



ECOSYS P2135dn

SERVICE MANUAL

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Rev.2



CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

It may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for proper disposal.

ATTENTION

IL Y A UN RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UN MODÈLE DE TYPE INCORRECT. METTRE AU REBUT LES BATTERIES UTILISÉES SELON LES INSTRUCTIONS DONNÉES.

Il peut être illégal de jeter les batteries dans des eaux d'égout municipales. Vérifiez avec les fonctionnaires municipaux de votre région pour les détails concernant des déchets solides et une mise au rebut appropriée.

Revision history

Revision	Date	Pages	Revised contents
1	5 November 2013	1-1-1	First print time: 8 seconds or less Warm-up time: Numerical change and a low electric power mode addition
		1-1-2	Added: Resolution 300 dpi
		1-2-1	Correction: Machine Top 400 mm/15 3/4"
2	10 April 2014	Contents	Deleted page of contents and added
		1-1-2	Correction: Power source Rated input
		1-3-6	Added: a comment for the item column of (50)
		1-6-3, 1-6-4	Deleted procedure of SD and added emergency update
		2-4-2	Added: Comment to (2)Repetitive defects gauge
		2-4-3	Added: Exchange time of MK
		Address	Correction


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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 power switch on.
 - Always wash hands afterwards.
- Never dispose of toner or toner bottles in fire. Toner may cause sparks when exposed directly to fire in a furnace, etc.
- Should smoke be seen coming from the 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.
- Keep the machine away from flammable liquids, gases, and aerosols. A fire or an electric shock might occur.



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CONTENTS

1-1 Specifications

1-1-1 Specifications	1-1-1
1-1-2 Parts names	1-1-3
(1) Overall	1-1-3
(2) Operation panel	1-1-4
1-1-3 Machine cross section	1-1-5

1-2 Installation

1-2-1 Installation environment	1-2-1
1-2-2 Unpacking	1-2-2
(1) Removing the tapes	1-2-3
1-2-3 Installing the expanded memory (option)	1-2-4
1-2-4 Installing the SD card (optional)	1-2-5

1-3 Maintenance Mode

1-3-1 Service mode	1-3-1
(1) Executing a service item	1-3-1
(2) Contents of service mode items	1-3-2
(3) Printing an event log (EVENT LOG)	1-3-11

1-4 Troubleshooting

1-4-1 Paper misfeed detection	1-4-1
(1) Paper misfeed indication	1-4-1
(2) Paper misfeed detection condition	1-4-1
1-4-2 Self-diagnostic function	1-4-2
(1) Self-diagnostic function	1-4-2
(2) Self diagnostic codes	1-4-3
1-4-3 Image formation problems	1-4-8
(1) Completely blank printout	1-4-9
(2) All-black printout	1-4-9
(3) Dropouts	1-4-10
(4) Black dots	1-4-10
(5) Black horizontal streaks	1-4-10
(6) Black vertical streaks	1-4-11
(7) Unsharpness	1-4-11
(8) Gray background	1-4-11
(9) Dirt on the top edge or back of the paper	1-4-12
(10) Undulated printing at the right edge (scanning start position)	1-4-12
1-4-4 Electric problems	1-4-13
1-4-5 Mechanical problems	1-4-15

1-5 Assembly and Disassembly

1-5-1 Precautions for assembly and disassembly	1-5-1
(1) Precautions	1-5-1
(2) Drum	1-5-1
(3) Toner container	1-5-1
(4) How to tell a genuine Kyocera toner container	1-5-2
1-5-2 Outer covers	1-5-3
(1) Detaching and refitting the top cover	1-5-3
(2) Detaching and refitting the right and left covers	1-5-4
1-5-3 Paper feed section	1-5-6
(1) Detaching and refitting the paper feed roller assembly (paper feed roller and pickup roller)	1-5-6
(2) Detaching and refitting the retard roller assembly	1-5-8
(3) Detaching and refitting the MP paper feed roller	1-5-10
1-5-4 Developing section	1-5-11
(1) Detaching and refitting the developing unit	1-5-11
1-5-5 Drum section	1-5-12
(1) Detaching and refitting the drum unit	1-5-12
(2) Detaching and refitting the main charger unit	1-5-13

1-5-6	Transfer/separation section	1-5-14
(1)	Detaching and refitting the transfer roller	1-5-14
1-5-7	Fuser section	1-5-16
(1)	Detaching and refitting the fuser unit.....	1-5-16
(2)	Switching the fuser pressure	1-5-18
1-5-8	PWBs	1-5-19
(1)	Detaching and refitting the control PWB	1-5-19
(2)	Detaching and refitting the power source PWB.....	1-5-22
(3)	Detaching and refitting the high voltage PWB.....	1-5-24
1-5-9	Others	1-5-28
(1)	Detaching and refitting the main motor	1-5-28
(2)	Detaching and refitting the laser scanner unit.....	1-5-29
(3)	Detaching and refitting the eraser lamp (PWB).....	1-5-31
(4)	Direction of installing the left cooling fan motor and right cooling fan motor	1-5-32
 1-6 Firmware		
1-6-1	Downloading firmware	1-6-1
(1)	Firmware files	1-6-1
(2)	Downloading the firmware from the USB memory	1-6-2
(3)	Emergency-UPDATE	1-6-4
 2-1 Mechanical Construction		
2-1-1	Paper feed/conveying section.....	2-1-1
(1)	Cassette paper feed section.....	2-1-1
(2)	MP tray paper feed section	2-1-2
(3)	Paper conveying section	2-1-3
2-1-2	Drum section.....	2-1-4
(1)	Drum section	2-1-4
(2)	Main charger unit.....	2-1-5
2-1-3	Optical section	2-1-6
(1)	Laser scanner unit.....	2-1-6
2-1-4	Developing section.....	2-1-8
2-1-5	Transfer/separation section	2-1-9
2-1-6	Cleaning section	2-1-10
2-1-7	Fuser section	2-1-11
2-1-8	Paper exit section	2-1-13
2-1-9	Duplex/conveying section	2-1-15
 2-2 Electrical Parts Layout		
2-2-1	Electrical parts layout.....	2-2-1
(1)	PWBs	2-2-1
(2)	Switches and sensors	2-2-3
(3)	Other electrical components.....	2-2-4
 2-3 Operation of the PWBs		
2-3-1	Power source PWB.....	2-3-1
2-3-2	Control PWB	2-3-3
 2-4 Appendixes		
2-4-1	Appendixes	2-4-1
(1)	Wiring diagram	2-4-1
(2)	Repetitive defects gauge.....	2-4-2
(3)	Maintenance parts list	2-4-3

1-1-1 Specifications

Item		Specification
Type		Desktop
Printing method		Electrophotography, laser scan
Paper weight		Cassette: 60 to 120 g/m ² (Duplex: 60 to 105 g/m ²) MP tray: 60 to 220 g/m ²
Paper type	Cassette	Plain, Preprinted, Bond, Recycled, Rough, Letterhead, Color (Colour), Prepunched, High quality, Custom 1 to 8
	MP tray	Plain, Transparency, Preprinted, Labels, Bond, Recycled, Rough, Vellum, Letterhead, Color (Colour), Prepunched, Envelope, Cardstock, Thick paper, High quality, Custom 1 to 8
Paper size	Cassette	A4, JIS B5, A5, Folio, Legal, Letter, Oficio II, Statement, Executive, A6, ISO B5, Envelope C5, 16K, Custom, 216×340 mm
	MP tray:	A4, JIS B5, A5, Folio, Legal, Letter, Oficio II, Statement, Executive, ISO B5, Envelope C5, Envelope #10, Envelope #9, Envelope #6-3/4, Envelope Monarch, Envelope DL, Ofuku Hagaki, 16K, Yokei 2, Yokei 4, Custom, 216×340 mm
Printing speed	Simplex printing	35 ppm (A4) 37 ppm (Letter) 17 ppm (A5)
	Duplex printing	19 ppm (A4) 20 ppm (Letter)
First print time		8 seconds or less (A4, feed from cassette) (Excluding time for system stabilization immediately after turning on the main power.)
Warm-up time (22 °C/71.6 °F, 60%RH)	Power on	16.5 seconds or less
	Low-power	10 seconds or less
	Sleep	16.5 seconds or less
Paper capacity	Cassette	250 sheets (80 g/m ² , A4/Letter or smaller)
	MP tray	50 sheets (80 g/m ² , A4/Letter or smaller)
Output tray capacity	Simplex printing	250 sheets (80 g/m ²)
	Duplex printing	200 sheets (80 g/m ²)
Continuous printing		1 to 999 sheets
Photoconductor		OPC drum (diameter 30 mm)
Image write system		Semiconductor laser (1 beam)
Charging system		Scorotron (positive charging)
Developing system		Mono component dry developing method Toner replenishing: Automatic from the toner container
Transfer system		Transfer roller (negative-charged)
Separation system		Small diameter separation, discharger brush
Cleaning system		Drum: Counter blade

Item		Specification
Charge erasing system		Exposure by eraser lamp (LED)
Fusing system		Heat roller system
Resolution		Fine 1200 mode, Fast 1200 mode, 600 dpi, 300 dpi
Operating environment	Temperature	10 to 32.5 °C/50 to 90.5 °F
	Humidity	15 to 80%
	Altitude	2,500 m/8,202 ft maximum
	Brightness	1,500 lux maximum
Controller		PowerPC 465 500 MHz
Memory	Standard	256 MB
	Maximum	1280 MB
Supported OS		Windows XP, Windows Vista, Windows 7, Windows 8, Windows Server 2003, Windows Server 2008, Windows Server 2012, Windows Server 2012 R2, Apple Macintosh OS 10.x
Interface		USB interface (USB 2.0): 1 Network: 1 (10BASE-T/100BASE-TX/1000BASE-T) USB host (USB 2.0): 1 KUIO-W slot: 1
PDL		PRESCRIBE
Dimension (W × D × H)		375 × 393 × 267 mm 14 3/4 × 15 1/2 × 10 1/2"
Weight (without toner container)		12 kg/26.5 lb or less
Rated input		120 V AC, 60 Hz, 8.0 A 220 to 240 V AC, 50/60 Hz, 4.2 A
Options		Expanded memory, Paper feeder × 2

NOTE: These specifications are subject to change without notice.

1-1-2 Parts names

(1) Overall

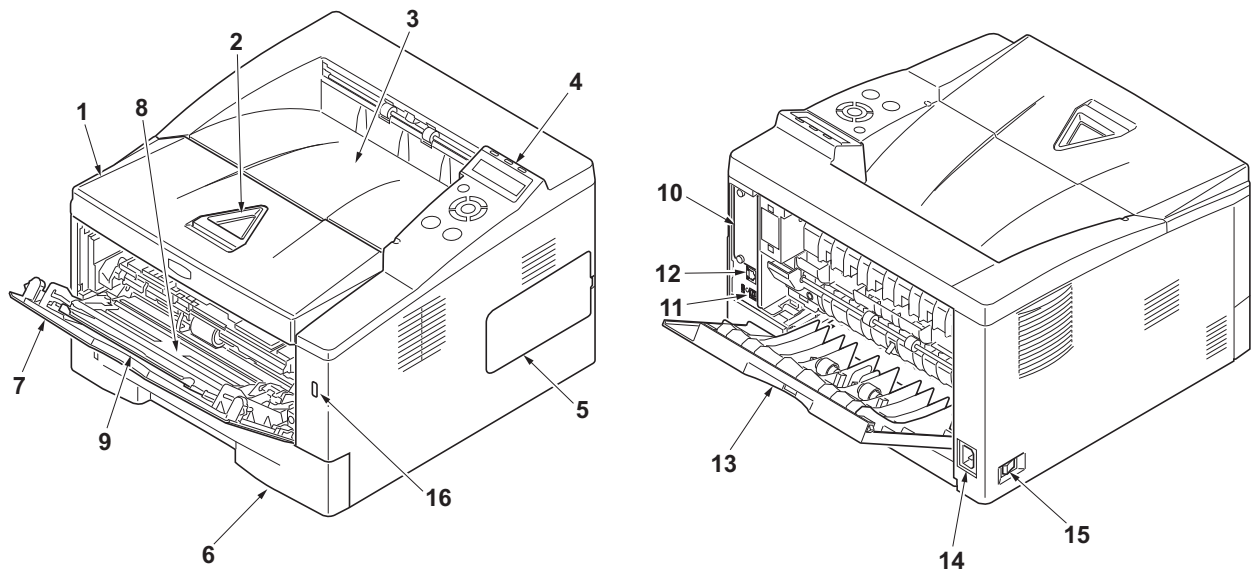


Figure 1-1-1

- | | |
|---------------------|-----------------------------------|
| 1. Top cover | 9. Sub tray |
| 2. Paper stopper | 10. Optional interface slot cover |
| 3. Top tray | 11. USB interface connector |
| 4. Operation panel | 12. Network interface connector |
| 5. Right side cover | 13. Rear cover |
| 6. Cassette | 14. Power cord connector |
| 7. Front cover | 15. Power switch |
| 8. MP tray | 16. USB memory slot |

(2) Operation panel

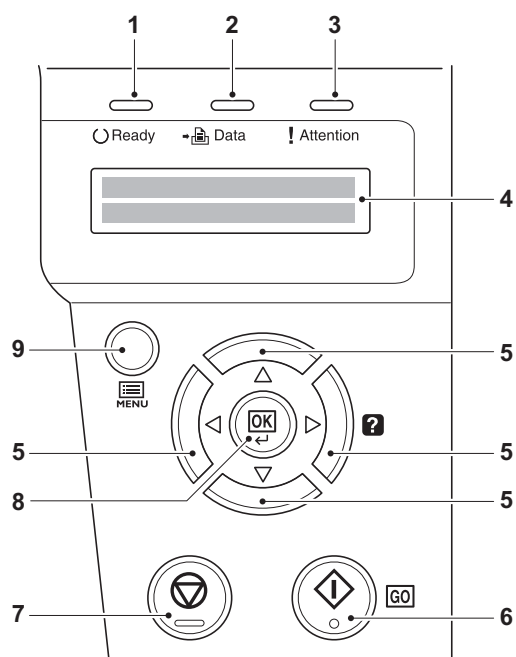


Figure 1-1-2

1. Ready indicator
2. Data indicator
3. Attention indicator
4. Message display
5. Cursor keys
6. GO key
7. CANCEL key
8. OK key
9. MENU key

1-1-3 Machine cross section

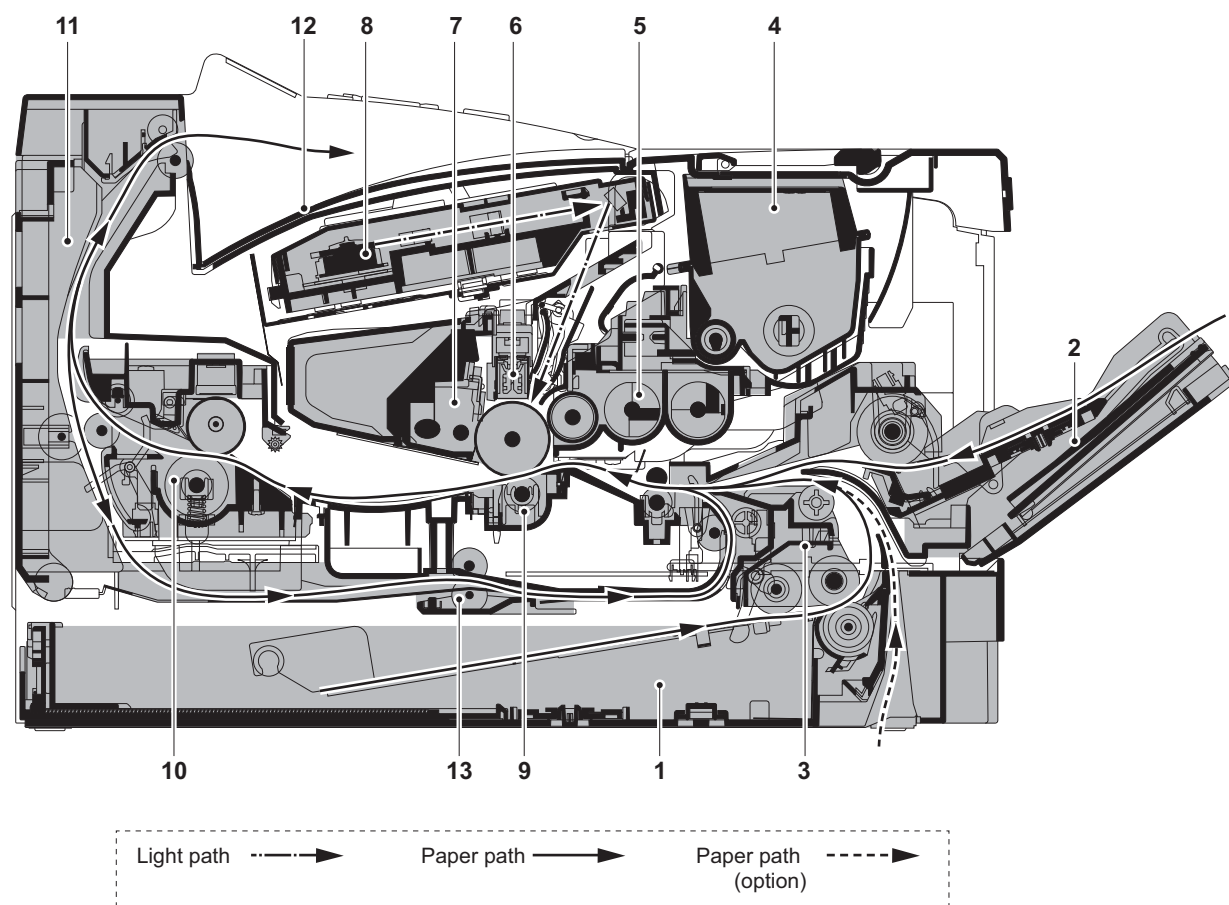


Figure 1-1-3

- | | |
|---------------------------------|--------------------------------|
| 1. Cassette | 7. Drum unit |
| 2. MP tray | 8. Laser scanner unit |
| 3. Paper feed/conveying section | 9. Transfer/separation section |
| 4. Toner container | 10. Fuser section |
| 5. Developing unit | 11. Paper exit section |
| 6. Main charger unit | 12. Top tray |
| | 13. Duplex/conveying section |

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1-2-1 Installation environment

1. Temperature: 10 to 32.5°C/50 to 90.5°F
2. Humidity: 15 to 80%RH
3. Power supply: 120 V AC, 8.0 A
220 - 240 V AC, 4.2 A
4. Power source frequency: 50 Hz $\pm 0.3\%$ /60 Hz $\pm 0.3\%$
5. Installation location

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

Avoid locations subject to high temperature and high humidity or low temperature and low humidity; an abrupt change in the environmental temperature; and cool or hot, direct air.

Avoid places subject to dust and vibrations.

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

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

Avoid air-borne substances that may adversely affect the machine or degrade the photoconductor, such as mercury, acidic or alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.

Select a well-ventilated location.
6. Allow sufficient access for proper operation and maintenance of the machine.

Machine front: 500 mm/19 11/16"

Machine rear: 200 mm/7 7/8"

Machine right: 300 mm/11 13/16"

Machine left: 300 mm/11 13/16"

Machine top: 400 mm/15 3/4"

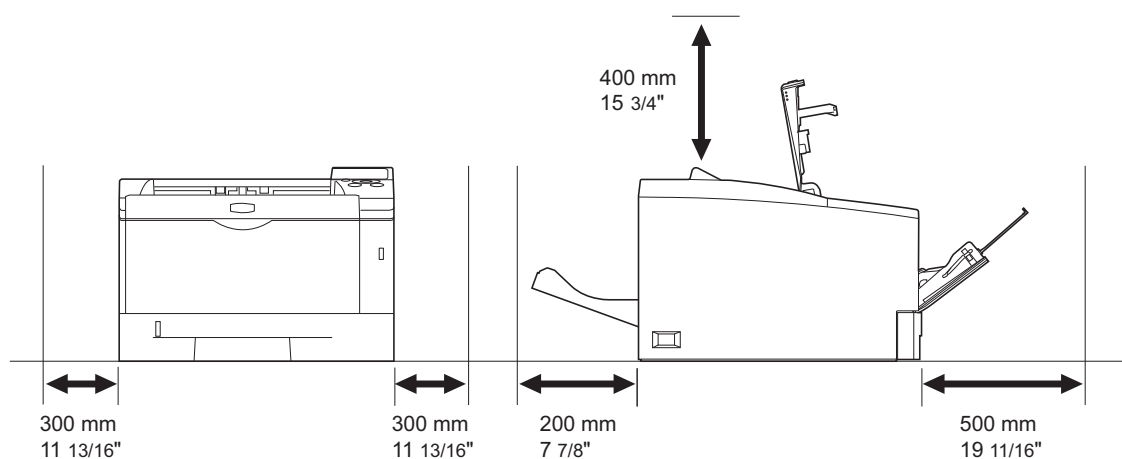
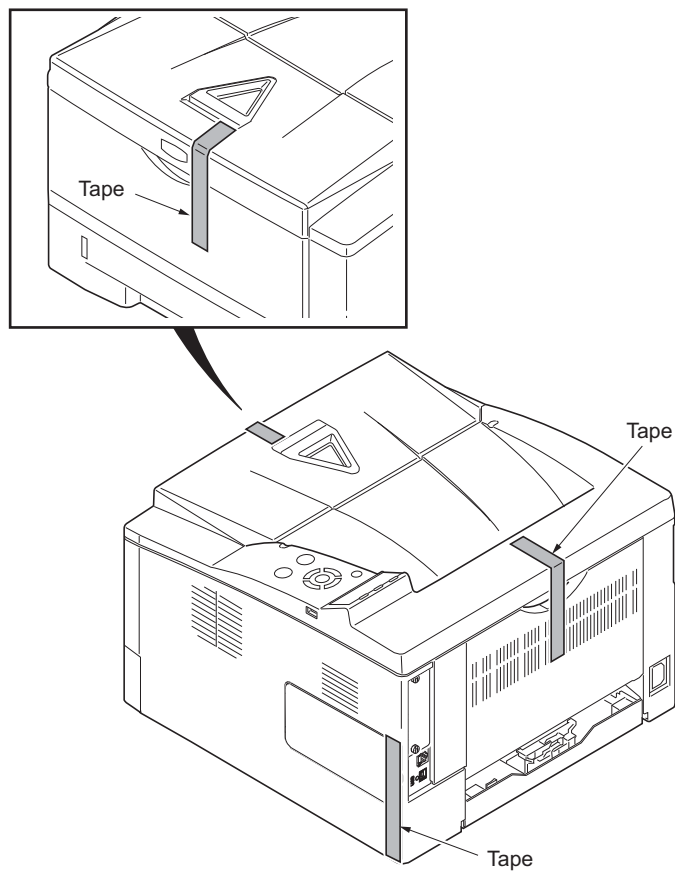


Figure 1-2-1

(1) Removing the tapes**Procedure**

1. Remove three tapes.

**Figure 1-2-3**

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

Procedure

1. Turn off printer power switch.
Caution: Do not insert or remove expanded memory while printer power is on.
Doing so may cause damage to the printer and the expanded memory.
2. Remove the right side cover.
3. Remove the tape.

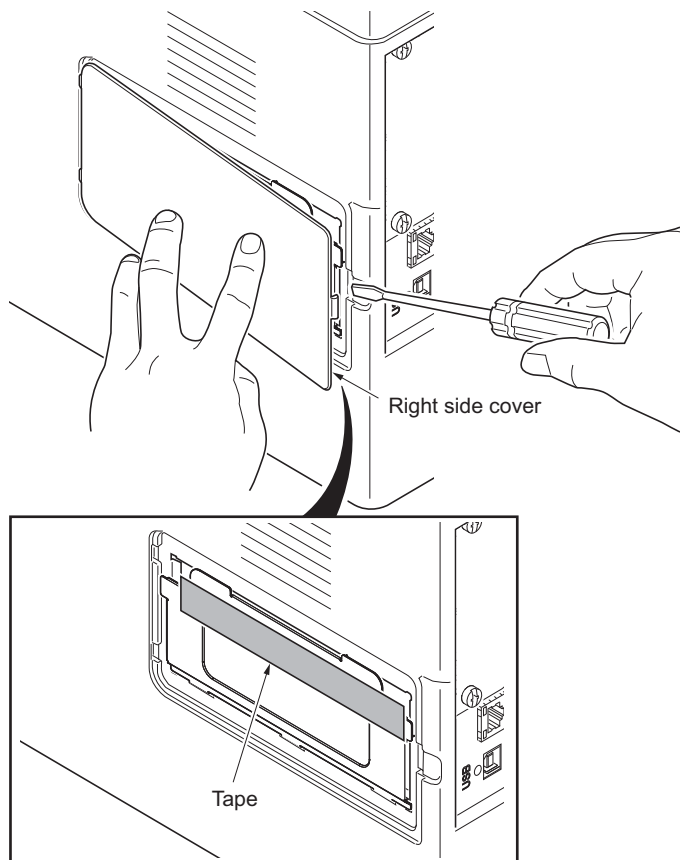


Figure 1-2-4

4. Open the memory slot cover.
 5. Insert the expanded memory into the memory socket so that the notches on the memory align with the corresponding protrusions in the slot.
 6. Close the memory slot cover.
 7. Refit the right side cover.
 8. Print a status page to check the memory expansion (See page 1-3-2).
- If memory expansion has been properly performed, information on the installed memory is printed with the total memory capacity has been increased. Standard memory capacity 128 MB.

