



FS-6020

SERVICE MANUAL

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Revision 2



Revision history

Revision	Date	Replaced pages	Remarks
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Safety precautions

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

Safety warnings and precautions

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

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

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

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

Symbols

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



General warning.



Warning of risk of electric shock.



Warning of high temperature.

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



General prohibited action.



Disassembly prohibited.

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



General action required.



Remove the power plug from the wall outlet.



Always ground the copier.

1. Installation Precautions

WARNING

- Do not use a power supply with a voltage other than that specified. Avoid multiple connections to one outlet: they may cause fire or electric shock. When using an extension cable, always check that it is adequate for the rated current. 
- Connect the ground wire to a suitable grounding point. Not grounding the copier may cause fire or electric shock. Connecting the earth wire to an object not approved for the purpose may cause explosion or electric shock. Never connect the ground cable to any of the following: gas pipes, lightning rods, ground cables for telephone lines and water pipes or faucets not approved by the proper authorities. 

CAUTION:

- Do not place the copier on an infirm or angled surface: the copier may tip over, causing injury..... 
- Do not install the copier in a humid or dusty place. This may cause fire or electric shock..... 
- Do not install the copier near a radiator, heater, other heat source or near flammable material. This may cause fire. 
- Allow sufficient space around the copier to allow the ventilation grills to keep the machine as cool as possible. Insufficient ventilation may cause heat buildup and poor copying performance..... 
- Always handle the machine by the correct locations when moving it..... 
- Always use anti-toppling and locking devices on copiers so equipped. Failure to do this may cause the copier to move unexpectedly or topple, leading to injury..... 
- Avoid inhaling toner or developer excessively. Protect the eyes. If toner or developer is accidentally ingested, drink a lot of water to dilute it in the stomach and obtain medical attention immediately. If it gets into the eyes, rinse immediately with copious amounts of water and obtain medical attention. 
- Advise customers that they must always follow the safety warnings and precautions in the copier's instruction handbook. 

2. Precautions for Maintenance

WARNING

- Always remove the power plug from the wall outlet before starting machine disassembly..... 
- Always follow the procedures for maintenance described in the service manual and other related brochures. 
- Under no circumstances attempt to bypass or disable safety features including safety mechanisms and protective circuits. 
- Always use parts having the correct specifications..... 
- Always use the thermostat or thermal fuse specified in the service manual or other related brochure when replacing them. Using a piece of wire, for example, could lead to fire or other serious accident. 
- When the service manual or other serious brochure specifies a distance or gap for installation of a part, always use the correct scale and measure carefully. 
- Always check that the copier is correctly connected to an outlet with a ground connection..... 
- Check that the power cable covering is free of damage. Check that the power plug is dust-free. If it is dirty, clean it to remove the risk of fire or electric shock..... 
- Never attempt to disassemble the optical unit in machines using lasers. Leaking laser light may damage eyesight. 
- Handle the charger sections with care. They are charged to high potentials and may cause electric shock if handled improperly. 

CAUTION

- Wear safe clothing. If wearing loose clothing or accessories such as ties, make sure they are safely secured so they will not be caught in rotating sections..... 
- Use utmost caution when working on a powered machine. Keep away from chains and belts..... 
- Handle the fixing section with care to avoid burns as it can be extremely hot..... 
- Check that the fixing unit thermistor, heat and press rollers are clean. Dirt on them can cause abnormally high temperatures..... 
- Do not remove the ozone filter, if any, from the copier except for routine replacement..... 

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



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



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



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



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



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



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



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



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



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



3. Miscellaneous

WARNING

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



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1-1-1 Specifications

Type	Desktop
Printing system	Electrophotographic printing
Paper	Cassette: Plain paper (60 to 90 g/m ²) Recycled paper (60 to 90 g/m ²) Thick paper (90 to 105 g/m ²) MP tray: Plain paper (60 to 90 g/m ²) Recycled paper (60 to 90 g/m ²) Thick paper (90 to 200 g/m ²) Special paper: Transparencies, labels, envelopes, postcards, tracing paper
Printing sizes	A4 (297 × 420 mm) B4 (257 × 364 mm) A4R (210 × 297 mm) A4 (297 × 210 mm) B5 (257 × 182 mm) Folio (210 × 182 mm) Ledger (11" × 17") Legal (8.5" × 14") Letter-R (11" × 8.5") Letter (11" × 8.5") Non-standard size (148 to 297 mm × 210 to 432 mm: cassette) Non-standard size (70 to 148 mm × 297 to 450 mm: MP tray)
Print speed	Cassette (Values within [] are speed of printing through an optional duplexer DU-400.) A4: 20 pages/minutes [20 images/minutes] A3: 11 pages/minutes [11 images/minutes] B4: 12 pages/minutes [12 images/minutes] A4R: 15 pages/minutes [15 images/minutes] B5: 17 pages/minutes [17 images/minutes] A5: 20 pages/minutes [20 images/minutes] Ledger: 11 pages/minutes [11 images/minutes] Legal: 13 pages/minutes [13 images/minutes] Letter: 20 pages/minutes [20 images/minutes] Letter-R: 16 pages/minutes [16 images/minutes] MP tray (in cassette mode) A4: 20 pages/minutes A3: 11 pages/minutes B4: 12 pages/minutes A4R: 15 pages/minutes B5: 17 pages/minutes A5: 20 pages/minutes Ledger: 11 pages/minutes Legal: 13 pages/minutes Letter: 20 pages/minutes Letter-R: 16 pages/minutes
First print time	Standby mode: 22 seconds or less (A4) [when the EcoPower mode is on] Sleep mode: 22 seconds or less (A4) [when the EcoPower mode is on] Standby mode: 12 seconds or less (A4) [when the EcoPower mode is off] Sleep mode: 22 seconds or less (A4) [when the EcoPower mode is off]
Warm-up time	Sleep mode: 28 seconds or less (room temperature 23 °C, 60 % RH) Power on: 60 seconds or less (room temperature 23 °C, 60 % RH)
Paper feed system	One universal type cassette, and one MP tray
Paper loading capacity	Cassette: 250 sheets (75 g/m ² , 0.1 µm) MP tray: 100 sheets (75 g/m ² , 0.1 µm) Duplexer: No stack
Paper eject system	Face down; 250 sheets (75 g/m ² , 0.1 µm) equipped with face-down paper full sensor
Photoconductor	OPC drum (diameter 30 mm)
Charging system	Scorotron (positive charging)
Exposure light source	Semiconductor laser
Developing system	One-component dry developing (reverse developing) Developer: One-component magnetic toner Toner replenishing: Automatic from the toner container

Transfer system	Roller transfer (negative charging)
Separation system	Small radius curvature separation and separation charger brush (positive charging)
Fixing system	Heat roller system
Charge erasing system	Exposure by eraser lamp (LED)
Cleaning system.....	Counter blade
Controller hardware.....	CPU: Power PC405 (200 MHz) Code ROM: 4 MB (32 Mbit × 2) Font ROM: 4 MB (32 Mbit × 1) Main RAM: 16 MB in standard configuration (on-board); can be expanded to 144 MB (standard 16 MB + 128 MB) at the maximum by adding optional expansion memory Optional expansion RAM: 1 slot 100-pin DIMM (16, 32, 64 or 128 MB)
Interface	Parallel: High-speed (bi-directional), IEEE 1284 Nibble/ECP mode USB: Full-Speed USB2.0 Serial (optional): RS-232C, maximum speed 115.2 Kbps Serial interface board IB-11 must be installed. Network (optional): 10 Base-TX/100 Base-TX/10 Base-2 Network interface card: IB-21 (10 Base-TX/100 Base-TX/10 Base-2) Network interface card IB-21E (10 Base-TX/100 Base-TX) Wireless LAN card IB-22 must be installed.
Controller software	a) Emulation (1) Standard Line Printer IBM Proprinter X24E Epson LQ-850 KCGL Diablo 630 PCL6 (PCL5e + PCLXL protocol class 2.0) (2) Option Japanese KPDL3 (PostScript 3 compatible) UG-13 b) Fonts: (1) Western fonts Bitmap fonts: 1 Line Printer bitmap fonts Outline fonts: 80 outline fonts 79 bitmap emulate downloadable font: Kyocera Mita format/HP format 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) (4) Text: TEXT, RTXT etc. (5) Others: Macro, JOBx, Device setting etc. d) Connectivity plug & play, Windows 95/98/ME/NT4.0/2000/XP SNMP (KM-NET viewer)
Smoothing	KIR: equivalent to 2400 dpi, two levels by On and Off (Available only in 600 dpi mode or fast 1200 mode; On at the factory default setting)
Toner saving	EcoPrint mode
Resolution	Fast 1200 mode: 1800 × 600 dpi 600 dpi mode: 600 × 600 dpi 300 dpi mode: 300 × 300 dpi (Fast 1200 mode at the factory default setting)
Gray scale	Fast 1200 mode: 220 levels 600 dpi mode: 203 levels
Dimensions	Main unit: 467 × 410 × 310 mm/18 ³ / ₈ " × 16 ¹ / ₈ " × 12 ³ / ₁₆ " (W × D × H)
Weight	Main unit: 18 kg/39.7 lbs

Power source	120 V AC, 60 Hz (U.S.A./Canada) 220-240 V AC, 50/60 Hz (European countries)
Power consumption	Maximum: 961 W Normal operating: 382 W Ready: 21 W EcoPower: 8 W
Current	10.8 A: 21 W (U.S.A./Canada) 7.2 A: 21 W (European countries)
Noise	Printing: 54 dB(A) Ready: 31 dB(A)
Options	Expansion memory (one of 16/32/64/128 MB 100-pin DIMM), KPLD3 upgrade kit UG-13, memory card (CompactFlash), hard disk unit (Microdrive), network interface card IB-20 (10 BASE-T/100BASE-TX/10BASE-2), network interface card IB-21E (10 BASE-T/100BASE-TX), wireless network interface card IB-22 (compatible to IEEE 802.11b), serial interface board IB-11, paper feeder PF-400 (250 sheets [60 to 105 g/m ²] × 1 cassette, A3, A4, A4R, A5, B4, B5, folio, ledger, legal, let5ter, and letter-R), duplexer DU-400

1-1-2 Parts names

(1) Printer

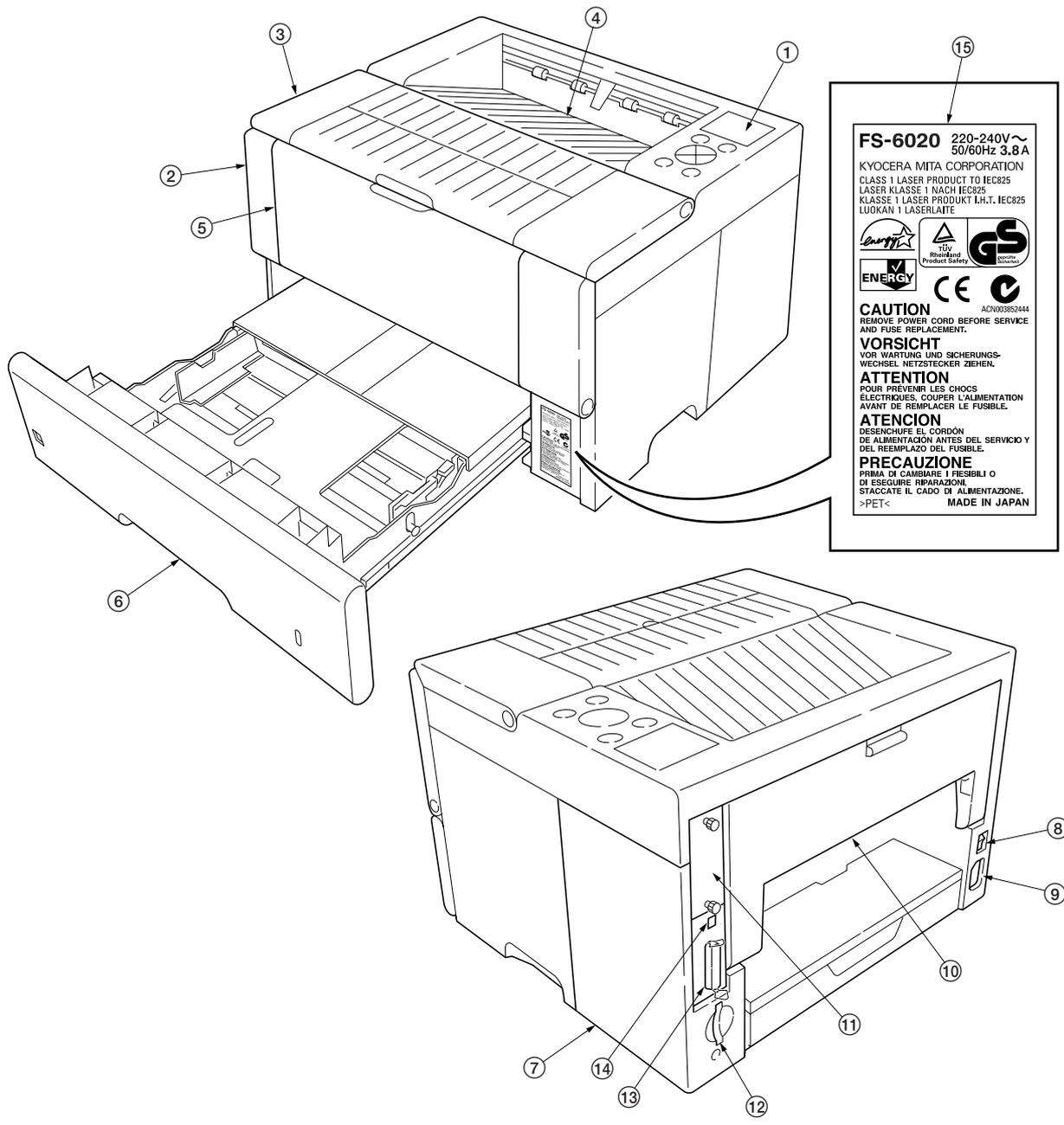


Figure 1-1-1

- ① Operation panel
- ② Front cover
- ③ Top cover
- ④ Face-down tray
- ⑤ MP tray
- ⑥ Paper cassette
- ⑦ Optional interface slot cover
- ⑧ Power switch
- ⑨ AC inlet
- ⑩ Rear cover
- ⑪ Optional interface slot
- ⑫ Memory card slot
- ⑬ Parallel interface
- ⑭ USB interface
- ⑮ Caution label

(2) Operation panel

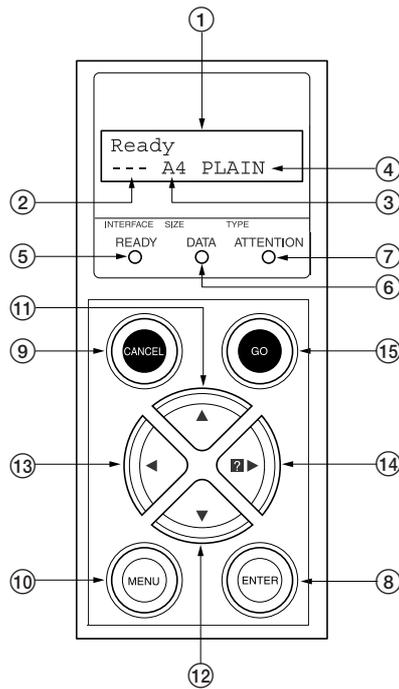


Figure 1-1-2

- | | |
|------------------------|--------------|
| ① Message display | ⑨ CANCEL key |
| ② Interface indicator | ⑩ MENU key |
| ③ Paper size indicator | ⑪ ▲ key |
| ④ Paper type indicator | ⑫ ▼ key |
| ⑤ READY indicator | ⑬ ◀ key |
| ⑥ DATA indicator | ⑭ ▶ key |
| ⑦ ATTENTION indicator | ⑮ GO key |
| ⑧ ENTER key | |

1-1-3 Machine cross section

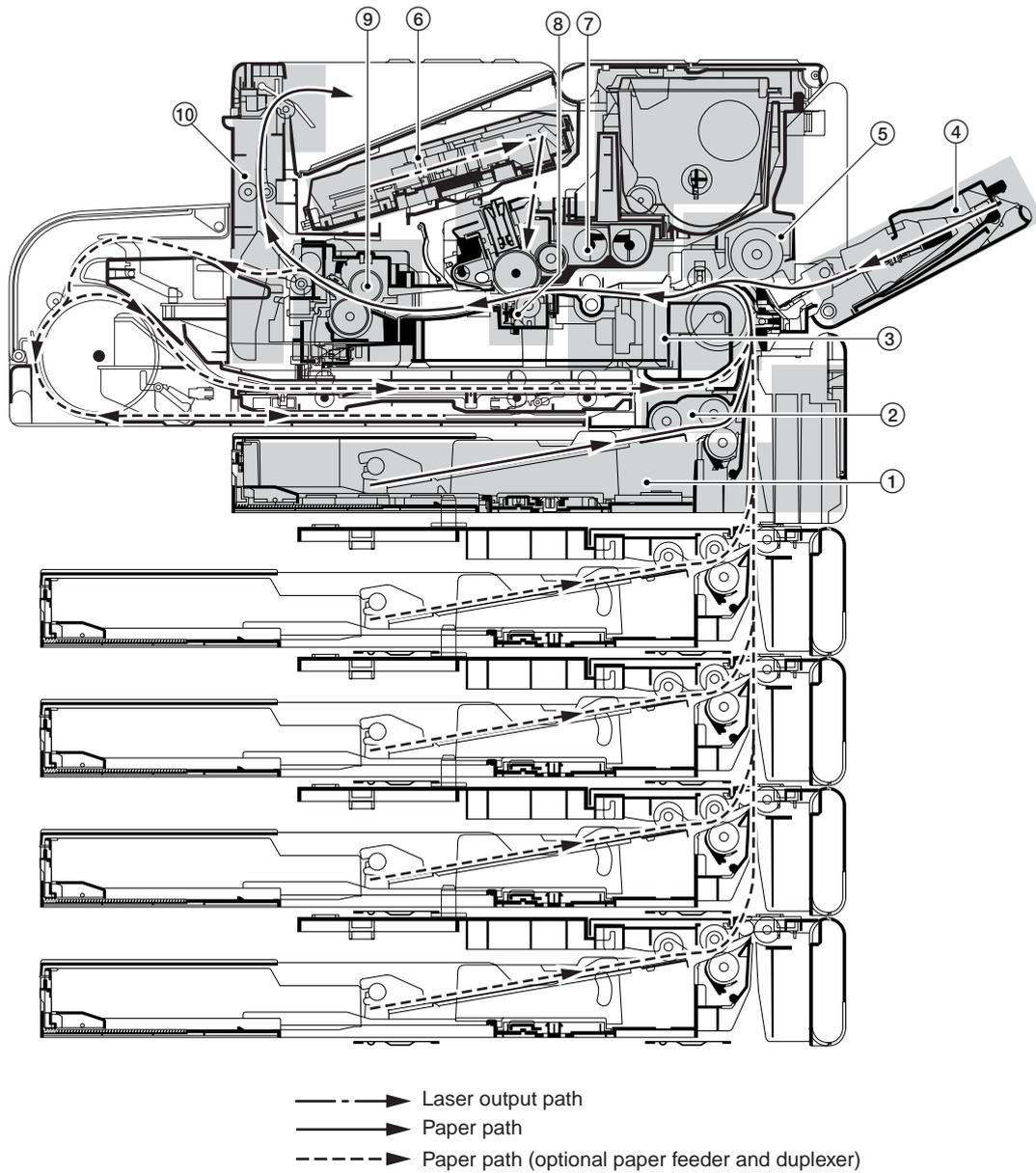


Figure 1-1-3 Machine cross section

- ① Paper cassette
- ② Paper feed section
- ③ Conveying section
- ④ MP tray
- ⑤ MP tray feed section
- ⑥ Laser scanner unit section
- ⑦ Process unit section
- ⑧ Transfer/separation section
- ⑨ Fixing section
- ⑩ Face-down eject/feedshift section

1-1-4 Drive system

(1) Drive system

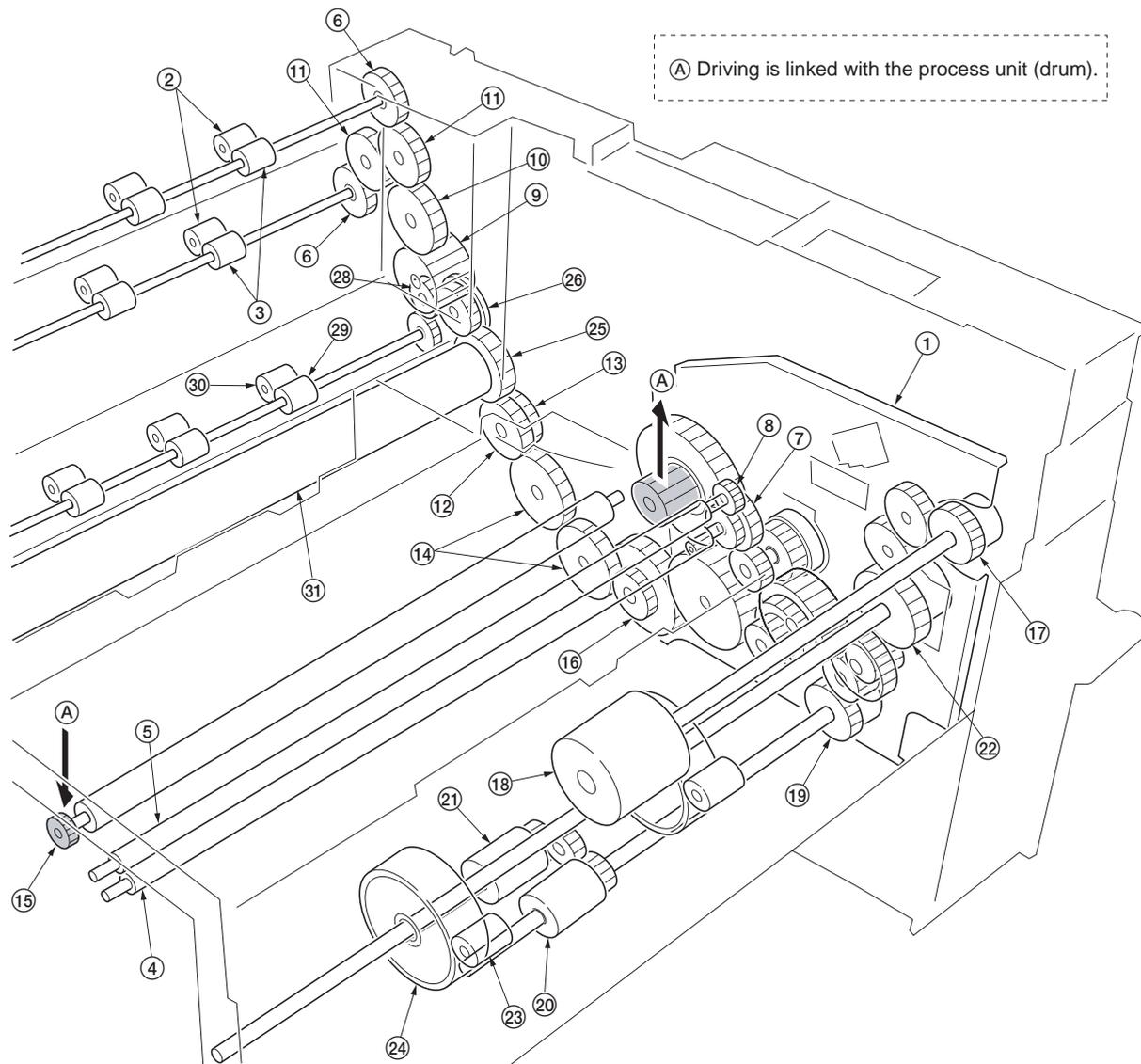


Figure 1-1-4

- | | | |
|------------------------------------|----------------------------|-----------------------------|
| ① Drive assembly | ⑫ Free gear Z34S | ⑳ Middle feed clutch (gear) |
| ② Pinch roller | ⑬ Free gear Z29S | ㉑ Pinch roller |
| ③ Face-down roller | ⑭ Gear Z52S | ㉒ Middle feed roller |
| ④ Upper registration roller | ⑮ Transfer roller gear Z18 | ㉓ Heat roller gear Z36 |
| ⑤ Lower registration roller | ⑯ Gear Z24S-Z96H | ㉔ Fixing joint gear Z32 |
| ⑥ Face-down roller gear Z18 | ⑰ MP tray feed pulley | ㉕ Fixing idle gear Z22 |
| ⑦ Registration roller gear Z32-Z31 | ⑱ MP tray feed roller | ㉖ Eject gear Z22 |
| ⑧ Registration roller gear Z24 | ⑲ Feed clutch (gear) | ㉗ Eject roller |
| ⑨ Joint gear Z31 | ㉑ Feed roller | ㉘ Eject pulley |
| ⑩ Gear Z35 | ㉒ Pickup roller | ㉙ Heat roller |
| ⑪ Idle gear Z25 | | |

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1-2-1 Process unit

Note the following when handling or storing the process unit.

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

1-2-2 Toner container

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

1-2-3 Installation environment

1. Temperature: 10 - 32.5°C/50 - 90.5°F
2. Humidity: 20 - 80%RH
3. Power supply: 120 V AC, 10.8 A (U.S.A./Canada)
220 - 240 V AC, 7.2 A (European countries)
4. Power source frequency: 50 Hz \pm 2%/60 Hz \pm 2%
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, NO_x, SO_x gases and chlorine-based organic solvents.
 - Select a room with good ventilation.
6. Allow sufficient access for proper operation and maintenance of the machine.
Machine front: 1000 mm/39³/₈" Machine rear: 100 mm/3¹⁵/₁₆"
Machine right: 700 mm/27¹/₂" Machine left: 600 mm/23⁵/₈"

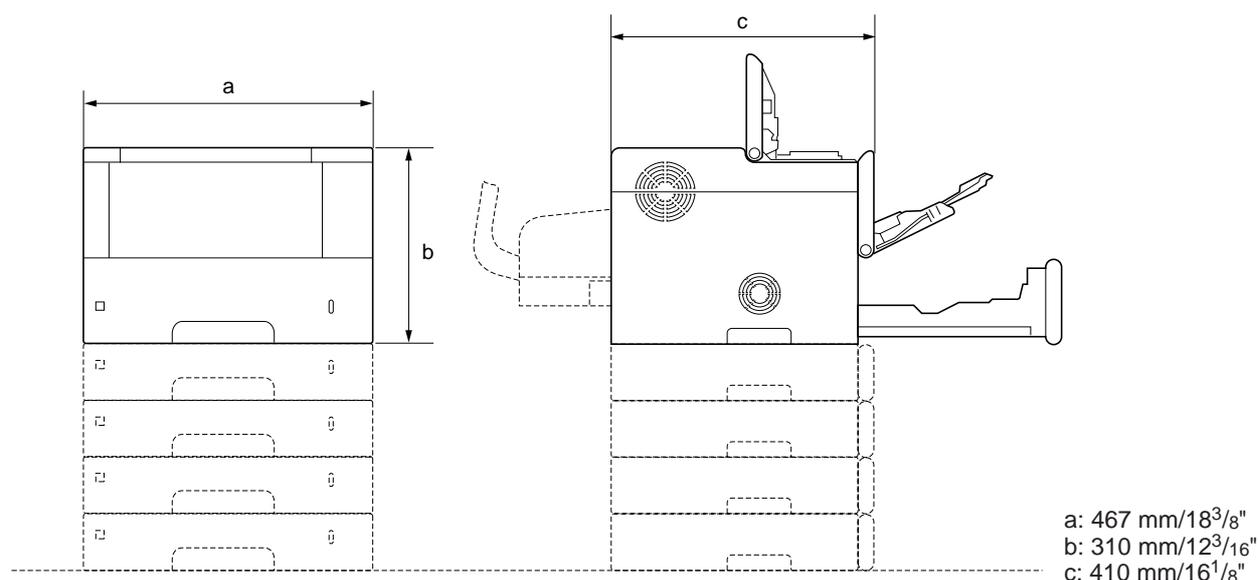
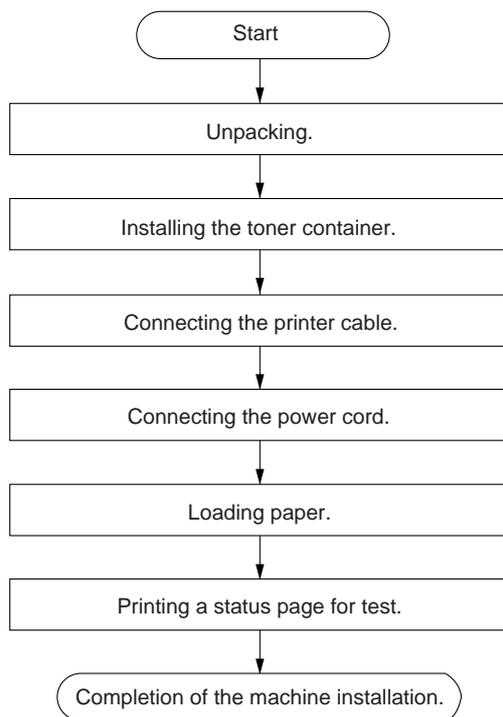


Figure 1-2-1 Installation dimensions

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1-3-1 Unpacking and installation

(1) Installation procedure



Unpacking.

Unpack as shown in the figure below.

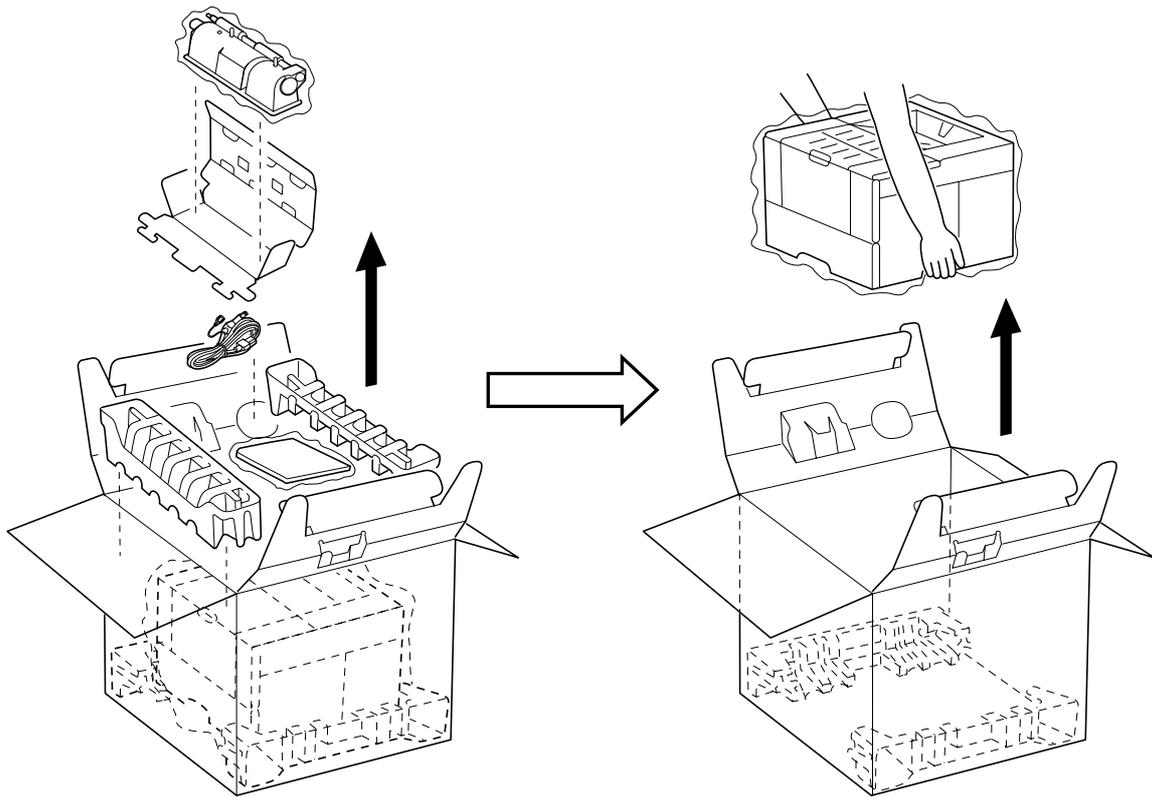


Figure 1-3-1 Unpacking

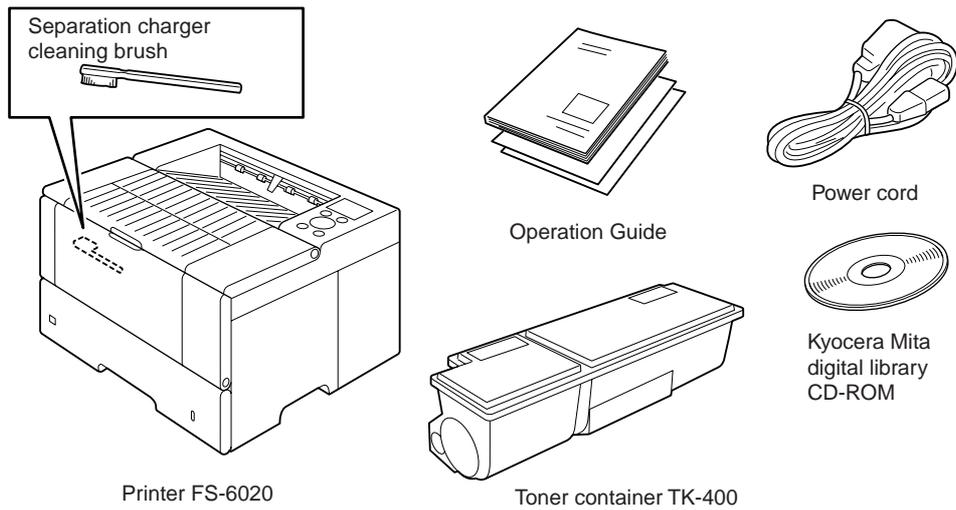
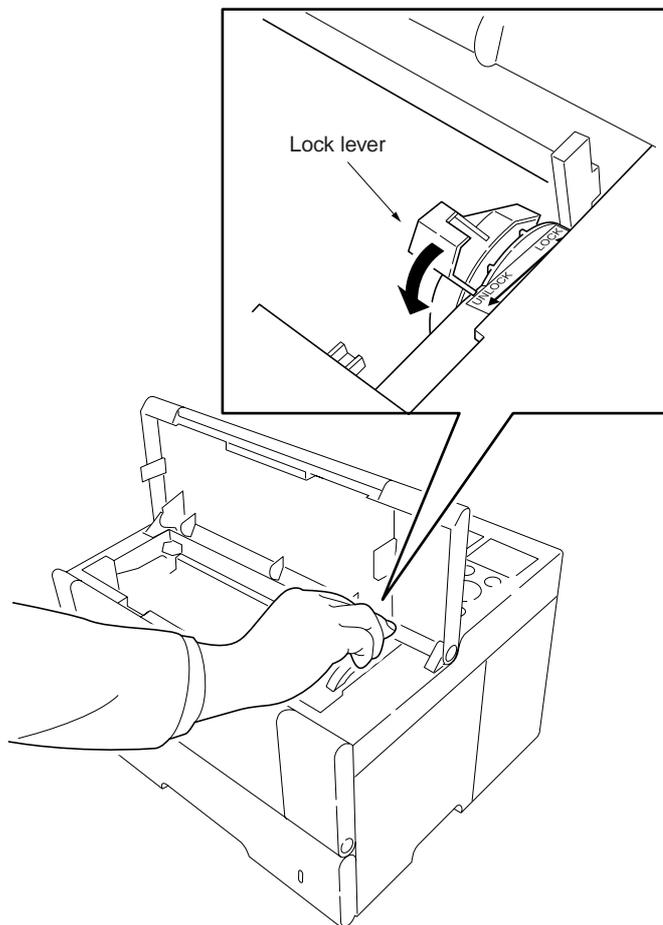


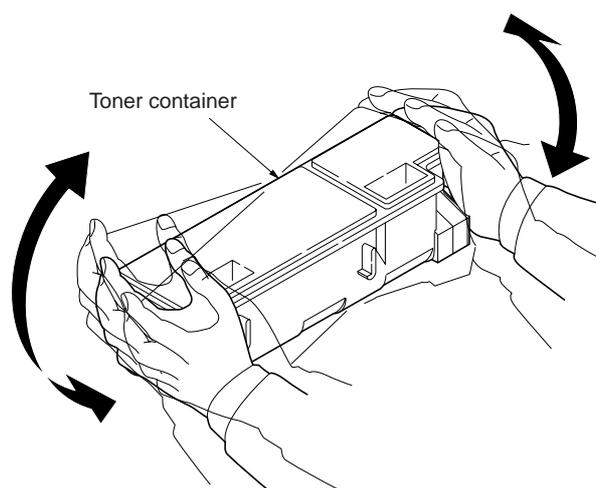
Figure 1-3-2 Shipped components

Installing the toner container.

1. Open the top cover.
2. Turn the lock lever to the UNLOCK position.
(LOCK position at shipping)

**Figure 1-3-3**

3. Shake the toner container more than ten times to loosen the toner.

**Figure 1-3-4**

4. Remove the protective seal from the toner container.

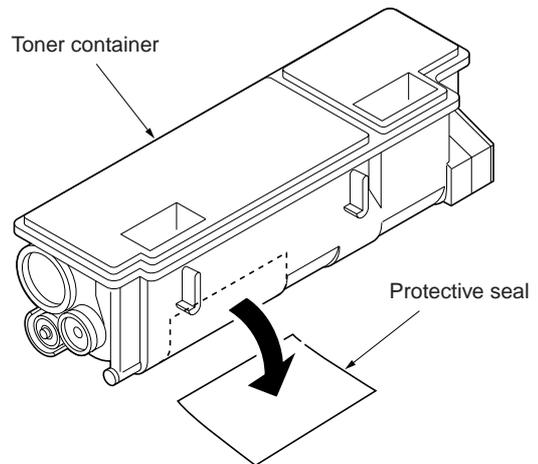


Figure 1-3-5

5. Install the toner container into the printer.
6. Push the upper part of the toner container on which "PUSH HERE" is printed until the container clicks.
7. Turn the lock lever to the LOCK position.
8. Close the top cover.

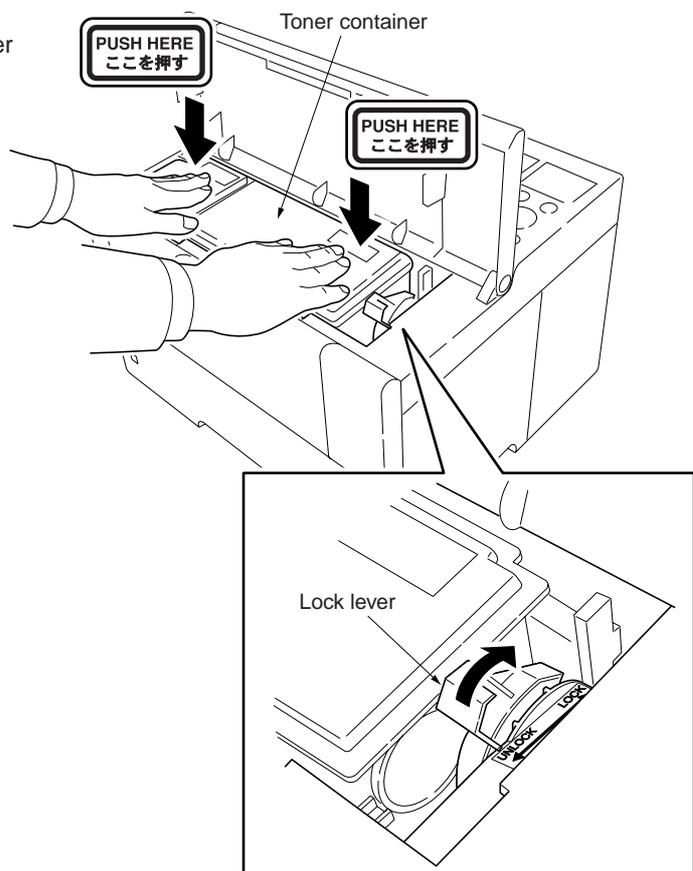


Figure 1-3-6

Connecting the printer cable.

For connection to a computer, parallel interface or USB interface can be used in the standard configuration. If an optional network interface card or serial interface card is installed, network connection or serial interface connection is available.

1. Connect the parallel interface cable or the USB interface cable to their relevant interface connector.

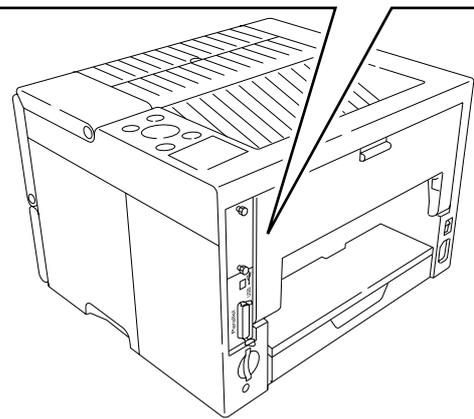
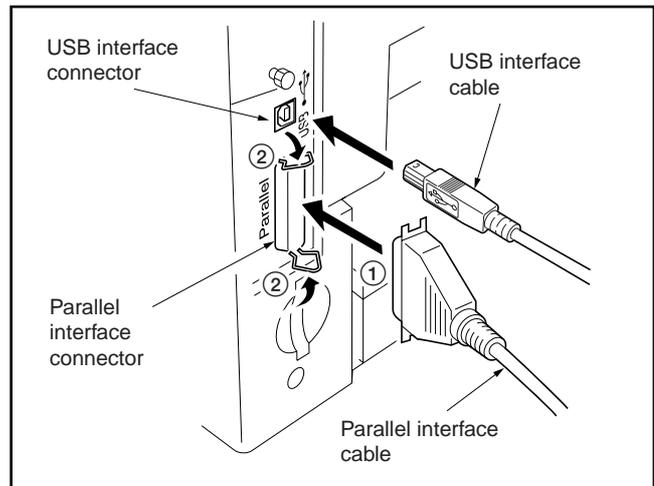


Figure 1-3-7

Connecting the power cord.

1. Connect the power cord to the AC inlet.

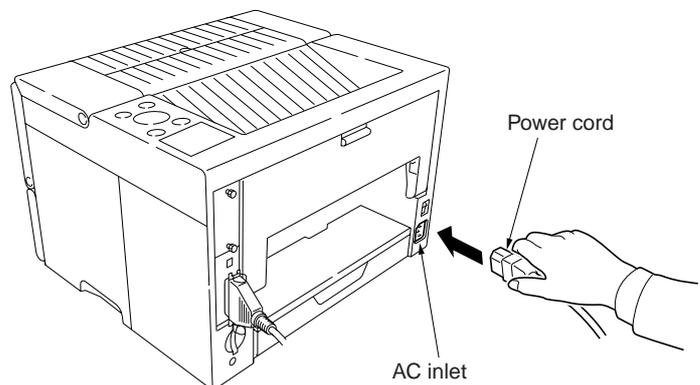


Figure 1-3-8

Loading paper.

1. Remove the cassette from the printer.
2. Adjust the paper guides and the paper stopper according to the paper size to be used.
3. Set the stack of paper that does not exceed the paper upper limit marks on the paper guides and the paper stopper by aligning the top of the stack and placing the rear side first. (Approximate 250 sheets of 0.1 mm thick paper can be loaded.)

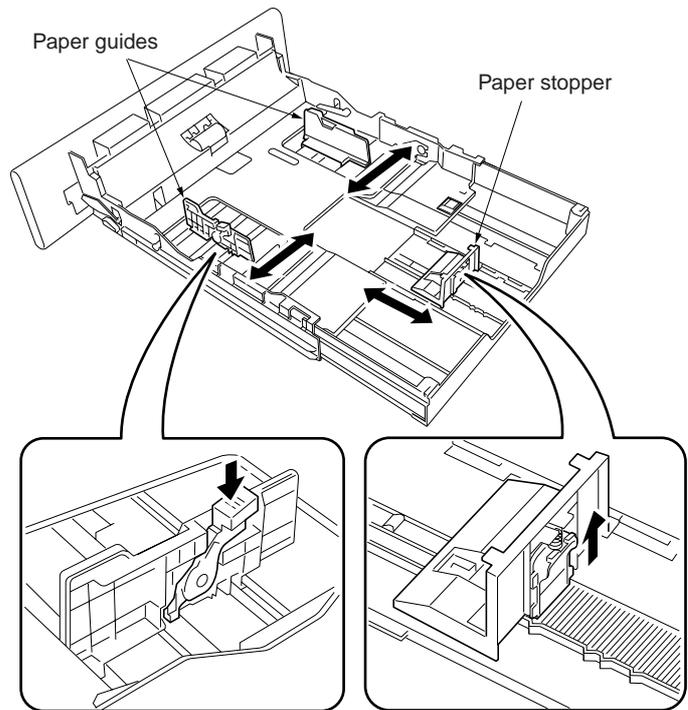


Figure 1-3-9

4. Turn the paper size dial so that the size of the loaded paper is indicated in the paper size indication window.
If "OTHER" is selected, paper size setting must be performed on the operation panel of the printer.
5. Install the cassette into the printer.

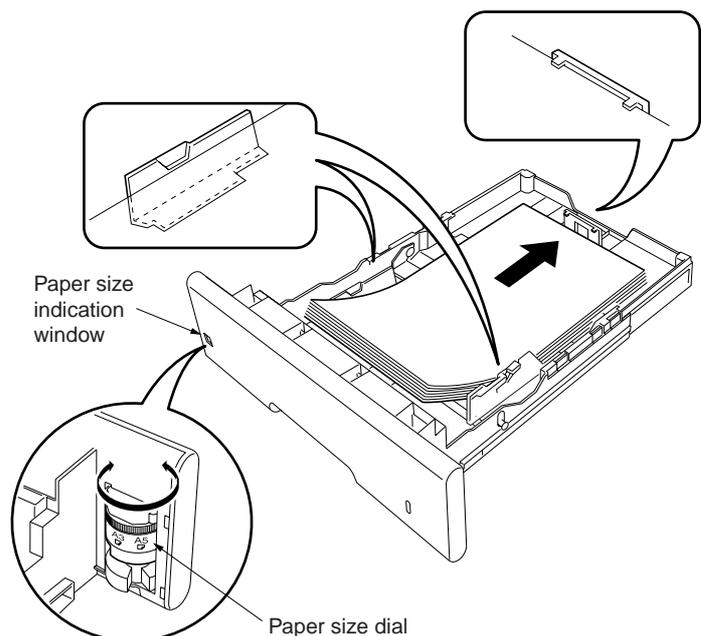


Figure 1-3-10

Printing a status page for test.

1. Turn on the printer power switch. Initialization of the machine will start. The message will change from "Self test" to "Please Wait Adding toner" and then change to "Ready" when initialization is complete (after approximately 15 minutes).
2. Use the following key operation to print a status page for test.
 - ① Press the MENU key when "Ready" is displayed.
 - ② Press the ▼ key to display "Print Status Page".
 - ③ Press the ENTER key to display "Print Status Page?".
 - ④ Press the ENTER key. "Processing" will be displayed and status page printing will start. When printing is complete, "Ready" will appear again.
3. Check to see if the printout of the status page is proper.

Completion of the machine installation.

1-3-2 Installing expansion memory (optional)

Procedure

1. Turn off the printer power switch.

Cautions

Do not insert or remove expansion memory while the printer power is on. Doing so may cause damage to the printer or the expansion memory.

2. Remove one screw and then remove the optional interface slot cover.
3. Open the stoppers of the memory socket.

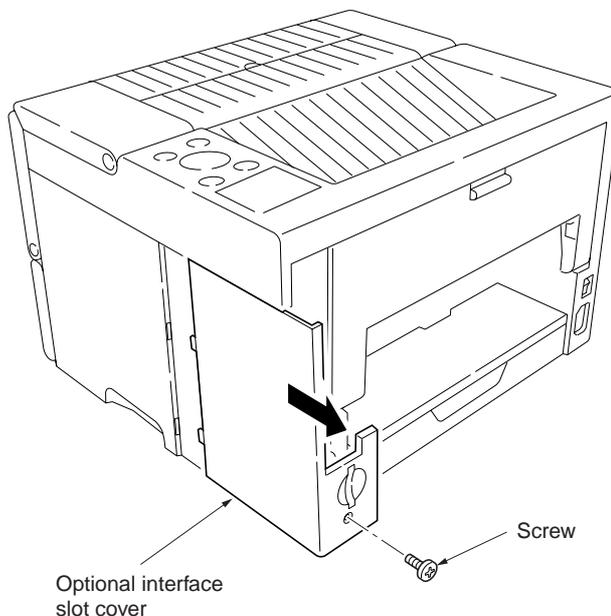


Figure 1-3-11

4. Insert the memory so that the two notches of the memory are engaged with the projections of the memory socket.

* Memory produced by Melco Inc. of which the operation has been confirmed is recommended.

5. Close the stoppers of the memory socket.
6. Reattach the optional interface slot cover to its original position.
7. Print a status page to check the memory expansion.

* If memory expansion has been properly performed, information on the installed memory is printed and the total memory capacity has been increased. (Memory capacity at shipping is 16 MB.)

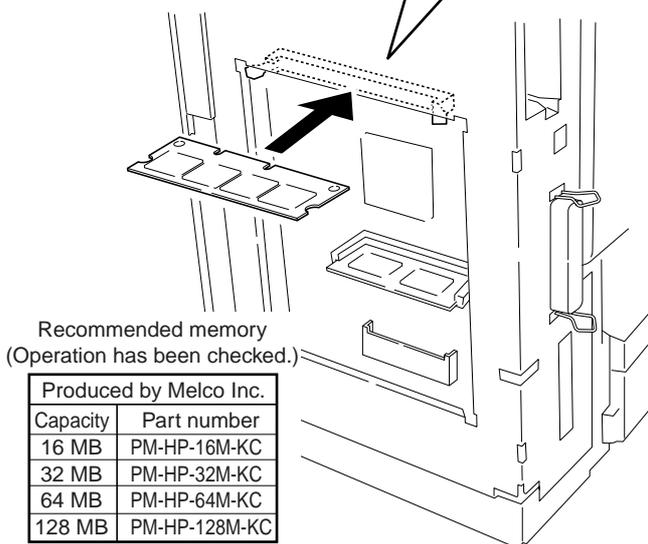
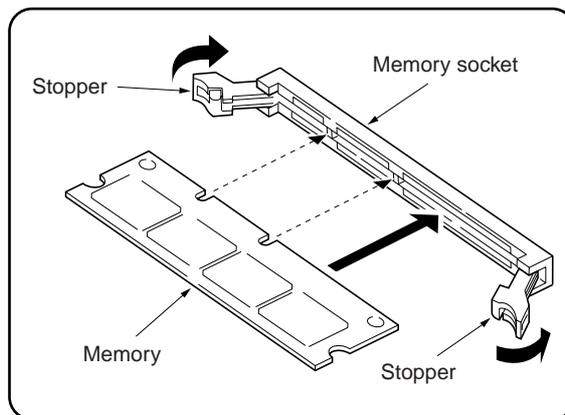
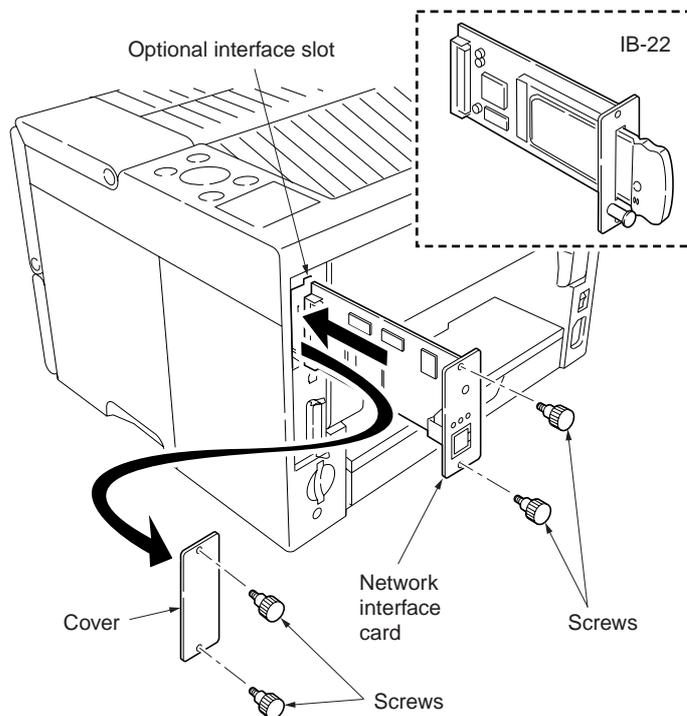


Figure 1-3-12

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

Procedure

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



Network interface card that can be installed

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

Figure 1-3-13

4. Connect the network cable (in the case of IB-20 or IB-21E).
5. Perform the network setting. (See IB-2x quick configuration guide.)

