KYOCERA

FS-C5020N
FS-C5030N

SERVICE MANUAL

Published in September 2006
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Revision history

Revision	Date	Replaced	Remarks
2.0	13 April 2005	Revised all	Combined: 24 ppm printer (2F4)
3.0	8 July 2005	1-1-1, 1-1-2, 1-1-3, 1-1-4, 1-3-9, 1-4-10, 1-5-3, 1-5-4, 1-5-5, 1-5-6, 1-5-17, 1-5-18, 1-5-19, 1-5-20, 1-5-25, 1-5-33, 1-6-13, 1-6-23, 1-6-42, 1-6-47, 1-6-49, 1-6-52, 2-1-10, 2-1-16, 2-1-19, 2-1-20, 2-2-2, 2-3-3, 2-4-25	
4	15 December 2005	1-4-12, 1-4-13	
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CONTENTS

2-4 Appendixes

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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 printer.

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 printer 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 printer on an infirm or angled surface: the printer may tip over, causing injury. .....

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

- Do not install the printer near a radiator, heater, other heat source or near flammable material.

  This may cause fire. .....

- Allow sufficient space around the printer 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 printers so equipped. Failure to do this may cause the printer 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 printer'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 printer 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 printer 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 power 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 printer, remove the power plug from the wall outlet immediately. .....

3.Miscellaneous

⚠WARNING

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

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1-1-1 Specifications

16 ppm printer (FS-C5020N)

Type	Desktop
Printing system	Electrophotographic printing (tandem)
Paper type	Cassette: Plain paper (60 to 90 g/m²) Recycled paper (60 to 90 g/m²) Thick paper (90 to 105 g/m²) MP tray: Plain paper (60 to 90 g/m²) Recycled paper (60 to 90 g/m²) Thick paper (90 to 200 g/m²) Special paper: Transparencies, labels, envelopes, postcards, tracing paper
Paper sizes	A4 (210 × 297 mm) B5 (182 × 257 mm) A5 (148 × 210 mm) Letter (8 1/2" × 11") Legal (8 1/2" × 14") Non-standard size (148 to 216 mm × 210 to 356 mm: cassette), (70 to 216 mm × 148 to 297 mm: MP tray)
Print speeds	Cassette (Values within [ ] are for duplex printing using the duplexer DU-300/301.) A4: 16 pages/minutes [16 pages/minutes] B5: 17 pages/minutes [16 pages/minutes] A5: 17 pages/minutes [16 pages/minutes] Letter-R: 17 pages/minutes [16 pages/minutes] Legal: 14 pages/minutes [14 pages/minutes] MP tray (in cassette mode) A4: 15 pages/minutes B5: 16 pages/minutes A5: 16 pages/minutes Letter: 16 pages/minutes Legal: 13 pages/minutes
First print time	Standby mode: 16 seconds or less (A4) Sleep mode: 96 seconds or less (A4)
Warm-up time	Sleep mode: 80 seconds or less (room temperature 23 °C, 60% RH) Power on: 80 seconds or less (room temperature 23 °C, 60% RH)
Paper feed system	One universal cassette and one MP tray
Paper loading capacity	Cassette: 500 sheets (80 g/m², 0.11 µm) MP tray: 100 sheets (80 g/m², 0.11 µm)
Paper eject system	Face down: 250 sheets (80 g/m², 0.11 µm), equipped with a face-down paper full sensor Face up: 250 sheets, Optional face-up tray PT-300 must be installed (100 sheets when the duplexer DU-300/301 is installed
Photoconductor	OPC drum (diameter 30 mm)
Charging system	Scorotron (positive charging)
Light source	LED
Developing system	Touch down development method Developer: Two-component Toner replenishing: Automatic from the toner container
Transfer system	Primary transfer: Transfer belt (negative-charged) Secondary transfer: Transfer roller (negative-charged)
Separation system	Small radius curvature separation
Fixing system	Heat roller system (Oil-less) Heat roller (diameter 36 mm, 500 W halogen heater lamp) Pressure roller (diameter 36 mm, 350 W halogen heater lamp)
Charge erasing system	Exposure by eraser lamp (LED)
Cleaning system	Drum: Counter blade Primary transfer belt: Fur brush

Controller hardware	CPU: Power PC750CXr (400 MHz) System ROM: 8 MB (32 Mbit × 2) Font ROM: 2 MB (16 Mbit × 1) Main RAM: 128 MB standard (DIMM); expanding up to 1024 MB (512 MB × 2) at the maximum by adding optional expansion memory Optional expansion RAM (DIMM): 2 slot (1 slot is used for standard memory) 100-pin DIMM (64, 128, 256 or 512 MB)
Interface	Parallel: High-speed (bi-directional), IEEE 1284 Nibble/ECP mode USB: High-Speed USB2.0 Optional interface (KUIO-LV) ×1: Network interface card IB-20 (10 Base-TX/100 Base-TX/10 Base-2), IB-21E (10 Base-TX/100 Base-TX), wireless LAN card IB-22 must be installed.
Controller software	a) Emulation PCL6 (PCL5e+PCLXL) KPDL3 (PostScript 3 compatible) b) Fonts: Bitmap font: 1 Line Printer bitmap font Outline fonts: 80 PCL fonts 136 KPDL3 fonts: c) Graphic: (1) Raster graphic: 75, 100, 150, 200*, 300, 600* dpi (*200 dpi is supported when the resolution is 600 dpi.) (2) Vector graphic: Line, Box, Circle, Arc, Fill pattern etc. (3) Bar code: One-dimensional bar code: 45 types Two-dimensional bar code: 1 type (PDF-417) d) Connectivity plug & play, Windows 95/98/ME/NT4.0/2000/XP SNMP (KM-NET viewer)
Resolution	600 × 600 dpi (multi 4-bit)
Dimensions	Main unit: 385 × 345 × 470 mm/15.2" × 13.6" × 18.5" (W × D × H)
Weight	Main unit: 22 kg/48.6 lbs (not including toner containers)
Power source	220 - 240 V AC, 50/60 Hz (European countries) 120 V AC, 60 Hz (U.S.A./Canada)
Power consumption	Maximum:1061 W (220 - 240 V model), 1066 W (120 V model) Normal operating: 467 W (220 - 240 V model), 475 W (120 V model) Ready: 195 W (220 - 240 V model), 183 W (120 V model) EcoPower: 16 W (220 - 240 V model), 16 W (120 V model)
Current	4.5 A (220 - 240 V model), 9.1 A (120 V model)
Noise	Printing: 53 dB(A) Ready: 36 dB(A)
Options	Expansion memory (64/128/256/512 MB 100-pin DIMM), memory card (CompactFlash), hard disk unit HD-4/5, network interface card IB-20 (10 BASE-T/100BASE-TX/10BASE-2),network interface card IB-21E (10BASE-T/100BASE-TX), wireless LAN card IB-22 (compatible to IEEE802.11b), serial interface board IB-11, (Maximum: 115 kbps), paper feeder PF-60 (500 sheets [60 to 105 g/m^2] ×1 cassette, A4, A5, B5, legal, letter, custom), duplexer DU-300/301, face-up output tray PT-300 (250 sheets) envelope feeder EF-60A

24 ppm printer (FS-C5030N)

Type	Desktop
Printing system	Electrophotographic printing (tandem)
Paper type	Cassette: Plain paper (60 to 90 g/m²) Recycled paper (60 to 90 g/m²) Thick paper (90 to 105 g/m²) MP tray: Plain paper (60 to 90 g/m²) Recycled paper (60 to 90 g/m²) Thick paper (90 to 200 g/m²) Special paper: Transparencies, labels, envelopes, postcards, tracing paper
Paper sizes	A4 (210 × 297 mm) B5 (182 × 257 mm) A5 (148 × 210 mm) Letter (8 1/2" × 11") Legal (8 1/2" × 14") Non-standard size (148 to 216 mm × 210 to 356 mm: cassette), (70 to 216 mm × 148 to 297 mm: MP tray)
Print speeds	Cassette (Values within [ ] are for duplex printing using the duplexer DU-301.) A4: 24 pages/minutes [24 pages/minutes] B5: 26 pages/minutes [24 pages/minutes] A5: 26 pages/minutes [24 pages/minutes] Letter-R: 26 pages/minutes [24 pages/minutes] Legal: 21 pages/minutes [20 pages/minutes] MP tray (in cassette mode) A4: 22 pages/minutes B5: 23 pages/minutes A5: 23 pages/minutes Letter: 23 pages/minutes Legal: 19 pages/minutes
First print time	Standby mode: 12 seconds or less (A4) Sleep mode: 72 seconds or less (A4)
Warm-up time	Sleep mode: 60 seconds or less (room temperature 23 °C, 60% RH) Power on: 80 seconds or less (room temperature 23 °C, 60% RH)
Paper feed system	One universal cassette and one MP tray
Paper loading capacity	Cassette: 500 sheets (80 g/m², 0.11 µm) MP tray: 100 sheets (80 g/m², 0.11 µm)
Paper eject system	Face down: 250 sheets (80 g/m², 0.11 µm), equipped with a face-down paper full sensor Face up: 100 sheets (optional face-up tray PT-301 must be installed)
Photoconductor	OPC drum (diameter 30 mm)
Charging system	Scorotron (positive charging)
Light source	LED
Developing system	Touch down development method Developer: Two-component Toner replenishing: Automatic from the toner container
Transfer system	Primary transfer: Transfer belt (negative-charged) Secondary transfer: Transfer roller (negative-charged)
Separation system	Small radius curvature separation
Fixing system	Heat roller (diameter 36.5 mm, 850 W halogen heater lamp) [Oil-less] Press belt
Charge erasing system	Exposure by eraser lamp (LED)
Cleaning system	Drum: Counter blade Primary transfer belt: Fur brush

Controller hardware	CPU: Power PC750FX (600 MHz) System ROM: 8 MB (32 Mbit × 2) Font ROM: 2 MB (16 Mbit × 1) Main RAM: 128 MB standard (DIMM); expanding up to 1024 MB (512 MB × 2) at the maximum by adding optional expansion memory Optional expansion RAM (DIMM): 2 slot (1 slot is used for standard memory) 100-pin DIMM (64, 128, 256 or 512 MB)
Interface	Parallel: High-speed (bi-directional), IEEE 1284 Nibble/ECP mode USB: High-Speed USB2.0 Optional interface (KUIO-LV) × 1: Network interface card IB-20 (10 Base-TX/100 Base-TX/10 Base-2), IB-21E (10 Base-TX/100 Base-TX), wireless LAN card IB-22 must be installed.
Controller software	a) Emulation PCL6 (PCL5e+PCLXL) KPDL3 (PostScript 3 compatible) b) Fonts: Bitmap font: 1 Line Printer bitmap font Outline fonts: 80 PCL fonts 136 KPDL3 fonts: c) Graphic: (1) Raster graphic: 75, 100, 150, 200*, 300, 600* dpi (*200 dpi is supported when the resolution is 600 dpi.) (2) Vector graphic: Line, Box, Circle, Arc, Fill pattern etc. (3) Bar code: One-dimensional bar code: 45 types Two-dimensional bar code: 1 type (PDF-417) d) Connectivity plug & play, Windows 95/98/ME/NT4.0/2000/XP SNMP (KM-NET viewer)
Resolution	600 × 600 dpi (multi 4-bit)
Dimensions	Main unit: 385 × 345 × 470 mm/15.2" × 13.6" × 18.5" (W × D × H)
Weight	Main unit: 23 kg/50.8 lbs (not including toner containers)
Power source	220 - 240 V AC, 50/60 Hz (European countries) 120 V AC, 60 Hz (U.S.A./Canada)
Power consumption	Maximum: 1112 W (220 - 240 V model), 1095 W (120 V model) Normal operating: 551 W (220 - 240 V model), 540 W (120 V model) Ready: 180 W (220 - 240 V model), 157 W (120 V model) EcoPower: 21 W (220 - 240 V model), 18 W (120 V model)
Current	4.6 A (220 - 240 V model), 9.4 A (120 V model)
Noise	Printing: 55 dB(A) Ready: 36 dB(A)
Options	Expansion memory (64/128/256/512 MB 100-pin DIMM), memory card (CompactFlash), hard disk unit HD-4/5, network interface card IB-20 (10 BASE-T/100BASE-TX/10BASE-2),network interface card IB-21E (10BASE-T/100BASE-TX), wireless LAN card IB-22 (compatible to IEEE802.11b), serial interface board IB-11, (Maximum: 115 kbps), paper feeder PF-60 (500 sheets [60 to 105 g/m^2] × 1 cassette, A4, A5, B5, legal, letter, custom), duplexer DU-301, face-up output tray PT-301 (100 sheets) envelope feeder EF-60A

1-1-2 Parts names

(1) Overall

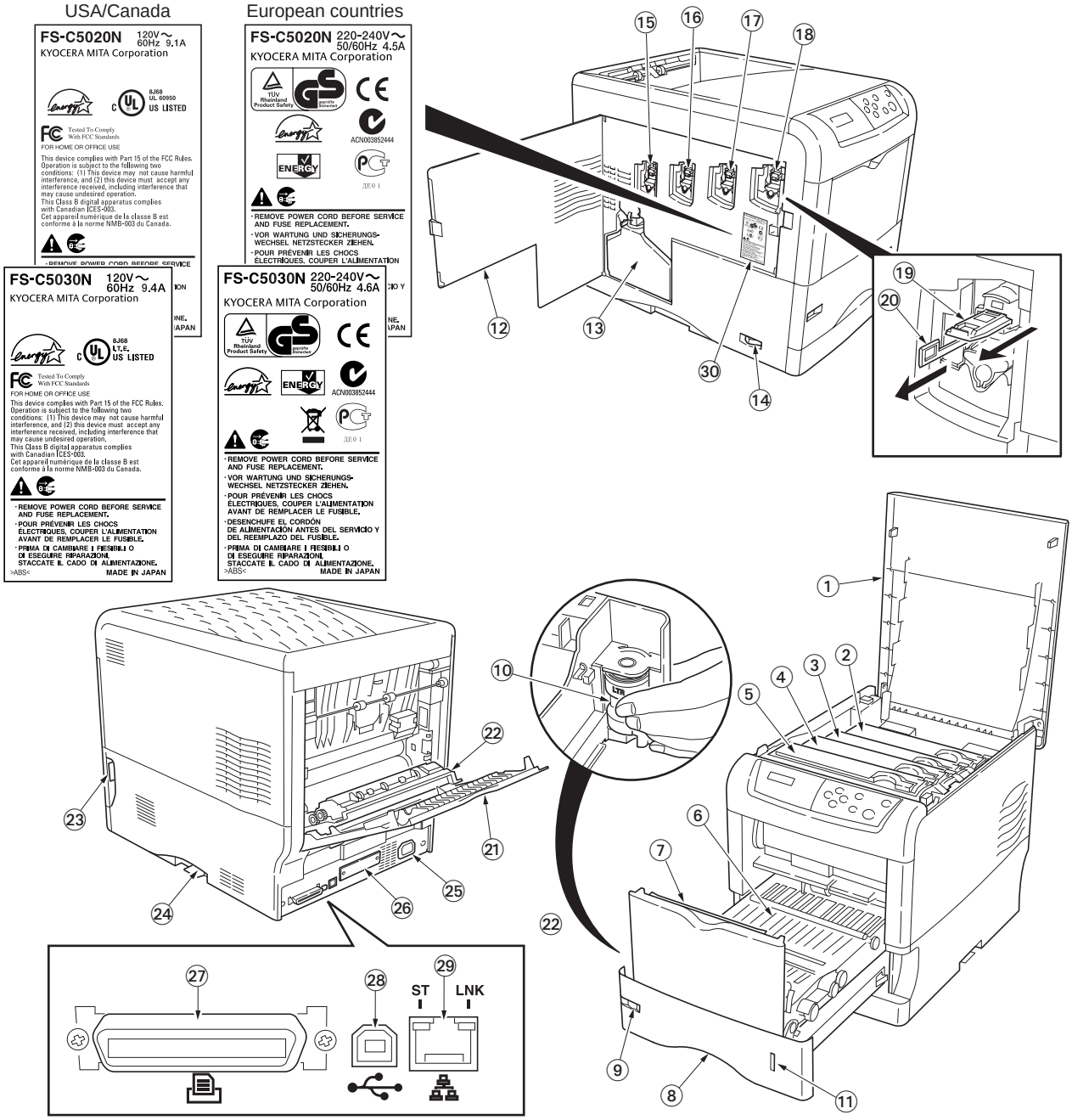

Figure 1-1-1

1. Top cover
2. Magenta toner container
3. Cyan toner container
4. Yellow toner container
5. Black toner container
6. Paper feed unit
7. MP tray
8. Paper cassette
9. Paper size window
10. Paper size dial
11. Paper gauge
12. Left side cover
13. Waste toner box
14. Power switch
15. Magenta main charger unit
16. Cyan main charger unit
17. Yellow main charger unit
18. Black main charger unit
19. Main charger wire cleaner
20. Lens cleaner
21. Rear cover
22. Fuser cover
23. Paper feed unit release lever
24. Memory card slot
25. AC inlet
26. Optional interface slot
27. Parallel interface connector
28. USB interface connector
29. Network interface connector
30. Rating label

(2) Operation panel

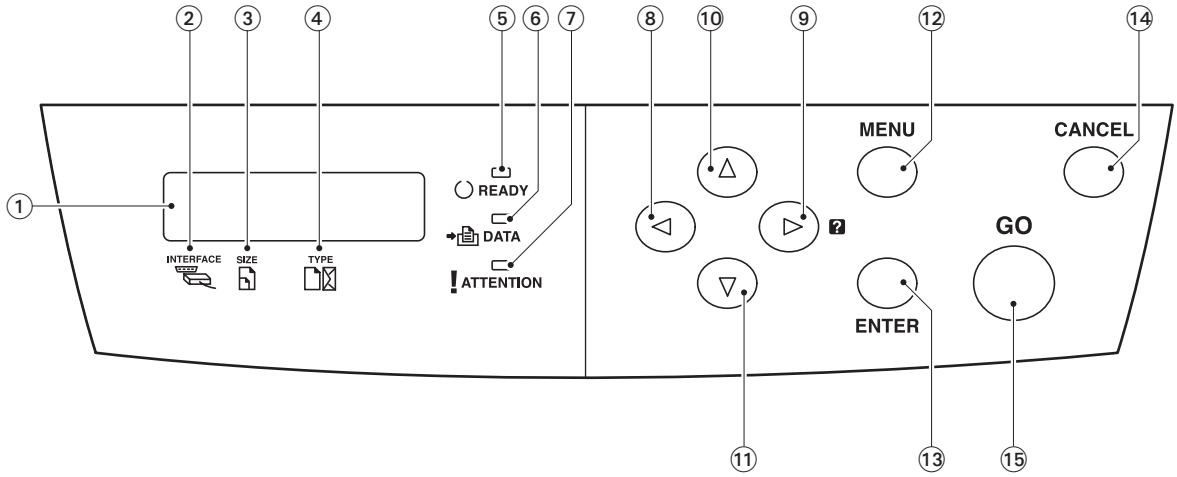

Figure 1-1-2

1. Message display
2. Interface indicator (INTERFACE)
3. Paper size indicator (SIZE)
4. Paper type indicator (TYPE)
5. Ready indicator (READY)
6. Data indicator (DATA)
7. Attention indicator (ATTENTION)
8. ◀ key (Left)
9. ▶ [?] key (Right)
10. ▲ key (Up)
11. ▼ key (Down)
12. MENU key
13. ENTER key
14. CANCEL key
15. GO key

1-1-3 Cross section view

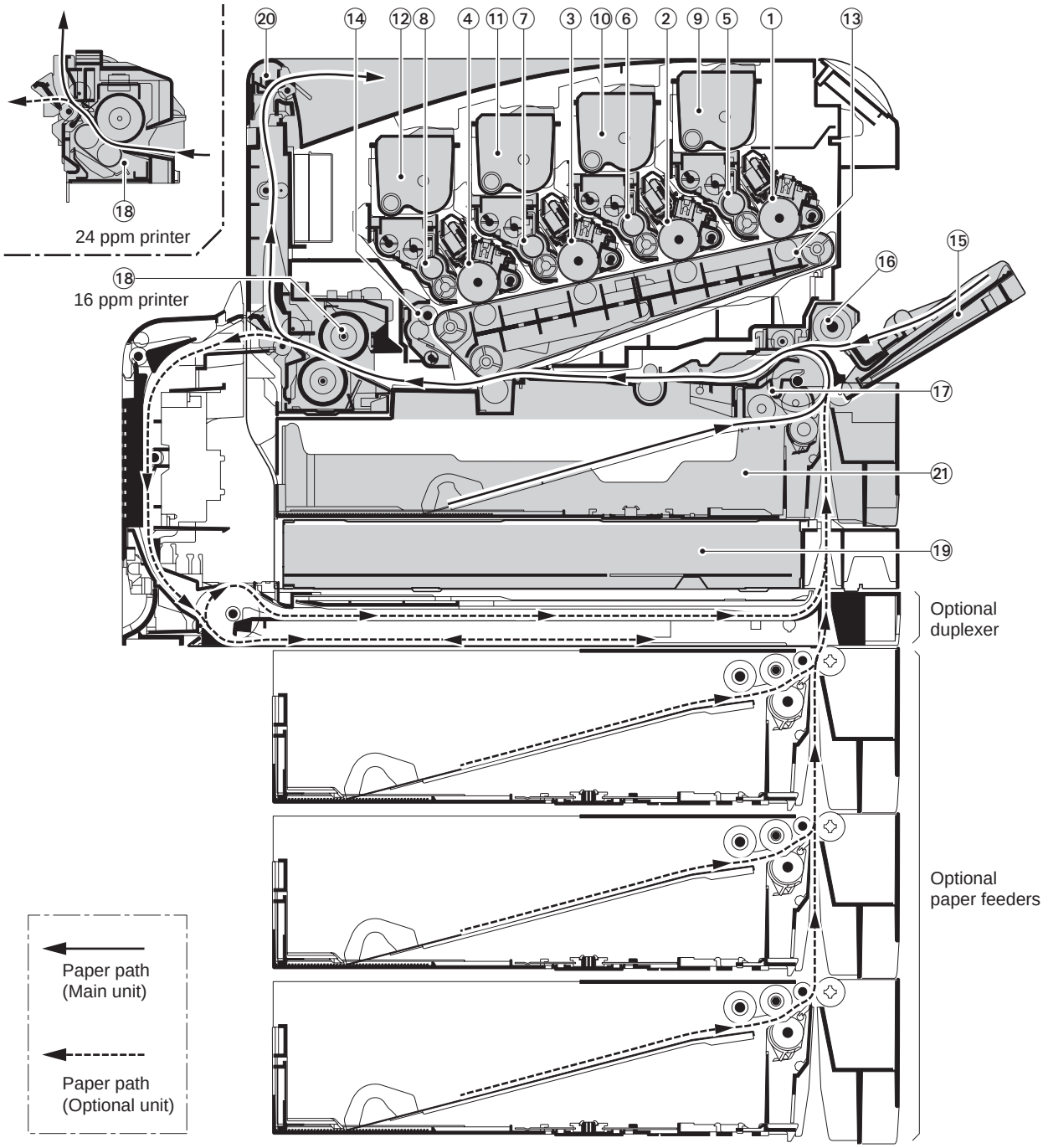

Figure 1-1-3

1. Black drum unit
2. Yellow drum unit
3. Cyan drum unit
4. Magenta drum unit
5. Black developer unit
6. Yellow developer unit
7. Cyan developer unit
8. Magenta developer unit
9. Black toner container
10. Yellow toner container
11. Cyan toner container
12. Magenta toner container
13. Primary transfer unit
14. Primary transfer cleaning unit
15. MP tray
16. MP tray feed unit
17. Feed unit
18. Fuser unit
19. Controller box
20. Face-down tray unit (vertical path)
21. Paper cassette

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1-2-1 Drum unit

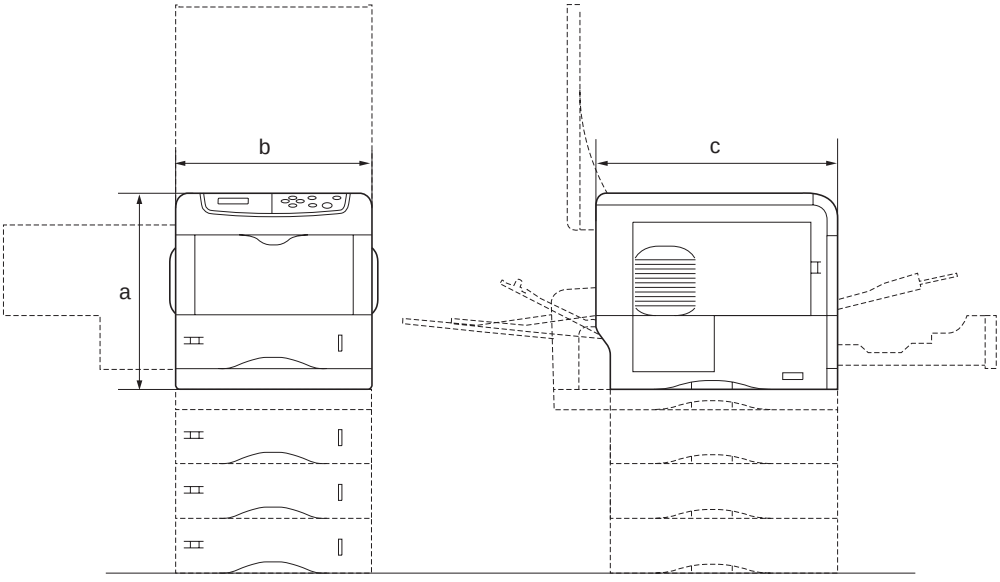
Note the following when handling or storing the drum (drum unit).
Note the following when handling or storing the drum unit.

- When removing the drum unit, never expose the drum surface to strong direct light.
- Avoid abrupt changes in temperature and humidity.
- Avoid exposure to any substance which is harmful to or may affect the quality of the drum.
- Do not touch the drum surface with any object. Should it be touched by hands or stained with oil, clean it.

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

1-2-2 Installation environment

1. Temperature: 10 - 32.5 °C/50 - 90.5 °F
2. Humidity: 20 - 80%RH
3. Power supply: 120 V AC (U.S.A./Canada), 220 - 240 V AC (European countries)
4. Power source frequency: 50 Hz ±2%/60 Hz ±2%
5. installation location
   Avoid direct sunlight or bright lighting. Ensure that the photo-conductor will not be exposed to direct sunlight or other strong light when removing paper jams.
   Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.
   - Avoid dust and vibration.
   - Choose a surface capable of supporting the weight of the machine.
   - Place the machine on a level surface (maximum allowance inclination: 1°).
   - Avoid air-borne substances that may adversely affect the machine or degrade the photo-conductor, such as mercury, acidic of alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.
   - Select a room with good ventilation.
6. Allow sufficient access for proper operation and maintenance of the machine.
   Machine front: 60 cm/23.6"
   Machine rear: 25 cm/9.8"
   Machine right: 25 cm/9.8"
   Machine left: 40 cm/15.8"
   Machine top: 75 cm/29.5"



a: 385 mm/15.2"
b: 345 mm/13.6"
c: 470 mm/18.5"

Figure 1-2-1 Installation dimensions

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1-3-1 Unpacking and installation

(1) Installation procedure

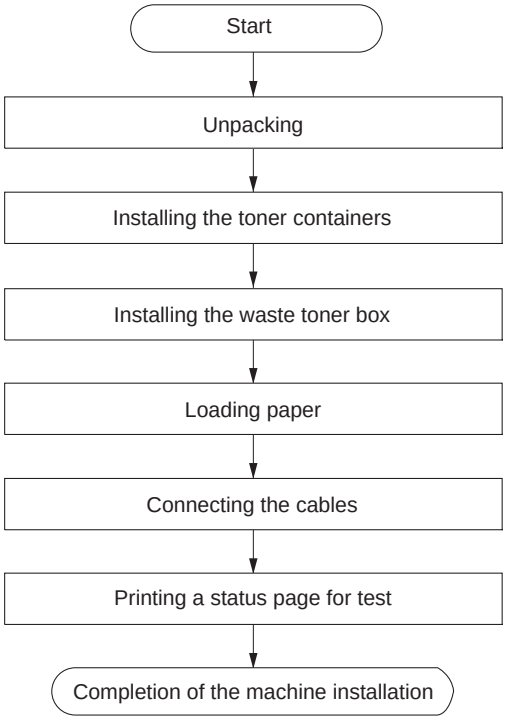


Figure 1-3-1

Unpacking.

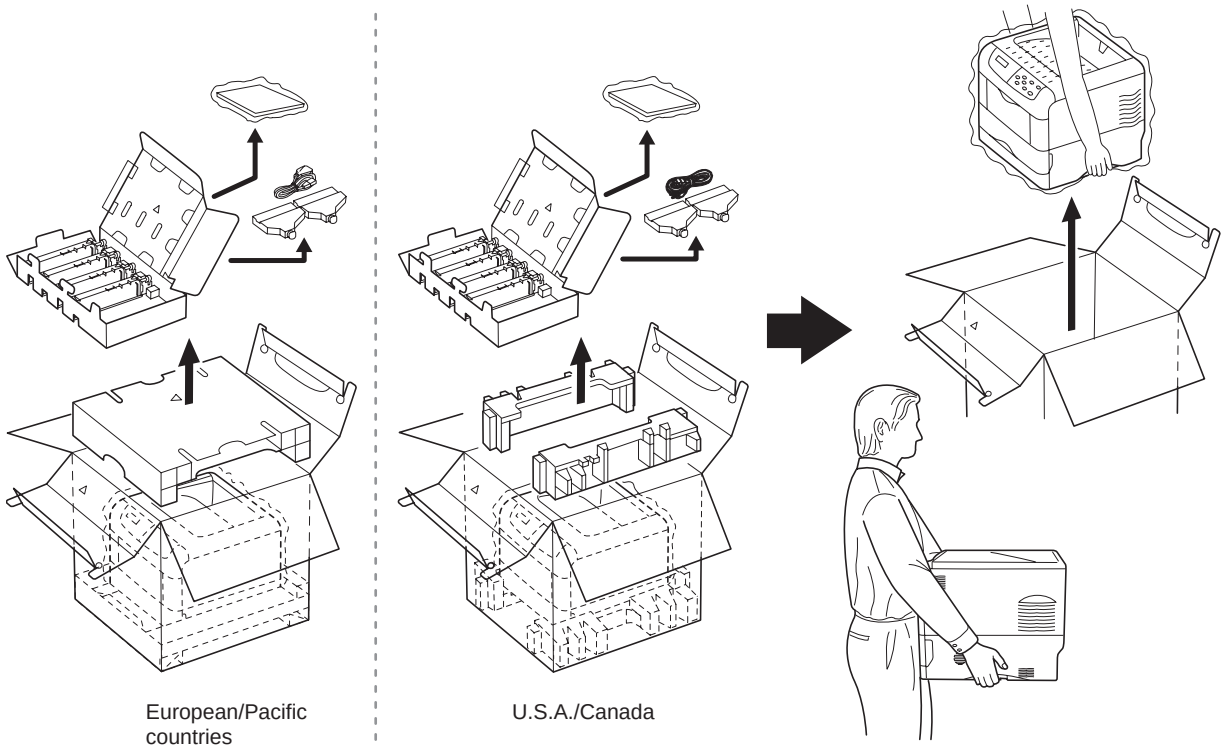


Figure 1-3-2 Unpacking

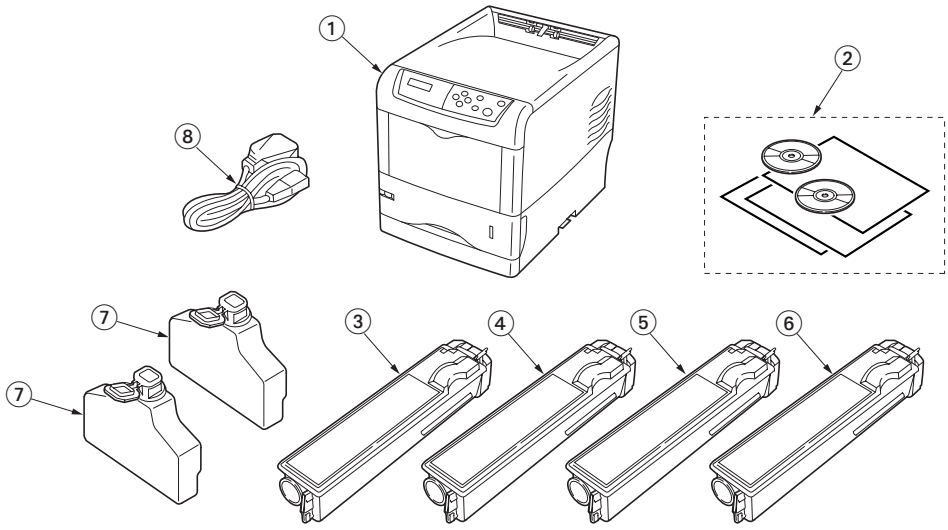


Figure 1-3-3

1. Printer
2. Document and software
   - Installation guide
   - Basic operation guide
   - CD-ROMs
3. Magenta toner container
4. Cyan toner container
5. Yellow toner container
6. Black toner container
7. Waste toner boxes (one is a spare)
8. Power cord

1. Open the top cover and remove the packing item.
2. Remove the packing cover and all packing tapes.

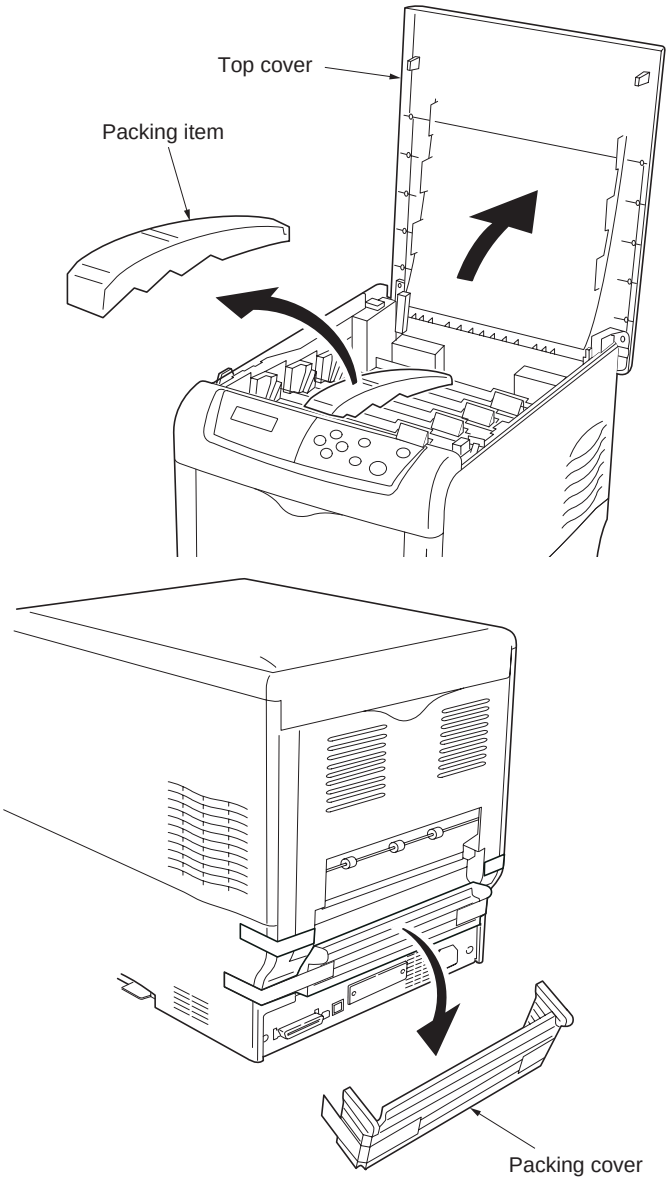


Figure 1-3-4

Installing the toner containers.

1. Shake the black toner container several times to loosen the toner inside.

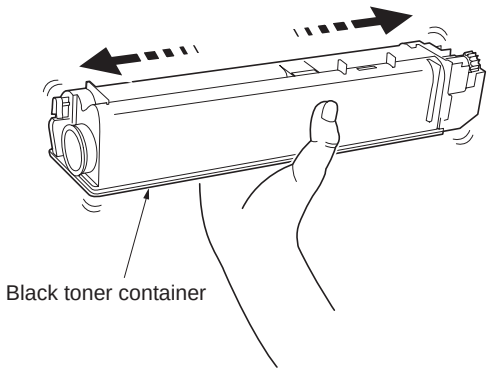


Figure 1-3-5

2. Open the top cover.
3. Install the black toner container into the printer. The black toner container must be installed in the front most developer.

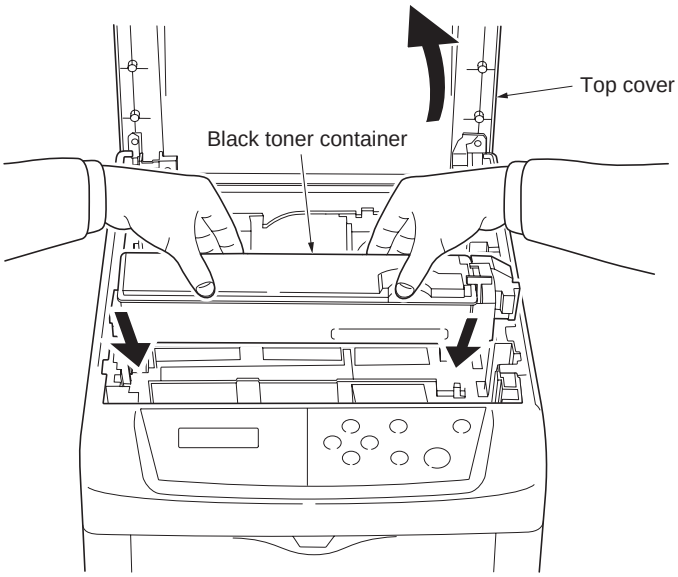


Figure 1-3-6

4. Push in the black toner container firmly until it locks in the developer.

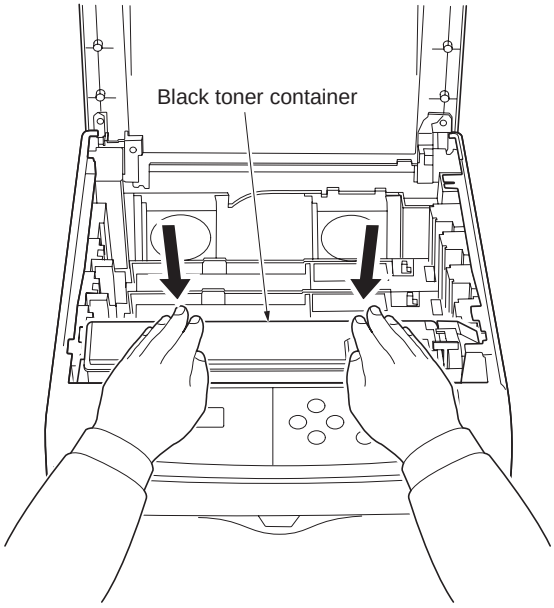


Figure 1-3-7

5. Turn the lock lever backward to the lock position.
6. Install other toner containers in the same procedure.
7. Close the top cover.

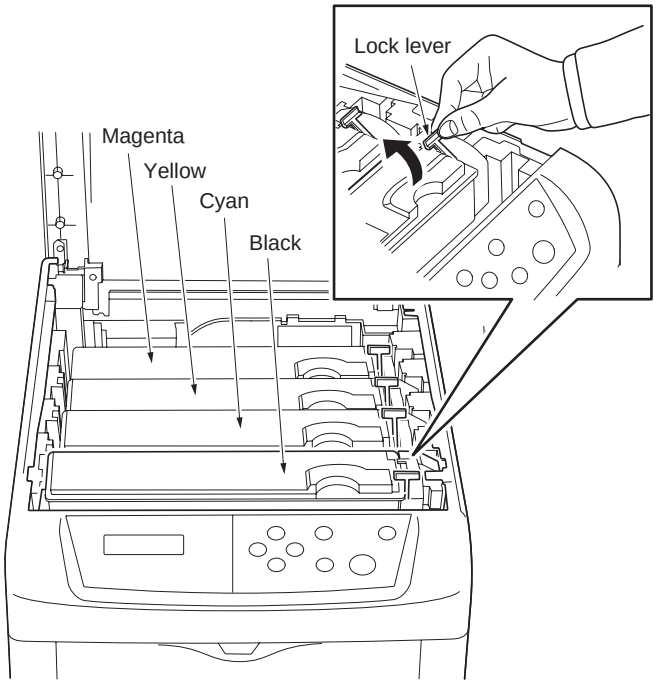


Figure 1-3-8

Installing the waste toner box.

1. Open the side cover.
2. Install the waste toner box.
3. Close the side cover.

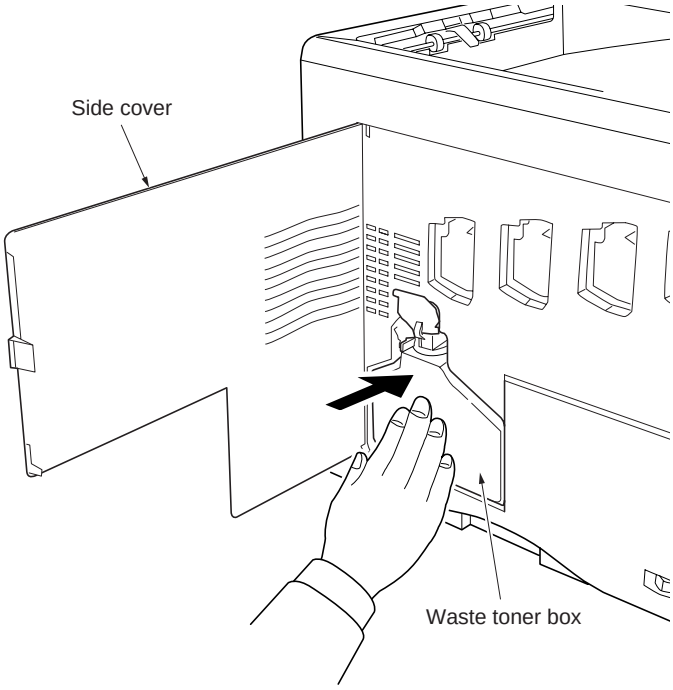


Figure 1-3-9

Loading paper.

1. Remove the cassette from the printer.
2. Adjust the paper guides and the paper stopper according to the paper size to be used.
3. Turn the dial so that the size of the loaded paper is indicated in the paper size indication window.

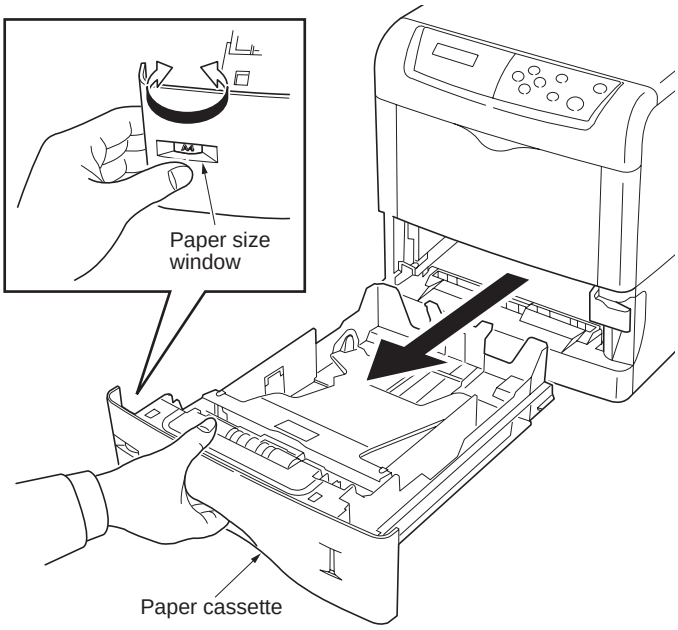


Figure 1-3-10

Connecting the cable.

1. Connect the USB, ethernet, or parallel cable between the printer and the computer.
2. Connect the power cord to the printer AC inlet.
3. Connect the power cord to the wall outlet.

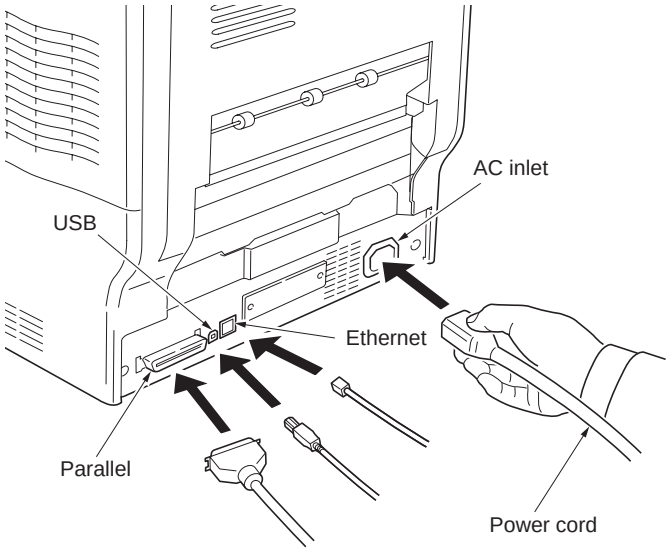


Figure 1-3-11

Printing a status page for test.

1. Turn on the printer power switch. The message will change from [Self test] to [Ready] when initialization is complete.
   Use the following key operation to print a status page for test.
   Press the MENU key when [Ready] is displayed.
   Press the ▼ or ▲ key to display [Print Status Page].
   Press the ENTER key to display [Print Status Page?].
   Press the ENTER key. [Processing] will be displayed and the status page will be printed. When printing is complete, [Ready] will appear again.
2. Check to see if the status page is properly printed.

Completion of the machine installation.

1-3-2 Installing expansion memory (optional)

<Procedure>

1. Turn off printer power.
   Caution: Do not insert or remove expansion memory while printer power is on. Doing so may cause damage to the printer and the expansion memory.
2. If a memory card is currently installed in the memory card slot (See the figure), remove the memory card first.
3. Remove two screws and then remove the main controller PWB.

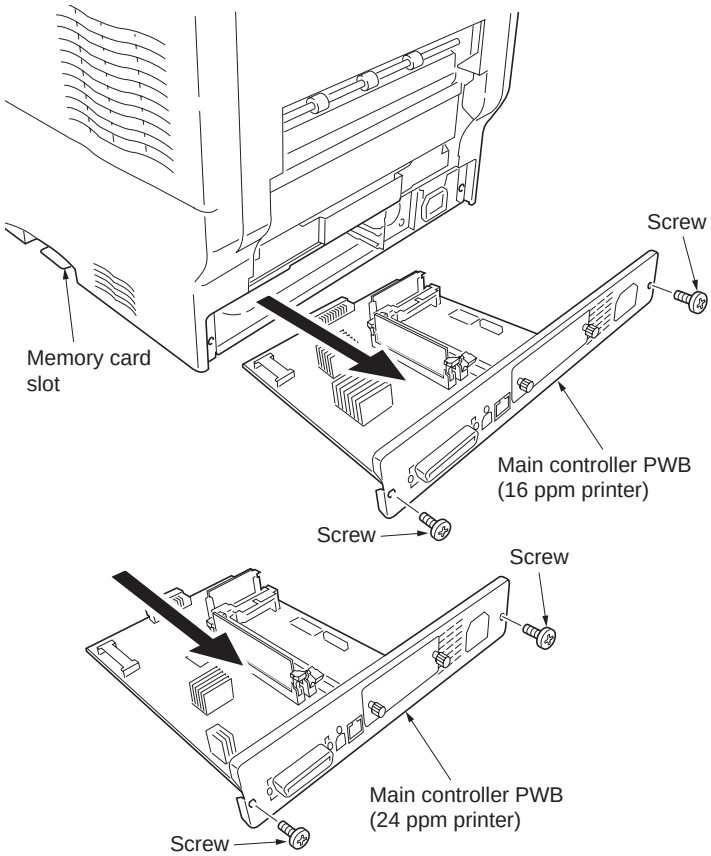


Figure 1-3-12

4. Open the stoppers of the memory socket.
5. Insert the memory so that the two notches of the memory are engaged with the projections of the memory socket.
6. Close the stoppers of the memory socket.
7. Reattach the main controller PWB in the printer.
8. Print a status page to check the memory expansion.

* If memory expansion has been properly performed, information on the installed memory is printed with the total memory capacity has been increased (standard memory capacity 128 MB).

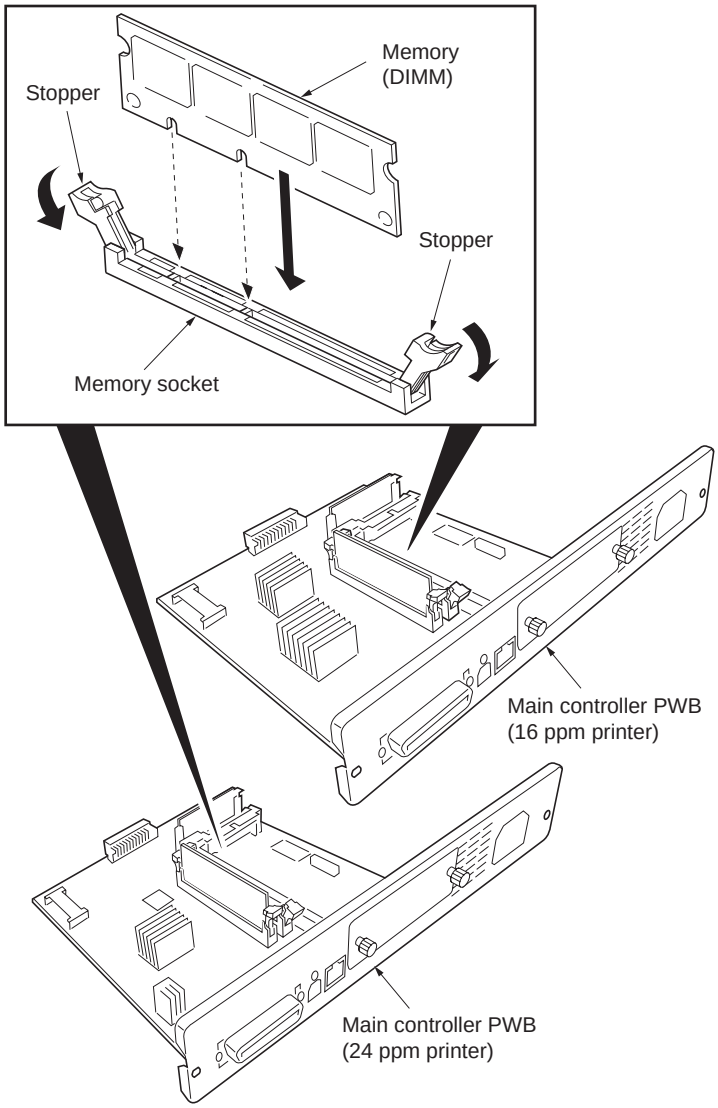


Figure 1-3-13

1-3-3 Installing a memory card (optional)

<Procedure>

1. Turn off printer power.
   Caution: Do not insert or remove memory card while printer power is on. Doing so may cause damage to the printer and the memory card.
2. Insert the memory card into the memory card slot.
3. Format the memory card before use. (Refer to the operation guide.)

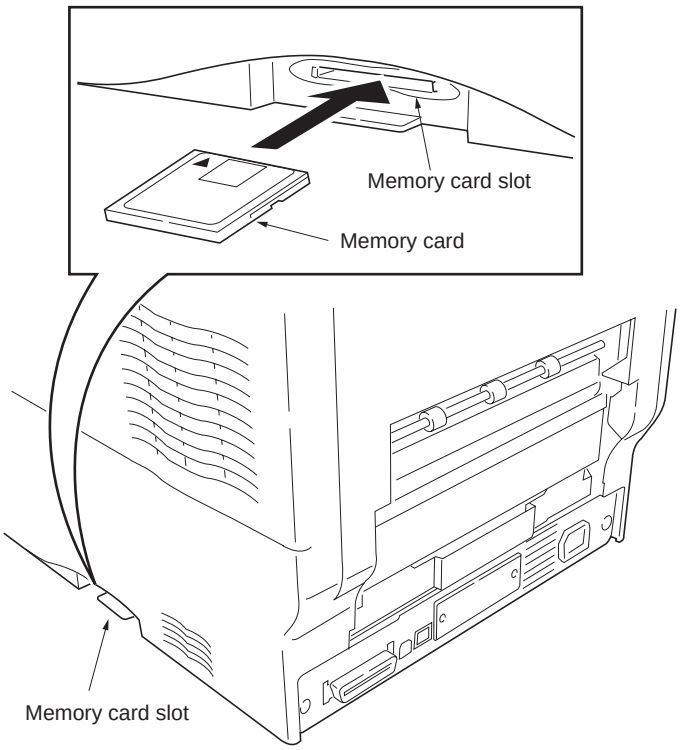
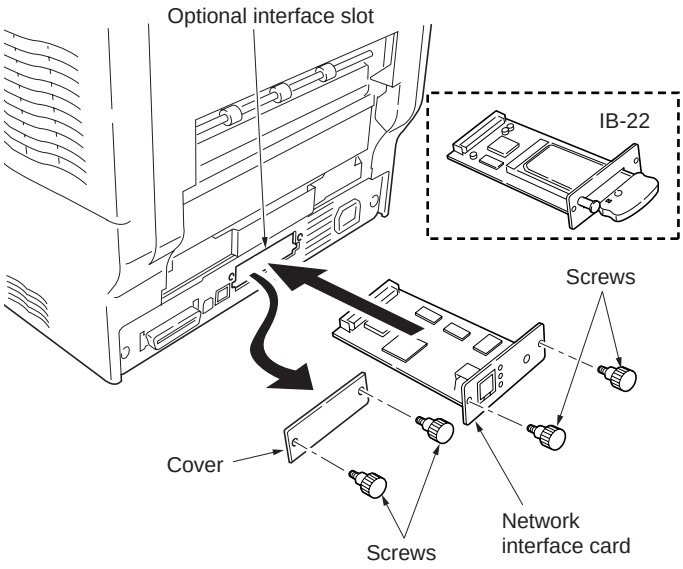


Figure 1-3-14

1-3-4 Installing the network interface card (optional)

<Procedure>

1. Turn off printer power.
2. Remove the two screws and then remove the optional interface slot cover.
3. Insert the network interface card into the optional interface slot.
4. Use the two screws to secure the network interface card.

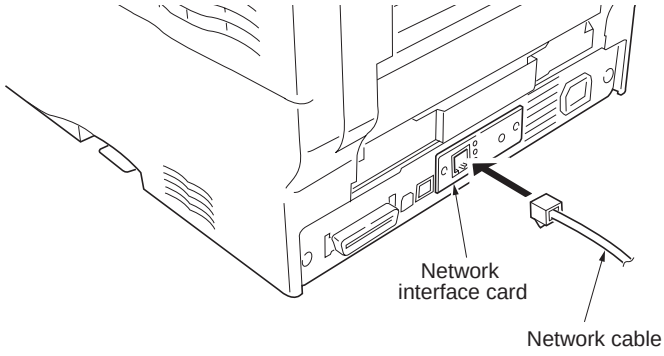


Network interface cards avilable

Part number	Specifications	Remarks
IB-20	10 Base-TX,100 Base-TX,10 Base2	
IB-21E	10 Base-TX,100 Base-TX	
IB-22	Compatible to IEEE 802.11b	Wireless LAN

Figure 1-3-15

5. Connect the network cable (IB-20 and IB-21E).
6. Configure the network interface card. (See the IB-2x quick configuration guide.)



Network configuration (ex. IB-22)

Item	Setting
Wireless LAN Mode	Ad hoc/802.11 Ad hoc/ Infrastruccture/Automatic
SSID	Any string (up to 32 characters)
Channel	Depends on the environment
Encryption (WEP)	DISABLE/64 bit/128 bit
WEP key	Hexadecimal setting (00-FF) 64 bits = 10 digits, 128 bits = 26 digits

Figure 1-3-16

1-3-5 Installing the hard disk unit (optional)

<Procedure>

1. Turn off printer power.
2. Remove the two screws and remove the optional interface slot cover.
3. Insert the hard disk unit into the optional interface slot.
4. Use the two screws to secure the hard disk unit.
5. Format the hard disk unit. (Refer to the operation guide.)

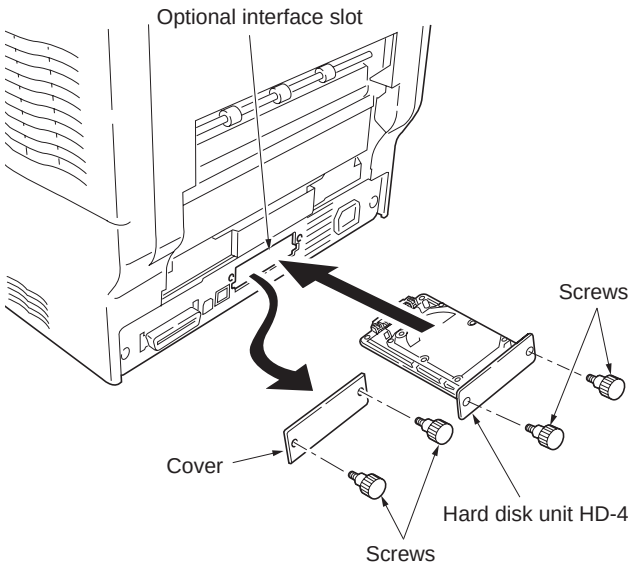
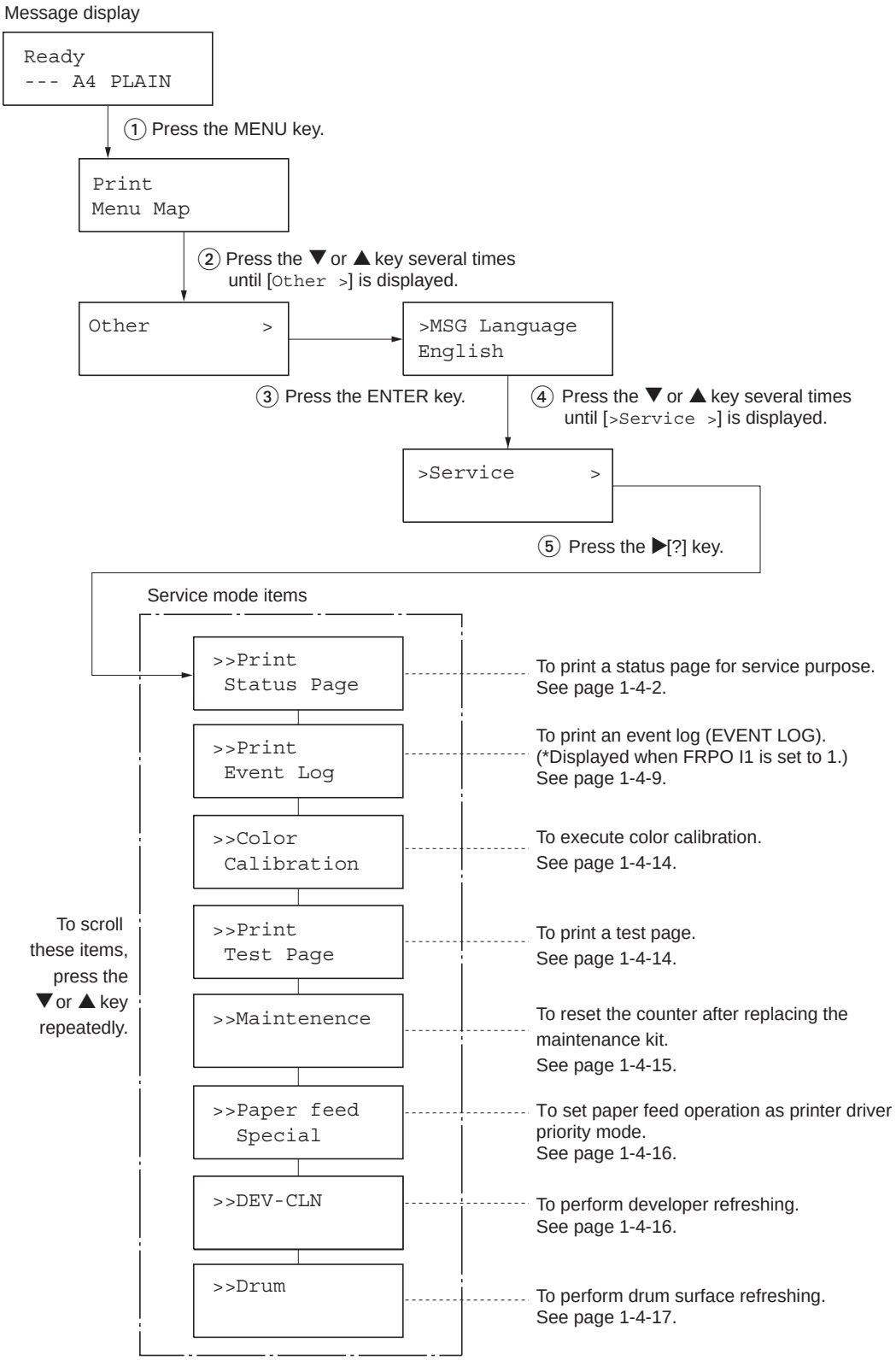


Figure 1-3-17

1-4-1 Service mode

The printer is equipped with various service mode that can be accessed with the MENU key operation on the operation panel.

(1) Executing service mode



Service items	Description
>>Print Status Page	**Printing a status page for service purpose** **Description** Prints a status page for service purpose. The status page includes various printing settings and service cumulatives. **Purpose** To acquire the current printing environmental parameters and cumulative information. **Procedure** 1. Enter the service mode [>>Print Status Page]. 2. Press the ENTER key. “Print Status Page?” will be displayed. 3. Press the ENTER key. Two pages will be printed. (The second page includes service information.)

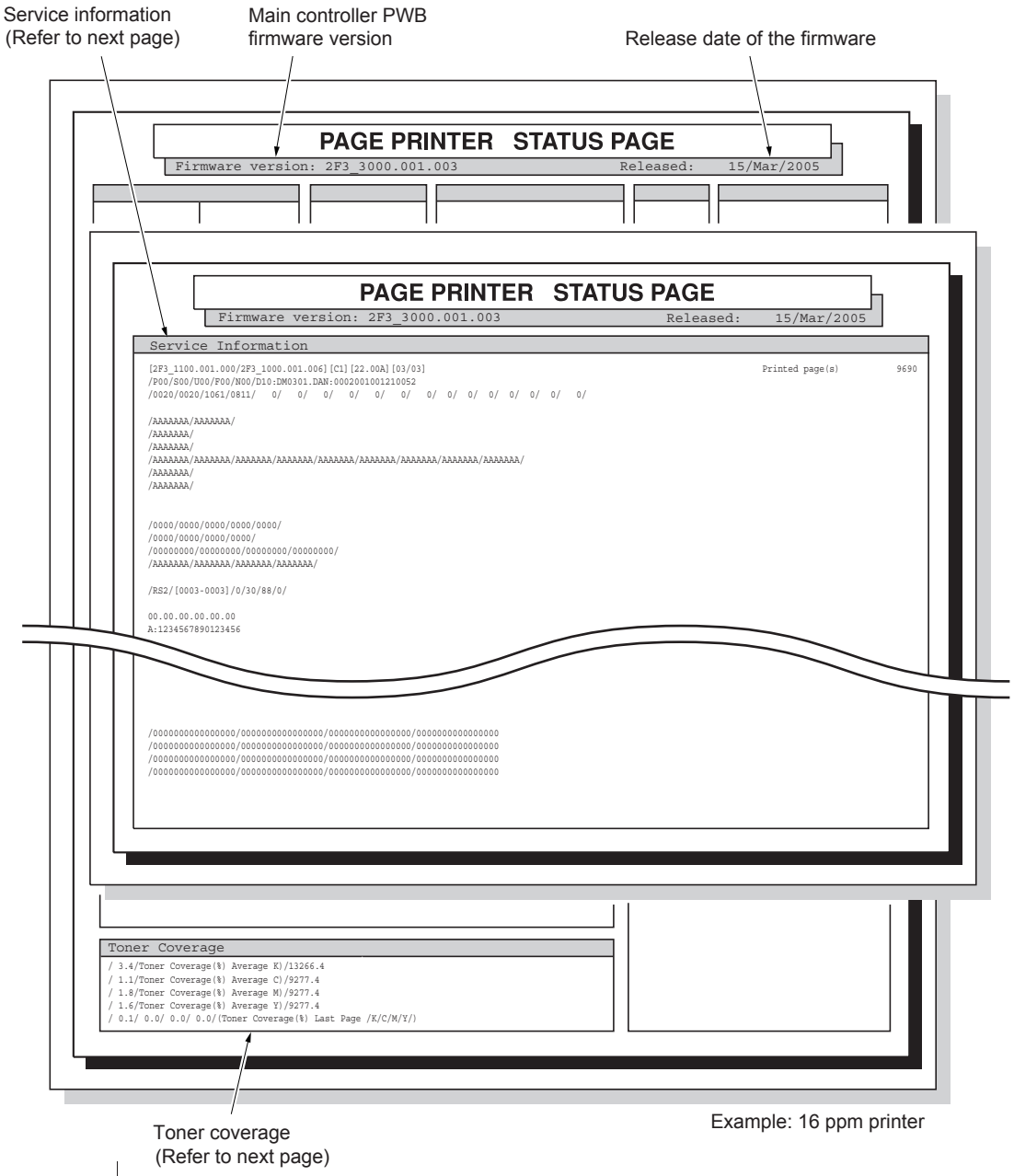


Figure 1-4-1

Service items	Description
	Toner coverage (see Figure 1-4-2 below)

Toner coverage

Annotations: Toner coverage (%) — K: Black, C: Cyan, M: Magenta, Y: Yellow — Number of pages printed coverted in reference to A4 or Letter size.

```
Toner Coverage
   / 3.4/Toner Coverage(%) Average K)/13266.4
   / 1.1/Toner Coverage(%) Average C)/9277.4
   / 1.8/Toner Coverage(%) Average M)/9277.4
   / 1.6/Toner Coverage(%) Average Y)/9277.4
   / 0.1/ 0.0/ 0.0/ 0.0/(Toner Coverage(%) Last Page /K/C/M/Y/)
```

Toner coverage (%) of the page printed most previously.
/Black /Cyan /Magenta /Yellow/

Figure 1-4-2 Toner coverage

Service information (16 ppm printer)

```
Service information

   [2F3_1000.010.002/2F3_3000.008.007][C1][22.00A][03/03]        Printed page(s)     9690
                   ①                   ②    ③     ④                          ⑤
   /P00/S00/U00/F00/N00/D10:DM0301.DAN:0002001001210052
     ⑥   ⑦   ⑧   ⑨   ⑩            ⑪
   /0020/0020/1061/0811/   0/   0/   0/   0/   0/   0/   0/ 0/  0/  0/  0/  0/  0/   0/
              ⑫                         ⑬                          ⑭            ⑮
⑯ /AAAAAAA/AAAAAAA/
⑰ /AAAAAAA/
⑱ /AAAAAAA/
   /AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/
                  ⑲                   ⑳                     ㉑
㉒ /AAAAAAA/
㉓ /AAAAAAA/


㉔ /0000/0000/0000/0000/0000/
㉕ /0000/0000/0000/0000/
㉖ /00000000/00000000/00000000/00000000/
㉗ /AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/

   /RS2/[0003-0003]/0/30/88/
     ㉘      ㉙      ㉚ ㉛ ㉜
㉞ 00.00.00.00.00.00
㉟ A:1234567890123456

㊱ /03030303/03030303/03030303/03000000/00000000/03030303/03030303/

㊲ SPD1:0203040508090A0B0C0D0F101112131415161718191A1B1C1D1E1F202122235E
㊳ SPD2:0203040508090A0B0C0D0F101112131415161718191A1B1C1D1E1F202122235E


㊺ /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000

   DN:SPL9200007/SPL9200007/SPL9200007/SPL9200007/SN:SPL9200010
                          ㊻                              ㊼
```

Figure 1-4-3 Service information (16 ppm printer)

Service items	Description
	Service information (24 ppm printer)

```
Service information

   [2F4_1000.013.002/2F4_3000.007.004][C1][22.00A][03/03]        Printed page(s)      9690
                     ①                 ②    ③      ④                       ⑤
   /P00/S00/U00/F00/N00/D10:DM0301.DAN:0002001001210052
     ⑥   ⑦   ⑧   ⑨   ⑩              ⑪
   /0020/0020/1061/0811/    0/    0/    0/    0/    0/    0/    0/  0/  0/  0/  0/  0/   0/   0/
           ⑫                            ⑬                              ⑭             ⑮
⑯ /AAAAAAA/AAAAAAA/
⑰ /AAAAAAA/
⑱ /AAAAAAA/
   /AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/
                ⑲                  ⑳                ㉑
㉒ /AAAAAAA/
㉓ /AAAAAAA/

㉔ /0000/0000/0000/0000/0000/
㉕ /0000/0000/0000/0000/
㉖ /00000000/00000000/00000000/00000000/
㉗ /AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/

   /RS2/[0003-0003]/0/30/88/0/
    ㉘      ㉙      ㉚㉛㉜㉝
㉞ 00.00.00.00.00.00
㉟ A:1234567890123456

㊱ /03030303/03030303/03030303/03000000/00000000/03030303/03030303/

㊲ SPD1:0203040508090A0B0C0D0F101112131415161718191A1B1C1D1E1F202122235E
㊳ SPD2:0203040508090A0B0C0D0F101112131415161718191A1B1C1D1E1F202122235E

㊴ CT01:/0000/0000/0000/0000
㊵ CT02:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT03:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT04:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT05:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT06:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT07:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT08:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT09:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
㊶ CT10:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT11:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT12:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
   CT13:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
㊷ CT14:/0000/0000/00/00/00/00/00
㊸ CT15:/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000/0000
㊹ CT16:/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/E00/B00/

㊺ /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000
   /0000000000000000/0000000000000000/0000000000000000/0000000000000000

   DN:SPL9200007/SPL9200007/SPL9200007/SPL9200007/SN:SPL9200010
                      ㊻                             ㊼
```

Figure 1-4-4 Service information (24 ppm printer)

Service items	Description

	Items	Description
①	Engine ROM information	[ROM mask version/Software version]
②	Operation panel PWB information	[Operation panel PWB mask ROM version]
③	Boot ROM information	[Boot ROM version and Flash DIMM type]
④	Software jumper switch information (hexadecimal)	[First byte/second byte (displayed in OEM mode only)] First byte Bit 0 = 1: (Fixed) Bit 1 = 0: Overseas, 1: Domestic (Japan) Bit 2, 3 (Not used) Bit 4 = 0: Kyocera, 1: OEM Bit 5 = 0: For Europe, 1: For US Bit 6 = 0: Non MICR mode, 1: MICR mode Bit 7 = 0: (Not used) Second byte: Displayed in OEM mode only
⑤	Total page	Total print page count
⑥	Parallel I/O information	-
⑦	Serial I/O error code	00: Normal Bit 0: Framing error Bit 1: Overrun error Bit 2: Parity error
⑧	USB information	00: Not connected 01: Full-Speed 02: Hi-Speed
⑨	Operation panel lock status (displayed only when locked)	01: Partial lock 02: Full lock
⑩	NVRAM error (displayed only when any error has occurred)	01: ID error 02: Version error 03: Checksum error 04: NVRAM crash error
⑪	NVRAM downloading status	00: Normal (not downloaded) Bit 0: Font data Bit 1: Host data Bit 2: Macro data Bit 3: Program data Bit 4: Operation panel message data (file name displayed) Bit 5: OEM data Bit 6: Web template data (version displayed) Bit 7: Error occurred
⑫	Printable area setting	/Top offset/Left offset/Page length/Page width
⑬	Left offset for each paper source	/MP tray/Cassette 1/Cassette 2/Cassette 3/Cassette 4/ Envelope feeder/Duplexer
⑭	Top offset for each paper source	/MP tray/Cassette 2/Cassette 3/Cassette 4/Duplexer
⑮	Offset for page rotation	/Top offset/Left offset/
⑯	Optional paper feeder life counter	/Paper feeder 1/Paper feeder 2/
⑰	Optional paper feeder life counter	/Paper feeder 3/

Service items	Description

	Items	Description
⑱	Paper exit position counter	/Duplexer/
⑲	Drum life counter	/Black/Cyan/Magenta/Yellow/
⑳	Primary transfer unit life counter	-
㉑	Developing units conuter	/Black/Cyan/Magenta/Yellow/
㉒	Color print counter	-
㉓	Maintenance kit counter	-
㉔	Optional unit software version	/Paper feeder1/Paper feeder 2/Paper feeder 3/Envelope feeder/Duplexer
㉕	Drum ID	/Black/Cyan/ Magenta/Yellow/
㉖	LED print head compensation value	-
㉗	Develper refreshing mode counter	/Black/Cyan/Magenta/Yellow/
㉘	Serial interface information	RS2: RS-232C RS4: RS-422A
㉙	Optional paper feeder/bulk stacker installation information	First 2 bytes Bit 0: MPF Bit 1 to 6: Paper feeder 1 to 6 Bit 7: Duplexer Bit 8: Reserved Bit 9: Envelope feeder Bit 10 to 15: Reserved Second 2 bytes Bit 0: Face-up Bit 1: Face-down Bit 2 to 15: Reserved
㉚	Operation panel message language	PMSG command setting (decimal)
㉛	Current temperature	0 to 60 °C (in 1 °C increment, "-"= Humidity/temperature sensor is abnormal.)
㉜	Current humidity	10 to 90% RH (in 2% increment)
㉝	Message conversion information	0: Old 1: Newly unified (GO)
㉞	MAC address	-
㉟	Fixed asset number	(maximum 16 characters)
㊱	Media type attributes	Media type setting value from 1 to 28 (fixing temperature, paper thickness, duplex printing. See page 1-4-8.) (14 to 20 are unused and always 0x00.)
㊲	Memory SPD information (slot 1)	Bus error if all digits are "E".
㊳	Memory SPD information (slot 2)	Bus error if all digits are "E".
㊴	Calibration information 1 (CT01)	/Average background S-wave/Average background P-wave/ Dark potential S-wave/Dark potential P-wave/

NOTE:

Code conversion

A	B	C	D	E	F	G	H	I	J
0	1	2	3	4	5	6	7	8	9

Service items	Description

	Items	Description
㊵	Calibration information 2 (CT02 to CT09) [I/O output data information]	Each 2 bytes in the following order: /99.6%/95%/85%/70%/55%/40%/27%/15%/ CT02: /S-wave background Magenta/ P-wave background Magenta/ CT03: /S-wave background Cyan/ P-wave background Cyan/ CT04: /S-wave background Yellow/ P-wave background Yellow/ CT05: /S-wave background Black/ P-wave background Black/ CT06: /S-wave patch Magenta/ P-wave patch Magenta/ CT07: /S-wave patch Cyan/ P-wave patch Cyan/ CT08: /S-wave patch Yellow/ P-wave patch Yellow/ CT09: /S-wave patch Black/ P-wave patch Black/
㊶	Calibration information 3 (CT10 to CT13) [Measure bias data information]	Each 2 bytes in the following order: /450V/400V/350V/Beta/ CT10: /S-wave background Magenta/ S-wave background Cyan/ S-wave background Yellow/ S-wave background Black/ CT11: /P-wave background Magenta/ P-wave background Cyan/ P-wave background Yellow P-wave background Black/ CT12: /S-wave patch Magenta/ S-wave patch Cyan/ S-wave patch Yellow/ S-wave patch Black/ CT13: /P-wave patch Magenta/ P-wave patch Cyan/ P-wave patch Yellow/ P-wave patch Black/
㊷	Calibration information 4 (CT14)	/Background P-wave max. (2 bytes)/ Background P-wave min. (2 bytes)/ Developing bias data Magenta (1 byte)/ Developing bias data Cyan (1 byte)/ Developing bias data Yellow (1 byte)/ Developing bias data Black (1 byte)/ LED control voltage (2 bytes)/
㊸	Calibration information 5 (CT15)	Relative compensation for toner (2 bytes) Each 2 bytes in the following order: /Magenta 450/400/350/Beta/ Cyan 450/400/350/Beta/ Yellow 450/400/350/Beta/ Black 450/400/350/Beta/
㊹	Calibration information 6 (CT16)	/Total number of times/ Number of cancellation/ Number of retries/ E10 error/ E11 error/ E12 error/ Calibration result (IO)*1/ Calibration result (bias)*2/ *1: E00: Completed normally. E10: Sensor value does not proportionally increase. E1X: Calibration sensor (Toner ID sensor) error E11: Sensor value increases too few. E12: Sensor value increases too few and does not increase proportionally. E20: Calibration cancelled from engine request. *2: B00: Completed normally. All biases (C/M/Y/K) are within range of 0x8B - 0xE1. B10: Bias sensor value error One of the biases (C/M/Y/K) is less than 0x8A or more than 0xE2.
㊺	Engine parameter setting	16 ppm printer: Hexadecimal, 128 bytes (256 digits)
		24 ppm printer: Hexadecimal, 256 bytes (512 digits)
㊻	Drum serial number	/Black/Cyan/Magenta/Yellow/
㊼	Machine serial number	-

Service items	Description

Table 1-4-1 Media type attribute

No.	Type	Yes/ No	Type adjust default	Paper feed source			Paper destination		
				Paper cassette	MP tray	Envelope feeder	Duplexer	Face-down tray	Face-up tray
1	Plain	YES	Normal2	YES	YES	YES	YES	YES	YES
2	Transparency	YES	Extra Thick	NO	YES	NO	NO	YES	YES
3	Preprinted	YES	Normal2	YES	YES	YES	YES	YES	YES
4	Labels	YES	Thick1	NO	YES	YES	NO	YES	YES
5	Bond	YES	Normal2	YES	YES	YES	YES	YES	YES
6	Recycled	YES	Normal2	YES	YES	YES	YES	YES	YES
7	Vellum	YES	Thin	NO	YES	NO	NO	YES	YES
8	Rough	YES	Normal2	YES	YES	YES	YES	YES	YES
9	Letter Head	YES	Normal2	YES	YES	YES	YES	YES	YES
10	Color	YES	Normal2	YES	YES	YES	YES	YES	YES
11	Prepunched	YES	Normal2	YES	YES	YES	YES	YES	YES
12	Envelope	YES	Thick1	NO	YES	YES	NO	YES	YES
13	Cardstock	YES	Thick2	NO	YES	YES	NO	YES	YES
14	Coated	YES	Normal2	NO	YES	YES	NO	YES	YES
15	2'nd Side	NO	-	-	-	-	-	-	-
16	Thick	YES	Thick1	NO	YES	YES	NO	YES	YES
17	Fine	YES	Normal2	YES	YES	YES	YES	YES	YES
18	Reserved	-	-	-	-	-	-	-	-
19	Reserved	-	-	-	-	-	-	-	-
20	Reserved	-	-	-	-	-	-	-	-
21	Custom1	YES	Normal2	YES	YES	YES	YES	YES	YES
22	Custom2	YES	Normal2	YES	YES	YES	YES	YES	YES
23	Custom3	YES	Normal2	YES	YES	YES	YES	YES	YES
24	Custom4	YES	Normal2	YES	YES	YES	YES	YES	YES
25	Custom5	YES	Normal2	YES	YES	YES	YES	YES	YES
26	Custom6	YES	Normal2	YES	YES	YES	YES	YES	YES
27	Custom7	YES	Normal2	YES	YES	YES	YES	YES	YES
28	Custom8	YES	Normal2	YES	YES	YES	YES	YES	YES

Table 1-4-2 Type adjust setting

No.	Type	Speed (line)			Speed in gloss mode		
		1	3/4	1/2	1	3/4	1/2
1	Thin	YES	-	-	-	YES	-
2	Normal1	YES	-	-	-	YES	-
3	Normal2	YES	-	-	-	YES	-
4	Normal3	YES	-	-	-	YES	-
5	Thick1	-	YES	-	-	-	YES
6	Thick2	-	-	YES	-	-	YES
7	Thick3	-	-	YES	-	-	YES
8	Extra Thick	-	-	YES	-	-	-

Note that a half speed is 55*[1]/50*[2] % of the normal speed. Since the speed of printing in gross mode gets slower than normal, printing in media types including Thick2, Thick3, and Extra Thick is not possible in gloss mode.