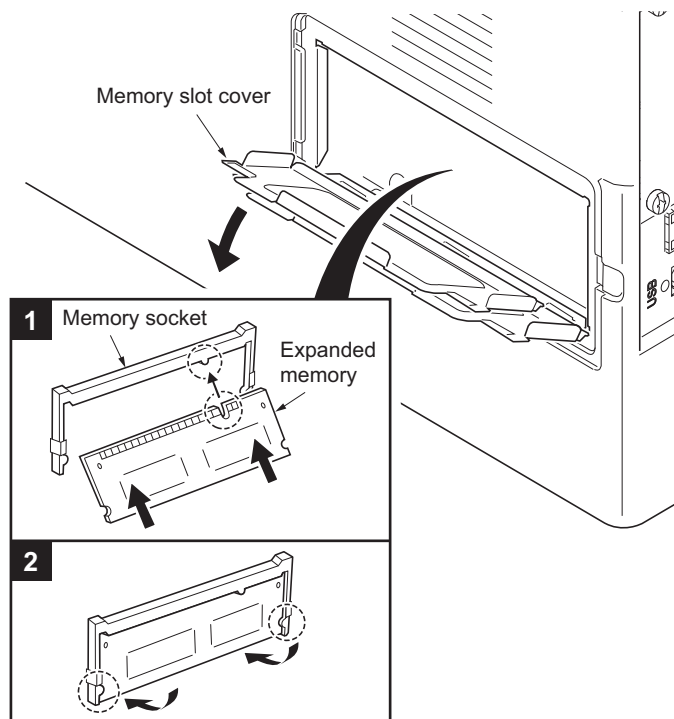


Figure 1-2-5

1-2-4 Installing the SD card (optional)

Procedure

1. Turn off printer power switch.
 Caution: Do not insert or remove SD card while printer power is on.
 Doing so may cause damage to the printer and the SD card.
2. Open the rear cover.

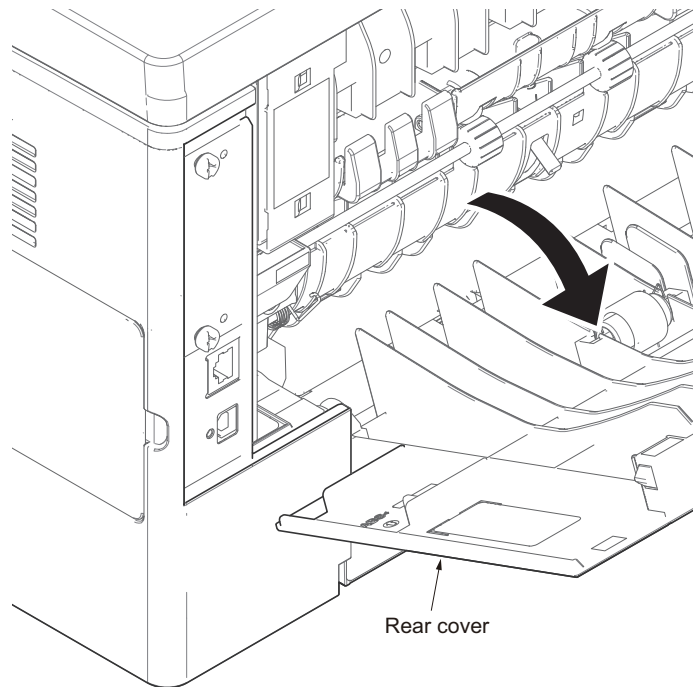


Figure 1-2-6

3. Remove two screws and then remove the optional interface slot cover.
4. Insert the SD card into the SD card slot. Push it in all the way.
5. Secure the optional interface slot cover by using two screws.
6. Format the SD card before use.

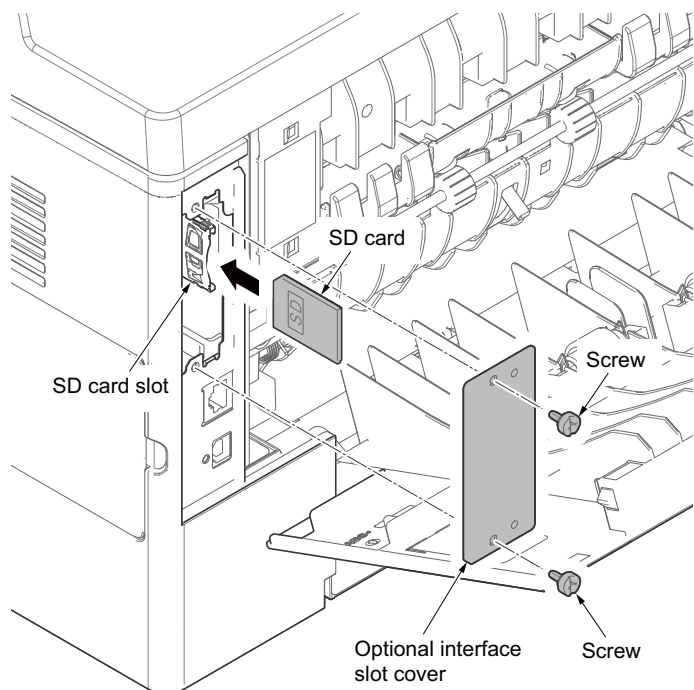


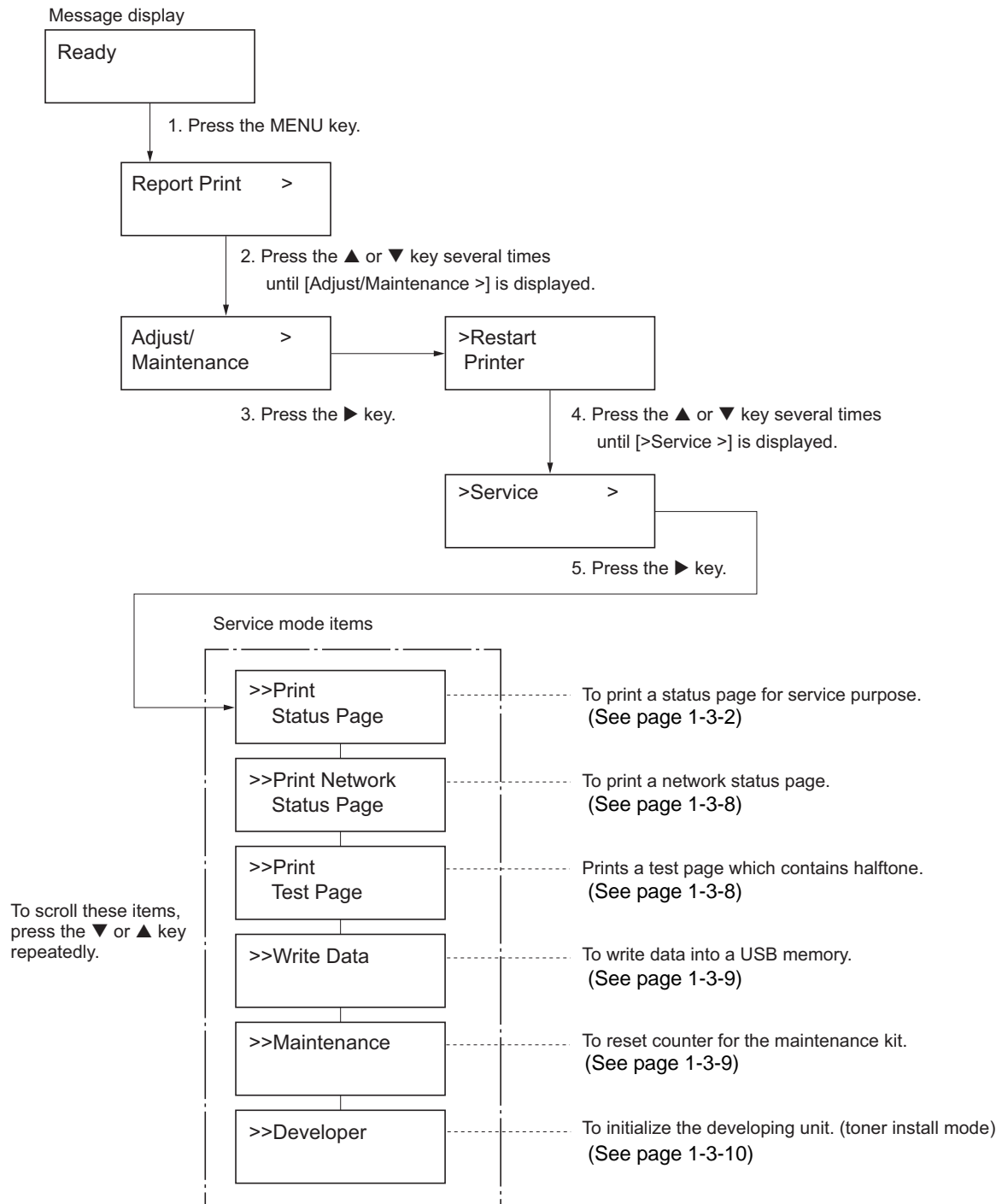
Figure 1-2-7

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1-3-1 Service mode

The printer is equipped with a service function which can be used to maintain and service the machine.

(1) Executing a service item



(2) Contents of service mode items

Service items	Description
<div>>>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 printing settings and service cumulative.</p> <p>Purpose To acquire the current printing environmental parameters and cumulative information.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Print Status Page]. 2. Press the OK key. [Print Status Page?] will be displayed. 3. Press the OK key. [Processing] will be displayed. Two pages will be printed. <p>Completion</p>

Service Status Page

Printer

(2) 2013/06/29 15:15

(1) Firmware version 2PJ_2000.000.000 2013.06.29 (3) [XXXXXXXX] (4) [XXXXXXXX] (5) [XXXXXXXX]

Controller Information

Memory status

(7) Standard Size	128.0 KB	.
(8) Option Slot	128.0 KB	.
(9) Total Size	256.0 KB	.

Time

(10) Local Time Zone	+01:00 Tokio	.
(11) Date and Time	19/06/2010 16:39	.
(12) Time Server	10.183.53.13	.

Installed Options

(13) Paper feeder2	Installed	.
(14) Paper feeder3	Installed	.
(15) Memory card	Installed	.

Print Setting

(16) MP Tray Priority	Auto feed	.
-----------------------	-----------	---

(17) Print Coverage

(18) Average(%)	/ Usage Page(A4/Letter Conversion)	PDF mode	Y5	00
K: 1.10	/ 1111111.11			

(19) Last Page (%) 1.00

(20) FRPO Status

User Top Margin	A1+A2/100	0.00
User Left Margin	A3+A4/100	0.00
.	.	.
.	.	.

(21) RP Code

1234 5678 9012
5678 9012 3456
9012 3456 7890
3456 7890 1234

1 (6) [XXXXXXXXXXXXXXXXXXXX]

Figure 1-3-1 Service status page 1

TONER
www.tonerplus.com.ua

Figure 1-3-2Service status page 2

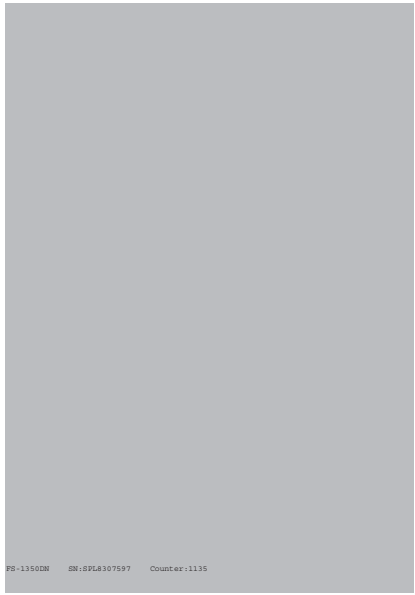
Service items		Description
Details of service status page		
No.	Items	Description
(1)	Firmware version	-
(2)	System date	-
(3)	Engine soft version	-
(4)	Engine boot version	-
(5)	Operation panel mask version	-
(6)	Machine serial number	-
(7)	Standard memory size	-
(8)	Optional memory size	-
(9)	Total memory size	-
(10)	Local time zone	-
(11)	Report output date	Day/Month/Year hour:minute
(12)	NTP server name	-
(13)	Presence or absence of the optional paper feeder 2	Installed/Not Installed
(14)	Presence or absence of the optional paper feeder 3	Installed/Not Installed
(15)	Presence or absence of the optional memory card (SD card)	Installed/Not Installed
(16)	MP Tray Priority Setting	OFF/Auto Feed/Always
(17)	Page of relation to the A4/Letter	* :Print Coverage provides a close-matching reference of toner consumption and will not match with the actual toner consumption.
(18)	Average coverage for printer	Black
(19)	Coverage on the final output page	-
(20)	FRPO setting	-
(21)	RP Code	Code the engine software version and the date of update. Code the main software version and the date of update. Code the engine software version and the date of the previous update. Code the main software version and the date of the previous update.

Service items		Description
No.	Items	Description
(22)	NV RAM version	_ 1F3 1225 _ 1F3 1225 (a) (b) (c) (d) (e) (f) (a) Consistency of the present software version and the database _ (underscore): OK * (Asterisk): NG (b) Database version (c) The oldest time stamp of database version (d) Consistency of the present software version and the ME firmware version _ (underscore): OK * (Asterisk): NG (e) ME firmware version (f) The oldest time stamp of the ME database version Normal if (a) and (d) are underscored, and (b) and (e) are identical with (c) and (f).
(23)	Mac address	-
(24)	The last sent date and time	-
(25)	Transmission address	-
(26)	Destination information	-
(27)	Area information	-
(28)	Margin settings	Top margin/Left margin
(29)	Top offset for each paper source	MP tray/Paper feeder 1/Paper feeder 2/ Duplex/Page rotation
(30)	Left offset for each paper source	MP tray/Paper feeder 1/Paper feeder 2/ Duplex/Page rotation
(31)	L value settings	Top margin integer part / Top margin decimal part/ Left margin integer part / Left margin decimal part/
(32)	Life counter (The first line)	Machine life/MP tray/Cassette/Paper feeder 1/ Paper feeder 2/Duplex
	Life counter (The second line)	Drum counter K/ Developer counter K/Maintenance kit counter
(33)	Panel lock information	F00: OFF F01: Partial Lock 1 F02: Partial Lock 2 F03: Partial Lock 3 F04: Full Lock

Service items		Description	
No.	Items	Description	
(34)	USB information	U00: Not installed U01: Full speed U02: Hi speed	
(35)	Paper handling information	0: Paper source unit select 1: Paper source unit	
(36)	Auto cassette change	0:Auto cassette change prohibition 1:Auto cassette change permission	
(37)	Black and white printing double count mode	0: All single counts 3: Folio, Single count, Less than 330 mm (length)	
(38)	Billing counting timing	-	
(39)	Temperature (machine inside)	-	
(40)	Temperature (machine outside)	-	
(41)	Relative temperature (machine outside)	-	
(42)	Absolute temperature (machine outside)	-	
(43)	XLI calibration information	-	
(44)	Beam A/BD synchronous fine-tuning value	-	
(45)	Beam B/BD synchronous fine-tuning value	-	
(46)	Fixed assets number	-	
(47)	Job end judgment time-out time	-	
(48)	Job end detection mode	-	
(49)	PRESCRIBE environmental reset	-	
(50)	Media type attributes 1 to 28 (Not used: 18, 19, 20) * : For details on settings, refer to MDAT command in "Prescribe Commands Reference Manual.	Weight settings 0: Light 1: Normal 1 2: Normal 2 3: Normal 3 4: Heavy 1 5: Heavy 2 6: Heavy 3 7: Extra Heavy	Fuser settings 0: High 1: Middle 2: Low 3: Vellum Duplex settings 0: Disable 1: Enable

Service items		Description																				
No.	Items	Description																				
(51)	RFID information	Product (OEM/maker) / destination code / a toner name / lot number / toner capacity / toner empty information / number of times of toner refilling																				
(52)	Toner install mode information	0:OFF t:ON																				
(53)	Engine parameter information	-																				
(54)	DRT table number	-																				
(55)	DRT parameter coefficient	-																				
(56)	Soft version of the optional paper feeder	Paper feeder 1/Paper feeder 2																				
(57)	Version of the optional message	-																				
(58)	Toner Low setting	0: Invalid 1: Effective																				
(59)	Toner Low detection level	0 to 100(%)																				
(60)	ErP application	0: ErP Un-Applying mode 1: ErP Application mode																				
(61)	Full page printing mode	0: Normal mode (The factory default settings) 1: Full page mode																				
(62)	Wake UP mode	0: OFF (Don't wake up) 1: ON (Do wake up)																				
(63)	Wake Up Timer	Displays the wake-up time																				
(64)	Drum ID	-																				
(65)	Drum serial number	-																				
<div>Code conversion</div> <table><tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>I</td><td>J</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr></table>			A	B	C	D	E	F	G	H	I	J	0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J													
0	1	2	3	4	5	6	7	8	9													

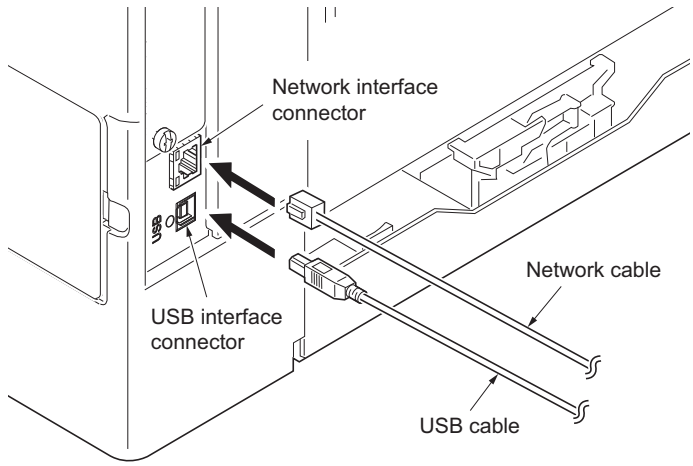
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Service items	Description
<div data-bbox="172 253 435 338" style="border: 1px solid black; padding: 5px; width: fit-content;"> >>Print Network Status Page </div>	<p>Printing a status page for network</p> <p>Description On the status page for network, detailed network setting information is printed.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Print Network Status Page]. 2. Press the OK key. [>>Print Network Status Page?] will be displayed. 3. Press the OK key. Three sheets of network status page will be printed. <p>Completion</p>
<div data-bbox="172 595 435 680" style="border: 1px solid black; padding: 5px; width: fit-content;"> >>Print Test Page </div>	<p>Printing a test page</p> <p>Description Prints a test page which contains halftone.</p> <p>Purpose To check the activation of the developer and drum units.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Print Test Page]. 2. Press the OK key. [>>Print Test Page?] will be displayed. 3. Press the OK key. A sheet of test page will be printed. <p>Completion</p> <div data-bbox="750 960 1192 1581" style="border: 1px solid black; padding: 10px; margin: 20px auto; width: 277px; height: 277px;">  </div> <p style="text-align: center;">Figure 1-3-3</p>

Service items	Description
<div data-bbox="177 259 440 344" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">>>Write Data</div>	<p>Write data (USB memory data write)</p> <p>Description To write data into a USB memory.</p> <p>Procedure Install the USB memory before attempting to write data.</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Write Data]. 2. Press the OK key. [>>Write Data?] will be displayed. 3. Press the OK key. [Data waiting] is displayed and the printer waits for data to be written. 4. When the data is sent, [Processing] appears and the data is written to USB memory. When data writing ends, the display returns to [Ready]. <p>Completion</p>
<div data-bbox="177 716 440 801" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">>>Maintenance</div>	<p>Counter reset for the maintenance kit</p> <p>Description The "Install MK" message means that maintenance kit should be replaced at 100,000 pages of printing. The interval counter must be manually reset using this service item.</p> <p>Maintenance kit MK-172 (for 120 V specifications) Maintenance kit MK-170 (for 230 V specifications) Maintenance kit MK-174 (for 240 V specifications)</p> <p>Maintenance kit includes the following units: Drum unit Developing unit</p> <p>Purpose To reset the life counter for the developing unit and drum unit included in maintenance kit.</p> <p>Procedure for replacing the maintenance kit Drum unit (See page 1-5-12) Developing unit (See page 1-5-11)</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Maintenance]. 2. Press the OK key. [>>Maintenance?] will be displayed. 3. Press the OK key twice. The counter for each component is reset immediately. <p>Completion</p> <p>Note: Occurrences of resetting the maintenance kits are recorded on the service status page or event log in number of pages at which the maintenance kit was replaced (See page 1-3-2, 1-3-11). This may be used to determine the possibility that the counter was erroneously or unintentionally reset.</p>

Service items	Description
<div data-bbox="177 259 440 344" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">>>Developer</div>	<p>Toner install mode</p> <p>Description The new developing unit is shipped from the factory with no toner contained. The developing unit can be automatically replete with toner when a toner container is installed onto it and the printer is turned on. However, because the toner reservoir in the developing unit has a large capacity, it requires a lengthy period of time until a substantial amount of toner has been fed to get the printer ready. (A new developing unit needs approximately 260 g for triggering the sensor inside.)</p> <p>Purpose To execute when the developing unit has been replaced.</p> <p>Method</p> <ol style="list-style-type: none"> 1. Enter the maintenance mode [>>Developer]. 2. Press the OK key. [>>Developer?] will be displayed. 3. Press the OK key. [Ready] will be displayed. 4. Turn off and on the printer. [Self test] [Please wait (Adding toner)] will displayed. The printer continually engages in this mode for a period of approximately 15 minutes, after which the printer reverts to the [Ready] state. [Ready] will displayed. Developing unit initialization is finished. <p>Completion</p>

(3) Printing an event log (EVENT LOG)

Service items	Description
Printing an event log (EVENT LOG)	<p>Printing an event log (EVENT LOG)</p> <p>Description Prints a history list of occurrences of paper jam, self-diagnostics, toner replacements, etc.</p> <p>Purpose To allow machine malfunction analysis based on the frequency of paper misfeeds, self diagnostic errors and replacements.</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Connect the USB or network cable between printer and PC (network). 2. Connect the power cord.  <p style="text-align: center;">Figure 1-3-4</p> <ol style="list-style-type: none"> 3. Turn printer power on. Make sure the printer is ready. 4. Send the following PRESCRIBE command sequence from the PC to the printer. <pre>!R!KCFG"ELOG";EXIT;</pre> <p>A sheet of event log will be printed.</p> <p>Completion</p> <p>Remarks: Details of configurations (See above 4.)</p> <p>Notes on Connecting to USB</p> <ol style="list-style-type: none"> (1) Save the Prescribe commands above as a text file in the PC. (2) Select the Sharing tab of the printer properties and share the printer. (3) Select a USB port in the Port tab. (Specify the printer name for sharing.) (4) From the DOS Prompt, execute the following command line: copy file-name\\computer-name\shared-printe File-name should be the name of the file that was saved in step 1. <p>Notes on connecting via network (using FTP protocol)</p> <ol style="list-style-type: none"> (1) Save the Prescribe commands above as a text file in the PC. (2) From the DOS Prompt, execute the following command line: ftp printer-IP-address Do not specify user name and password. (3) From the DOS Prompt, execute the following command: put file-name File-name should be the name of the file that was saved in step 1.

Service items	Description
	Detail of event log

Event Log

Printer

(1) Firmware version 2PJ_2000.000.000 2013.05.31

(2) 2013/05/31 15:15

(3) [XXXXXXXX] (4) [XXXXXXXX] (5) [XXXXXXXX]

(7) Paper Jam Log

#	Count.	Event Descriptions	Data and Time
12	1876543	0501.01.08.01.01	2013/03/02 11:11
11	166554	4020.01.08.01.01	2013/03/02 10:57
10	4988	0501.01.08.01.01	2013/03/02 10:44
9	4988	4020.01.08.01.01	2013/03/02 10:00
8	1103	0501.01.08.01.01	2013/03/02 09:27
7	1103	4020.01.08.01.01	2013/03/01 17:30
6	1027	0501.01.08.01.01	2013/03/01 10:02
5	1027	4020.01.08.01.01	2013/03/01 08:57
4	1027	0501.01.08.01.01	2013/02/29 17:00
3	1027	4020.01.08.01.01	2013/02/29 15:38
2	406	0501.01.08.01.01	2013/02/28 09:00
1	36	4020.01.08.01.01	2013/02/28 08:12

0501.01.08.01.01

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

(11) Counter Log

(f) J0100: 0	(g) C0000: 0	(h) T00: 10
J0105: 0	C0001: 1	T01: 20
J0106: 0	C0002: 2	T02: 30
J0110: 0	C0003: 3	T03: 40
J0111: 0	C0004: 4	T04: 50
J0512: 0	C0005: 5	T05: 999
J0513: 0	C0006: 6	
J0518: 0	C0007: 7	
J0519: 0	C0008: 8	
J1020: 0	C0009: 9	
J4201: 0	C0010: 10	
J4202: 0	C0011: 11	
J4203: 0		
J4208: 0		
J4209: 0		
.		
.		
.		
.		
.		
.		