Setting items for wireless network interface card IB-22

Variable name	Setting range
Wireless LAN Mode	Ad hoc/802.11 Ad hoc/ Infrastructure/Automatic
SSID	Any string (up to 32 characters)
Channel	Depends on the setting range available for the wireless NIC.
Encryption(WEP)	DISABLE/64 bit/128 bit
WEP key	Hexadecimal setting (00-FF) 64 bits = 10 digits 128 bits = 26 digits

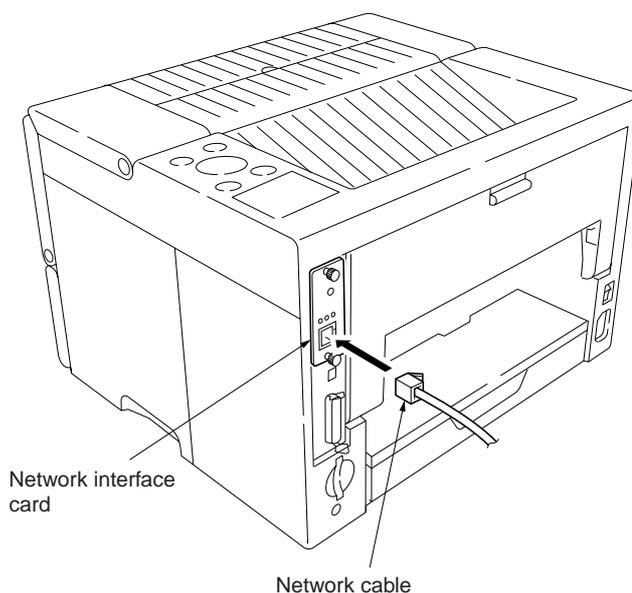


Figure 1-3-14

1-3-4 Installing hard disk unit (optional)

Procedure

1. Remove one screw and then remove the optional interface slot cover.

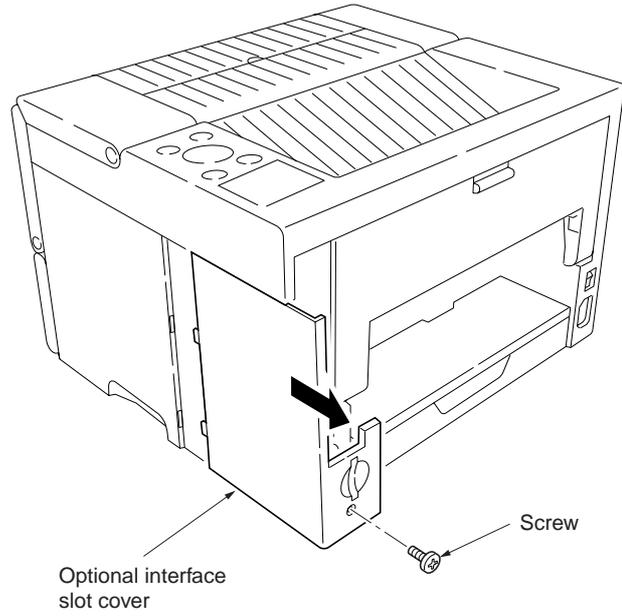
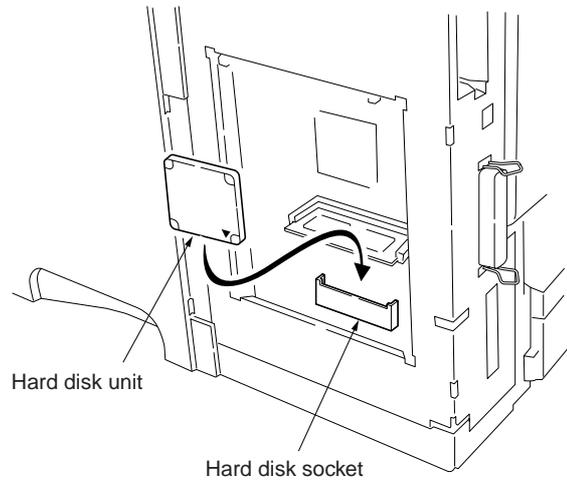


Figure 1-3-15

2. Insert the hard disk unit into the hard disk socket.
3. Reattach the optional interface slot cover to its original position.
4. Format the hard disk. (Refer to the operation guide.)



Hard disk units that can be installed (Microdrive)

Manufactured by IBM	
Capacity	Model number
340 MB	DMDM-10340
512 MB	DSCM-10512
1 GB	DSCM-11000

Figure 1-3-16

1-3-5 Installing memory card (optional)

Procedure

1. Turn off the printer power switch.

Cautions

Do not insert or remove a memory card while the printer power is on. Doing so may cause damage to the printer or the memory card.

2. Insert the memory card into the memory card slot.

* A memory card of which the operation has been confirmed is recommended. (Refer to the CF guideline.)

3. Format the memory card. (Refer to the operation guide.)

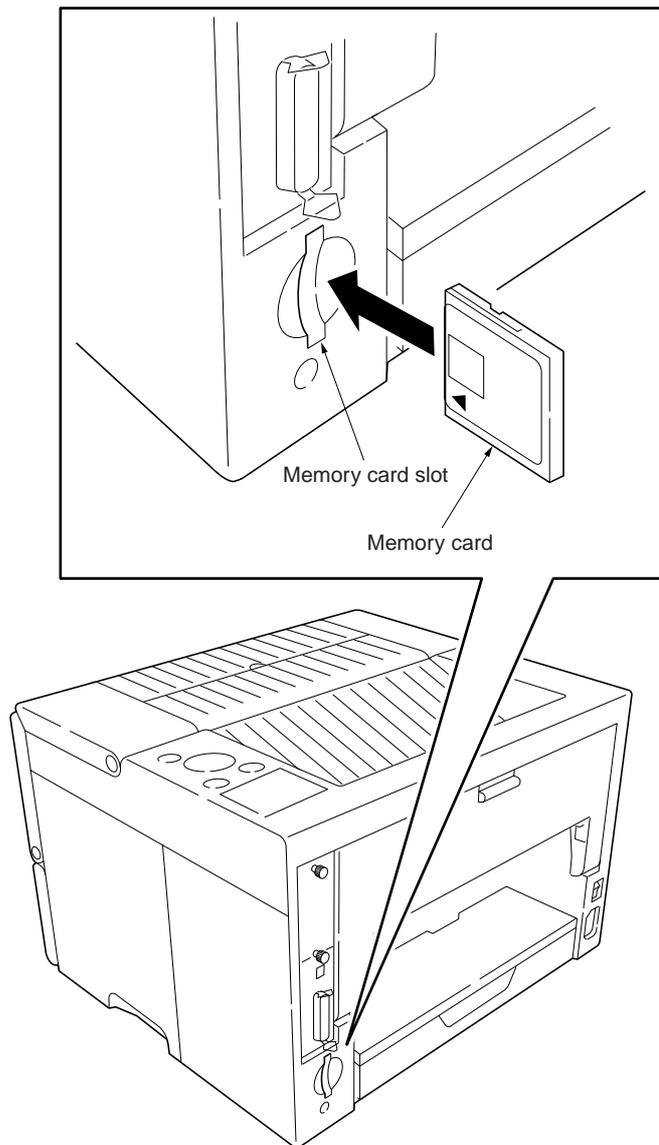


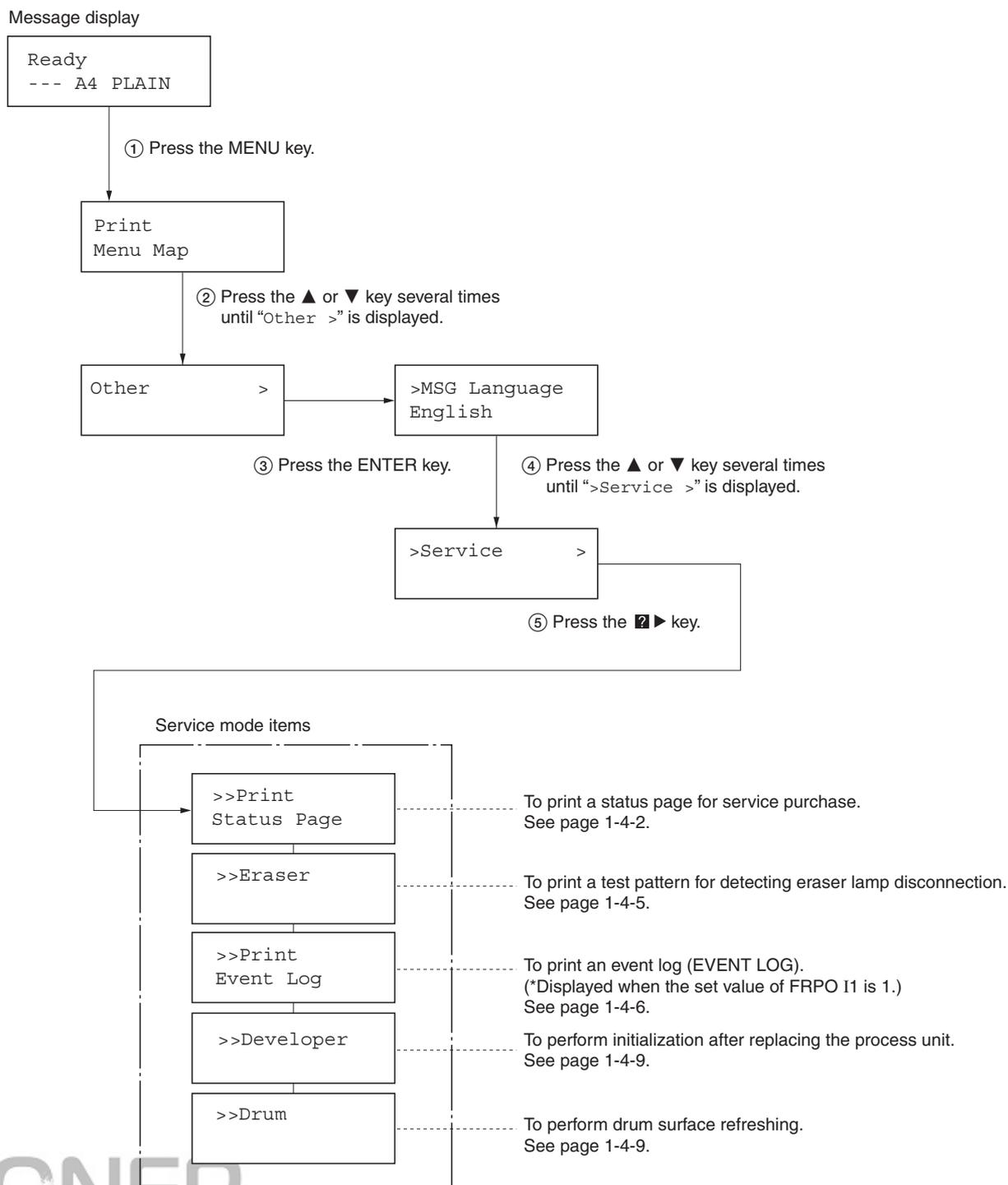
Figure 1-3-17

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1-4-1 Service mode

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

(1) Executing service mode



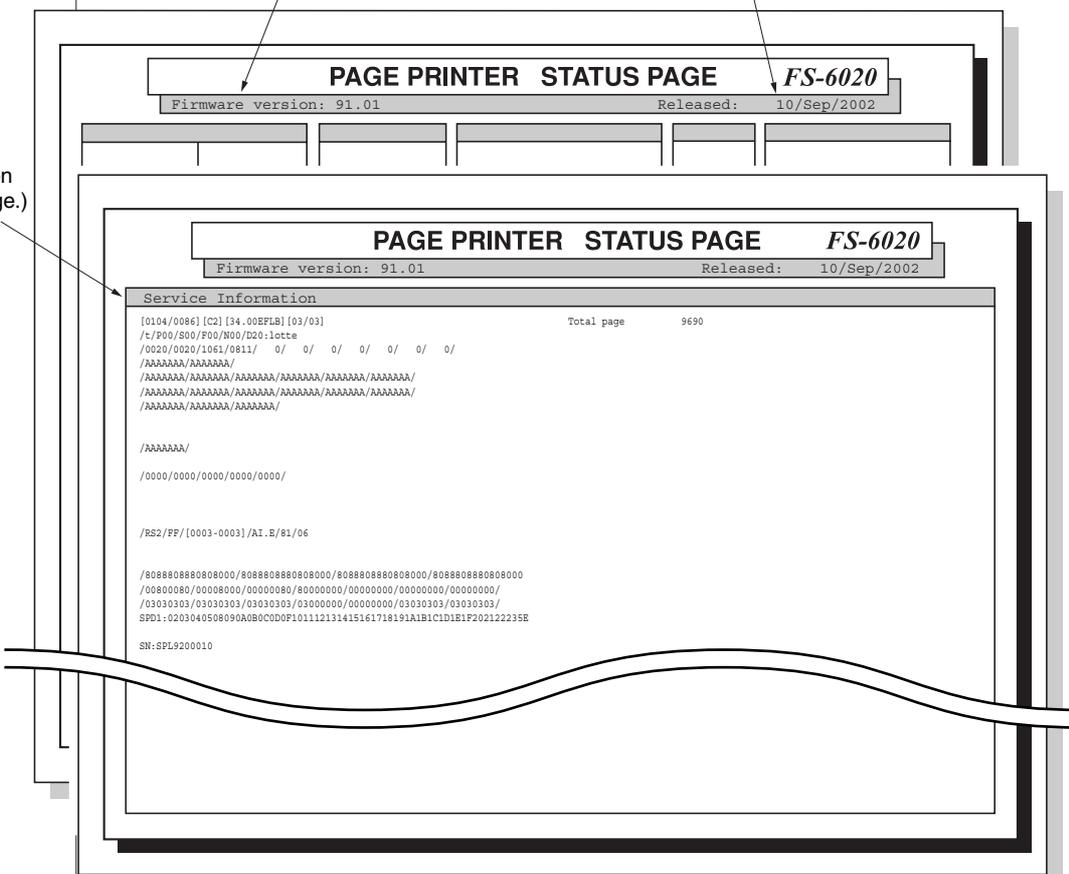
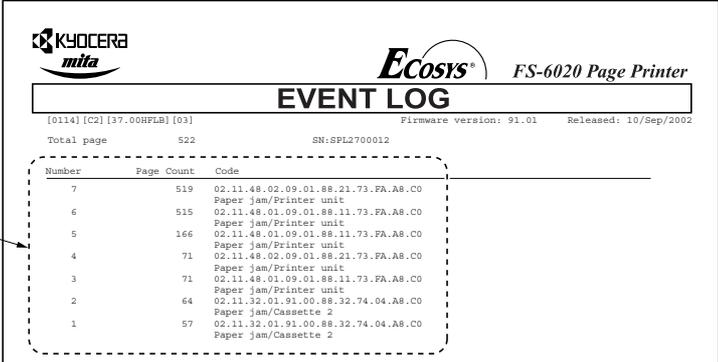
Service items	Description
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> >>Print Status Page </div>	<p>Printing a status page for service purpose</p> <p>Description Prints a status page for service purpose. The status page includes various printer settings and service data.</p> <p>Purpose To acquire printer setting environment and service data information.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the service mode [>>Print Status Page]. 2. Press the ENTER key. "Print Status Page?" will be displayed. 3. Press the ENTER key. Two status pages will be printed. (The second status page includes service information.) <div style="text-align: center; margin: 20px 0;"> Main PWB firmware version Released date of the firmware </div>  <p style="margin-left: 20px;">Service information (See the next page.)</p>

Fig. 1-4-1 Status page for service

Service items	Description
Item	Description
④ Software jumper switch information (hexadecimal)	[First byte/second byte (displayed in OEM mode only)] First byte Bit 0 = 1: (Fixed) Bit 1 = 0: Overseas; 1: Domestic (Japan) Bit 2, 3 (Not used) Bit 4 = 0: Kyocera; 1: OEM Bit 5 = 0: For Europe; 1: For US Bit 6 = 0: Non MICR mode; 1: MICR mode Bit 7 = 0: Kyocera; 1: Kyocera Mita Second byte: Displayed in OEM mode only.
⑤ Total page	Total print page count
⑥ Toner installation information (displayed only when the mode is set)	(Toner installation mode display) Standby mode (After prescribe command TNRE "INST" is entered, until the power is turned off)
⑦ Parallel I/O information	-
⑧ Serial I/O error code (Not supported by this machine)	00: Normal Bit 0: Framing error Bit 1: Overrun error Bit 2: Parity error
⑨ Operation panel lock status (displayed only when locked)	01: Partial lock 02: Full lock
⑩ NVRAM error (displayed only when any error has occurred)	01: ID error 02: Version error 03: Checksum error 04: NVRAM crash error
⑪ NVRAM downloading status	00: Normal (not downloaded) Bit 0: Font data Bit 1: Host data Bit 2: Macro data Bit 3: Program data Bit 4: Operation panel message data (file name displayed) Bit 5: OEM data (file name displayed) Bit 6: Reserved Bit 7: Error occurred
⑫ Printable area setting	/Top offset/Left offset/Page length/Page width
⑬ Left offset for each paper source	/MP tray/Cassette 1/Cassette 2/Cassette 3/Cassette 4 /Cassette 4/Duplexer
⑭ Page counter according to paper size	/Legal/Small/ "Small" means sizes smaller than legal and that can be fed.
⑮ Page counter according to paper feeder (2 or 3)	/Feeder 2 (total)/Feeder 2 (small)/Feeder 2 (large) /Feeder 3 (total)/Feeder 3 (small)/Feeder 3 (large) * "Total" is calculated by adding the number for "small" to 2 × number for "large" (double count). * "Small" means sizes of which the length in the sub-scan direction is less than 335 mm (length of legal size), and "large" means sizes of which the length is 335 mm or more.
⑯ Page counter according to paper feeder (4 or 5)	/Feeder 4 (total)/Feeder 4 (small)/Feeder 4 (large)/Feeder 5 (total)/Feeder 5 (small)/Feeder 5 (large) * "Total" is calculated by adding the number for "small" to 2 × number for "large" (double count). * "Small" means sizes of which the length in the sub-scan direction is less than 335 mm (length of legal size), and "large" means sizes of which the length is 335 mm or more.

Service items	Description
Item	Description
⑰ Duplexer life counter	/Duplexer (total)/Duplexer (small)/Duplexer (large)/ * "Total" is calculated by adding the number for "small" to 2 × number for "large" (double count). * "Small" means sizes of which the length in the sub-scan direction is less than 335 mm (length of legal size), and "large" means sizes of which the length is 335 mm or more.
⑱ Maintenance kit counter	-
⑲ Optional unit version	/Feeder 2/Feeder 3/Feeder 4/Feeder 4/Duplexer/
⑳ Serial interface information	RS2: RS-232C RS4: RS-422A
㉑ Drum sensitivity information	-
㉒ Optional unit information	Upper 2 bytes Bit 0: MPF Bits 1 to 6: Feeders 1 to 6 (6 is not supported) Bit 7: Duplexer Bits 8 to 15: Reserved Lower 2 bytes Bit 0: Bit 1: Face-up (not supported) Bits 2 to 15: Reserved
㉓ Average printing ratio (2 digits for integer part, 1 digit for decimal part)	Printing ratio for the total period from shipping (displayed in %)
㉔ Operation panel message language	PMSG command setting (decimal)
㉕ Toner capacity setting	Decimal (× 100 sheets)
㉖ Engine parameter setting	Hexadecimal, 32 bytes (64 digits)
㉗ Media type attributes	Media type setting value from 1 to 28 (fixing temperature, paper thickness, duplex printing) (14 to 20 are unused and always 0x00.)
㉘ Media type attributes	Media type setting value from 1 to 28 (print density) (14 to 20 are unused and always 0x00.)
㉙ Memory SPD information (slot 1)	Bus error if all digits are "E".
㉚ Machine serial number	-

Service items	Description
<div style="border: 1px solid black; padding: 5px; width: fit-content;">>>Eraser</div>	<p>Printing a test pattern for detecting eraser lamp disconnection</p> <p>Description Prints a page that includes a test pattern (black bar with approximately 1 cm width) using high voltage output control of engine/high voltage PWB. If the eraser operates normally, the black bar is printed. If the eraser does not operate normally, the bar is not printed.</p> <p>Purpose To check for disconnection based on printing of the black bar. The conventional self-diagnostic function does not check the eraser lamp disconnection error (error code 5300 [E5]).</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Load paper into the paper cassette. 2. Enter the service mode [>>Eraser]. 3. Press the ENTER key. Message ">>Eraser ?" will be displayed. 4. Press the ENTER key. 5. A status page or a menu map will be printed. If the eraser lamp is normal, a page including a test pattern (black bar with approximately 1 cm width) is printed. <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: center;">Fig. 1-4-2 Test pattern for detecting eraser lamp disconnection</p>

Service items	Description																																																																							
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> >>Print Event Log </div>	<p>Printing an event log (EVENT LOG)</p> <p>Description Prints the history of paper misfeeds and self-diagnostic errors including up to 16 items from the latest occurrence of such an error. (If the number of errors exceeds 16, errors will be deleted sequentially from the oldest one.)</p> <p>Purpose To allow machine malfunction analysis based on the frequency of paper misfeeds and self-diagnostic errors.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the service mode [>>Print Event log]. (*Displayed when the set value of FRPO I1 is 1) 2. Press the ENTER key. ">>Print Event Log?" will be displayed. 3. Press the ENTER key. A sheet of event log will be printed. <div style="text-align: center; margin: 20px 0;">  </div> <p style="text-align: center;">Fig. 1-4-3 Event log (EVENT LOG)</p> <p>Details of event list The event list includes the following information.</p> <p>(A) Number Prints a list of error history (1 to 16). A smaller number means an older event.</p> <p>(B) Number of pages Number of pages printed when an error occurred</p> <p>(C) Description Indicates the description of error.</p> <p>(D) Code Code ①: 02 (Fixed) Code ②: Error type 01: Self-diagnostic (See code table 2) 11: Paper misfeed (See code table 1) 1C: Toner container replacement (See code table 3) Code ③ to ⑨: Detail of code ②.</p> <div style="text-align: center; margin: 20px 0;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Number</th> <th style="width: 15%;">Page Count</th> <th style="width: 75%;">Code</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>519</td> <td>02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit</td> </tr> <tr> <td>6</td> <td>515</td> <td>02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit</td> </tr> <tr> <td>5</td> <td>166</td> <td>02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit</td> </tr> <tr> <td>4</td> <td>71</td> <td>02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit</td> </tr> <tr> <td>3</td> <td>71</td> <td>02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit</td> </tr> <tr> <td>2</td> <td>64</td> <td>02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2</td> </tr> <tr> <td>1</td> <td>57</td> <td>02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2</td> </tr> </tbody> </table> <div style="margin-top: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">(A)</td> <td style="width: 10%; text-align: center;">(B)</td> <td style="width: 10%; text-align: center;">①</td> <td style="width: 10%; text-align: center;">②</td> <td style="width: 10%; text-align: center;">③</td> <td style="width: 10%; text-align: center;">④</td> <td style="width: 10%; text-align: center;">⑤</td> <td style="width: 10%; text-align: center;">⑥</td> <td style="width: 10%; text-align: center;">⑦</td> <td style="width: 10%; text-align: center;">⑧</td> <td style="width: 10%; text-align: center;">⑨-(a)</td> <td style="width: 10%; text-align: center;">⑨-(b)</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">519</td> <td colspan="8" style="text-align: center;">02.11.48.02.09.01.88.21.73.FA.A8.CO</td> <td style="text-align: center;">←(D)</td> </tr> <tr> <td colspan="11"></td> <td style="text-align: center;">←(C)</td> </tr> <tr> <td colspan="11" style="text-align: center;">Paper jam/Printer unit</td> <td></td> </tr> </table> </div> </div>	Number	Page Count	Code	7	519	02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit	6	515	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit	5	166	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit	4	71	02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit	3	71	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit	2	64	02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2	1	57	02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2	(A)	(B)	①	②	③	④	⑤	⑥	⑦	⑧	⑨-(a)	⑨-(b)	7	519	02.11.48.02.09.01.88.21.73.FA.A8.CO								←(D)												←(C)	Paper jam/Printer unit											
Number	Page Count	Code																																																																						
7	519	02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit																																																																						
6	515	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit																																																																						
5	166	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit																																																																						
4	71	02.11.48.02.09.01.88.21.73.FA.A8.CO Paper jam/Printer unit																																																																						
3	71	02.11.48.01.09.01.88.11.73.FA.A8.CO Paper jam/Printer unit																																																																						
2	64	02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2																																																																						
1	57	02.11.32.01.91.00.88.32.74.04.A8.CO Paper jam/Cassette 2																																																																						
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Paper jam/Printer unit																																																																								

Service items		Description	
Table 1-4-2 Code table 1			
Code digit and description		Details of code	
①	Identification code	02: (Fixed)	
②	Error type (hexadecimal)	11: Paper misfeed	
③	Paper misfeed location (ASCII)	31: Cassette 1 32: Cassette 2 33: Cassette 3 34: Cassette 4 35: Cassette 5 42: MP tray 47: Rear cover 48: Inside the printer 49: Duplexer	
④	Paper misfeed sensor location (hexadecimal)	01: Paper feed sensor [32] Paper feed sensor [33] Paper feed sensor [34] Paper feed sensor [35] Registration sensor [48] Switchback timing sensor [49] 02: Eject sensor [47] Refeed rear edge sensor [49] 03: Refeed eject sensor [49] 99: Not determined Values within [] indicate paper misfeed locations.	
⑤	Cause of paper misfeed (hexadecimal)	01: Paper did not pass within a specified time. 02: Paper did not arrive within a specified time. 09: Paper remains longer than a specified time. (other than 01 and 02) 11: Paper misfeed occurred when paper is being transported. 91: Paper remains when power is turned on. 99: Others (Paper stopped due to external cause such as opening of a cover during printing.)	
⑥	Paper source (hexadecimal)	00: MP tray 01: Cassette 1 (in the printer) 02: Cassette 2 03: Cassette 3	04: Cassette 4 05: Cassette 5 06: Reserved 07: Reserved 08: Duplexer 99: Reserved
⑦	Paper size (hexadecimal)	01: Monarch 02: Business 03: International DL 04: International CS 05: Executive 06: Letter size 07: Legal size 08: A4 09: B5 0A: A3 0B: B4 0C: Ledger size	0D: A5 0E: A6 0F: B6 10: Commercial #9 11: Commercial #6 12: ISO B5 13: Custom size 1E: C4 1F: Postcard 20: Reply-paid postcard 21: Oficio II 22: 216 × 310 mm 22: 216 × 316 (mm) 24: A3 wide 25: Ledger wide 27: 8K 28: 16K 32: Statement 33: Folio 34: Western type 2 35: Western type 4 86: Letter-R 88: A4-R 89: B5-R

Service items		Description
Code digit and description		Details of code
⑧	Main cause of paper misfeed (hexadecimal)	<p>10: Paper does not arrive at the registration sensor. 11: Paper does not pass the registration sensor. 12: Paper remains at the registration sensor when power is turned on. 20: Paper does not arrive at the eject sensor. 21: Paper does not pass the eject sensor. 22: Paper remains at the eject sensor when power is turned on. 30: Paper does not arrive at the paper feeder 1 feed sensor. 31: Paper does not pass the paper feeder 1 feed sensor. 32: Paper remains at the paper feeder 1 feed sensor when power is turned on. 40: Paper does not arrive at the paper feeder 2 feed sensor. 41: Paper does not pass the paper feeder 2 feed sensor. 42: Paper remains at the paper feeder 2 feed sensor when power is turned on. 50: Paper does not arrive at the paper feeder 3 feed sensor. 51: Paper does not pass the paper feeder 3 feed sensor. 52: Paper remains at the paper feeder 3 feed sensor when power is turned on. 60: Paper does not arrive at the paper feeder 4 feed sensor. 61: Paper does not pass the paper feeder 4 feed sensor. 62: Paper remains at the paper feeder 4 feed sensor when power is turned on. A1: Paper does not arrive at the duplexer switchback timing sensor. A2: Paper does not arrive at the duplexer refeed rear edge sensor. A3: Paper does not pass the duplexer switchback timing sensor. A4: Paper does not arrive at the duplexer refeed eject sensor. A5: Paper does not pass the duplexer refeed rear edge sensor. A6: Paper does not pass the duplexer refeed eject sensor. A7: Duplexer overflow (Third sheet is commanded when second sheet remains.) A8: Duplexer drive signal output from the printer while paper is transported turns off. A9: Paper remains in the duplexer when power is turned on. AA: The rear cover of the duplexer is opened while paper is transported. B1 to B3, C1: Reserved E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of a cover) F0 to FF: Paper misfeed by another cause</p>
⑨	(a) Misfed paper width (hexadecimal)	0000 to FFFF [in 0.1 mm] Example: 73FA (hexadecimal) = 29690 (decimal) = 296.9 mm
	(b) Misfed paper length (hexadecimal)	0000 to FFFF [in 0.1 mm] Example: A8C0 (hexadecimal) = 43200 (decimal) = 432.0 mm

Service items	Description	
Table 1-4-3 Code table 2		
	Code digit and description	Details of code
①	Identification code (hexadecimal)	02: (Fixed)
②	Error type (hexadecimal)	01: Self-diagnostic error
③		00: Unused
④	Self-diagnostic error code (hexadecimal)	4 digits self-diagnostic error code (Upper digit of former 2 digits)
⑤	Self-diagnostic error code (hexadecimal)	4 digits self-diagnostic error code (Lower digit of former 2 digits)
⑥ to ⑨		00: Unused
Table 1-4-4 Code table 3		
	Code digit and description	Details of code
①	Identification code (hexadecimal)	02: (Fixed)
②	Error type (hexadecimal)	1C: Toner container replacement
③ to ⑨		00: Unused
>>Developer	<p>Initialization after replacing the process unit (toner installation mode)</p> <p>Description Replenishes toner rapidly from the toner container into the process unit.</p> <p>Purpose To execute after replacing the process unit to replenish toner rapidly into the process unit that includes no toner.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the service mode [>>Developer]. 2. Press the ENTER key. Message ">>Developer?" will be displayed. 3. Press the ENTER key. Message "Ready" will be displayed. 4. Turn off and then on the printer. The toner installation mode will start after warm-up is complete, and "Please Wait Adding toner" will be displayed during this operation. The operation will be complete after approximately 15 minutes. <p>* To cancel this mode, use the following procedure instead of turning on the power while pressing all cassette size switches like in the former models. Turn off and then on the printer to restart the printer. Enter the service mode [>>Developer] during warm-up. Run this mode again. Then this mode will be canceled.</p>	
>>Drum	<p>Initialization after replacing the process unit (toner installation mode)</p> <p>Drum surface refreshing</p> <p>Description Rotates the drum approximately 5 minutes with toner lightly on the overall drum using the high-voltage output control of the engine/high voltage PWB. The cleaning blade in the process unit scrapes toner off the drum surface to clean it.</p> <p>Purpose To clean the drum surface when image failure occurs due to the drum. This mode is effective when dew condensation on the drum occurs.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the service mode [>>Drum]. 2. Press the ENTER key. Message ">>Drum?" will be displayed. 3. Press the ENTER key. Drum surface refreshing will start and finish after approximately 3 minutes. 	



1-5-1 Paper misfeed detection

(1) Paper misfeed indication

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

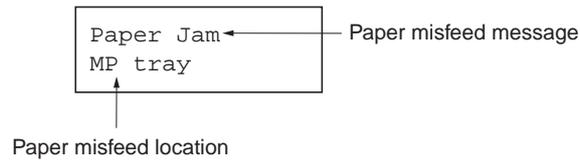


Figure 1-5-1 Paper misfeed message display

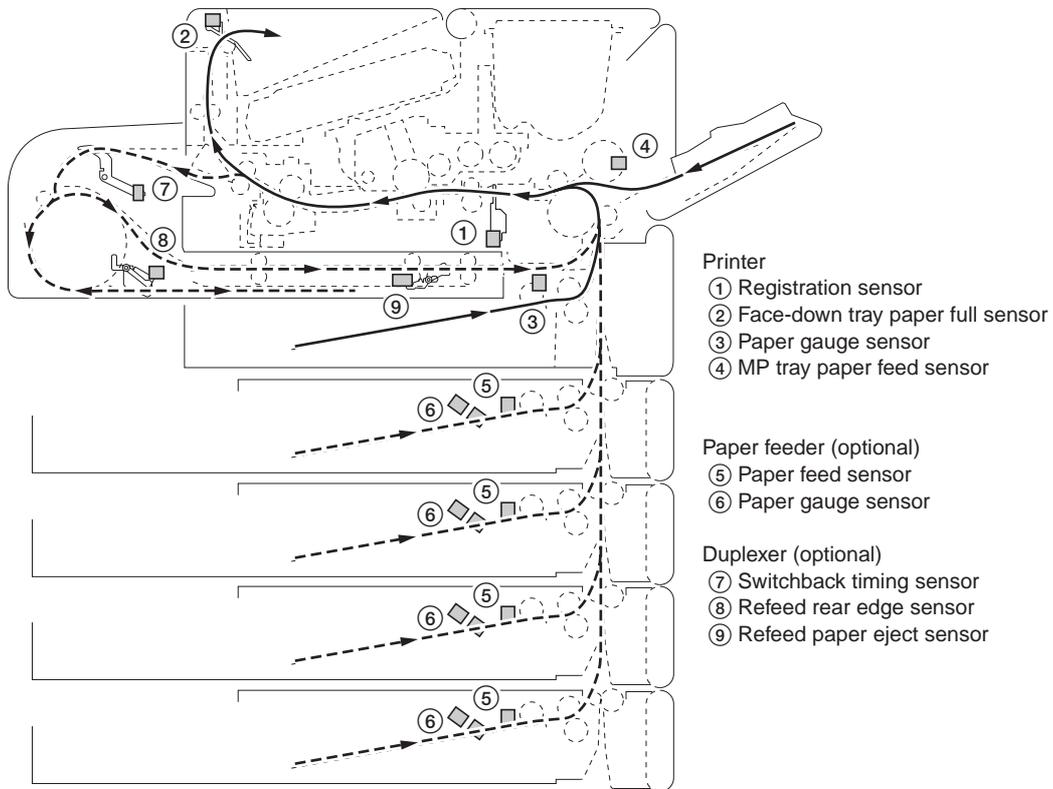


Figure 1-5-2 Paper misfeed detection

1-5-2 Self-diagnosis

(1) Self-diagnostic function

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

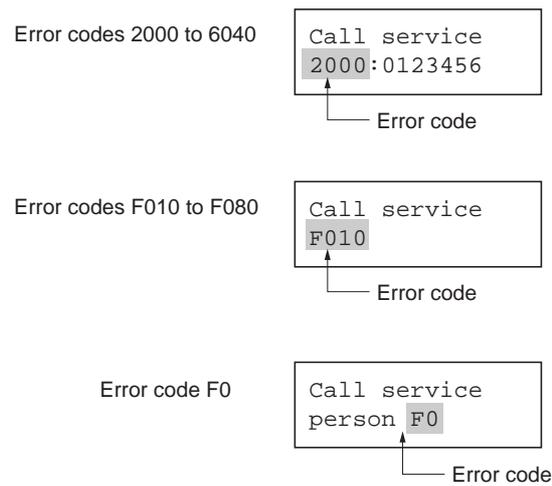


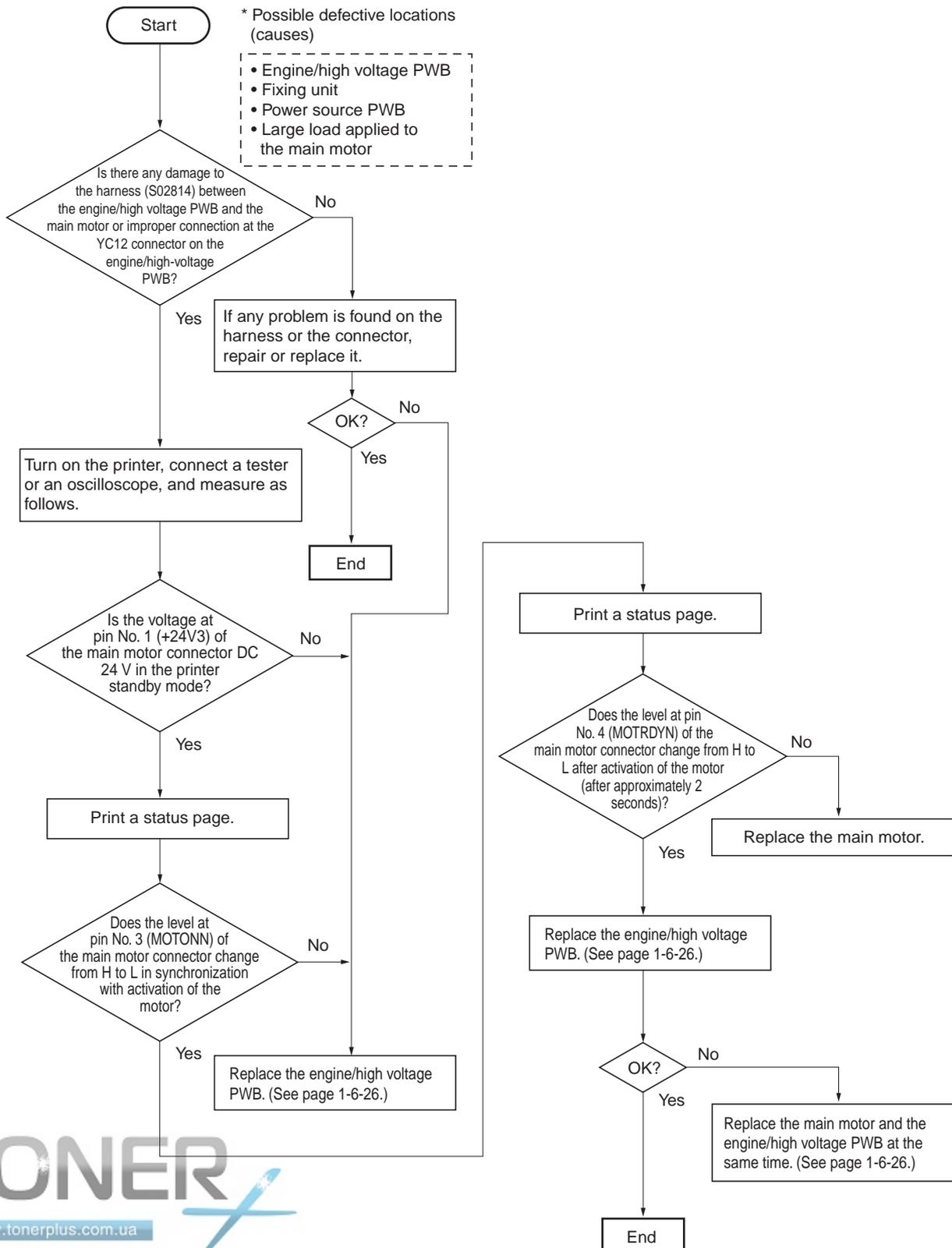
Figure 1-5-3 Error message display

(1-1) Error code 2000 [E1] (main motor error)

Detection conditions

- The main motor ready signal (MOTRDYN) does not become ready (low level) a specified time after the main motor drive signal (MOTONN) is turned on.
- The main motor ready signal (MOTRDYN) does not become ready (low level) a specified time after the main motor drive signal (MOTONN) is turned off.

Corrective measures

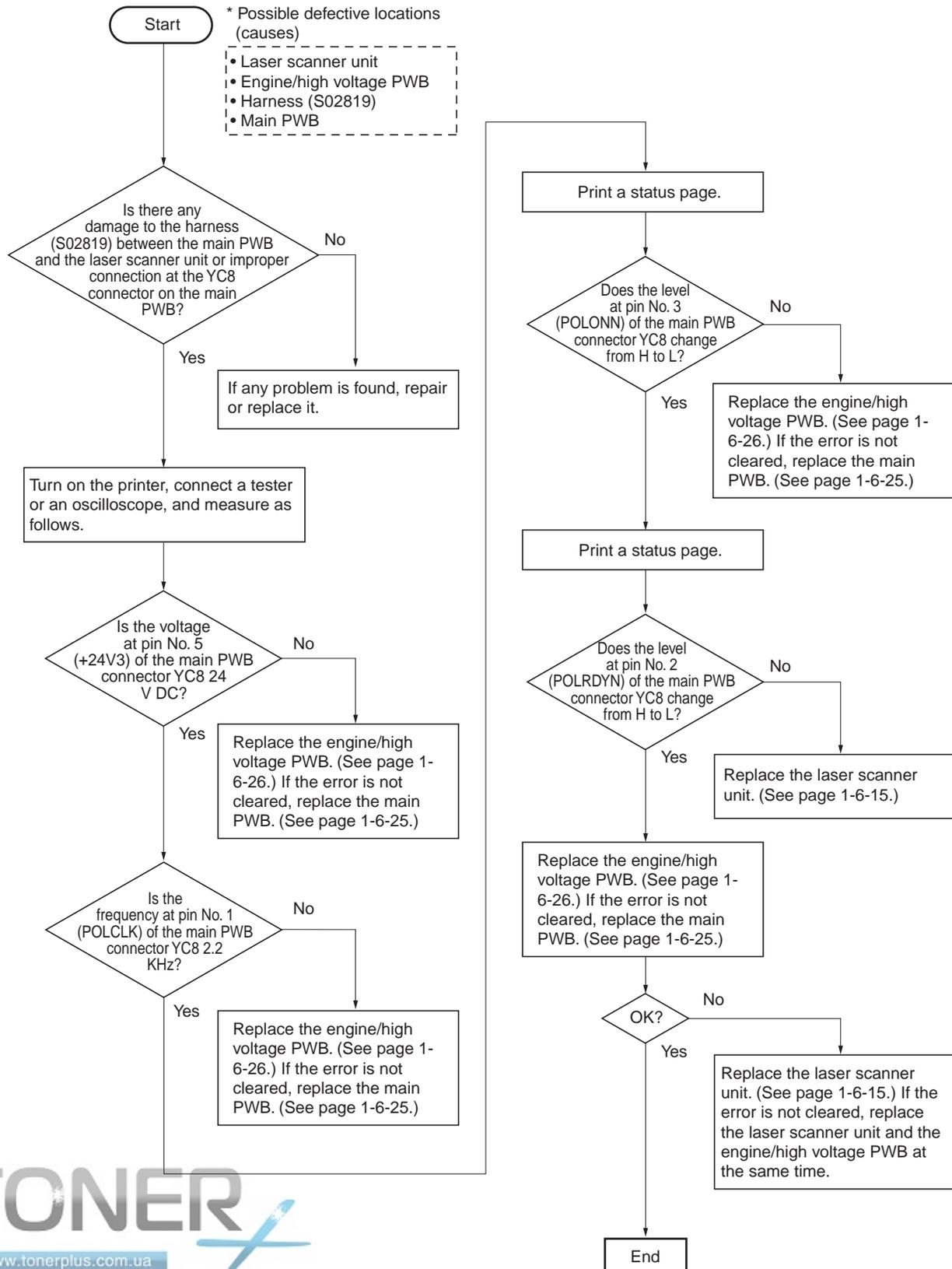


(1-2) Error code 4000 [E2] (polygon motor error)

Detection conditions

- The polygon motor ready signal (MOTRDYN) does not become ready (L level) within a specified time after the polygon motor drive signal (POLONN) is turned on (L level).

Corrective measures

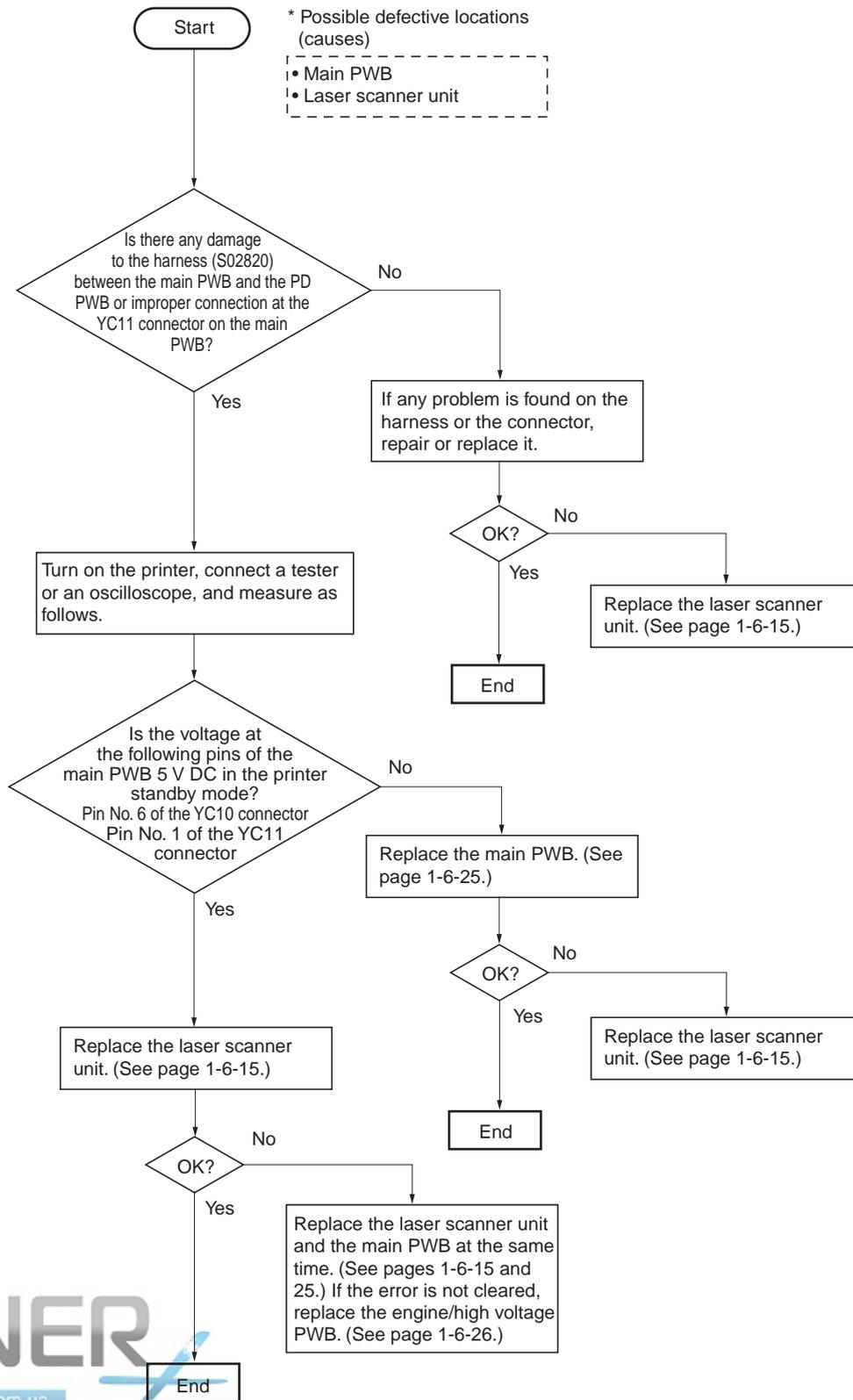


(1-3) Error code 4200 [E3] (laser output error)

Detection conditions

- The pin photo signal (PDN) is not output within a specified time after the polygon motor ready signal (MOTRDYN) becomes ready (L level).

Corrective measures



(1-4) Error code 6000 [E4] (fixing heater lamp/fixing thermistor error)

Detection conditions

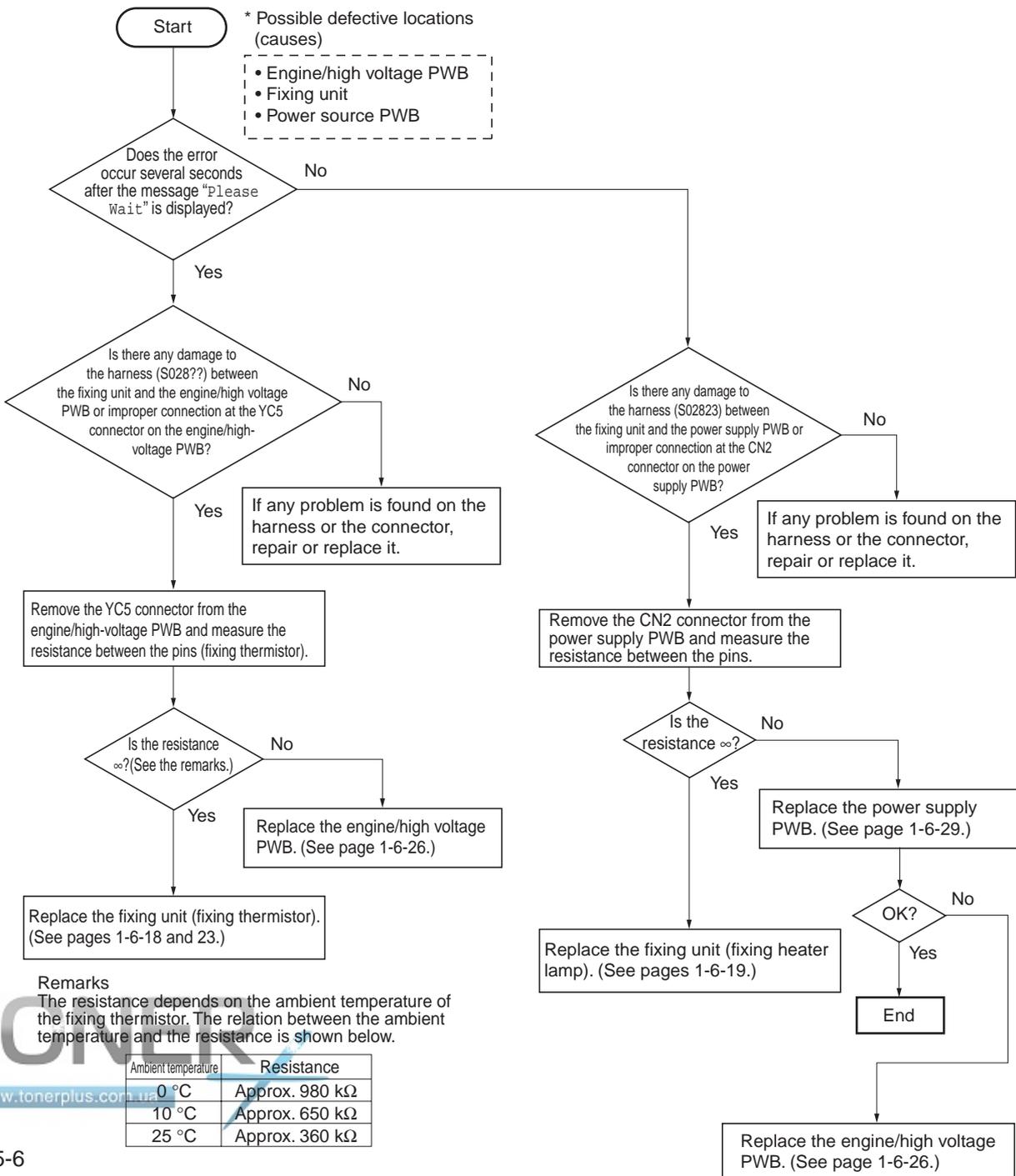
- The fixing thermistor disconnection detection circuit in the engine/high voltage PWB outputs the disconnection detection signal (THDEAD) to the CPU more than a specified time after power is turned on.
- The fixing temperature does not rise at least 1 °C when the fixing heater lamp is continuously on for approximately 20 seconds during printer warm-up or in the standby mode.
- The fixing temperature does not rise at least 1 °C when the fixing heater lamp is continuously on for approximately 15 seconds during printing.
- The fixing temperature does not lower when the fixing heater lamp is off for a specified time or more.
- * The fixing temperature is the average value calculated using the input voltage from the fixing thermistor detected several times in a specified time to avoid influence of noise and so on.

Corrective measures

Cautions

Be careful when handling the fixing unit because it is hot.

Take care not to get an electric shock because AC power is supplied from the power source PWB to the fixing unit.



Remarks
The resistance depends on the ambient temperature of the fixing thermistor. The relation between the ambient temperature and the resistance is shown below.

Ambient temperature	Resistance
0 °C	Approx. 980 kΩ
10 °C	Approx. 650 kΩ
25 °C	Approx. 360 kΩ

(1-5) Error code 6020 [A2] (abnormally high fixing temperature error)

Detection conditions

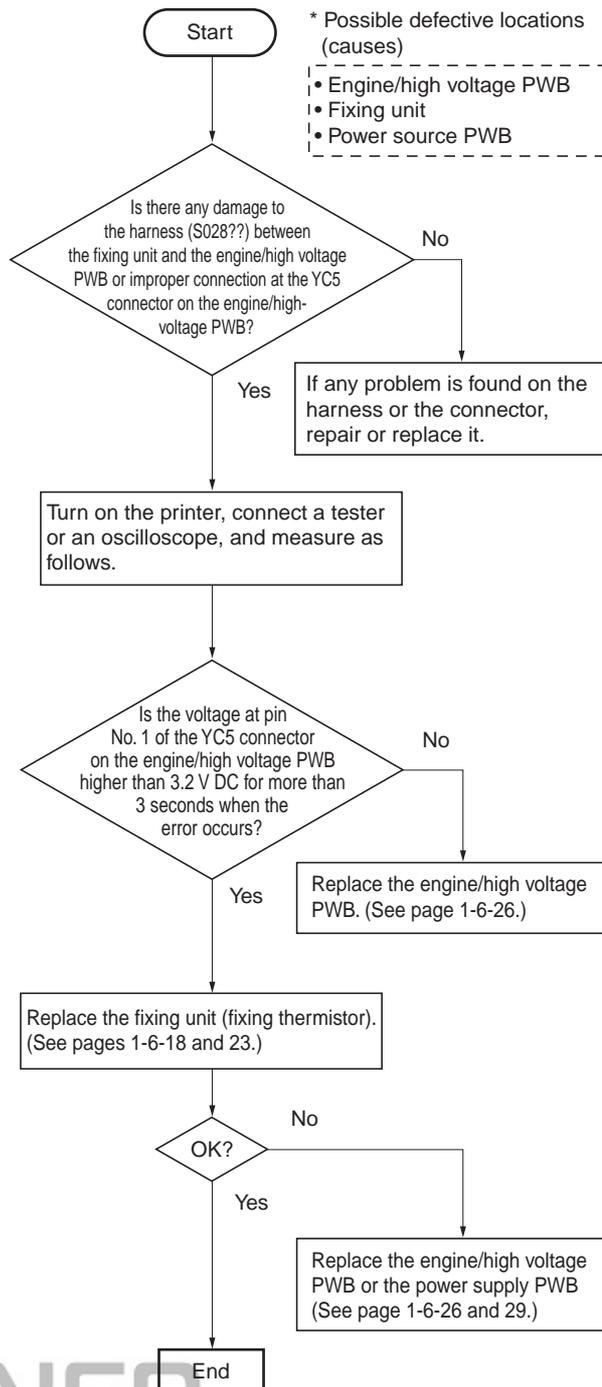
- The fixing heater lamp runaway protection circuit in the engine/high voltage PWB outputs continuously the abnormally high temperature detection signal (HTEMPN) to the CPU for a longer time than specified.