*[1]: 16 ppm printer, *[2]: 24 ppm printer

Service items	Description
>>Print Event Log	**Printing an event log (EVENT LOG)** **Description** Prints the history of paper misfeeds and self-diagnostic errors including up to 16 items from the latest occurrence of such an error. (If the number of errors exceeds 16, errors will be deleted sequentially from the oldest one.) **Purpose** To allow machine malfunction analysis based on the frequency of paper misfeeds and self-diagnostic errors. **Procedure** 1. Enter the service mode [>>Print Event log]. 2. Press the ENTER key. “>>Print Event Log?” will be displayed. 3. Press the ENTER key. A sheet of event log will be printed.

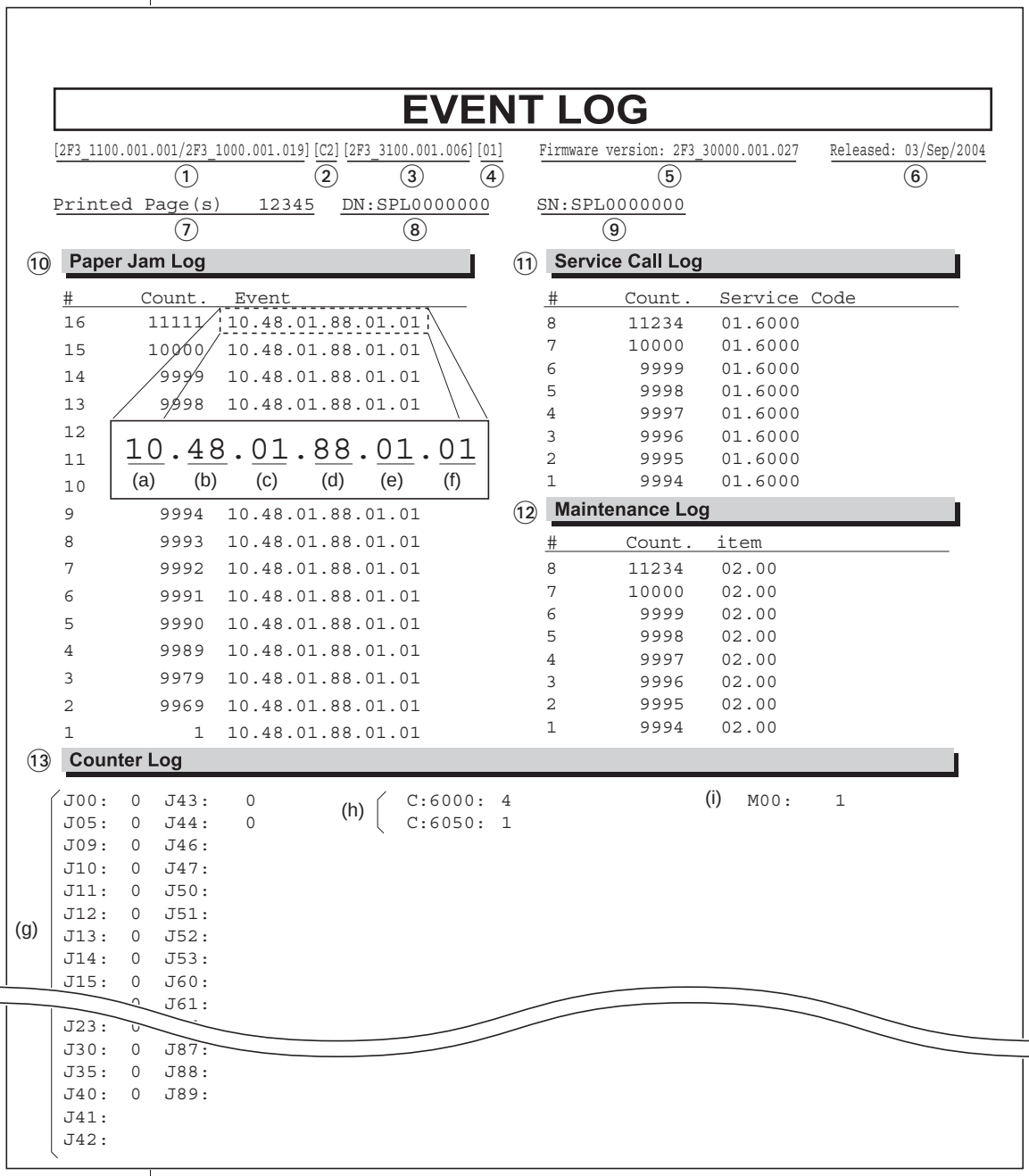
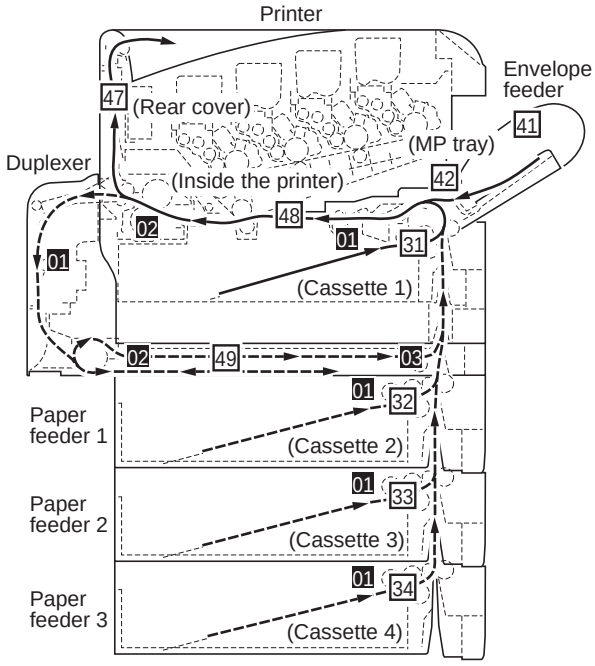


Figure 1-4-5 Event log (EVENT LOG)

Service items	Description

	Items	Description		
①	Engine controller PWB mask version	[Engine mask version/Engine software version]		
②	Operator panel PWB mask version	-		
③	BROM version			
④	Software jumper switch information (hexadecimal) [First byte/second byte (displayed in OEM mode only)]	First byte bit 0 = 1: (Fixed) bit 1 = 0: Overseas, 1: Domestic (Japan) bit 2, 3 (Not used) bit 4 = 0: Kyocera, 1: OEM bit 5 = 0: For Europe, 1: For US bit 6 = 0: Non MICR mode, 1: MICR mode bit 7 (Not used) Second byte: Displayed in OEM mode only		
⑤	Main controller PWB mask version			
⑥	Main controller PWB firmware release date			
⑦	Total page counter			
⑧	Drum serial number			
⑨	Printer serial number			
⑩	Paper Jam Log	# Remembers 1 to 16th of occurrence. If the occurrence of the previous paper jam is less than 16, all of the paper jams are logged. When the occurrence exeeeds 16, the oldest occurrence is removed.	Count. The total page count at the time of the paper jam.	Event Log code (2-digit, hexadecimal, 6 categories) (a) Cause of a paper jam (b) Position of paper jam (c) Paper source (d) Paper size (e) Paper type (f) Paper exit Refer to the below for the details of each log code.
		(a) Cause of paper jam 10: Paper does not arrive at the registration sensor. [42] (MP tray) 10: Paper does not arrive at the registration sensor. [31] (Cassette 1) 10: Paper does not arrive at the registration sensor. [31] (Cassette 2) 10: Paper does not arrive at the registration sensor. [31] (Cassette 3) 10: Paper does not arrive at the registration sensor. [31] (Cassette 4) 10: Paper does not arrive at the registration sensor. [31] (Duplexer) 10: Paper does not arrive at the registration sensor. [41] (Envelope feeder)		

Service items	Description

	Items	Description
⑩ cont.		11: Paper does not pass the registration sensor. [48] 12: Paper remains at the registration sensor when power is turned on. [48] 20: Paper does not arrive at the exit sensor. [48] 21: Paper does not pass the exit sensor. [48] 22: Paper remains at the exit sensor when power is turned on. [48] 30: Paper does not arrive at the paper feeder 1 paper sensor. [42] (Cassette 2) 30: Paper does not arrive at the paper feeder 1 paper sensor. [42] (Cassette 3) 30: Paper does not arrive at the paper feeder 1 paper sensor. [42] (Cassette 4) 31: Paper does not pass the paper feeder 1 paper sensor. [32] 32: Paper remains at the paper feeder 1 paper sensor when power is turned on. [48] 40: Paper does not arrive at the paper feeder 2 paper sensor. [33] (Cassette 3) 40: Paper does not arrive at the paper feeder 2 paper sensor. [34] (Cassette 4) 41: Paper does not pass the paper feeder 2 paper sensor. [33] 42: Paper remains at the paper feeder 2 paper sensor when power is turned on. [33] 50: Paper does not arrive at the paper feeder 3 paper sensor. [34] (Cassette 4) 51: Paper does not pass the paper feeder 3 paper sensor. [34] 52: Paper remains at the paper feeder 3 paper sensor when power is turned on. [34] A1: Paper does not arrive at the vertical path sensor. [48] (duplexer) A2: Paper does not arrive at the switchback sensor. [49] (duplexer) A3: Paper does not pass the duplex refeed sensor. [49] (duplexer) A4: Paper does not arrive at the duplexer refeed eject sensor. [49] A5: Paper does not pass the duplexer refeed rear edge sensor. [49] A6: Paper does not pass the duplexer refeed eject sensor. [49] A7: Duplexer overflow (Third sheet is commanded when second sheet remains). [49] A9: Paper remains in the duplexer when power is turned on. [49] E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of a cover) F0 to FE: Paper misfeed by another cause. Values within [ ] indicate paper misfeed locations. (hexadecimal)
		(b) Detail of jam location  **Figure 1-4-6**

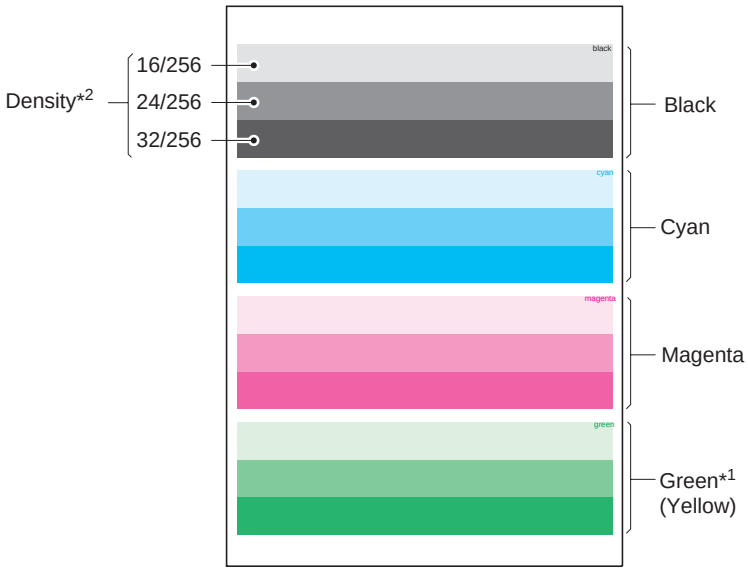
Service items	Description

	Items	Description
⑩ cont.		(c) Detail of paper source (Hexadecimal) 00: MP tray 01: Paper cassette 1 02: Paper cassette 2 03: Paper cassette 3 04: Paper cassette 4 05 to 06: Not used 07: Duplexer 08: Not used 09: Envelope feeder
		(d) Detail of paper size (Hexadecimal) 01: Monarch 02: Business 03: International DL 04: International C5 05: Executive 06: Letter-R 86: Letter-E 07: Legal 08: A4R 88: A4E 09: B5R 89: B5E 0A: A3 0B: B4 0C: Ledger BF: B6 10: Commercial 9 11: Commercial 6 12: ISO B5 13: Custom 1E: International C4 1F: JIS hagaki 20: JIS oufuku 21: Officio2 22: Special 1 23: Special 2 24: A3 wide 25: Ledger wide 26: Full bleed paper (12 × 18) 27: 8K 28: 16K-R A8: 16K-E 32: Statement-R B2: Statement-E 33: Folio 34: Youkei 2 35: Youkei 4
		(e) Detail of paper type (Hexadecimal) 01: Plain 02: Transparency 03: Preprint 04: Labels 05: Bond 06: Recycle 07: Vellum 08: Rough 09: Letter head 0A: Color 0B: Prepunched 0C: Envelope 0D: Cardstock 0E: Coated 0F: 2nd side 10: Media 16 11: High quality 15: Custom 1 16: Custom 2 17: Custom 3 18: Custom 4 19: Custom 5 1A: Custom 6 1B: Custom 7 1C: Custom 8
		(f) Detail of paper exit location 01: Face-down output tray (FD) 02: Face-up output tray /Finisher face-up (FU) 03: Finisher face-down (FD) 04: Finisher sub tray (FU) 05: Job separator 0B: Multi tray bin 1/Mailbox bin 1 (FD) 0C: Multi tray bin 1/Mailbox bin 1 (FU) 0D: Mailbox [general] (FD) 0E: Mailbox [general] (FU) 15: Multi tray bin 2/Mailbox bin 2 (FD) 16: Multi tray bin 2/Mailbox bin 2 (FU) 1F: Multi tray bin 3/Mailbox bin 3 (FD) 20: Multi tray bin 3/Mailbox bin 3 (FU) 29: Multi tray bin 4/Mailbox bin 4 (FD) 2A: Multi tray bin 4/Mailbox bin 4 (FU) 33: Multi tray bin 5/Mailbox bin 5 (FD) 34: Multi tray bin 5/Mailbox bin 5 (FU) 3D: Mailbox bin 6 (FD) 3E: Mailbox bin 6 (FU) 47: Mailbox bin 7 (FD) 48: Mailbox bin 7 (FU)

Service items	Description

	Items	Description		
⑪	Service Call (Self diagnostic ellor) Log	# Remembers 1 to 8th of occurrence of self diagnostics error. If the occurrence of the previous diagnostics error is less than 8, all of the diagnostics errors are logged.	Count. The total page count at the time of the self diagnostics error.	Service Code Example 01.6000 01 means a self-diagnostic error; 6000 means a self-diagnostic error code. See page 1-5-3.
⑫	Maintenance Log	# Remembers 1 to 8th of occurrence of replacement. If the occurrence of the previous replacement of toner container is less than 8, all of the occurrences of replacement are logged.	Count. The total page count at the time of the replacement of the toner container. This is virtually logged as the occurrence of the Toner Empty condition since the replacement of the toner container is not precisely detectable.	Item Code of maintenance replacing item (1 byte, 2 categories) First byte (Replacing item) 01: Toner container Second byte (Type of replacing item) 00: Black 01: Cyan 02: Magenta 03: Yellow First byte (Replacing item) 02: Maintenance kit Second byte (Type of replacing item) 00: Fixed
⑬	Counter Log Comprised of three log counters including paper jams, self diagnostics errors, and replacement of the toner container.	Jam Indicates the log counter of paper jams depending on location. Refer to Paper Jam Log. All instances including those are not occurred are displayed.	Self diagnostic error Indicates the log counter of self diagnostics errors depending on cause. See page 1-5-3. Example: C6000: 4 Self diagnostics error 6000 has happened four times.	Toner container replacing Indicates the log counter depending on the maintenance item for maintenance. T: Toner container 00: Black 01: Cyan 02: Magenta 03: Yellow M: Maintenance kit 00: MK-510 MK-512 MK-520 MK-522 Example: T00: 1 The (black) toner container has been replaced once.

Service items	Description
>>Color Calibration	**Execution of color calibration** **Description** Executing the density of color using. **Purpose** To carry out color calibration manually besides it can be carried out automatically each time the printer is turned on. **Procedure** 1. Enter the service mode [>>Color Calibration]. 2. Press the ENTER key twice. The color calibration starts and automatically finishes. **Completion**
>>Print Test Page	**Printing a test page** **Description** Four colors are printed respectively with halftones of three different levels. **Purpose** To check the activation of the developer and drum units of four colors. **Procedure** 1. Enter the service mode [>>Printing Test Page]. 2. Press the ENTER key twice. The test page is printed. **Completion**



*1: Since focusing in yellow is hardly readable, yellow is mixed with cyan for more readability, resulting in green.
*2: Each portion of colors has three different magnitude of halftones (bands). If focus is excessively lost, dots are not recognizable with the 16/256 band, resulting in uneven density. It also results in vertical streaks in the 24/256 and/or 32/256 bands.

Figure 1-4-7 Test page

Service items	Description
>>Maintenance	**Counter reset for the maintenance kit**

Description

The "Install MK" message means that maintenance kit should be replaced at 200,000 images of printing. The interval counter must be manually reset using this service item.
Maintenance kit includes the following units:

Item		16 ppm printer		24 ppm printer	
		For European countries	For USA/ Canada	For European countries	For USA/ Canada
Maitenance kit		MK-510	MK-512	MK-520	MK-522
	Drum units × 4	DK-510		DK-520	
	Black developer unit	DV-510K	DK-512K	DV-510K	DK-512K
	Yellow developer unit	DV-510Y	DK-512Y	DV-510Y	DK-512Y
	Magenta developer unit	DV-510M	DK-512M	DV-510M	DK-512M
	Cyan developer unit	DV-510C	DK-512C	DV-510C	DK-512C
	Primary transfer set (Primary transfer unit and primary transfer cleaning unit)	TR-510		TR-520	
	Paper feed unit	FE-510			
	Fuser unit	FK-510		FK-520	
	Ozone filters × 2	[Part No.: 2D902530]			
	Feed rollers set	Retard roller: [Part No.: 5AAVROLL+052] MP tray feed roller: [Part No.: 5AAVROLL+051]			

Purpose

To reset the life counter for the developer units and drum units included in maintenance kit.

Procedure for replacing the maintenance kit

1. Remove the four old drum units (See page 1-6-13).
2. Remove the LED print head from each old drum unit and then refit to the new drum unit (See page 1-6-15).
3. Install the four new drum units.
4. Replace the four developer units (See page 1-6-12).
5. Replace the fuser unit (See page 1-6-25 or 1-6-32).
6. Replace the paper feed unit (See page 1-6-6).
7. Replace the primary transfer unit (See page 1-6-23).
8. Replace the primary transfer cleaning unit (See page 1-6-24).
9. Replace the two ozone filters (See page 1-6-51).
10. Replace the retard roller (See page 1-6-8).
11. Replace the MP tray feed roller (See page 1-6-11).

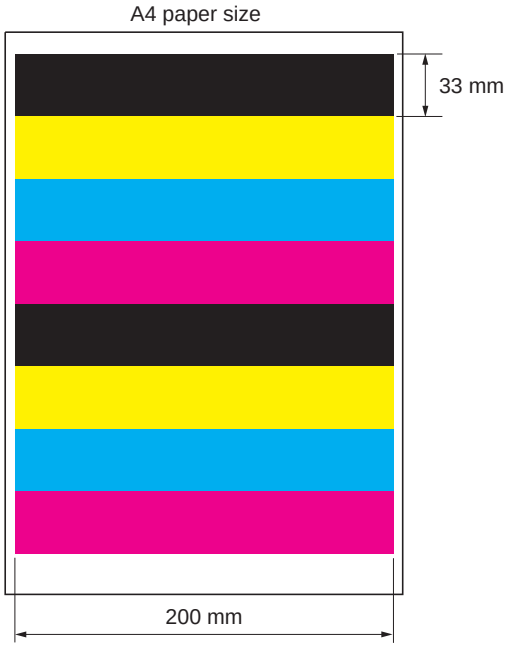
Procedure

Enter the service mode [>>Maintenance].

1. Press the ENTER key, “>>Maintenance?” is displayed.
2. Press the ENTER key twice. The counter for each component is reset immediately.

Completion

Note:
Occurrences of resetting the maintenance kits are recorded on the service status page in number of pages or images at which the maintenance kit was replaced (See page 1-4-2). This may be used to determine the possibility that the counter was errorneously or unintentionally reset.

Service items	Description
>>Paper feed	**Setting the paper feed operation (printer driver priority mode)** **Description** With printer driver priority mode, when selecting the specific paper feed location (a cassette or MP tray) with the printer driver (it is not automatic selection), paper is fed from the selected location. Message "Add Paper" is displayed when there is no paper in that location. When selecting the MP tray as the paper feed location, paper is fed with the timing of maximum size (A4). As for the setting media type (setting the paper type), setting of the printer driver is notified to the engine controller PWB. Duplex printing operation is still the ordinary operation, and paper jam occurs if paper size is different from the setting of the printer. **Purpose** To set the printer driver priority mode which priority is given to the setup of a printer driver when the ordinary paper feed operation mode is not suitable for the usage condition of the user. **Procedure** 1. Enter the service mode [>>Paper feed]. 2. Press the ENTER key. Message “>>Paper feed?” will be displayed. 3. Select the mode (Special? or Normal?) pressing the ▲ key or ▼ key. Special: Ordinary paper feed operation mode (Default) Normal: Printer driver priority mode 4. Press the ENTER key. **Completion**
>>DEV-CLN	**Developer refreshing** **Description** The laser output of the image data for developer refreshing is carried out, and operation to exposure, developing, and primary transfer is performed by 10 pages. (Paper is not fed) **Purpose** To perform when occurring the decrease of image density or the developing problem. **Procedure** 1. Enter the service mode [>>DEV-CLN]. 2. Press the ENTER key. Message “>>DEV-CLN?” will be displayed. 3. Press the ENTER key. Developer refreshing will be started. **Completion**  Toner image on the primary transfer belt **Figure 1-4-8 Developer refreshing Image data**

Service items	Description
>>Drum	**Drum surface refreshing** **Description** Rotates the drum approximately 3[*1]/2[*2] minutes with toner lightly applied onto the drum using the high-voltage output contorl of the engine contorller PWB. The cleaning blade in the durm unit scrapes toner off the drum surface to clean it. **Purpose** To clean the drum surface when image failure occurs due to contamination. This mode is useful when dew condensation on the drum occurs. **Procedure** 1. Enter the service mode [>>Drum]. 2. Press the ENTER key. Message “>>Drum?” will be displayed. 3. Press the ENTER key. Drum surface refreshing will start and finish after approximately 3[*1]/2[*2] minutes.

[*1]: 16 ppm printer, [*2]: 24 ppm printer

1-4-2 Maintenance

(1) Method of removing the toner soiling which comes in contact with heat roller and press roller/belt

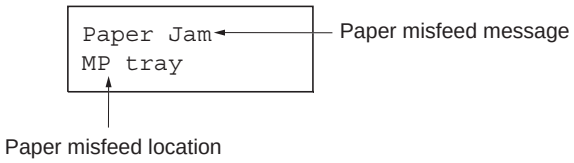
When misfeeding has occurred in the fuser unit, misfeed paper can coil around the heat roller or the press roller/belt. Removing the misfed paper will cause, there are times when the toner soiling remains in the heat roller or the press roller/belt). Follow the procedure below in this case and remove the toner soiling from the heat roller or the press roller/belt.

1. Remove the misfed paper. Cancel misfeed by opening and closing a cover. wait until the message display shows “Ready”.
2. Press [MENU] and set paper type to [Transparency] and paper source to [MP tray].
3. Set the a sheet (transparency sheet [3M CG3700] or thick paper with the of more than weight above 135 g/m^2) to MP tray.
4. Press [MENU] and print a status page. (The toner soiling which comes in contact with the heat roller and the press roller/belt will be transferred onto paper).
5. Until the toner soiling is cleared, repeat (Usually when 4 - 5 it prints, the soiling goes out) the above procedure.

1-5-1 Paper misfeed detection

(1) Paper misfeed indication

When a paper misfeed occurs, the printer immediately stops printing and displays the paper misfeed message on the operation panel. To remove paper misfed in the printer, pull out the paper cassette, pull out the paper feed unit or open the rear cover.



(2) Paper misfeed detection

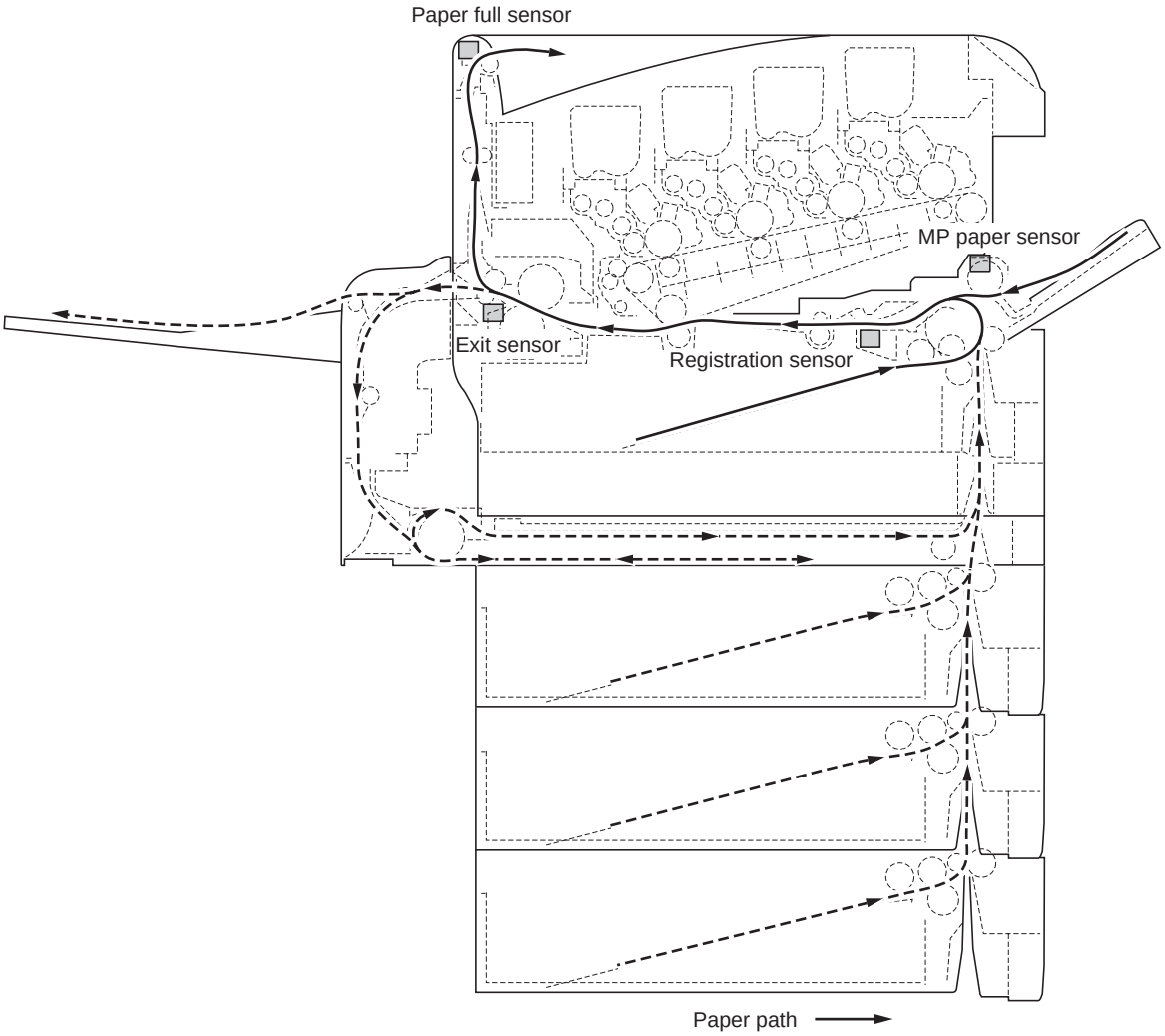


Figure 1-5-1 Paper misfeed detection

1-5-2 Self-diagnosis

(1) Self-diagnostic function

This printer is equipped with self-diagnostic function. When a problem is detected, the printer stops printing and display an error message on the operation panel. An error message consists of a message prompting a contact to service personnel, total print count, and a four-digit error code (2 digits for F0 only) indicating the type of the error. (The display varies depending on the type of the error.)

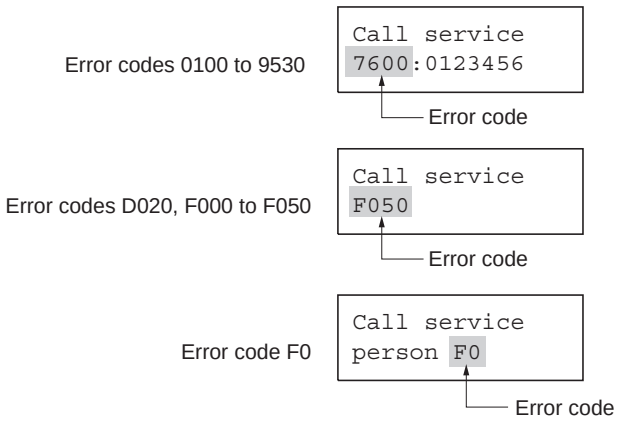


Figure 1-5-2 Error message display

(2) Self-diagnostic code

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0100	**EEPROM (U12) write error** • When it cannot make normal to access to the EEPROM (U12) which is installed in the socket of the engine controller PWB (A0004). (The total counter, serial number and engine parameter etc. are stored in the EEPROM [U12]).	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		EEPROM (U12) installing malfunction.	Check the bending of the lead pin and floating of the IC, there is trouble, if there is trouble, remedy or replace.
0420	**Paper feeder communication error** • When turning on power, the ASIC of the engine controller PWB (A0004) recognized the optional paper feeder PF-60, but when it becomes not be able to communicate from the middle. After the error occurring, when power source is turned on/off, there are times when the paper feeder is not recognized.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective paper feeder PF-60.	After removing or replacing the paper feeder PF-60, do the operation check. If operation is normal, replace the paper feeder PF-60.
		Defective duplexer DU-300/301.	If the duplexer DU-300/301 is installed, after removing or replacing the duplexer DU-300/301, do the operation check. If operation is normal, replace the duplexer DU-300/301.
		Defective harness (S02852) between engine controller PWB (A0004) and interface connector, or poor contact of the connector terminals.	Check the continuity of the harness (S02852). Check the insertion of YC7 of the engine controller PWB (A0004), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
0460	**Duplexer communication error** • When turning on power, the ASIC of the engine controller PWB (A0004) recognized the optional duplexer DU-300/301, but when it becomes not be able to communicate from the middle. After the error occurring, when power source is turned on/off, there are times when the duplexer is not recognized.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective duplexer DU-300/301.	After removing or replacing the duplexer DU-300/301, do the operation check. If operation is normal, replace the duplexer DU-300/301.
		Defective paper feeder PF-60.	If the optional paper feeder PF-60 is installed, after removing or replacing the paper feeder PF-60, do the operation check. If operation is normal, replace the paper feeder PF-60.
		Defective harness (S02852) between engine controller PWB (A0004) and interface connector, or poor contact of the connector terminals.	Check the continuity of the harness (S02852). Check the insertion of YC7 of the engine controller PWB, if there is trouble, remedy or replace.
0470 (24 ppm printer only)	**Duplexer incompatibility error** • The incompatible duplexer DU-300 is installed to the 24 ppm printer.	Installing the duplexer, which is incompatible with the printer specification.	Install the compatible duplexer DU-301 to the 24 ppm printer.
0480	**Duplexer firmware error** • When turning on power, the ASIC of the engine controller PWB (A0004) recognized the optional duplexer DU-300/301, but the firmware checksum error is reported from the duplexer. The duplexer is not recognized because of the defective firmware.	Defective duplexer.	After removing or replacing the duplexer DU-300/301, do the operation check. If operation is normal, replace the duplexer DU-300/301.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0951	**LED print head 4 (EEPROM) communication error [black drum unit]** • The LED print head 4 (EEPROM) of the black drum unit does not communicate with the engine controller PWB (A0004) normally. The incompatible LED print head is installed to the printer.	Defective LED print head 4.	Replace the LED print head 4. See page 1-6-15.
		Installing the LED print head, which is incompatible with the printer specification.	Install the compatible LED print head to the black drum unit.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the insertion of YC3 of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective FFCs (S03011) between LED print head 4 and LED print heads relay PWB (A0008), or poor contact of the FFC terminals.	Check the connection of the FFCs with the black drum unit and the printer main unit, check the continuity of the FFCs (S03011), check the connection of the LED print head 4, if there is trouble, remedy or replace. See page 1-6-15.
0952	**LED print head 2 (EEPROM) communication error [cyan drum unit]** • The LED print head 2 (EEPROM) of the cyan drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective LED print head 2.	Replace the LED print head 2. See page 1-6-15.
		Installing the LED print head, which is incompatible with the printer specification.	Install the compatible LED print head to the black drum unit.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the insertion of YC3 of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective FFCs (S03011) between LED print head 2 and LED print heads relay PWB (A0008), or poor contact of the FFC terminals.	Check the connection of the FFCs with the cyan drum unit and the printer main unit, check the continuity of the FFCs (S03011), check the connection of the LED print head 2, if there is trouble, remedy or replace. See page 1-6-15.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0953	**LED print head 1 (EEPROM) communication error [magenta drum unit]** • The LED print head 1 (EEPROM) of the magenta drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective LED print head 1.	Replace the LED print head 1. See page 1-6-15.
		Installing the LED print head, which is incompatible with the printer specification.	Install the compatible LED print head to the black drum unit.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the insertion of YC3 of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective FFCs (S03011) between LED print head 1 and LED print heads relay PWB (A0008), or poor contact of the FFC terminals.	Check the connection of the FFCs with the magenta drum unit and the printer main unit, check the continuity of the FFCs (S03011), check the connection of the LED print head 1, if there is trouble, remedy or replace. See page 1-6-15.
0954	**LED print head 3 (EEPROM) communication error [yellow drum unit]** • The LED print head 3 (EEPROM) of the yellow drun unit does not communicate with the engine controller PWB (A0004) normally.	Defective LED print head 3.	Replace the LED print head 3. See page 1-6-15.
		Installing the LED print head, which is incompatible with the printer specification.	Install the compatible LED print head to the black drum unit.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the insertion of YC3 of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective FFCs (S03011) between LED print head 3 and LED print heads relay PWB (A0008), or poor contact of the FFC terminals.	Check the connection of the FFCs with the magenta drum unit and the printer main unit, check the continuity of the FFCs (S03011), check the connection of the LED print head 3, if there is trouble, remedy or replace. See page 1-6-15.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
1200	**Side registration motor error** • The duplexer PWB of the optional duplexer cannot detect the home position of the adjust guide.	Defective duplexer DU-300/301.	Refer to the duplexer DU-300/301's service manual.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
2610	**Paper feed motor error (top)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (top).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
2620	**Paper feed motor error (middle)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (middle).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
2630	**Paper feed motor error (bottom)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (third).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
5301	**Eraser lamp 4 error (black drum unit)** • The eraser lamp 4 [PWB] (KP-1090) of the black drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective eraser lamp 4 [PWB] (KP-1090).	Replace the eraser lamp 4 [PWB] (KP-1090).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective drum PWB 4 (KP-972).	Replace the black drum unit. See page 1-6-13.
		Defective harness (S02868) between drum PWB 4 (KP-972) and eraser lamp 4 [PWB] (KP-1090), or poor contact of the connector terminals.	Check the connection of the YC402 connector of the drum PWB 4 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
5302	**Eraser lamp 2 error (cyan drum unit)** • The eraser lamp 2 [PWB] (KP-1090) of the cyan drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective eraser lamp 2 [PWB] (KP-1090).	Replace the eraser lamp 2 [PWB] (KP-1090).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective drum PWB 2 (KP-972).	Replace the cyan drum unit. See page 1-6-13.
		Defective harness (S02868) between drum PWB 2 (KP-972) and eraser lamp 2 [PWB] (KP-1090), or poor contact of the connector terminals.	Check the connection of the YC402 connector of the drum PWB 2 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
5303	**Eraser lamp 1 error (magenta drum unit)** • The eraser lamp 1 [PWB] (KP-1090) of the magenta drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective eraser lamp 1 [PWB] (KP-1090).	Replace the eraser lamp 1 [PWB] (KP-1090).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective drum PWB 1 (KP-972).	Replace the magenta drum unit. See page 1-6-13.
		Defective harness (S02868) between drum PWB 1 (KP-972) and eraser lamp 1 [PWB] (KP-1090), or poor contact of the connector terminals.	Check the connection of the YC402 connector of the drum PWB 1 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
5304	**Eraser lamp 3 error (yellow drum unit)** • The eraser lamp 3 [PWB] (KP-1090) of the yellow drum unit does not communicate with the engine controller PWB (A0004) normally.	Defective eraser lamp 3 [PWB] (KP-1090).	Replace the eraser lamp 3 [PWB] (KP-1090).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective drum PWB 3 (KP-972).	Replace the yellow drum unit. See page 1-6-13.
		Defective harness (S02868) between drum PWB 3 (KP-972) and eraser lamp 3 [PWB] (KP-1090), or poor contact of the connector terminals.	Check the connection of the YC402 connector of the drum PWB 3 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6000	**Fuser temperature time-out error (heat roller)** • Doing the control which turns on the fuser heater lamp 1 which is built in to the heat roller of the fuser unit, the fuser temperature which fuser thermistor 1 detects stipulated temperature did not rise within stipulated time.	Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1, if there is trouble, remedy or replace. See page 1-6-26 or 1-6-33.
		Fuser thermostat 1 operated.	Replace the Fuser thermostat 1. See page 1-6-26 or 1-6-33.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-41.
		Defective fuser PWB.	Replace the fuser PWB (KP-970*[1]/A0003*[2]).
		Defective harness of the fuser thermistor 1, or poor contact of the connector terminals.	Check the harness of the fuser thermistor 1, check the connection YC694 connector of the fuser PWB (KP-970*[1]/A0003*[2]), if there is trouble, remedy or replace.
		Defective fuser heater lamp 1.	Replace the fuser heater lamp 1. See page 1-6-26 or 1-6-33.
		[16 ppm printer] Defective harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model) between fuser unit connector and fuser heater lamp 1.	Check the continuity of the harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model), check the connection YC694 connector of the fuser PWB (KP-970*[1]/A0003*[2]), if there is trouble, remedy or replace.
		[24 ppm printer] Defective harness (S02883: 220 - 240 V AC model, S02884: 120 V AC model) between fuser unit connector and fuser heater lamp 1.	Check the continuity of the harness (S02883: 220 - 240 V AC model, S02884: 120 V AC model), check the connection YC694 connector of the fuser PWB (KP-970*[1]/A0003*[2]), if there is trouble, remedy or replace.
		[16 ppm printer] Defective harness (S02856) between fuser unit connector and power supply PWB.	Check the continuity of the harness (S02856), check the connection CN2 connector of the power supply PWB, if there is trouble, remedy or replace.
		[24 ppm printer] Defective harness (S02882) between fuser unit connector and power supply PWB.	Check the continuity of the harness (S02882), check the connection CN2 connector of the power supply PWB, if there is trouble, remedy or replace.

*[1]: 16 ppm printer, *[2]: 24 ppm printer

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6020	**Fuser abnormal high temperature error (heat roller)** • Abnormal high fuser temperature of the heat roller was detected.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective fuser PWB.	Replace the fuser PWB (KP-970*1/A0003*2).
		Defective power supply PWB (A0004).	Replace the power supply PWB. See page 1-6-41.
		Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1,if there is trouble, remedy or replace. See page 1-6-26 or 1-6-33.
6030	**Fuser thermistor 1 broken error (heat roller)** • It was judged it has been broken from the fact that it is not the input signal from of the fuser thermistor 1 which detects the fuser temperature of the heat roller.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective harness of the fuser PWB between fuser thermistor 1 or poor contact of the connector terminals.	Check harness of the fuser PWB (KP-970*1/A0003*2), check the conenction YC694 connector of the fuser PWB (KP-970*1/A0003*2), if there is trouble, remedy or replace.
		Defective harness (S02854) between fuer PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02854), check the connection YC691 connector of the fuser PWB (KP-970*1/A0003*2), if there is trouble, remedy of replace.
		Defective harness (S02853) power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
		Defective fuser PWB.	Replace the fuser PWB (KP-970*1/A0003*2).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-35.
		Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1, if there is trouble, remedy or replace. See page 1-6-26 or 1-6-33.

*1: 16 ppm printer, *2: 24 ppm printer

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6100 (16 ppm printer only)	**Fuser temperature time-out error (press roller)** • Doing the control which turns on the fuser heater lamp 2 which is built in to the press roller of the fuser unit, the fuser temperature which fuser thermistor 2 detects stipulated temperature did not rise within stipulated time.	Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2, if there is trouble, remedy or replace. See page 1-6-26.
		Fuser thermostat 2 operated.	Replace the fuser thermostat 2. See page 1-6-26.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-41.
		Defective fuser PWB.	Replace the fuser PWB (KP-970).
		Defective harness of the fuser thermistor 2, or poor contact of the connector terminals.	Check the harness of the fuser thermistor 1, check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective fuser heater lamp 2.	Replace the fuser heater lamp 2. See page 1-6-26.
		Defective harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model) between fuser unit connector and fuser heater lamp 2.	Check the continuity of the harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model), check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02856) between fuser unit connector and power supply PWB.	Check the continuity of the harness (S02856), check the connection CN2 connector of the power supply PWB, if there is trouble, remedy or replace.
6120 (16 ppm printer only)	**Fuser abnormal high temperature error (press roller)** • Abnormal high fuser temperature of the press roller was detected.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective fuser PWB.	Replace the fuser PWB (KP-970).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-35.
		Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2, if there is trouble, remedy or replace. See page 1-6-26.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6130 (16 ppm printer only)	**Fuser thermistor 2 broken error (press roller)** • It was judged it has been broken from the fact that it is not the input signal from of the fuser thermistor 2 which detects the fuser temperature of the press roller.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective harness of the fuser PWB between fuser thermistor 2 or poor contact of the connector terminals.	Check harness of the fuser PWB (KP-970), check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02854) between fuser PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02854), check the connection YC691 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02853) power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-41.
		Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2, if there is trouble, remedy or replace. See page 1-6-26.
6400	**Zero cross signal error** • The zero cross signal which from the POWER supply PWB is outputted to the engine controller PWB (A0004) was not detected.	Defective power supply PWB.	Replace the power supply PWB. See page 1-6-41.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
7001	**Toner motor 4 overcurrent detection error (black toner)** • The engine controller PWB (A0004) detected the overcurrent of toner motor 4.	Defective toner motor 4.	Replace the toner motor 4. See page See page 1-6-50.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Lump of toner inside black toner container or defectiveness of toner replenishment drive system.	Replace the black toner container.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7002	**Toner motor 2 overcurrent detection error (cyan toner)** • The engine controller PWB (A0004) detected the overcurrent of toner motor 2.	Defective toner motor 2.	Replace the toner motor 2. See page 1-6-50.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Lump of toner inside cyan toner container or defectiveness of toner replenishment drive system.	Replace the cyan toner container.
7003	**Toner motor 1 overcurrent detection error (magenta toner)** • The engine controller PWB (A0004) detected the overcurrent of toner motor 1.	Defective toner motor 1.	Replace the toner motor 1. See page 1-6-50.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Lump of toner inside magenta toner container or defectiveness of toner replenishment drive system.	Replace the magenta toner container.
7004	**Toner motor 3 overcurrent detection error (yellow toner)** • The engine controller PWB (A0004) detected the overcurrent of toner motor 3.	Defective toner motor 3.	Replace the toner motor 3. See page 1-6-50.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Lump of toner inside yellow toner container or defectiveness of toner replenishment drive system.	Replace the yellow toner container.
7401	**Black developer unit non- installing error** • The toner sensor 4 inside the black developer unit did not output the density detection signal, judged the engine controller PWB (A0004) the black developer unit is not installed.	Defective harness of the toner sensor 4, defective connection of the connector between black developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 4, check the connection of the connector with the black developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 4.	Replace the black developer unit. See page 1-6-12.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective engine relay PWB (A0009).	Replace the engine relay PWB (A0009).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7402	**Cyan developer unit non- installing error** • The toner sensor 2 inside the cyan developer unit did not output the density detection signal, judged the engine controller PWB (A0004) the cyan developer unit is not installed.	Defective harness of the toner sensor 2, defective connection of the connector between cyan developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 2, check the connection of the connector with the cyan developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 2.	Replace the cyan developer unit. See page 1-6-12.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective engine relay PWB (A0009).	Replace the engine relay PWB (A0009).
7403	**Magenta developer unit non- installing error** • The toner sensor 1 inside the magenta developer unit did not output the density detection signal, judged the engine controller PWB (A0004) the magenta developer unit is not installed.	Defective harness of the toner sensor 1, defective connection of the connector between magenta developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 1, check the connection of the connector with the magenta developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 1.	Replace the magenta developer unit. See page 1-6-12.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective engine relay PWB (A0009).	Replace the engine relay PWB (A0009).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7404	**Yellow developer unit non- installing error** • The toner sensor 3 inside the yellow developer unit did not output the density detection signal, judged the engine controller PWB (A0004) the yellow developer unit is not installed.	Defective harness of the toner sensor 3, defective connection of the connector between yellow developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 3, check the connection of the connector with the yellow developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 3.	Replace the yellow developer unit. See page 1-6-12.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective engine relay PWB (A0009).	Replace the engine relay PWB (A0009).
7411	**Black drum unit non- installing error** • The EEPROM (U401) on the drum PWB 4 (KP-972) inside the black drum unit does not communicate normally. The incompatible drum unit is installed to the printer.	Defective harness between drum PWB 4 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the black drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Installing the drum unit, which is incompatible with the printer specification.	Install the compatible drum unit to the printer.
		Defective drum PWB 4 (KP-972).	Replace the drum PWB 4 (KP-972).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7412	**Cyan drum unit non- installing error** • The EEPROM (U401) on the drum PWB 2 (KP-972) inside the cyan drum unit does not communicate normally. The incompatible drum unit is installed to the printer.	Defective harness between drum PWB 2 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the cyan drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Installing the drum unit, which is incompatible with the printer specification.	Install the compatible drum unit to the printer.
		Defective drum PWB 2 (KP-972).	Replace the drum PWB 2 (KP-972).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
7413	**Magenta drum unit non- installing error** • The EEPROM (U401) on the drum PWB 1 (KP-972) inside the magenta drum unit does not communicate normally. The incompatible drum unit is installed to the printer.	Defective harness between drum PWB 1 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the magenta drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Installing the drum unit, which is incompatible with the printer specification.	Install the compatible drum unit to the printer.
		Defective drum PWB 1 (KP-972).	Replace the drum PWB 1 (KP-972).
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7414	**Yellow drum unit non- installing error** • The EEPROM (U401) on the drum PWB 3 (KP-972) inside the yellow drum unit does not communicate normally. The incompatible drum unit is installed to the printer.	Defective harness between drum PWB 3 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the yellow drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Installing the drum unit, which is incompatible with the printer specification.	Install the compatible drum unit to the printer.
		Defective drum PWB 3 (KP-972).	Replace the drum PWB 3 (KP-972).
		Defective LED print heads relay PWB (A0008).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective LED print heads relay PWB (A0008).	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
		Defective harness (S02869) between engine controller PWB (A0004) and LED print heads relay PWB (A0008) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
7600	**Toner ID sensor error** • The detection signal of the toner ID sensor was abnormal value.	Defective toner ID sensor.	Replace the toner ID sensor.
		Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective harness (S02865) between engine controller PWB (A0004) and toner ID sensor or poor contact of the connector terminals.	Check the continuity of the harness (S02865), check the connection YC11 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
9530	**Backup data error** • The serial number of the machine written on the EEPROM of the engine controller PWB (A0004) differs with that is written on both the flash memory of the engine controller PWB (A0004) and the EEPROM of the drum PWB as a backup.	Replacing both the engine controller PWB (A0004) and the drum unit at the same time.	Check that the machine operates properly by reverting the engine controller and the drum unit to the old ones. To replace the engine controller PWB (A0004) and the drum unit at the same time, turn on the printer after replacing either one. Check that the printer operates properly and then turn off the printer. Replace the other and turn on the printer to check that the printer operates properly. Be sure to replace one by one.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
D020	**Engine firmware error** • Serious status inconsistency that is fatal to keep controlling in the engine firmware is detected.	Malfunction of the engine firmware or defective engine firmware.	Turn the power off/on to restart the printer. If the error is not resolved, check the update information on the engine firmware. Update the engine firmware as needed.
F0 (F000)	**Operation panel PWB communication error** • The operation panel PWB (A0007) does not communicate to the main contorller PWB (A0010*1/A0011*2) normally 30 seconds.	Defective main controller PWB (A0010*1/A0011*2).	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
		Defective operation panel PWB (A0007).	Replace the operation panel PWB (A0007).
F010	**System DIMM PWB checksum error** • The system DIMM PWB (A1137*1/KP-893*2) which sores the program checksum did not coincide.	Defective system DIMM PWB (A1137*1/KP-893*2).	Replace system DIMM PWB (A1137*1/KP-893*2).
		Defective main controller PWB (A0010*1/A0011*2).	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
F020	**Main controller PWB memory check error** • It could not access to the standard memory or the optional expanding memory ich are mounted on the main PWB (A0010*1/A0011*2) normally.	Defective main controller PWB (A0010*1/A0011*2).	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
		Defective expanding memory.	If the expanding memory is installed, after removing or replacing the expanding memory, do the operation check. If operation is normal, replace the expanding memory. See page 1-3-8.
F030	**Main controller PWB system error** • The error which is related to the system other than the error code F0 (F010) and F020 occurred.	Defective main controller PWB (A0010*1/A0011*2).	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
F040	**Engine controller PWB communication error** • The main controller PWB (A0010*1/A0011*2) does not communicate to the engine controller PWB (A0004) normally.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
		Defective main controller PWB (A0010*1/A0011*2).	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
F050	**Engine controller PWB flash ROM error** • Abnormality occurring in the flash ROM which is mounted on the engine controller PWB (A0004), the main controller PWB (A0010*1/A0011*2) received notification.	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.

*1: 16 ppm printer, *2: 24 ppm printer

1-5-3 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) "Close top cover" display is not cancelled to closing the top cover.	Right edge of the top cover floating, it is not closed completely.	Close the top cover securely.
	Defective top cover switch 2.	Replace the top cover switch 2.
	Defective top cover/paper feed unit switch (SW701) of the sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Defective harness (S02880) between engine controller PWB (A0004) and top cover switch 2 or poor contact of the connector terminals.	Check the continuity of the harness (S02880), check the connection YC11 connector of the engine controller PWB (A0004), if there is trouble, remedy or replace.
	Malfunctioning interlock rod that interfaces between the top cover and the top cover/paper feed unit switch (SW701).	Check to see if the interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
	Defective harness (S02849) between engine controller PWB (A0004) and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (A0004), check the connection YC701 and YC702 connectors of the sensor PWB (A0001), if there is trouble, remedy or replace.
(2) "Close side cover" display is not cancelled to closing the top cover.	Defective side cover switch (SW702) of the sensor PWB (A0001).	Replace the sensor PWB (A0001).
	The actuator of the side cover switch (SW702) of the sensor PWB (A0001) is bent.	Check the bending of the actuator of the side cover switch, if there is trouble, remedy or replace.
	Defective sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
	Defective harness (S02849) between engine controller PWB (A0004) and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (A0004), check the connection YC701 and YC702 connectors of the sensor PWB (A0001), if there is trouble, remedy or replace.

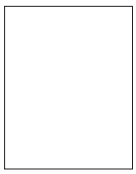
Problem	Causes	Check procedures/corrective measures
(3) "Close paper transfer unit" display is not cancelled to closing the paper feed unit.	Defective top cover/paper feed unit switch (SW701) of the sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Malfunctioning interlock rod that interfaces between the top cover and the top cover/paper feed unit switch (SW701).	Check to see if the interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
	Defective harness (S02849) between engine controller PWB (A0004) and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (A0004), check the connection YC701 and YC702 connectors of the sensor PWB (A0001), if there is trouble, remedy or replace.
(4) "Cassette 1 not loaded" display is not cancelled to closing the paper cassette.	Defective cassette size switch.	Replace the cassette size switch.
	Defective sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Defective harness (S02861) between cassette size switch and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02861), check the connection YC703 connector of sensor PWB (A0001), if there is trouble, remedy or replace.
	Defective harness (S02849) between engine controller PWB (A0004) and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (A0004), check the connection YC701 and YC702 connectors of the sensor PWB (A0001), if there is trouble, remedy or replace.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
(5) "Check waste toner box" display is not cancelled to replacing the waste toner box.	The waste toner full sensor or the waste toner full sensor [PWB] (KP-974) the sensor section is dirty.	Replace the waste toner full sensor or the waste toner full sensor [PWB] (KP-974).
	Defective harness (S02863) between bias high voltage PWB (KP-980) and waste toner full sensor [PWB] (KP-974) or poor contact of the connector terminals.	Check the continuity of the harness (S02863), check the connection of YC802 connector of the bias high voltage PWB (KP-980), check the connection of YC682 connector of the waste toner full sensor [PWB] (KP-974) if there is trouble, remedy or replace.
	Defective harness (S02862) between waste toner full sensor and waste toner full sensor [PWB] (KP-974) or poor contact of the connector terminals.	Check the continuity of the harness (S02862), check the connection YC681 connector of the waste toner full sensor [PWB] (KP-974), if there is trouble, remedy or replace.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.

Problem	Causes	Check procedures/corrective measures
(6) The paper size is not recognized as the size set with the paper size dial.	Defective cassette size switch.	Replace the cassette size switch.
	Defective sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Defective harness (S02861) between cassette size switch and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02861), check the connection YC703 connector of sensor PWB (A0001), if there is trouble, remedy or replace.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
(7) Paper misfeed display is not cancelled.	Defective registration sensor.	Replace the sensor PWB (A0001).
	Defective sensor PWB (A0001).	Replace the sensor PWB (A0001).
	Defective harness (S02849) between engine controller PWB (A0004) and sensor PWB (A0001) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (A0004), check the connection YC701 and YC702 connectors of the sensor PWB (A0001), if there is trouble, remedy or replace.
	Defective exit sensor.	Replace the fuser PWB (KP-970*[1]/A0003*[2]).
	Defective harness (S02849) between fuser PWB (KP-970*[1]/A0003*[2]) and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC691 connector of the fuser PWB (KP-970*[1]/A0003*[2]), if there is trouble, remedy or replace.
	Defective harness (S02853) between power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
	Defective engine controller PWB (A0004).	Replace the engine controller PWB (A0004). See page 1-6-41.
	Defective power supply PWB.	Replace the power supply PWB. See page 1-6-41.

*[1]: 16 ppm printer, *[2]: 24 ppm printer

1-5-4 Image formation problems

(1) No image appears (entirely white).



See page 1-5-25.

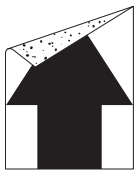
(2) No image appears (entirely black).

See page 1-5-25.

(3) A specific color is printed solid.

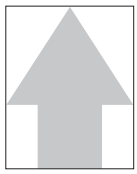
See page 1-5-26.

(4) The back side gets dirty.



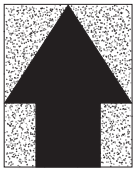
See page 1-5-26.

(5) Image is too light.



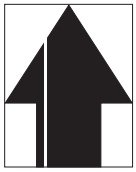
See page 1-5-27.

(6) The background is colored.



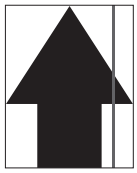
See page 1-5-28.

(7) White streaks are printed vertically.



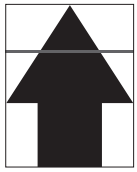
See page 1-5-29.

(8) Black streaks are printed vertically.



See page 1-5-30.

(9) Streaks are printed horizontally.



See page 1-5-30.

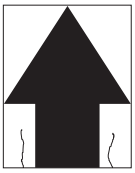
(10) Spots are printed.

See page 1-5-31.

(11) The leading edge of image begins to print too early or too late.

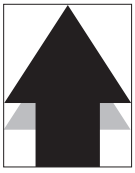
See page 1-5-31.

(12) Paper is wrinkled.



See page 1-5-32.

(13) Offset occurs.

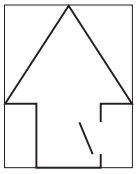


See page 1-5-32.

(14) Part of image is missing.

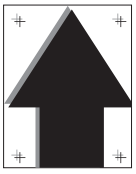
See page 1-5-32.

(15) Fusing is loose.



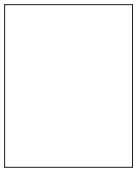
See page 1-5-33.

(16) Colors are printed offset to each other.



See page 1-5-33.

(1) No image appears (entirely white).



Causes
1. The LED print head has not done functioning.
2. Defective developing sleeve bias or developing magnet bias output.
3. Defective secondary transfer bias output.
4. Malfunction of the developer installation.

Causes	Check procedures/corrective measures
1. The LED print head has not done functioning.	
A. Defective FFC connection to the LED print heads relay PWB.	Check the FFC connection to the LED print heads relay PWB. (Do not attempt to disconnect/connect the FFC while power is on.) See page 1-6-15 [20].
B. Defective FFC connection to the LED print head.	Check the FFC connection to the LED print head. See page 1-6-15 [18].
C. Defective main controller PWB.	Replace the main controller PWB (A0010*[1]/A0011*[2]). See page 1-6-40.
D. Defective LED print heads relay PWB.	Replace the LED print heads relay PWB (A0008). See page 1-6-44.
2. Defective developing sleeve bias or developing magnet bias output.	
A. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
B. Defective main high voltage PWB.	Replace the main high voltage PWB. See page 1-6-45.
3. Defective secondary transfer bias output.	
A. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB. See page 1-6-46.
4. Malfunction of the developer installation.	Reinstall the developer. See page 1-6-12.

*1: 16 ppm printer, *2: 24 ppm printer

(2) No image appears (entirely black).

Causes
1. No main charging.
2. Defective LED print heads relay PWB.

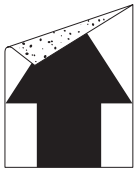
Causes	Check procedures/corrective measures
1. No main charging.	
A. Poor contact of output terminal of main high voltage PWB.	Check the installation of the main high voltage PWB, If it installation incorrectly, reinstall it. See page 1-6-45.
B. Defective main high voltage PWB.	Replace the main high voltage PWB. See page 1-6-45.
C. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
2. Defective LED print heads relay PWB.	Replace the LED print heads relay PWB (A0008). See page 1-6-44.

(3) A specific color is printed solid.

Causes
1. Defective main charger unit which corresponds to the color causing the problem.
2. Disconnected main charger wire.

Causes	Check procedures/corrective measures
1. Defective main charger unit which corresponds to the color causing the problem.	Check if the main charger unit is properly seated. If necessary, reseat it properly.
2. Disconnected main charger wire.	Replace main charger unit.

(4) The back side gets dirty.

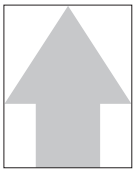


Causes
1. Dirty secondary transfer roller.
2. Dirty paper conveying path of the paper feed unit.
3. Dirty heat roller and press roller*1/belt*2.

Causes	Check procedures/corrective measures
1. Dirty secondary transfer roller.	Clean the secondary transfer roller.
2. Dirty paper conveying path of the paper feed unit.	Clean the paper conveying path of the paper feed unit.
3. Dirty heat roller and press roller*1/belt*2.	Clean the heat roller and press roller*1/belt*2. See page 1-4-18.

*1: 16 ppm printer, *2: 24 ppm printer

(5) Image is too light.

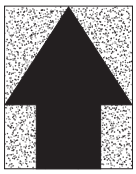


Causes
1. Defective developing bias output.
2. Dirty drum.
3. Defective color calibration.
4. Dirty SELFOC lens of LED print head.

Causes	Check procedures/corrective measures
1. Defective developing bias output.	
A. Defective developer.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the developer for that color. See pages 1-4-14, 1-6-12.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB. See page 1-6-46.
C. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
D. Defective main controller PWB.	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
E. Defective drum unit.	Replace the drum unit. See page 1-6-13.
2. Dirty drum.	Perform the drum surface refreshing. See page 1-4-17.
3. Defective color calibration.	
A. Dirty sensing surface of the toner ID sensor.	Clean the sensing surface of the toner ID sensor.
B. The printer environment considerably changed since an automatic calibration was made.	Perform the color calibration of service mode. See page 1-4-14.
4. Dirty SELFOC lens of LED print head.	Clean the SELFOC lens of LED print head by using lens cleaner.

*1: 16 ppm printer, *2: 24 ppm printer

(6) The background is colored.



Causes
1. Defective developing sleeve bias output.
2. Defective primary transfer cleaning unit.
3. Defective color calibration.

Causes	Check procedures/corrective measures
1. Defective developing sleeve bias output.	
A. Defective developer.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the developer for that color. See pages 1-4-14, 1-6-12.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB. See page 1-6-46.
C. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
D. Defective main controller PWB.	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-40.
E. Defective drum unit.	Replace the drum unit. See page 1-6-13.
2. Defective primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-24.
3. Defective color calibration.	
A. Dirty sensing surface of the toner ID sensor.	Clean the sensing surface of the toner ID sensor.
B. The printer environment considerably changed since an automatic calibration was made.	Perform the color calibration of service mode. See page 1-4-14.

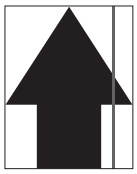
*1: 16 ppm printer, *2: 24 ppm printer

(7) White streaks are printed vertically.

Causes
1. Defective LED print head output.
2. Defective main charging output.
3. Foreign object in one of the developers.
4. Adhesion of soiling to primary transfer belt.

Causes	Check procedures/corrective measures
1. Defective LED print head output.	
A. Poor insertion of LED cleaner.	Check if the LED cleaner unit is properly seated. If necessary, reseat it properly.
B. Dirty SELFOC lens of LED print head.	Clean the SELFOC lens of LED print head by using lens cleaner.
C. Focus is lost with the LED print head.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the LED print head for that color. See page 1-4-14, 1-6-15).
D. Defective LED print head.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the LED print head for that color. See page 1-4-14, 1-6-15).
2. Defective main charging output.	
A. Adhesion of oxide to main charger wire.	Clean the main charger wire by using main charger wire cleaner.
B. Dirty main charger grid.	Clean the main cherger grid by using main charger grid cleaner.
C. Dirty main charger shield.	Replace the main charger unit.
3. Foreign object in one of the developers.	Check the image by using the test print of service mode. If the white line appears on a particular page, replace the developer for that color (See page 1-4-14, 1-6-12).
4. Adhesion of soiling to primary transfer belt.	Replace the primary transfer unit. See page 1-6-22.

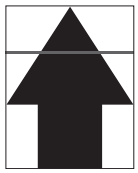
(8) Black streaks are printed vertically.



Causes
1. Dirty main charger wire.
2. Poor insertion of the main charger wire cleaner.
3. Dirty or flawed drum.
4. Deformed or worn cleaning blade in the drum unit.
5. Defect fur brush of the primary transfer cleaning unit.
6. Worn primary transfer belt.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Clean the main charger wire by using main charger wire cleaner.
2. Poor insertion of the main charger wire cleaner.	Check if the main charger wire cleaner is properly seated. If necessary, reseat it properly.
3. Dirty or flawed drum.	
A. Dirty drum.	Perform the drum surface refreshing. See page 1-4-17.
B. Flawed drum.	Replace the drum unit. See page 1-6-13.
4. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-13.
5. Defect fur brush of the primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-24.
6. Worn primary transfer belt.	Replace the primary transfer unit. See page 1-6-22.