(8) Service Call Log

#	Count.	Service Code	Data and Time
8	1881214	01.6000	2013/03/02 11:11
7	178944	01.2100	2013/03/02 10:57
6	5296	01.4000	2013/03/02 10:44
5	5295	01.6000	2013/03/02 10:00
4	2099	01.2100	2013/03/02 09:27
3	1054	01.4000	2013/03/01 17:30
2	809	01.6000	2013/03/01 10:02
1	30	01.2100	2013/03/01 08:57

(9) Maintenance Log

#	Count.	Item	Data and Time
3	104511	01.00	2013/03/02 11:11
2	3454	01.01	2013/03/02 10:57
1	34	01.01	2013/03/02 10:44

(10) Unknown toner Log

#	Count.	Item	Data and Time
4	3454	01.00	2013/03/02 11:11
3	3454	01.00	2013/03/02 10:57
2	406	01.00	2013/03/02 10:44
1	32	01.00	2013/03/02 10:00

(6) [XXXXXXXXXXXXXXXXXXXXX]

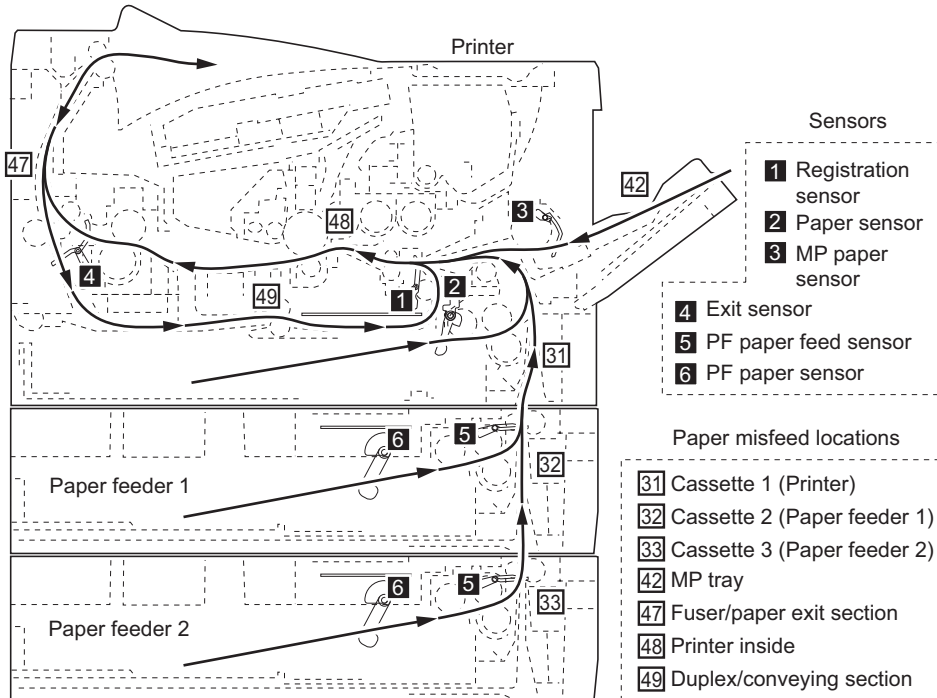
Figure 1-3-5 Event log

No.	Items	Description
1	Firmware version	-
2	Engine software version	-
3	Engine boot version	-
4	Main ROM version	-
5	Panel mask version	-
6	Machine serial number	-

Service items		Description		
7	Paper Jam Log	Description		
		#	Count.	Event
		Remembers 1 to 16 of occurrence. If the occurrence of the previous paper jam is less than 16, all of the paper jams are logged. When the occurrence exceeded 16, the oldest occurrence is removed.	The total page count at the time of the paper jam.	Log code (2 digit, hexadecimal, 5 categories) (a) Cause of a paper jam (b) Paper source (c) Paper size (d) Paper type (e) Paper exit
		(a) Cause of paper jam		
		0101: Wait for ready of print-process package [48] 0105: Registration sensor not detected [-] 0107: Wait for ready of fuser package [48] 0110: Top tray open [-] 0501: No paper feed from cassette 1 [31] 0502: Rear cover open (paper feeder 2) [32] 0503: Rear cover open (paper feeder 3) [33] 0508: No paper feed from duplex section [49] 0509: No paper feed from MP tray [42] 0511: Multiple sheets in cassette 1 [31] 0512: Multiple sheets in cassette 2 [32] 0513: Multiple sheets in cassette 3 [33] 0518: Multiple sheets in duplex section [49] 0519: Multiple sheets in MP tray [42] 1403: PF feed sensor 1 does not turn ON (Paper feeder 2) [32] 1413: PF feed sensor 1 does not turn OFF (Paper feeder 2) [32] 1420: PF feed sensor 1 is turned ON [32] 1620: PF feed sensor 2 is turned ON (Power on/Warm-up) [33] 4002: Registration sensor does not turn ON (Paper feeder 1) [31] 4003: Registration sensor does not turn ON (Paper feeder 2) [31] 4012: Registration sensor does not turn OFF (Paper feeder 1) [48] 4013: Registration sensor does not turn OFF (Paper feeder 2) [48] 4020: Registration sensor is turned ON (Power on/Warm-up) [48] 4201: Eject sensor does not turn ON (Cassette1) [48] 4202: Eject sensor does not turn ON (Paper feeder 1) [48] 4203: Eject sensor does not turn ON (Paper feeder 2) [48] 4208: Eject sensor does not turn ON (Duplex) [48] 4209: Eject sensor does not turn ON (MP tray) [48] 4211: Eject sensor does not turn OFF (Cassette1) [47] 4212: Eject sensor does not turn OFF (Paper feeder 1) [47] 4213: Eject sensor does not turn OFF (Paper feeder 2) [47] 4218: Eject sensor does not turn OFF (Duplex) [47] 4219: Eject sensor does not turn OFF (MP tray) [47] 4220: Eject sensor is turned ON (Power on/Warm-up) [47]		

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Service items		Description
No.	Items	Description
7 cont.		<p>4301: The duplex sensor does not turn ON (cassette1) [47] 4302: The duplex sensor does not turn ON (Paper feeder 1) [47] 4303: The duplex sensor does not turn ON (Paper feeder 2) [47] 4309: The duplex sensor does not turn ON (MP tray) [47] 4311: The duplex sensor does not turn OFF (cassette1) [49] 4312: The duplex sensor does not turn OFF (Paper feeder 1) [49] 4313: The duplex sensor does not turn OFF (Paper feeder 2) [49] 4319: The duplex sensor does not turn OFF (MP tray) [49]</p> <p>Note: Within [] indicate paper misfeed locations. (Refer to figure 1-3-6 below.)</p>  <p style="text-align: center;">Figure 1-3-6</p>

Service items		Description				
No.	Items	Description				
7 cont.		(b) Detail of paper source (Hexadecimal)				
		00: MP tray 01: Cassette 1 (Printer) 02: Cassette 2 (Paper feeder 1) 03: Cassette 3 (Paper feeder 2) 04 to 09: -				
		(c) Detail of paper size (Hexadecimal)				
		00: (indefinite) 0B: B4 23: Special 2 01: Monarch 0C: Ledger 24: A3 wide 02: Business 0D: A5 25: Ledger wide 03: International DL 0E: A6 26: Full bleed paper 04: International C5 0F: B6 (12 ´ 8) 05: Executive 10: Commercial #9 27: 8K 06: Letter-R 11: Commercial #6 28: 16K-R 06: Letter-E 12: ISO B5 2a: 216 x 340mm 07: Legal 13: Custom size A8: 16K-E 08: A4R 1E: C4 32: Statement-R 88: A4E 1F: Postcard B2: Statement-E 09: B5R 20: Reply-paid postcard 33: Folio 89: B5E 21: Oficio II 34: Western type 2 0A: A3 22: Special 1 35: Western type 4				
		(d) Detail of paper type (Hexadecimal)				
		01: Plain 0A: Color 15: Custom 1 02: Transparency 0B: Prepunched 16: Custom 2 03: Preprint 0C: Envelope 17: Custom 3 04: Labels 0D: Cardstock 18: Custom 4 05: Bond 0E: Coated 19: Custom 5 06: Recycle 0F: 2nd side 1A: Custom 6 07: Vellum 10: Media 16 1B: Custom 7 08: Rough 11: High quality 1C: Custom 8 09: Letter head				
		(e) Detail of paper exit location (Hexadecimal)				
		01: Face down tray (FU) 02 to 48: -				
		8	Service Call (Self diagnostic error) Log	#	Count.	Service Code
				Remembers 1 to 8 of occurrence of self diagnostics error. If the occurrence of the previous diagnostics error is less than 8, all of the diagnostics errors are logged.	The total page count at the time of the self diagnostics error.	Self diagnostic error code (See page 1-4-3) Example 01.6000 01 means a self-diagnostic error; 6000 means a self diagnostic error code.

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Service items		Description		
No.	Items	Description		
9	Maintenance Log	<p>#</p> <p>Remembers 1 to 8 of occurrence of replacement. If the occurrence of the previous replacement of toner container is less than 8, all of the occurrences of replacement are logged.</p>	<p>Count.</p> <p>The total page count at the time of the replacement of the toner container.</p> <p>* :The toner replacement log is triggered by toner empty. This record may contain such a reference as the toner container is inserted twice or a used toner container is inserted.</p>	<p>Item</p> <p>Code of maintenance replacing item (1 byte, 2 categories)</p> <p>First byte (Replacing item) 01: Toner container Second byte (Type of replacing item) 00: Black (Fixed)</p> <p>First byte (Replacing item) 02: Maintenance kit Second byte (Type of replacing item) 01: MK-170/172/174</p>
10	Unknown Toner Log	<p>#</p> <p>Remembers 1 to 5 of occurrence of unknown toner detection.</p> <p>If the occurrence of the previous unknown toner detection is less than 5, all of the unknown toner detection are logged.</p>	<p>Count.</p> <p>The total page count at the time of the "Toner Empty" error with using an unknown toner container.</p>	<p>Item</p> <p>Unknown toner log code (1 byte, 2 categories)</p> <p>First byte 01: Fixed (Toner container)</p> <p>Second byte 00: Black (Fixed)</p>
11	Counter Log	<p>(f) Jam</p> <p>Indicates the log counter of paper jams depending on location.</p> <p>Refer to Paper Jam Log.</p> <p>All instances including those are not occurred are displayed.</p>	<p>(g) Self diagnostic error</p> <p>Indicates the log counter of self diagnostics errors depending on cause. (See page 1-4-3)</p> <p>Example C6000: 4</p> <p>Self diagnostics error 6000 has happened four times.</p>	<p>(h) Maintenance item replacing</p> <p>Indicates the log counter depending on the maintenance item for maintenance.</p> <p>T: Toner container 00: Black M: Maintenance kit 00: MK-170/172/174</p> <p>Example T00: 1</p> <p>The (black) toner container has been replaced once.</p> <p>* :The toner replacement log is triggered by toner empty. This record may contain such a reference as the toner container is inserted twice or a used toner container is inserted.</p>

1-4-1 Paper misfeed detection

(1) Paper misfeed indication

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

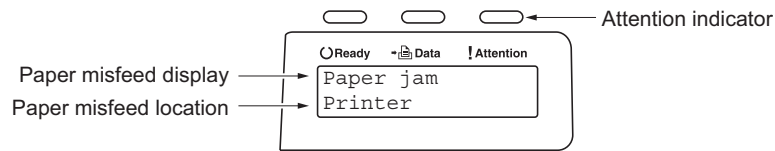


Figure 1-4-1

(2) Paper misfeed detection condition

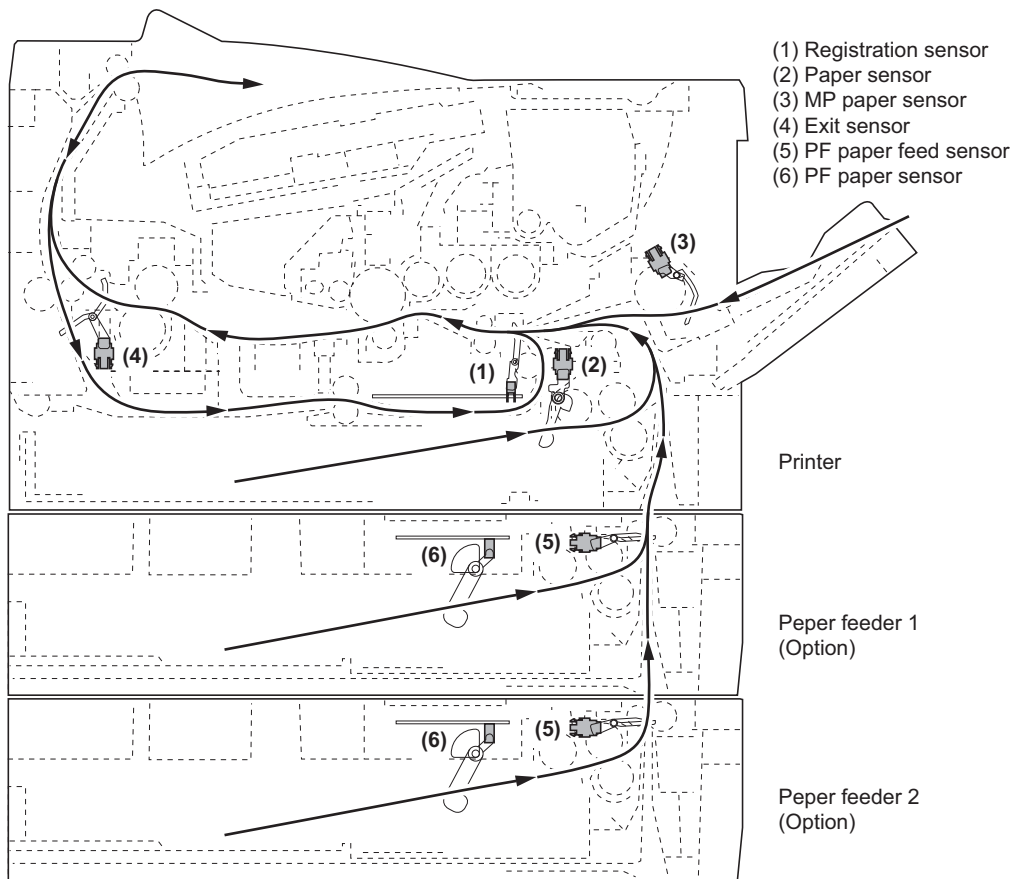


Figure 1-4-2

1-4-2 Self-diagnostic function

(1) Self-diagnostic function

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

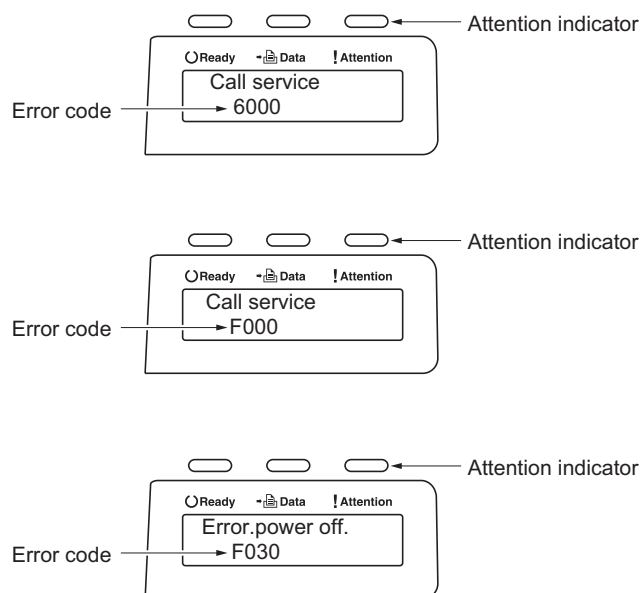


Figure 1-4-3

(2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0100	Backup memory device error	Defective flash memory (U14).	Replace the control PWB (See page 1-5-19).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
0110	Backup memory data error	Defective flash memory (U14).	Replace the control PWB (See page 1-5-19).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
0120	MAC address data error	Defective control PWB.	Replace the control PWB (See page 1-5-19).
0150	Control PWB EEPROM error Detecting control PWB EEPROM (U2001) communication error.	Improper installation control PWB EEPROM (U2001).	Check the installation of the EEPROM (U2001) and remedy if necessary (See page 1-5-19).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
0170	Billing counting error	Defective control PWB.	Replace the control PWB (See page 1-5-19).
0420	Paper feeder communication error Communication error between control PWB and optional paper feeder.	Improper installation paper feeder.	Follow installation instruction carefully again.
		Defective harness between control PWB (YC344) and paper feeder interface connector, or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
		Defective harness between PF main PWB (YC5) and paper feeder interface connector, or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness (Refer to the service manual for the paper feeder).
		Defective PF main PWB.	Replace the PF main PWB (Refer to the service manual for the paper feeder).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0840	Faults of RTC The time is judged to go back based on the comparison of the RTC time and the current time or five years or more have passed.	The battery is disconnected from the control PWB.	Check visually and remedy if necessary
		Defective control PWB.	Replace the control PWB and check for correct operation (see page 1-5-19).
0970	12 V power down detect Power is disconnected during sleeping.	Defective power source PWB.	Replace the power source PWB and check for correct operation.
2000	Main motor error The main motor ready input is not given for 2 s during the main motor is ON.	Defective harness between main motor (CN1) and control PWB (YC331), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective drive transmission system of the main motor.	Check if the rollers and gears rotate smoothly. If not, grease the bushings and gears. Check for broken gears and replace if any.
		Defective main motor.	Replace the main motor (See page 1-5-28).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
4000	Polygon motor (laser scanner unit) error The polygon motor ready input is not given for 6 s during the polygon motor is ON.	Defective harness between polygon motor and control PWB (YC9), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective laser scanner unit.	Replace the laser scanner unit (See page 1-5-29).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
4200	BD error (laser scanner unit) error	Defective laser scanner unit.	Replace the laser scanner unit (See page 1-5-29).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).

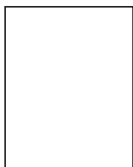
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6000	Broken fuser heater lamp wire The fuser temperature does not rise after the fuser heater lamp has been turned on.	Poor contact in the fuser thermistor connector terminals.	Reinsert the connector (See page 1-5-16).
		Poor contact in the fuser heater lamp connector terminals.	Reinsert the connector (See page 1-5-16).
		Fuser thermistor installed incorrectly.	Replace the fuser unit (See page 1-5-16).
		Fuser thermal cut-out triggered.	Replace the fuser unit (See page 1-5-16).
		Fuser heater lamp installed incorrectly.	Replace the fuser unit (See page 1-5-16).
		Broken fuser heater lamp wire.	Replace the fuser unit (See page 1-5-16).
6020	Abnormally high fuser thermistor temperature Fuser thermistor detects abnormally temperature. When the temperature of a fuser thermistor detects 195 °C or more at the time of heater OFF and 155 °C or more.	Shorted fuser thermistor.	Replace the fuser unit (See page 1-5-16).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
6030	Broken fuser thermistor wire Input from fuser thermistor is 0 (A/D value).	Poor contact in the fuser thermistor connector terminals.	Reinsert the connector (See page 1-5-16).
		Broken fuser thermistor wire.	Replace the fuser unit (See page 1-5-16).
		Fuser thermistor installed incorrectly.	Replace the fuser unit (See page 1-5-16).
		Fuser thermal cut-out triggered.	Replace the fuser unit (See page 1-5-16).
		Fuser heater lamp installed incorrectly.	Replace the fuser unit (See page 1-5-16).
		Broken fuser heater lamp wire.	Replace the fuser unit (See page 1-5-16).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6400	Zero cross signal error The zero cross signal does not reach the control PWB for specified time.	Defective harness between high voltage PWB (CN202) and control PWB (YC337), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective harness between power source PWB (YC103) and high voltage PWB (CN202), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective power source PWB.	Replace the power source PWB (See page 1-5-22).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
F000	Control PWB - Operation panel PWB communication error	Defective harness between operation panel PWB (YC1) and control PWB (YC7), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
		Defective operation panel PWB.	Replace the operation panel PWB.
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
F010	Control PWB checksum error	Defective code ROM (flash memory).	Turn the power switch off/on to restart the printer. If the error is not resolved, replace the control PWB (See page 1-5-19).
		Defective control PWB.	Replace the control PWB (See page 1-5-19).
F020	Control PWB RAM checksum error	Defective main memory (RAM) on the control PWB.	Turn the power switch off/on to restart the printer. If the error is not resolved, replace control PWB (See page 1-5-19).
		Defective expanded memory (DIMM).	Replace the expanded memory (DIMM) (See page 1-2-4).
F040	Control PWB engine communication error	Defective control PWB.	Turn the power switch off/on to restart the printer. If the error is not resolved, replace control PWB (See page 1-5-19).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
F050	Control PWB engine checksum error	Some error may have occurred when downloading the firmware of the control PWB.	Download the firmware of the control PWB again using the memory card (SD card) (See page 1-6-4).
		Defective control PWB.	Turn the power switch off/on to restart the printer. If the error is not resolved, replace control PWB (See page 1-5-19).

1-4-3 Image formation problems

(1) Completely blank printout.



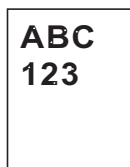
See page 1-4-9

(2) All-black printout.



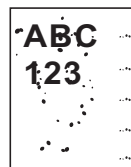
See page 1-4-9

(3) Dropouts.



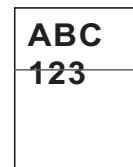
See page 1-4-10

(4) Black dots.



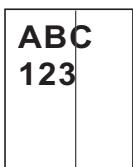
See page 1-4-10

(5) Black horizontal streaks.



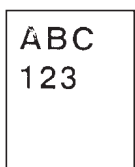
See page 1-4-10

(6) Black vertical streaks.



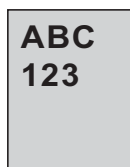
See page 1-4-11

(7) Unsharpness.



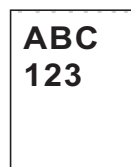
See page 1-4-11

(8) Gray background.



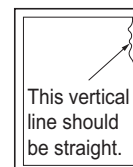
See page 1-4-11

(9) Dirt on the top edge or back of the paper.



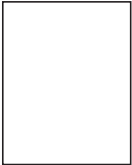
See page 1-4-12

(10) Undulated printing at the right edge (scanning start position).




See page 1-4-12

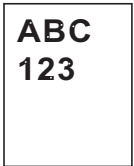
(1) Completely blank printout.

Print example	Causes	Check procedures/corrective measures
	Defective drum unit or developing unit.	Open the top cover and check that the drum unit and developing unit are correctly seated. Investigate that the terminals between the main charger unit and the drum unit are not in loose contact (See page 1-5-12 and 1-5-11).
	Defective transfer bias output or developing bias output.	Replace the high voltage PWB (See page 1-5-24).
	Poor contact of developing bias terminal (spring) and high voltage output terminal B (J401, J402, J403) on the high voltage PWB. Poor contact of transfer bias terminal (spring) and transfer bias terminal T (J201, J202, J203) on the high voltage PWB.	Check the high voltage PWB visually and correct or replace if necessary (See page 1-5-24).
	Defective laser scanner unit.	Replace the laser scanner unit (See page 1-5-29).
	Defective control PWB.	Replace the control PWB (See page 1-5-19).

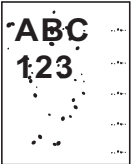
(2) All-black printout.

Print example	Causes	Check procedures/corrective measures
	Defective main charger unit.	Open the top cover and check that the drum unit and developing unit are correctly seated (See page 1-5-12). Investigate that the terminals between the main charger unit and the drum unit are not in loose contact.
	Poor contact of main charger terminal (spring) and main charger output terminal M on the high voltage PWB.	Check the high voltage PWB visually and correct or replace if necessary (See page 1-5-24).
	Defective main charging output.	Replace the high voltage PWB (See page 1-5-24).
	Broken main charger wire.	Replace the main charger unit (See page 1-5-13).
	Defective control PWB.	Replace the control PWB (See page 1-5-19).

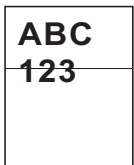
(3) Dropouts.

Print example	Causes	Check procedures/corrective measures
	Defective developing roller (developing unit).	If the defects occur at regular intervals of 62.8 mm/2 1/2" (See page 2-4-2), the problem may be the damaged developing roller (in the developing unit). Replace the developing unit (See page 1-5-11).
	Defective drum unit.	If the defects occur at regular intervals of 94 mm/3 11/16" (See page 2-4-2), the problem may be the damaged drum (in the drum unit). Replace the drum unit (See page 1-5-12).
	Defective fuser unit (heat roller or press roller).	If the defects occur at regular intervals of 73.162 mm/2 7/8", or 78.5 mm/3 1/16" (See page 2-4-2), the problem may be the damaged heat roller or press roller (in the fuser unit). Replace fuser unit (See page 1-5-16).
	Defective paper specifications.	Paper with rugged surface or dump tends to cause dropouts. Replace paper with the one that satisfies the paper specifications.
	Defective transfer roller installation.	The transfer roller must be supported by the bushes at the both ends. Clean the bush to remove oil and debris. Replace the transfer roller if necessary (See page 1-5-14).
	Defective transfer bias output.	Replace the high voltage PWB or control PWB (See page 1-5-24 or 1-5-19).

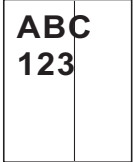
(4) Black dots.

Print example	Causes	Check procedures/corrective measures
	Defective drum unit or developing unit.	If the defects occur at regular intervals of 94 mm/3 11/16" (See page 2-4-2), the problem may be the damaged drum (in the drum unit). Replace drum unit (See page 1-5-12). If the defects occur at random intervals, the toner may be leaking from the developing unit or drum unit. Replace the developing unit or drum unit (See page 1-5-11 or 1-5-12).

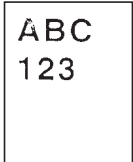
(5) Black horizontal streaks.

Print example	Causes	Check procedures/corrective measures
	Defective drum unit's ground.	Check that the drum shaft and the grounding tab (printer) are in good contact. Apply the grounding tab a small amount of electroconductive grease as required.
	Defective drum unit.	Replace the drum unit (See page 1-5-12).

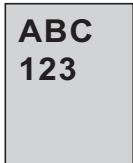
(6) Black vertical streaks.

Print example	Causes	Check procedures/corrective measures
	Adhesion of oxide to main charger wire.	Remove the drum unit (See page 1-5-12). Slide the charger cleaner (green) left and right 2 or 3 times to clean the charger wire, then return it to its original position (CLEANER HOME POSITION). Refer to the operation guide.
	Defective drum unit.	A streak of toner remaining on drum after printing means that the cleaning blade (in the drum unit) is not working properly. Replace the drum unit (See page 1-5-12).
	Defective developing roller (developing unit).	Replace the developing unit (See page 1-5-11).

