



FS-1030D



SERVICE MANUAL

Published in December 2005

842G6111

2G6SM001

Rev.1

Revision history

Revision	Date	Replaced pages	Remarks
1	20 December 2005	1-1-1	-



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 (\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.



Advise 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 main switch on.

Always wash hands afterwards.

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



Should smoke be seen coming from the 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.



This page is intentionally left blank.

CONTENTS

1-1 Specifications	
1-1-1 Specifications	1-1-1
1-1-2 Name of parts	1-1-3
(1) Overall	1-1-3
(2) Operation panel	1-1-4
1-1-3 Machine cross section	1-1-5
1-2 Handling Precautions	
1-2-1 Process unit (drum)	1-2-1
1-2-2 Installation environment	1-2-1
1-3 Installation	
1-3-1 Unpacking and installation	1-3-1
(1) Installation procedure	1-3-1
1-3-2 Installing the expanding memory (option)	1-3-9
1-3-3 Installing the memory card (option)	1-3-10
1-3-4 Installing the network interface card (option)	1-3-11
1-4 Maintenance	
1-4-1 Maintenance	1-4-1
(1) Executing service mode	1-4-1
1-5 Troubleshooting	
1-5-1 Paper misfeed detection	1-5-1
(1) Paper misfeed indication	1-5-1
(2) Paper misfeed detection	1-5-1
1-5-2 Self-diagnosis	1-5-2
(1) Self-diagnostic function	1-5-2
(2) Self-diagnostic indication	1-5-2
1-5-3 Image formation problems	1-5-12
(1) No image appears (entirely white).	1-5-13
(2) No image appears (entirely black).	1-5-13
(3) Image is too light.	1-5-13
(4) Background is visible.	1-5-14
(5) A white line appears longitudinally.	1-5-14
(6) A black line appears longitudinally.	1-5-15
(7) A black line appears laterally.	1-5-15
(8) One side of the print image is darker than the other.	1-5-15
(9) Black dots appear on the image.	1-5-16
(10) Image is blurred.	1-5-16
(11) Paper creases.	1-5-16
(12) Offset occurs.	1-5-17
(13) Image is partly missing.	1-5-17
(14) Fixing is poor.	1-5-17
1-5-4 Electrical problems	1-5-18
(1) The machine does not operate when the power switch is turned on.	1-5-18
(2) The main motor does not operate.	1-5-18
(3) Cooling fan does not operate.	1-5-18
(4) The feed clutch does not operate.	1-5-18
(5) The MP feed clutch does not operate.	1-5-18
(6) The registration clutch does not operate.	1-5-19
(7) The switchback solenoid does not operate.	1-5-19
(8) The eraser lamp does not turn on.	1-5-19
(9) The heater lamp does not turn on.	1-5-19

(10) The heater lamp does not turn off.	1-5-19
(11) Main charging is not performed.	1-5-19
(12) Transfer charging is not performed.	1-5-19
(13) A paper jam in the paper feed or exit section is indicated when the power switch is turned on.	1-5-19
(14) The LED indicator requesting covers to be closed is displayed when the front cover is closed.	1-5-20
(15) Others.	1-5-20
1-5-5 Mechanical problems	1-5-21
(1) No primary paper feed.	1-5-21
(2) No secondary paper feed.	1-5-21
(3) Skewed paper feed.	1-5-21
(4) Multiple sheets of paper are fed at one time.	1-5-21
(5) Paper jams.	1-5-21
(6) Abnormal noise is heard.	1-5-21

1-6 Assembly and Disassembly

1-6-1 Precautions for assembly and disassembly	1-6-1
(1) Precautions	1-6-1
1-6-2 Removing the process unit	1-6-2
1-6-3 Removing the principal outer covers	1-6-3
(1) Removing the top cover/output tray	1-6-3
(2) Removing the right cover	1-6-4
(3) Removing the left cover	1-6-4
1-6-4 Removing the feed roller	1-6-5
1-6-5 Removing the MP feed roller	1-6-6
1-6-6 Removing the transfer roller	1-6-8
1-6-7 Removing the principal PWBs	1-6-9
(1) Removing the engine PWB	1-6-9
(2) Removing the main PWB	1-6-10
(3) Removing the power supply unit and high voltage unit	1-6-12
(4) Removing the bias PWB	1-6-13
1-6-8 Removing the main motor and drive unit	1-6-15
1-6-9 Removing and splitting the fuser unit	1-6-19
(1) Removing the separation craws	1-6-21
(2) Removing the heater lamp	1-6-22
(3) Removing the heat roller	1-6-23
(4) Removing the fuser thermistor	1-6-25
(5) Removing the thermal cutout	1-6-26
(6) Removing the press roller	1-6-27
1-6-10 Removing the laser scanner unit and the eraser lamp	1-6-28
1-6-11 Removing the main charger unit	1-6-31

1-7 Upgrading the firmware

1-7-1 Upgrading the firmware on the main PWB	1-7-1
(1) Firmware program data format	1-7-1
(2) Downloading the firmware from the parallel interface	1-7-2
(3) Downloading the firmware from the memory card	1-7-3
(4) Downloading errors	1-7-4

2-1 Mechanical construction

2-1-1 Paper feeding system	2-1-1
(1) Paper feed control	2-1-2
(2) Paper feeding mechanism	2-1-3
(3) Switchback/refeed system	2-1-4
2-1-2 Electrophotographic system	2-1-6
(1) Electrophotographic cycle	2-1-6

(1-1) Process unit mechanism	2-1-7
(2) Main charging	2-1-8
(2-1) Photo conductive drum	2-1-8
(2-2) Charging the drum	2-1-9
(3) Exposure	2-1-10
(3-1) Laser scanner unit	2-1-11
(3-2) Drum surface potential	2-1-12
(4) Development	2-1-13
(5) Transfer	2-1-14
(6) Fusing	2-1-15
(6-1) Fuser unit mechanism	2-1-16
(7) Cleaning	2-1-17
 2-2 Electrical Parts Layout	
2-2-1 Electrical parts layout	2-2-1
(1) Electrical parts layout	2-2-1
 2-3 Operation of the PCBs	
2-3-1 Main PWB	2-3-1
2-3-2 Engine PWB	2-3-2
(1) Eraser lamp control circuit	2-3-3
(2) Heater lamp control circuit	2-3-4
(3) Polygon motor control circuit	2-3-5
2-3-3 Power supply unit	2-3-8
2-3-4 Bias PWB	2-3-10
2-3-5 High voltage unit	2-3-11
(1) Interlock switch	2-3-12
 2-4 Appendixes	
Timing chart No. 1	2-4-1
Timing chart No. 2	2-4-2
Wiring diagram	2-4-3
Repetitive defects gauge	2-4-4

This page is intentionally left blank.

1-1-1 Specifications

Type	Desktop
Printing system	Electrophotography using laser scan
Paper type	Cassette: Plain paper, recycled paper, thick paper: 60 to 105 g/m ² MP tray: Plain paper, recycled paper, thick paper: 60 to 163 g/m ² Note: Transparency, adhesive backed labels, envelopes and post cards supported
Paper size	Cassette: A4, B5 (JIS), A5, Folio, Legal, Letter, Oficio II, Executive, B5 (ISO), Envelope C5, 16K, Other 148 × 210 to 216 × 356 mm (4.1 × 8.3" to 8.5 × 14") Duplex printing is only available for A4, Letter, or Legal size. MP Tray: A4, B5 (JIS), A5, Folio, Legal, Letter, Oficio II, Statement, Executive, A6, B6, B5 (ISO), Envelope C5, Envelope #10, Envelope #9, Envelope #6, Envelope Monarch, Envelope DL, 16K, Other 70 × 148 to 216 × 356 mm (2.8 × 5.8" to 8.5 × 14")
Printing speed	1-sided printing: 22 pages/min. (A4, plain), 23 pages/min. (Letter, plain) 2-sided printing: 12 pages/min. (A4/Letter, plain) Note: When printing multiple copies of the same page
First print	10 seconds or less (A4/Letter), depends on input data
Warm-up time	15 seconds or less (power on), 10 seconds or less (sleep) Note: Room temperature 23°C/73.4°F, humidity 50% RH
Paper feed system	One universal cassette and one MP tray
Paper loading capacity	Cassette: 250 sheets (80 g/m ²) MP tray: 50 sheets (80 g/m ²)
Paper eject system	Face down: 250 sheets (80 g/m ²), 200 sheets (duplex printing)
Standard memory	32 MB, expandable up to 288 MB
Additional memory	1 slot (16/32/64/128 MB DIMM)
Resolution	Fast 1200 mode 600 dpi (vertical and horizontal) with KIR
Photoconductor	OPC (drum diameter 30 mm)
Charging system	Single positive corona charging
Developing system	Single element reversing process
Transfer system	Transfer roller
Fixing system	Heat roller Heat source: halogen heaters (750 W) Control temperature: 180°C/356°F (at normal ambient temperature) Abnormally high temperature protection device: thermal cutout
Charge erasing system	Exposure by eraser lamp (LED array)
Cleaning system	Cleaning blade
Controller hardware	CPU: Power PC405 (266 MHz) System ROM: 4 MB Font ROM: 2 MB (16 Mbit × 1) Main RAM: 32 MB standard (on-board); expanding up to 288 MB (standard 32 MB + 256 MB) at the maximum by adding optional expansion memory Optional expansion RAM (DIMM): 1 slot

Controller software	a) Emulation PCL6 (PCL5e + PCLXL) KPDL3 (PostScript 3 compatible) b) Fonts: Bitmap font: 1 Line Printer bitmap font Outline fonts: 35 PCL6 (PCL5e/PCL-XL) fonts 45 KPDL2 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
Interface	Parallel: Hi-speed (bi-directional), IEEE 1284 Nibble/ECP mode USB: Full-Speed USB2.0 Optional interface (KUIO-LV) × 1: Network interface card IB-21E (10 Base-T/100 Base-TX) must be installed. Optional serial interface: RS-232C (Max. 115.2 Kbps), Serial interface board IB-11 must be installed.
Dimensions (W) × (D) × (H)	378 × 235 × 375 mm 14.9" × 9.3" × 14.8"
Weight	Approx. 10.5 kg/23.2 lbs
Power source	110 V AC, 60 Hz, 6.5 A 120 V AC, 60 Hz, 7.1 A 220 - 240 V AC, 50/60 Hz, 3.8 A
Power consumption	Max.: 819 W During sleep mode: 4.4 W (110 V AC), 4.5 W (120 V AC), 4.3 W (220 - 240 V AC)
Noise	During printing: LpA = 65 dB (A) During standby: LpA = 30 dB (A) During sleep mode: Immeasurably low
Options	Paper feeder, Additional memory (DIMM), Memory card, Network interface card IB-21E, Serial interface board IB-11

1-1-2 Name of parts

(1) Overall

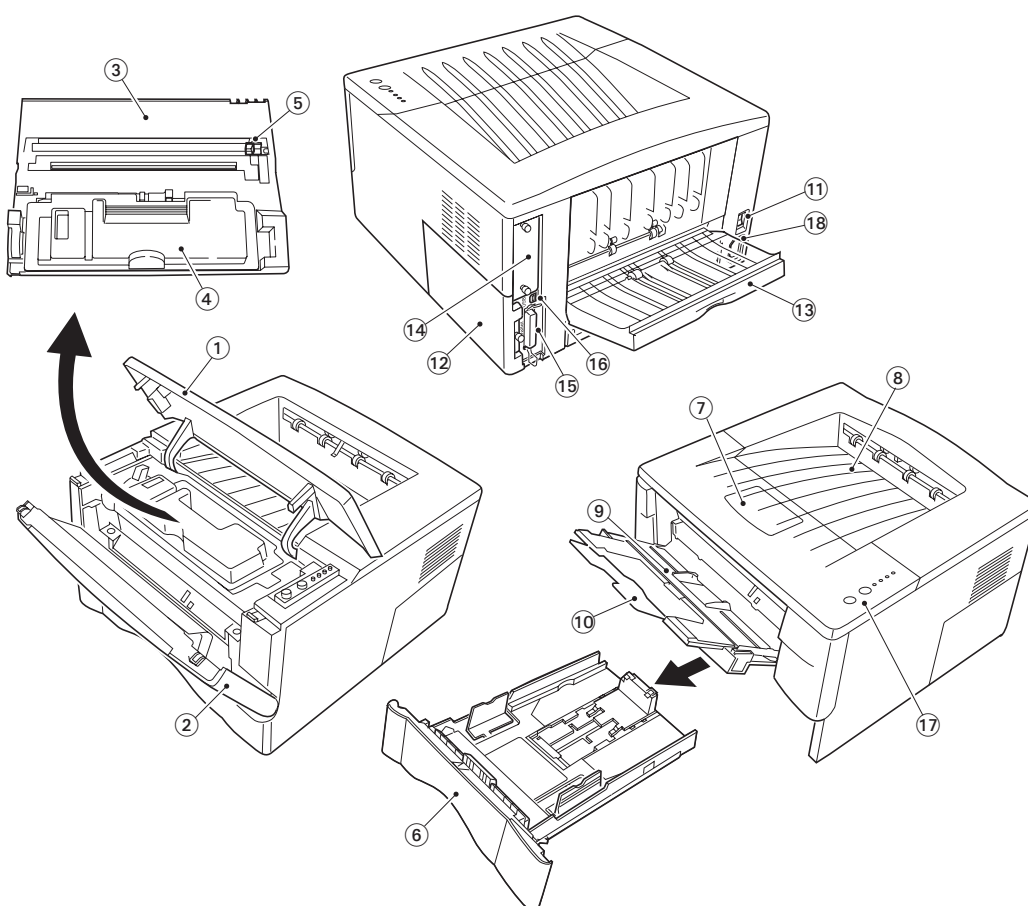


Figure 1-1-1

- | | |
|-------------------------|----------------------------------|
| 1. Top cover | 10. Extension tray |
| 2. Front cover | 11. Power switch |
| 3. Process unit | 12. Memory cover |
| 4. Toner container | 13. Rear cover |
| 5. Main charger cleaner | 14. Optional interface slot |
| 6. Cassette | 15. Parallel interface connector |
| 7. Paper stopper | 16. USB interface connector |
| 8. Output tray | 17. Operation panel |
| 9. MP tray | 18. AC inlet |

(2) Operation panel

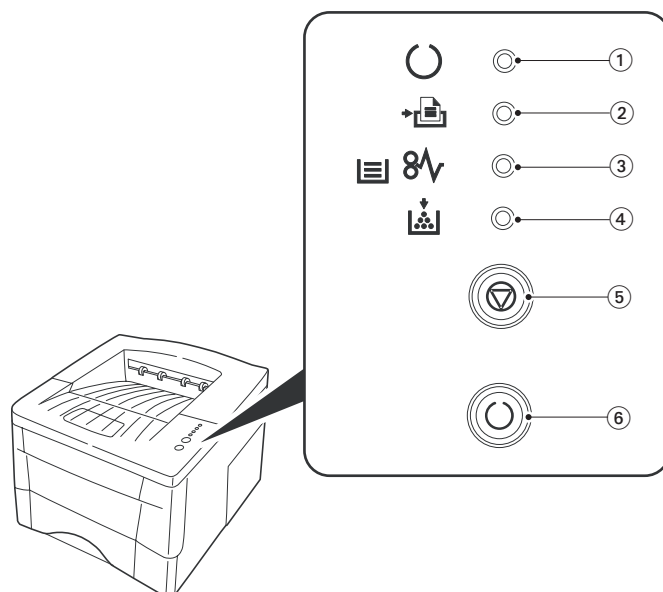


Figure 1-1-2

1. Ready indicator (Green)
2. Data indicator (Green)
3. Attention indicator (Red)
4. Toner indicator (Red)
5. CANCEL key
6. GO key

1-1-3 Machine cross section

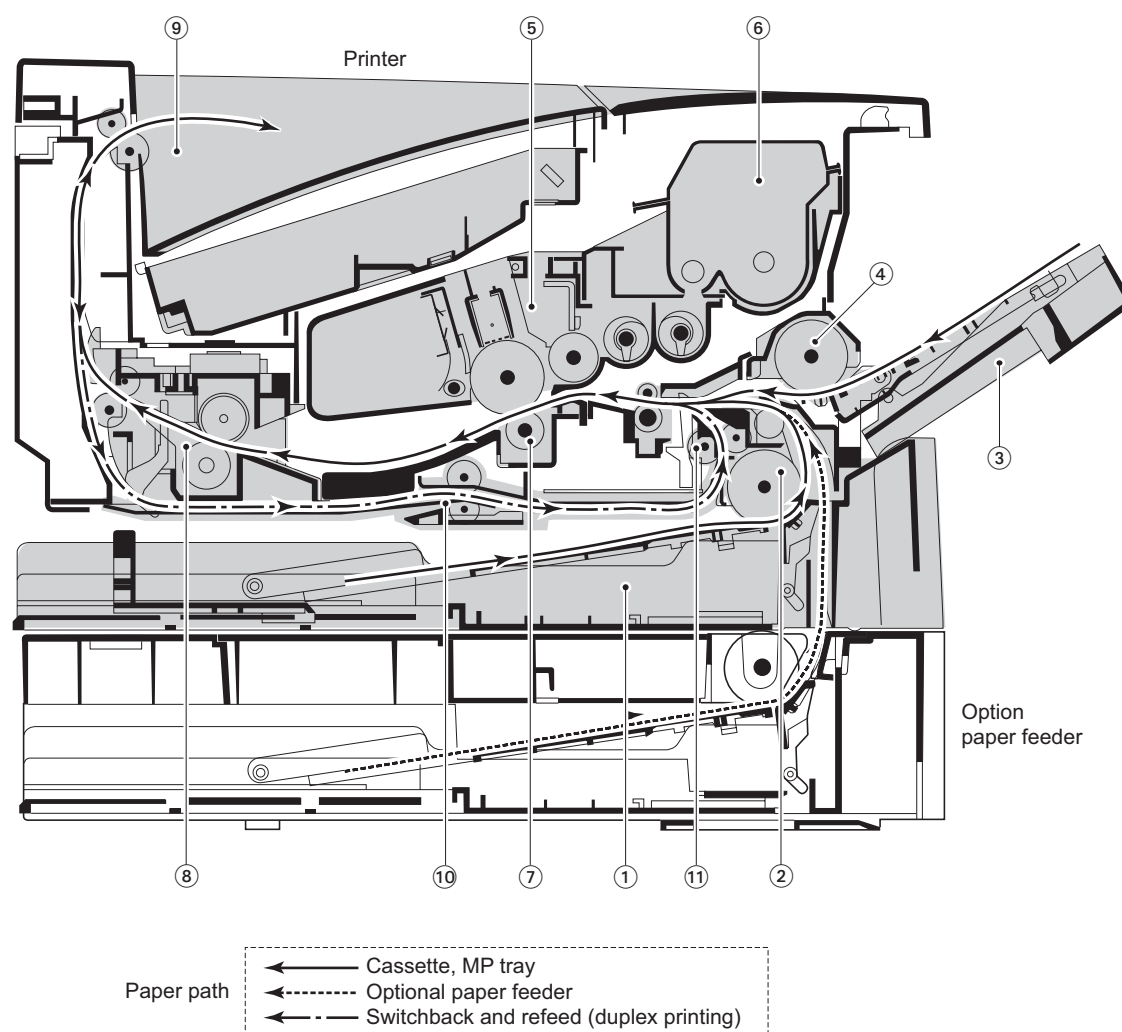


Figure 1-1-3

- | | |
|----------------------------|-----------------------|
| 1. Cassette | 7. Transfer section |
| 2. Paper feed unit | 8. Fuser unit |
| 3. MP tray | 9. Output tray |
| 4. MP tray paper feed unit | 10. Conveying section |
| 5. Process unit | 11. Refeed unit |
| 6. Toner container | |

This page is intentionally left blank.

1-2-1 Process unit (drum)

Note the following when handling or storing the drum.

When removing the process unit, never expose the drum surface to strong direct light.

Keep the drum at an ambient temperature between 10°C/50°F and 32.5°C/90.5°F and at a relative humidity not higher than 80% RH. Avoid abrupt changes in temperature and humidity.

Avoid exposure to any substance which is harmful to or may affect the quality of the drum.

Do not touch the drum surface with any object. Should it be touched by hands or stained with oil, clean it.

1-2-2 Installation environment

1. Temperature: 10 - 32.5°C/50 - 90.5°F

2. Humidity: 20 - 80%RH

3. Power supply: 110 V AC, 6.5 A

120 V AC, 7.1 A

220 - 240 V AC, 3.8 A

4. Power source frequency: 50 Hz $\pm 0.3\%$ /60 Hz $\pm 0.3\%$

5. Installation location

Avoid direct sunlight or bright lighting. Ensure that the photoconductor will not be exposed to direct sunlight or other strong light when removing paper jams.

Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.

Avoid dust and vibration.

Choose a surface capable of supporting the weight of the machine.

Place the machine on a level surface (maximum allowance inclination: 1°).

Avoid air-borne substances that may adversely affect the machine or degrade the photoconductor, such as mercury, acidic or 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: 50 cm/19¹¹/₁₆"

Machine rear: 40 cm/15³/₄"

Machine right: 25 cm/9⁷/₈"

Machine left: 25 cm/9⁷/₈"

Machine above: 30 cm/11¹³/₁₆"

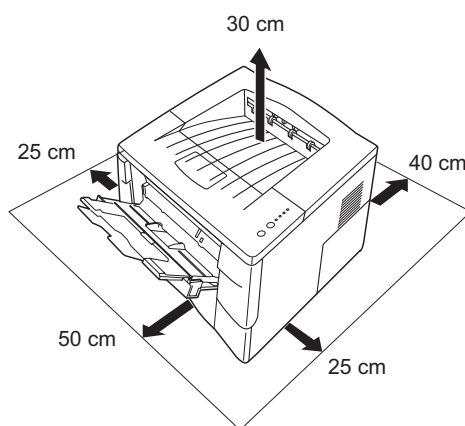
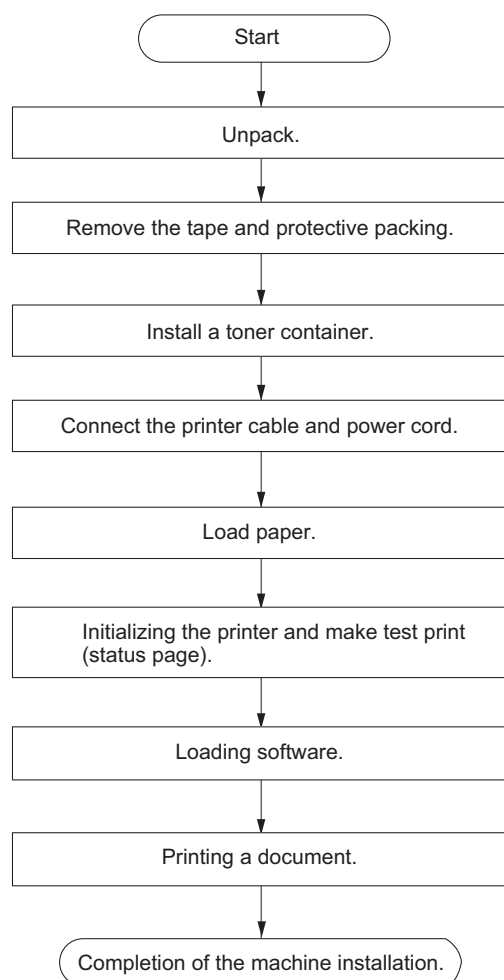


Figure 1-2-1

This page is intentionally left blank.

1-3-1 Unpacking and installation

(1) Installation procedure



Unpack.

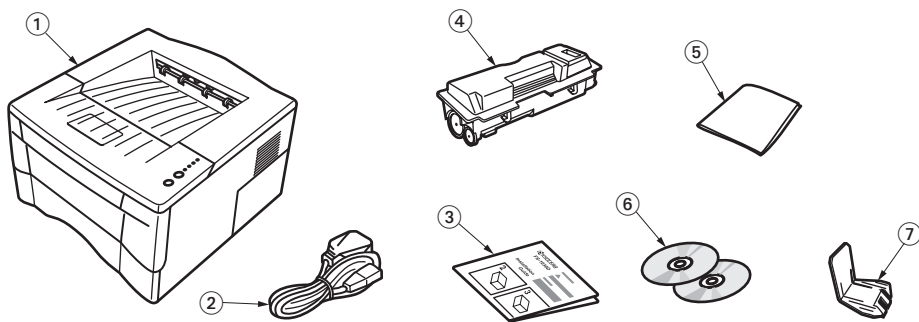
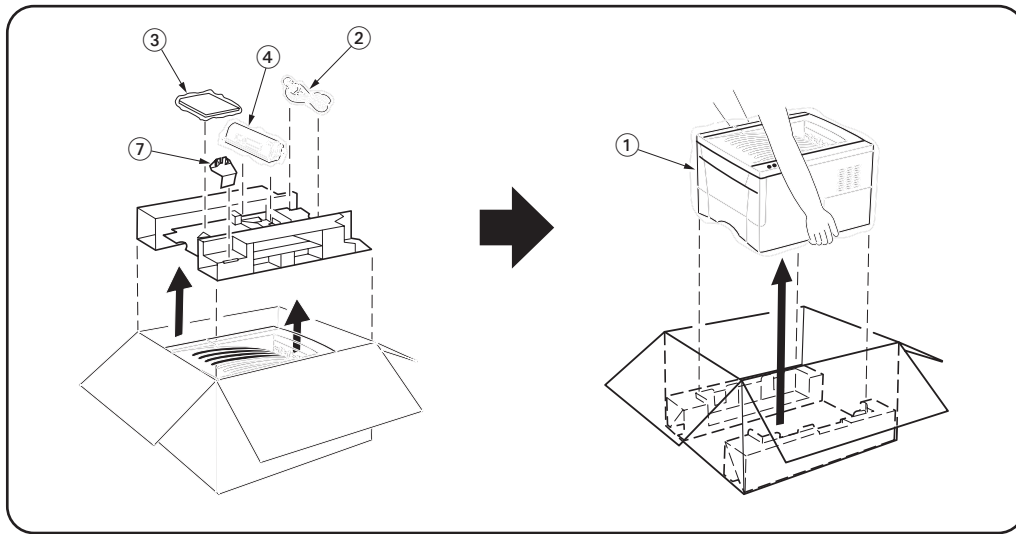
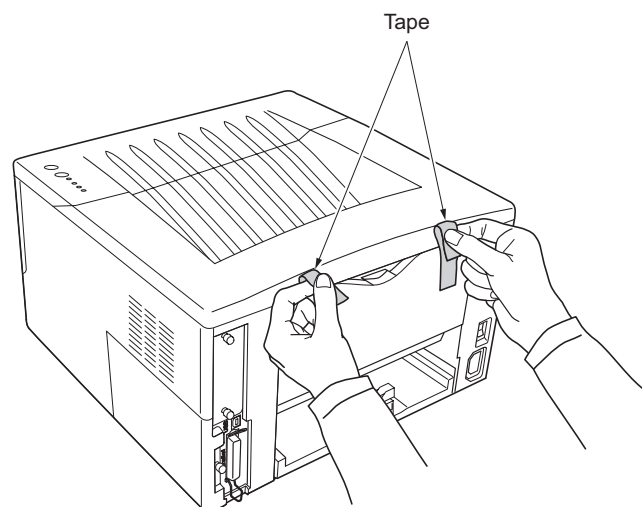


Figure 1-3-1 Unpacking

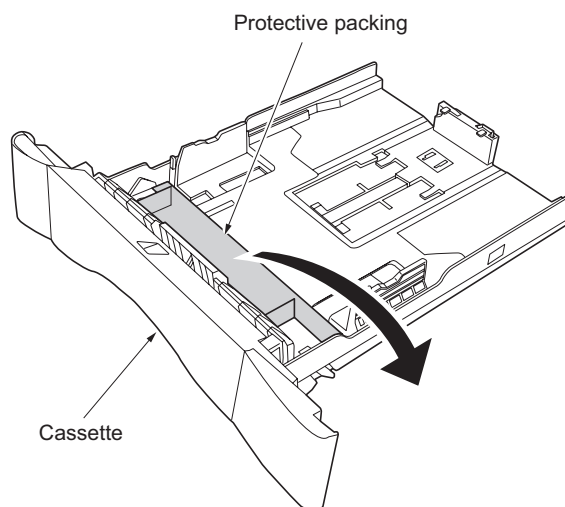
1. Printer
2. Power cord
3. Installation guide
4. Toner container
5. Cleaning cloth
6. CD-ROMs
7. Extension tray [For inch model only]

Remove the tape and protective packing

1. Remove the two tape.

**Figure 1-3-2**

2. Pull the cassette out of the printer.
3. Remove the protective packing from inside the cassette.

**Figure 1-3-3**

Install a toner container.

1. Open the top cover.
2. Move the lock lever until it is in its unlocked position (marked [UNLOCK]).

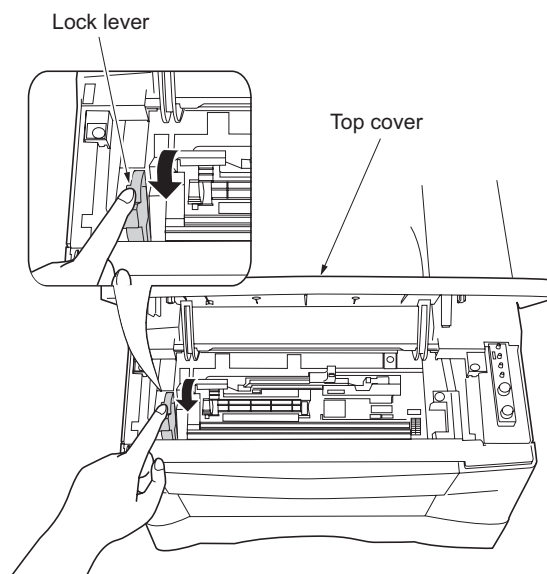


Figure 1-3-4

3. Shake the toner container horizontally back and forth five or six times so that the toner inside of it becomes evenly distributed.

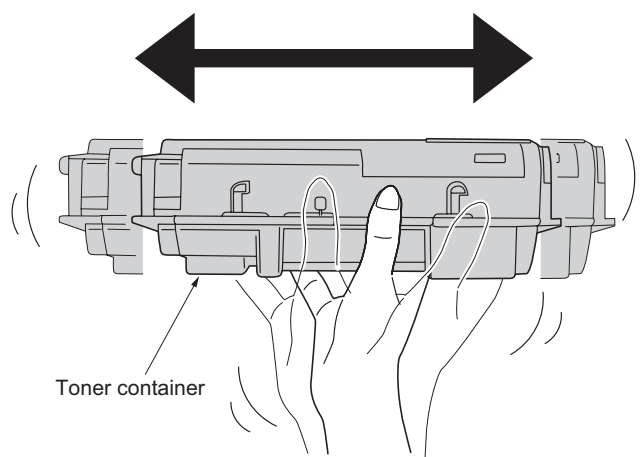


Figure 1-3-5

4. Remove the orange protective seal.

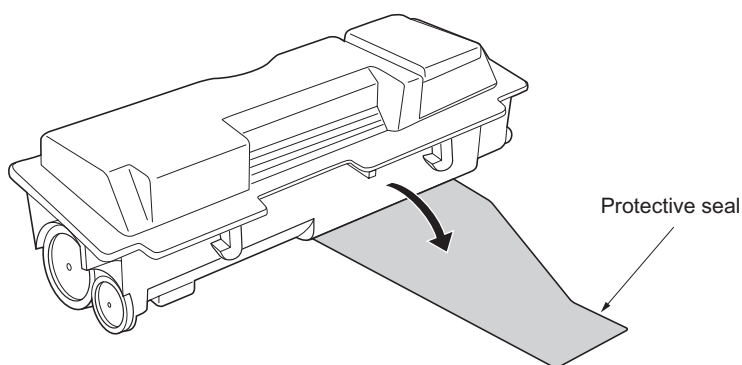


Figure 1-3-6

5. Set the toner container into the process unit.

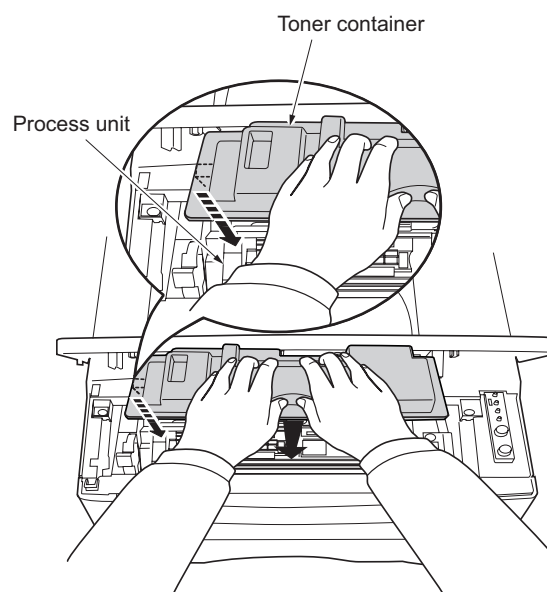


Figure 1-3-7

6. Push in on the areas of the toner container marked [PUSH HERE] until the container clicks into place in the process unit.

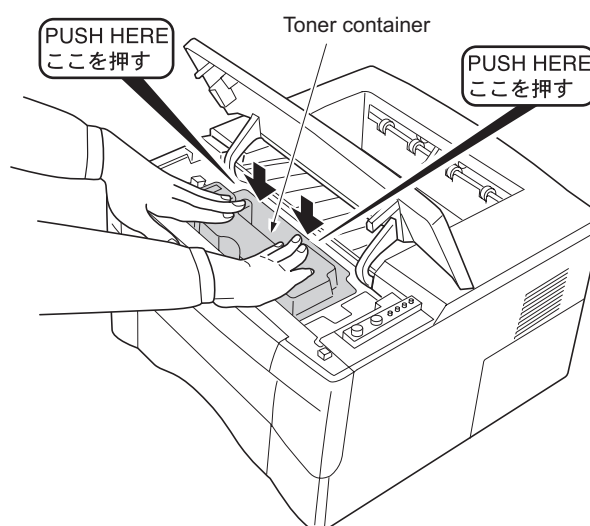


Figure 1-3-8

7. Push the lock lever back into its locked position.
8. Close the top cover.

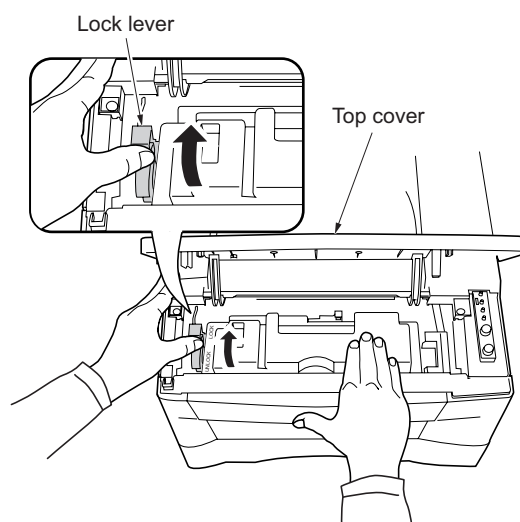


Figure 1-3-9

Connect the printer cable and power cord.

1. Connect the printer cable (parallel or USB).

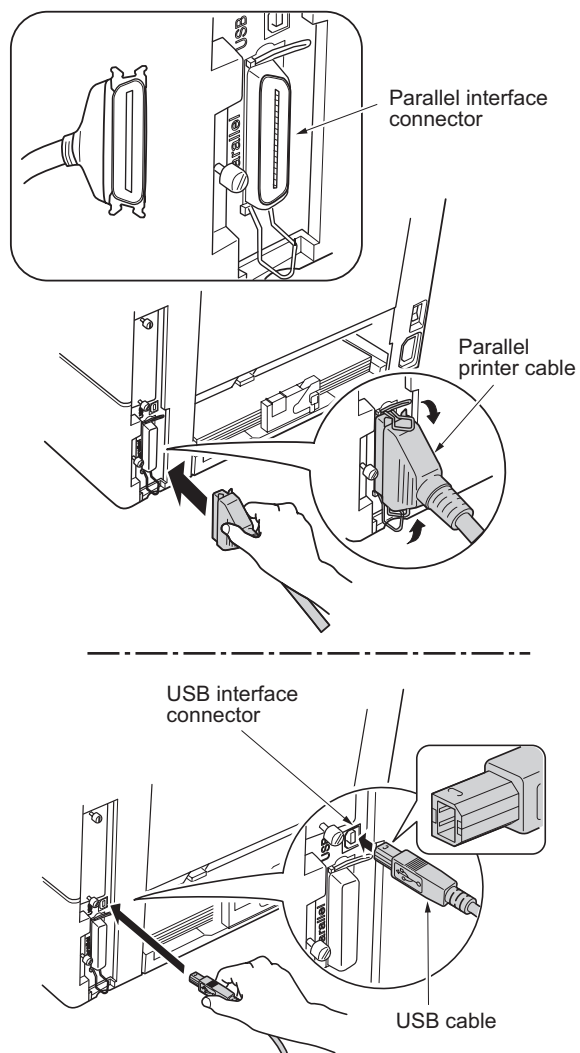


Figure 1-3-10

2. Connect the power cord.

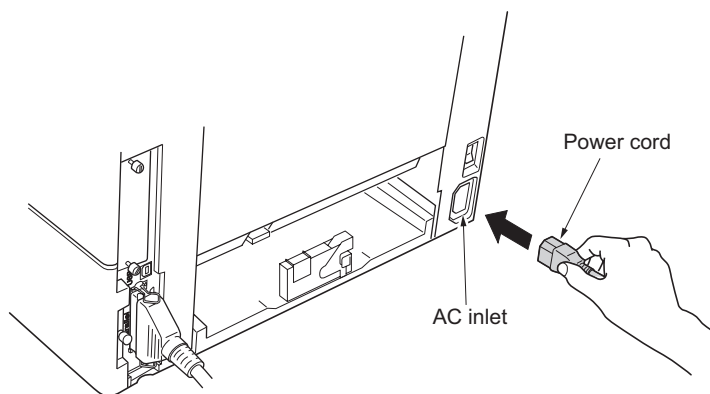


Figure 1-3-11

Load paper.

1. Pull the cassette out of the printer.
2. Set the paper in the cassette.

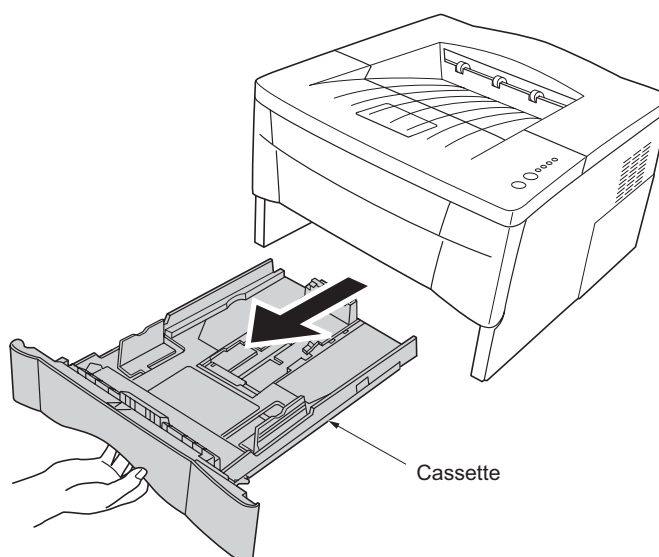


Figure 1-3-12

Initializing the printer and make test print (status page).

1. Turn on the printer's power switch. Upon turning on the power, the printer's 4 indicators flash in sequence until printer initialization is complete, then the indicator [on line] lights steadily.
2. The printer can print two different types of status page standard and service-purpose. A service-purpose status page contains more detailed information about printer settings than a standard status page.

To print a standard status page, press the GO key for at least 3 seconds and the indicators light in sequence from top to bottom.

To print a service-purpose status page, press the GO key for more than 10 seconds and the indicators light in sequence twice from top to bottom.

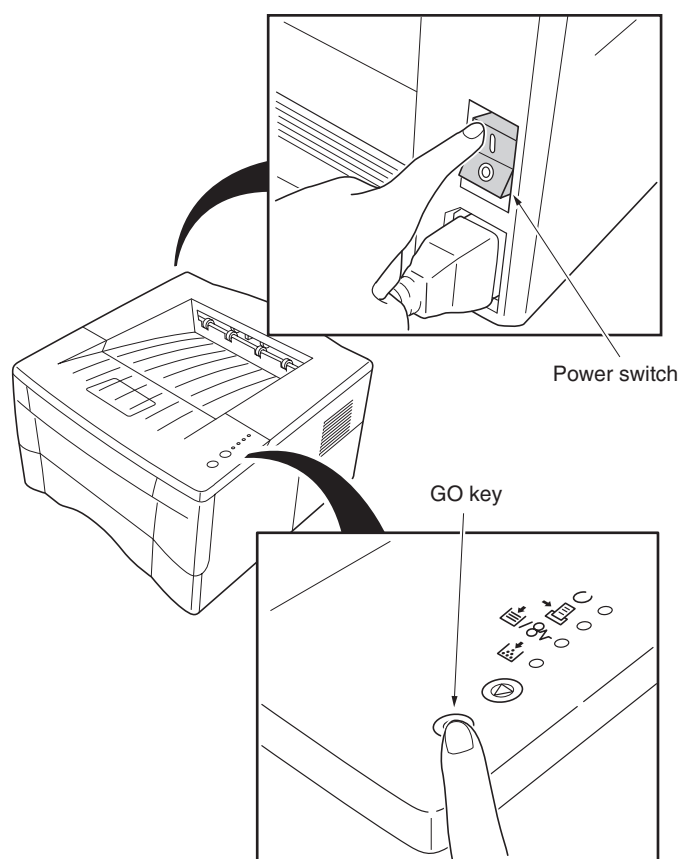


Figure 1-3-13

Loading software.

Ensure the printer is plugged in and connected to the computer's parallel or USB port before installing software from the CD-ROM.