Corrective measures

Cautions

Be careful when handling the fixing unit because it is hot.

Take care not to get an electric shock because AC power is supplied from the power source PWB to the fixing unit.



(1-6) Error code 6400 [A0] (fixing heater lamp control zero-cross signal detection error)

Detection conditions

- The zero-cross signal (ZCROSS) that is output from the power source PWB and input to the CPU on the engine/high voltage PWB is not input for a specified time.

Corrective measures

* Possible defective locations (causes)

- Engine/high voltage PWB
- Power source PWB

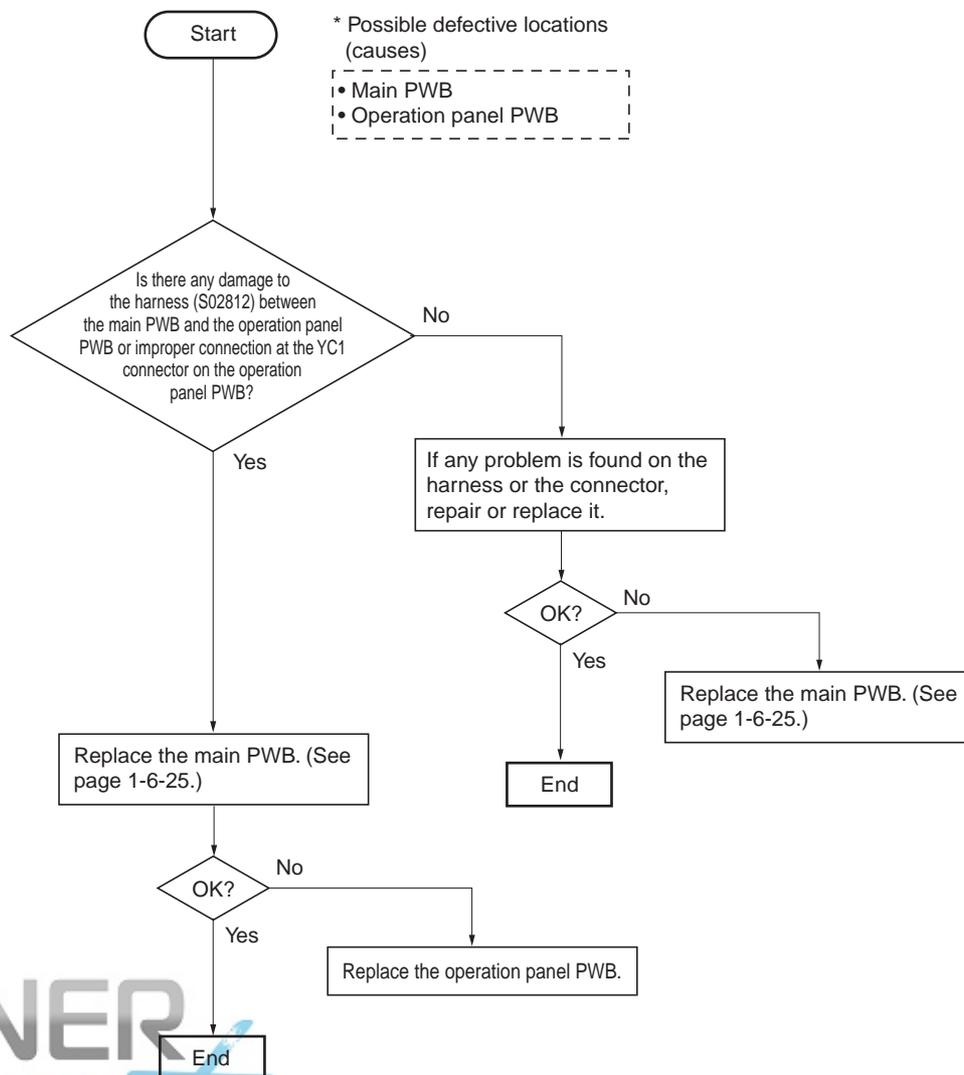
- Replace either or both of the power source PWB and the engine/high voltage PWB. (See pages 1-6-29 and 26.)

(1-7) Error code F0 [F0] (communication error between the operation panel PWB and main PWB)

Detection conditions

- Serial communication between the operation panel PWB and the main PWB malfunctions.

Corrective measures

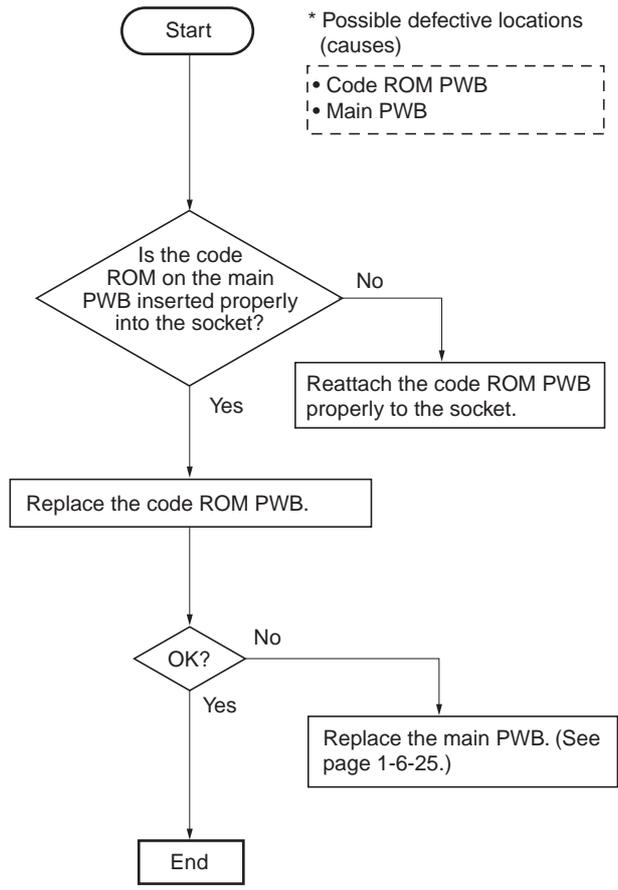


(1-8) Error code F010 [F1] (code ROM checksum error)

Detection conditions

- Checksum of the code ROM PWB attached to the socket (YS1) on the main PWB malfunctions.

Corrective measures

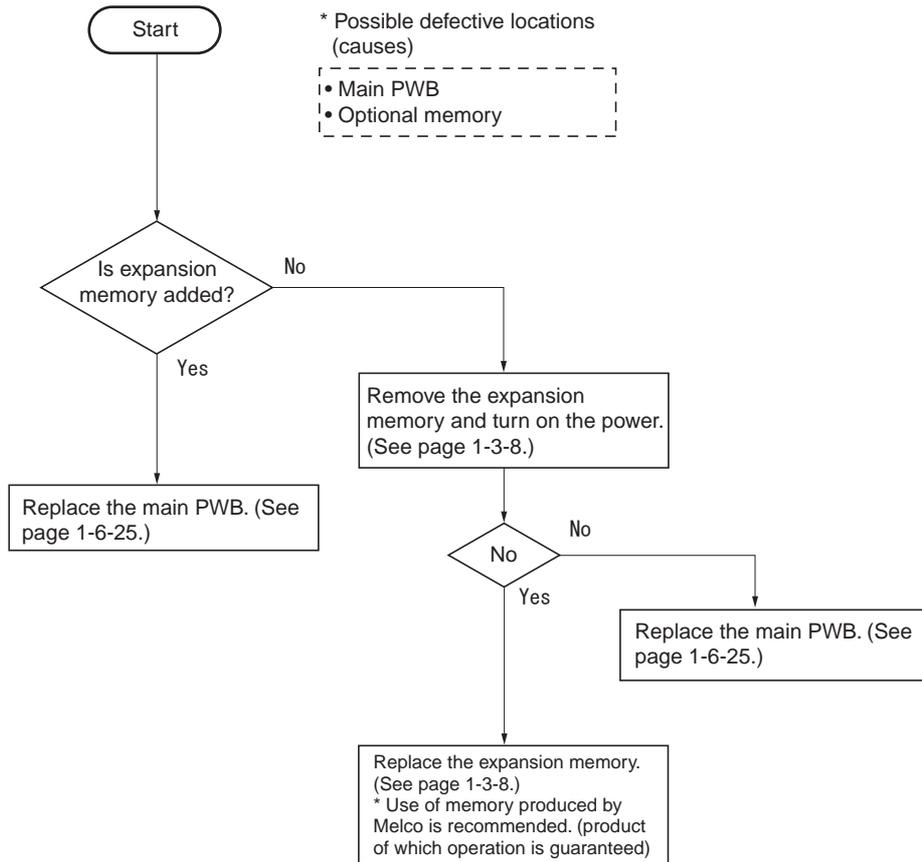


(1-9) Error code F020 [F2] (main PWB RAM checksum error)

Detection conditions

Checksum in the standard RAM mounted on the main PWB or in optional expansion memory is not correct.

Corrective measures



(1-10) Error code F030 [F3] (main PWB controller error)

Detection conditions

- The controller (CPU) on the main PWB malfunctions.

Corrective measures

* Possible defective locations (causes)

- Main PWB

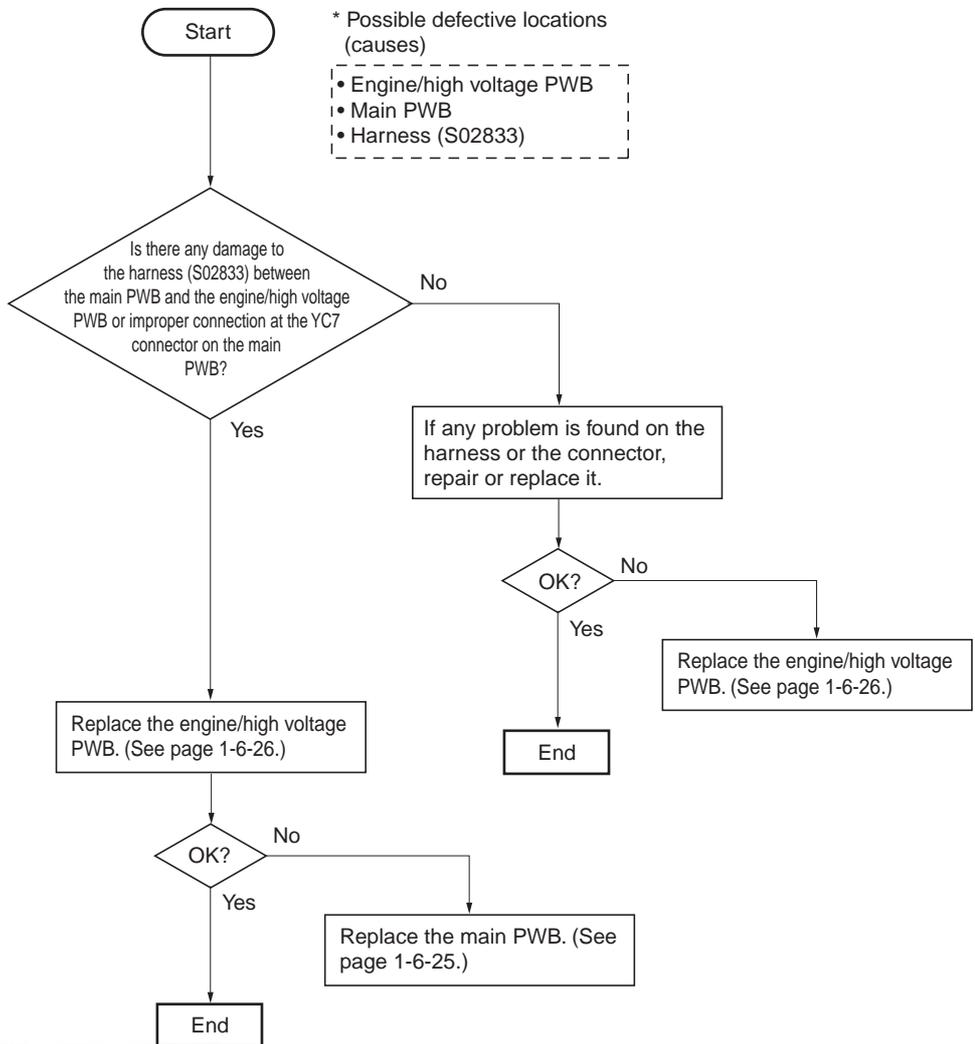
- Replace the main PWB. (See page 1-6-25.)

(1-11) Error code F040 [E0] (communication error between engine/high voltage PWB and main PWB controller)

Detection conditions

- Communication between the CPU on the engine/high voltage PWB and the controller (CPU) on the main PWB malfunctions.

Corrective measures



(1-12) Error code F050 [E6] (engine/high-voltage flash memory checksum error)

Detection conditions

- Checksum of the program built in the CPU on the engine/high voltage PWB is not correct.

Corrective measures

* Possible defective locations
(causes)

- Engine/high voltage PWB

- Replace the engine/high voltage PWB. (See page 1-6-26.)

(1-13) Error code F080 [E6] (system firmware download error)

Detection conditions

- Checksum is not correct when system firmware is downloaded.
- The flash memory is empty.

Corrective measures

* Possible defective locations
(causes)

- Main PWB
- Code ROM PWB
- Downloaded firmware
- Downloading tools

- Replace either or both of the main PWB and the code ROM PWB. (See page 1-6-26.)
- Check to see if the downloaded firmware is proper.
- Check to see if any of downloading tools (memory card, computer, printer cable, etc.) malfunctions.

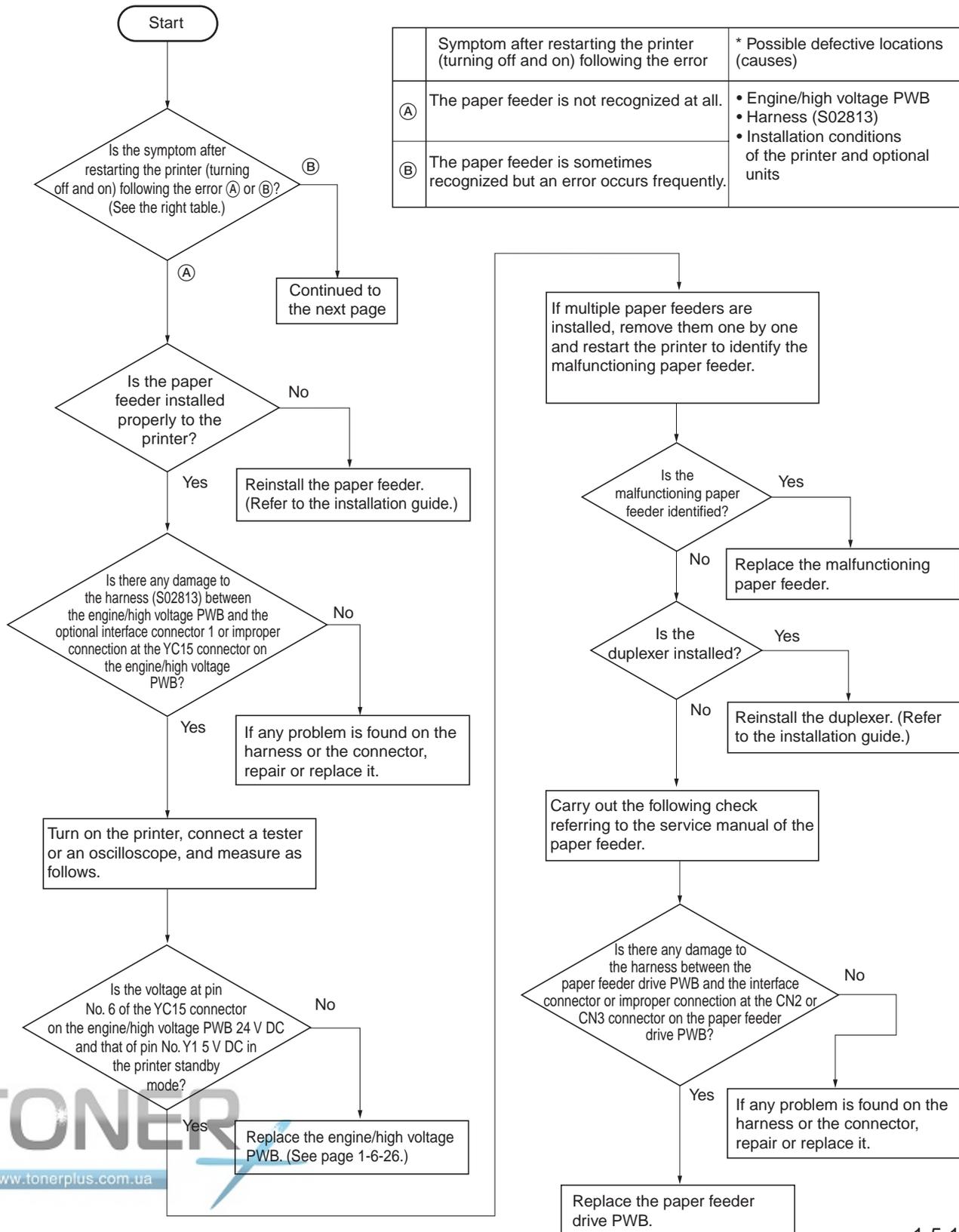
(1-14) Error code 0420 [C0] (serial communication error between paper feeder and engine/high voltage PWB)

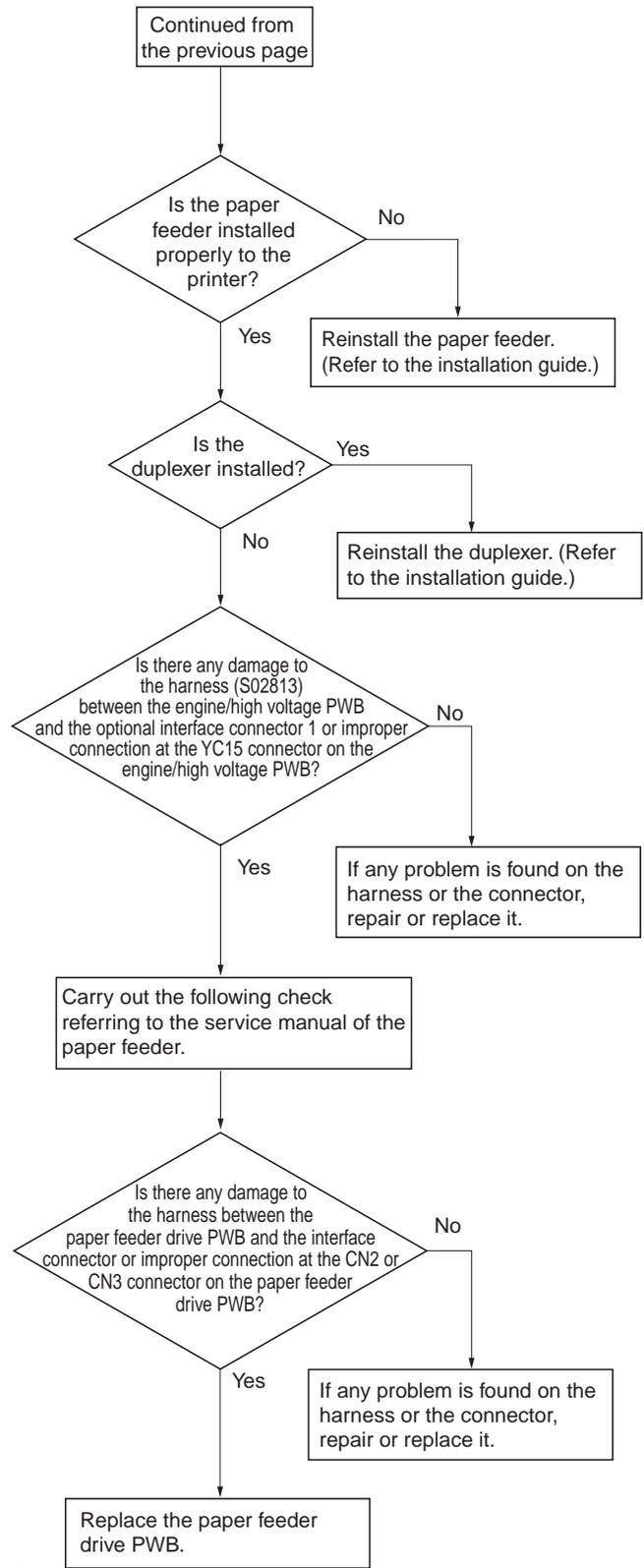
Detection conditions

- Communication ready signal time-out occurs continuously more than specified times in serial communication with an optional paper feeder that is recognized by the CPU on the engine/high voltage PWB.
- Inconsistency of values in serial communication data occurs more than specified times.

Corrective measures

	Symptom after restarting the printer (turning off and on) following the error	* Possible defective locations (causes)
(A)	The paper feeder is not recognized at all.	<ul style="list-style-type: none"> • Engine/high voltage PWB • Harness (S02813) • Installation conditions of the printer and optional units
(B)	The paper feeder is sometimes recognized but an error occurs frequently.	



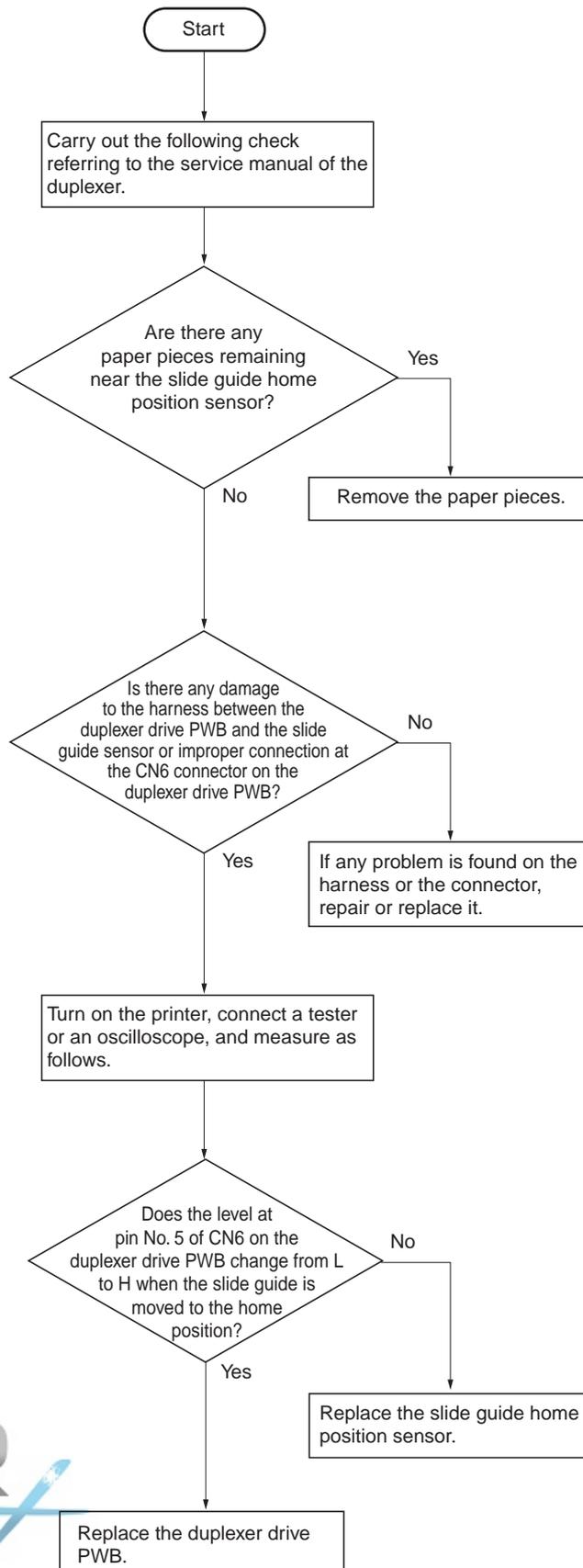


(1-15) Error code 1210 [C2] (duplexer slide guide home position detection error)

Detection conditions

- The duplexer drive PWB of the optional duplexer cannot detect the home position of the slide guide.

Corrective measures

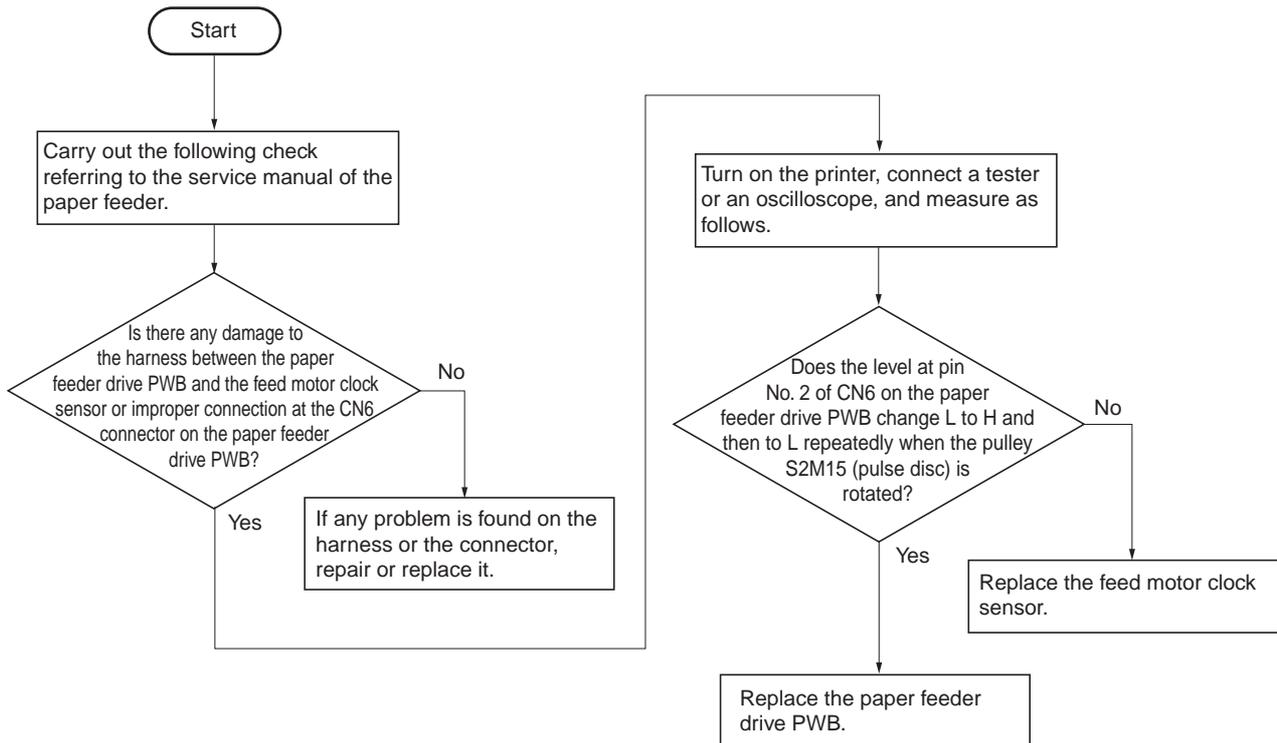


(1-16) Error code 2610 [B2] (paper feeder 1 feed motor error)

Detection conditions

- When the paper feeder drive PWB of the optional paper feeder 1 drives the feed motor, no proper clock pulse is input from the feed motor clock sensor.

Corrective measures



(1-17) Error code 2620 [B3] (paper feeder 2 feed motor error)

Detection conditions

- When the paper feeder drive PWB of the optional paper feeder 2 drives the feed motor, no proper clock pulse is input from the feed motor clock sensor.

Corrective measures

- Same as error code 2610 [B2]

(1-18) Error code 2630 [B4] (paper feeder 3 feed motor error)

Detection conditions

- When the paper feeder drive PWB of the optional paper feeder 3 drives the feed motor, no proper clock pulse is input from the feed motor clock sensor.

Corrective measures

- Same as error code 2610 [B2]

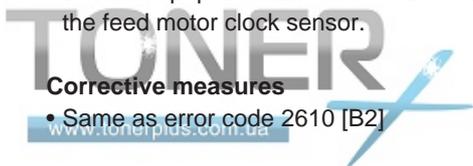
(1-19) Error code 2640 [B5] (paper feeder 4 feed motor error)

Detection conditions

- When the paper feeder drive PWB of the optional paper feeder 4 drives the feed motor, no proper clock pulse is input from the feed motor clock sensor.

Corrective measures

- Same as error code 2610 [B2]



1-5-3 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) Even if the top cover is closed, the message "Close top cover" remains.	Defective top cover interlock switch.	If 24 V DC is not output to pin No. 6 of the YC4 connector on the engine/high voltage PWB when the top cover is closed, replace the engine/high voltage PWB. (See page 1-6-26.)
	Malfunctioning interlock rod that interfaces between the top cover and the top cover interlock switch.	Check to see if the interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB. (See page 1-6-26.)
(2) Even if the rear cover is closed, the message "Close rear cover" remains.	Defective rear cover interlock switch.	If 24 V DC is not output to pin Nos. 1 and 2 of the CN3 connector on the power source PWB when the rear cover is closed, replace the power source PWB. (See page 1-6-29.)
	Malfunctioning rear interlock rod that interfaces between the rear cover and the rear cover interlock switch.	Check to see if the rear interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB. (See page 1-6-26.)
(3) The message "Paper Jam" remains.	Paper pieces remain near the registration sensor or the eject sensor.	Check the locations near the registration sensor and the eject sensor and remove any paper pieces.
	Malfunctioning actuator of the registration sensor.	Check to see if the actuator of the registration sensor malfunctions or is damaged. If it malfunctions, repair or replace it.
	Defective registration sensor.	Replace the engine/high voltage PWB. (See page 1-6-26.)
	Malfunctioning actuator of the eject sensor.	Check to see if the actuator of the eject sensor malfunctions or is damaged. If it malfunctions, repair or replace it.
	Defective connection between the eject sensor and the engine/high voltage PWB.	Check to see if the harness (S02828) between the eject sensor and the engine/high voltage PWB is damaged or if the connector YC11 of the engine/high voltage PWB is improperly connected. If any problem is found, repair the relevant component.
	Defective eject sensor.	If the level at pin No. 2 of the YC11 connector on the engine/high voltage PWB remains low when the actuator of the eject sensor is not operating, replace the eject sensor.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB. (See page 1-6-26.)
(4) The message "Face-down tray paper full" remains.	Malfunctioning actuator of the face-down tray paper full sensor.	Check to see if the actuator of the face-down tray paper full sensor malfunctions or is damaged. If it malfunctions, repair or replace it.
	Defective connection between the face-down tray paper full sensor and the engine/high voltage PWB.	Check to see if the harness (S02815) between the face-down tray paper full sensor and the engine/high voltage PWB is damaged or if the connector YC13 of the engine/high voltage PWB is improperly connected. If any problem is found, repair or replace the relevant component.

Problem	Causes	Check procedures/corrective measures
(4) The message "Face-down tray paper full" remains.	Defective face-down tray paper full sensor.	If the level at pin No. 2 of the YC13 connector on the engine/high voltage PWB remains low when the actuator of the face-down tray paper full sensor is not operating, replace the face-down tray paper full sensor.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB. (See page 1-6-26.)
(5) The paper size is not recognized as the size set with the paper size dial of the cassette.	Defective cassette size switch.	Check to see if the level at pin Nos. 1 (CAS2), 2 (CAS1), and 4 (CAS0) of the YC7 connector on the engine/high voltage PWB changes to H or L when each cassette size switch is pressed. If any problem is found, replace the cassette size switch.
	Defective connection between the cassette size switch and the engine/high voltage PWB.	Check to see if the harness (S02821) between the cassette size switch and the engine/high voltage PWB is damaged or if the connector YC7 on the engine/high voltage PWB is improperly connected. If any problem is found, repair or replace the relevant component.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB. (See page 1-6-26.)
(6) The message "Self test" remains when the printer is started.	Defective main PWB.	Replace the main PWB. (See page 1-6-25.)
(7) No message is displayed when the power switch is turned on. (All dots of LCD are on.)	Defective main PWB.	Replace the main PWB. (See page 1-6-25.)
	Defective code ROM PWB on the main PWB.	Replace the code ROM PWB.
	Defective operation panel PWB.	Replace the operation panel PWB.
(8) No message is displayed when the power switch is turned on. (All dots of LCD are off.)	Defective power cord connection.	Check to see if the power cord is securely connected to the outlet and the printer AC inlet.
	Defective power cord.	Replace the power cord.
	Defective power source PWB.	Replace the power source PWB. (See page 1-6-29.)
	Defective main PWB.	Replace the main PWB. (See page 1-6-25.)
	Defective operation panel PWB.	Replace the operation panel PWB.
	Defective connection between the main PWB and the engine/high voltage PWB.	Check to see if the harness (S02833) between the main PWB and the engine/high voltage PWB is damaged or if the connector YC7 on the main PWB is improperly connected. If any problem is found, repair the relevant component.
	Short circuit of electric wiring occurs in any electric part and the overcurrent detection function of the power source PWB stops output of 5 V DC and 24 V DC power supply.	Check to see if any electric part or wiring is damaged. If any problem is found, repair or replace the relevant component.



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 connectors with bare hands. It will damage the PWB.
- Do not touch any PWB containing ICs with bare hands or any object prone to static charge.
- Use the following testers when measuring voltages:

Hioki 3200

Sanwa MD-180C

Sanwa YX-360TR

1-6-2 Covers

(1) Detaching and refitting the top cover

Procedure

1. Open the front and top covers and remove the two screws.
2. Push the top cover to rear, and remove the two inner hooks.
3. Remove one connector from the operation panel PWB, and remove the top cover.

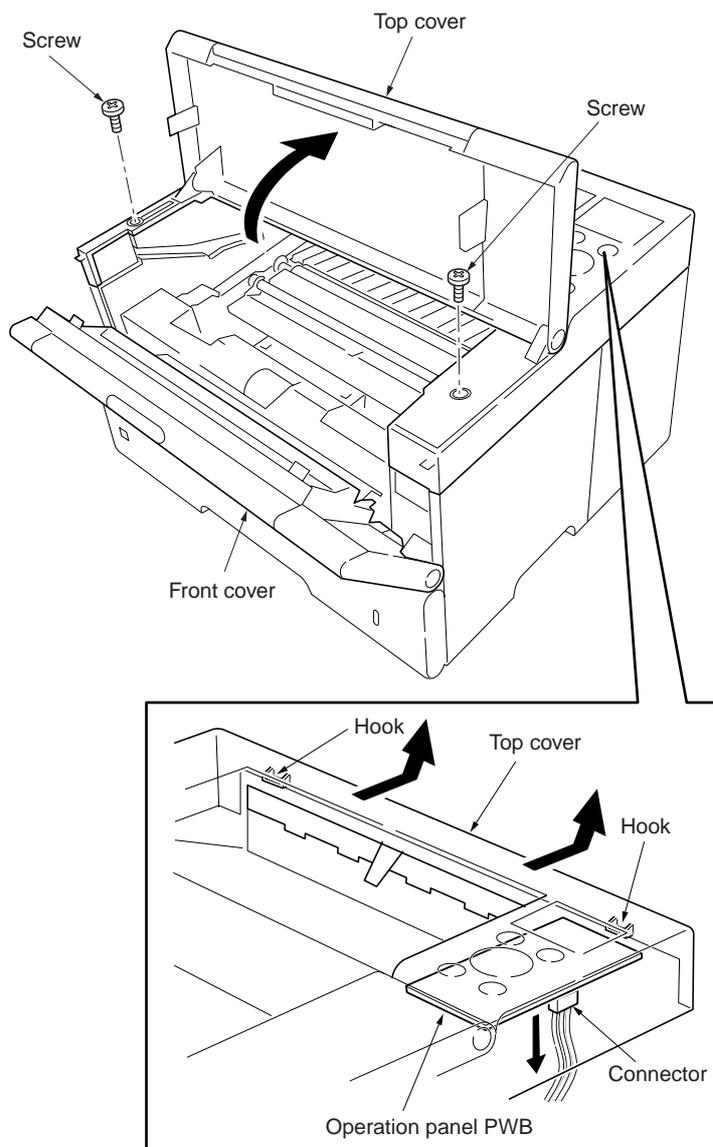


Figure 1-6-1

(2) Detaching and refitting the left cover**Procedure**

1. Remove the top cover (see page 1-6-2).
2. Remove the rear cover (see page 1-6-5).
3. Draw the paper cassette.
4. Remove the four inner hooks and remove the left cover.

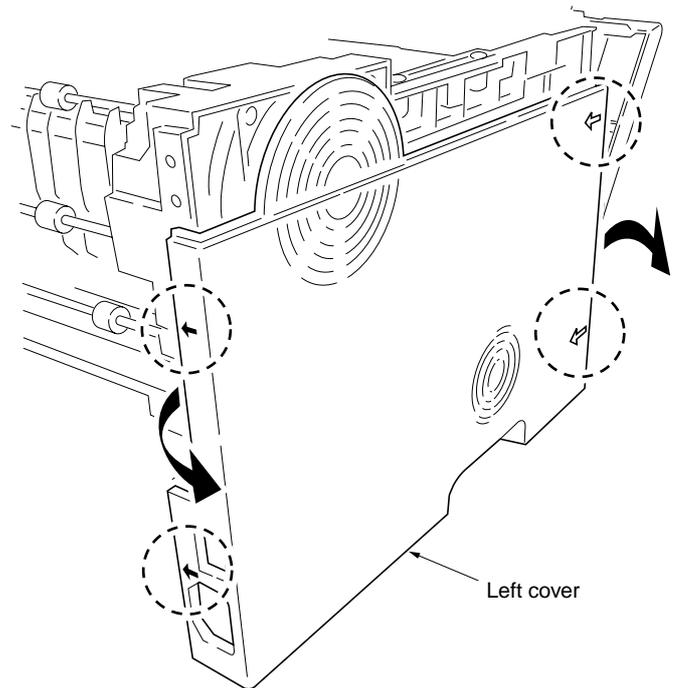


Figure 1-6-2

(3) Detaching and refitting the right cover

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the rear cover (see page 1-6-5).
3. Draw the paper cassette.
4. Remove one screw and then remove the optional interface slot cover.
5. Remove the four inner hooks and remove the right cover.

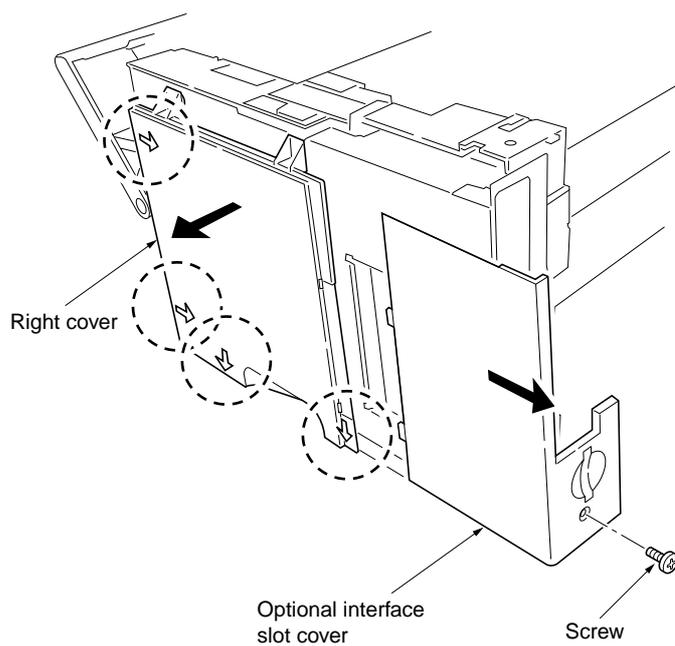
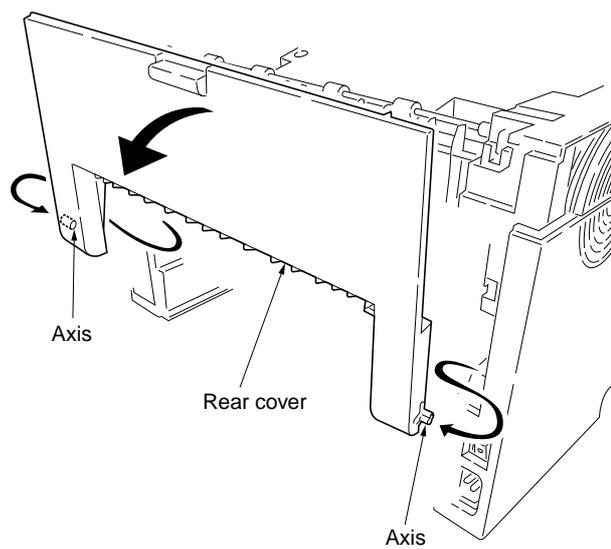


Figure 1-6-3

(4) Detaching and refitting the rear cover**Procedure**

1. Open the rear cover and remove the axes from holes of the frame.

**Figure 1-6-4**

(5) Detaching and refitting the front cover

Procedure

1. Open the front cover.
2. Push the claws and then pull up the right and left hinge pins.
3. Remove the front cover.

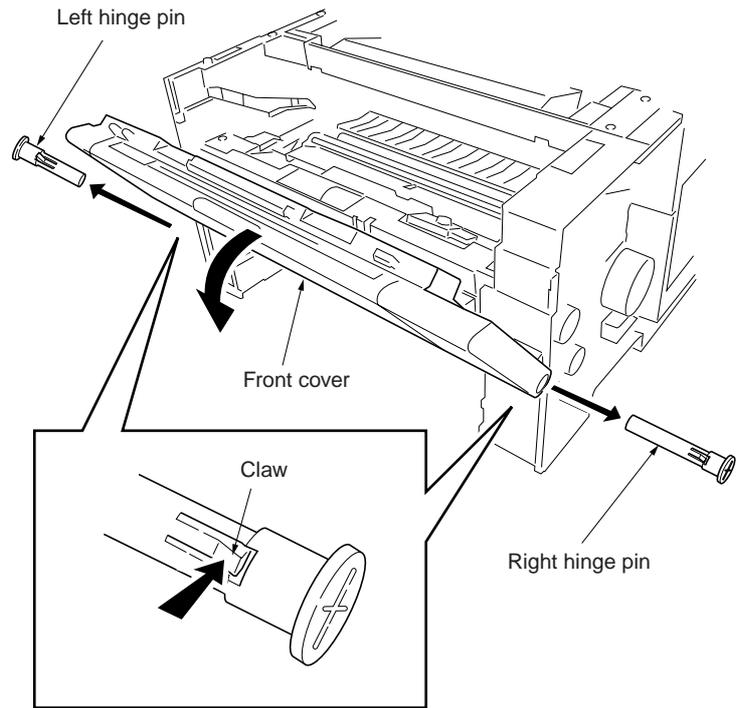


Figure 1-6-5

1-6-3 Paper feed section

(1) Detaching and refitting the feed and pickup rollers

Perform the following procedure when the feed roller or pickup roller is to be checked or replaced.

Procedure

1. Draw the paper cassette.
2. Push the stopper and then slide the shaft to the stopper side.
3. Remove the feed roller or pickup roller.
4. Replace or check the feed/pickup roller.
5. Refit all the removed parts.

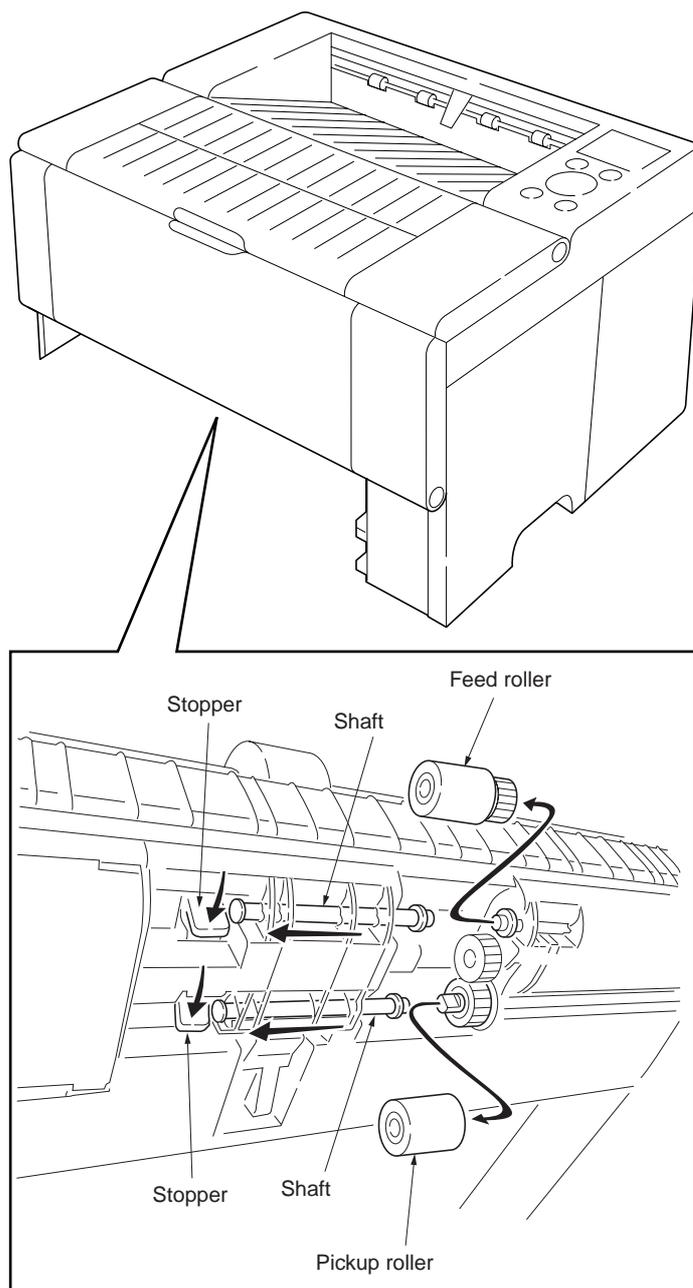


Figure 1-6-6

(2) Detaching and refitting the paper feed unit

Perform the following procedure when the paper feed unit is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the right cover (see page 1-6-4).
4. Remove one connector from the engine/high voltage PWB.

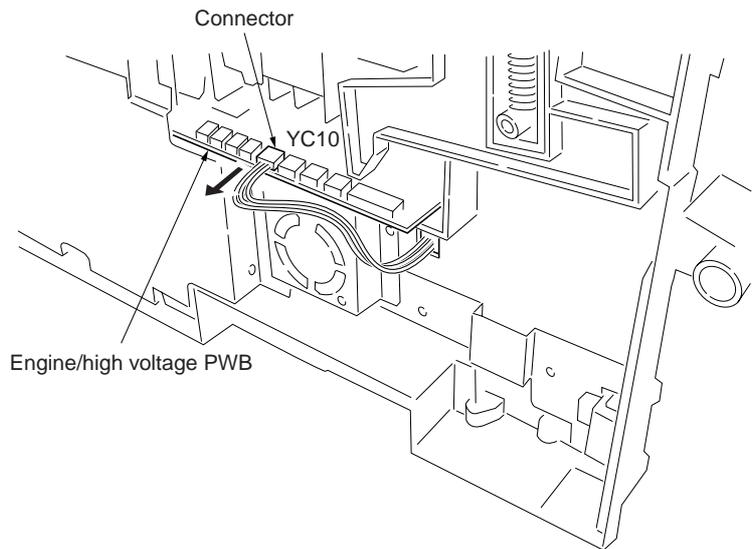


Figure 1-6-7

5. Remove the hook of ground spring.
6. Remove the feed clutch and bush.

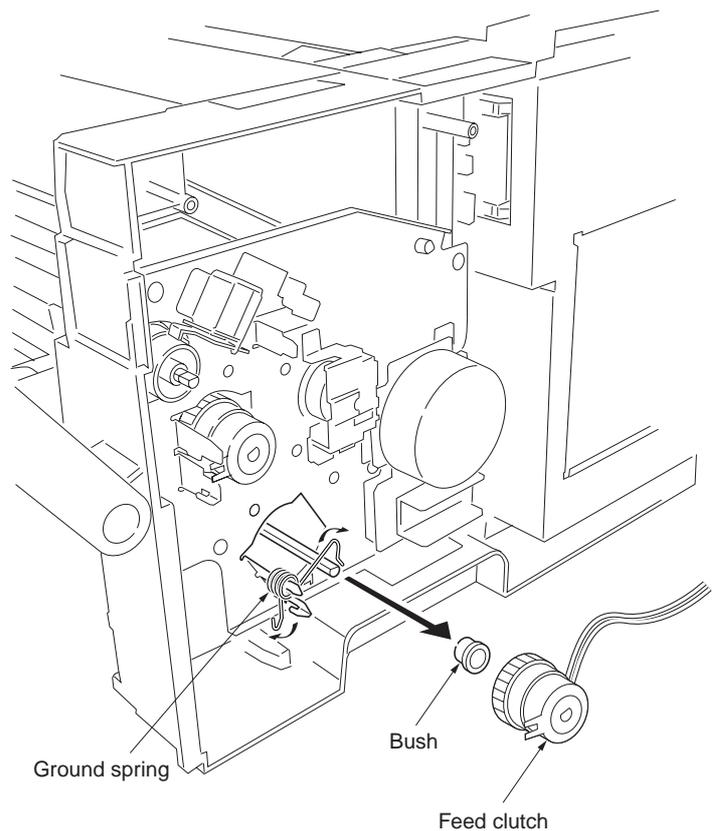


Figure 1-6-8

7. Turn the bottom of the printer upward.
8. Remove the two screws and the remove the paper feed unit.
9. Refit all the removed parts.

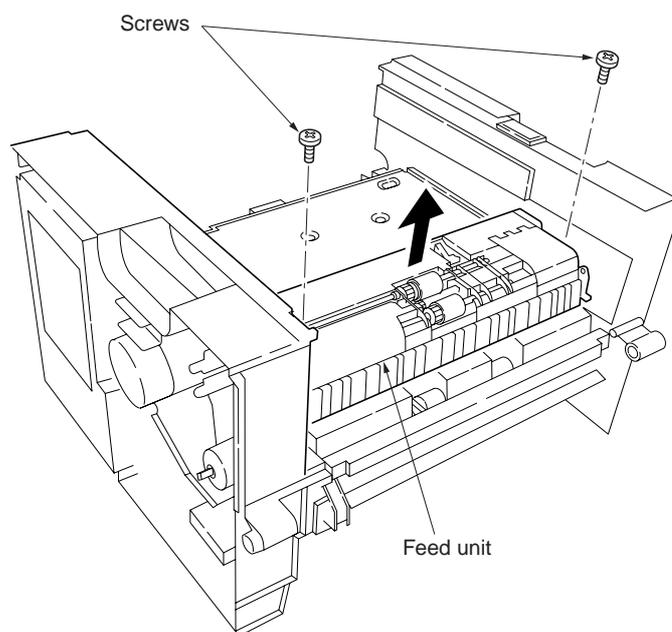


Figure 1-6-9

(3) Detaching and refitting the MP tray feed roller

Perform the following procedure when the MP tray feed roller is to be checked or replaced.

Procedure

1. Remove the process unit.
2. Remove one stop ring.
3. Remove the MP tray feed roller from the shaft.
4. Replace or Check the MP tray feed roller.
5. Refit all the removed parts.

