5 V DC supply, output
6-1	6-5	5 V DC	5 V DC supply, output
6-2	6-6	5 V DC	5 V DC supply, output
6-3	6-7	5 V DC	5 V DC supply, output
6-4	6-8	5 V DC	5 V DC supply, output
7-1	7-4	3.4 V DC	3.4 V DC supply, output
7-2	7-5	3.4 V DC	3.4 V DC supply, output
7-3	7-6	–5 V DC	–5 V DC supply, output
8-1	8-5	5 V DC	5 V DC supply, output
8-2	8-6	–5 V DC	–5 V DC supply, output
8-3	8-7	–12 V DC	–12 V DC supply, output
8-4	8-7	–12 V DC	–12 V DC supply, output
9-1	9-2	0/5 V DC (pulse)	PSPCB zero-cross signal, input
9-3	9-2	0/5 V DC	FH-M on/off, input
9-4	9-2	0/5 V DC	FH-S on/off, input
9-5	9-2	0/5 V DC	DH on/off, input
9-6	9-2	5 V DC	5 V DC supply, input

2-3-2 Engine main PCB

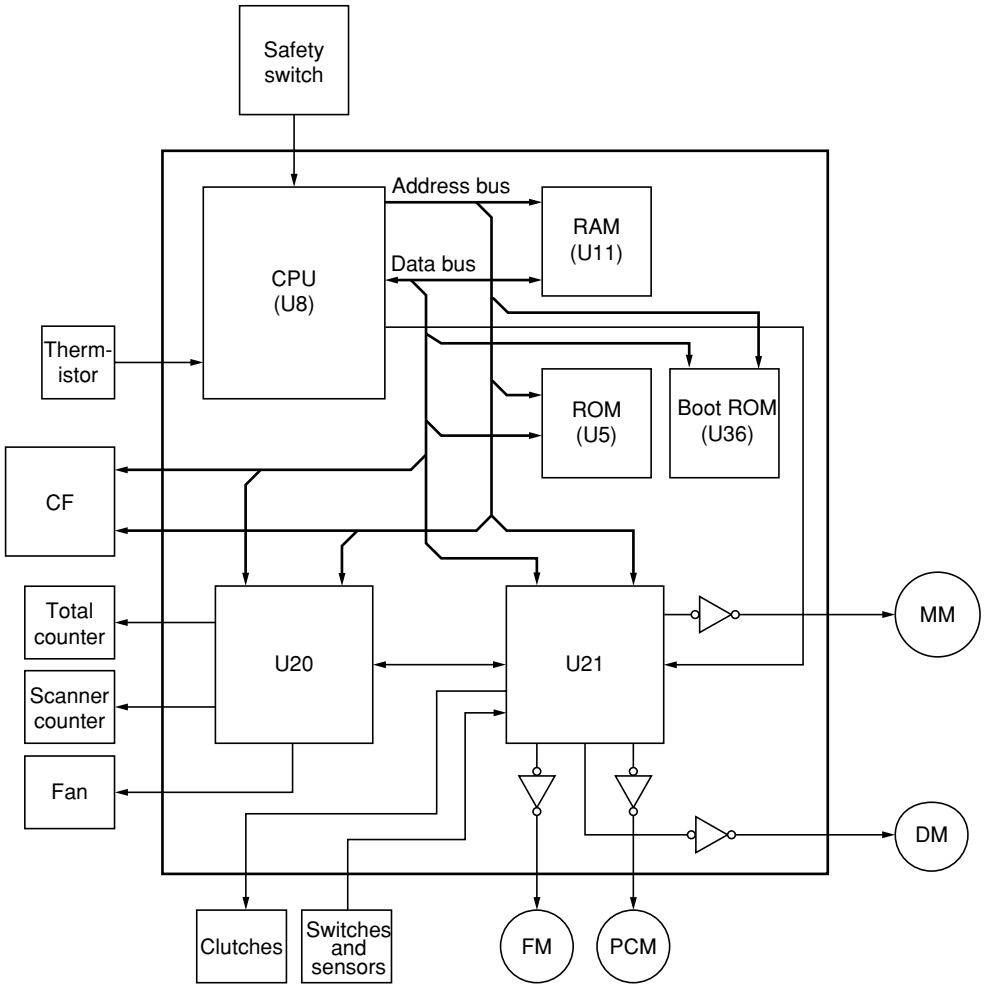


Figure 2-3-3 Engine main PCB block diagram

The engine main PCB (EMPCB) centers on CPU U8 and includes the ROM and RAM circuit, I/O control circuit, analog signal input/output circuit and communication control circuit.
CPU U8 controls the entire system based on the data written into RAM U11 according to the control program in ROM U5.
CPU U8 also controls motors and clutches via ASIC U20 and U21.