1. Switch on the PC and activate Windows.
NOTE: If the Welcome to the Found New Hardware Wizard dialog box displays, select Cancel.
2. Insert the CD-ROM (Software Library) into the CD-ROM drive.
3. The installation program launches and the License Agreement displays. Select View License Agreement to read the information and select Accept to proceed.
NOTE: If the installation program fails to launch, use Windows Explorer to access the CD-ROM and select Setup.exe.
4. Select Install KX Driver and follow the on-screen instructions to complete the software installation.
5. Once the installation is complete, the Printer Installed Successfully dialog box displays.



Figure 1-3-14



Figure 1-3-15

Printing a document.

1. Ensure the paper required is loaded in the printer.
2. From the application File menu, select Print. The Print dialog box displays.
3. Select the drop down list of printer names. All the printers installed are listed. Select the FS-1030D.
4. Select the options required, enter the number of copies required and if printing more than one set, select Collate. Select OK to start printing.

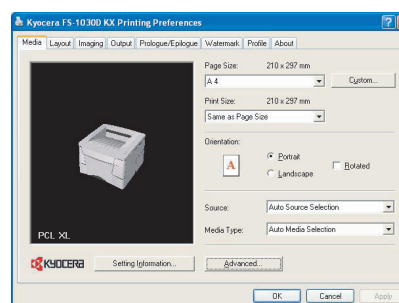


Figure 1-3-16



Completion of machine installation.

1-3-2 Installing the expanding memory (option)

The main board of the printer is equipped with one socket for memory expansion. Expansion memory is available in the form of DIMM (Dual In-line Memory Module).

CAUTION

Take precautions that no foreign substances such as metal chips or liquid get inside the printer during the installation process. Operation of the printer during the presence of a foreign substance may lead to fire or electric shock.

WARNING

Turn the printer's power switch off. Unplug the printer's power cable.

Procedure

1. Remove the one screw and then remove the memory cover.
2. Open the clips on both ends of the DIMM socket.
3. Insert the DIMM into the DIMM socket so that the notches on the DIMM align with the corresponding protrusions in the slot.
4. Close the clips on the DIMM slot to secure the DIMM.

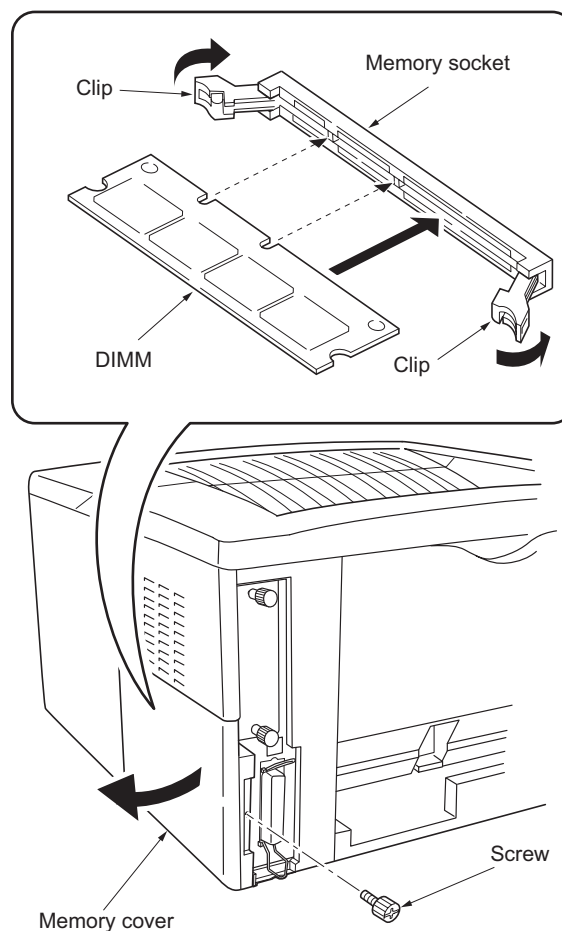


Figure 1-3-17 Inserting the DIMM

1-3-3 Installing the memory card (option)

The main board of the printer is equipped with one slot for memory card.

CAUTION

Take precautions that no foreign substances such as metal chips or liquid get inside the printer during the installation process. Operation of the printer during the presence of a foreign substance may lead to fire or electric shock.

WARNING

Turn the printer's power switch off. Unplug the printer's power cable and disconnect the printer from the computer or the network. Never insert or remove a memory card while the printer power is ON.

Failure to turn the power switch OFF will immediately halt the printer with a [Memory card err20] message (this message may not always appear). It also could result in any damage to the printer's electronic parts or the memory card. Turn the power switch ON again to restart the printer.

Procedure

1. Remove the two screws and then remove the option interface slot cover (or network interface card/serial interface board).
2. Insert the memory card in the slot. Push it in all the way.
3. Secure the option interface slot cover (or network interface card/serial interface board) by using two screws.

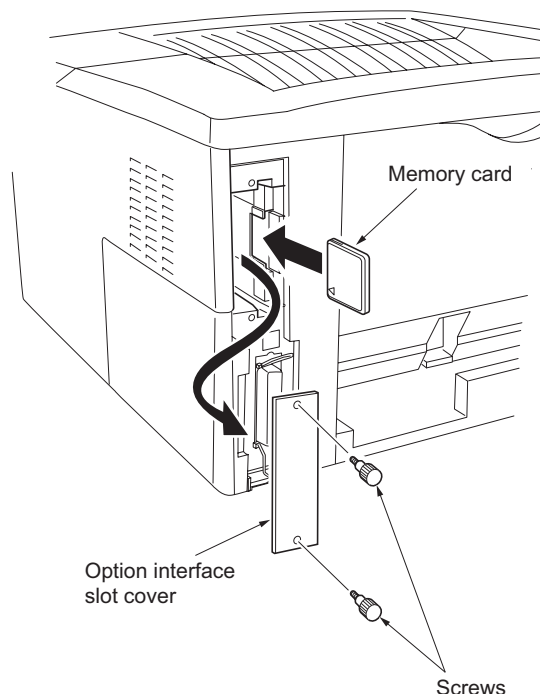


Figure 1-3-18 Inserting the memory card

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

If the serial interface board kit is installed, remove it to use the network interface card.

CAUTION

Take precautions that no foreign substances such as metal chips or liquid get inside the printer during the installation process. Operation of the printer during the presence of a foreign substance may lead to fire or electric shock.

WARNING

Turn the printer's power switch off. Unplug the printer's power cable.

Procedure

1. Remove the two screws and then remove the option interface slot cover (or the serial interface board).
2. Insert the network interface card in the slot. Push it in all the way.
3. Secure the network interface card by using two screws.

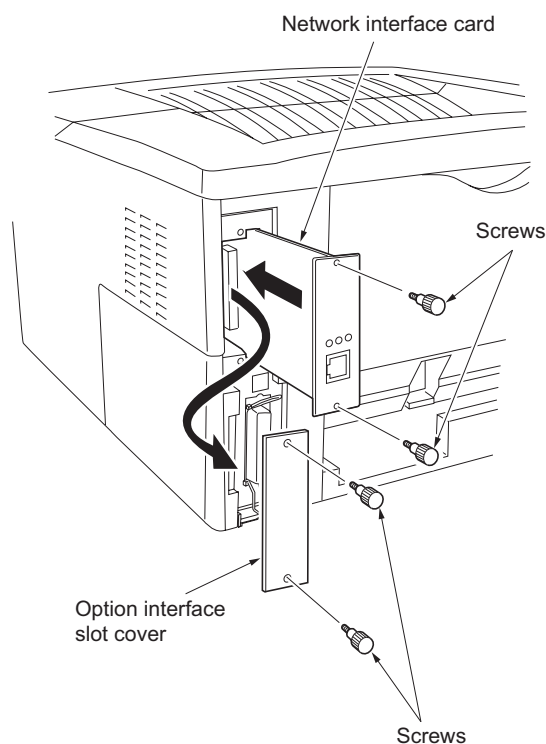


Figure 1-3-19 Inserting the network interface card

This page is intentionally left blank.



1-4-1 Maintenance

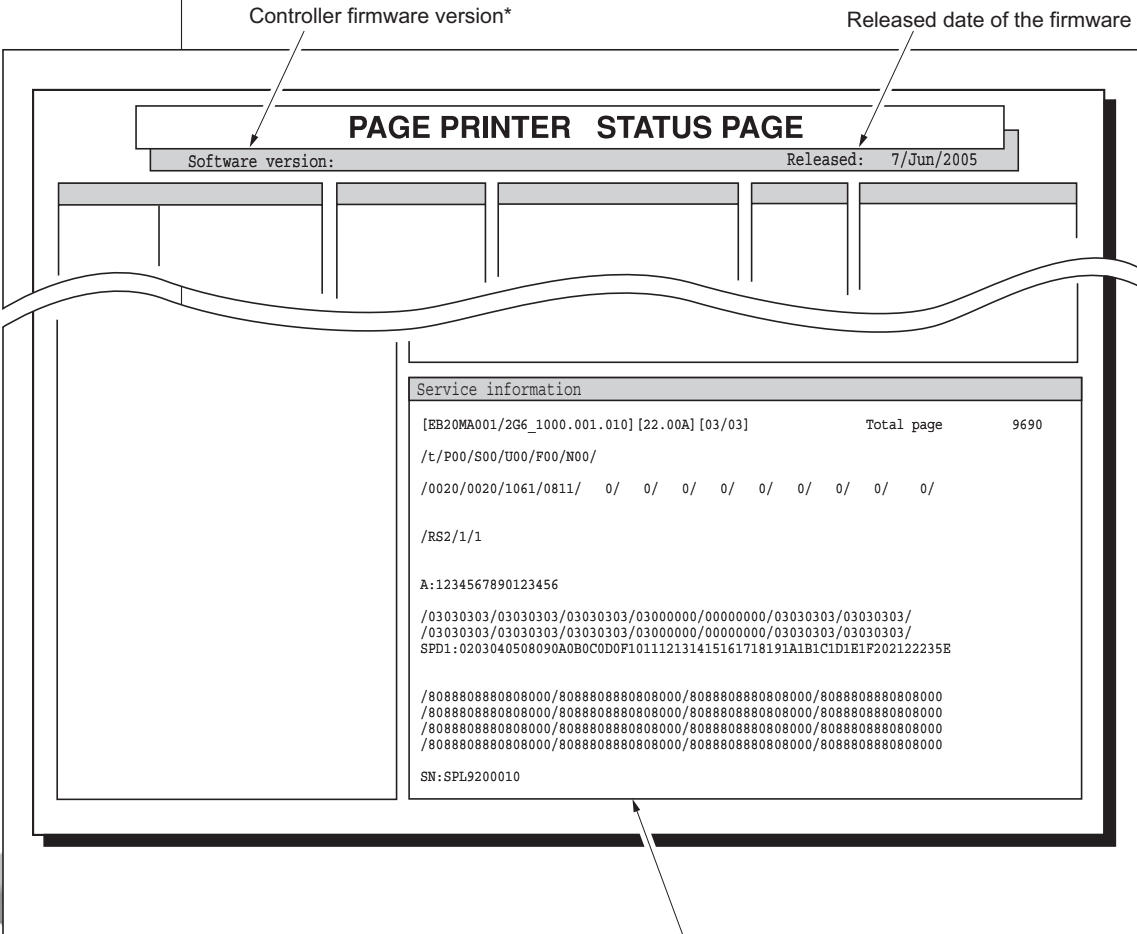
The product incorporates several service modes which are activated by using the keys on the operator panel or by commanding from a PC.

(1) Executing service mode

Printing a service status page See page 1-4-2.

Printing an event log (EVENT LOG) See page 1-4-5.



Service items	Description
Printing a service status page	<p>Description Prints a service status page for service purpose. The service status page includes various printing settings and service cumulative.</p> <p>Purpose To acquire the current printing environmental parameters and cumulative information.</p> <p>Procedure To print a service status page, using the GO key on the operator panel. Or, have a PC running MS-DOS and proceed as follows:</p> <p>GO key [Prints a user status page] Press the GO key for 3 seconds or more and less than 10 seconds.</p> <p>[Prints a service status page] Press the GO key for 10 seconds or more.</p> <p>PC 1. Connect the USB or parallel cable between printer and PC. 2. Turn printer power on. Make sure the printer is ready. 3. At the DOS prompt, send the following command to the printer:</p> <pre>echo !R! STAT1;EXIT;>prn</pre> <p>The service status page is printed. (If you omit "1" a user status page is printed.)</p> 


Service items	Description
	Details of service information
Service information	
<div>[EB20MA001/2G6_1000.001.010] [22.00A] [03/03] Total page 9690</div> <div><div>①</div><div>②</div><div>③</div><div>④</div></div> <div>/t/P00/S00/U00/F00/N00/</div> <div><div>⑤</div><div>⑥</div><div>⑦</div><div>⑧</div><div>⑨</div><div>⑩</div></div> <div>/0020/0020/1061/0811/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/</div> <div><div>⑪</div><div>⑫</div><div>⑬</div><div>⑭</div></div> <div>/RS2/1/1</div> <div><div>⑮</div><div>⑯</div><div>⑰</div></div> <div>A:1234567890123456</div> <div>⑱</div> <div>⑲ /03030303/03030303/03030303/03000000/00000000/03030303/03030303/</div> <div>⑳ /03030303/03030303/03030303/03000000/00000000/03030303/03030303/</div> <div>㉑ SPD1:0203040508090A0B0C0D0F101112131415161718191A1B1C1D1E1F202122235E</div> <div>⑳ /8088808880808000/8088808880808000/8088808880808000/8088808880808000</div> <div>/8088808880808000/8088808880808000/8088808880808000/8088808880808000</div> <div>/8088808880808000/8088808880808000/8088808880808000/8088808880808000</div> <div>/8088808880808000/8088808880808000/8088808880808000/8088808880808000</div> <div>SN:SPL9200010</div> <div>㉒</div>	

Figure 1-4-2 Service information

No.	Item	Description
①	Engine ROM information	[Flash ROM version]
②	Boot ROM information	[Boot ROM version and flash DIMM version]
③	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

www.tonerplus.com.ua

Service items		Description
No.	Item	Description
④	Total page	Total print page count
⑤	Toner install mode	-
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	Operator 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	Printable area setting	/Top offset/Left offset/Page length/Page width
⑫	Left offset for each paper source	/MP tray/Cassette/Option paper feeder/(non support)
⑬	Top offset for each paper source	/MP tray/Option paper feeder/(non support)
⑭	Offset for page rotation	/Top offset/Left offset/
⑮	Serial interface information (displayed only when serial interface board IB-11 installed)	RS2: RS-232C RS4: RS-422A
⑯	Operator panel message language	PMSG command setting (decimal)
⑰	Number of rebooting for vertical distortion check	-
⑱	Fixed asset number	(maximum 16 characters)
⑲	Media type attributes	Media type setting value from 1 to 28 (fuser temperature, paper thickness, duplex printing) (unused media type always 0x00.)
⑳	Media type attributes	Media type setting value from 1 to 28 (print density) (unused media type always 0x00.)
㉑	Memory SPD information (slot 1)	32 bytes (2 to 6 bytes, 8 to 36 bytes and 94 to 95 bytes)
㉒	Engine parameter setting	Hexadecimal, 128 bytes (256 digits)
㉓	Machine serial number	-



www.tonerplus.com.ua

Service items	Description
Printing an event log (EVENT LOG)	<p>Description Prints a history list of occurrences of paper jam, self-diagnostics, toner replacements, etc.</p> <p>Purpose Analyze the failure by determining the cause depending on the history of occurrence.</p> <p>Procedure 1. Connect the USB or parallel cable between printer and PC. 2. Turn printer power on. Make sure the printer is ready. 3. At the DOS prompt, send the following command to the printer:</p> <pre>echo !R! ELOG;EXIT;>prn</pre> <p>Event log will be printed.</p>

EVENT LOG

[EB20MA001/2G6_1000.001.019] [C2] [40.00SFLB] [01]
Firmware version: 2G6_30000.001.024 Released: 15/Jul/2005

Total page 12345
DN:SPL00000000
SN:SPL00000000

⑩ Paper Jam Log

#	Count.	Event
8	9993	10.48.01.88.01.01
7	9997	10.48.01.88.01.01
6	9991	10.48.01.88.01.01
5	9990	10.48.01.88.01.01
4	9989	10.48.01.88.01.01
3	9979	10.48.01.88.01.01
2	9969	10.48.01.88.01.01
1	1	10.48.01.88.01.01

10.48.01.88.01.01

(a)(b)(c)(d)(e)(f)

⑪ Service Call Log

#	Count.	Service Code
8	11234	01.6000
7	10000	01.6000
6	9999	01.6000
5	9998	01.6000
4	9997	01.6000
3	9996	01.6000
2	9995	01.6000
1	9994	01.6000

⑫ Maintenance Log

#	Count.	item
8	11234	02.00
7	10000	02.00
6	9999	02.00
5	9998	02.00
4	9997	02.00
3	9996	02.00
2	9995	02.00
1	9994	02.00

⑬ Counter Log

(g)

J00: 0 J43: 0

J05: 0 J44: 0

J09: 0 J46:

J10: 0 J47:

J11: 0 J50:

J12: 0 J51:

J13: 0 J52:

J14: 0 J53:

J15: 0 J60:

J23: 0 J61:

J30: 0 J87:

J35: 0 J88:

J40: 0 J89:

J41:

J42:

(h)

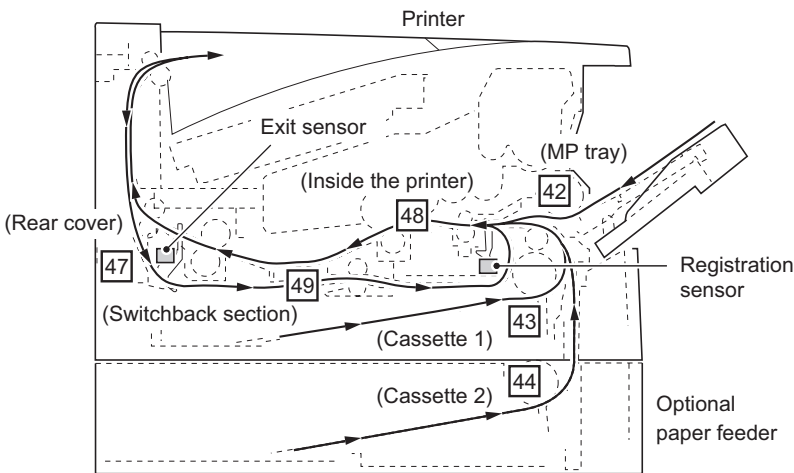
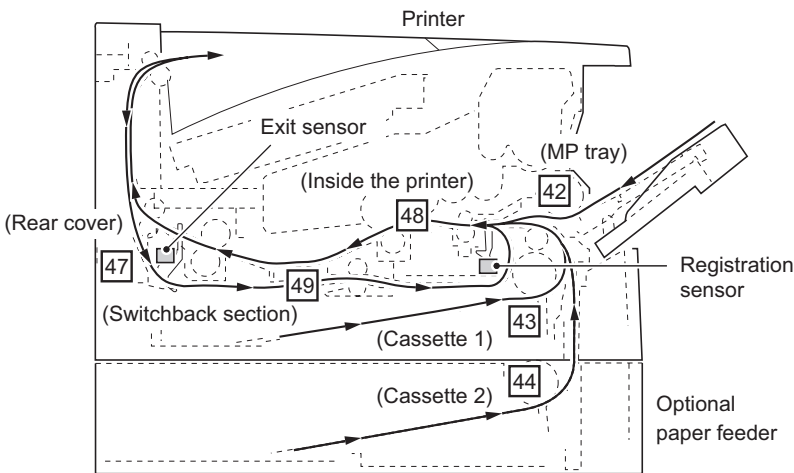
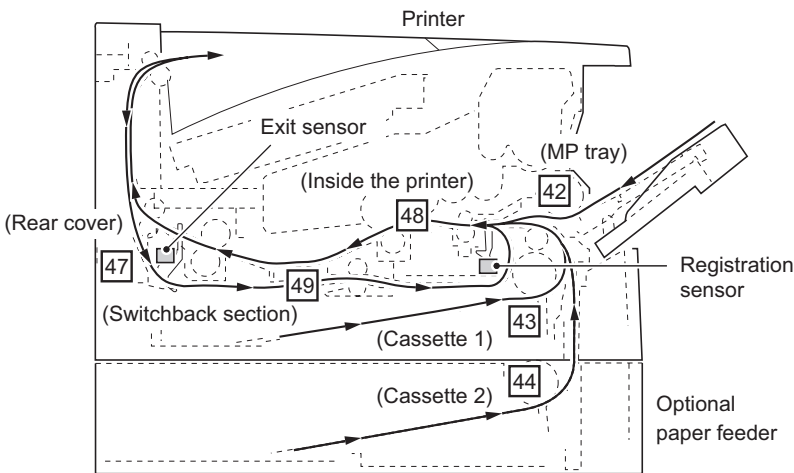
C:6000: 4

C:6050: 1

(i) T00: 1

Figure 1-4-3 Event log (EVENT LOG)

Service items		Description		
Items		Description		
①	PWB mask version	[Engine mask version/Engine software version]		
②	Operation 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 PWB mask version			
⑥	Main PWB firmware release date			
⑦	Total page counter			
⑧	Drum serial number			
⑨	Printer serial number			
⑩	Paper Jam Log	<u>#</u> Remembers 1 to 8th of occurrence. If the occurrence of the previous paper jam is less than 8, all of the paper jams are logged. When the occurrence exceeds 8, the oldest occurrence is removed.	<u>Count.</u> The total page count at the time of the paper jam.	<u>Event</u> Log code (2 digit, hexadecimal, 6 categories) (a) Cause of a paper jam (b) Detail of paper misfeed location (c) Detail of paper source (d) Detail of paper size (e) Detail of paper type (f) Detail of paper exit location Refer to the next page for the details of each log code.

Service items	Description				
	<table border="1"> <thead> <tr> <th data-bbox="196 315 576 351">Items</th><th data-bbox="576 315 1412 351">Description</th></tr> </thead> <tbody> <tr> <td data-bbox="196 351 576 1868"> 10 Paper Jam Log </td><td data-bbox="576 351 1412 1868"> <p>(a) Cause of paper jam</p> <p>10: Paper does not arrive at the registration sensor. [42] (MP tray) 10: Paper does not arrive at the registration sensor. [43] (Cassette 1) 10: Paper does not arrive at the registration sensor. [44] (Cassette 2) 10: Paper does not arrive at the registration sensor. [49] (Switchback section) 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. [47] 22: Paper remains at the exit sensor when power is turned on. [47] A1: Paper does not arrive at the exit sensor. [47] A3: Paper does not pass the exit sensor. [49] E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of the top cover) [00] F0: Paper misfeed by another cause. [00]</p> <p>Values within [] indicate paper misfeed locations. (hexadecimal) [00]: Undefined</p> <p>(b) Detail of paper misfeed location</p>  <p>(c) Detail of paper source (Hexadecimal)</p> <p>00: MP tray 01: Cassette 1 02: Cassette 2 03 to 07, 09: Not used</p> </td></tr> </tbody> </table>	Items	Description	10 Paper Jam Log	<p>(a) Cause of paper jam</p> <p>10: Paper does not arrive at the registration sensor. [42] (MP tray) 10: Paper does not arrive at the registration sensor. [43] (Cassette 1) 10: Paper does not arrive at the registration sensor. [44] (Cassette 2) 10: Paper does not arrive at the registration sensor. [49] (Switchback section) 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. [47] 22: Paper remains at the exit sensor when power is turned on. [47] A1: Paper does not arrive at the exit sensor. [47] A3: Paper does not pass the exit sensor. [49] E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of the top cover) [00] F0: Paper misfeed by another cause. [00]</p> <p>Values within [] indicate paper misfeed locations. (hexadecimal) [00]: Undefined</p> <p>(b) Detail of paper misfeed location</p>  <p>(c) Detail of paper source (Hexadecimal)</p> <p>00: MP tray 01: Cassette 1 02: Cassette 2 03 to 07, 09: Not used</p>
Items	Description				
10 Paper Jam Log	<p>(a) Cause of paper jam</p> <p>10: Paper does not arrive at the registration sensor. [42] (MP tray) 10: Paper does not arrive at the registration sensor. [43] (Cassette 1) 10: Paper does not arrive at the registration sensor. [44] (Cassette 2) 10: Paper does not arrive at the registration sensor. [49] (Switchback section) 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. [47] 22: Paper remains at the exit sensor when power is turned on. [47] A1: Paper does not arrive at the exit sensor. [47] A3: Paper does not pass the exit sensor. [49] E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of the top cover) [00] F0: Paper misfeed by another cause. [00]</p> <p>Values within [] indicate paper misfeed locations. (hexadecimal) [00]: Undefined</p> <p>(b) Detail of paper misfeed location</p>  <p>(c) Detail of paper source (Hexadecimal)</p> <p>00: MP tray 01: Cassette 1 02: Cassette 2 03 to 07, 09: Not used</p>				

Service items		Description		
Items		Description		
⑩	Paper Jam Log	(d) Detail of paper size (Hexadecimal)		
		00: (Undefined)	0B: B4	23: Special 2
		01: Monarch	0C: Ledger	24: A3 wide
		02: Business	0D: A5	25: Ledger wide
		03: International DL	0E: A6	26: Full bleed paper (12
		04: International C5	0F: B6	x 18)
		05: Executive	10: Commercial 9	27: 8K
		06: Letter-R	11: Commercial 6	28: 16K-R
		86: Letter-E	12: ISO B5	A8: 16K-E
		07: Legal	13: Custom	32: Statement-R
		08: A4R	1E: C4	B2: Statement-E
		88: A4E	1F: JIS hagaki	33: Folio
		09: B5R	20: JIS oufuku	34: Youkei 2
		89: B5E	21: Officio 2	35: Youkei 4
		0A: A3	22: Special 1	
		(e) Detail of paper type (Hexadecimal)		
		01: Plain	0A: Color	16: Custom 2
		02: Transparency	0B: Prepunched	17: Custom 3
		03: Preprint	0C: Envelope	18: Custom 4
		04: Labels	0D: Cardstock	19: Custom 5
		05: Bond	0E: Coated	1A: Custom 6
		06: Recycle	0F: 2nd side	1B: Custom 7
		07: Vellum	10: Media 16	1C: Custom 8
		08: Rough	11: High quality	
		09: Letter head	15: Custom 1	
		(f) Detail of paper exit location		
		01: Output tray (face-down)		
		02 to 48: Not used		

TONER

www.tonerplus.com.ua

Service items		Description		
Items		Description		
⑪	Service Call Log (Self diagnostic error)	# Remembers 1 to 8 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.	<u>Count.</u> The total page count at the time of the self diagnostics error.	<u>Service Code</u> See page 1-5-3.
⑫	Maintenance Log	# Remembers 1 to 8 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.	<u>Count.</u> 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.	<u>item</u> Code of maintenance replacing item (1 byte, 2 category) 01: Toner container
⑬	Counter Log Comprised of three log counters including paper jams, self diagnostics errors, and replacement of the toner container.	(g) Jam Indicates the log counter of paper jams depending on location. Refer to ⑩ Paper Jam Log. All instances including those are not occurred are displayed.	(h) 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.	(i) Toner container replacing Indicates the log counter depending on the maintenance item for maintenance. T: Toner container 00: Black Example: T00: 1 The (black) toner container has been replaced once.

This page is intentionally left blank.



1-5-1 Paper misfeed detection

(1) Paper misfeed indication

If a paper jam occurs while printing, the printer notifies it by the following combination of the four indicators. Remove the jammed paper as described below. After removal, open and close the top cover once to initialize the jam sensing.

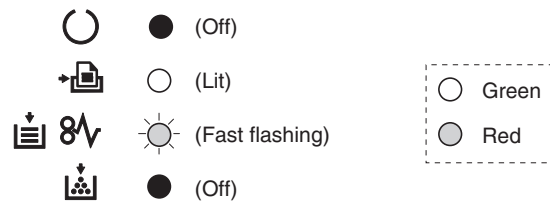


Figure 1-5-1 Paper misfeed indication

(2) Paper misfeed detection

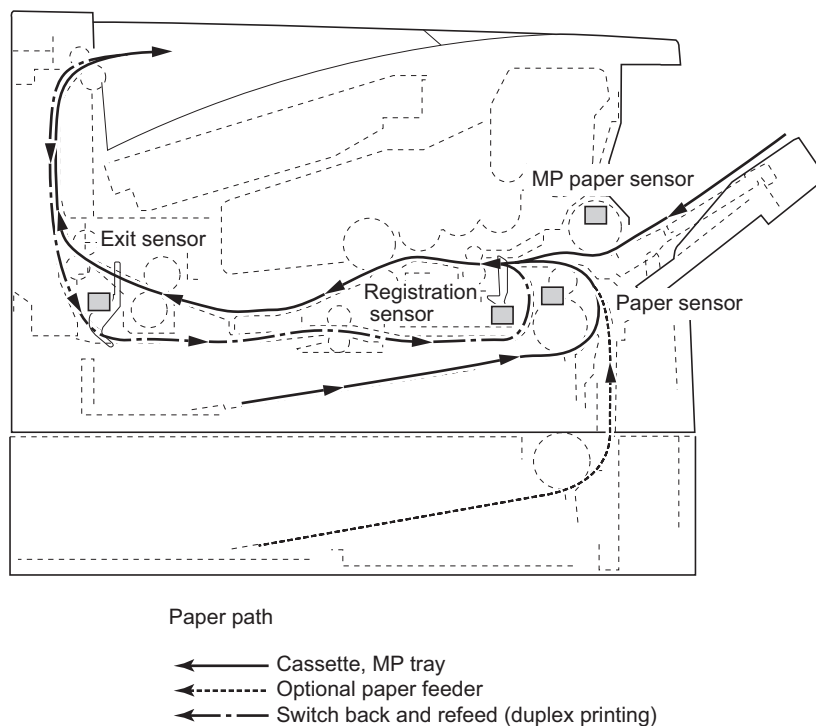


Figure 1-5-2

1-5-2 Self-diagnosis

(1) Self-diagnostic function

Service errors are represented by the alternating flashing of the indicators (LEDs). Each error is represented by the notation of four digits code and can be monitored on the Remote Operation Panel utility. e.g. Call service 2000 is for the main motor error.

(2) Self diagnostic indication

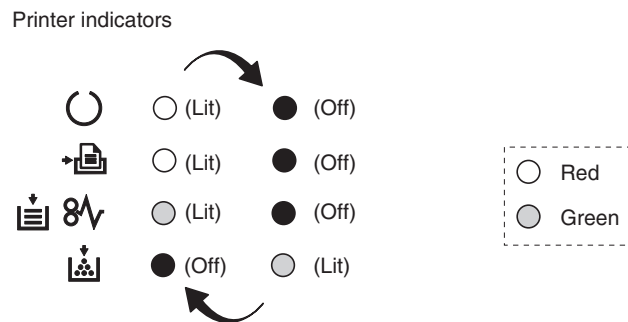
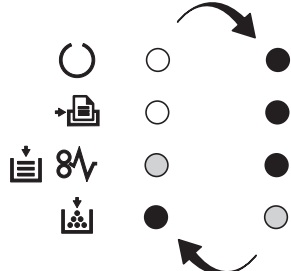
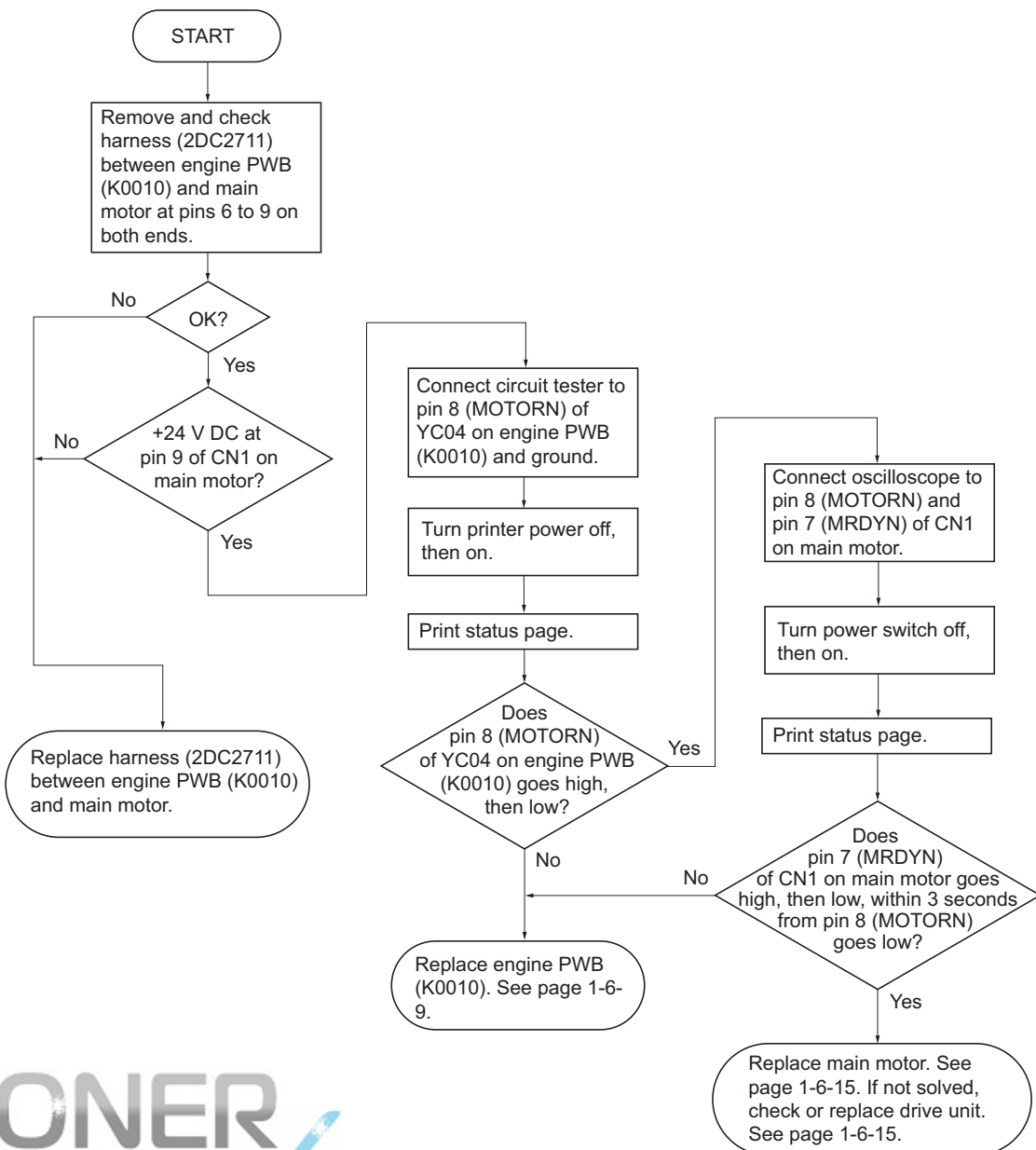
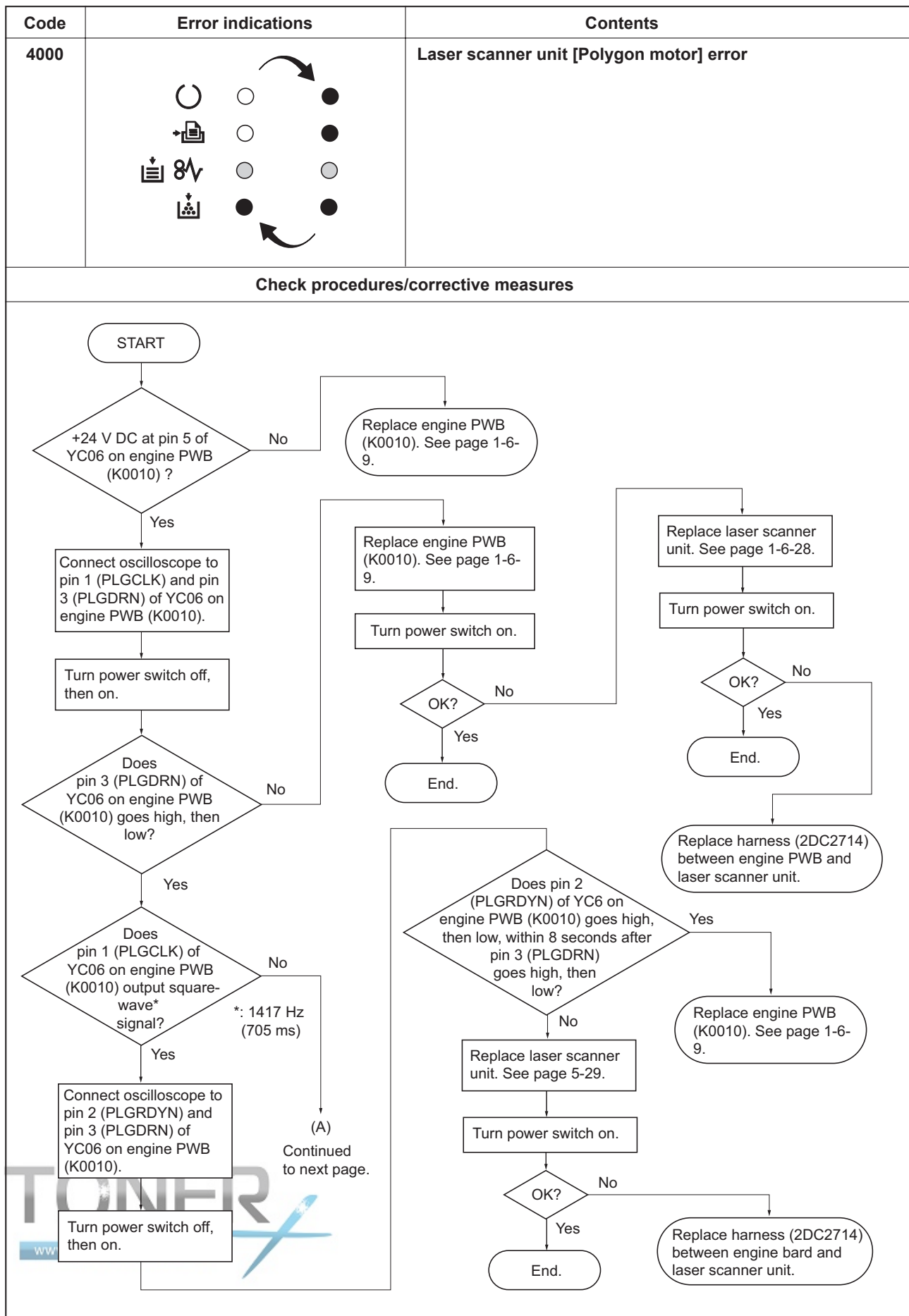


Figure 1-5-3 Self diagnostic indication

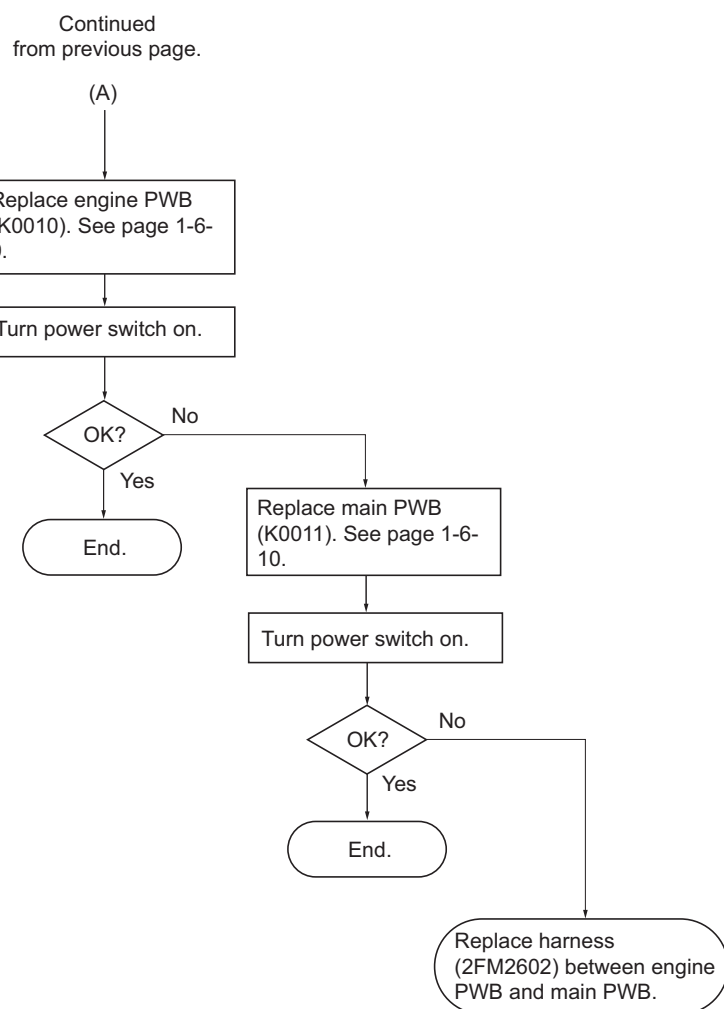
Code	Error indications	Contents
2000		Main motor error

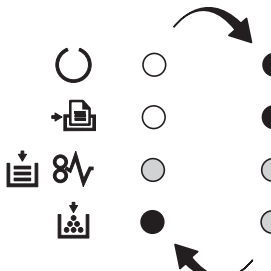
Check procedures/corrective measures





Check procedures/corrective measures



Code	Error indications	Contents
4200		Laser scanner unit [Pin photo diode] error
Check procedures/corrective measures		
<p>START</p> <p>Decision: +5 V DC at pin 6 of YC07 on main PWB (K0011) ?</p> <p>If No: Replace main PWB (K0011). See page 1-6-10.</p> <p>If Yes: Connect oscilloscope to pin 4 (OUTPEN) of YC07 on main PWB (K0011). Turn power switch off, then on.</p> <p>Decision: Does pin 4 (OUTPEN) of YC06 on main PWB (K0011) goes high, then low before "4200" error?</p> <p>If No: Replace main PWB (K0011). See page 1-6-10. Turn power switch on. Decision: OK? If Yes: End. If No: Replace engine PWB (K0010). See page 1-6-9. Turn power switch on. Decision: OK? If Yes: End. If No: Replace harness (2FM2602) between main PWB and engine PWB.</p> <p>If Yes: Connect oscilloscope to pin 4 (OUTPEN) and pin 8 (PDN) of YC07 on main PWB (K0011). Turn power switch off, then on.</p> <p>Decision: Does pin 8 (PDN) of YC06 on main PWB (K0011) output pulse signal*, within 0.1 second after pin 4 (OUTPEN) goes high, then low?</p> <p>If Yes: (C) Continued to next page.</p> <p>If No: (B) Continued to next page.</p> <p>*: Pin photo diode detect horizontal synchronization signal (Frequency: 1417 Hz, Low level width: 10 ms)</p> <p>TONERplus.com.ua</p>		

Check procedures/corrective measures

Continued
from previous page.