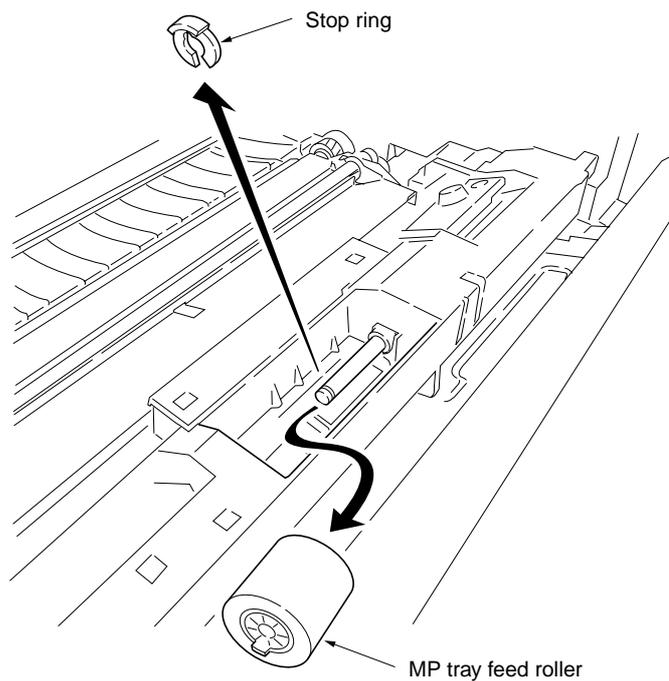


Figure 1-6-10

(4) Detaching and refitting the MP tray feed unit

Perform the following procedure when the MP tray feed unit is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the right cover (see page 1-6-4).
4. Remove the MP tray feed roller (see page 1-6-10).
5. Remove the stop ring.

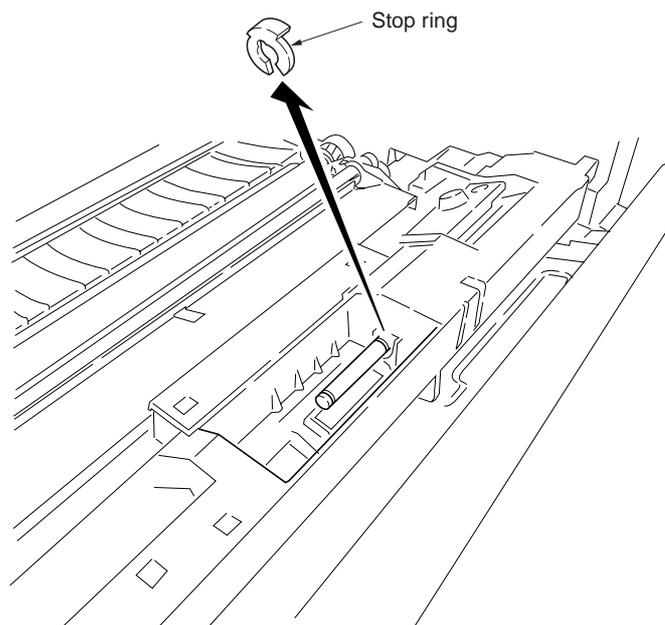


Figure 1-6-11

6. Remove the hook of ground spring.
7. While opening the claw, remove the MP tray feed pulley.
8. Remove one bush.

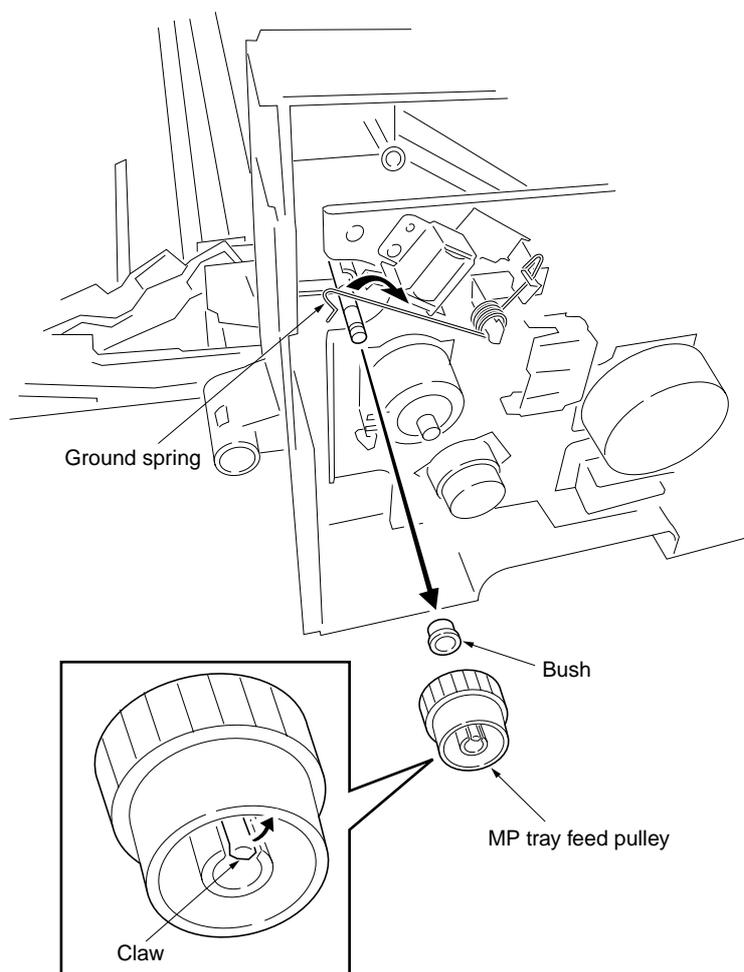


Figure 1-6-12

9. Remove the two connectors from the engine/
high voltage PWB.

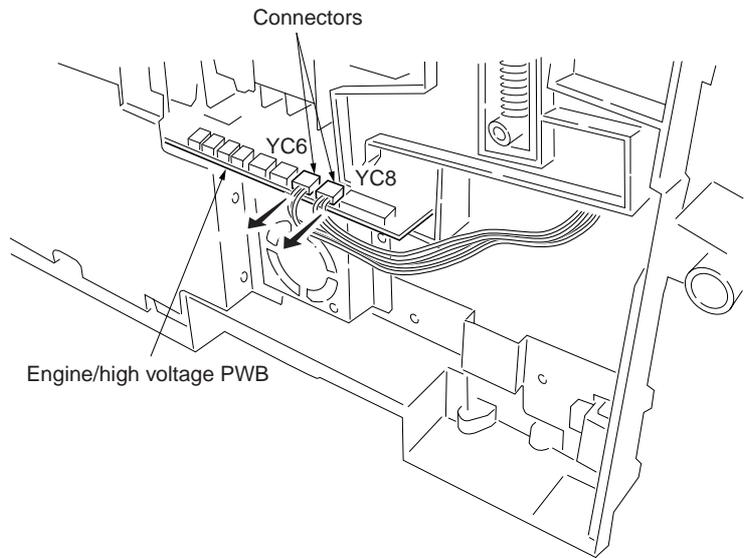


Figure 1-6-13

10. Remove the two screws and then the MP tray
feed unit.
11. Replace or check the MP tray feed unit.
12. Refit all the removed parts.

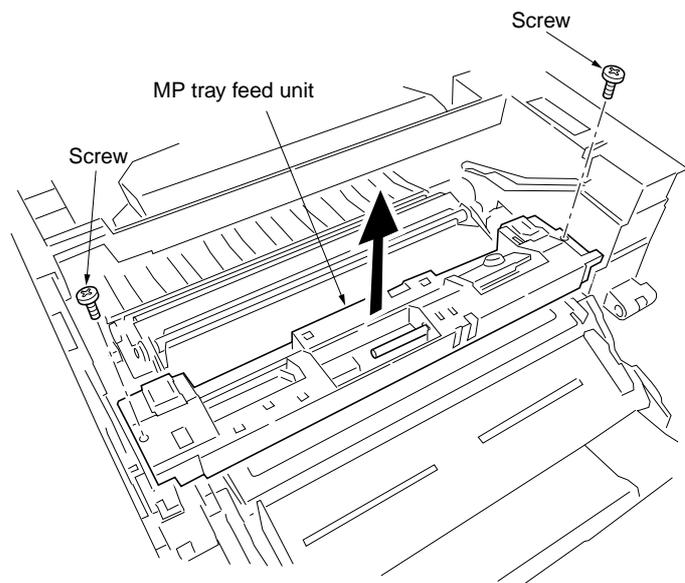


Figure 1-6-14

(5) Detaching and refitting the retard roller

Perform the following procedure when the retard roller is to be checked or replaced.

Procedure

1. Draw the paper cassette.
2. Remove the retard roller holder from the paper feed cassette.
3. Remove the retard roller from the holder.
4. Replace or check the retard roller.
5. Refit all the removed parts.

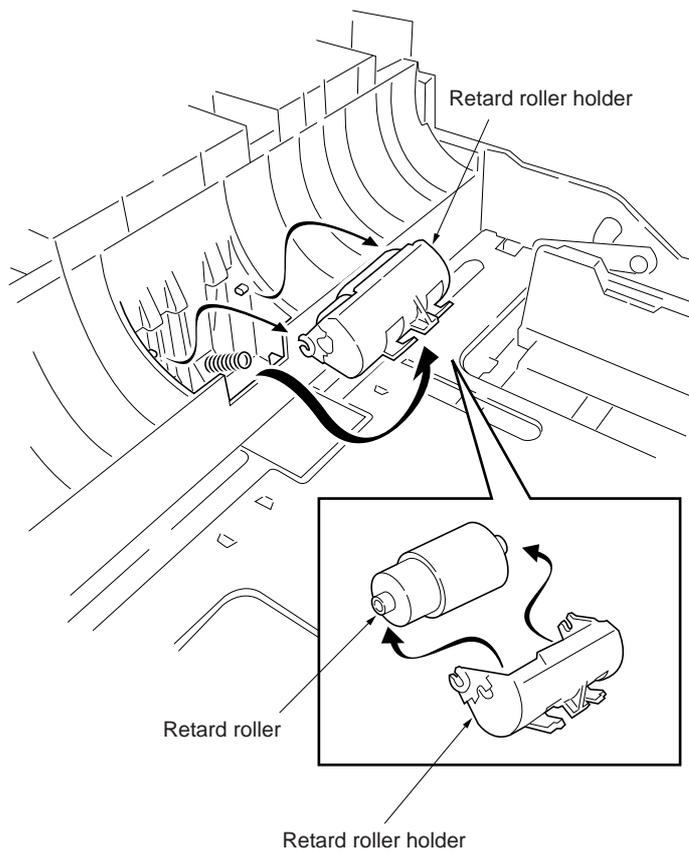


Figure 1-6-15

(6) Detaching and refitting the drive assembly

Perform the following procedure when the drive assembly is to be checked or replaced.

Procedure

1. Remove the three hooks of ground springs.
2. Remove the feed clutch and middle feed clutch.

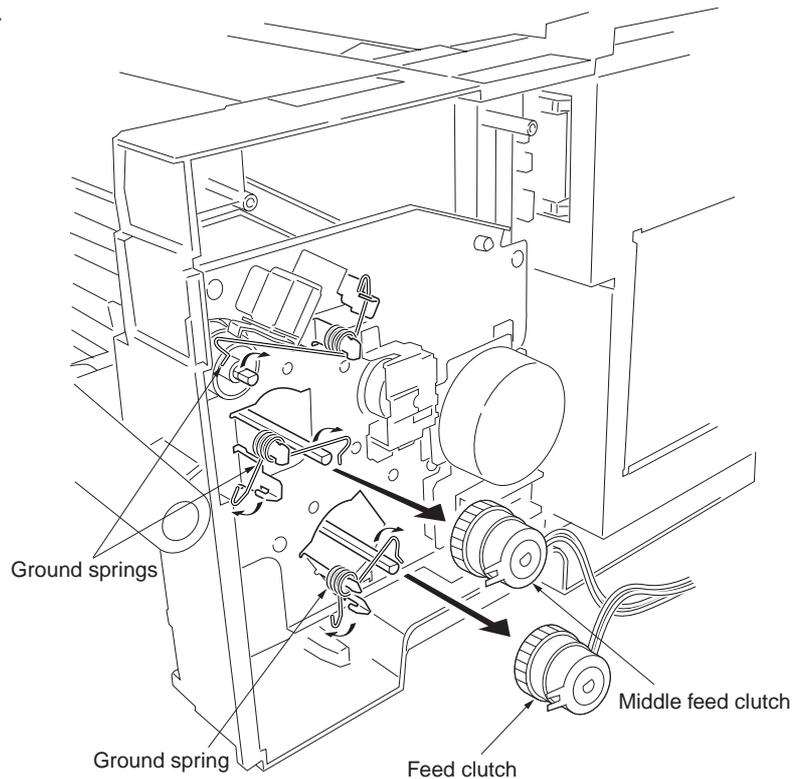


Figure 1-6-16

3. Remove the four connectors from the main PWB and one connector from the main motor.
4. Remove the four screws and then the drive assembly.
5. Replace or check the drive assembly.
6. Refit all the removed parts.

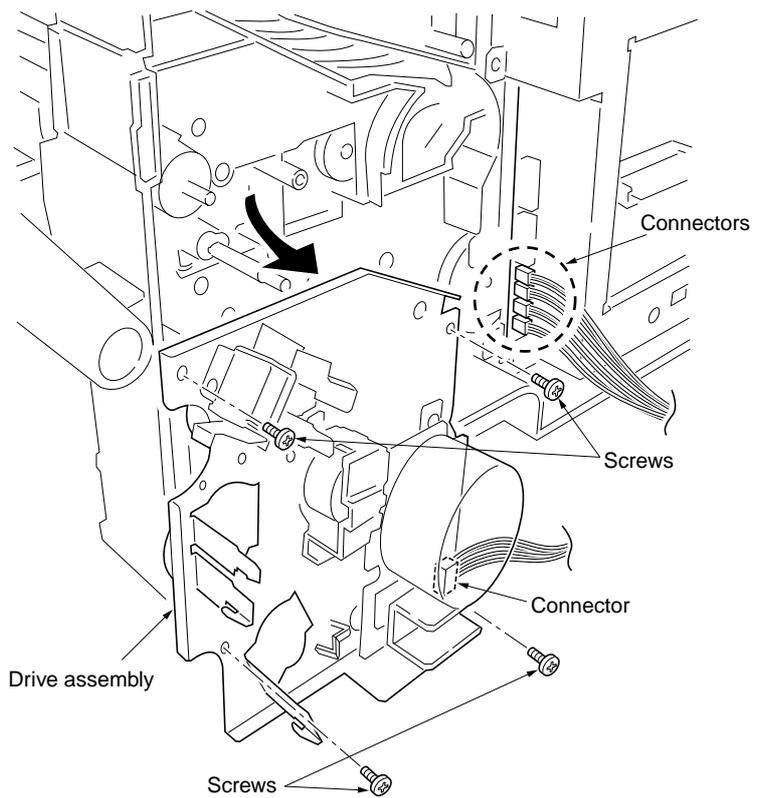


Figure 1-6-17

1-6-4 Laser scanner unit section

(1) Detaching and refitting the laser scanner unit

Perform the following procedure when the laser scanner unit is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the right cover (see page 1-6-4).
3. Remove the two connectors from the main PWB and one connector from the laser scanner unit.
4. Remove the four screws and then remove the laser scanner unit.
5. Replace or check the laser scanner unit.
6. Refit all the removed parts.

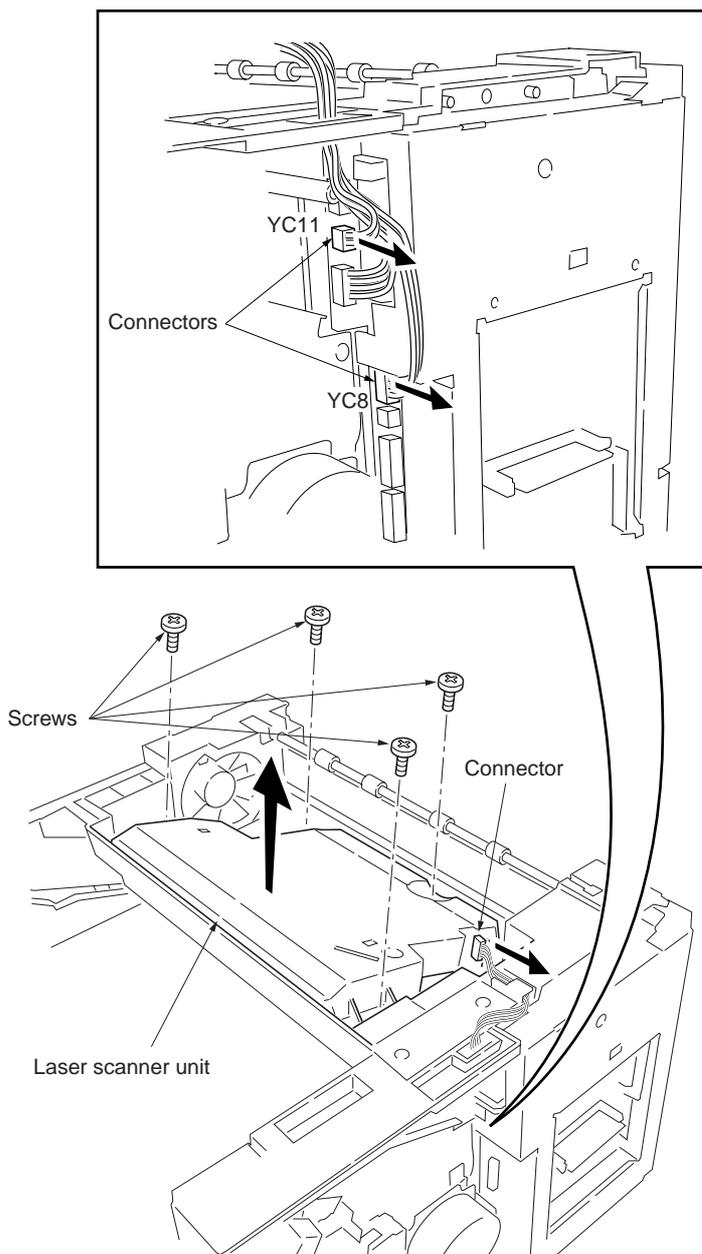


Figure 1-6-18

1-6-5 Process unit section

(1) Detaching and refitting the main charger unit

Perform the following procedure when the main charger unit is to be checked or replaced.

Procedure

1. Remove the process unit.
2. Push the claw and remove the cap.
3. While sliding the main charger unit slightly and then pull it out.
4. Check or replace the main charger unit.
5. Refit all the removed parts.

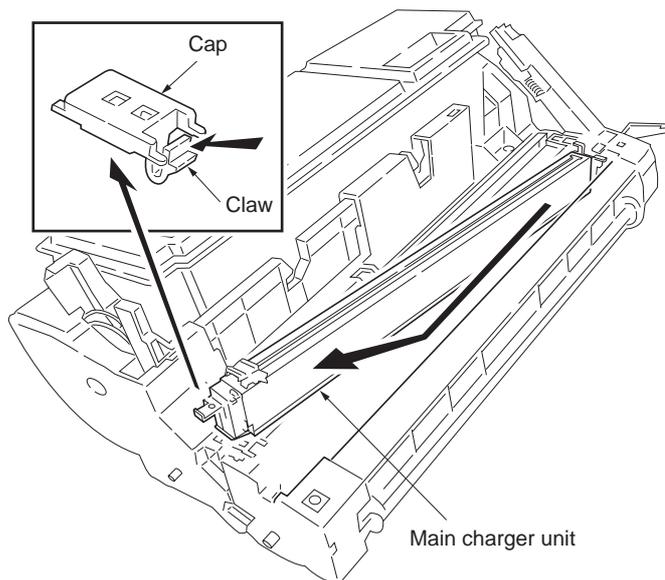


Figure 1-6-19

1-6-6 Transfer/separation section

(1) Detaching and refitting the transfer roller and separation charger unit

Perform the following procedure when the transfer roller or separation charger unit is to be checked or replaced.

Procedure

1. Remove the process unit.
2. Open the upper paper chute.
3. While sliding the lower paper guide and then remove the hooks.
4. Remove the transfer roller.
5. Remove the transfer roller gear Z18 from the transfer roller.
6. Remove the four hooks and then remove the separation charger unit.
7. Check or replace the transfer roller/separation charger unit.
8. Refit all the removed parts.

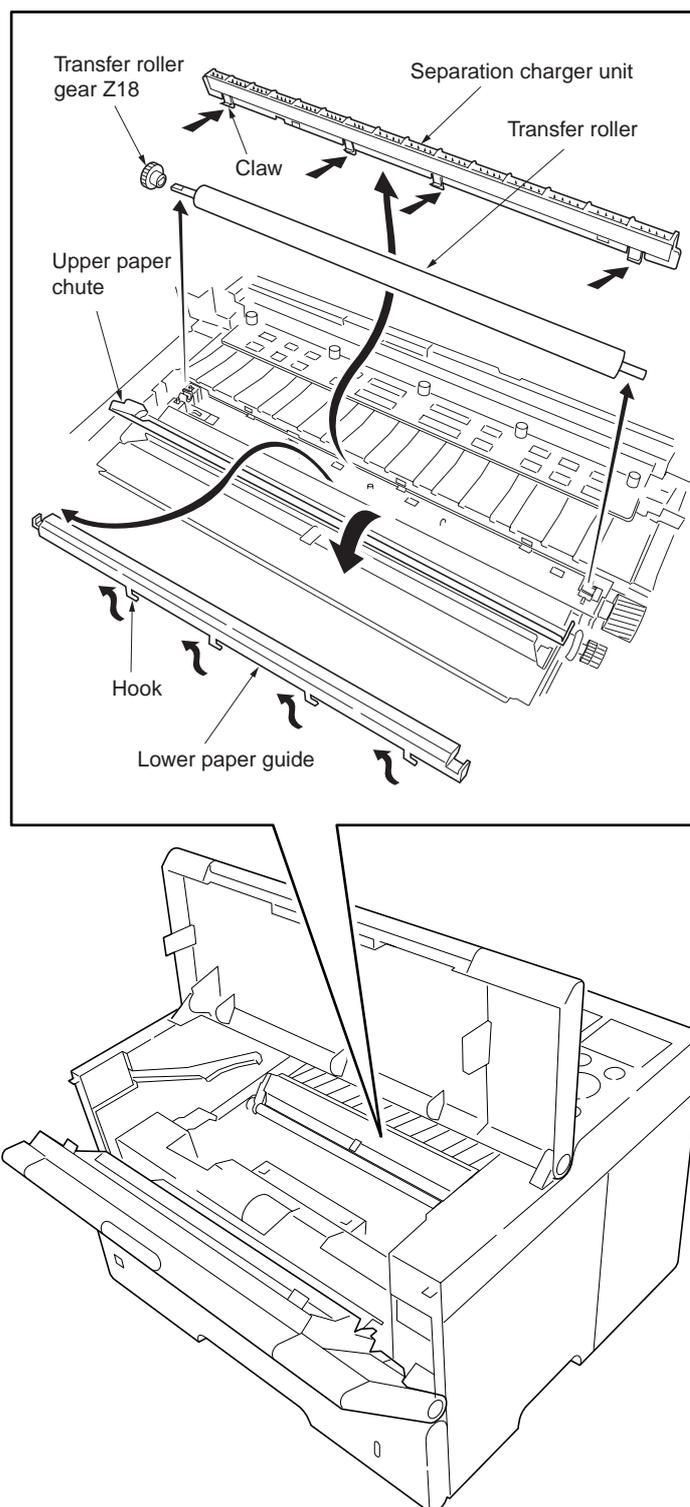


Figure 1-6-20

1-6-7 Fixing section

(1) Detaching and refitting the fixing unit

Perform the following procedure when the fixing unit is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the right cover (see page 1-6-4).
4. Remove the rear cover (see page 1-6-5).
5. Remove one connector from the power source PWB and one connector from the engine/high voltage PWB.
6. Remove the two screws and then remove the fixing unit.
7. Check or replace the fixing unit.
8. Refit all the removed parts.

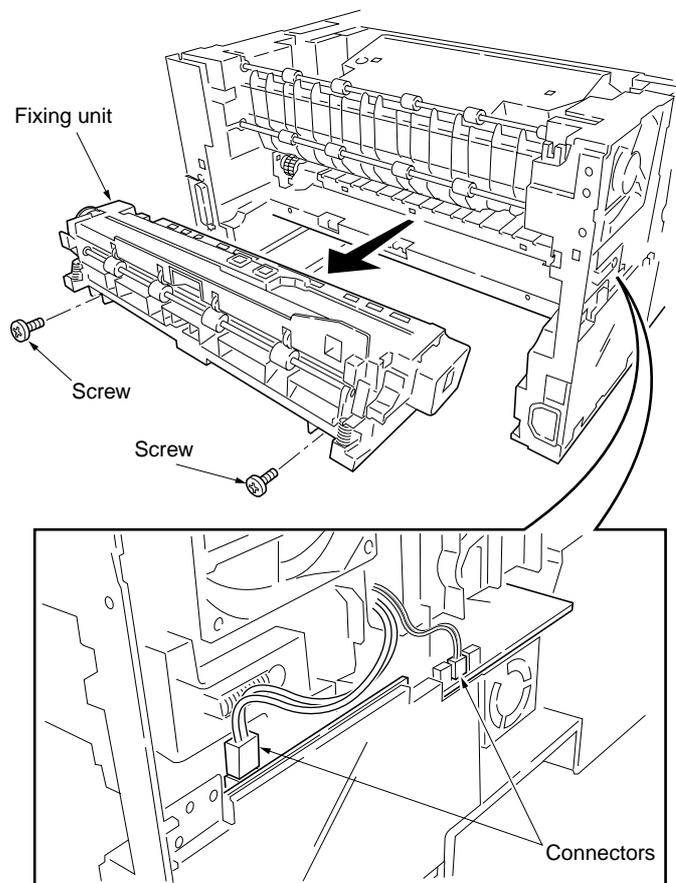


Figure 1-6-21

(2) Detaching and refitting the fixing heater lamp

Perform the following procedure when the fixing heater lamp is to be checked or replaced.

Procedure

1. Remove the fixing unit (see page 1-6-18).
2. Remove the two screws and then divide into the upper fixing frame and the lower fixing frame.

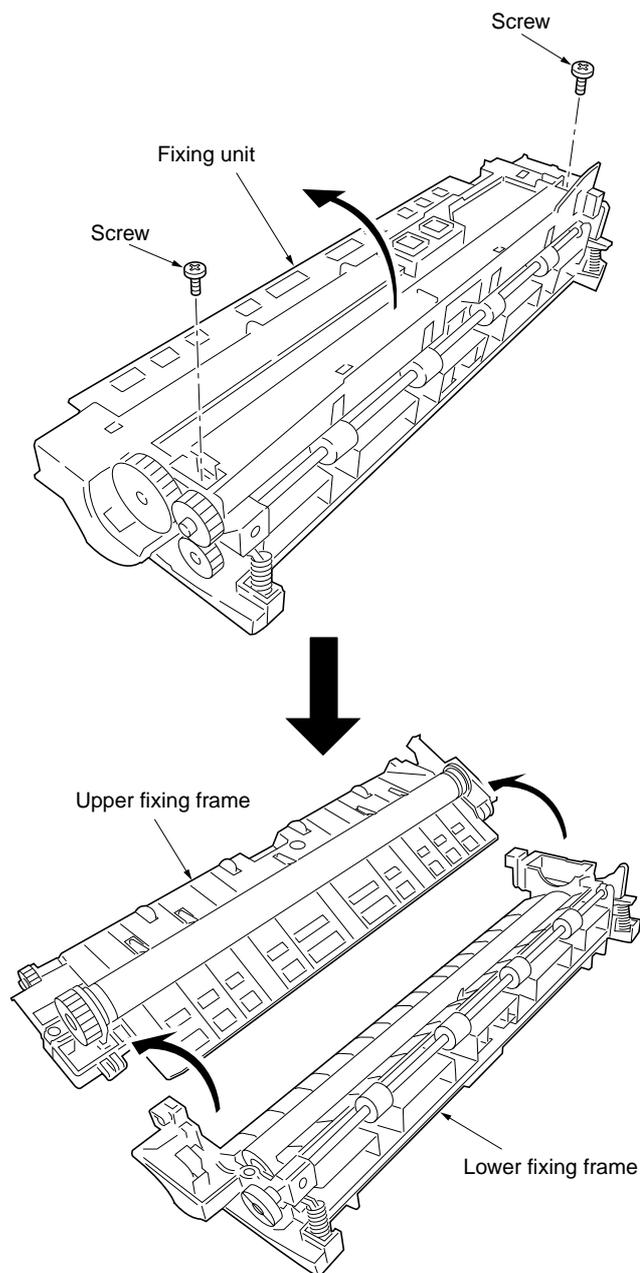


Figure 1-6-22

3. Remove one screw and then the terminal.

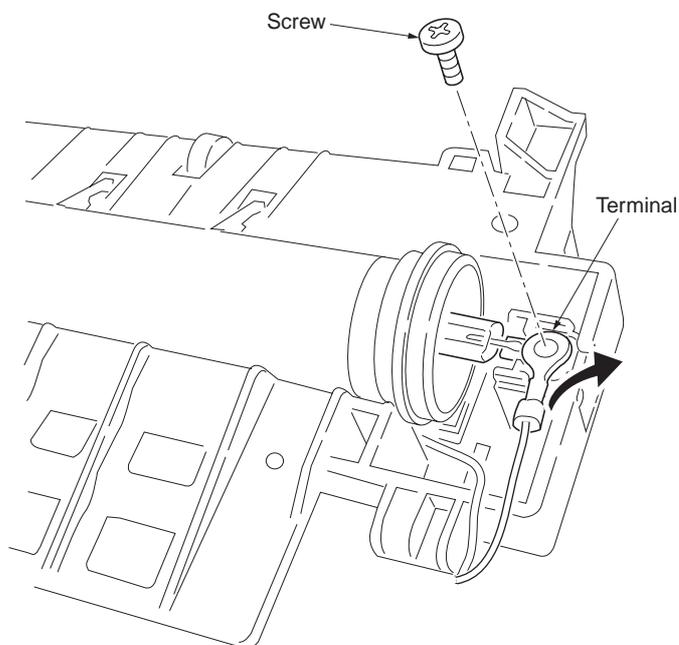


Figure 1-6-23

4. Remove one screw and then pull the fixing heater lamp.
5. Check or replace the fixing heater lamp.
6. Refit all the removed parts.

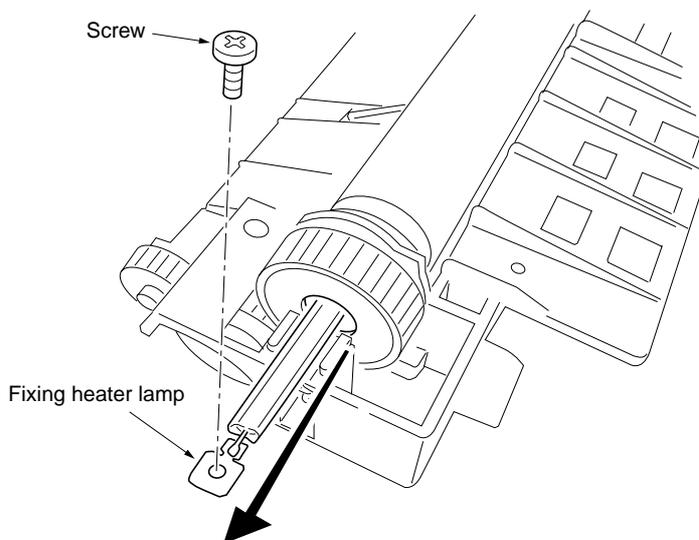


Figure 1-6-24

(3) Detaching and refitting the heat roller

Perform the following procedure when the heat roller is to be checked or replaced.

Procedure

1. Remove the fixing unit (see page 1-6-18).
2. Remove the fixing heater lamp.
3. Pull the left and right heat roller bushes up and then remove the heat roller.
4. Remove the heat roller gear Z36 and left and right heat roller bushes from the heat roller.
5. Check or replace the heat roller.
6. Refit all the removed parts.

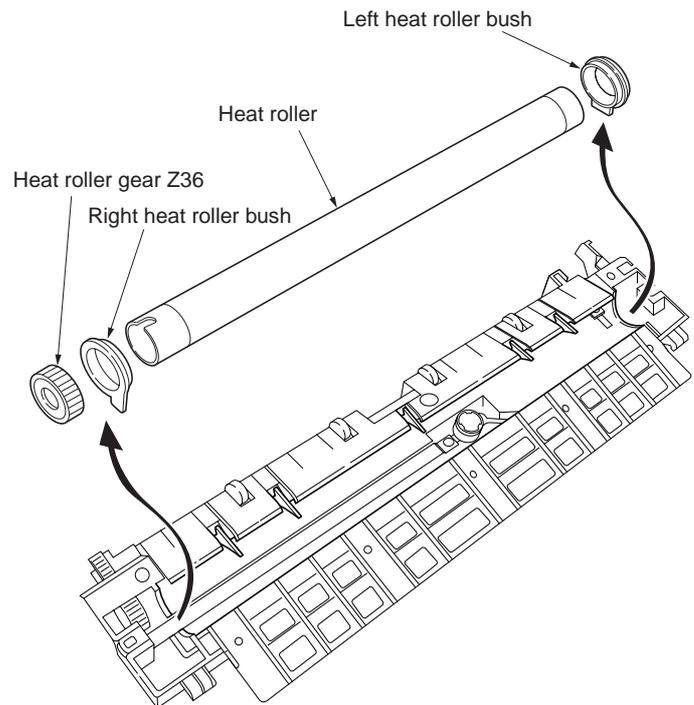


Figure 1-6-25

(4) Detaching and refitting the press roller

Perform the following procedure when the press roller is to be checked or replaced.

Procedure

1. Divide the fixing unit into the upper fixing frame and the lower fixing frame (see page 1-6-19).
2. Remove the press roller from the lower fixing assembly.
3. Check or replace the press roller.
4. Refit all the removed parts.

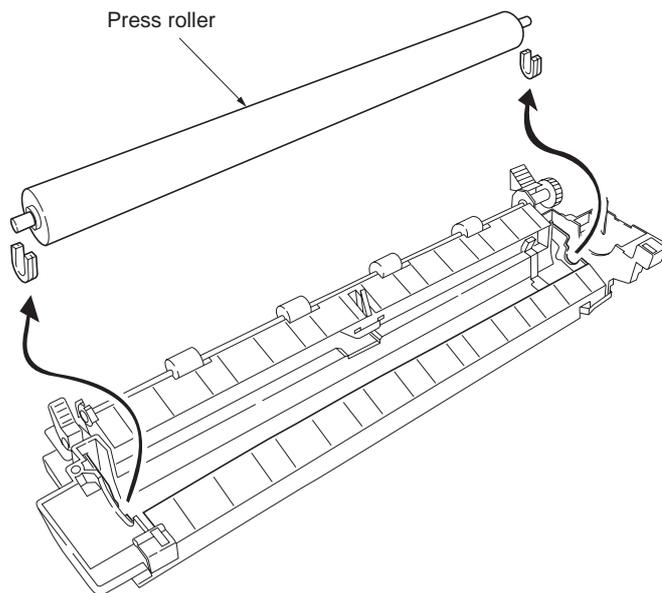


Figure 1-6-26

(5) Detaching and refitting the fixing thermistor and separator

Perform the following procedure when the fixing thermistor and separator are to be checked or replaced.

Procedure

1. Divide the fixing unit into the upper fixing frame and the lower fixing frame (see page 1-6-19).
2. Remove one screw.
3. Push the two claws and then remove the upper eject guide.

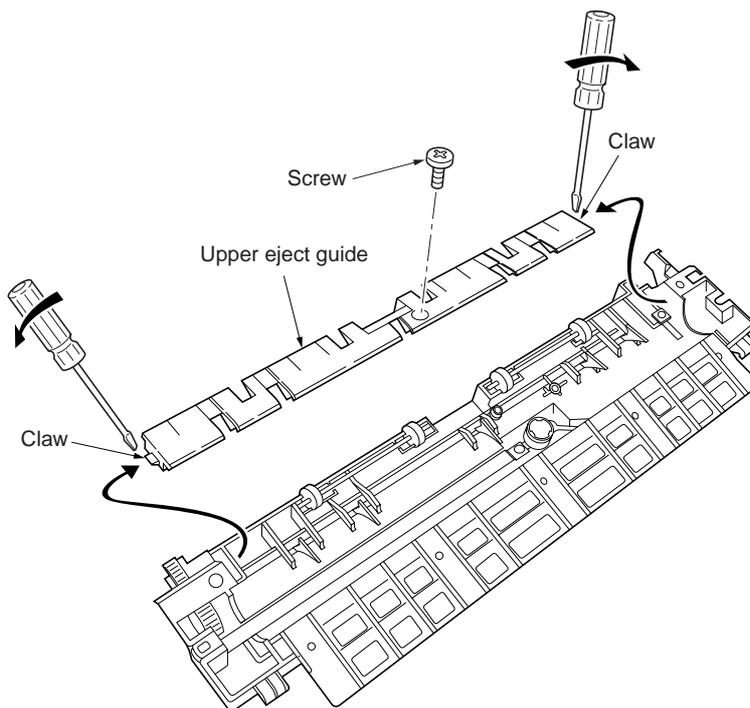


Figure 1-6-27

4. Remove one screw and then the fixing thermistor.
5. Lift the separator upwards and pull it out.
6. Check or replace the fixing thermistor and separator.
7. Refit all the removed parts.

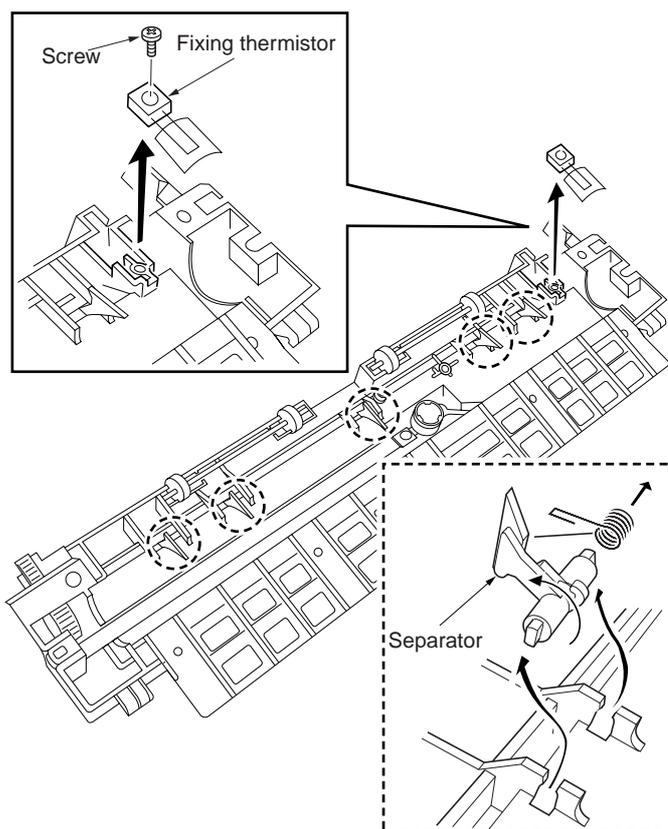


Figure 1-6-28

(6) Detaching and refitting the fixing thermostat

Perform the following procedure when the fixing thermostat is to be checked or replaced.

Procedure

1. Remove the heat roller (see page 1-6-24).
2. Remove the two screws and then the terminal plate and round terminal.
3. Remove the fixing thermostat.
4. Check or replace the fixing thermostat.
5. Refit all the removed parts.

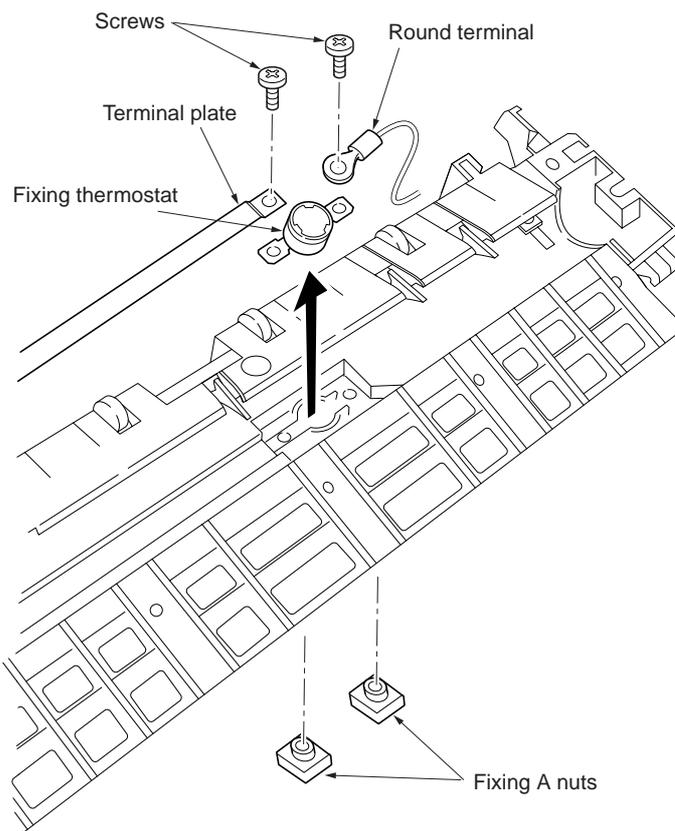


Figure 1-6-29

1-6-8 PWBs

(1) Detaching and refitting the main PWB

Perform the following procedure when the main PWB is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the right cover (see page 1-6-4).
4. Remove all (ten) connectors from the main PWB.
5. Remove the five screws and then the main PWB cover.

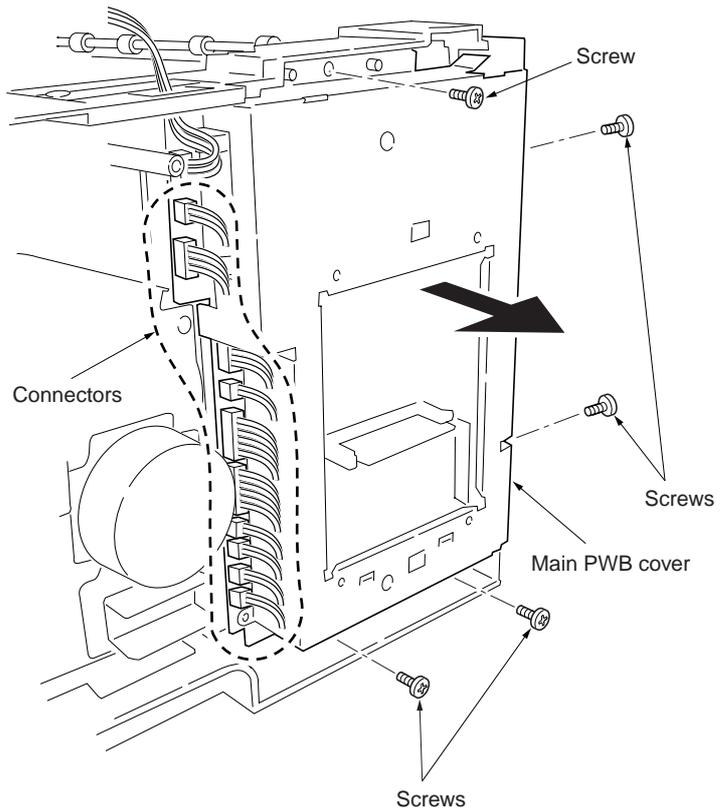


Figure 1-6-30

6. Remove the seven screws and then the main PWB.
7. Check or replace the main PWB.
8. Refit all the removed parts.

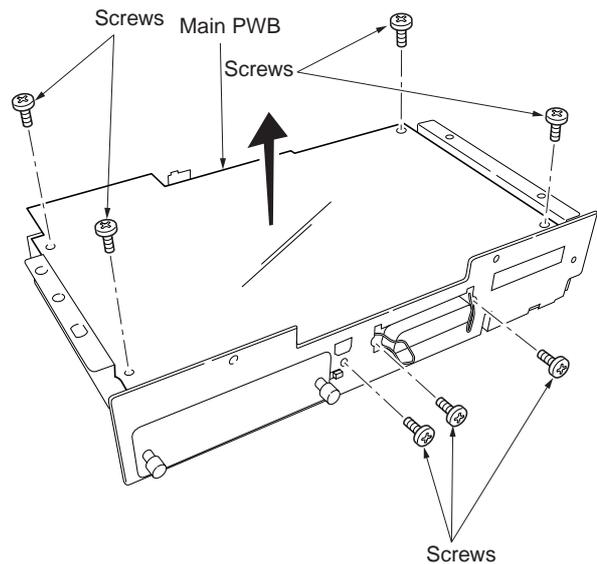


Figure 1-6-31

(2) Detaching and refitting the engine/high voltage PWB

Perform the following procedure when the engine/high voltage PWB is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the right cover (see page 1-6-4).
4. Remove all (nine) connectors from the engine/high voltage PWB.
5. Remove the power source PWB (see page 1-6-28).

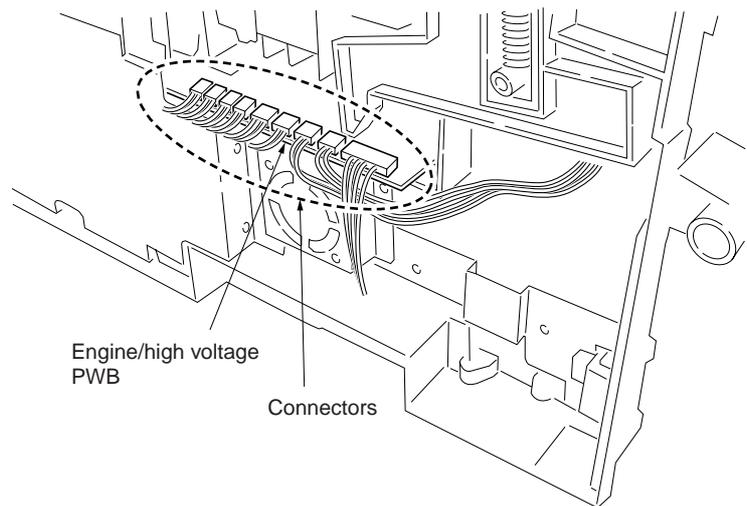


Figure 1-6-32

6. Remove the two connectors from the main PWB and one connector from the main motor.

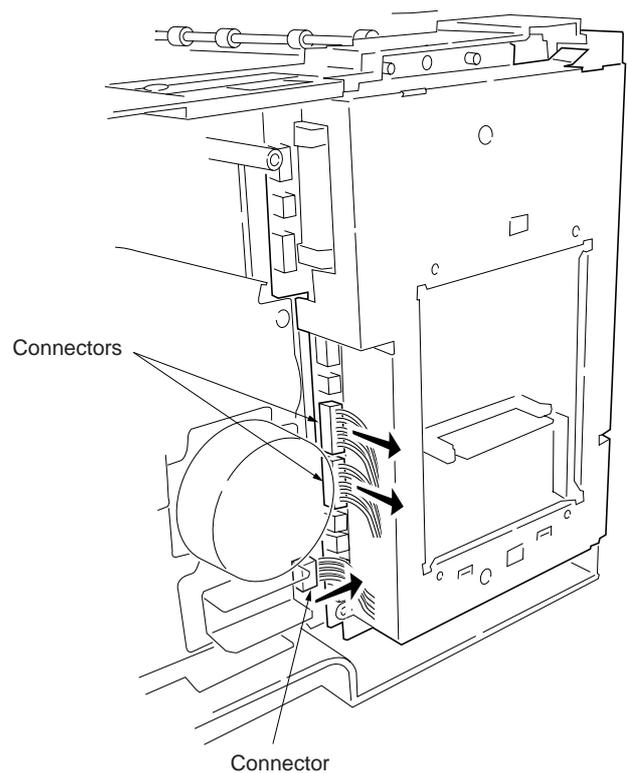


Figure 1-6-33

7. Remove the feed unit (see page 1-6-8).
8. Remove the middle roller guide.
9. Remove the seven screws and then the bottom frame plate.

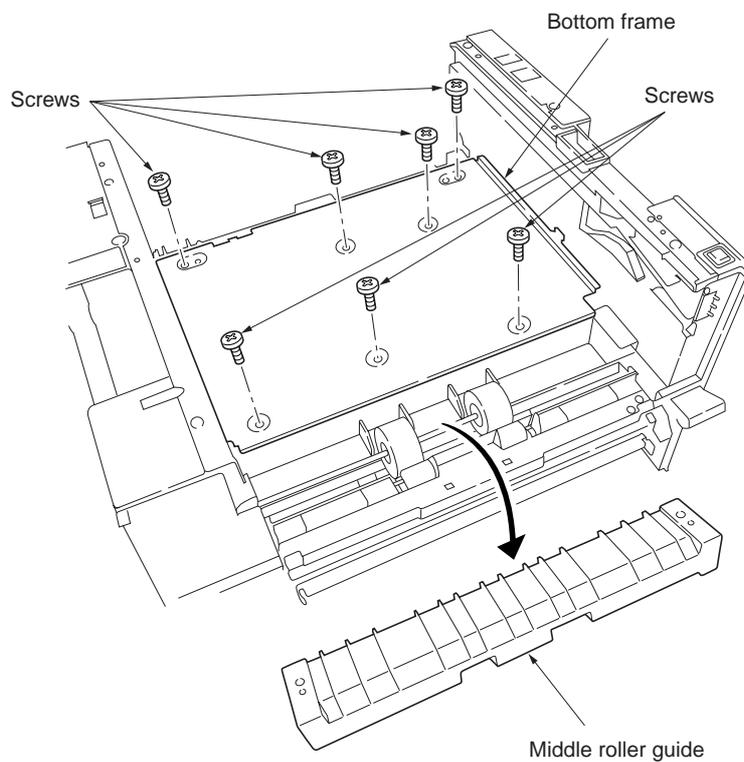


Figure 1-6-34

10. Remove the two connectors from the engine/ high voltage PWB.
11. Remove the two screws and then the engine/ high voltage PWB.

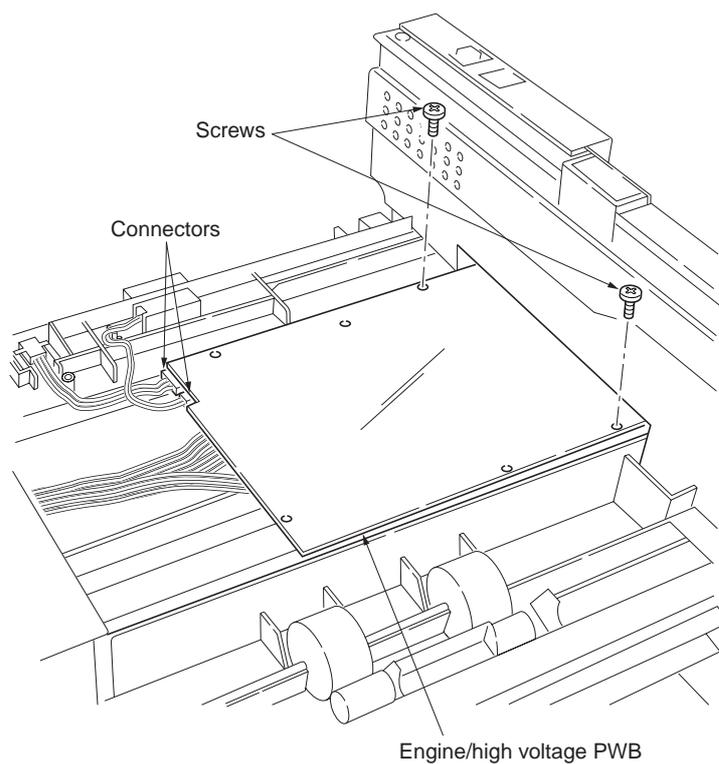


Figure 1-6-35

FS-6020

12. Remove EEPROM (U3) from the socket of the engine/high voltage PWB.
13. Replace EEPROM (U3) to the socket of the new engine/high voltage PWB.
14. Attach the new engine/high voltage PWB and refit all the removed parts.

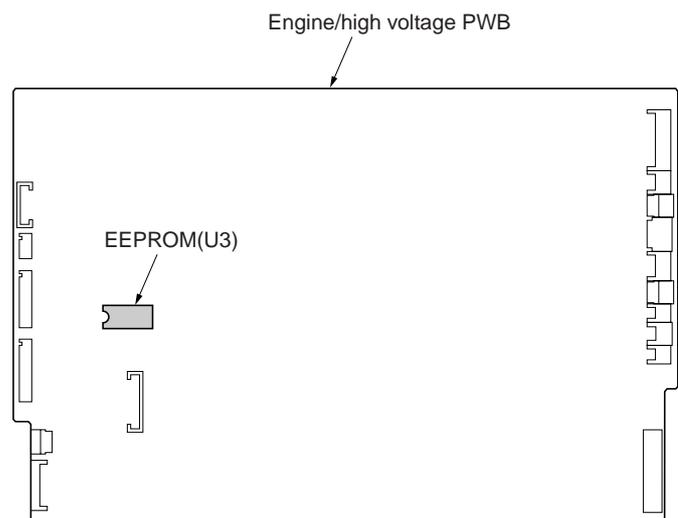


Figure 1-6-36

(3) Detaching and refitting the power source PWB

Perform the following procedure when the power source PWB is to be checked or replaced.

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the left cover (see page 1-6-3).
3. Remove the two connectors.
4. Remove the five screws and then the power source PWB.
 - * Power source PWB and engine/high voltage PWB are connected directly with the PWB connector.
5. Check or replace the power source PWB.
6. Refit all the removed parts.