(9) Streaks are printed horizontally.



Causes
1. Poor contact of output terminal of main charger unit.
2. Poor contact of grounding terminal of drum unit.
3. Poor contact of developing bias terminal of developer.

Causes	Check procedures/corrective measures
1. Poor contact of output terminal of main charger unit.	Insert the main charger unit properly.
2. Poor contact of grounding terminal of drum unit.	Replace the drum unit. See page 1-6-13.
3. Poor contact of developing bias terminal of developer.	Replace the developer. See page 1-6-12.

(10) Spots are printed.

Causes
1. Dirty or flawed drum.
2. Deformed or worn cleaning blade in the drum unit.
3. Defect fur brush of the primary transfer cleaning unit.
4. Flawed developing sleeve roller.
5. Dirty heat roller and press roller*1/belt*2.

Causes	Check procedures/corrective measures
1. Dirty or flawed drum.	Perform the drum surface refreshing. See page 1-4-17.
2. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-13.
3. Defect fur brush of the primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-24.
4. Flawed developing sleeve roller.	Replace the developer. See page 1-6-12.
5. Dirty heat roller and press roller*1/belt*2.	Clean the heat roller and press roller*1/belt*2. See page 1-4-18.

*1: 16 ppm printer, *2: 24 ppm printer

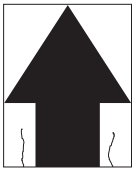
(11) The leading edge of image begins to print too early or too late.

Causes
1. Registration clutch operating incorrectly.
2. Defective engine controller PWB.
3. Defective main controller PWB.

Causes	Check procedures/corrective measures
1. Registration clutch operating incorrectly.	Check the installation of the registration clutch. If it operates incorrectly, replace it.
2. Defective engine controller PWB.	Replace the engine controller PWB (A0004). See page 1-6-41.
3. Defective main controller PWB.	Replace the main controller PWB (A0010*1/A0011*2). See page 1-6-34.

*1: 16 ppm printer, *2: 24 ppm printer

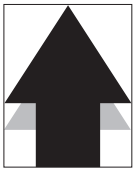
(12) Paper is wrinkled.



Causes
1. Paper curled.
2. Paper damp.

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

(13) Offset occurs.



Causes
1. Deformed or worn cleaning blade in the drum unit.
2. Wrong types of paper.

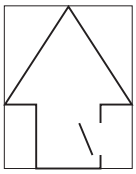
Causes	Check procedures/corrective measures
1. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-13.
2. Wrong types of paper.	Check if the paper meets specifications. Replace paper.

(14) Part of image is missing.

Causes
1. Paper damp.
2. Paper creased.
3. Drum condensation.
4. Flawed drum.
5. Flawed primary transfer belt.

Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions, replace the paper.
2. Paper creased.	Replace the paper.
3. Drum condensation.	Perform the drum surface refreshing. See page 1-4-17.
4. Flawed drum.	Replace the drum unit. See page 1-6-13.
5. Flawed primary transfer belt.	Replace the primary transfer unit. See page 1-6-22.

(15) Fusing is loose.

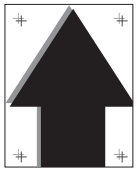


Causes
1. Wrong types of paper.
2. Defective pressure for the heat roller and press roller (press belt).
3. Flawed heat roller or press roller*1/belt*2.

Causes	Check procedures/corrective measures
1. Wrong types of paper.	Check if the paper meets specifications, replace paper.
2. Defective pressure for the heat roller and press roller*1/belt*2.	Check the fuser pressure springs. See page 1-6-26 [28] or 1-6-33 [37].
3. Flawed heat roller or press roller*1/belt*2.	Replace the heat roller and press roller*1/belt*2. See page 1-6-26 or 33.

*1: 16 ppm printer, *2: 24 ppm printer

(16) Colors are printed offset to each other.



Causes
1. The drum unit is not properly seated in its position.
2. The primary transfer belt is not in its proper position or the primary transfer unit is defective.

Causes	Check procedures/corrective measures
1. The drum unit is not properly seated in its position.	Perform the color registration to correct (Refer to operation guide).
2. The primary transfer belt is not in its proper position or the primary transfer unit is defective.	Confirm the position of the primary transfer belt. Check the primary transfer unit. Replace the primary transfer unit. See page 1-6-22.

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1-6-1 Precautions for assembly and disassembly

(1) Precautions

Be sure to turn the power switch off and disconnect the power plug before starting disassembly.
When handling PWBs, do not touch connectors with bare hands or damage the PWB.
Do not touch any PWB containing ICs with bare hands or any object prone to static charge.
Use only the specified parts to replace the fixing unit thermostat. Never substitute electric wires, as the printer may be seriously damaged.
When removing the hook of the connector, be sure to release the hook.

1-6-2 Outer covers

(1) Detaching and refitting the top cover

Procedure

1. Open the rear cover.
2. Open the top cover.
3. Remove the opening and closing axis from the main unit frame and then remove the upper cover.

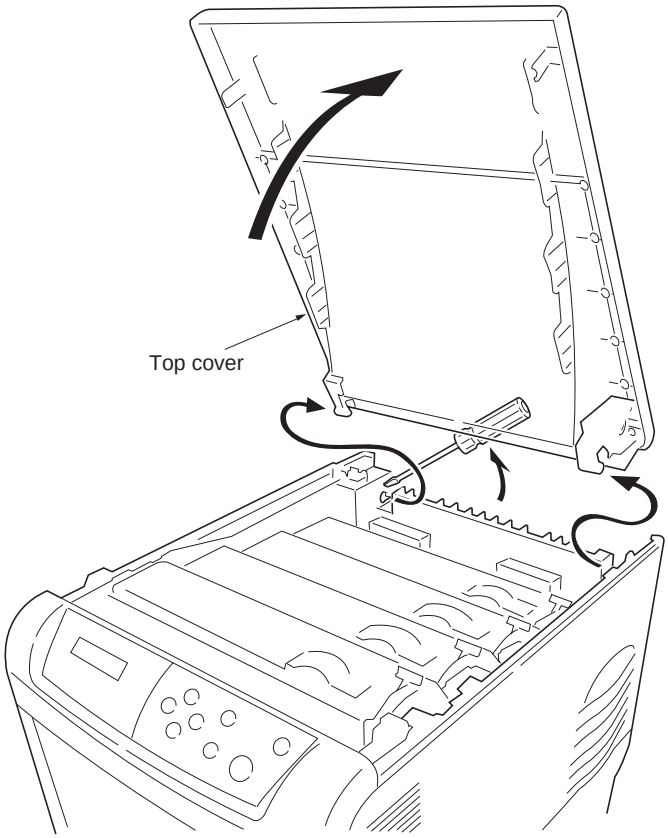


Figure 1-6-1

(2) Detaching and refitting the rear cover

Procedure

1. Open the rear cover.
2. Remove the opening and closing axis from the main unit frame and then remove the rear cover.

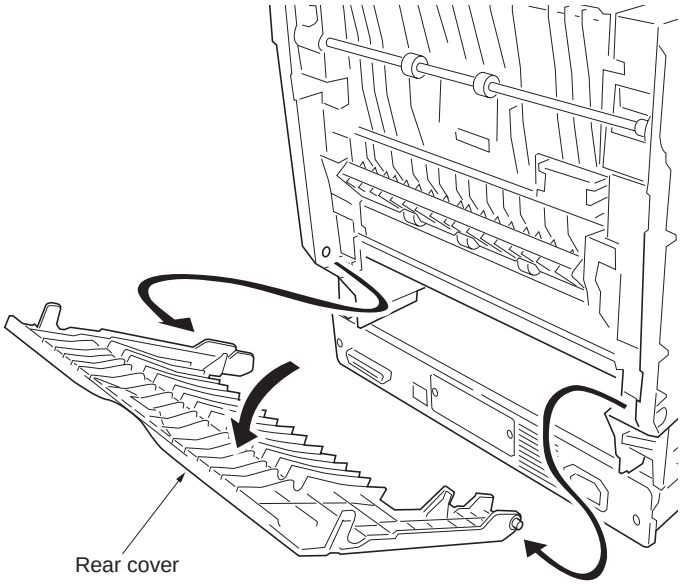


Figure 1-6-2

(3) Detaching and refitting the right cover

Procedure

1. Remove the top cover (See page 1-6-2).
2. Remove the one screw.

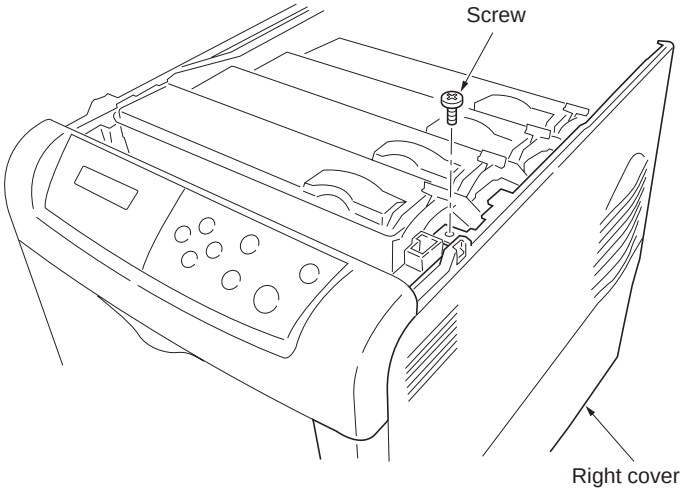


Figure 1-6-3

3. Remove the paper feed unit (See page 1-6-6).
4. Using a flat blade screwdriver, unlatch the right cover at the nine positions as shown in the diagram.

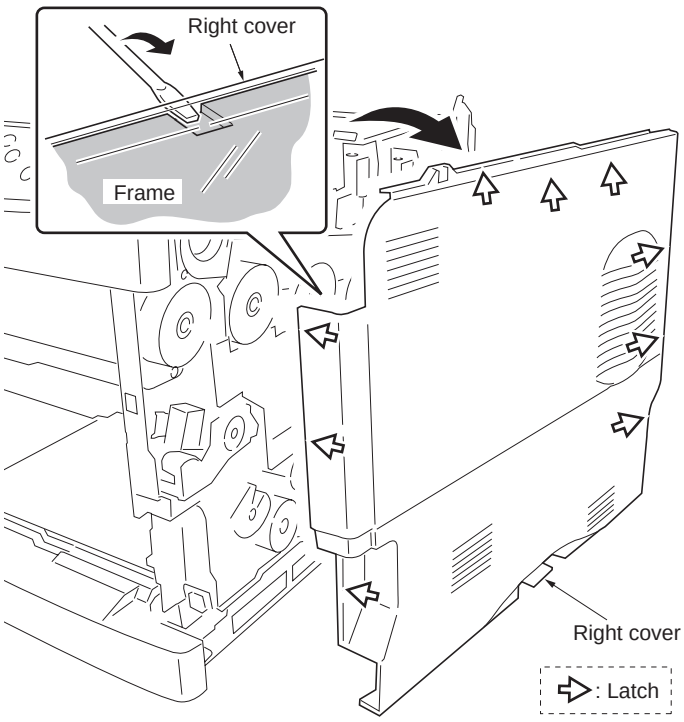


Figure 1-6-4

(4) Detaching and refitting the left cover

Procedure

1. Remove the top cover (See page 1-6-2).
2. Open the left side cover and then remove the one screw.
3. Remove the waste toner box. To remove waste toner box, press the lock lever in.

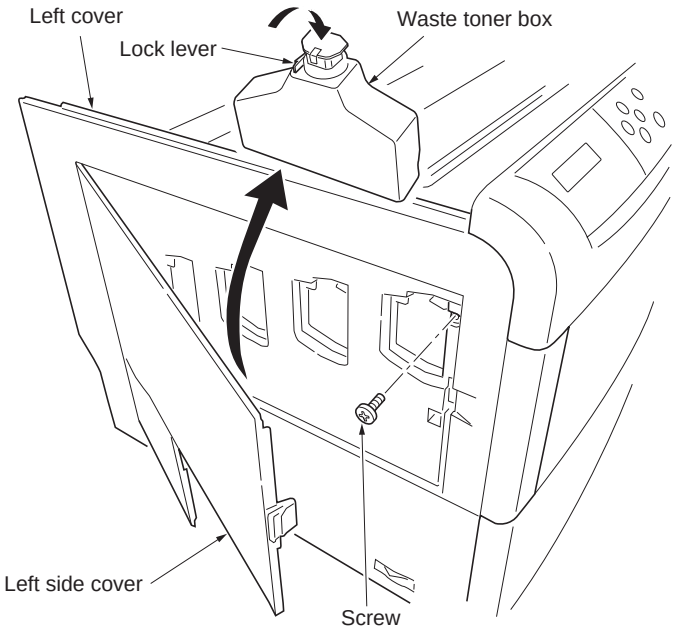


Figure 1-6-5

4. Remove the paper feed unit (See page 1-6-6).
5. Using a flat blade screwdriver, unlatch the right cover at the nine positions as shown in the diagram.

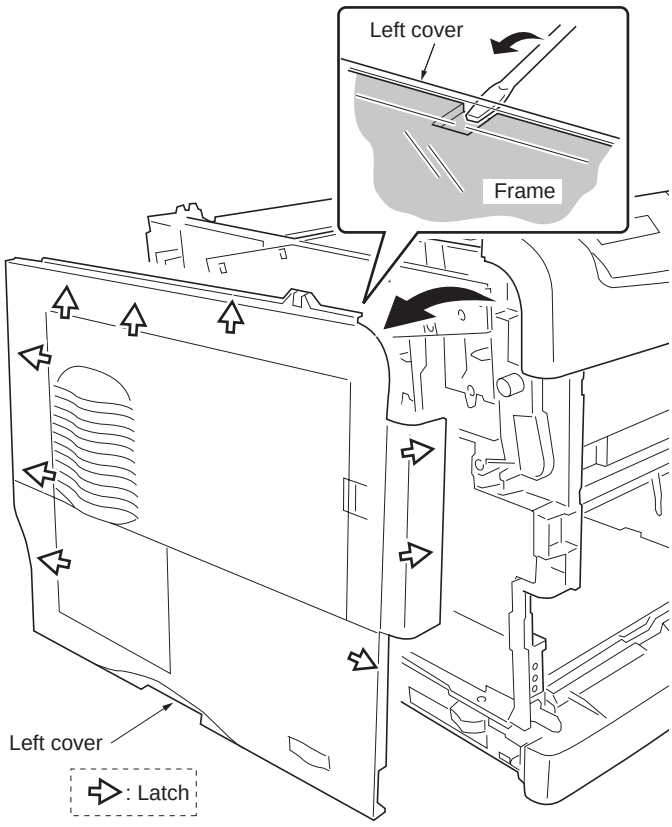


Figure 1-6-6

1-6-3 Paper feed unit

(1) Detaching and refitting the paper feed unit

Procedure

1. Pull out the paper feed unit until stop.
2. While pressing the left and right lock release buttons and then remove the paper feed unit.

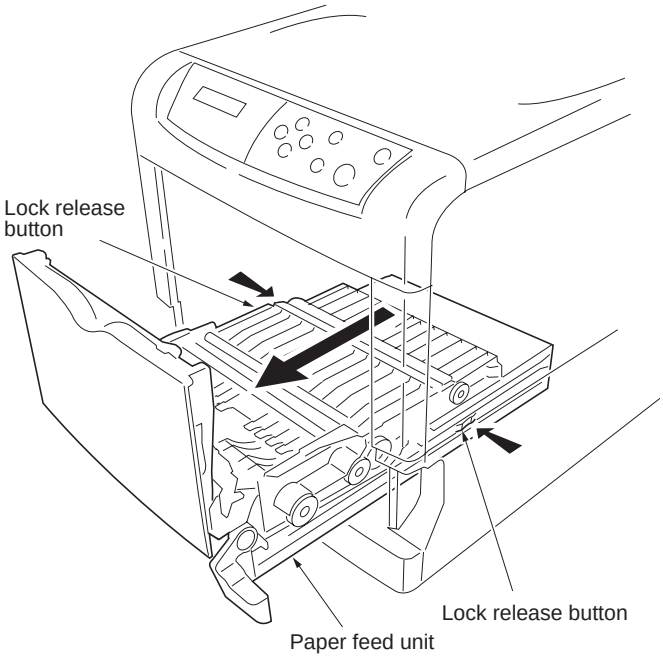


Figure 1-6-7

(2) Detaching and refitting the paper feed roller

Procedure

1. Remove the paper feed unit (See previous page).
2. Turn over the paper feed unit.
3. While pushing the lock release buttons and then detach the joint.
4. Unlatch the latches and then remove paper feed roller unit.

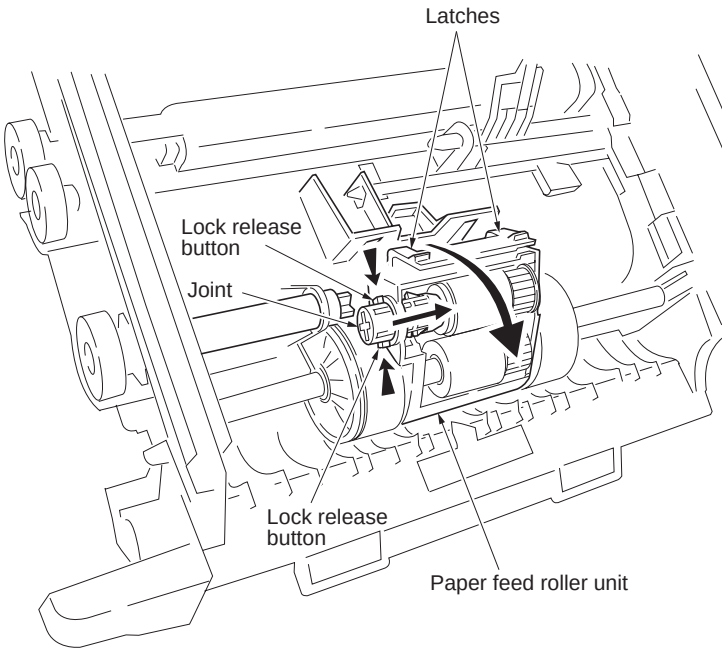


Figure 1-6-8

5. Unlatch the three latches and then remove the feed bracket cover.
6. Remove the feed roller and pickup roller.

* The one-way clutch is built in to the pickup gear Z32S. When the pickup gear Z32S is installed again, the surface of one-way clutch side is directed to feed bracket cover side.

7. Check or replace the feed roller and then refit all the removed parts.

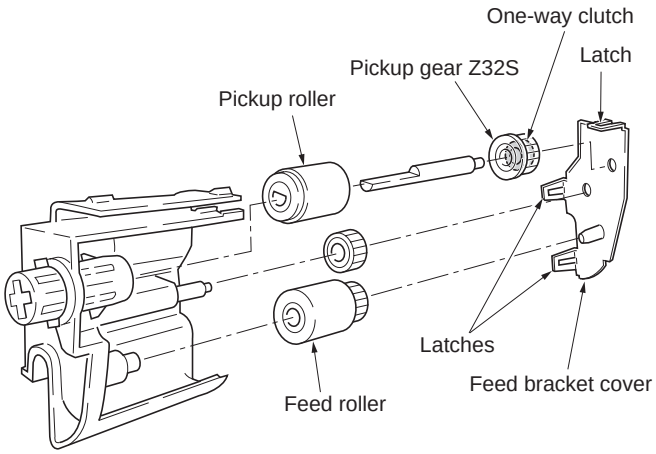


Figure 1-6-9

(3) Detaching and refitting the retard roller

Procedure

1. Remove the paper cassette.
2. Unlatch the two latches and then remove the retard roller holder.
3. Remove the retard roller from retard roller holder.
4. Check or replace the retard roller and then refit all the removed parts.

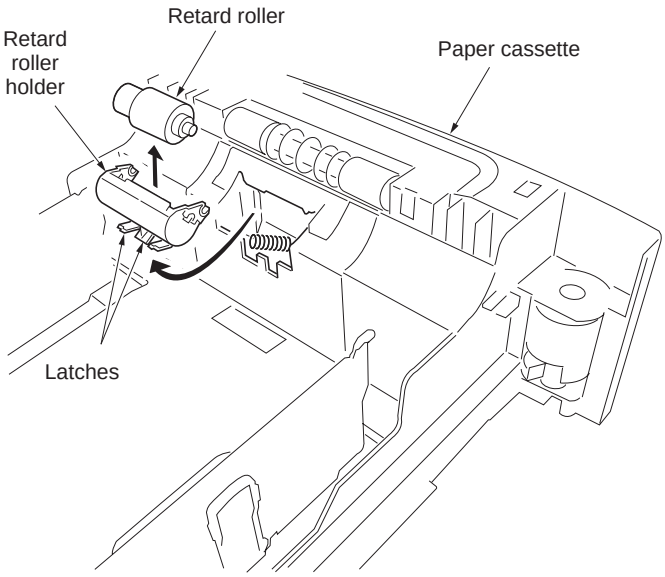


Figure 1-6-10

(4) Detaching and refitting the secondary transfer roller

Procedure

1. Remove the paper feed unit (See page 1-6-6).
2. Removing the hook by sliding and then remove the paper chute.
3. Remove the secondary transfer roller.
4. Remove the transfer roller gear.
5. Check or replace the secondary transfer roller and then refit all the removed parts.

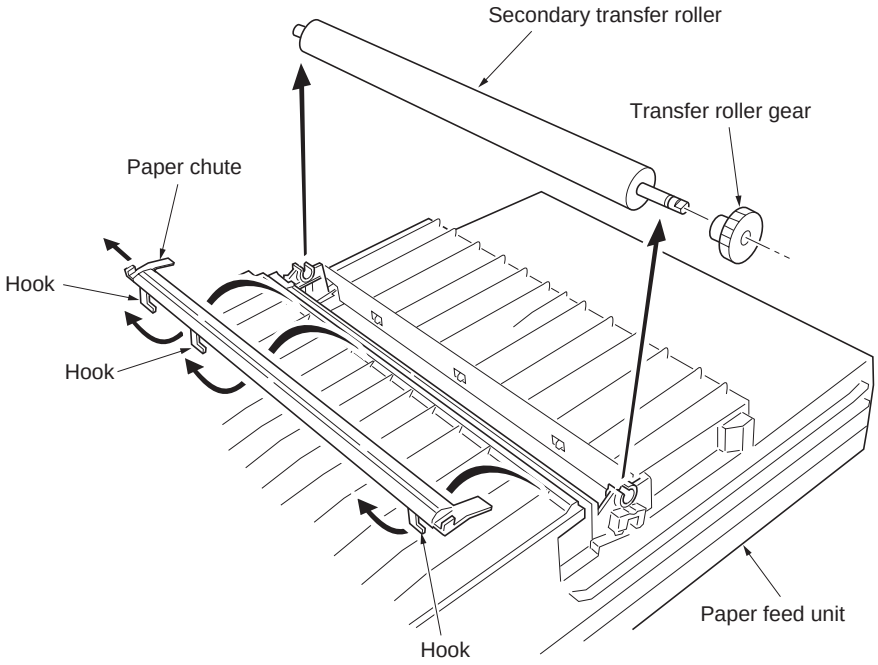


Figure 1-6-11

1-6-4 MP tray feed unit

(1) Detaching and refitting the MP tray feed unit

Procedure

1. Remove the paper feed unit (See page 1-6-6).
2. Remove the paper right cover (See page 1-6-4).
3. Remove the main high voltage PWB (See page 1-6-45).
4. Remove the paper feed drive unit (See page 1-6-48).
5. While pushing the two latches from inside the main unit frame and then remove the MP tray feed unit.
6. Check or replace the MP tray feed unit and then refit all the removed parts.

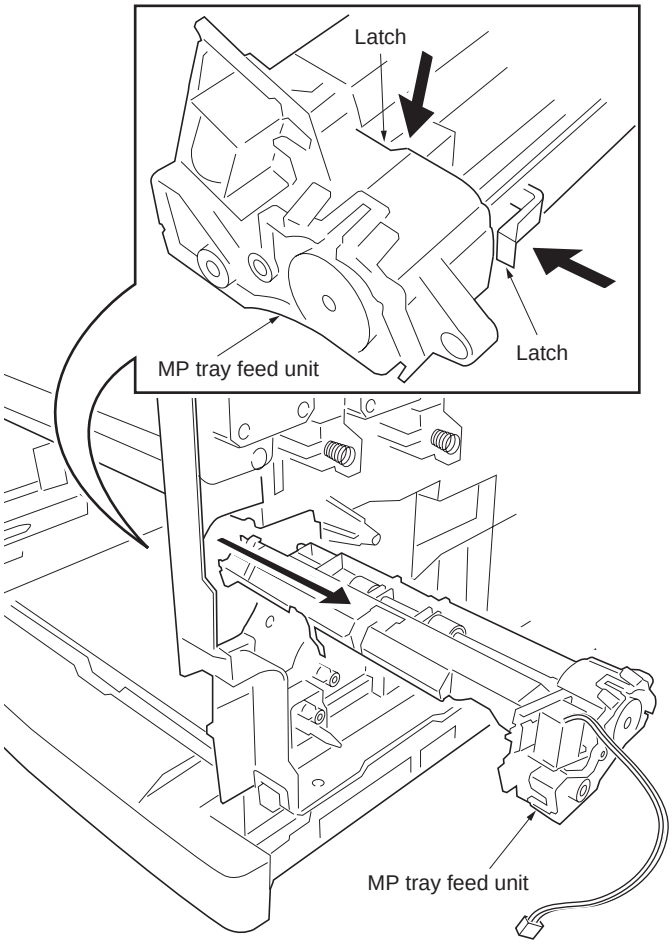


Figure 1-6-12

(2) Detaching and refitting the MP tray feed roller

Procedure

1. Remove the paper feed unit (See page 1-6-6).
2. Pull up the MP tray holder and then sliding do.
3. Remove the MP tray feed roller.
4. Check or replace the MP tray feed roller and then refit all the removed parts.

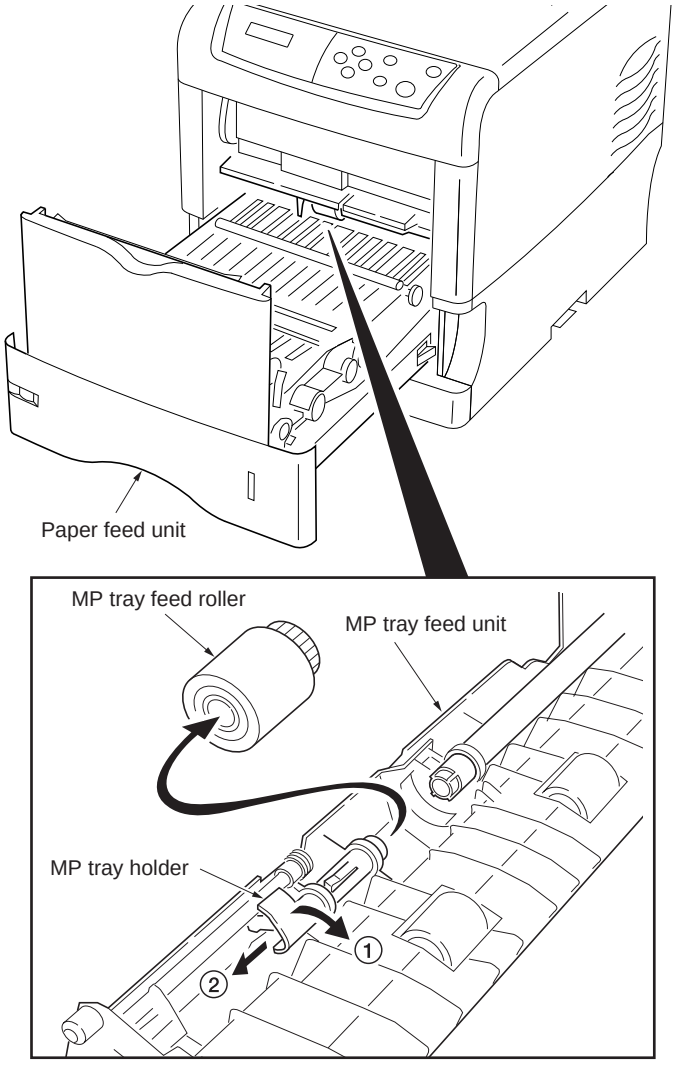


Figure 1-6-13

1-6-5 Developing section

(1) Detaching and refitting the developer unit

Procedure

1. Open the top cover.
2. Remove the one connector.
3. While releasing two release levers and then remove the developer unit. (Use the same procedure for other developers.)

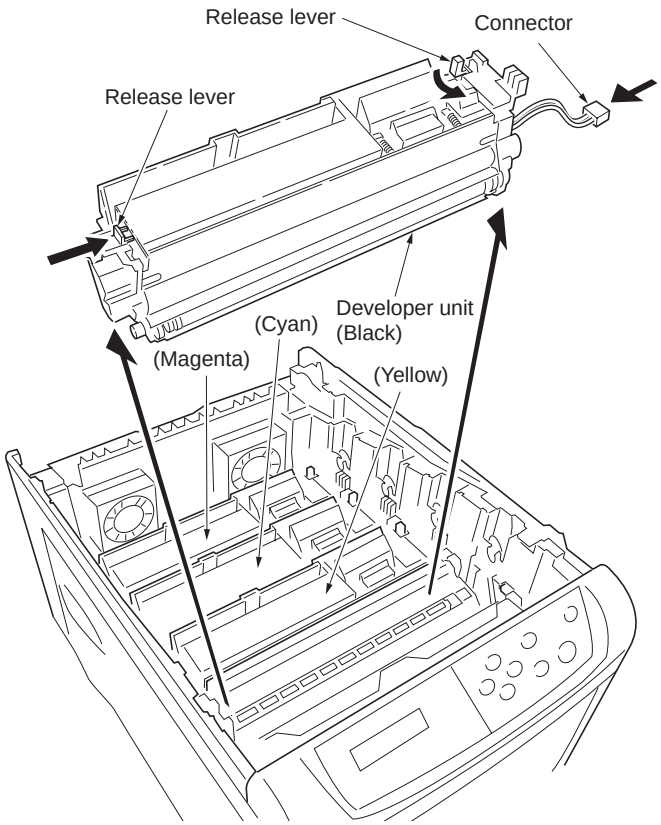


Figure 1-6-14

1-6-6 Drum section

(1) Detaching and refitting the drum unit

To replace the drum unit and the engine controller PWB at the same time, turn on the printer after replacing either one. Check that the printer operates properly and then turn off the printer. Replace the other and turn on the printer to check that the printer operates properly. Be sure to replace one by one. Refer to self-diagnostic code 9530 (See page 1-5-19).

Procedure

1. Remove the developer unit (See previous page).
2. Remove the each connector cover.
3. Remove the FFC-a and FFC-b from the FFC connectors.
4. Remove the one connector.

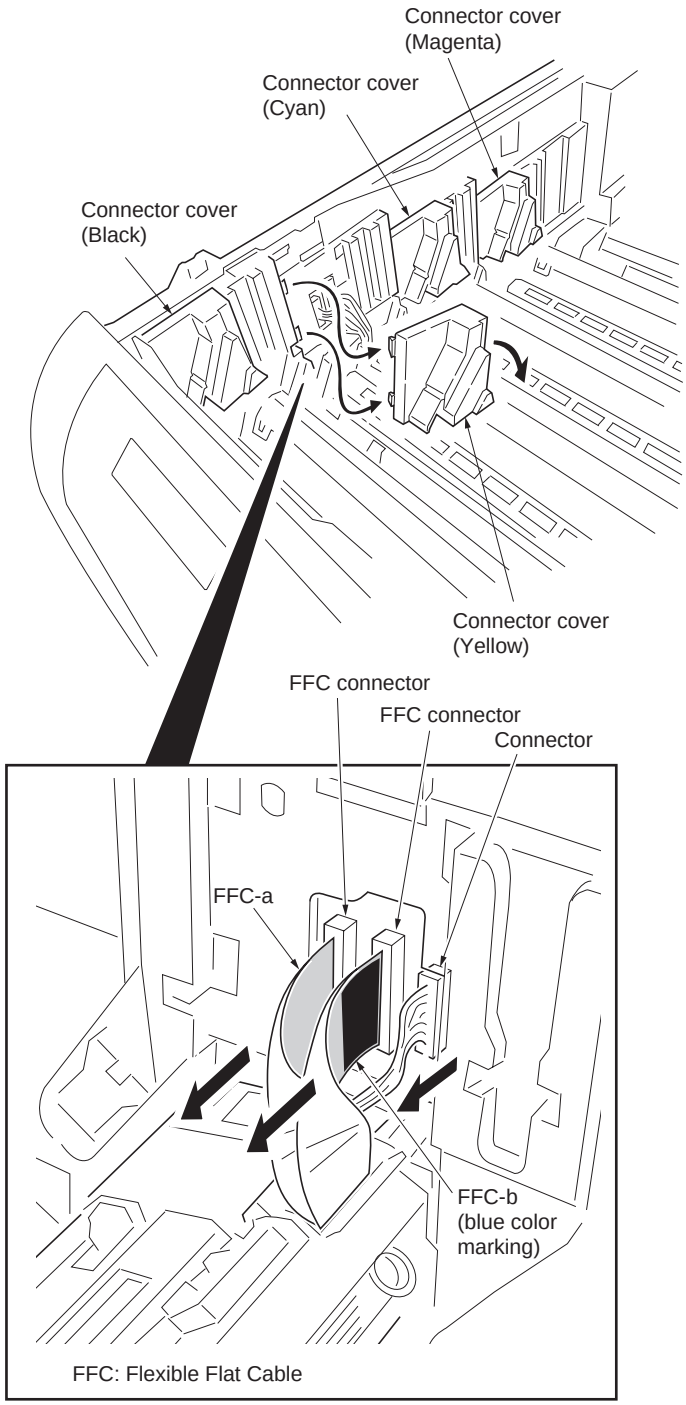
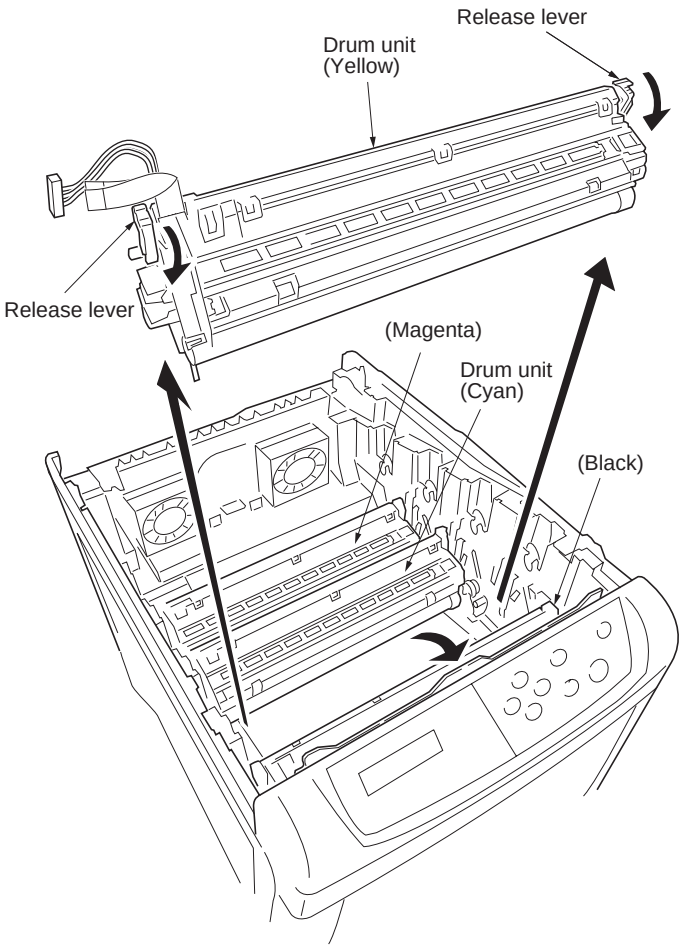


Figure 1-6-15

5. While releasing two release levers and then remove the drum unit. (also 4 colors with the same procedure, there is no order.)
6. Check or replace the drum unit and then refit all the removed parts.



NOTE: When refitting the drum unit, insert the FFC straightly to the FFC connector when connecting the FFC.

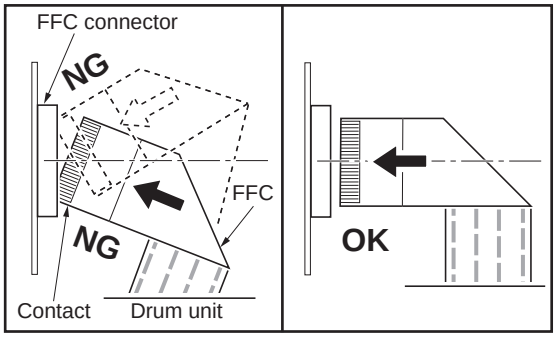


Figure 1-6-16

(2) Replacing the LED print head and drum unit

Replacement kit (packing contents)

Drum unit

Item \ Kit	16 ppm printer	24 ppm printer	Remark
	DK-510	DK-520	
① Drum unit	1	1	
② FFC (white)	1	1	
③ FFC (blue)	1	1	
④ FFC (blue)		1	With conductive tape (for black)

LED print head

Item \ Kit	16 ppm printer	24 ppm printer	Remark
	LK-510	LK-520	
⑤ LED print head	1	1	
② FFC (white)	1	1	
③ FFC (blue)	1	1	
④ FFC (blue)		1	With conductive tape (for black)

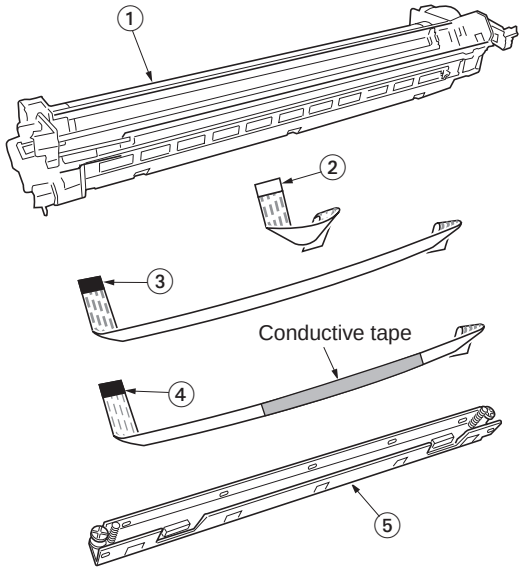


Figure 1-6-17 Packing items

Procedure

1. Switch off the printer.
2. Open the top cover.
3. Remove the toner containers and developer units.
4. Remove the drum unit connector cover for the color to be replaced.

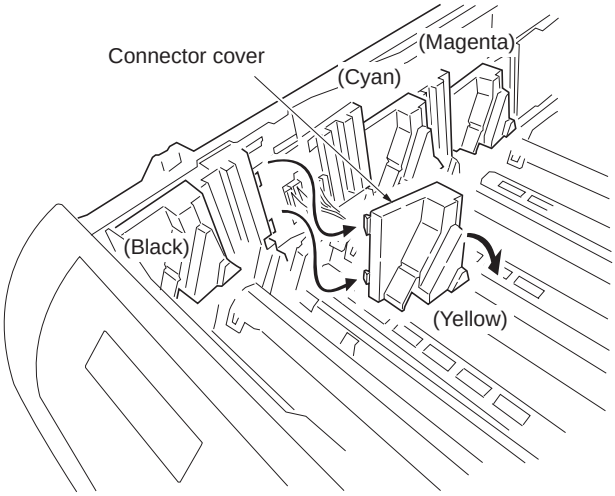


Figure 1-6-18

5. Remove two Flexible Flat Cables (FFCs) and one connector.

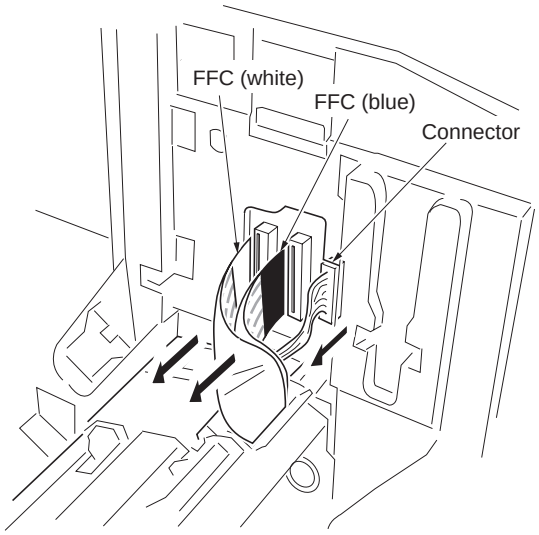


Figure 1-6-19

6. Turn the release lever and remove the drum unit.

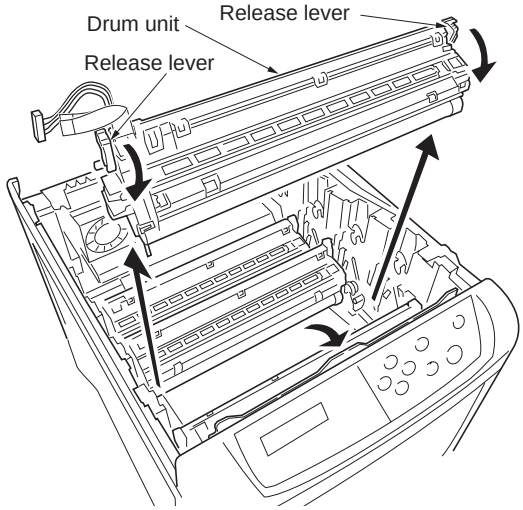


Figure 1-6-20

7. Remove the three hooks and then remove the LED print head cover from the drum unit.
8. Remove the FFCs form the LED print head cover.

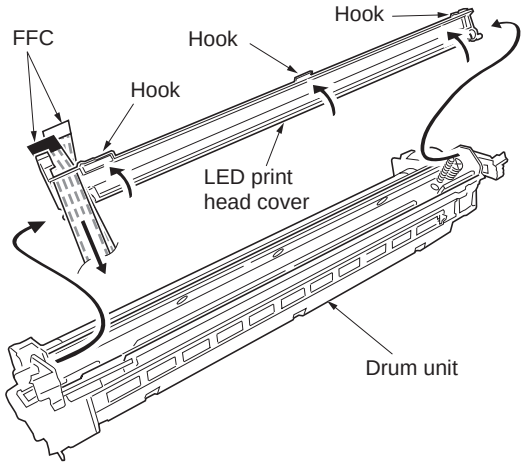


Figure 1-6-21

9. Remove the LED print head from the drum unit.
   Caution: When handling the LED heads, discharge the body of static electricity by using an anti-static wrist strap band or anti-static globes.
   Note: Do not touch the pins (painted red).

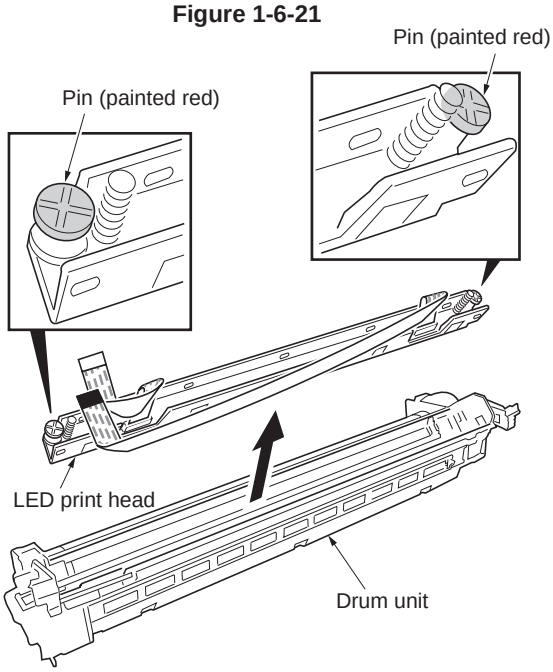


Figure 1-6-22

10. Unlock the connector hook on the LED print head and then pull the white FFC out.
11. Using the same procedure, pull the blue FFC out.

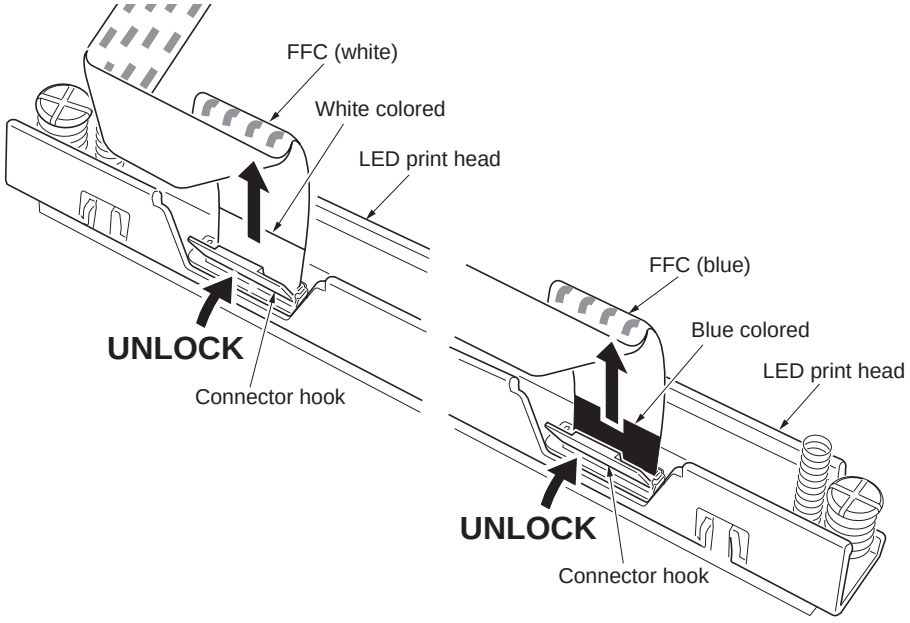
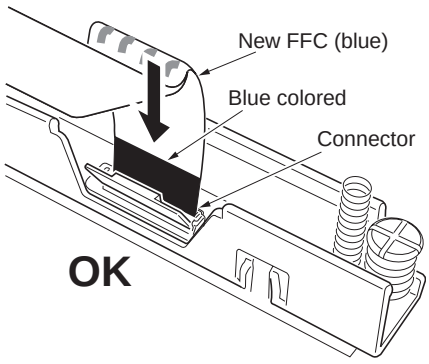


Figure 1-6-23

12. Insert the new blue FFC vertically into the connector. Ensure the FFC is in line with the connector and not slanted.
    The contact side of the FFC is opposite the connector hook.
    Note: Only for black drum unit of 24 ppm printer, apply the new blue FFC with conductive tape.



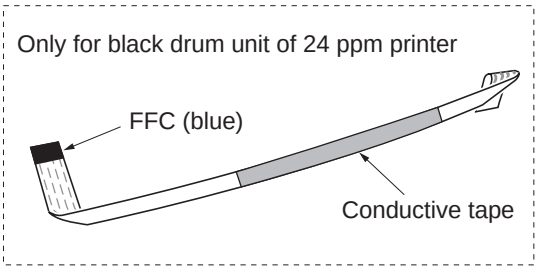


Figure 1-6-24

13. Turn the connector hook down to lock the new blue FFC.
14. Using the same procedure, connect the new white FFC to the connector.

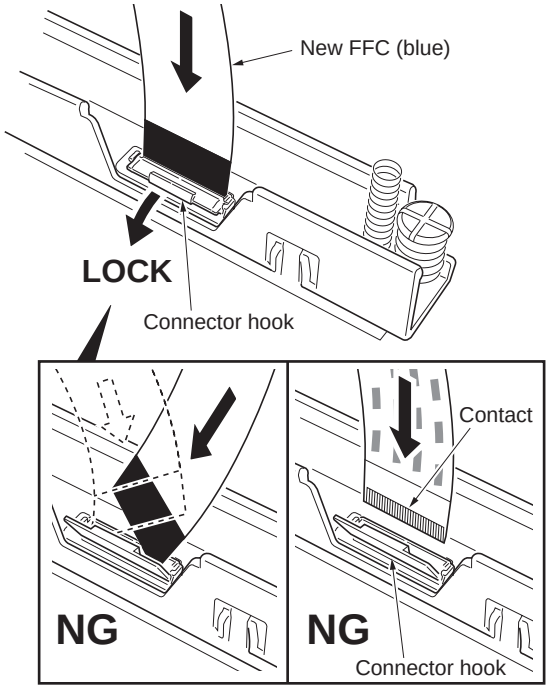


Figure 1-6-25

15. Attach the LED print head into the new drum unit.

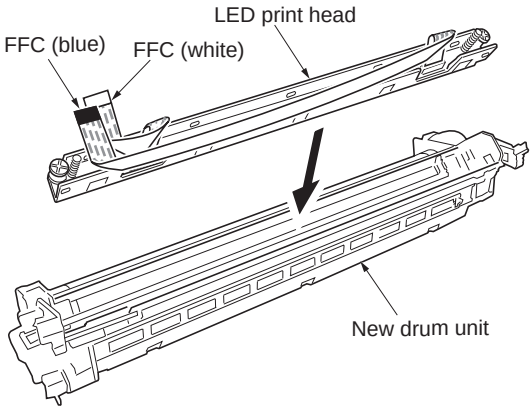


Figure 1-6-26

16. Attach the LED print head cover into the new drum unit.

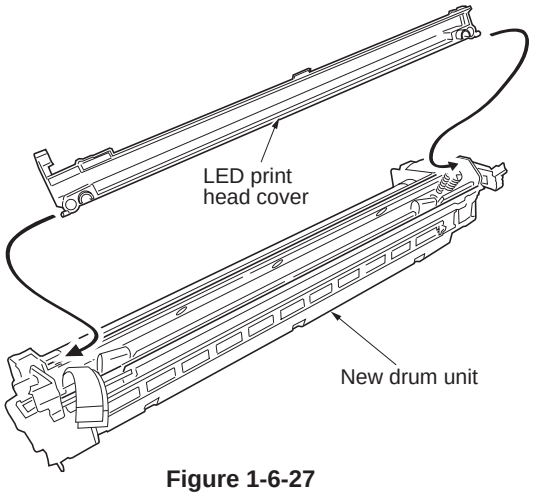


Figure 1-6-27

17. Pass the blue and white FFCs to opening of the LED print head cover.
18. Store the FFCs in the crevice between LED print head (metal) and sponge.
19. Close the LED print head cover and hold the three hooks.

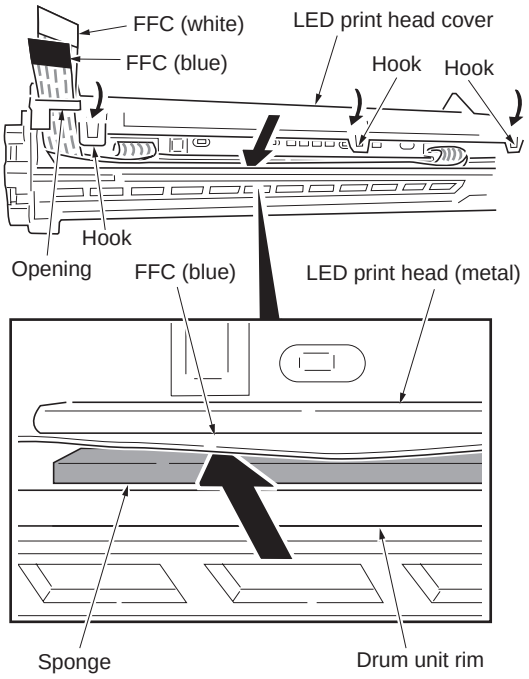


Figure 1-6-28

20. Check that the press springs on both sides of the LED print head are not buckling.
Note: If the press springs are buckling, push down on the central part of the LED print head cover to correct the buckle.

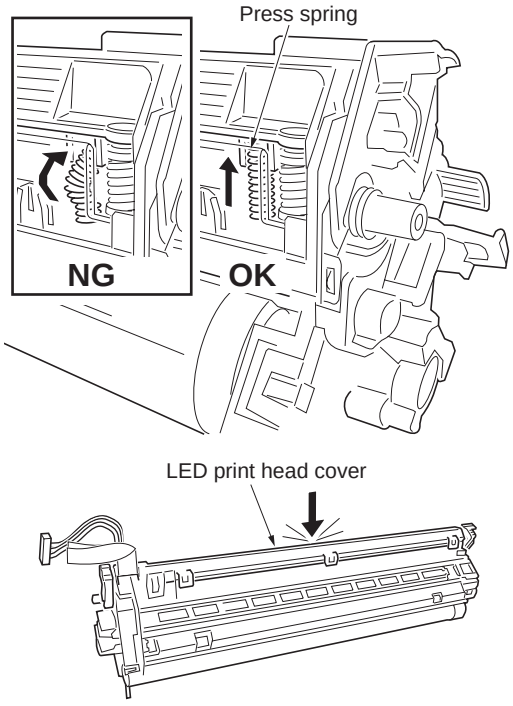


Figure 1-6-29

21. Refit the drum unit into the printer, and lock the release levers.

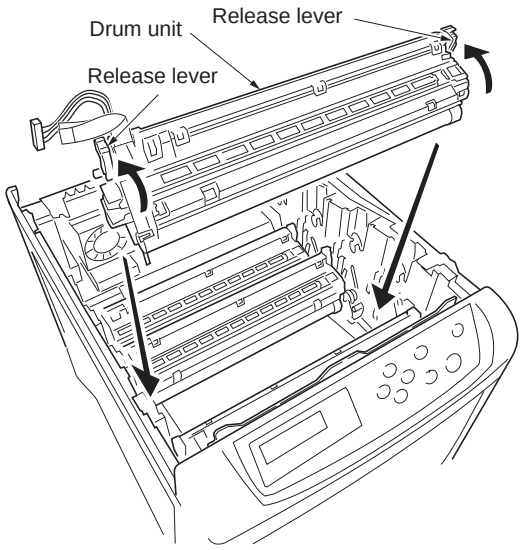
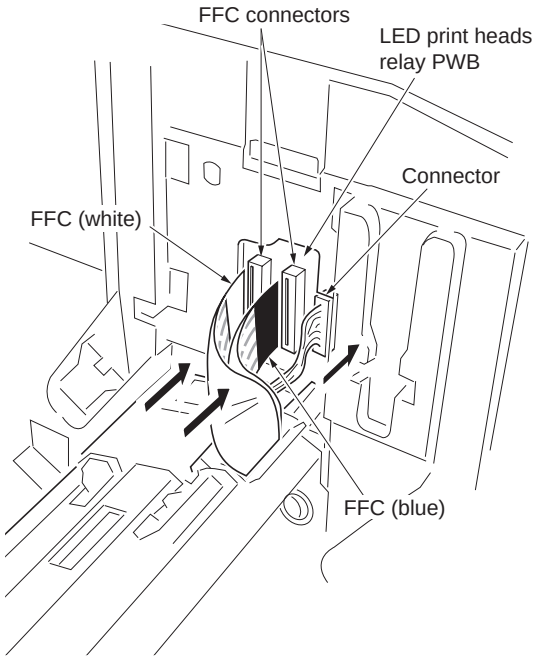


Figure 1-6-30

22. Connect one connector.
23. Insert the blue and white FFCs horizontally to the FFC connectors (LED print heads relay PWB).
    Note: Ensure the FFCs are not inserted at a slant to the connectors.



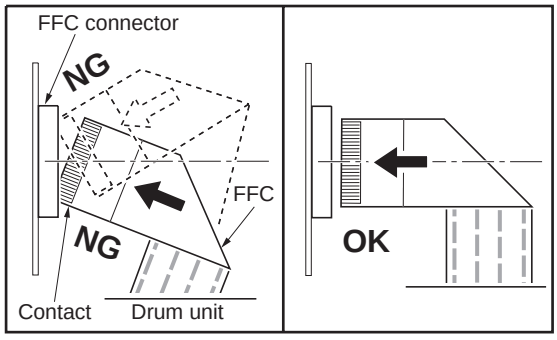


Figure 1-6-31

24. Refit the connector cover.
25. Refit the developer units and toner containers to the printer.
26. Close the top cover.

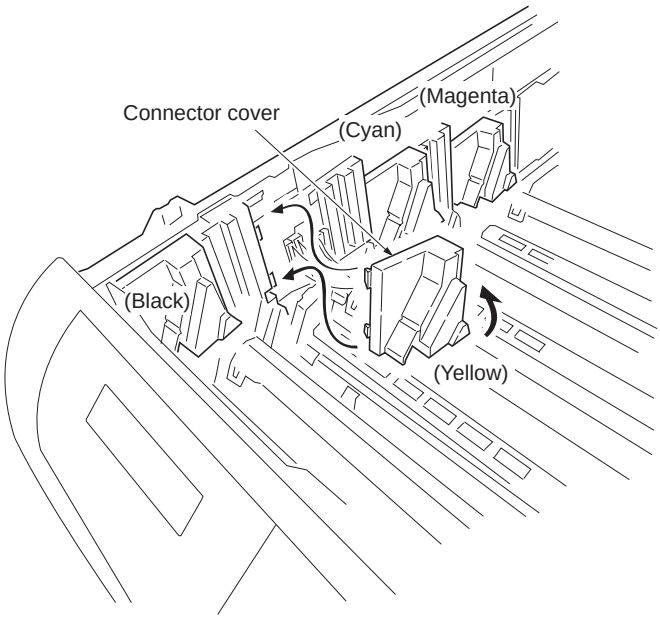


Figure 1-6-32

27. Turn the power on. Print a test page - selected from the service mode MENU of the operation panel.
28. Check that there is no fault in a print out.

Note: After the LED print head has been replaced, the printer requires approximately 30 seconds until it gets ready. This is required because the printer needs to download the data stored in the EEPROM mounted on the LED print head for optimizing the LED print head performance.
Caution: If there is a fault with the test page or a fault is displayed on the self-diagnostic display, check the following:

If the test print image is partly missing or a fault is displayed:
The FFC connection to the LED print head (Step 12).
The FFC connection to the printer (Step 23).
The positioning of the blue and white FFCs - ensure they are in the correct order (Step 23).
Damage of FFC.

If test print is blurred or out of focus:
The state of press spring (Step 20).

1-6-7 Primary transfer section

(1) Detaching and refitting the primary transfer unit

Procedure

1. Remove the all drum units (See page 1-6-13).
2. Pull two handles and raise.
3. Remove the primary transfer unit with the handles.
4. Check or replace the primary transfer unit and then refit all the removed parts.

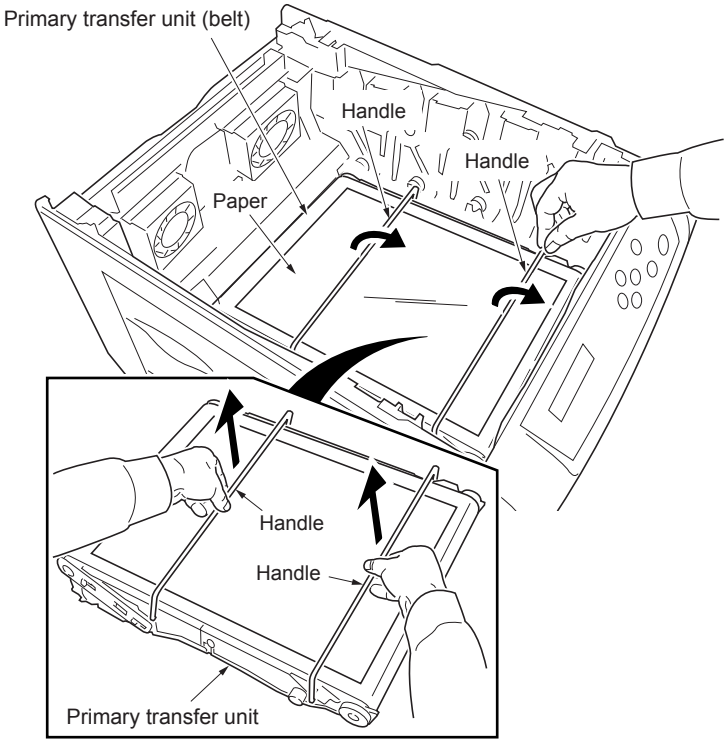


Figure 1-6-33 (a)

(2) Detaching and refitting the primary transfer belt

Procedure

1. Remove primary transfer unit (See above).
2. Remove the paper chute.
3. Remove the two handles.
4. Remove the two screws and then make the primary transfer unit two-fold.
5. Remove the primary transfer belt.
6. Check or replace the primary transfer belt and then refit all the removed parts.

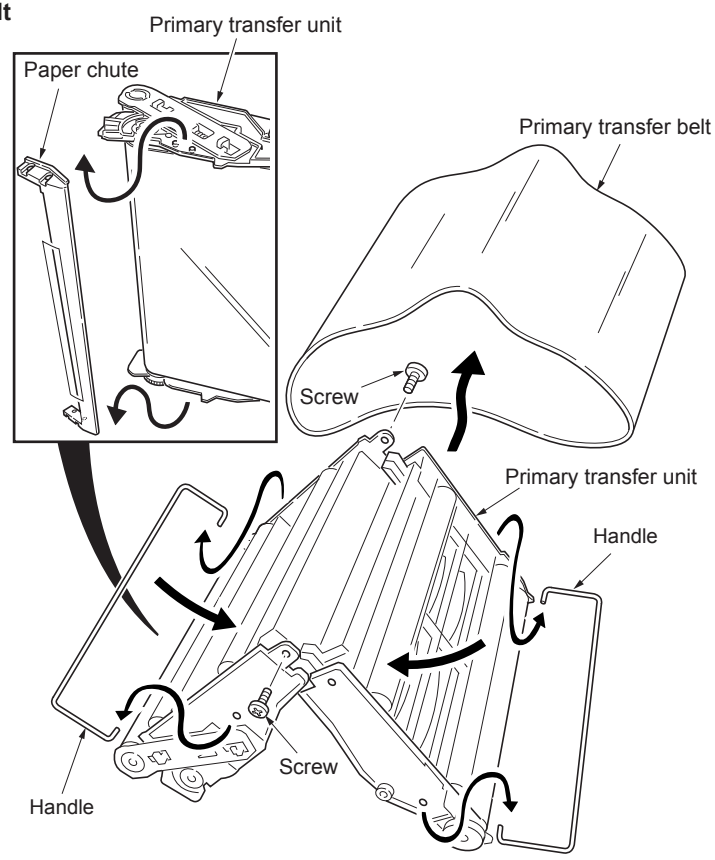


Figure 1-6-33 (b)

(3) Replacing the primary transfer unit

NOTE: Check that the engine firmware version of the 16 ppm printer is 004.004 or later, and then replace the primary transfer unit.

Procedure

1. Connect the power cord and then turn on the power switch.
2. Print the status pages (See page 1-4-2).
3. Turn off the power switch and then remove the power cord.
4. Remove the all developer and drum units (See page 1-6-13).
5. Place a paper on the primary transfer belt.
6. Hold the edge of the handle and then raise the handle(s).
7. Hold the center of two handles by the both hands.
8. Remove the transfer unit from the printer.
9. Place a paper on the new primary transfer unit (belt).
10. Hold the edge of the handle and then raise the handle(s).
11. Hold the center of two handles by the both hands.
12. Install the new primary transfer unit into the printer.
13. Remove the paper on the new primary transfer unit (belt).
14. Put the two handles down on the home position.
15. Refit all removal parts.
16. Connect the power cord and then turn on the power switch.
17. Print a status page (See page 1-4-2).
18. Make sure reset of the primary transfer unit life counter [AAAAAA] and then follow the following procedure (See page 1-4-4).
    When It was reset: Go to the step 24.
    When It was not reset: Go to the step 19.
19. Connect the parallel printer cable between printer and PC.
20. Send the following command from PC.
    `!R! KCFG"LRFE","ITTR",0;EXIT;`
21. Turn off and on the power switch.
22. Print the status pages (See page 1-4-2).
23. Make sure reset of the primary transfer unit life counter [AAAAAA] on the service information (See page 1-4-4).
    NOTE: When if it was not reset [AAAAAA], perform the steps 20 to 22 again.
24. Perform the "Execution of color calibration" (See page 1-4-14).
25. Perform the "Printing a test page" and then make sure printing image (See page 1-4-14).

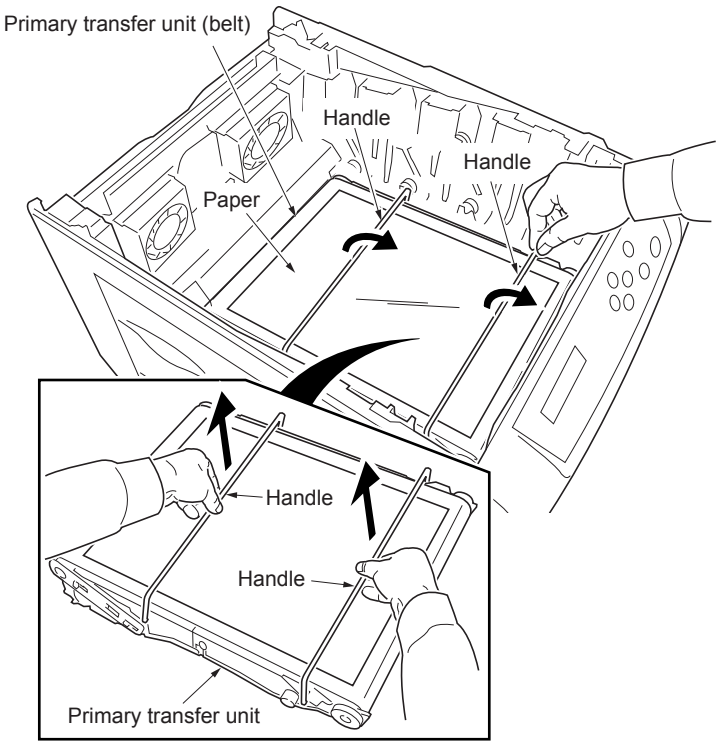


Figure 1-6-34 (a)

Service status page (extracts from the service information)

```
Service Information
[2F3 1000.010.002/2F3 3000.008.007][C1][22.00A][03/03] Printed
/P007S00/U00/F00/N00/D10:DM0301.DAN:0002001001210052
/0020/0020/1061/0811/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/

/AAAAAAA/AAAAAAA/
/AAAAAAA/
/AAAAAAA/
/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/AAAAAA/AAAAAAA/AAAAAAA/AAAAAA
/AAAAAAA/
/AAAAAAA/
                                  Primary transfer unit life counter
```

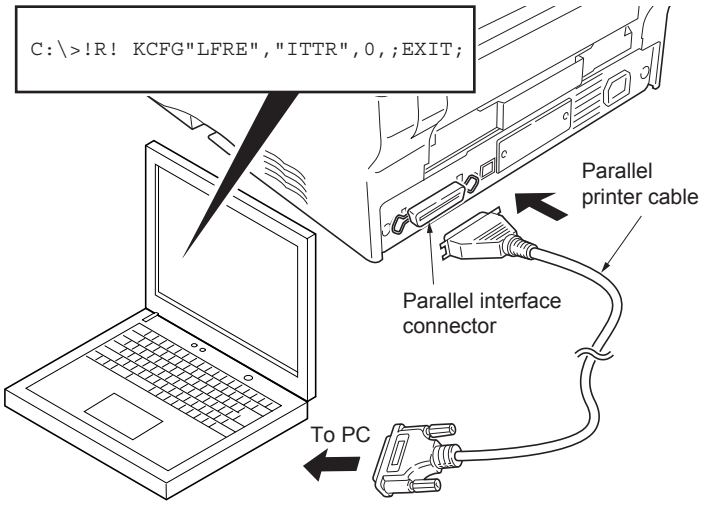


Figure 1-6-34 (b)

(4) Detaching and refitting the primary transfer cleaning unit

Procedure

1. Remove the primary transfer unit (See page 1-6-16).
2. Pull out the primary transfer cleaning unit from the main unit frame a little with underneath the right ①.
3. Pull out the waste toner outlet ② which is on the left side of the primary transfer cleaning unit from the main unit frame.
4. Remove the primary transfer cleaning unit.
5. Check or replace the primary transfer cleaning unit and then refit all the removed parts.

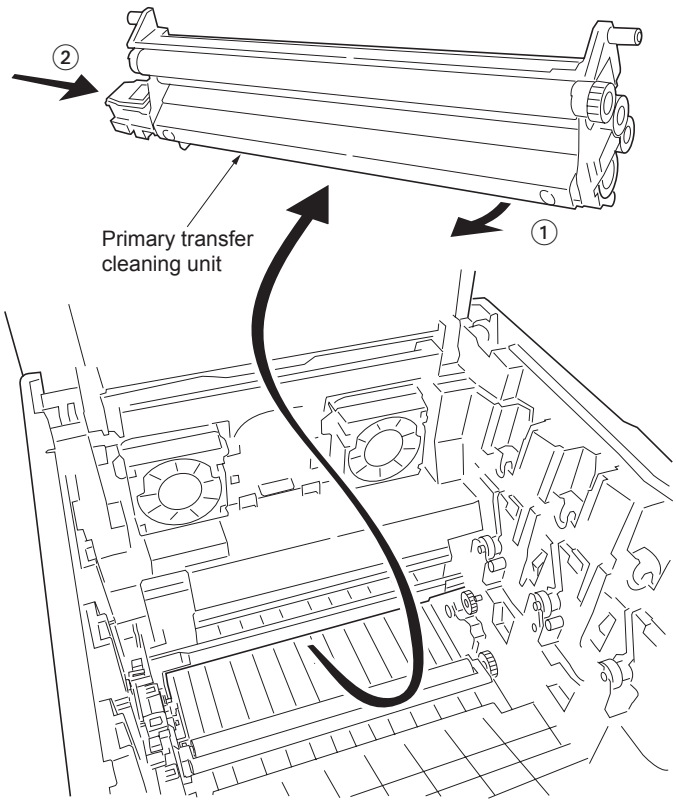


Figure 1-6-35

1-6-8 Fuser unit (16 ppm printer)

(1) Detaching and refitting the fuser unit

Procedure

1. Remove the rear cover (See page 1-6-3).
2. Remove the right cover and left cover (See page 1-6-4, 1-6-5).
3. Remove the two screws and then remove the fuser unit.
4. Check or replace the fuser unit and then refit all the removed parts.

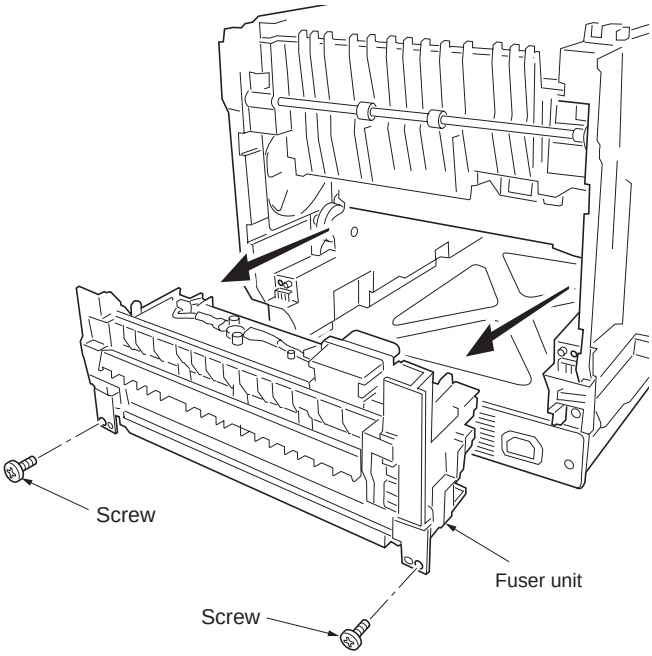


Figure 1-6-36

(2) Detaching and refitting the fuser thermistor 1 and 2, fuser thermostat 1 and 2, fuser heater lamp 1 and 2, heat roller, and press roller

Procedure

1. Remove the fuser unit (See previous page).
2. While two latches unlatching, remove the fuser bottom cover by making slide.
3. Remove the one tab.