(B)

Replace laser scanner
unit. See page 1-6-28.Replace main PWB
(K0011). See page 1-6-
10.

Turn power switch on.

OK?
Yes
NoReplace engine PWB
(K0010). See page 1-6-9.

Turn power switch on.

OK?
Yes
No

End.

Continued
from previous page.

(C)

Replace main PWB
(K0011). See page 1-6-
10.

Turn power switch on.

OK?
Yes
No

End.

Replace engine PWB
(KP-0010). See page 1-
6-9.OK?
Yes
No

End.

Replace harness
(2FM2602) between main
PWB and engine PWB.Replace harness
(2DC2714) between
engine board and laser
scanner unit.

Turn power switch on.

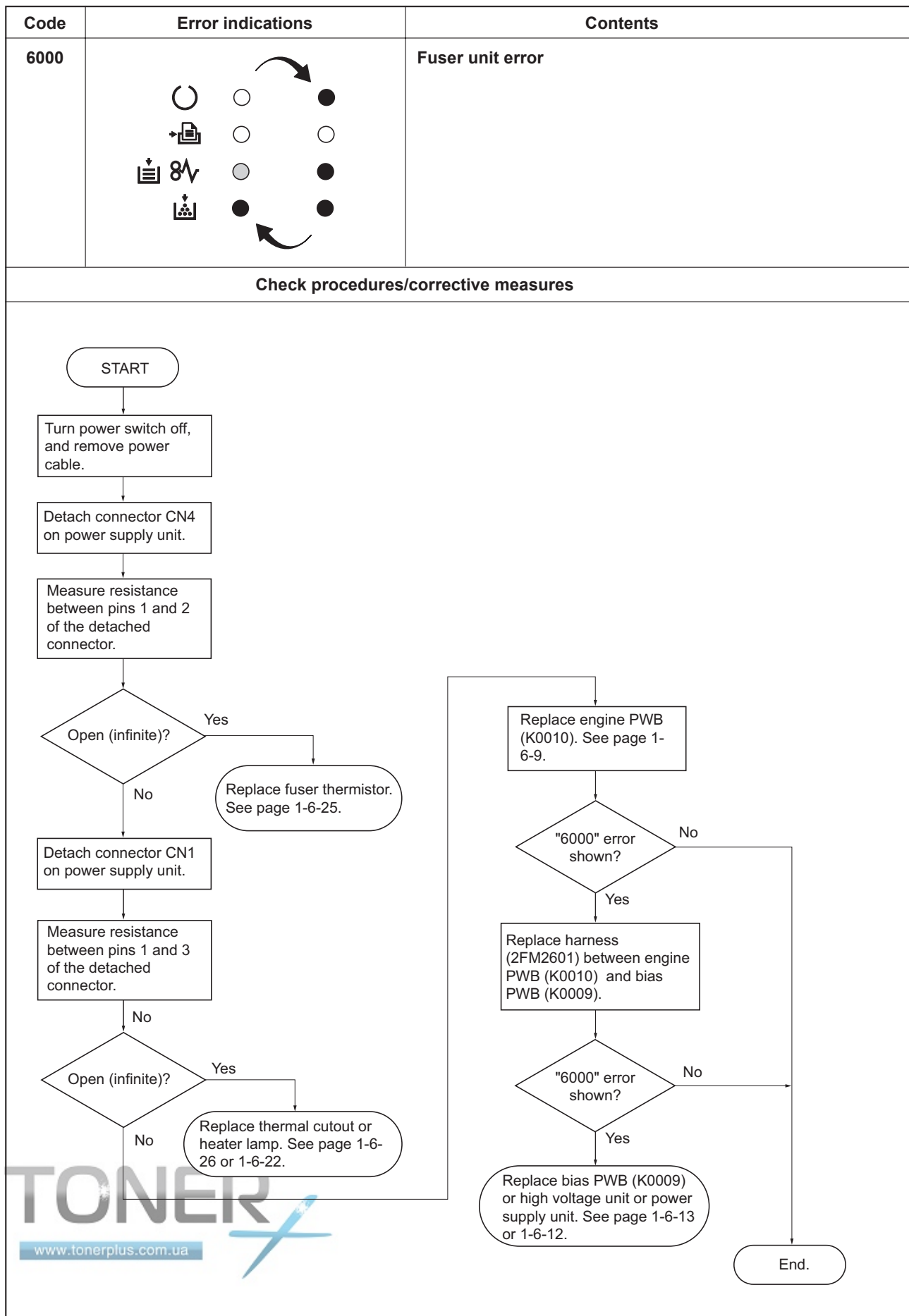
OK?
Yes
NoReplace harness
(2FM2608) between
main PWB and laser
scanner unit.

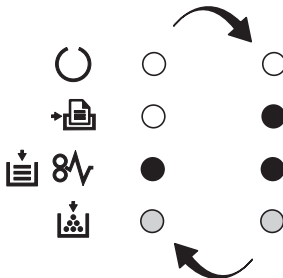
Turn power switch on.

OK?
Yes
No

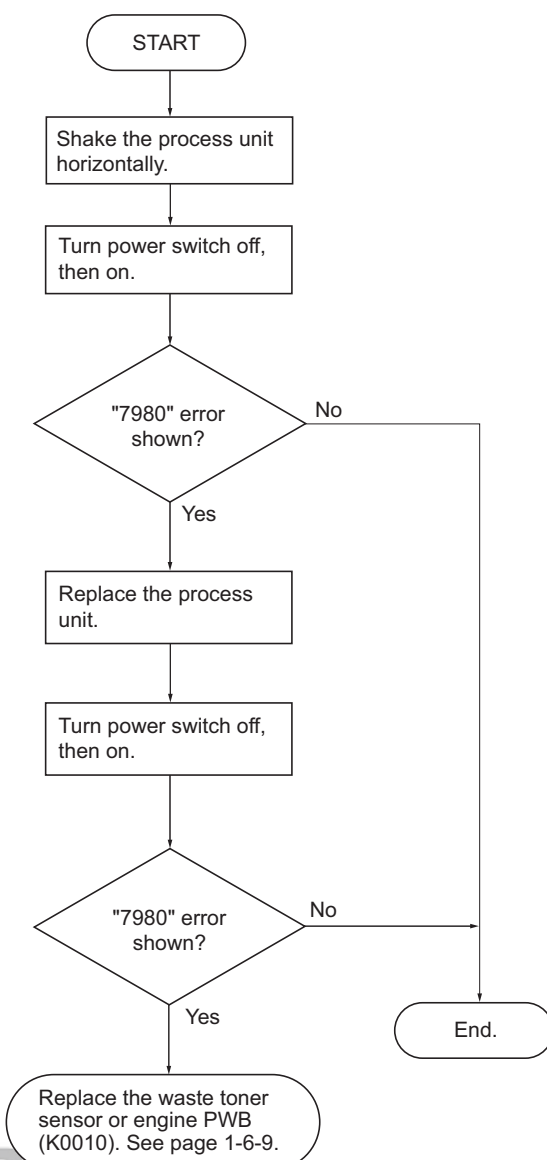
End.

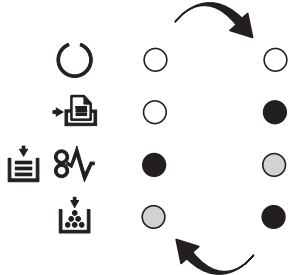
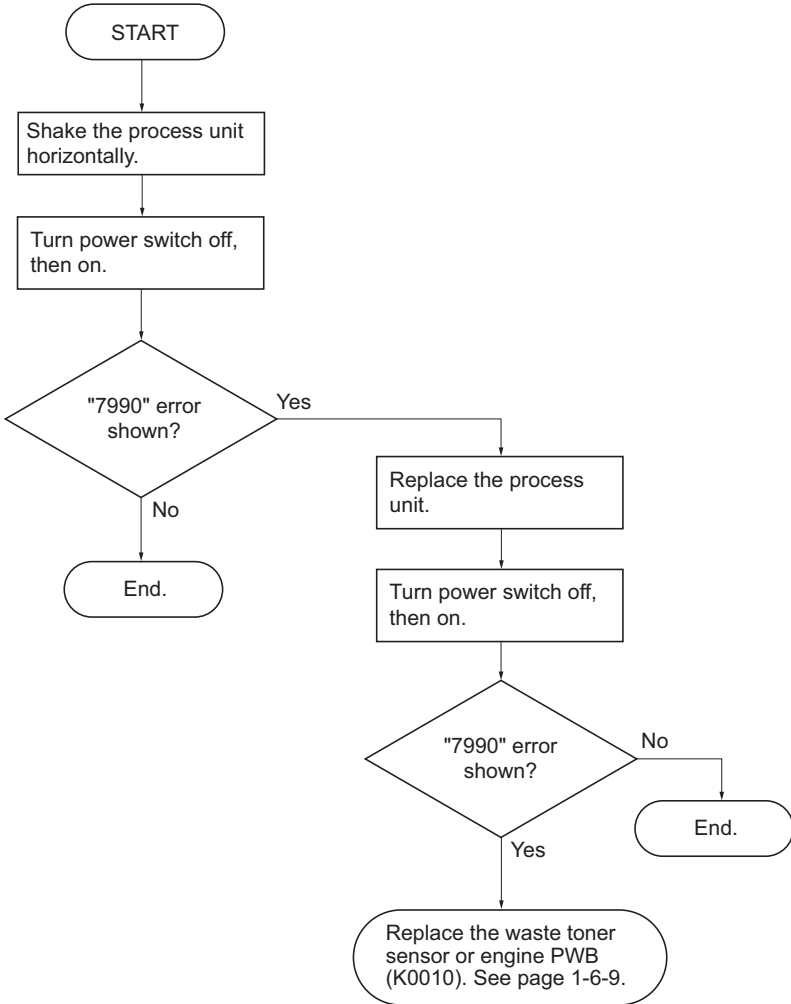
Replace harness
(2FM2602) between main
PWB and engine PWB.

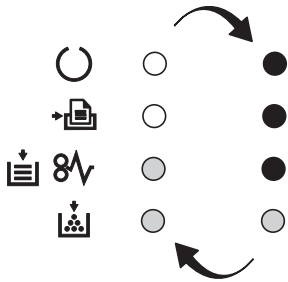
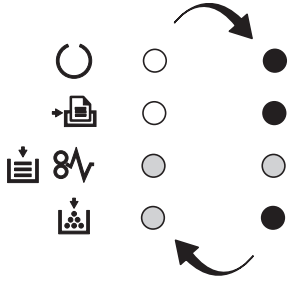
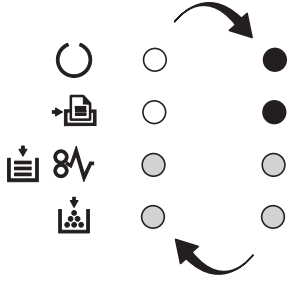
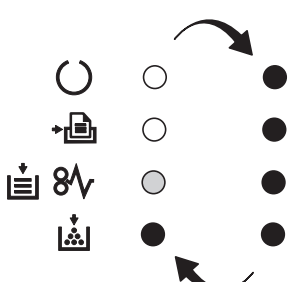
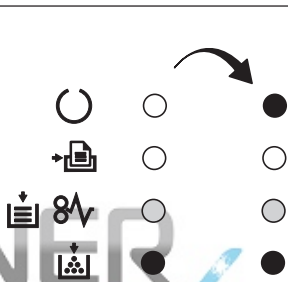


Code	Error indications	Contents
7980		Waste toner full [Total page count less than 100,000 pages of printing]

Check procedures/corrective measures



Code	Error indications	Contents
7990		Waste toner full [Total page count more than 100,000 pages of printing]
Check procedures/corrective measures		
 <pre> graph TD START([START]) --> Shake[Shake the process unit horizontally.] Shake --> PowerOff[Turn power switch off, then on.] PowerOff --> Error1{7990 error shown?} Error1 -- No --> End1([End.]) Error1 -- Yes --> ReplacePU[Replace the process unit.] ReplacePU --> PowerOff2[Turn power switch off, then on.] PowerOff2 --> Error2{7990 error shown?} Error2 -- No --> End2([End.]) Error2 -- Yes --> ReplaceSensor([Replace the waste toner sensor or engine PWB (K0010). See page 1-6-9.]) </pre>		

Code	Error indications	Contents	Check procedures/corrective measures
F010		Controller checksum error	Turn power switch off, then on. If not solved, replace main PWB (See page 1-6-10).
F020		Controller RAM read/write error	Remove the expansion memory (DIMM). Turn power switch off, then on. If not solved, replace main PWB. If solved, replace the expanding memory (See pages 1-6-10 and 1-3-9).
F030		Controller system error	Turn power switch off, then on. If not solved, replace main PWB (See page 1-6-10).
F040		Communication error	Turn power switch off, then on. If not solved, replace engine PWB (See page 1-6-9) or main PWB (See page 1-6-10).
F050		Engine ROM checksum error	Turn power switch off, then on. If not solved, replace engine PWB (See page 1-6-9).

1-5-3 Image formation problems

(1) No image appears
(entirely white).



See page 1-5-13

(2) No image appears
(entirely black).



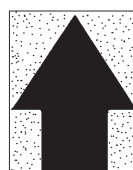
See page 1-5-13

(3) Image is too light.



See page 1-5-13

(4) Background is visible.



See page 1-5-14

(5) A white line appears
longitudinally.



See page 1-5-14

(6) A black line appears
longitudinally.



See page 1-5-15

(7) A black line appears
laterally.



See page 1-5-15

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



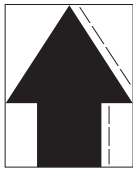
See page 1-5-15

(9) Black dots appear on
the image.



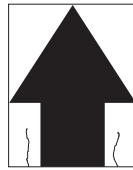
See page 1-5-16

(10) Image is blurred.



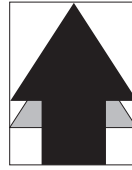
See page 1-5-16

(11) Paper creases.



See page 1-5-16

(12) Offset occurs.

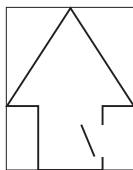


See page 1-5-17

(13) Image is partly missing. (14) Fixing is poor.



See page 1-5-17



See page 1-5-17

- (1) No image appears
(entirely white).



Causes

1. Defective process unit installation.
2. No transfer charging.
3. Defective laser scanner unit.

Causes	Check procedures/corrective measures
1. Defective process unit installation.	Check that the process unit is inserted correctly.
2. No transfer charging.	Check the transfer bias output on the high voltage unit. This requires removal of the left cover and the test equipment. Replace the high voltage unit if high voltage potential is not available on the unit (See page 1-6-12).
3. Defective laser scanner unit.	The scanner components within the scanner may be disordered. Replace the laser scanner unit if necessary (See page 1-6-28).

- (2) No image appears
(entirely black).



Causes

1. No main charging.

Causes	Check procedures/corrective measures
1. No main charging.	
A. Broken main charger wire.	Replace the process unit.
B. Leaking main charger housing.	Replace the process unit.
C. The connector terminals of the high voltage board make poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
D. Defective engine PWB (K0010).	Replace the engine PWB (K0010) and check for correct operation.
E. Defective high voltage unit.	Replace the high voltage unit and check for correct operation.

- (3) Image is too
light.

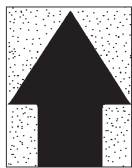


Causes

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

Causes	Check procedures/corrective measures
1. Insufficient toner.	If the add toner indicator lights, replace the toner container.
2. Deteriorated developer.	Replace the process unit.
3. Dirty or deteriorated drum.	Replace the process unit.

(4) Background is visible.



Causes

1. Defective print density setting.
2. Defective surface potential of the drum.
3. Defective developing roller.

Causes	Check procedures/corrective measures
1. Defective print density setting.	Open the printer top cover and check that the process unit is correctly seated. Poor contact main charger terminal between the process unit and the printer main unit.
2. Defective surface potential of the drum.	The drum potential should be approximately 400 V. This may vary depending on production lots. Measurement is possible only by using the jig and tool specifically designed for this purpose. The drum unit will have to be replaced if it bears values far out of the allowable range.
3. Defective developing roller.	If a process unit which is known to work normally is available for check, replace the current process unit in the printer with the normal one. If the symptom disappears, replace the process unit with a new one.

(5) A white line appears longitudinally.

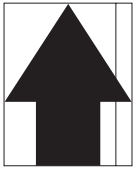


Causes

1. Dirty or flawed main charger wire.
2. Foreign matter in the developing section.
3. Flawed drum.

Causes	Check procedures/corrective measures
1. Dirty or flawed main charger wire.	Replace the process unit.
2. Foreign matter in the developing section.	Replace the process unit.
3. Flawed drum.	Replace the process unit.

- (6) A black line appears longitudinally.



Causes

1. Contaminated main charger wire.
2. Dirty or flawed drum.
3. Deformed or worn cleaning blade.
4. Defective magnet roller (in the process unit).

Causes	Check procedures/corrective measures
1. Contaminated main charger wire.	Clean the main charger wire by pulling the green colored cleaning knob in and out several times.
2. Dirty or flawed drum.	Replace the process unit.
3. Deformed or worn cleaning blade.	Replace the process unit.
4. Defective magnet roller (in the process unit).	Replace the process unit.

- (7) A black line appears laterally.



Causes

1. Defective process unit's grounding
2. Flawed drum.
3. Dirty developing section.
4. Leaking main charger housing.

Causes	Check procedures/corrective measures
1. Defective process unit's grounding.	The drum axle in the process unit and its counter part, the grounding tab in the printer, must be in a good contact. If necessary, apply a small amount of electro-conductive grease onto the tab.
2. Flawed drum.	Replace the process unit.
3. Dirty developing section.	Replace the process unit.
4. Leaking main charger housing.	Replace the process unit.

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



Causes

1. Dirty main charger wire.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Replace the process unit.

(9) Black dots appear on the image.



Causes

1. Dirty or flawed drum.
2. Dirty contact glass.
3. Deformed or worn cleaning blade.

Causes	Check procedures/corrective measures
1. Dirty or flawed drum.	Replace the process unit.
2. Dirty contact glass.	Clean the contact glass.
3. Deformed or worn cleaning blade.	Replace the process unit.

(10) Image is blurred.

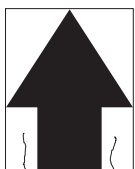


Causes

1. Deformed press roller.
2. Paper conveying section drive problem.

Causes	Check procedures/corrective measures
1. Deformed press roller.	Replace the press roller (see page 1-6-27).
2. Paper conveying section drive problem.	Check the gears and belts and, if necessary, grease them.

(11) Paper creases.



Causes

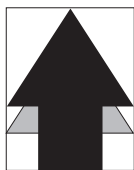
1. Paper curled.
2. Paper damp.

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

(12) Offset occurs.

Causes

1. Defective cleaning blade.



Causes	Check procedures/corrective measures
1. Defective cleaning blade.	Replace the process unit.

(13) Image is partly missing.

Causes

1. Paper damp.
2. Paper creased.
3. Flawed drum.

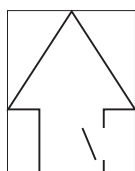


Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions.
2. Paper creased.	Replace the paper.
3. Flawed drum.	Replace the process unit.

(14) Fixing is poor.

Causes

1. Wrong paper.
2. Flawed press roller.



Causes	Check procedures/corrective measures
1. Wrong paper.	Check if the paper meets specifications.
2. Flawed press roller.	Replace the press roller (see page 1-6-27).

1-5-4 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate when the power switch is turned on.	No electricity at the power outlet.	Measure the input voltage.
	The power cord is not plugged in properly.	Check the contact between the power plug and the outlet.
	The front cover is not closed completely.	Check the front cover.
	Broken power cord.	Check for continuity. If none, replace the cord.
	Defective power switch.	Check for continuity across the contacts. If none, replace the power switch.
	Blown fuse in the power supply unit.	Check for continuity. If none, remove the cause of blowing and replace the fuse.
	Defective interlock switch.	Check for continuity across the contacts of switch. If none, replace the switch.
	Defective power supply unit.	With AC present, check for 24 V DC at CN2-12, 2-13 and 5 V DC at CN2-1, 2-2 on the power supply unit. If none, replace the power supply unit.
(2) The main motor does not operate.	Poor contact in the main motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken main motor gear.	Check visually and replace the main motor if necessary.
	Defective main motor.	Replace the main motor. See page 1-6-15.
	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.
(3) Cooling fan does not operate.	Broken cooling fan coil.	Check for continuity across the coil. If none, replace cooling fan.
	Poor contact in the cooling fan connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
(4) The feed solenoid does not operate.	Broken feed solenoid coil.	Check for continuity across the coil. If none, replace the feed clutch.
	Poor contact in the feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.
(5) The MP feed solenoid does not operate.	Broken MP feed solenoid coil.	Check for continuity across the coil. If none, replace the MP feed solenoid.
	Poor contact in the MP feed solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.

Problem	Causes	Check procedures/corrective measures
(6) The registration solenoid does not operate.	Broken registration solenoid coil.	Check for continuity across the coil. If none, replace the registration solenoid.
	Poor contact in the registration solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.
(7) The switchback solenoid does not operate.	Broken switchback solenoid coil.	Check for continuity across the coil. If none, replace the switchback solenoid.
	Poor contact in the switchback solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.
(8) The eraser lamp does not turn on.	Poor contact in the eraser lamp connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective eraser lamp.	Check for continuity. If none, replace the eraser lamp. See page 1-6-30.
	Defective engine PWB (K0010).	If the eraser lamp turns on when YC14-2 on the engine PWB (K0010) is held low, replace the engine PWB (K0010). See page 1-6-9.
(9) The heater lamp does not turn on.	Broken wire in heater lamp.	Check for continuity across heater lamp. If none, replace the heater lamp. See page 1-6-22.
	Thermal cutout triggered.	Check for continuity across thermal cutout. If none, remove the cause and replace the thermal cutout. See page 1-6-26.
(10) The heater lamp does not turn off.	Defective engine PWB (K0010).	Replace the engine PWB (K0010). See page 1-6-9.
	Dirty sensor part of the fuser thermistor.	Check visually and clean the fuser thermistor sensor parts.
(11) Main charging is not performed.	Broken main charger wire.	See page 1-5-13.
	Leaking main charger housing.	
	Poor contact in the high voltage board connector terminals.	
	Defective engine PWB (K0010).	
	Defective high voltage unit.	
(12) Transfer charging is not performed.	Poor contact in the high voltage unit connector terminals.	See page 1-5-13.
	Defective engine PWB (K0010).	
	Defective high voltage unit.	

Problem	Causes	Check procedures/corrective measures
(13) A paper jam in the paper feed or exit section is indicated when the power switch is turned on.	A piece of paper torn from copy paper is caught around registration sensor or exit sensor.	Check and remove if any.
	Defective registration sensor.	Replace registration sensor if indication of the corresponding sensor is not light.
	Defective exit sensor.	Replace exit sensor if indication of the corresponding sensor is not light.
(14) The LED indicator requesting cover to be closed is displayed when the front cover is closed.	Poor contact in the connector terminals of interlock switch.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective interlock switch.	Check for continuity across switch. If there is no continuity when the switch is on, replace it.
(15) Others.	Wiring is broken, shorted or makes poor contact.	Check for continuity. If none, repair.
	Noise.	Locate the source of noise and remove.

1-5-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the feed roller and MP feed roller are dirty with paper powder.	Clean with isopropyl alcohol.
	Check if the feed roller and MP feed roller are deformed.	Check visually and replace any deformed rollers. See pages 1-6-5 and 1-6-6.
	Electrical problem with the feed solenoid (clutch) and MP feed solenoid (clutch).	Repair or replace if necessary.
(2) No secondary paper feed.	Check if the surfaces of the upper and lower registration rollers are dirty with paper powder.	Clean with isopropyl alcohol.
	Electrical problem with the registration solenoid (clutch).	Repair or replace if necessary.
(3) Skewed paper feed.	Deformed feed roller or MP feed roller.	Repair or replace if necessary.
(4) Multiple sheets of paper are fed at one time.	Defective feed roller, MP feed roller or friction plate.	Check the drawer claw visually and correct or replace if necessary.
(5) Paper jams.	Check if the paper is curled.	Change the paper.
	Deformed guides along the paper conveying path.	Check visually and replace any deformed guides.
	Check if the contact between the upper and lower registration rollers is correct.	Check visually and remedy if necessary.
	Check if the press roller is extremely dirty or deformed.	Clean or replace the press roller. See page 1-6-27.
	Check if the contact between the heat roller and its separation claws is correct.	Repair if any springs are off the separation claws.
(6) Abnormal noise is heard.	Check if the rollers and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic solenoids are installed correctly: feed solenoid (clutch), MP feed solenoid (clutch) and registration solenoid (clutch).	Correct.

This page is intentionally left blank.

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 (printed wiring boards), do not touch parts with bare hands. The PWBs are susceptible to static charge.

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 thermal cutout. Never substitute electric wires, as the printer may be seriously damaged.

1-6-2 Removing the process unit

1. Open the front top cover.
2. Open the front cover.
3. Lift the process unit together with the toner container out of the printer.

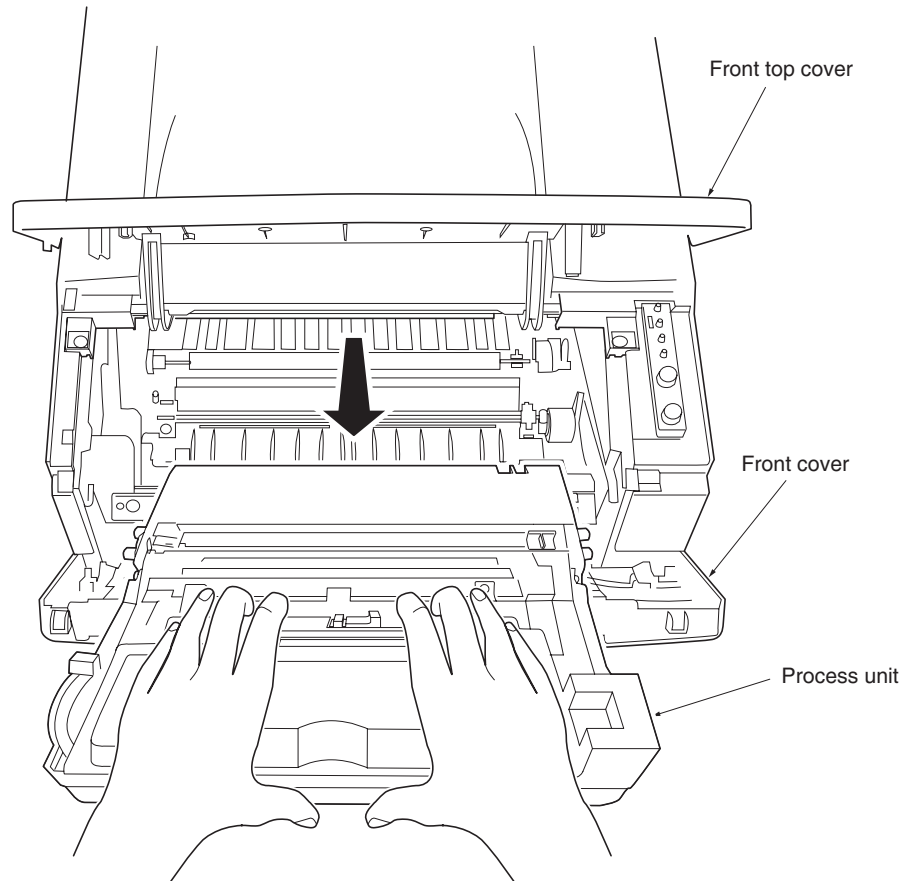


Figure 1-6-1 Removing the process unit

CAUTIONS

After removing the process unit, seal it in the protective bag and place it on flat surface. Do not place the process unit in a dusty area.

Do not give impact to the process unit.

Do not place floppy disks near the process unit.

1-6-3 Removing the principal outer covers

(1) Removing the top cover/output tray

1. Open the top cover.
2. Remove two screws.
3. Remove the top cover/output tray.

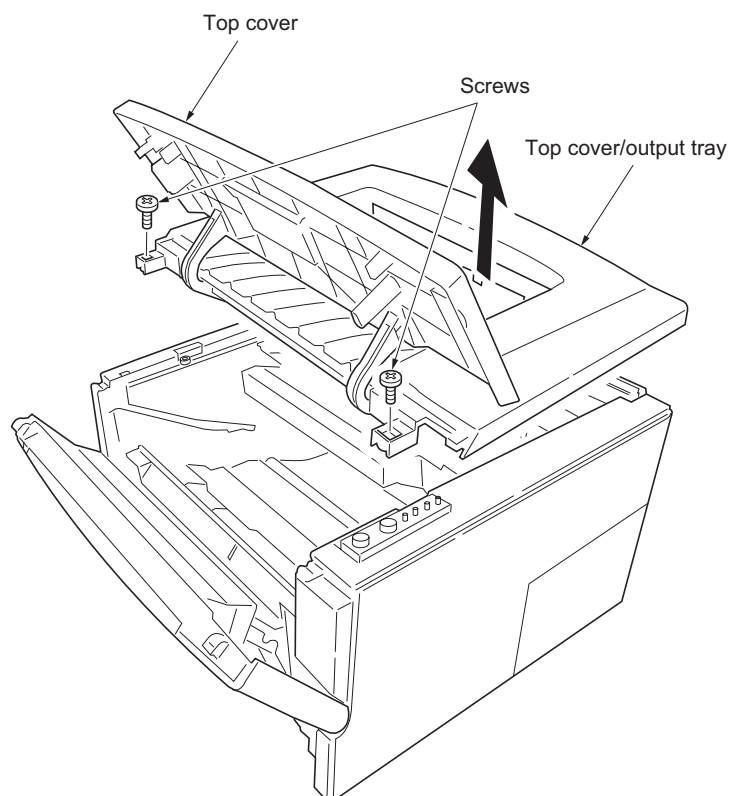
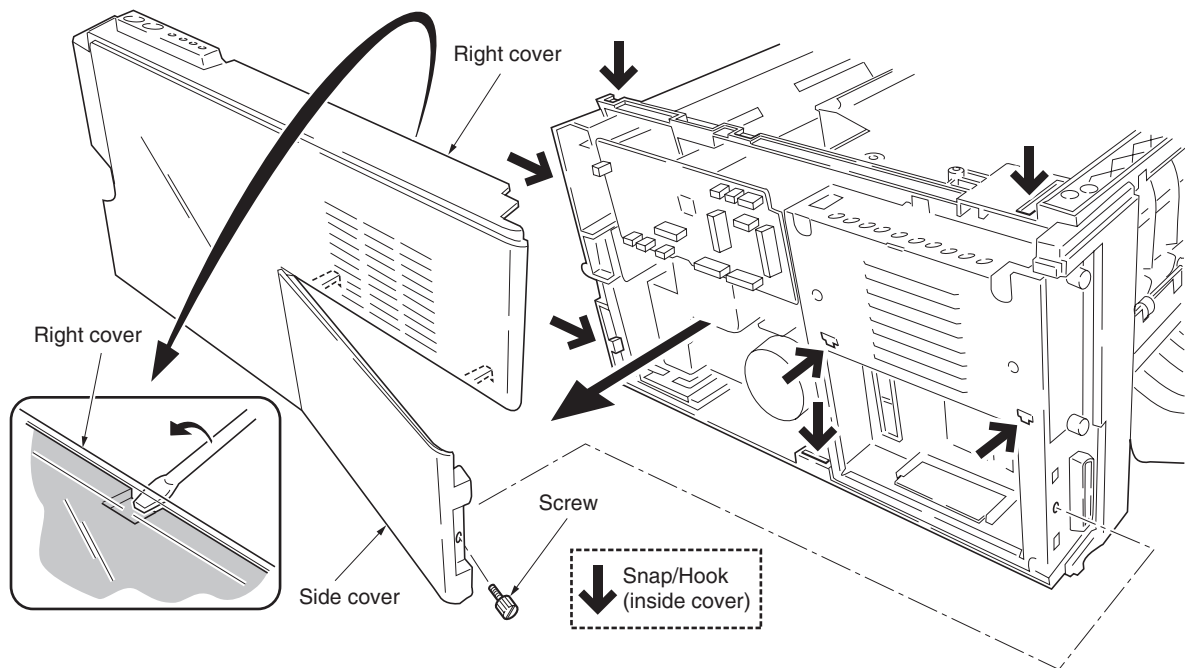


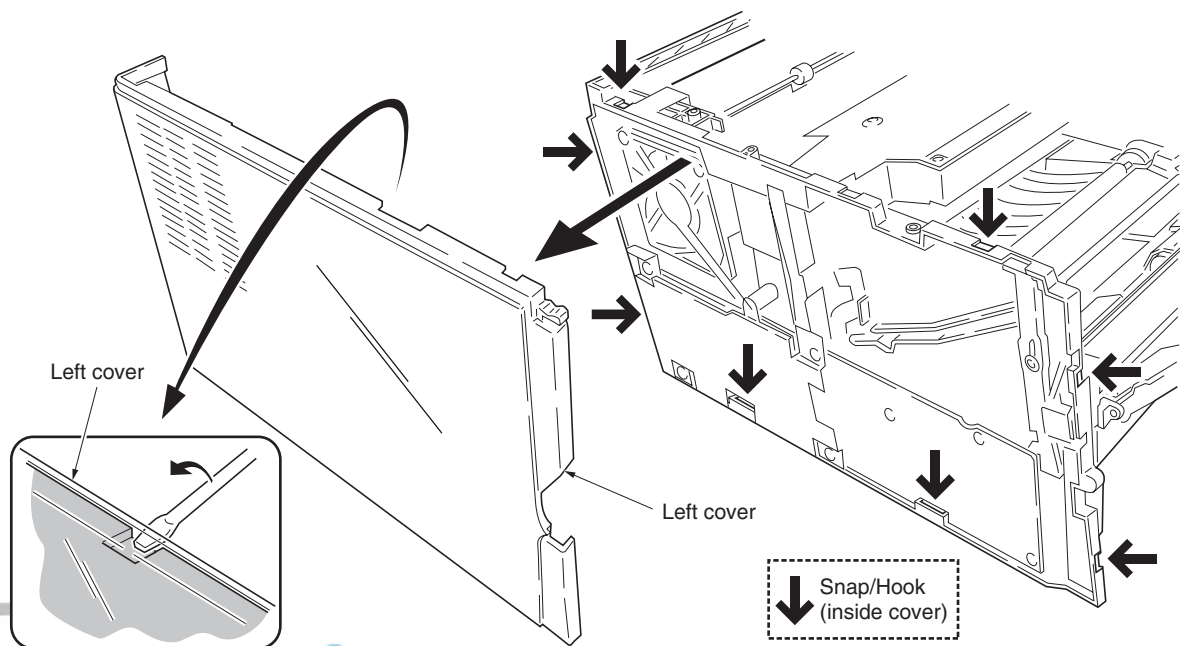
Figure 1-6-2 Removing the top cover/output tray

(2) Removing the right cover

1. Remove one screw.
2. Remove the side cover.
3. Unlatch the six snaps and one hook hole on the chassis, remove the right cover.

**Figure 5-2-3 Removing the right cover****(3) Removing the left cover**

1. Unlatch the six snaps and two hook holes on the chassis, remove the left cover.

**Figure 1-6-4 Removing the left cover**

1-6-4 Removing the feed roller

CAUTION

When refit the feed roller, fit the D-cut shaft into the D-shape hole of the feed roller.

1. Remove the paper cassette and the process unit. (See page 1-6-2)
2. Stand the machine the front side up.
3. Move the feed roller in the direction (A) and remove the feed roller.

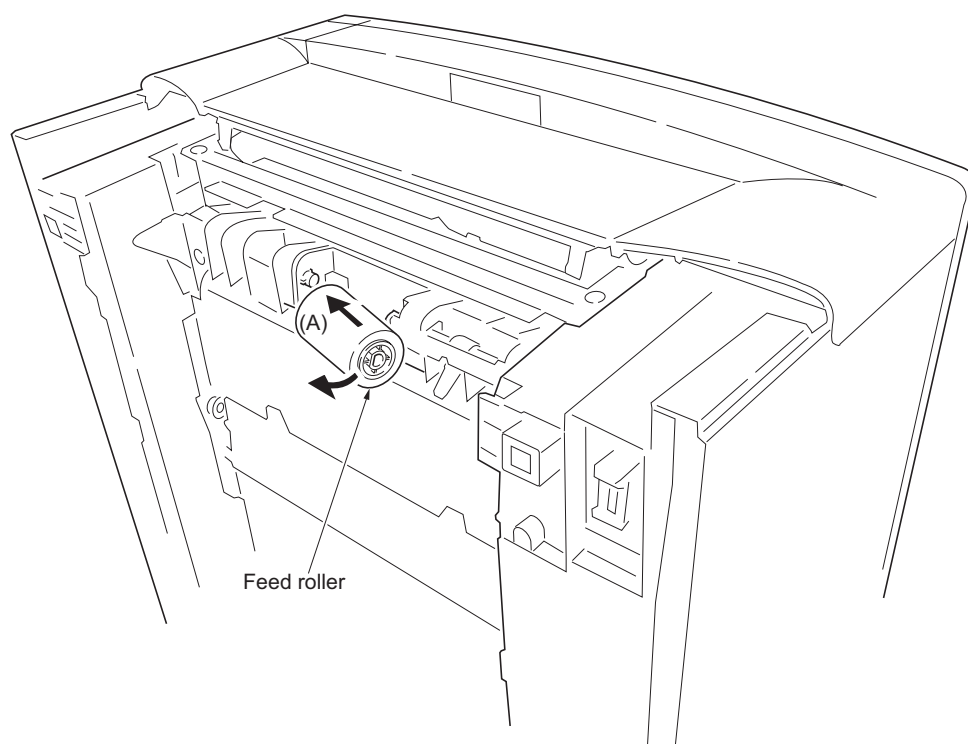


Figure 1-6-5 Removing the feed roller

1-6-5 Removing the MP feed roller

1. Remove the engine PWB (See page 1-6-9).
2. Remove wires from the wire saddles.
3. Remove one screw and then remove the cord cover.
4. Remove the one screw.
5. Remove the grounding plate.
6. Remove one stop ring.
7. Remove the MP feed clutch.

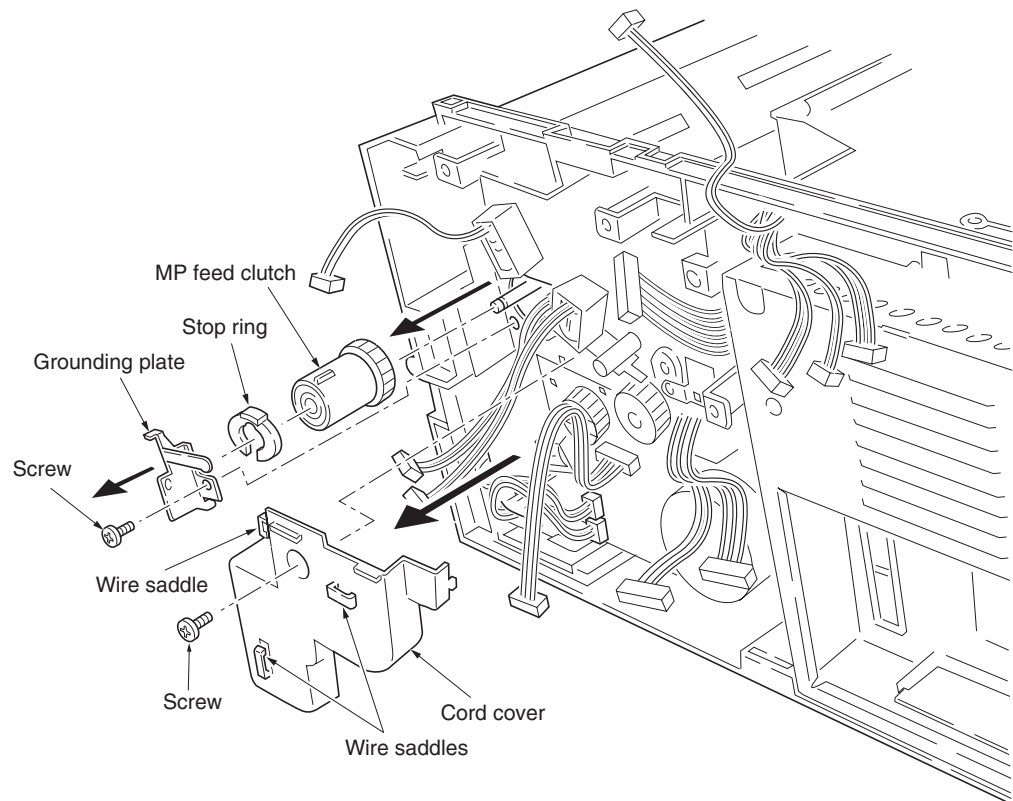


Figure 1-6-6 Removing the MP feed clutch

6. Remove one screw.
7. Remove the toner sensor and spring.
8. While pressing the latch by using the driver and then remove the paper guide.
9. Remove two screws and then remove the MP feed unit.