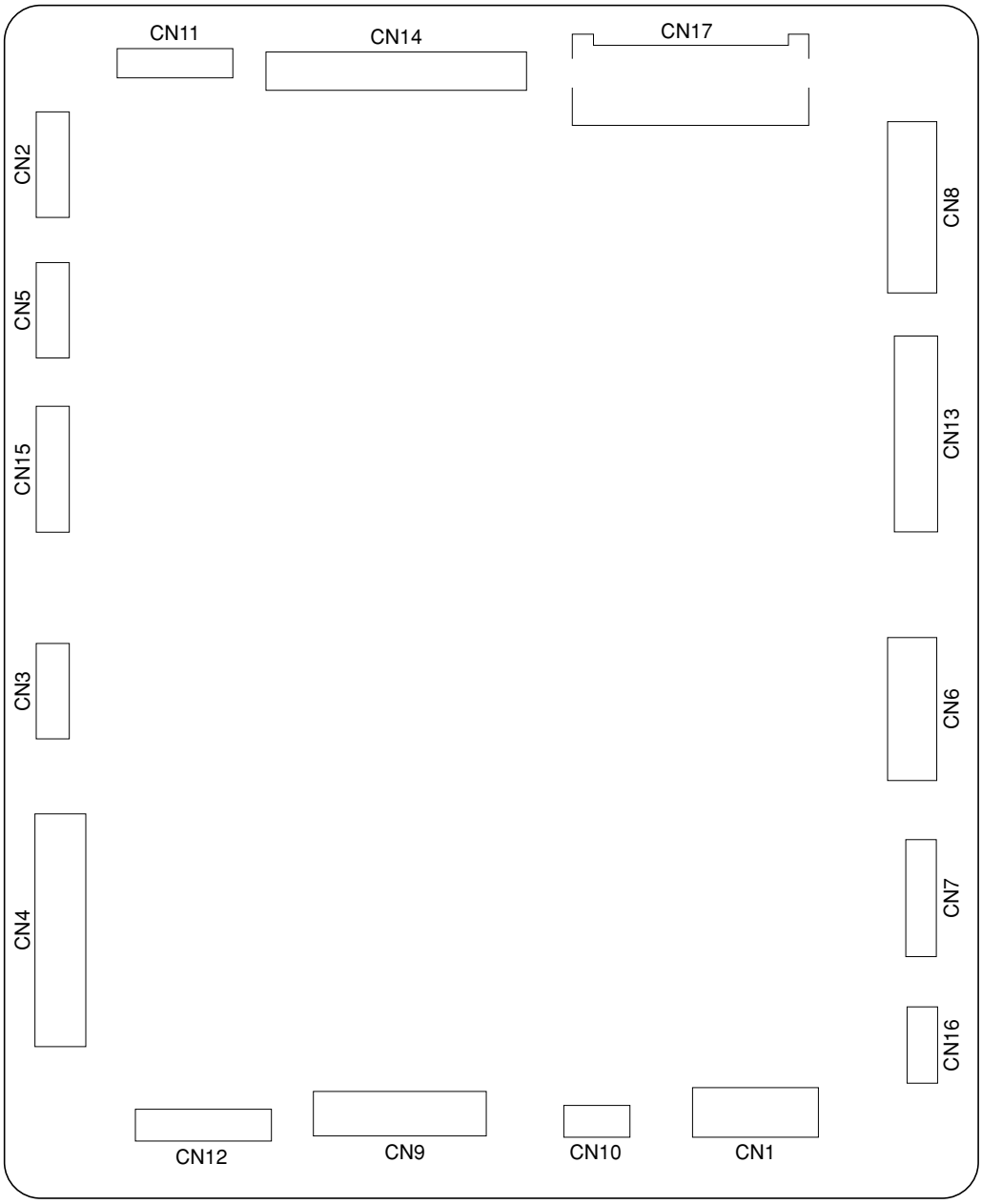


Figure 2-3-4 Engine main PCB silkscreen image

Terminals (CN)		Voltage	Remarks
1-1	1-2	24 V DC	24 V DC supply, input
1-3	1-5	5 V DC	5 V DC supply, input
1-4	1-6	5 V DC	5 V DC supply, input
2-1	2-2	0 – 5 V DC	DTH detection voltage, input
2-3	2-4	0/24 V DC	ETTH on/off, output
2-5	2-6	0/5 V DC	DPPCB DPS signal, output
2-7	2-8		TNS detection voltage, input
2-9	2-8	7.2 – 15 V DC	TNS control voltage, output
2-12	2-16	0 – 5 V DC	FTH4 on/off, input
2-13	2-16	0 – 5 V DC	FTH3 on/off, input
2-14	2-17	0 – 5 V DC	FTH2 on/off, input
2-15	2-17	0 – 5 V DC	FTH1 on/off, input
3-3	3-14	0/5 V DC	STHVT ST ALARM signal, input
3-4	3-14	5/0 V DC	RUSW-U on/off, input*
3-5	3-14	5/0 V DC	RUSW-M on/off, input
3-6	3-14	5/0 V DC	RUSW-L on/off, input
3-7	3-14	0/5 V DC	RSW on/off, input
3-8	3-14	0/5 V DC	CHPSW-R on/off, input
3-9	3-14	0/5 V DC	CHPSW-L on/off, input
3-10	3-14	0/5 V DC	OFS on/off, input
3-11	3-14	0/5 V DC	BTSW on/off, input
3-12	3-14	0/5 V DC	BRSW on/off, input
3-13	3-14	5/0 V DC	ESW on/off, input
3-15	3-14	5 V DC	5 V DC supply for ESW and BTSW, output
3-16	3-14		EPI signal, input
4-1	4-2	24/0 V DC	TM on/off, output
4-3	2-2	0 – 15 V DC	STHVT (TC) on/off, output
4-4	2-2	0/24 V DC	STHVT (SC) on/off, output
4-5	2-2	0/14 V DC	TC H/L CHANGE signal, output
4-6	2-2	0/5 V DC	SC H/L CHANGE signal, output
4-7	2-2	0/5 V DC (pulse)	PSPCB zero-cross signal, input
4-8	2-2	0/5 V DC	FH-M on/off, output
4-9	2-2	0/5 V DC	FH-S on/off, output
4-10	2-2	0/24 V DC	FFM-R on/off, output
4-11	2-2	0/5 V DC	DH on/off, input
4-12	2-2	0/24 V DC	FFM-L on/off, output
4-13	2-2	0/5 V DC	FFM-R full-/half-speed, output
4-14	2-2	0/24 V DC	PCFM on/off, output
4-15	2-2	0/5 V DC	FFM-L full-/half-speed, output
4-16	2-2	5/0 V DC	CM (–) signal, output
4-17	2-2	0/5 V DC	PCFM full-/half-speed, output
4-18	2-2	5/0 V DC	CM (+) signal, output
4-19	2-2	0/24 V DC	MSW off signal, output
4-23	2-2	0/24 V DC	Total counter count signal TC, output
4-24	2-2	0/24 V DC	Scanner counter count signal SC, output
4-25	2-2	0/24 V DC	PRY1 on/off, output
4-26	2-2	24 V DC	24 V DC supply for PRY1, output
4-27	2-2	24/0 V DC	SSW3 on/off, input
4-30	2-2	24/0 V DC	SSW4 on/off, input
4-31	2-2	24/0 V DC	SSW1 on/off, input
5-1	5-2	0/5 V DC (pulse)	Serial signal for LPHPCB, output
5-3	5-4	0/5 V DC (pulse)	Serial signal from LPHPCB, input
5-5	5-4	0/5 V DC	LPHPCB VSYNC signal, output
5-6	5-4	0/5 V DC	LPHPCB RESET signal, output
5-7	5-4	0/5 V DC	LPHPCB ENGN WRITING signal, output
6-1	1-2	0/24 V DC	BRCL on/off, output