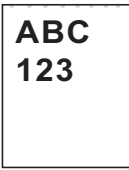
(7) Unsharpness.

Print example	Causes	Check procedures/corrective measures
	Defective paper specifications.	Replace paper with the one that satisfies the paper specification.
	Defective transfer roller installation.	The transfer roller must be supported by the bushes at the both ends. Clean the bush to remove oil and debris. Replace the transfer roller if necessary (See page 1-5-14).
	Defective transfer bias output.	Replace the high voltage PWB or control PWB (See page 1-5-24 or 1-5-19).
	EcoPrint mode setting.	The EcoPrint mode can provide faint, unsharp printing because it acts to conserve toner for draft printing purpose. For normal printing, turn the EcoPrint mode off by using the operator panel. For details, refer to the operation guide.

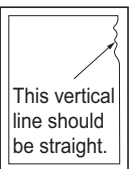
(8) Gray background.

Print example	Causes	Check procedures/corrective measures
	Print density setting.	The print density may be set too high. Try adjusting the print density. For details, refer to the operation guide.
	Defective potential on the drum surface.	Replace the drum unit (See page 1-5-12).
	Defective main charger grid.	Clean the main charger grid (See page 1-5-13).
	Defective developing roller (developing unit).	If a developing unit which is known to work normally is available for check, replace the current developing unit in the printer with the normal one. If the symptom disappears, replace the developing unit with a new one (See page 1-5-11).

(9) Dirt on the top edge or back of the paper.

Print example	Causes	Check procedures/corrective measures
	Toner contamination in various parts.	Dirty edges and back of the paper can be caused by toner accumulated on such parts as the paper chute guide, paper conveying paths, the bottom of the drum and developing unit, and the fuser unit inlet. Clean these areas and parts to remove toner.
	Defective transfer roller.	If the transfer roller is contaminated with toner, clean the transfer roller using a vacuum cleaner or by continuously printing a low density page until the symptom has faded away.

(10) Undulated printing at the right edge (scanning start position).

Print example	Causes	Check procedures/corrective measures
	Defective polygon motor (laser scanner unit).	Replace the laser scanner unit (See page 1-5-29).
	Defective control PWB.	Replace the control PWB (See page 1-5-19).

1-4-4 Electric problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate when the power switch is turned on.	No electricity at the power outlet.	Measure the input voltage.
	The power cord is not plugged in properly.	Check the contact between the power plug and the outlet.
	The top cover is not closed completely.	Check the top cover.
	Broken power cord.	Check for continuity. If none, replace the cord.
	Defective power switch.	Check for continuity across the contacts. If none, replace the power source PWB (See page 1-5-22).
	Blown fuse in the power source PWB.	Check for continuity. If none, remove the cause of blowing and replace the power source PWB (See page 1-5-22).
	Defective interlock switch.	Check for continuity across the contacts of interlock switch. If none, replace the power source PWB (See page 1-5-22).
	Defective power source PWB.	Replace the power source PWB (See page 1-5-22).
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(2) Right cooling fan motor does not operate.	Broken right cooling fan motor coil.	Check for continuity across the coil. If none, replace the right cooling fan motor.
	Defective harness between right cooling fan motor and control PWB (YC341), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(3) Left cooling fan motor does not operate.	Broken left cooling fan motor coil.	Check for continuity across the coil. If none, replace the left cooling fan motor.
	Defective harness between left cooling fan motor and control PWB (YC104), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(4) Registration clutch does not operate.	Broken registration clutch coil.	Check for continuity across the coil. If none, replace the registration clutch.
	Defective harness between registration clutch and control PWB (YC334), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(5) Paper feed clutch does not operate.	Broken paper feed clutch coil.	Check for continuity across the coil. If none, replace the paper feed clutch.
	Defective harness between paper feed clutch and control PWB (YC334), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).

Problem	Causes	Check procedures/corrective measures
(6) Developing clutch does not operate.	Broken developing clutch coil.	Check for continuity across the coil. If none, replace the developing clutch.
	Defective harness between developing clutch and control PWB (YC334), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(7) MP paper feed solenoid does not operate.	Broken MP paper feed solenoid coil.	Check for continuity across the coil. If none, replace the MP paper feed solenoid.
	Defective harness between MP paper feed solenoid and control PWB (YC335), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(8) Duplex solenoid does not operate.	Broken duplex solenoid coil.	Check for continuity across the coil. If none, replace the duplex solenoid.
	Defective harness between duplex solenoid and control PWB (YC343), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(9) Eraser lamp does not turn on.	Defective harness between eraser lamp (YC701) and control PWB (YC342), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Defective eraser lamp (PWB).	Replace the eraser lamp (PWB) (See page 1-5-31).
	Defective control PWB.	Replace the control PWB (See page 1-5-19).
(10) Paper indicator is flashing when paper is present in the cassette.	Defective paper sensor.	Replace the paper sensor.
	Defective harness between paper sensor and control PWB (YC344), or improper connector insertion.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
(11) A paper jam in the paper feed/conveying section or fuser section is indicated when the power switch is turned on.	A piece of paper torn from paper is caught around registration sensor or exit sensor.	Check and remove if any.
	Defective registration sensor on the high voltage PWB.	Replace the high voltage PWB (See page 1-5-24).
	Defective exit sensor.	Replace the exit sensor.
(12) Attention indicator is lit when the top cover is closed.	Defective interlock switch on the power source PWB.	Check for continuity across the interlock switch. If there is no continuity when the interlock switch is on, replace the power source PWB (See page 1-5-22).

1-4-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the paper feed roller is dirty with paper powder.	Clean with isopropyl alcohol.
	Check if the paper feed roller is deformed.	Check visually and replace any deformed paper feed roller (assembly) (See page 1-5-6).
	Defective paper feed clutch installation.	Check visually and remedy if necessary.
(2) No secondary paper feed.	Check if the surfaces of the upper and lower registration rollers are dirty with paper powder.	Clean with isopropyl alcohol.
	Defective registration clutch installation.	Check visually and remedy if necessary.
(3) Skewed paper feed.	Paper width guide in a cassette installed incorrectly.	Check the paper width guide visually and correct or replace if necessary.
(4) Multiple sheets of paper are fed at one time.	Check if the separator pad or MPF separation pad is worn.	Replace the separator pad if it is worn.
	Check if the paper is curled.	Replace the paper.
(5) Paper jams.	Check if the paper is excessively curled.	Replace the paper.
	Check if the contact between the upper and lower registration rollers is correct.	Check visually and remedy if necessary.
	Check if the heat roller or press roller is extremely dirty or deformed.	Replace the fuser unit (See page 1-5-16).
	Check if the contact between the ejection roller and fuser ejection pulley is correct.	Check visually and remedy if necessary.
(6) Toner drops on the paper conveying path.	Check if the drum unit or developing unit is extremely dirty.	Clean the drum unit or developing unit (See page 1-5-11 or 1-5-12).
(7) Abnormal noise is heard.	Check if the pulleys, rollers and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic clutches are installed correctly: Paper feed clutch, registration clutch and developing clutch.	Check visually and remedy if necessary.

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1-5-1 Precautions for assembly and disassembly

(1) Precautions

Be sure to turn the power switch off and disconnect the power plug before starting disassembly.

When handling PWBs, do not touch connectors with bare hands or damage the PWB.

Do not touch any PWB containing ICs with bare hands or any object prone to static charge.

When removing the hook of the connector, be sure to release the hook.

Take care not to get the wire caught.

To reassemble the parts, use the original screws. If the types and the sizes of screws are not known, refer to the PARTS LIST.

(2) Drum

Note the following when handling or storing the drum.

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

Keep the drum at an ambient temperature between 0 °C/32 °F and 40 °C/104 °F and at a relative humidity not higher than 90% RH. Avoid abrupt changes in temperature and humidity.

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

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

(3) Toner container

Store the toner container in a cool, dark place.

Avoid direct light and high humidity.

(4) How to tell a genuine Kyocera toner container

As a means of brand protection, the Kyocera toner container utilizes an optical security technology to enable visual validation. A validation viewer is required to accomplish this.

Hold the validation viewer over the left side part of the brand protection seal on the toner container. Through each window of the validation viewer, the left side part of the seal should be seen as follows:

A black-colored band when seen through the left side window

A shiny or gold-colored band when seen through the right side window

The above will reveal that the toner container is a genuine Kyocera branded toner container, otherwise, it is a counterfeit.

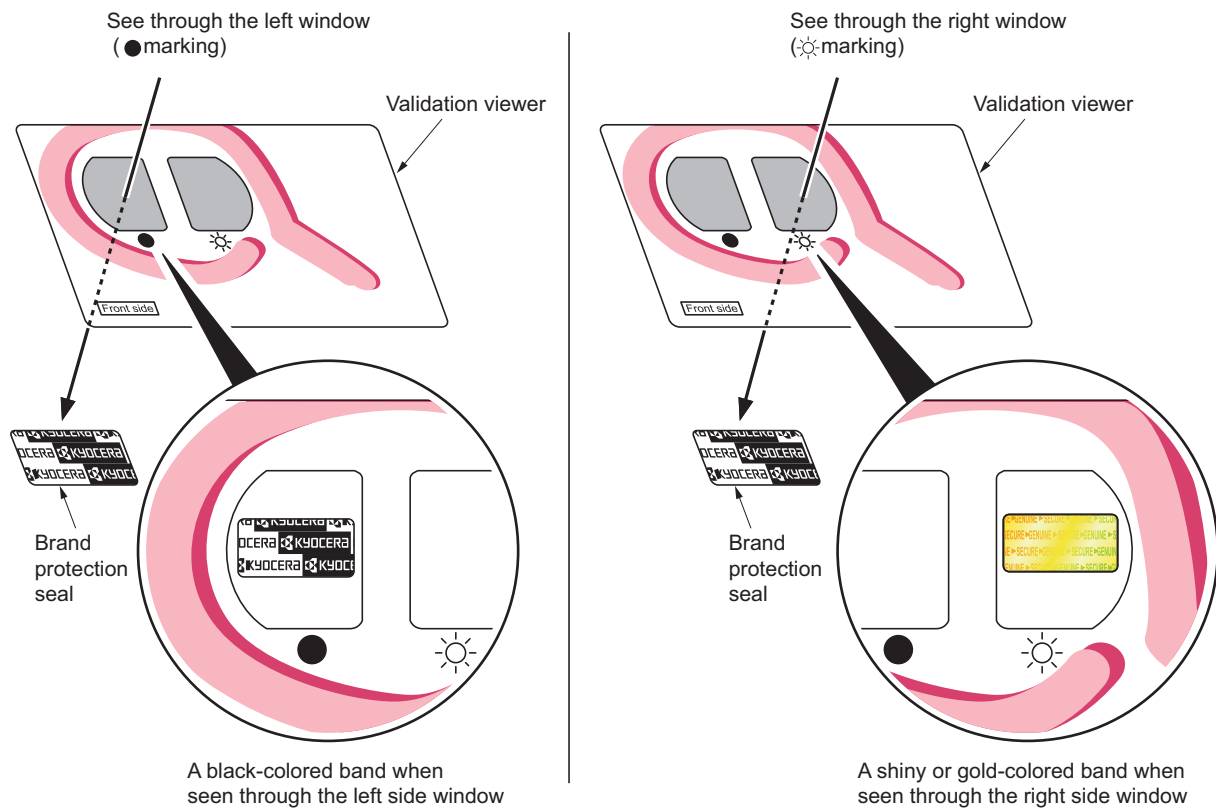


Figure 1-5-1

The brand protection seal has an incision as shown below to prohibit reuse.

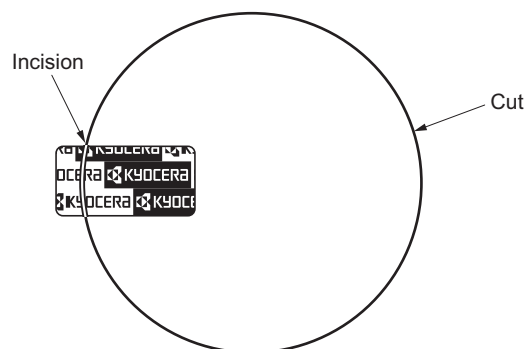


Figure 1-5-2

1-5-2 Outer covers

(1) Detaching and refitting the top cover

Procedure

1. Open the top cover.
2. Remove two screws.

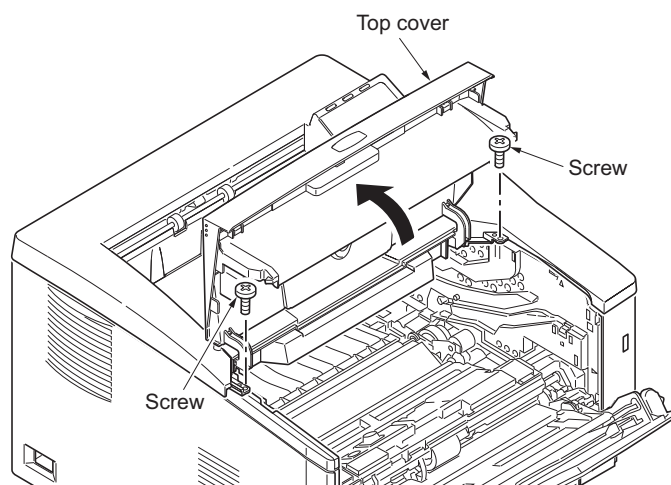


Figure 1-5-3

3. Extract the boss from the hole.
4. Unhook the A hook.
5. Unhook two B hooks.
6. Remove the connector.
7. Remove the top cover.

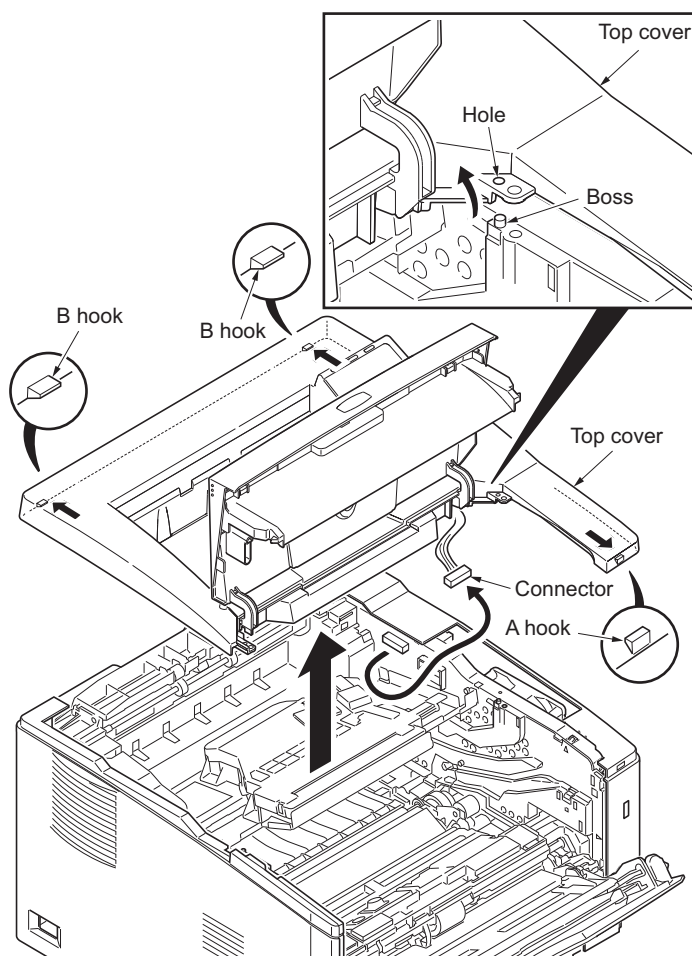


Figure 1-5-4

(2) Detaching and refitting the right and left covers

Procedure

1. Remove the top cover (See page 1-5-3).
2. Remove the cassette (See page 1-5-6).
3. Open the front cover.
4. Unhook seven hooks and then remove the right cover.

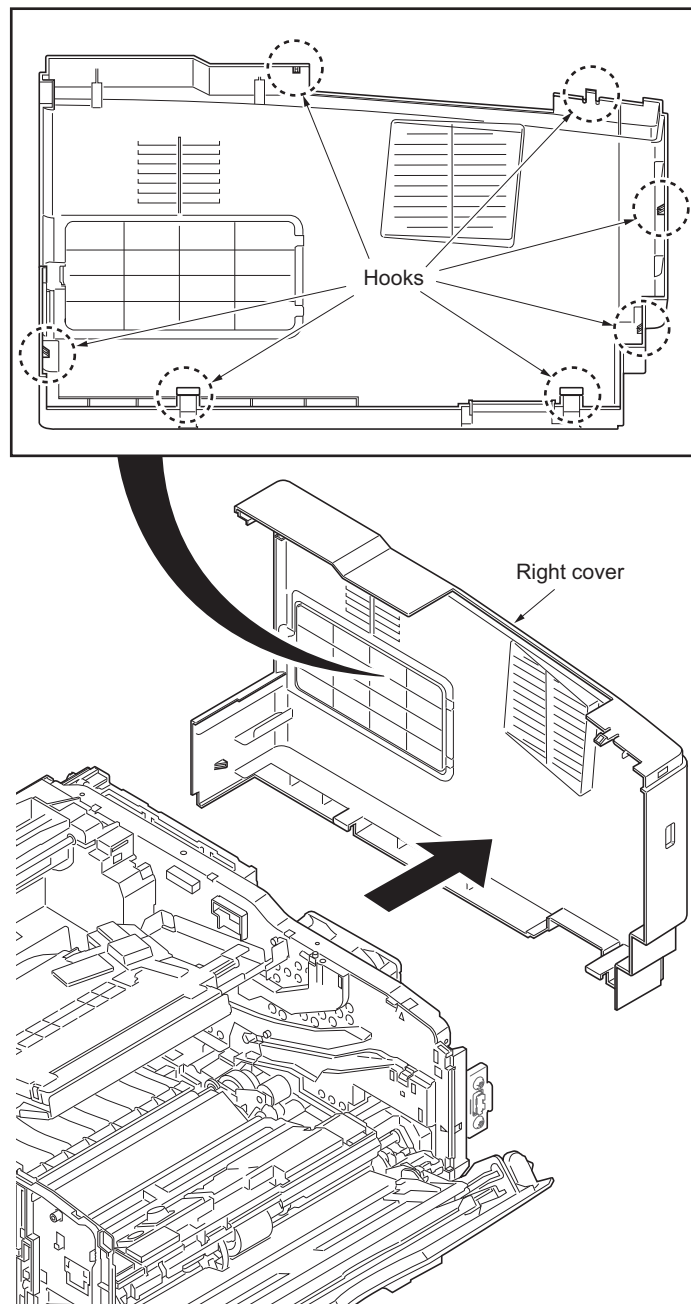


Figure 1-5-5

5. Unhook seven hooks and then remove the left cover.

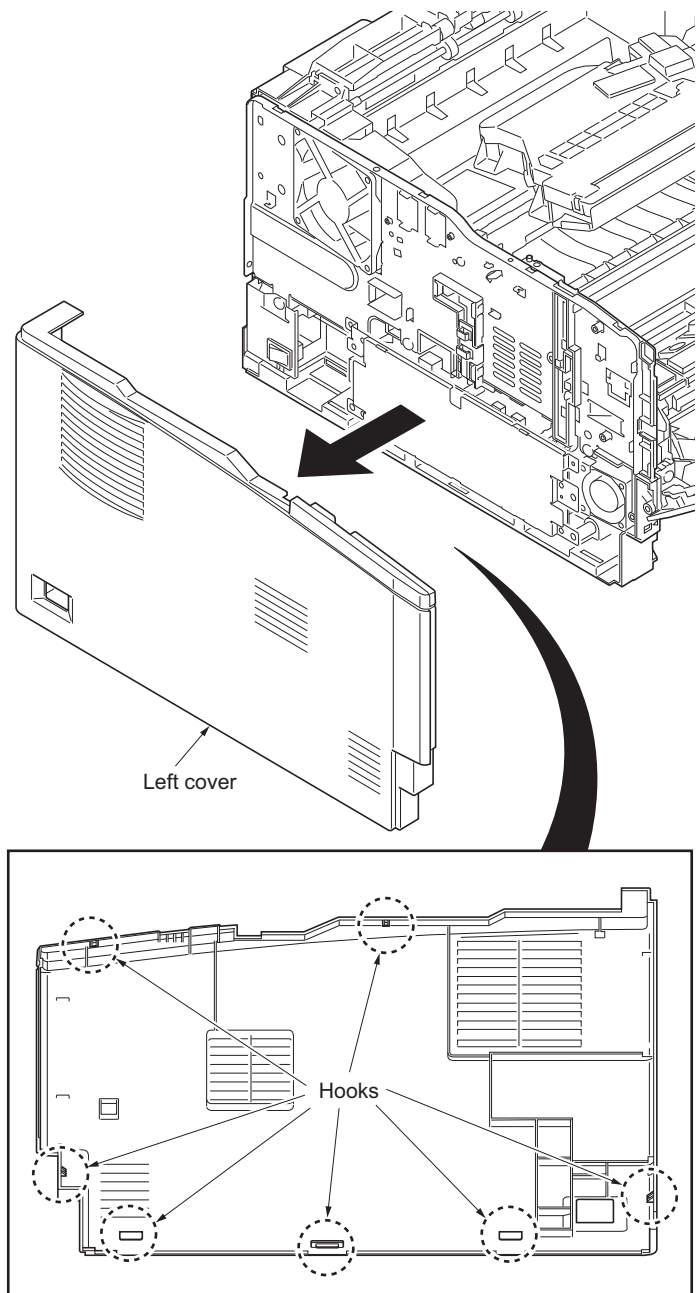


Figure 1-5-6

1-5-3 Paper feed section

(1) Detaching and refitting the paper feed roller assembly (paper feed roller and pickup roller)

Procedure

1. Remove the cassette.

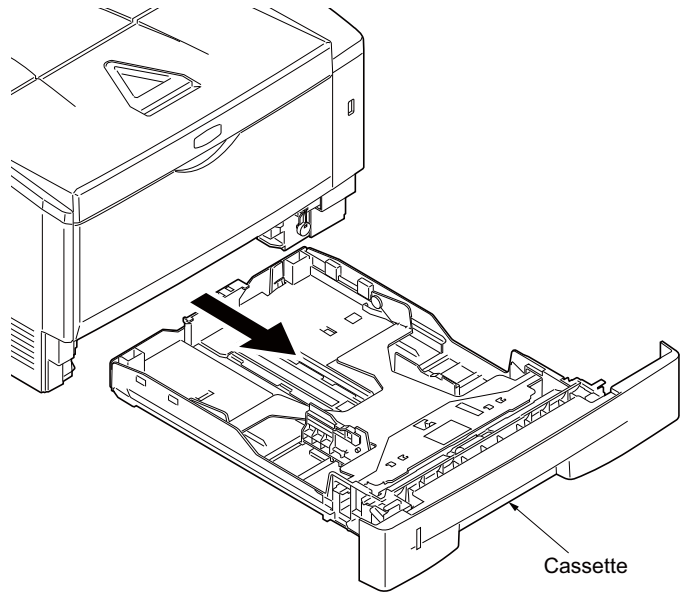


Figure 1-5-7

2. Slide the feed shaft.
3. While pressing the lever and then remove the paper feed roller assembly.

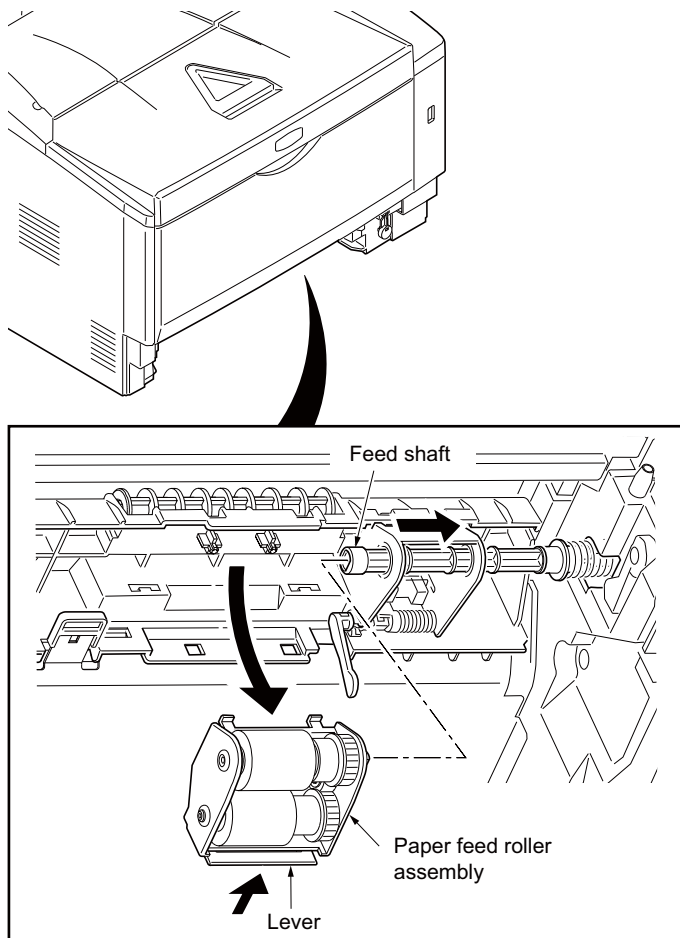
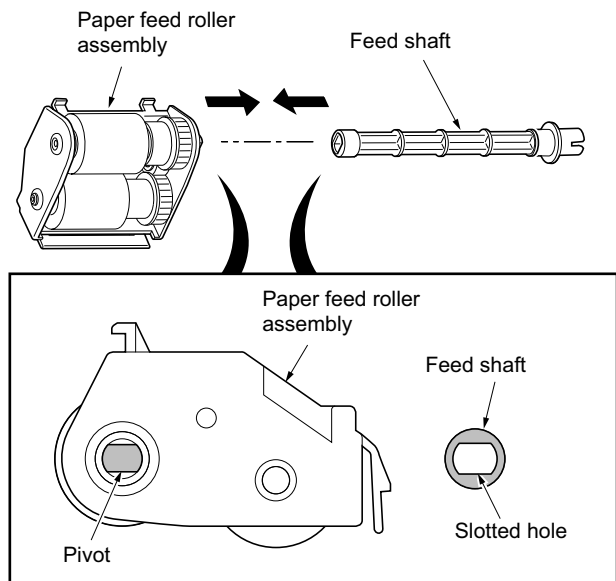


Figure 1-5-8

4. Check or replace the paper feed roller assembly and refit all the removed parts. When refitting the paper feed roller assembly, be sure to align the paper feed roller pivot with the slotted hole on the feed shaft.