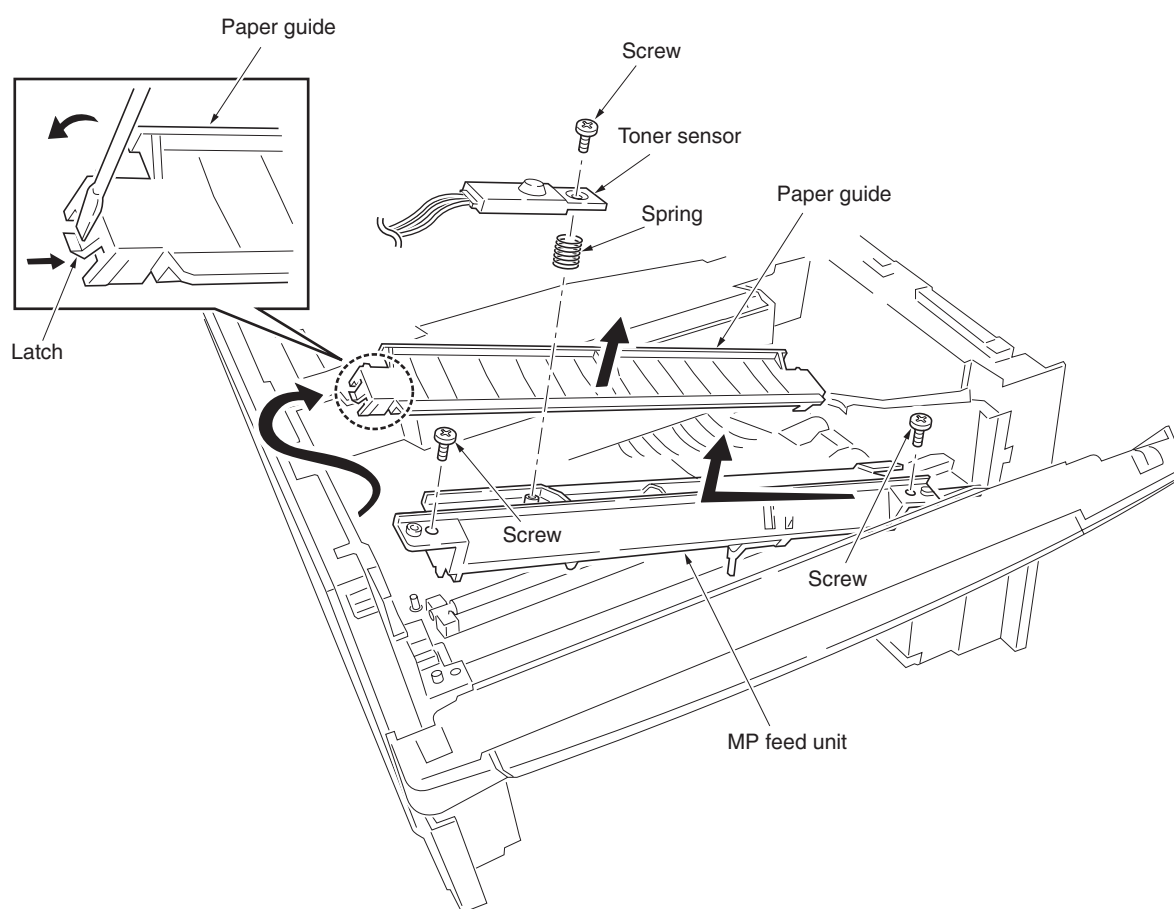


Figure 1-6-7 Removing the MP feed unit

10. Remove one stop ring and then remove the MP feed roller.

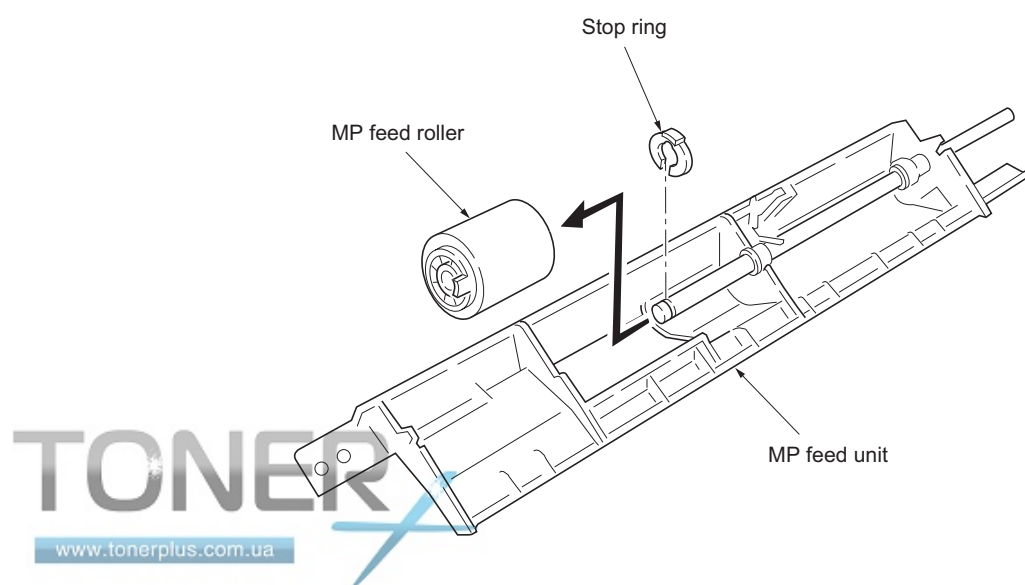


Figure 1-6-8 Removing the MP feed roller

1-6-6 Removing the transfer roller

CAUTION

Do not touch the transfer roller (sponge) surface. Oil and dust (particles of paper, etc.) on the transfer roller can significantly deteriorate the print quality (white spots, etc.).

When refitting the bushes and springs, make sure to refit the black colored bush and spring on the left side. Also, observe the correct direction to which the bush is fit in reference to the paper passing direction.

1. Remove the process unit (See page 1-6-2).
2. Remove the transfer roller from the both bushes.

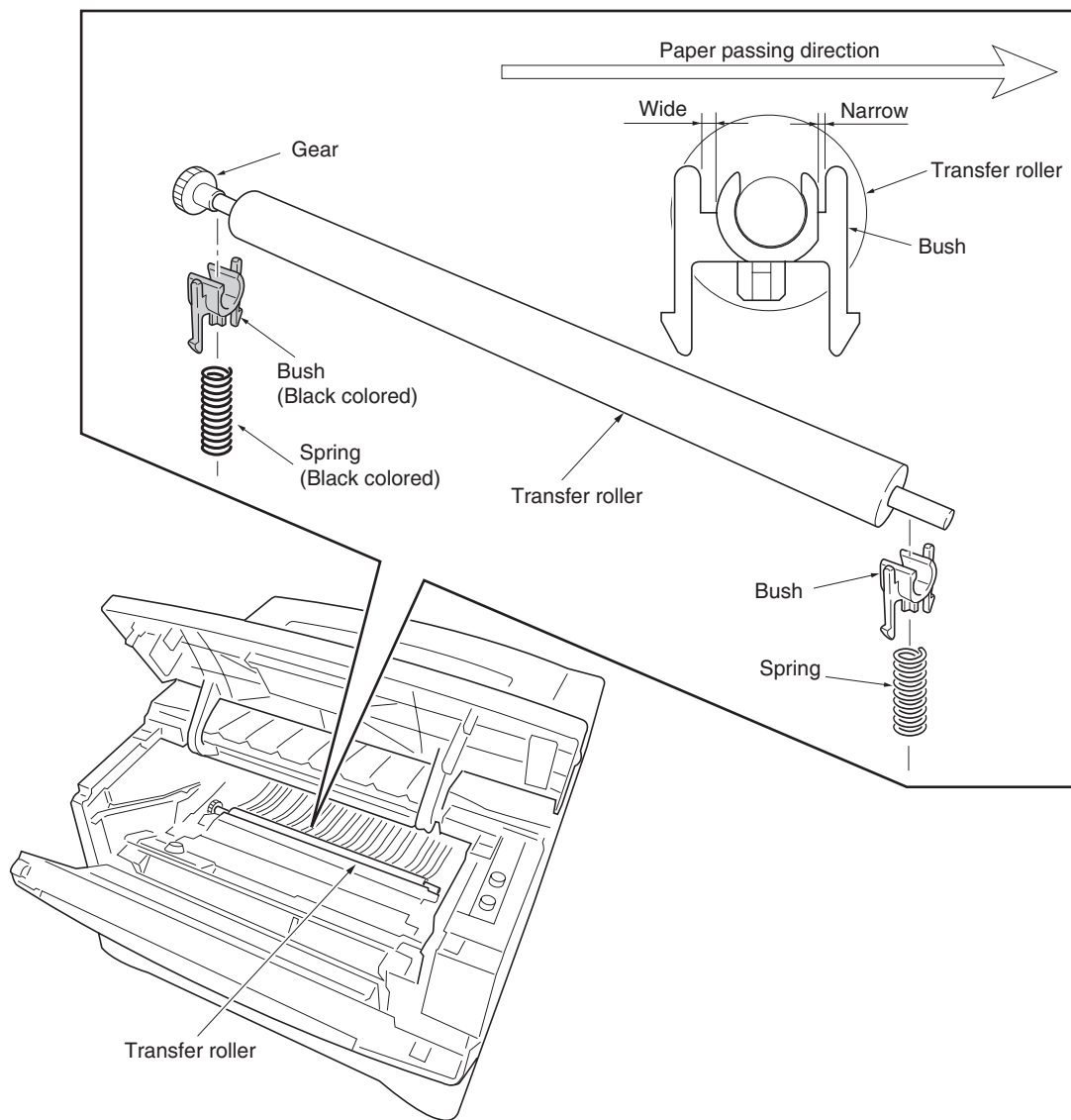


Figure 1-6-9 Removing the transfer roller

1-6-7 Removing the principal PWBs

(1) Removing the engine PWB

1. Remove the right cover (See page 1-6-4).
2. Remove all (twelve) connectors from the engine PWB.
3. Remove three screws.
4. Remove the engine PWB.

* When replacing the PWB with a new PWB, remove the EEPROM (U2) from the old PWB and mount it to the new PWB.

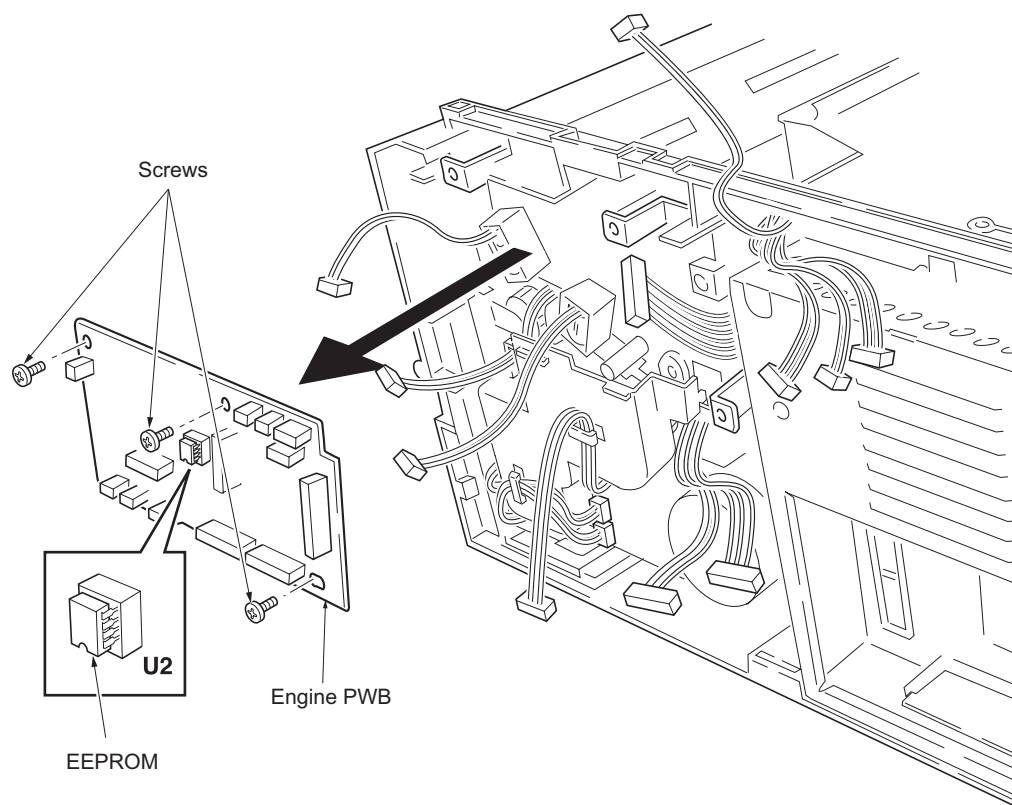


Figure 1-6-10 Removing the engine PWB

(2) Removing the main PWB

1. Remove the process unit (See page 1-6-2).
2. Remove the top cover/face-down output tray and right cover (See pages 1-6-3 and 1-6-4).
3. Remove two connectors from main PWB.
4. Remove six screws.
5. Remove the controller box (with main PWB).

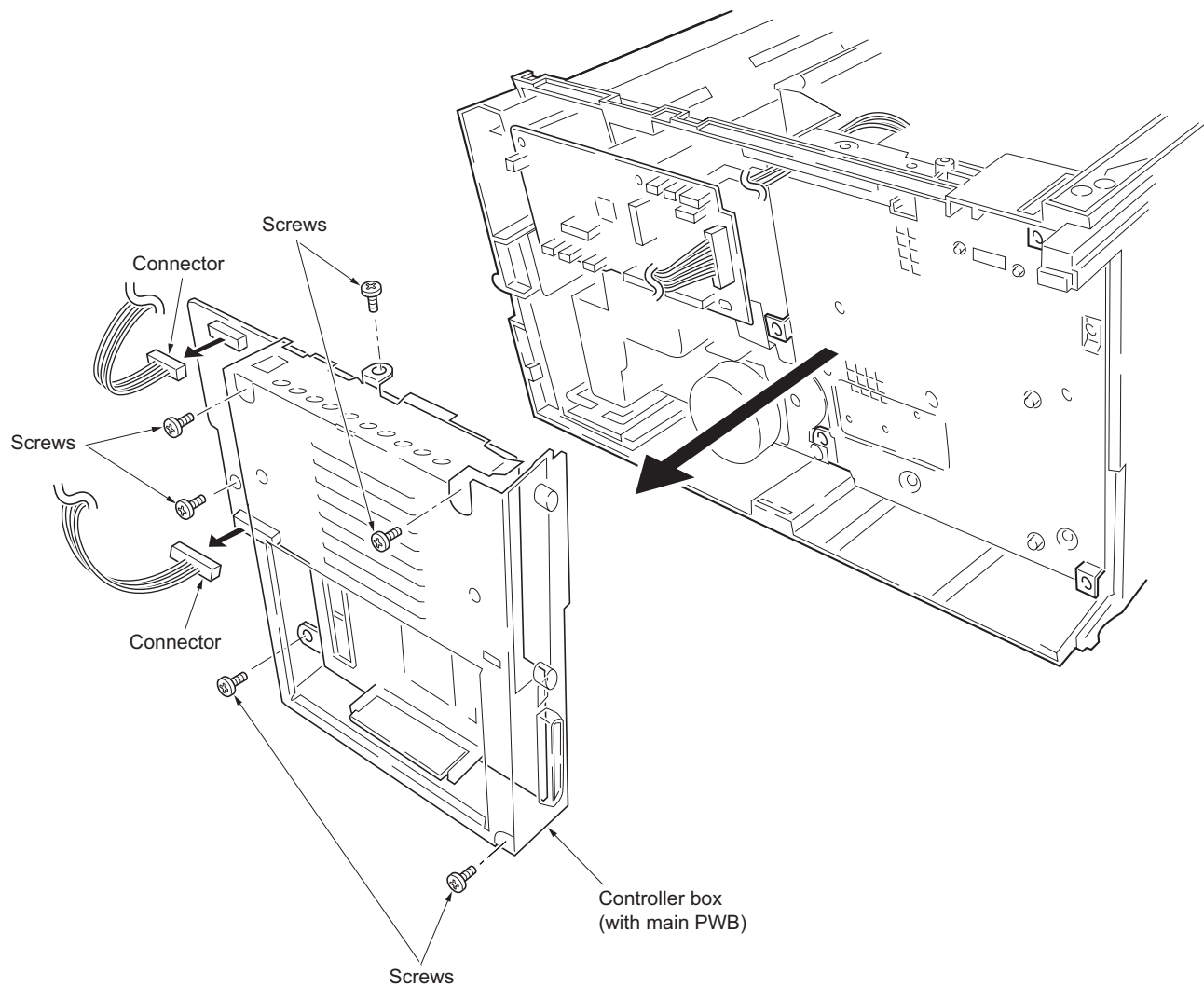


Figure 1-6-11 Removing the controller box (with main PWB)

6. Remove two screws at the back of the main PWB.
7. Remove three screws from the parallel interface connector and USB connector.
8. Remove the main PWB.

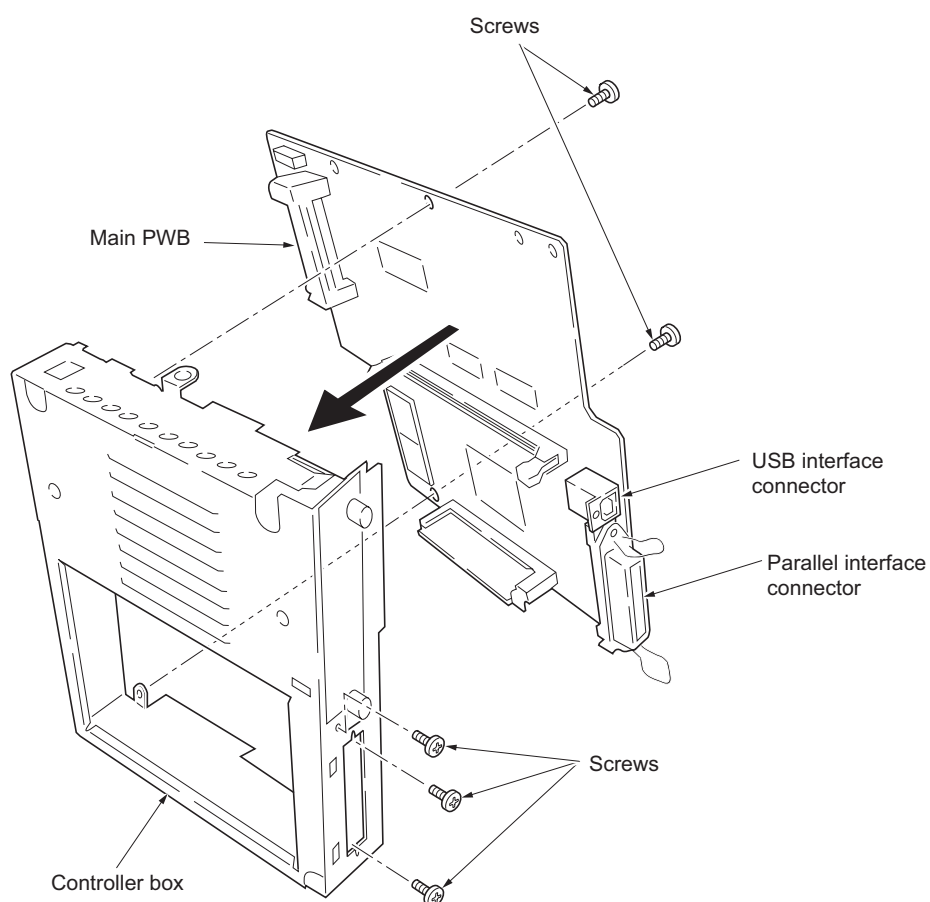


Figure 1-6-12 Removing the main PWB

(3) Removing the power supply unit and high voltage unit

1. Remove the process unit (See page 1-6-2).
2. Remove the left cover (See page 1-6-4).
3. Remove three connectors from the power supply unit.
4. Remove nine screws.
5. Remove the power supply unit and high voltage unit. (Note: The high voltage unit is directly connected to the bias PWB.)
6. Separate the high voltage unit from the power supply unit.

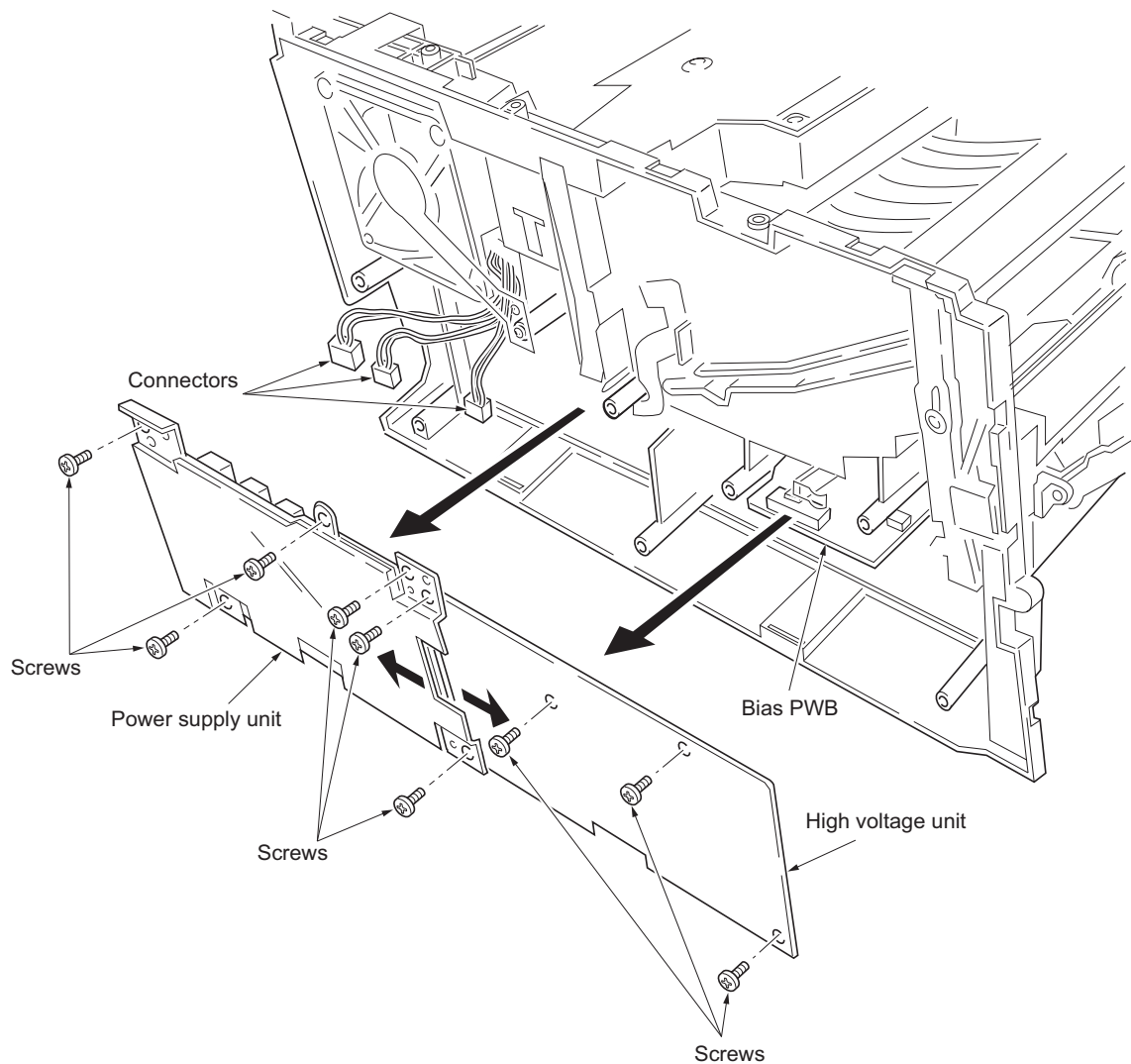
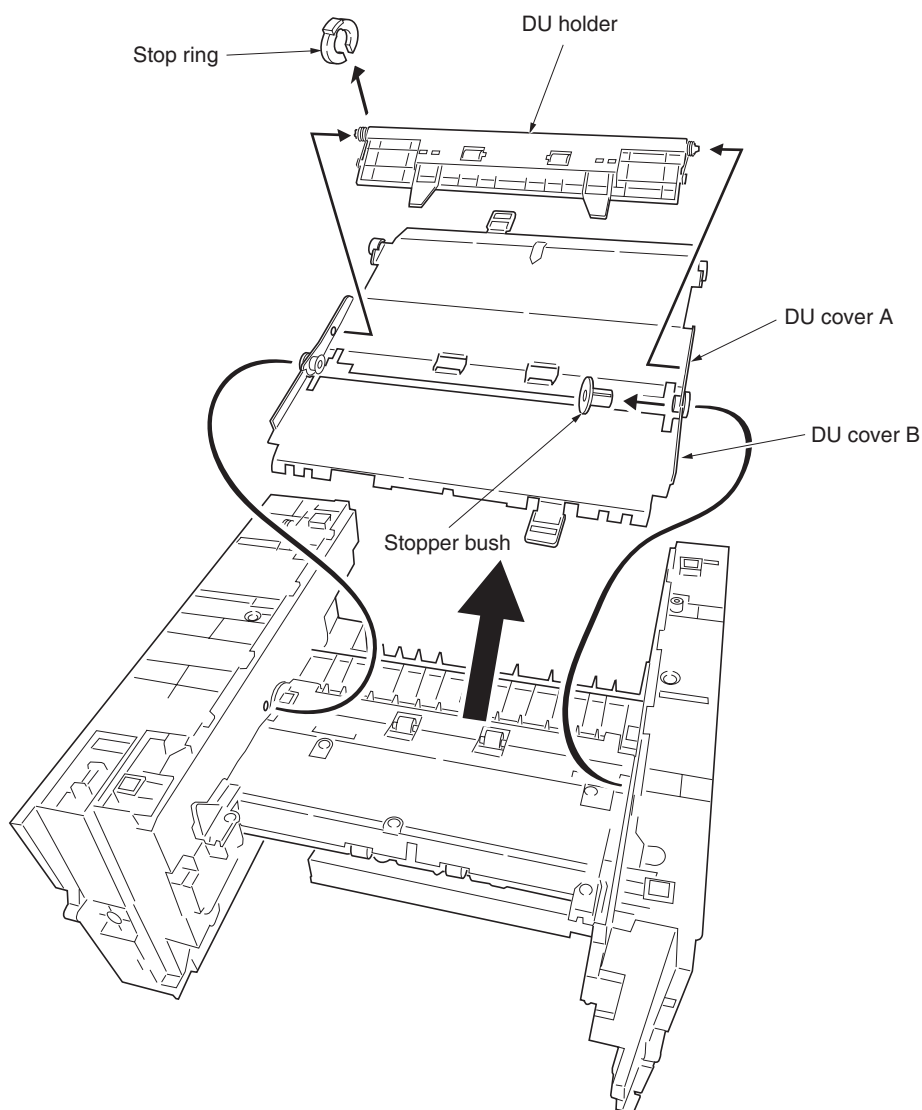


Figure 1-6-13 Removing the power supply unit and high voltage unit

(4) Removing the bias PWB

1. Remove the cassette and process unit (See page 1-6-2).
2. Remove the left cover (See page 1-6-4).
3. Remove the power supply unit and high voltage unit (See the previous page).
4. Turn the machine with the bottom side up.
5. Remove the one stop ring and then remove the DU holder.
6. Remove one stopper bush and then remove the DU cover A and B.

**Figure 1-6-14 Removing the DU cover A and B**

2G6

7. Remove five screws.
8. Remove the bottom cover.
9. Remove the three connectors from the bias PWB.
10. Remove the bias PWB.

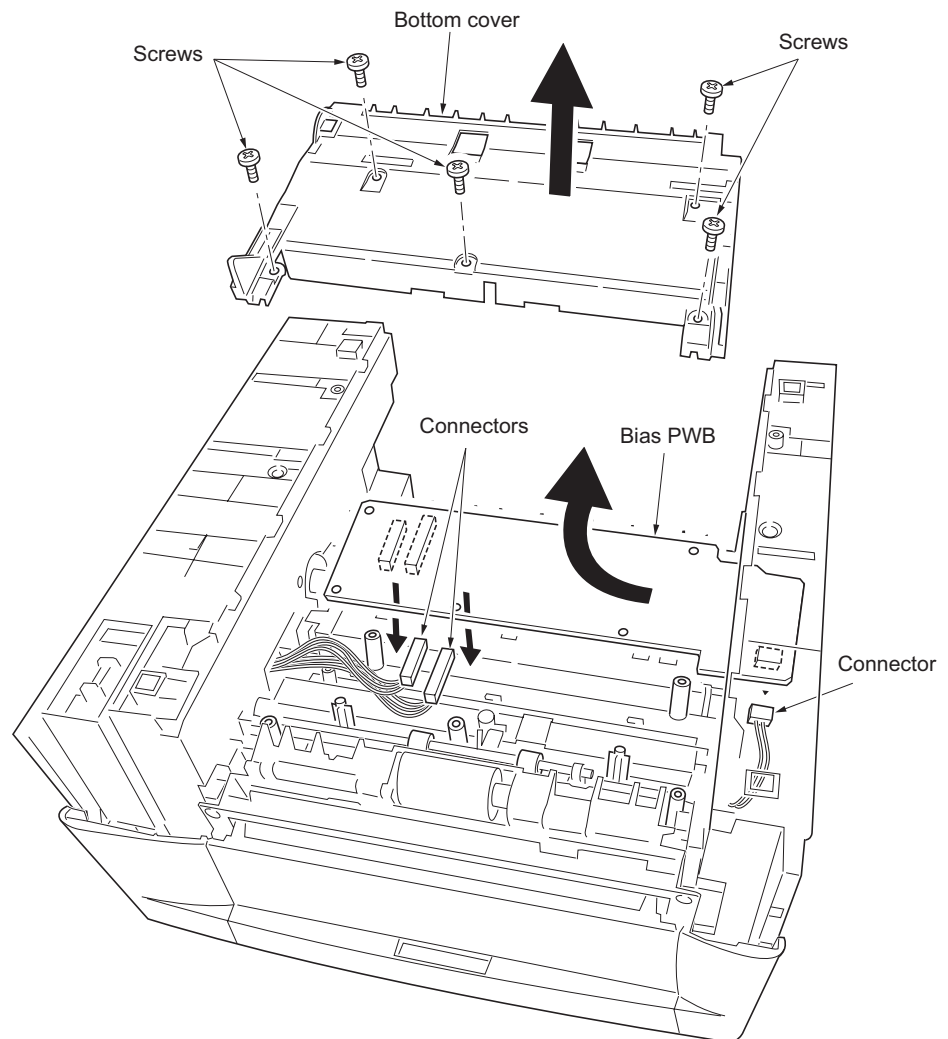


Figure 1-6-15 Removing the bias PWB

1-6-8 Removing the main motor and drive unit

1. Remove the cassette and process unit (See page 1-6-2).
2. Remove the right cover (See page 1-6-4).
3. Remove three connectors from the main motor.
4. Remove four screws.
5. Remove main motor.

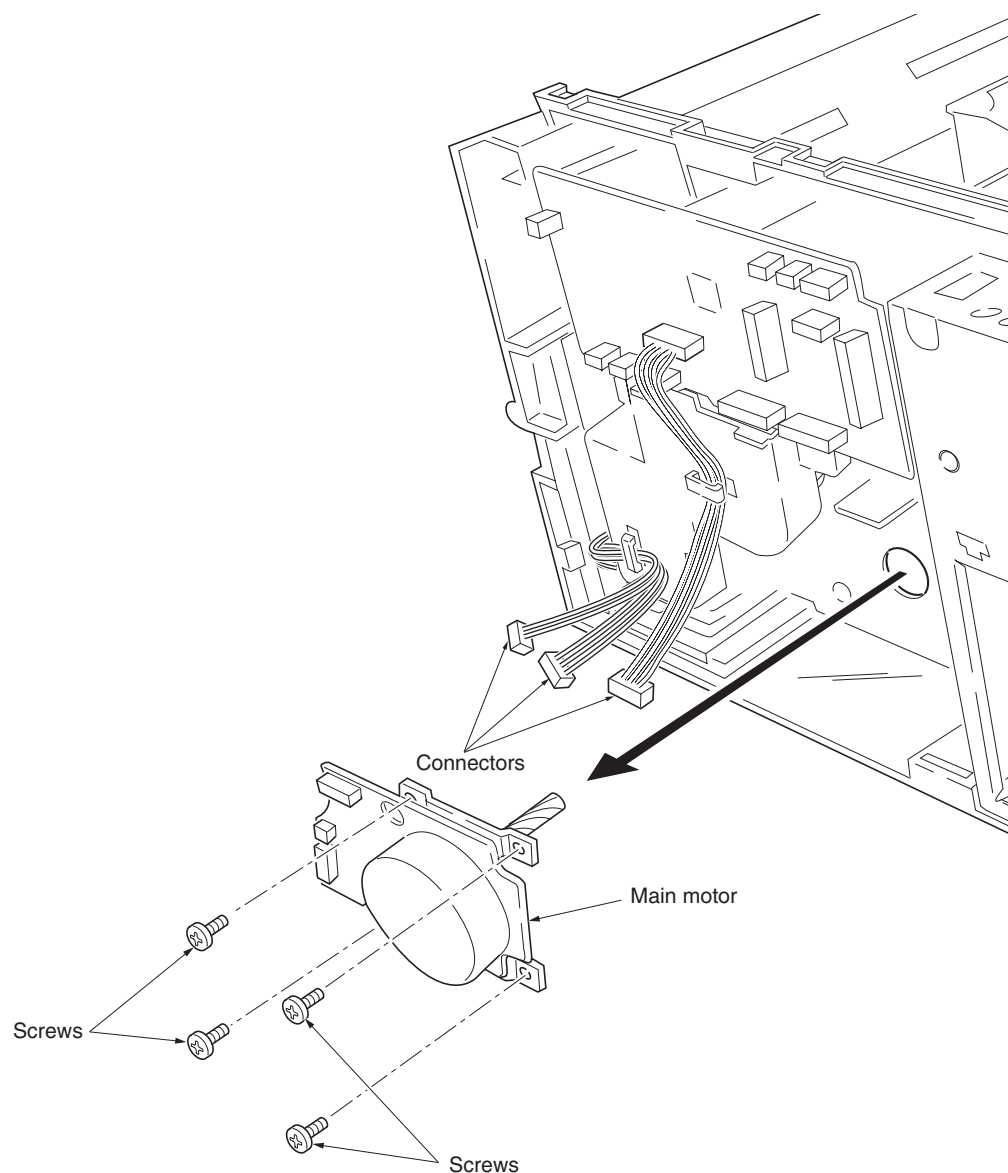


Figure 1-6-16 Removing the main motor

6. Remove the engine PWB (See page 1-6-9).
7. Remove wires from wire saddles on the cord cover.
8. Remove one screw.
9. Remove the cord cover.

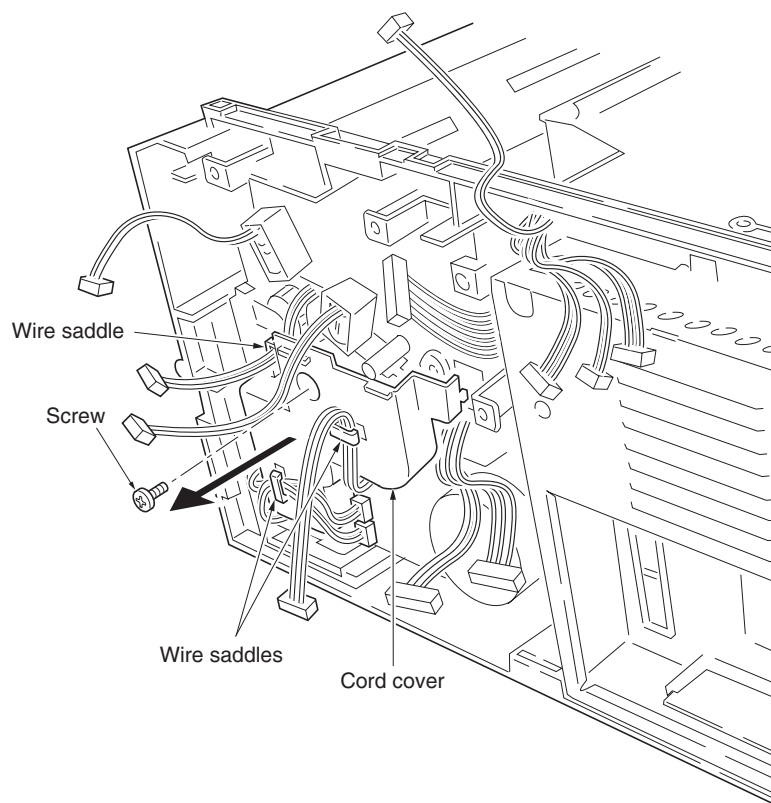


Figure 1-6-17 Removing the cord cover

10. Remove the main PWB (See page 1-6-10).
11. Remove one screw and then remove the grounding plate.
12. Remove one screw and then remove the feed solenoid.
13. Remove three stop rings.
14. Remove MP feed clutch (gear), feed clutch (gear), and registration clutch (gear).

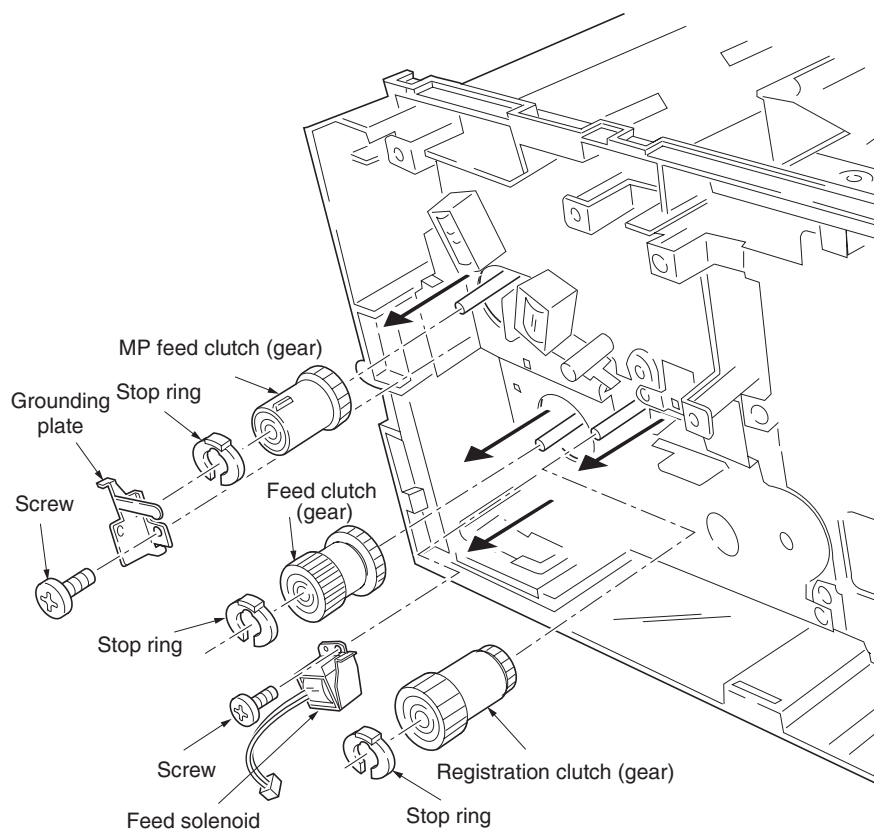


Figure 1-6-18 Removing the clutches

2G6

15. Remove the four screws.
16. Remove the drive unit.

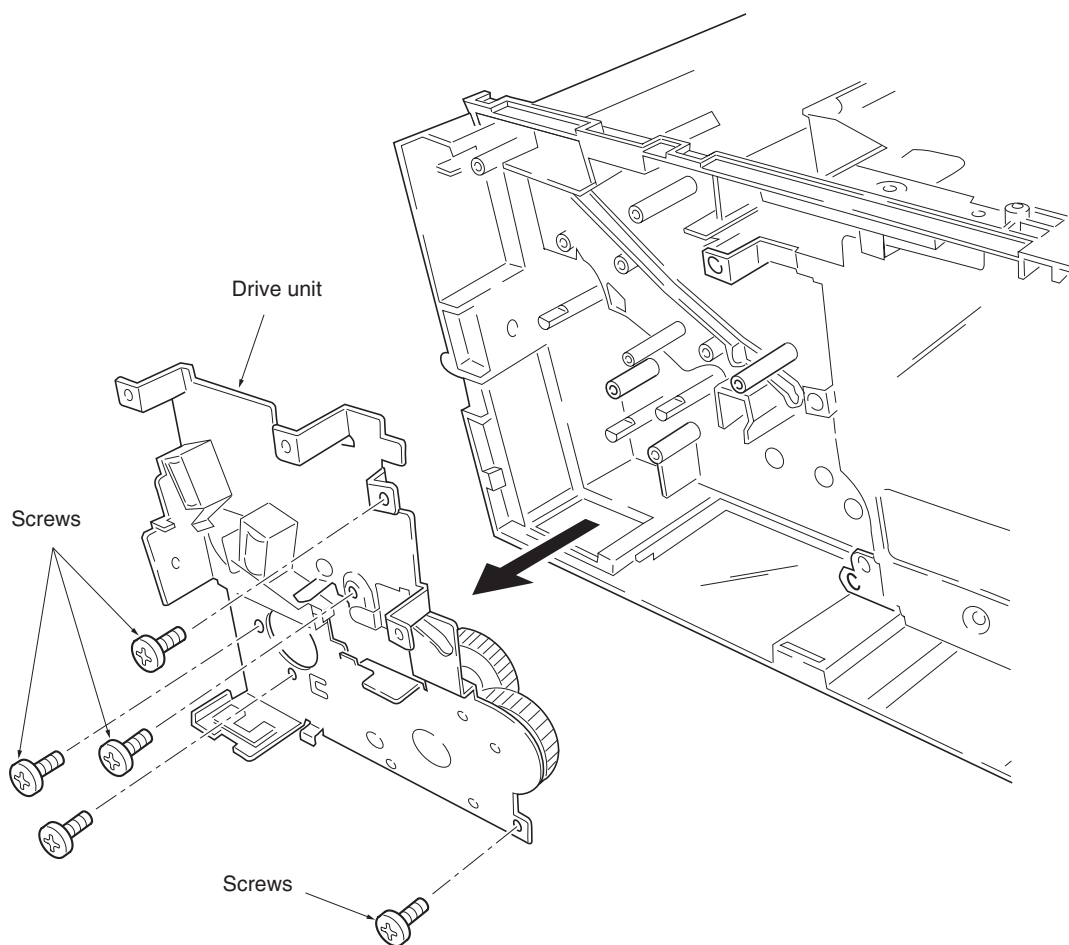


Figure 1-6-19 Removing the drive unit

1-6-9 Removing and splitting the fuser unit

WARNING

The fuser unit is hot after the printer was running. Wait until it cools down.