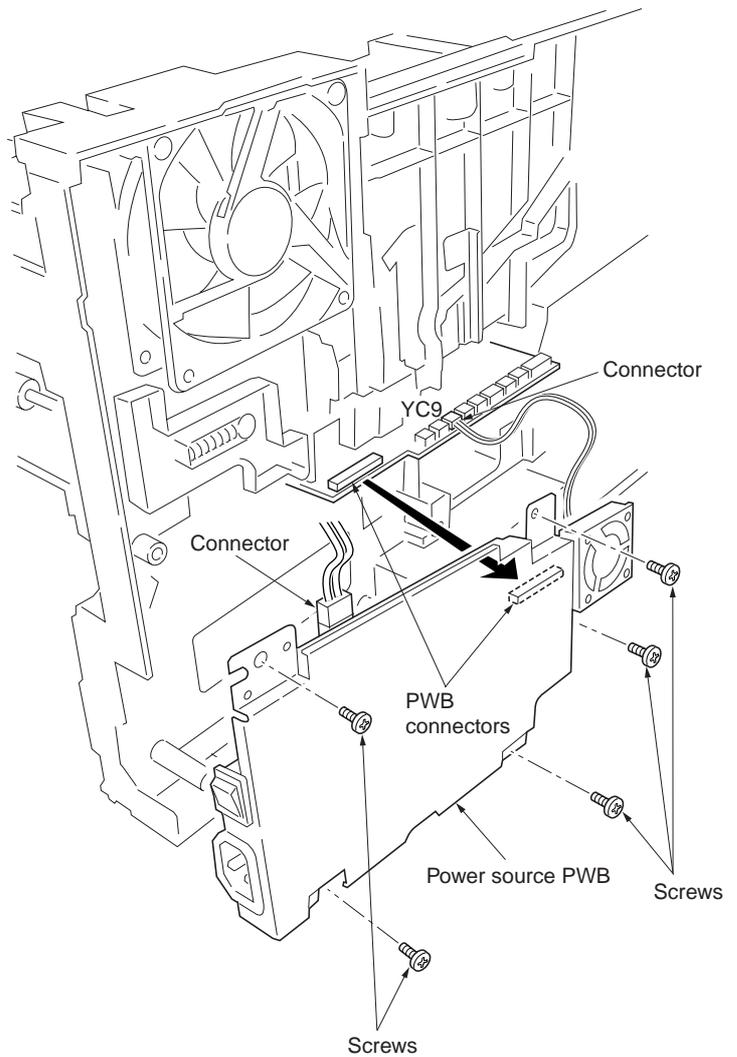


Figure 1-6-37

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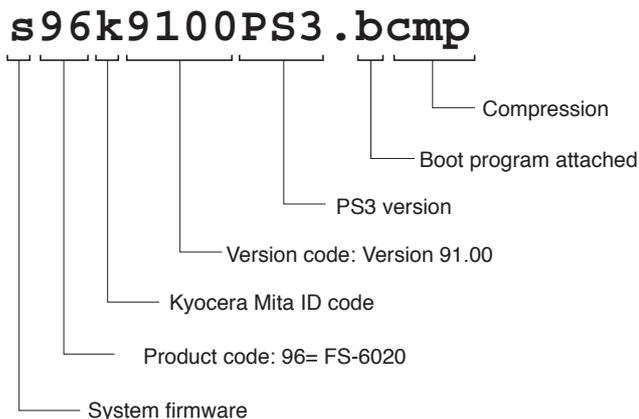
1-7-1 Downloading firmware

The system firmware can be upgraded by downloading new firmware. Downloading can be made either by directly sending the new firmware from PC via the parallel interface or using a memory card that contains the new firmware. The message data for the operation panel display is also downloadable so that a new message language is appended for the operation panel. The message data should be downloaded directly from PC.

(1) Format for the firmware files

The file names for the firmware files are coded as follows.

System firmware file name example



Operation panel message data file name example

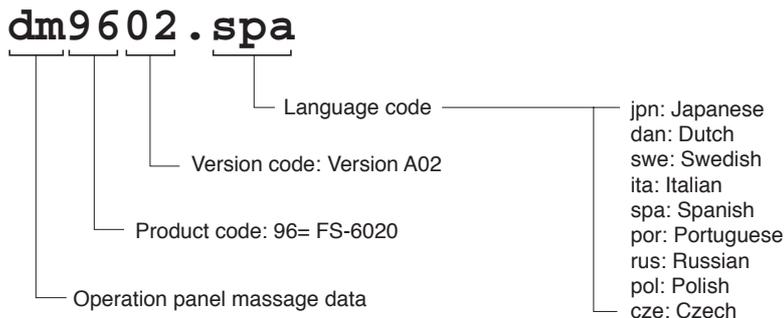


Table 1-7-1

(2) Downloading firmware via the parallel interface

To download the system firmware using the parallel interface, use the procedure below.

Connecting the parallel printer cable

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

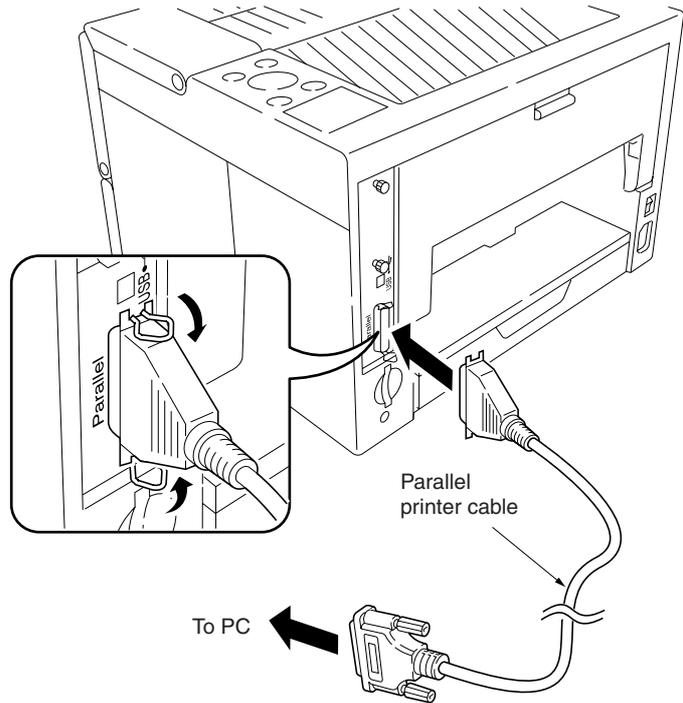


Figure 1-7-1

Downloading the firmware file

1. Turn printer power on.
2. Confirm that display ① is displayed.
3. At the DOS prompt, enter command ②.
* Enter UPGR 'SYS' in capitals.
4. Confirm that message display ③ is displayed.
5. At the DOS prompt, enter command ④ so that the system firmware (example: s96K9100.bcmp) is copied to the printer.
6. Message display ⑤ is displayed during downloading. When message display ⑥ is displayed to indicate downloading is finished, turn printer power off, then on.
7. Confirm that message display ⑦ is displayed after warm-up.
 1. Print a status page. (See page 1-4-2.)
 2. Check that the status page shows the

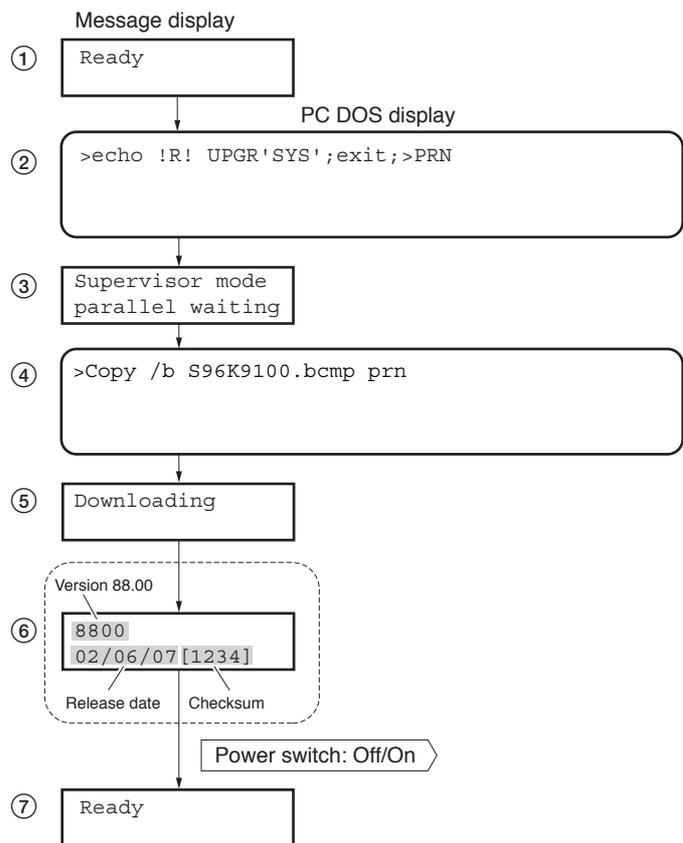


Figure 1-7-2

Confirming upgrading

updated firmware version.



(3) Downloading firmware using the memory card

The procedure below provides how to download firmware from a memory card.

Formatting the memory card

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

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

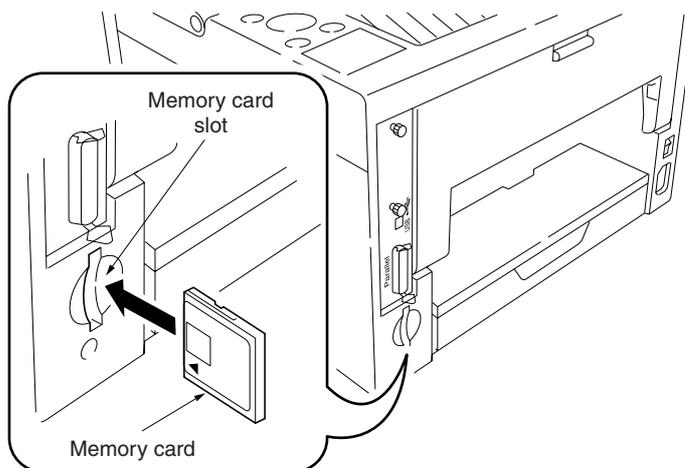


Figure 1-7-3

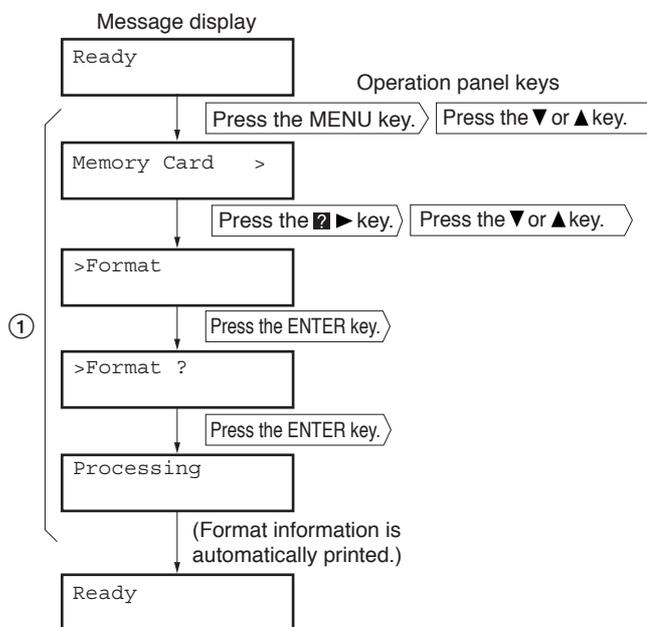


Figure 1-7-4

5. Remove the formatted memory card from the memory card slot.

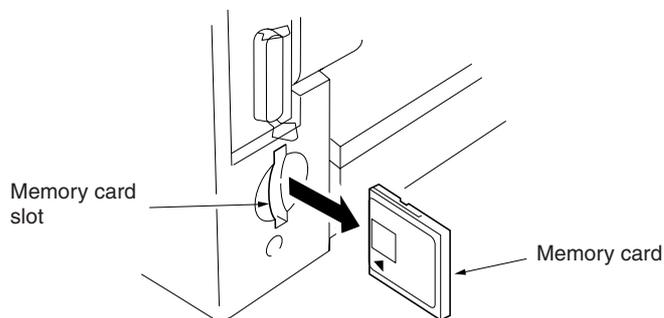


Figure 1-7-5

Copying firmware files to the memory card

1. Insert the memory card to the PC's slot or to the adaptor.
2. Copy the firmware file to download to the root directory of the memory card.
3. Remove the memory card from the PC's slot or the adaptor.

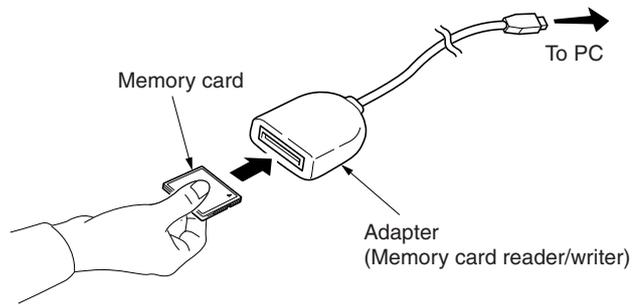


Figure 1-7-6

Downloading firmware file

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

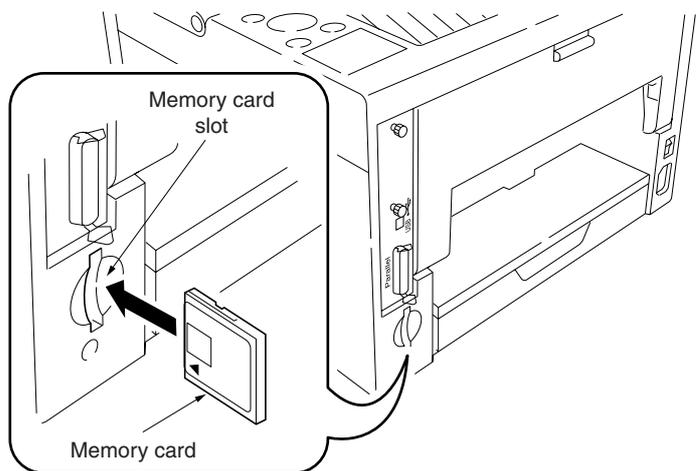


Figure 1-7-7

3. Turn printer power on. The firmware file in the memory card will be automatically downloaded.
4. Message display ① is displayed during downloading. When message display ② is displayed to indicate downloading is finished.
5. Turn printer power off.
6. Remove the memory card from memory card slot.
7. Turn printer power on.
8. Confirm that message display ③ is displayed after warm-up.

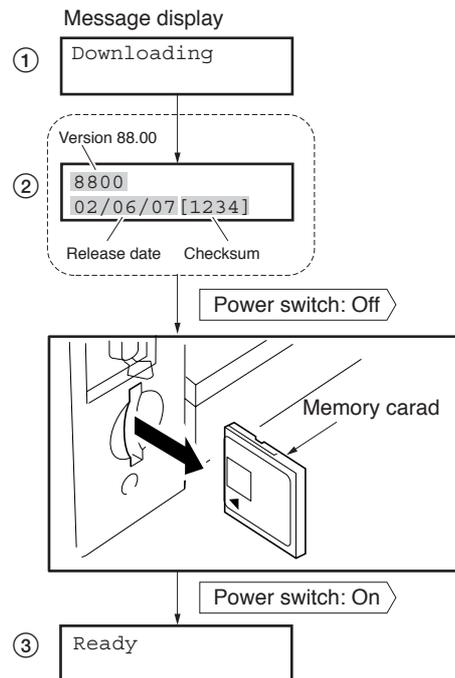


Figure 1-7-8

Downloading firmware file

1. Print a status page. (See page 1-4-2.)
2. Check that the status page shows the updated firmware version.



(4) Downloading the message data

To download the new message data, progress the following procedures.

Connecting the parallel printer cable

1. Turn OFF the power supply switch to the printer and computer.
2. Connect the parallel printer cable between the computer and printer.

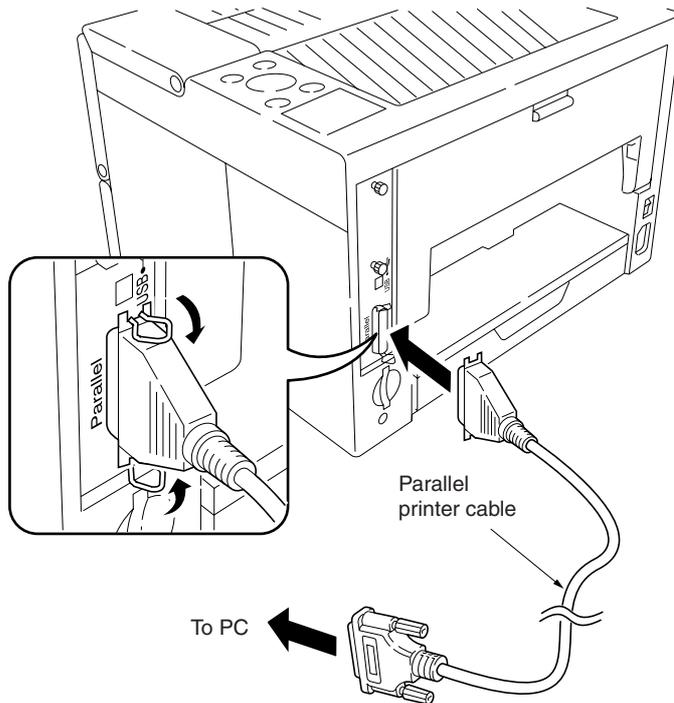


Figure 1-7-9

Downloading the message data file

1. Turn ON the power to the printer.
2. Check that the message indication ① is indicated.
3. Input the command ② following the DOS prompt indication.
* Enter BOOST 'SPR' in capitals.
4. Check that the message indication ③ is indicated.
5. Input the command ④ following the DOS prompt indication and copy the message data file to the printer (e.g.; dm9602.spa).
6. The message indication ⑤ is indicated while downloading the data file. When the message indication ⑥ is indicated, which shows the end of downloading, turn OFF the power switch once and then turn it on again.
7. Check that the message indication ⑦ is indicated after warming up the printer.

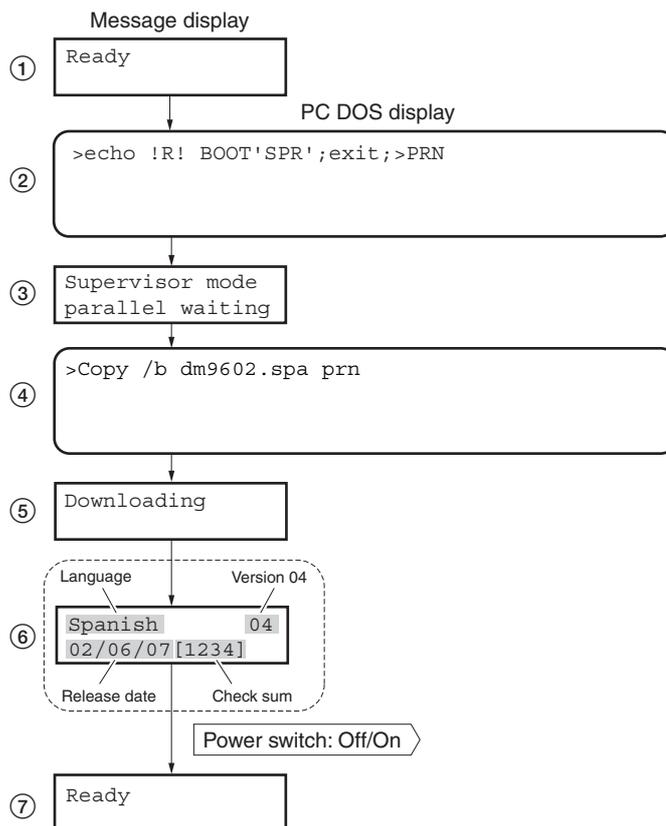


Figure 1-7-10

Checking the update

1. Print the status page. (See page 1-4-2.)
2. Print the status page to check that the firmware version has been updated.



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2-1-1 Paper feed/conveying section

Paper feed/conveying section consists of the paper feed unit that feeds paper from the paper cassette and the MP tray paper feed unit that feeds paper from the MP tray, and the conveying section that conveys the fed paper to the transfer/separation section.

(1) Paper feed section/paper cassette

Paper cassette is the universal type that is applicable to various paper sizes by adjusting the paper guides and stopper and approximate 250 pages can be put in.

Mechanism in the paper cassette consists of the cassette actuator board that lifts the paper in order to let it touch the pickup roller and the retard roller that prevents papers from multiple feeding. Paper that is drawn out by the rotation of pickup roller of the paper feed unit is then sent in between the feed roller and the retard roller. Function of the built-in torque limiter in the retard roller gives weak resistance force against the rotation. Normally, when only a page is drawn out by the rotation of pickup roller, the paper is conveyed to the printer by the rotation of feed roller on its own. If the pickup roller drew out two lapped pages somehow, the upper paper is conveyed by the feed roller and the lower paper stays due to the rotation resistant force of the retard roller because the friction force between papers is smaller than the rotation resistance force of the retard roller and then the multiple paper feed can be prevented.

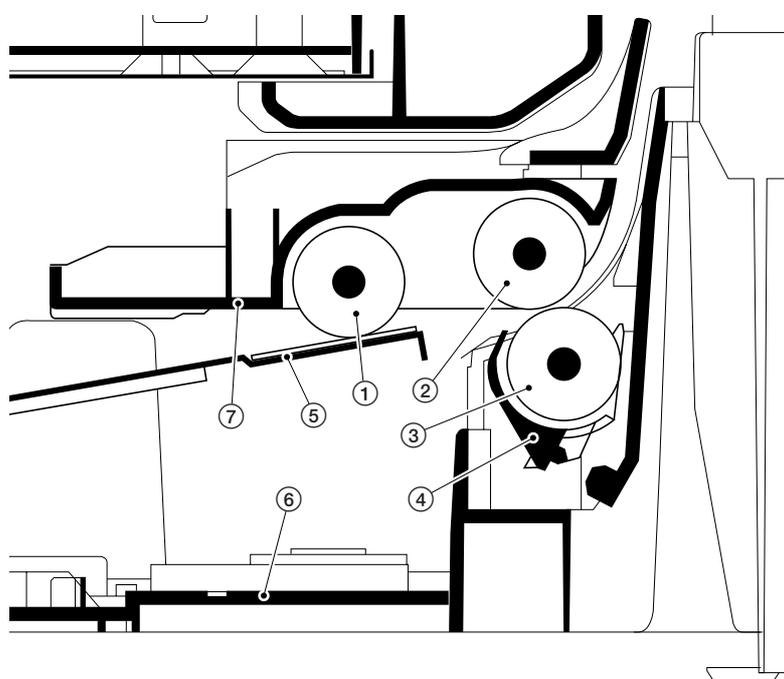


Figure 2-1-1 Paper feed section

- ① Pickup roller
- ② Feed roller
- ③ Retard roller
- ④ Retard roller holder
- ⑤ Bottom plate
- ⑥ Cassette base
- ⑦ Feed guide

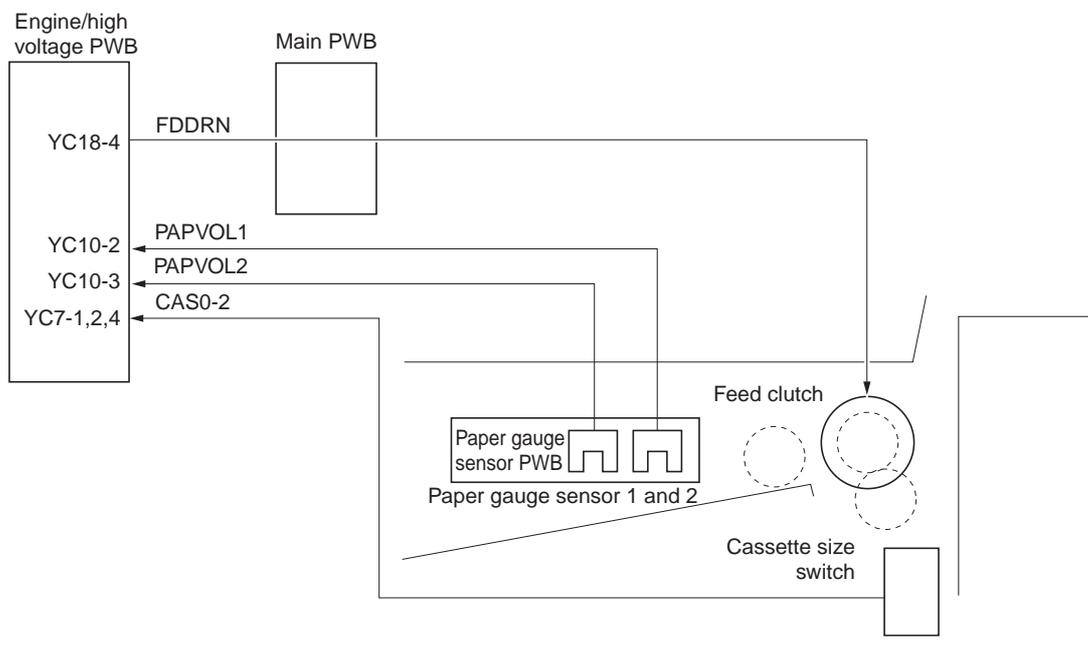
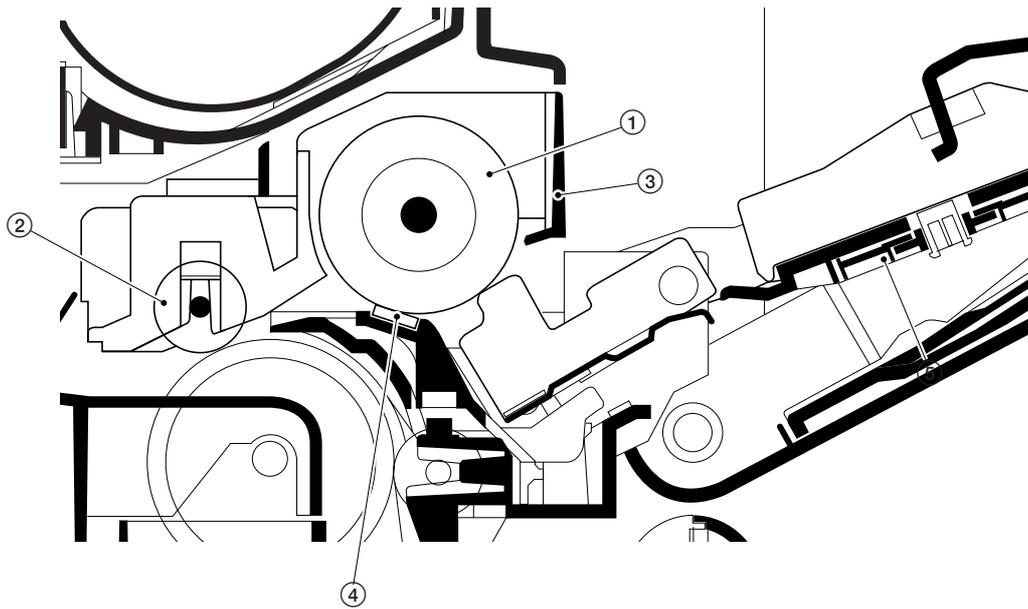


Figure 2-1-2 Paper feed section block diagram

(2) MP tray feed section

The MP tray can contain about 100 pages. Feeding is performed by the rotation of the MP tray feed roller from the MP tray. Function of the MP tray friction pad prevents papers from multiple feeding.



- ① MP tray feed roller
- ② MP tray middle pulley
- ③ MP tray feed guides
- ④ MP tray friction pad

Figure 2-1-3 Paper feeding from the MP tray

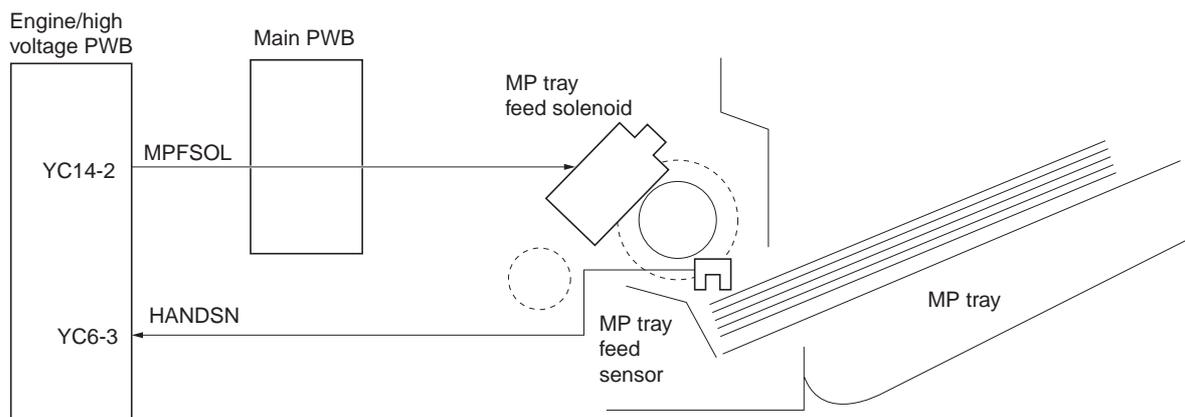


Figure 2-1-4 MP tray feed section block diagram

(3) Conveying section

The conveying section consists of the parts shown in the following illustration and conveys papers from the cassette or the MP tray to the transfer/separation section when papers are fed, or while refeeding when the optional duplexer is operated. Paper by feeding or refeeding is conveyed by the middle feed roller to the position where the registration sensor is turned on, and then sent to the transfer/separation section by the upper registration roller and lower registration roller.

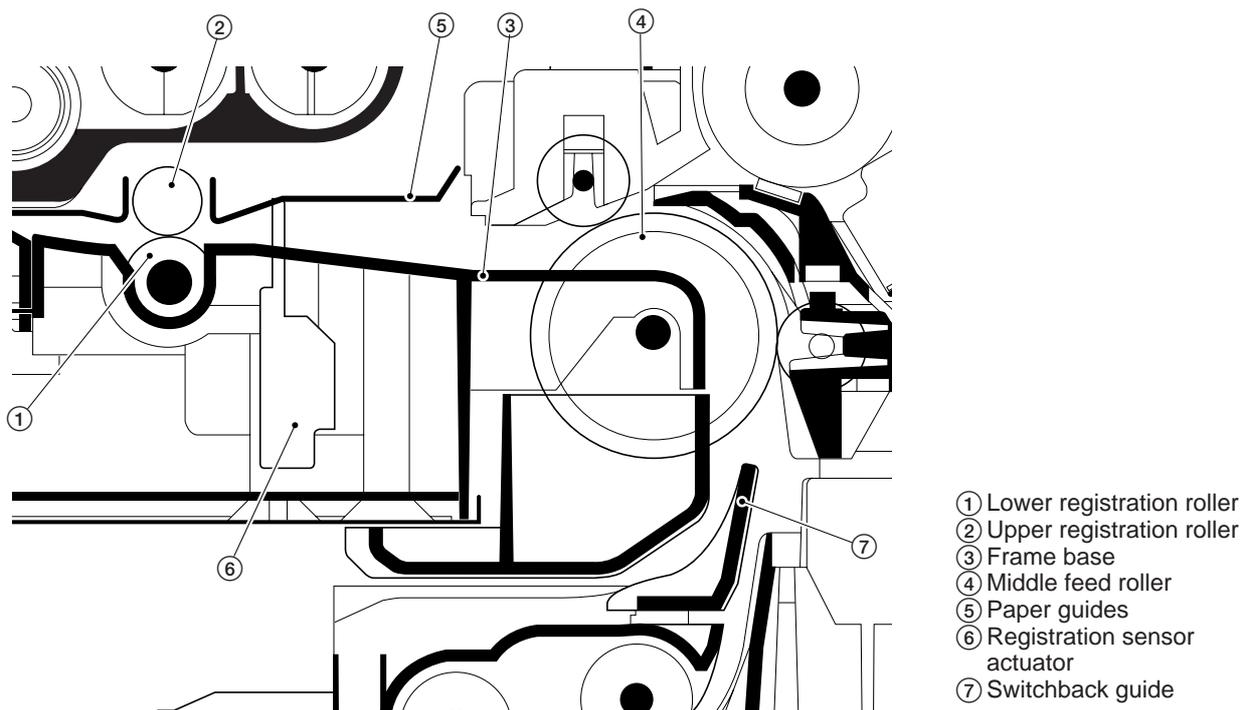


Figure 2-1-5 Conveying section

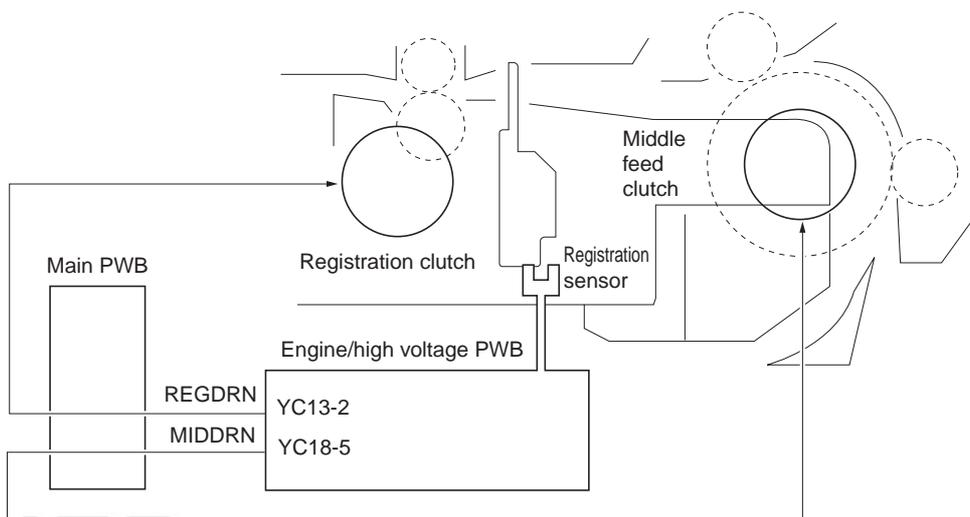


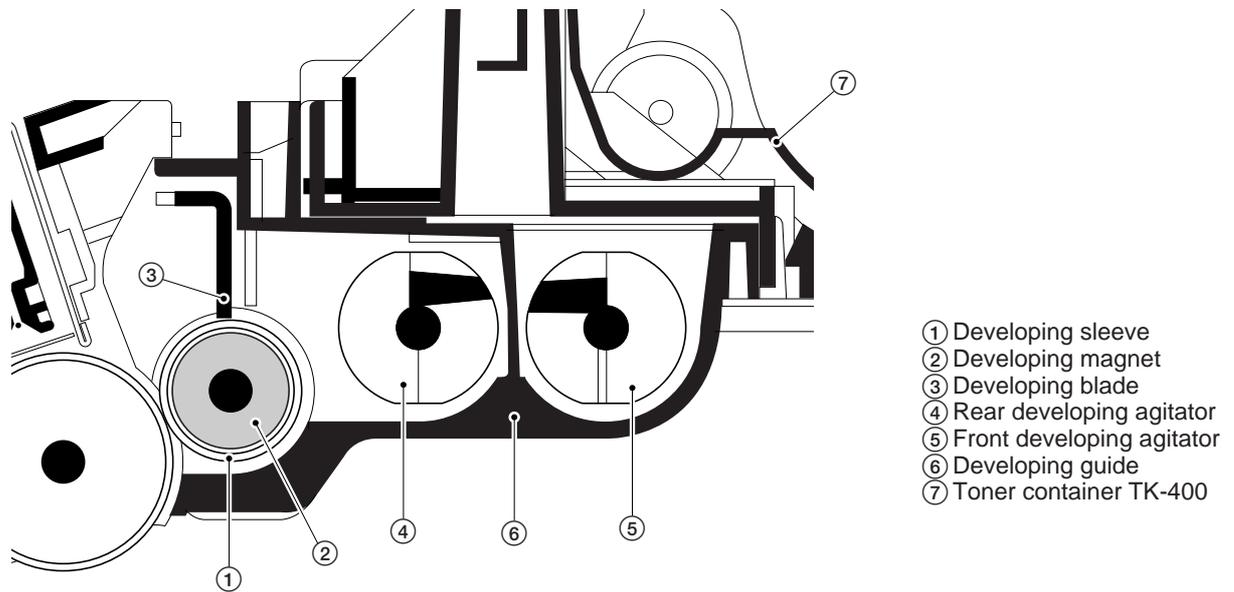
Figure 2-1-6 Conveying section block diagram

2-1-2 Process unit section

For the process unit, many sections related to the printing process are gathered up as one unit such as the development section, main charger section, drum section, cleaning section and toner container TK-400. The electrical part in the process unit is only the zener diode PWB that sets the grid electrostatic potential, and only the high voltage terminal of the main charger and the drive link with the drive group gears are provided between the process unit and main unit frame because the toner sensor is equipped with the main unit frame side.

(1) Development section

Development section consists of the parts in the following illustration. The toner supplied from the toner container TK-400 is agitated after developing and agitating at the mixer section that consists of the development agitator's front to electrostatically charge and sent to the developing roller. The development roller consists of the rotating developing sleeve and the developing magnet (roller) that is fixed inside of the sleeve. The toner is attracted by a magnetic force of the developing magnet to the surface of the developing sleeve and then exposed to the drum side by the rotation of the developing sleeve.



- ① Developing sleeve
- ② Developing magnet
- ③ Developing blade
- ④ Rear developing agitator
- ⑤ Front developing agitator
- ⑥ Developing guide
- ⑦ Toner container TK-400

Figure 2-1-7 Development section

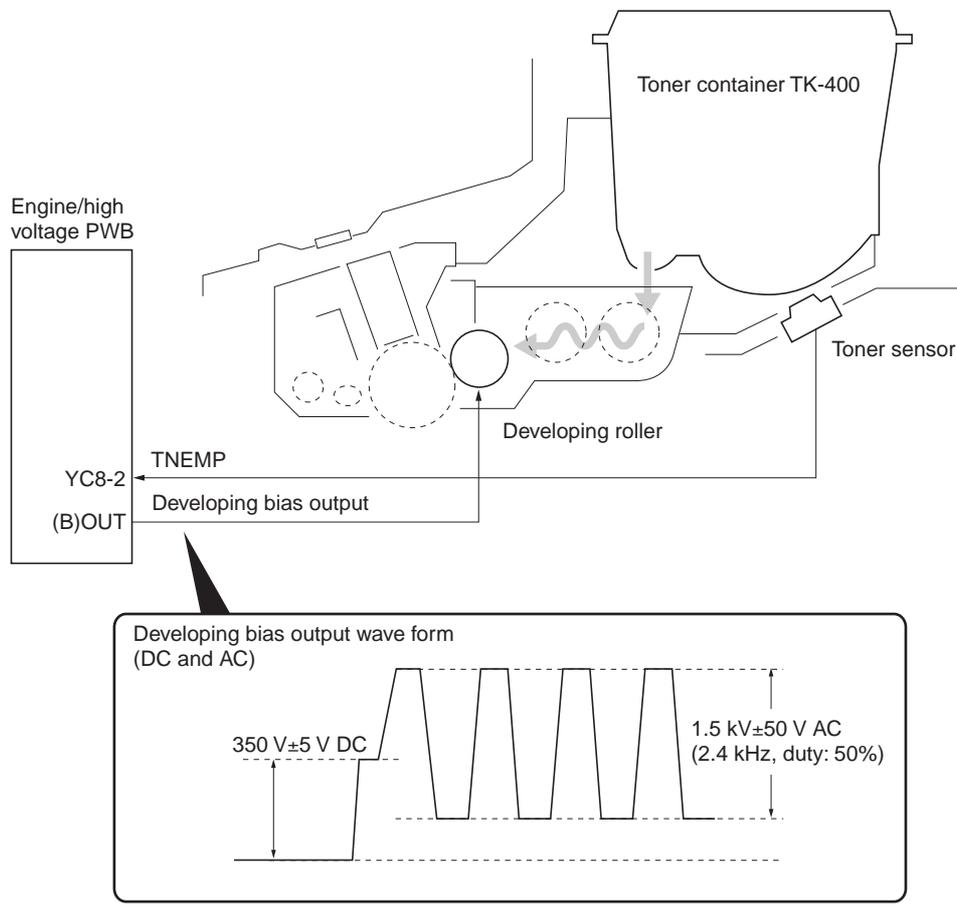


Figure 2-1-8 Development section block diagram

Formation of the magnetic toner brush

The developing roller consists of the developing magnet (roller) equipped with three magnetic poles and the developing sleeve. The magnetic toner brush is formed on the magnetic pole N1 of the developing sleeve. The height of this magnetic toner brush is restricted by the developing blade, and the development depends on the pole position of the developing magnet (roller) and the position of the developing blade.

In addition, the developing bias is loaded onto the developing magnet, which is output from the engine/high voltage PWB providing the enhanced contrast of images.

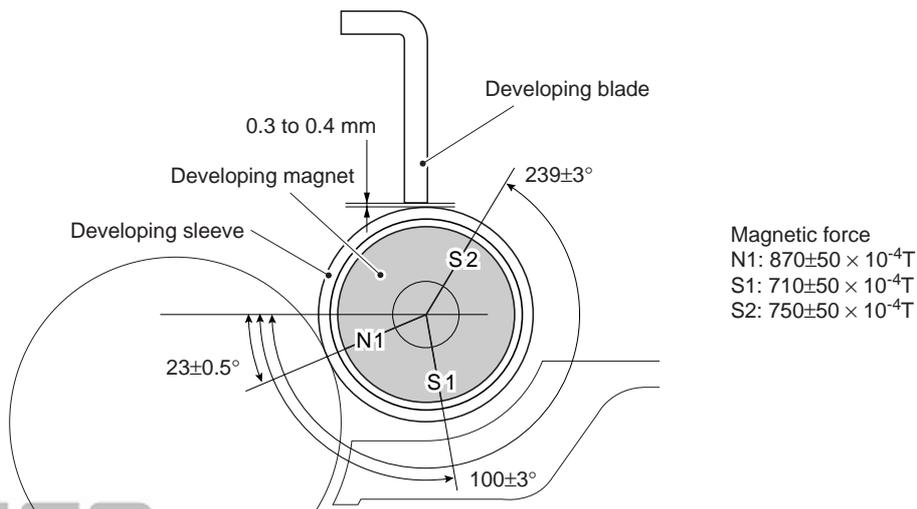
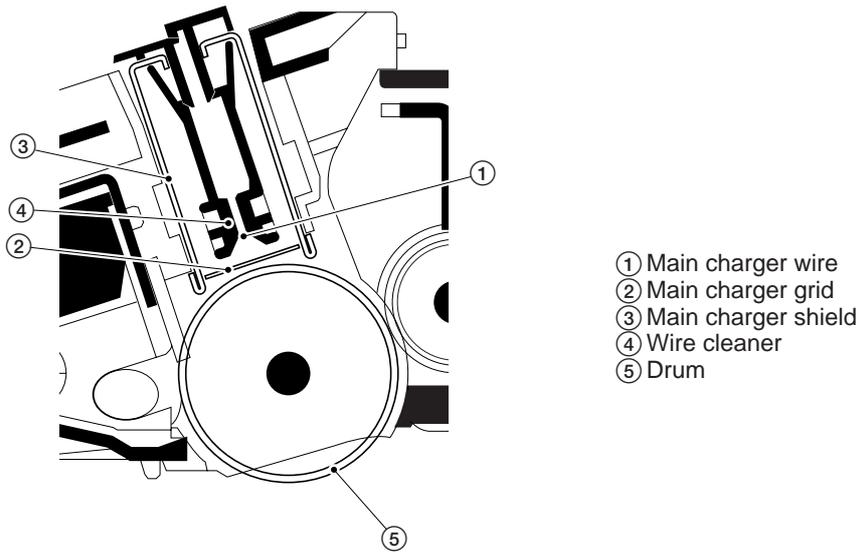


Figure 2-1-9 Formation of the magnetic brush



(2) Main charger/drum section

Main charger unit consists of the main charger shield, main charger wire, grid and wire cleaner, and electrostatically charges the drum surface uniformly to prepare for the formation of electrostatic latent images by the irradiation of laser light. The grid acts so that the drum surface voltage is constant.



- ① Main charger wire
- ② Main charger grid
- ③ Main charger shield
- ④ Wire cleaner
- ⑤ Drum

Figure 2-1-10 Main charger unit/drum section

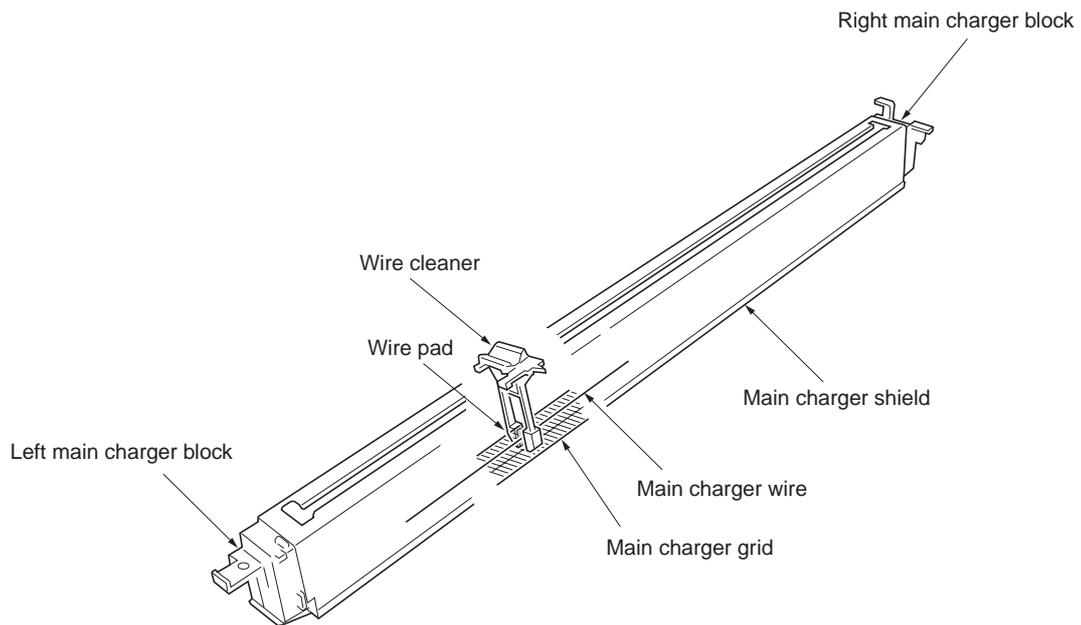


Figure 2-1-11 Main charger unit

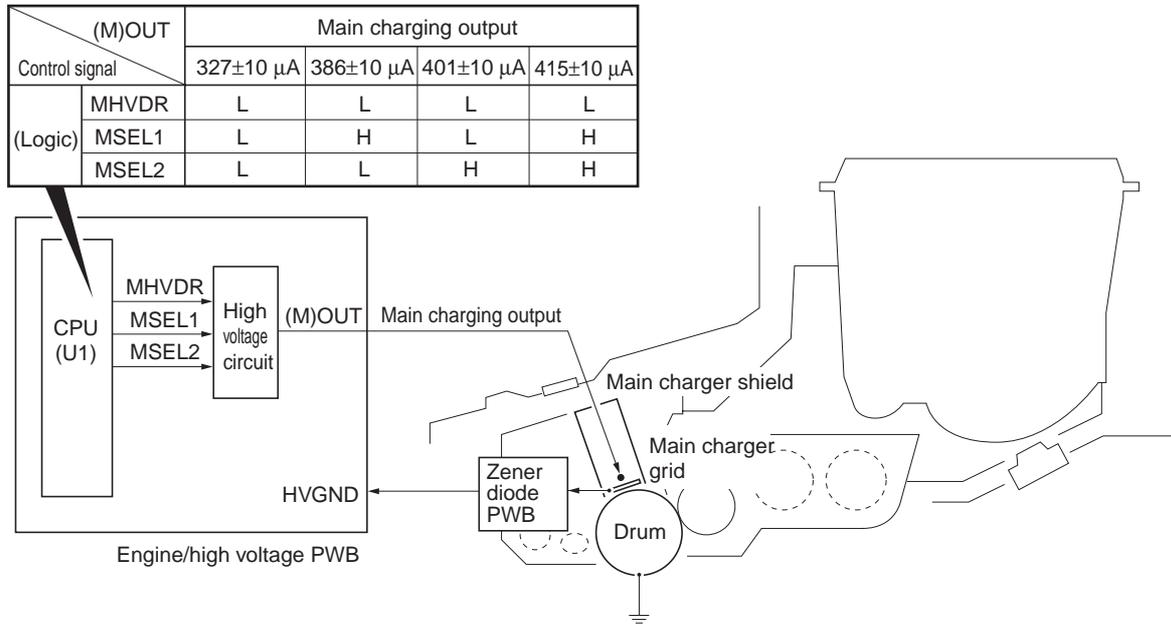


Figure 2-1-12 Main charger section block diagram

2-1-3 Laser scanner unit section

(1) Laser scanner unit

Print data is processed as the image data by the main PWB and sent to the laser scanner unit (LSU). The laser scanner unit forms the electrostatic latent image on the drum surface by turning on/off the laser light according to the image data.

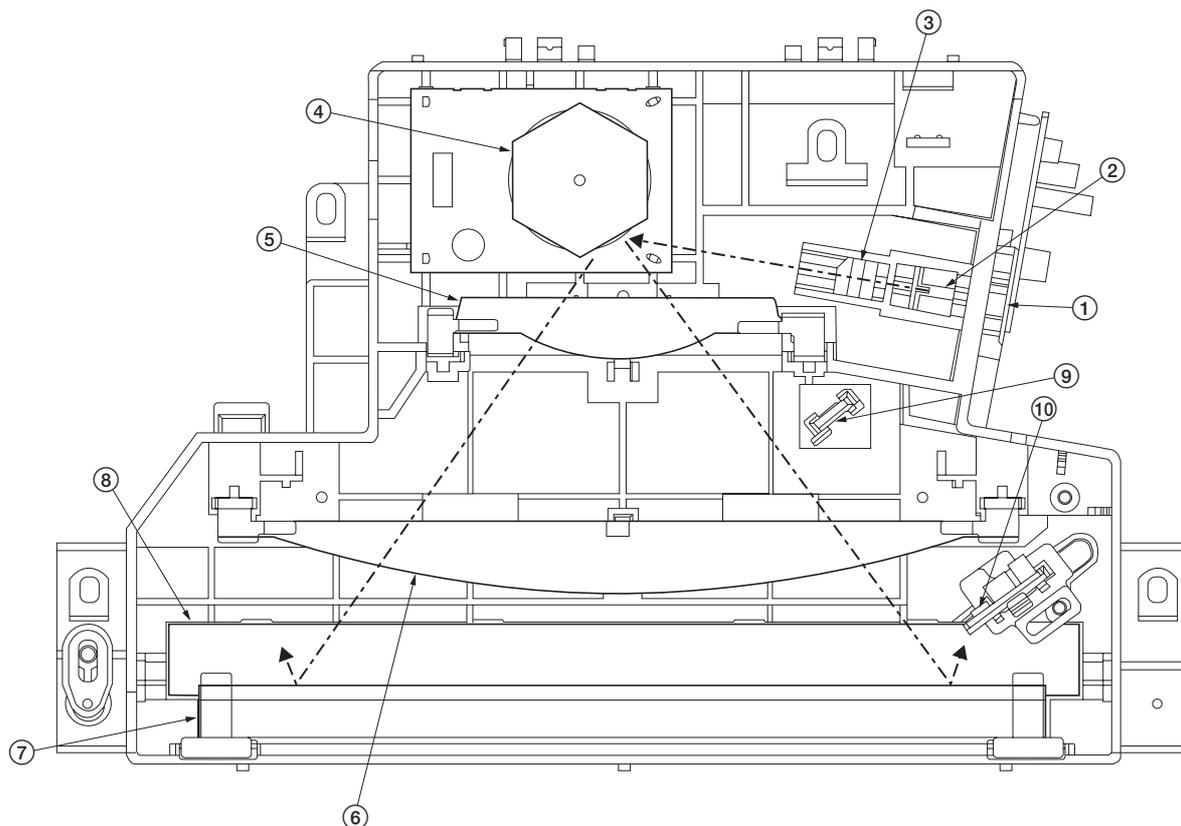


Figure 2-1-13 Laser scanner unit

- 1. Laser diode Emits the diffused invisible light laser.
- 2. Collimator lens Changes the diffused laser light to the parallel light.
- 3. Cylindrical lens Corrects the vertical angle when the laser light hits the one surface of polygon mirror.
- 4. Polygon motor Polygon motor has a 6 face mirror. Individual mirror corresponds to the width of scan lines on the drum that is scanned by the laser light.
- 5. f-θ main lens See f-θ sub lens as follows.
- 6. f-θ sub lens The main and sub f-θ lenses equalize the focus distortion caused around the edge of drum. The effective length drawn (Fig.2-1-14 (A) and (B) on the next page) on the drum by the laser light is longer as the laser reaches further to the end of the drum and then the distance shown by (A) and (B) are not identical (A>B). These distances can be equal by positioning the f-θ lens between the polygon mirror and the drum. (A=B)
- 7. Direction change mirror Changes the direction so that the laser light beams to the drum vertically. Diffused laser light now accurately can beam to the drum.
- 8. Protective glass Prevents dust and dirt from entering the laser scanner unit.
- 9. SOS lens Bents the first shot of laser scanning to the pin photo sensor direction.
- 10. Pin photo sensor Receives the laser light through the SOS lens as mentioned above and then outputs as the horizontal synchronous signal.