**Figure 1-5-9**

(2) Detaching and refitting the retard roller assembly

Procedure

1. Remove the cassette (See page 1-5-6).
2. Push the bottom plate down until it locks.
3. Unhook two hooks and then remove the retard guide.

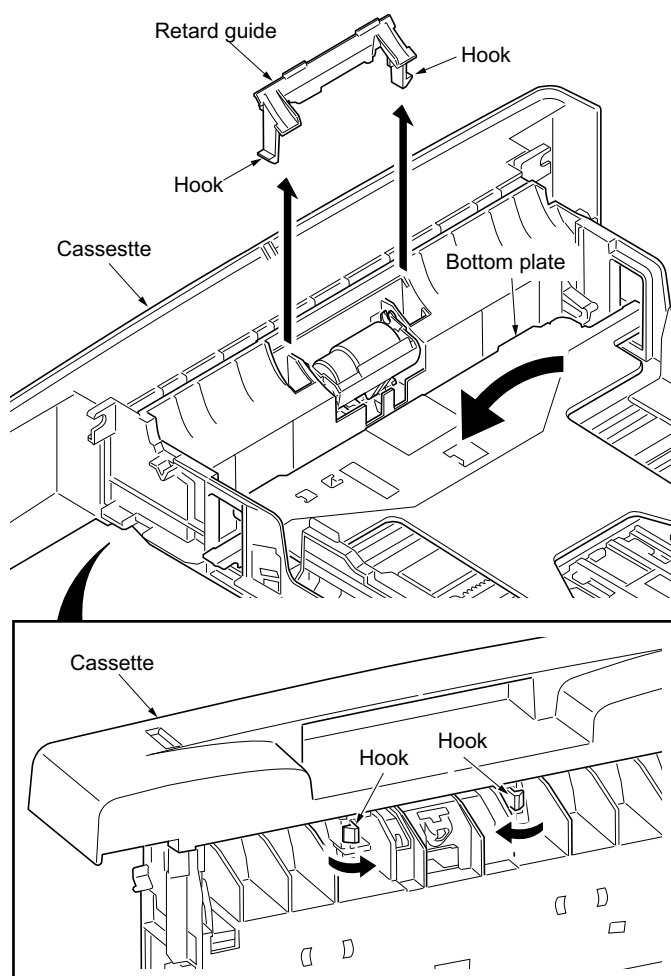


Figure 1-5-10

4. Remove the retard roller assembly.

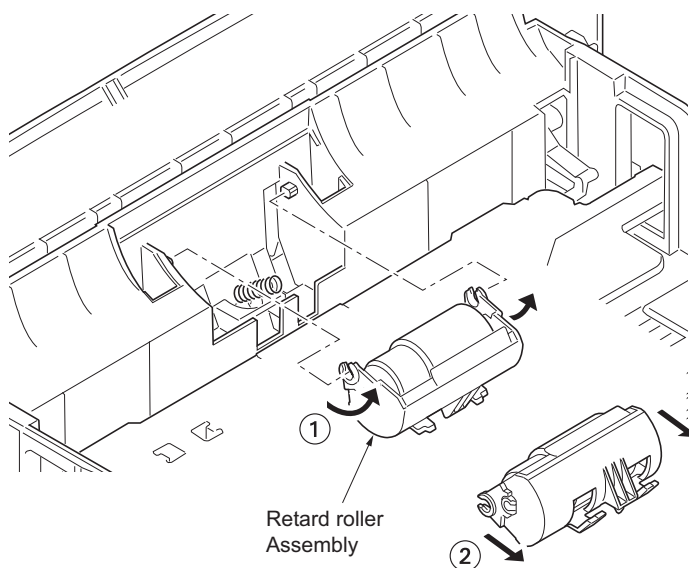


Figure 1-5-11

5. Check or replace the retard roller assembly and refit all the removed parts.
Caution: Before refitting the retard roller assembly, firmly install the spring onto the projection of the retard roller assembly.

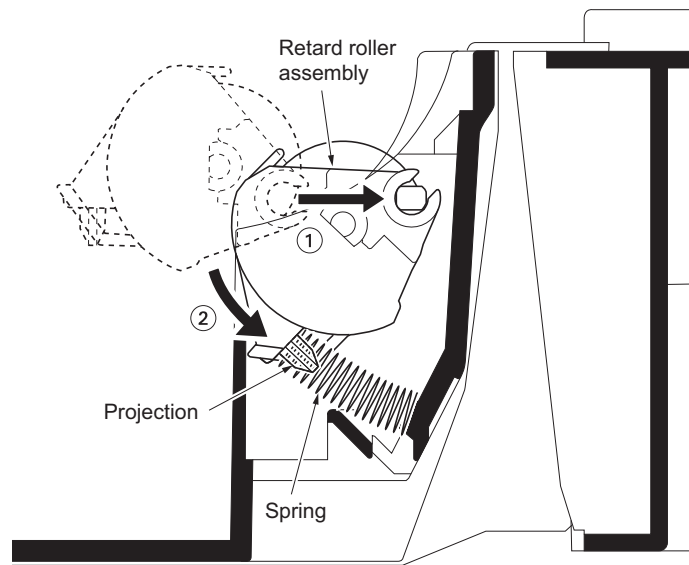


Figure 1-5-12

(3) Detaching and refitting the MP paper feed roller

Procedure

1. Open the front cover.
2. Pull the MP feed holder (lever) down (1).
3. Slide the MP feed holder (2).
4. Remove the MP paper feed roller (3).

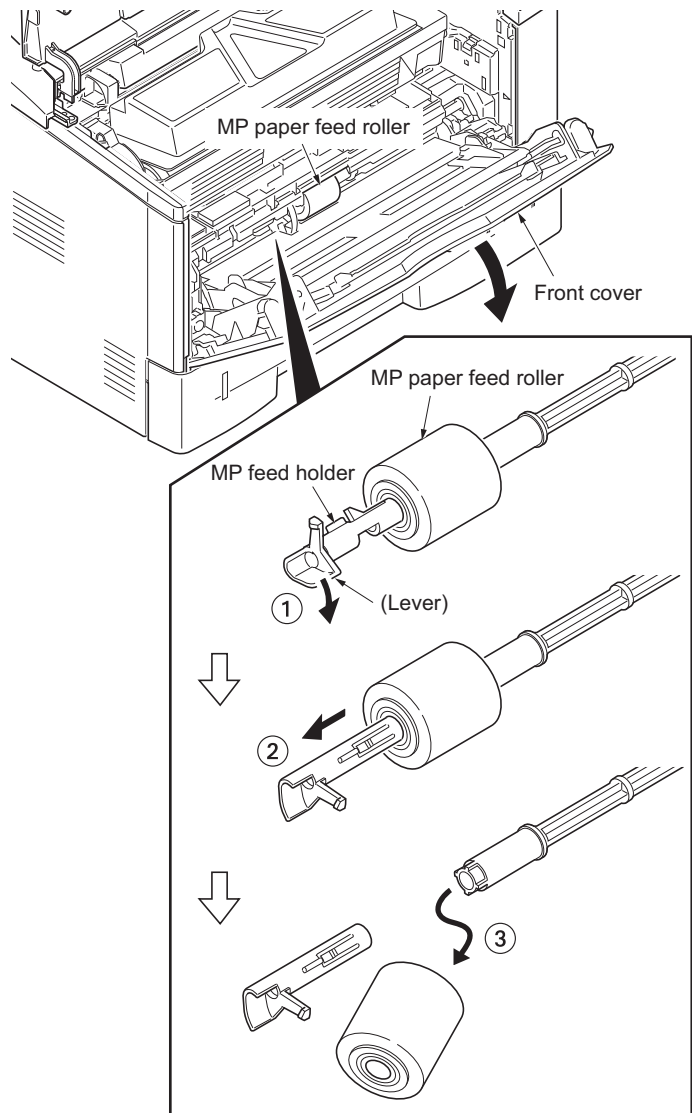


Figure 1-5-13

5. Check or replace the MP paper feed roller and refit all the removed parts.
When refitting the MP paper feed roller, be sure to align the MPF feed shaft pivot with the slotted hole on the MP paper feed roller.

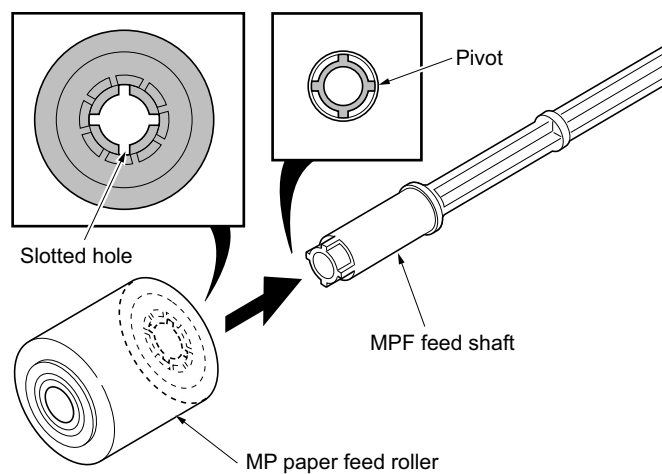


Figure 1-5-14

1-5-4 Developing section

(1) Detaching and refitting the developing unit

Procedure

1. Open the top cover.
2. Open the front cover.
3. Remove the developing unit (with toner container).
4. Check or replace the developing unit and refit all the removed parts.
5. When the developing unit is replaced with a new one, carry out the following procedure.
6. Perform toner install mode in the service mode (see page 1-3-10).

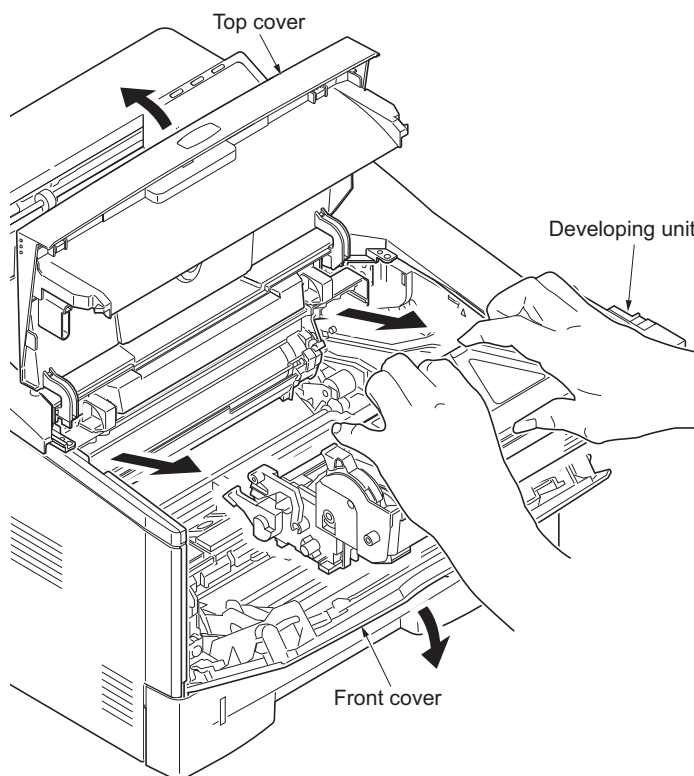


Figure 1-5-15

1-5-5 Drum section

(1) Detaching and refitting the drum unit

Procedure

1. Remove the developing unit (See page 1-5-11).
2. Remove the drum unit.
3. Check or replace the drum unit and refit all the removed parts.

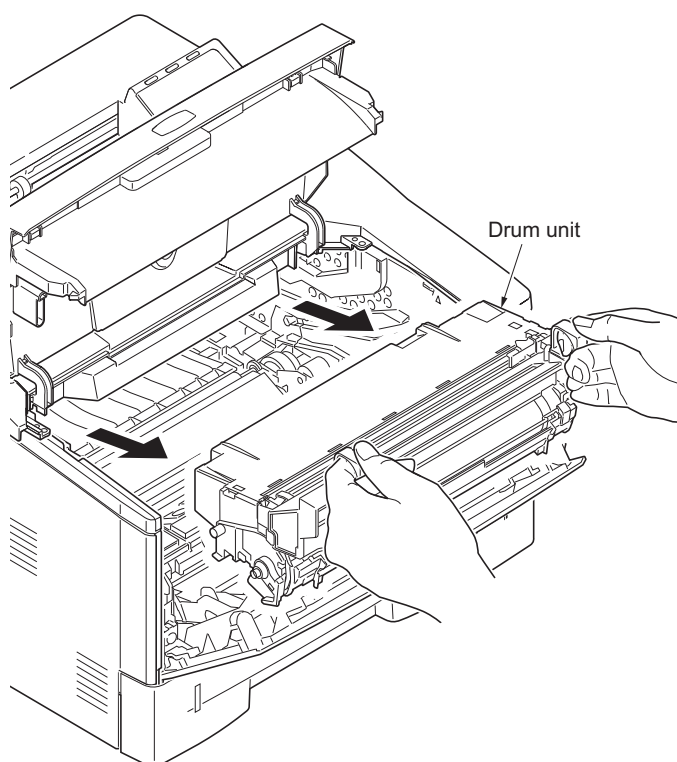


Figure 1-5-16

(2) Detaching and refitting the main charger unit

Procedure

1. Remove the drum unit (See page 1-5-12).
2. Remove the tape.
3. While pushing on the main plate (1), slide the main charger unit (2).

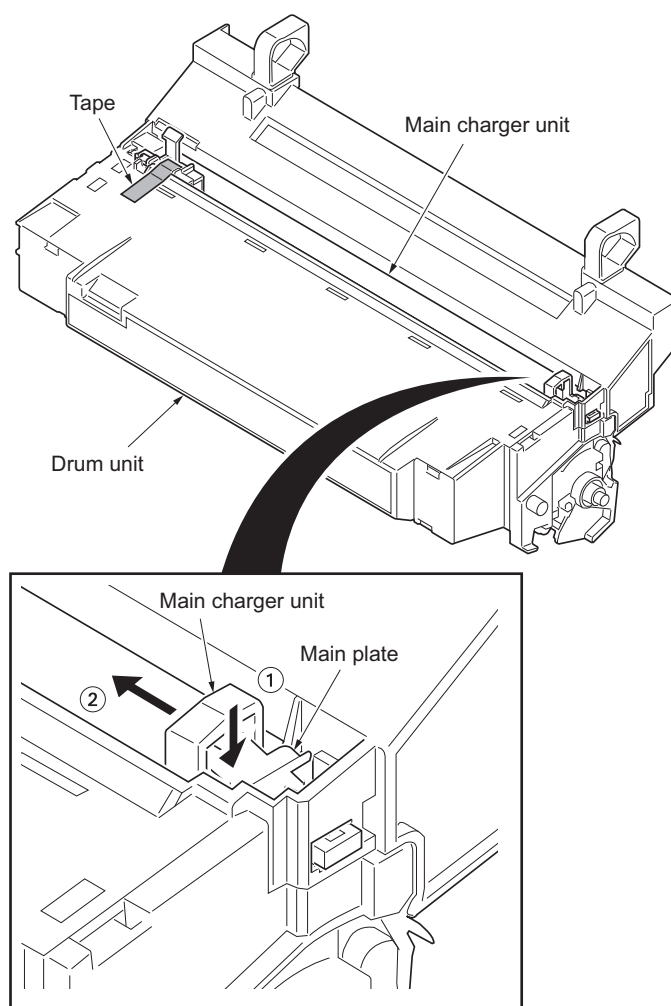


Figure 1-5-17

4. Remove the main charger unit by lifting it.
5. Check or replace the main charger unit and refit all the removed parts.

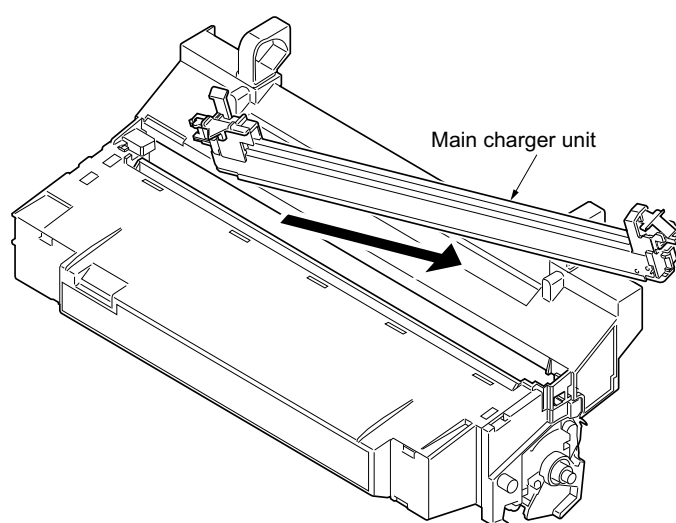


Figure 1-5-18

1-5-6 Transfer/separation section

(1) Detaching and refitting the transfer roller

Procedure

1. Remove the developing unit (See page 1-5-11).
2. Remove the drum unit (See page 1-5-12).
3. Slide the paper chute guide and unhook the hooks.
4. Remove the paper chute guide.

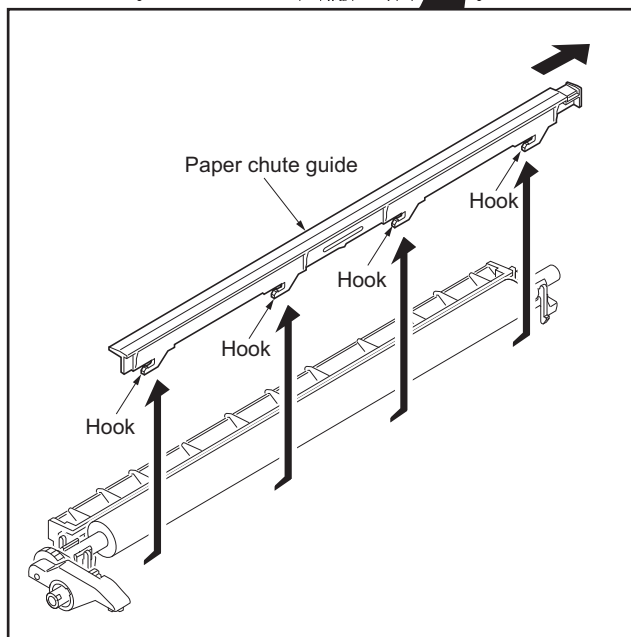
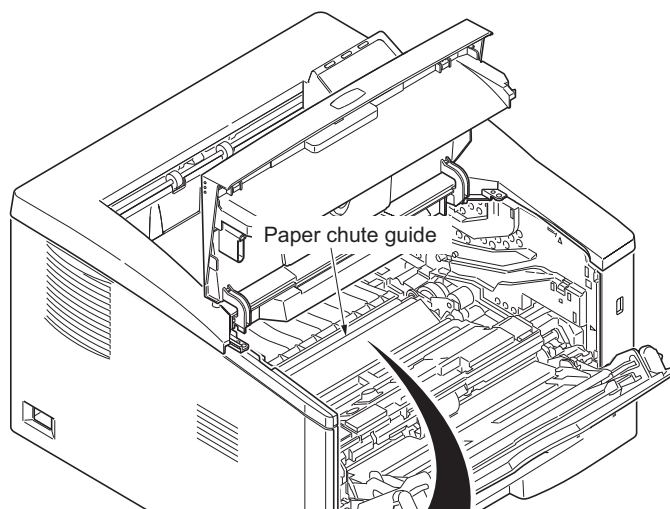


Figure 1-5-19

5. Remove the transfer roller's shaft from the both transfer bushes.
6. Remove the gear Z16 from the transfer roller.

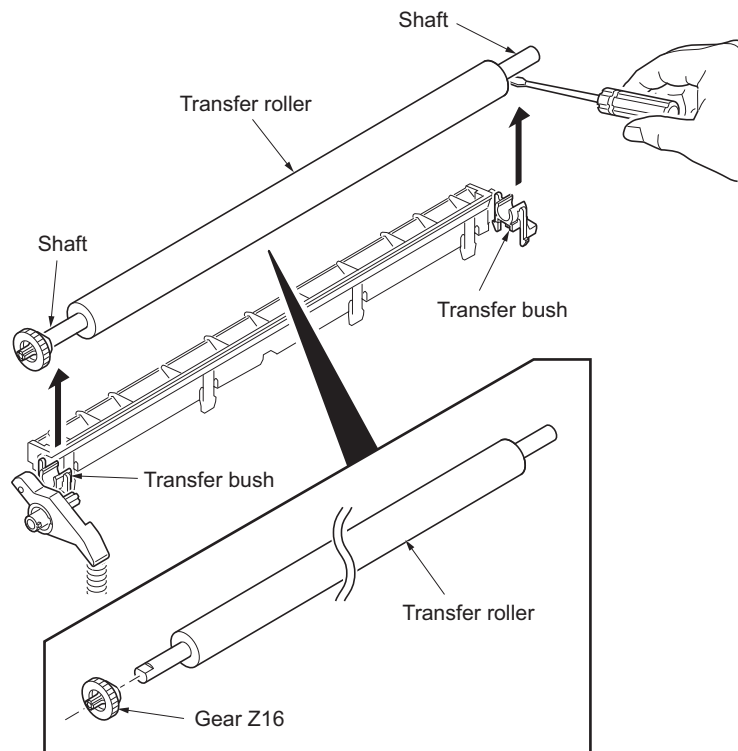


Figure 1-5-20

7. Check or replace the transfer roller and refit all the removed parts.
 Caution: When refitting the transfer roller, be careful about following point.
 Push the release lever to raise the lever end, then insert the front of gear Z16 under the release lever end.