CAUTION

When refitting the fuser unit, make sure the fuser unit gear and the printer's drive gear are properly meshed with each other. For this, rotate the main motor several turns before fixing screws.

1. Remove the rear side cover.
2. Remove the right and left cover (See page 1-6-4).
3. Remove the two connectors.
4. Remove two screws.
5. Remove the fuser unit.

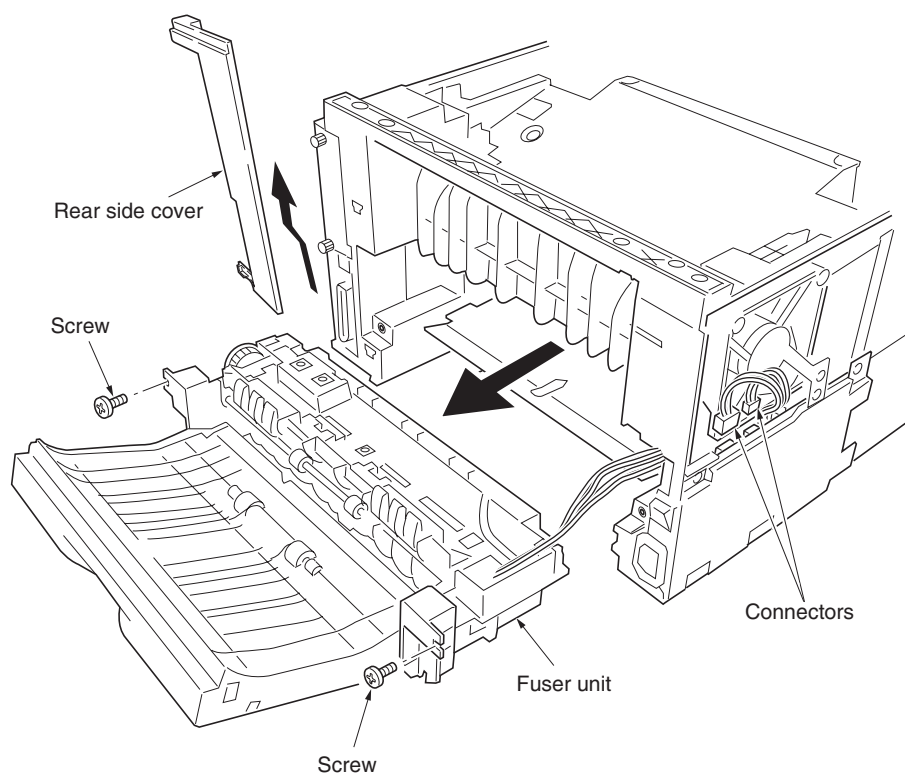


Figure 1-6-20 Removing the fuser unit

2G6

6. Remove two screws.
7. Open and split the fuser unit.

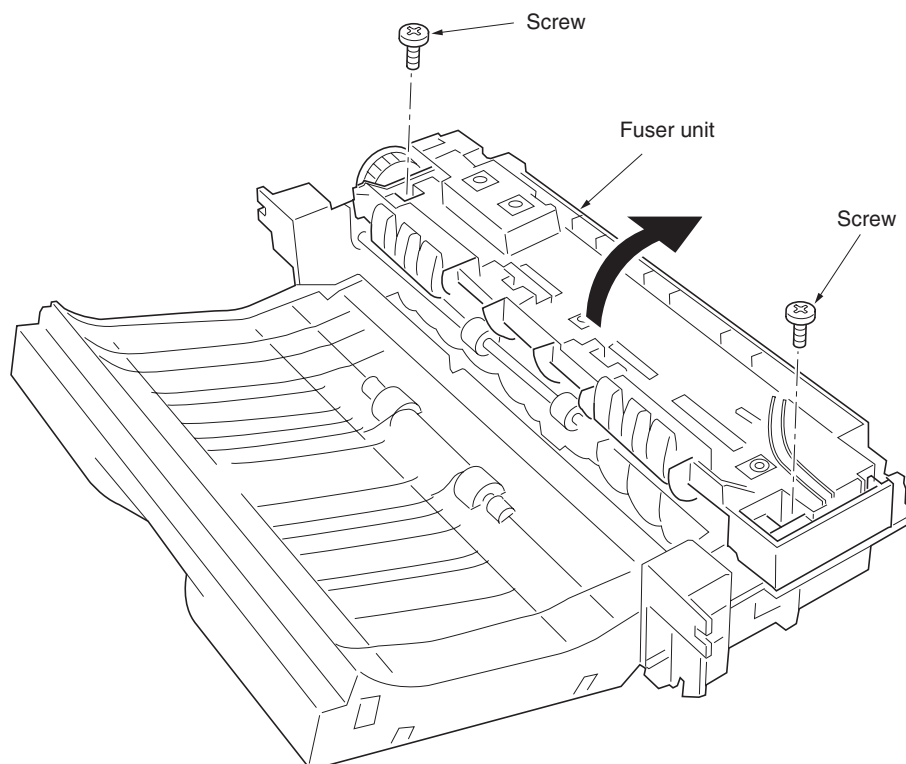


Figure 1-6-21 Splitting the fuser unit

(1) Removing the separation claws

WARNING

The separation claws are extremely hot immediately after the printer was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-19).
2. Loosen the stopper screws.
3. Hold the separation claw upright, and remove the separation claw and separation claw springs.

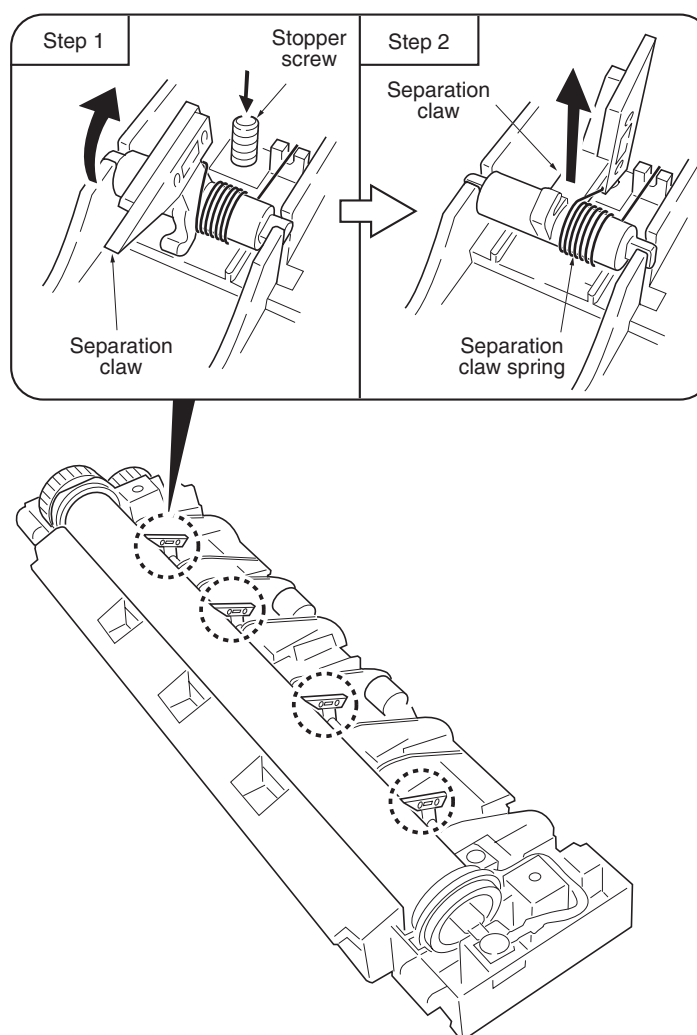


Figure 1-6-22 Removing the separation claws

(2) Removing the heater lamp**WARNING**

The heater lamp is extremely hot immediately after the printer was running.
Allow substantial period of time until it cools down. Also, the heater lamp is fragile: Handle it with great care.

CAUTION

The heater lamps are fragile. Use extreme care when handling not to drop or break.
Do not directly touch on the heater lamp. Finger prints on the heater lamp's outer surface can prevent proper fusing of toner on paper. When holding
When refitting the heater lamp, direct the voltage and wattage marking facing the machine's right (Heat gear Z33) side.

1. Remove and split the fuser unit (See page 1-6-19).
2. Remove all (four) separation claws (See previous page).
3. Remove two screws.
4. Remove the heater lamp from the heat roller.

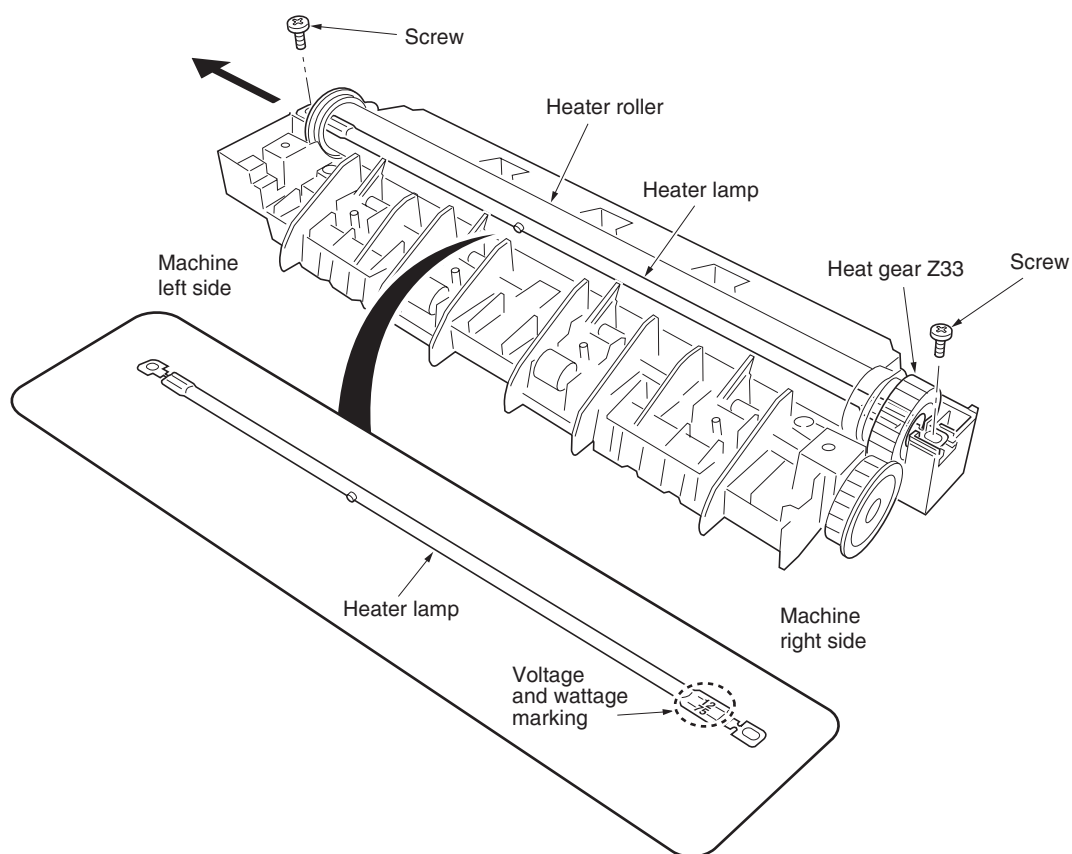


Figure 1-6-23 Removing the heater lamp

(3) Removing the heat roller

WARNING

The heat roller is extremely hot immediately after the printer was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-19).
2. Remove the heater lamp (See previous page).
3. Press the lamp A holder away from the heat roller. Pull up both heat R bush and heat L bush at the same time.

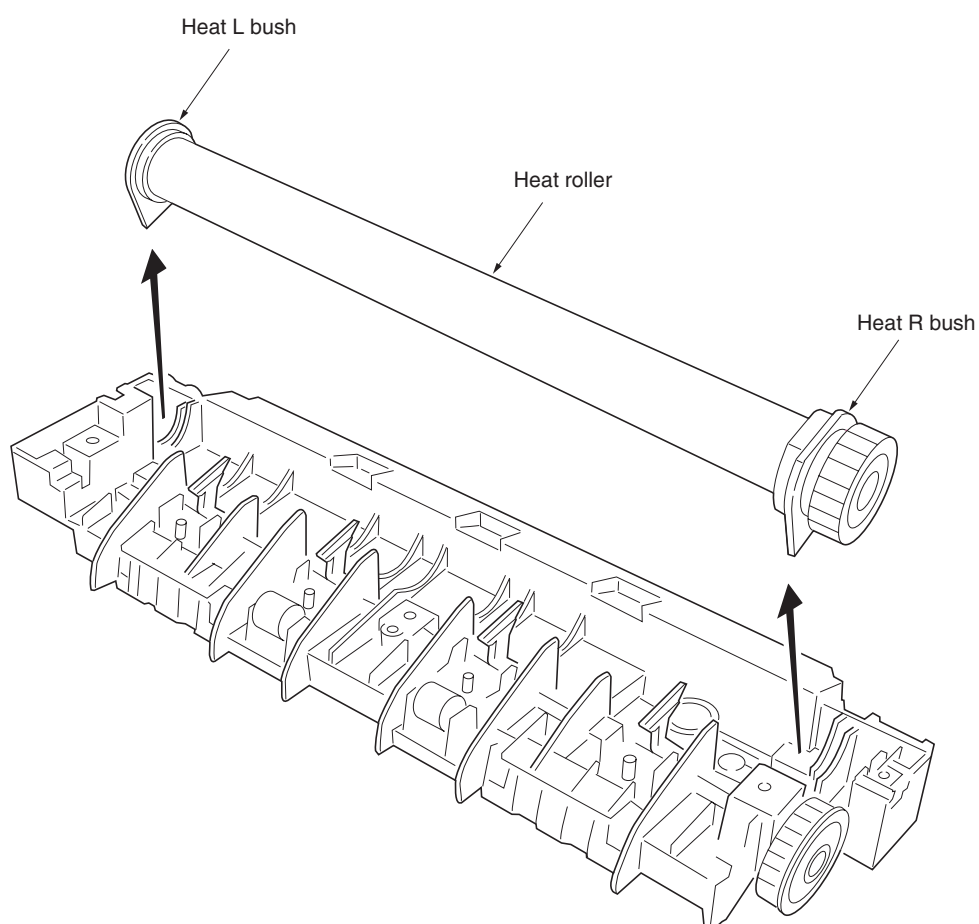


Figure 1-6-24 Removing the heat R bush and heat L bush

4. Remove the heat gear Z33, heat R bush, and heat L bush from the heat roller.

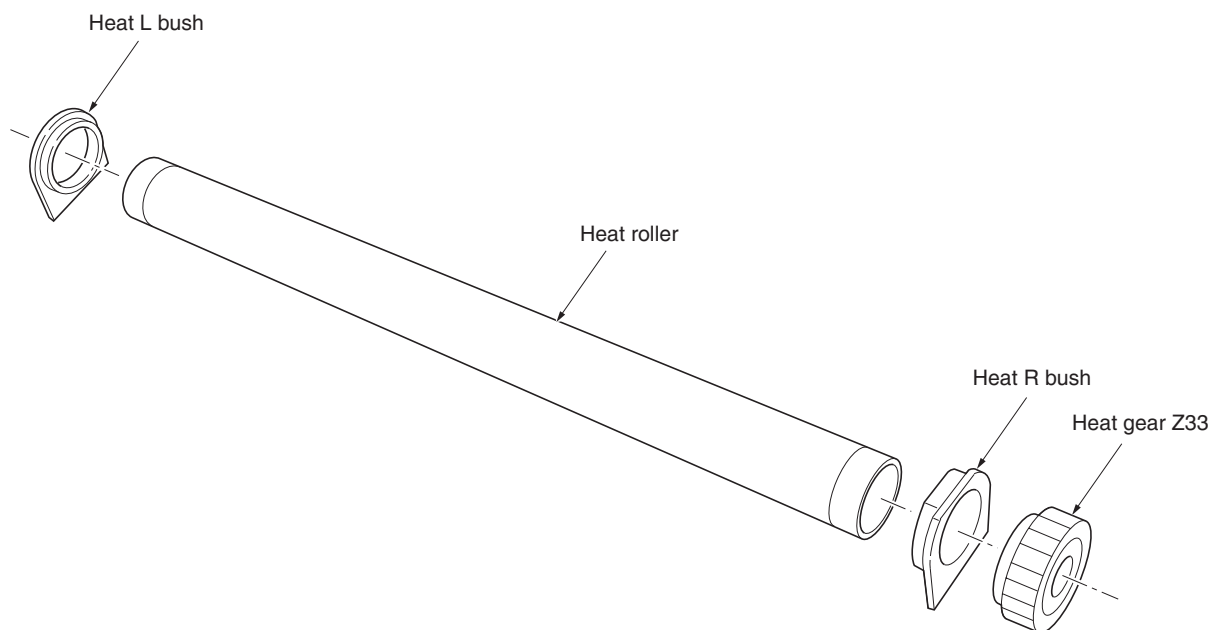
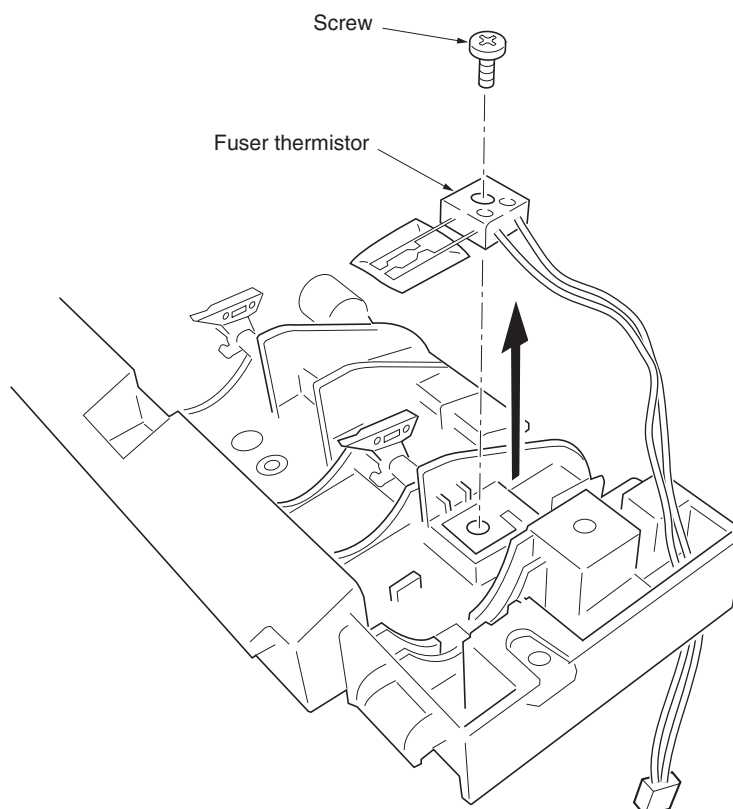


Figure 1-6-25 Removing the heat roller

(4) Removing the fuser thermistor

1. Remove and split the fuser unit (See page 1-6-19).
2. Remove the heater lamp (See page 1-6-22).
3. Remove the heat roller (See page 1-6-23).
4. Remove one screw.
5. Remove the fuser thermistor.

**Figure 1-6-26 Removing the fuser thermistor**

(5) Removing the thermal cutout**CAUTION**

Do not bend the terminals of the thermal cutout.

1. Remove and split the fuser unit (See page 1-6-19).
2. Remove the heater lamp (See page 1-6-22).
3. Remove the heat roller (See page 1-6-23).
4. Remove the two screws.
5. Remove the thermal cutout.

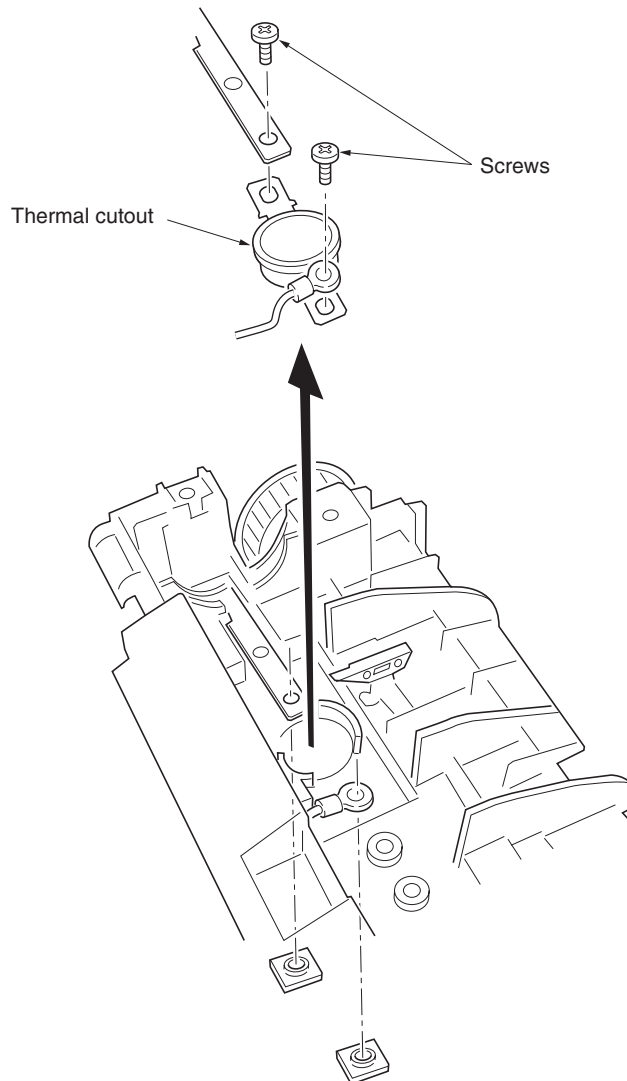


Figure 1-6-27 Removing the thermal cutout

(6) Removing the press roller

WARNING

The press roller is extremely hot immediately after the printer was running. Allow substantial period of time until it cools down.

1. Remove and split the fuser unit (See page 1-6-19).
2. Remove the press roller from the fuser unit.

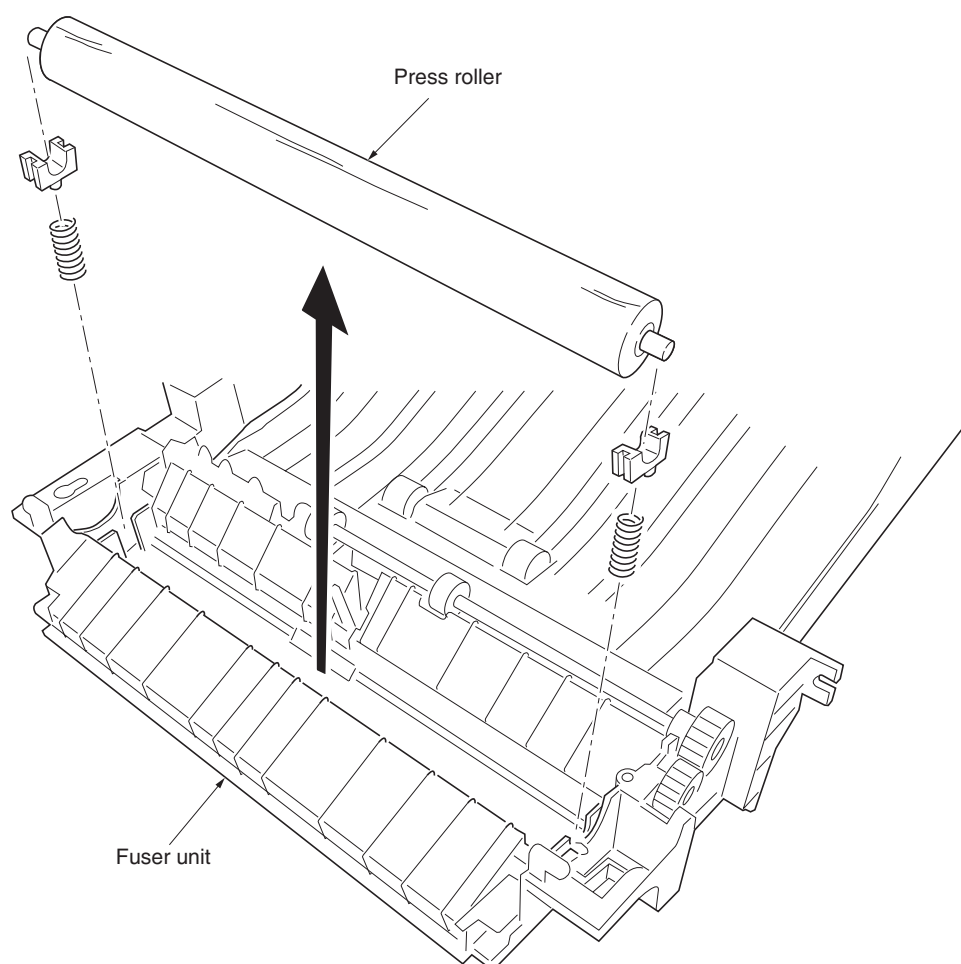


Figure 1-6-28 Removing the press roller

1-6-10 Removing the laser scanner unit and the eraser lamp

1. Remove the right cover and left cover (See page 1-6-4).
2. Remove four connectors.
3. Remove the scanner seal.
4. Remove six screws and then remove the LSU shield.

* When refitting the LSU shield, tighten a screw in order of ④ from ①.

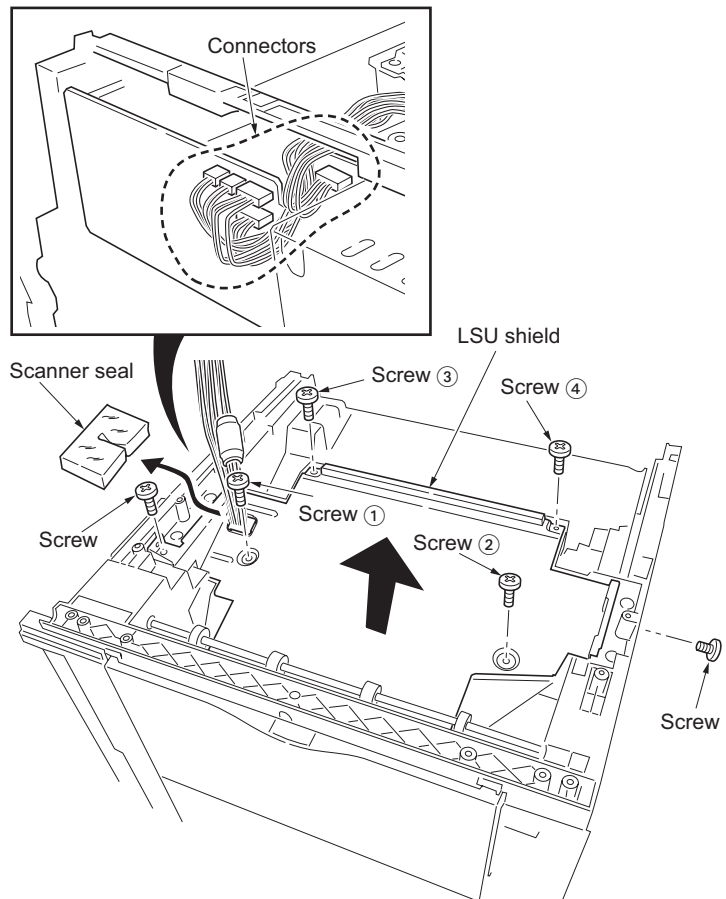


Figure 1-6-29 Removing the LSU shield

4. Remove three screws.
 5. Remove two connectors from the laser scanner unit.
 6. Remove the laser scanner unit.
- * When refitting the laser scanner unit, tighten a screw in order of ③ from ①.

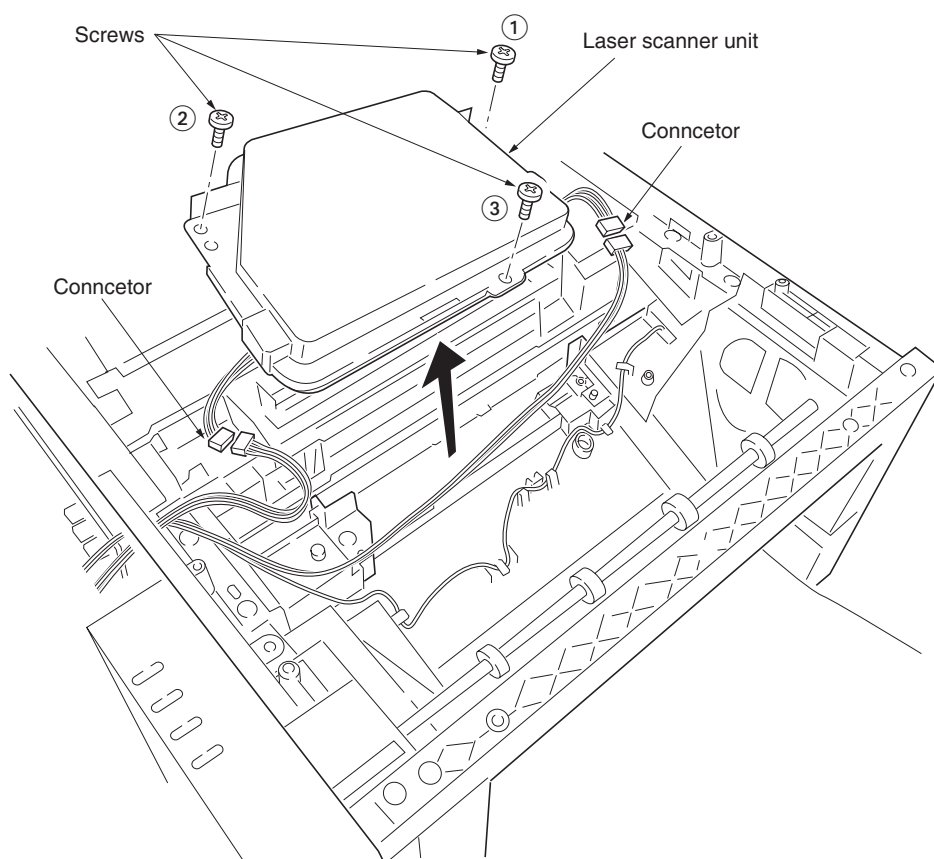
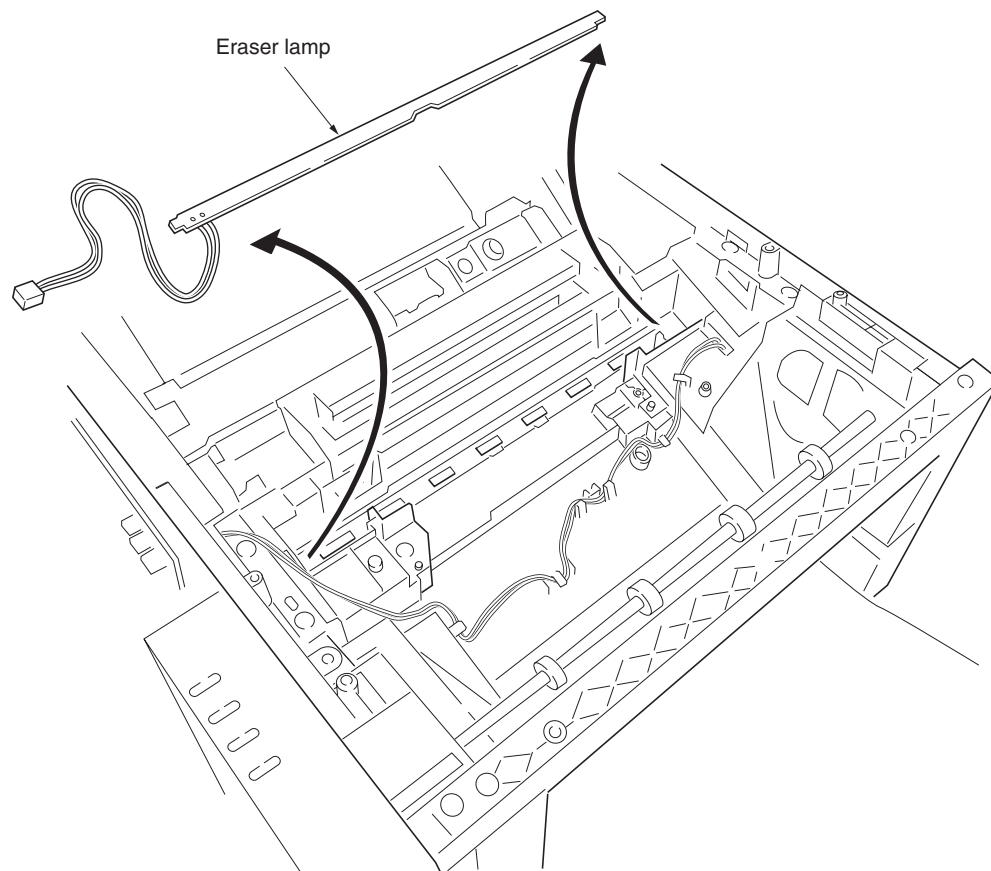


Figure 1-6-30 Removing the laser scanner unit

2G6

7. Remove the eraser lamp.



1-6-31 Removing the eraser lamp

1-6-11 Removing the main charger unit

1. Remove the process unit from the printer (See page 1-6-2).
2. Unlatch the three snaps, and remove the main charger cap.
3. Draw the main charger unit in the direction of arrow (A), then pull it out in the direction of arrow (B).

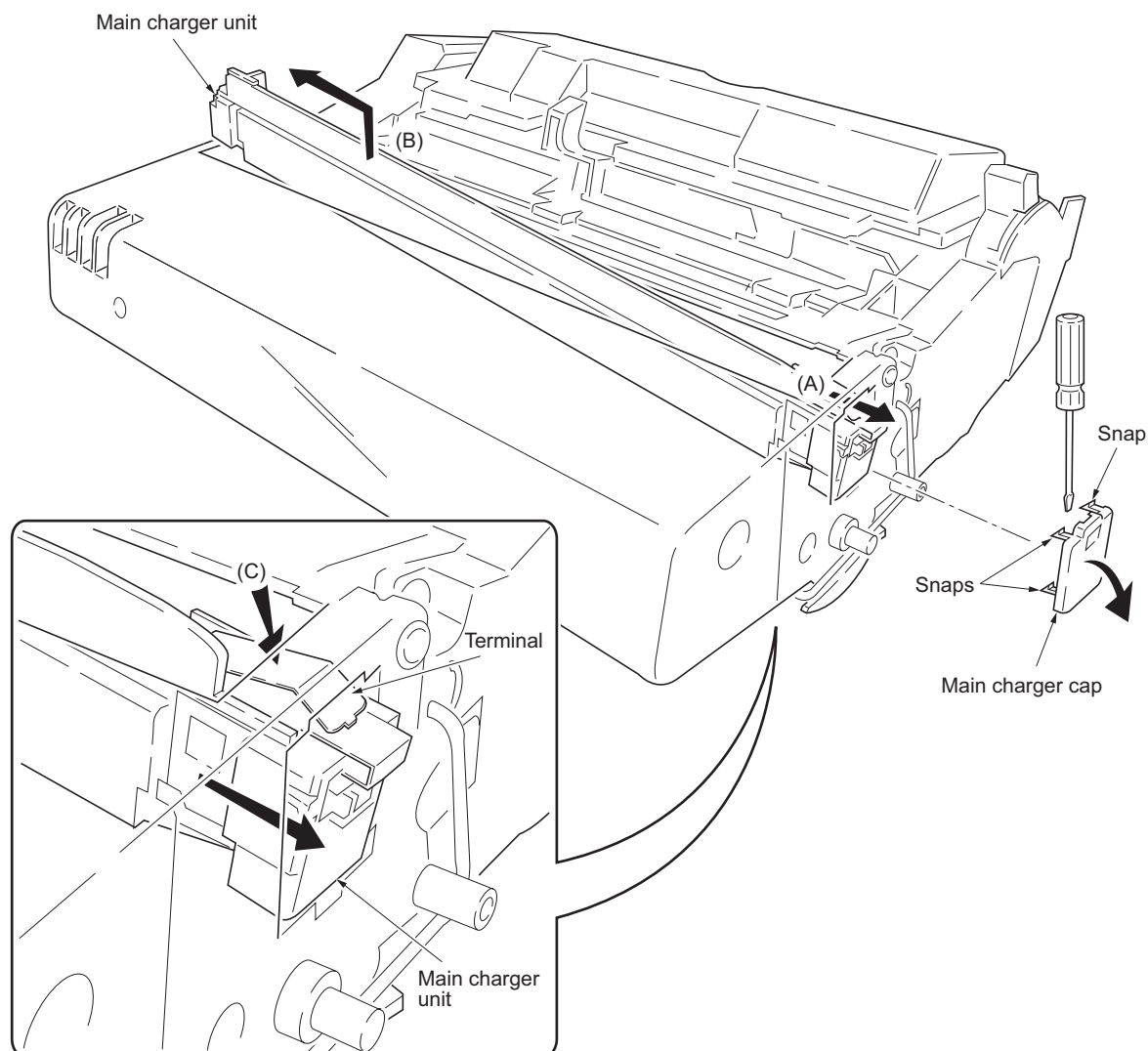


Figure 1-6-32 Removing the main charger unit

CAUTION

When refitting the main charger unit, hold terminal down (C), then push frontwards. Use care not to deform the terminal.

This page is intentionally left blank.

1-7-1 Upgrading the firmware on the main PWB

Updating the system (controller) firmware is possible by downloading the firmware through the parallel interface or through the memory card (CompactFlash). These firmware programs are directly overwritten in the system DIMM (Flash ROM type only) on the main PWB. The operation panel message in different languages can also be downloaded through the parallel interface or through the memory card.

(1) Firmware program data format

System firmware

The data to be downloaded are supplied in the following format:

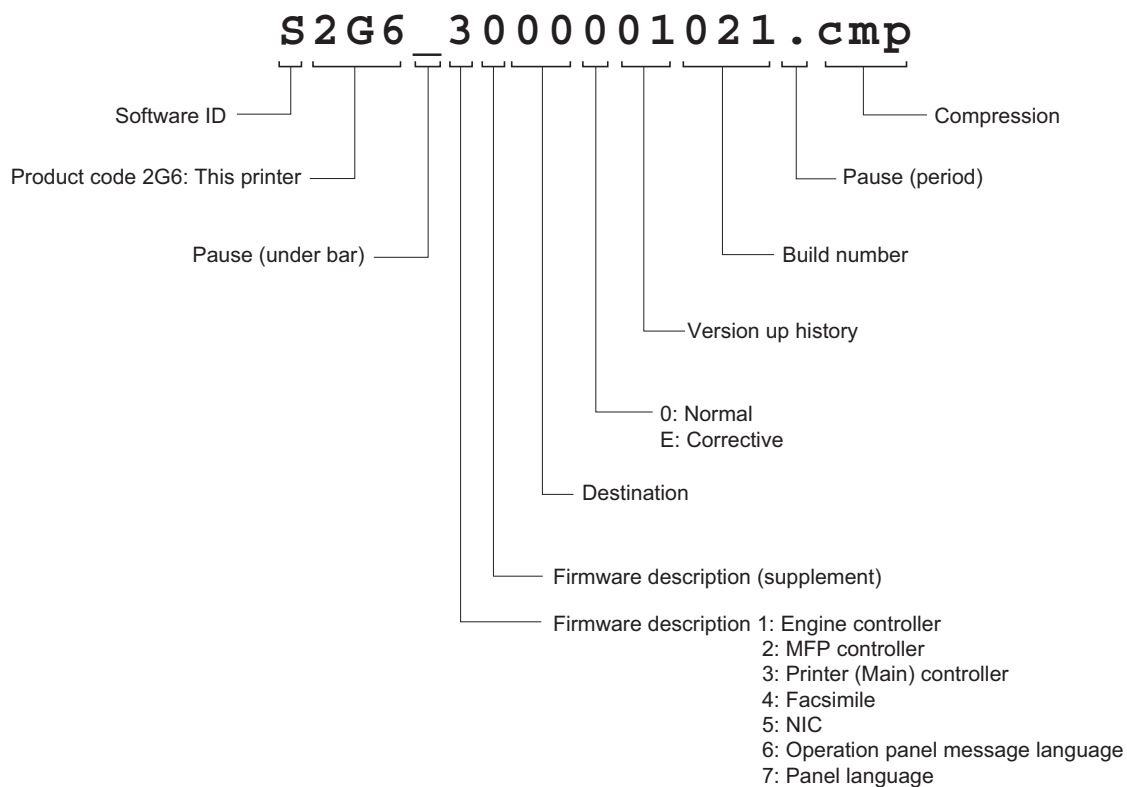


Figure 1-7-1 Firmware program data format

(2) Downloading the firmware from the parallel interface

This section explains how to download firmware data from the parallel interface. The printer system can automatically recognize whether the data to be overwritten is for controller firmware.

CAUTION

Downloading the firmware takes several minutes. Do not turn power off during downloading.

NOTE

MS-DOS is required for a downloading from the parallel interface. The computer must be connected to the printer with a parallel cable.

Procedure

1. Turn printer power on. Make sure the printer is ready.
2. At the DOS prompt, send the following command to the printer:

```
echo !R! UPGR "SYS";EXIT;>prn
```

3. Confirm that downloading was finished normally by the LED indicator. (See page 1-7-4)
4. Turn power off.
5. Turn power on again. Check the printer gets ready.
 - * Confirm the status page shows the new firmware version (See service information on the status page). If downloading fails, the printer indicates an error display using the LED indicators. To identify error, refer to the table on page 1-7-4.

(3) Downloading the firmware from the memory card

To download data written in a memory card (CompactFlash) to the printer, proceed as explained in this section.

CAUTION

Downloading firmware takes several minutes.

Do not turn power off during downloading. If downloading is interrupted by an accidental power failure, etc., the system DIMM may have to be replaced.