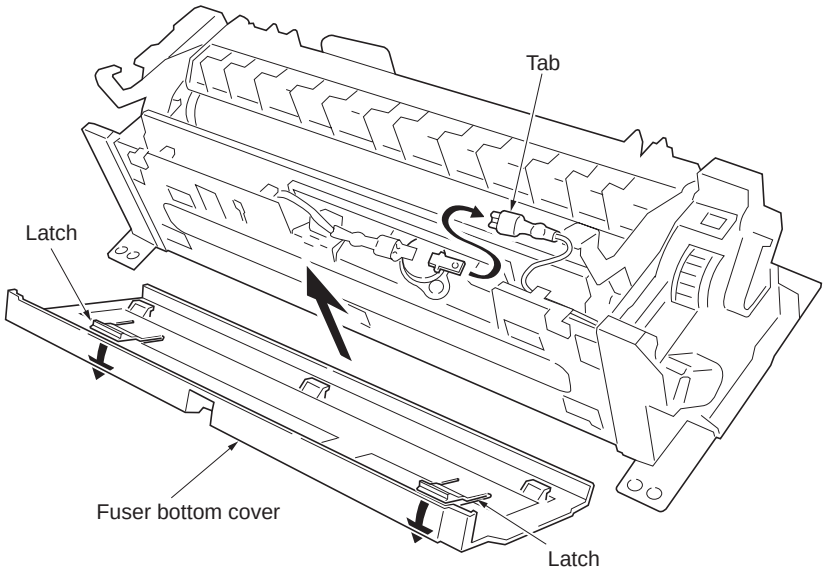


Figure 1-6-37

4. Remove the two screws form the terminals.

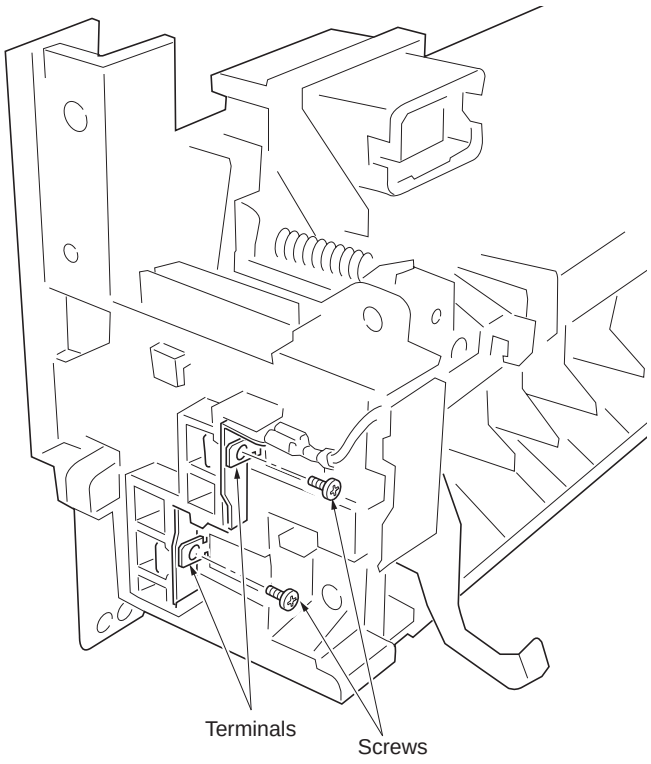


Figure 1-6-38

5. Remove the three connectors from the fuser PWB.
6. Remove the one tab.
7. While unlatching the latches and then remove the fuse unit connector.
8. Remove the terminal.

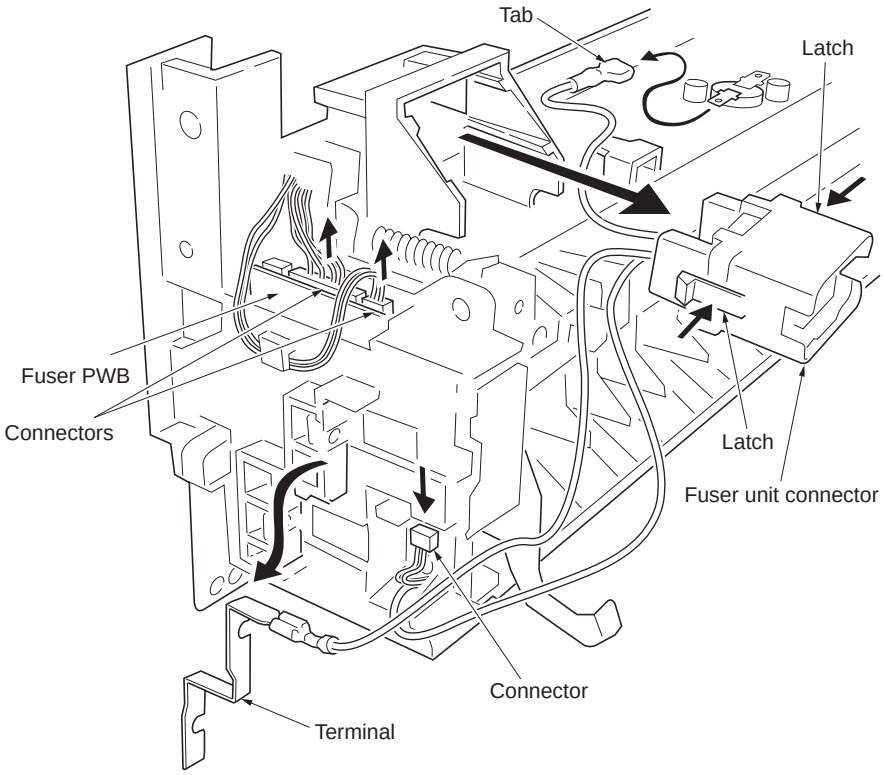


Figure 1-6-39

9. Remove the one screw and then remove the fuser left cover.

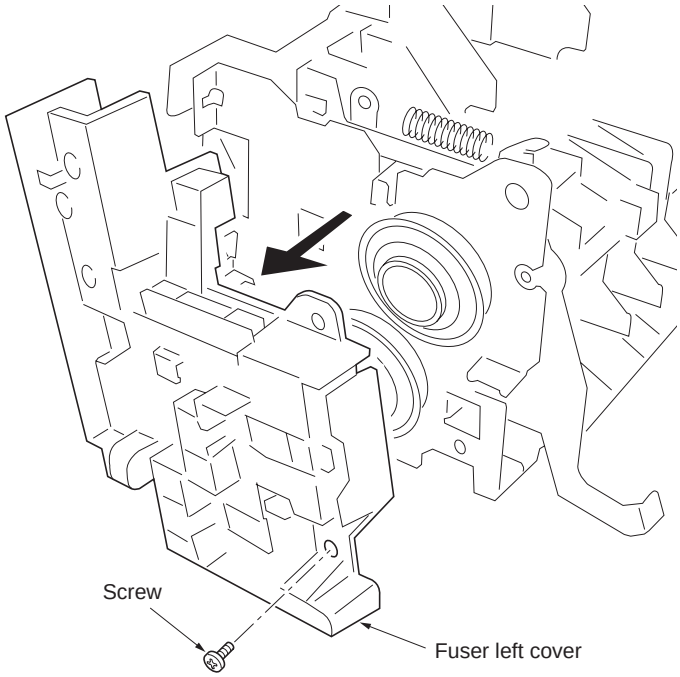


Figure 1-6-40

10. Remove the one screw and then remove the fuser right cover.
11. Remove the fuser heater lamp 1 and 2.

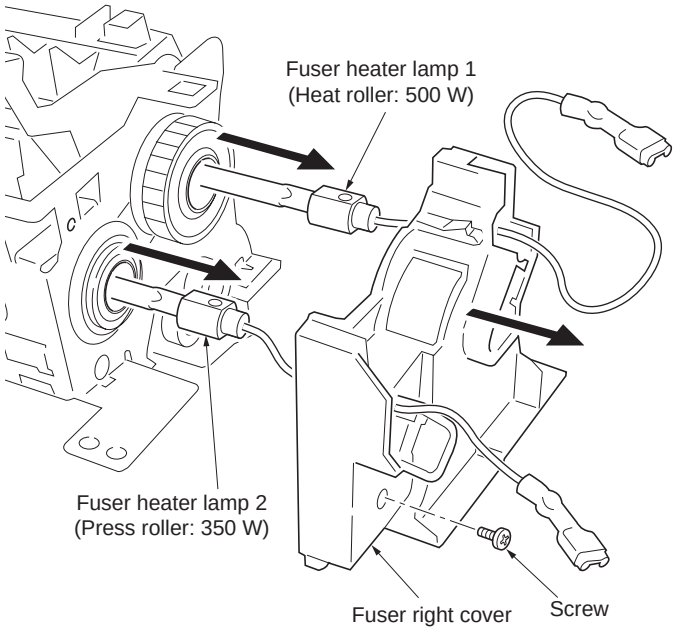


Figure 1-6-41

12. Remove the two pressure springs.
13. Remove the fuser upper cover, right pressure lever and left pressure lever.
14. Remove the fuser stay.

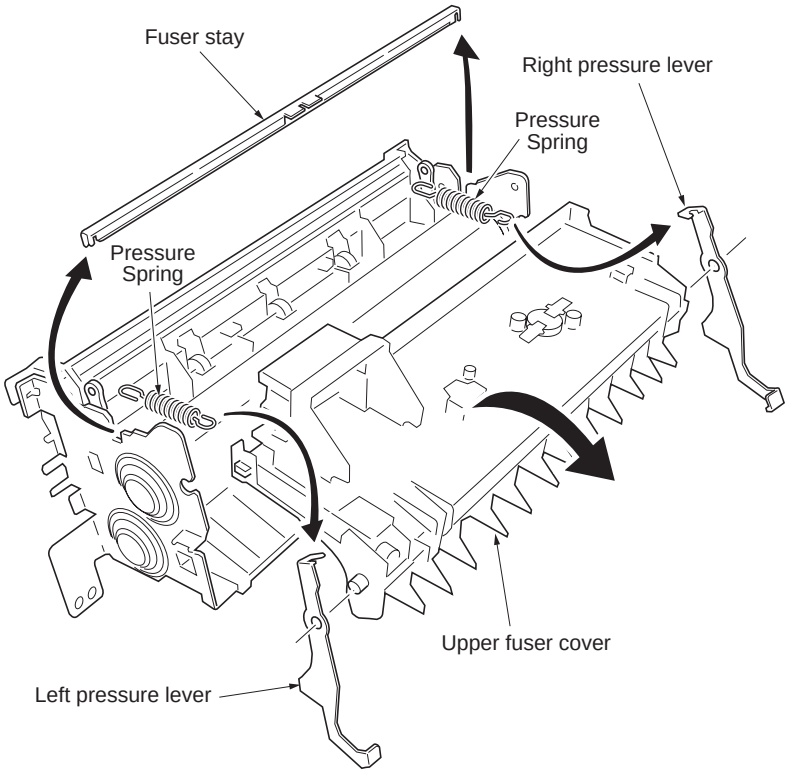


Figure 1-6-42

15. Remove the two screws and then remove the fuser thermostat 1.
16. Remove the one screw and then remove the fuser thermistor 1.

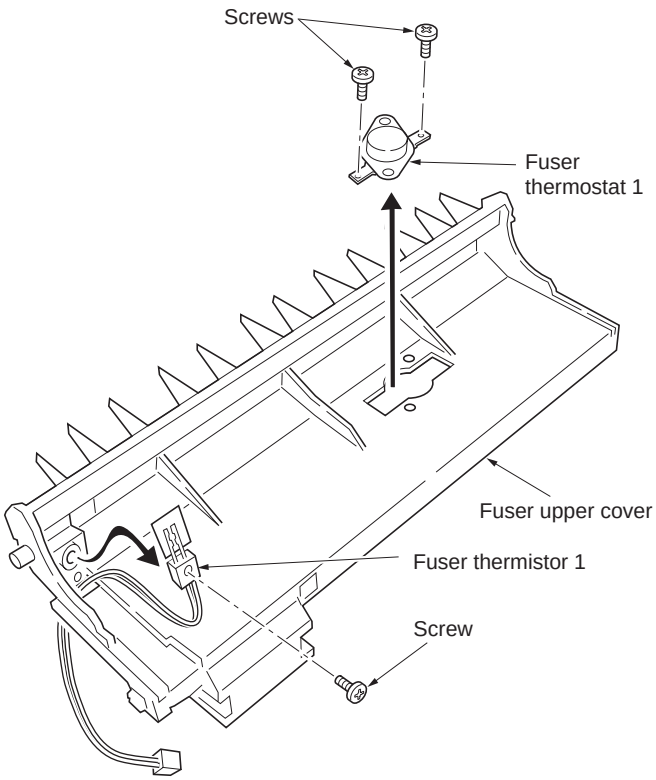


Figure 1-6-43

17. Remove the user lower guide.
18. Remove the one tab.
19. Remove the two screws and then remove the fuser thermostat 2.
20. Remove the one screw and then remove the fuser thermistor 2.

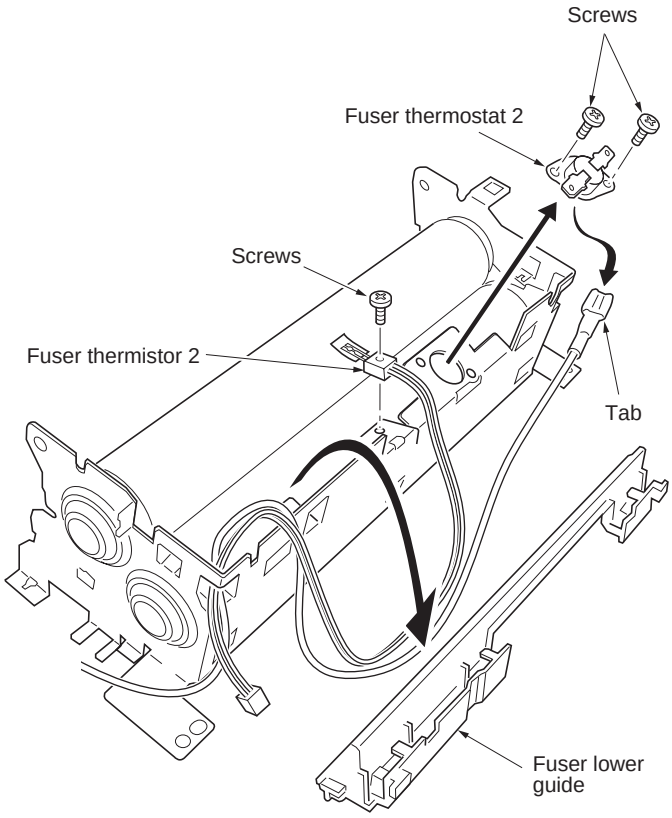


Figure 1-6-44

21. Remove the one C-ring, fuser gear, one C-ring, one bush and, one bearing.
22. Remove the one C-ring, one bush and, one bearing.
23. Remove the heat roller.

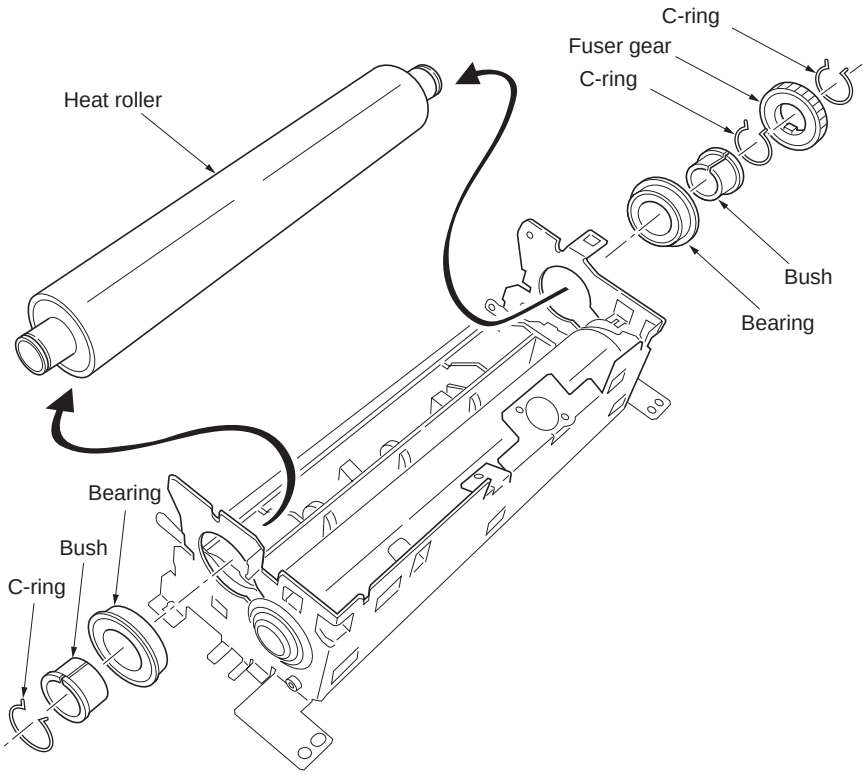


Figure 1-6-45

24. Remove the two bushes and two bearings.
25. Remove the right stay, left stay and press roller.
26. Check or replace the fuser thermistor 1 and 2, fuser thermostat 1 and 2, fuser heater lamp 1 and 2, heat roller and, press roller then refit all the removed parts.

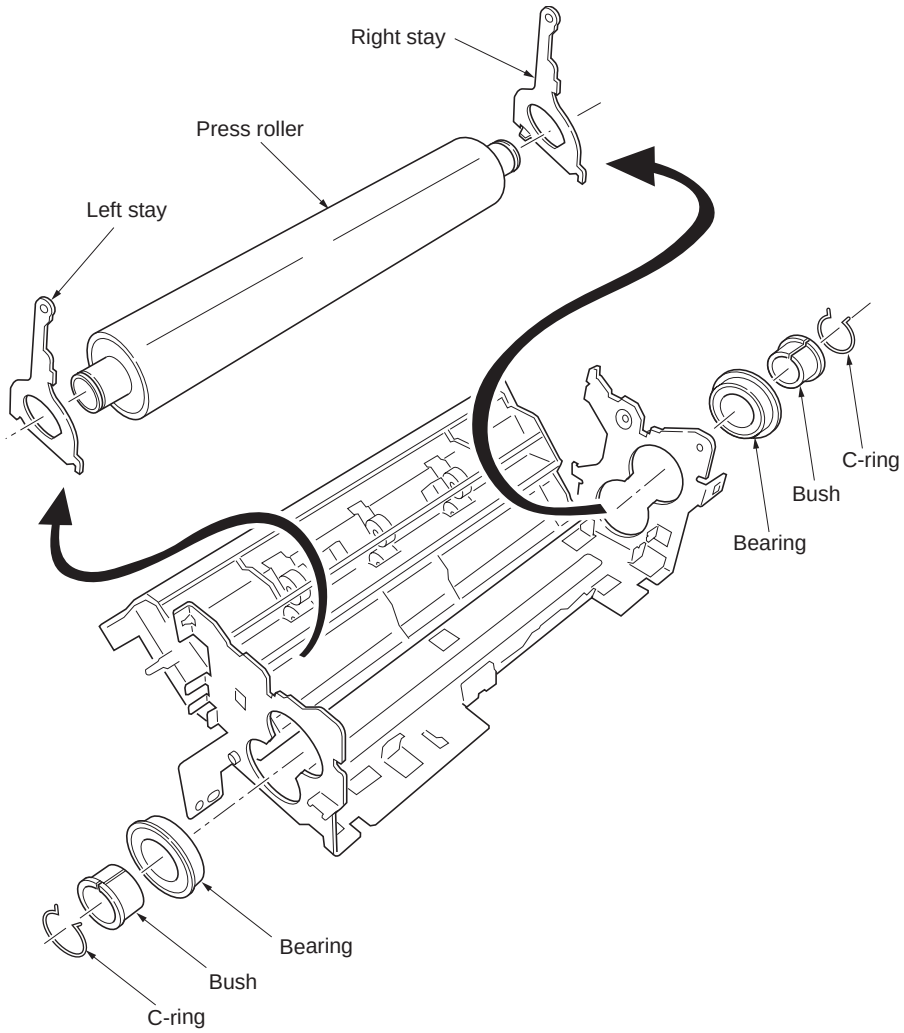


Figure 1-6-46

1-6-9 Fuser unit (24 ppm printer)

(1) Detaching and refitting the fuser unit

Procedure

1. Remove the rear cover (See page 1-6-3).
2. Remove the right cover and left cover (See page 1-6-4, 1-6-5).
3. Remove the two screws and then remove the fuser unit.
4. Check or replace the fuser unit and then refit all the removed parts.

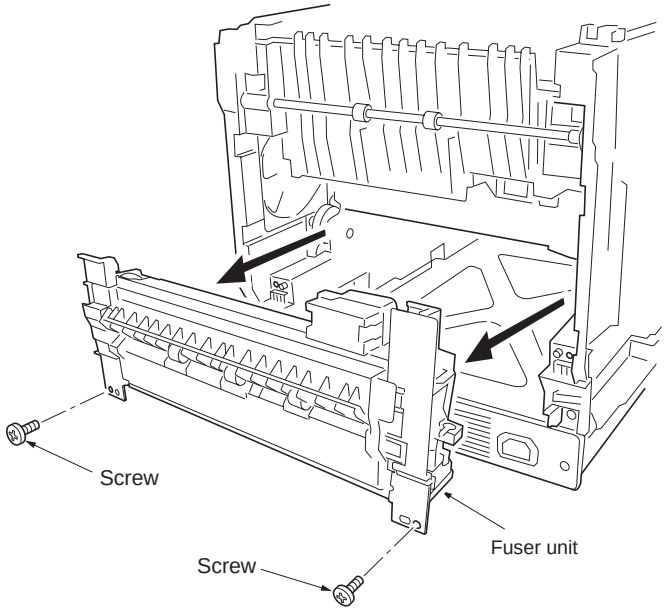


Figure 1-6-47

(2) Detaching and refitting the fuser thermistor 1, fuser thermostat 1, fuser heater lamp, heat roller, and press belt

Procedure

1. Remove the fuser unit (See previous page).
2. Remove the one screw and then the terminal and nut.

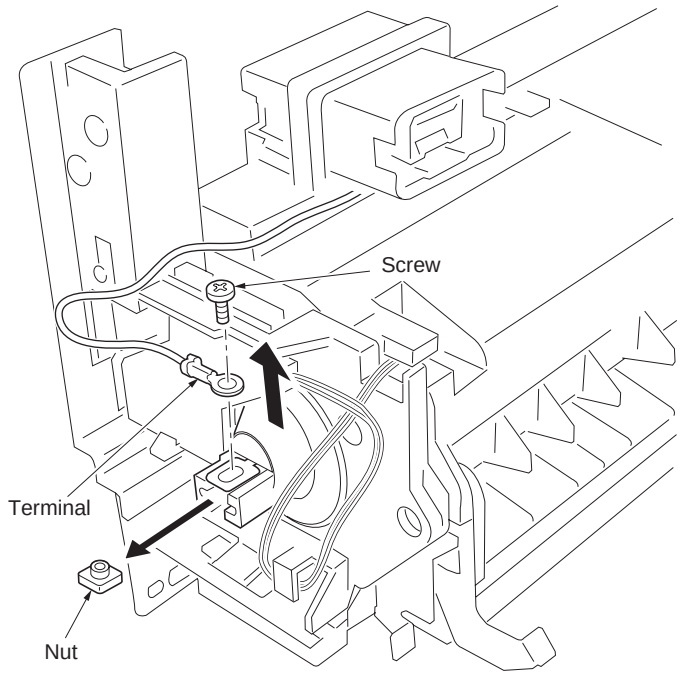


Figure 1-6-48

3. Remove the two connectors.
4. Remove the wire from wire clamp.
5. While unlatching the latch and then remove the fuser L cover.

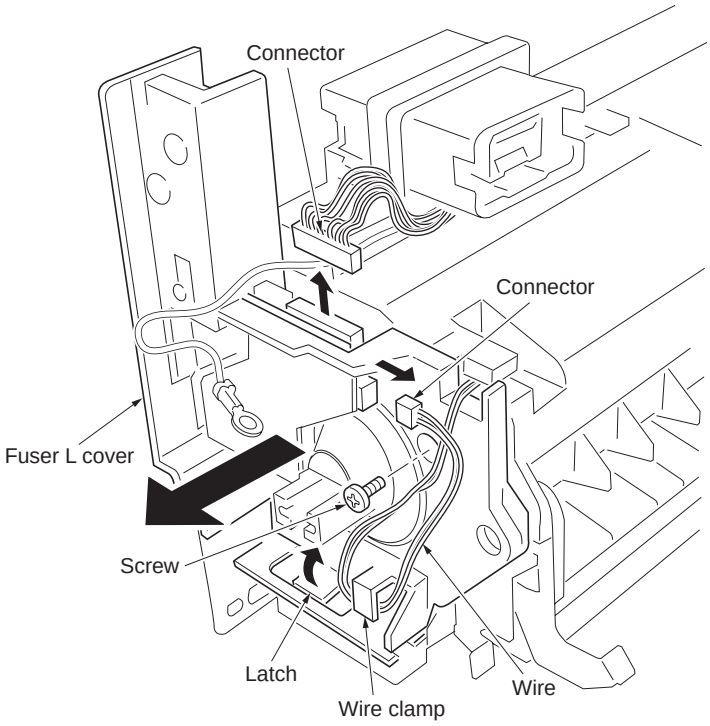


Figure 1-6-49

6. Remove the one tab from the terminal.
7. Remove the Lamp hold seal L.
8. Remove the wire form the two wire clamps.
9. Remove the one screw.
10. While unlatching the latch and then detach the fuser R cover.
11. Unhook the projection and then remove the fuser R cover.
12. Remove the wire from the fuser R cover and Fuser gear sleeve.
13. Remove the heater lamp.

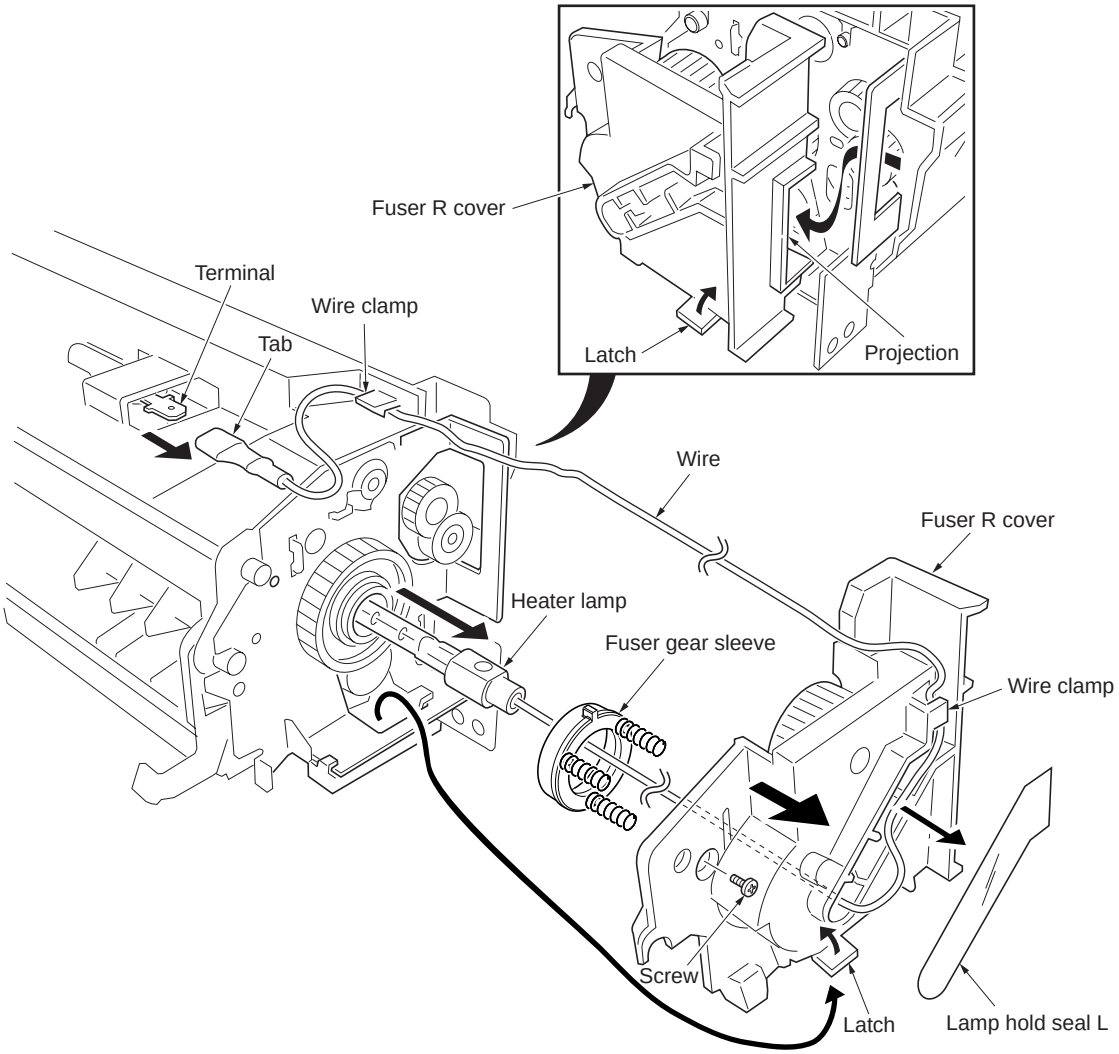


Figure 1-6-50

14. Remove the one tab from the terminal.
15. While removing the fuser UP cover and then remove the wire.
16. Remove the one screw and then remove the fuser thermistor 1.
17. Remove the two screws and then remove the fuser thermostat 1.

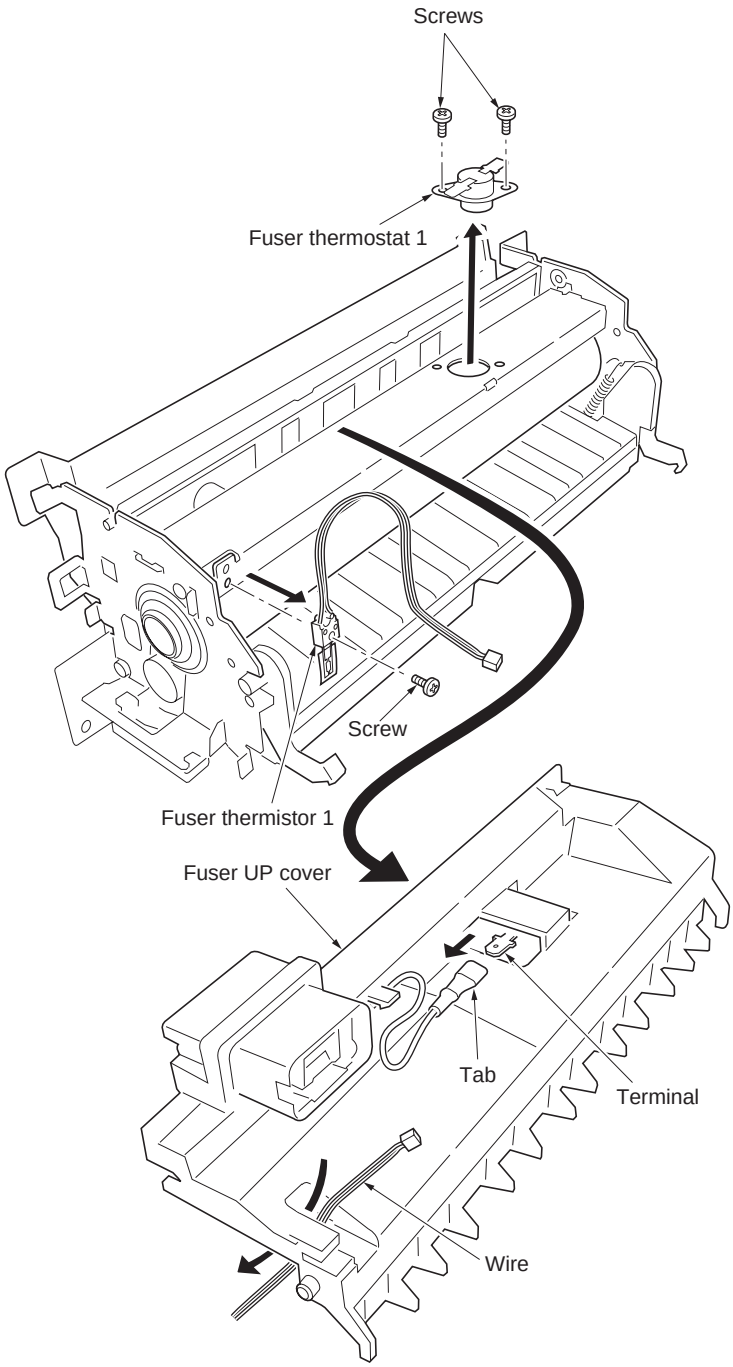


Figure 1-6-51

18. While sliding (direction of the arrow ①) the exit guide and then detach the axis.
19. While detaching the axis and then remove the exit guide.

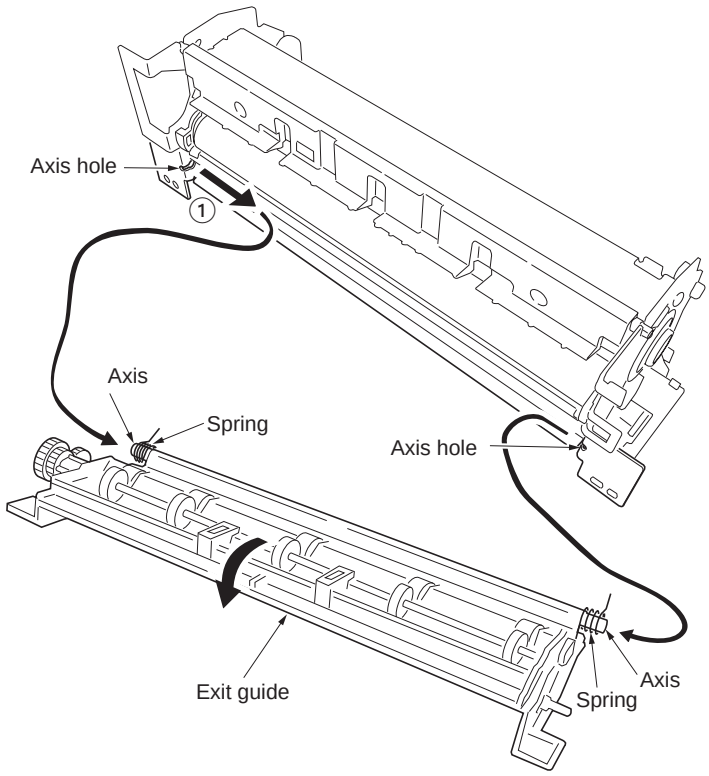


Figure 1-6-52

20. Turn the fuser unit bottom side up.
21. While unlatching the two latches and then remove the entrance guide.

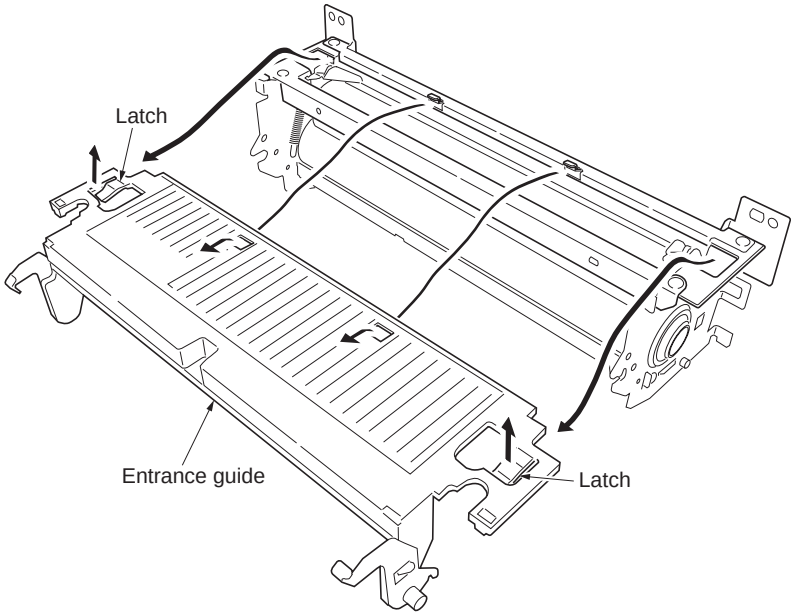


Figure 1-6-53

22. Remove the two press plates and two pressure springs.

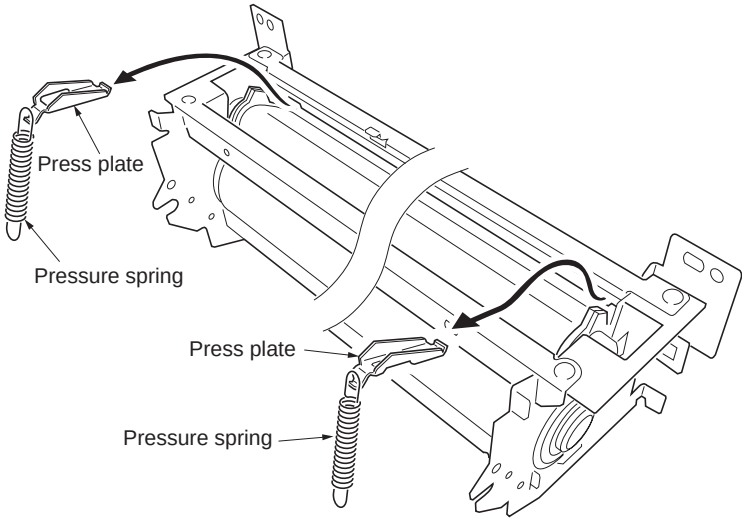


Figure 1-6-54

23. Remove the two screws and then remove the fuser B stay.
24. Remove the two screws and then remove the fuser C stay.

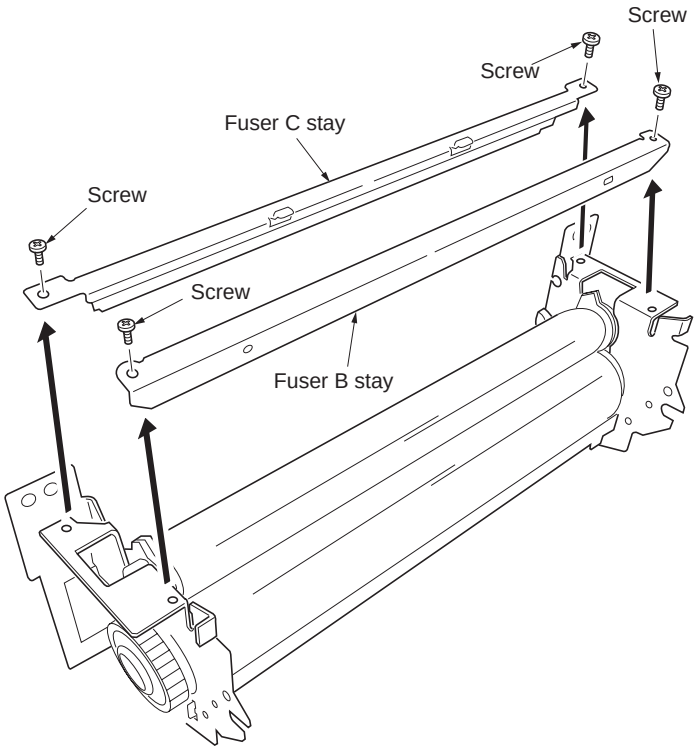


Figure 1-6-55

25. Remove the press belt assembly.

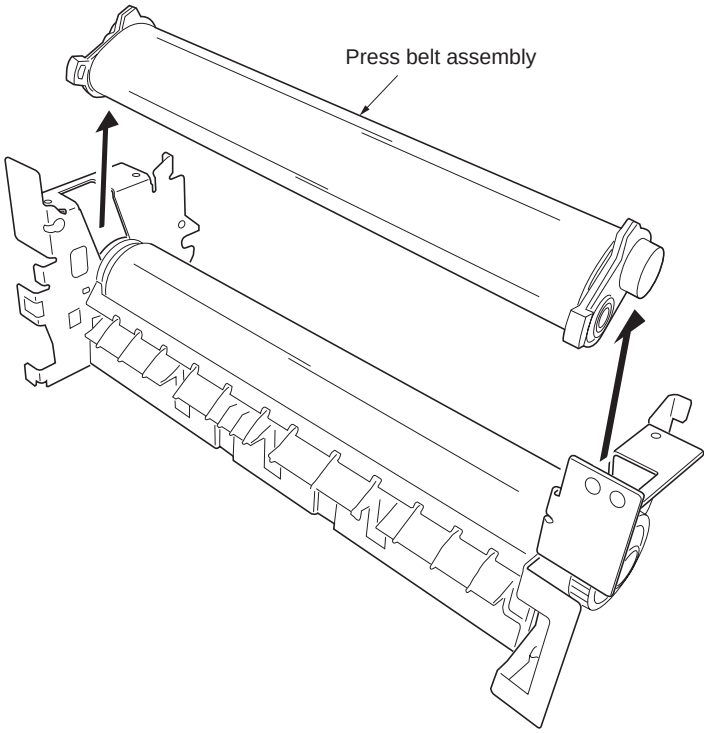


Figure 1-6-56

26. Remove the two roller holders with pitch plates.
27. Remove the belt roller A and belt roller.
28. Remove the each two bearings.

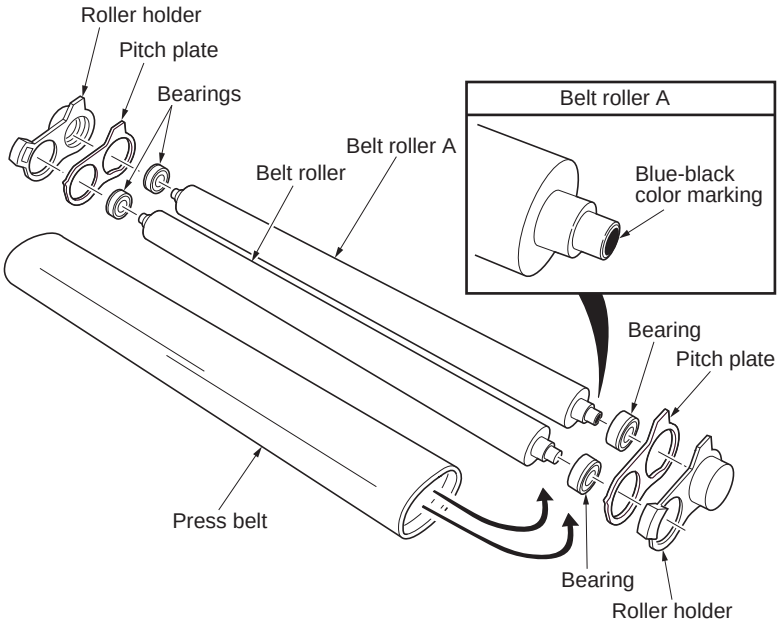


Figure 1-6-57

29. Remove the two screws and then remove the exit UP guide.
30. Remove the two C-rings.
31. Remove the stopper ring and heat Z43S gear.
32. Remove the two bearings.
33. Remove the heat roller with bushes.
34. Remove the two bushes from heat roller.

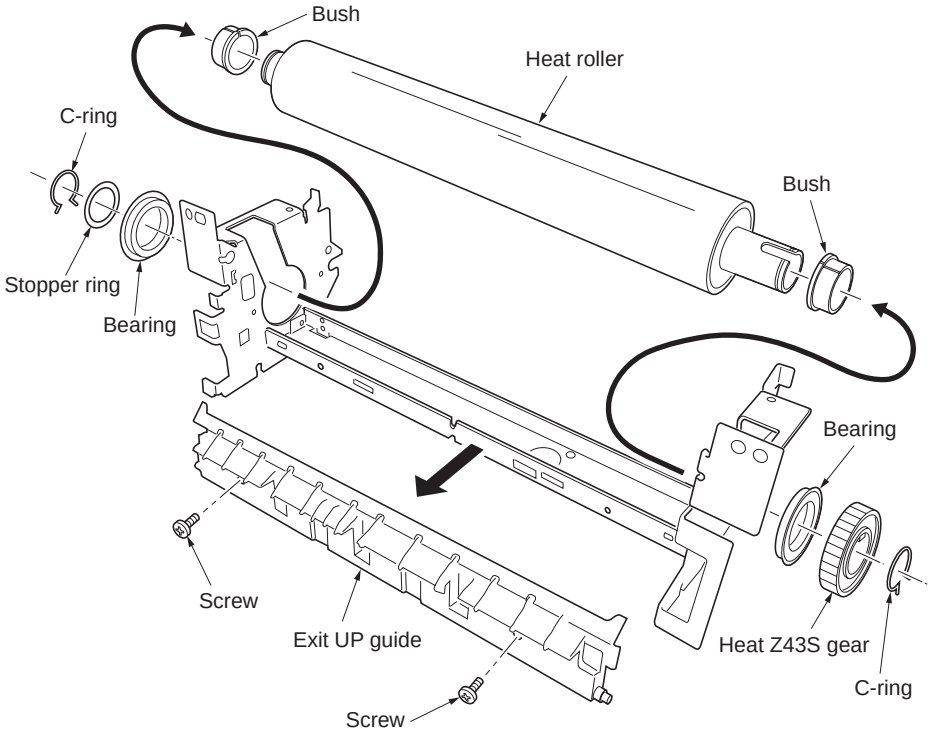


Figure 1-6-58

1-6-10 PWBs

(1) Detaching and refitting the main controller PWB

Procedure

1. Turn off the power switch and then remove the power cord.
2. When the optional memory card has been installed in the memory card slot already, remove that.
3. Remove the two screws and then remove the main controller PWB.

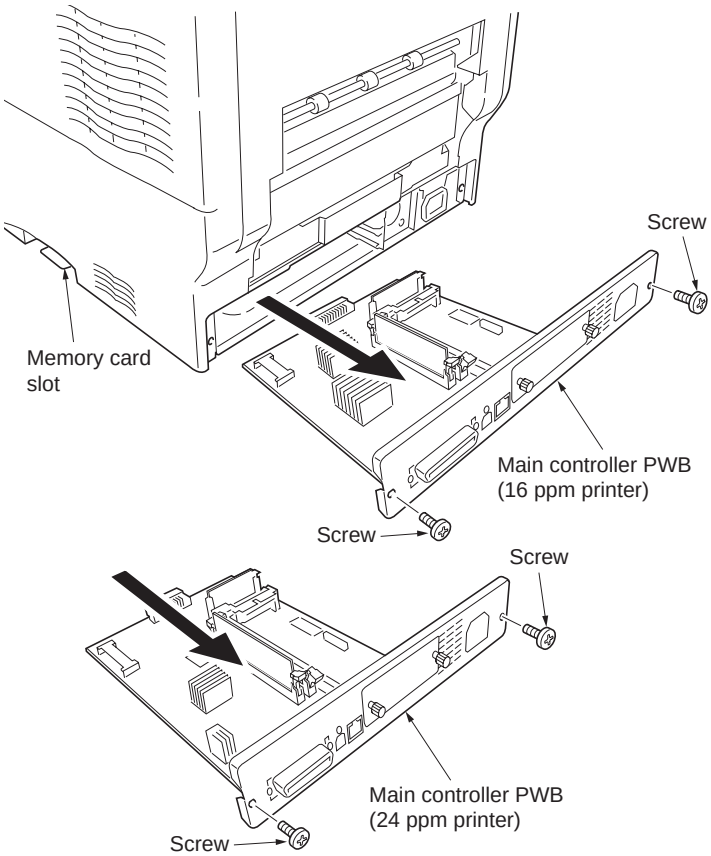


Figure 1-6-59

(2) Detaching and refitting the engine controller PWB and power supply PWB

To replace the engine controller PWB and the drum unit at the same time, turn on the printer after replacing either one. Check that the printer operates properly and then turn off the printer. Replace the other and turn on the printer to check that the printer operates properly. Be sure to replace one by one. Refer to self-diagnostic code 9530 (See page 1-5-19).

Procedure

1. Remove the main controller PWB (See previous page).
2. Remove the right cover, left cover and, rear cover. (See page 1-6-4, 1-6-5, and 1-6-3).
3. Remove the one screw and then remove the wire clamp and terminal.
4. Remove the all (machine left: five, machine right: four) connectors.

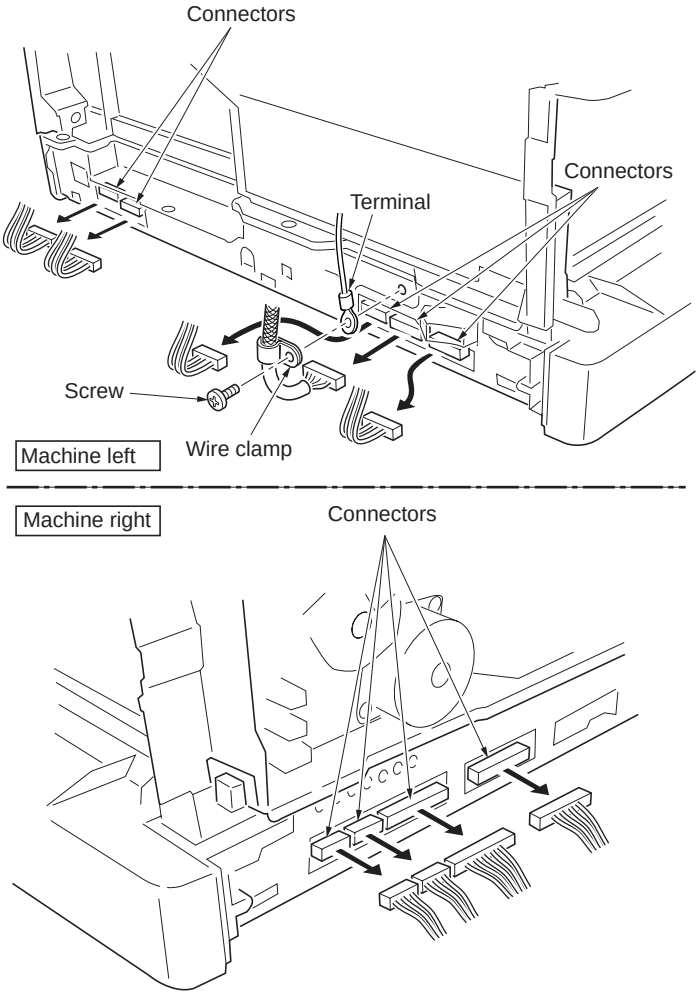


Figure 1-6-60

5. Remove three screws.
6. Loose the one screw (A).
7. Remove the main unit frontal projections and remove the controller box.

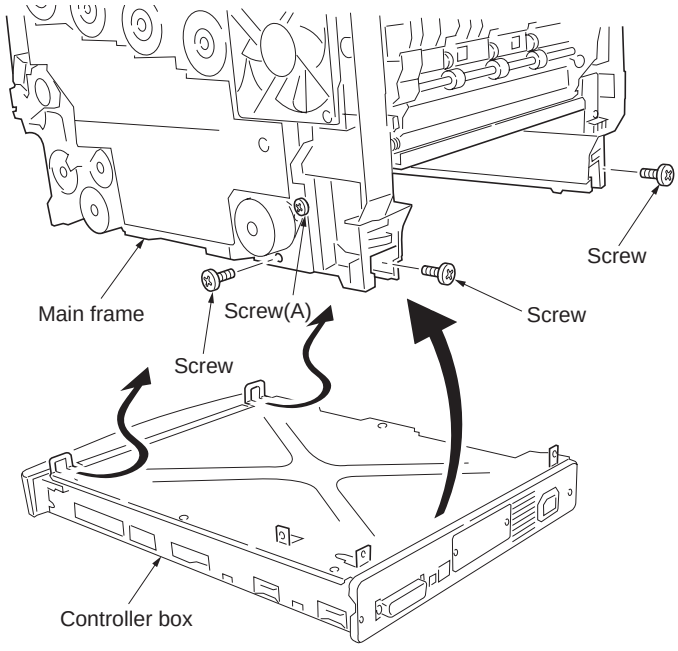


Figure 1-6-61

8. Remove the six screws and then remove the controller box cover.

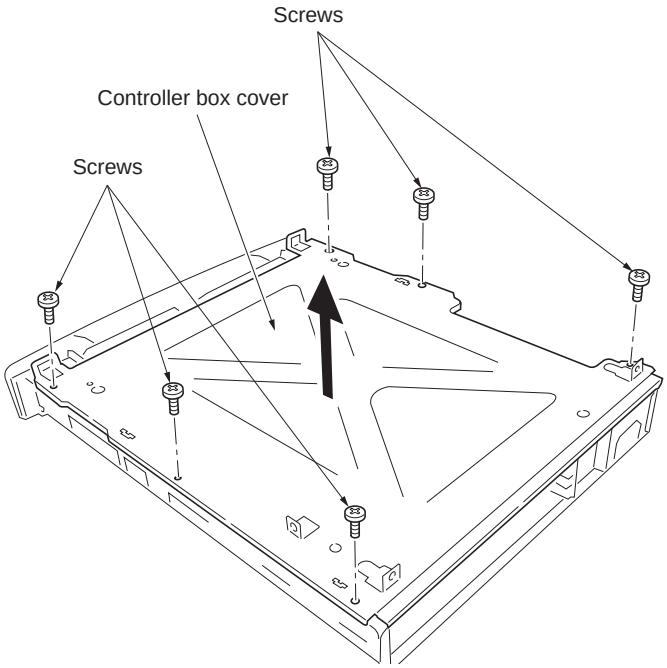


Figure 1-6-62

9. Remove the five screws.
10. Remove the two*1/three*2 connectors and then removing the connection with the power supply PWB, remove the engine controller PWB.
[*1: 16 ppm printer, *2: 24 ppm printer]

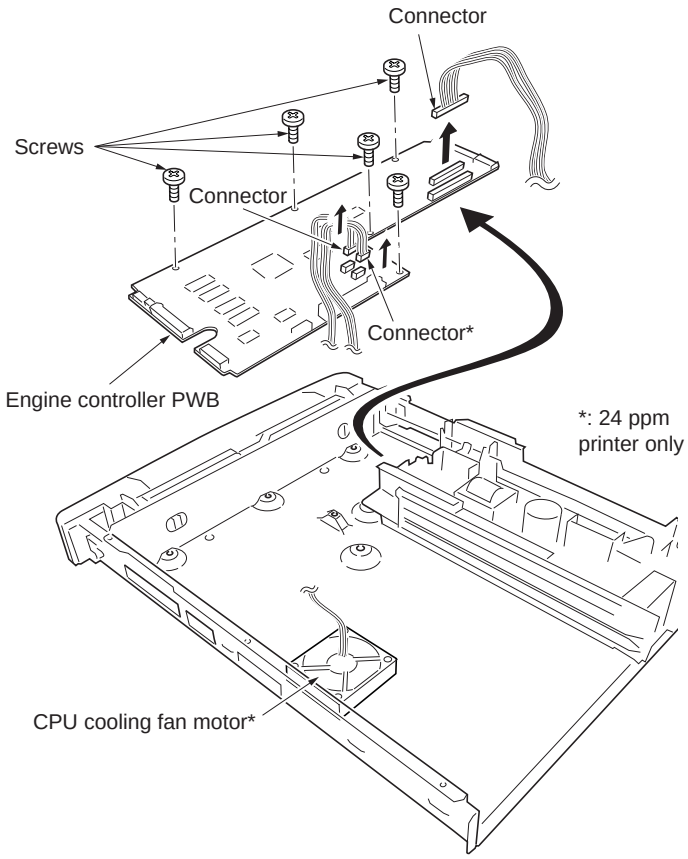


Figure 1-6-63

11. The EEPROM (U12) removing from the socket of the old engine controller PWB, it does again to install in the socket of the new engine controller PWB.

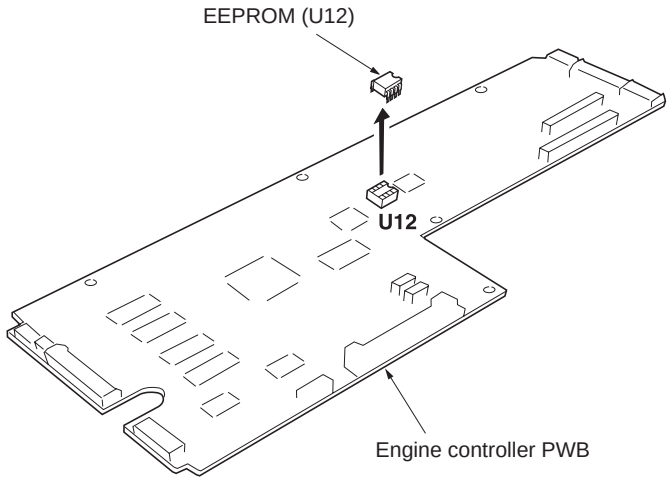


Figure 1-6-64

12. Remove the three screws, one terminal, one washer and then remove the power supply PWB.
13. Check or replace the engine controller PWB and power supply PWB then refit all the removed parts.

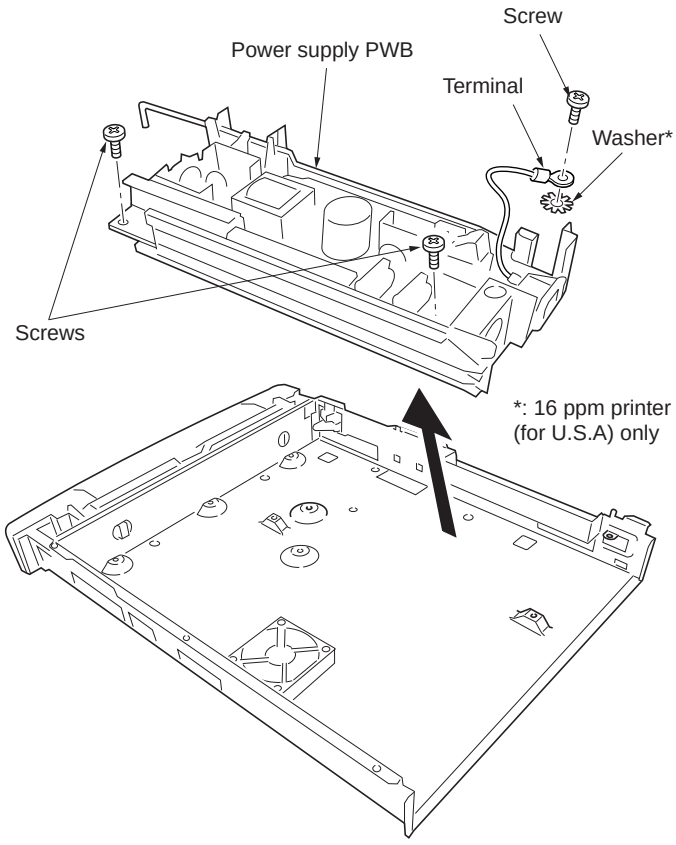


Figure 1-6-65

(3) Detaching and refitting the LED print heads relay PWB

Procedure

1. Remove the left cover (see page 1-6-4).
2. Remove the one screw.
3. Remove the two connectors and two tabs.
4. Unlatch the four latches and then remove the LED print heads relay PWB.
5. Check or replace the LED print heads relay PWB and then refit all the removed parts.

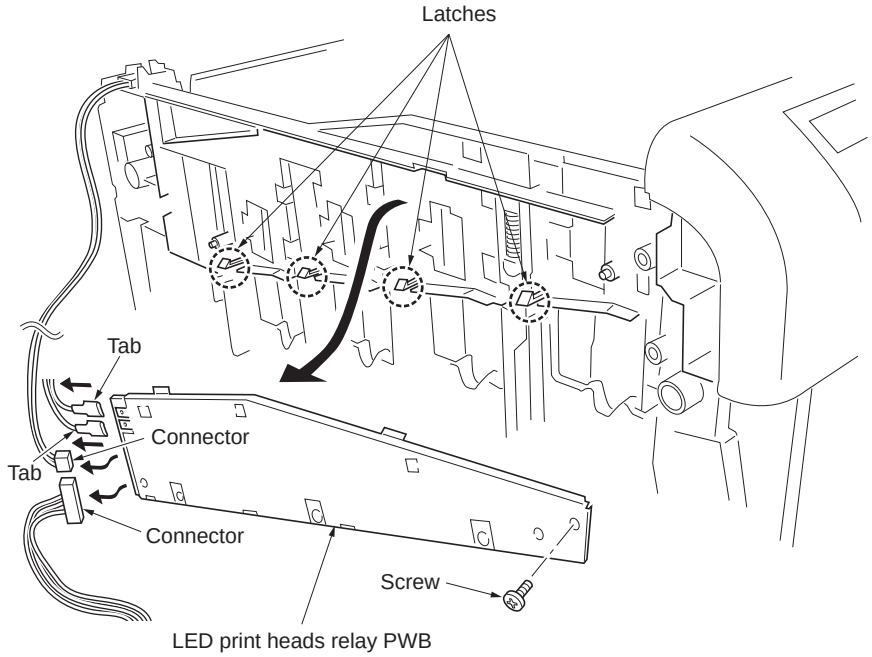


Figure 1-6-66

(4) Detaching and refitting the main high voltage PWB

Procedure

1. Remove the right cover (See page 1-6-4).
2. Unlatch the four latches and remove the one connector and then remove the main high voltage PWB.
3. Check or replace the main high voltage PWB and then refit all the removed parts.

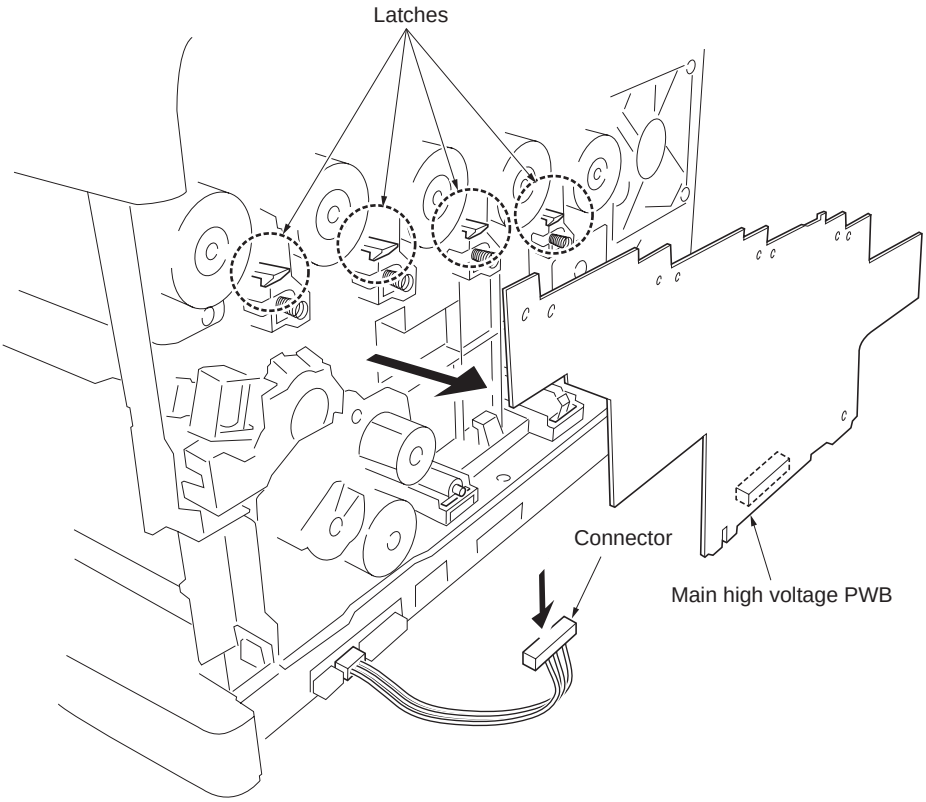


Figure 1-6-67

(5) Detaching and refitting the bias high voltage PWB

Procedure

1. Remove the right cover (See page 1-6-4).
2. Unlatch the five latches and remove the two connectors and then remove the bias high voltage PWB.
3. Check or replace the bias high voltage PWB and then refit all the removed parts.

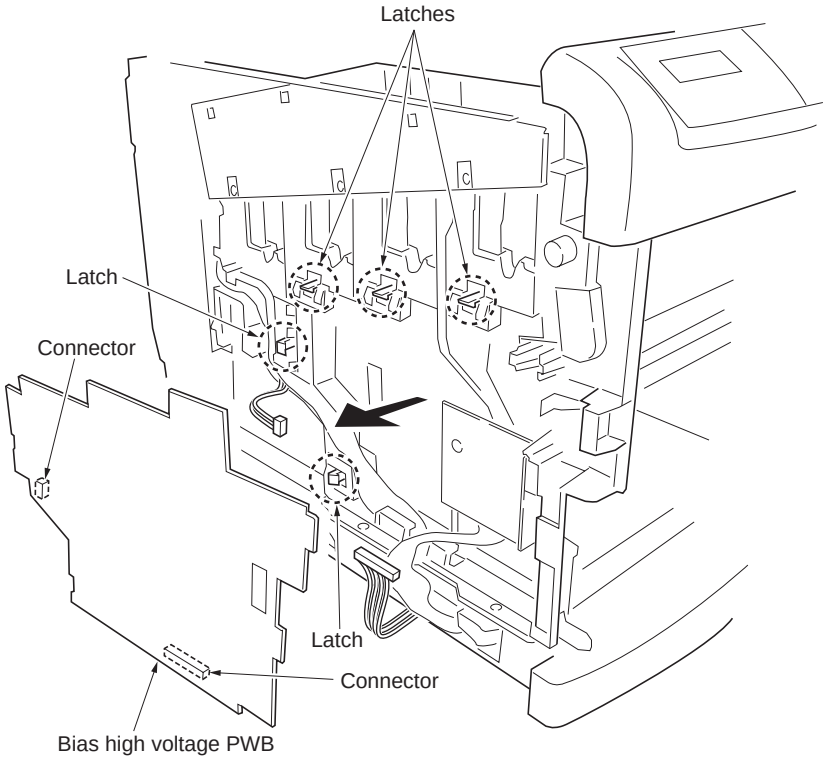


Figure 1-6-68

1-6-11 Others

(1) Detaching and refitting the main drive unit

Procedure

1. Remove the right cover (See page 1-6-4).
2. Remove the nine connectors from the main drive unit.
3. Remove the one connector.
4. Remove the six screws and four terminals then remove the main drive unit.
5. Check or replace the main drive unit and then refit all the removed parts.

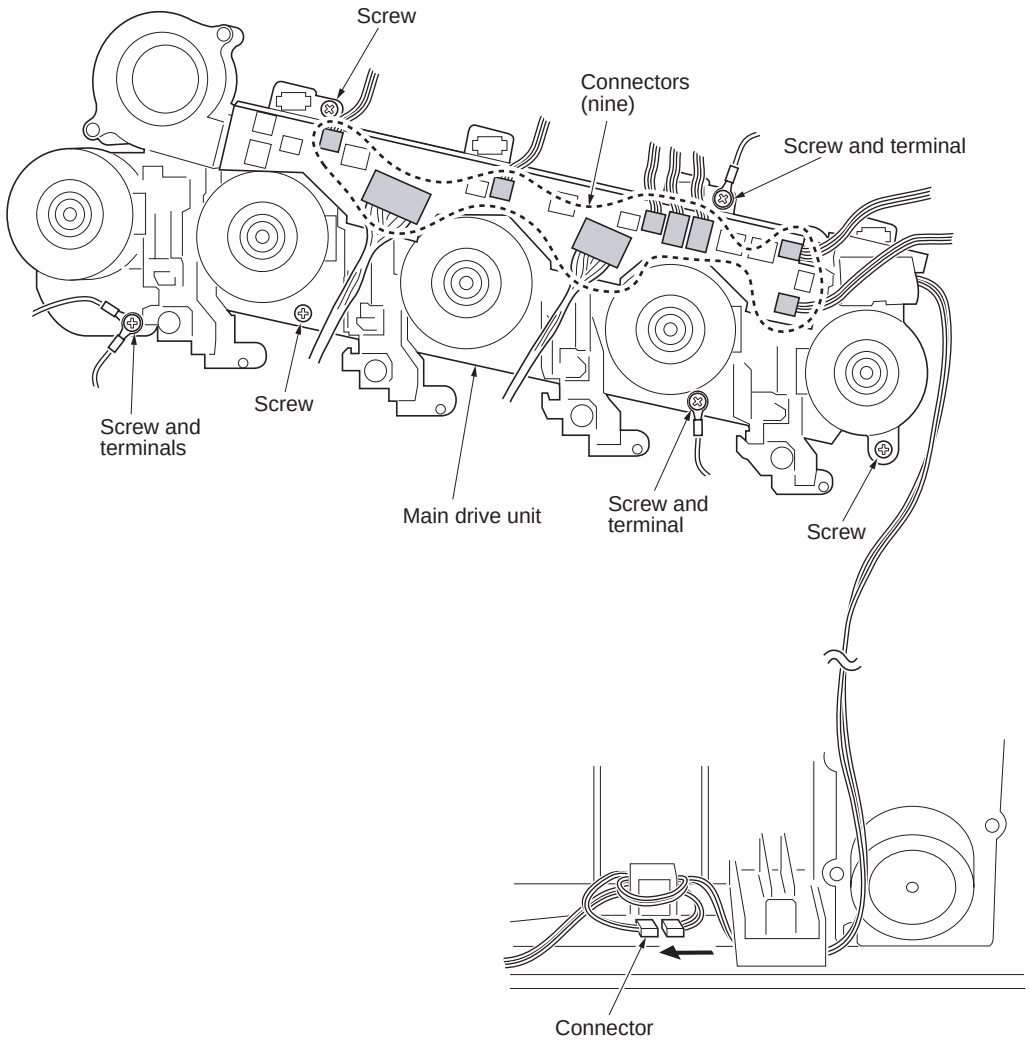


Figure 1-6-69

(2) Detaching and refitting the paper feed drive unit

Procedure

1. Remove the right cover (See page 1-6-4).
2. Remove five connectors.
3. Remove the harness from the two wire hooks.

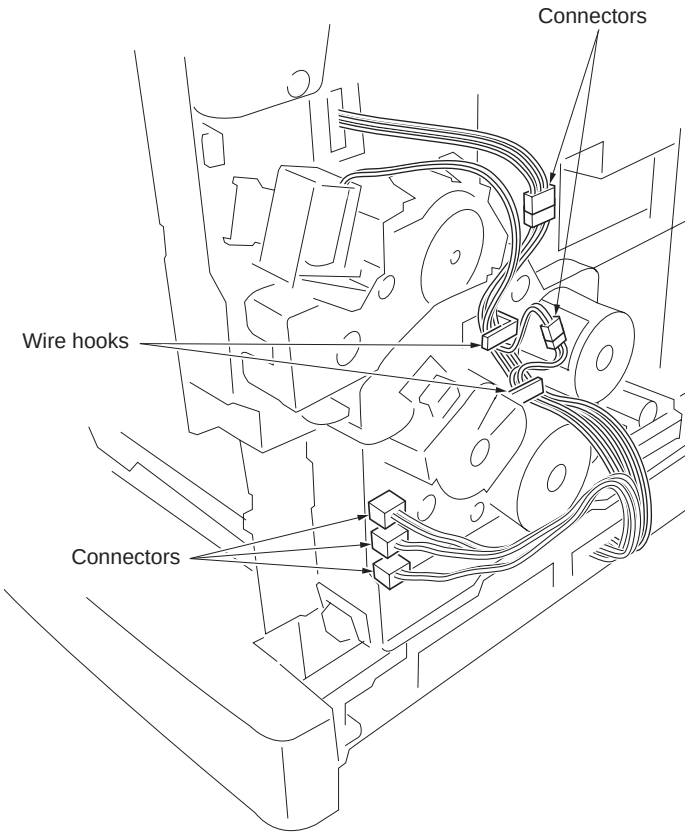


Figure 1-6-70

4. Remove the three screws and then remove the paper feed drive unit.
5. Check or replace the paper feed drive unit and then refit all the removed parts.