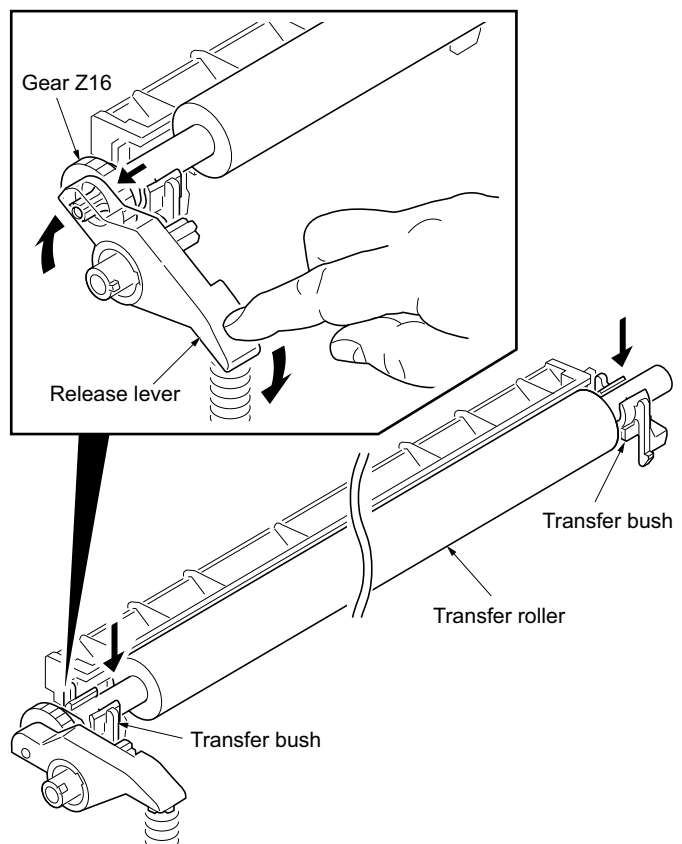


Figure 1-5-21

1-5-7 Fuser section

(1) Detaching and refitting the fuser unit

Procedure

1. Remove the outer covers (See page 1-5-3).
2. Remove two connectors.
3. Release the wires from wire clamps.

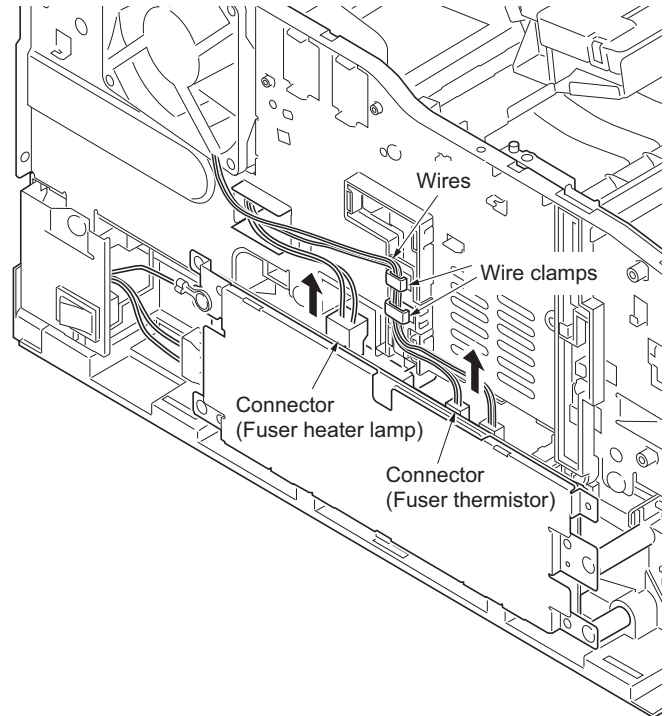


Figure 1-5-22

4. Remove the connector.

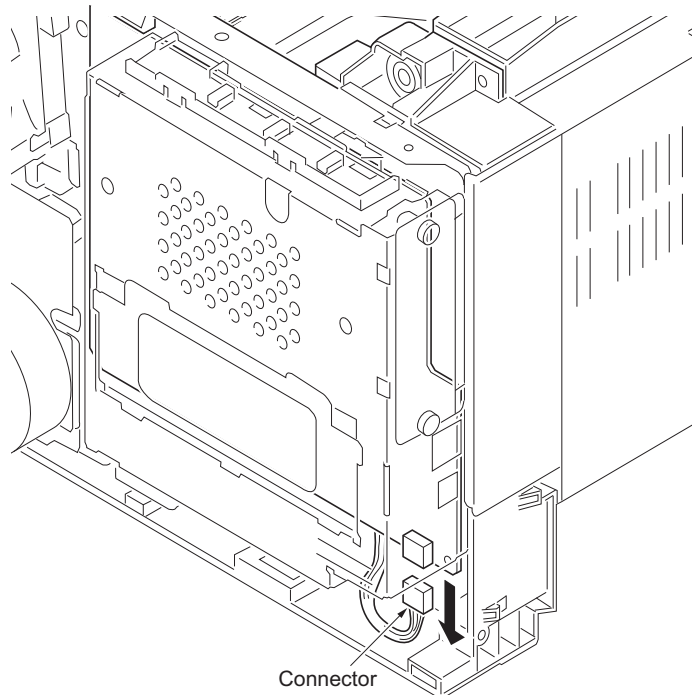
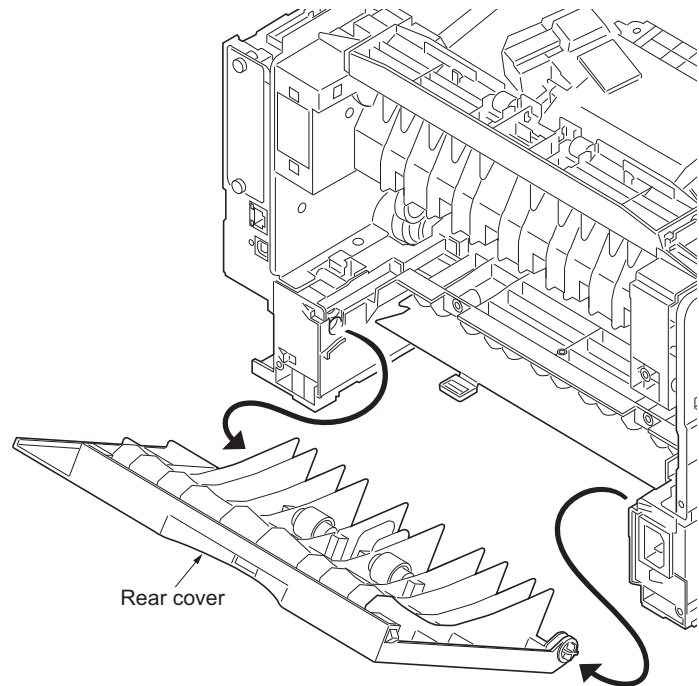
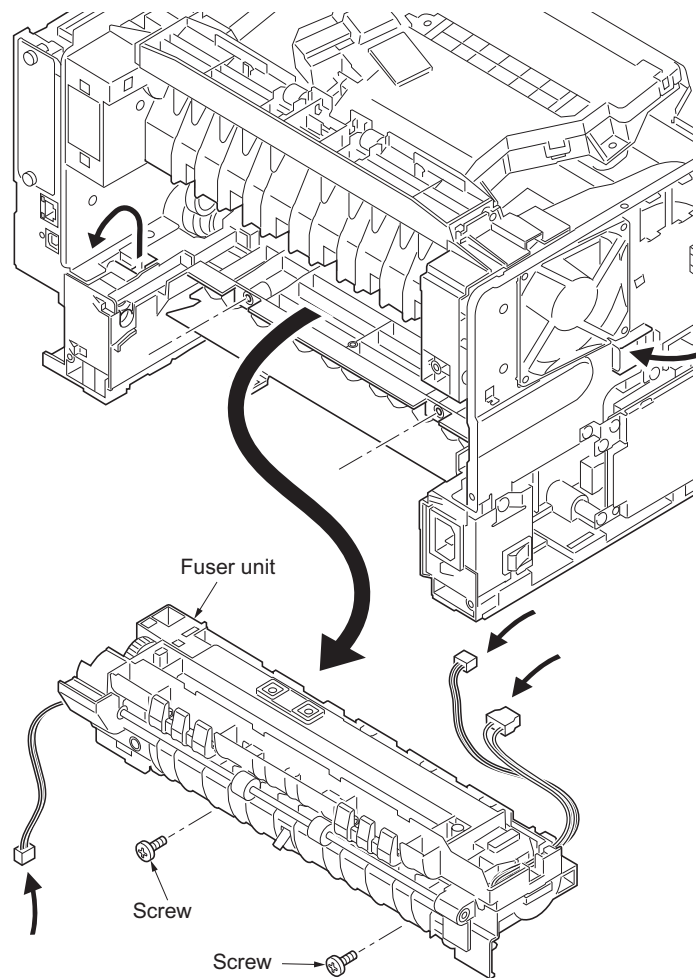


Figure 1-5-23

5. Open the rear cover and then remove the rear cover.

**Figure 1-5-24**

6. Remove two screws and then remove the fuser unit.
7. Check or replace the fuser unit and refit all the removed parts.

**Figure 1-5-25**

(2) Switching the fuser pressure

The fuser pressure may be decreased to suppress the print quality problems such as paper creases and curls. It must be cautioned that decreasing the fuser pressure could cause loose toner fusing.

Procedure

1. Remove the cassette (See page 1-5-6).
2. Open the duplex cover.
3. Slide the fuser lever R and L.

Normal:

Flush with the front of the machine.

Fuser pressure decreased:

Flush with the rear of the machine.

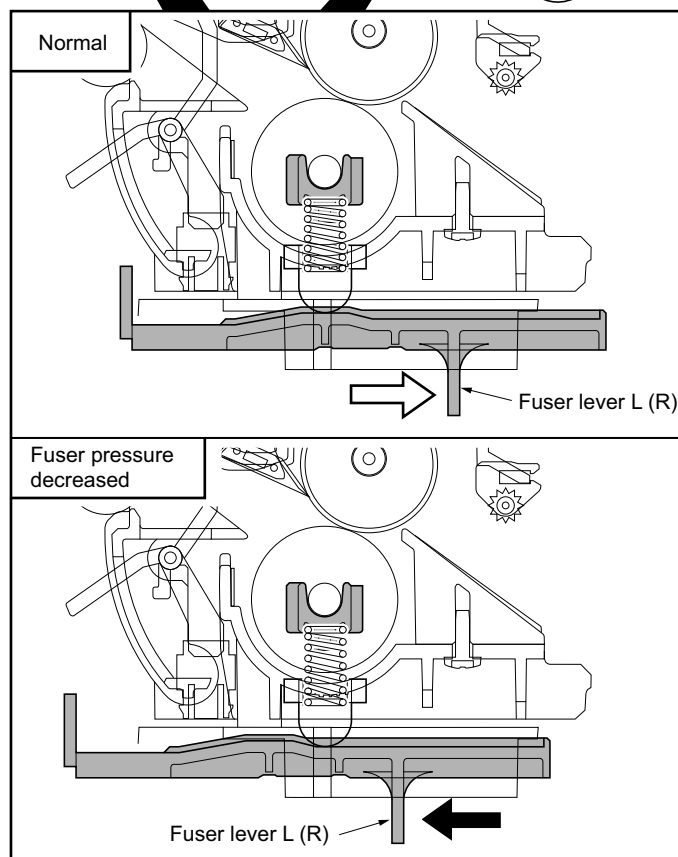
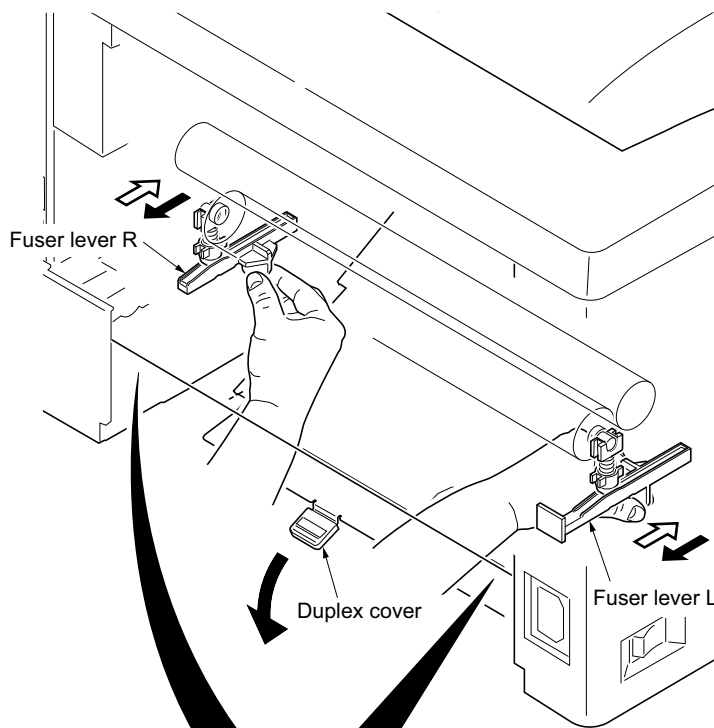


Figure 1-5-26

1-5-8 PWBs

(1) Detaching and refitting the control PWB

Procedure

1. Remove the right cover (See page 1-5-4).
2. Remove all connectors from the control PWB.

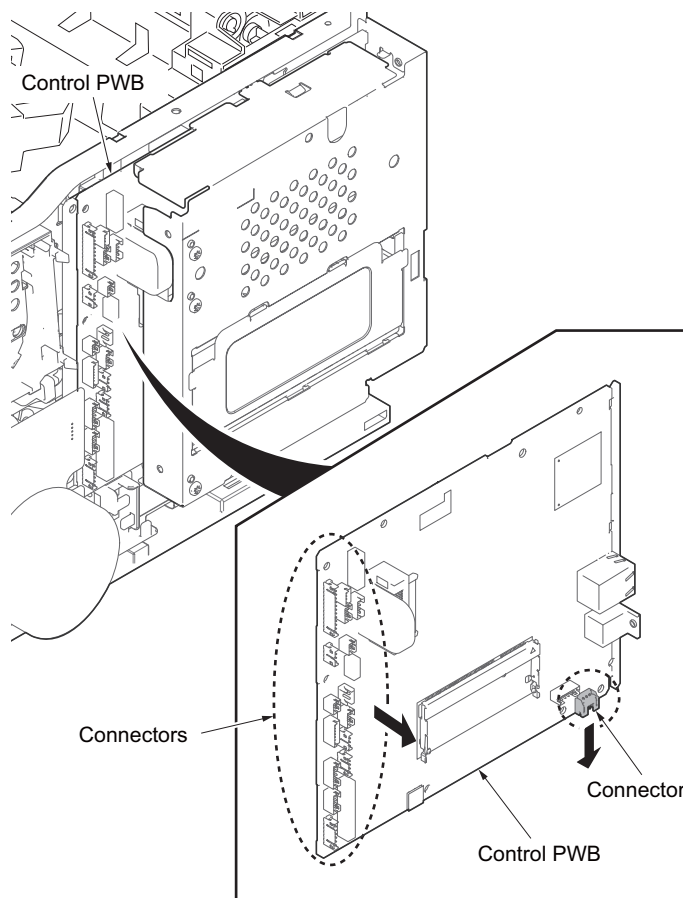


Figure 1-5-27

3. Remove five screws.
4. Unhook the hook and then remove the control PWB assembly.

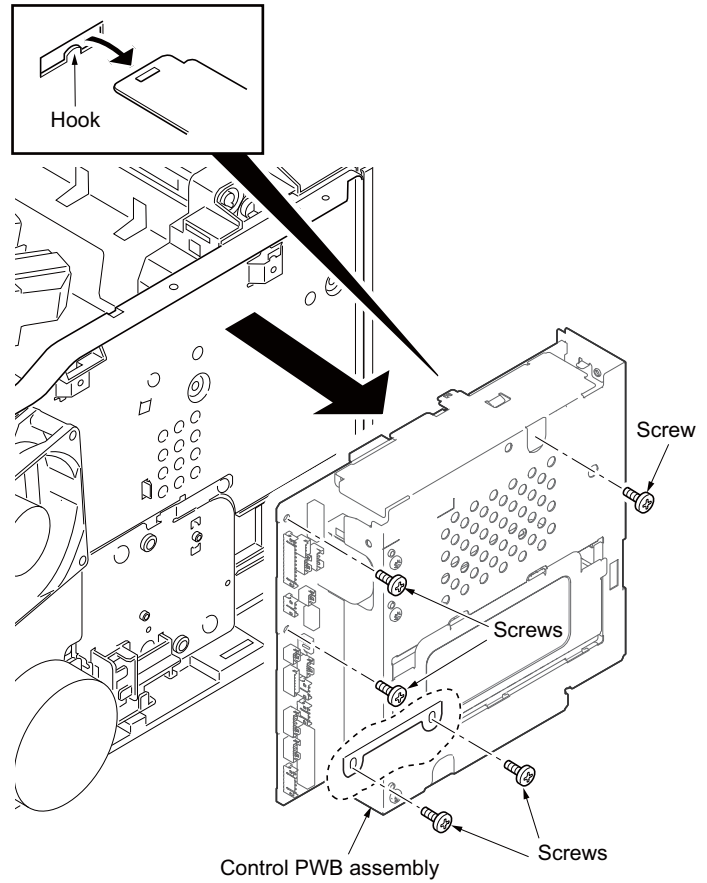
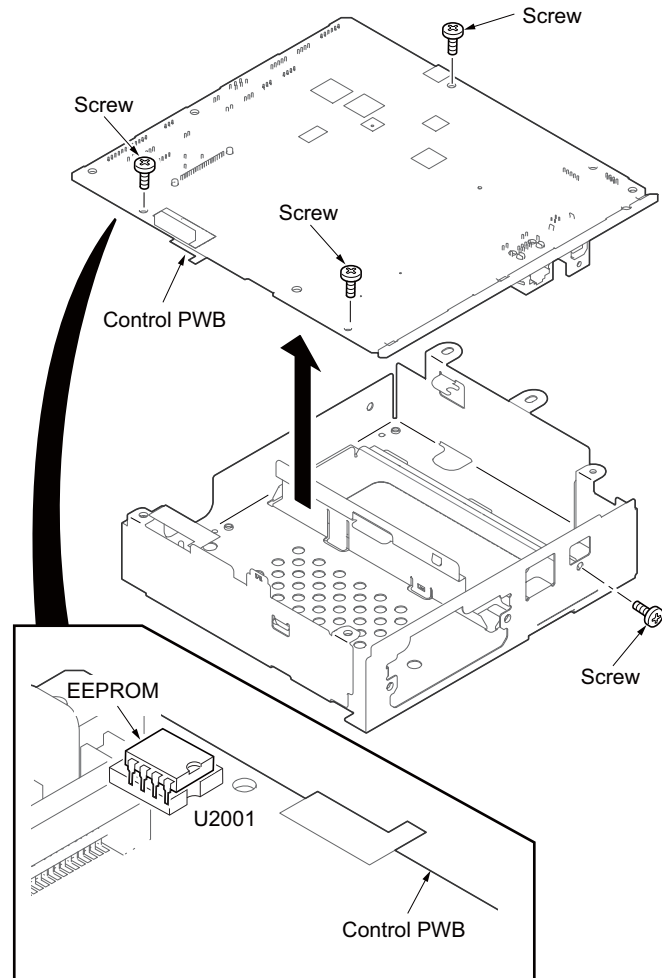


Figure 1-5-28

5. Remove four screws and then remove the control PWB.
6. Check or replace the control PWB and refit all the removed parts.
To replace the control PWB, remove the EEPROM (U300) from the old control PWB and mount it to the new control PWB.

**Figure 1-5-29**

(2) Detaching and refitting the power source PWB

Procedure

1. Remove the left cover (See page 1-5-4).
2. Remove four connectors.

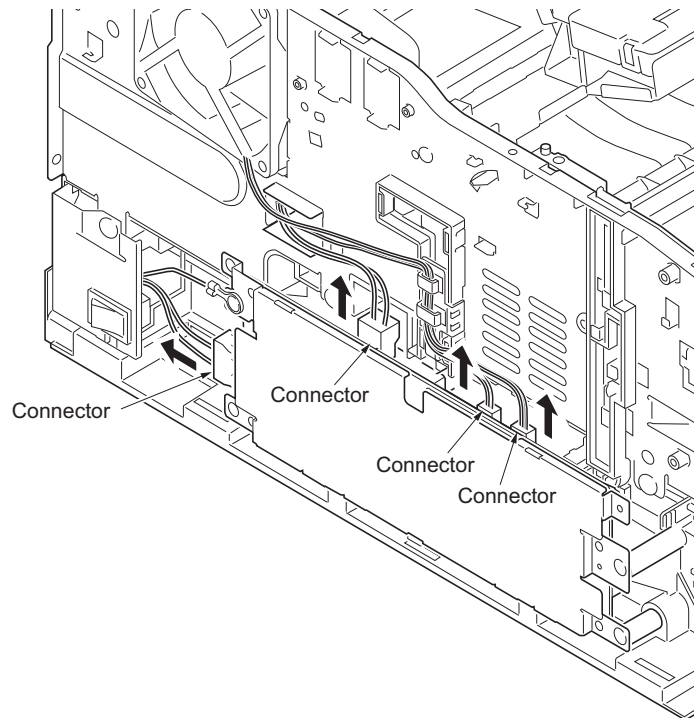


Figure 1-5-30

3. Remove four P tight screws, two screws and ground terminal.
4. Remove the power source PWB assembly from the high voltage PWB's connector.

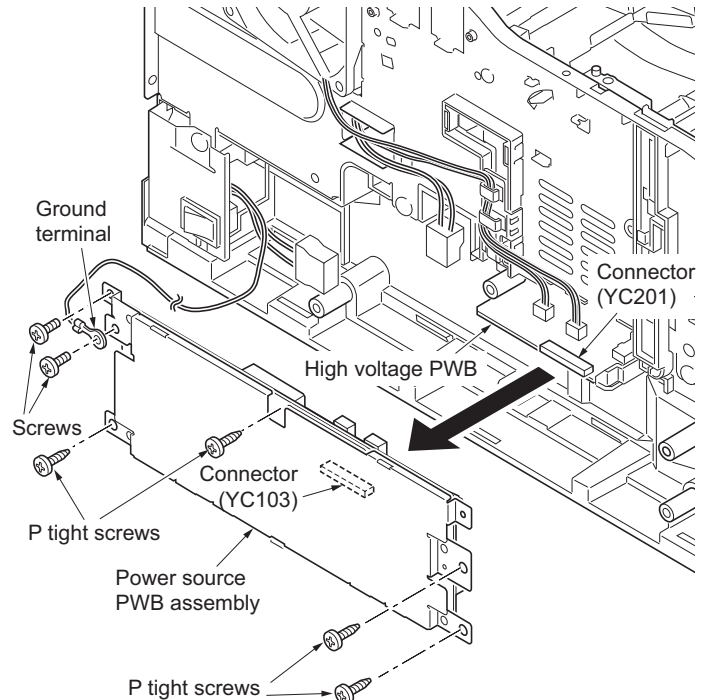
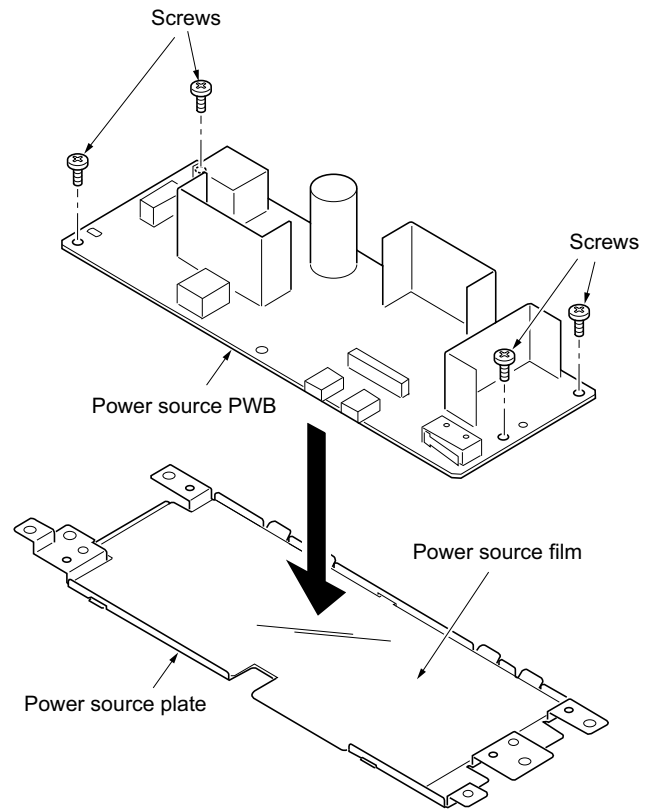


Figure 1-5-31

5. Remove four screws and then remove the power source plate from the power source PWB.
6. Check or replace the power source PWB and refit all the removed parts.
Caution: The power source film must be installed in the specified position.

**Figure 1-5-32**

(3) Detaching and refitting the high voltage PWB

Procedure

1. Remove the developing unit (See page 1-5-11).
2. Remove the drum unit (See page 1-5-12).
3. Remove the cassette (See page 1-5-6).
4. Remove the outer covers (See page 1-5-3).
5. Remove the power source PWB (See page 1-5-22).
6. Turn the printer with the bottom side up.
7. Remove the stop ring.
8. Remove the DU holder.

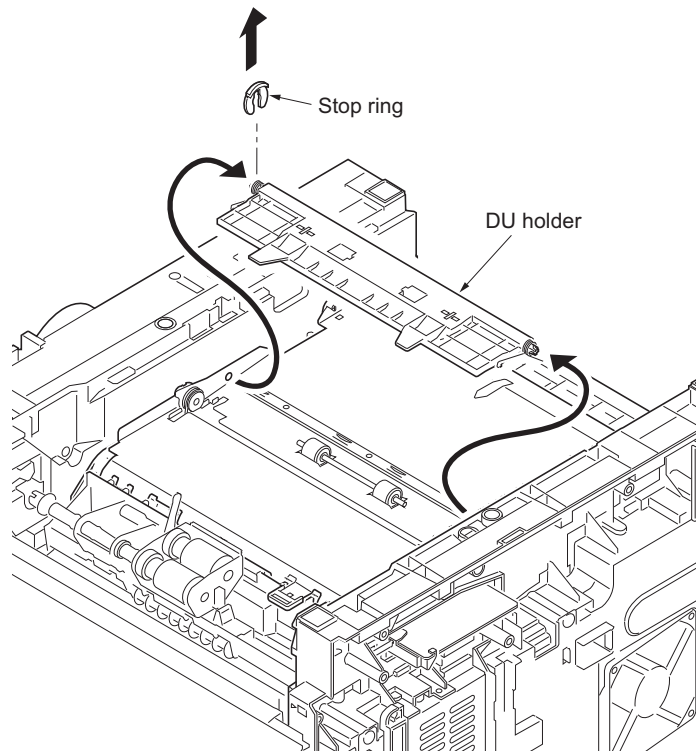


Figure 1-5-33

9. Pull out the DU bush.
10. Remove the DU cover assembly.

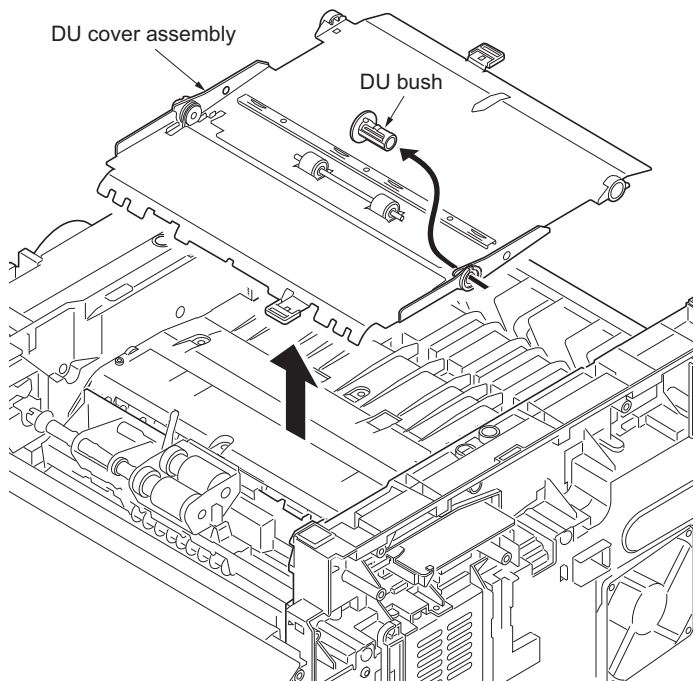
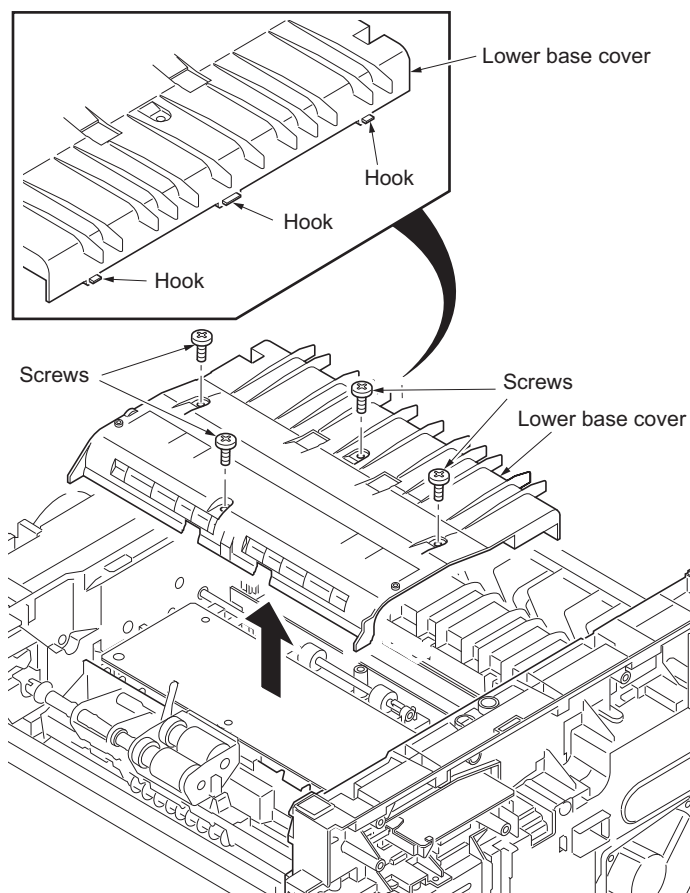


Figure 1-5-34

11. Remove four screws.
12. Unhook three hooks and then remove the lower base cover.

**Figure 1-5-35**

13. Remove the spring.
14. Remove the cassette pin.

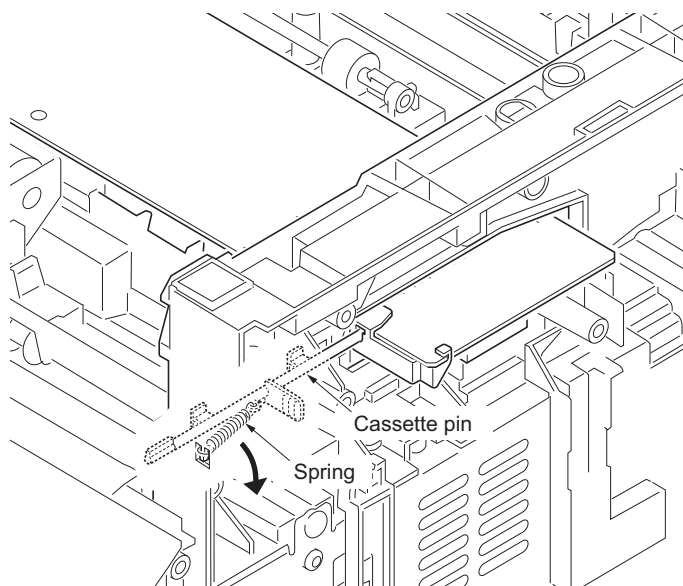


Figure 1-5-36

15. Remove two connectors and then remove the high voltage PWB.
16. Remove the cassette pin holder from the high voltage PWB.