NOTE

The firmware program data must be stored to the root directory of the memory card.

Procedure

1. Turn power switch off.
2. Remove the two screws and then remove the slot cover. Insert the memory card in the printer's memory card slot.
3. Turn power switch on.
4. The printers starts and finishes downloading automatically.
5. Confirm that downloading was finished normally by the LED indicator. (See page 1-7-4)
6. Turn power off.
7. Remove the memory card and then secure the slot cover by using two screws.
8. Turn power on again. Check the printer gets ready.
9. Turn power on again. Check the printer gets ready.

Confirm the status page shows the new firmware version (See service information on the status page). If downloading fails, the printer indicates an error display using the LED indicators. To identify error, refer to the table on page 1-7-4.

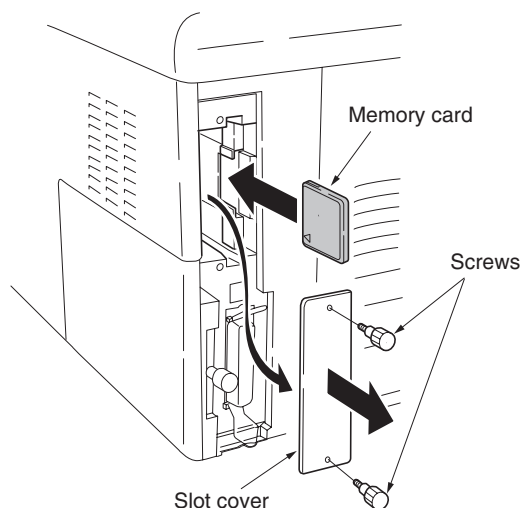
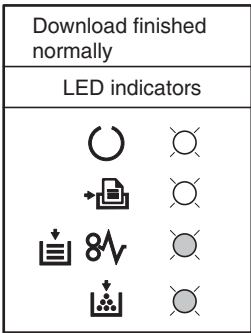
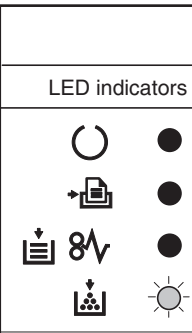




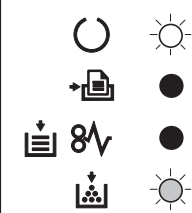

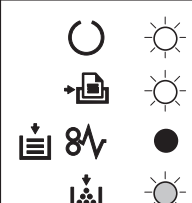











Figure 1-7-2

(4) Downloading errors

The following downloading errors are indicated on LED indicators when an error occurred during downloading the firmware data.

Download finished normally		Download errors			
LED indicators		LED indicators	Description	Cause	Corrective action
			Download data error	Deficit of a file header	Obtain normal firmware.
				Deficit of a data header	
				File checksum error	
				File header version error	
				Data header version error	
			System download error	Incompatibility of firmware and system DIMM board	Confirm whether the firmware conforms to this printer.
				Defective system DIMM board	Replace the system DIMM board.
			Download receiving error	Improper connection of parallel cable between PC and printer	Check the contact between PC and printer's interface connector.
				Defective parallel cable	Replace parallel cable.

Convention

Red	Green	Meaning
		Slow flashing
		Fast flashing
		Lit
		Off

If the corrective action above does not solve the problem, replace the engine PWB (K0010). See page 1-6-9.

2-1-1 Paper feeding system

The paper feeding system picks up paper from the cassette, MP tray, or if installed, the paper feeder, feeds it in the printer, and delivers it in the output tray. Paper is fed at the precise timing in synchronization with data processing. The paper feeding system finally delivers the printed page to either the face-down or face-up tray as manipulated by the user.

The figure below shows the components in the paper feeding system and the paths through which the paper travels. The sensors, clutches, etc., are described in the following pages.

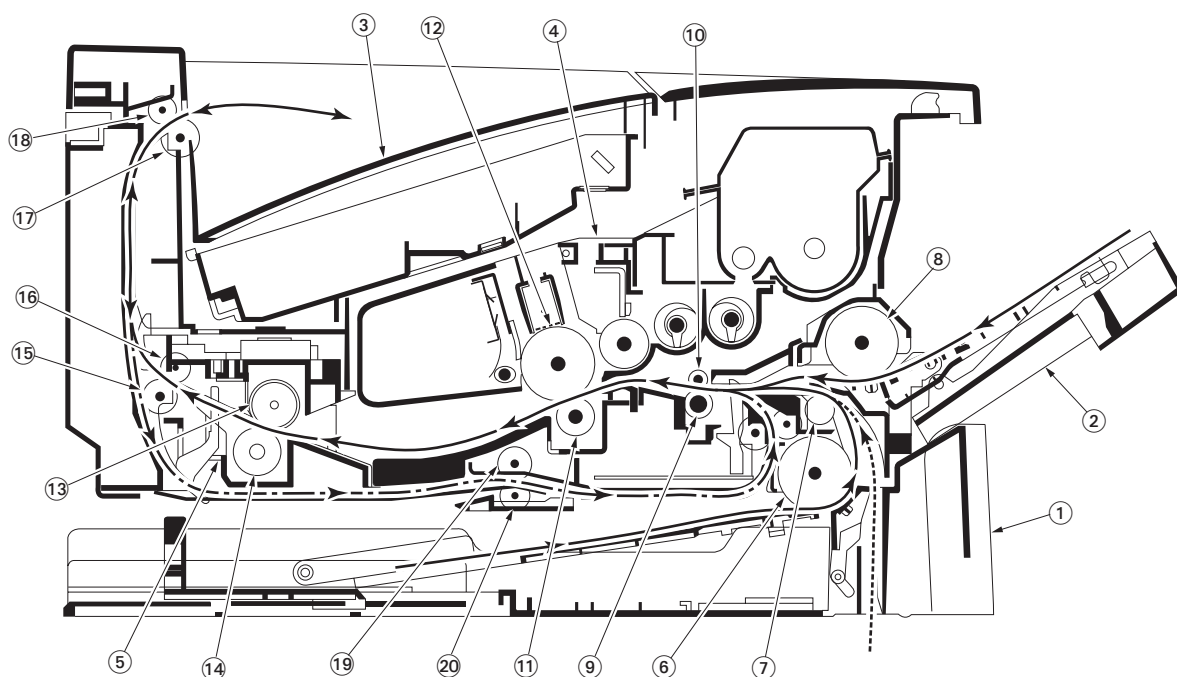


Figure 2-1-1 Paper feeding path

- | | |
|-------------------------------|-----------------------|
| 1. Cassette | 11. Transfer roller |
| 2. MP tray | 12. Drum |
| 3. Output tray | 13. Heat roller |
| 4. Process unit | 14. Press roller |
| 5. Fuser unit | 15. Lower exit roller |
| 6. Feed roller | 16. Exit pulley |
| 7. Feed pulley | 17. Upper exit roller |
| 8. MP feed roller | 18. Exit pulley |
| 9. Lower registration roller | 19. Conveying roller |
| 10. Upper registration roller | 20. Conveying pulley |

(1) Paper feed control

The following diagram shows interconnectivity of the feeding system components including the sensors and rollers. The engine board provides the signals in conjunction with the electrophotography process that is driven by the main board.

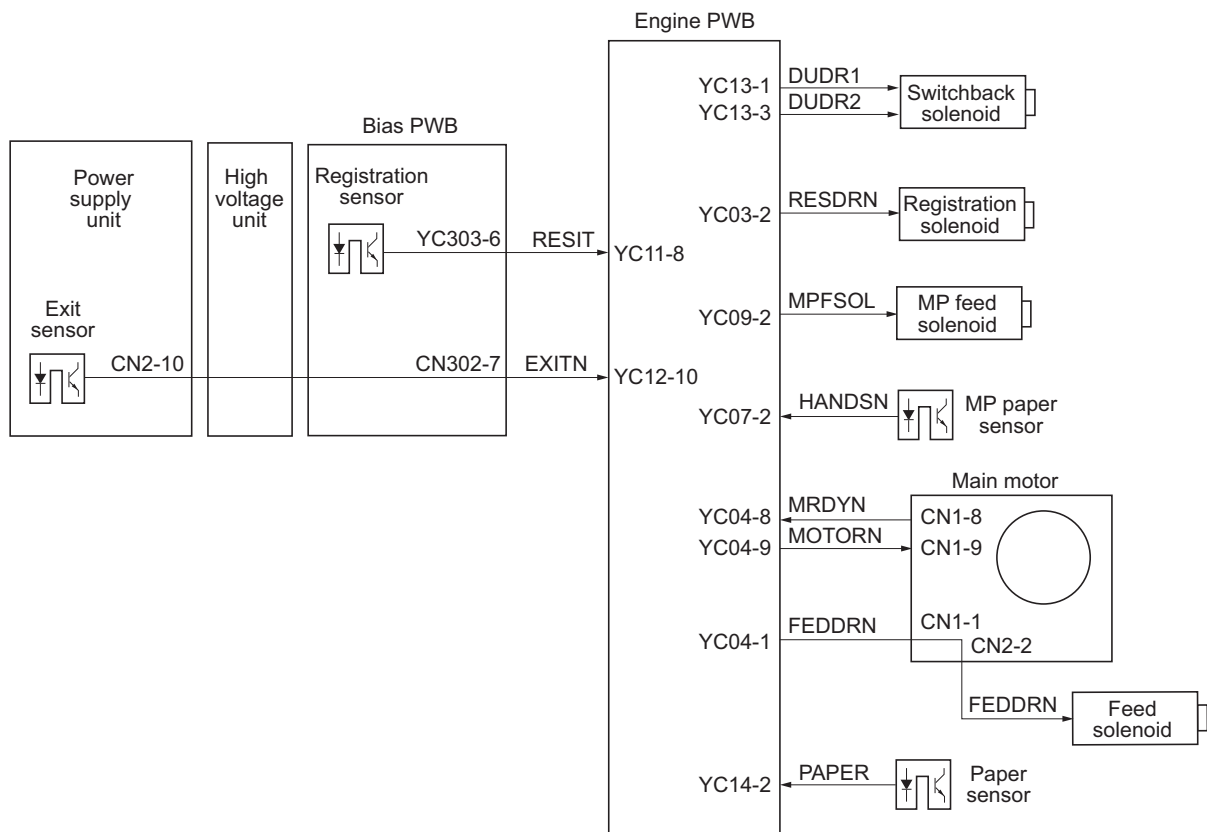


Figure 2-1-2 Paper feed control

(2) Paper feeding mechanism

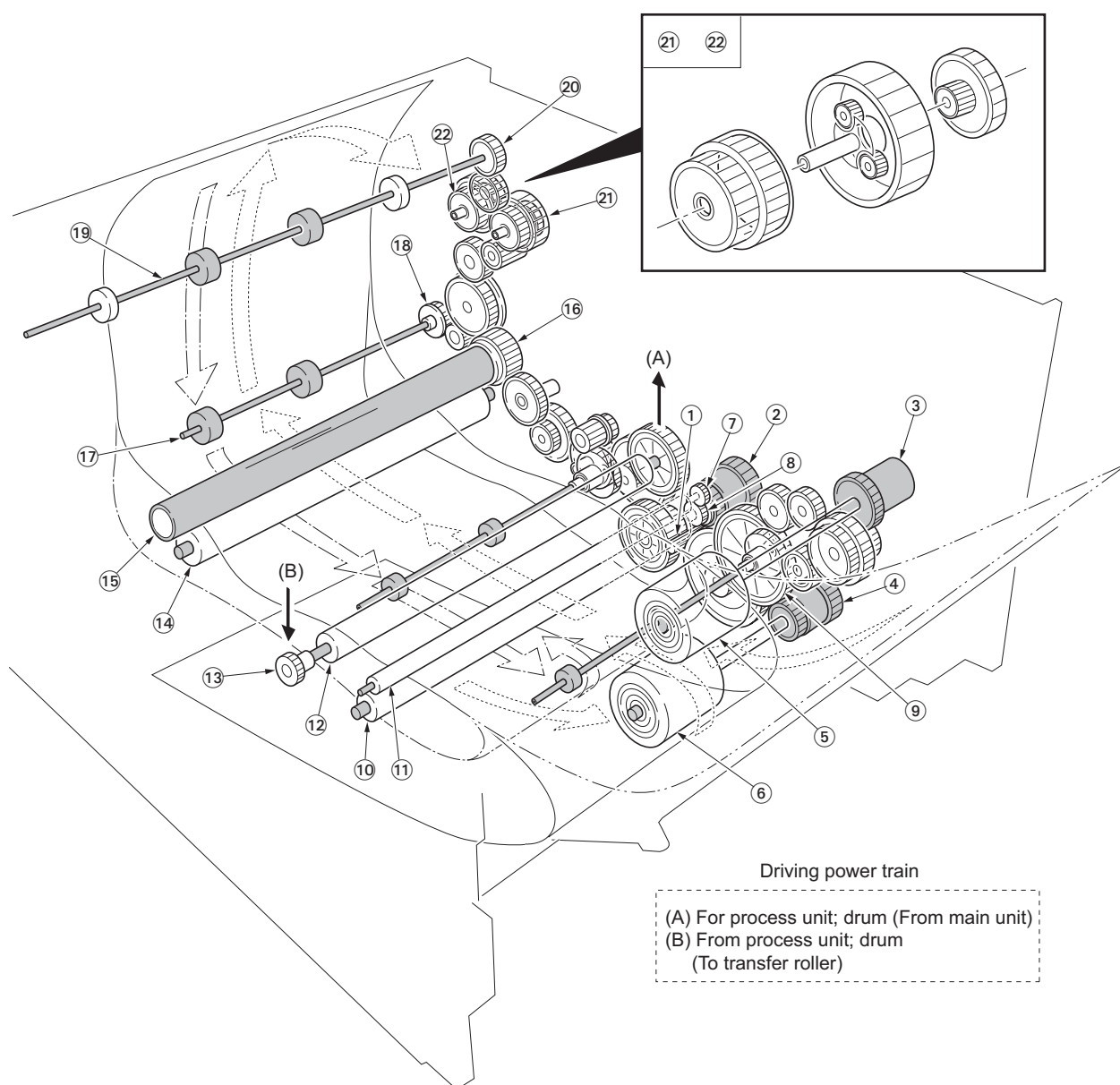


Figure 2-1-3 Paper feeding mechanism

- | | |
|-------------------------------|-------------------------------|
| 1. Main motor (gear) | 12. Transfer roller |
| 2. Registration clutch | 13. TC gear Z18 |
| 3. MP feed clutch | 14. Press roller |
| 4. Feed clutch | 15. Heat roller |
| 5. MP feed roller | 16. Heat gear Z33 |
| 6. Feed roller | 17. Lower exit roller |
| 7. Registration gear Z13 | 18. Exit gear Z23 |
| 8. Registration gear Z20 | 19. Upper exit roller |
| 9. Gear Z95-Z21H | 20. Exit gear Z23 UP |
| 10. Lower registration roller | 21. Planetary gear assembly A |
| 11. Upper registration roller | 22. Planetary gear assembly B |

(3) Switchback/refeed system

Paper that has already been fixed in the fuser unit on its first (front) side will be conveyed along the guide towards the face-down tray via the turning of the fuser unit's lower exit roller. At this point, the fuser unit's upper exit roller is turning in a forward direction and, in the case of 1-sided printing, the paper will be ejected onto the face-down tray through the normal action of that upper exit roller. However, in the case of duplex (2-sided) printing, once a specified amount of time has elapsed after the trailing edge of the paper turns off the exit sensor actuator (located inside the fuser unit), the fuser unit's upper exit roller will begin to turn in the opposite direction in order to reverse the direction of the paper feed. Then, the operation of the change guide and the direction of rotation of the lower exit roller will be applied to stop the paper from being fed back inside the fuser unit and, instead, will guide the paper into a section below the fuser unit. Next, after the paper has turned on the lower exit sensor actuator, that paper A will be fed to the conveying roller. Once the paper reaches the conveying roller, it will be fed towards the refeed roller through the action of the conveying roller. Once the paper reaches the refeed roller, it will be fed via the turning of that roller and, at the point that it turns on the registration sensor, the initial feeding (refeeding) operation of the second (rear) side is complete.

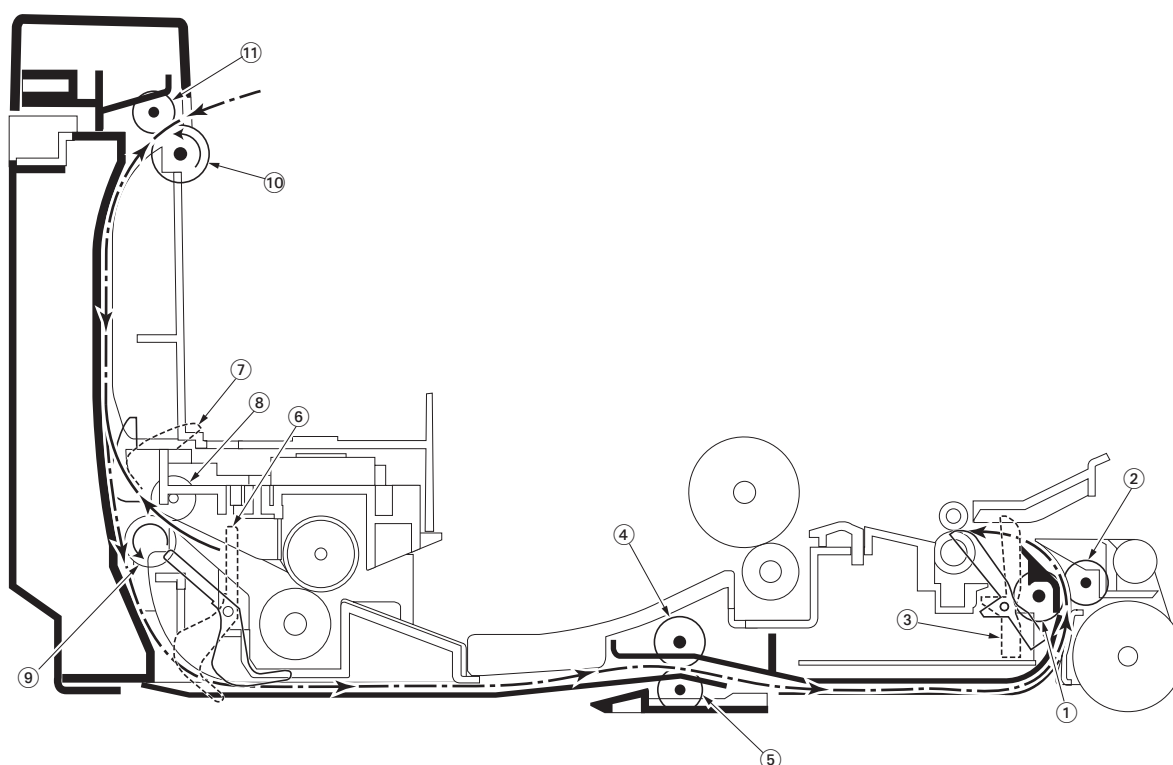


Figure 2-1-4 Paper switchback/refeed path

1. Refeed roller
2. Refeed pulley
3. Registration sensor (actuator)
4. Conveying roller
5. Conveying pulley
6. Exit sensor (actuator)
7. Change guide
8. Lower exit pulley
9. Lower exit roller
10. Upper exit pulley
11. Upper exit roller

Upper exit roller forward/reverse mechanism

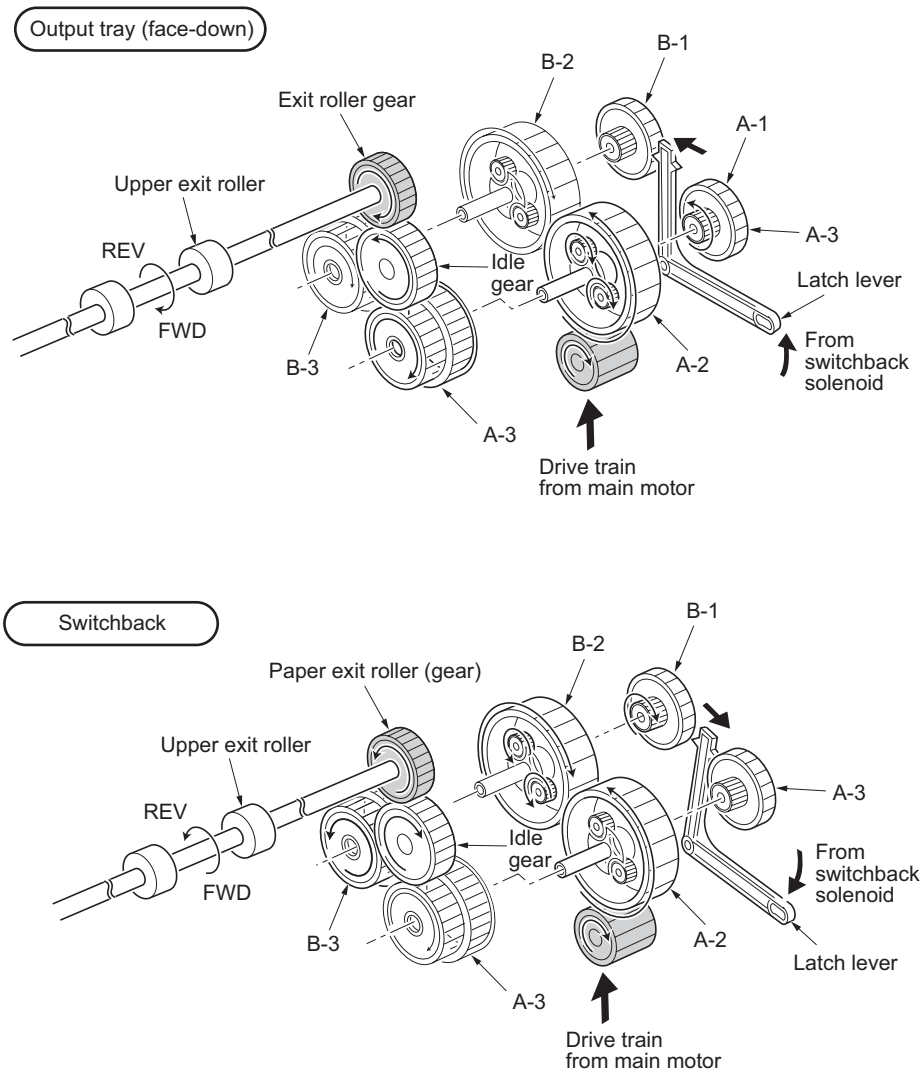


Figure 2-1-5 Upper exit roller forward/reverse drive mechanism

The forward/reverse mechanism for the upper exit roller is composed of the planetary gear assemblies A (A-1, A-2 and A-3) and B (B-1, B-2 and B-3), a switchback solenoid, and a latch lever, and it uses the driving force that is transmitted from the main motor to the upper exit roller in order to switch between forward and reverse rotation.

In the case of 1-sided (normal) printing, the latch to the latch lever catches on gear B-1, thus stopping planetary gear assembly B from functioning. This allows planetary gear assembly A to function and a forward driving force is transmitted to the exit roller gear through the idle gear, thus causing the upper exit roller to turn in a forward direction.

However, in the case of duplex (2-sided) printing, the latch lever moves through the operation of the switchback solenoid and catches on gear A-1, thus stopping planetary gear assembly A from functioning. This allows planetary gear assembly B to function and a reverse driving force is transmitted to the exit roller gear through the idle gear, thus causing the upper exit roller to turn in a reverse direction.

2-1-2 Electrophotographic system

Electrophotography is the technology used in laser printing which transfer data representing texts or graphics objects into a visible image which is developed on the photosensitive drum, finally fusing on paper, using light beam generated by a laser diode.

This section provides technical details on the printer's electrophotography system.

(1) Electrophotographic cycle

The electrophotography system of the printer performs a cyclic action made of six steps as follows. Each step is technically explained in the following sections.

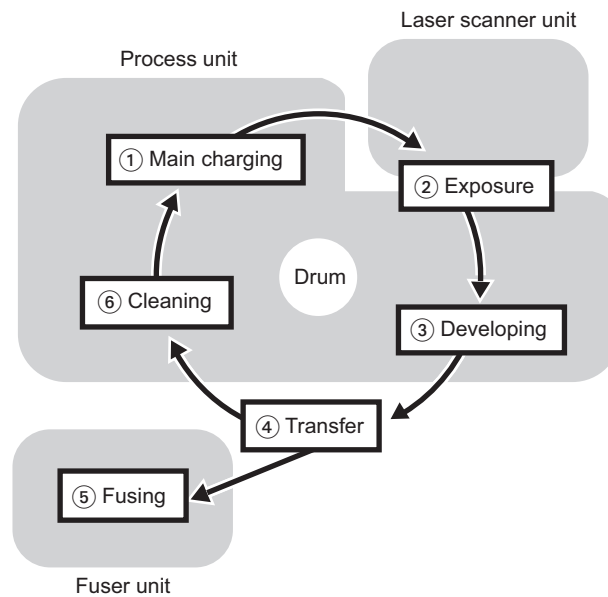


Figure 2-1-6 Electrophotographic cycle

The sections for main charging, exposure (drum), developing, and cleaning are modularized in one process unit.

(1-1) Process unit mechanism

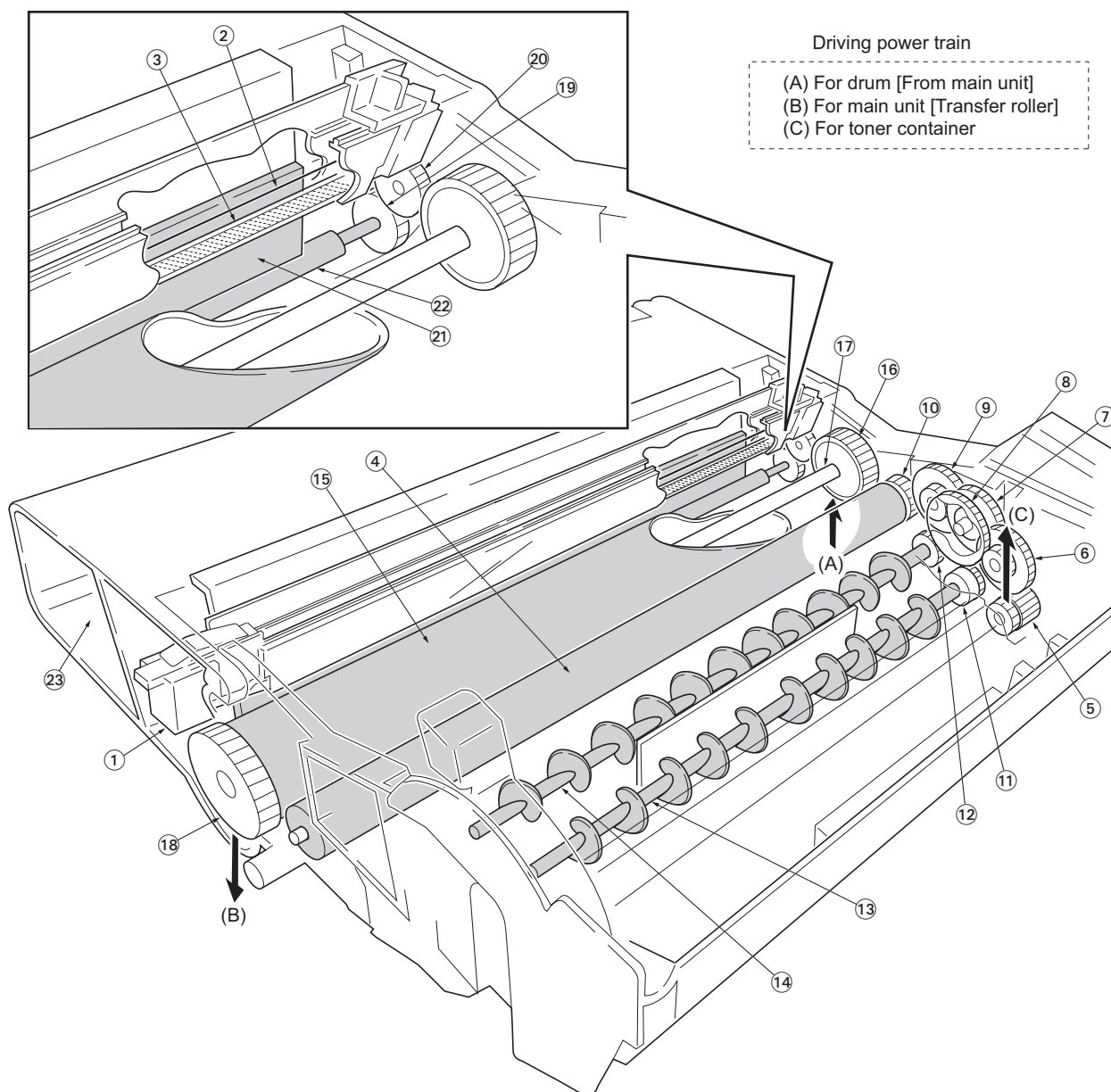


Figure 2-1-7 Process unit mechanism

- | | |
|----------------------|---------------------------|
| 1. Main charger unit | 12. DLP screw B |
| 2. Charger wire | 13. DLP screw A |
| 3. Grid | 14. Drum |
| 4. Developing roller | 15. Drum gear Z35H |
| 5. Gear Z14-Z18 | 16. Drum shaft |
| 6. Gear Z14-Z36 | 17. Drum gear Z36 |
| 7. Gear Z18-Z36 | 18. Sweep gear Z13 |
| 8. Free gear Z40 | 19. Idle gear 18H |
| 9. Gear Z18-Z35H | 20. Cleaning blade |
| 10. MAG gear Z24H | 21. Sweep roller |
| 11. Mixer gear Z20 B | 22. Waste toner reservoir |
| 12. Mixer gear Z20 A | |

(2) Main charging

(2-1) Photo conductive drum

The durable layer of organic photoconductor (OPC) is coated over the aluminum cylinder base. The OPC tends to reduce its own electrical conductance when exposed to light. After a cyclic process of charging, exposure, and development, the electrostatic image is constituted over the OPC layer.

Since the OPC is materialized by resin, it is susceptible to damage caused by sharp edges such as a screwdriver, etc., resulting in a print quality problem. Also, finger prints can cause deterioration of the OPC layer, therefore, the drum (in the process unit) must be handled with care. Substances like water, alcohol, organic solvent, etc., should be strictly avoided.

As with all other OPC drums, the exposure to a strong light source for a prolonged period can cause a print quality problem. The limit is approximately 500 lux for less than five minutes. If the drum (process unit) remains removed from the printer, it should be stored in a cool, dark place.

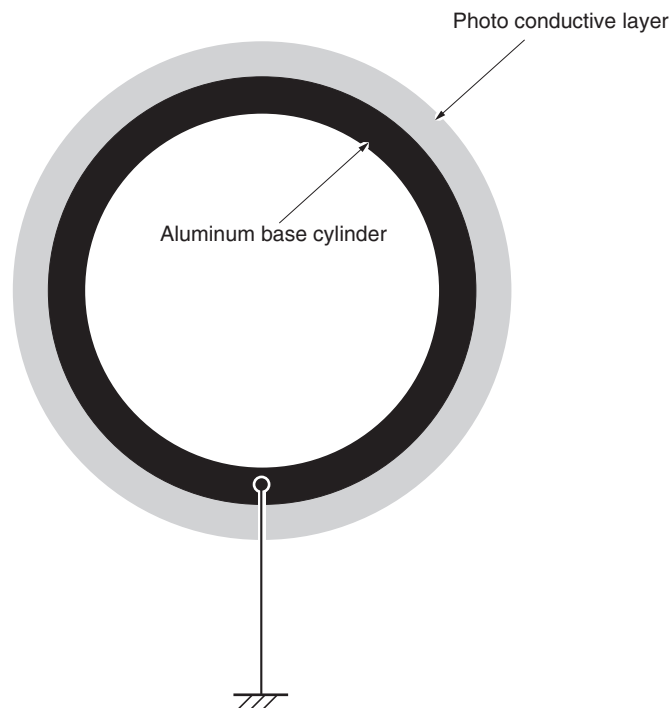


Figure 2-1-8 Photo conductive drum

(2-2) Charging the drum

The following shows a simplified diagram of the electrophotographic components in relation to the engine system. Charging the drum is done by the main charger unit (A).

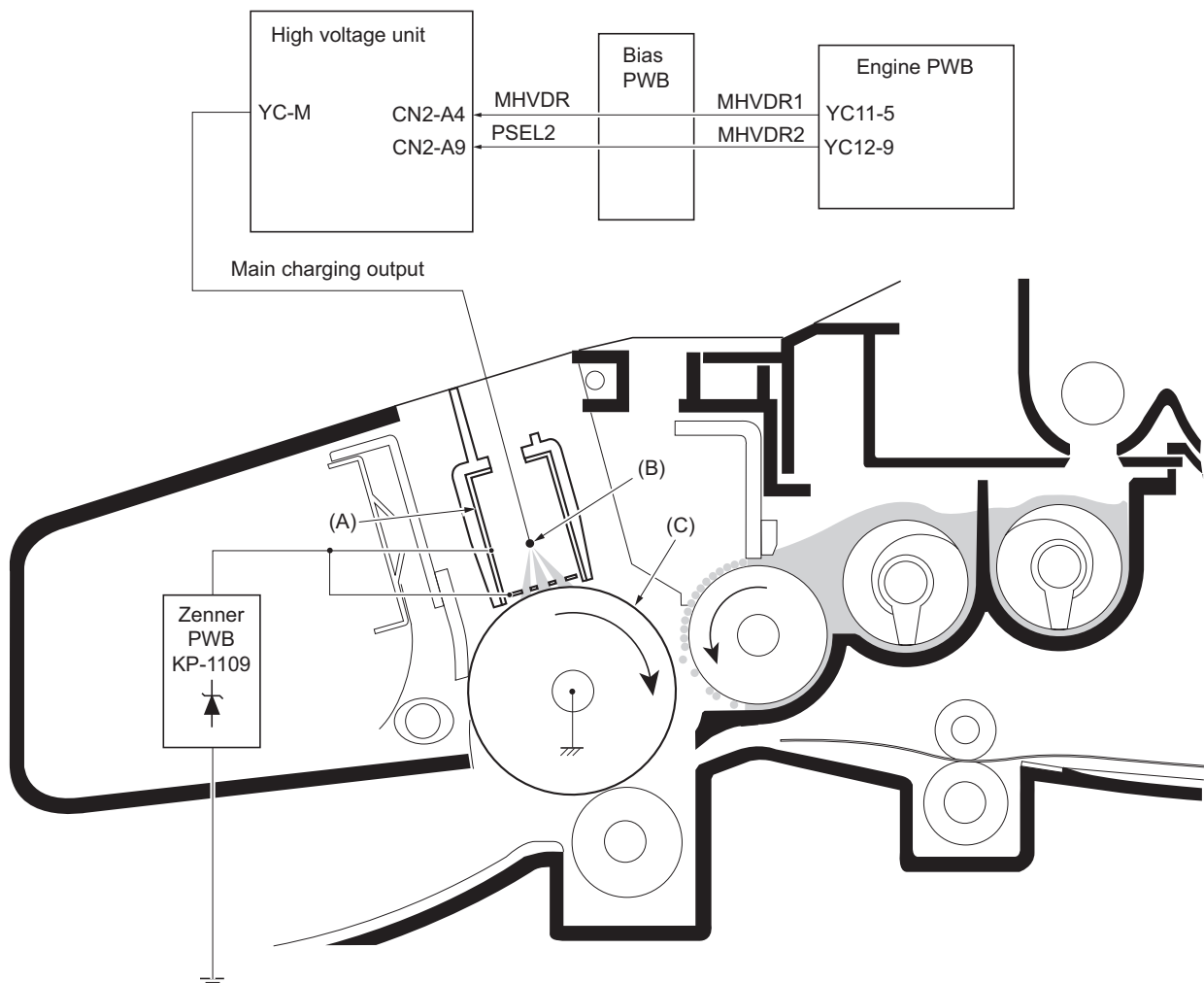


Figure 2-1-9 Charging the drum

As the drum (C) rotates in a “clean (neutral)” state, its photoconductive layer is given a uniform, positive (+) corona charge dispersed by the main charger wire (B).

Due to high-voltage scorotron charging, the charging wire can get contaminated by oxidization after a long run. Therefore, it must be cleaned periodically from time to time. Cleaning the charging wire prevents print quality problems such as black streaks.

(3) Exposure

The charged surface of the drum (A) is then scanned by the laser beam from the laser scanner unit (B).

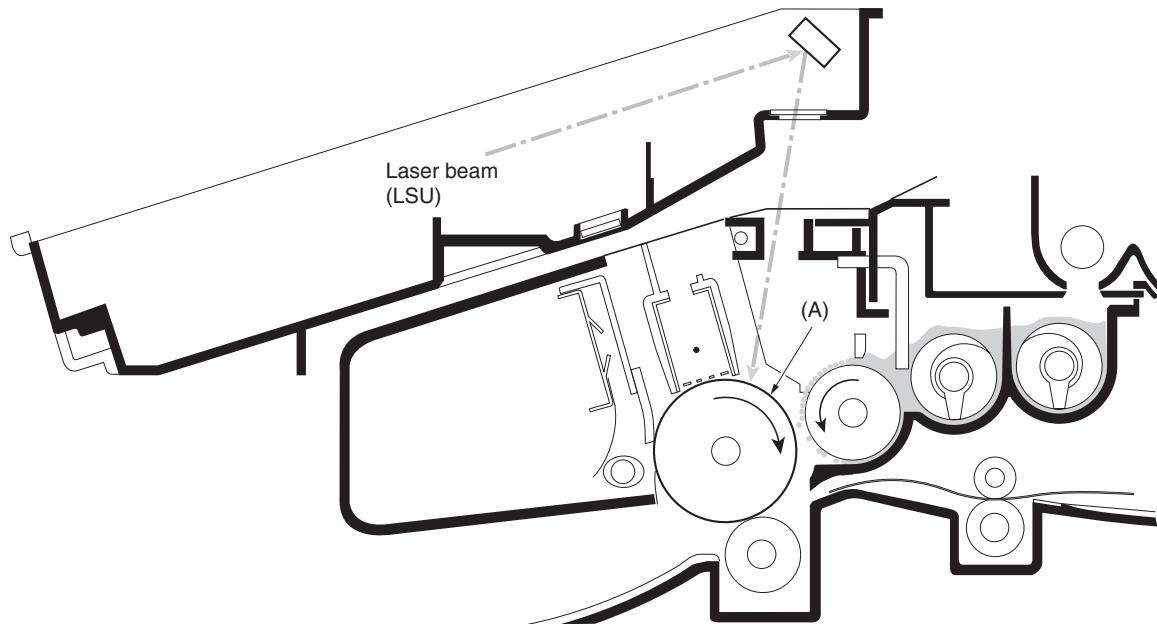
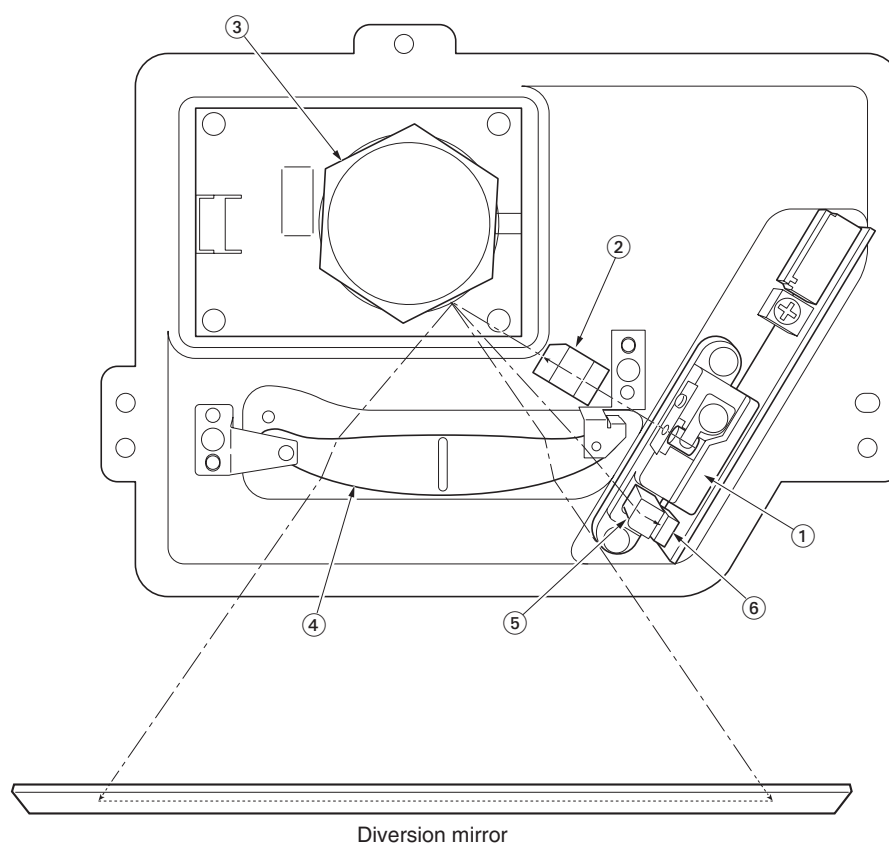


Figure 2-1-10 Exposure

The laser beam (780 nm wavelength) beam is dispersed as the polygon motor (polygon mirrors) revolves to reflect the laser beam over the drum. Various lenses and mirror are housed in the scanner unit, adjust the diameter of the laser beam, and focalize it at the drum surface.

(3-1) Laser scanner unit**Figure 2-1-11 Laser scanner unit**

- | | |
|---------------------------------|---|
| 1. Laser diode | Emits diffused, visible laser. |
| 2. Cylindrical lens | Compensates the vertical angle at which the laser beam hits a polygon mirror segment. |
| 3. Polygon mirror (motor) | Has six mirror segments around its hexagonal circumference; each mirror corresponding to one scanned line width on the drum when laser beam scans on it. |
| 4. F-theta lens | The f-theta lens equalizes focusing distortion on the far ends of the drum. |
| 5. Sensor mirror | Bends the very first shot of a laser scan towards the pin photo sensor (6). |
| 6. Pin photo sensor | When shone by the sensor mirror above, this photo-sensor generates a trigger signal for the engine controller to start activating the paper feeding system. |

(3-2) Drum surface potential

The laser beam is continually switched on and off depending on the print data. It is on for a black (exposed) dot and off for a white (blank) dot. Since the drum surface is evenly charged, whenever it is illuminated by the laser beam, the electrical resistance of the photoconductor is reduced and the potential on the photoconductor is also lowered. Resulted on the drum surface is an electrostatic image which represents the data to print. Note that the area to be printed black has the low potential, constituting a "positively exposed" image.