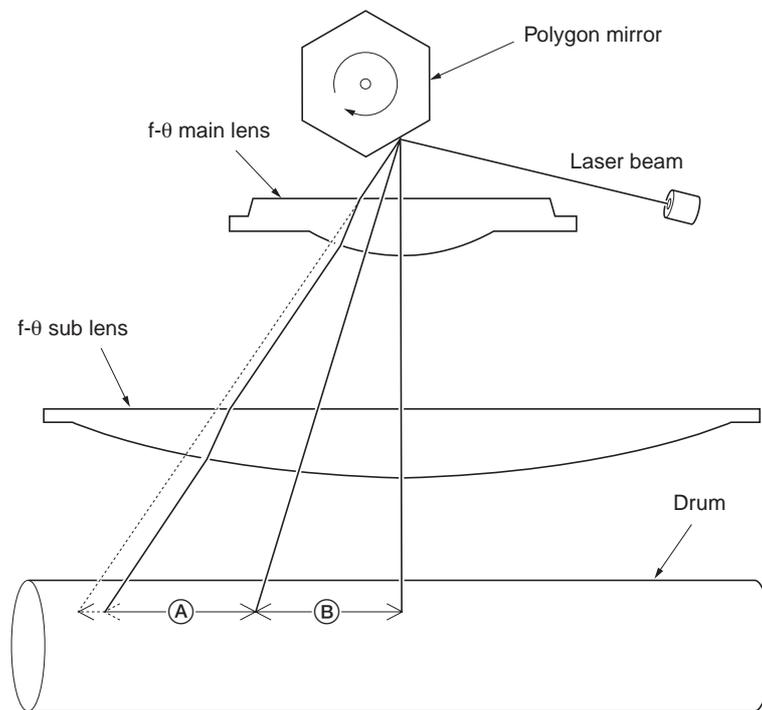


Figure 2-1-14 f-θ lens

Image resolution

This printer can print out images in the image resolution of 600 × 600 dpi and also in the Fast1200 mode that provides the image resolution with finer density. The Fast1200 mode outputs the further microscopic dots and improves the resolution, and furthermore it is possible to express the halftone in addition to depicture the monochrome images by controlling the irradiation time of laser light.

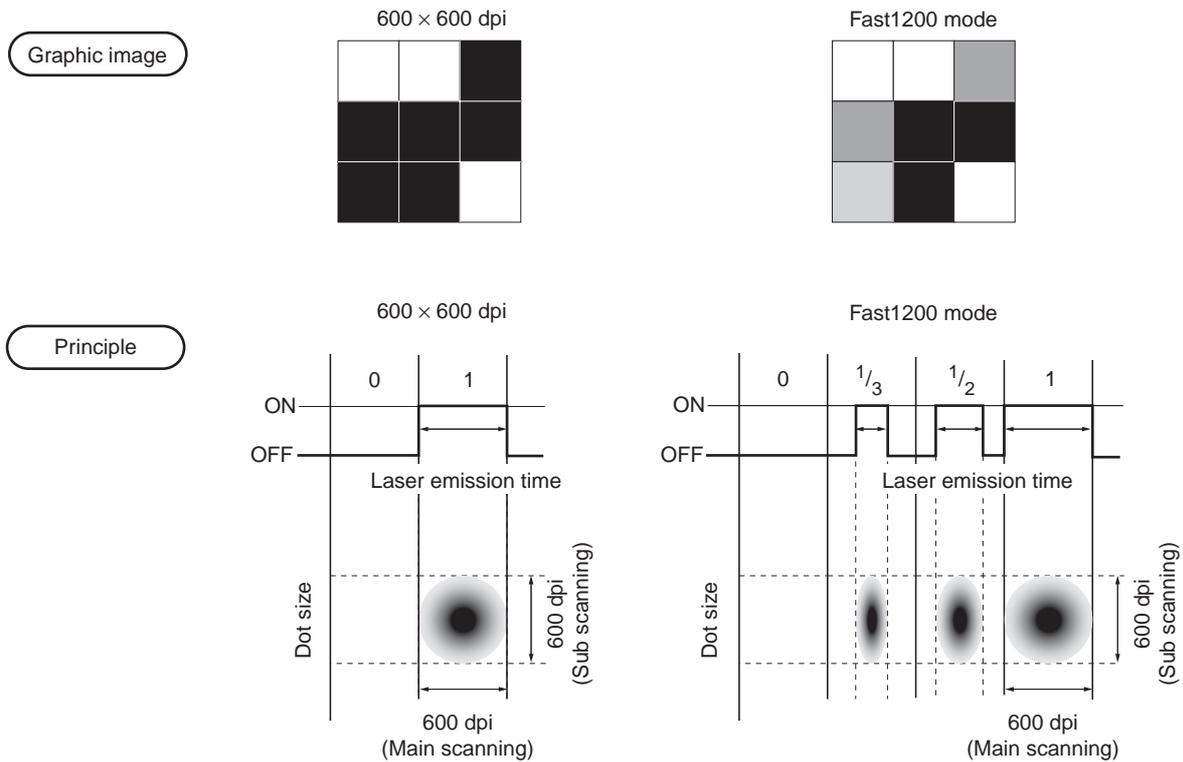
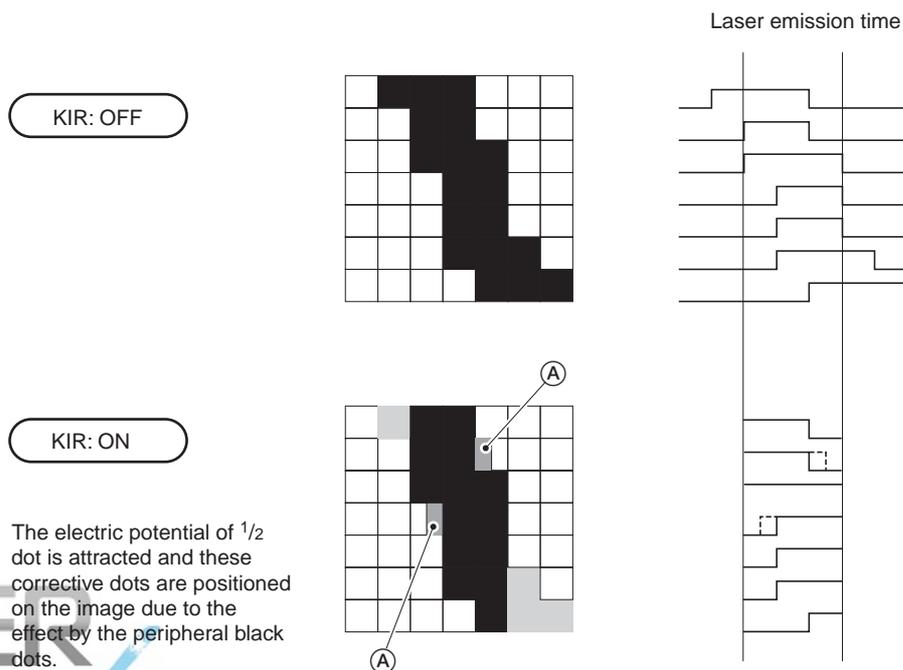


Figure 2-1-15 Image resolution

Smoothing (KIR)

The printer applies the KIR (Kyocera Image Refinement) to the smoothing processing, which is the exclusive image processing technology developed by Kyocera Mita Corporation. This function corrects the jaggy part of image (jagged lines) on slant lines or curves, which is easy to notice, to the smooth line by embedding small dots.



Ⓐ: The electric potential of 1/2 dot is attracted and these corrective dots are positioned on the image due to the effect by the peripheral black dots.



Figure 2-1-16 Smoothing (KIR)

2-1-4 Transfer/separation section

Transfer/separation section consists of the transfer roller and separation charger brush. The transfer bias is loaded to the transfer roller by the high voltage output from the engine/high voltage PWB and the toner on the drum is attracted to the transfer roller side due to the electric potential difference and then transferred to the paper. The separation bias is loaded to the separation charger brush output from the engine/high voltage PWB acting to separate the paper with toner transferred from the drum.

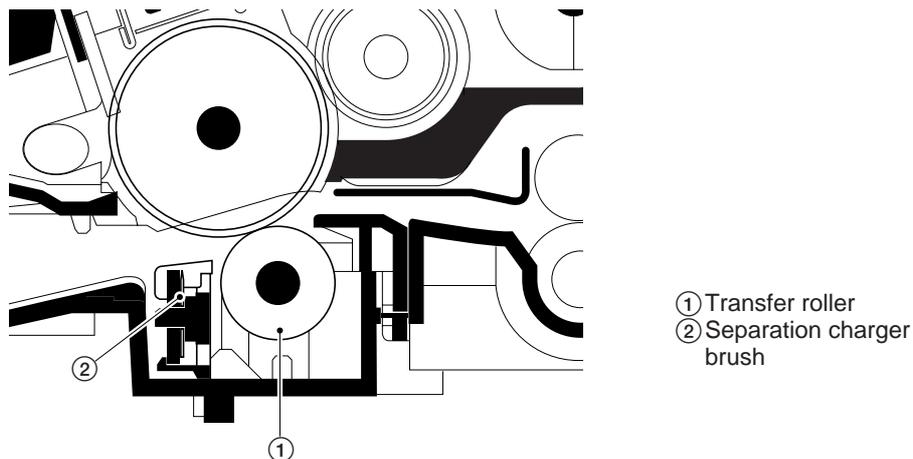
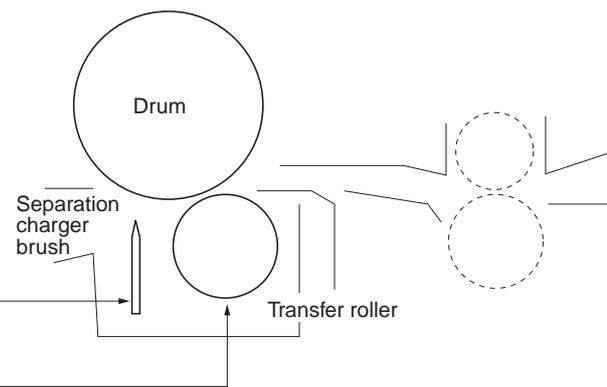
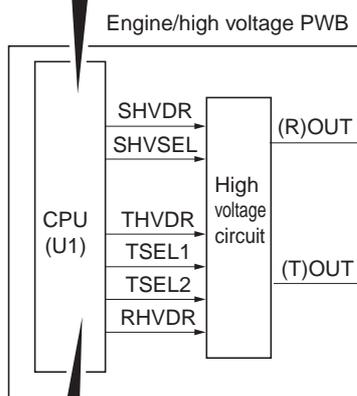


Figure 2-1-17 Transfer/separation section

		(R)OUT	
		Separation bias output	
Control signal		5 μ A	10 μ A
(Logic)	SHVDR	L	L
	SHVSEL	L	H



		(T)OUT					Transfer reverse voltage 500 V
		Transfer bias output					
Control signal		10 μ A	15 μ A	20 μ A	25 μ A	0	
(Logic)	THVDR	L	L	L	L	H	H
	TSEL1	L	L	H	H	-	-
	TSEL2	L	H	L	H	-	-
	RHVDR	H	H	H	H	H	L

Figure 2-1-18 Transfer/separation section block diagram

2-1-5 Cleaning section

The cleaning section consists of the following parts and removes the residual toner on the drum after transferring the toner from the drum to the paper and collects it as a waste toner. The eraser light emission removes the residual electrical charge on the drum surface.

The cleaning blade is always applied to the drum to scrape off the residual toner. The scraped toner is conveyed to the cleaner screw by the sweep roller as a waste toner. The cleaner screw sends the waste toner to the waste toner conveying belt that is attached to the outside of the frame drum. The waste toner conveying belt conveys the waste toner to the waste toner reservoir that is provided by separating the inside of the toner container.

The drum that the residual toner is removed is irradiated by the eraser lamp (PWB) light attached to the upper part of the process unit (the lower part of the laser scanner unit). The eraser lamp (PWB) consists of the LED array that corresponds to the length of drum, and it is designed to remove the residual electrostatic charge on the drum surface by irradiating the eraser light and then give the uniform charging on the drum by the main charger which is the next process.

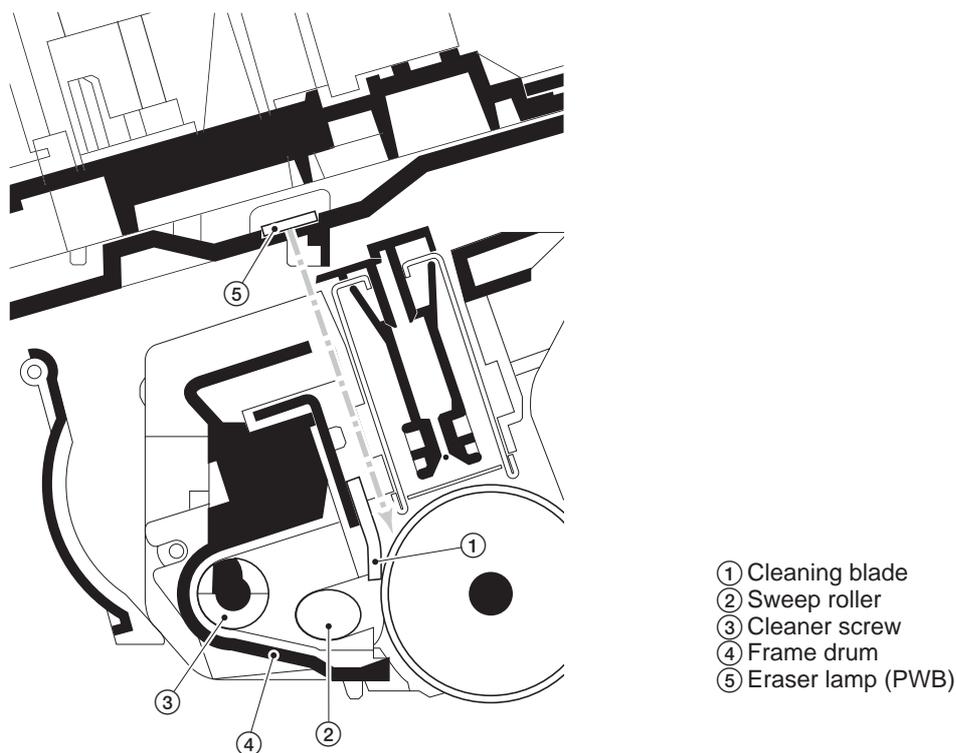


Figure 2-1-19 Cleaning/charge erasing section

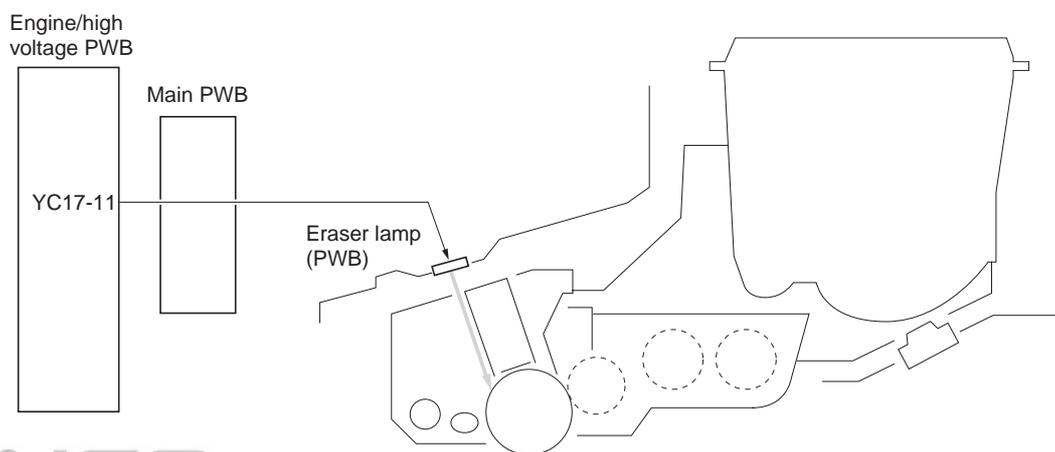


Figure 2-1-20 Cleaning section block diagram

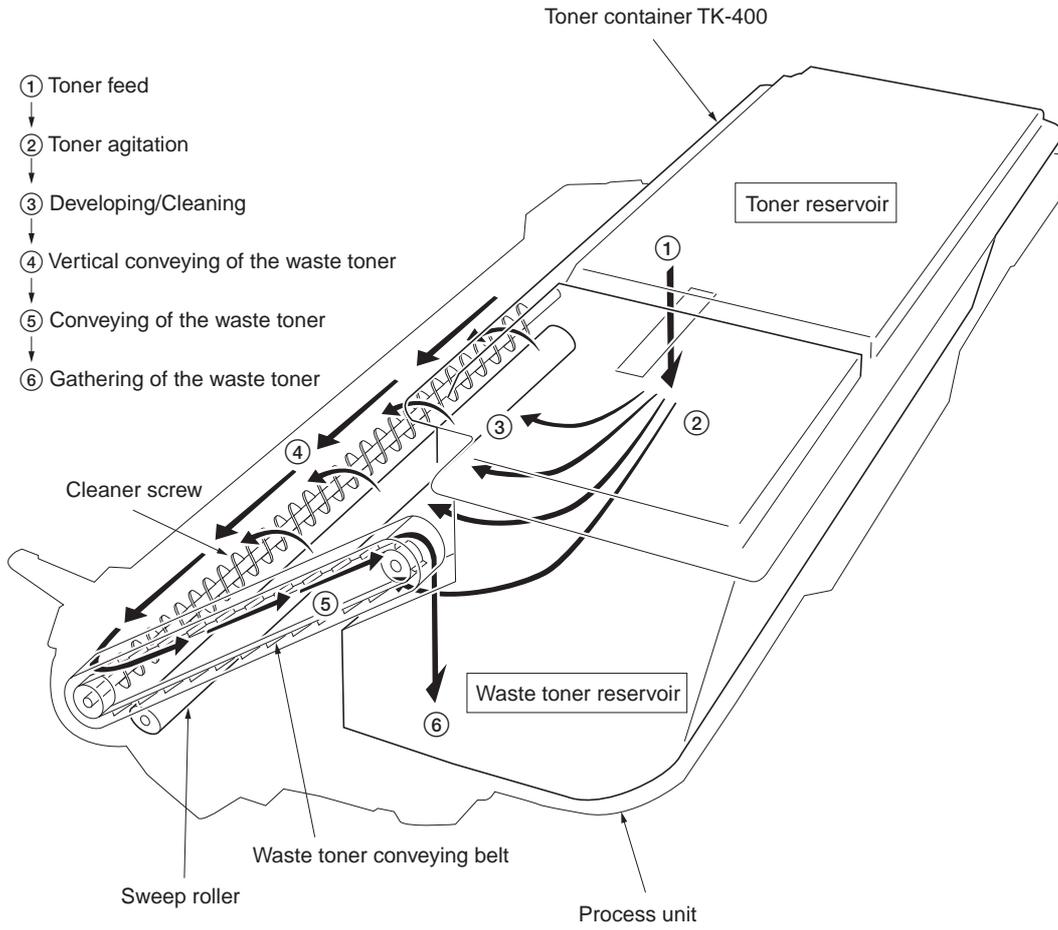


Figure 2-1-21 Flow of toner

2-1-6 Fixing section

The fixing section consists of the following parts and fixes the toner that is transferred to the paper at the transfer/separation section. The paper sent from the transfer/separation section is interleaved between the heat roller and the press roller. The heat roller is heated by the fixing heater lamp installed inside, and the toner is fused by heat and pressure and fixed onto the paper because the press roller is pressed by the fixing press spring.

The fixing thermistor detects the temperature of the surface on the heat roller heated by the fixing heater lamp and this temperature is controlled by the engine/high voltage PWB. If the fixing section shows extremely high temperature, the power line will be shut off and the fixing heater lamp is forced to turn off.

When fixing of toner is complete, the paper is separated from the heat roller by the separator and ejected to the eject/feedshift section.

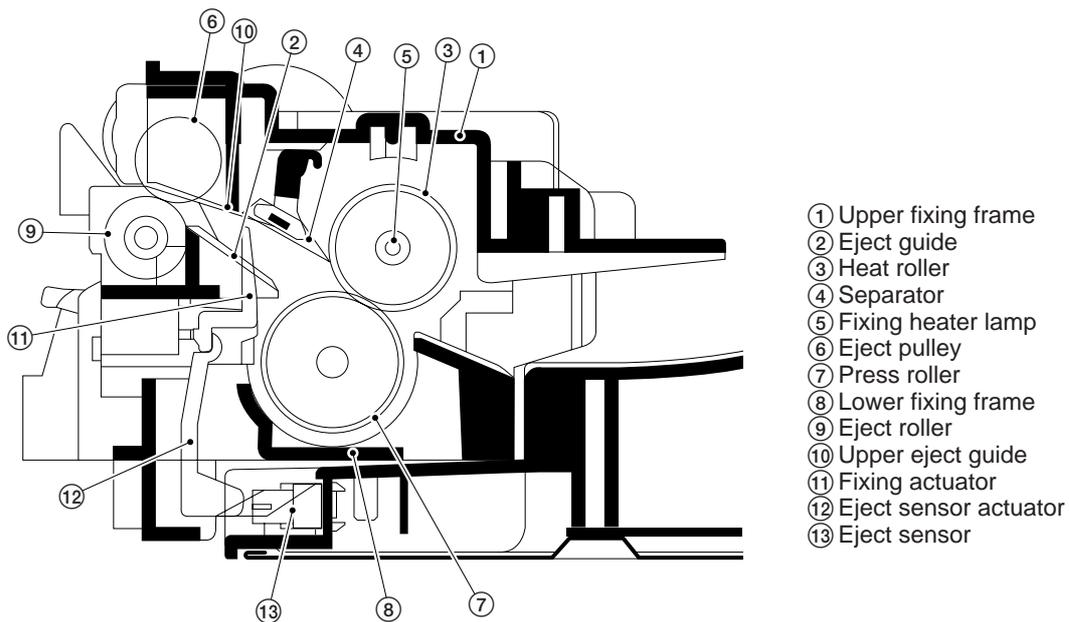


Figure 2-1-22 Fixing section

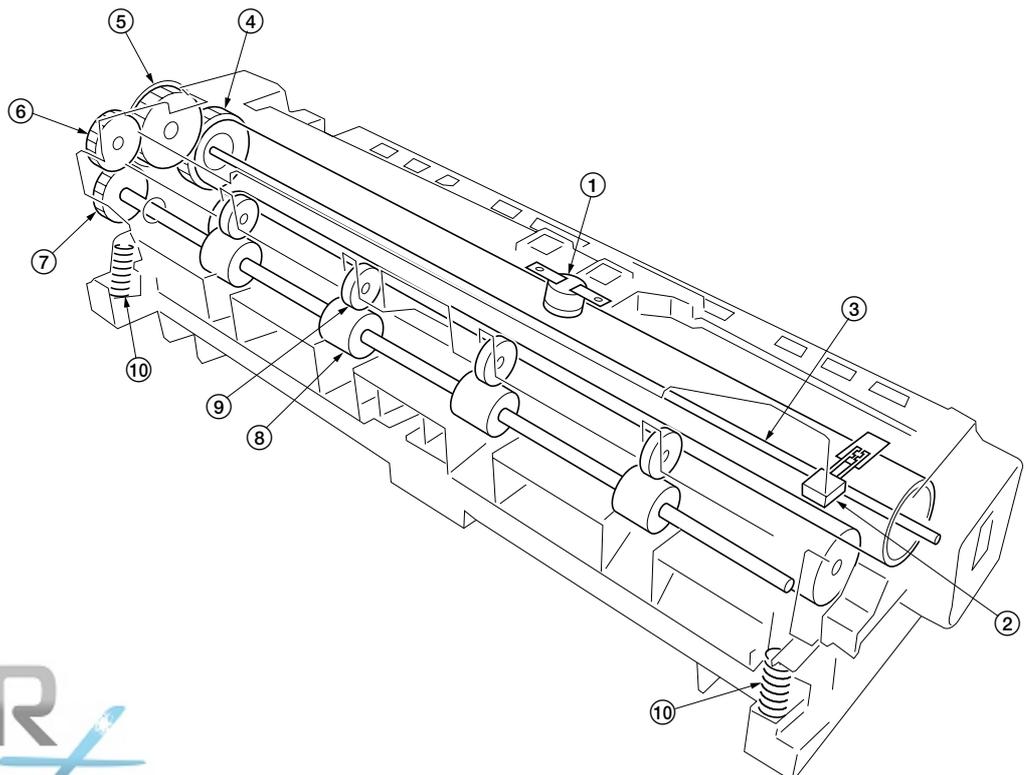


Figure 2-1-23 Fixing unit

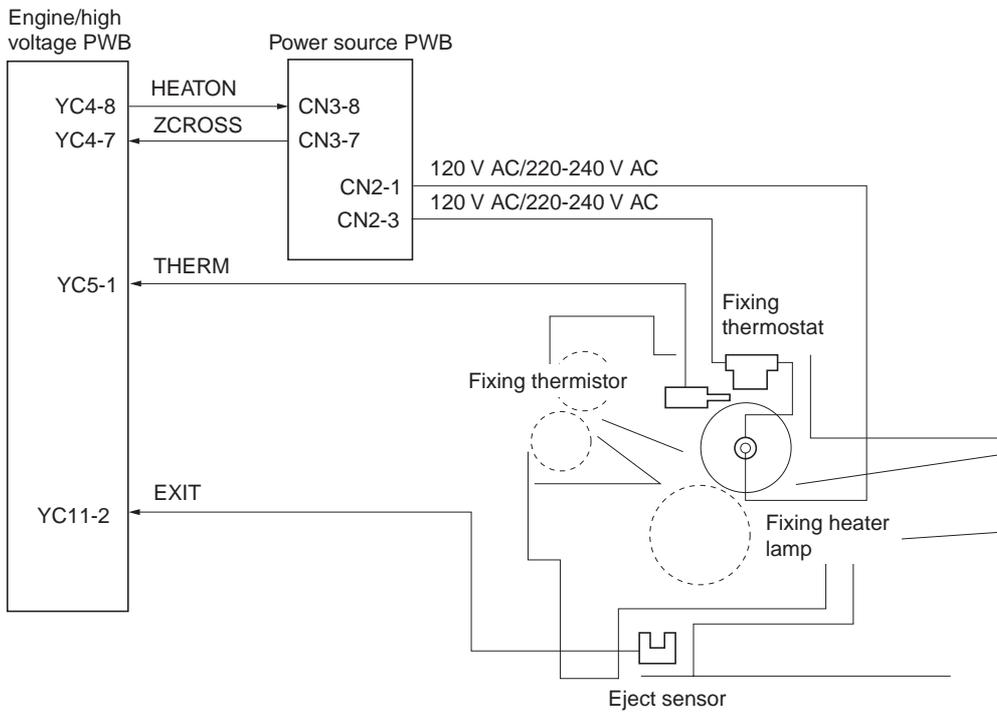


Figure 2-1-24 Fixing unit block diagram

2-1-7 Face-down eject/feedshift section

The face-down eject/feedshift section consists of the vertical path assembly that conveys the paper which is fixed with toner at the fixing section to the face-down tray, and the feedshift guide that operates when duplex printing is performed (when the optional duplexer is equipped).

Normally the feedshift guide is down since it does not operate, therefore the paper that came out of the fixing section is guided to the vertical path along the upper side of the feedshift guide and then ejected to the face-down tray by the rotation of the face-down roller.

During the duplex printing, the feedshift guide is raised operated by the feedshift solenoid in the duplexer, and the paper came out of the fixing section is guided to the inside of the duplexer along the lower surface of the feedshift guide.

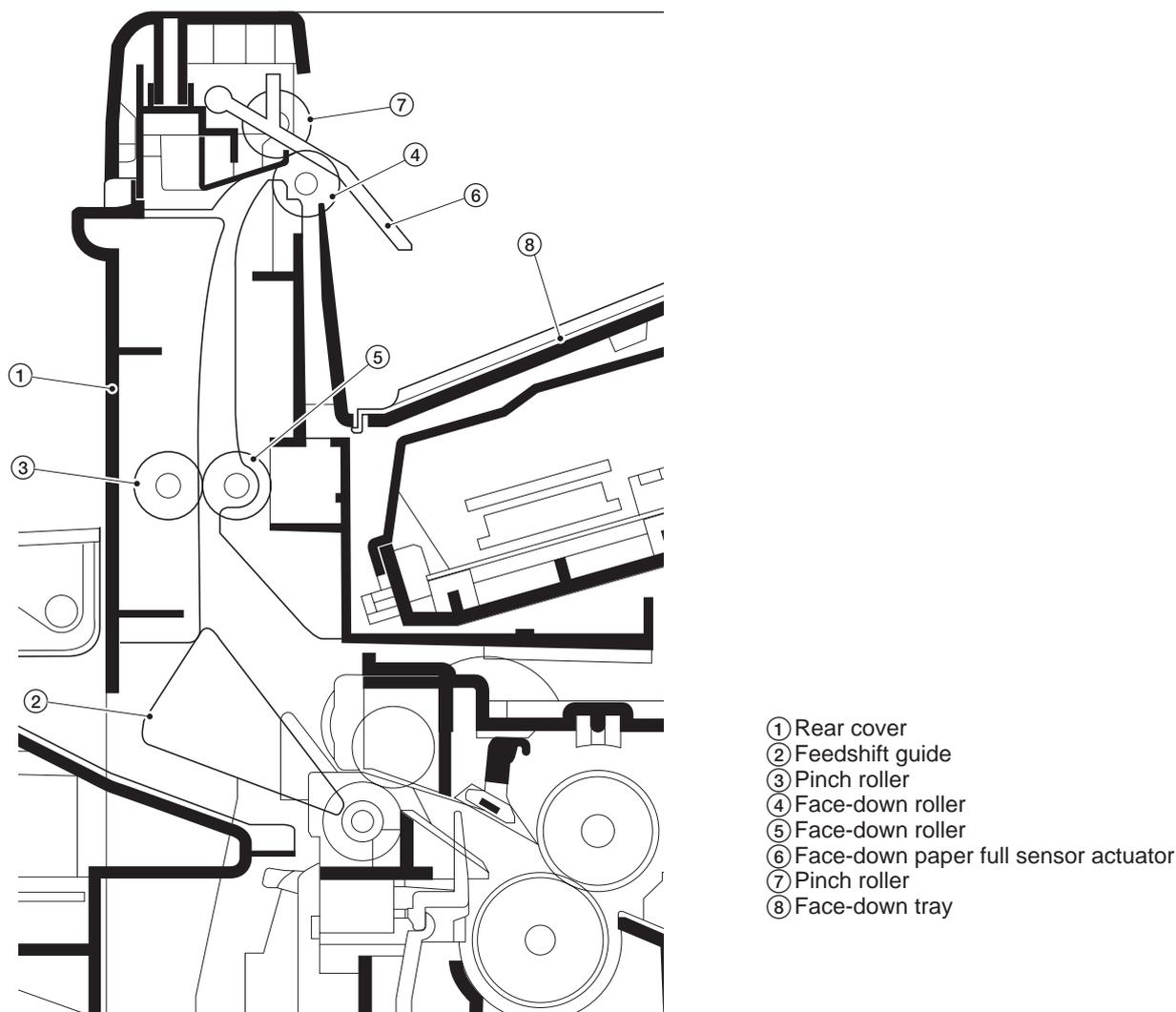


Figure 2-1-25 Face-down eject/feedshift section

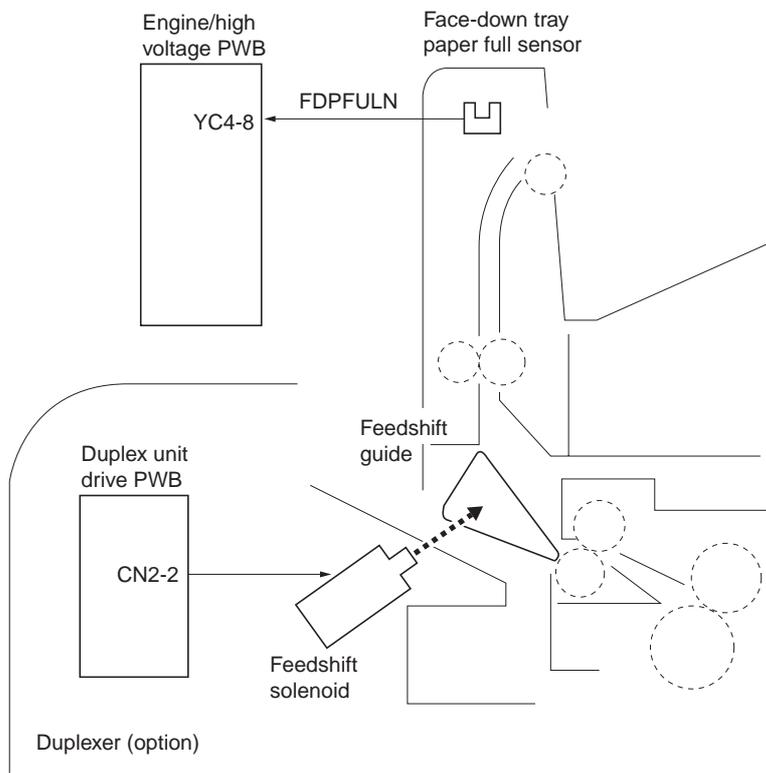


Figure 2-1-26 Face-down eject/feedshift section block diagram

2-2-1 Electrical parts layout

(1) Main frame

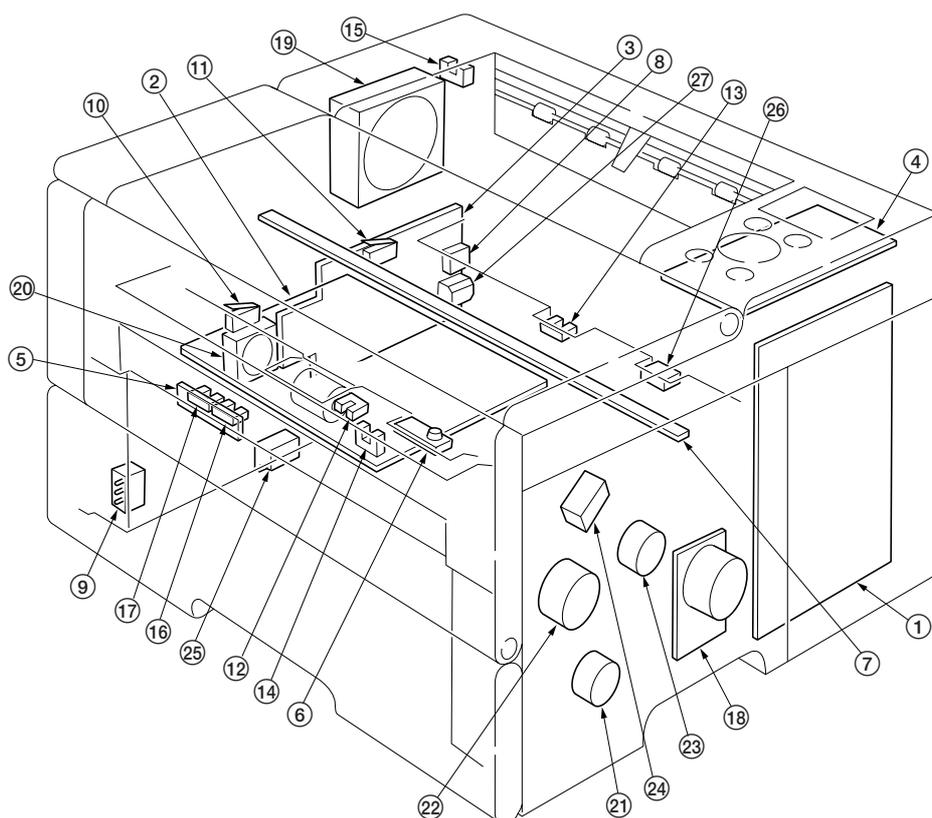


Figure 2-2-1 Main frame

- | | |
|--|--|
| 1. Main PWB [KP-935] | Controls the software such as the print data processing and provides the interface with computers. |
| 2. Engine/high voltage PWB [KP-936] | Controls the input/output of electrical parts and generates the high voltage. |
| 3. Power source PWB | Generates 24 V DC and 5 V DC power source. Controls the fixing heater lamp. |
| 4. Operation panel PWB [KP-938] | Indicates the LCD message display and LED indicators. Controls key inputs. |
| 5. Paper gauge sensor (PWB) [KP-944] | Consists of the paper gauge sensor 1 and 2. |
| 6. Toner sensor (PWB) [KP-786] | Detects the toner in the toner container. |
| 7. Eraser lamp (PWB) [KP-940] | Eliminates the residual electrostatic charge on the drum. |
| 8. Power switch | Turns ON/OFF the AC power source. |
| 9. Cassette size switch | Detects the paper size dial setting of the paper setting dial. |
| 10. Top cover interlock switch | Shuts off 24 V power line when the top cover is opened. |
| 11. Rear cover interlock switch | Shuts off 24 V power line when the rear cover is opened. |
| 12. MP tray feed sensor | Detects paper misfeed in the MP tray. |
| 13. Eject sensor | Detects paper misfeed in the fixing unit. |
| 14. Registration sensor | Detects the timing of primary feeding. |
| 15. Face-down tray paper full sensor | Detects the paper full in the face-down tray. |
| 16. Paper gauge sensor 1 (PH1) | Detects the paper remaining amount level. |
| 17. Paper gauge sensor 2 (PH2) | Detects the paper remaining amount level. |
| 18. Main motor | Drives the entire machine. |
| 19. Cooling fan motor | Cools the interior of machine. |
| 20. Power source fan motor | Cools the peripheral area of the power source PWB. |
| 21. Feed clutch | Controls the primary paper feed from the paper cassette. |
| 22. Middle feed clutch | Controls the paper conveying at the conveying section. |

FS-6020

- 23. Registration clutch Controls the second paper feed.
- 24. MP tray feed solenoid Controls the primary paper feed from the MP tray.
- 25. Optional interface connector 1 Connects the signal lead and power source cord with the optional paper feeder.
- 26. Optional interface connector 2 Connects the signal lead and power source cord with the optional duplexer.
- 27. AC inlet Connects the AC power source.

(2) Process unit, laser scanner unit and fixing unit

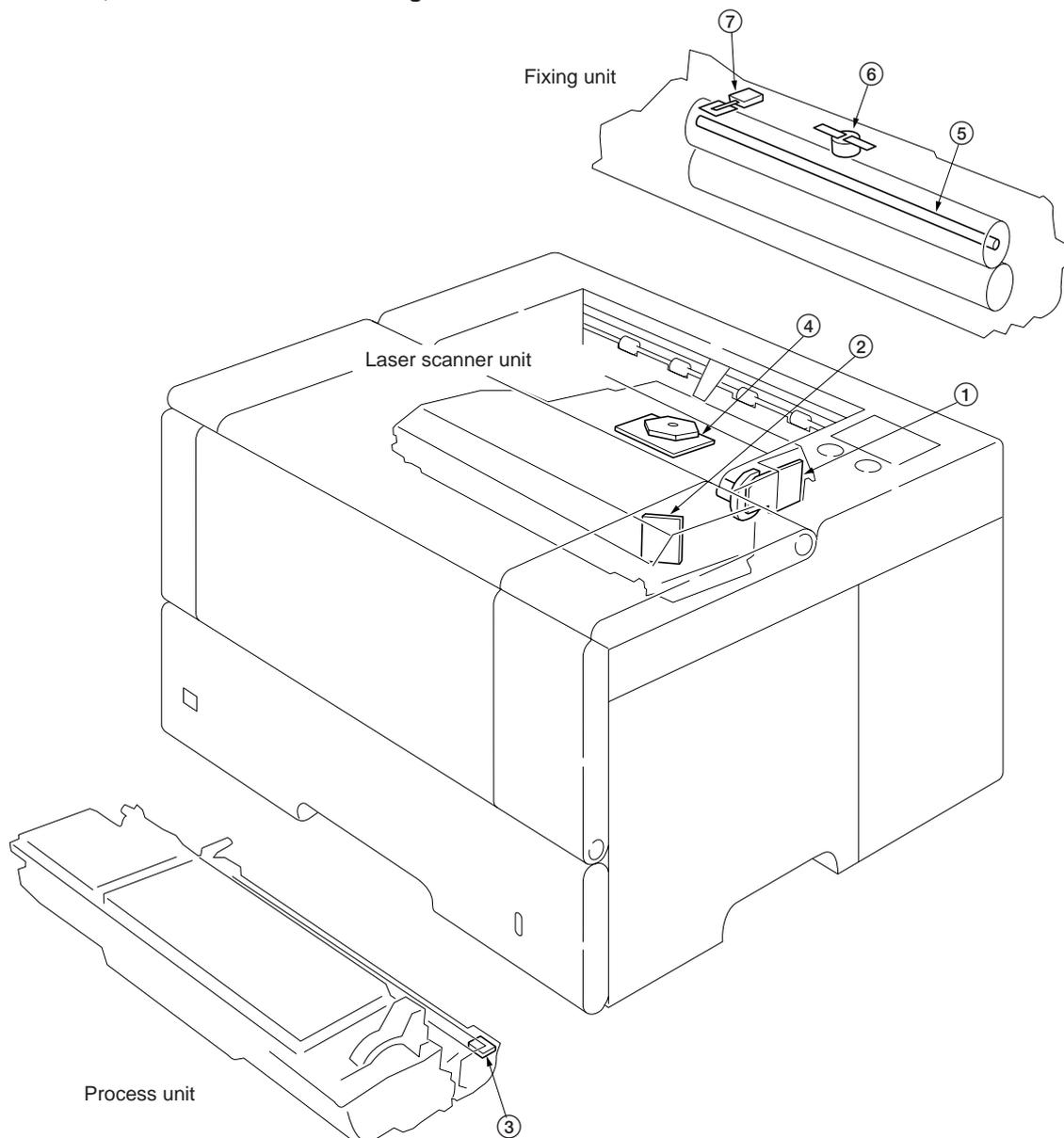


Figure 2-2-2 Process unit, laser scanner unit and fixing unit

- 1. APC PWB [KP-986] Controls the laser output.
- 2. PD PWB [KP-638] Detects the horizontal synchronous signal.
- 3. Zener diode PWB [KP-945] Adjusts the main charger grid electrostatic potential.
- 4. Polygon motor Drives the polygon mirror.
- 5. Fixing heater lamp Heats the heat roller.
- 6. Fixing thermostat Shuts off the power source to the fixing heater lamp when the heat roller reaches extremely high temperature.
- 7. Fixing thermistor Detects the temperature of the heat roller.

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2-3-1 Power source PWB

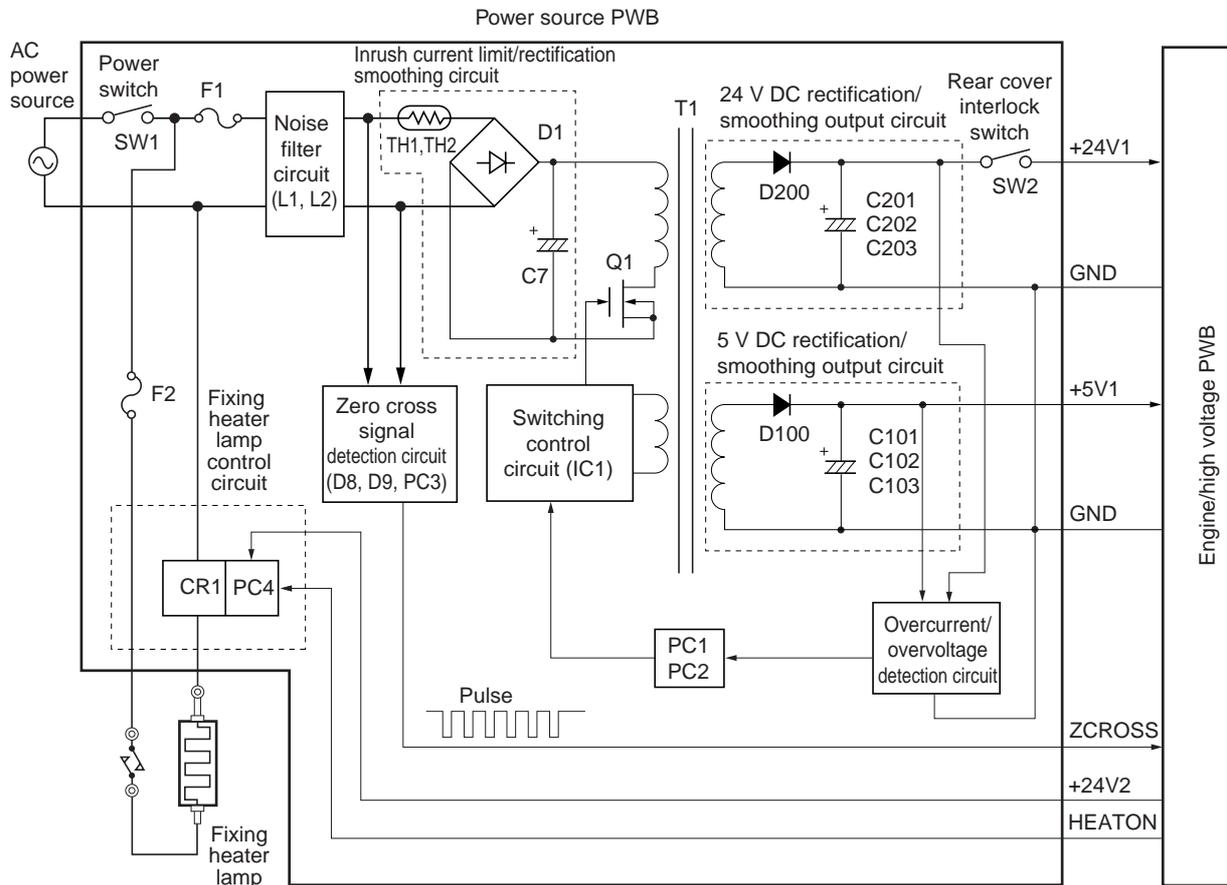


Figure 2-3-1 Power source PWB block diagram

The power source PWB consists of the switching regulator section that is the main part, other zero cross signal detection circuit and fixing heater control circuit. The switching regulator circuit consists of the noise filter circuit, inrush current limit/rectification circuit, switching control circuit, 5 V DC rectification/smoothing output circuit, 24 V DC rectification/smoothing circuit and overcurrent/overvoltage detection circuit, and this circuit converts the AC power input to the 5 V DC and 24 V DC power source by the switching operation and outputs it to the engine/high voltage PWB. The zero cross signal detection circuit detects the 0 V point (zero cross) of the AC wave form and outputs to the engine/high voltage circuit, and the engine/high voltage PWB outputs the fixing heater lamp ON signal (HEATON) to the fixing heater lamp control circuit based on the timing of zero cross signal and controls the AC power loading to the fixing heater lamp.

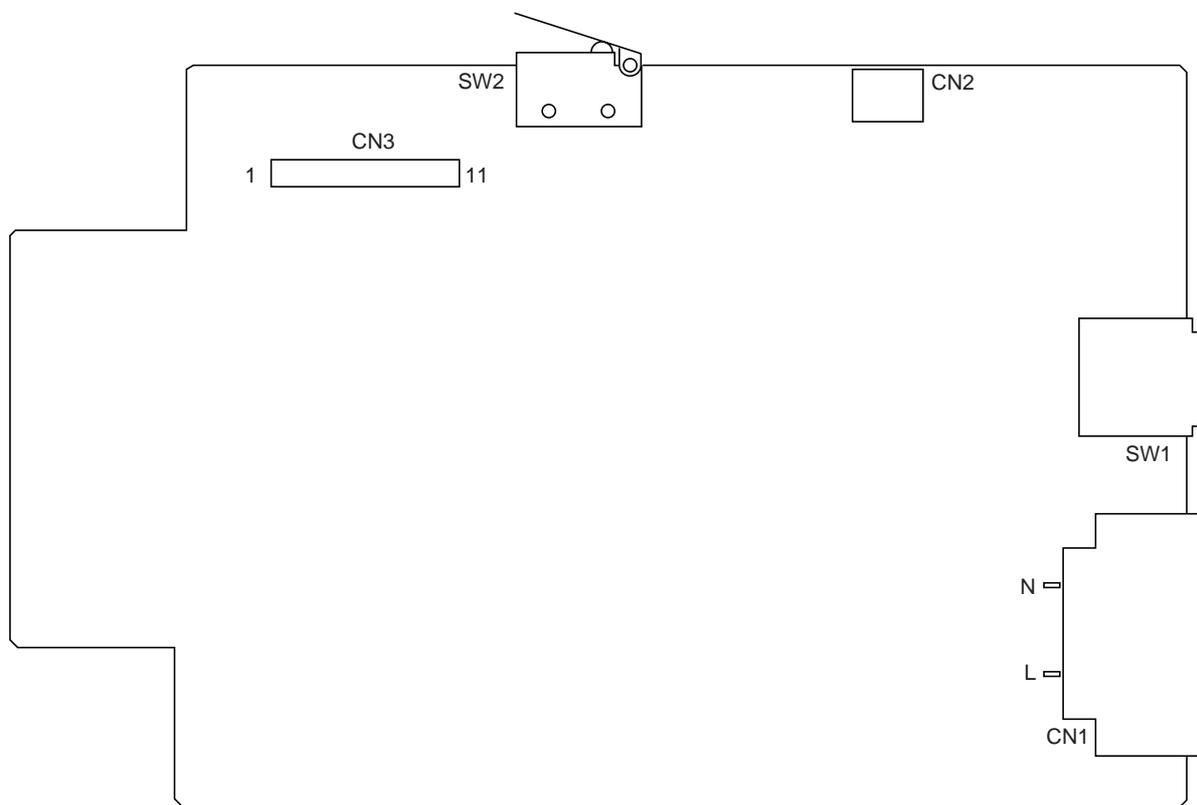


Figure 2-3-2 Power source PWB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
CN1 AC inlet	L	LIVE	I	120/220-240 V AC	AC power input
	N	NEUTRAL	I	120/220-240 V AC	AC power input
CN2 Connected to the fixing heater lamp and fixing thermostat	1	LIVE	O	120/220-240 V AC	Power supply for fixing heater lamp
	2	-	-	-	-
	3	NEUTRAL	O	120/220-240 V AC	Power supply for fixing heater lamp
CN3 Connected to the engine/high voltage PWB	1	+24V1	O	24 V DC	24 V DC power output (via rear cover interlock switch)
	2	+24V1	O	24 V DC	24 V DC power output (via rear cover interlock switch)
	3	GND	-	Ground	Ground
	4	GND	-	Ground	Ground
	5	HVGND	-	Ground	Ground for high voltage
	6	+24V2	O	24 V DC	24 V DC power output
	7	ZCROSS	O	0/5 V DC (pulse)	Zero-cross signal
	8	HEATONN	I	0/5 V DC	Fixing heater lamp ON signal
	9	+5V1	O	5 V DC	5 V DC power output
	10	+5V1	O	5 V DC	5 V DC power output
	11	+24V	O	24 V DC	24 V DC power output



2-3-2 Engine/high voltage PWB

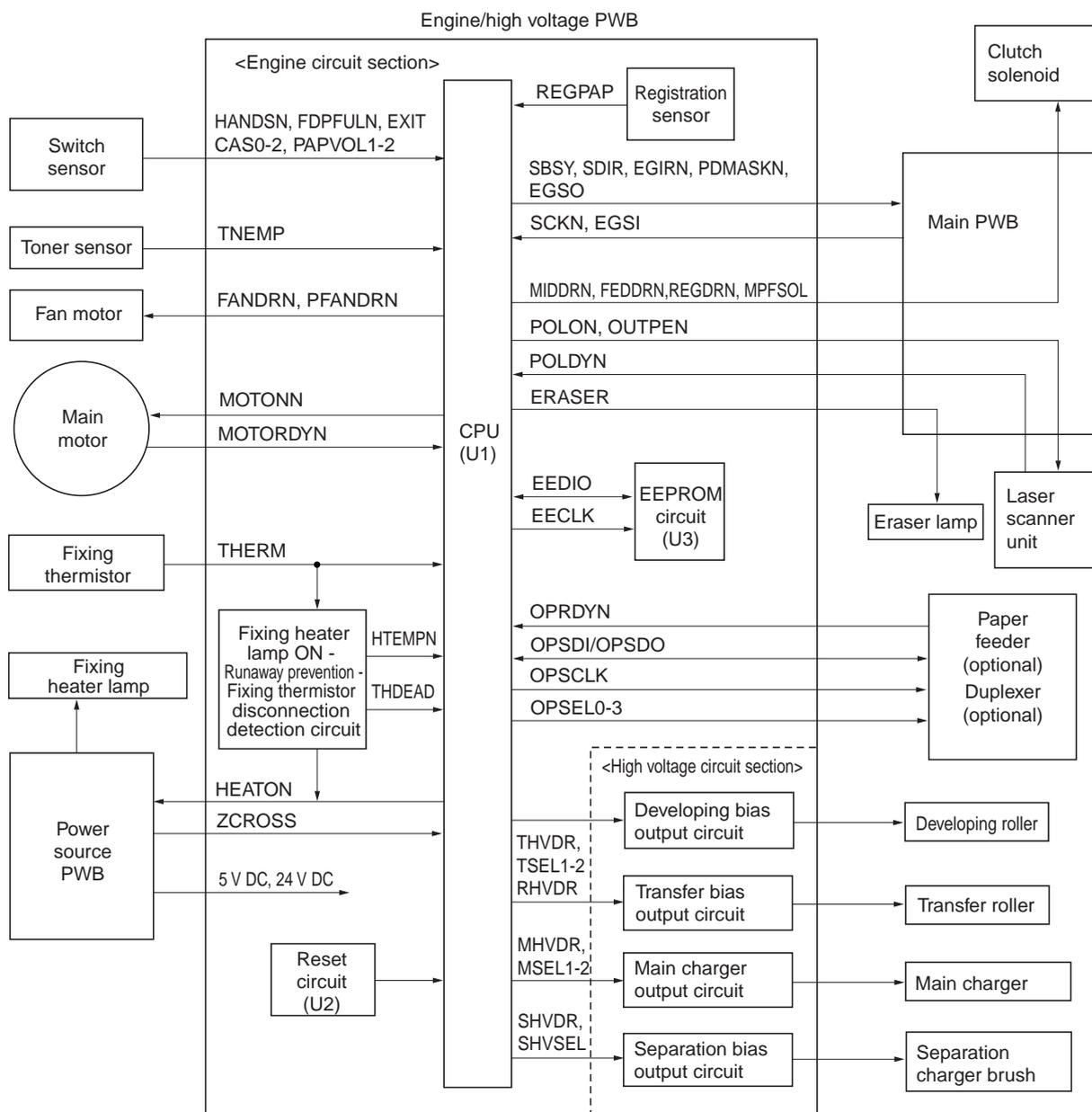


Figure 2-3-3 Engine/high voltage PWB block diagram

The engine/high voltage PWB consists mainly of CPU (U1) and it is primarily divided into the engine circuit section that controls the entire hardware such as the process and paper conveying mechanism and the high voltage circuit section that generates various high voltages to output during the process operation.