* Optional

Terminals (CN)		Voltage	Remarks
6-2	1-2	0/24 V DC	BFCL on/off, output
6-4	1-2	0/24 V DC	RRCL on/off, output
6-5	1-2	0/24 V DC	RFCL on/off, output
6-6	1-2	0/24 V DC	FCL-U on/off, output*
6-7	1-2	0/24 V DC	FCL-M on/off, output
6-8	1-2	0/24 V DC	FCL-L on/off, output
6-9	1-2	0/24 V DC	RWCL-U on/off, output*
6-10	1-2	0/24 V DC	RWCL-M on/off, output
6-11	1-2	0/24 V DC	RWCL-L on/off, output
6-12	1-2	0/17 V DC	MHVTPCB main charger on/off, output
6-13	1-2	0/24 V DC	MHVTPCB developing bias on/off, output
6-15	1-2	0/24 V DC	SSOL on/off, output
6-16	1-2	0/16 V DC	CL-R, CL-M, CL-L on/off, output
6-18	1-2	0/5 V DC	MHVT ALARM signal, input
6-19	1-2	0/24 V DC	PRY2 on/off, output
7-1	1-2	0/5 V DC	PFM on/off, output
7-2	1-2	0/5 V DC	PFM CLOCK signal, output
7-3	1-2	0/5 V DC	DM on/off, output
7-4	1-2	0/5 V DC	DM CLOCK signal, output
7-5	1-2	0/5 V DC	FM on/off, output
7-6	1-2	0/5 V DC	FM CLOCK signal, output
7-7	1-2	0/5 V DC	MM on/off, output
7-8	1-2	0/5 V DC	MM CLOCK signal, output
7-9	1-2	0/5 V DC	MMFGPS on/off, input
7-11	1-2	0/5 V DC	DM ALARM signal, input
7-12	1-2	0/5 V DC	FM ALARM signal, output
7-13	1-2	0/5 V DC	PESW-U on/off, input*
7-14	1-2	0/5 V DC	PESW-M on/off, input
7-15	1-2	0/5 V DC	PESW-L on/off, input
7-16	1-2	0 – 5 V DC	DB control voltage, output
7-17	1-2	0 – 3.5 V DC	GRID control voltage, output
10-1	1-5	0/5 V DC	PSSW2-U on/off, input*
10-2	1-5	0/5 V DC	PSSW3-U on/off, input*
10-3	1-5	0/5 V DC	PSSW4-U on/off, input*
10-4	1-5	0/5 V DC	PSSW5-U on/off, input*
10-5	1-5	5/0 V DC	CLM (+) signal, output
10-6	1-5	5/0 V DC	CLM (–) signal, output
10-7	1-5	0/5 V DC	LICSW on/off, input*
10-8	1-5	0/5 V DC	PLSW on/off, input*
10-9	1-2	0/5 V DC	PWSW on/off, input
11-1	11-2	0/5 V DC (pulse)	Serial signal for IPUPCB, output*
11-3	11-2	0/5 V DC (pulse)	Serial signal from IPUPCB, input*
11-5	11-4	0/5 V DC	IPUPCB ACK signal, input*
11-6	11-4	0/5 V DC	IPUPCB ERROR signal, input*
11-7	11-4	0/5 V DC	IPUPCB ACK signal, output*
11-8	11-4	0/5 V DC	IPUPCB ERROR signal, output*
11-9	11-4	0/5 V DC	IPUPCB ENGN WRITING signal, output*
11-10	11-4	0/5 V DC	IPUPCB JIGSEL signal, input*
13-A1	13-A2	0/5 V DC	IPUPCB SCAN0 signal, input*
13-A3	13-A4	0/5 V DC	IPUPCB SRDY0 signal, output*
13-A5	13-A6	0/5 V DC	IPUPCB EPRDY0 signal, output*
13-A7	13-A8	0/5 V DC	IPUPCB CPRDY0 signal, input*
13-A9	13-A10	0/5 V DC	IPUPCB SBSY0 signal, output*
13-A11	13-A12	0/5 V DC	IPUPCB CBSY0 signal, input*
13-A13	13-A15	0/5 V DC	IPUPCB STS0 signal, input*
13-A14	13-A16	0/5 V DC	IPUPCB /STS0 signal, input*

* Optional

Terminals (CN)		Voltage	Remarks
13-B1	13-B2	0/5 V DC	IPUPCB PRINT0 signal, input*
13-B3	13-B4	0/5 V DC	IPUPCB PRDY0 signal, output*
13-B5	13-B10	0/5 V DC	IPUPCB CMD0 signal, input*
13-B6	13-B10	0/5 V DC	IPUPCB /CMD0 signal, input*
13-B7	13-B10	0/5 V DC	IPUPCB CCLK0 signal, input*
13-B8	13-B10	0/5 V DC	IPUPCB /CCLK0 signal, input*
13-B9	13-B10	0/5 V DC	IPUPCB COPY0 signal, input*
13-B11	13-B12	0/5 V DC (pulse)	Serial signal for IPUPCB, output*
13-B13	13-B14	0/5 V DC (pulse)	Serial signal from IPUPCB, input*
14-A2	14-A1	5 V DC	5 V DC supply, output
14-A3	14-A1	0/5 V DC	Data 0, input
14-A4	14-A1	0/5 V DC	Data 1, input
14-A5	14-A1	0/5 V DC	Data 2, input
14-A6	14-A1	0/5 V DC	Data 3, input
14-A7	14-A1	0/5 V DC	Data 4, input
14-A8	14-A1	0/5 V DC	Data 5, input
14-A9	14-A1	0/5 V DC	Data 6, input
14-A10	14-A1	0/5 V DC	Data 7, input
14-A19	14-A1	0/5 V DC	_CSSEL signal, input
14-A20	14-A1	0/5 V DC	_END signal, output
14-A22	14-A1	5 V DC	5 V DC supply, output
14-A23	14-A1	5 V DC	5 V DC supply, output
14-A24	14-A1	0/5 V DC	_JICROM signal, output
14-A25	14-A1	5 V DC	5 V DC supply, output
14-B2	14-B1	5 V DC	5 V DC supply, output
14-B3	14-B1	0/5 V DC	Address A0, output
14-B4	14-B1	0/5 V DC	Address A1, output
14-B5	14-B1	0/5 V DC	Address A2, output
14-B6	14-B1	0/5 V DC	Address A3, output
14-B7	14-B1	0/5 V DC	Address A4, output
14-B8	14-B1	0/5 V DC	Address A5, output
14-B9	14-B1	0/5 V DC	Address A6, output
14-B10	14-B1	0/5 V DC	Address A7, output
14-B11	14-B1	0/5 V DC	Address A8, output
14-B12	14-B1	0/5 V DC	Address A9, output
14-B13	14-B1	0/5 V DC	Address A10, output
14-B14	14-B1	0/5 V DC	Address A11, output
14-B15	14-B1	0/5 V DC	Address A12, output
14-B16	14-B1	0/5 V DC	Address A13, output
14-B17	14-B1	0/5 V DC	Address A14, output
14-B18	14-B1	0/5 V DC	Address A15, output
14-B19	14-B1	0/5 V DC	Address A16, output
14-B20	14-B1	0/5 V DC	Address A17, output
14-B21	14-B1	0/5 V DC	Address A18, output
14-B22	14-B1	5 V DC	5 V DC supply, output
14-B25	14-B1	5 V DC	5 V DC supply, output
15-1	15-2	5 V DC	5 V DC supply for OPCB, output
15-3	15-2	0/5 V DC	BUZZER REM signal, output
15-4	15-2	0/5 V DC	LCDPCB LCD RS signal, output
15-5	15-2	0/5 V DC	LCDPCB LCD R/W signal, output
15-6	15-2	0/5 V DC	LCDPCB LCD E signal, output
15-7	15-2	0/5 V DC	LCDPCB LCD D4 data, output
15-8	15-2	0/5 V DC	LCDPCB LCD D5 data, output
15-9	15-2	0/5 V DC	LCDPCB LCD D6 data, output
15-10	15-2	0/5 V DC	LCDPCB LCD D7 data, output
15-11	15-2	0/5 V DC	OPCB KEY0 signal, output

* Optional

Terminals (CN)		Voltage	Remarks
15-12	15-2	0/5 V DC	OPCB KEY1 signal, output
15-13	15-2	0/5 V DC	OPCB KEY2 signal, output
15-14	15-2	0/5 V DC	OPCB KEY3 signal, output
15-15	15-2	0/5 V DC	OPCB scan signal SCAN0, output
15-16	15-2	0/5 V DC	OPCB scan signal SCAN1, output
15-17	15-2	0/5 V DC	OPCB scan signal SCAN2, output
15-18	15-2	0/5 V DC	OPCB LED0 signal, output
15-19	15-2	0/5 V DC	OPCB LED1 signal, output
15-20	15-2	0/5 V DC	OPCB LED2 signal, output
16-1	1-5	0/5 V DC	PFSW-U on/off, input*
16-2	1-5	0/5 V DC	PFSW-M on/off, input
16-3	1-5	0/5 V DC	PFSW-L on/off, input
16-4	1-5	0/5 V DC	PSSW1 on/off, input
16-5	1-5	0/5 V DC	PSSW2 on/off, input
16-6	1-5	0/5 V DC	PSSW3 on/off, input
16-7	1-5	0/5 V DC	PSSW4 on/off, input
16-8	1-5	0/5 V DC	PSSW5 on/off, input
16-9	1-5	0/24 V DC	LFM-R/L on/off, output
16-10	1-5	0/5 V DC	OFS on/off, input