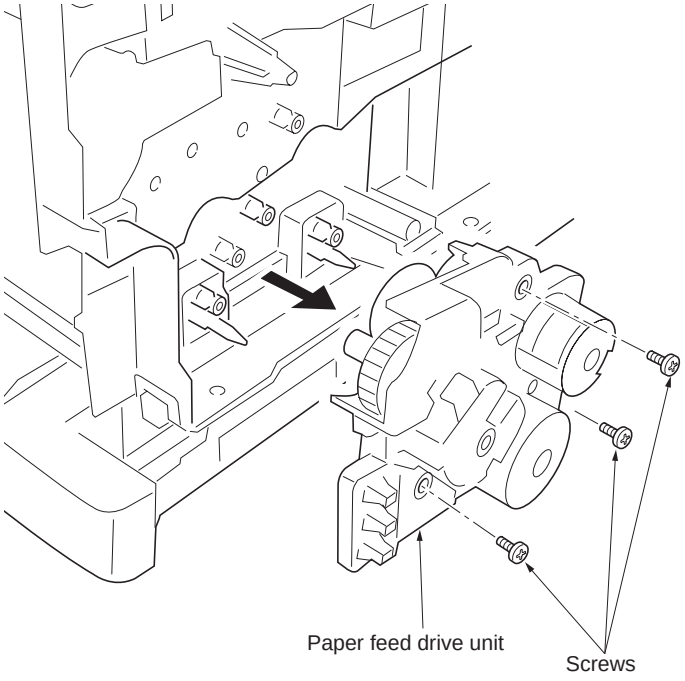


Figure 1-6-71

(3) Detaching and refitting the fuser drive unit

Procedure

1. Remove the right cover (See page 1-6-4).
2. Remove the main drive unit (See page 1-6-47).
3. Remove the one connector.
4. Remove the two screws and the remove the fuser drive unit.
5. Check or replace the fuser drive unit and then refit all the removed parts.

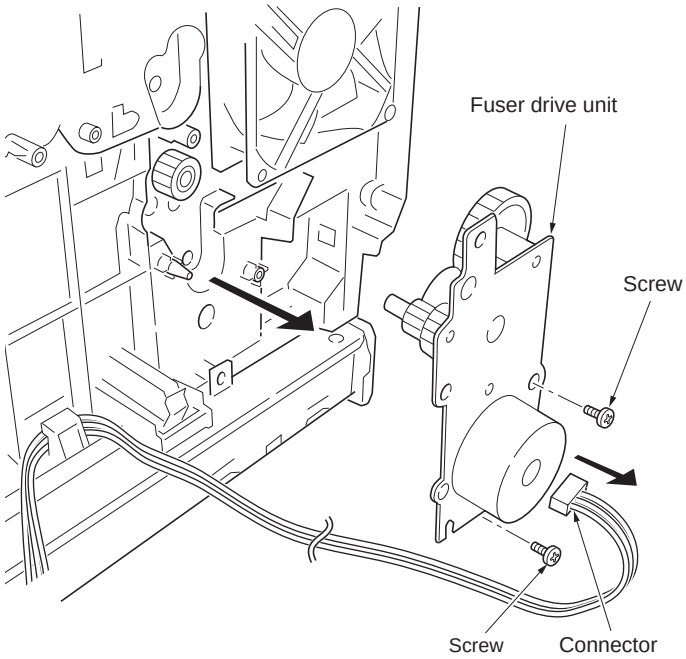


Figure 1-6-72

(4) Detaching and refitting the toner motor 1, 2, 3 and 4

Procedure

1. Remove the right cover (See page 1-6-4).
2. Remove the one connector.
3. Remove the hole which is inserted into the projection of main unit frame side, slide toner motor 4 to up in order to remove the hook.
4. Remove the toner motor 4.
5. Check or replace the toner motor 4 and then refit all the removed parts. (Also four toner motors with the same procedure, there is no order.)

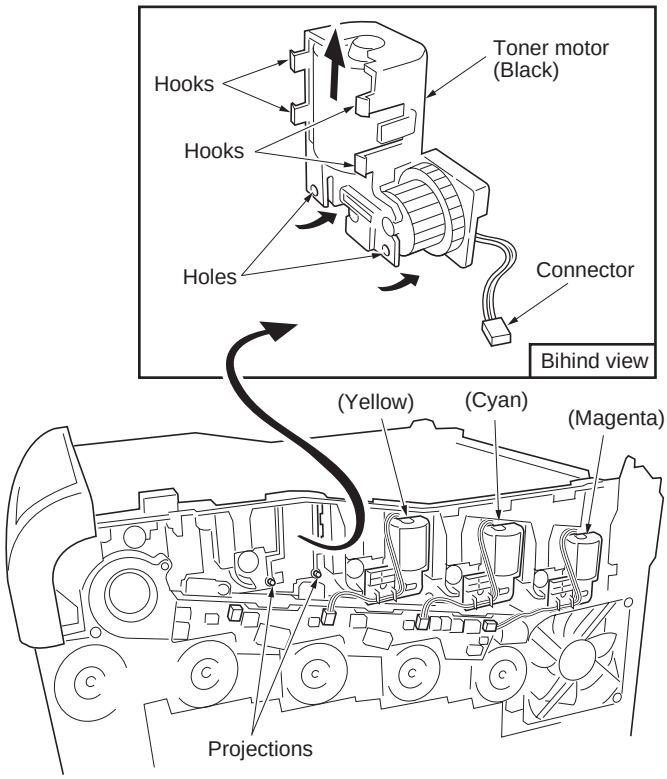


Figure 1-6-73

(5) Detaching and refitting the ozone filters

Procedure

1. Open the top cover.
2. Remove the ozone filters from the ozone fan motor 1 and 2.
3. Check or replace the ozone filters and then refit all the removed parts.

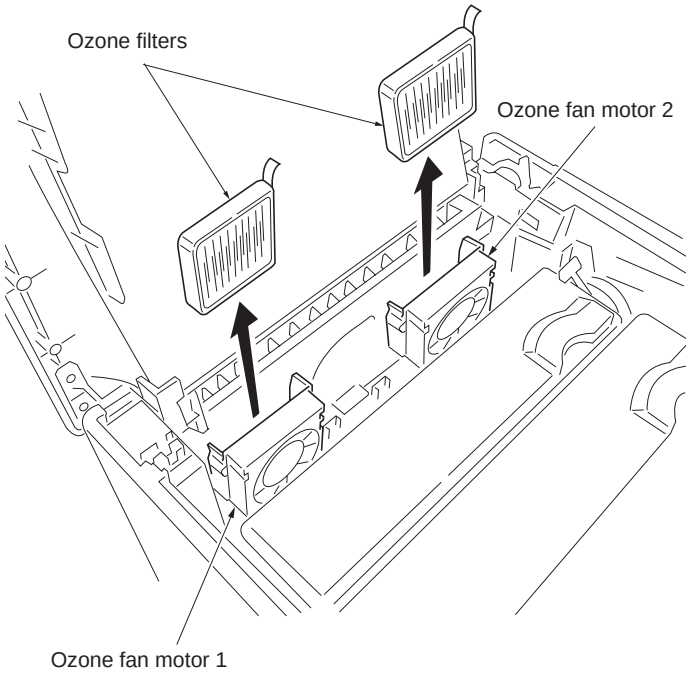


Figure 1-6-74

(6) Detaching and refitting the waste toner duct

Procedure

1. Remove the primary transfer unit (See page 1-6-22).
2. Remove the primary transfer cleaning unit (See page 1-6-24)
3. Unlatch the three latches and then remove the waste toner duct.
4. Check or replace the waste toner duct and then refit all the removed parts.

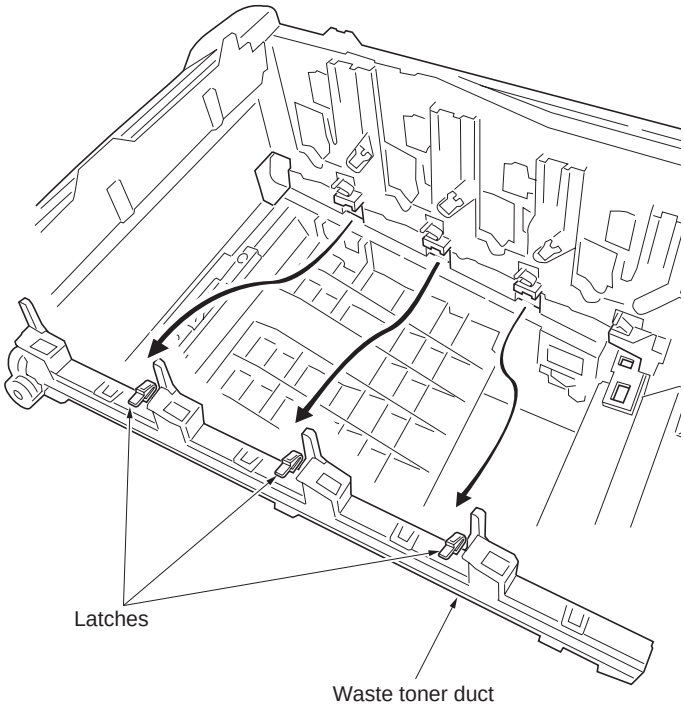


Figure 1-6-75

1-7-1 Downloading firmware

The system firmware can be update by downloading new firmware. Downloading can be made either by directly sending the new firmware from PC via the parallel interface or using a memory card that contains the new firmware.

Firmware file name example

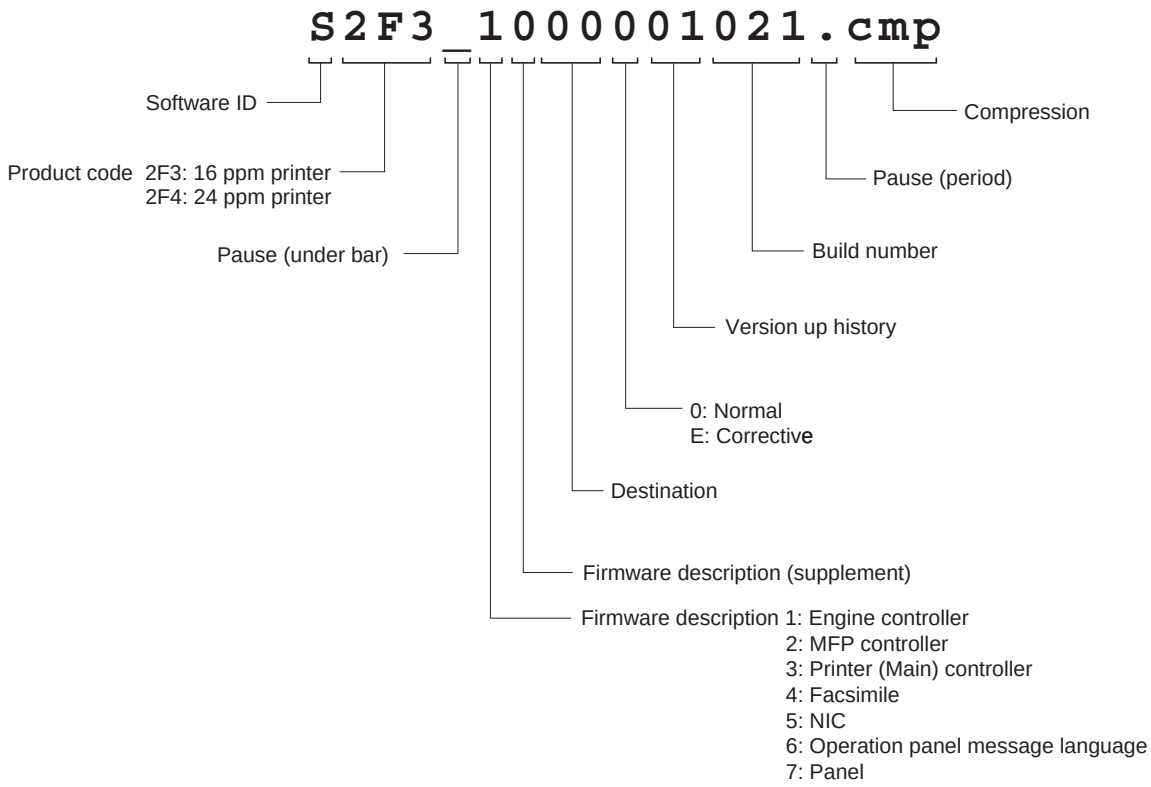


Figure 1-7-1

(1) Downloading the firmware from the parallel interface

To download the system firmware using the parallel interface, use the procedure below. Note that you can download both the system and engine firmware at a time.

1. Turn printer and PC power off.
2. Connect the parallel printer cable between the PC and the printer.

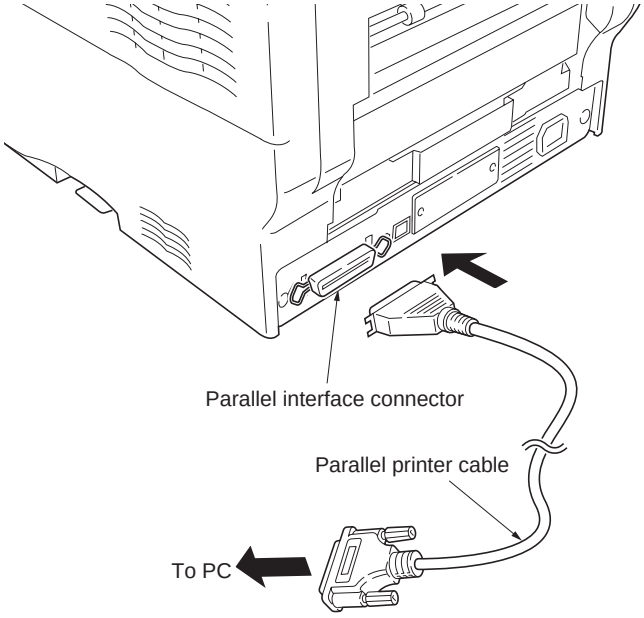


Figure 1-7-2

3. Turn printer power on.
4. Confirm that display (1) is displayed.
5. At the DOS prompt, enter command (2).
* Enter UPGR 'SYS' in capitals.
6. Confirm that message display (3) is displayed.
7. At the DOS prompt, enter command (4) so that the system firmware (example: S2F3_3000001021.cmp) is copied to the printer.
8. Message display (5) is displayed during downloading. When message display (6) is displayed to indicate downloading is finished, turn printer power off and then turn on.
9. Confirm that message display (7) is displayed after warm-up.
10. Print a status page. Check that the status page shows the updated firmware version.

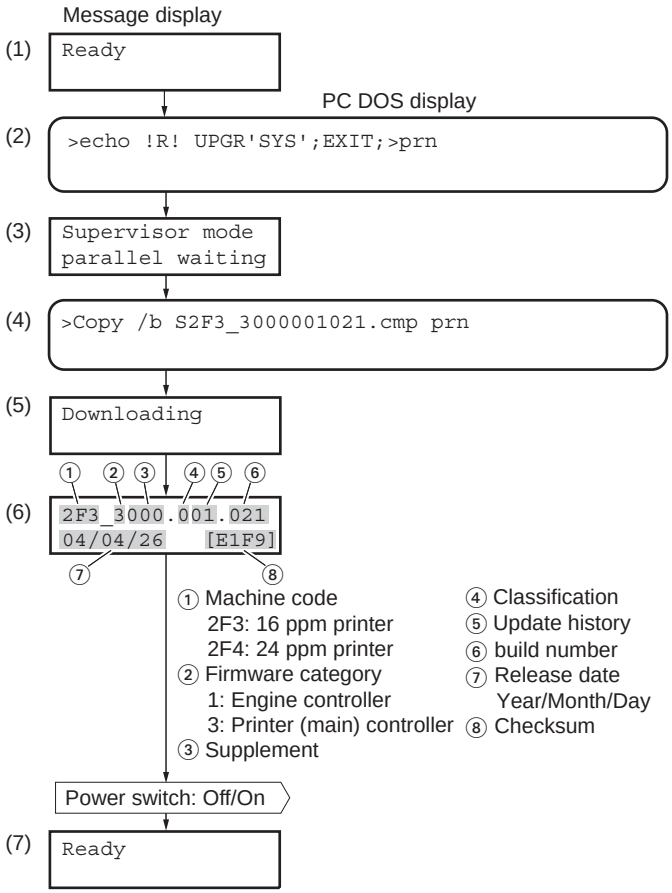


Figure 1-7-3

(2) Downloading the firmware from the memory card

The procedure below provides how to download firmware from a memory card. Note that you can download both the system and engine firmware at a time.

1. Turn printer power off.
2. Insert the memory card into the printer's memory card slot.

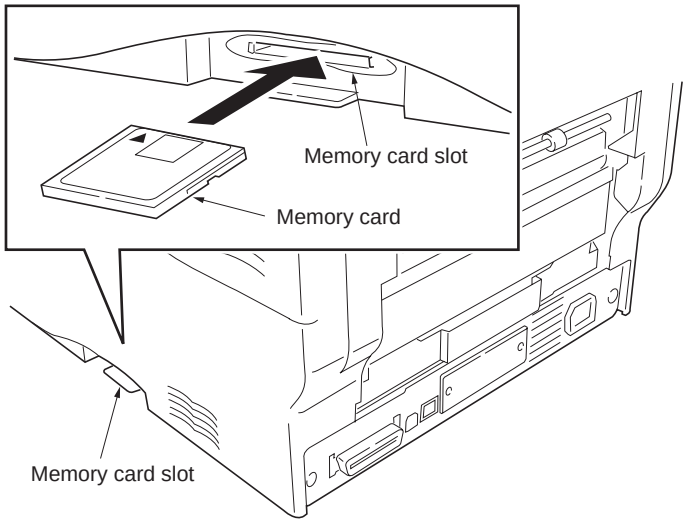


Figure 1-7-4

3. Turn printer power on.
4. Press MENU key on the printer's operation panel and carry out the memory card formatting procedure (1).
5. When formatting is complete, turn printer power off.

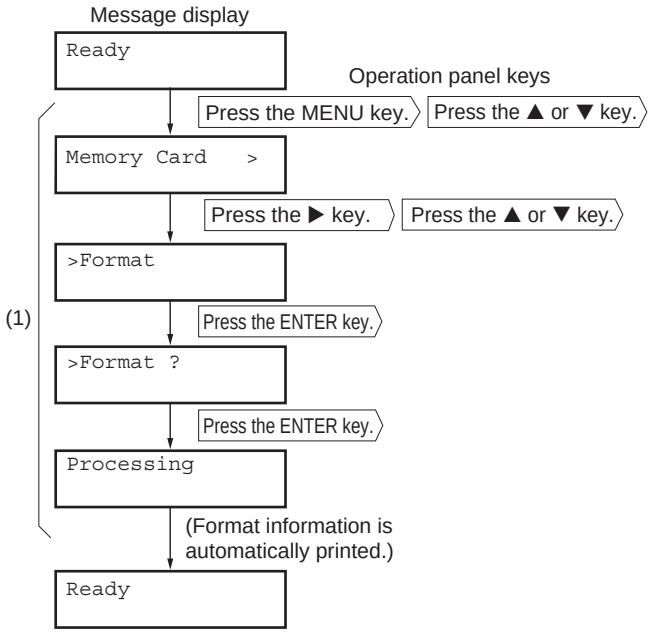


Figure 1-7-5

6. Remove the formatted memory card from the memory card slot.
7. Insert the memory card to the PC's slot or to the adaptor.
8. Copy the firmware file to download to the root directory of the memory card.
9. 8. Remove the memory card from the PC's slot or the adaptor.

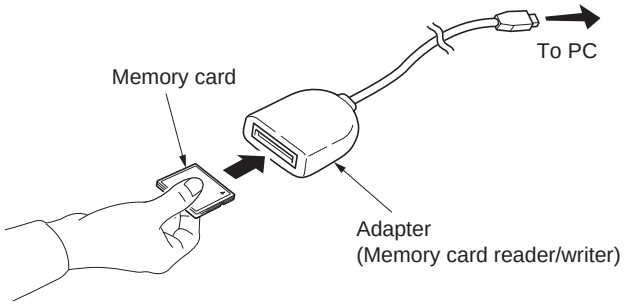


Figure 1-7-6

10. Confirm that the printer's power switch is set to off.
11. Insert the memory card into the printer's memory card slot.

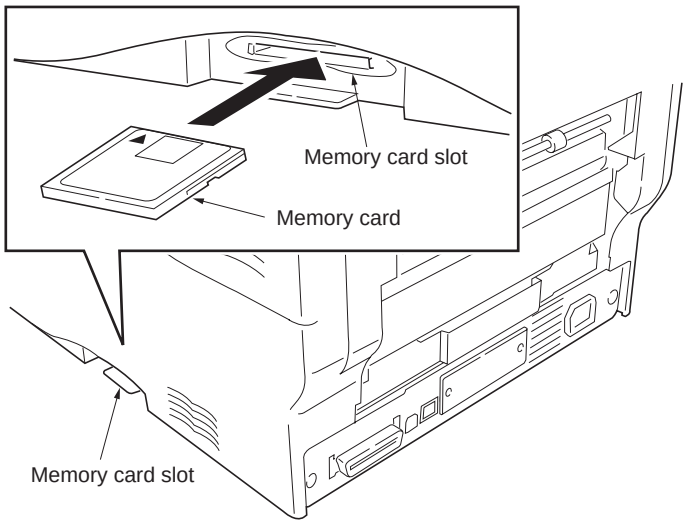


Figure 1-7-7

12. Turn printer power on.
13. When message display (1) is displayed to detect firmware in the memory card.
14. Message display (2) is displayed during downloading.
15. When message display (3) is displayed to indicate downloading is finished.
16. Turn printer power off.
17. Remove the memory card from memory card slot.
18. Turn printer power on.
19. Confirm that message display (4) is displayed after warm-up.
20. Print the status page. Print the status page to check that the firmware version has been updated.

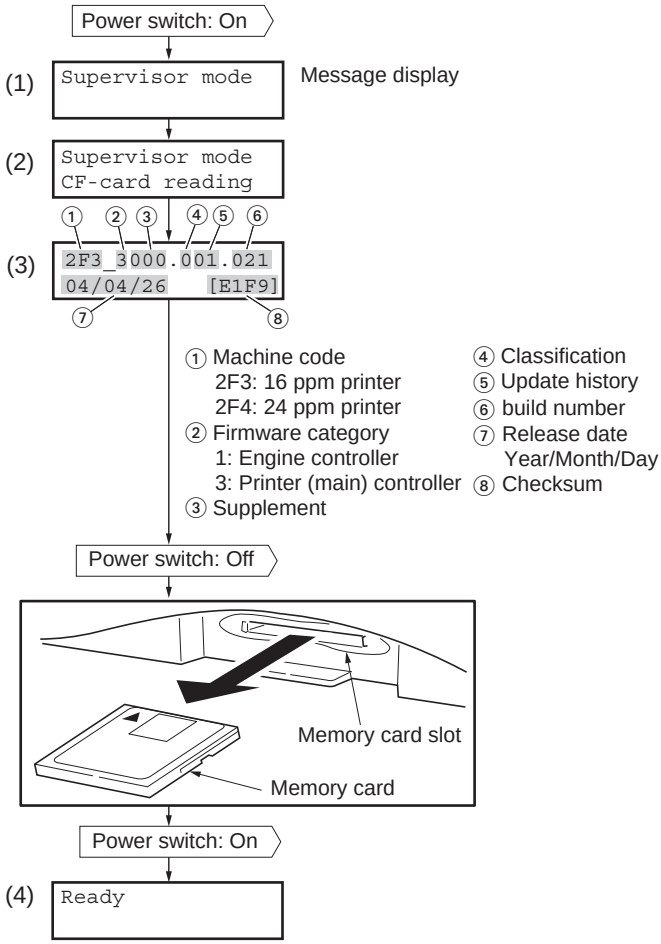


Figure 1-7-8

2-1-1 Paper feed section

There is paper feed from the paper cassette which can load paper 500 and paper feed from the MP tray which can load paper 100 in paper feed method of this printer.
The paper feed section is composed of paper cassette, paper feed unit, paper feed drive unit, MP tray and, MP tray feed unit.

(1) Paper feeding from paper cassette

The paper cassette is fit underneath the paper feed unit. The paper stored in the paper cassette is lifted up so that it is pressed against the pickup roller as the bottom plate in the paper cassette is raised by the lifter mechanism. The sheet at top is rewound to the pick up roller and sent to the paper feed roller which forward the paper in the printer. In order to prevent paper misfeed during feeding, the retard roller which is positioned face-to-face with the paper feed roller acts to prevent feeding more than one sheet at a turn of the pick up roller. The paper cassette has an opening at the front side. This opening is a loophole for the paper that is fed by the optional paper feeder or the duplexer which feeds paper into the printer.

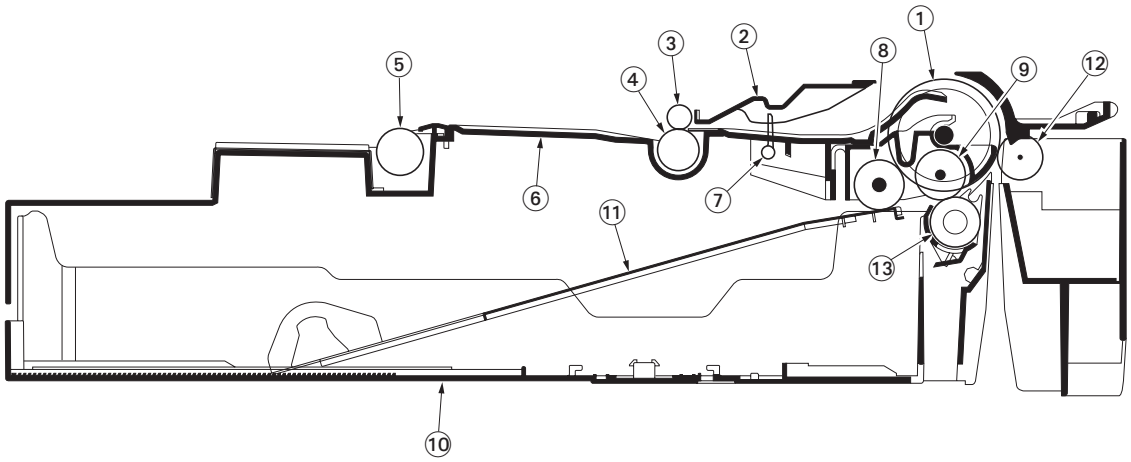


Figure 2-1-1 Paper cassette

(1) Guide roller
(2) Paper guide
(3) Upper registration roller
(4) Lower registration roller
(5) Secondary transfer roller
(6) Feed base
(7) Registration sensor (actuator)
(8) Pickup roller
(9) Feed roller
(10) Cassette base
(11) Bottom plate
(12) Feed pulley
(13) Retard roller

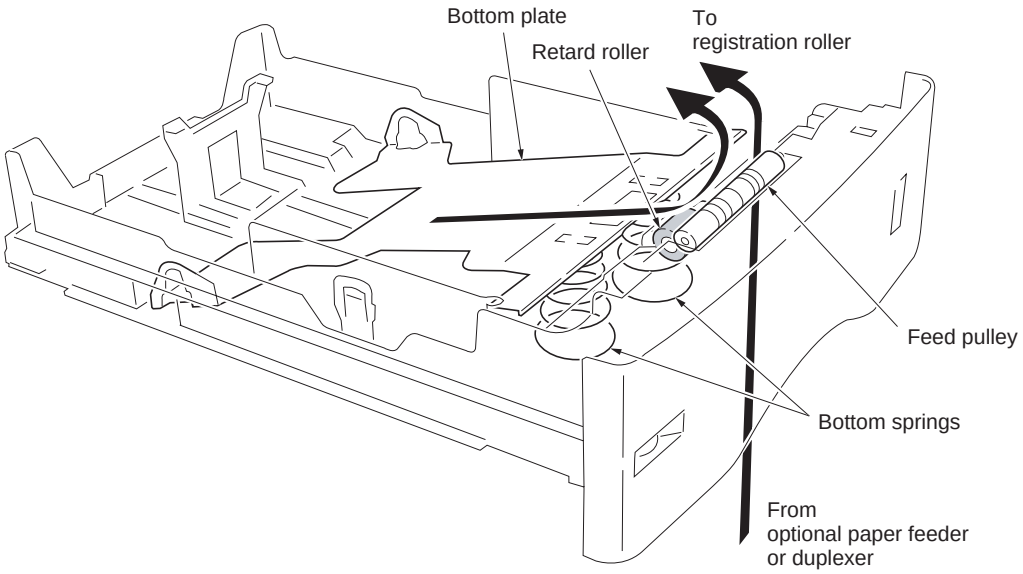
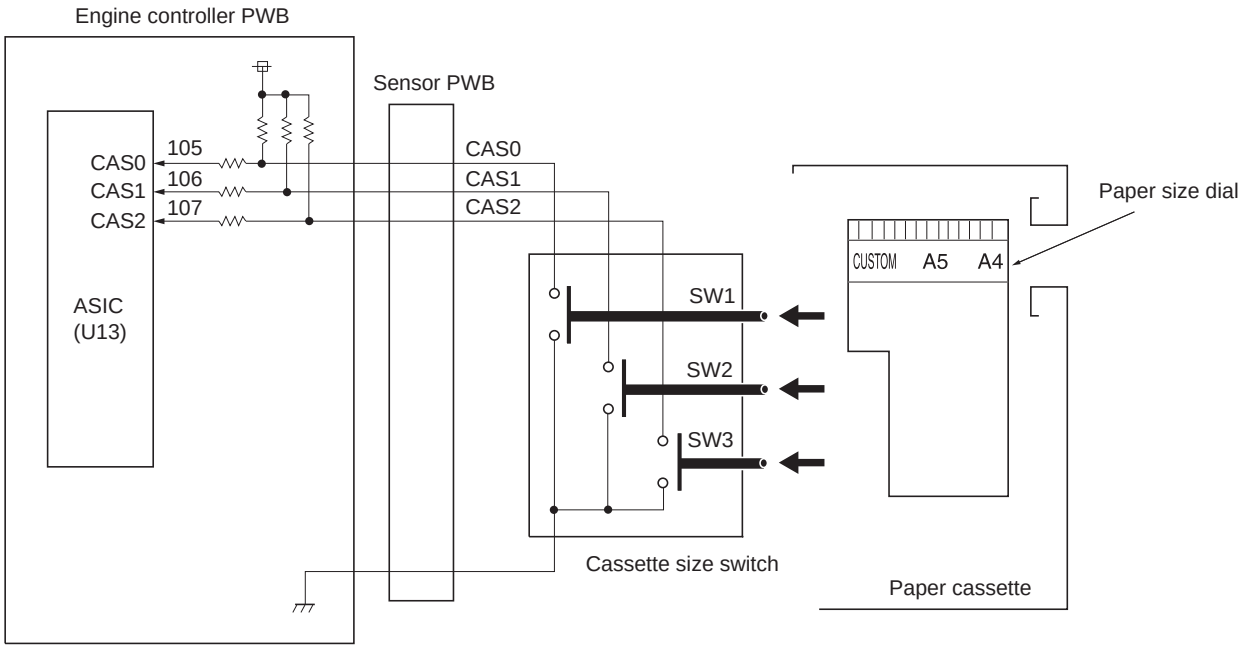
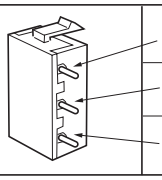


Figure 2-1-2

The paper size dial has predetermined patterns of activating the paper size switches using concaves and convexes according to paper sizes. SW1, SW2, and SW3 produce corresponding signals for paper sizes.



Cassette size switch		Paper size							
		Cassette not installed	Other	Legal	Letter	A4	A5	B5	
	SW1	H	H	H	H	L	L	L	L
	SW2	H	H	L	L	H	H	L	L
	SW3	H	L	H	L	H	L	H	L

Paper size dial

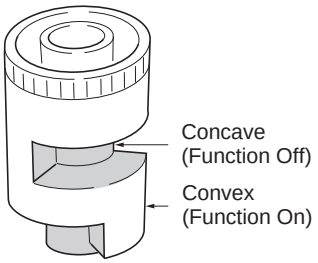
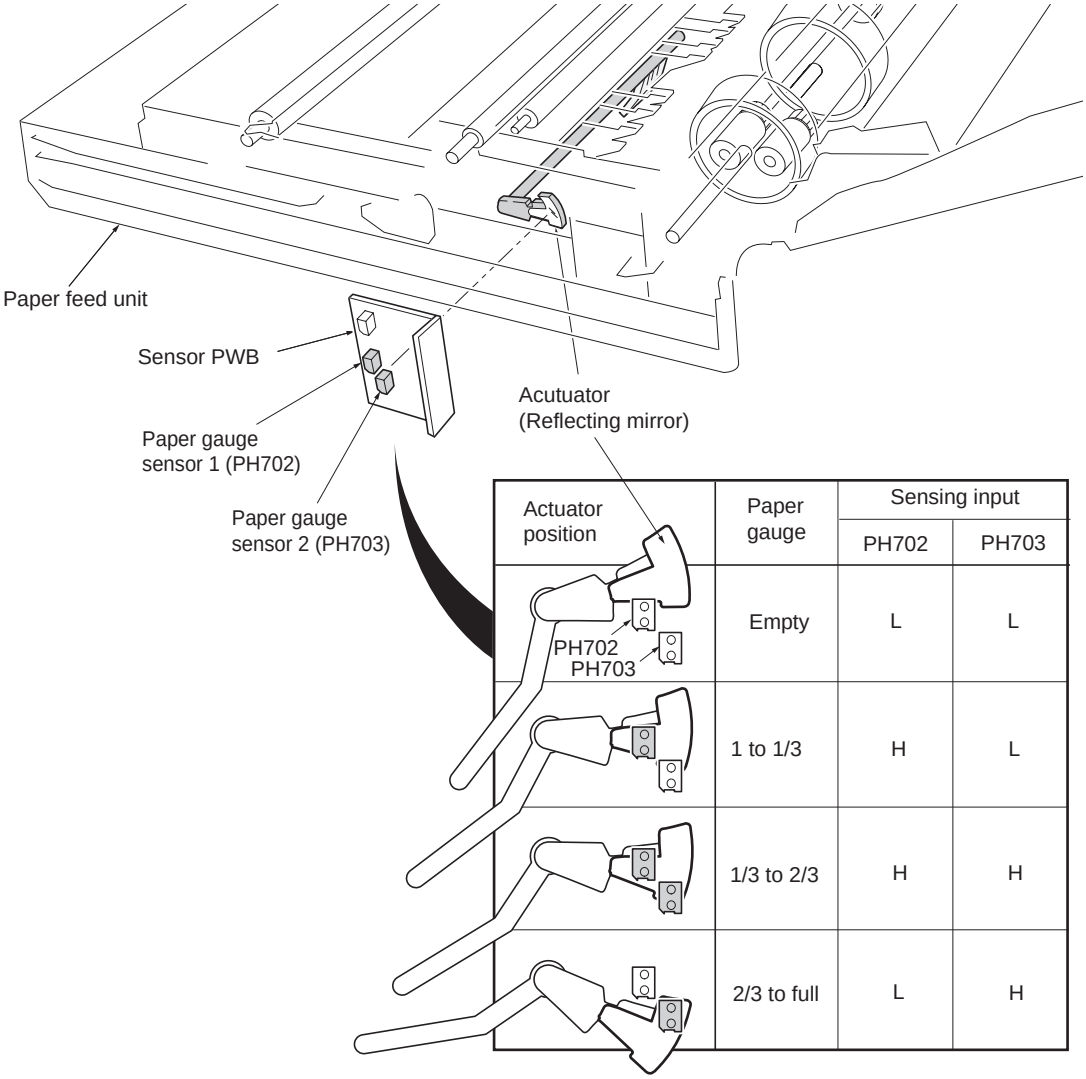


Figure 2-1-3

Paper gauge sensing circuit

The actuator which has a light reflector at one end keeps tracking of the height of the paper stack in the paper cassette. The angle of the reflector varies according to the actuator angle which means the amount of paper remaining. As the reflector moves across the detecting surface of paper gauge sensor (photo interrupter) 1 and 2, the on and off states of these sensors vary in combination as shown in the table below, allowing to determine the amount of remaining paper in the cassette.



Actuator position	Paper gauge	Sensing input	
		PH702	PH703
	Empty	L	L
	1 to 1/3	H	L
	1/3 to 2/3	H	H
	2/3 to full	L	H

Figure 2-1-4

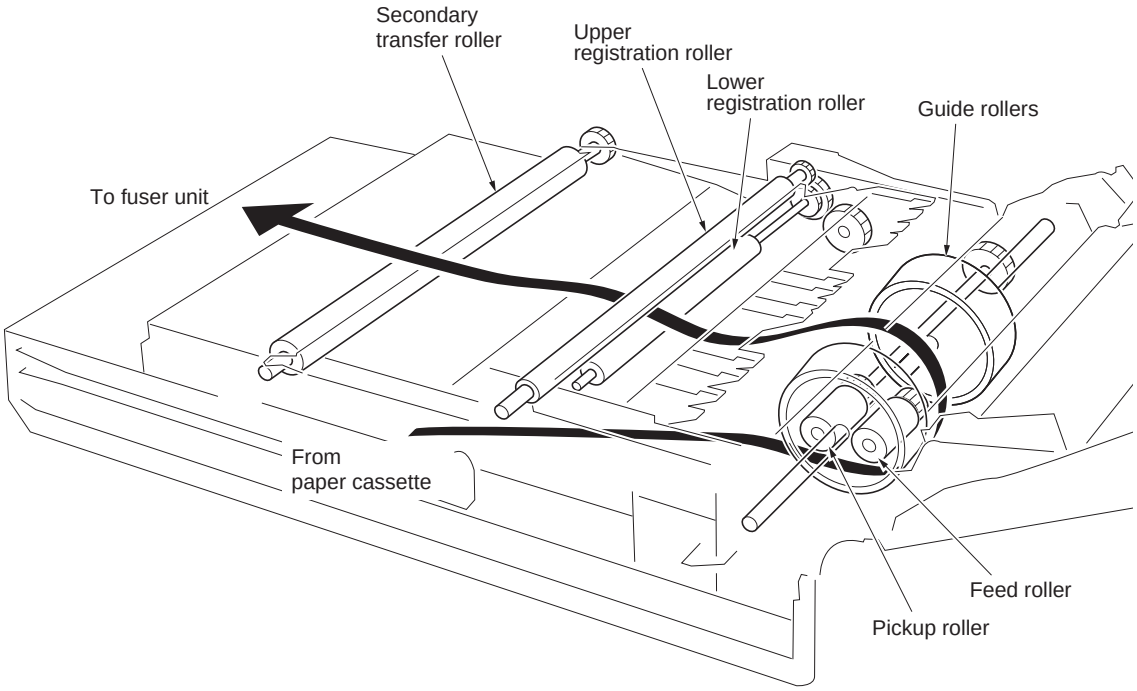


Figure 2-1-5 Paper feed unit

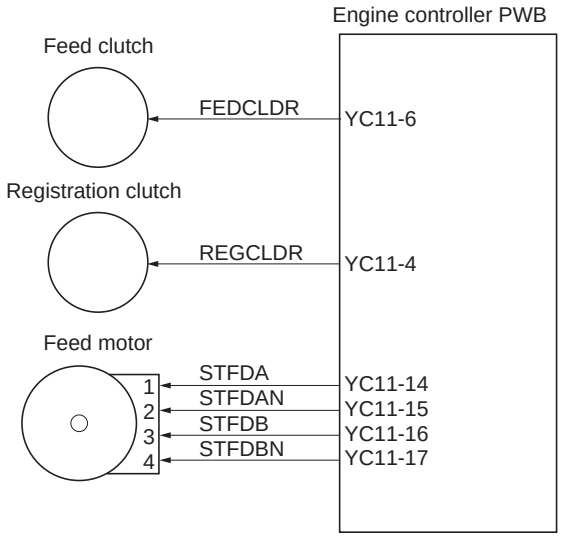


Figure 2-1-6 Paper cassette paper feed section block diagram

(2) Paper feeding from MP tray

The MP tray bottom which is driven by the MP feed solenoid press the paper against the MP feed roller. The sheet is rewound to the MP feed roller, then forward to the registration roller by means of the MP middle roller.

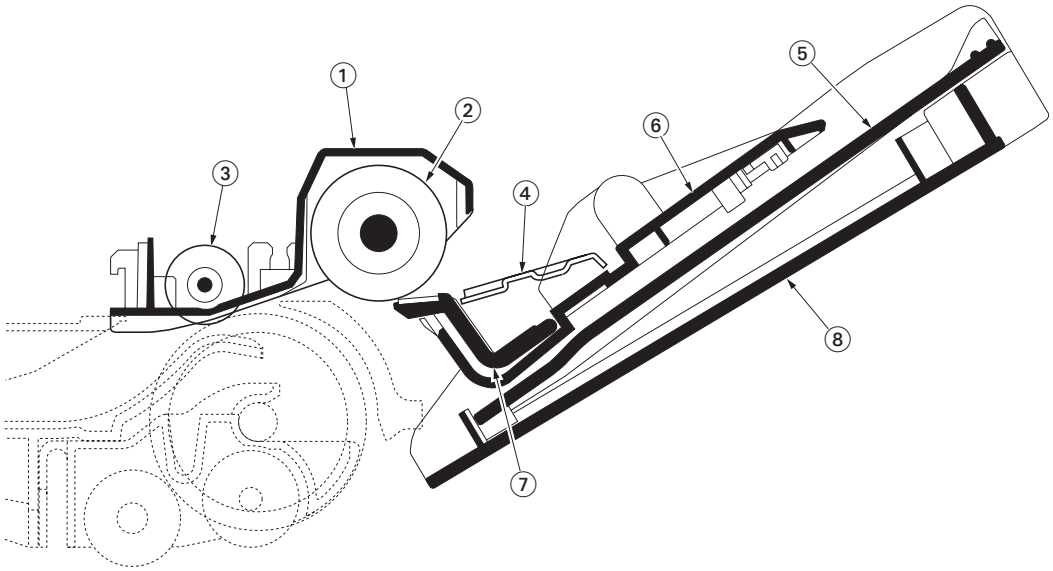


Figure 2-1-7 MP tray paper feed section

(1)	MP frame	(5)	MP middle tray
(2)	MP feed roller	(6)	MP base
(3)	MP middle roller	(7)	Separator
(4)	Multi bottom	(8)	MP tray cover

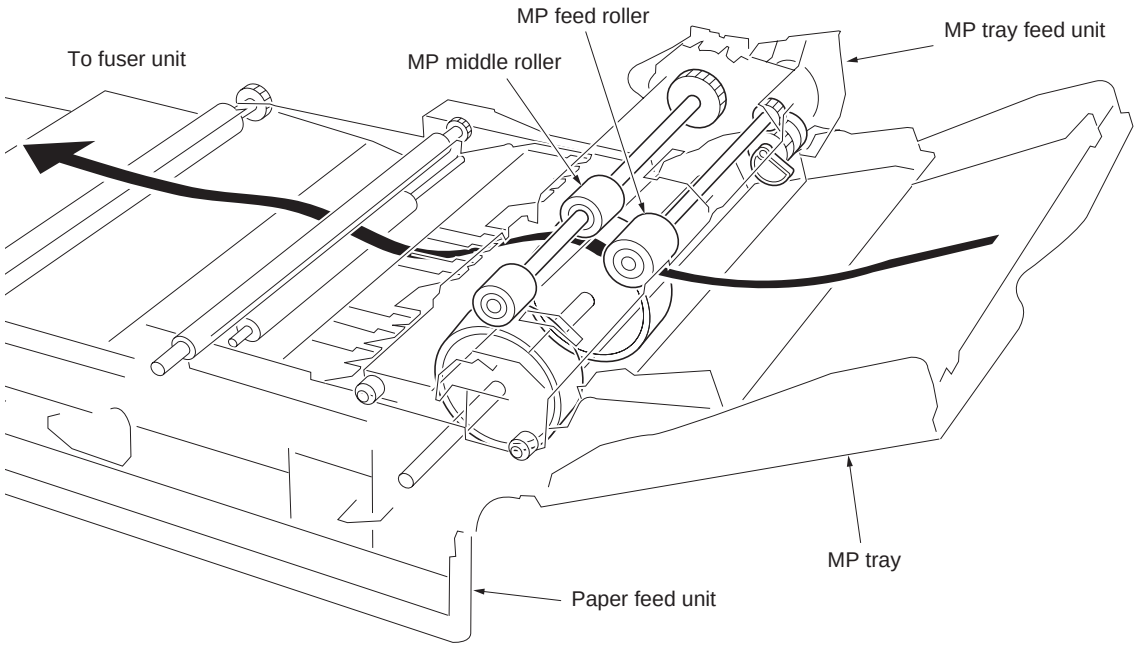


Figure 2-1-8

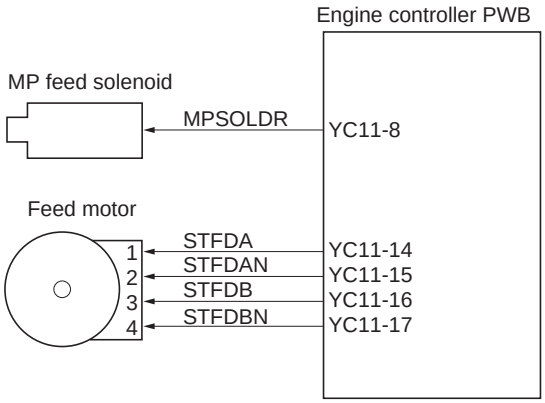


Figure 2-1-9 MP tray paper feed section block diagram

2-1-2 Developing section

(1) Developer unit

Developing section is composed of mixer screw, developing blade, developing magnet roller and, developing sleeve.

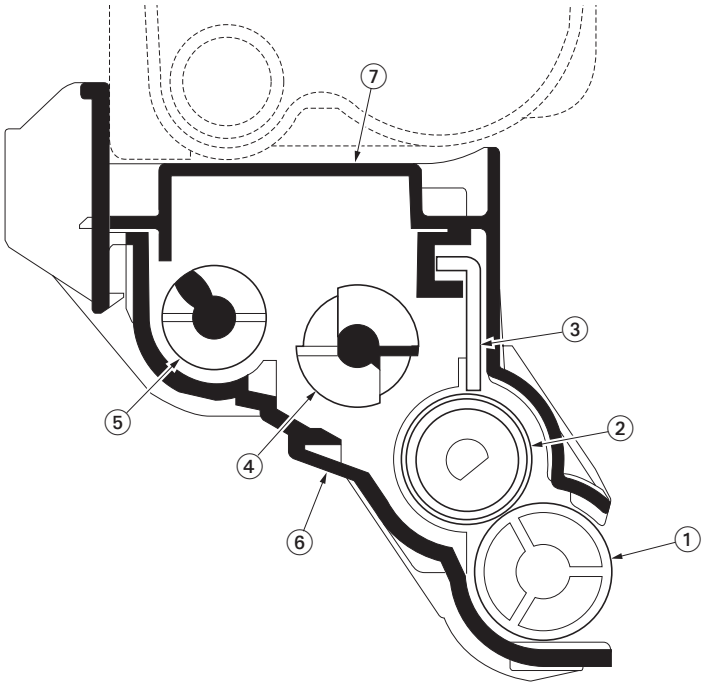


Figure 2-1-10 Developer unit

(1) Developing sleeve
(2) Developing magnet roller
(3) Doctor blade
(4) Mixer screw B
(5) Mixer screw A
(6) Developer case
(7) Developer lid

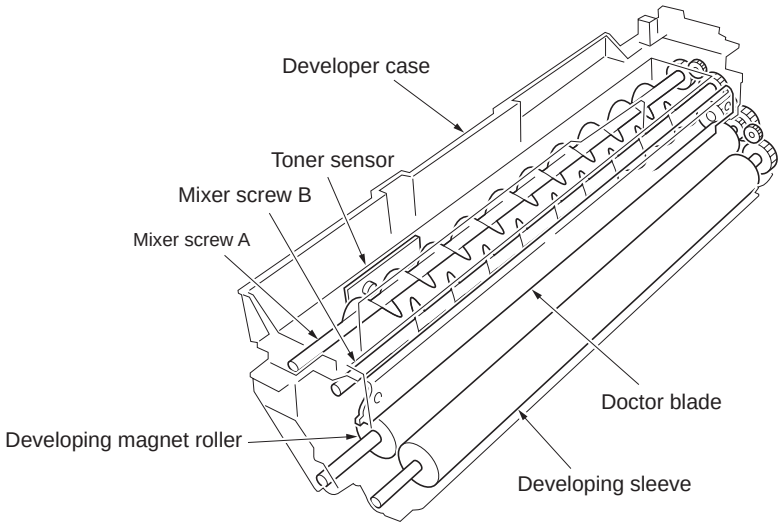


Figure 2-1-11 Developer unit

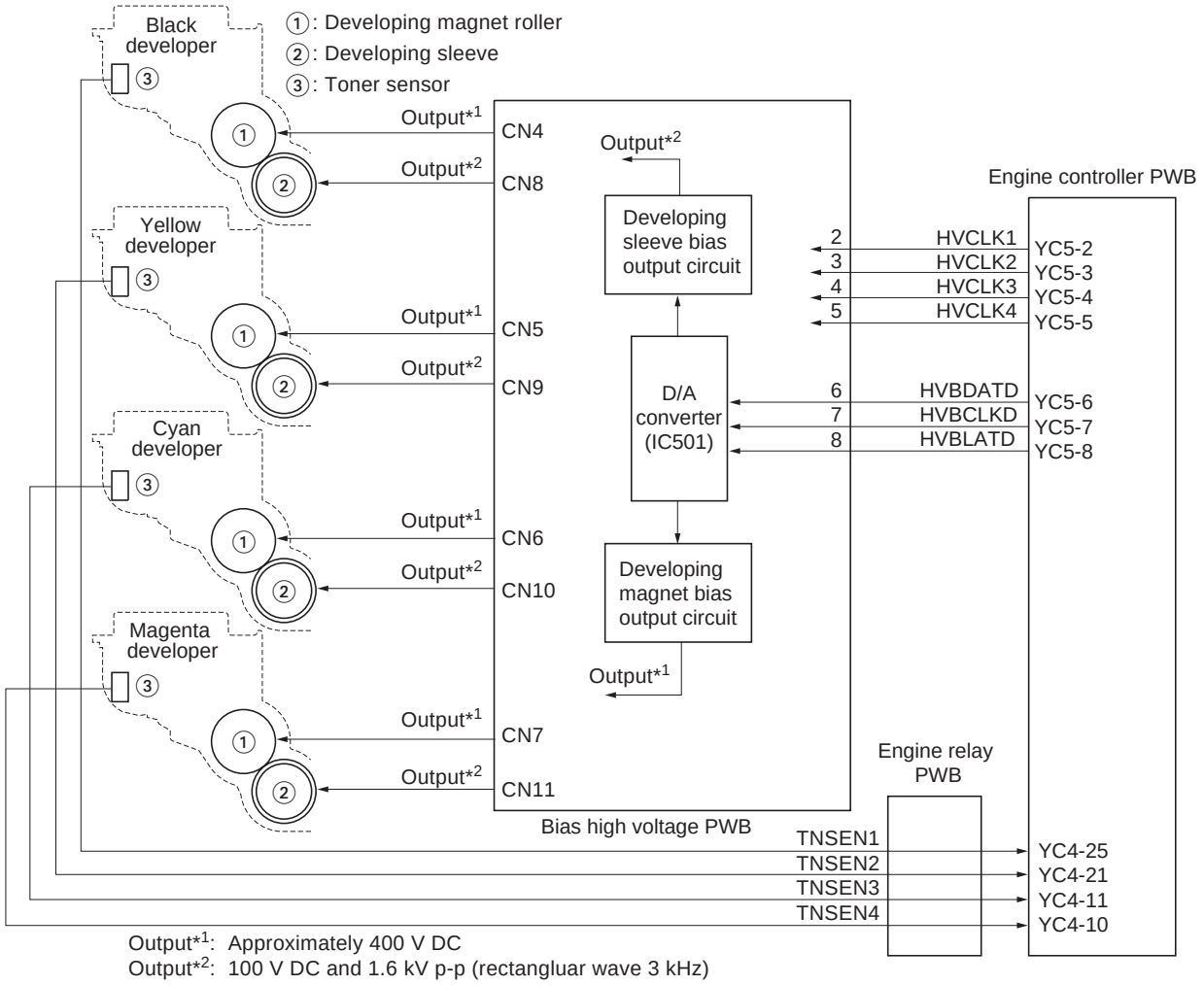


Figure 2-1-12 Developing section block diagram

(2) Touch down developing method

Touchdown development system is a development system having the best of both mono-component system and dual component system. Dual component developer which is a powder of mixture of toner and carrier powder is continuously agitated by mixer screws A and B in the toner hopper in the developer unit. The toner and carrier powder are adsorbed to each other by means of electrostatic charge developed by the friction when they are stirred. The developing magnet roller is comprised of a magnet and a sleeve which revolves coaxially with the magnet. The developer powder forms 'brushes' of toner and carrier on the magnet sleeve along the magnetic field centering the magnet. The 'brushes' are truncated to a constant length of height (approximately 0.5 to 0.55 millimeters) as they pass under the doctor blade. The developing magnet roller lies along the developing sleeve at the distance of 0.40 millimeters. As the developing magnet roller revolves, the brushes formed at pole N1 sweep the developing sleeve and the toner is transferred to the developing sleeve as it is attracted by the difference in potential between them. The toner on the developing sleeve is approximately 70 micrometer in thickness. The developing sleeve is located 0.23 millimeter from the drum. The toner is transferred to the drum by means of the DC/AC bias applied to the developing sleeve.

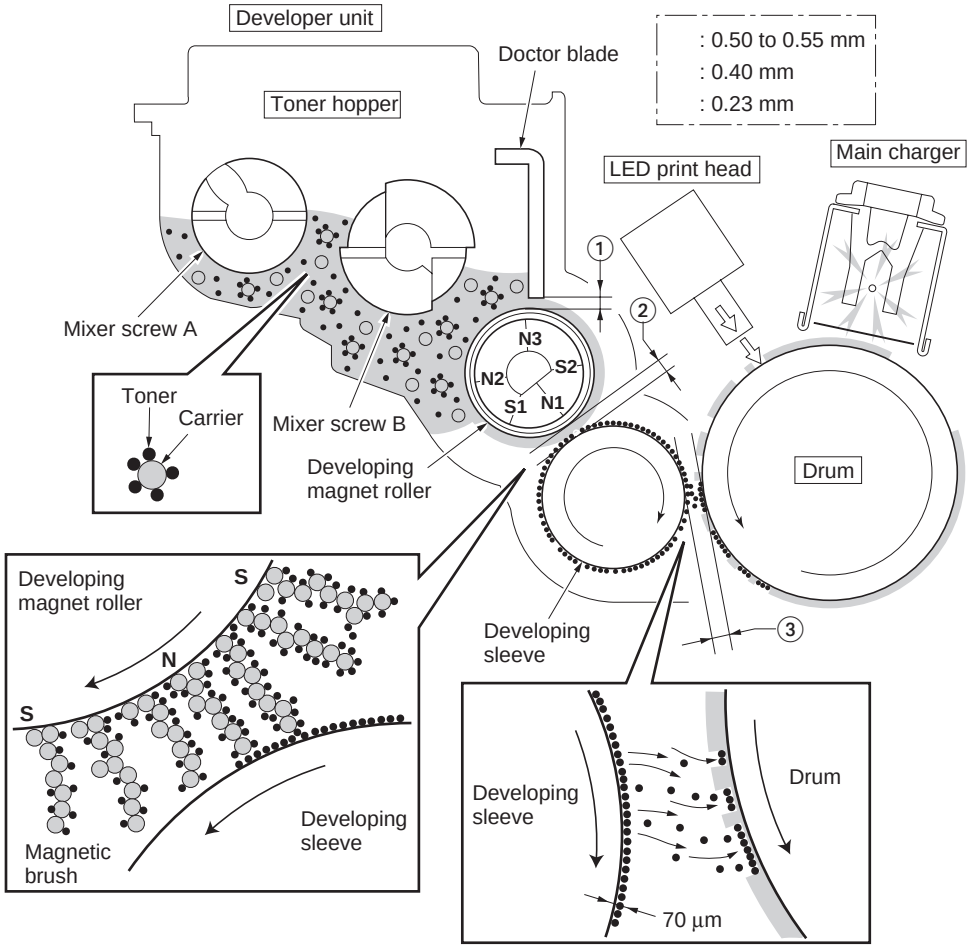


Figure 2-1-13

(3) Developer drive stop mechanism

Developer drive stop mechanism detaches the drive transmission of developers other than black developer at the time of monochrome printing and makes stop, drives only black developer due to the movable part and the operation of developer drive stop motor with idle plate lever, cam lever, cam gear and idle arm plate etc. which in main drive unit are provided.
Each drum motor gear (K1, Y1, C1, M1) is always geared with each idle gear (K2, Y2, C2, M2), so that the drive of idle gear is transmitted to developer gear (K3, Y3, C3, M3) and developers are driven.
Since the shaft of idle gear (K2) which transmits a drive to a black developer is being fixed to main drive unit, although a drive is transmitted to developer gear (K3) and a black development unit always drives.
But idle gear which transmits drive to developer of the other colors (Y2, C2, M2) because in idle arm plate which mobility it does it is installed, the idle gear (Y2, C2, M2) with developer gear (Y3, C3, M3) connection leaves due to the mobility of idle arm plate, the mechanism where drive is separated.
According to this mechanism, although all developers are driven at the time of color printing, only a black developer is driven at the time of monochrome printing.

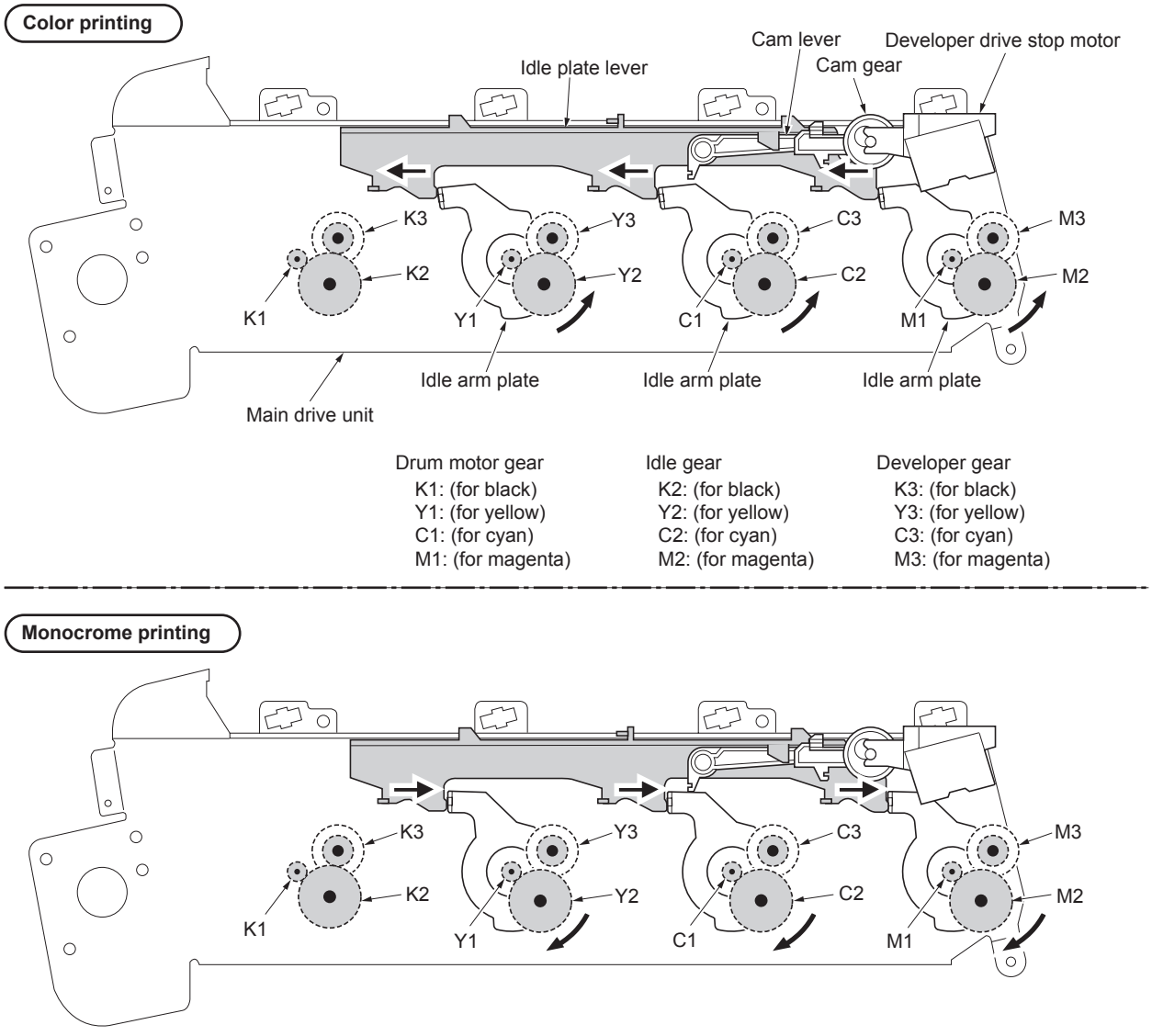


Figure 2-1-14

2-1-3 Drum section

The drum unit includes a photoconductive drum, eraser lamp, LED print head, cleaning blade and, a main charger unit. The drum unit is removable with the main charger unit.

(1) Drum unit

The tandem development system uses four drum units which are isomorphic to each other, in cyan, magenta, yellow, and black colors. In the drum unit, the main charger disperses charging potential over the drum to evenly charge the drum. When the light emitted by LED hits the charged drum, the electrostatic latent image is developed on the drum. The electrostatic latent image is 'developed' by toner applied by the developer unit and transferred onto the primary transfer belt in four colors. The toner remaining on the drum is scraped off by the cleaning blade and driven outside by the spiral screw. The residual potential on the drum is discharged by the exposure to the eraser lamp. Thus, the drum becomes ready for the next main charging.

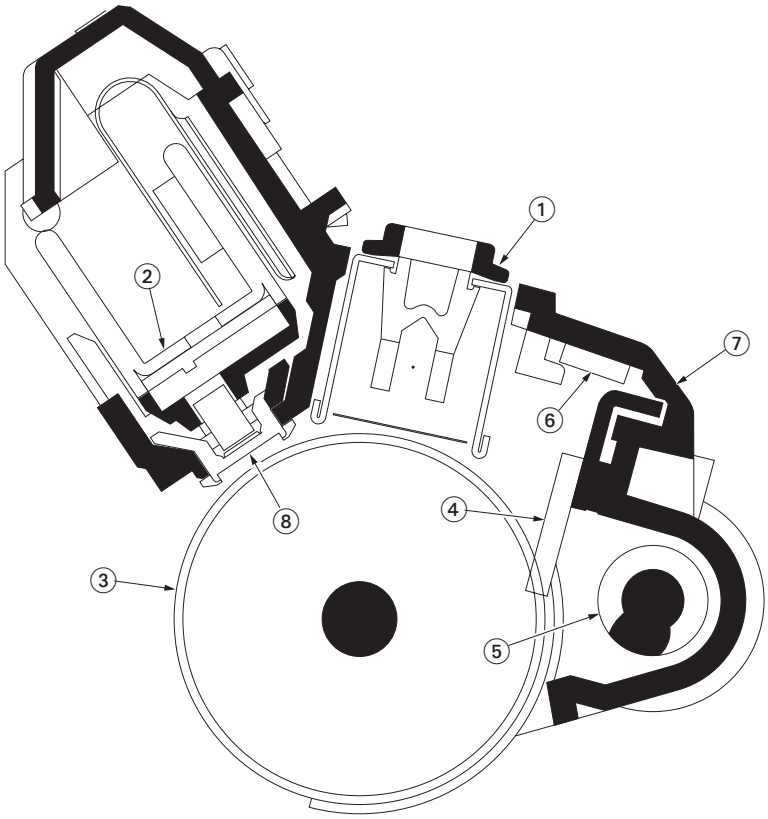


Figure 2-1-15 Drum unit

(1)	Main charger unit	(5)	Waste toner exit screw
(2)	LED print head	(6)	Eraser lamp [PWB]
(3)	Drum	(7)	Drum frame
(4)	Cleaning blade	(8)	Lens cleaner

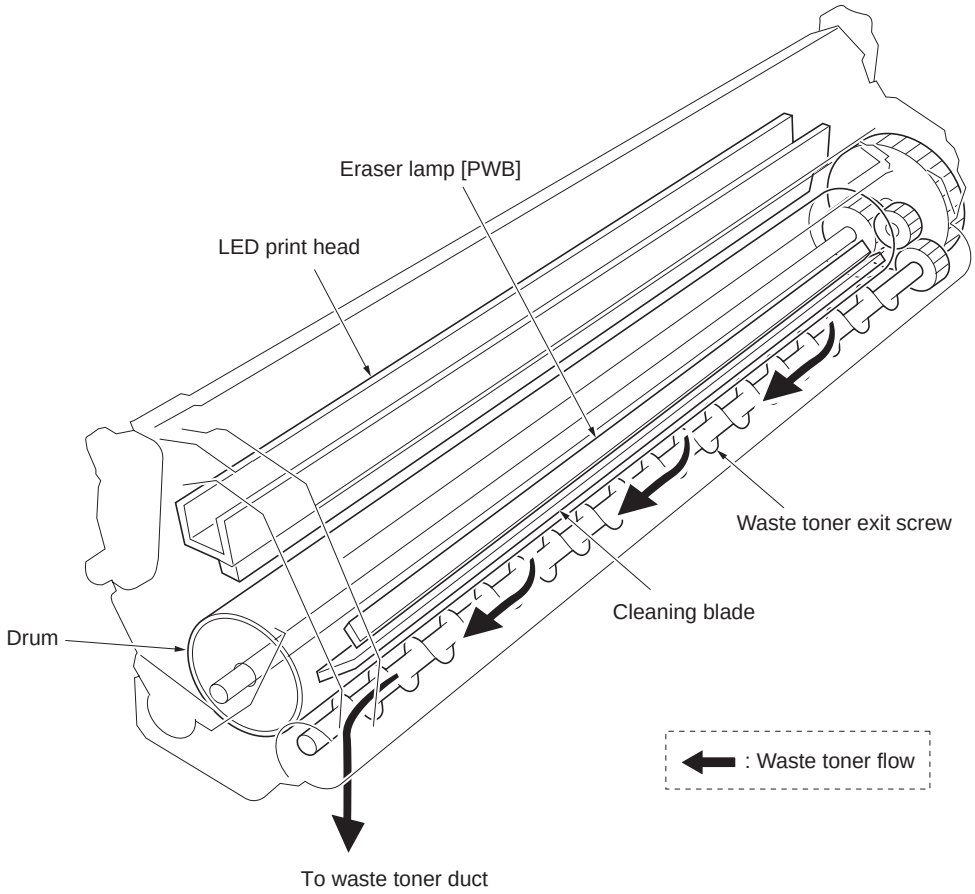


Figure 2-1-16 Drum unit

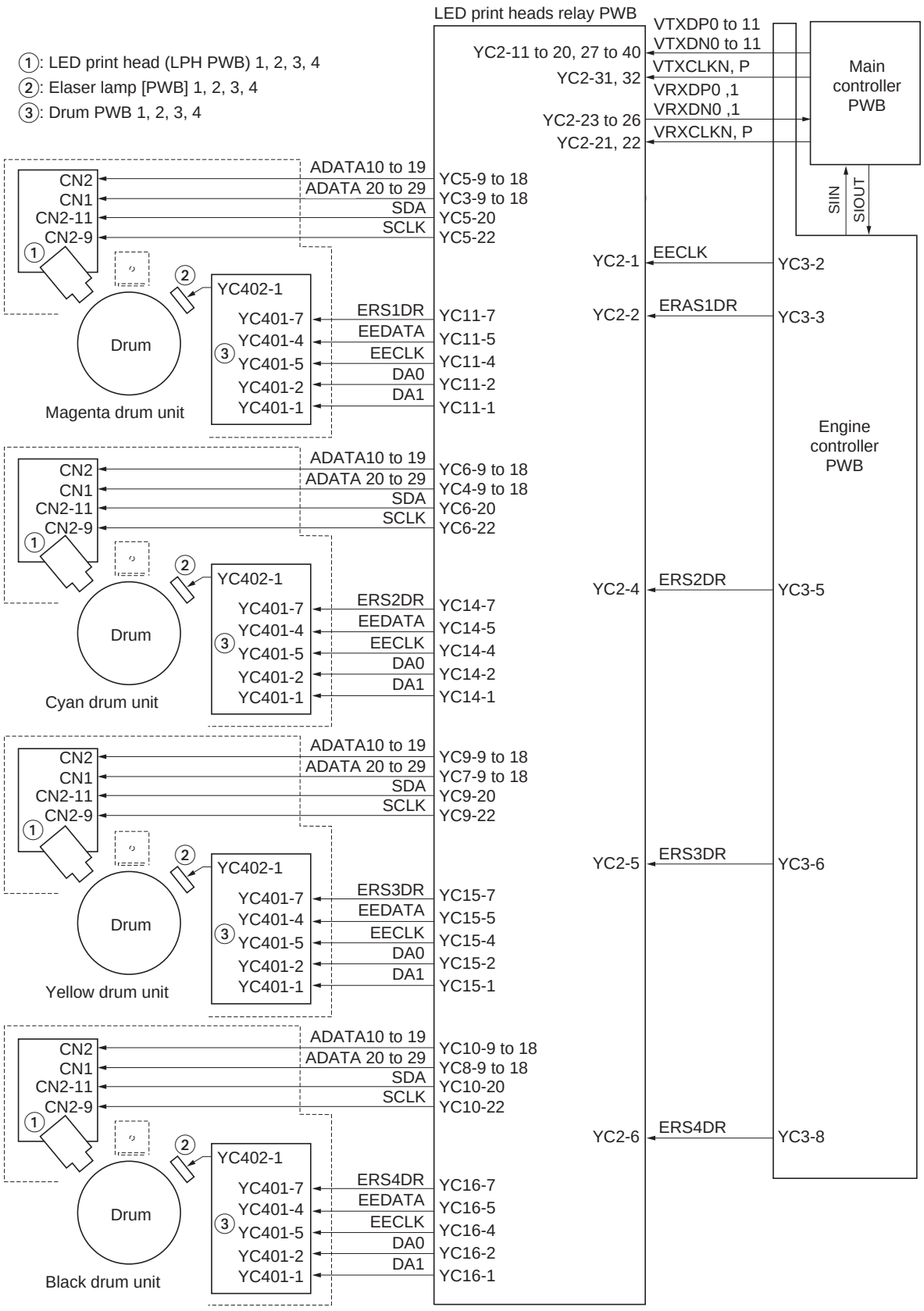


Figure 2-1-17 Drum section block diagram

(2) Waste toner ejecting mechanism

The waste toner which is ejected from the drum units drops on the waste toner conveyer through a duct. The waste toner is conveyed towards the primary transfer cleaning unit, finally stored in the waste toner box.