(1) Fixing heater lamp control circuit

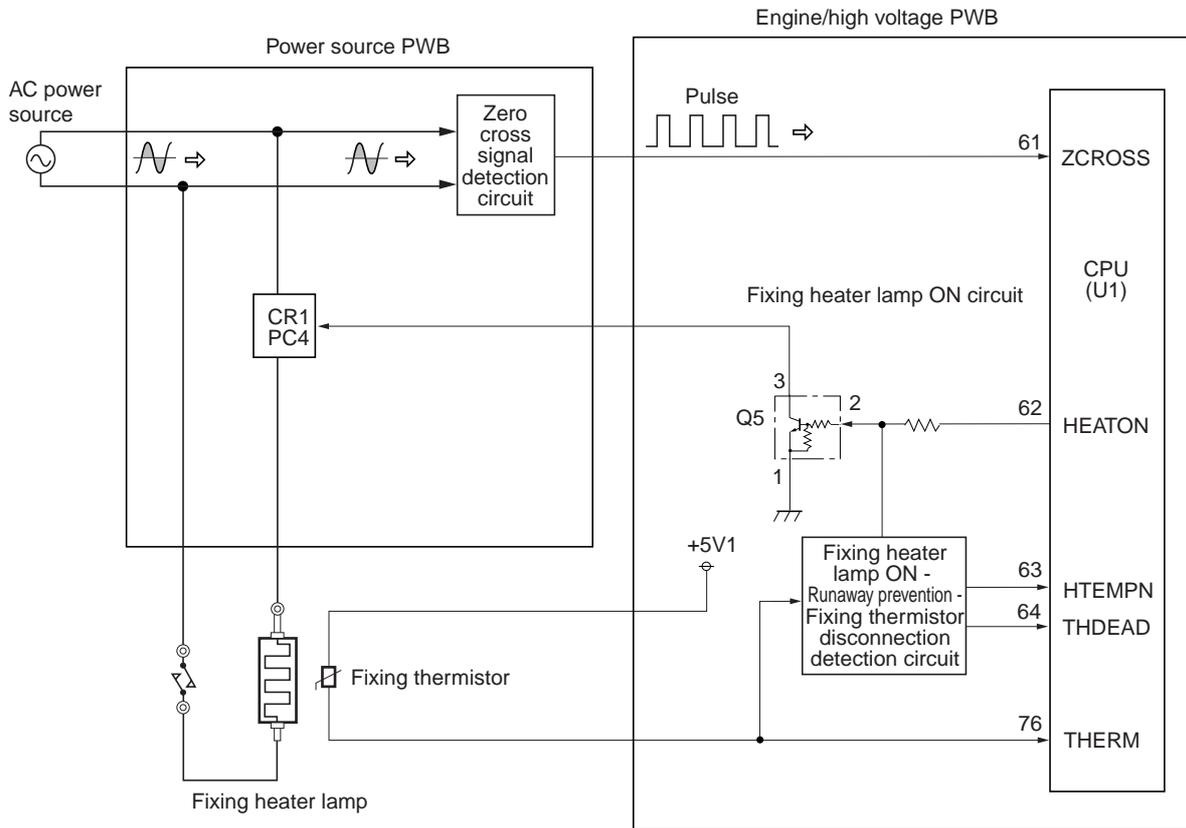


Figure 2-3-4 Fixing heater lamp control circuit

The ON/OFF action of the fixing heater lamp is controlled by the fixing heater lamp lighting ON signal (HEATON) output from the No.62 pin of CPU (U1) of the engine/high voltage PWB. When the HEATON signal reaches the H level, the photo triac (PC4) - Thyristor (CR1) turns on because the transistor (Q5) turns on and then the AC voltage is loaded to the fixing heater lamp.

The HEATON signal turns ON/OFF the photo triac (PC4) - Thyristor (CR1) being synchronized with the zero cross signal (ZCROSS) that is detected by the zero cross signal detection circuit on the power source PWB. The ZCROSS signal detects the zero cross point (0V) where the AC power source changes between positive/negative domains and it is input to the No.61 pin of the CPU (U1) of the engine/high voltage PWB. Since the ON/OFF operation of the photo triac (PC4) - Thyristor (CR1) is performed at the zero cross point (0V), it can avoid the sharp change of current and restrain noises generated from the AC power source.

(2) Fixing heater lamp lighting runaway prevention - fixing thermistor disconnection detection circuit

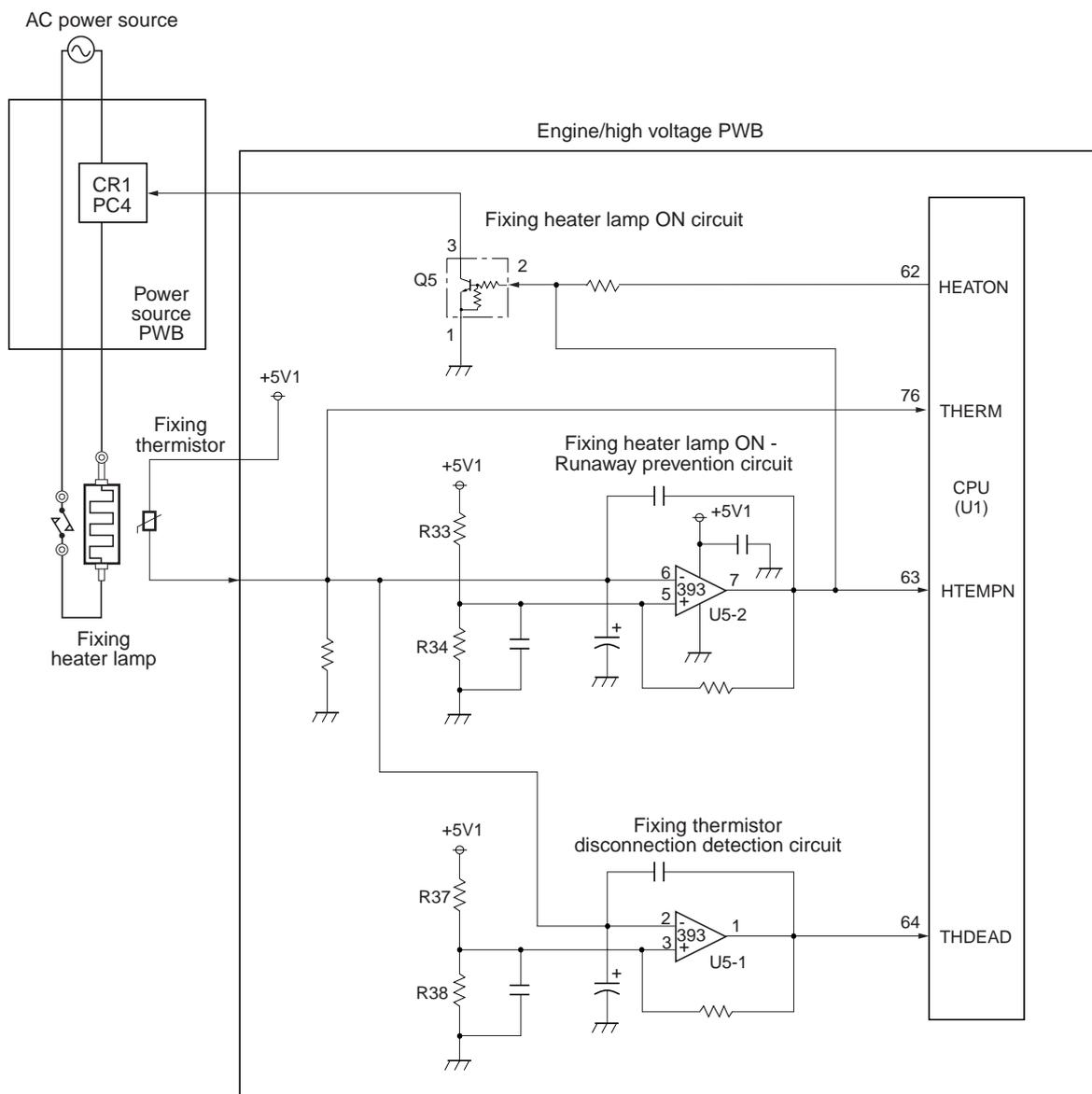
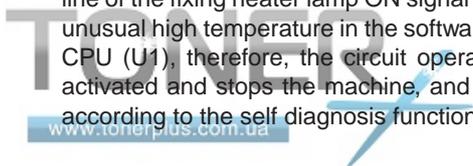


Figure 2-3-5 Fixing heater lamp lighting runaway prevention - fixing thermistor disconnection detection circuit

The fixing thermistor detection voltage (THERM) is input to the CPU (U1) and branched to input to the No.6 pin of he comparator (U5-1). The comparator compares the THERM signal voltage with the voltage set at the No.5 pin (= the voltage 3.2V that the temperature 230 °C is assumed in the case of unusually high temperature) by the divided voltage of resistors (R33 and R34). If the voltage at the No.6 pin is higher than that of No.5 pin, the output level of No.7 pin is L. For the HEATON signal, the circuit that forcibly turns off the fixing heater lamp by the hardware-based method and forcibly makes the HEATON signal to L level regardless of controls by CPU (U1) is provided because the No.7 pin is connected with the output line of the fixing heater lamp ON signal (HEATON). This circuit is provided for the purpose of fail safe, it usually monitors the unusual high temperature in the software system by the input voltage of the THERMA signal that is input to the No.76 pin of CPU (U1), therefore, the circuit operates the control to turn off the fixing heater lamp before the mentioned circuit is activated and stops the machine, and then indicates the error code 6020 that shows the fixing high temperature failure according to the self diagnosis function.



(3) Interlock switch - eco-power circuit

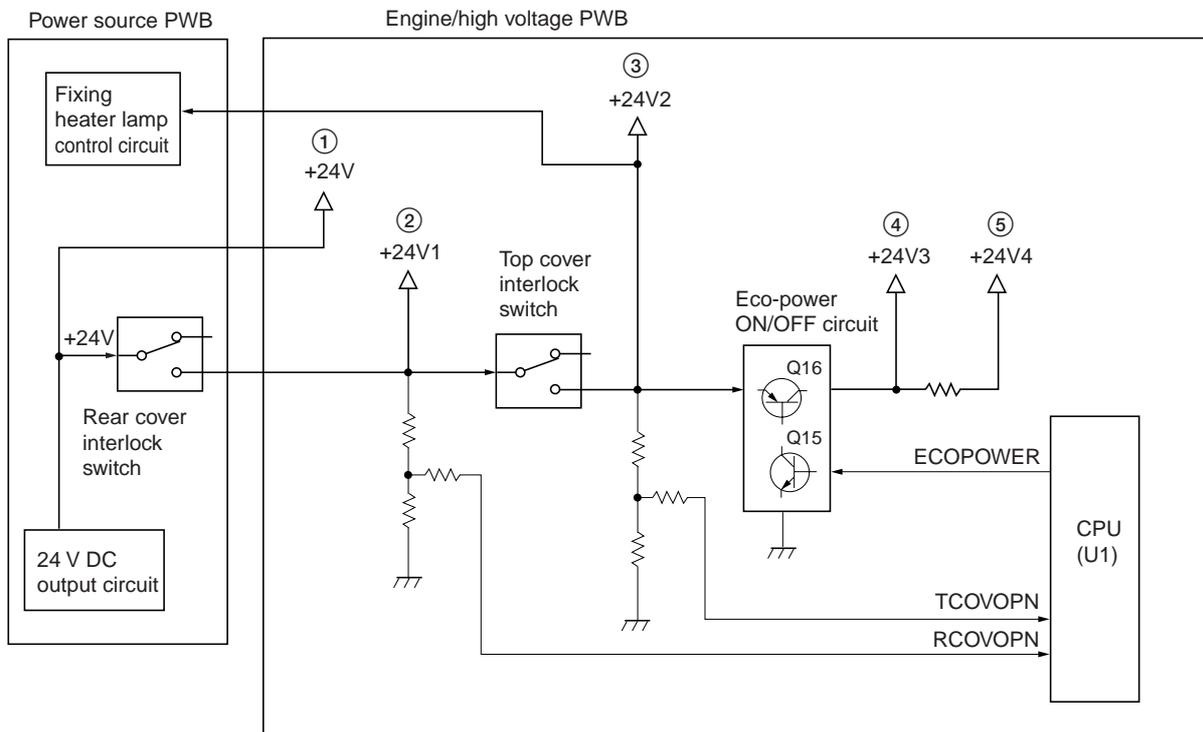


Figure 2-3-6 Interlock switch - eco-power circuit

The 24 V DC power source line is shut off by the top cover interlock switch or the rear cover interlock switch that is turned OFF when the top cover or the rear cover is opened. At the same time, the 24 V DC power supply is stopped to the motor and clutch and it is also output to the CPU of the engine/high voltage PWB as the cover open detection signal.

The 24 V DC power is divided into five groups of +24V, +24V1, +24V2, +24V3 and +24V4 as follows, and the loads that supply the 24 V DC power source or the cover open detection signals are different.

- ① +24V Cooling fan motor
- ② +24V1 Rear cover open detection signal (RCOVOPN)
- ③ +24V2 Top cover open detection signal (TCOVOPN), paper feeder, duplexer and power source PWB (Fixing heater lamp control circuit)
- ④ +24V3 Main motor, eraser, main PWB, polygon motor, feed clutch, MP tray feed clutch, middle feed clutch and MP tray feed solenoid
- ⑤ +24V4 Engine/High voltage (High voltage section)

In the eco-power mode, the circuit shuts off the +24V power source that is used by the printer unit in order to reduce the power consumption. In the eco-power mode, the eco-power mode signal (ECPOWER) becomes L level, which is output from the CPU of the engine/high voltage PWB. The signal at this level turns off the transistors (Q15, Q16) of the eco-circuit, accordingly the supply of +24V3 and +24V4 to the power line is shut off and the operation of connected load will stop.

(4) Optional equipment identification circuit

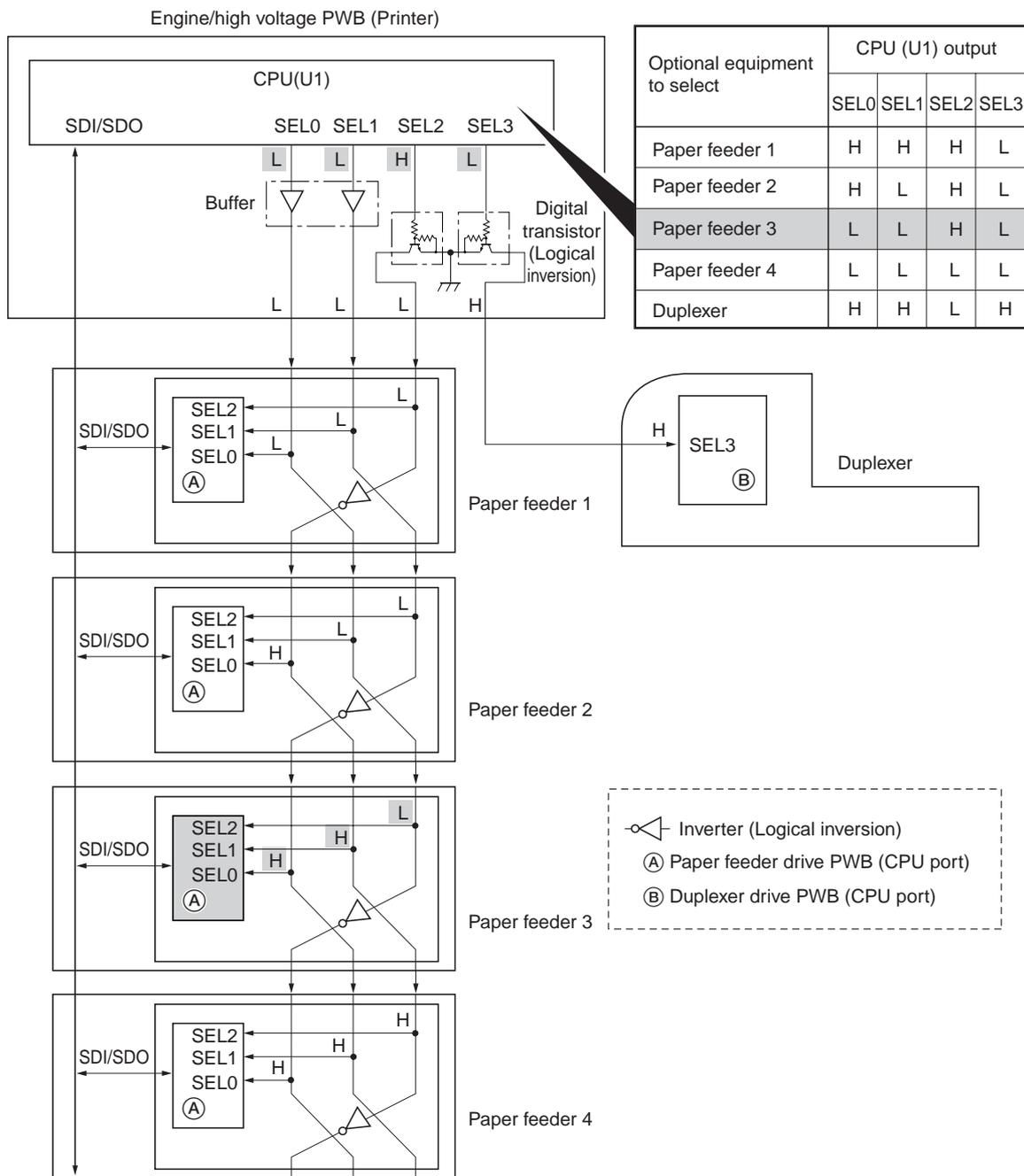


Figure 2-3-7 Optional equipment identification circuit

The CPU (U1) of the engine/high voltage PWB outputs four optional equipment selection signals (SEL0-4) and specifies the 4 paper feeders and duplexer.

When it is required that the CPU (U1) of the engine/high voltage PWB controls the specified paper feeder or checks if the paper feeder is equipped, the combination of the selection signal (The illustration shows the selection case when the paper feeder 3 is selected), which is determined per paper feeder, is output. The combination to be input per stacked paper feeder will be different because crossing of signal leads and logical inversion are executed in the circuit of each paper feeder drive PWB. The CPU of the paper feeder drive PWB is programmed to react only when the level of SEL0-4 signal is input in combination of (SEL0=H, SEL0=H, SEL0=L) and reply to the CPU (U1) of the engine/high voltage PWB. Consequently, the CPU (U1) judges that the paper feeder on the level in question is not equipped if the said paper feeder does not reply even if the CPU (U1) output the SEL0-4 signal to the paper feeder to be specified. Only the duplexer will be selected when the SEL3 signal is set as H level.

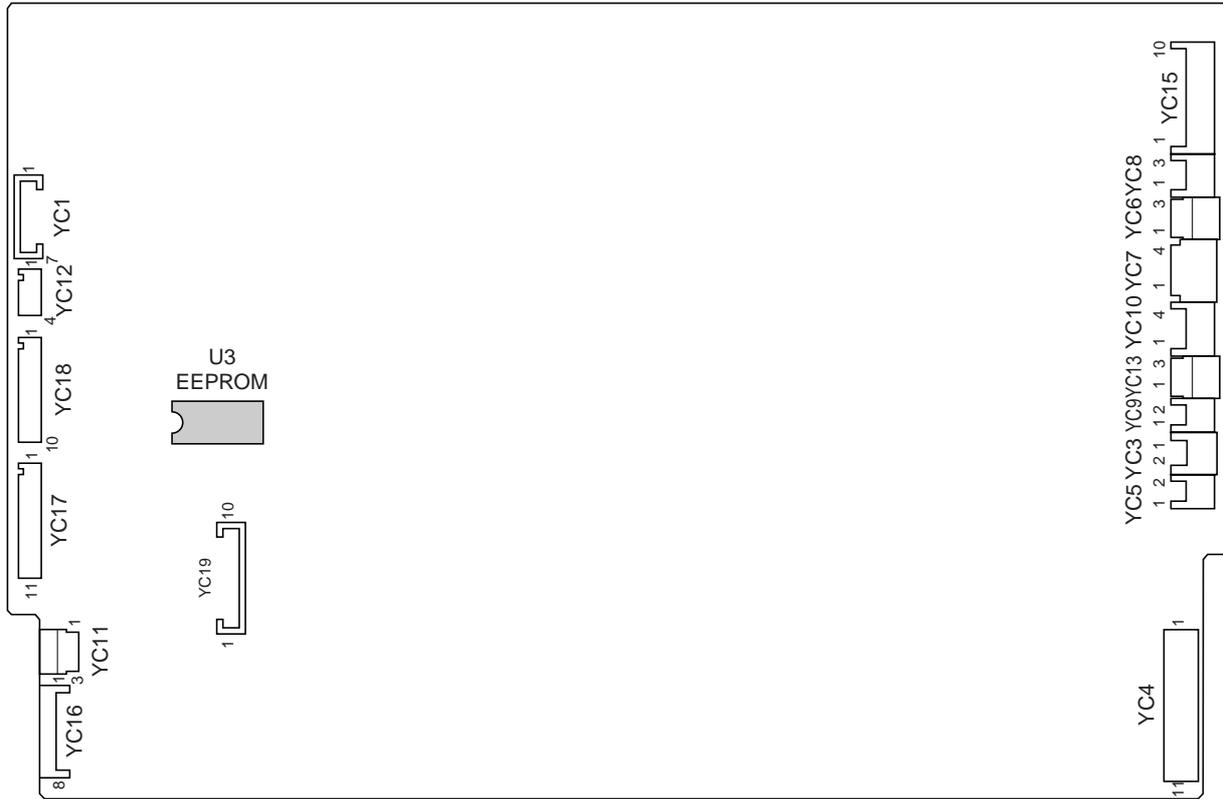


Figure 2-3-8 Engine/high voltage PWB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
YC1 Connected to the ROM writer	1	+5V	I	5 V DC	5 V DC power
	2	VPP	-	Ground	Ground
	3	WRSO	I	0/5 V DC(pulse)	Data input signal
	4	WRSI	O	0/5 V DC(pulse)	Data output signal
	5	SCK	I	0/5 V DC(pulse)	Clock signal for read/write
	6	RSTN	I	0/5 V DC	Reset signal
	7	GND	-	Ground	Ground
YC3 Connected to the cooling fan motor	1	+24V	O	24 V DC	24 V DC power supply for cooling fan motor
	2	FANDRN	O	0/24 V DC	Cooling fan motor: On/Off
YC4 Connected to the power source PWB	1	+24V1	I	24 V DC	24 V DC power input (via rear cover interlock switch)
	2	+24V1	I	24 V DC	24 V DC power input (via rear cover interlock switch)
	3	GND	-	Ground	Ground
	4	GND	-	Ground	Ground
	5	HVGND	-	Ground	Ground for high voltage
	6	+24V2	I	24 V DC	24 V DC power input
	7	ZCROSS	I	0/5 V DC (pulse)	Zero-cross signal
	8	HEATONN	O	0/5 V DC	Fixing heater lamp ON signal
	9	+5V1	I	5 V DC	5 V DC power input
	10	+5V1	I	5 V DC	5 V DC power input
	11	+24V	I	24 V DC	24 V DC power input
YC6 Connected to the MP tray feed sensor	1	ANODE	O	5 V DC	5 V DC power supply for MP tray feed sensor
	2	GND	-	Ground	Ground
	3	HANDSN	I	0/5 V DC	MP tray feed sensor: On/Off
YC7 Connected to the cassette size switch	1	CAS2	I	0/5 V DC	Cassette size switch (SW2): On/Off
	2	CAS1	I	0/5 V DC	Cassette size switch (SW1): On/Off
	3	GND	-	Ground	Ground
	4	CAS1	I	0/5 V DC	Cassette size switch (SW0): On/Off
YC8 Connected to the toner sensor	1	+5V1	O	5 V DC	5 V DC power supply for toner sensor
	2	TNEMPN	I	0/5 V DC	toner sensor: On/Off
	3	GND	-	Ground	Ground
YC9 Connected to the power source fan motor	1	+5V1	O	DC5V	5 V DC power supply for power source fan motor
	2	PFANDRN	O	DC0V/3.75V/5V	Power source fan motor: High speed/Low speed/Off
YC10 Connected to the paper gauge sensor	1	+5V3	O	5 V DC	5 V DC power supply for paper gauge sensor
	2	PAPVOL1	I	0/5 V DC	Paper gauge sensor 1: On/Off
	3	PAPVOL2	I	0/5 V DC	Paper gauge sensor 2: On/Off
	4	GND	-	Ground	Ground
YC11 Connected to the eject sensor	1	GND	-	Ground	Ground
	2	EXITPAP	I	0/5 V DC	Eject sensor: On/Off
	3	+5V1	I	5 V DC	5 V DC power supply for eject sensor

Connector	Pin No.	Signal	I/O	Voltage	Description
YC12 Connected to the main motor	1	+24V3	O	24 V DC	24 V DC power supply for main motor
	2	GND	-	Ground	Ground
	3	MMOTONN	O	0/5 V DC	Main motor: On/Off
	4	MMOTRDYN	I	0/5 V DC	Main motor ready signal
YC13 Connected to the face-down tray paper full sensor	1	GND	-	Ground	Ground
	2	FDPFULN	I	0/5 V DC	Face-down tray paper full sensor: On/Off
	3	+5V3	I	5 V DC	Power supply for face-down tray paper full sensor
YC15 Connected to the interface connector (for optional paper feeder)	1	+24V2	O	24 V DC	24 V DC power
	2	OPSCCLK	O	0/5 V DC (pulse)	Clock signal for serial communication
	3	+5V1	O	5 V DC	5 V DC power
	4	OPRDYN	I	0/5 V DC	Paper feeder ready signal
	5	OPSEL0	O	0/5 V DC	Optional unit select signal 0
	6	OPSEL1	O	0/5 V DC	Optional unit select signal 1
	7	OPSEL2	O	0/5 V DC	Optional unit select signal 2
	8	OPSDI	I	0/5 V DC (pulse)	Serial communication input signal
	9	OPSDO	O	0/5 V DC (pulse)	Serial communication output signal
	10	GND	-	Ground	Ground
YC16 Connected to the interface connector (for optional duplexer)	1	+24V2	O	24 V DC	24 V DC power
	2	OPSCCLK	O	0/5 V DC (pulse)	Clock signal for serial communication
	3	+5V1	O	5 V DC	5 V DC power
	4	OPRDYN	I	0/5 V DC	Duplexer ready signal
	5	OPSEL3	O	0/5 V DC	Optional unit select signal 3
	6	OPSDI	I	0/5 V DC (pulse)	Serial communication input signal
	7	OPSDO	O	0/5 V DC (pulse)	Serial communication output signal
	8	GND	-	Ground	Ground
YC17 Connected to the main PWB	1	EGIRN	O	0/5 V DC	Engine interrupt signal
	2	SDIR	O	0/5 V DC	Communication direction change signal
	3	SBSY	O	0/5 V DC	Engine busy signal
	4	PDMASKN	O	0/5 V DC	PD mask control signal
	5	EGSO	O	0/5 V DC (pulse)	Engine interface serial communication data output signal
	6	EGSI	I	0/5 V DC (pulse)	Engine interface serial communication data input signal
	7	SCKN	I	0/5 V DC (pulse)	Clock signal for engine interface serial communication
	8	OUTPEN	O	0/5 V DC	laser: On/Off
	9	POLONN	O	0/5 V DC	Polygon motor: On/Off
	10	POLRDYN	I	0/5 V DC	Polygon motor ready signal
	11	ERASER	O	0/24 V DC	Eraser lamp: On/Off
	12	ERDEADN1	I	0/5 V DC	Not used
	13	ERDEADN2	I	0/5 V DC	Not used
YC18 Connected to the main PWB	1	+24V3	O	24 V DC	24 V DC power
	2	REGDRN	O	0/24 V DC	Registration clutch: On/Off
	3	MPFSOL	O	0/24 V DC	MP tray feed solenoid: On/Off
	4	FEDDRN	O	0/24 V DC	Feed clutch: On/Off
	5	MIDDRN	O	0/24 V DC	Middle feed clutch: On/Off
	6	GND	-	Ground	Ground
	7	GND	-	Ground	Ground
	8	RESETN	O	0/5 V DC	Reset signal
	9	+5V1	O	5 V DC	5 V DC power
	10	+5V1	O	5 V DC	5 V DC power



2-3-3 Main PWB

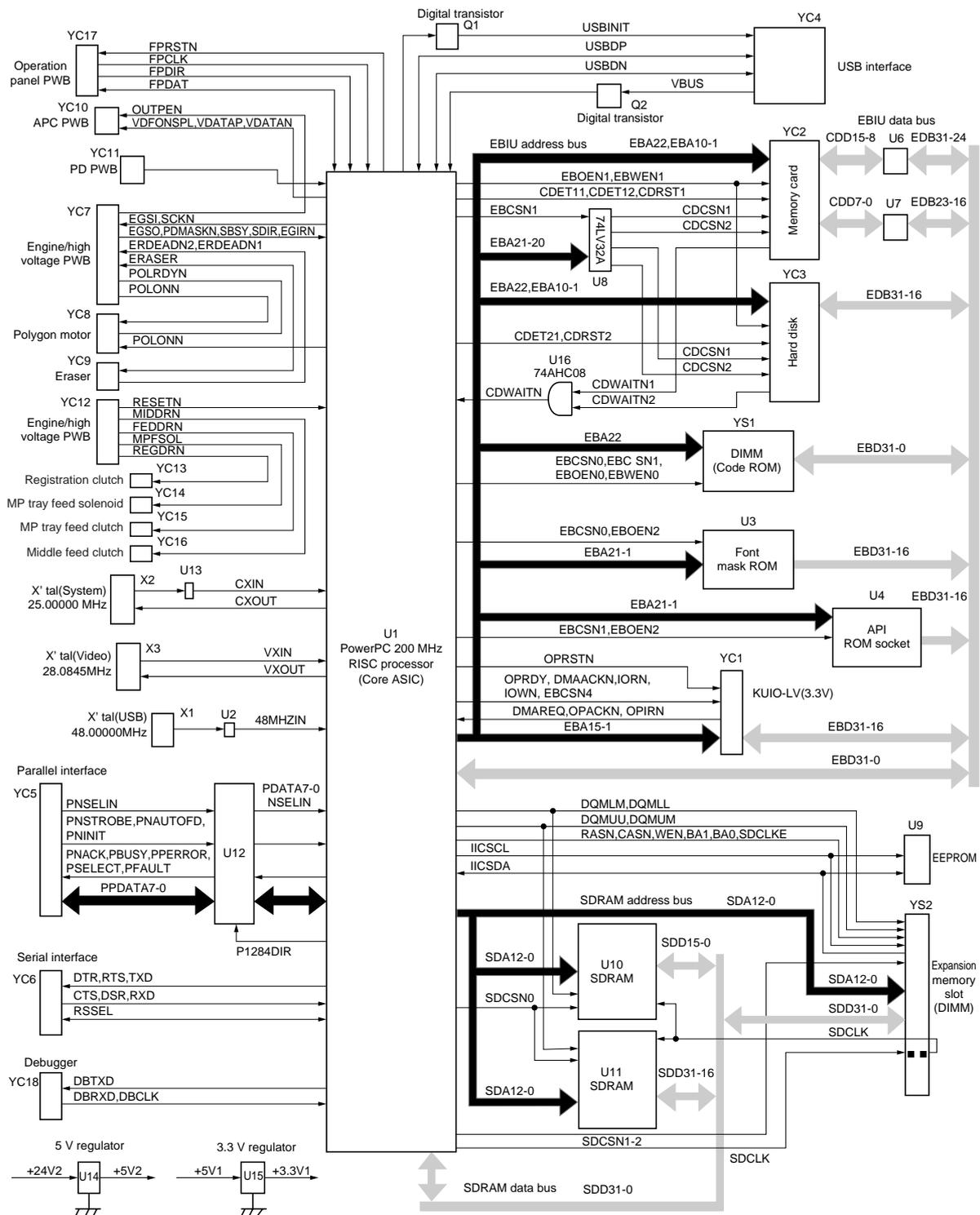


Figure 2-3-9 Main PWB block diagram

The main PWB consists mainly of CPU (U1) and primarily performs the printing data processing and interface controls with computers. The CPU (U1) outputs the laser light and executes printing following the code ROM (YS1) that stores the control programs being linked with the process and paper conveying mechanism that the engine/high voltage PWB controls.



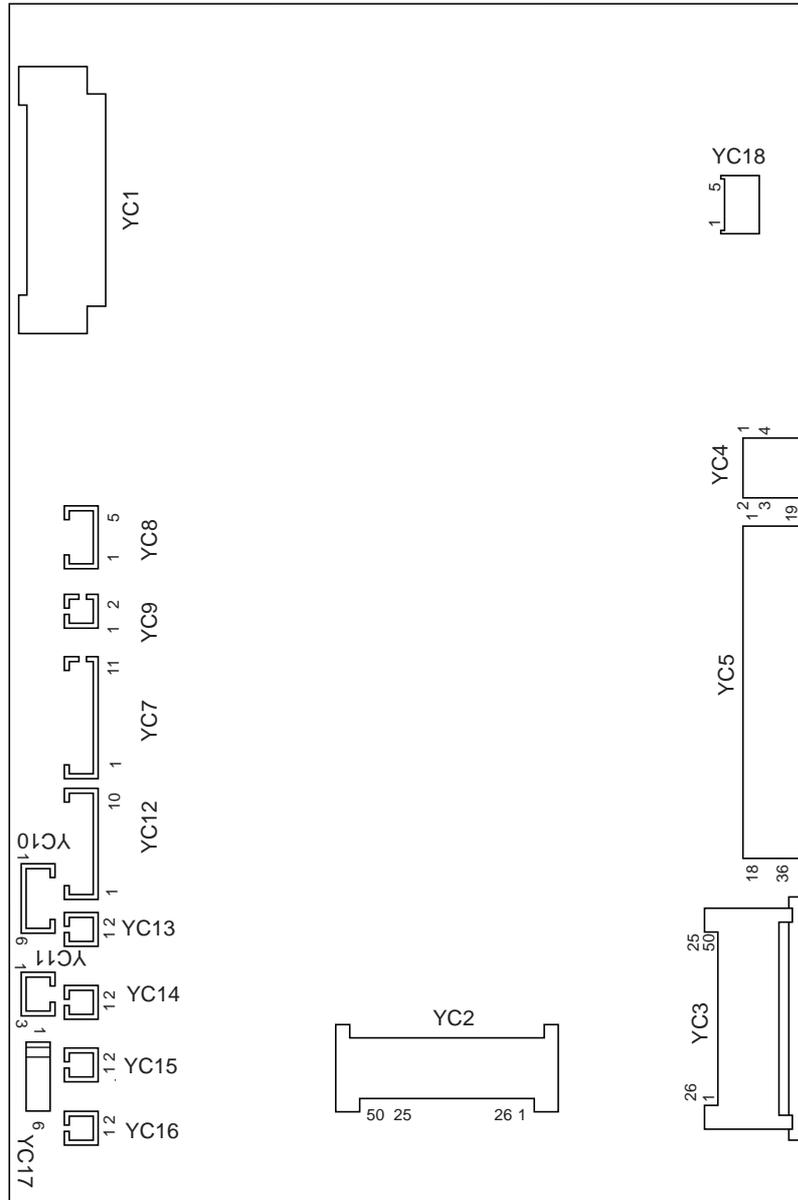
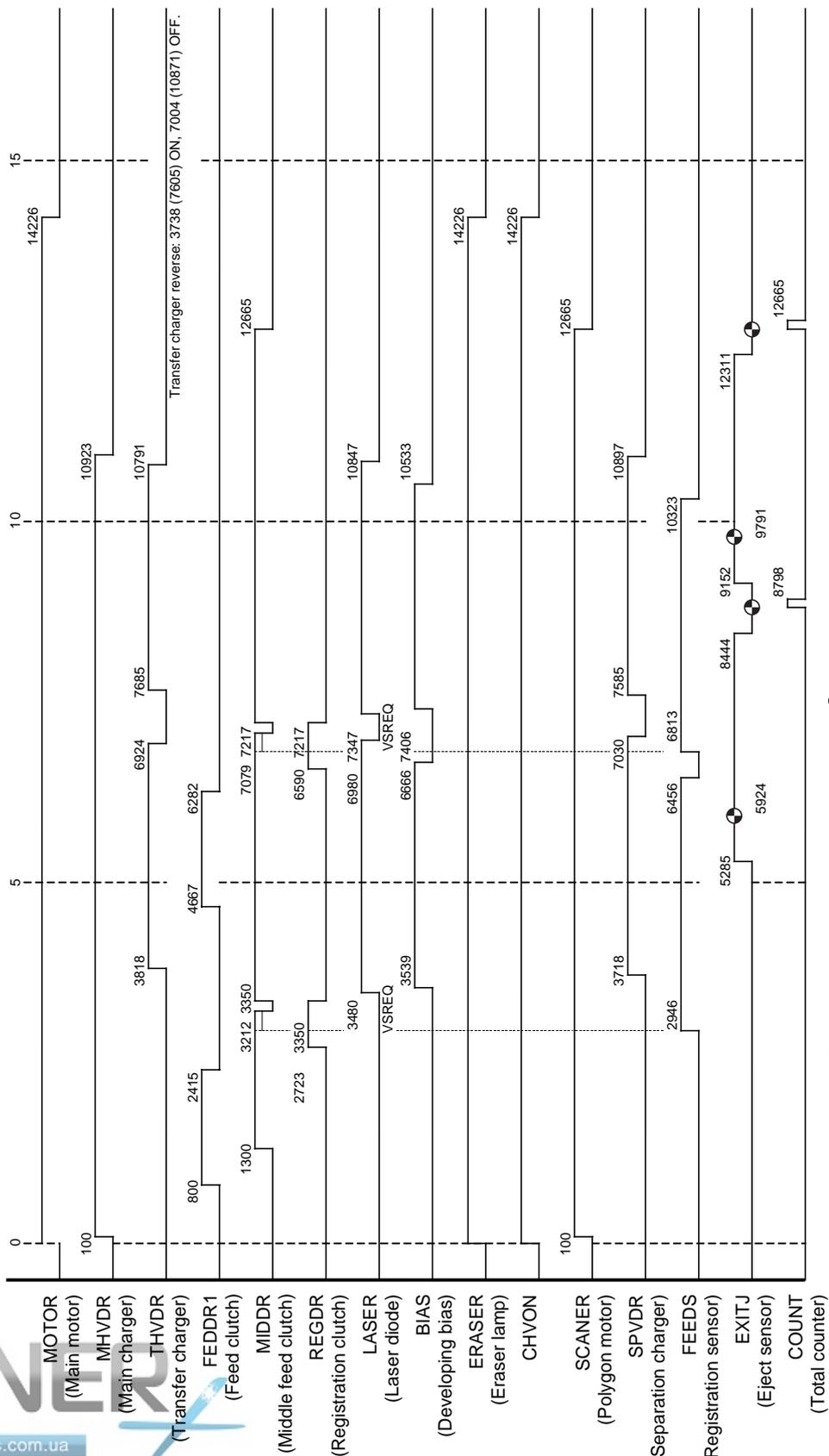


Figure 2-3-10 Main PWB silk-screen diagram

Timing chart No. 1 Paper cassette feeding, two A4 size papers

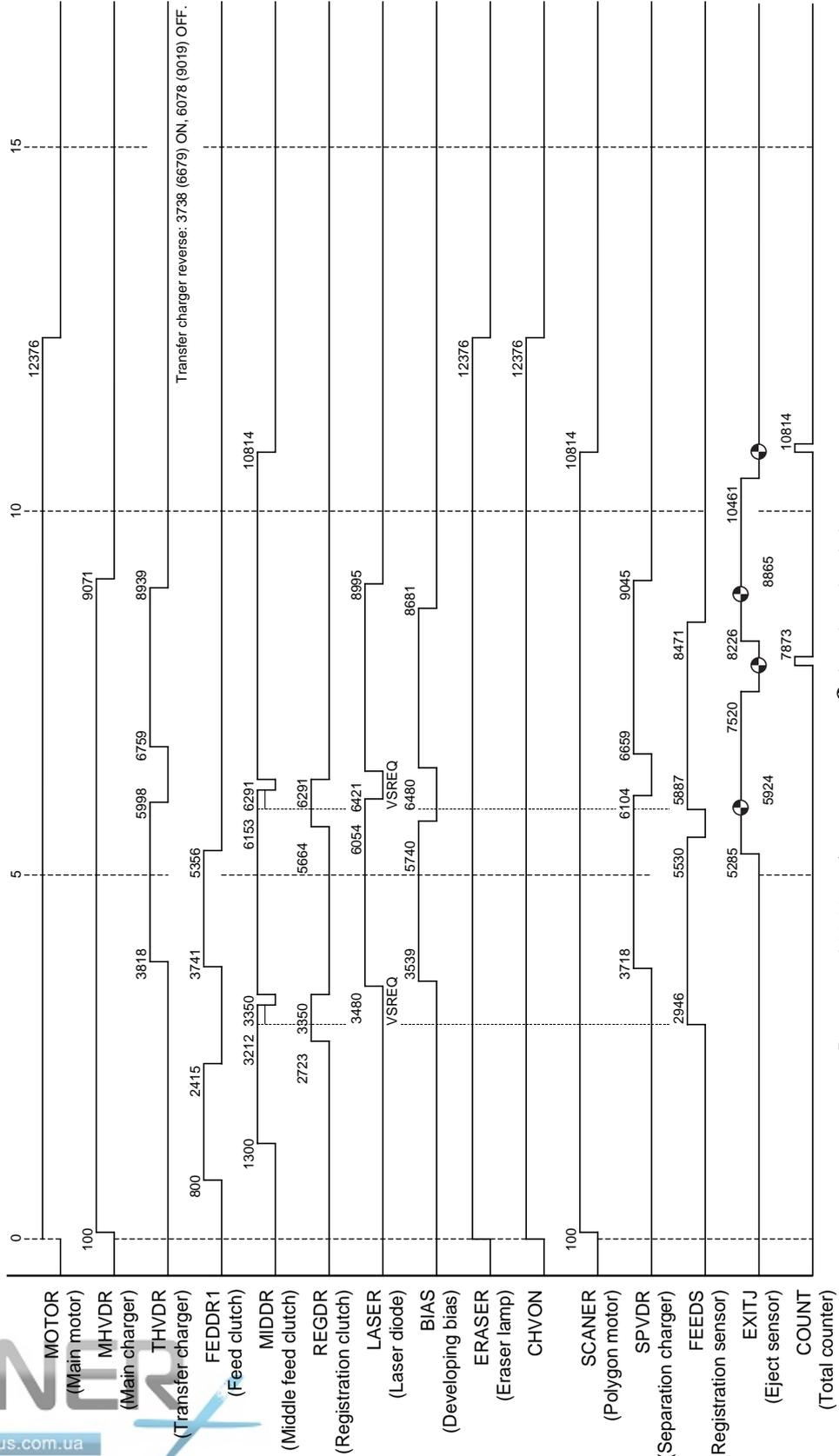


Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 15.52 ppm

● Jam detection timing



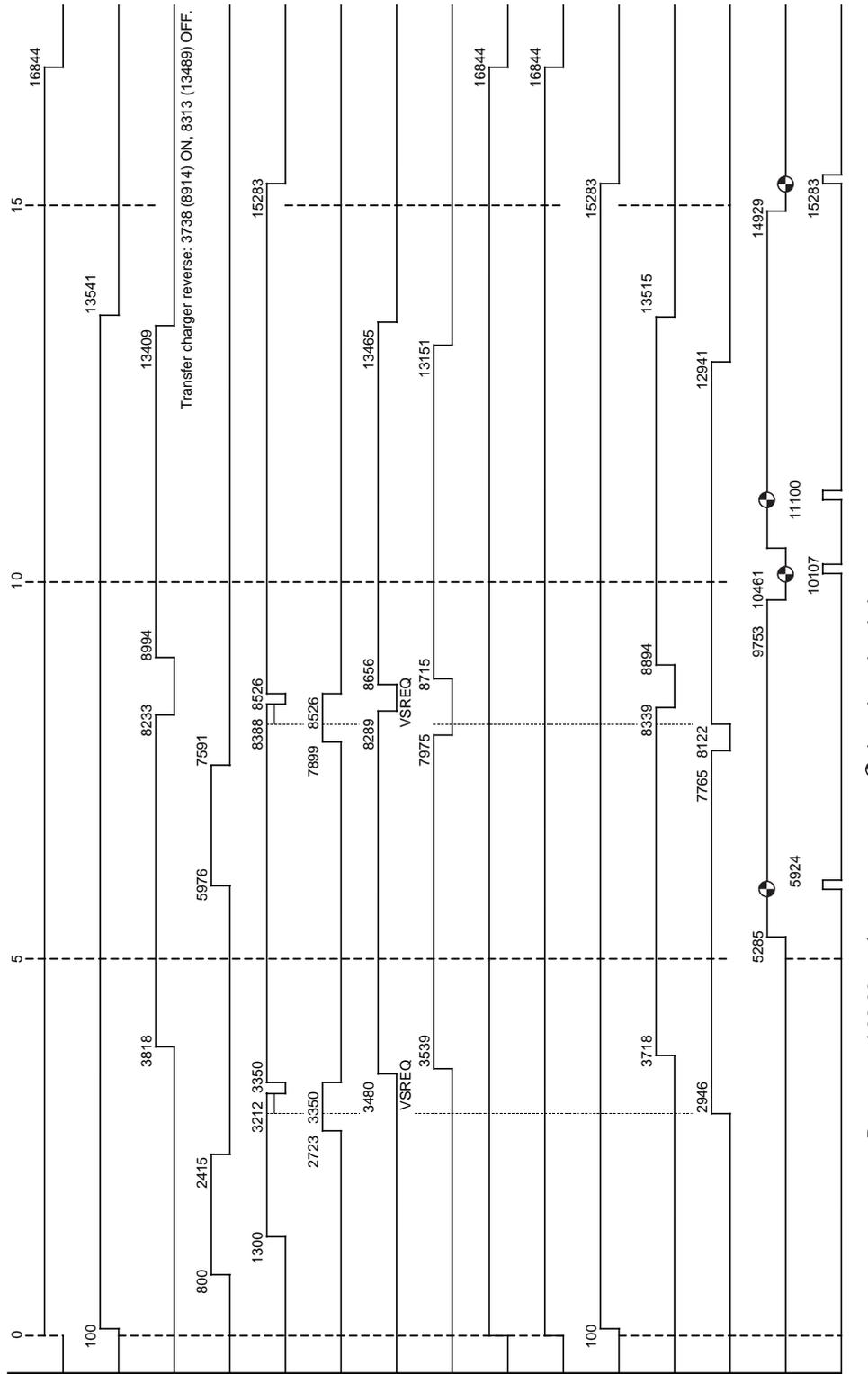
Timing chart No. 2 Paper cassette feeding, two A4R size papers



Drum speed:92.99 mm/s
 Paper feeding speed:94.12 mm/s
 Printing speed:20.40 ppm

●:Jam detection timing

Timing chart No. 3 Paper cassette feeding, two A3 size papers

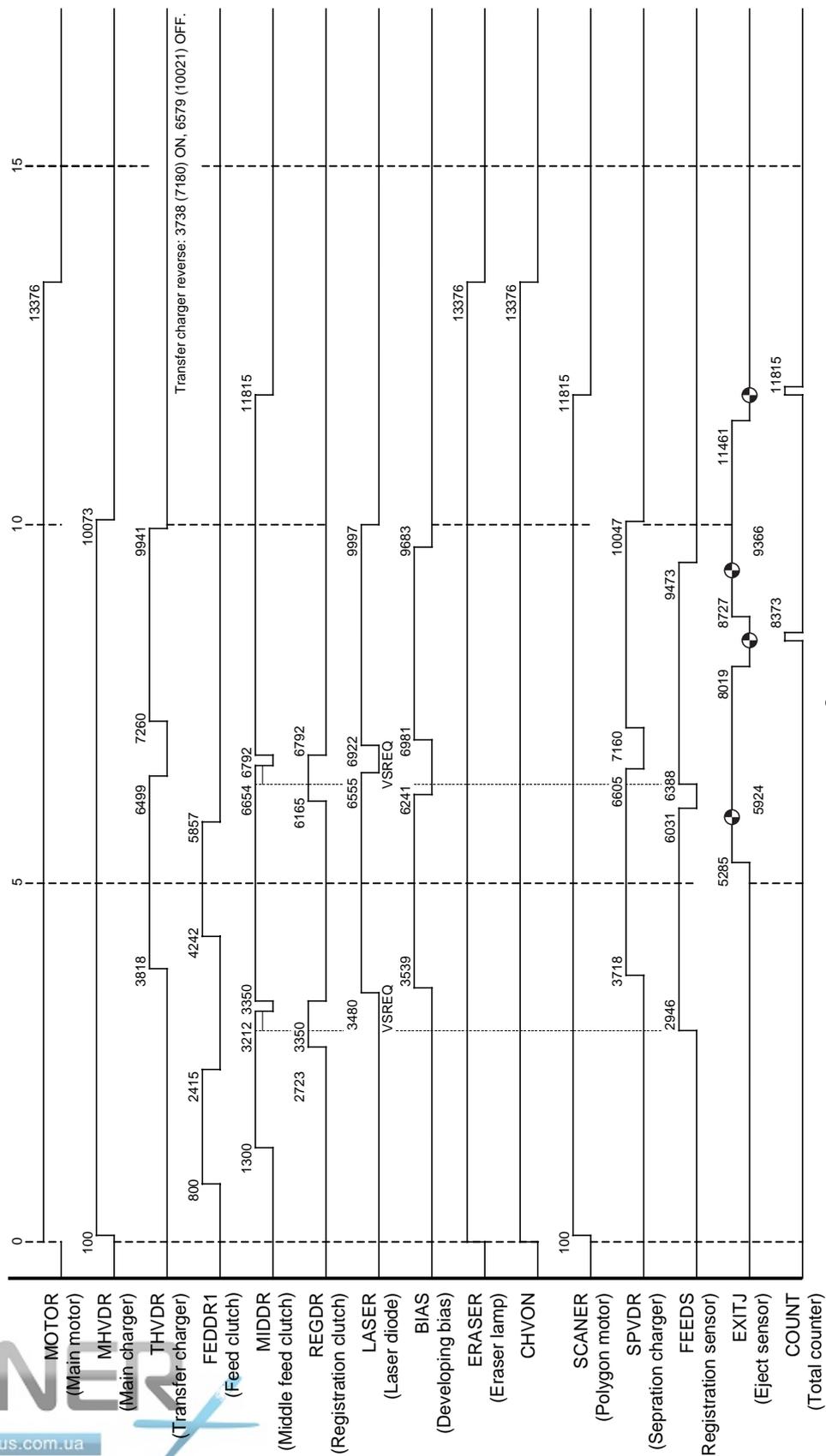


●: Jam detection timing

Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 11.59 ppm



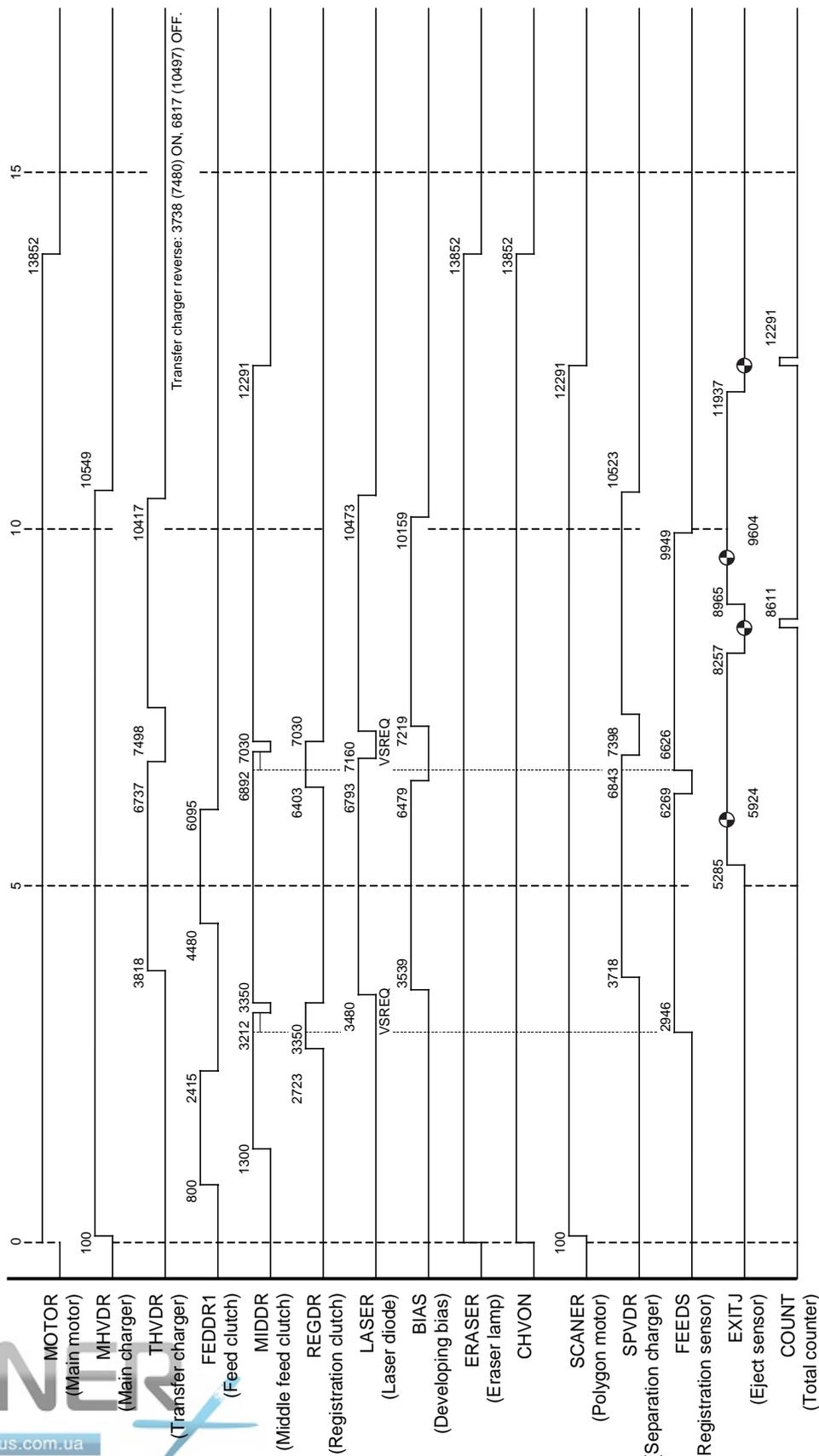
Timing chart No. 4 Paper cassette feeding, two B5 size papers