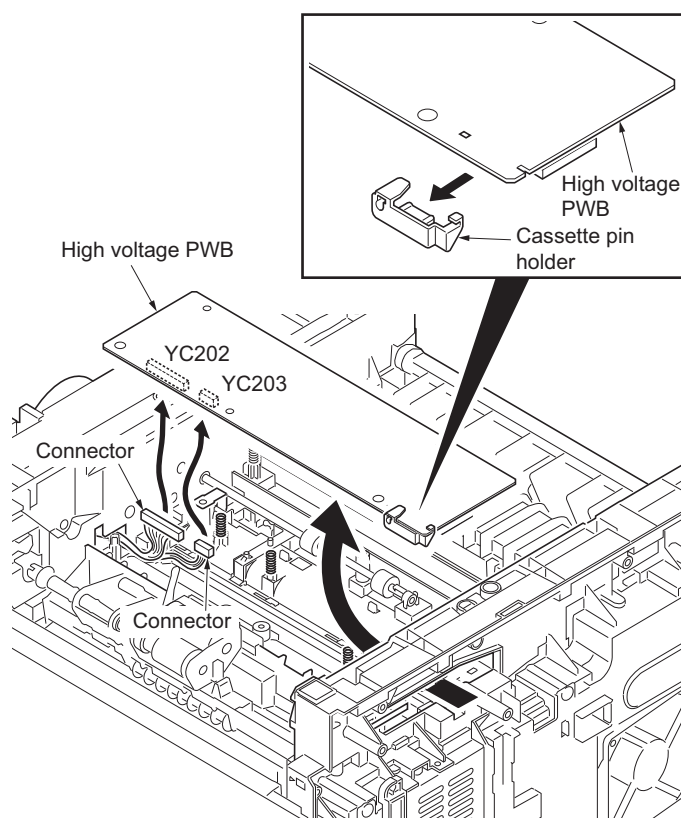


Figure 1-5-37

17. Check or replace the high voltage PWB and refit all the removed parts.

When refitting the high voltage PWB, be careful about following points.

- Position the ground plate so that it is atop the high voltage PWB.
- Each interface is firmly in contact with each spring.
- The bias contact pin must be installed in the specified position.
- The cassette pin must be inserted in the cassette pin holder.

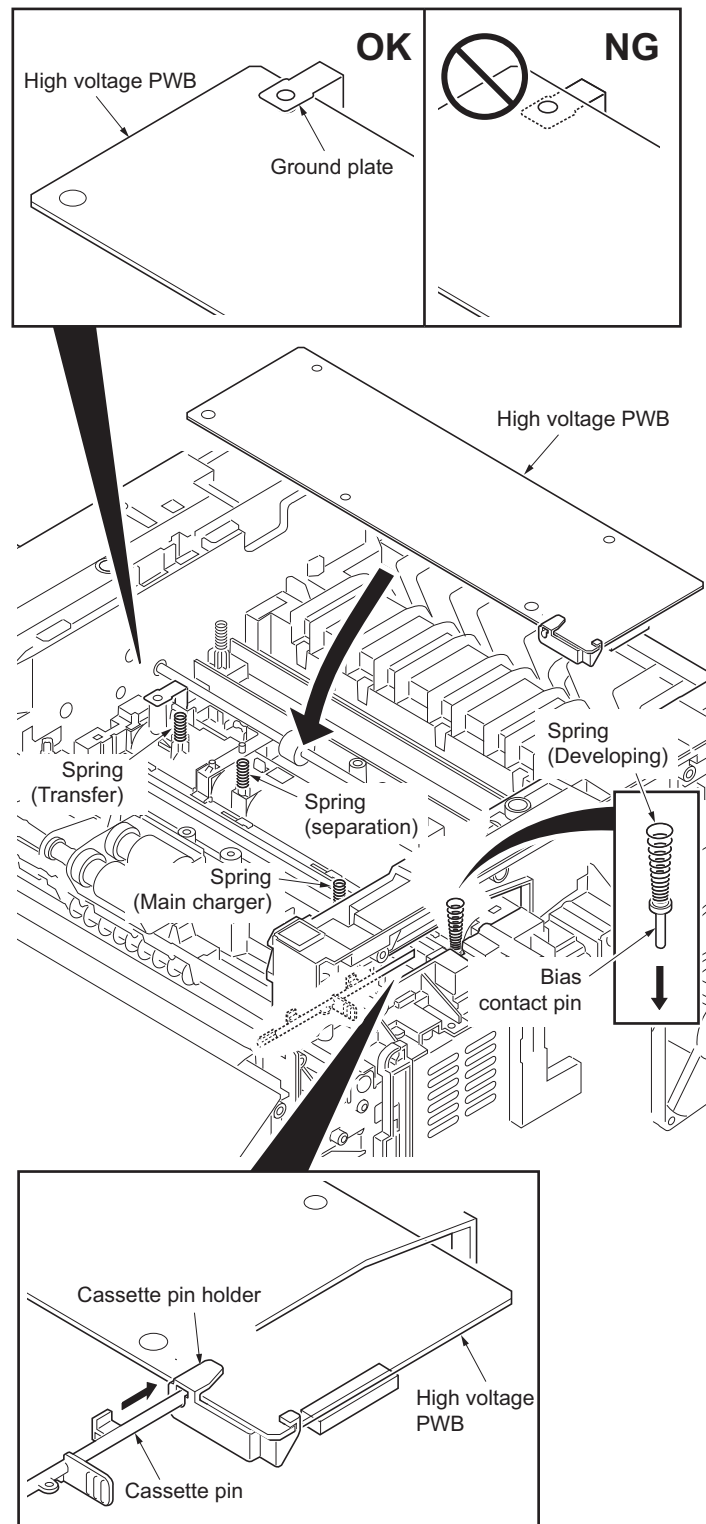


Figure 1-5-38

1-5-9 Others

(1) Detaching and refitting the main motor

Procedure

1. Remove the right cover (See page 1-5-4).
2. Remove the connector.

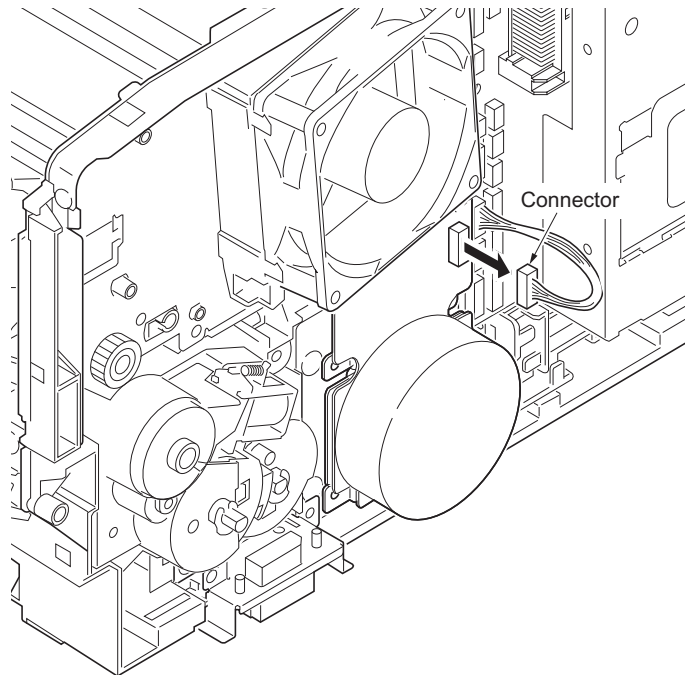


Figure 1-5-39

3. Remove the M3 screw and two M4 screws.
4. Remove the main motor.
5. Check or replace the main motor and refit all the removed parts.

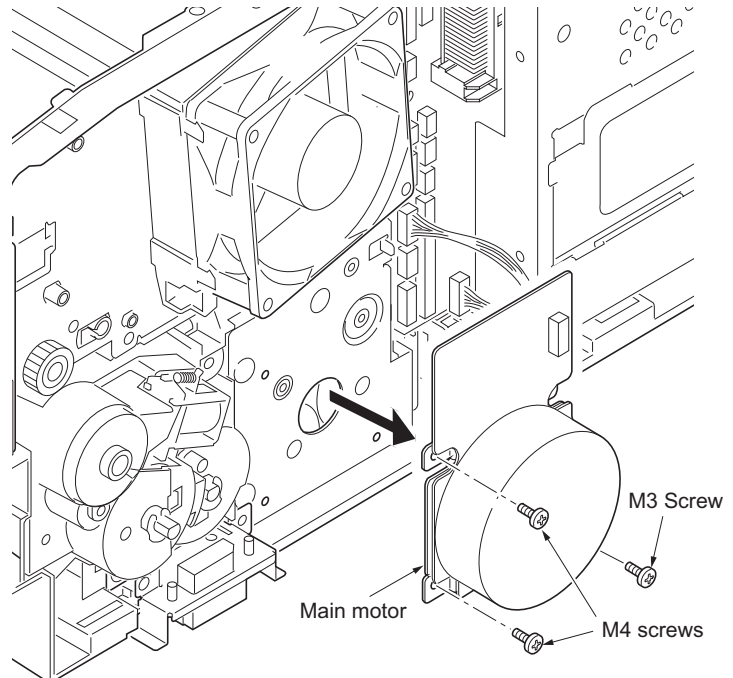


Figure 1-5-40

(2) Detaching and refitting the laser scanner unit

Procedure

1. Remove the right cover (See page 1-5-4).
2. Remove the connector from the control PWB.
3. Release the wire clamp.
4. Draw in the connector inside.

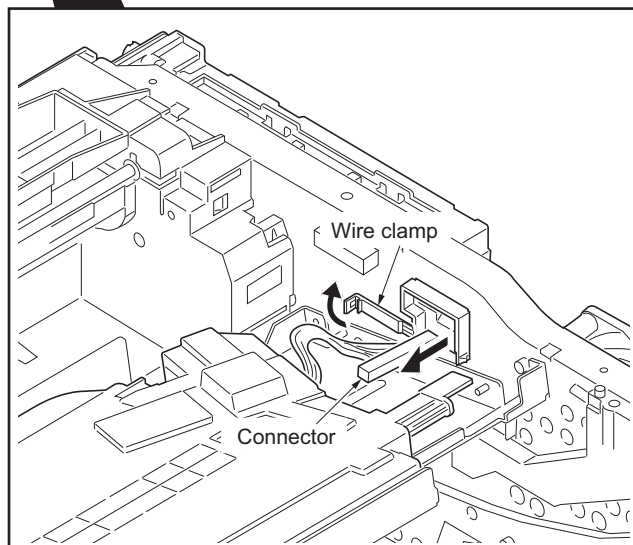
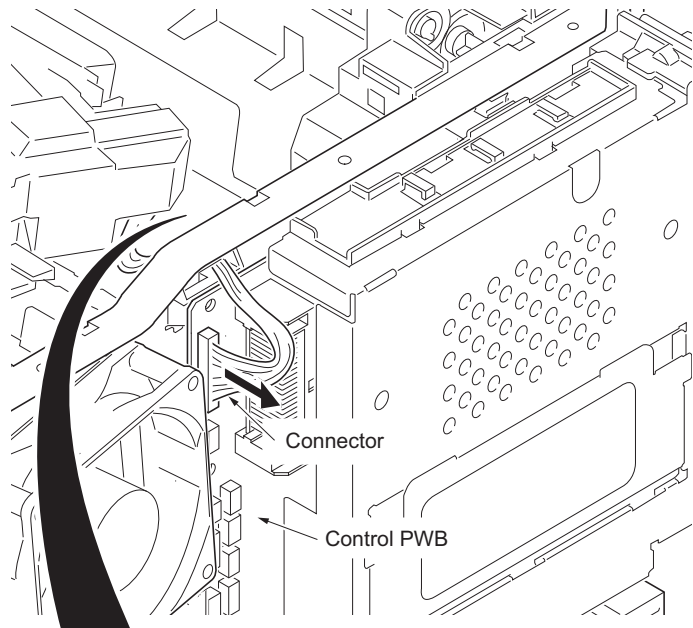
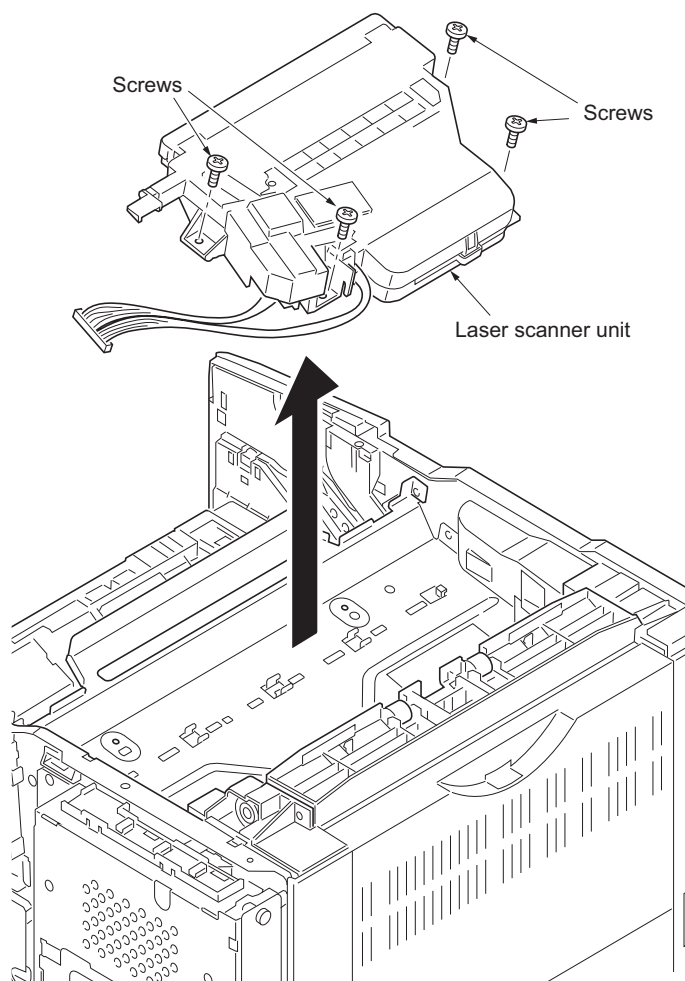


Figure 1-5-41

5. Remove four screws and then remove the laser scanner unit.
6. Check or replace the laser scanner unit and refit all the removed parts.

**Figure 1-5-42**

(3) Detaching and refitting the eraser lamp (PWB)

Procedure

1. Remove the laser scanner unit (See page 1-5-29).
2. Remove the connector.
3. Slide the eraser holder.
4. Unhook the hooks and then remove the eraser holder.

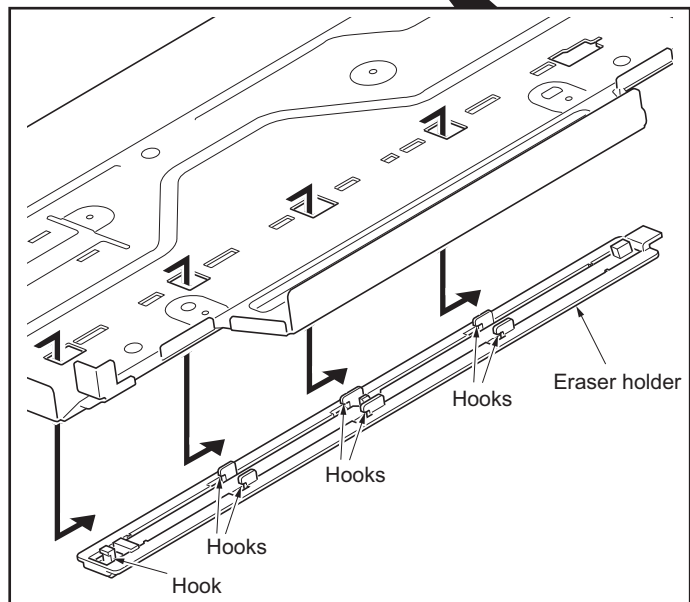
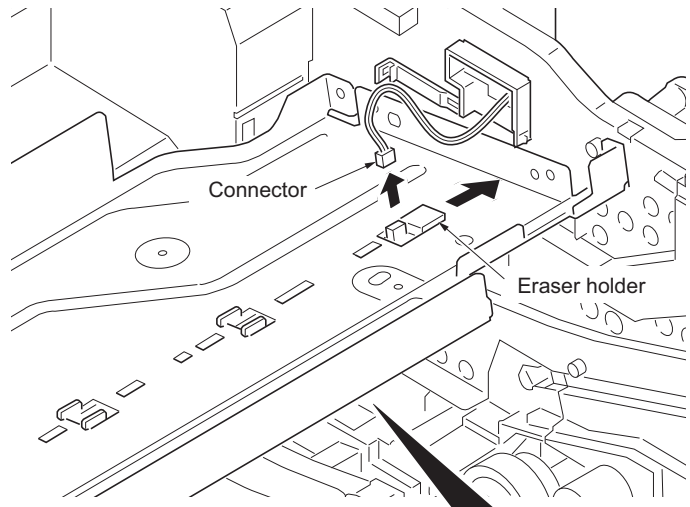


Figure 1-5-43

5. Remove the eraser lamp (PWB) from the eraser holder.
6. Check or replace the eraser lamp (PWB) and refit all the removed parts.

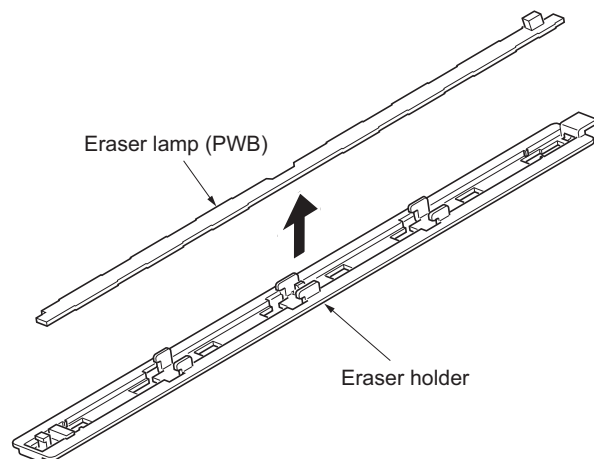
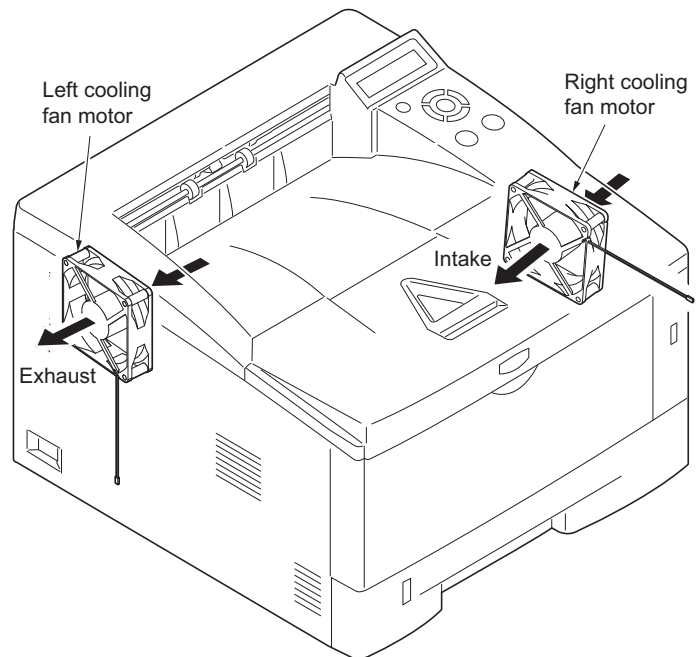


Figure 1-5-44

(4) Direction of installing the left cooling fan motor and right cooling fan motor

When detaching or refitting the left cooling fan motor or right cooling fan motor, be careful of the airflow direction (intake or exhaust).

**Figure 1-5-45**

1-6-1 Downloading firmware

(1) Firmware files

Firmware files are named after the following codes:

Firmware file name example

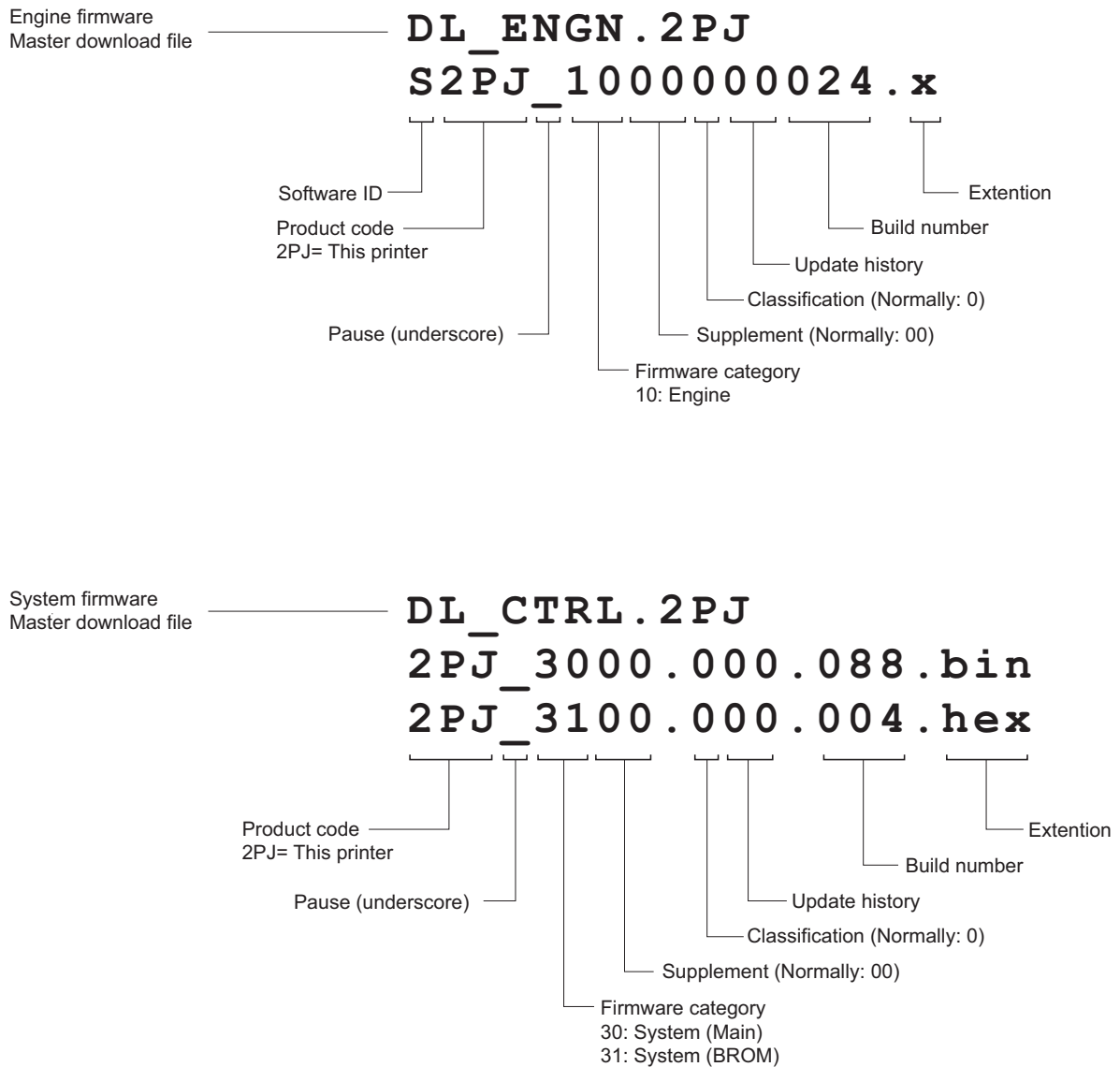


Figure 1-6-1

(2) Downloading the firmware from the USB memory

To download data written in a USB memory to the printer, proceed as explained in this section.