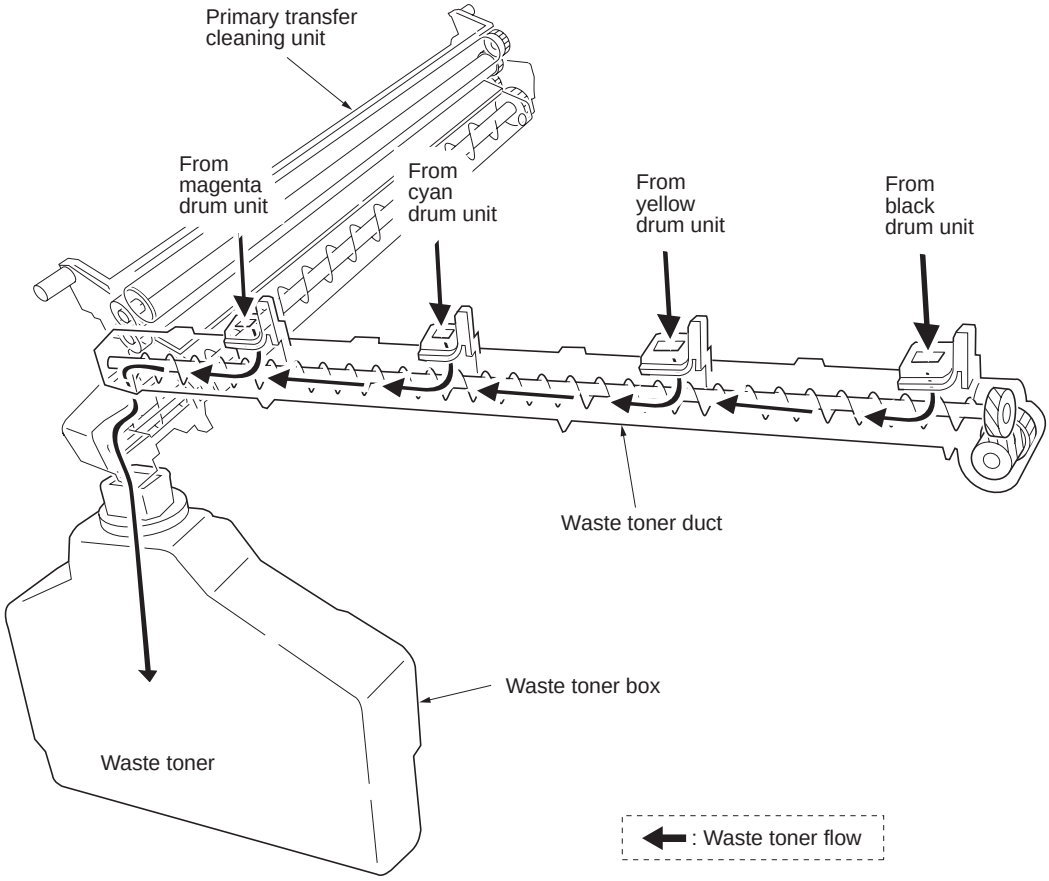


Figure 2-1-18 Waste toner ejecting mechanism

(3) LED print head

The LED print head is comprised of SELFOC lens array, and an LPH PWB. The LPH PWB arrays 5184 of LED chips in line. It also includes the driver circuit for the LED chips. The light which is switched on and off depending on video data irradiate the drum through the SELFOC lens, to form an image. The LED print head is of 600 dpi, therefore the exposure of the light is as dense as 600 dots per a inch. The EEPROM on the LPH PWB stores data for compensation of fluctuation of luminosity over all LED chips in the array.

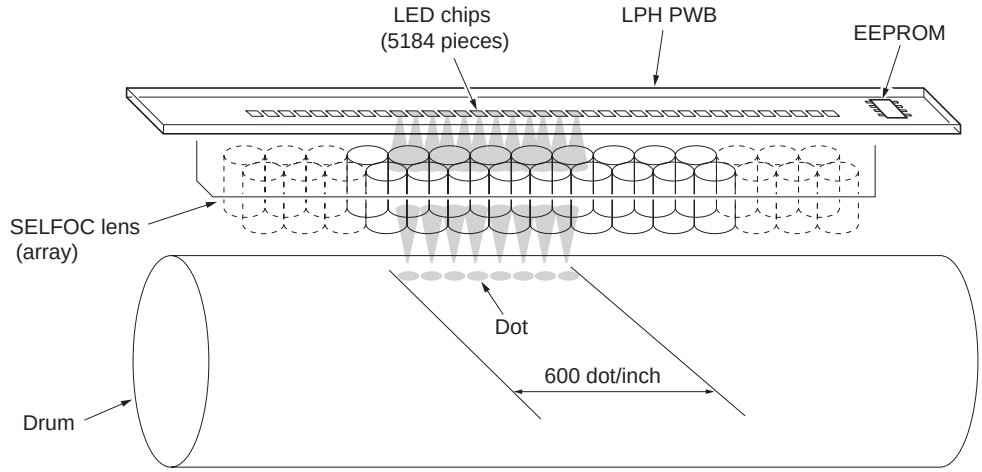


Figure 2-1-19 LED print head

Data to print is processed by the main controller PWB and transferred to the LED print head relay PWB in synchronization with VIDEO signal through the engine controller PWB. VIDEO signal is sent from ASIC (U22) on the mail controller PWB to ASIC (U1) on the LED print head relay PWB using LVDS method. LVDS stands for Low Voltage Differential Signaling which uses 16 pairs of signal lines (32 in all).The main controller PWB converts VIDEO signal into a unique format using LVDS depending on compensating data stored in a flash DIMM.
The LED print head has an EEPROM on the LPH PWB. The EEPROM includes data for compensating the fluctuation of luminosity of every LED chip. At power-up, the compensating data in EEPROM are cached in the flash DIMM on the main controller PWB. In a subsequent power-up, the main controller PWB refers the flash DIMM to obtain the compensating data and the EEPROM is checked with its checksum only.
If the LED print head or the main controller PWB is replaced, checksum becomes error. The compensating data is transferred to the main controller PWB again from the EEPROM. In case of failure with EEPROM on the LPH PWB or with compensating data, the printer displays service call 0951, 0952, 0953, or 0954 within approximately 30 seconds.

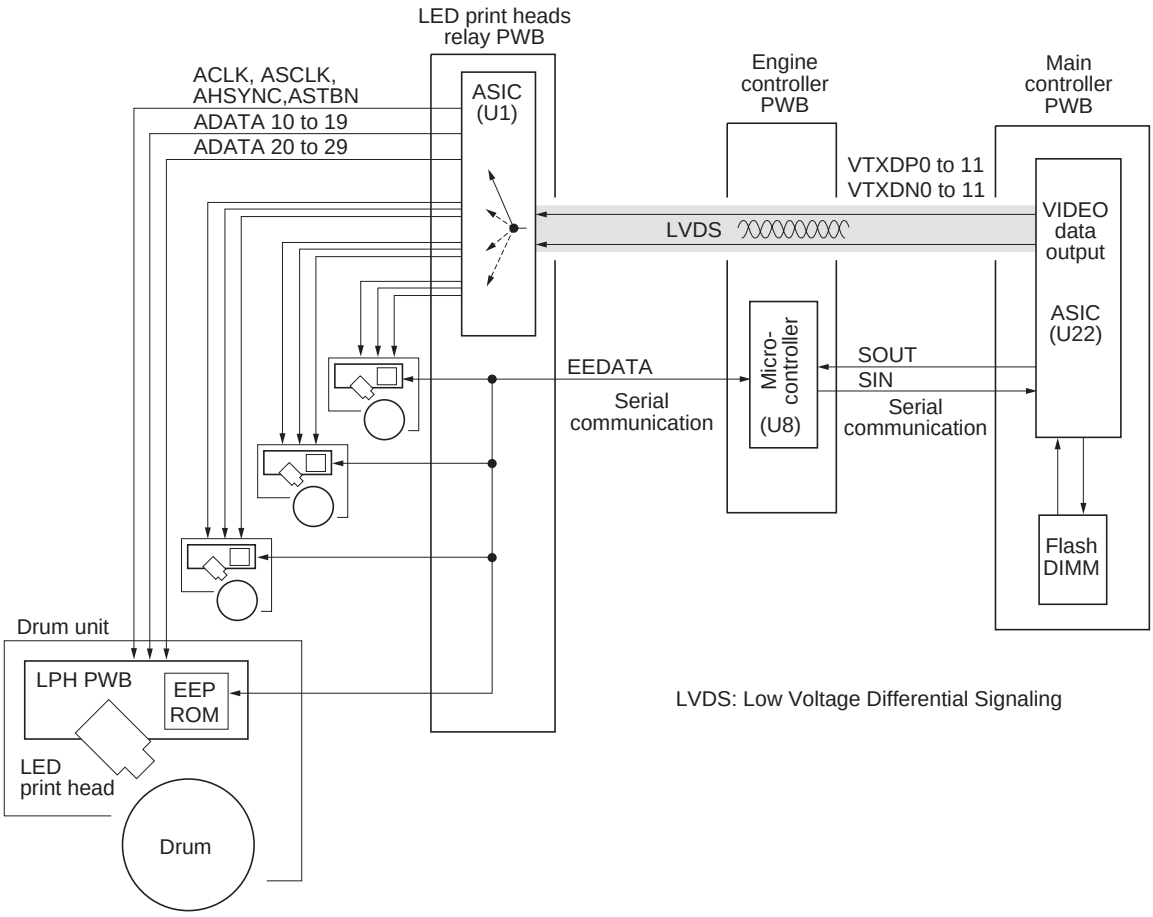


Figure 2-1-20 LED print head block diagram

(4) Main charger unit

Main charger unit is comprised of the main charger wire, main charger grid, main charger shield, and the main charger cleaner which are modularized and fitted to the drum unit.

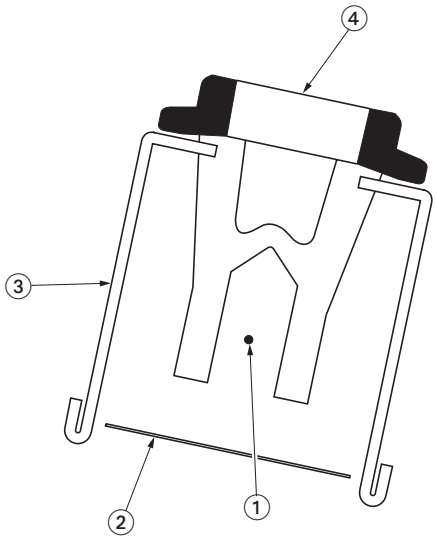


Figure 2-1-21

(1) Main chrger wire
(2) Main charger grid
(3) Main charger shield
(4) Main charger cleaner

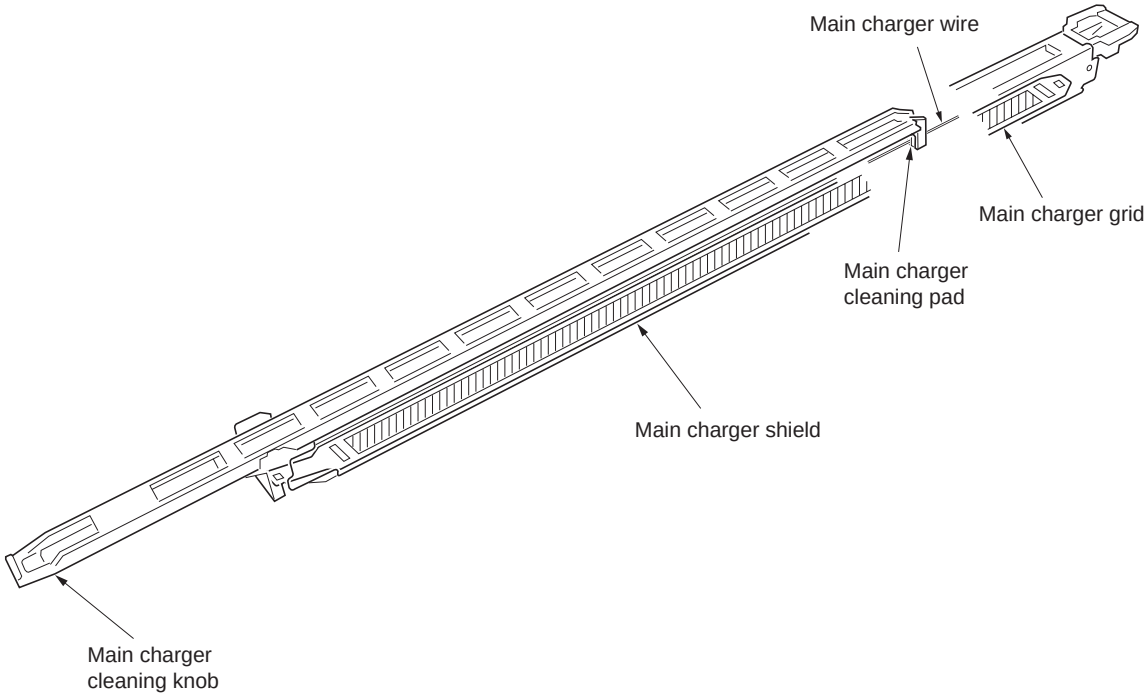


Figure 2-1-22 Main charger unit

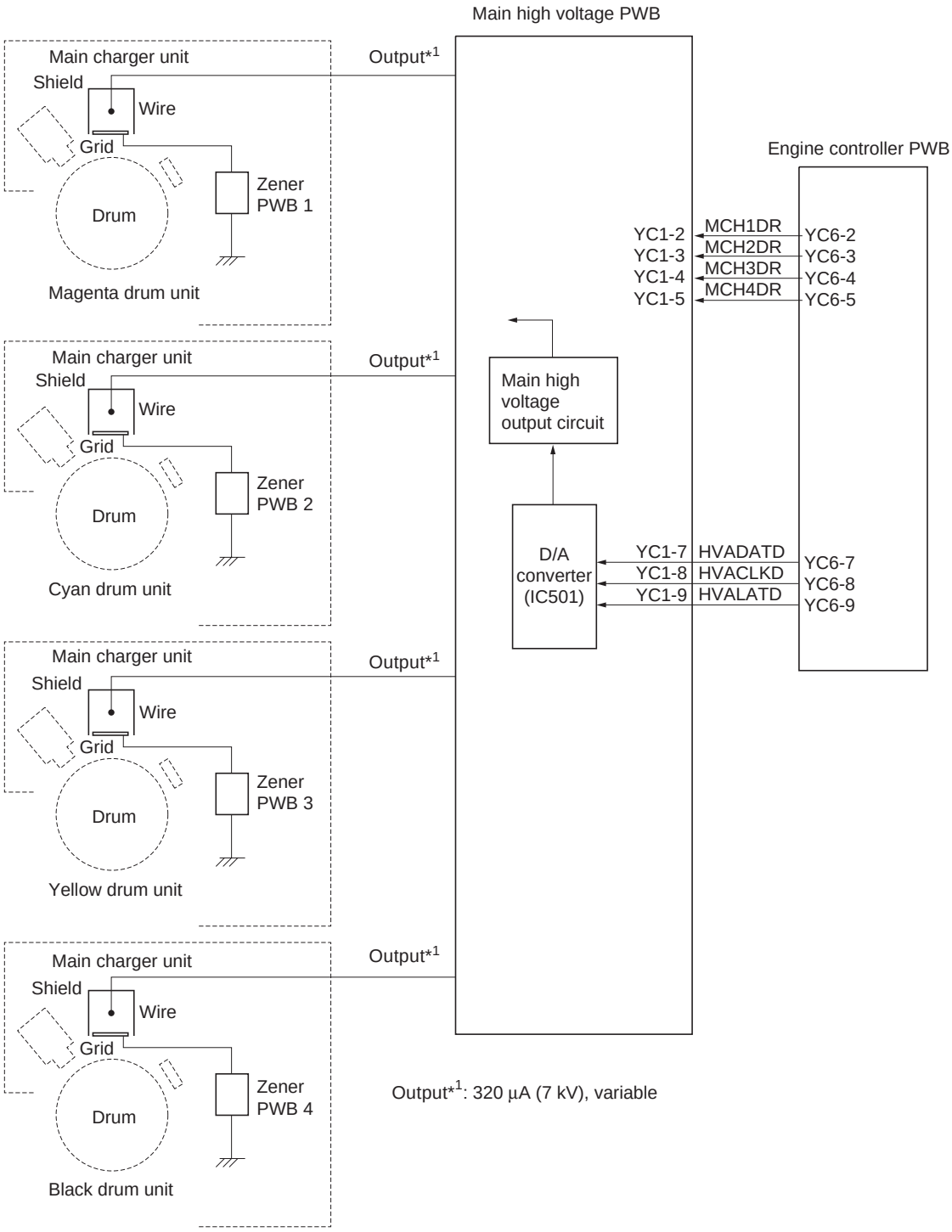


Figure 2-1-23 Main charger output block diagram

2-1-4 Primary transfer section

Primary transfer section is composed of the primary transfer unit and primary transfer cleaning unit.

(1) Primary transfer unit

The primary transfer unit is comprised of the primary transfer belt, tension rollers, and four primary transfer rollers of colors. Color image is transferred on the transfer belt as the four layers different colors. The toner ID sensor mounted on the main frame monitors the density of the toner on the primary transfer belt.

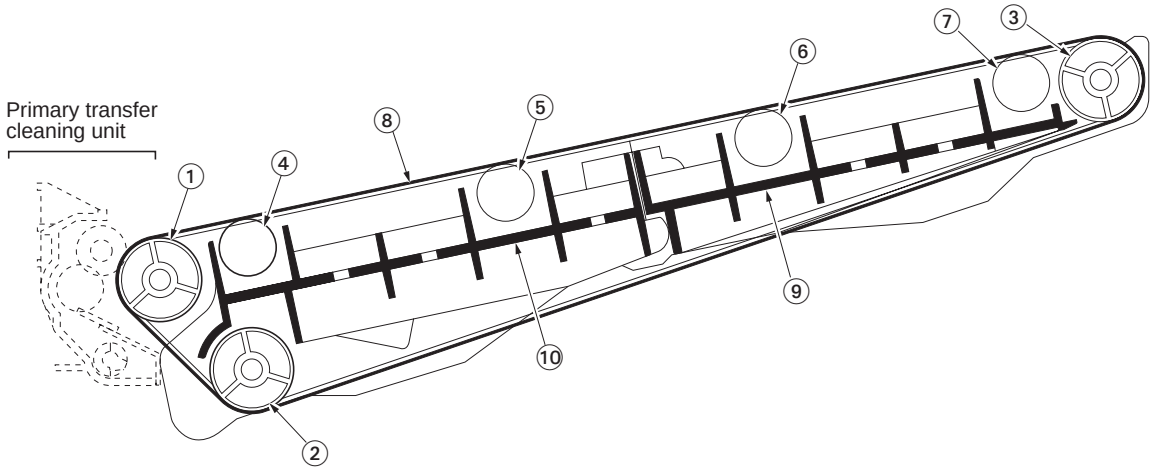


Figure 2-1-24 Primary transfer unit

(1) Tension roller
(2) Backup roller
(3) Drive roller
(4) Primary transfer roller (magenta)
(5) Primary transfer roller (cyan)
(6) Primary transfer roller (yellow)
(7) Primary transfer roller (black)
(8) Primary transfer belt
(9) Drive base
(10) Tension base

The primary transfer belt is made of stratum fluorine coat, stratum elastic, and stratum resin in the order from the surface to the bottom. These substances ensure smooth paper travel as well as the durability of the belt itself.

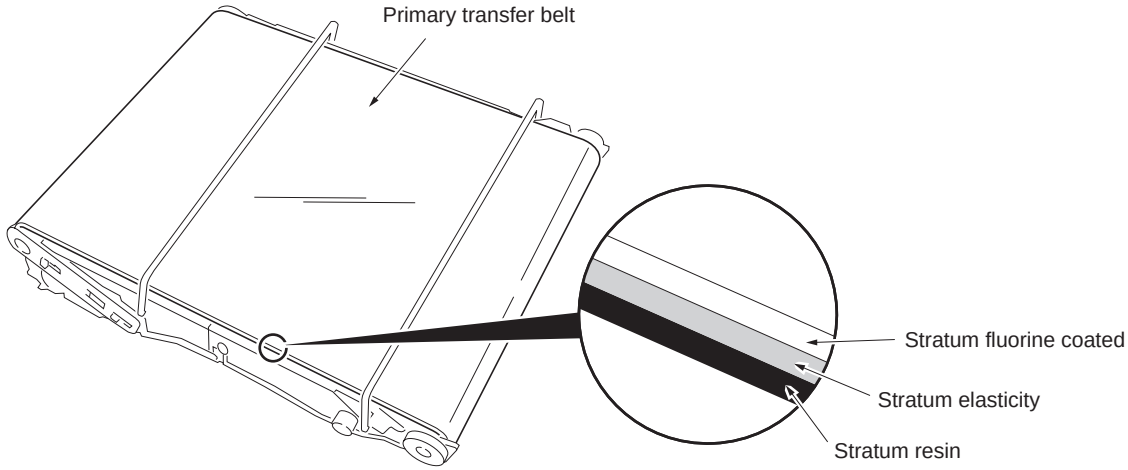


Figure 2-1-25 Primary transfer unit

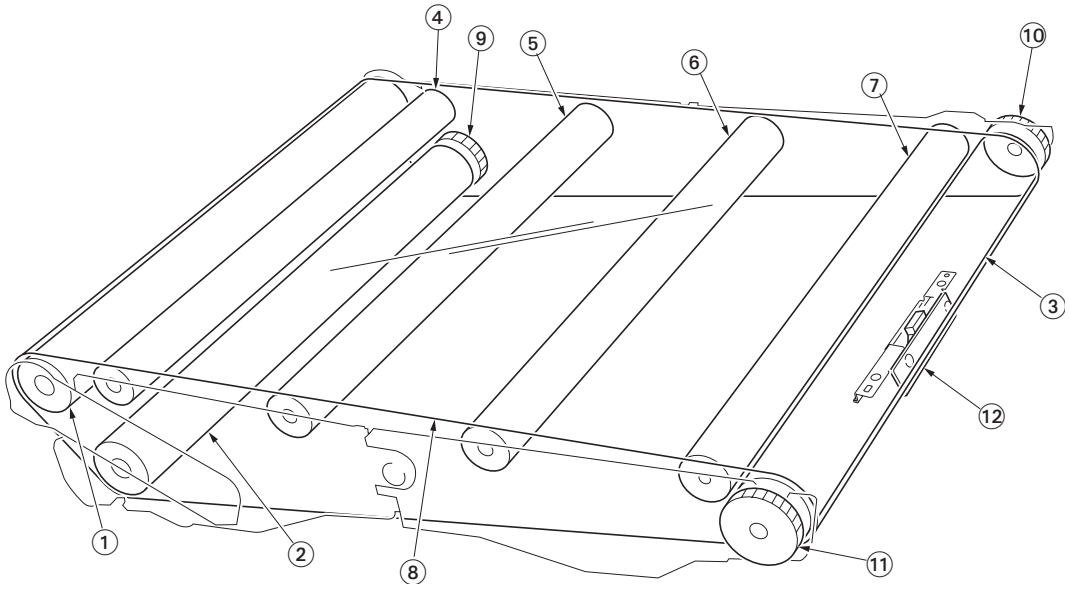


Figure 2-1-26

(1) Tension roller
(2) Backup roller
(3) Drive base
(4) Primary transfer roller (magenta)
(5) Primary transfer roller (cyan)
(6) Primary transfer roller (yellow)
(7) Primary transfer roller (black)
(8) Primary transfer belt
(9) Backup gear 29H
(10) Image gear 22H
(11) Image gear 28S
(12) Toner ID sensor (mounted on the main frame)

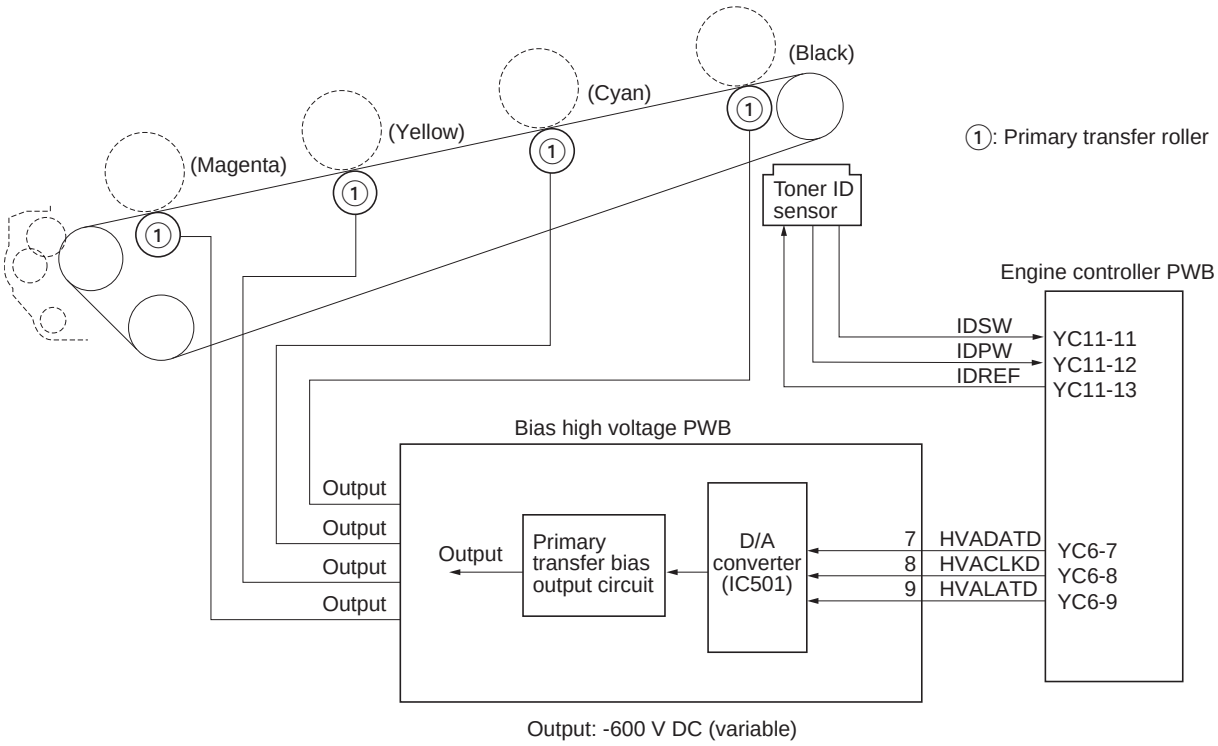


Figure 2-1-27 Primary transfer section block diagram

(2) Primary transfer cleaning unit

The primary transfer cleaning unit is composed of the fur brush, brush cleaning roller, cleaning blade and, cleaning screw. After secondary transferring is done, the toner which remains in the primary transfer belt is collected back in the waste toner box. The brush cleaning roller and the fur brush are applied with the DC bias of approximately 500 V DC through the conductive cleaning frame from the main high voltage PWB. The voltage at the fur brush is approximately 300 V DC.
The toner remaining on the primary transfer belt is transferred onto the fur brush that is biased and continuously revolving. It is then scraped off of the fur brush by the metal brush cleaning roller in the cleaning frame. The brush cleaning roller has the cleaning blade which scrapes off the waste toner. The waste toner scraped off of the brush cleaning roller falls onto the cleaning screw, then driven outward from the cleaning frame.

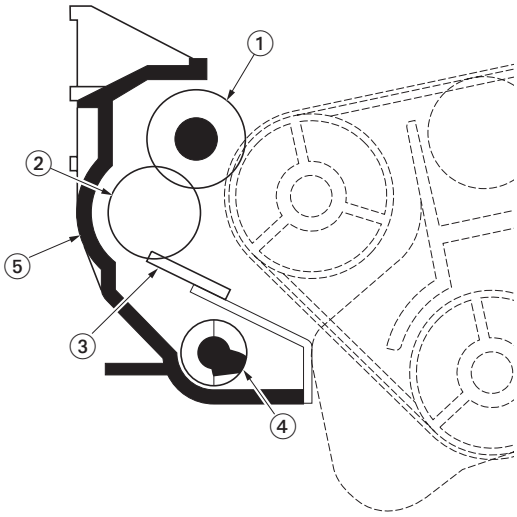


Figure 2-1-28 Primary transfer cleaning unit

(1) Fur brush
(2) Brush cleaning roller
(3) Cleaning blade
(4) Cleaning screw
(5) Cleaning frame

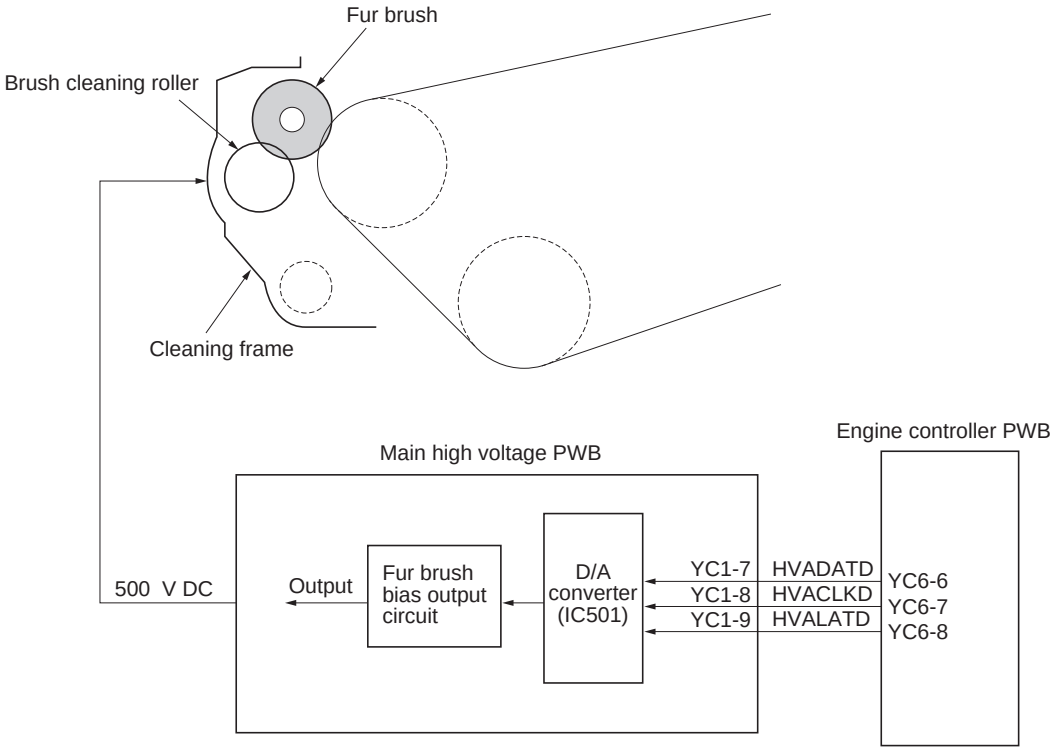


Figure 2-1-29 Primary transfer cleaning unit block diagram

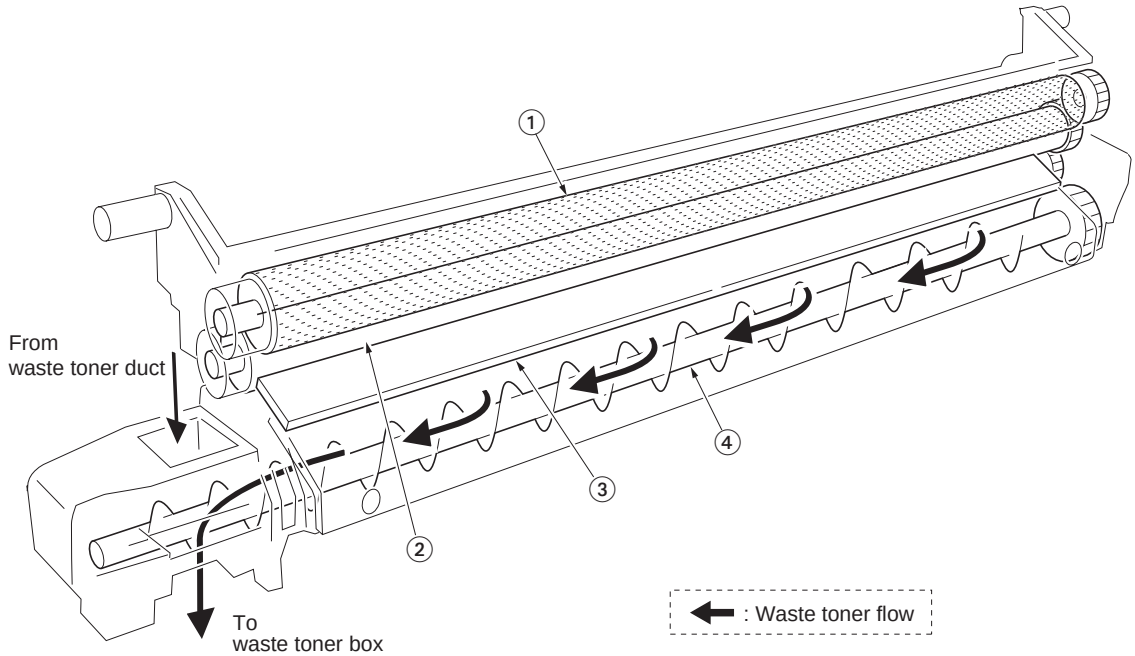


Figure 2-1-30 Primary transfer cleaning unit

(1) Fur brush
(2) Brush cleaning roller
(3) Cleaning blade
(4) Cleaning screw

A full color image is developed by recoating four colors on the primary transfer belt. If the density of each color is not kept constant, the resultant color image will be deteriorated. The toner ID sensor mounted on the primary transfer belt to the printer main unit side maintains the constant color fidelity.
The toner ID sensor includes a LED, deflection beam splitters of BS1 and BS2, photo diode PD2 and PD3 that scale toner density, and associated components.
The deflection beam splitter 1 (BS1) splits the light from the LED to S wave and P wave. S wave oscillates vertically in reference to the entrance plane; whereas, P wave oscillates horizontally in reference to the entrance plane. S wave reaches the photo diode (PD1) and acts to stabilize the luminosity of the LED by means of the feed back circuit. P wave is irradiated to toner, then it produces scattered light wave S and reflection wave P which bounced on the primary transfer belt. They reach the deflection beam splitter 2 (BS2) where they are distinguished as P wave and S wave, respectively, then detected by photo diode 2 (PD2) and photo diode 3 (PD3).

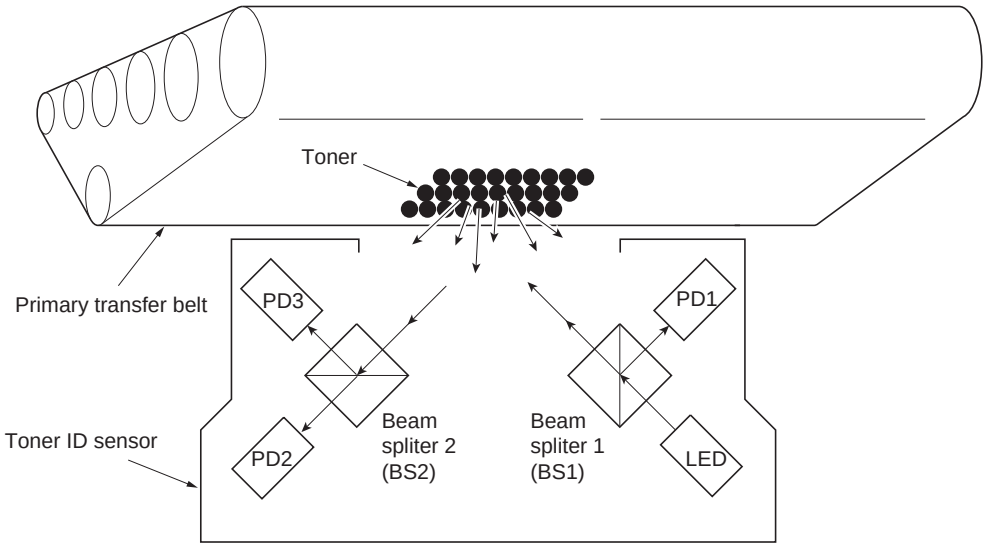


Figure 2-1-31 Toner ID sensor

2-1-5 Secondary transfer and separation section

The secondary transfer and separation section includes the secondary transfer roller which is installed on the paper feed unit. The secondary transfer roller is applied by the bias high voltage PWB of DC bias. The image constituted by toner on the primary transfer belt is transferred on paper by means of the difference in potential. The paper is separated from the transfer belt as the curvature radius of the secondary transfer roller is considerably small.

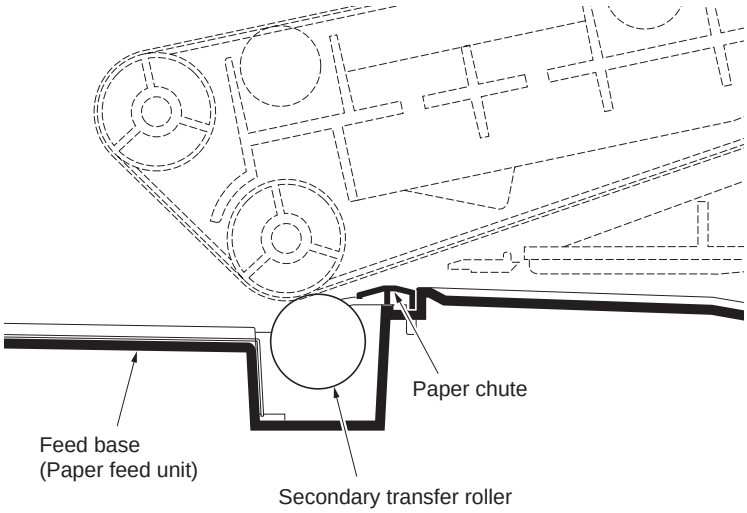


Figure 2-1-32

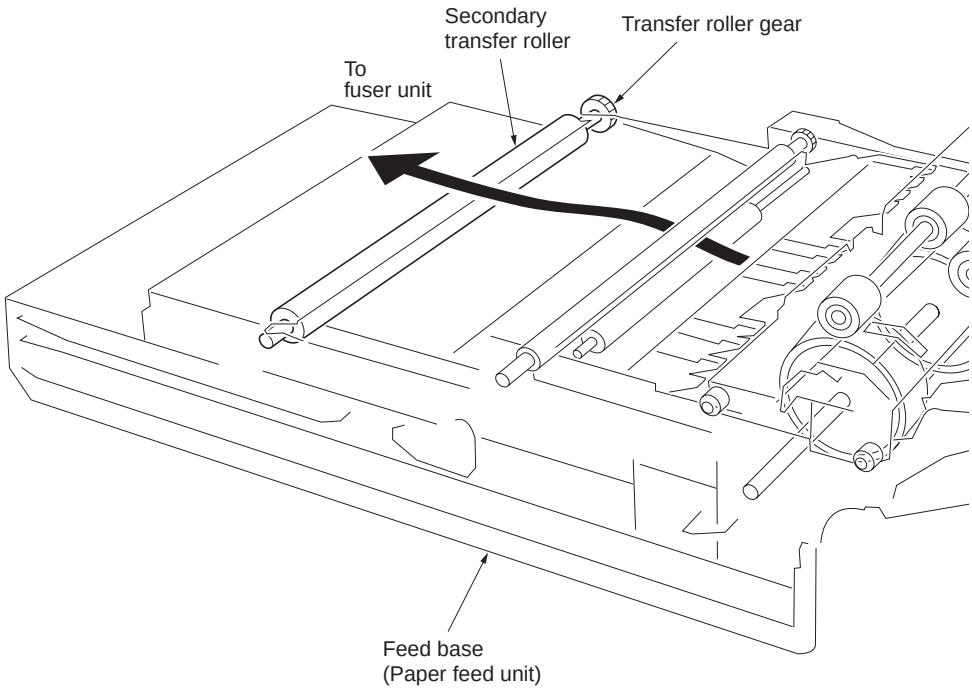


Figure 2-1-33 Secondary transfer unit

The primary transfer roller bias is triggered by a serial data which is generated by the engine controller PWB and derived from the bias high voltage PWB. The engine controller PWB converts current and voltage into serial data and applies it to the bias high voltage PWB. The bias high voltage PWB then uses D/A converter (IC501) and revert it into analog voltage. The analog voltage is applied to the high voltage output circuit which in turn applies the secondary transfer roller with the bias accordingly.

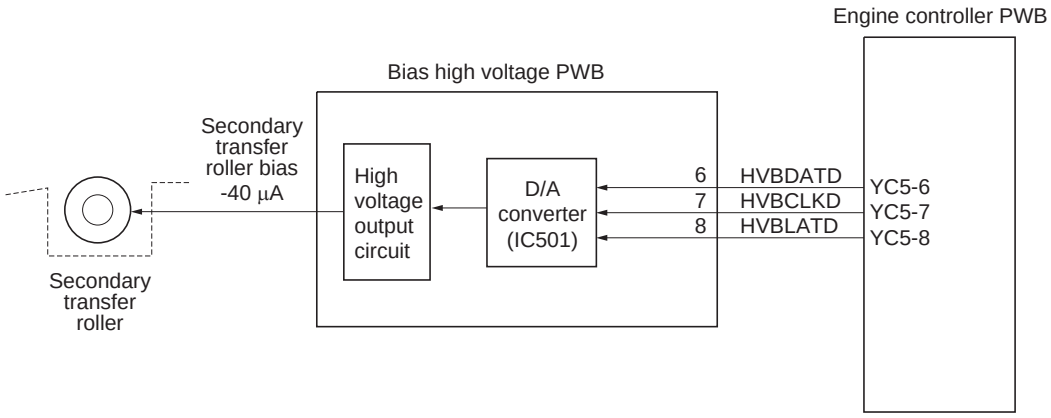


Figure 2-1-34 Secondary transfer unit block diagram

2-1-6 Fuser section

(1) Fuser unit (16 ppm printer)

The fuser unit is composed of the heat roller, press roller, fuser heater lamp 1, fuser heater lamp 2, and the change guide. Paper sent from the secondary transfer and separation section is applied with heat and pressure to permanently fuse toner on paper. The change guide switches the destination of paper to the face-down tray or optional face-up tray. It also sends paper to the duplexer.

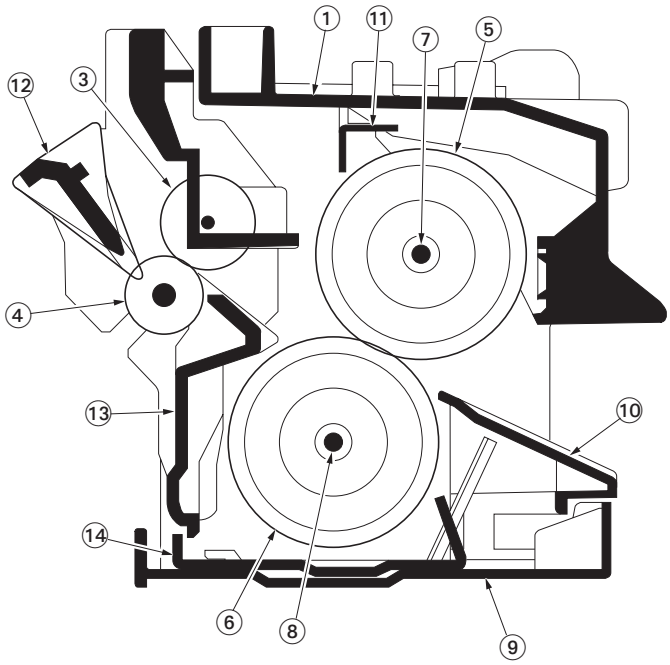


Figure 2-1-35 Fuser unit (16 ppm printer)

(1) Upper fuser frame
(2) Lower fuser frame
(3) Upper exit roller
(4) Lower exit roller
(5) Heat roller
(6) Press roller
(7) Fuser heater lamp 1
(8) Fuser heater lamp 2
(9) Lower fuser cover
(10) Lower entrance guide
(11) Stay plate
(12) Change guide
(13) Exit guide
(14) Fuser frame

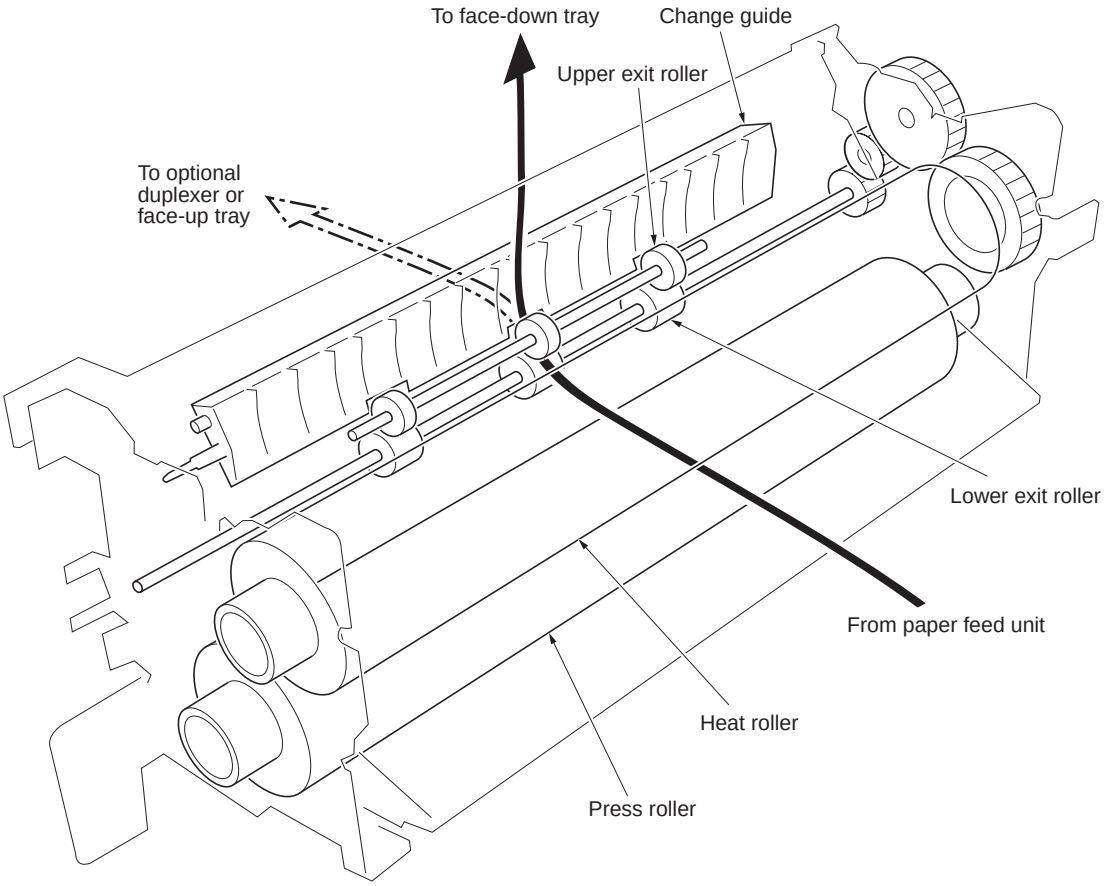


Figure 2-1-36 Fuser unit (16 ppm printer)

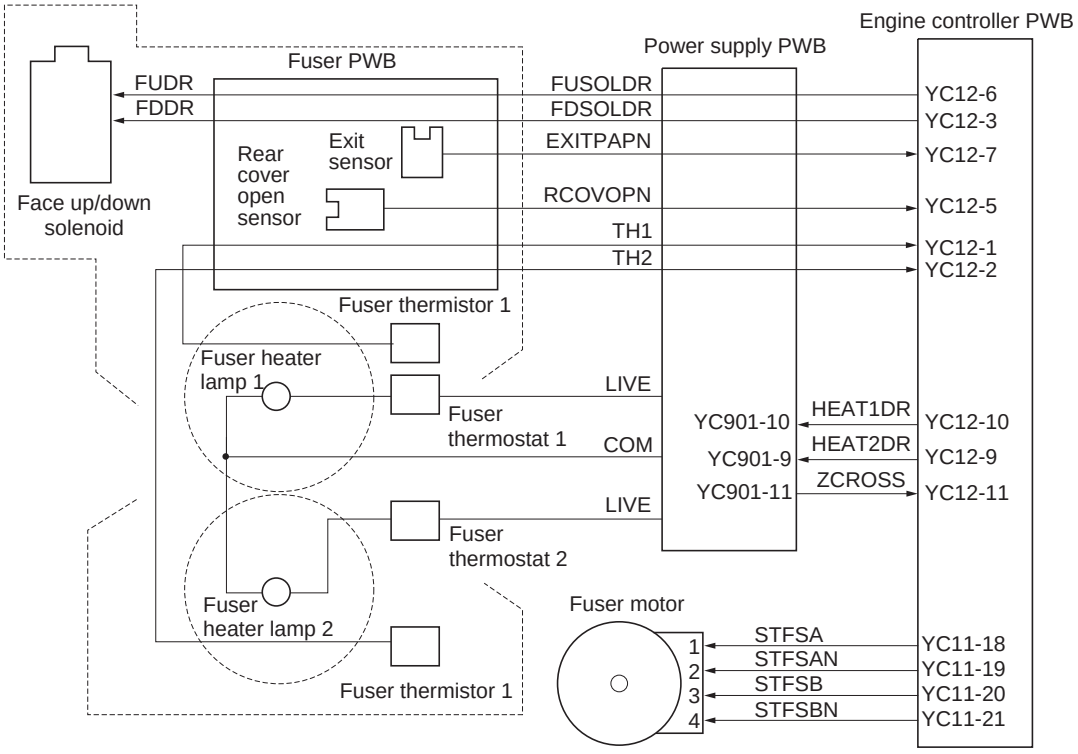


Figure 2-1-37 Fuser unit block diagram (16 ppm printer)

(2) Fuser unit (24 ppm printer)

The fuser unit is composed of the heat roller, press belt, fuser heater lamp 1, and the change guide. Paper sent from the secondary transfer and separation section is applied with heat and pressure to permanently fuse toner on paper. The change guide switches the destination of paper to the face-down tray or optional face-up tray. It also sends paper to the duplexer.

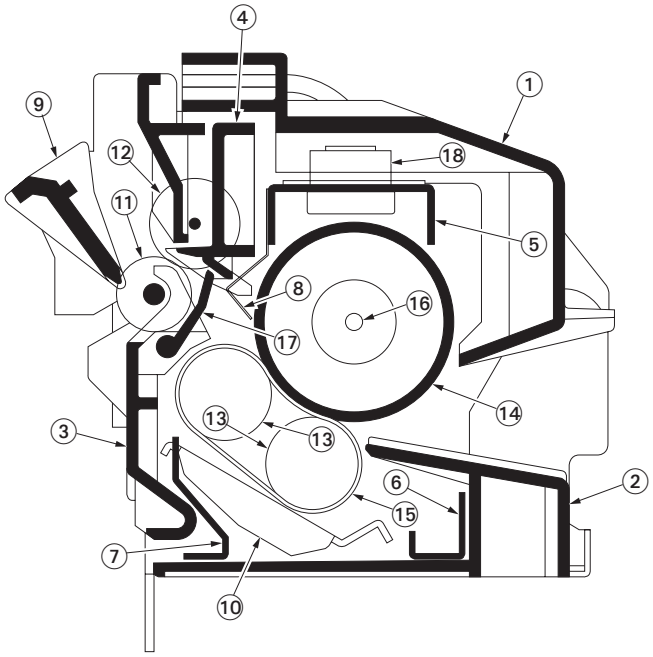


Figure 2-1-38 Fuser unit (24 ppm printer)

(1) Fuser UP cover
(2) Entrance guide
(3) Exit guide
(4) Exit UP guide
(5) Fuser A stay
(6) Fuser B stay
(7) Fuser C stay
(8) Separator plate
(9) Change guide
(10) Press plate
(11) Exit roller
(12) Exit pulley
(13) Press belt rollers
(14) Heat roller
(15) Press belt
(16) Heater lamp
(17) Exit sensor (acutuator)
(18) Fuser thermostat 1

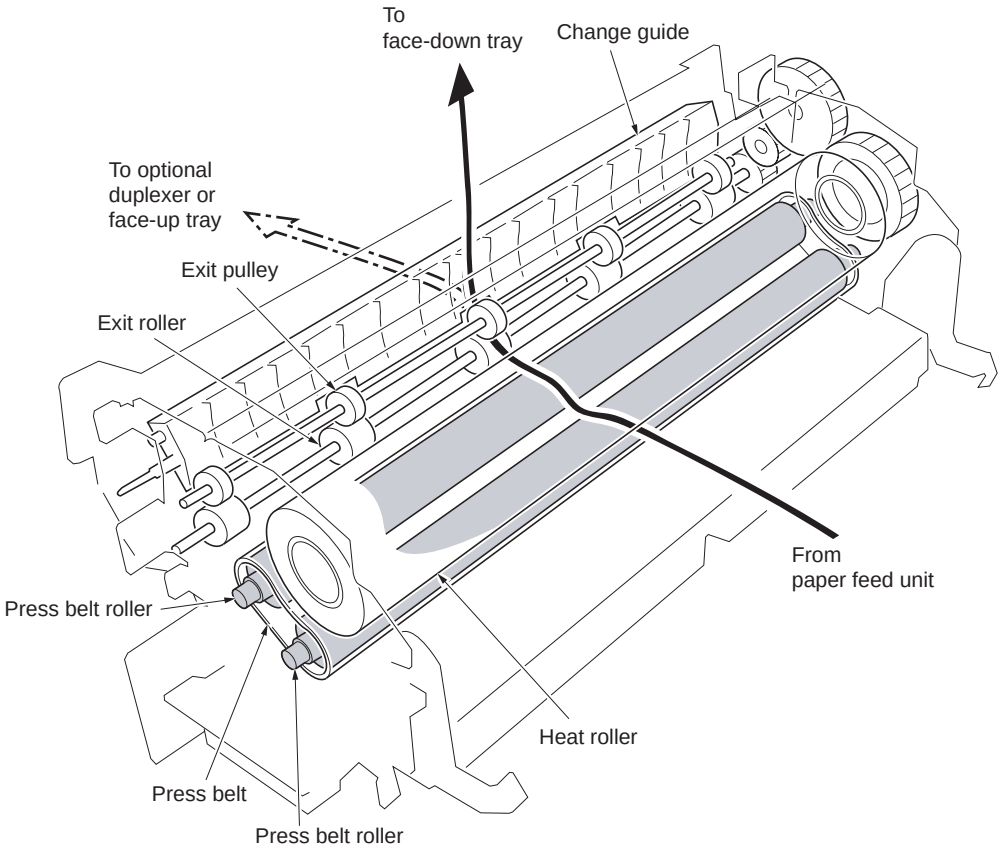


Figure 2-1-39 Fuser unit (24 ppm printer)

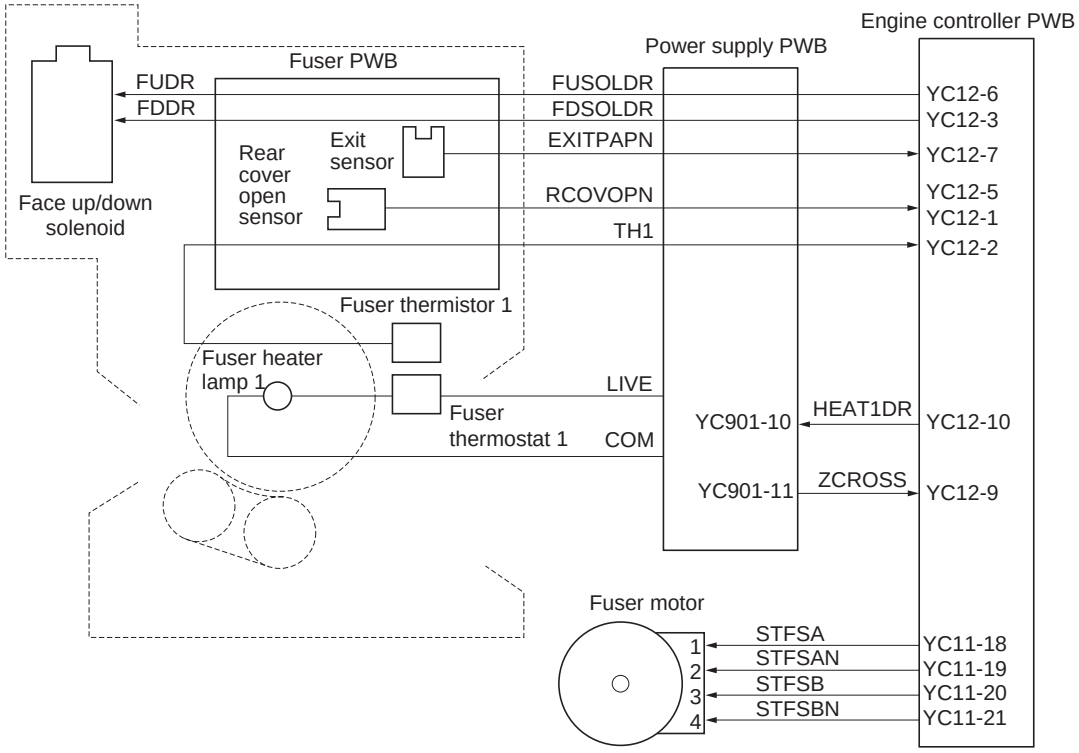


Figure 2-1-40 Fuser unit (24 ppm printer) block diagram

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2-2-1 Electrical parts layout

(1) Main frame and controller box

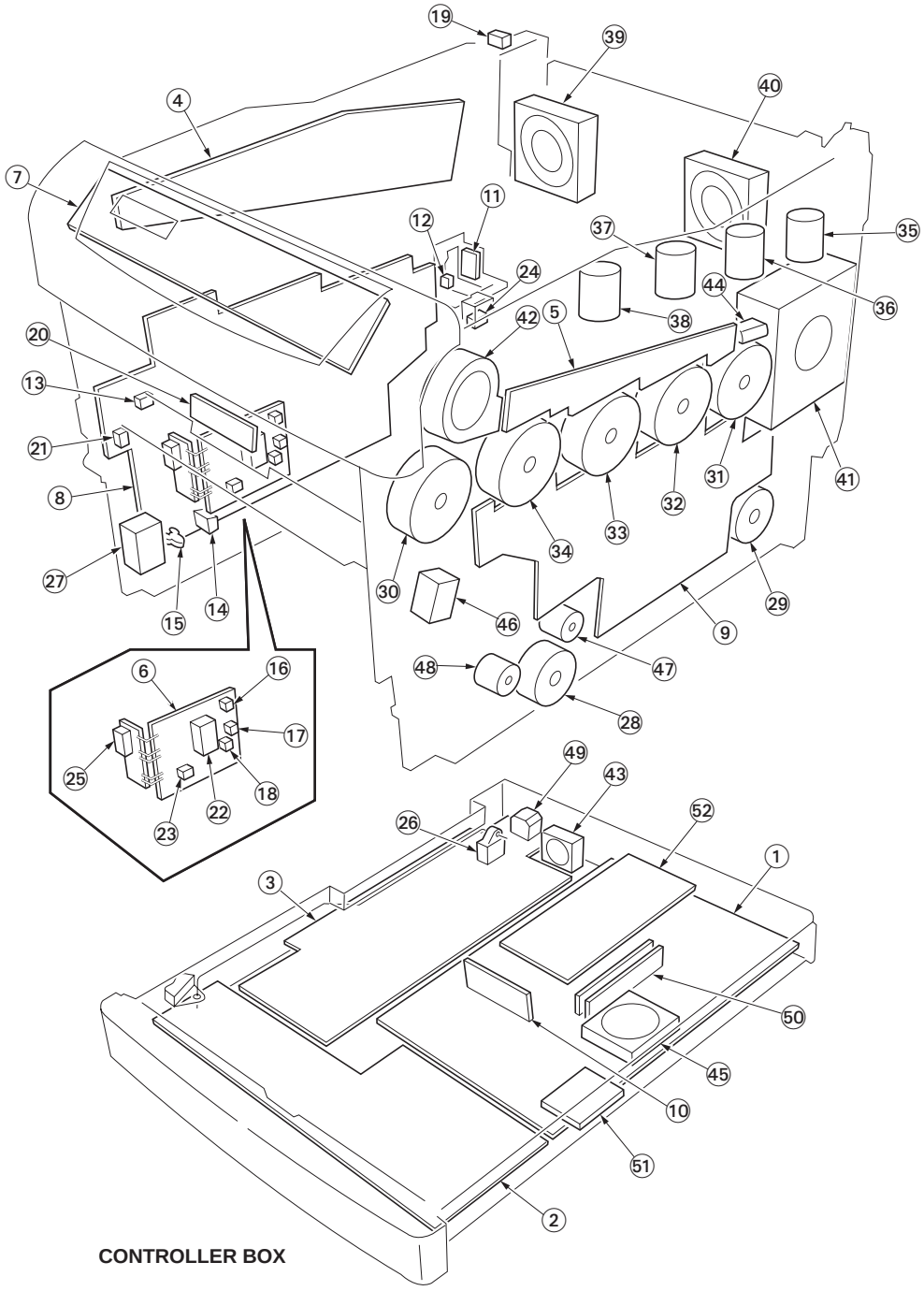

Figure 2-2-1 Main frame and controller box

1. Main controller PWB ..... Controls the software such as the print data processing and provides the interface with computers.
2. Engine controller PWB..... Controls printer hardware such as high voltage/bias output control, paper conveying system control, and fuser temperature control, etc.
3. Power supply PWB ..... Generates 3.3 V DC, 5V DC and 24 V DC power source. Controls the fuser heater lamp 1 and 2*[1]
4. LED print heads relay PWB ..... Consists the LED print head control circuit and wiring relay circuit between engine controller PWB and drum units.
5. Engine relay PWB..... Interconnects the engine controller PWB and the electrical parts.

6. Sensor PWB ..... Consists the top cover/paper feed unit switch, side cover switch, top cover switch 1, paper gauge switch 1/2, registration sensor, and, wiring relay circuit.
7. Operation panel PWB ..... Indicates the LCD message display and LED indicators. Controls key inputs.
8. Bias high voltage PWB ..... Generates the developing magnet roller bias, developing sleeve bias, and secondary transfer bias.
9. Main high voltage PWB..... Generates the main charger high voltage and primary transfer rollers bias.
10. System DIMM PWB ..... System program (firmware).
11. Waste toner full sensor PWB ..... Detects the waste toner box being full.
12. Waste toner full sensor ..... Section of LED light emitting for waste toner detection.
13. MP tray paper sensor..... Detects paper misfeed in the MP tray.
14. Humidity sensor ..... Detects the ambient humidity.
15. Temperature sensor ..... Detects the ambient temperature.
16. Registration sensor ..... Detects the timing of primary feeding.
17. Paper gauge sensor 1..... Detects the paper remaining amount level.
18. Paper gauge sensor 2..... Detects the paper remaining amount level.
19. Paper full sensor ..... Detects whether the face-down tray is full.
20. Toner ID sensor..... Measures image density for color calibration.
21. Envelope feeder install sensor ..... Installing detection of optional envelope feeder.
22. Top cover/feed unit switch..... Shuts off 24 V power line when the top cover is opened.
23. Top cover switch 1 ..... Detects the top cover open.
24. Top cover switch 2 ..... Detects the top cover and left side cover open.
25. Side cover switch ..... Shuts off 24 V power line when the left side cover is opened.
26. Power switch..... Turns ON/OFF the AC power source.
27. Cassette size switch ..... Detects the paper size dial setting of the paper setting dial.
28. Feed motor..... Drives the paper feed section.
29. Fuser motor..... Drives the primary transfer cleaning unit, fuser unit and exit section.
30. Primary transfer motor ..... Drives the primary transfer unit.
31. Drum motor 1 ..... Drives the magenta drum unit.
32. Drum motor 2 ..... Drives the cyan drum unit.
33. Drum motor 3 ..... Drives the yellow drum unit.
34. Drum motor 4 ..... Drives the black drum unit.
35. Toner motor 1..... Replenishes the magenta developer with toner.
36. Toner motor 2..... Replenishes the cyan developer with toner.
37. Toner motor 3..... Replenishes the yellow developer with toner.
38. Toner motor 4..... Replenishes the black developer with toner.
39. Ozone fan motor 1 ..... The exhaust gas of ozone.
40. Ozone fan motor 2 ..... The exhaust gas of ozone.
41. Main fan motor ..... Dissipates heat from the fuser unit.
42. Drum motor cooling fan motor ..... Dissipates heat from the drum motors.
43. Controller box fan motor ..... Dissipates heat from the controller box.
44. Developer drive stop motor..... Detaches and makes stop the drive transmission of developers other than black developer at the time of monochrome printing.
45. CPU cooling fan motor*[2] ..... Cools the main controller PWB (CPU).
46. MP tray feed solenoid ..... Controls the primary paper feed from the MP tray.
47. Registration clutch ..... Controls the second paper feed.
48. Feed clutch ..... Controls the paper cassette paper feed.
49. AC inlet ..... Connects the AC power source.
50. Expanding memory (optional) ..... For expanding main RAM.
51. Expanding memory card (optional) ..... Expands the print job function.
52. Expanding board (optional)..... Expands the interface, network interface card or serial interface board.

*[1]: 16 ppm printer only.

*[2]: 24 ppm printer only.

(2) Drum unit, developer unit and fuser unit

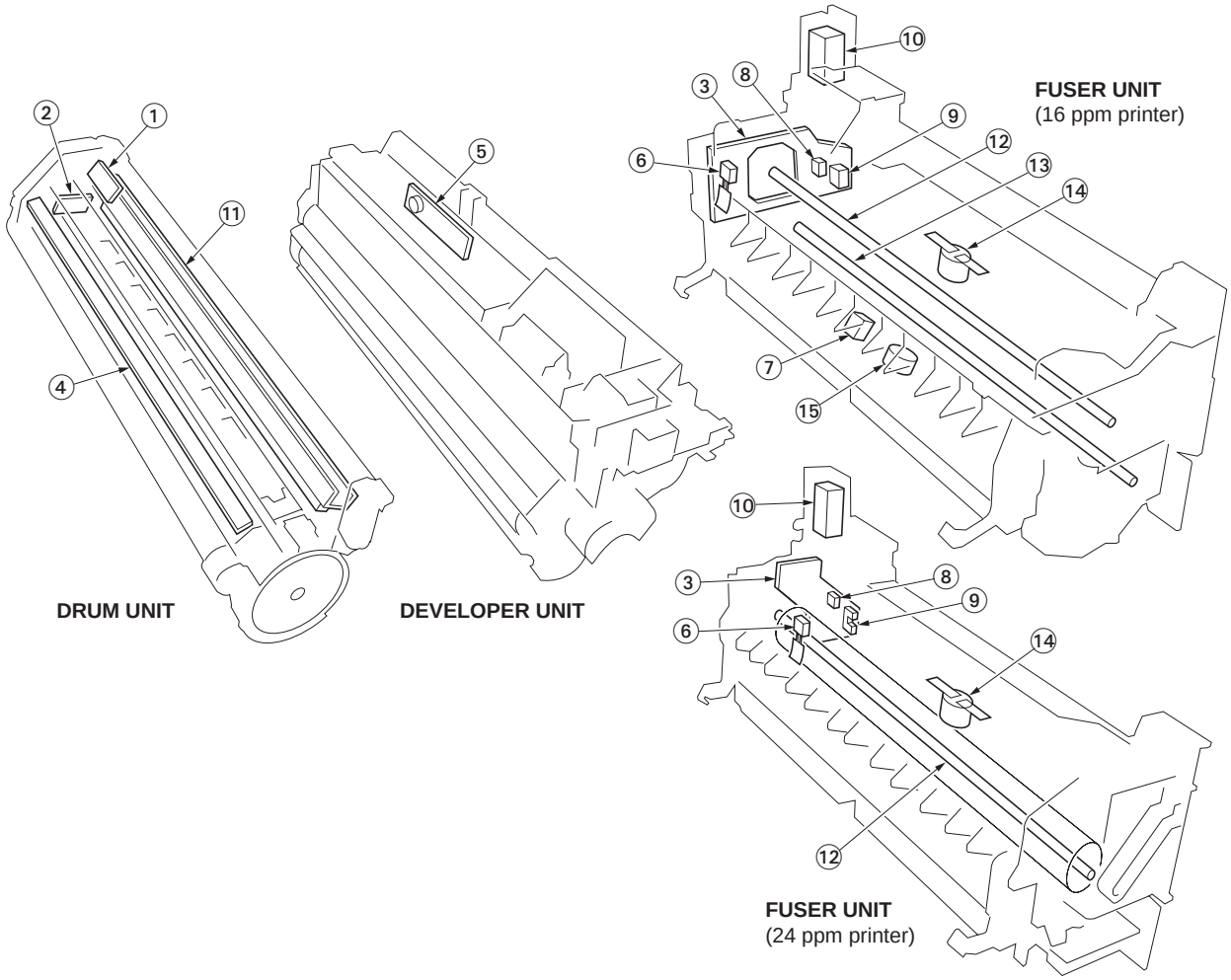

Figure 2-2-2 Drum unit, developer unit and fuser unit

1. Drum PWB 1, 2, 3, 4 ..... Drum PWB 1 (magenta), drum PWB 2 (cyan), drum PWB 3 (yellow), drum PWB 4 (black) wiring relay circuit inside each color drum unit. Drum individual information in EEPROM storage.
2. Zener PWB 1, 2, 3, 4 ..... Adjusts the main charger grid electrostatic potential.
3. Fuser PWB ..... Relays wirings from electrical components on the fuser unit.
4. Eraser lamp 1, 2, 3, 4 ..... Eliminates the residual electrostatic charge on the drum.
5. Toner sensor 1, 2, 3, 4 ..... Measures the toner concentration in the toner hopper.
6. Fuser thermistor 1 ..... Detects the temperature of the heat roller.
7. Fuser thermistor 2*[1] ..... Detects the temperature of the press roller*[1].
8. Exit sensor ..... Detects paper misfeed in the fuser unit.
9. Rear cover open/close sensor ..... Detects the rear cover open.
10. Face up/down solenoid ..... Switches the output stack between face up and face down.
11. LED print head 1, 2, 3, 4 ..... LED print head 1 (magenta), LED print head 2 (cyan), LED print head 3 (yellow), LED print head 4 (black) lighting of dot light to drum of each color drum unit.
12. Fuser heater lamp 1 ..... Heats the heat roller.
13. Fuser heater lamp 2*[1] ..... Heats the press roller*[1].
14. Fuser thermostat 1 ..... Disable power for the fuser heater lamp 1 in emergency.
15. Fuser thermostat 2*[1] ..... Disable power for the fuser heater lamp 2*[1] in emergency.

*[1]: 16 ppm printer only.