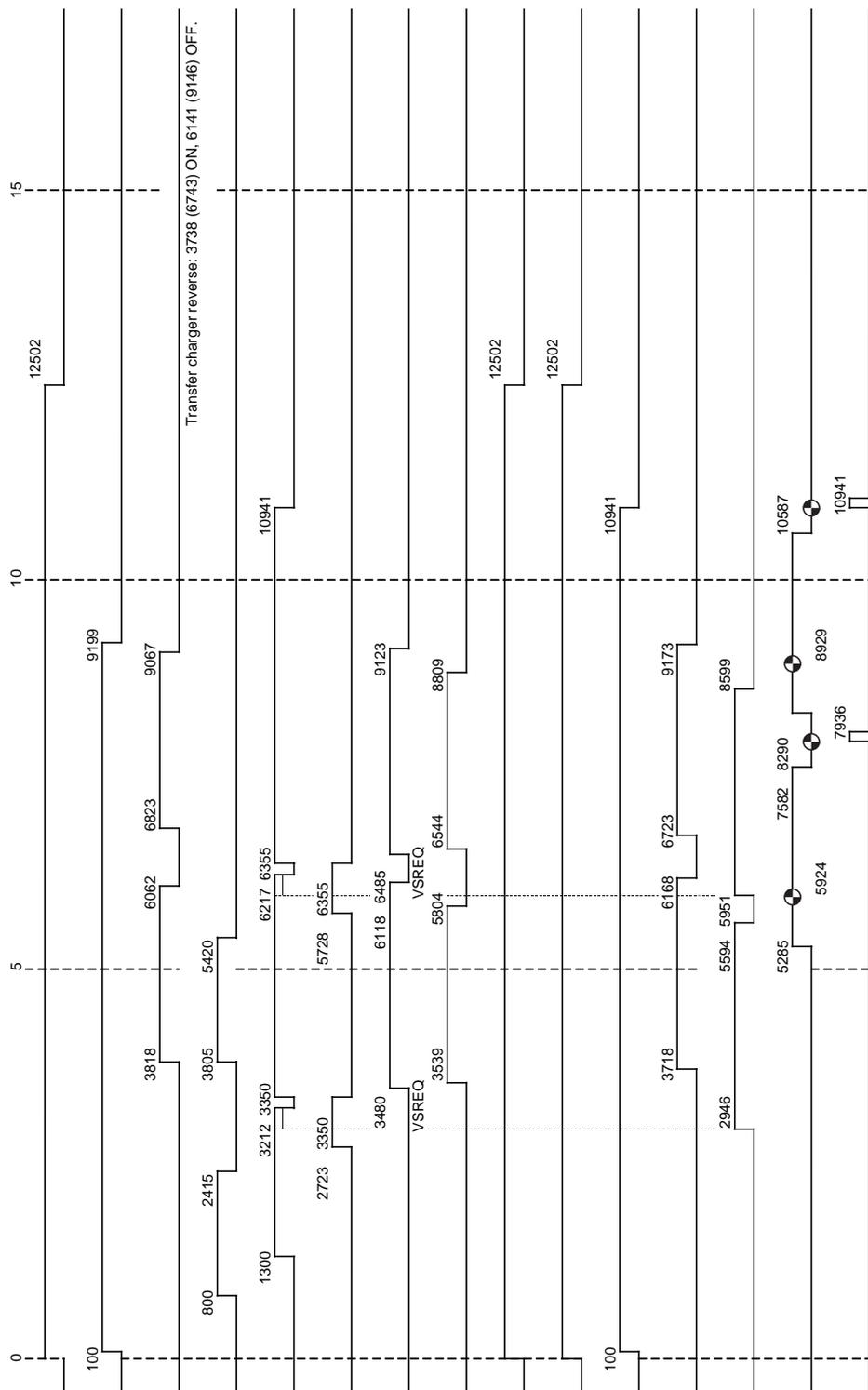
●: Jam detection timing

Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 17.43 ppm

Timing chart No. 6 Paper cassette feeding, two letter size papers



Timing chart No. 7 Paper cassette feeding, two letter R size papers

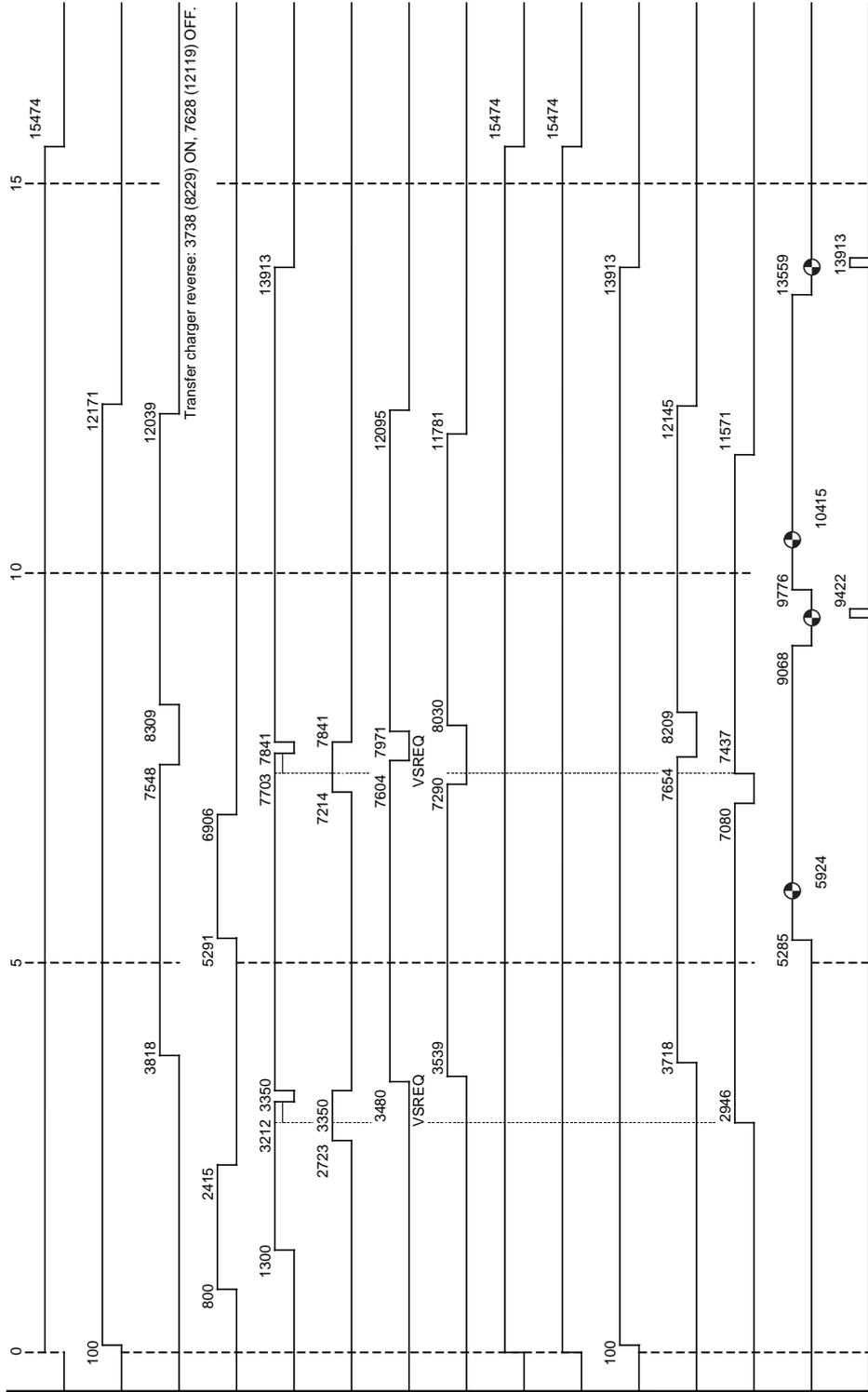


Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 20.00 ppm

● Jam detection timing



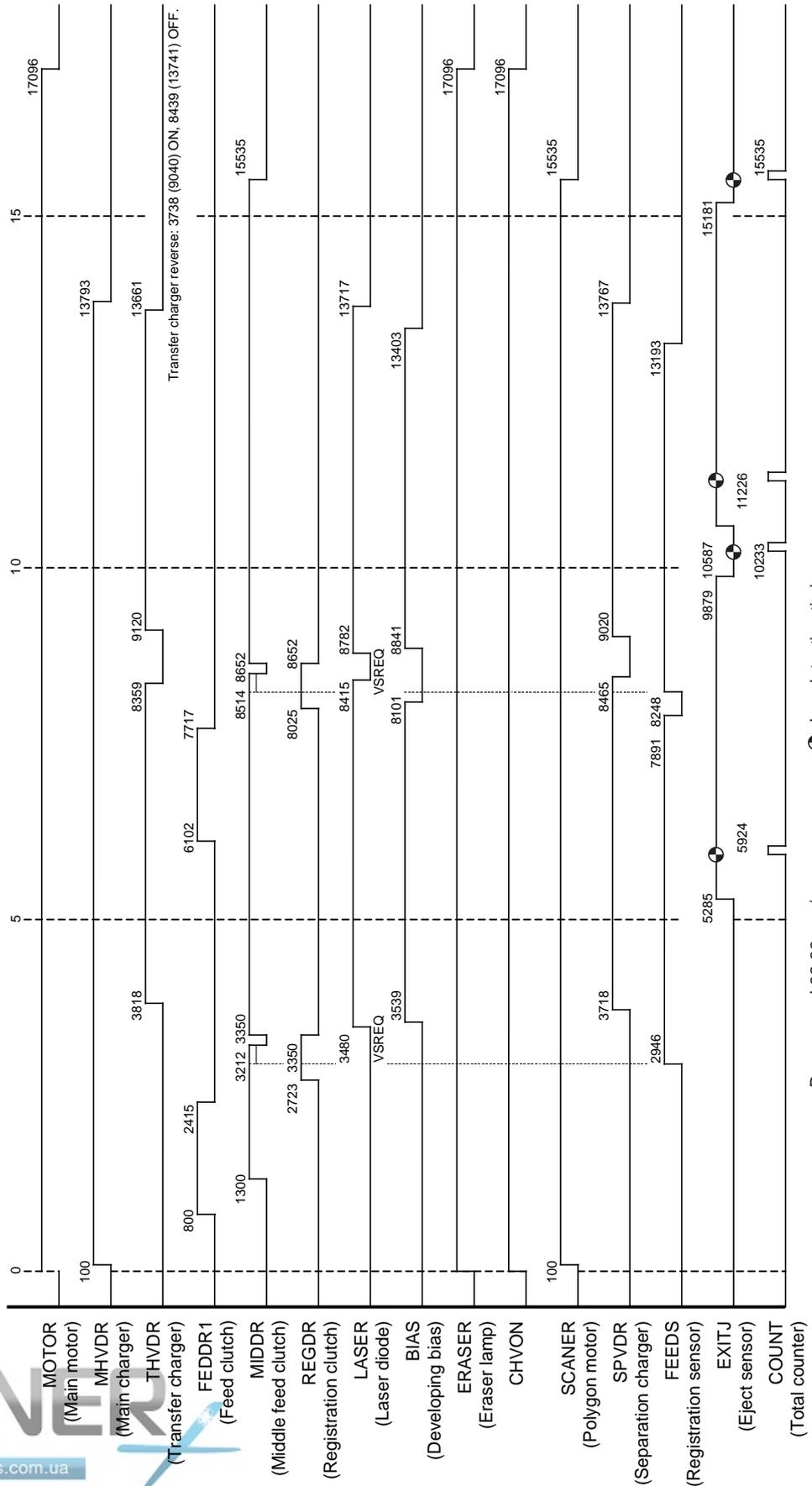
Timing chart No. 8 Paper cassette feeding, two legal size papers



● Jam detection timing

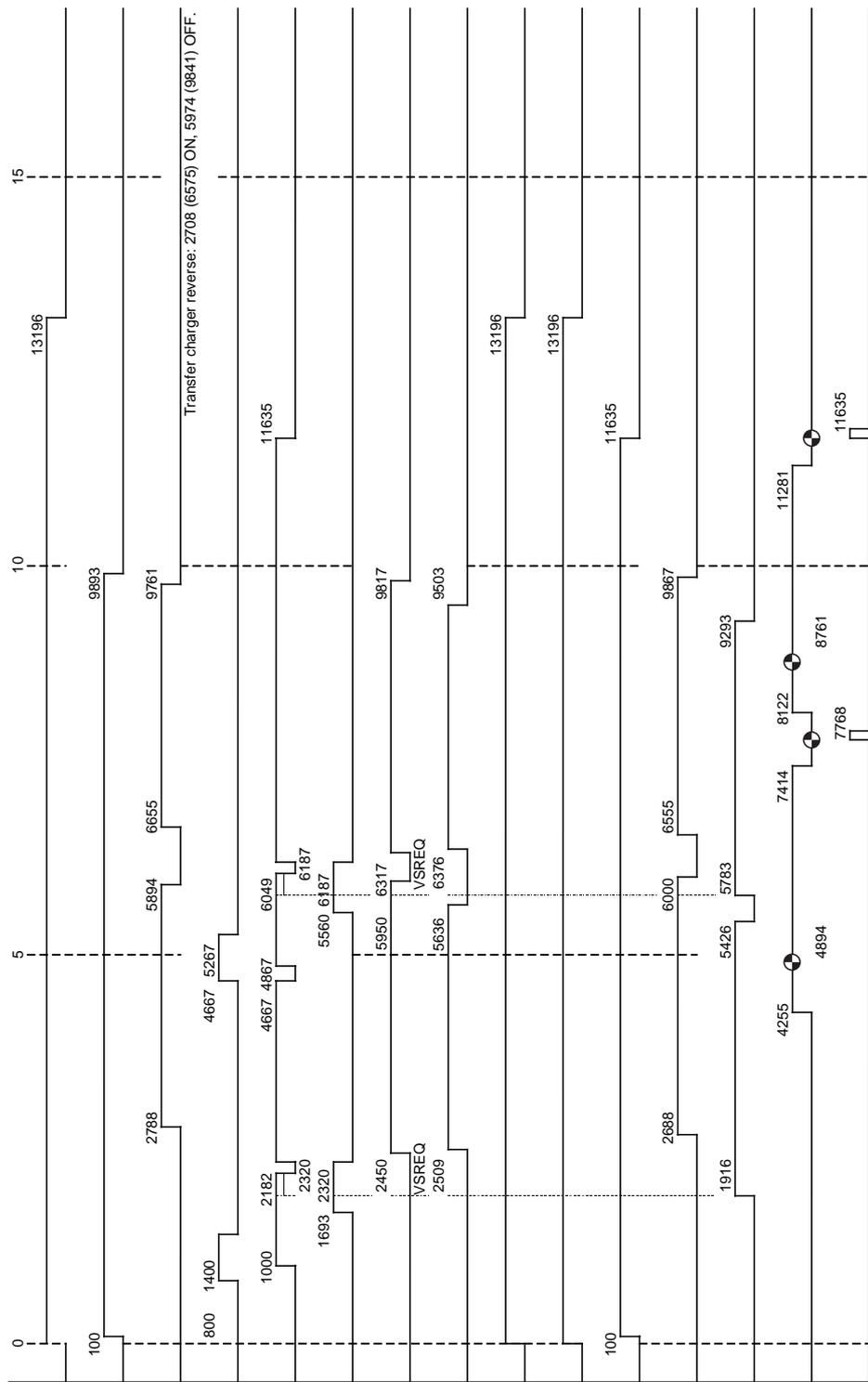
Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 13.36 ppm

Timing chart No. 9 Paper cassette feeding, two ledger size papers



Drum speed: 92.99 mm/s
 Paper feeding speed: 94.12 mm/s
 Printing speed: 11.32 ppm

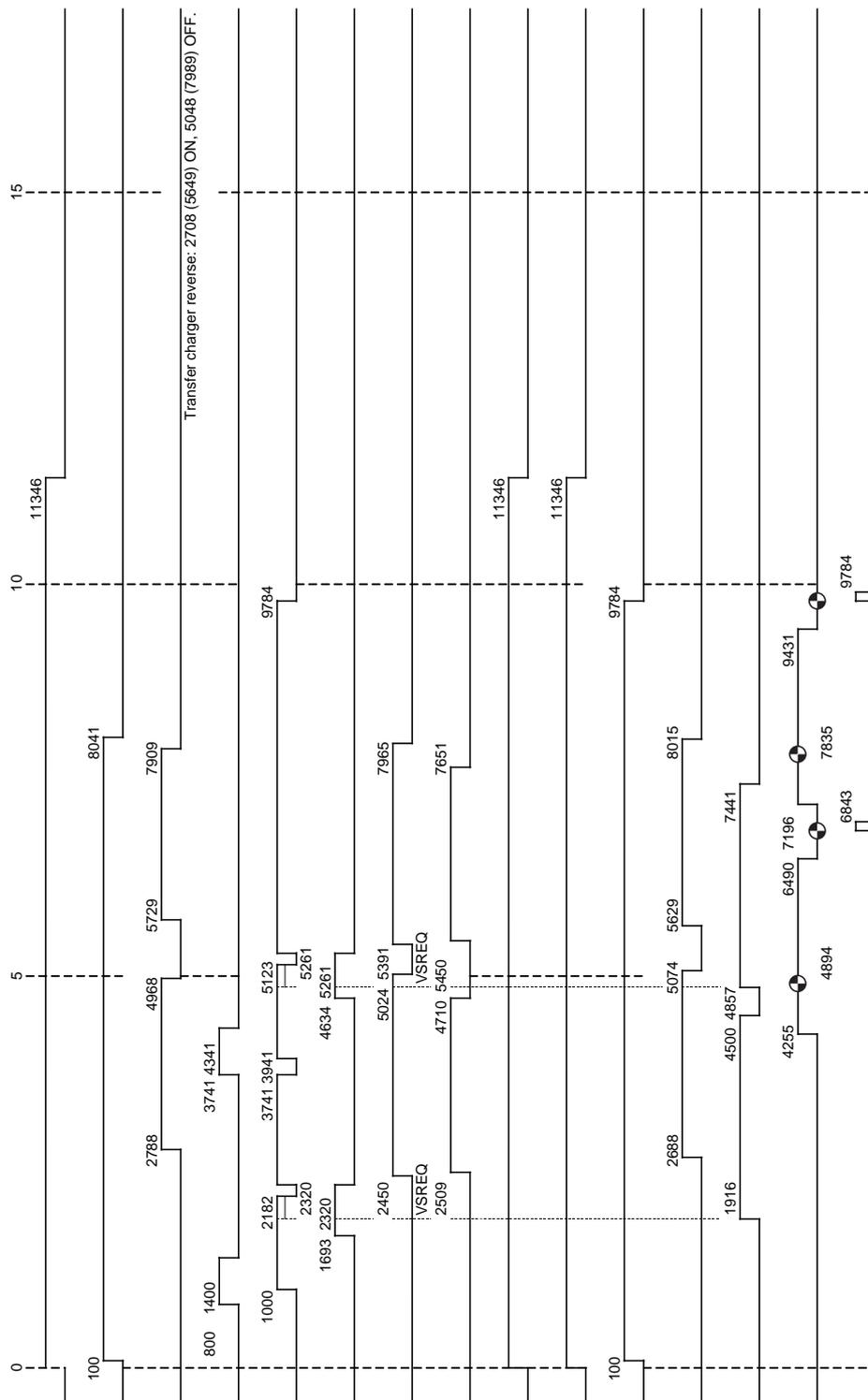
Timing chart No. 10 MP tray feeding, two A4 size papers



Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 15.52 ppm



Timing chart No. 11 MP tray feeding, two A4R size papers

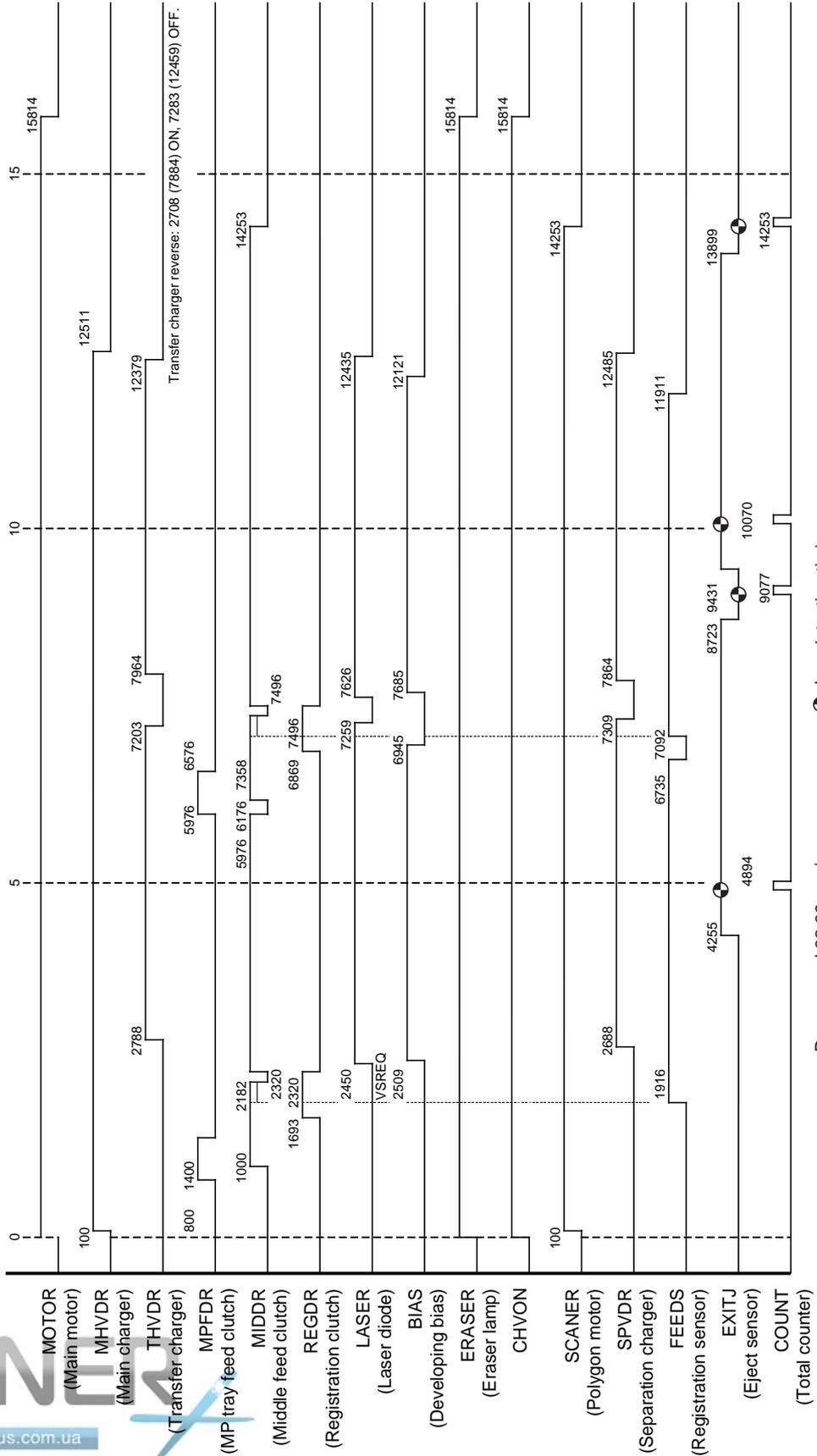


MOTOR (Main motor)
 MHVDR (Main charger)
 THVDR (Transfer charger)
 MPFDR (MP tray feed clutch)
 MIDD (Middle feed clutch)
 REGDR (Registration clutch)
 LASER (Laser diode)
 BIAS (Developing bias)
 ERASER (Eraser lamp)
 CHYON (Scanner)
 SPVDR (Separation charger)
 FEEDS (Registration sensor)
 EXITJ (Eject sensor)
 COUNT (Total counter)

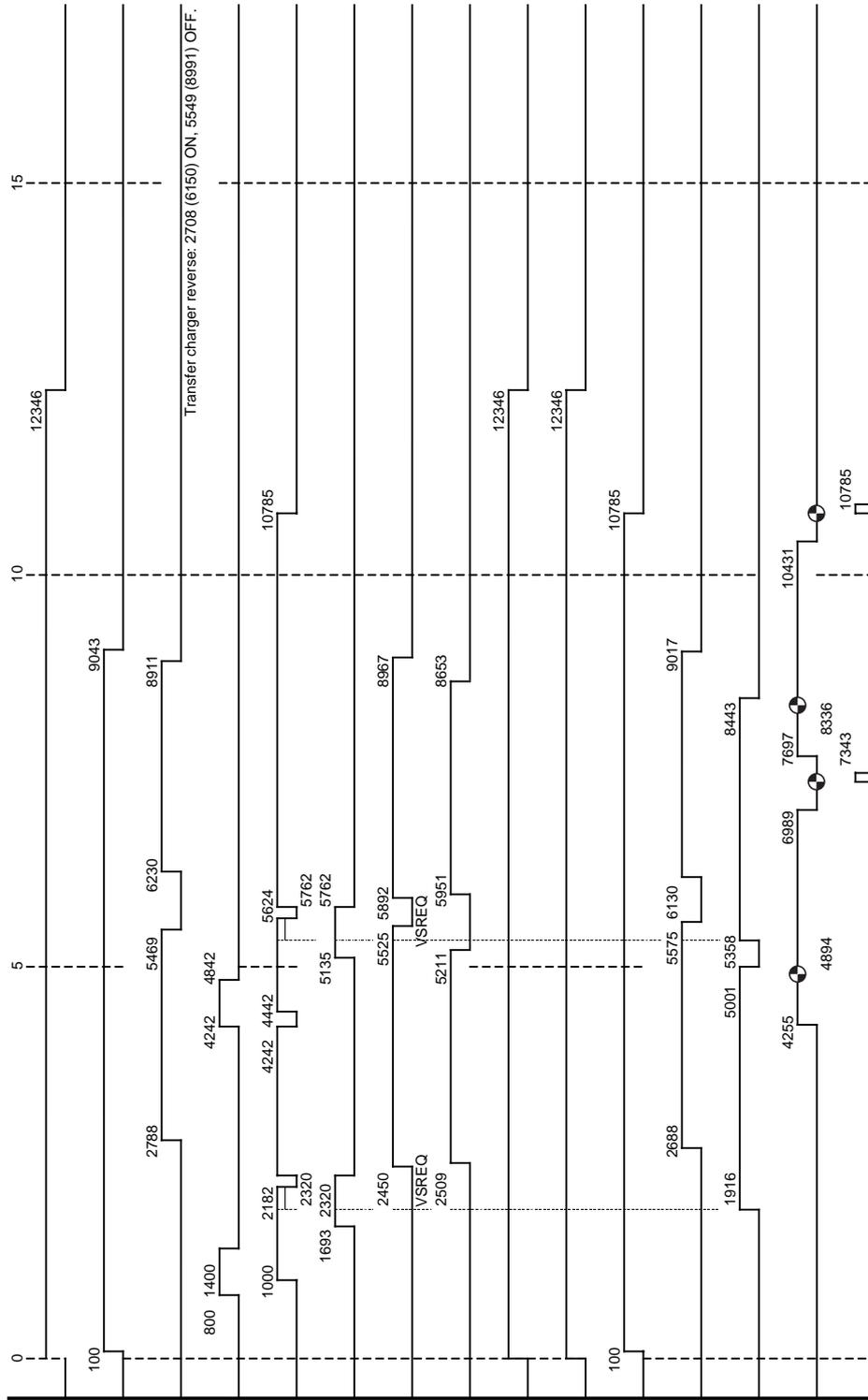
Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 20.40 ppm

● Jam detection timing

Timing chart No. 12 MP tray feeding, two A3 size papers

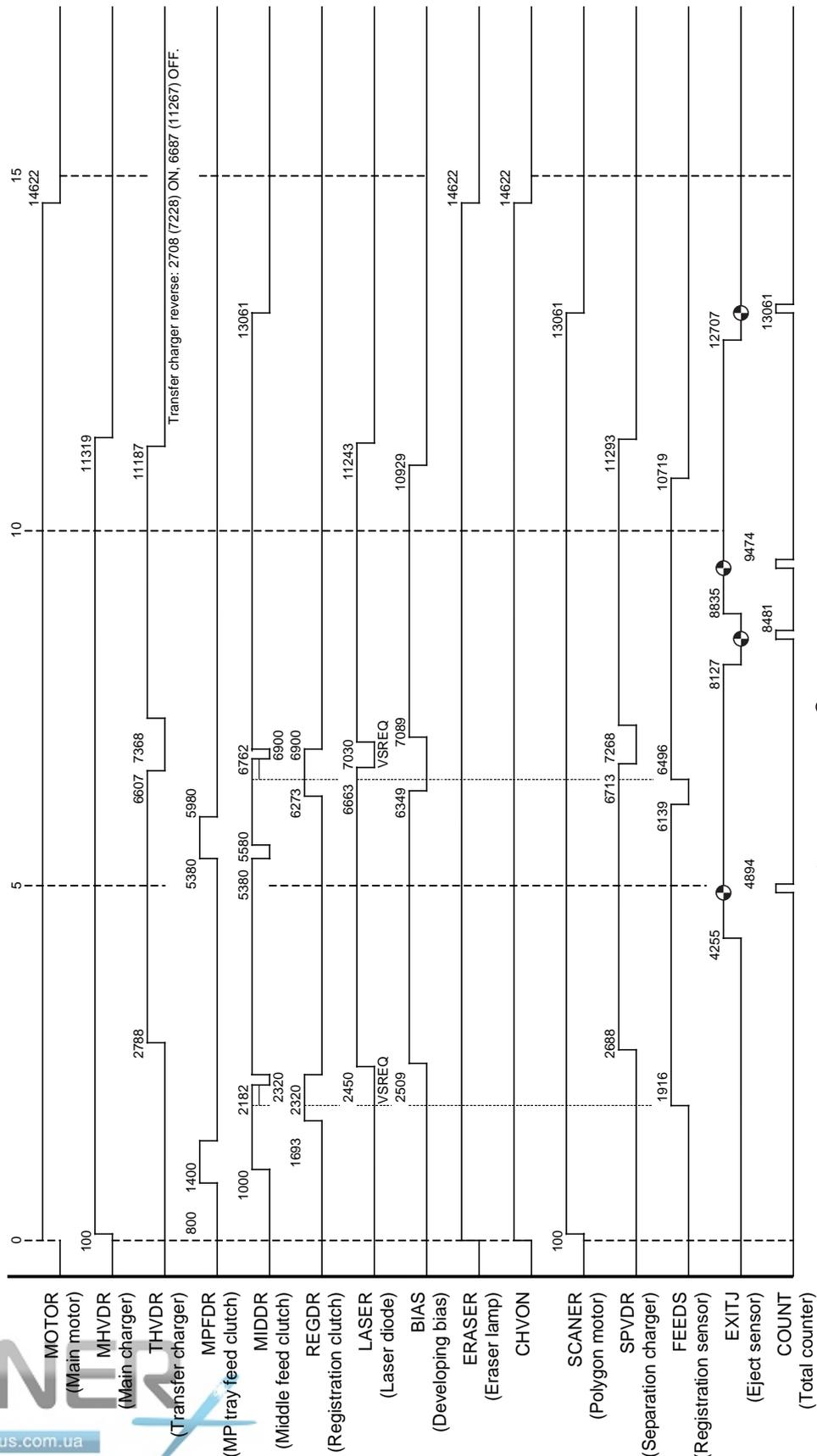


Timing chart No. 13 MP tray feeding, two B5 size papers



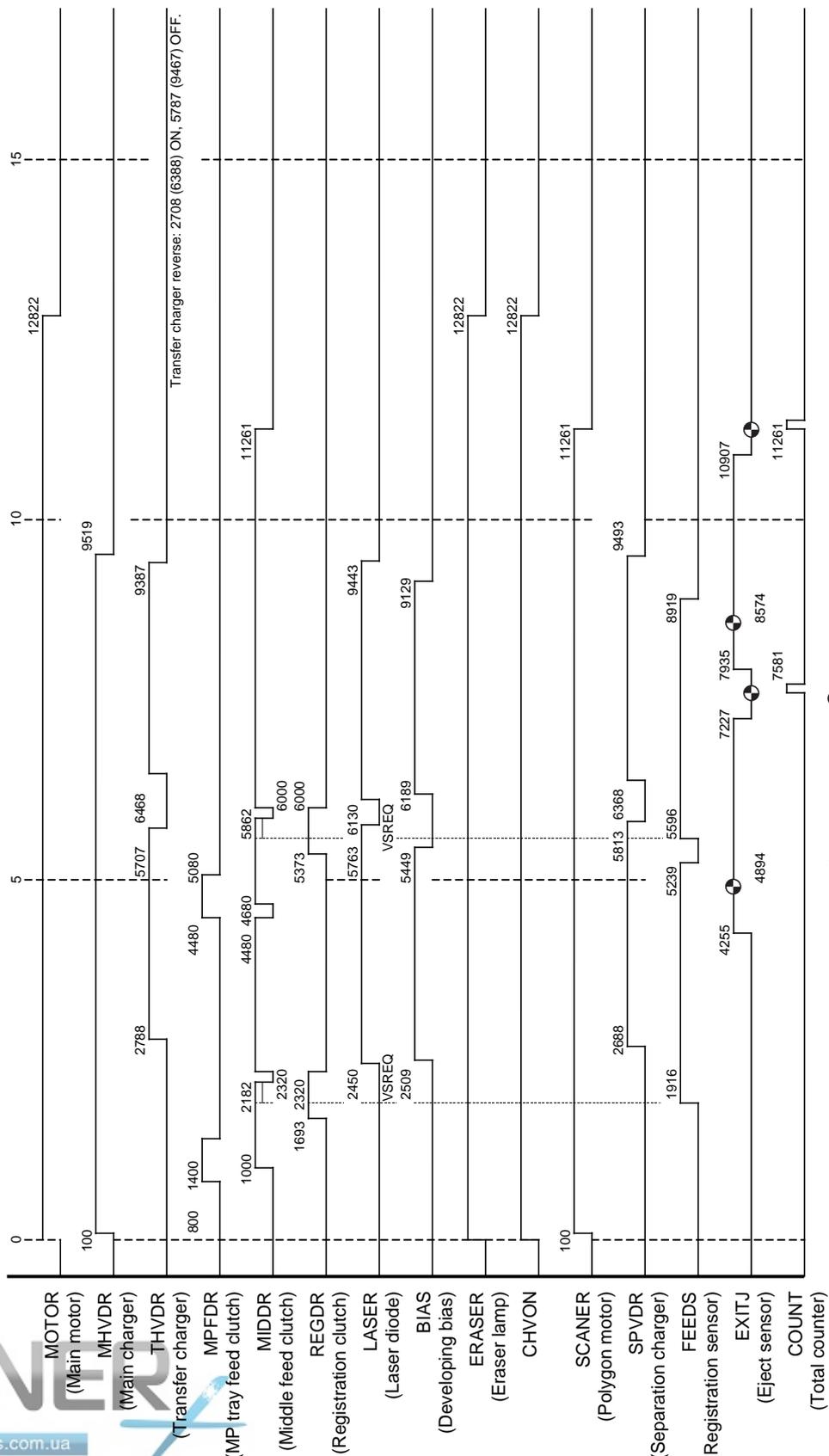
Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 17.43 ppm

Timing chart No. 14 MP tray feeding, two B4 size papers

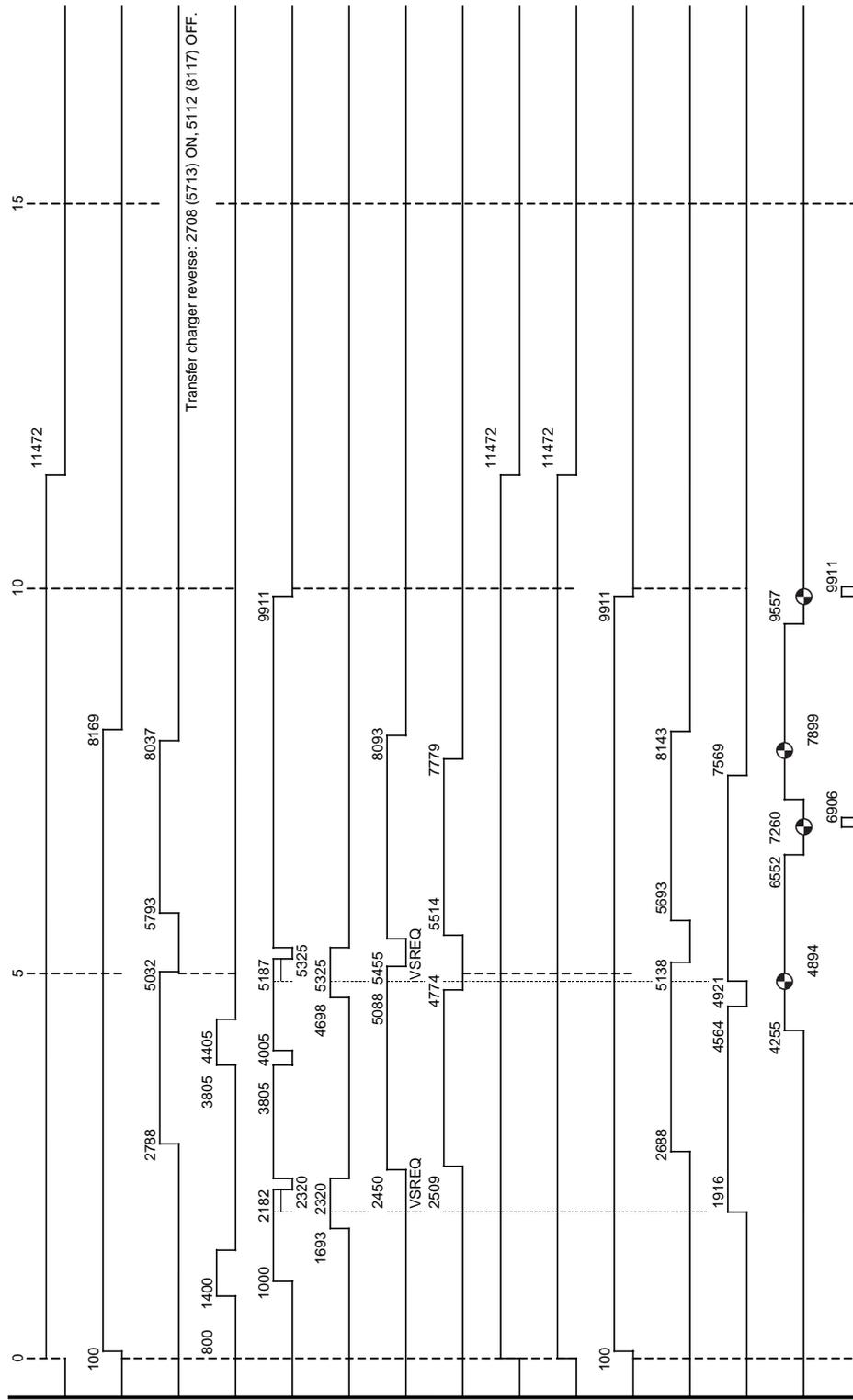


Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 13.10 ppm

Timing chart No. 15 MP tray feeding, two letter R size papers



Timing chart No. 16 MP tray feeding, two letter size papers

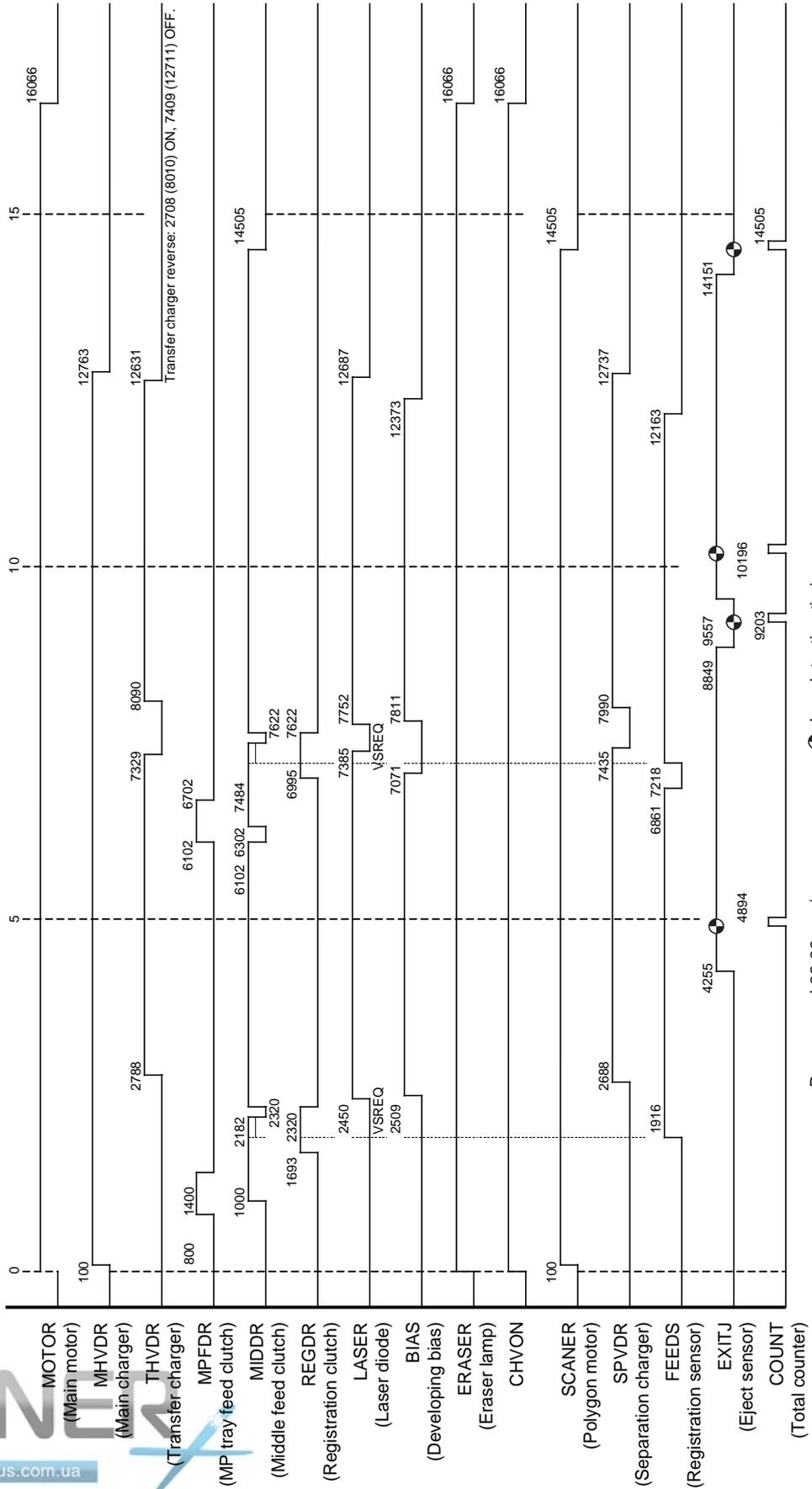


Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 20.00 ppm

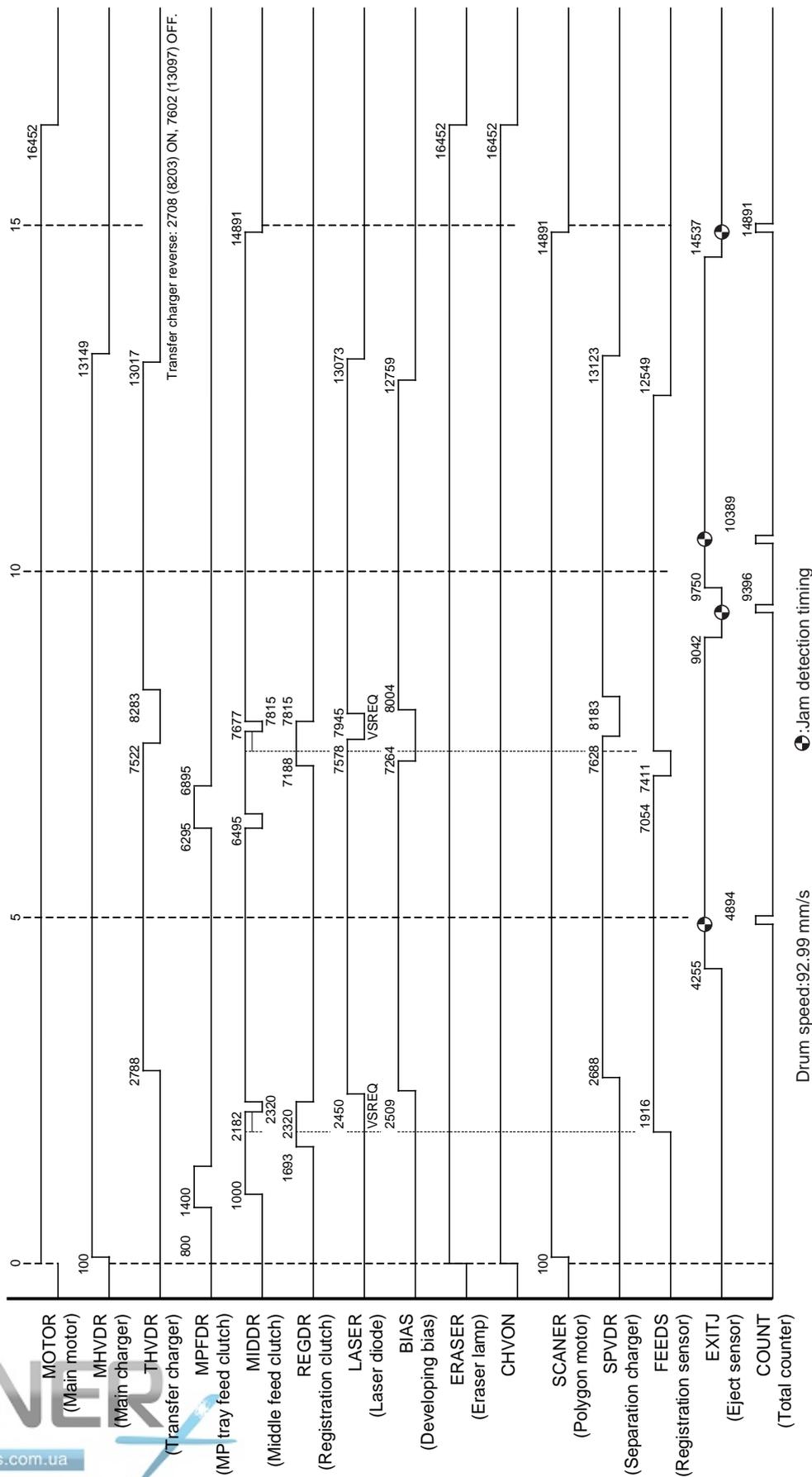
● Jam detection timing



Timing chart No. 18 MP tray feeding, two ledger size papers



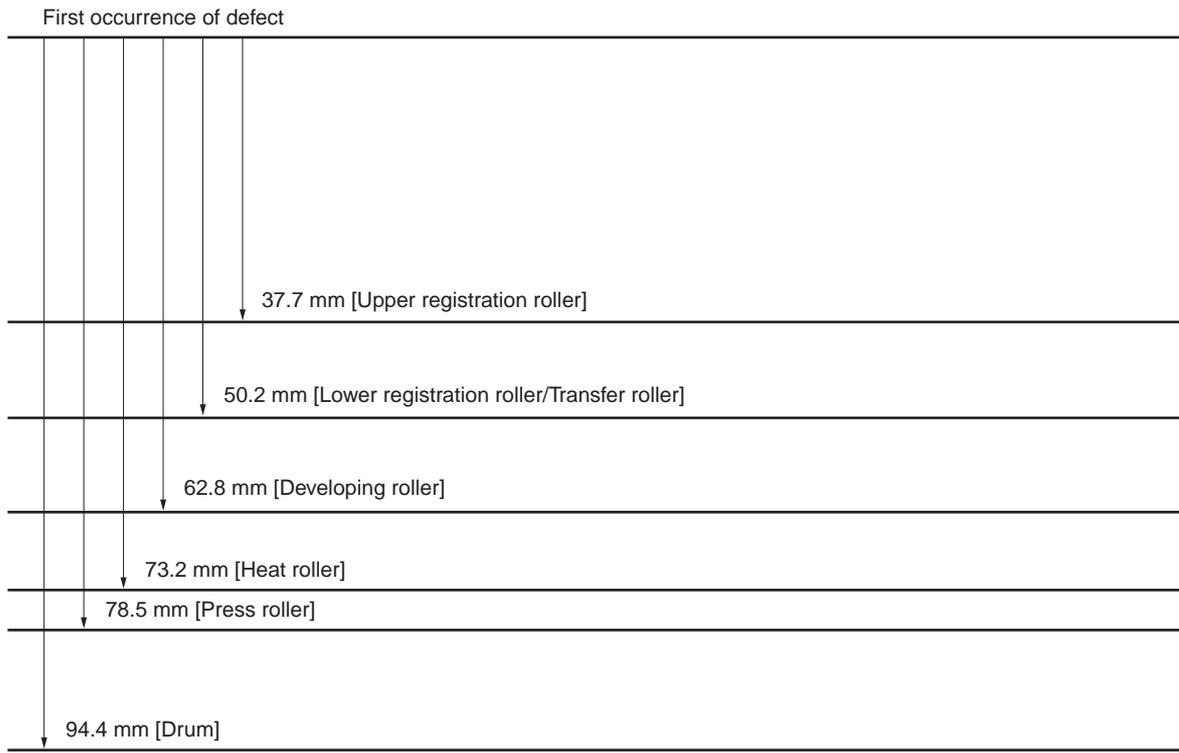
Timing chart No. 19 MP tray feeding, two custom size papers



Drum speed: 92.99 mm/s
 Paper feeding speed: 94.13 mm/s
 Printing speed: 10.92 ppm



Repetitive defects gauge



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