* Optional

2-3-3 Operation unit PCB

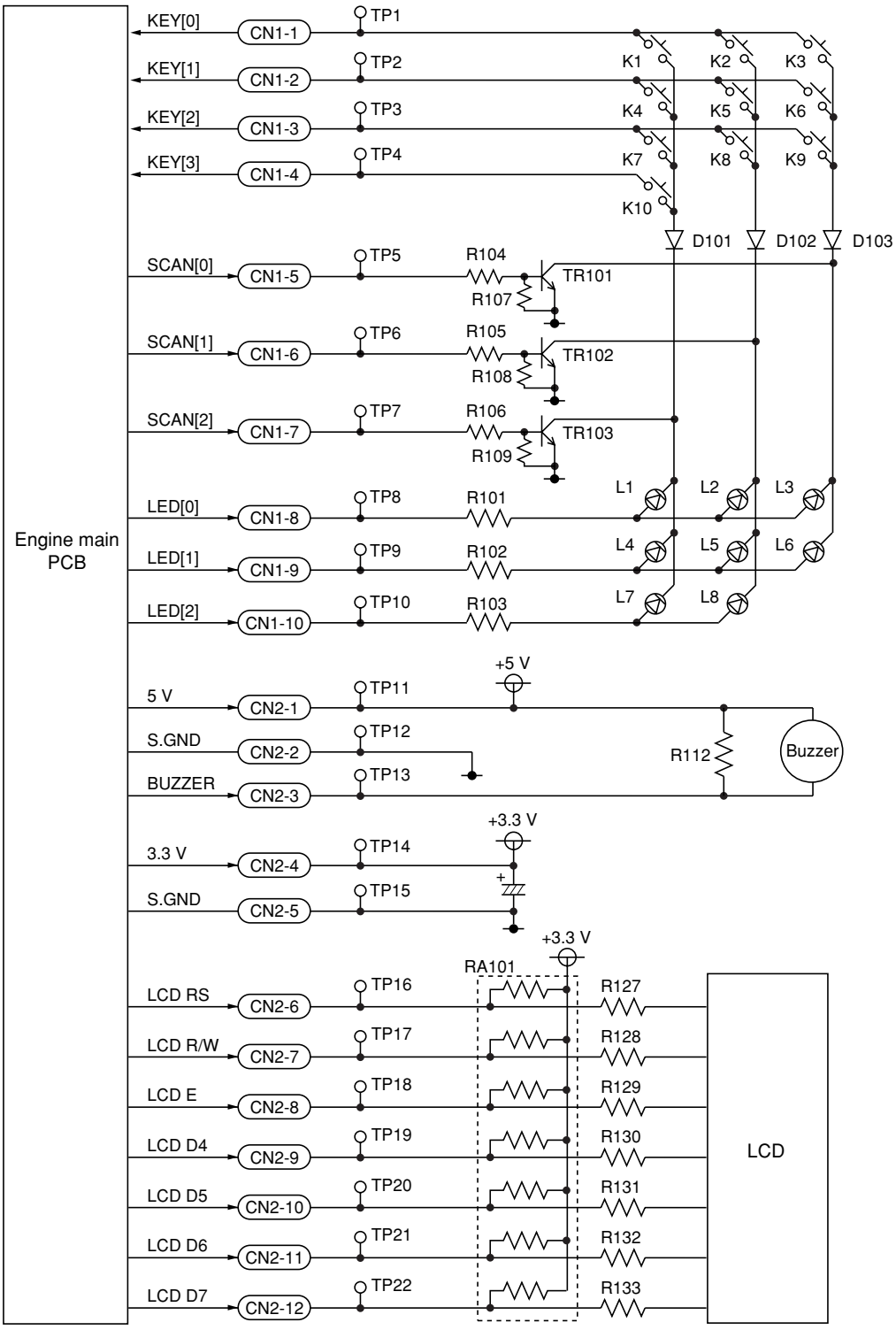


Figure 2-3-5 Operation unit PCB block diagram

Selection of key switches and the lighting of LEDs of the operation unit PCB (OPCB) are determined by scan signals (SCAN[0] to SCAN[2]) from the engine main PCB (EMPCB) and LED lighting selection signals (LED[0] to LED[2]). The key switch (K1 to K10) operated is identified by the scan signals (SCAN[0] to SCAN[2]) and the return signals (KEY[0] to KEY[3]).
As an example, to light L1, LED lighting selection signal LED[0] should be driven low in synch with a low level of scan signal SCAN[2]. LEDs can be lit dynamically by repeating such operations.
As an example, if K1 is pressed, the corresponding key switch is turned on feeding the low level of scan signal SCAN[2] back to the engine main PCB (EMPCB) via return signal KEY[0]. The engine main PCB (EMPCB) locates the position where the line outputting the scan signal and the line inputting the return signal cross, and thereby determines which key switch was operated.