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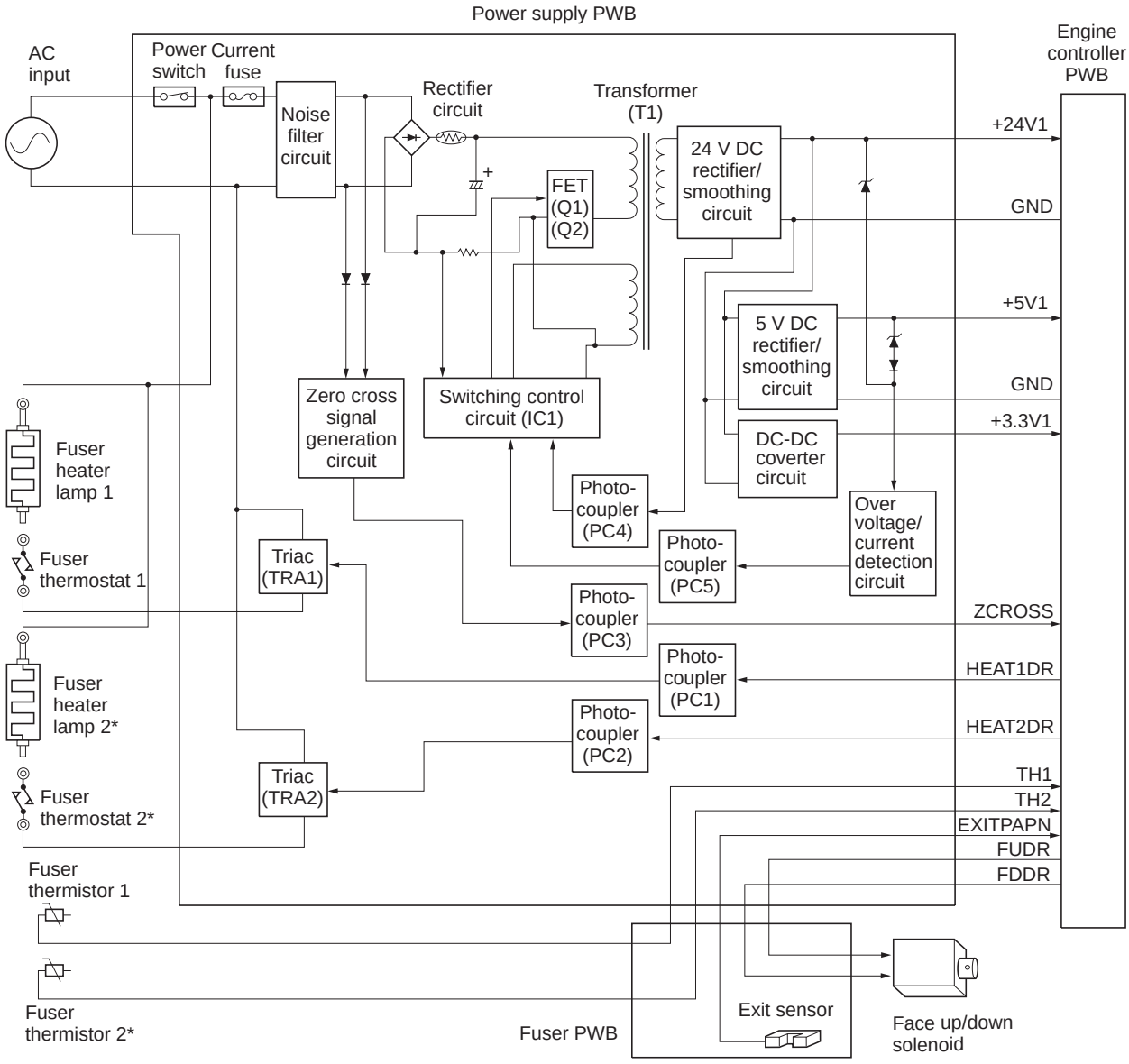
2-3-1 Power supply PWB



*: 16 ppm printer only.

Figure 2-3-1 Power supply PWB block diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
CN1	1	AC (LIVE)	I	220 - 240 V AC 120 V AC	AC power input
Connected to the AC inlet	2	-	-	-	Frame ground
	3	AC (NEUTRAL)	I	220 - 240 V AC 120 V AC	AC power input
YC901	1	TH1	O	Analog	Fuser thermistor 1 detection voltage output
Connected to the engine controller PWB	2	TH2*1	O	Analog	Fuser thermistor 2*1 detection voltage output
	3	FDSOLDR	I	0/24 V DC	Face up/down solenoid control signal
	4	+5V2	O	5 V DC	5 V DC power output
	5	RCOVOPN	O	0/5 V DC	Rear cover open/close sensor: rear cover Open/ Close
	6	FUSOLDR	I	0/24 V DC	Face up/down solenoid control signal
	7	EXITPAPN	O	0/5 V DC	Exit sensor: On/Off
	8	+24V2	O	24 V DC	24 V DC power output
	9	HEAT2DR*1	I	0/24 V DC	Fuser heater lamp 2*1: On/Off
	10	HEAT1DR	I	0/24 V DC	Fuser heater lamp 1: On/Off
	11	ZCROSS	O	0/5 V DC (pulse)	Zero cross signal output
	12	-	-	-	N.C.
	13	+24V1	O	24 V DC	24 V DC power output
	14	+24V1	O	24 V DC	24 V DC power output
	15	+24V1	O	24 V DC	24 V DC power output
	16	+24V1	O	24 V DC	24 V DC power output
	17	GND	-	-	Ground
	18	GND	-	-	Ground
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	GND	-	-	Ground
	22	GND	-	-	Ground
	23	GND	-	-	Ground
	24	GND	-	-	Ground
	25	+3.3V1	O	3.3 V DC	3.3 V DC power output
	26	+3.3V1	O	3.3 V DC	3.3 V DC power output
	27	+3.3V1	O	3.3 V DC	3.3 V DC power output
	28	+3.3V1	O	3.3 V DC	3.3 V DC power output
	29	+5V1	O	5 V DC	5 V DC power output
	30	+5V1	O	5 V DC	5 V DC power output
YC902	1	GND	-	-	Ground
Connected to the fuser PWB	2	+24V2	O	24 V DC	24 V DC power output
	3	FDDR	O	0/24 V DC	Face up/down solenoid control signal
	4	EXITPAPN	I	0/5 V DC	Exit sensor: On/Off
	5	FUSOLDR	O	0/24 V DC	Face up/down solenoid control signal
	6	+5V1	O	5 V DC	5 V DC power output
	7	RCOVOPN	I	0/5 V DC	Rear cover open/close sensor: rear cover Open/ Close
	8	TH1	I	Analog	Fuser thermistor 1 detection voltage output
	9	TH2*1	I	Analog	Fuser thermistor 2*1 detection voltage output
YC903	1	HEATER LIVE*1	O	220 - 240 V AC 120 V AC	AC power output for fuser heater lamp 2*1
Connected to the fuser heater lamp 1 and 2*1, fuser thermostat 1 and 2*1	2	NC	-	-	Not Connected
	3	HEATER COM	O	220 - 240 V AC 120 V AC	Fuser heater lamps output (common)
	4	NC	-	-	Not Connected
	5	HEATER LIVE	O	220 - 240 V AC 120 V AC	AC power output for fuser heater lamp 1

*1: 16 ppm printer only.

2-3-2 Engine controller PWB

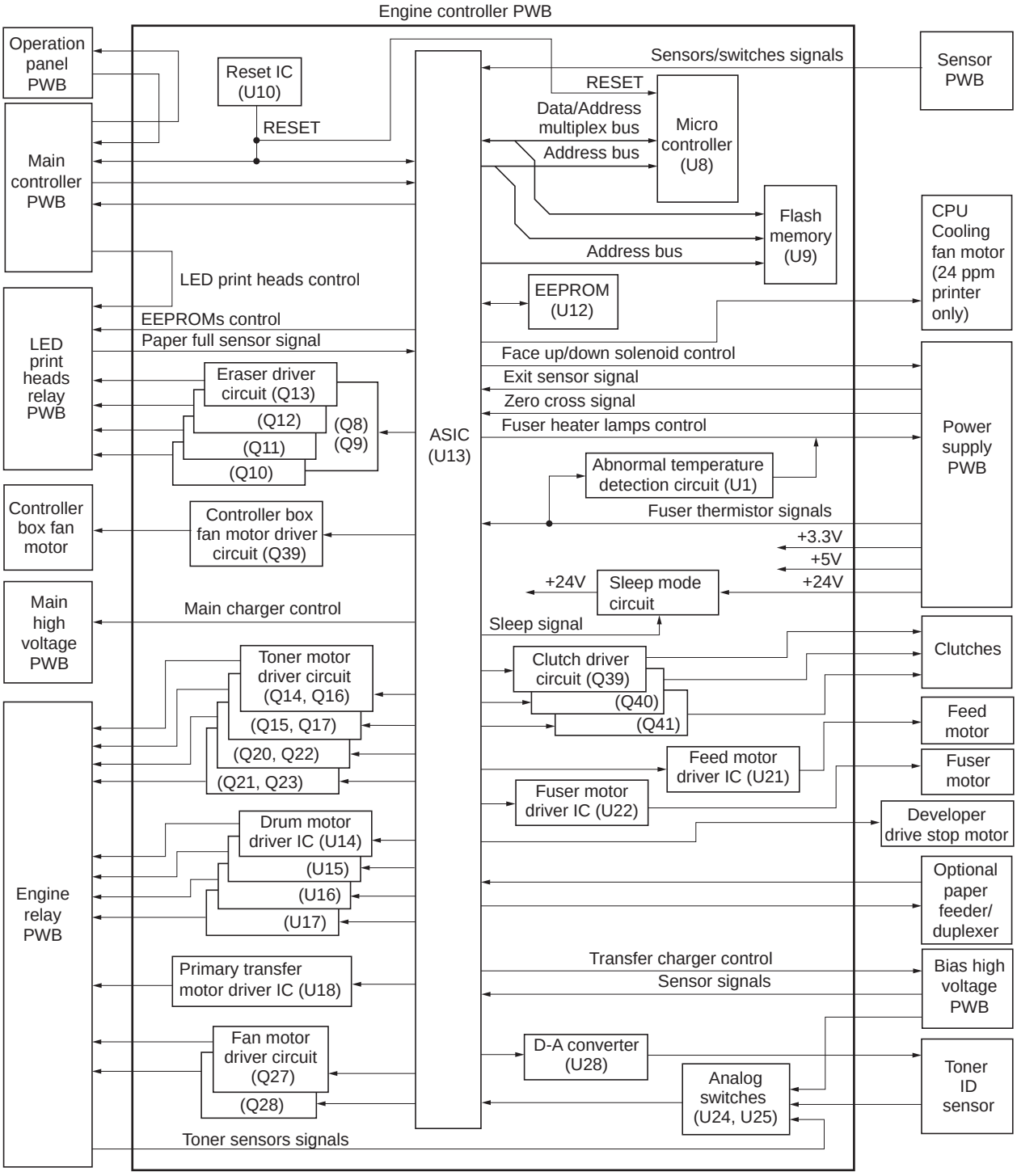


Figure 2-3-2 Engine controller PWB block diagram

(1) Fuser heater lamps control circuit

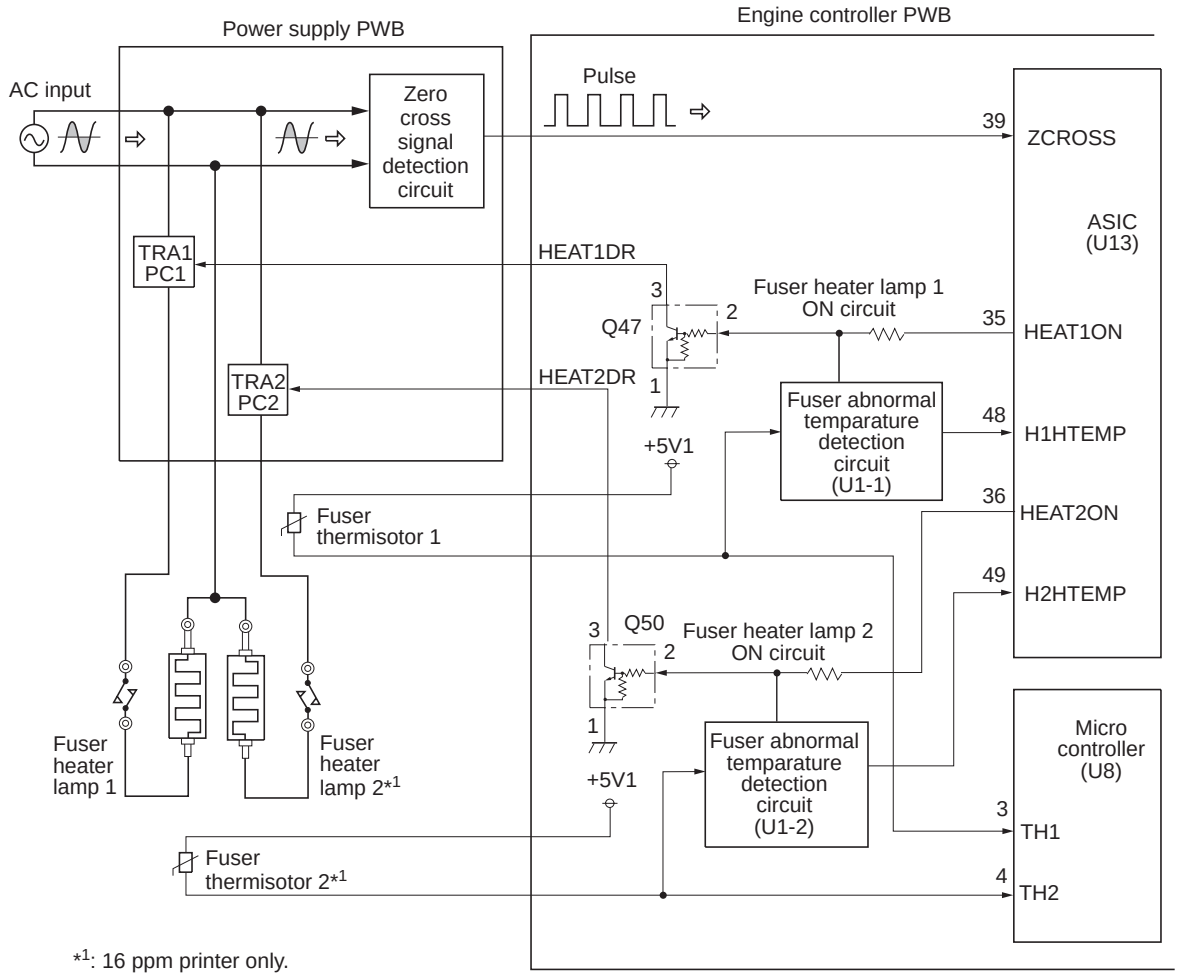


Figure 2-3-3

The ON/OFF action of the fuser heater lamp 1 and 2 are controlled by the fuser heater lamp 1 and 2 lighting ON signals (HEAT1ON, HEAT2ON*1) output from the No.35 and 36 pin of ASIC (U13) of the engine controller PWB. When the HEAT1ON and HEAT2ON*1 signals reach the H level, the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) turn on because the transistors (Q47, Q50) turn on and then the AC voltage is loaded to the fuser heater lamps. The HEAT1ON and HEAT2ON*1 signals turn ON/OFF the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) being synchronized with the zero cross signal (ZCROSS) that is detected by the zero cross signal detection circuit on the power supply PWB. The ZCROSS signal detects the zero cross point (0 V) where the AC power source changes between positive/negative domains and it is input to the No.39 pin of the ASIC (U13) of the engine/high voltage PWB. Since the ON/OFF operation of the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) are performed at the zero cross point (0V), it can avoid the sharp change of current and restrain noises generated from the AC power source.The fuser thermistor detection voltages (TH1, TH2) are input to the micro controller (U8) and branched to input to the comparator (U1-1, U1-2). The comparator (U1-1, U1-2) compares the TH1 and TH2*1 signals voltage with the unusually high temperature voltage. If the voltage TH1 and TH2*1 signals voltage are higher than unusually high temperature voltage, the output level is L. For the HEAT1ON and HEAT2ON*1 signals, the circuit that forcibly turns off the fuser heater lamps by the hardware-based method and forcibly makes the HEAT1ON and HEAT2ON*1 signals to L level regardless of controls by ASIC (U13) is provided fuser heater lamp ON signals (HEAT1ON, HEAT2ON*1).
This circuit is provided for the purpose of fail safe, it usually monitors the unusual high temperature in the software system by the input voltage of the TH1 and TH2*1 signals that are input to the No.3 and 4 pin of micro controller (U8), therefore, the circuit operates the control to turn off the fuser heater lamps before the mentioned circuit is activated and stops the machine, and then indicates the error code 6020 or 6120 that shows the fuser high temperature failure according to the self diagnosis function.

*1: 16 ppm printer only.

(2) Interlock and 24 V DC power supply circuit

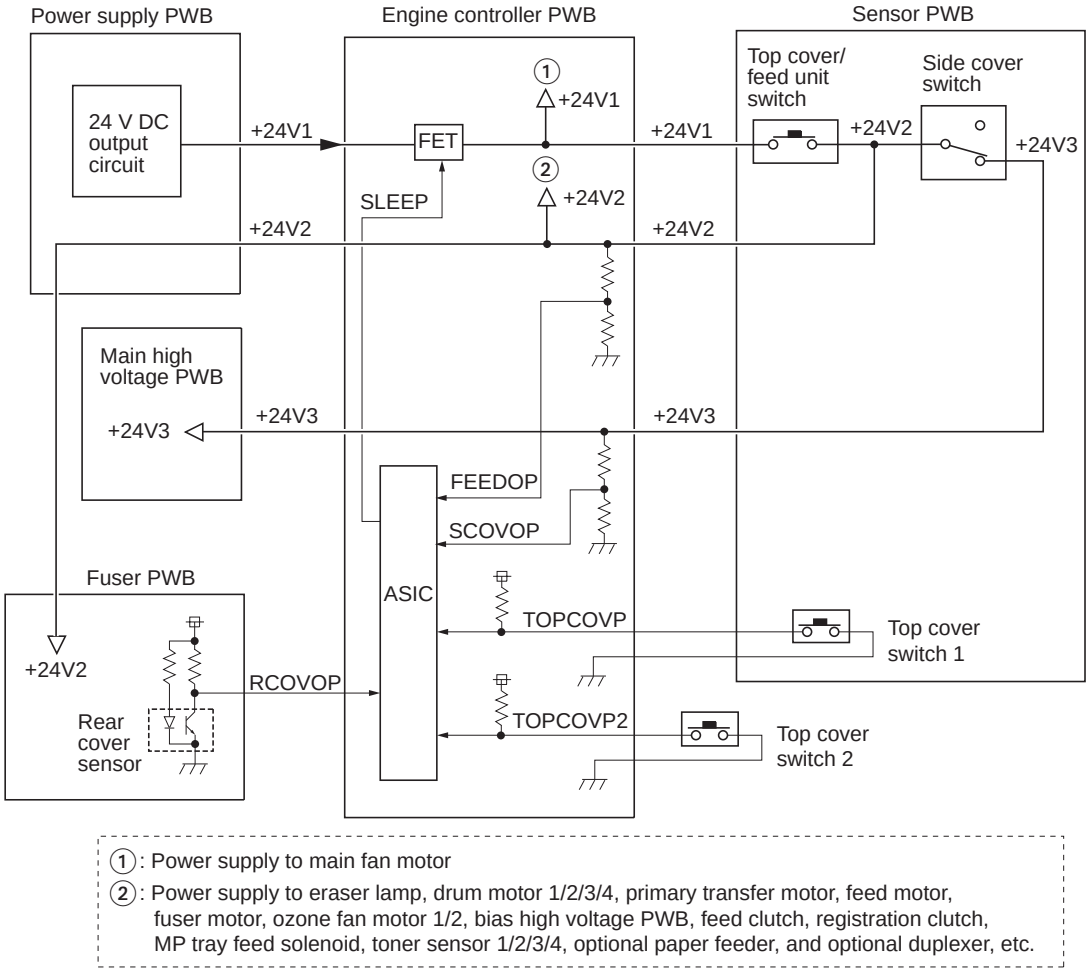


Figure 2-3-4

The 24 V DC power source line is shut off by the top cover/feed unit switch or the side cover switch that is turned OFF when the top cover or the side cover is opened. At the same time, the 24 V DC power supply is stopped to the motor and clutch and it is also output to the ASIC of the engine controller PWB as the cover open detection signal.
The 24 V DC power is divided into five groups of +24V1, +24V2, and +24V3 as figure 2-3-4, and the loads that supply the 24 V DC power source or the cover open detection signals are different.
In the Eco-power mode, the circuit shuts off the +24V power source that is used by the printer unit in order to reduce the power consumption. In the Eco-power mode, the sleep signal (SLEEP) becomes L level, which is output from the CPU of the engine controller PWB. The signal at this level turns off the FET of the Eco-circuit, accordingly the supply of +24V1 to the power line is shut off and the operation of connected load will stop.

Connector	Pin No.	Signal	I/O	Voltage	Description
YC2	1	+24V1	O	24 V DC	24 V DC power output
Connected to the sensor PWB	2	+24V1	O	24 V DC	24 V DC power output
	3	+24V1	O	24 V DC	24 V DC power output
	4	+24V1	O	24 V DC	24 V DC power output
	5	GND	-	-	Ground
	6	GND	-	-	Ground
	7	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	8	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	9	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	10	+5V2	O	5 V DC	5 V DC power output
	11	REGPAPN	I	0/5 V DC	Registration sensor: On/Off
	12	PAPVOL0	I	0/5 V DC	Paper gauge sensor 1: On/Off
	13	PAPVOL1	I	0/5 V DC	Paper gauge sensor 2: On/Off
	14	TCOVOP	I	0/5 V DC	Top cover switch 1: Top cover Close/Open
	15	CAS0	I	0/5 V DC	Cassette size switch (lower button: On/Off)
	16	CAS1	I	0/5 V DC	Cassette size switch (middle button: On/Off)
	17	CAS2	I	0/5 V DC	Cassette size switch (upper button: On/Off)
	18	+24V3	I	24 V DC	24 V DC power output (via side cover switch)
YC3	1	EECLK	O	0/5 V DC (pulse)	Clock for EEPROM data reading ana writing
Connected to the LED print heads relay PWB	2	ERS1DR	O	0/24 V DC	Eraser lamp 1 (black): On/Off
	3	EEDATA	I/O	0/5 V DC (pulse)	EEPROM data signal
	4	ERS2DR	O	0/24 V DC	Eraser lamp 2 (yellow): On/Off
	5	ERS3DR	O	0/24 V DC	Eraser lamp 3 (cyan): On/Off
	6	ERS4DR	O	0/24 V DC	Eraser lamp 4 (magenta): On/Off
	7	FDPFULN	I	0/5 V DC	Paper full sensor: On/Off
	8	BDMASK	O	0/5 V DC	Control signal
	9	VTXDN0	O	Analog	LED print head control video data signal (LVDS)
	10	VTXDP0	O	Analog	LED print head control video data signal (LVDS)
	11	VTXDN1	O	Analog	LED print head control video data signal (LVDS)
	12	VTXDP1	O	Analog	LED print head control video data signal (LVDS)
	13	VTXDN2	O	Analog	LED print head control video data signal (LVDS)
	14	VTXDP2	O	Analog	LED print head control video data signal (LVDS)
	15	VTXDN3	O	Analog	LED print head control video data signal (LVDS)
	16	VTXDP3	O	Analog	LED print head control video data signal (LVDS)
	17	VTXDN4	O	Analog	LED print head control video data signal (LVDS)
	18	VTXDP4	O	Analog	LED print head control video data signal (LVDS)
	19	VTXDN5	O	Analog	LED print head control video data signal (LVDS)
	20	VTXDP5	O	Analog	LED print head control video data signal (LVDS)
	21	VRXCLKN	O	0/3.3 V DC (pulse)	LED print head contorl clock signal
	22	VRXCLKP	O	0/3.3 V DC (pulse)	LED print head contorl clock signal
	23	VRXDN1	O	Analog	LED print head control video data signal (LVDS)
	24	VRXDP1	O	Analog	LED print head control video data signal (LVDS)
	25	VRXDN0	O	Analog	LED print head control video data signal (LVDS)
	26	VRXDP0	O	Analog	LED print head control video data signal (LVDS)
	27	VTXDN6	O	Analog	LED print head control video data signal (LVDS)
	28	VTXDP6	O	Analog	LED print head control video data signal (LVDS)
	29	VTXDN7	O	Analog	LED print head control video data signal (LVDS)
	30	VTXDP7	O	Analog	LED print head control video data signal (LVDS)
	31	VTXCLKN	O	0/3.3 V DC (pulse)	LED print head contorl clock signal
	32	VTXCLKP	O	0/3.3 V DC (pulse)	LED print head contorl clock signal
	33	VTXDN8	O	Analog	LED print head control video data signal (LVDS)
	34	VTXDP8	O	Analog	LED print head control video data signal (LVDS)
	35	VTXDN9	O	Analog	LED print head control video data signal (LVDS)
	36	VTXDP9	O	Analog	LED print head control video data signal (LVDS)
	37	VTXDN10	O	Analog	LED print head control video data signal (LVDS)
	38	VTXDP10	O	Analog	LED print head control video data signal (LVDS)

Connector	Pin No.	Signal	I/O	Voltage	Description
YC3	39	VTXDN11	O	Analog	LED print head control video data signal (LVDS)
Connected to the LED print heads relay PWB	40	VTXDP11	O	Analog	LED print head control video data signal (LVDS)
	41	+3.3V1	O	5 V DC	3.3 V DC power output
	42	+5V1	O	5 V DC	5 V DC power output
	43	+5V1	O	5 V DC	5 V DC power output
	44	+5V1	O	5 V DC	5 V DC power output
	45	+5V2	O	5 V DC	5 V DC power output
	46	GND	-	-	Ground
	47	GND	-	-	Ground
	48	GND	-	-	Ground
	49	GND	-	-	Ground
	50	GND	-	-	Ground
YC4	1	ST4A	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
Connected to the engine relay PWB	2	STMIDBN	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	3	ST4B	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	4	STMIDAN	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	5	ST4AN	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	6	STMIDBN	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	7	ST4BN	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	8	STMIDA	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	9	TNM4DR	O	0/24 V DC	Toner motor 4 (black): On/Off
	10	TNSEN4	I	Analog	Toner sensor 4 (black) detection voltage input
	11	TNSEN3	I	Analog	Toner sensor 3 (yellow) detection voltage input
	12	ST3BN	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	13	TNM3DR	O	DC0V/24V	Toner motor 3 (yellow): On/Off
	14	ST3AN	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	15	+24V2	O	24 V DC	24 V DC power output
	16	ST3B	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	17	+24V2	O	24 V DC	24 V DC power output
	18	ST3A	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	TNSEN2	I	Analog	Toner sensor 2 (cyan) detection voltage input
	22	HFANDR	O	0/24 V DC	Main fan motor: On/Off
	23	TNM2DR	O	0/24 V DC	Toner motor 2 (cyan): On/Off
	24	OZFANDR	O	0/24 V DC	Ozone fan motor 1, ozone fan motor 2 and, drum motors cooling fan motor: On/Off
	25	TNSEN1	I	Analog	Toner sensor 1 (magenta) detection voltage input
	26	TNM1DR	O	0/24 V DC	Toner motor 1 (magenta): On/Off
	27	ST2A	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	28	ST1BN	O	24 V DC	Drum motor 1 (magenta) energizatione pulse
	29	ST2B	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	30	ST1AN	O	24 V DC	Drum motor 1 (magenta) energization pulse
	31	ST2AN	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	32	ST1B	O	0/24 V DC (pulse)	Drum motor 1 (magenta) energization pulse
	33	ST2BN	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	34	ST1A	O	0/24 V DC (pulse)	Drum motor 1 (magenta) energization pulse

Connector	Pin No.	Signal	I/O	Voltage	Description
YC5	1	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
Connected to the bias high voltage PWB	2	HVCLK1	O	3KHz rectangular wave	Developing sleeve (magenta) output
	3	HVCLK2	O	3KHz rectangular wave	Developing sleeve (cyan) output
	4	HVCLK3	O	3KHz rectangular wave	Developing sleeve (yellow) output
	5	HVCLK4	O	3KHz rectangular wave	Developing sleeve (black) output
	6	HVBDATD	O	0/5 V DC (pulse)	Output control D/A converter serial signal
	7	HVBCLKD	O	0/5 V DC (pulse)	Output control D/A converter clock signal
	8	HVBLATD	O	0/5 V DC (pulse)	Output control D/A converter data latch signal
	9	GND	-	-	Ground
	10	+5V1	O	5 V DC	5 V DC power output
	11	MPFSENS1	I	0/5 V DC	MP tray paper sensor: On/Off
	12	MPFSENS2	I	0/5 V DC	Envelope feeder install sensor: Installed/Not installed
	13	WTLEDDR	O	0/5 V DC (pulse)	Waste toner full sensor (emitter) drive output
	14	WTSENS	I	0/5 V DC (pulse)	Waste toner full sensor (receiver) input, Full at voltage above the 2 V DC
	15	AIRTEMPH	I	Analog	Temperature sensor detection voltage input
	16	WETCK1	O	0/5 V DC (pulse)	Humidity sensor control signal (1 KHz)
	17	WETCK2	I	Analog	Temperature sensor detection signal
	18	GND	-	-	Ground
YC6	1	+24V3	I	24 V DC	24 V DC power input (via side cover switch)
Connected to the main high voltage PWB	2	MCH1DR	O	0/24 V DC	Main charger output control signal (Magenta): On/Off
	3	MCH2DR	O	0/24 V DC	Main charger output control signal (Cyan): On/Off
	4	MCH3DR	O	0/24 V DC	Main charger output control signal (Yellow): On/Off
	5	MCH4DR	O	0/24 V DC	Main charger output control signal (Black): On/Off
	6	+5V1	O	5 V DC	5 V DC power output
	7	HVADATD	O	0/5 V DC (pulse)	Output control D/A converter serial signal
	8	HVACLKD	O	0/5 V DC (pulse)	Output control D/A converter clock signal
	9	HVALATD	O	0/5 V DC (pulse)	Output control D/A converter data latch signal
	10	GND	-	-	Ground
YC7	1	GND	-	-	Ground
Connected to the optional paper feeder/ duplexer	2	OPRDYN	I	0/5 V DC	Optional unit ready signal: Ready/Not ready
	3	OPSEL2	O	0/5 V DC	Optional unit select signal: (bit2)
	4	OPSDO	O	0/5 V DC (pulse)	Optional unit serial communication data output
	5	OPSEL1	O	0/5 V DC	Optional unit select signal: (bit1)
	6	OPSDI	I	0/5 V DC (pulse)	Optional unit serial communication data input
	7	OPSEL0	O	0/5 V DC	Optional unit select signal: (bit0)
	8	OPSCLK	O	0/5 V DC (pulse)	Optional unit serial communication clock signal
	9	NC	-	-	Not connected
	10	OP5V	O	5 V DC	5 V DC power output (via fuse)
	11	GND	-	-	Ground
	12	OP24V	O	24 V DC	5 V DC power output (via fuse)
YC8	1	+5V1	O	5 V DC	5 V DC power output
Connected to the main controller PWB	2	+5V1	O	5 V DC	5 V DC power output
	3	+5V1	O	5 V DC	5 V DC power output
	4	+3.3V1	O	3.3 V DC	3.3 V DC power output
	5	GND	-	-	Ground
	6	VTXDP11	I	Analog	LED print head control video data signal (LVDS)
	7	VTXDP10	I	Analog	LED print head control video data signal (LVDS)
	8	VTXDP9	I	Analog	LED print head control video data signal (LVDS)
	9	VTXDP8	I	Analog	LED print head control video data signal (LVDS)
	10	VTXCLKP	I	0/3.3 V DC (pulse)	LED print head control clock signal
	11	VTXDP7	I	Analog	LED print head control video data signal (LVDS)
	12	VTXDP6	I	Analog	LED print head control video data signal (LVDS)

Connector	Pin No.	Signal	I/O	Voltage	Description
YC8	13	VRXDP0	I	Analog	LED print head control video data signal (LVDS)
Connected to the main controller PWB	14	VRXDP1	I	Analog	LED print head control video data signal (LVDS)
	15	VRXCLKP	I	0/3.3 V DC (pulse)	LED print head control clock signal
	16	VTXDP5	I	Analog	LED print head control video data signal (LVDS)
	17	VTXDP4	I	Analog	LED print head control video data signal (LVDS)
	18	VTXDP3	I	Analog	LED print head control video data signal (LVDS)
	19	VTXDP2	I	Analog	LED print head control video data signal (LVDS)
	20	VTXDP1	I	Analog	LED print head control video data signal (LVDS)
	21	VTXDP0	I	Analog	LED print head control video data signal (LVDS)
	22	GND	-	-	Ground
	23	FPDIR	O	0/3.3 V DC	Operation panel PWB cmmunication direction signal
	24	FPCLK	O	0/3.3 V DC (pulse)	Serial communication synchronizing clock signal
	25	FPRSTN	I	0/3.3 V DC	Operation panel PWB reset signal
	26	GND	-	-	Serial communication data output
	27	SYSRESN	-	0/5 V DC	System reset signal
	28	GND	-	-	Ground
	29	SBSYN	O	0/5 V DC	Control signal
	30	GND	-	-	Ground
	31	+5V1	O	5 V DC	5 V DC power output
	32	+5V1	O	5 V DC	5 V DC power output
	33	+5V1	O	5 V DC	5 V DC power output
	34	+3.3V	O	3.3 V DC	3.3 V DC power output
	35	+3.3V	O	3.3 V DC	3.3 V DC power output
	36	VTXDN11	I	Analog	LED print head control video data signal (LVDS)
	37	VTXDN10	I	Analog	LED print head control video data signal (LVDS)
	38	VTXDN9	I	Analog	LED print head control video data signal (LVDS)
	39	VTXDN8	I	Analog	LED print head control video data signal (LVDS)
	40	VTXCLKN	I	0/3.3 V DC (pulse)	LED print head control clock signal
	41	VTXDN7	I	Analog	LED print head control video data signal (LVDS)
	42	VTXDN6	I	Analog	LED print head control video data signal (LVDS)
	43	VRXDN0	I	Analog	LED print head control video data signal (LVDS)
	44	VRXDN1	I	Analog	LED print head control video data signal (LVDS)
	45	VRXCLKN	I	0/3.3 V DC (pulse)	LED print head control clock signal
	46	VTXDN5	I	Analog	LED print head control video data signal (LVDS)
	47	VTXDN4	I	Analog	LED print head control video data signal (LVDS)
	48	VTXDN3	I	Analog	LED print head control video data signal (LVDS)
	49	VTXDN2	I	Analog	LED print head control video data signal (LVDS)
	50	VTXDN1	I	Analog	LED print head control video data signal (LVDS)
	51	VTXDN0	I	Analog	LED print head control video data signal (LVDS)
	52	GND	-	-	Ground
	53	GND	-	-	Ground
	54	FPDATA	I/O	0/3.3 V DC (pulse)	Operation panel PWB control data signal
	55	EGIR	O	0/3.3 V DC	Control signal
	56	GND	-	-	Ground
	57	SIN	I	0/3.3 V DC (pulse)	Serial communication data input
	58	SCLKIN	I	0/3.3 V DC (pulse)	Serial communication synchronizing clock signal
	59	SOUT	O	0/3.3 V DC (pulse)	Serial communication data output
	60	SDIR	O	0/3.3 V DC	Control signal
YC10	1	+5V1	O	5 V DC	5 V DC power output
Connected to the operation panel PWB	2	FPDATA	I/O	0/3.3 V DC (pulse)	Operation panel PWB control data signal
	3	FPDIR	I	0/3.3 V DC	Operation panel PWB communication direction control signal
	4	FPCLK	I	0/3.3 V DC (pulse)	Operation panel PWB control data synchronizing clock signal
	5	GND	-	-	Ground
	6	FPRSTN	O	0/5 V DC	Operation panel PWB reset signal

Connector	Pin No.	Signal	I/O	Voltage	Description
YC11	1	TCOV0P2	I	DC0V/5V	Top cover switch: Top cover Close/Open
Connected to the registration clutch, feed clutch, MP tray feed solenoid, toner ID sensor, feed motor and, fuser motor, and developer drive stop motor	2	GND	-	-	Ground
	3	+24V2	O	24 V DC	24 V DC power (via top cover/paper feed unit switch)
	4	REGCLDR	O	0/24 V DC	Registration clutch: On/Off
	5	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	6	FEDCLDR	O	0/24 V DC	Feed clutch: On/Off
	7	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	8	MPSOLDR	O	0/24 V DC	MP tray feed solenoid: On/Off
	9	+5V1	O	5 V DC	5 V DC power
	10	GND	-	-	Ground
	11	IDSW	I	Analog	Toner ID sensor detection voltage (S-wave) input
	12	IDSW	I	Analog	Toner ID sensor detection voltage (P-wave) input
	13	IDREF	O	Analog	Toner ID sensor LED light emitting control signal
	14	STFDA	O	0/24 V DC (pulse)	Feed motor energization pulse
	15	STFDAN	O	0/24 V DC (pulse)	Feed motor energization pulse
	16	STFDB	O	0/24 V DC (pulse)	Feed motor energization pulse
	17	STFDBN	O	0/24 V DC (pulse)	Feed motor energization pulse
	18	STFSA	O	0/24 V DC (pulse)	Fuser motor energization pulse
	19	STFSAN	O	0/24 V DC (pulse)	Fuser motor energization pulse
	20	STFSB	O	0/24 V DC (pulse)	Fuser motor energization pulse
	21	STFSBN	O	0/24 V DC (pulse)	Fuser motor energization pulse
	22	DVEMOTA	O	0/24 V DC	Developer drive stop motor: Fwd/Rev
	23	DVEMOTB	O	24/0 V DC	Developer drive stop motor: Rev/Fwd
	24	GND	-	-	Ground

Connector	Pin No.	Signal	I/O	Voltage	Description
YC12	1	TH1	I	Analog	Fuser thermistor 1 detection voltage input
Connected to the power supply PWB	2	TH2*1	I	Analog	Fuser thermistor 2*1 detection voltage input
	3	FDSOLDR	O	0/24 V DC (pulse)	Face up/down solenoid control signal
	4	+5V2	I	5 V DC	5 V DC power input
	5	RCOVOPN	O	0/5 V DC	Rear cover open/close sensor: rear cover open/close
	6	FUSOLDR	O	0/24 V DC	Face up/down solenoid control signal
	7	EXITPAPN	I	0/5 V DC	Exit sensor: On/Off
	8	+24V2	I	24 V DC	24 V DC power input
	9	HEAT2DR*1	O	0/24 V DC	Fuser heater lamp 2*1: On/Off
	10	HEAT1DR	O	0/24 V DC	Fuser heater lamp 1: On/Off
	11	ZCROSS	I	0/5 V DC (pulse)	Zero cross signal input
	12	-	-	-	N.C.
	13	+24V1	I	24 V DC	24 V DC power input
	14	+24V1	I	24 V DC	24 V DC power input
	15	+24V1	I	24 V DC	24 V DC power input
	16	+24V1	I	24 V DC	24 V DC power input
	17	GND	-	-	Ground
	18	GND	-	-	Ground
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	GND	-	-	Ground
	22	GND	-	-	Ground
	23	GND	-	-	Ground
	24	GND	-	-	Ground
	25	+3.3V1	I	3.3 V DC	3.3 V DC power input
	26	+3.3V1	I	3.3 V DC	3.3 V DC power input
	27	+3.3V1	I	3.3 V DC	3.3 V DC power input
	28	+3.3V1	I	3.3 V DC	3.3 V DC power input
	29	+5V1	I	5 V DC	5 V DC power input
	30	+5V1	I	5 V DC	5 V DC power input
YC13	1	BFANDR	O	0/5 V DC	Controller box fan motor: On/Off
Connected to the controller box fan motor	2	GND	-	-	Ground
YC15	1	CPUFANDR	O	0/5 V DC	CPU cooling fan motor*2: On/Off
Connected to the CPU cooling fan motor*2	2	GND	-	-	Ground

*1: 16 ppm printer only, *2: 24 ppm printer only

2-3-3 Main controller circuit

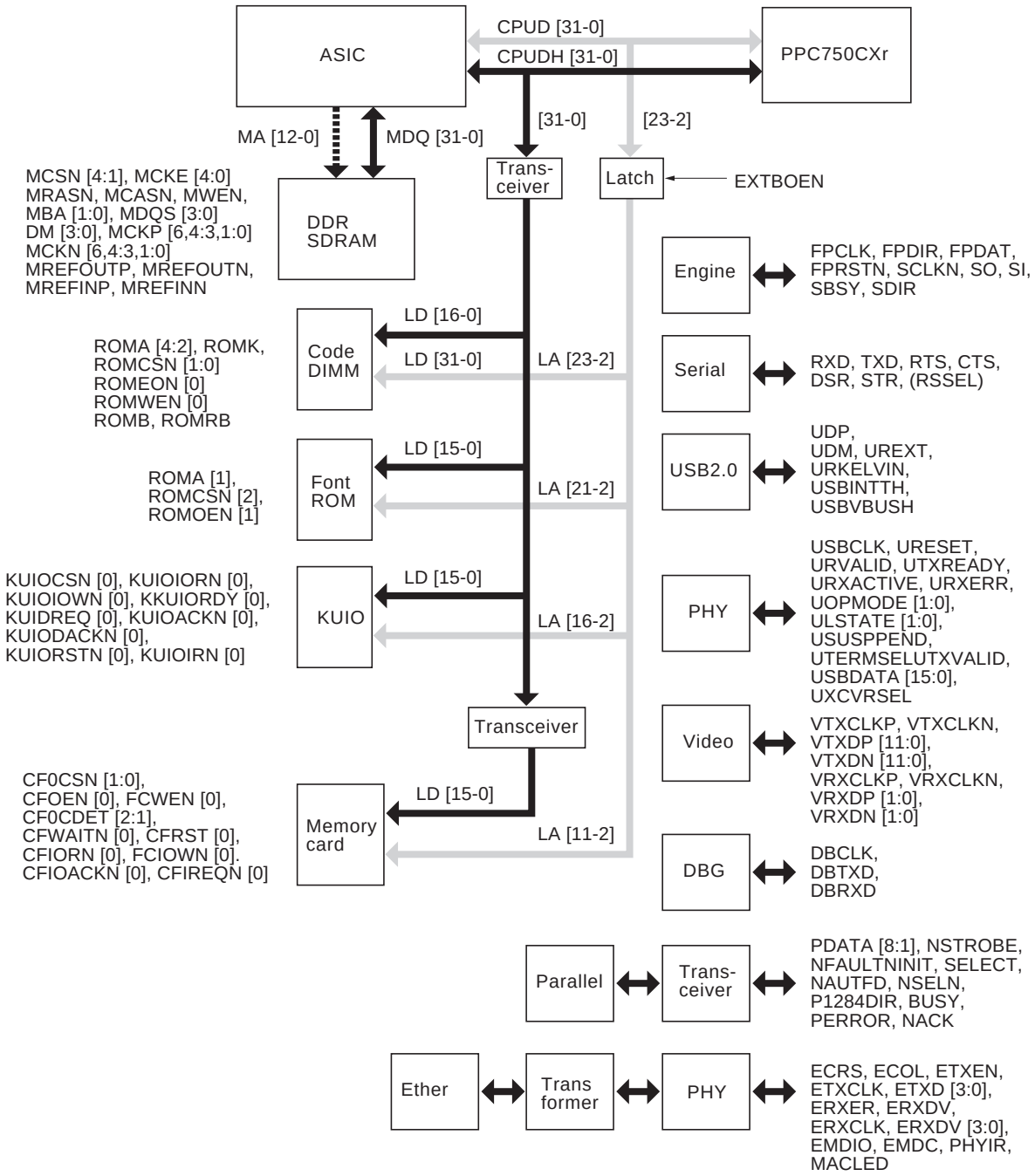
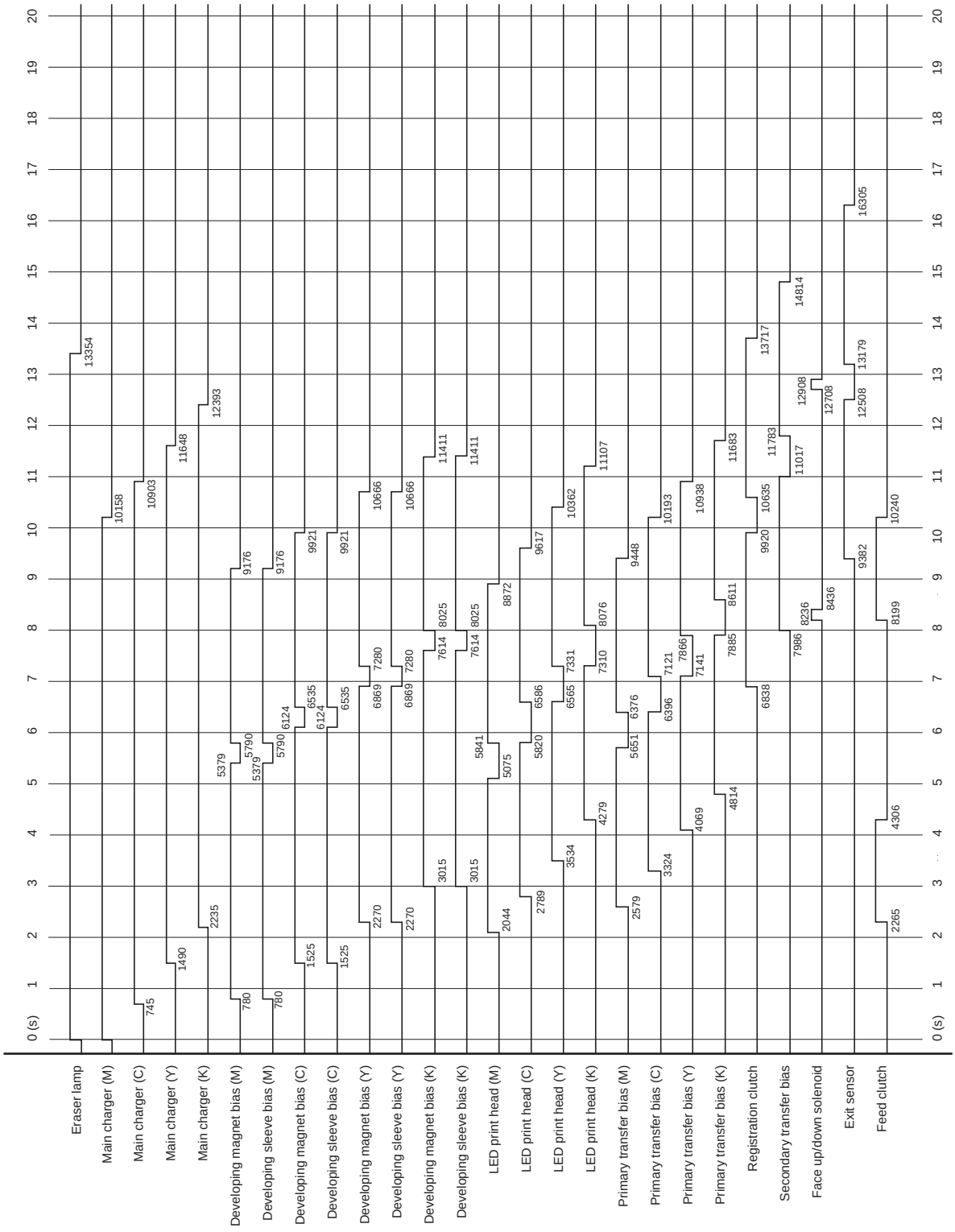


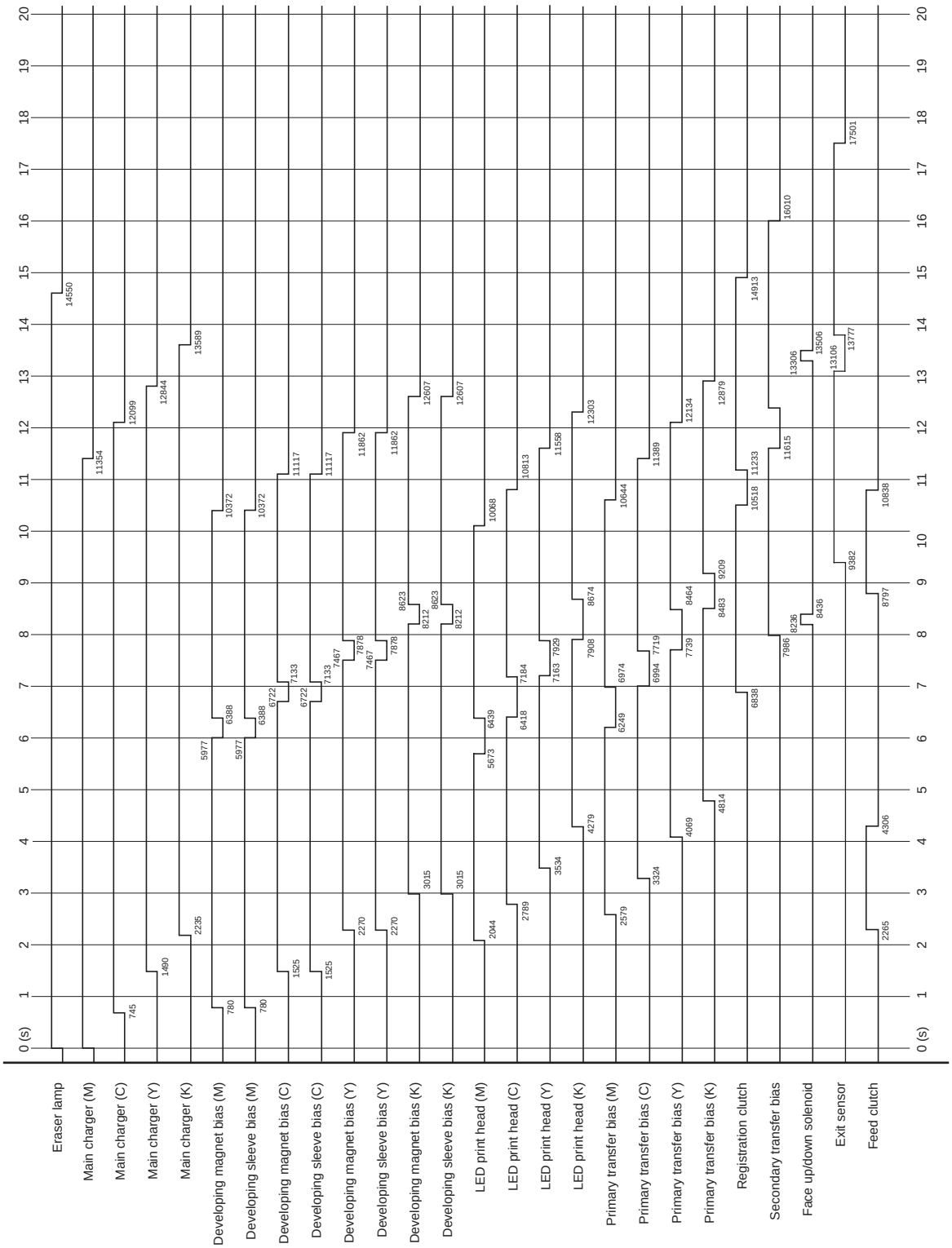
Figure 2-3-5 Main controller circuit block diagram

2-4-1 Appendixes

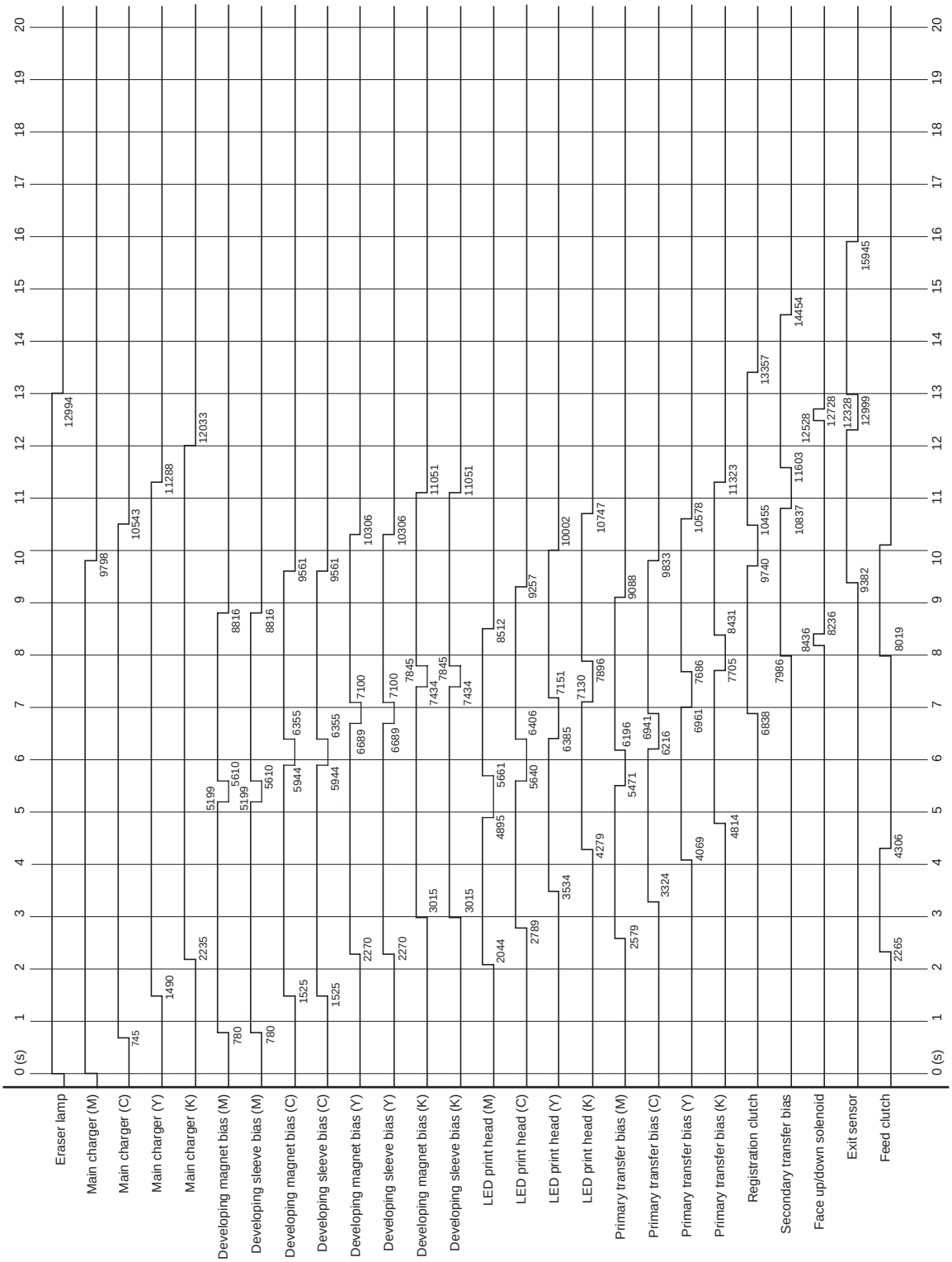
(1) Timing chart No. 1 Paper cassette, A4 size (16 ppm printer)



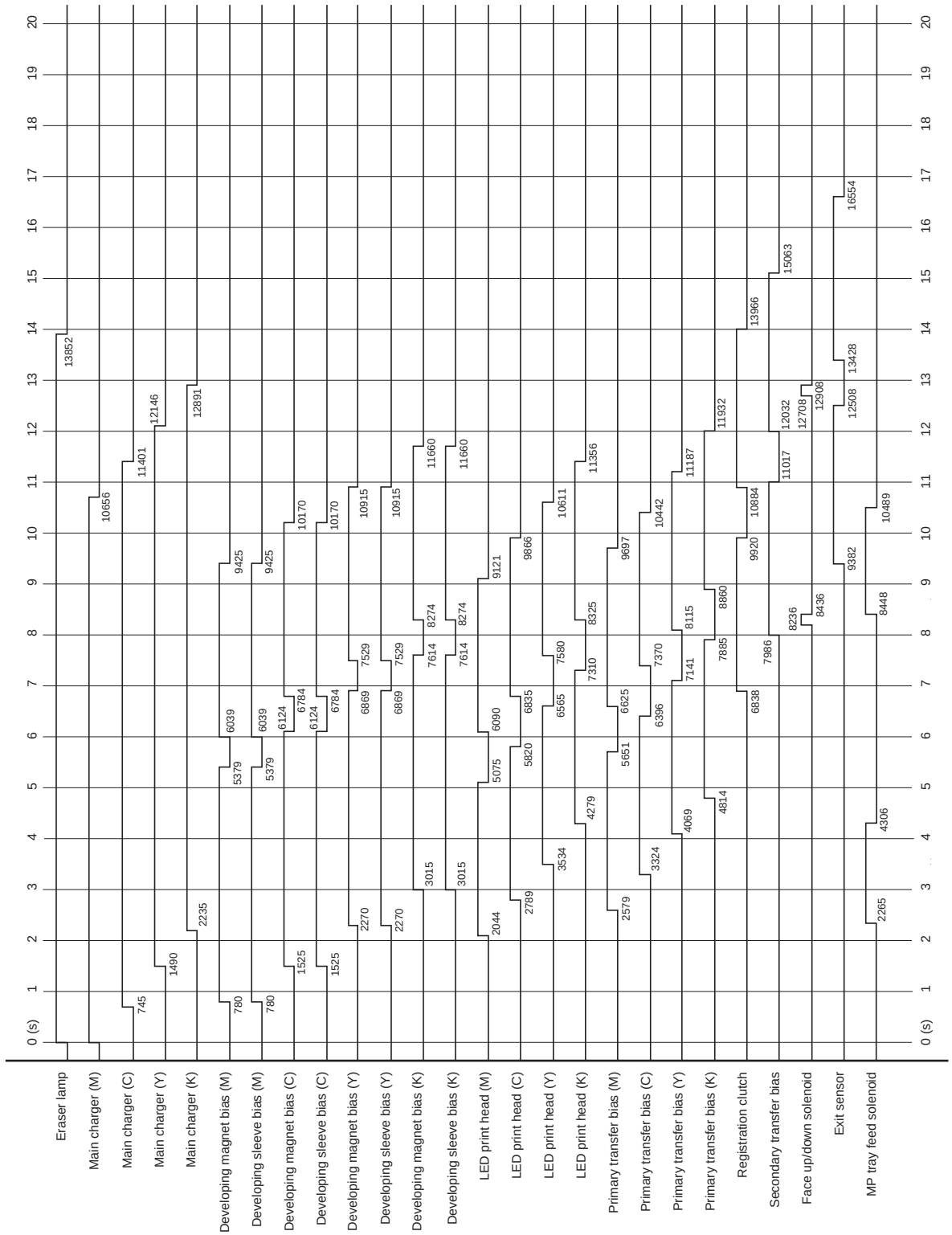
(2) Timing chart No. 2 Paper cassette, Legal size (16 ppm printer)



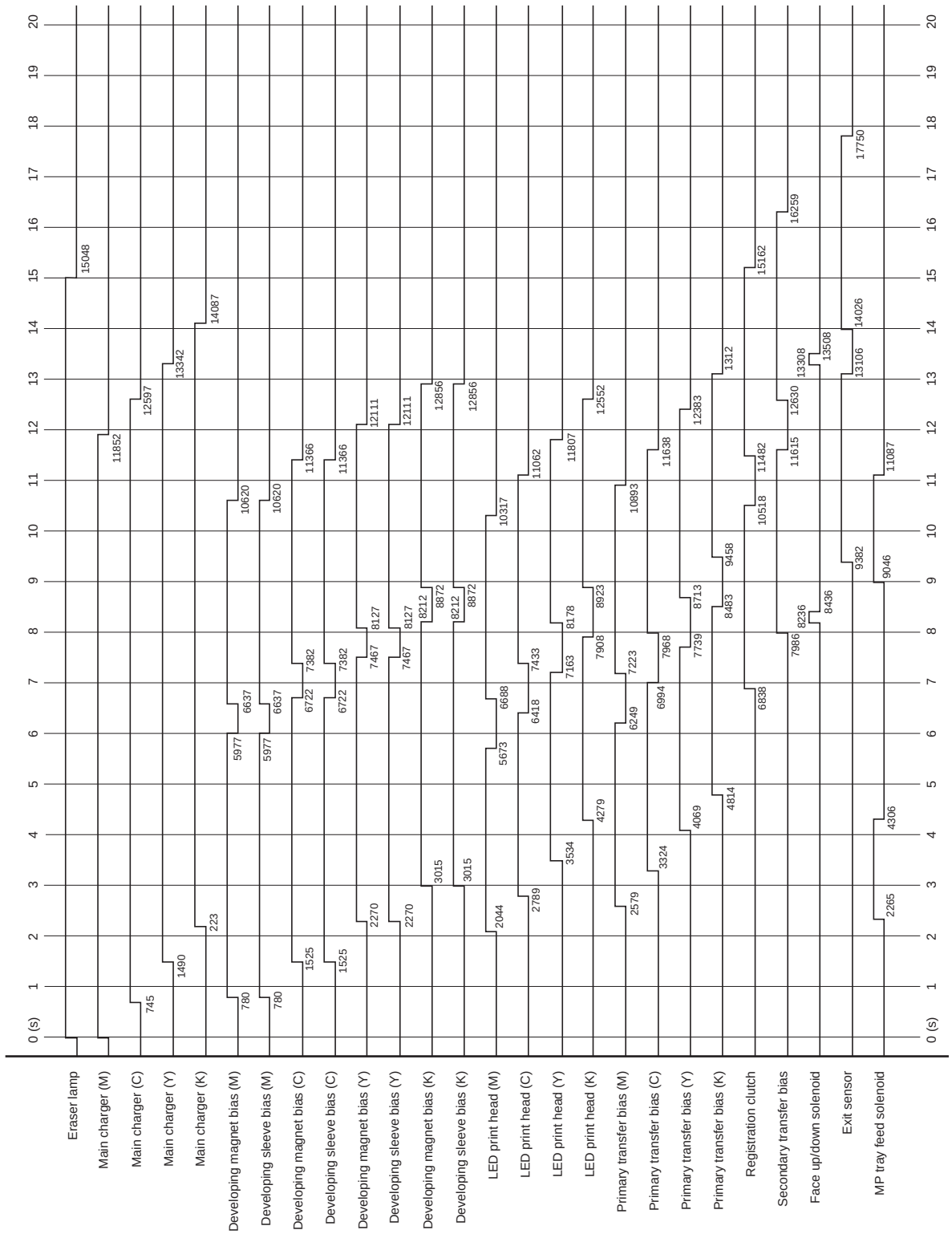
(3) Timing chart No. 3 Paper cassette, Letter size (16 ppm printer)



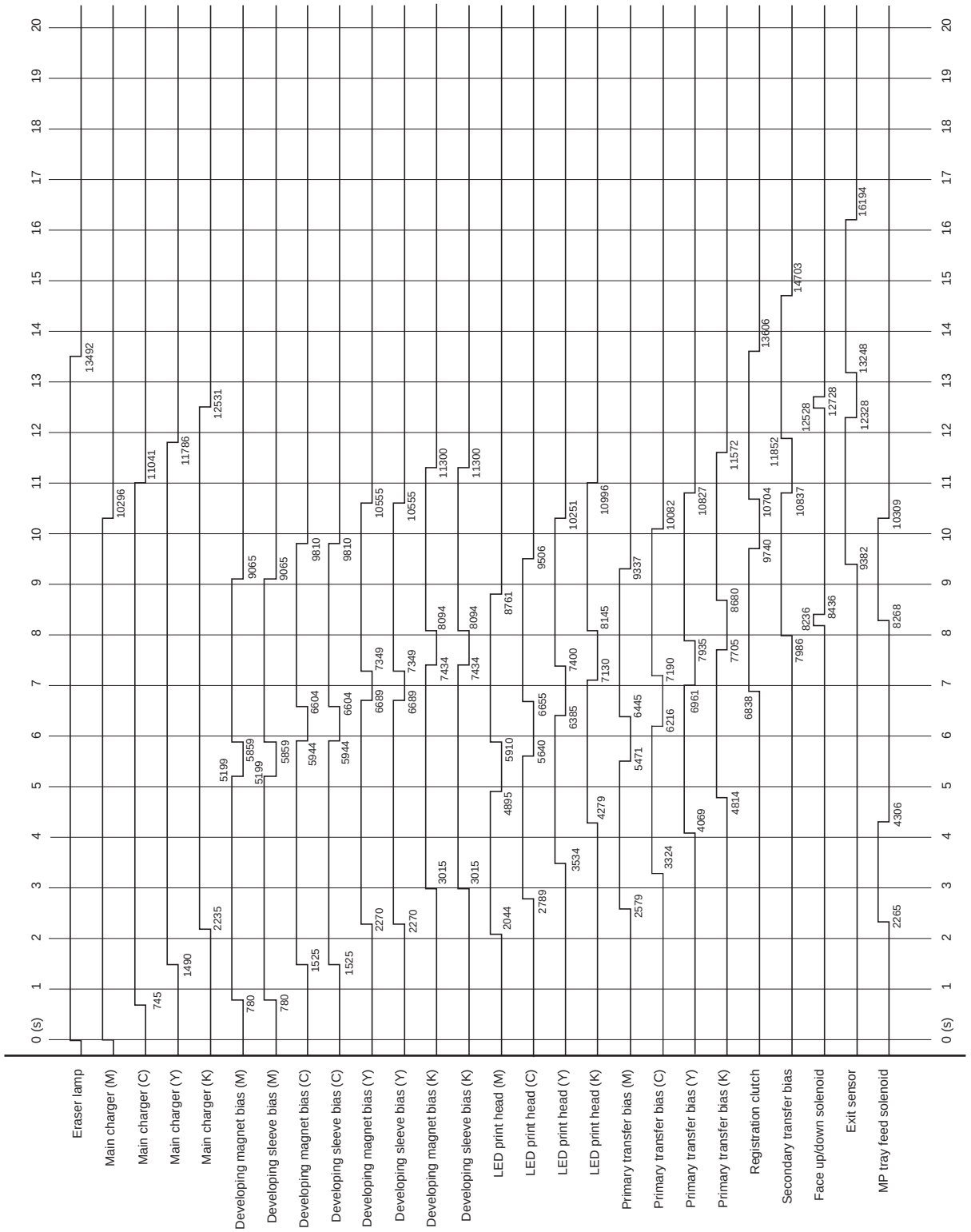
(4) Timing chart No. 4 MP tray, A4 size (16 ppm printer)



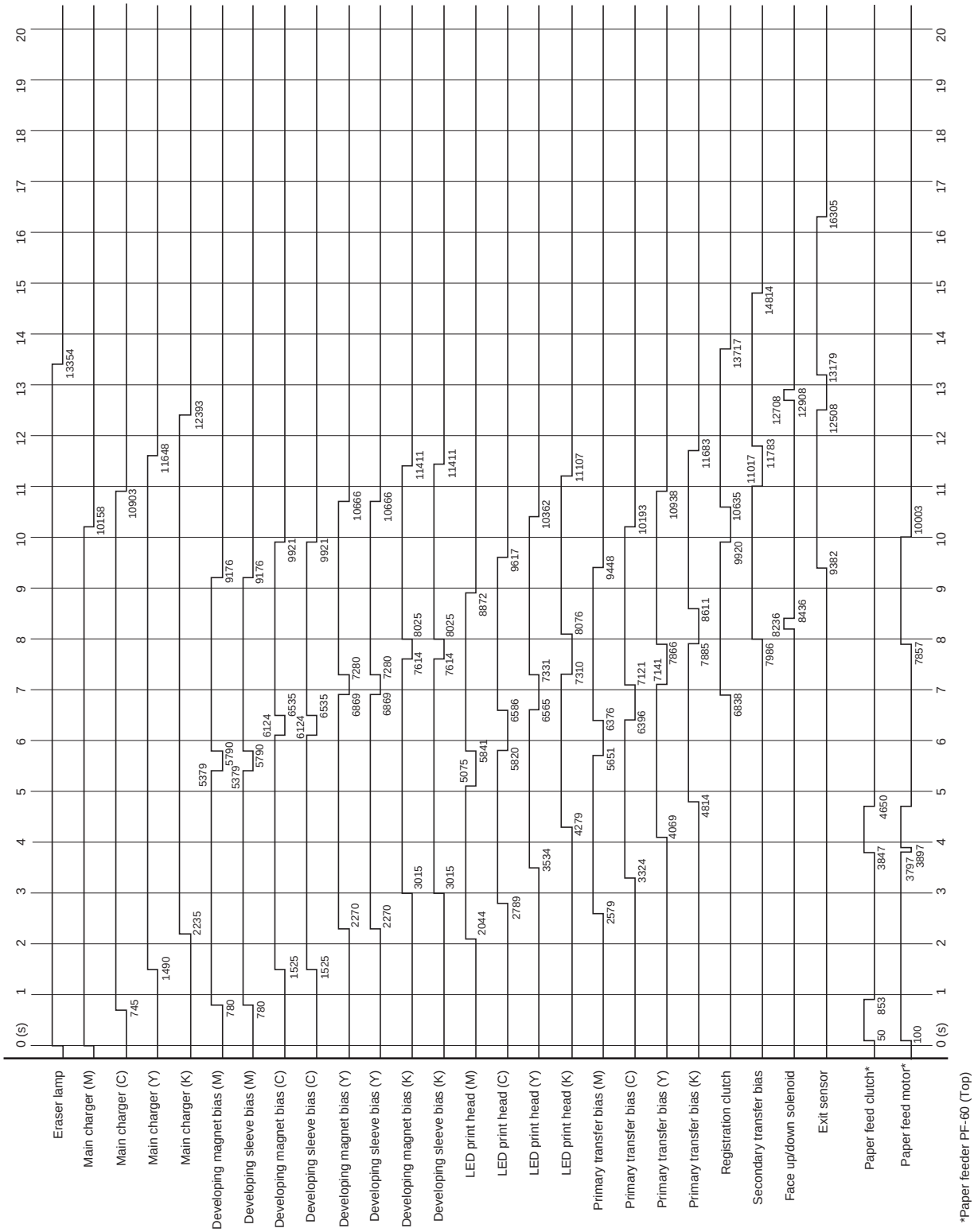
(5) Timing chart No. 5 MP tray, Legal size (16 ppm printer)



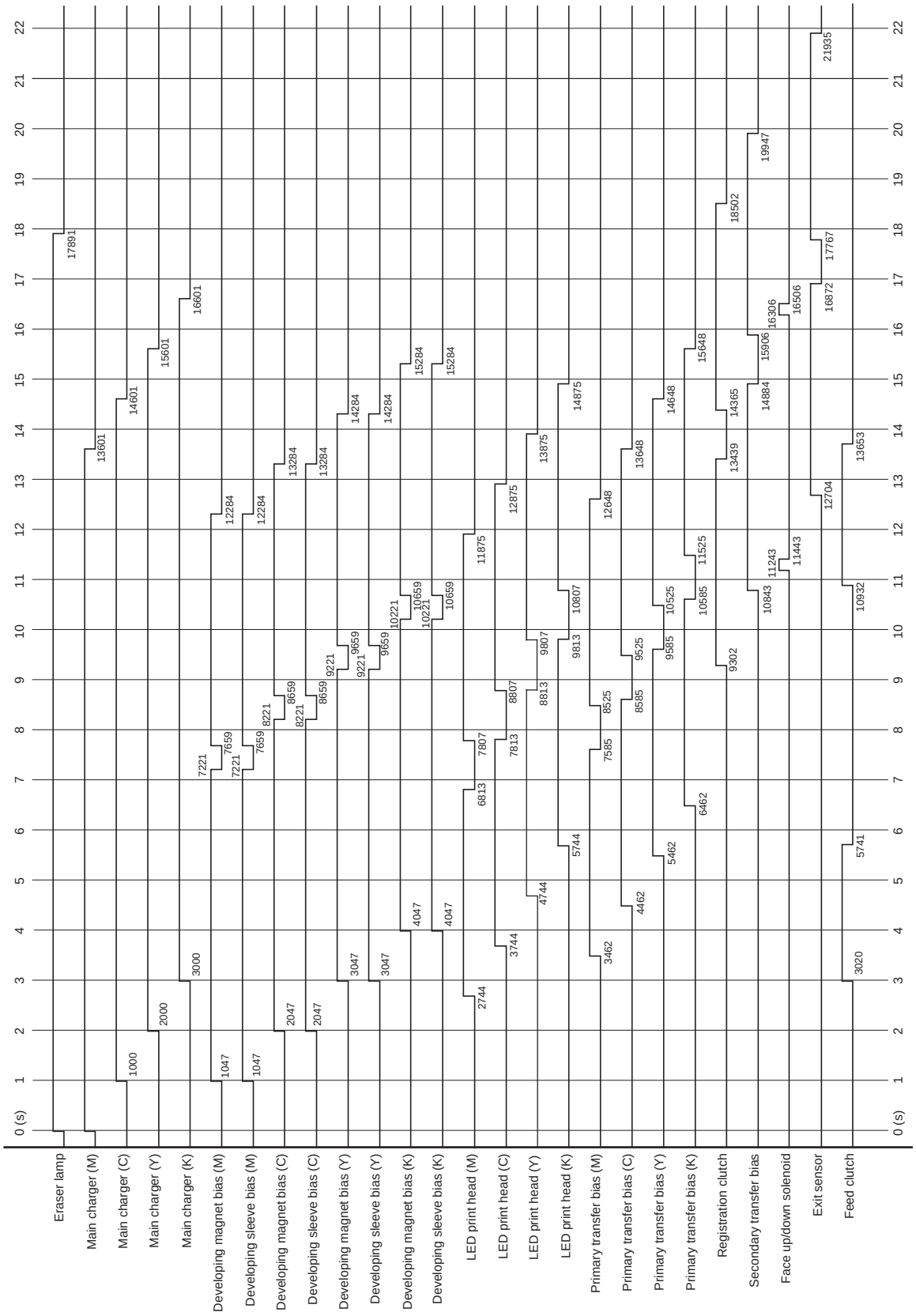
(6) Timing chart No. 6 MP tray, Letter size (16 ppm printer)