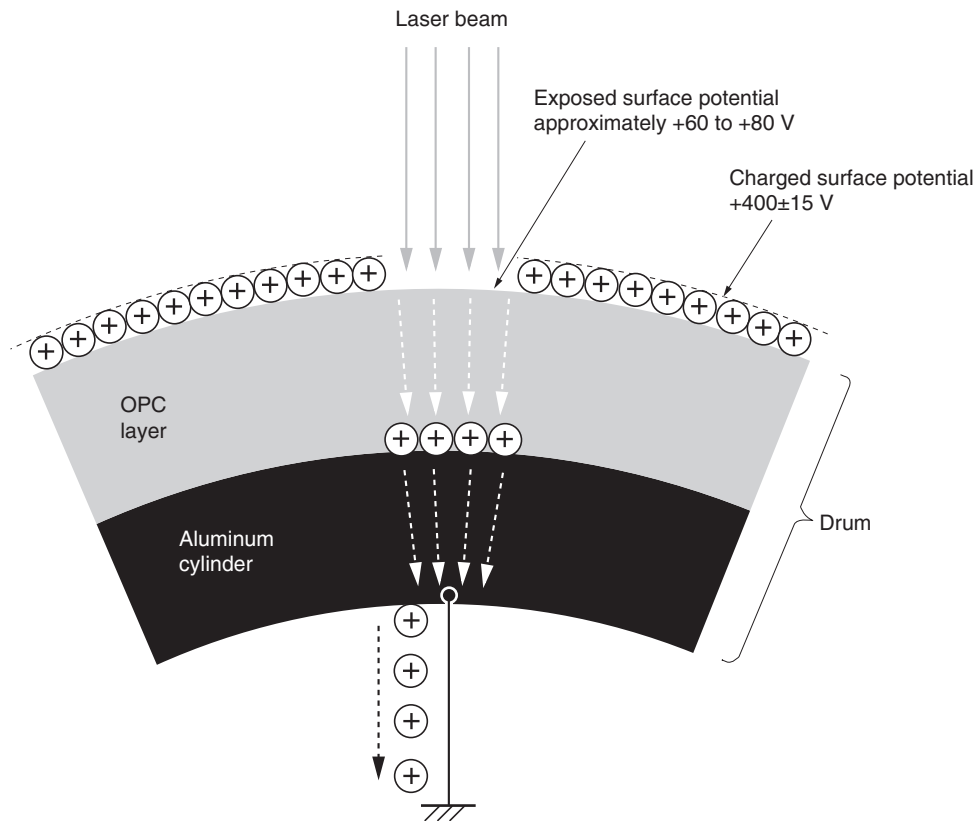


Figure 2-1-12 Drum surface potential

(4) Development

The latent image constituted on the drum is developed into a visible image. The developing roller (A) contains a 3-pole (S-N-S) magnet core (B) and an aluminum cylinder rotating around the magnet core (B). Toner attracts to the developing roller (A) since it is powdery ink made of black resin bound to iron particles. Doctor blade (C), magnetized by magnet (D), is positioned approximately 0.3 mm above the developing roller (A) to constitute a smooth layer of toner in accordance with the roller revolution.

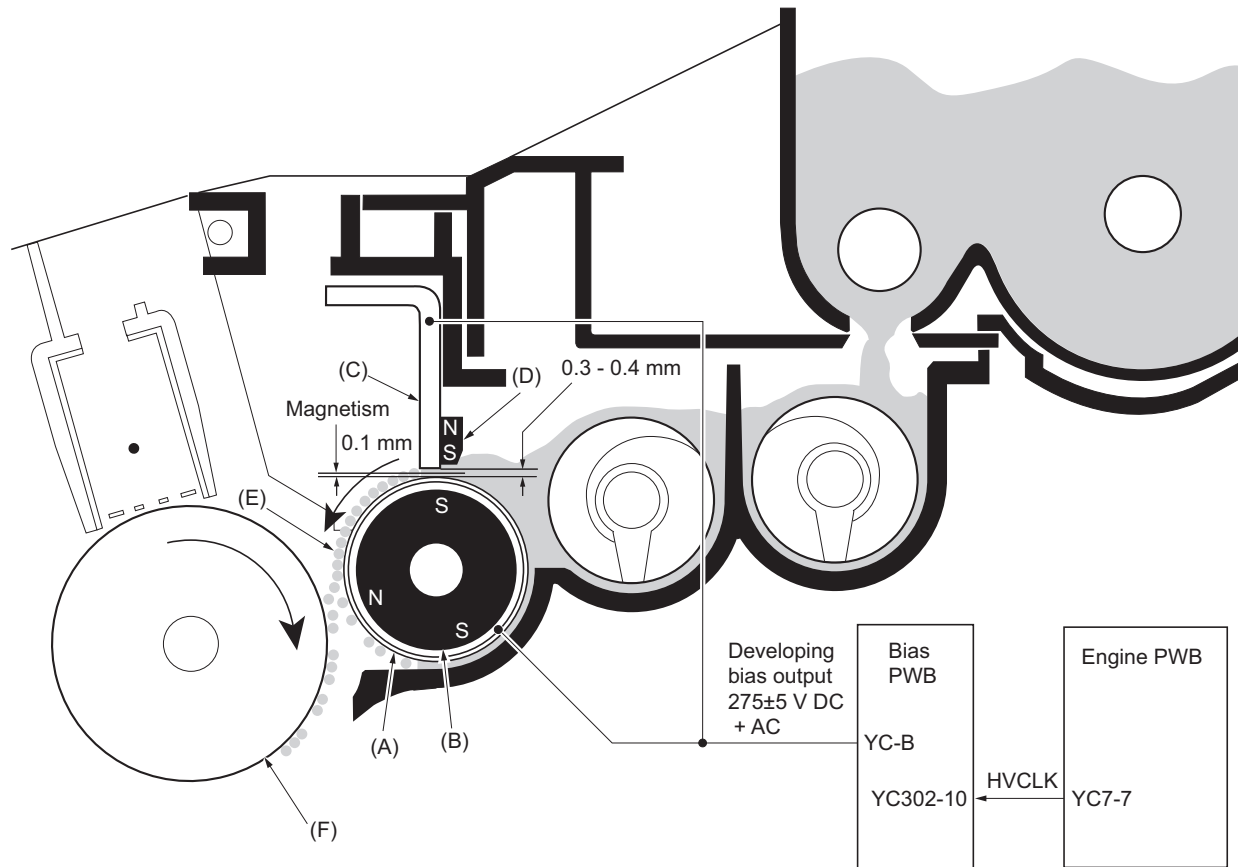


Figure 2-1-13 Development

The developing roller (A) is applied with the AC-weighted, positive DC power source. Toner (E) on the developing roller (A) is given a positive charge. The positively charged toner (E) is then attracted to the areas of the drum (F) which was exposed to the laser light. [The gap between the drum (F) and the developing roller (A) is approximately 0.3 mm.] The non-exposed areas of the drum (F) repel the positively charged toner as these areas maintain the positive charge. The developing roller (A) is also AC-biased to ensure contrast in yielding by compensating the toner's attraction and repelling action during development.

(5) Transfer

The image developed by toner on the drum (A) is transferred onto the paper because of the electrical attraction between the toner itself and the transfer roller (B). The transfer roller is negatively biased so that the positively charged toner is attracted onto the paper while it is pinched by the drum and the transfer roller.

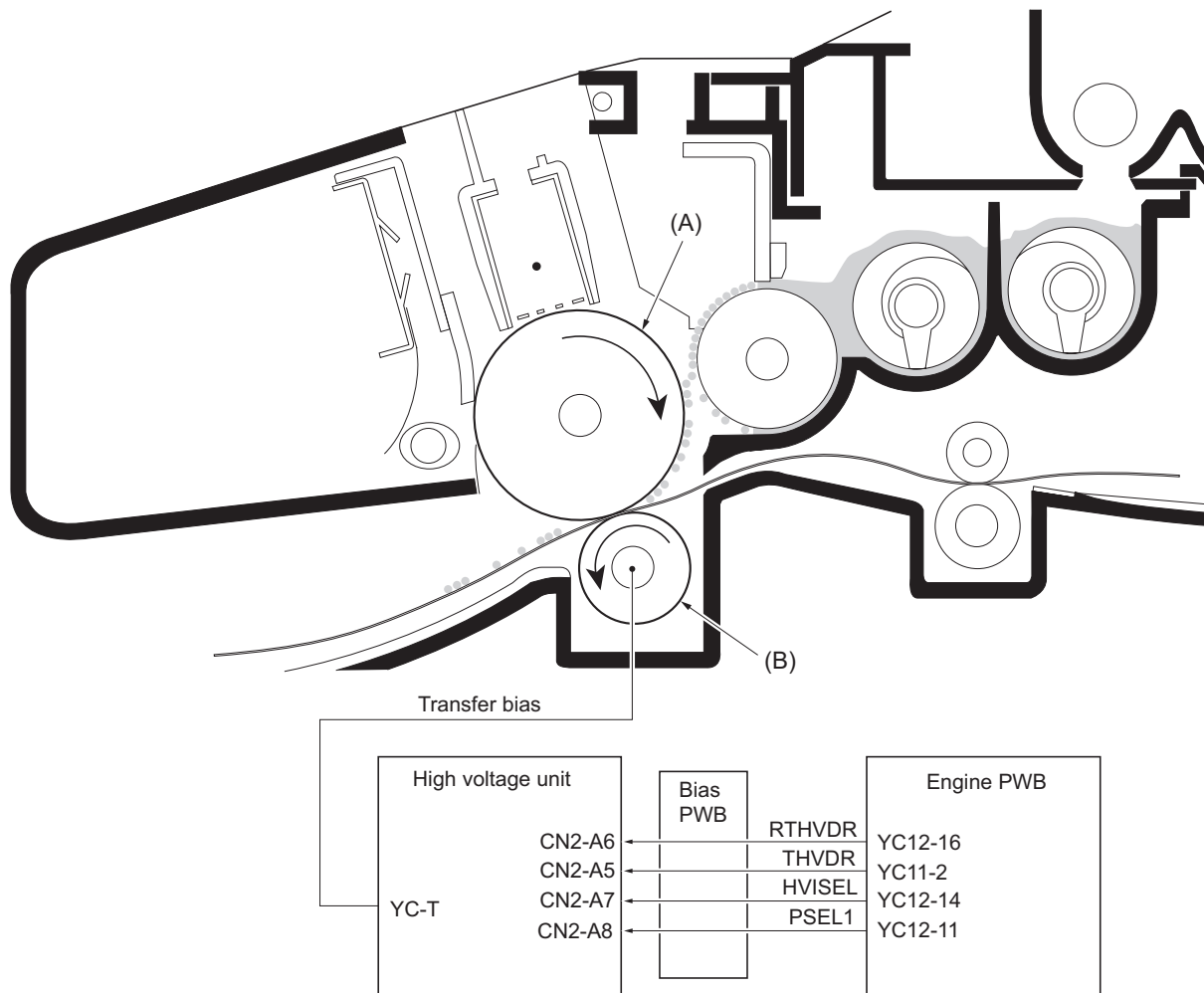


Figure 2-1-14 Transfer

The nominal transfer bias is set to approximately -1.8 kV (limit) with the -6 μ A current. Since the ideal potential of the transfer bias depends on the thickness of paper, the bias is raised to approximately -2.5 kV/-6 μ A for thicker paper. On the other hand, the bias current is reduced to -1.8 kV/-6 μ A for thin paper.

(6) Fusing

The toner on the paper is molten and pressed into the paper as it passes between the heat roller (A) and the press roller (B) in the fuser unit.

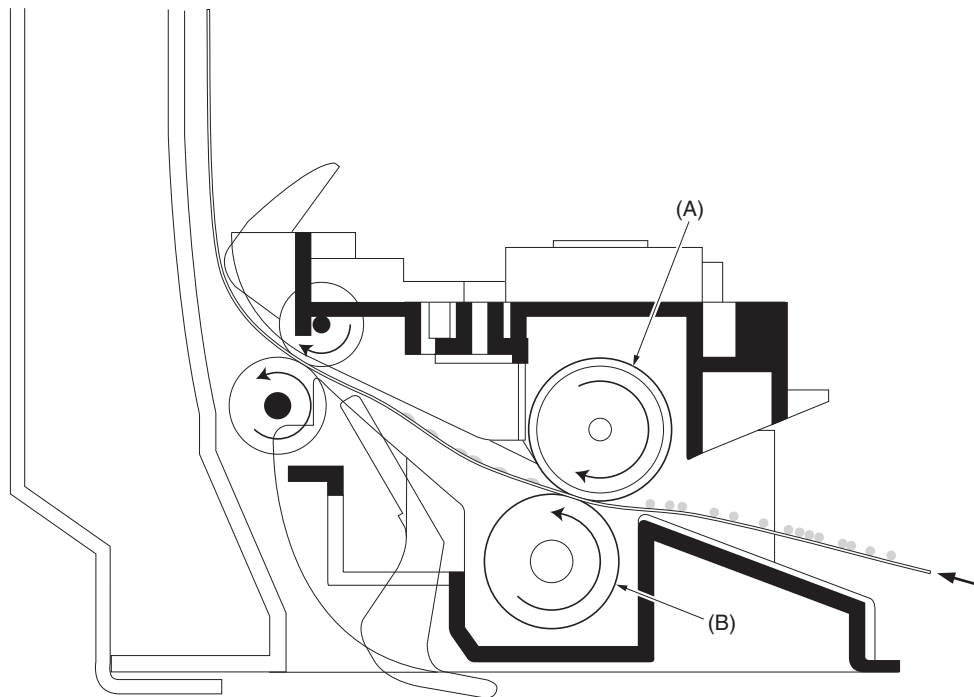


Figure 2-1-15 Fusing

The heat roller has a halogen lamp inside which continuously turns on and off by the thermistor to maintain the constant temperature onto the heat roller surface.

The heat roller is resin coated by fluorine to prevent toner from accumulating on the roller after a long run. Care must be taken while handling the heat roller not to scratch the roller surface as doing so may result in print problems.

The heat roller has four claws which are continuously in contact with its surface. These claws prevent the paper on which toner has been fused from being wound around the heat roller causing paper jam.

The pressure roller is made of the heat-resistant silicon rubber. This roller is used to strongly press the paper towards the heat roller by means of coil springs.

The temperature of the heat roller is constantly monitored by the engine board using the thermistor and triac. Should the temperature of the heat roller exceed the predetermined value, the thermal cutout is activated to effectively disconnect the heater (halogen) lamp from power.

(6-1) Fuser unit mechanism

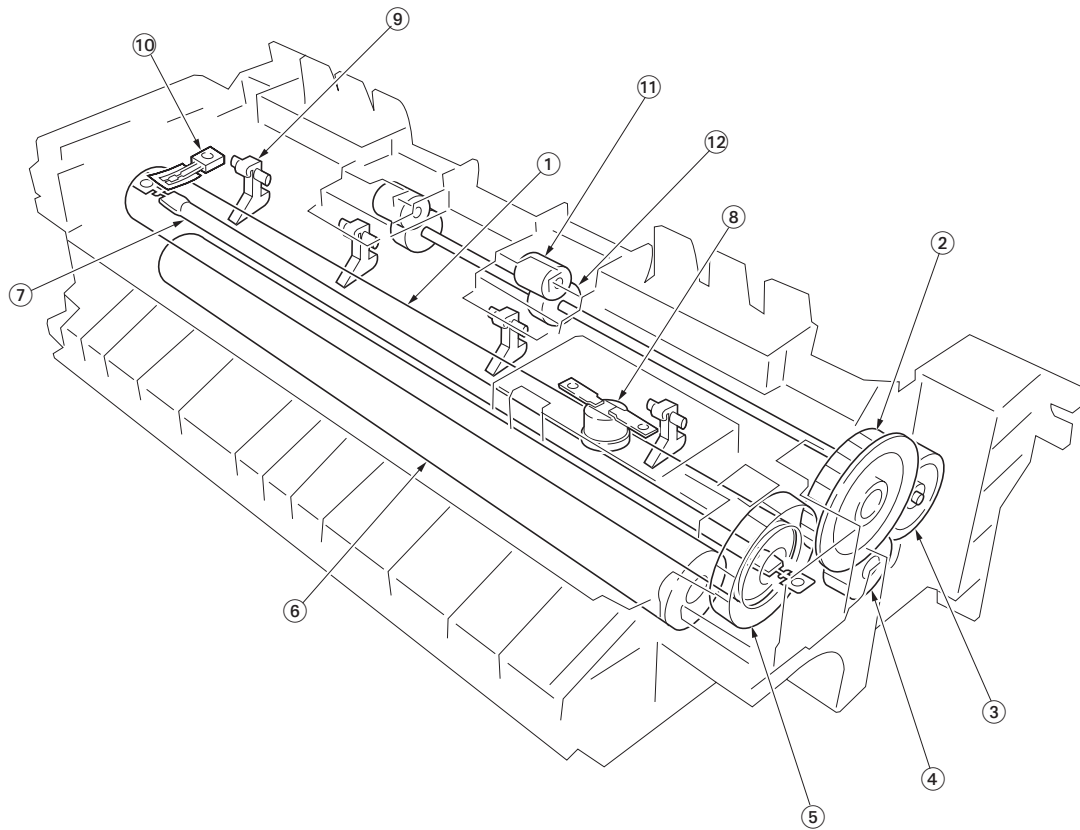


Figure 2-1-16 Fuser unit mechanism

- | | |
|------------------|-----------------------|
| 1. Heat roller | 7. Heater lamp |
| 2. Idle gear Z34 | 8. Thermal cutout |
| 3. Exit gear Z23 | 9. Separator(s) |
| 4. Idle gear Z18 | 10. Thermistor |
| 5. Heat gear Z33 | 11. Exit pulley(s) |
| 6. Press roller | 12. Lower exit roller |

(7) Cleaning

After the transferring process, the drum needs to be physically cleaned of toner which is residual after the development process. The cleaning blade (A) is constantly pressed against the drum (B) and scrapes the residual toner off to the sweep roller (C). The waste toner is collected at the output end of the sweep roller (C) and sent back to the toner container, into the waste toner reservoir (D).

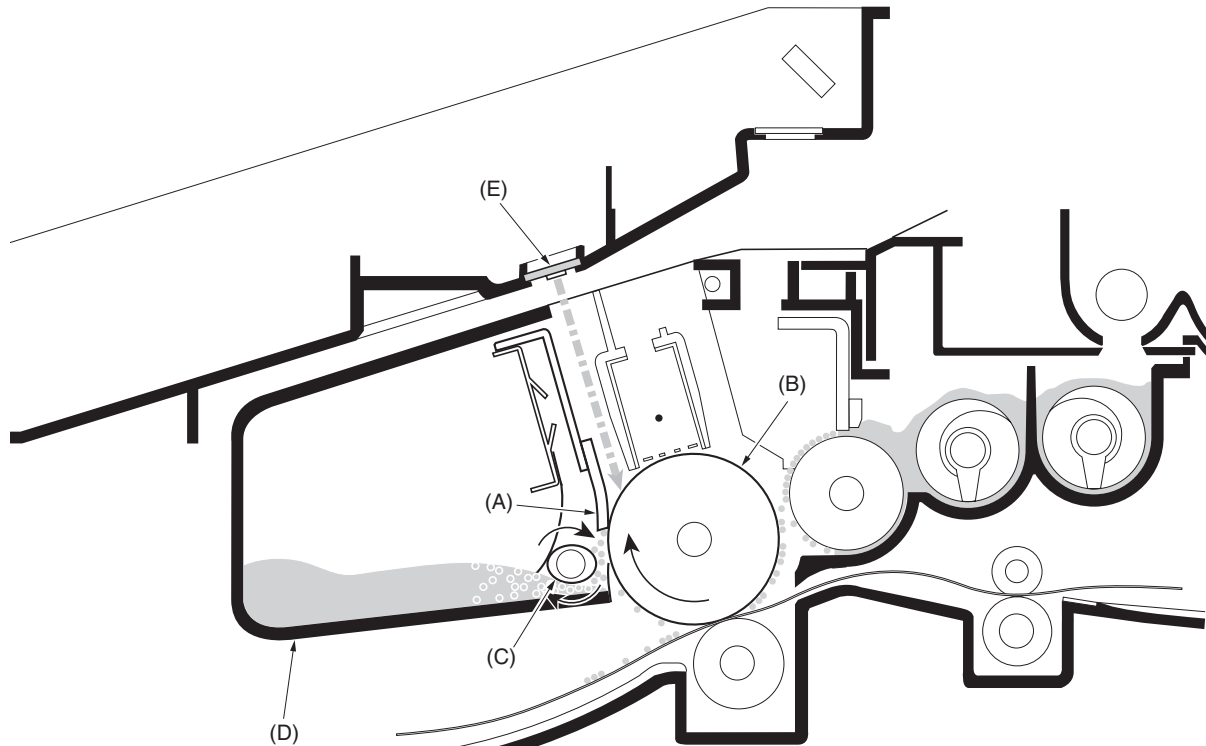


Figure 2-1-17 Drum cleaning and erasing static charge

After the drum (B) is physically cleaned, it then must be cleaned to the electrically neutral state. This is necessary to erase any residual positive charge, ready to accept the uniform charge for the next print process. The residual charge is canceled by exposing the drum (B) to the light emitted from the eraser lamp (E). This lowers the electrical conductivity of the drum surface making the residual charge on the drum surface escape to the ground.

This page is intentionally left blank.

2-2-1 Electrical parts layout

(1) Electrical parts layout

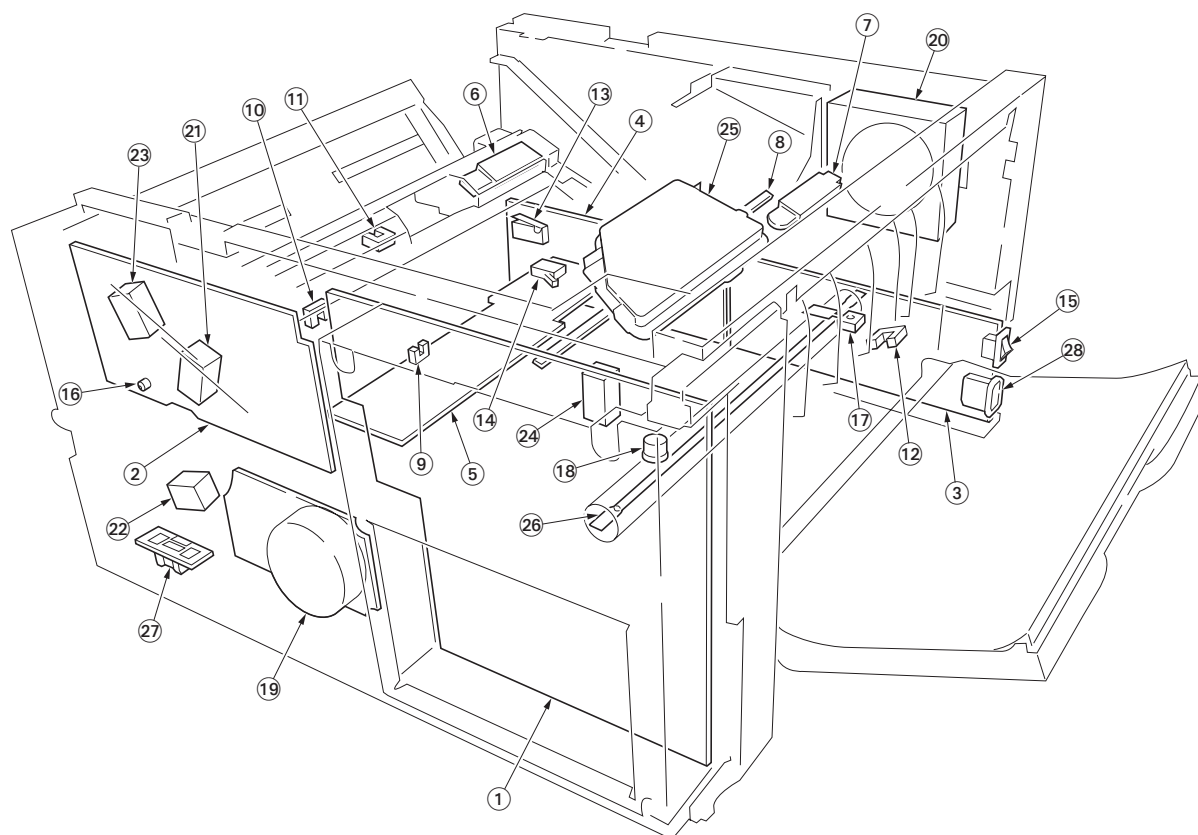


Figure 2-2-1 Electrical parts layout

- | | |
|---------------------------------------|--------------------------------------|
| 1. Main PWB (K0011) | 15. Power switch |
| 2. Engine PWB (K0010) | 16. Temperature thermistor |
| 3. Power supply unit | 17. Fuser thermistor |
| 4. High voltage unit | 18. Thermal cutout |
| 5. Bias PWB (K0009) | 19. Main motor |
| 6. Toner sensor [PWB] (KP-1115) | 20. Cooling fan |
| 7. Waste toner sensor [PWB] (KP-1115) | 21. Registration solenoid |
| 8. Eraser lamp [PWB] (A0050) | 22. Feed solenoid |
| 9. Registration sensor | 23. MP feed solenoid |
| 10. Paper sensor | 24. Switchback solenoid |
| 11. MP paper sensor | 25. Laser scanner unit |
| 12. Exit sensor | 26. Heater lamp |
| 13. Interlock switch | 27. Paper feeder interface connector |
| 14. Cassette switch | 28. AC Inlet |

This page is intentionally left blank.

2-3-1 Main PWB

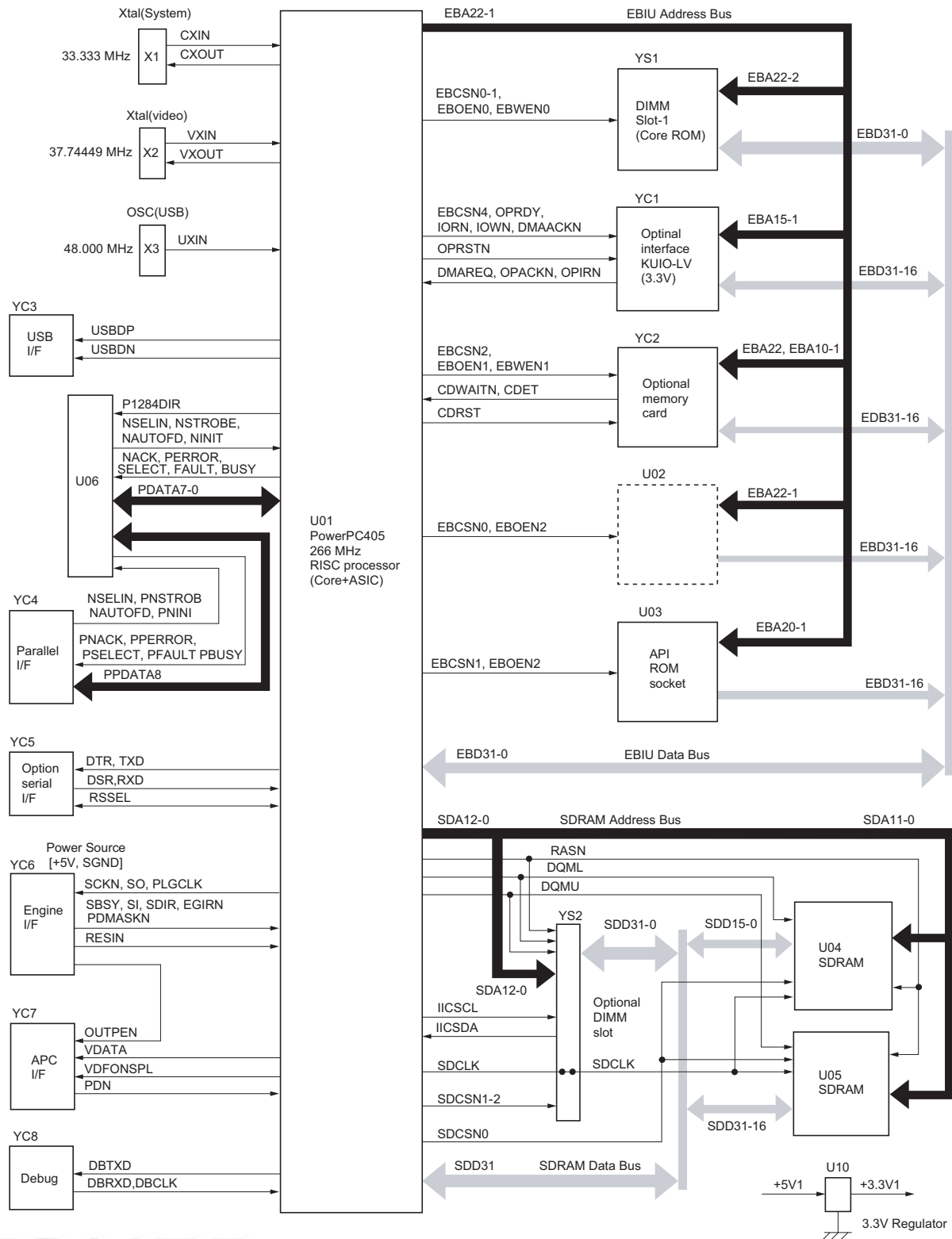


Figure 2-3-1 Main PWB circuit block diagram

2-3-2 Engine PWB

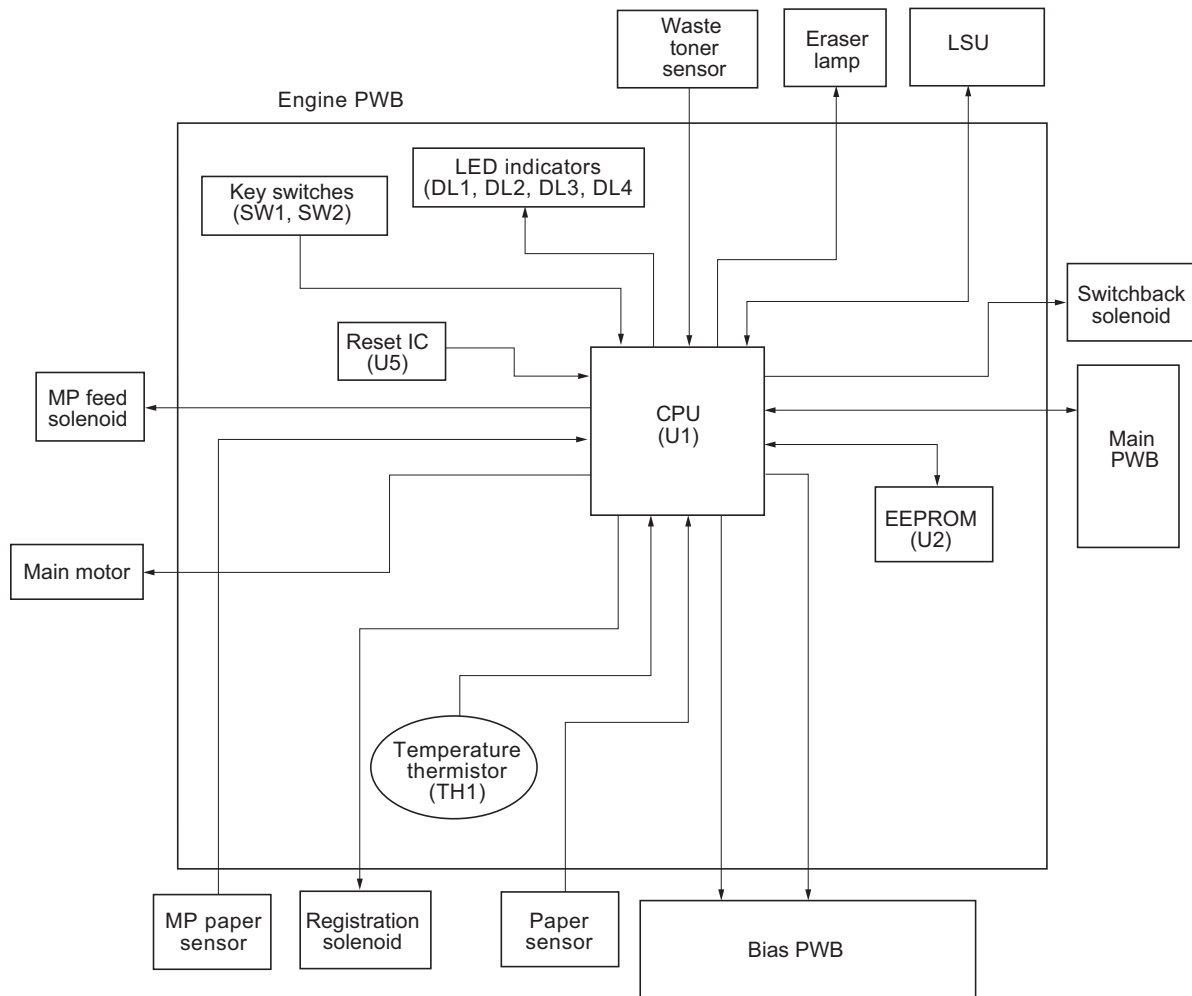


Figure 2-3-2 Engine PWB circuit block diagram

(1) Eraser lamp control circuit

The CPU (U1) turns pin #23 (ERASER) of U1 to H level, transistors (Q14) turns on consequently, and the 24 V DC given at pin #1 of connector YC5 applies to the eraser lamps. The eraser lamps thus illuminate as the current flows through the resistors (R109, R110, and R111), eraser lamp, the pin #2 of connector YC5, transistor Q14 and the ground.

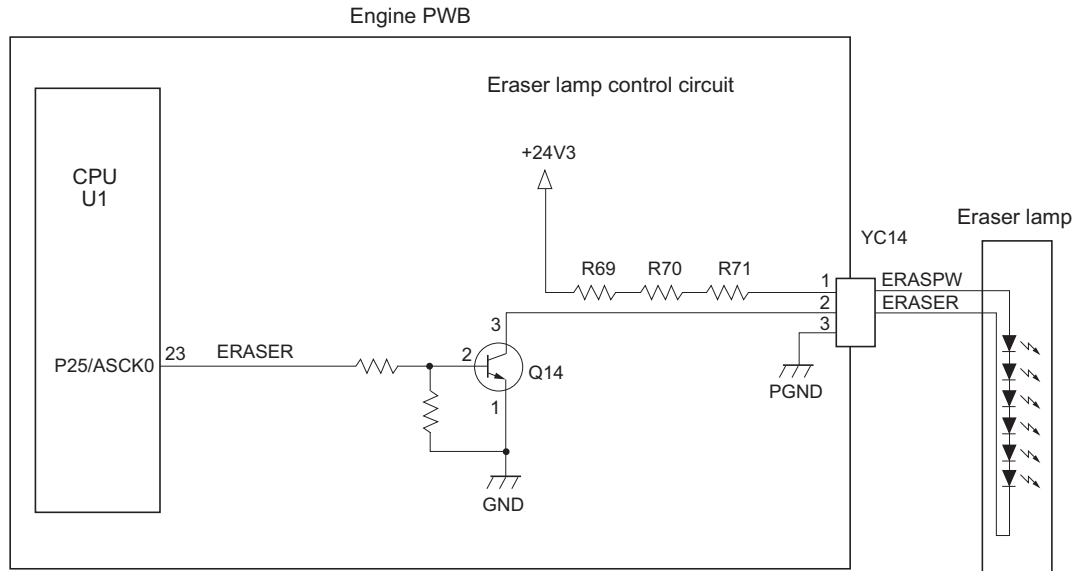


Figure 2-3-3 Eraser lamp control circuit

(2) Heater lamp control circuit

Activation of the heater lamp is dominated by the HEAT signal which is derived by the engine CPU (U1) at its pin #1. When its level is high, transistor Q10 turns on, photo-triac PC2 and triac TRA1 turn on simultaneously, and the heater lamp is applied with the primary AC voltage in turn.

Switching of triac TRA1, as affected by the HEAT signal is made in synchronization with the zero-cross signal ZCROSS which is generated by the power supply unit. The zero-cross signal detector watches the transition of alternating plus and negative current and detects the zero crosses. This detector derives the resultant ZCROSS signal at its pin #43 of the engine CPU (U1). Since abrupt change in the current flow can be significantly avoided by synchronizing triac TRA1 with the zero-cross signal, the possibility of noise due to the primary AC supply is greatly reduced.

CPU (U1) selectively switches among those variations for applying voltages to the heater lamp according to the THERM signal which appears at pin #33 as feedback.

A fraction of THERM is applied to pin #2 of comparator U4-1. The comparator maintains comparison of the potential at pin #2 and pin #3 which gives a reference for the possible anomaly in the heater temperature (bred by resistors R44 and R40). Should the voltage at pin #2 exceed that at pin #3, the level at pin #1 becomes low. Since pin #1 is wired (via transistor array QA4) to the output line for the HEAT signal, the HEAT signal is enforced to be low regardless the behavior of CPU (U1), thus preventing possible heat overrun.

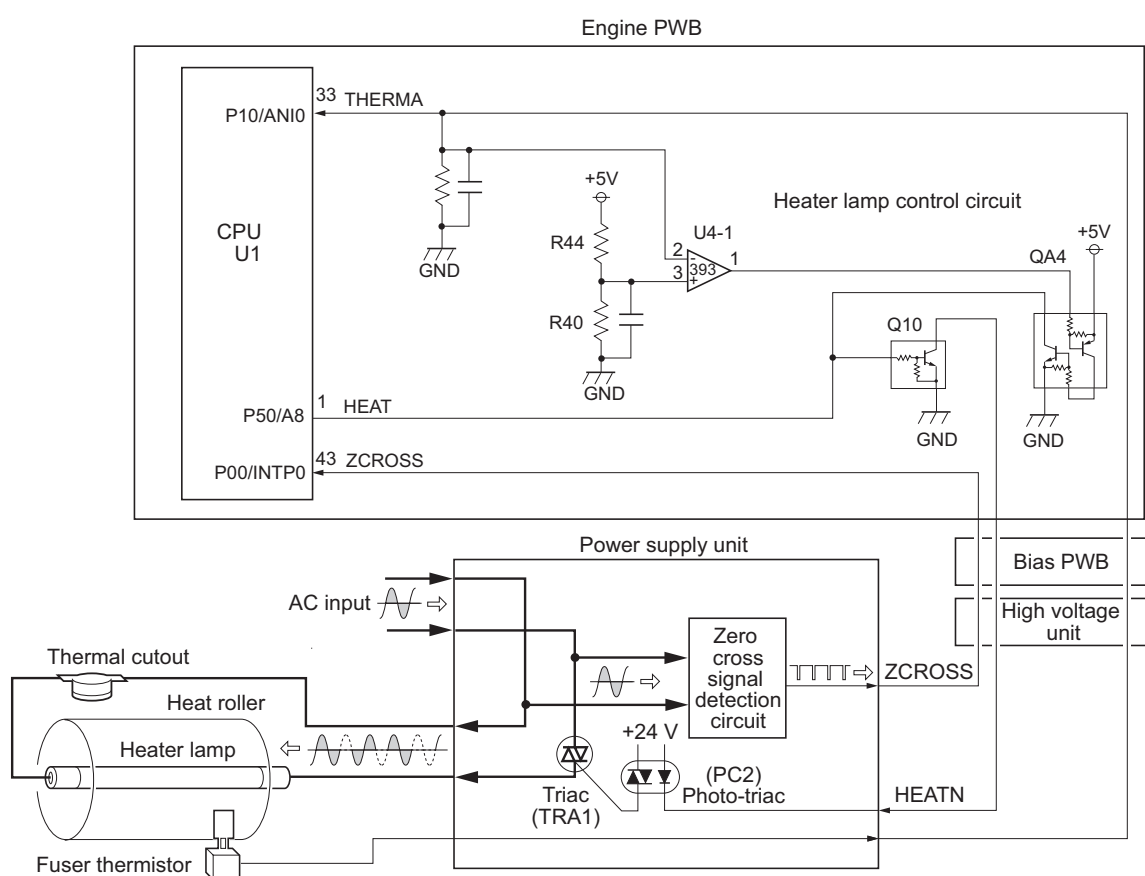


Figure 2-3-4 Heater lamp control circuit

(3) Polygon motor control circuit

The main PWB supplies the 2,799.21 Hz clock pulse (PLGCLK) via the engine board to the PLL control IC (IC1) for the polygon motor. To begin printing, the engine CPU U1 turns PLGDR to H level, the PLL control IC (IC1) starts to revolve the polygon motor so that the revolution is 27,992.1 rpm which depends on the PLGCLK clock pulse. When PLL control IC (IC1) finds that the polygon motor is revolving at the rated speed, turns PLGDRN to L level to acknowledge the engine CPU that the rated speed has been achieved.

On the contrary, if PLGRDYN does not turn to L level within 8 seconds since PLGDRN has been L level.