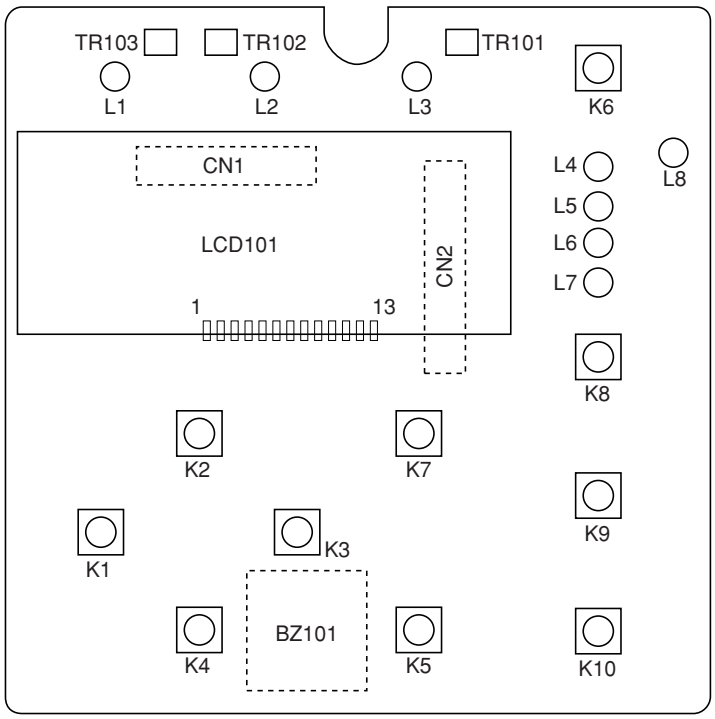
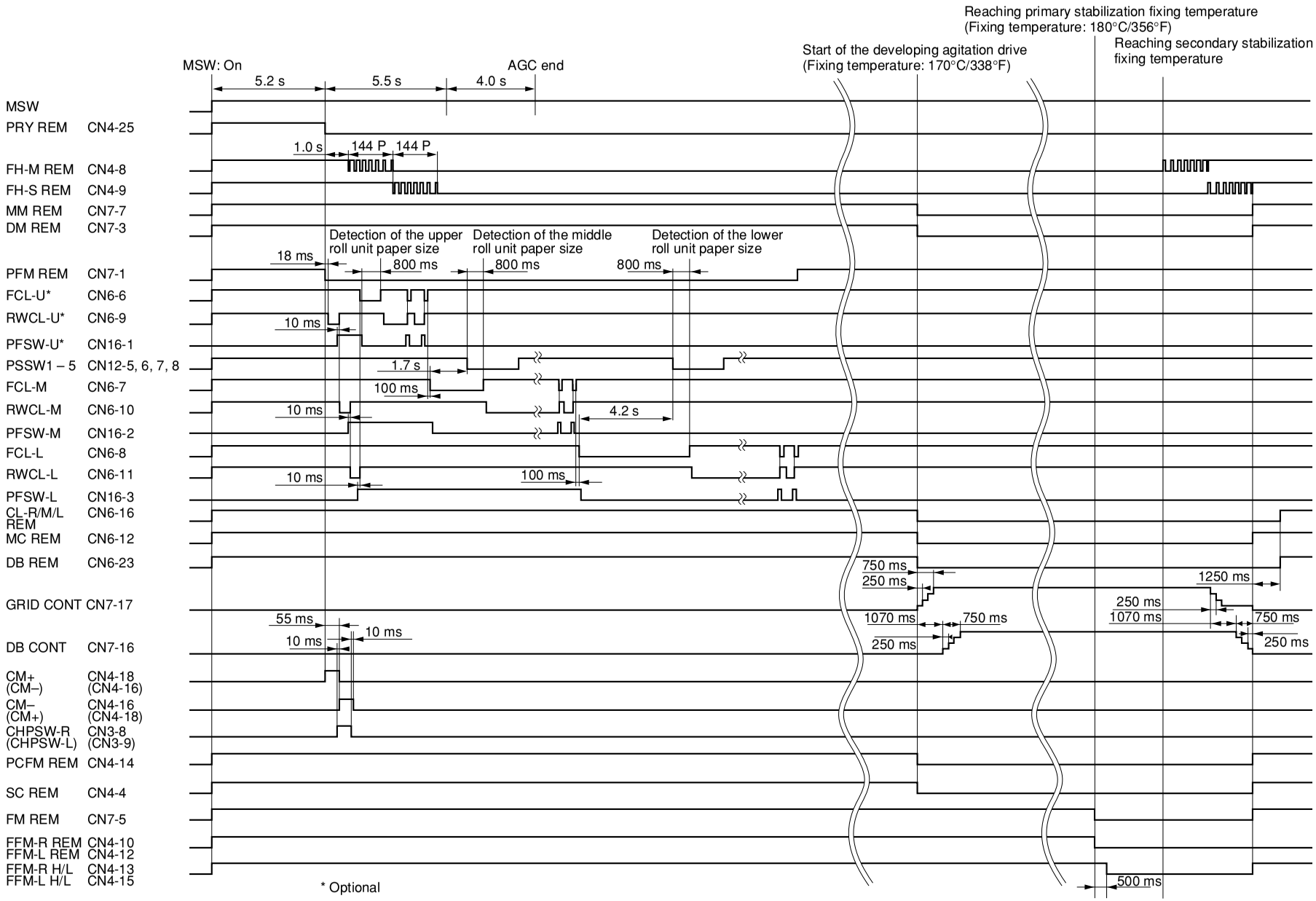


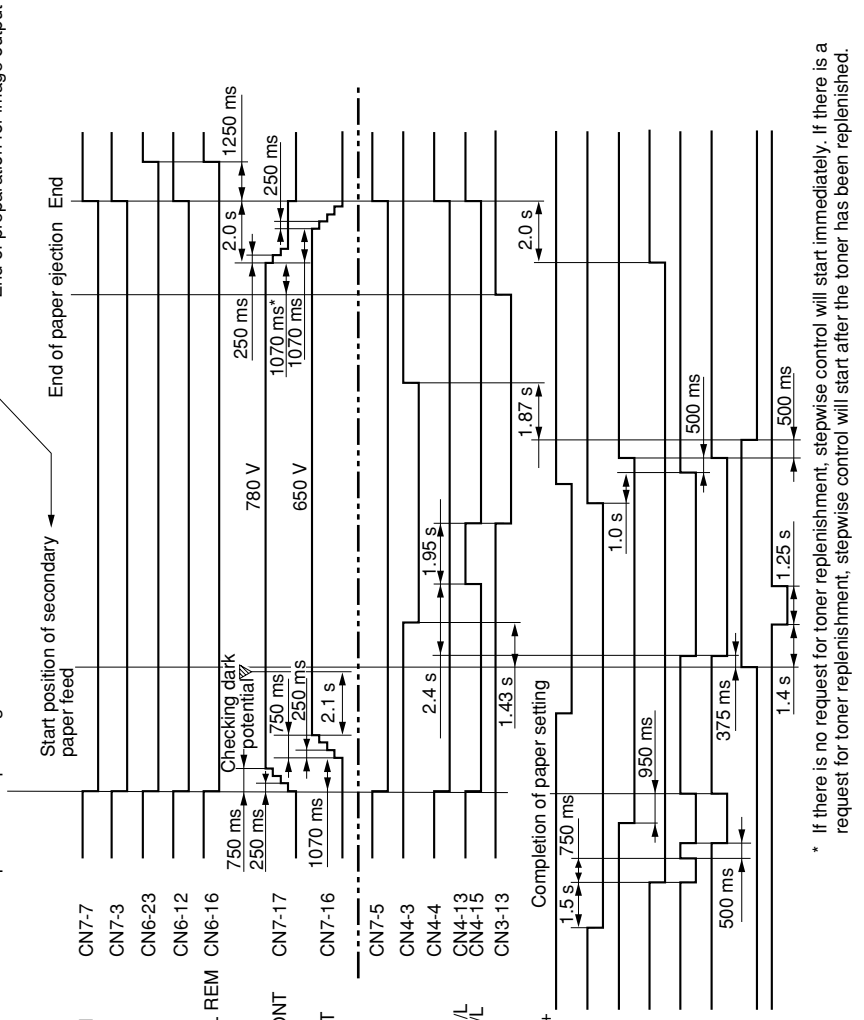
Figure 2-3-6 Operation unit PCB silkscreen image

Terminals (CN)		Voltage	Remarks
1-1	2-2	0/5 V DC	OPCB KEY0 signal, output
1-2	2-2	0/5 V DC	OPCB KEY1 signal, output
1-3	2-2	0/5 V DC	OPCB KEY2 signal, output
1-4	2-2	0/5 V DC	OPCB KEY3 signal, output
1-5	2-2	0/5 V DC	OPCB scan signal SCAN0, input
1-6	2-2	0/5 V DC	OPCB scan signal SCAN1, input
1-7	2-2	0/5 V DC	OPCB scan signal SCAN2, input
1-8	2-2	0/5 V DC	OPCB LED0 signal, input
1-9	2-2	0/5 V DC	OPCB LED1 signal, input
1-10	2-2	0/5 V DC	OPCB LED2 signal, input
2-1	2-2	5 V DC	5 V DC supply, input
2-3	2-2	0/5 V DC	BUZZER REM signal, input
2-4	2-5	3.3 V DC	3.3 V DC supply, input
2-6	2-5	0/5 V DC	LCDPCB LCD RS signal, output
2-7	2-5	0/5 V DC	LCDPCB LCD R/W signal, output
2-8	2-5	0/5 V DC	LCDPCB LCD E signal, output
2-9	2-5	0/5 V DC	LCDPCB LCD D4 data, output
2-10	2-5	0/5 V DC	LCDPCB LCD D5 data, output
2-11	2-5	0/5 V DC	LCDPCB LCD D6 data, output
2-12	2-5	0/5 V DC	LCDPCB LCD D7 data, output