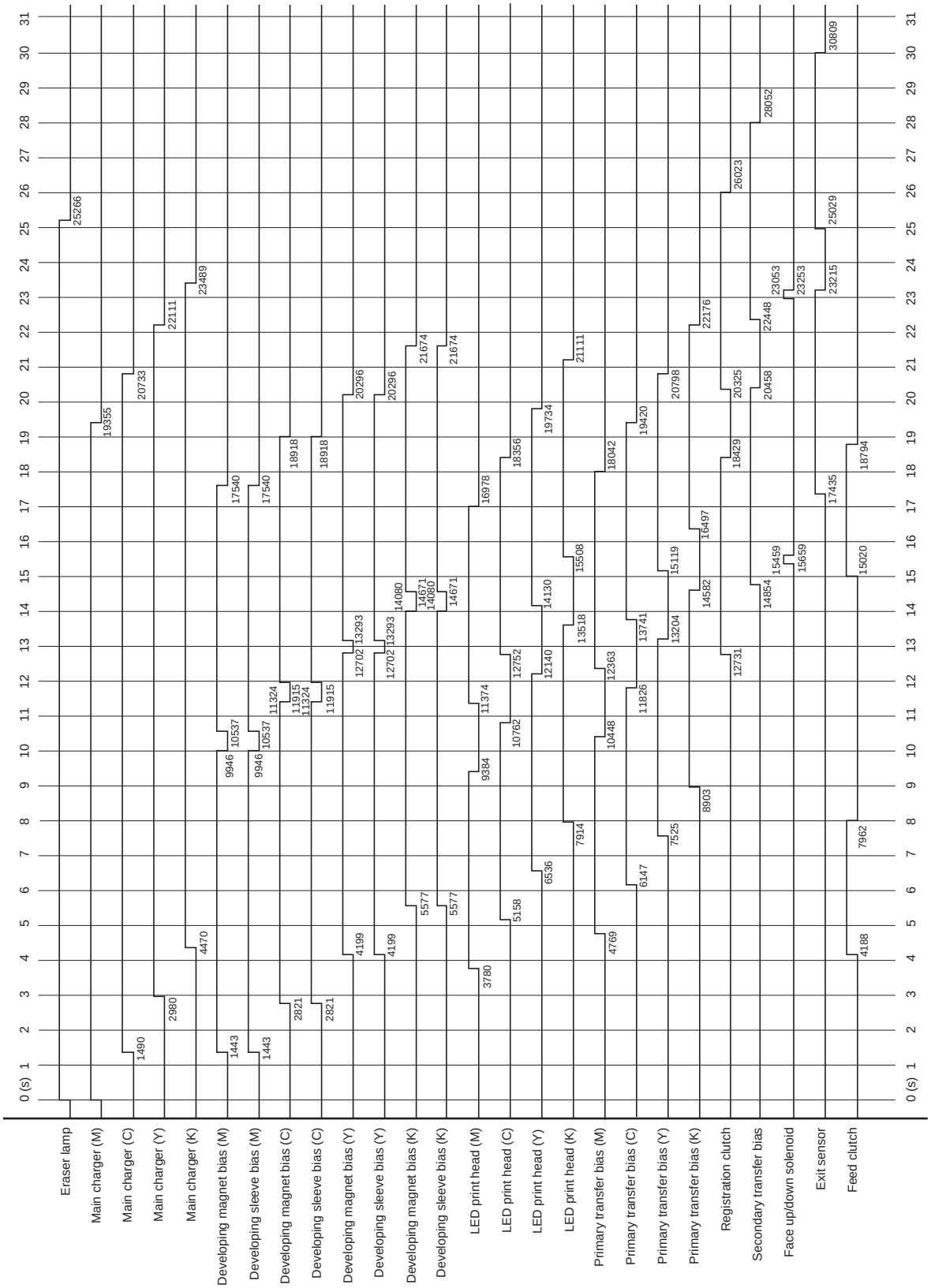
(7) Timing chart No. 7 Optional paper feeder, A4 size (16 ppm printer)



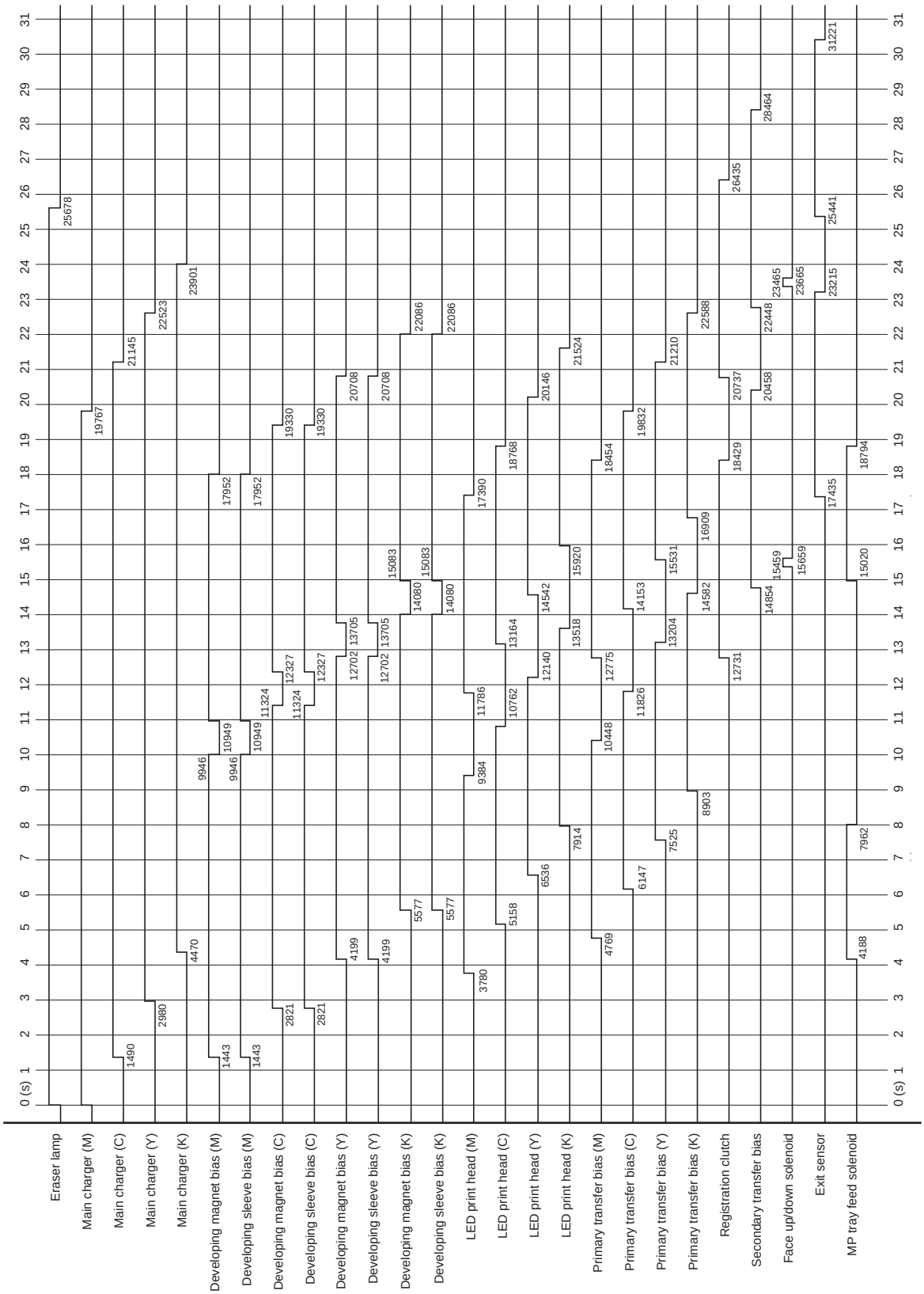
(8) Timing chart No. 8 Paper cassette, A4 size, Slow mode 1 [75 %] (16 ppm printer)



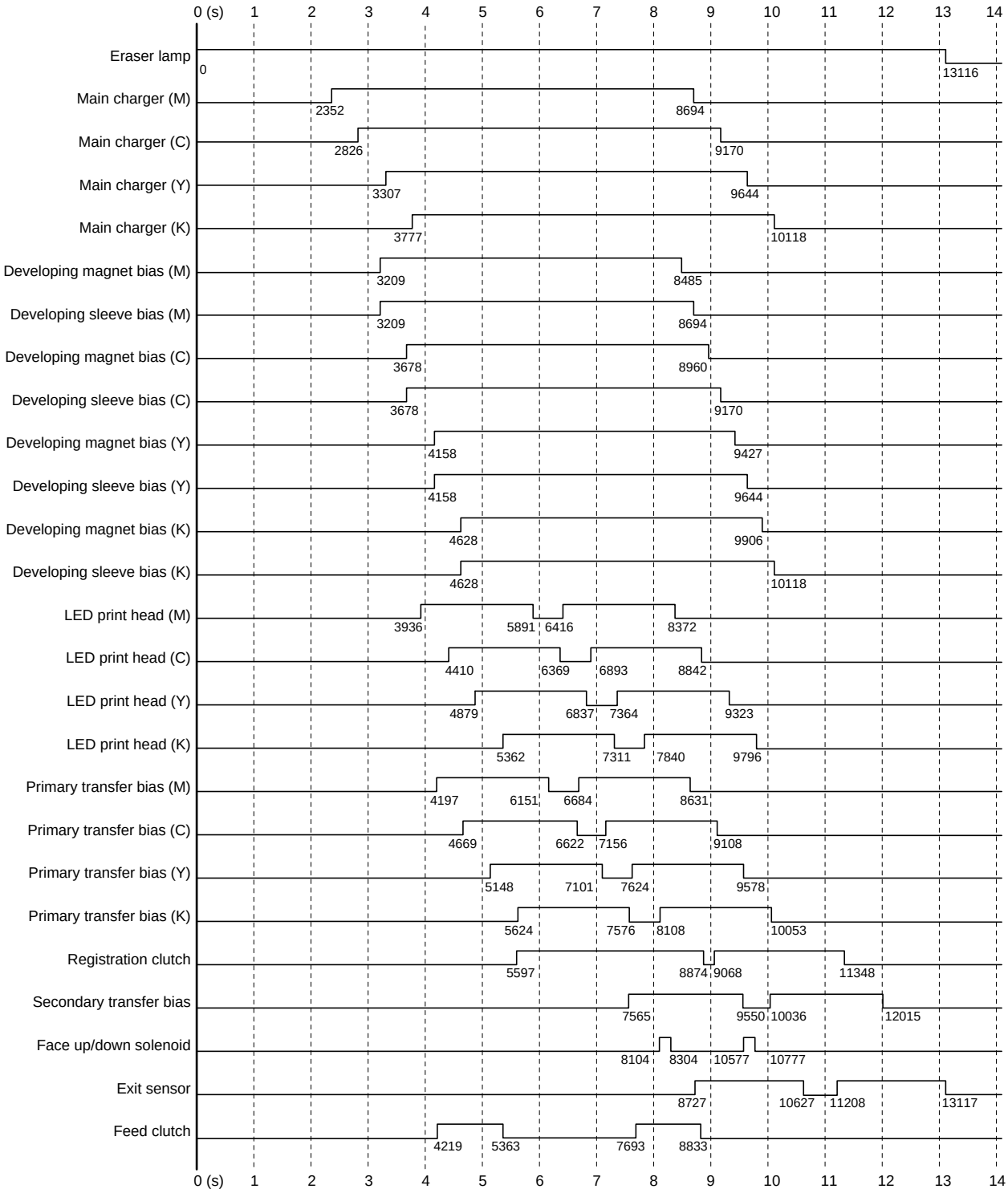
(9) Timing chart No. 9 Paper cassette, A4 size, Slow mode 2 [55 %] (16 ppm printer)



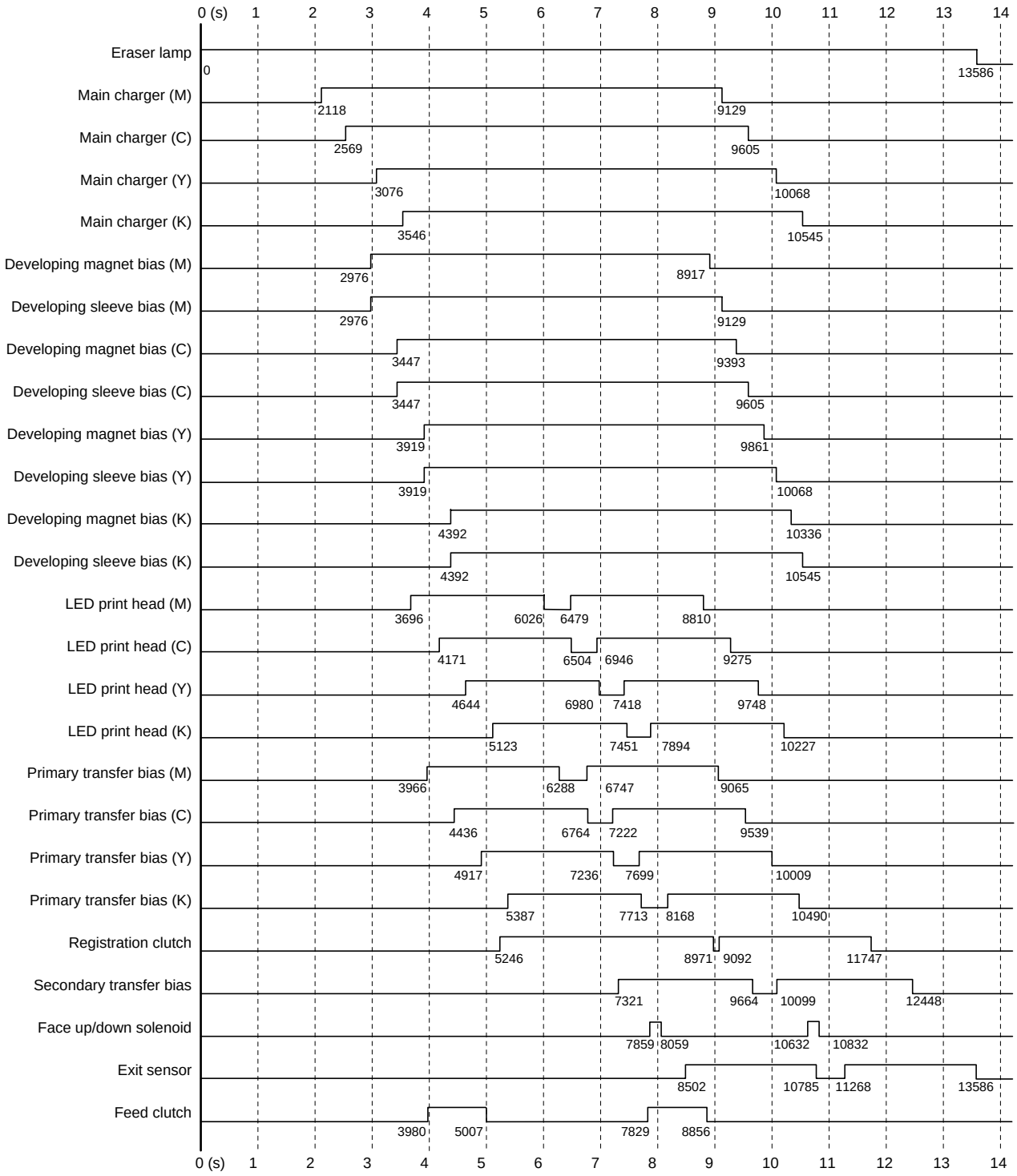
(10) Timing chart No. 10 MP tray, Transparency (16 ppm printer)



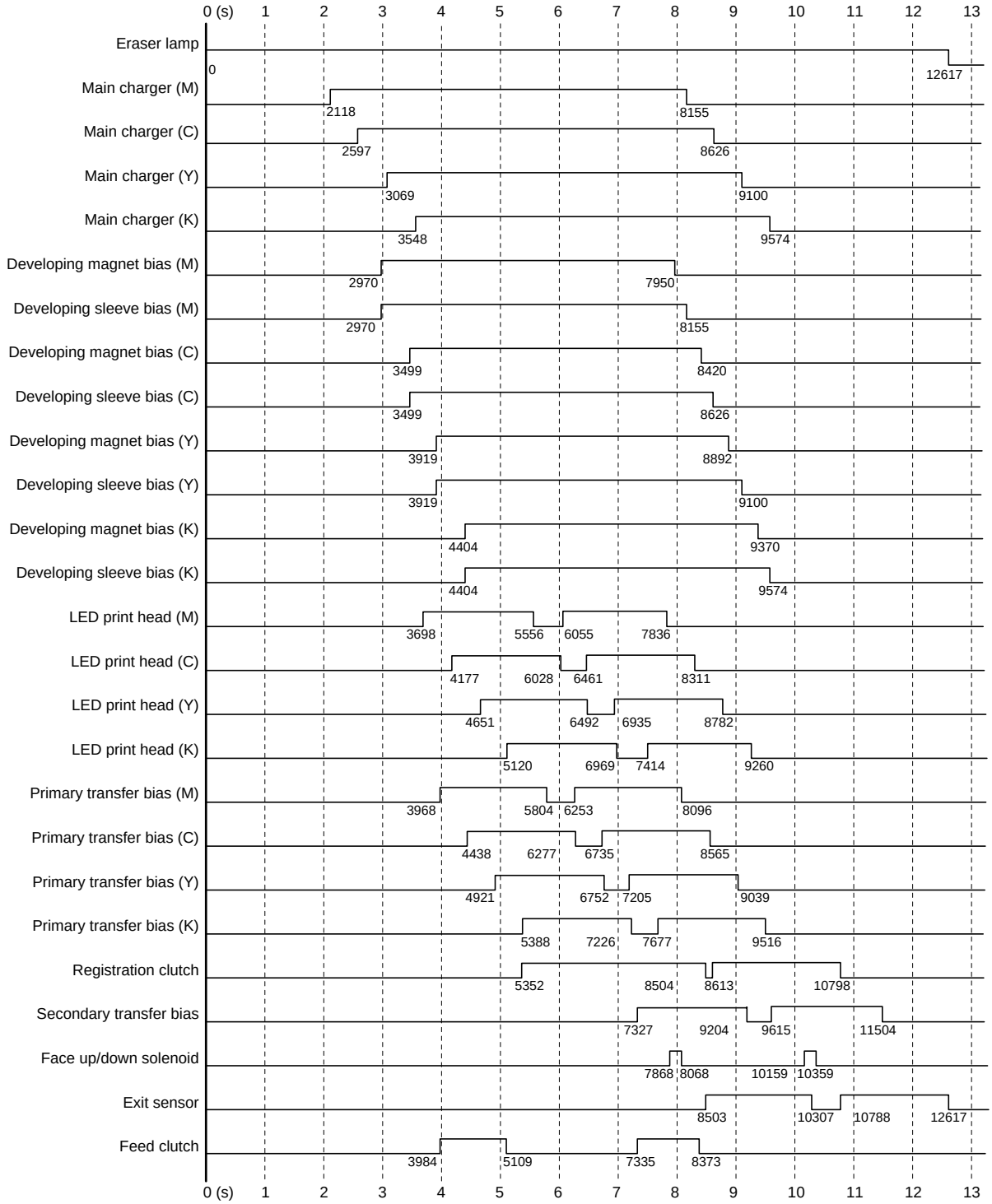
(11) Timing chart No. 11 Paper cassette, A4 size (24 ppm printer)



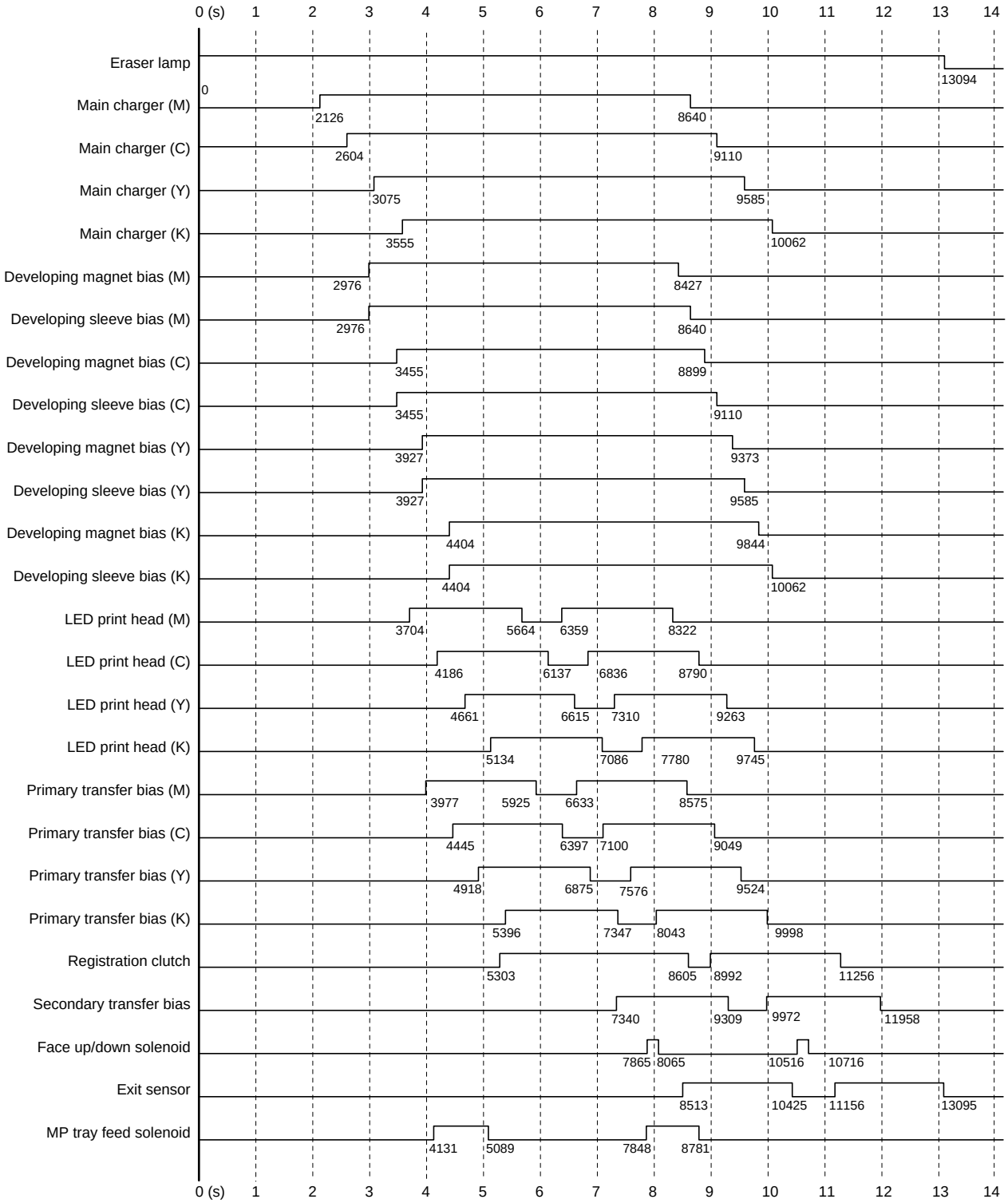
(12) Timing chart No. 12 Paper cassette, Legal size (24 ppm printer)



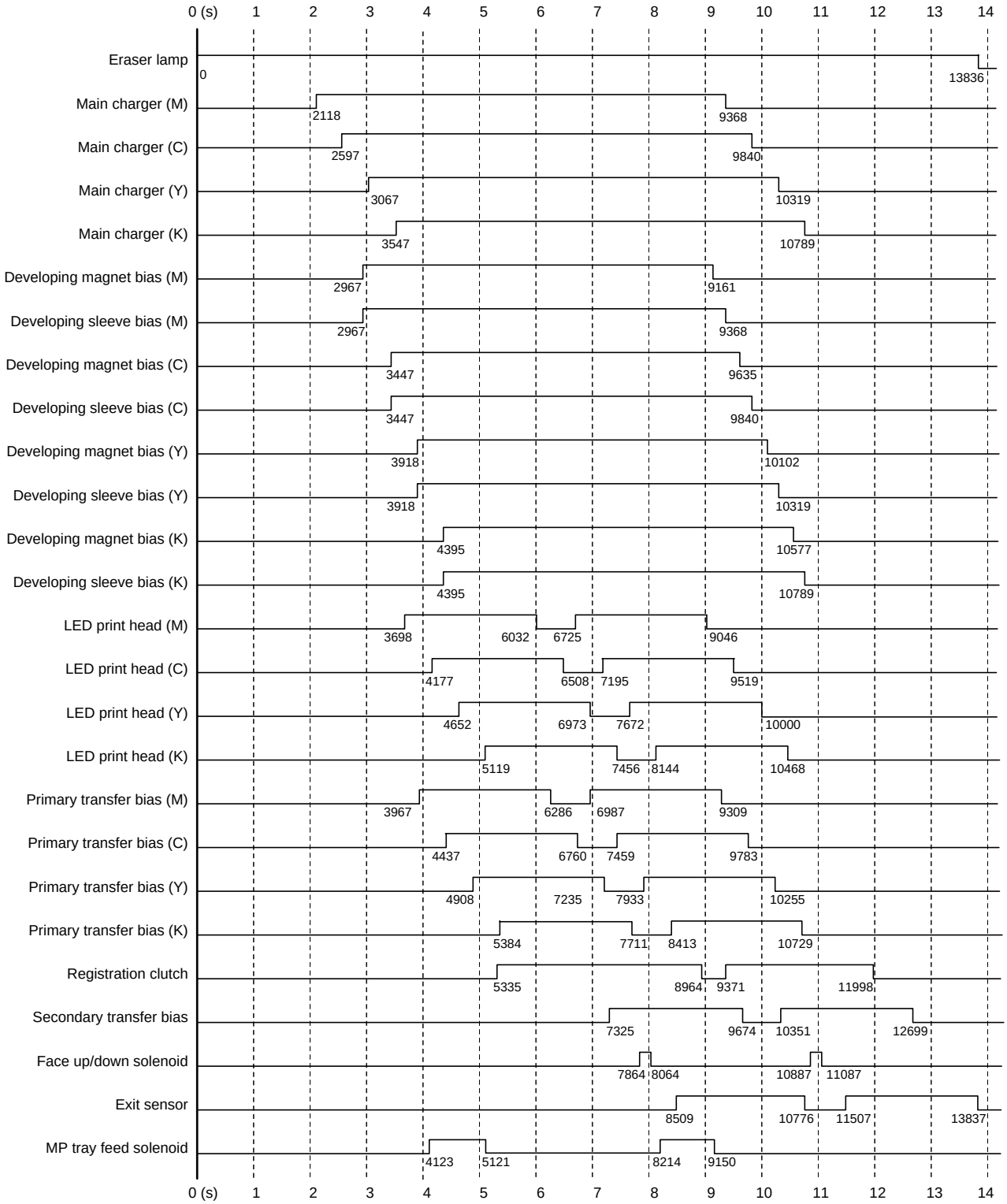
(13) Timing chart No. 13 Paper cassette, Letter size (24 ppm printer)



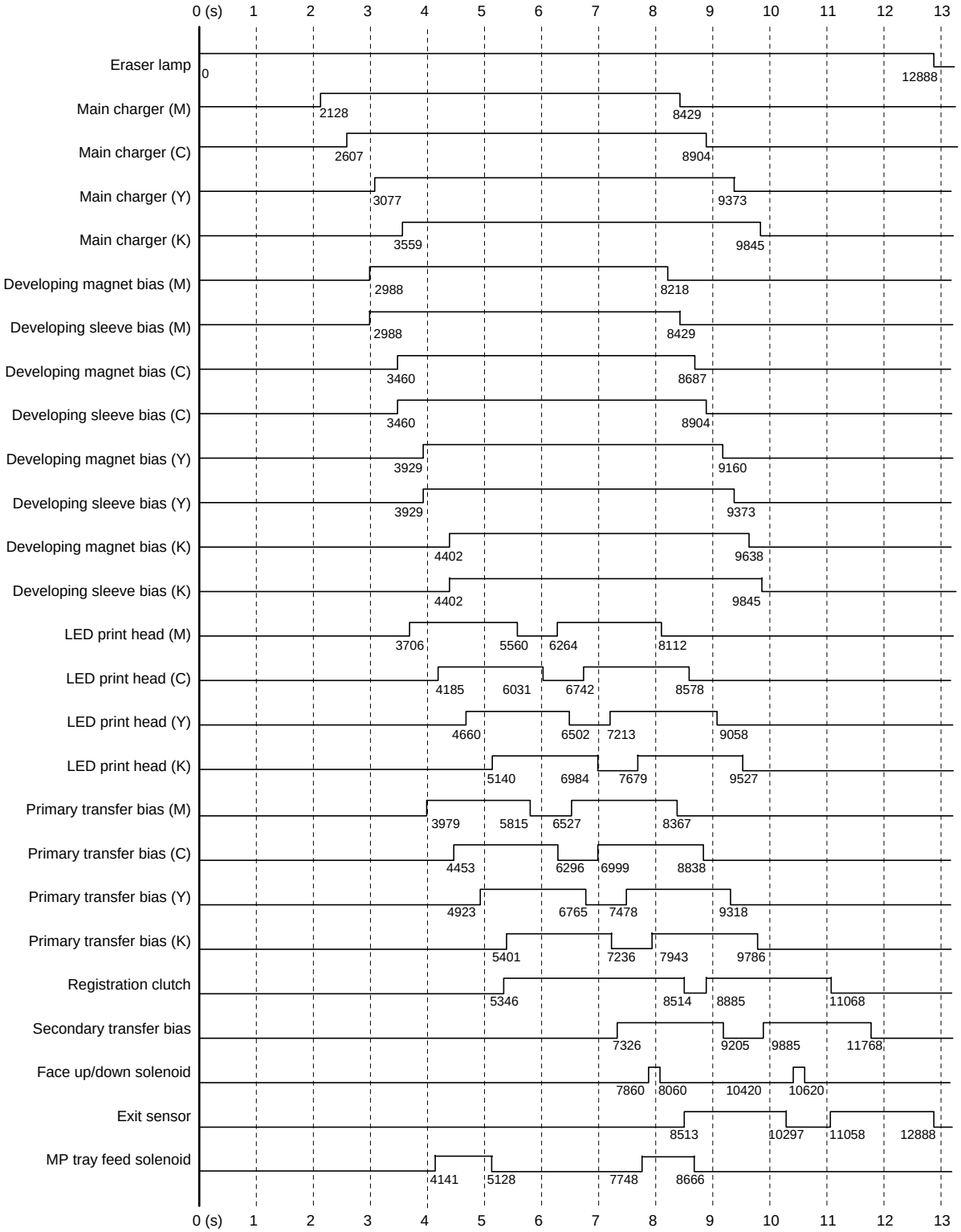
(14) Timing chart No.14 MP tray, A4 size (24 ppm printer)



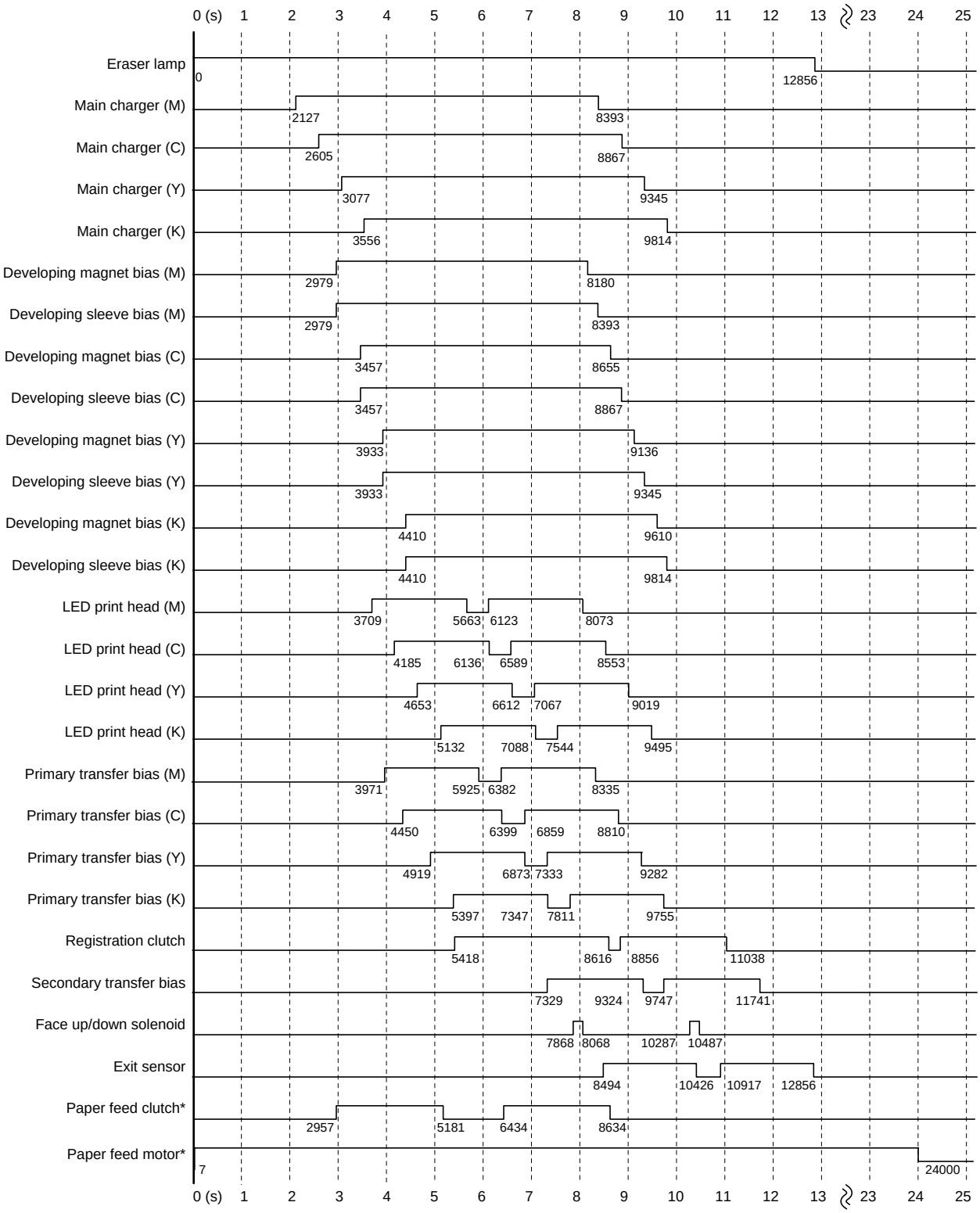
(15) Timing chart No. 15 MP tray, Legal size (24 ppm printer)



(16) Timing chart No. 16 MP tray, Letter size (24 ppm printer)

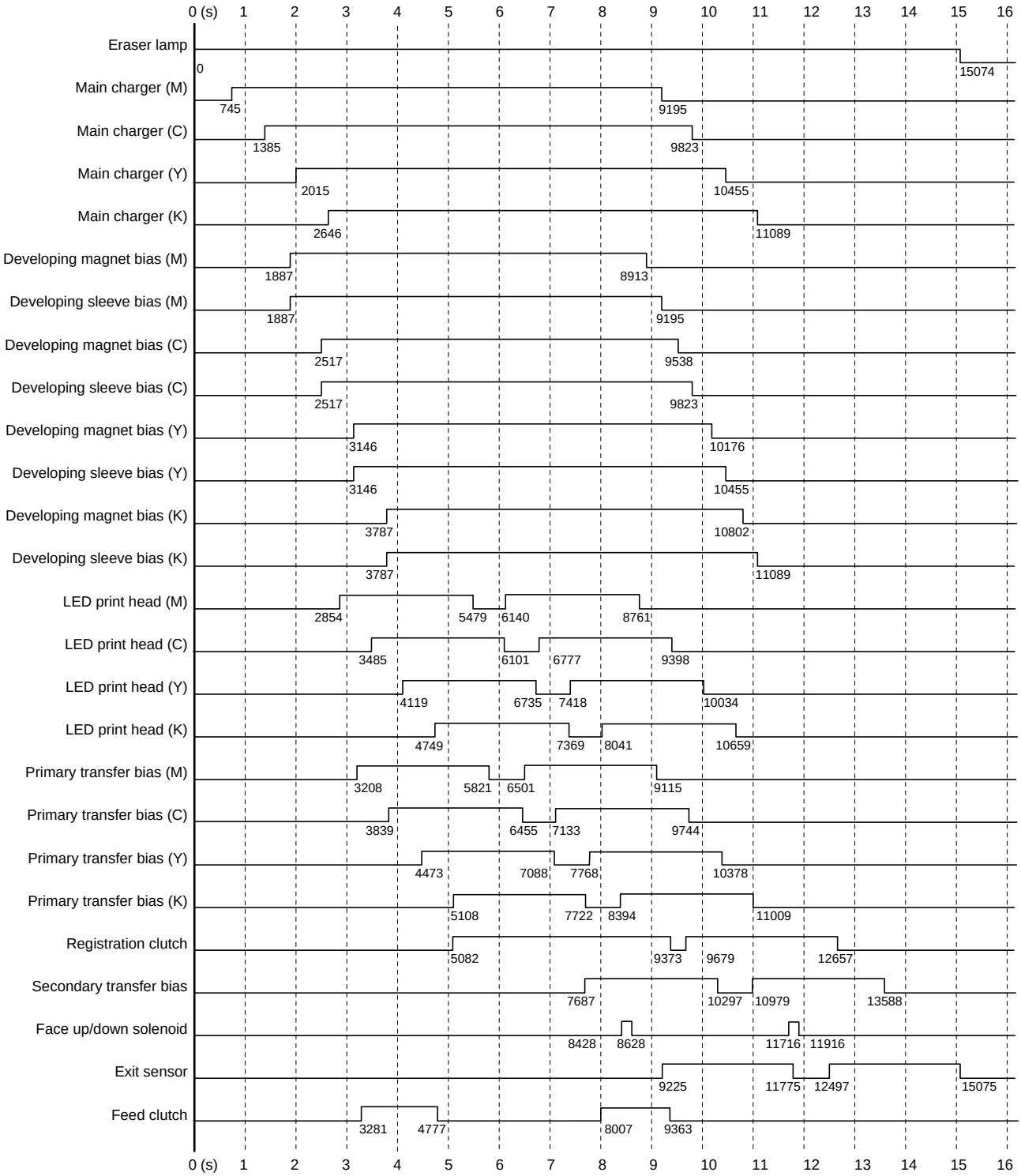


(17) Timing chart No. 17 Optional paper feeder, A4 size (24 ppm printer)

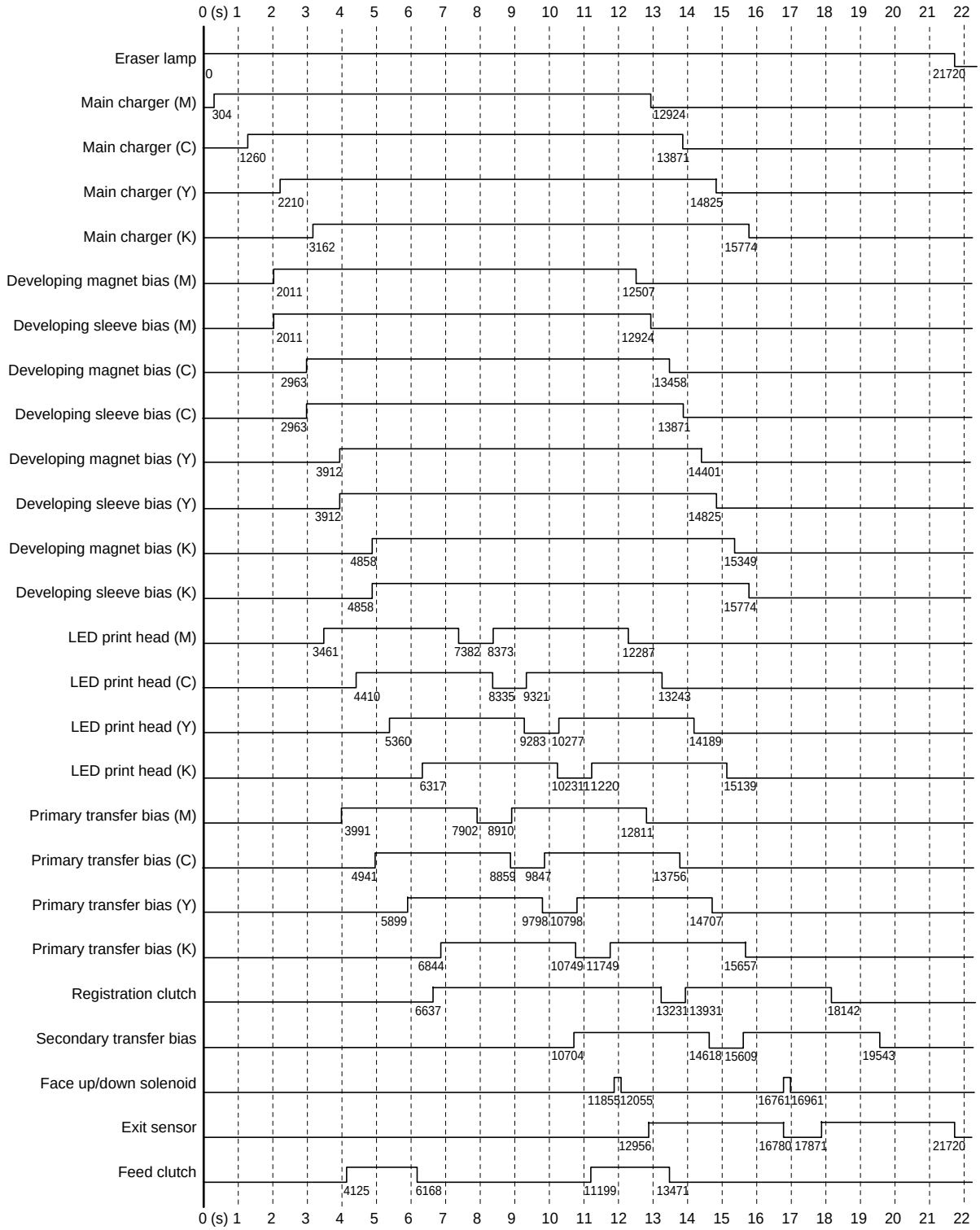


*Paper feeder PF-60 (Top)

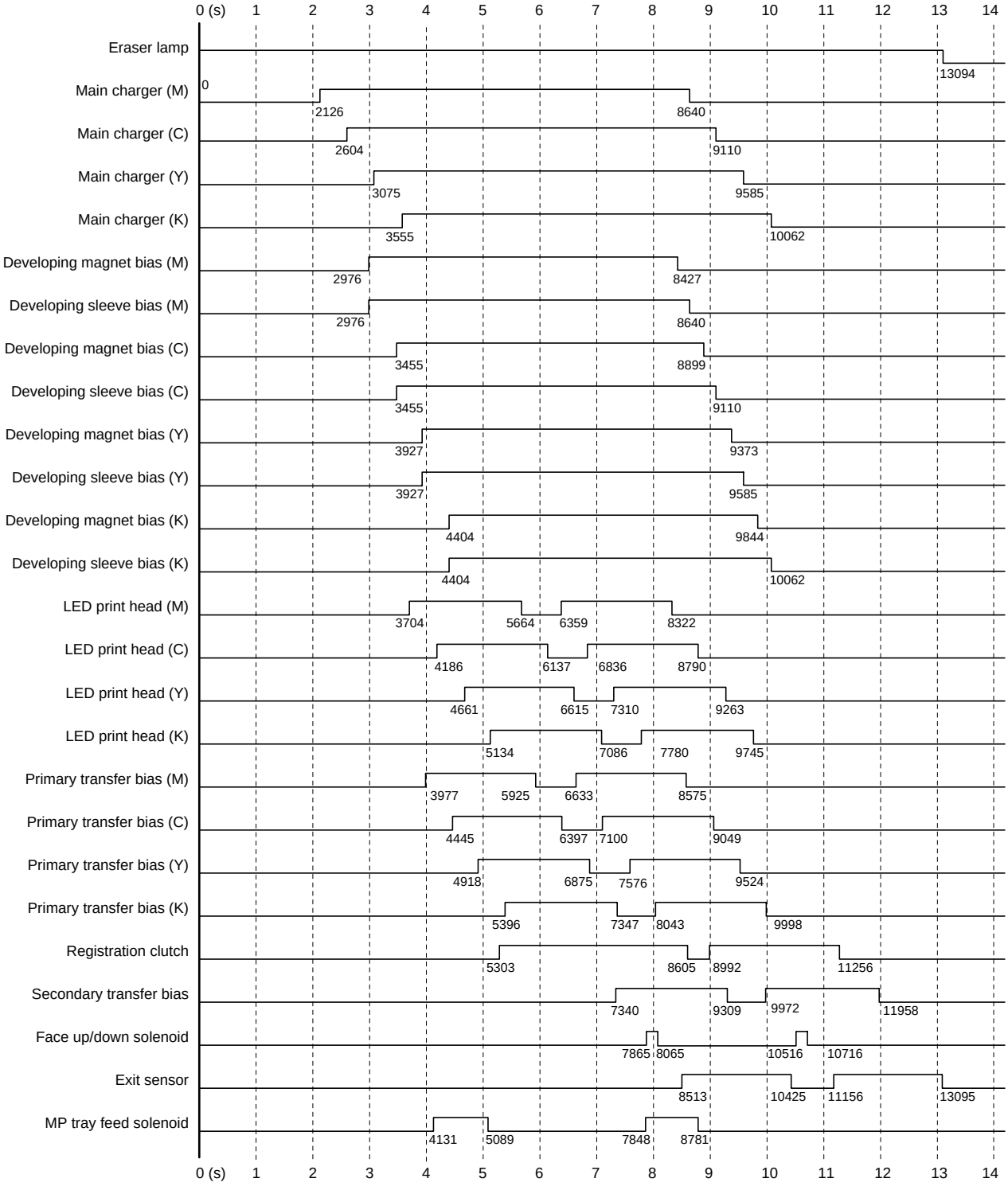
(18) Timing chart No. 18 Paper cassette, A4 size, Slow mode 1 [75 %] (24 ppm printer)



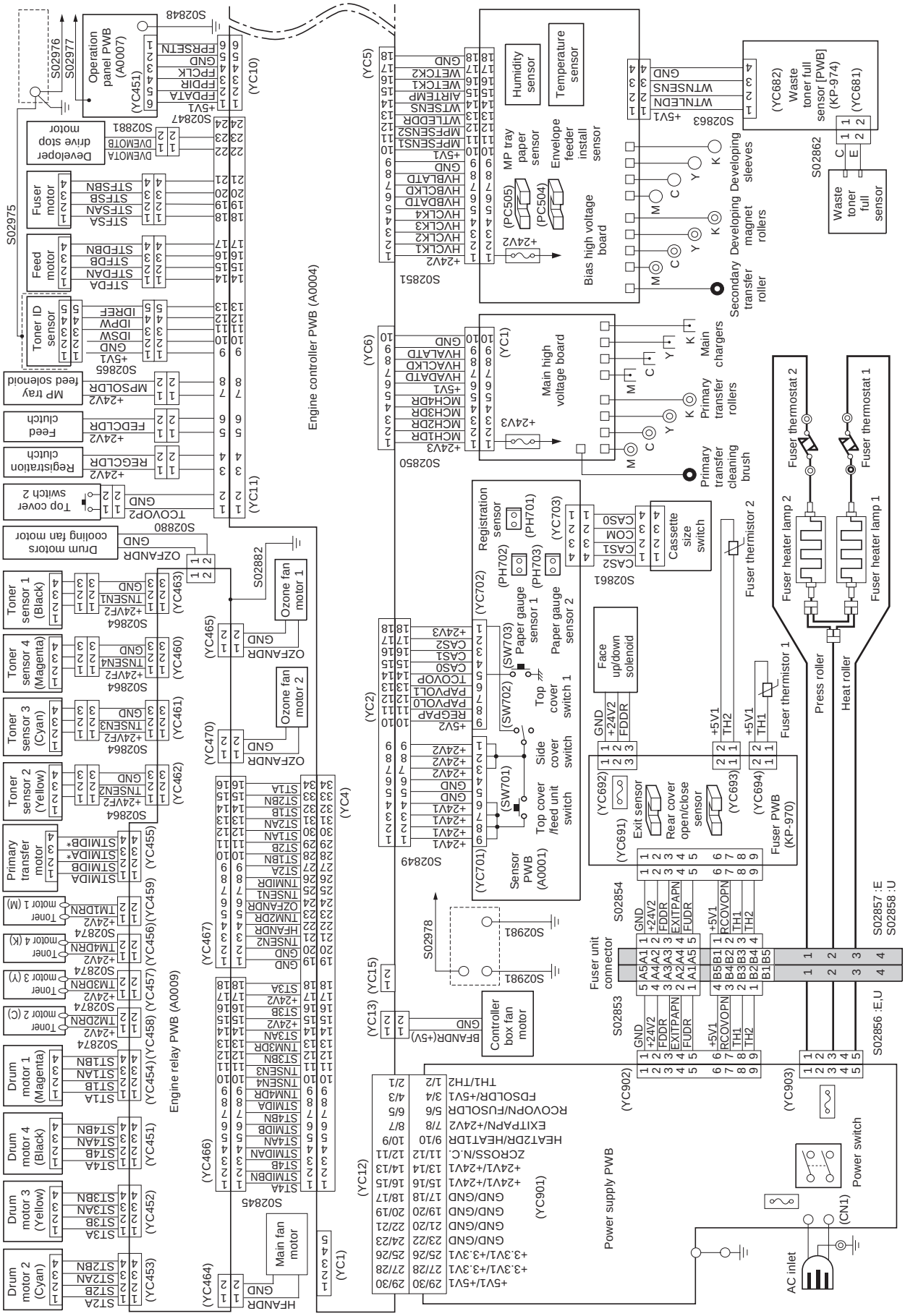
(19) Timing chart No. 19 Paper cassette, A4 size, Slow mode 2 [50 %] (24 ppm printer)

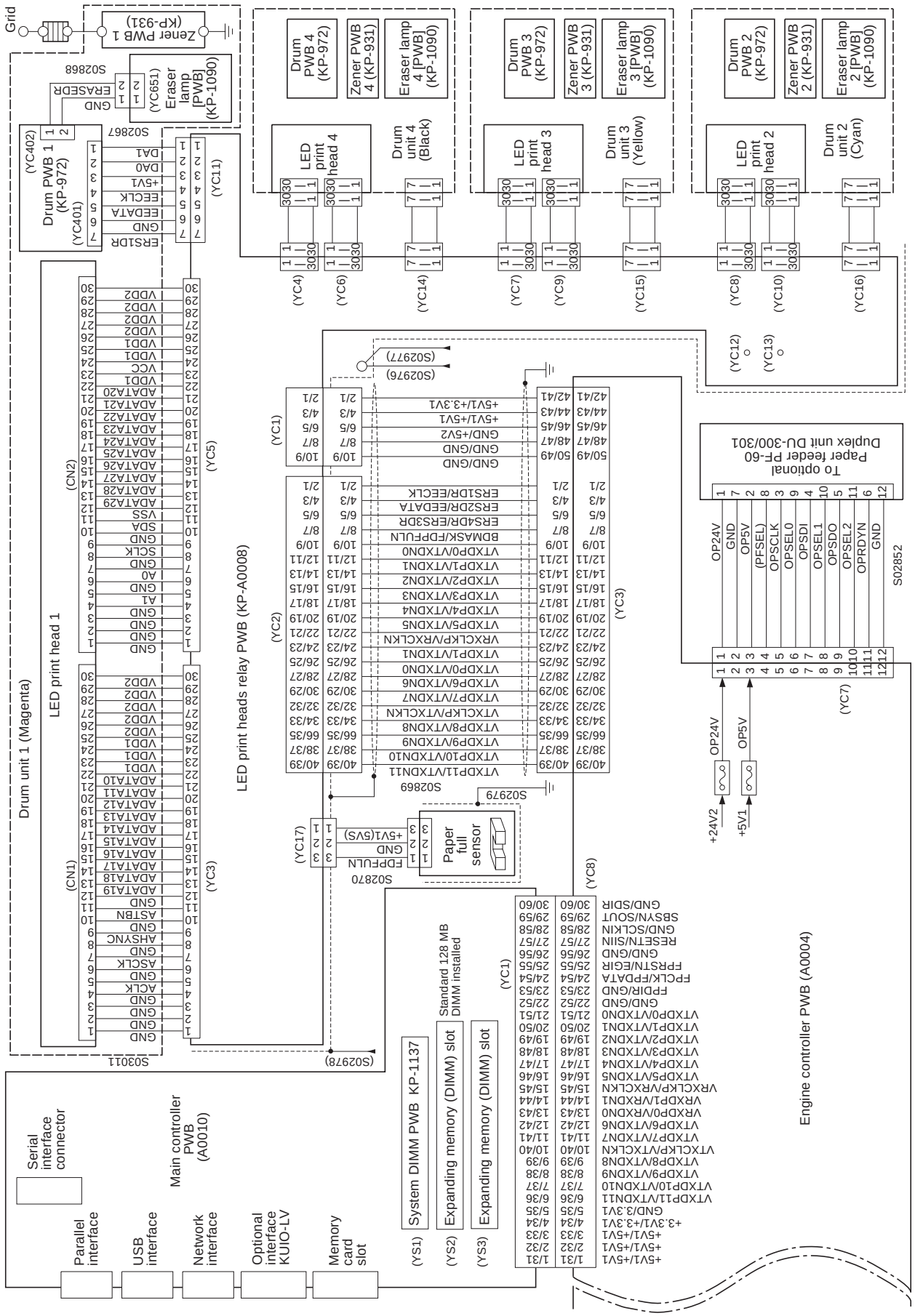


(20) Timing chart No. 20 MP tray, Transparency (24 ppm printer)

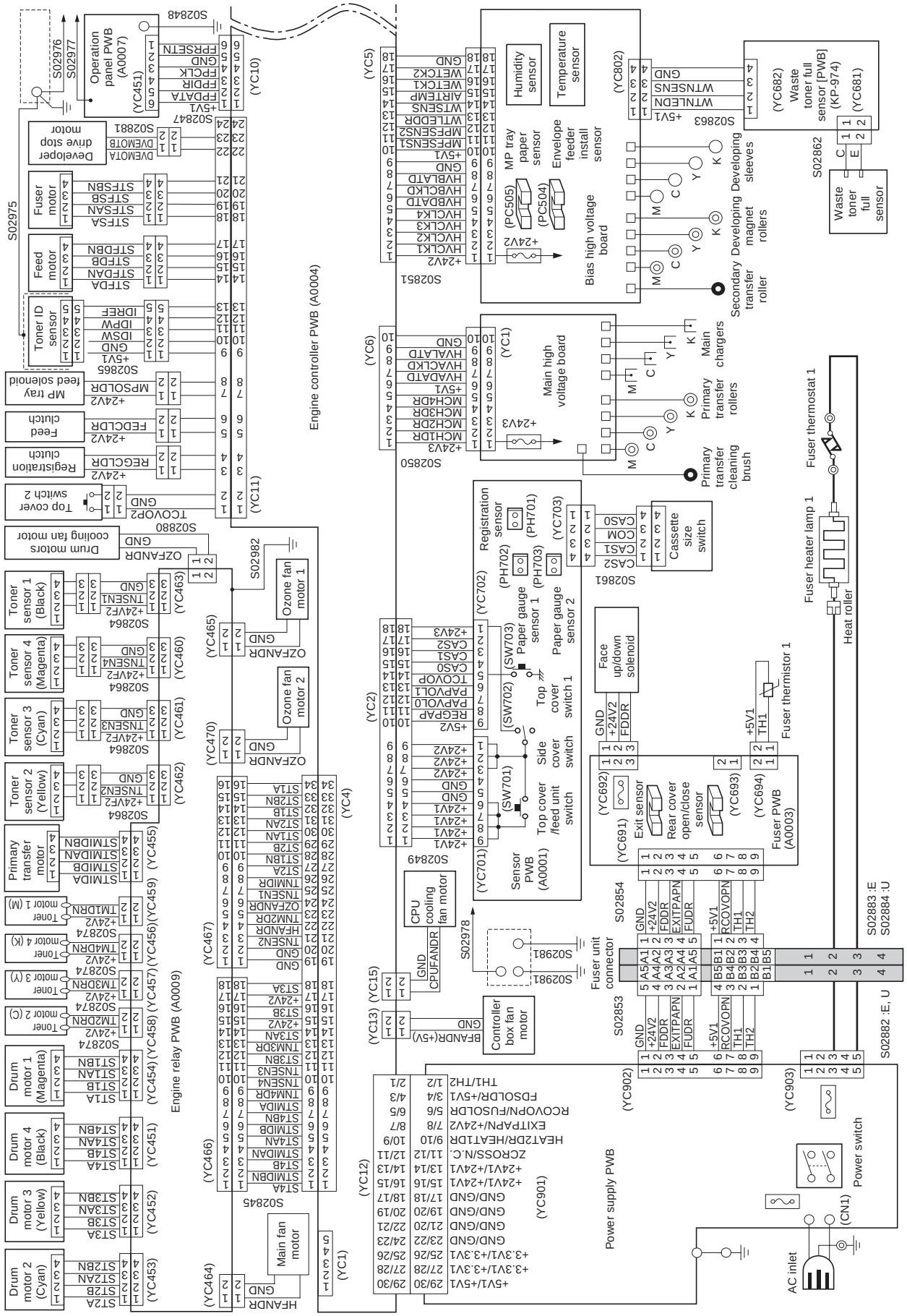


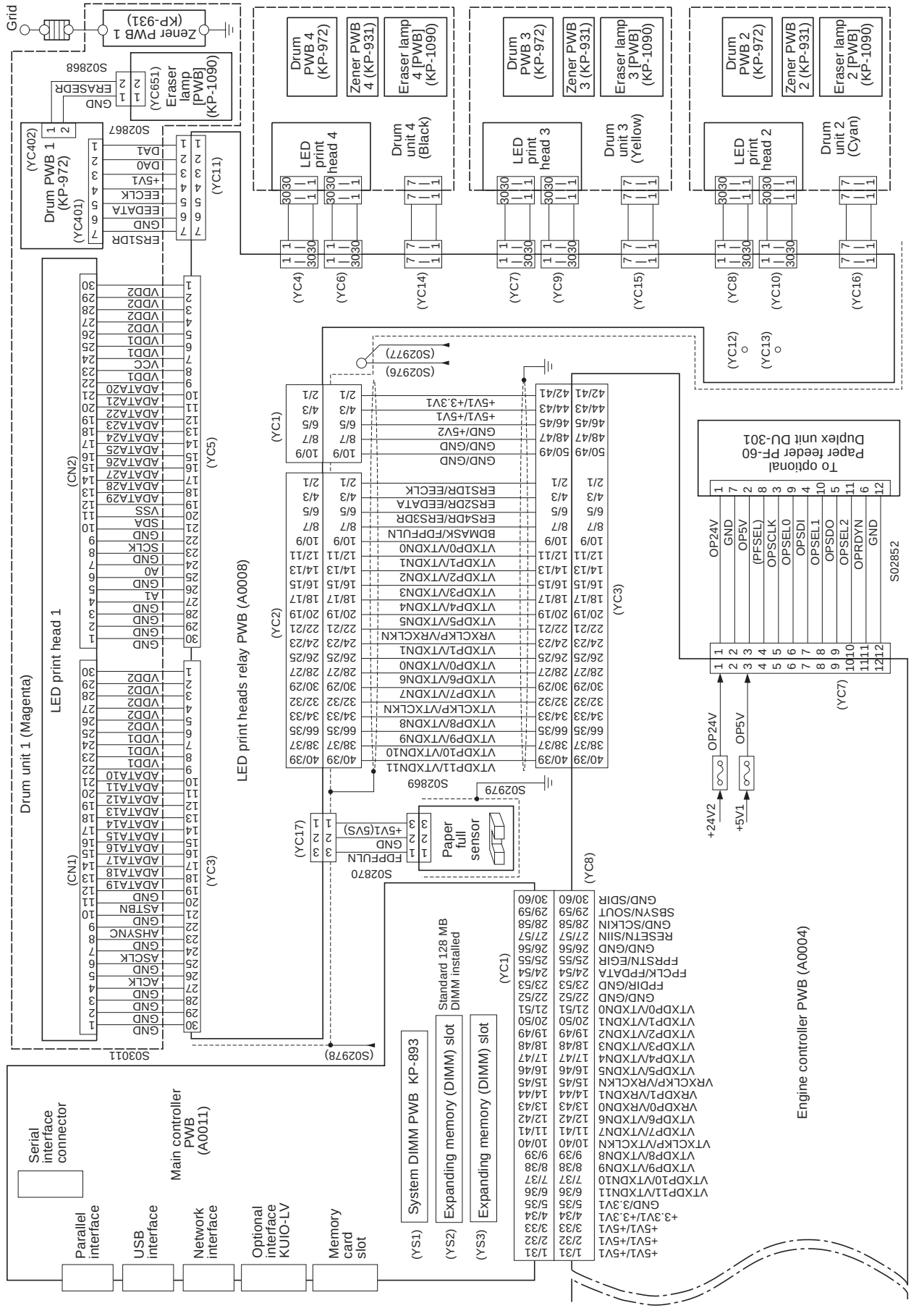
(21) Wiring diagram (16 ppm printer)



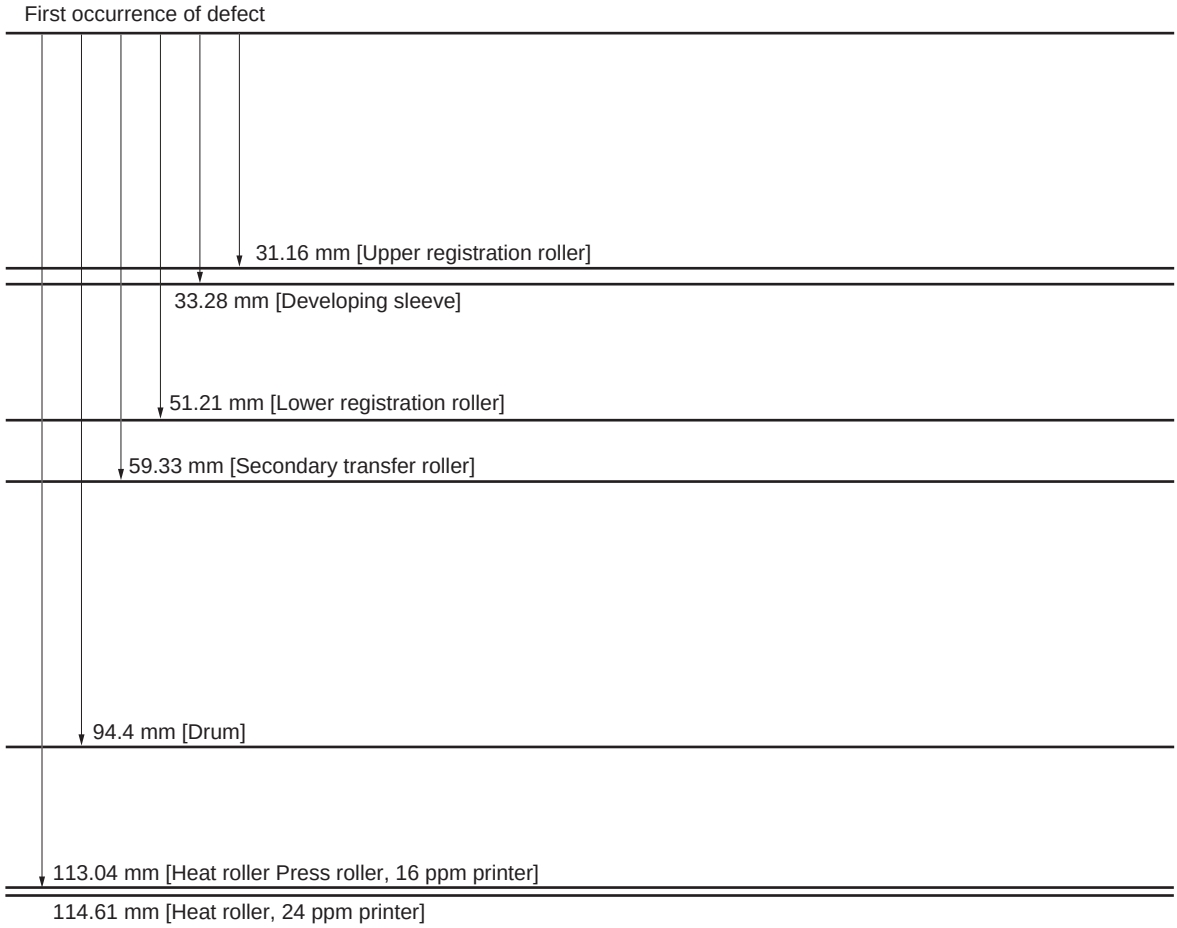


(22) Wiring diagram (24 ppm printer)





(23) Repetitive defects gauge



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KYOCERA MITA EUROPE B.V.

Hoeksteen 40, 2132 MS Hoofddorp,
The Netherlands
Phone: +31.20.654.0000
Home page: http://www.kyoceramita-europe.com
Email: info@kyoceramita-europe.com

KYOCERA MITA NEDERLAND B.V.
Beechavenue 25,1119RA Schiphol-Rijk
The Netherlands
Phone: +31.20.58.77.200

KYOCERA MITA (UK) LTD
8 Beacontree Plaza
Gillette Way Reading Berks RG2 0BS,
U.K.
Phone: +44.1189.311.500

KYOCERA MITA ITALIA S.p.A.
Via G. Verdi, 89 / 91, 20063 Cernusco s/N
Milano, Italy
Phone: +39.02.92179.1

S.A. KYOCERA MITA BELGIUM N.V.
Hermesstraat 8A,1930 Zaventem,
Belgium
Phone: +32.2.720.9270

KYOCERA MITA FRANCE S.A.
Parc Les Algorithmes Saint Aubin
91194 GIF-SUR-YVETTE,
France
Phone: +33.1.6985.2600

KYOCERA MITA ESPAÑA S.A.
Edificio Kyocera, Avda de Manacor No. 2,
28290 Las Matas (Madrid),
Spain
Phone: +34.91.631.8392

KYOCERA MITA FINLAND OY
Kirvesmiehenkatu 4, 00880 Helsinki,
Finland
Phone: +358.9.4780.5200

KYOCERA MITA (SCHWEIZ)
Hohlstrasse 614, 8048 Zürich
Switzerland
Phone: +41.1.908.4949

KYOCERA MITA DEUTSCHLAND GMBH
Mollsfeld 12,40670 Meerbusch,
Germany
Phone: +49.2159.918.0

KYOCERA MITA GMBH AUSTRIA
Eduard-Kittenberger-Gasse 95,
1230 Wien,
Austria
Phone: +43.1.86338.210

KYOCERA MITA SVENSKA AB
Vretenvägen 2, 6tr, 17 154 Solna,
Sweden
Phone: +46.8.546.55000

KYOCERA MITA NORGE
Postboks 150 Oppsal, NO 0619 Oslo
Olaf Helsetsvei 6, NO 0694 Oslo,
Norway
Phone: +47.22.62.73.00

KYOCERA MITA DANMARK A/S
Ejby Industrivej 1, DK-2600 Glostrup,
Denmark
Phone: +45.5687.1100

KYOCERA MITA PORTUGAL LDA.
Rua do Centro Cultural, 41 (Alvalade) 1700-106 Lisbon,
Portugal
Phone: +351.21.842.9100

KYOCERA MITA SOUTH AFRICA (PTY) LTD.
527 Kyalami Boulevard,
Kyalami Business Park Midrand,
South Africa
Phone: +27.(0)11.540.2600

KYOCERA MITA AMERICA, INC.

Headquarters:
225 Sand Road,
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
P.O. Box 302 125 NHPC, 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: 67418733

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

KYOCERA MITA TAIWAN Corporation.
7F-1~2, No.41, Lane 221, Gangchi Rd.
Neihu District, Taipei, Taiwan, 114. R.O.C.
Phone: (02) 87511560

KYOCERA MITA Corporation

2-28, 1-chome, Tamatsukuri, Chuo-ku
Osaka 540-8585, Japan
Phone: (06) 6764-3555
http://www.kyoceramita.com

Printed in Holland

KYOCERA MITA AMERICA, INC.

Headquarters:
225 Sand Road,
Fairfield, New Jersey 07004-0008
TEL : (973) 808-8444
FAX : (973) 882-6000

New York Branch:
1410 Broadway 23rd floor
New York, NY 10018
TEL : (917) 286-5400
FAX : (917) 286-5402

Northeastern Region:
225 Sand Road,
Fairfield, New Jersey 07004-0008
TEL : (973) 808-8444
FAX : (973) 882-4401

Midwestern Region:
201 Hansen Court Suite 119
Wood Dale, Illinois 60191
TEL : (630) 238-9982
FAX : (630) 238-9487

Western Region:
14101 Alton Parkway,
Irvine, California 92618-7006
TEL : (949) 457-9000
FAX : (949) 457-9119

Southeastern Region:
1500 Oakbrook Drive,
Norcross, Georgia 30093
TEL : (770) 729-9786
FAX : (770) 729-9873

Southwestern Region:
2825 West Story Road,
Irving, Texas 75038-5299
TEL : (972) 550-8987
FAX : (972) 252-9786

National Operation Center & National Training Center:
2825 West Story Road,
Irving, Texas 75038-5299
TEL : (972) 659-0055
FAX : (972) 570-5816

Latin America Division:
8240 N.W. 52nd. Terrace Dawson Building,
Suite 108 Miami, Florida 33166
TEL : (305) 421-6640
FAX : (305) 421-6666

KYOCERA MITA CANADA, LTD.

6120 Kestrel Road, Mississauga,
Ontario L5T 1S8, Canada
TEL : (905) 670-4425
FAX : (905) 670-8116

KYOCERA MITA MEXICO, S.A. DE C.V.

Av. 16 de Septiembre #407
Col. Santa Inés,
Azcapotzalco México,
D.F. 02130, México
TEL : (55) 5383-2741
FAX : (55) 5383-7804

http://www.kyoceramita.com

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