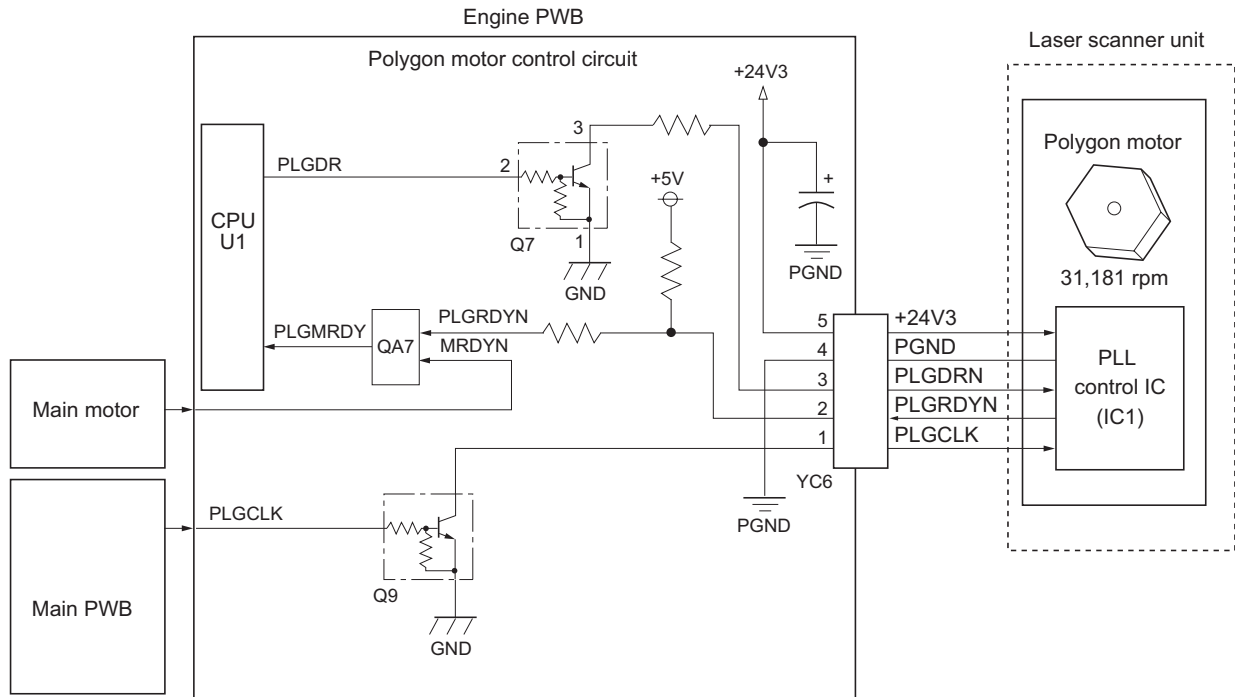


Figure 2-3-5 Polygon motor control circuit

Connector	Pin No.	Signal	I/O	Voltage	Description
YC1	1	RSTN	O	0/5 V DC	Reset signal: Reset/Normal
Connected to the main PWB	2	SGND	-	Ground	Ground
	3	EGIRN	O	0/5 V DC	Engine interrupt request signal
	4	SDIR	O	0/5 V DC	Serial line direction signal
	5	SBSY	O	0/5 V DC	Serial line busy signal
	6	PDMASKN	O	0/5 V DC	PDN mask signal
	7	EGSI	I	0/5 V DC	Engine serial input data signal
	8	SCKN	I	0/5 V DC (pulse)	Serial clock signal
	9	EGSO	O	0/5 V DC	Engine serial output data signal
	10	PLGCLK	I	0/5 V DC (pulse)	Polygon motor clock signal
	11	SGND	-	Ground	Ground
	12	OUTPEN	O	5 V DC	Video data output enable signal
	13	+5V1	O	5 V DC	5 V DC power supply for main PWB
	14	+5V1	O	5 V DC	5 V DC power supply for main PWB
	15	+5V1	O	5 V DC	5 V DC power supply for main PWB
	16	SGND	-	Ground	Ground
YC3	1	+24V3	O	24 V DC	24 V DC power supply for registration solenoid
Connected to the registration solenoid	2	RESDRN	O	0/24 V DC	Registration solenoid: On/Off
YC4	1	FEDDRN	O	0/24 V DC	Paper feed solenoid: On/Off
Connected to the main motor	2	PFSEN	I	0/5 V DC	Optional paper feeder: Installed/Not installed
	3	PFPERN	I	0/5 V DC	Paper sensor (Optional paper feeder): On/Off
	4	PFCLK	O	0/5 V DC (pulse)	Paper feed motor (Optional paper feeder) clock signal
	5	PFMDRN	O	0/5 V DC	Paper feed motor (Optional paper feeder): On/Off
	6	PGND	-	Ground	Ground
	7	+5V	O	5 V DC	5 V DC power supply for main motor and optional paper feeder
	8	MRDRN	O	0/5 V DC	Main motor ready signal: Ready/Not ready
	9	MOTRN	O	24 V DC	Main motor: On/Off
	10	+24V3	O	24 V DC	24 V DC power supply
YC5	1	ERASPW	O	24 V DC	24 V DC power supply for eraser lamp
Connected to the eraser lamp	2	ERASER	O	0/24 V DC	Eraser lamp: On/Off
YC6	1	PLGCLK	O	0/5 V DC (pulse)	Polygon motor clock signal
Connected to the laser scanner unit	2	PLGRDYN	I	0/5 V DC	Polygon motor ready signal: Ready/Not ready
	3	PLGDRN	O	0/5 V DC	Polygon motor: On/Off
	4	PGND	-	Ground	Ground
	5	+24V3	O	24 V DC	24 V DC power supply for laser scanner unit
YC7	1	+5V	O	5 V DC	5 V DC power supply for MP paper sensor
Connected to the MP paper sensor	2	HANDSN	I	0/5 V DC	MP paper sensor: On/Off
	3	SGND	-	Ground	Ground
YC9	1	+24V3	O	24 V DC	24 V DC power supply for MP feed solenoid
Connected to the MP feed solenoid	2	MPFSOL	O	0/24 V DC	MP feed solenoid: On/Off

Connector	Pin No.	Signal	I/O	Voltage	Description
YC10 Connected to the waste toner sensor	1	+5V	O	5 V DC	5 V DC power supply for waste toner sensor
	2	TNFULL	I	0/5 V DC	Waste toner sensor: Toner Full/Normal
	3	SGND	-	Ground	Ground
YC11 Connected to the bias PWB	1	SGND	-	Ground	Ground
	2	SGND	-	Ground	Ground
	3	SGND	-	Ground	Ground
	4	+5V	O	5 V DC	5 V DC power supply
	5	+5V	O	5 V DC	5 V DC power supply
	6	+5V	O	5 V DC	5 V DC power supply
	7	HVCLK	O	0/5 V DC (pulse)	Developing bias output clock signal
	8	ZCROSS	I	0/5 V DC (pulse)	Zero cross signal
	9	MHVDR2	O	0/5 V DC	Main charger output control 2: On/Off
	10	EXITN	I	0/5 V DC	Exit sensor: On/Off
	11	PSEL1	O	0/5 V DC	Transfer bias output control signal: On/Off
	12	SLEEP	O	0/5 V DC	Sleep mode control signal: On/Off
	13	+5V	O	5 V DC	5 V DC power supply
	14	HVISEL	O	0/5 V DC	Transfer bias (current) control signal: On/Off
	15	HEATN	O	0/24 V DC	Heater lamp: On/Off
	16	RTHVDR	O	0/5 V DC	Transfer bias (reverse) control signal: On/Off
YC12 Connected to the bias PWB	1	THERM	I	Analog	Fuser thermistor temperature detection signal
	2	THVDR	O	0/5 V DC	Transfer bias: On/Off
	3	FAN1	O	0/12/24 V DC	Cooling fan rotation: High/Low/Stop
	4	FAN2	O	0/24/24 V DC	Cooling fan rotation: Half/High/Stop
	5	MHVDR1	O	0/5 V DC	Main charger output control signal 1: On/Off
	6	+24V2	O	24 V DC	24 V DC power supply
	7	TONER	I	0/5 V DC	Toner sensor detection signal: Normal/Empty
	8	RESIT	I	0/5 V DC	Registration sensor: On/Off
	9	SWIN	I	0/5 V DC	Cassette switch: On/Off
	10	PGND	-	Ground	Ground
	11	PGND	-	Ground	Ground
	12	+24V3	O	24 V DC	24 V DC power supply
	13	+24V3	O	24 V DC	24 V DC power supply
YC13 Connected to the switchback solenoid	1	DUDR1	O	0/24 V DC	Switchback solenoid: On/Off
	2	COMMON	O	24 V DC	24 V DC power supply
	3	DUDR2	O	0/24 V DC	Switchback solenoid: On/Off
YC14 Connected to the paper sensor	1	+5V	O	5 V DC	5 V DC power supply for paper sensor
	2	PAPER	I	0/5 V DC	Paper sensor: On/Off
	3	GND	-	Ground	Ground

2-3-3 Power supply unit

The Power supply unit provides the AC power input and DC power and outputs. The high voltage bias generator circuit is mounted on a separate board. A simplified schematic diagram is shown below.

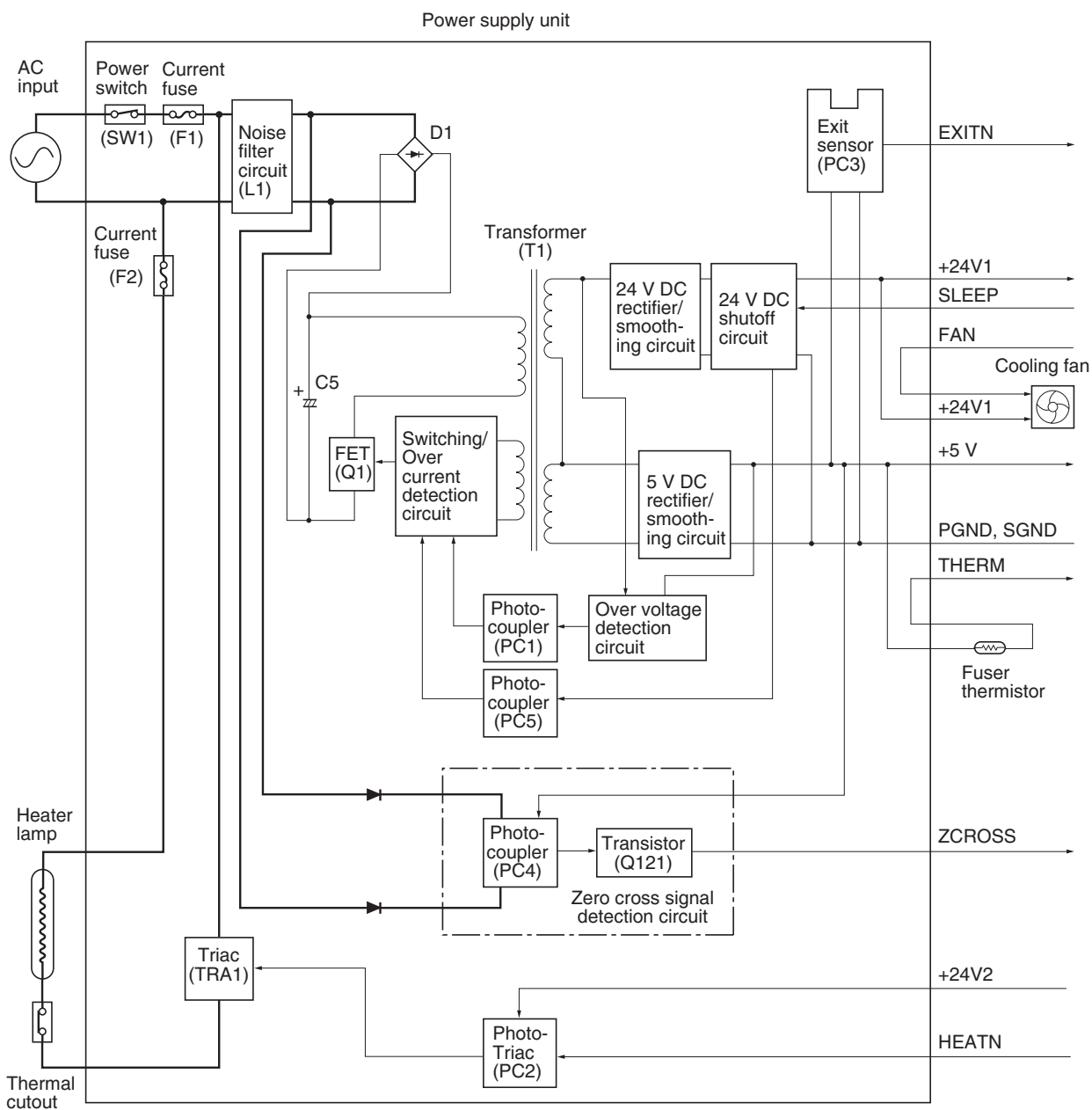


Figure 2-3-6 Power supply unit circuit block diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
CN1	1	Neutral	O	120 V AC	Power supply for heater lamp
Connected to the main PWB	3	Live	O	220 - 240 V AC 120 V AC 220 - 240 V AC	Power supply for heater lamp
YC2	1	+5V	O	5 V DC	5 V DC power supply
Connected to the High voltage unit	2	+5V	O	5 V DC	5 V DC power supply
	3	FAN	I	0/12/24 V DC	Cooling fan rotation: High/Low/Stop
	4	PGND	-	Ground	Ground
	5	PGND	-	Ground	Ground
	6	+24V2	I	24 V DC	24 V DC power supply
	7	THERM	O	Analog	Fuser thermistor temperature detection signal
	8	HEATN	I	0/24 V DC	Heater lamp: On/Off
	9	SLEEP	I	0/5 V DC	Sleep mode control signal: On/Off
	10	EXITN	O	0/5 V DC	Exit sensor: On/Off
	11	ZCROSS	O	0/5 V DC (pulse)	Zero cross signal
	12	+24V1	O	24 V DC	24 V DC power supply
	13	+24V1	O	24 V DC	24 V DC power supply
	14	SGND	-	Ground	Ground
	15	SGND	-	Ground	Ground
YC3	1	FAN	O	0/12/24 V DC	Cooling fan rotation: High/Low/Stop
Connected to the cooling fan	2	+24V1	O	24 V DC	24 V DC power supply for cooling fan
YC4	1	THERM	I	Analog	Fuser thermistor temperature detection signal
Connected to the fuser thermistor	2	+5V	O	5 V DC	5 V DC power supply for fuser thermistor
YC5	L	Live	I	110 V AC 120 V AC 220 - 240 V AC	AC input
Connected to the AC inlet	N	Neutral	I	110 V AC 120 V AC 220 - 240 V AC	AC input

2-3-4 Bias PWB

The Bias PWB contains the developing bias output circuit, registration sensor, and the cassette switch. It also provides a liaison connection to the High voltage unit, power supply unit, and the toner sensor.

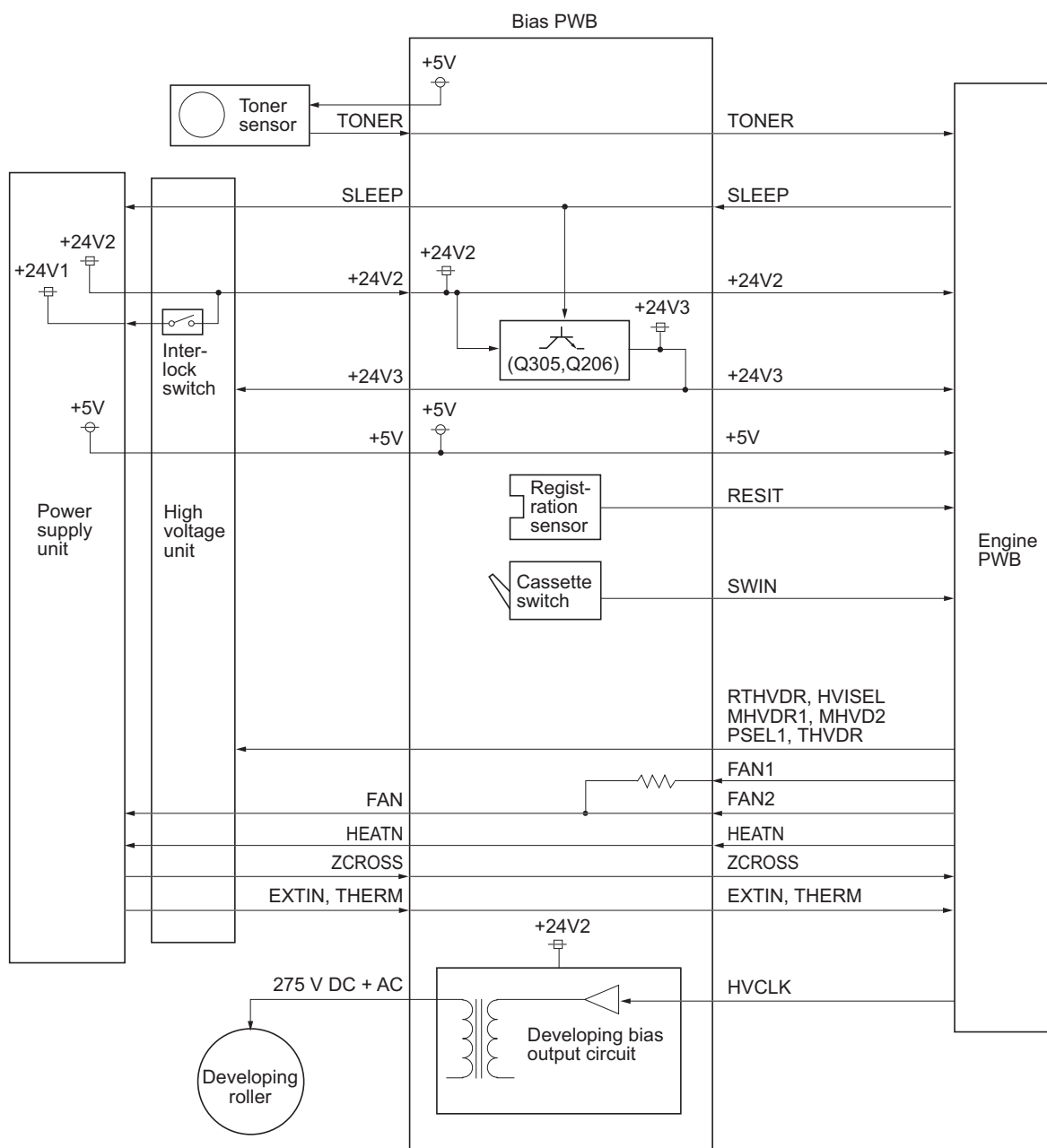


Figure 2-3-7 Bias PWB circuit block diagram

2-3-5 High voltage unit

The High voltage unit contains the high voltage output circuit, interlock switch circuit as well as providing a liaison connection with the Power supply unit, bias PWB, and the engine PWB.

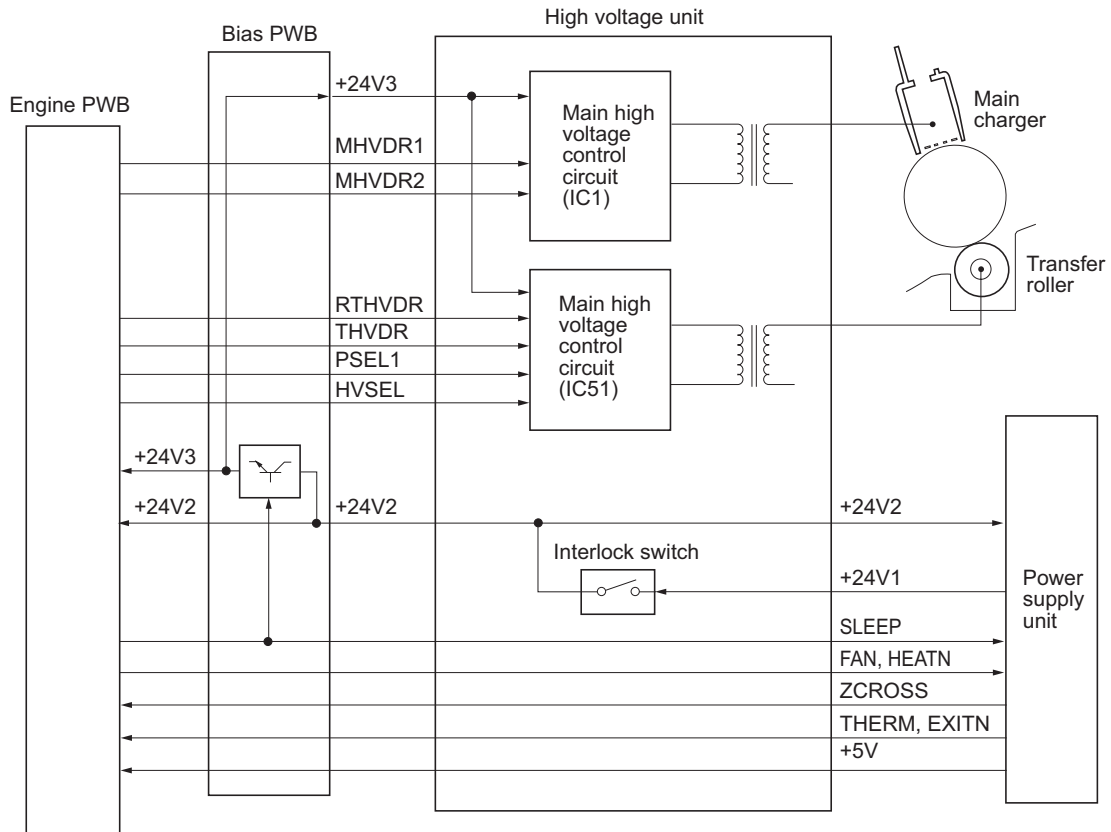


Figure 2-3-8 High voltage unit circuit block diagram

(1) Interlock switch

The interlock switch is located on the high voltage unit and opened and closed in conjunction with the front cover or the top cover via the interlock lever. This switch connects and disconnects the +24 V DC power supply line. If the front cover or the top cover is open, the interlock switch is open, and the +24 V DC to the high voltage output circuit, bias PWB, engine PWB, and the power supply unit is disconnected, deactivating the high voltage output, laser output, main motor output for safety. The cooling fan is an exception: Since the cooling fan is directly fed with +24 V DC from the power supply unit at the primary side (+24V1) of the interlock switch, the cooling fan is not deactivated even the cover is open.

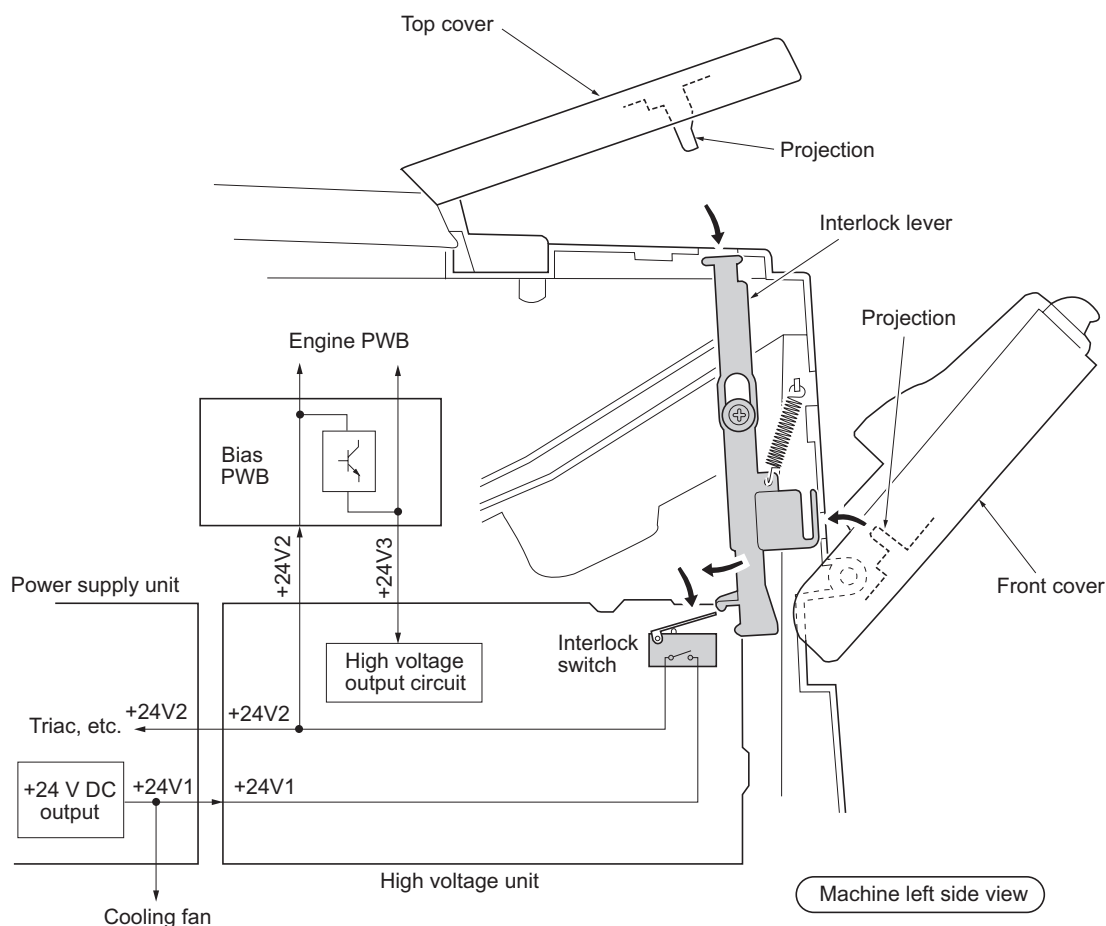
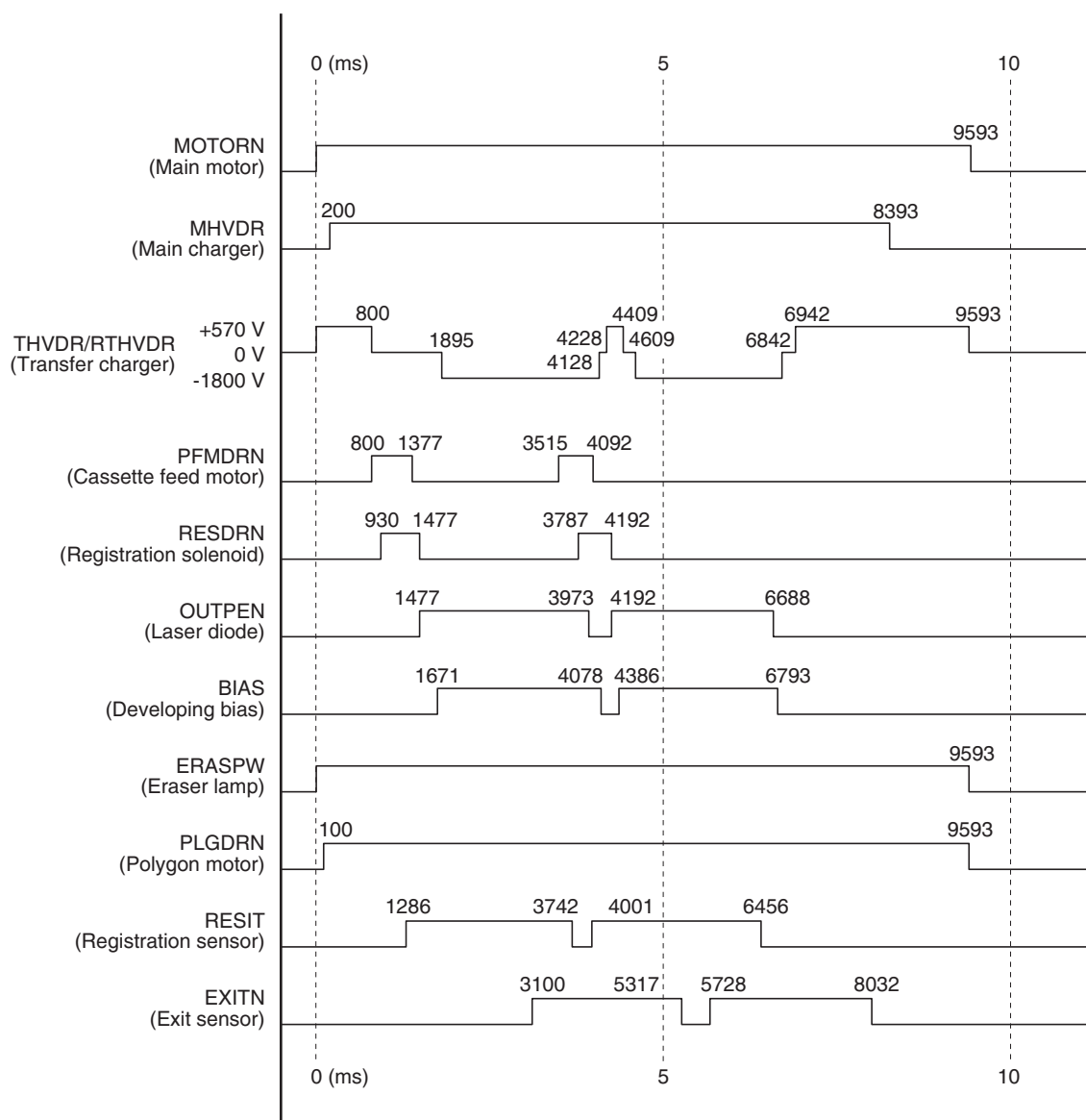


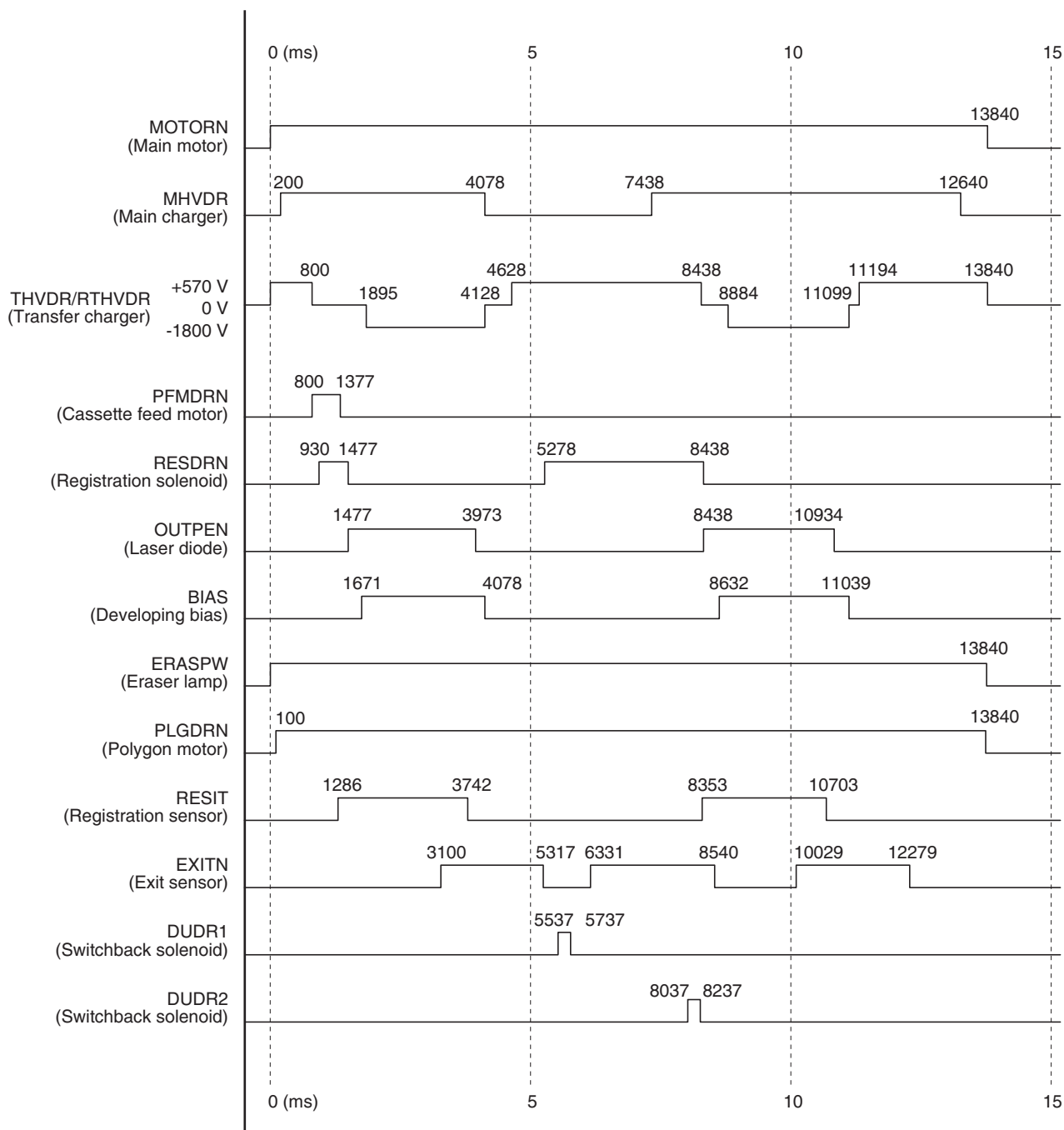
Figure 2-3-9 Interlock switch

Timing chart No. 1 Paper cassette feeding, A4/8¹/₂" × 11" paper, simplex printing



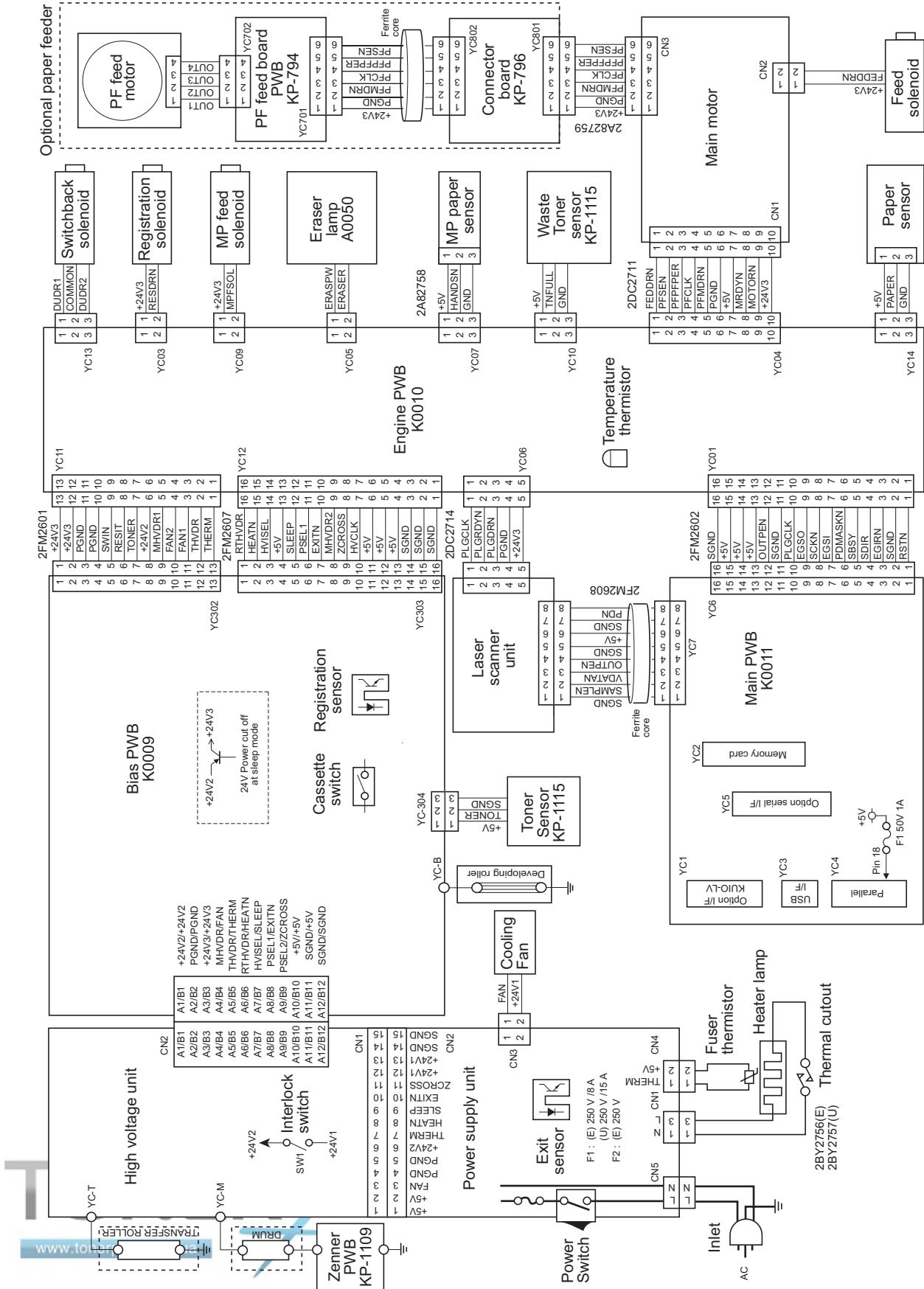
Drum speed: 132 mm/s
 Paper feeding speed: 222 mm/s
 Printing speed: 22.1 ppm

Timing chart No. 2 Paper cassette feeding, A4/8¹/₂" × 11" paper, duplex printing

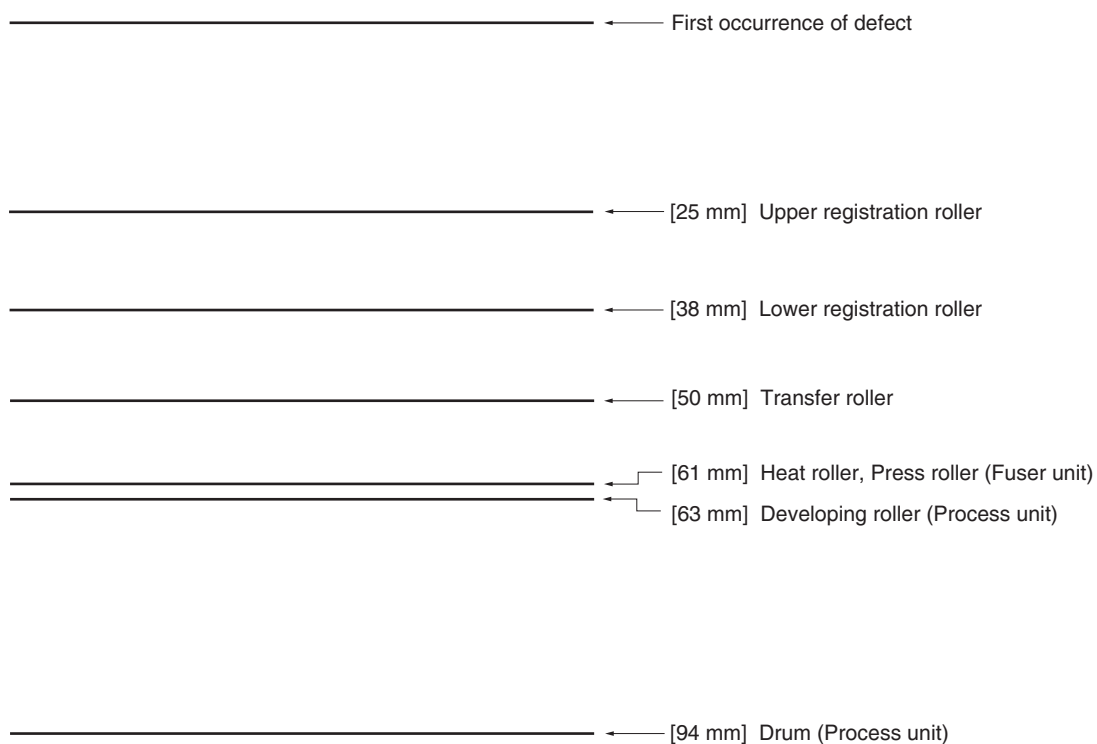


Drum speed: 132 mm/s
 Paper feeding speed: 222 mm/s
 Printing speed: 10.30 ppm

Wiring diagram



Repetitive defects gauge



MEMO:

MEMO:

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



KYOCERA MITA EUROPE B.V.

Hoeksteen 40, 2132 MS Hoofddorp,
The Netherlands
Phone: +31.(0)20.654.0000
Home page: <http://www.kyoceramita-europe.com>
Email: info@kyoceramita-europe.com

KYOCERA MITA NEDERLAND B.V.

Hoeksteen 40 2132 MS Hoofddorp,
The Netherlands
Phone: +31.(0)20.587.7200

KYOCERA MITA (UK) LTD.

8 Beacontree Plaza
Gillette Way, Reading Berks RG2 0BS,
UK
Phone: +44.(0)118.931.1500

KYOCERA MITA ITALIA S.P.A.

Via Verdi 89 / 91 20063 Cernusco sul Naviglio,
(Milano), Italy
Phone: +39.02.92179.1

S.A. KYOCERA MITA BELGIUM N.V.

Hermesstraat 8A 1930 Zaventem,
Belgium
Phone: +32.(0)2.720.9270

KYOCERA MITA FRANCE S.A.

Parc Les Algorithmes, Saint Aubin
91194 GIF-SUR-YVETTE,
France
Phone: +33.(0)1.6985.2600

KYOCERA MITA ESPAÑA S.A.

Edificio Kyocera, Avda de Manacor N. 2,
Urb. Parque Rozas 28290 Las Rozas, Madrid,
Spain
Phone: +34.(0)91.631.8392

KYOCERA MITA FINLAND OY

Kirvesmiehenkatu 4 00810 Helsinki,
Finland
Phone: +358.(0)9.4780.5200

KYOCERA MITA (SCHWEIZ) AG

Industriestrasse 28, 8604 Volketswil,
Switzerland
Phone: +41.(0)1.908.4949

KYOCERA MITA DEUTSCHLAND GMBH

Mollsfeld 12-40670 Meerbusch,
Germany
Phone: +49.(0)2159.918.0

KYOCERA MITA GMBH AUSTRIA

Eduard-Kittenberger Gasse 95
A-1230 Wien,
Austria

Phone: +43.(0)1.86338.401

KYOCERA MITA SVENSKA AB

Vretenragen 2, 6tr 171 54 Solna,
Sweden

Phone: +46.(0)8.546.550.00

KYOCERA MITA NORGE

Postboks 150 Oppsal, NO 0619 Oslo
Olaf Helsetsvei 6, NO 0694 Oslo,
Norway
Phone: +47.(0)22.62.73.00

KYOCERA MITA DANMARK A/S

Slotsmarken 11, 2 DK-2970 Hørsholm,
Denmark
Phone: +45.7022.3880

KYOCERA MITA PORTUGAL LDA.

Rua do Centro Cultural, no 41 1700-106 Lisbon,
Portugal
Phone: +351.(0)21.843.6780

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>