Timing Chart No. 1 From turning the main switch ON to stabilization

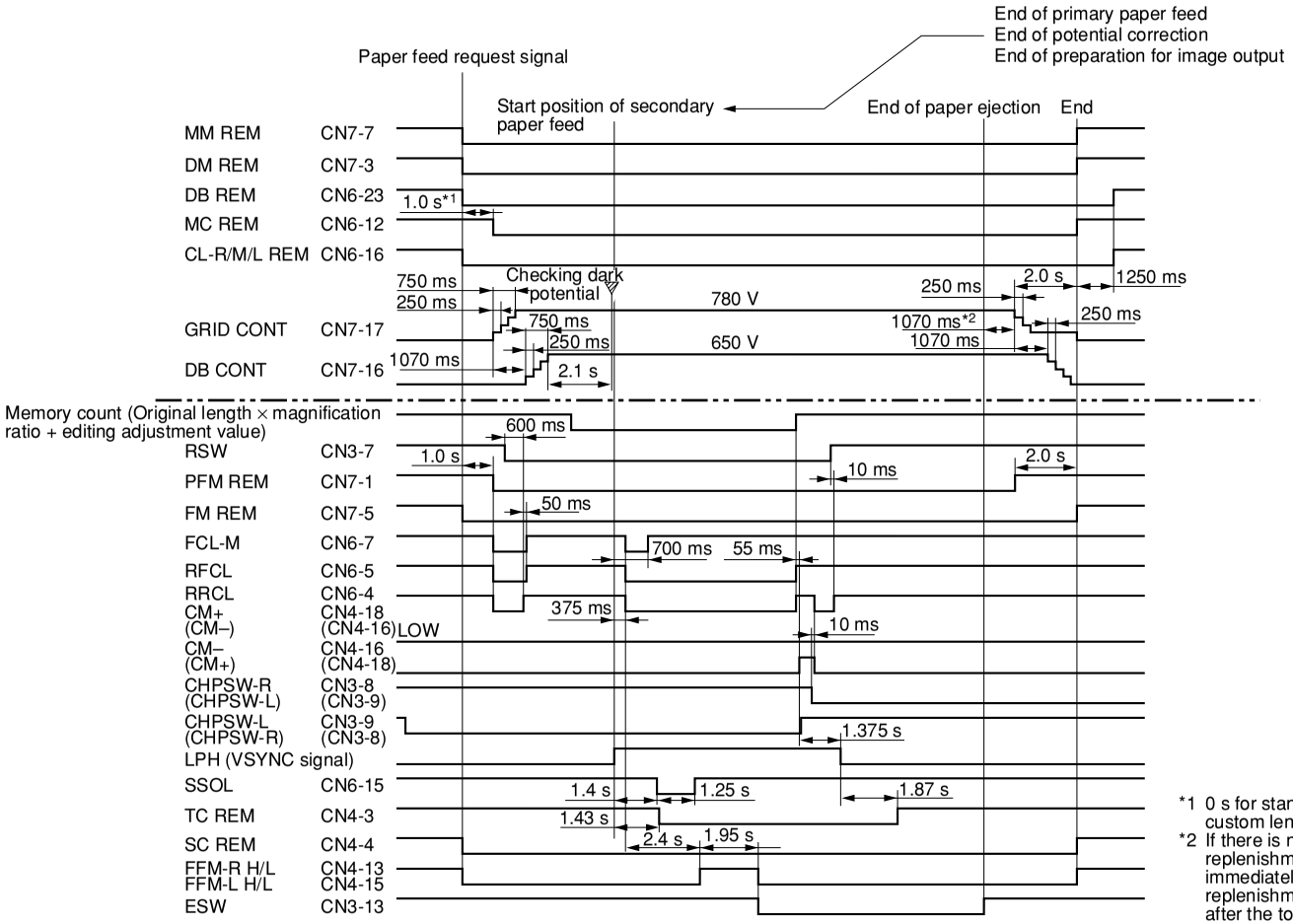


Timing Chart No. 2 Manual paper feed



* If there is no request for toner replenishment, stepwise control will start immediately. If there is a request for toner replenishment, stepwise control will start after the toner has been replenished.

Timing Chart No. 3 Roll paper feed, one print



*1 0 s for standard length cut and 1.0 s for custom length cut only.
*2 If there is no request for toner replenishment, stepwise control will start immediately. If there is a request for toner replenishment, stepwise control will start after the toner has been replenished.

Timing Chart No. 4 Roll paper feed, continuous print

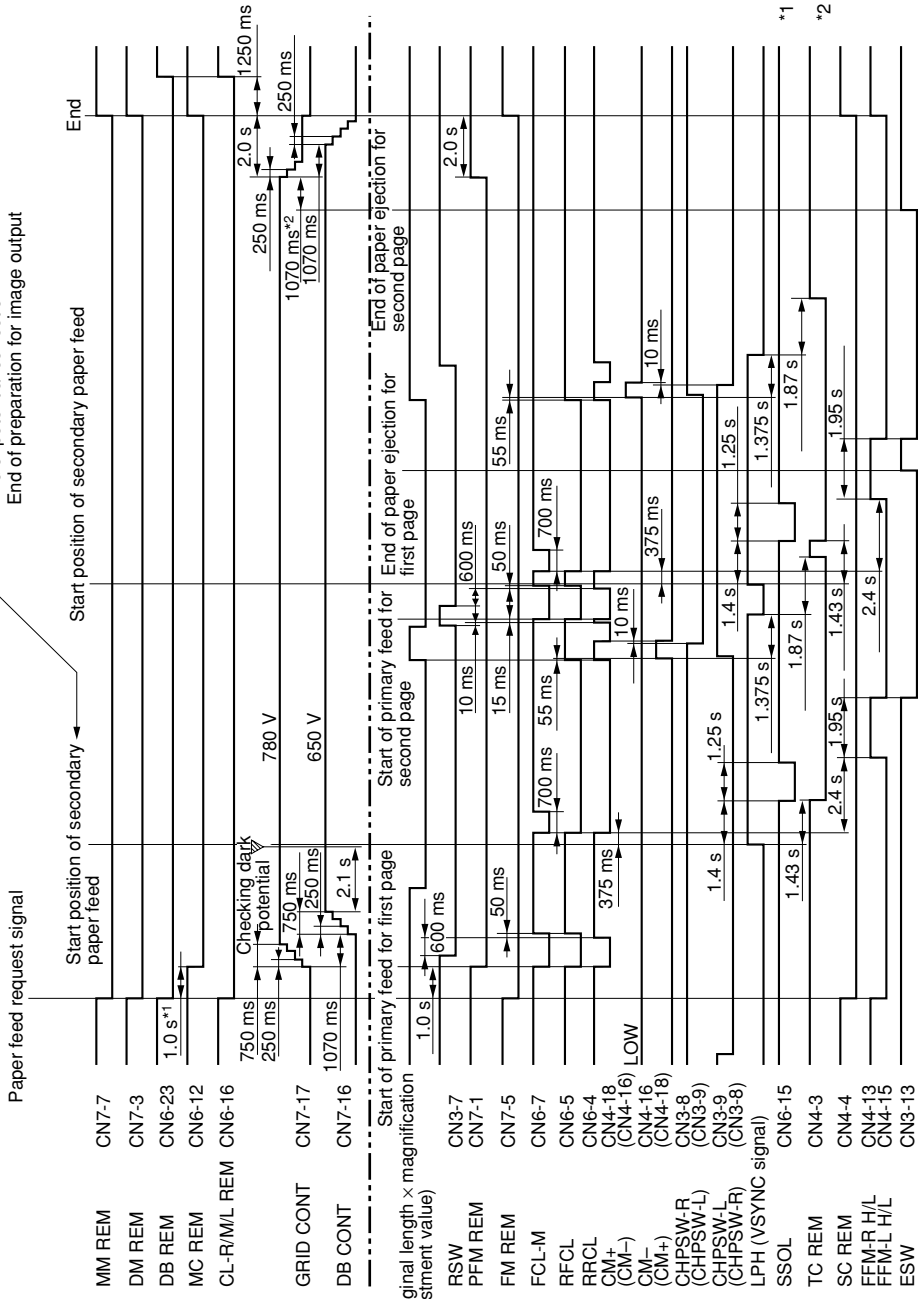
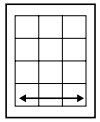
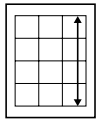
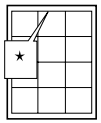
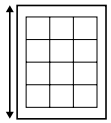
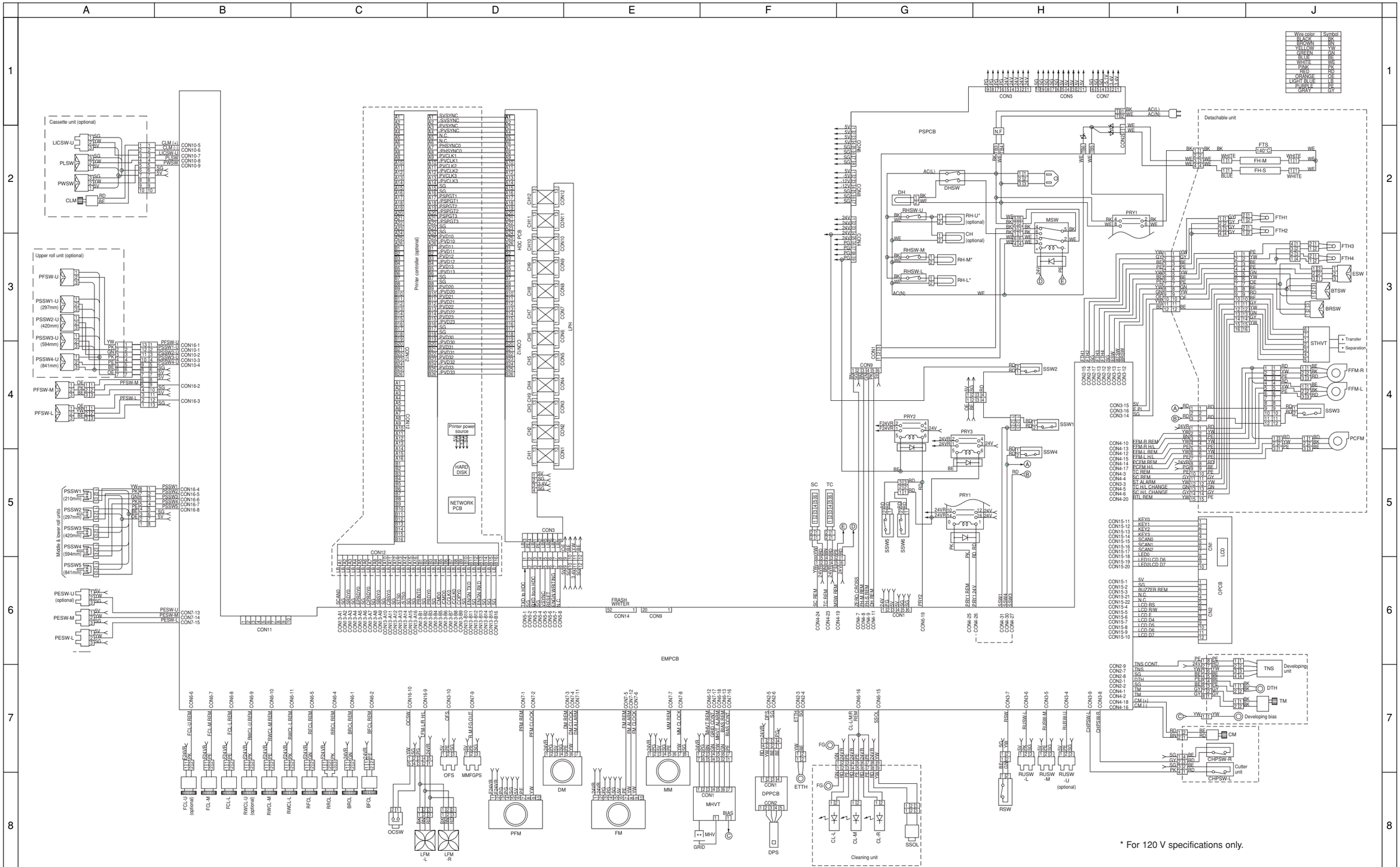


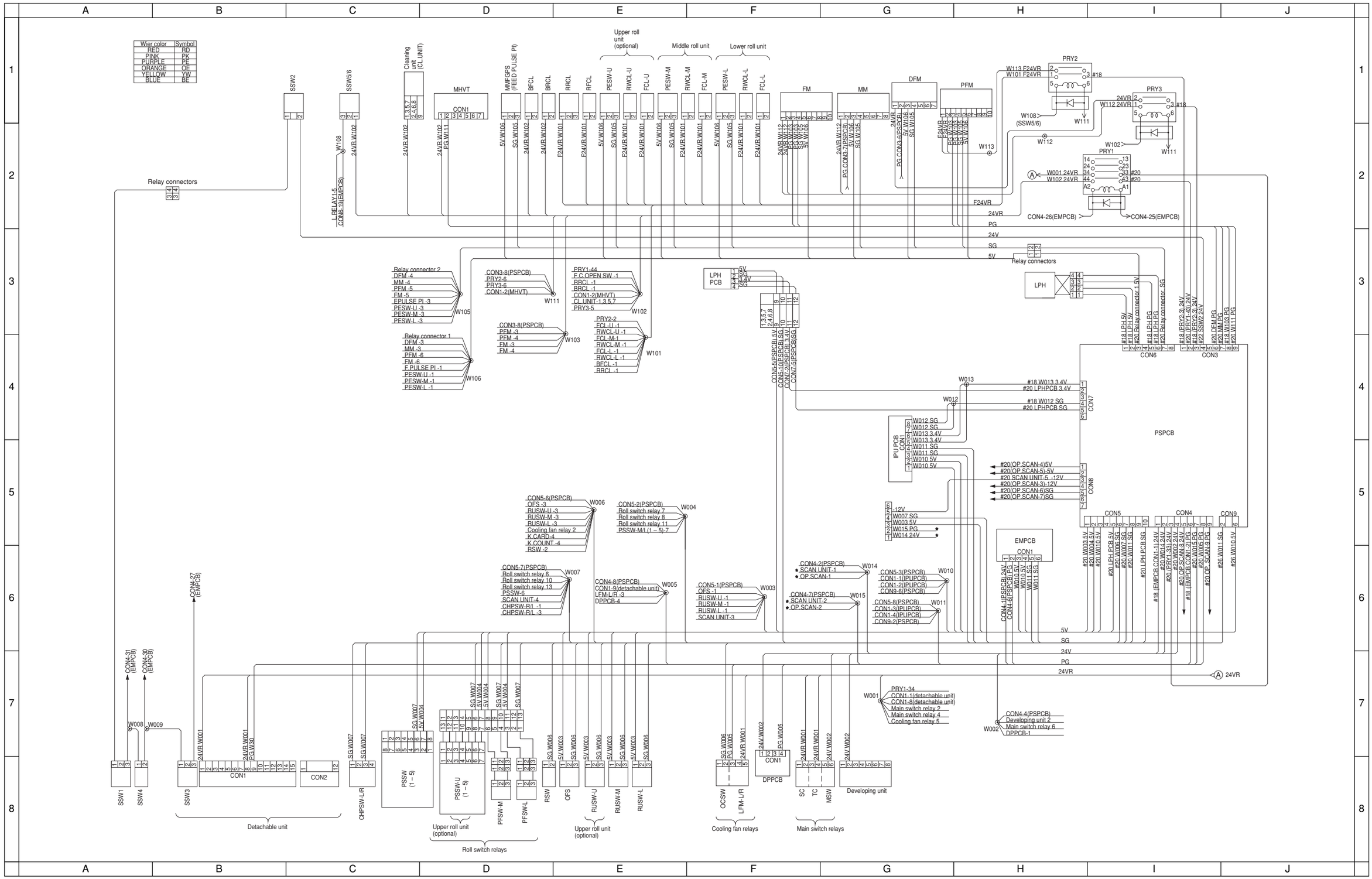
Image adjustment procedure table

Adjustment order	Item	Image	Adjustment details	Maintenance mode		Adjustment original	Reference page	Remarks
				No.	Mode			
①	Adjusting the magnification in the main scanning direction (printing side)		Adjusts the printing magnification	U039	Main scan (%)	Test pattern	P. 1-6-39	Adjust to obtain a grid length of 63.5 mm. 12 grids (762 mm)
②	Adjusting the magnification in the sub scanning direction (printing side)		Adjusts the printing magnification	U039	Sub scan (%)	Test pattern	P. 1-6-39	Adjust to obtain a grid length of 63.5 mm. 12 grids (762 mm)
③	Adjusting the leading edge registration (printing side)		Adjusts the printing magnification	U034	—	Test pattern	P. 1-6-40	Adjust so that the position of the leading line is 5 mm from the edge of paper.
④	Adjusting the standard cut length (printing side)		Adjusts the standard cut length	U041	—	Test pattern	P. 1-6-41	S: 297 mm M: 802 mm L: 1200 mm

General wiring diagram



Power source wiring diagram



KYOCERA MITA EUROPE B.V.

Hoeksteen 40, 2132 MS Hoofddorp,
The Netherlands
Phone: (020) 6540000
Home page: http://www.kyoceramita-europe.com
Email: info@kyoceramita-europe.com

KYOCERA MITA NEDERLAND B.V.
Hoeksteen 40, 2132 MS Hoofddorp,
The Netherlands
Phone: (020) 5877200

KYOCERA MITA (UK) LIMITED
8 Beacontree Plaza
Gillette Way,
Reading RG2 0BS UK
Phone: (0118) 931 1500

KYOCERA MITA ITALIA S.P.A.
Via Verdi 89/91 20063 Cernusco sul Naviglio
(Milano) Italy
Phone: 02-92179 1

S.A. KYOCERA MITA BELGIUM N.V.
Hermesstraat 8A, 1930 Zaventem, Belgium
Phone: (02) 7209270

KYOCERA MITA FRANCE S.A.
Parc les Algorithmes
SAINT AUBIN
91194 GIF-SUR-YVETTE
France
Phone: (01) 69852600

KYOCERA MITA ESPAÑA S.A.
Edificio Mita, Avda. De Manacor Nº2,
Urb. Parque Rozas, Apartado de Correos 76,
28230 Las Rozas, Madrid, Spain
Phone: (91) 631-8392

KYOCERA MITA FINLAND OY
Kirvesmiehenkatu 4, 00810 Helsinki,
Finland
Phone: (09) 478-05200

KYOCERA MITA (SCHWEIZ) AG
Hölzliwisen, Industriestrasse 28,
8604 Volketswil, Switzerland
Phone: (01) 908 4949

KYOCERA MITA DEUTSCHLAND GMBH
Mollsfeld 12 40670 Meerbusch,
Germany
Phone: 02159-918120

KYOCERA MITA GMBH AUSTRIA
Eduard-Kittenberger-Gasse 95,
1230, Wien, Austria
Phone: (01) 86338-0

KYOCERA MITA SVENSKA AB
Siktgatan 2,
162 50 Vällingby, Sweden
Phone: (08) 4719999

KYOCERA MITA DANMARK A/S
Industrivej 11, DK-4632 Bjæverskov,
Denmark
Phone: 56871100

KYOCERA MITA PORTUGAL LDA.
CASCAISTOCK-Armazem nº8,
Rua das Fisgas, Alcoitão,
2765 Estoril, Portugal
Phone: (21) 4602221

KYOCERA MITA SOUTH AFRICA (PTY) LTD.
UNIT 3, "Kyalami Crescent,"
Kyalami Business Park,
1685 Midrand, South Africa
Phone: (11) 466-3290

KYOCERA MITA AMERICA, INC.

Headquarters:
225 Sand Road, P.O. Box 40008,
Fairfield, New Jersey 07004-0008,
U.S.A.
Phone: (973) 808-8444

KYOCERA MITA AUSTRALIA PTY. LTD.
Level 3, 6-10 Talavera Road, North Ryde,
N.S.W. 2113 Australia
Phone: (02) 9888-9999

KYOCERA MITA NEW ZEALAND LTD.
1-3 Parkhead Place,
Albany, Auckland,
New Zealand
Phone: (09) 415-4517

KYOCERA MITA (THAILAND) CORP., LTD.
9/209 Ratchada-Prachachem Road,
Bang Sue, Bangkok 10800, Thailand
Phone: (02) 586-0320

KYOCERA MITA SINGAPORE PTE LTD.
121 Genting Lane, 3rd Level,
Singapore 349572
Phone: (65) 7418733

KYOCERA MITA HONG KONG LIMITED
11/F., Mita Centre,
552-566, Castle Peak Road,
Tsuen Wan, New Territories,
Hong Kong
Phone: (852) 24297422

KYOCERA MITA CORPORATION

2-28, 1-chome, Tamatsukuri, Chuo-ku
Osaka 540-8585, Japan
Phone: (06) 6764-3555

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