CAUTION

Downloading firmware takes several minutes. Do not turn power off during downloading. If downloading is interrupted by an accidental power failure, etc., the control PWB may have to be replaced.

Procedure

1. Turn printer power off.
2. Insert the USB memory to the PC's USB slot.
3. Copy the firmware files to download to the root directory of the USB memory.
4. Remove the USB memory from the PC's USB slot.
5. Insert the USB memory into the printer's USB memory slot.

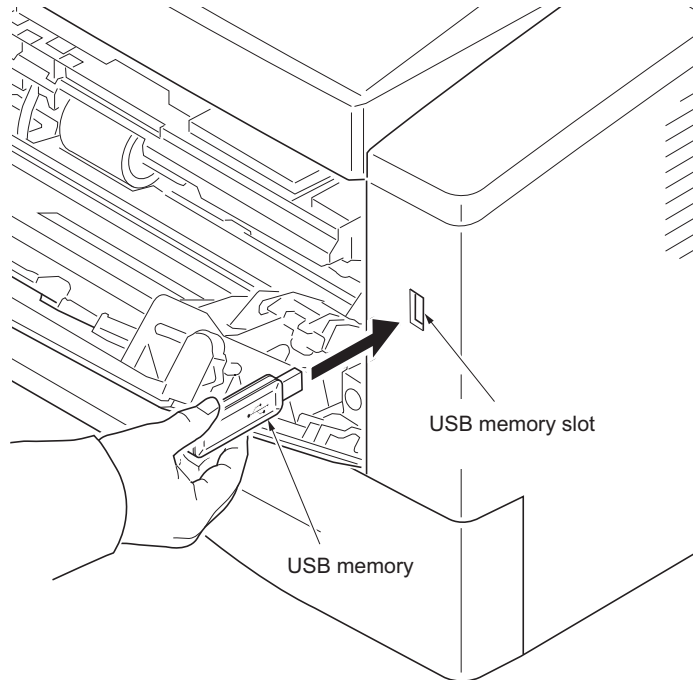


Figure 1-6-2

6. Turn printer power on.
7. When message display (1) is displayed to detect firmware in the USB memory.
8. Message display (2) is displayed during downloading.
9. When message display (3) is displayed to indicate downloading is finished.

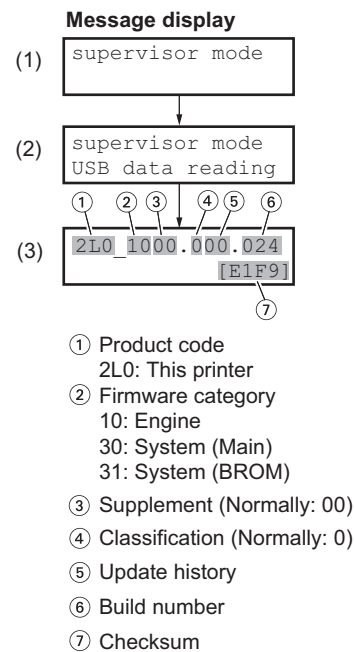
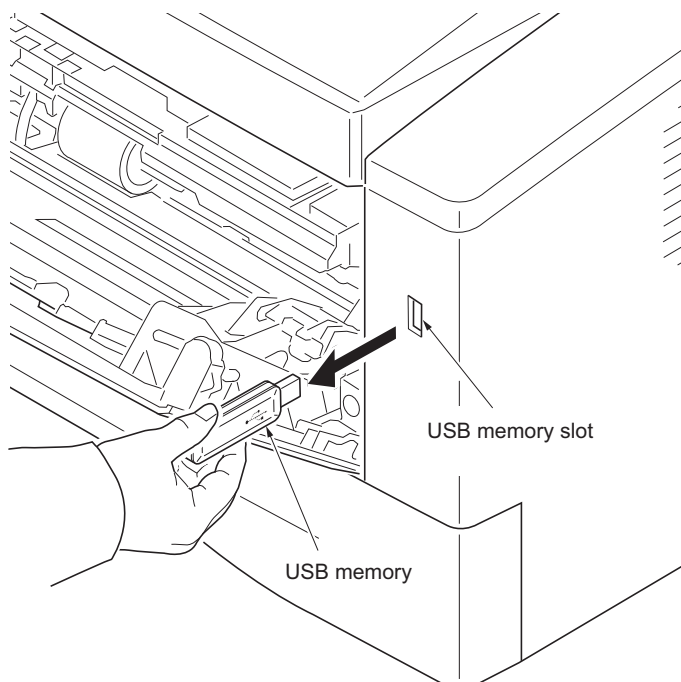


Figure 1-6-3

10. Turn printer power off.
11. Remove the USB memory from USB memory slot.
12. Turn printer power on.
13. Print the service status page to check that the firmware version has been updated.
(See page 1-3-8)

**Figure 1-6-4****Safe-UPDATE**

If the device is accidentally switched off or the USB memory is disconnected and upgrading was incomplete, upgrading is retried when turning the main power switch on next time. Insert USB memory and turn the main power switch on to perform steps 6 to 11 as the above.

(3) Emergency-UPDATE

If Safe-UPDATE is not successful in upgrading, the message below appears.

In that case, retry upgrading after recovering the software by following the procedure below.

FW-Update	
Error	FFFF

Preparation

The USB memory must be formatted in FAT or FAT32 in advance.

Extract the main firmware to download from the file.

Rename the file which was extracted from the archive.

[DL_CTRL.2PJ] to [KM_EMRG.2PJ]

Copy the all extracted files to the root of the USB memory.

Procedure

1. Turn the main power switch off.
2. Insert the USB memory which contains the firmware into the USB memory slot.
3. Turn the main power switch on.
4. Rewriting of the PWB software will start for restoration.
"Emergency Update" is displayed on the LCD of the operation panel.
5. "Completed" will be displayed when rewriting is successful.
* : "Failed" will be displayed when rewriting is failed.
6. Turn the main power switch off.
7. Wait for several seconds and then remove the USB memory from the USB memory slot.
8. Extract the firmware to download from the archive and copy to the root of the formatted USB memory.

NOTE: Deletes the "ES_SKIP.on" file When it is contained directly under the USB memory.

9. Insert the USB memory in which the firmware was copied in the USB memory slot.
10. Perform steps 6 to 11 on the previous page.
11. Turn the main power switch on.
12. Perform maintenance item U000 (Print a maintenance report) to check that the version of ROM U019 has been upgraded.

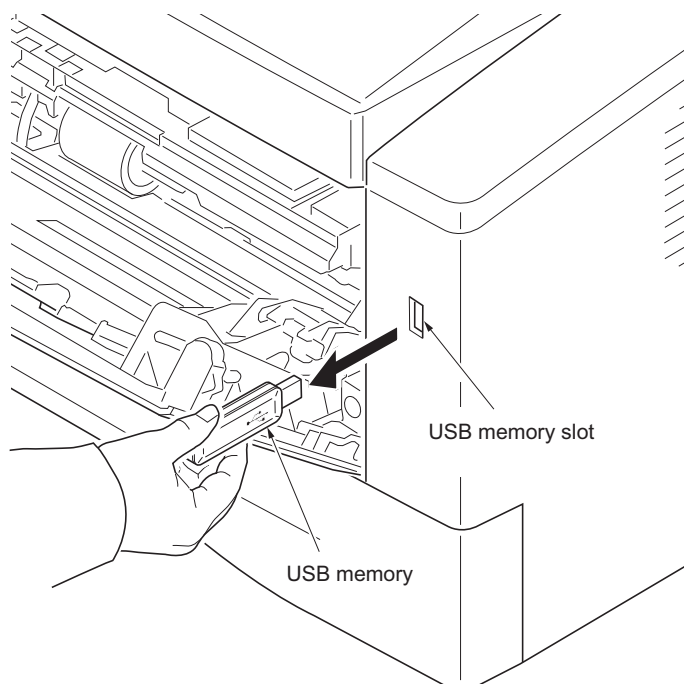


Figure 1-6-5

2-1-1 Paper feed/conveying section

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

(1) Cassette paper feed section

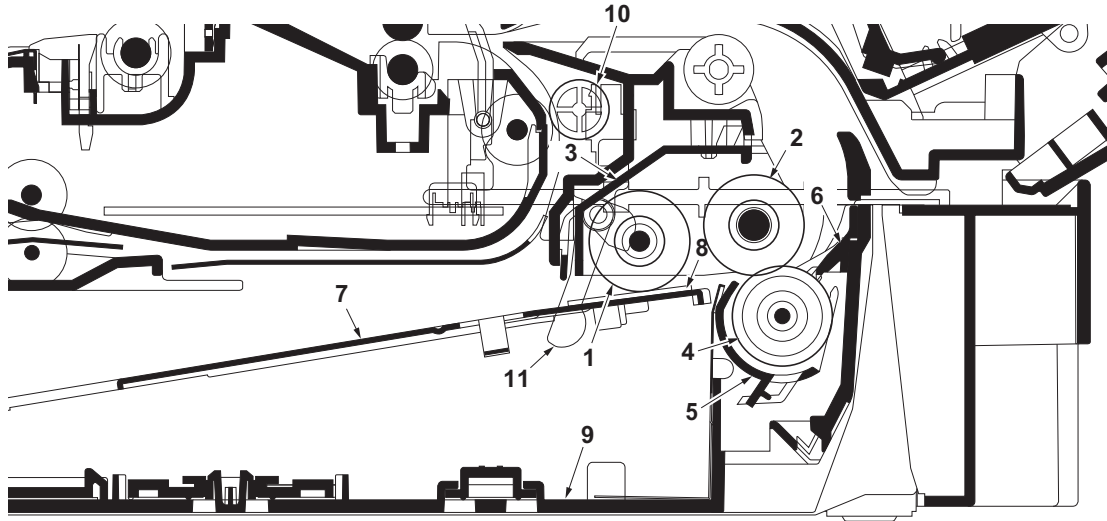


Figure 2-1-1 Cassette paper feed section

- | | |
|-----------------------|------------------------------|
| (1) Pickup roller | (7) Bottom plate |
| (2) Paper feed roller | (8) Bottom pad |
| (3) Feed holder | (9) Cassette base |
| (4) Retard roller | (10) Paper sensor |
| (5) Retard holder | (11) Actuator (paper sensor) |
| (6) Retard guide | |

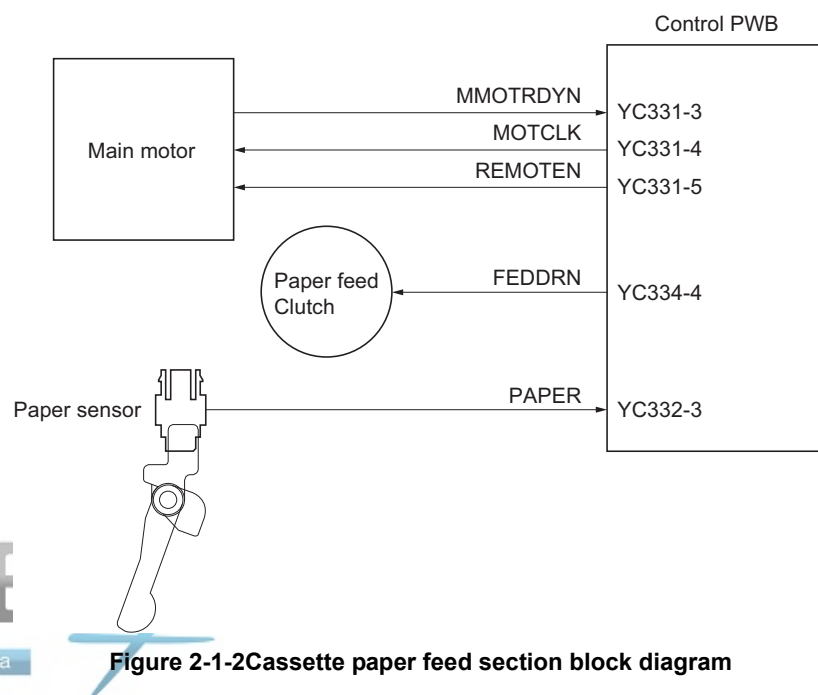


Figure 2-1-2 Cassette paper feed section block diagram

(2) MP tray paper feed section

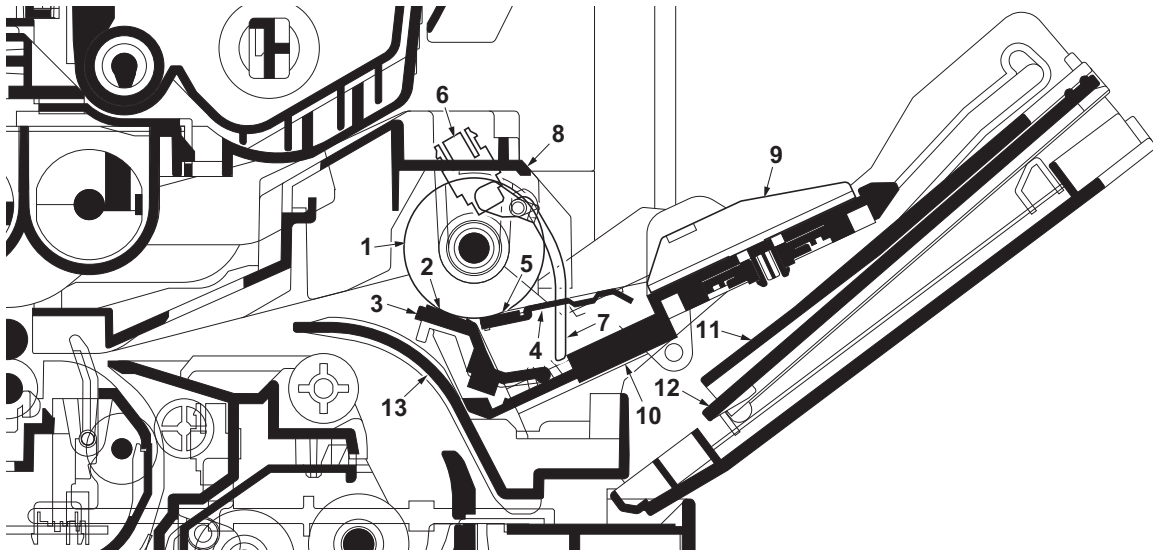


Figure 2-1-3 MP tray paper feed section

- | | |
|--------------------------------|----------------------|
| (1) MP paper feed roller | (8) MPF frame |
| (2) MPF separation pad | (9) MPF guide R/L |
| (3) MPF separator | (10) MPF base |
| (4) MPF bottom plate | (11) MPF middle tray |
| (5) MPF friction pad | (12) MPF upper tray |
| (6) MP paper sensor | (13) MPF turn guide |
| (7) Actuator (MP paper sensor) | |

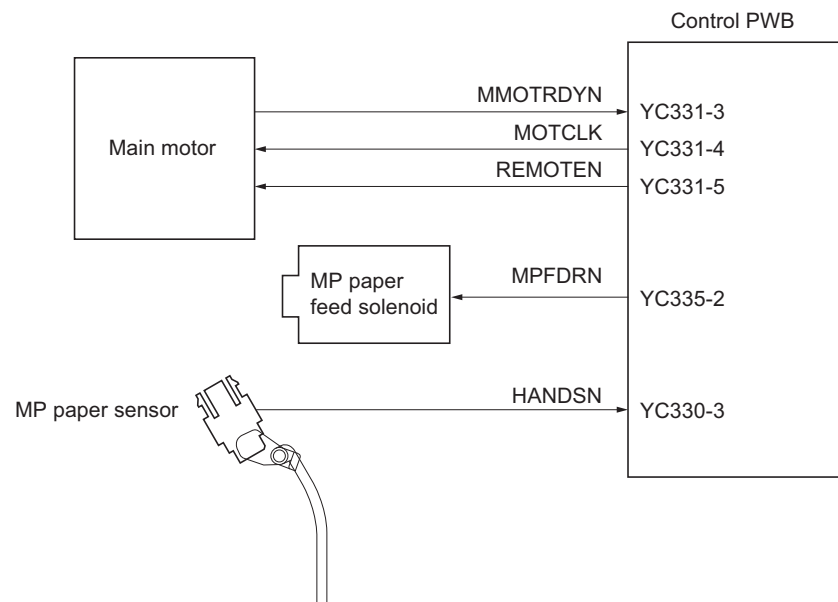


Figure 2-1-4 MP tray paper feed section block diagram

(3) Paper conveying section

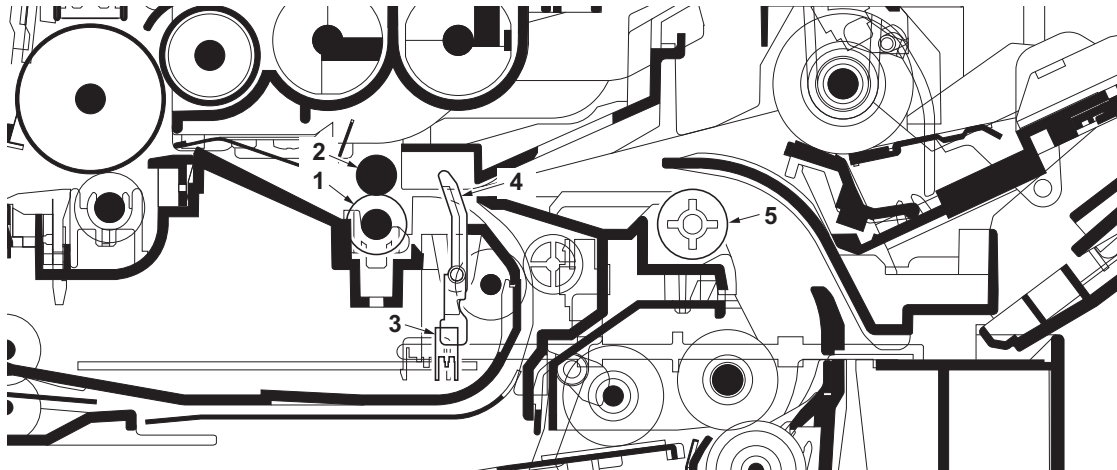


Figure 2-1-5 Paper conveying section

- (1) Lower registration roller
- (2) Upper registration roller
- (3) Registration sensor
- (4) Actuator (registration sensor)
- (5) Feed pulley

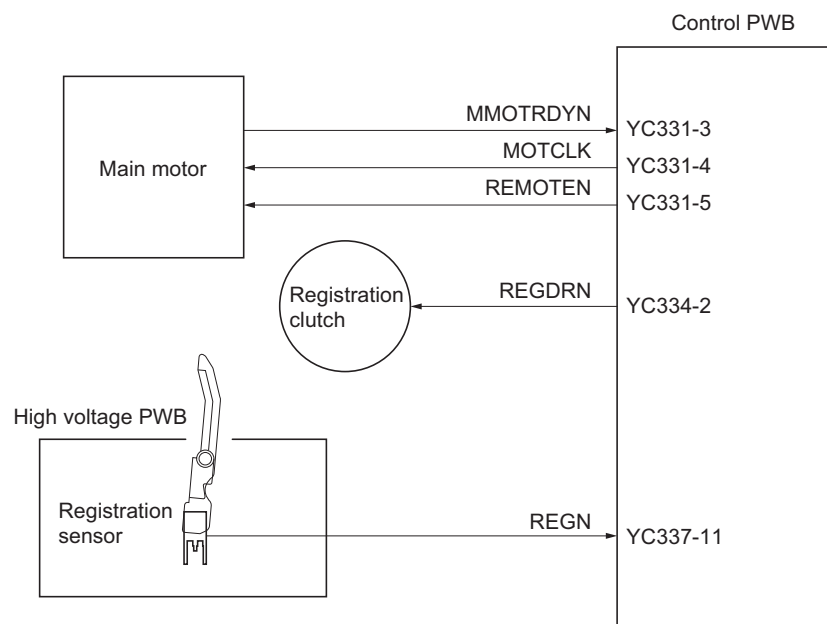


Figure 2-1-6 Paper conveying section block diagram

2-1-2 Drum section

(1) Drum section

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

Since the OPC is materialized by resin, it is susceptible to damage caused by sharp edges such as a screwdriver, etc., resulting in a print quality problem. Also, finger prints can cause deterioration of the OPC layer, therefore, the drum (in the drum unit) must be handled with care. Substances like water, alcohol, organic solvent, etc., should be strictly avoided. As with all other OPC drums, the exposure to a strong light source for a prolonged period can cause a print quality problem. The limit is approximately 500 lux for less than five minutes. If the drum (drum unit) remains removed from the printer, it should be stored in a cool, dark place.

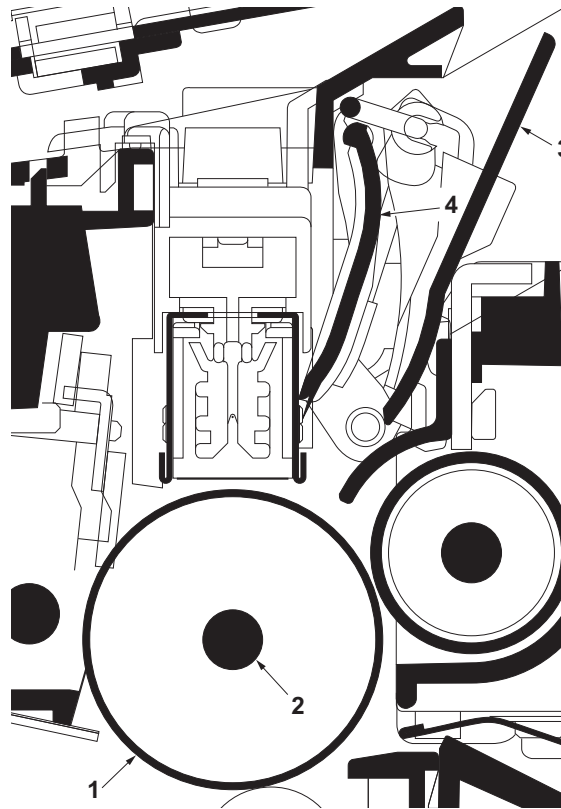


Figure 2-1-7 Drum section

- (1) Drum
- (2) Drum shaft
- (3) Drum cover A
- (4) Drum cover B

(2) Main charger unit

As the drum rotates in a “clean (neutral)” state, its photoconductive layer is given a uniform, positive (+) corona charge dispersed by the main charger wire. Due to high-voltage scorotron charging, the charging wire can get contaminated by oxidation after a long run. Therefore, the charger wire must be cleaned at a specific interval. Cleaning the charging wire prevents print quality problems such as black streaks.

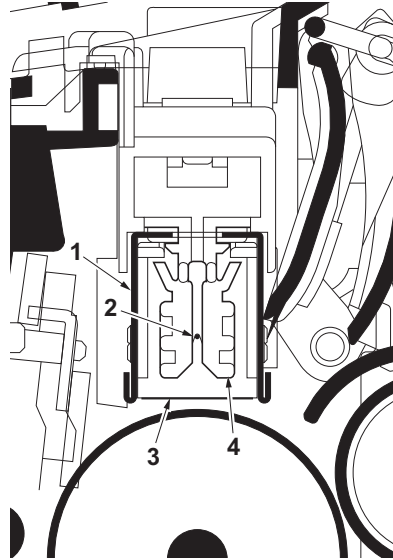


Figure 2-1-8 Main charger unit

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

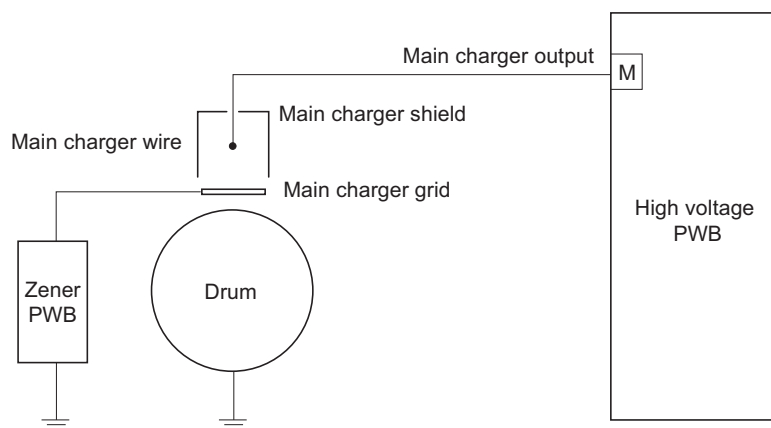


Figure 2-1-9 Drum unit and main charger unit block diagram

2-1-3 Optical section

(1) Laser scanner unit

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

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

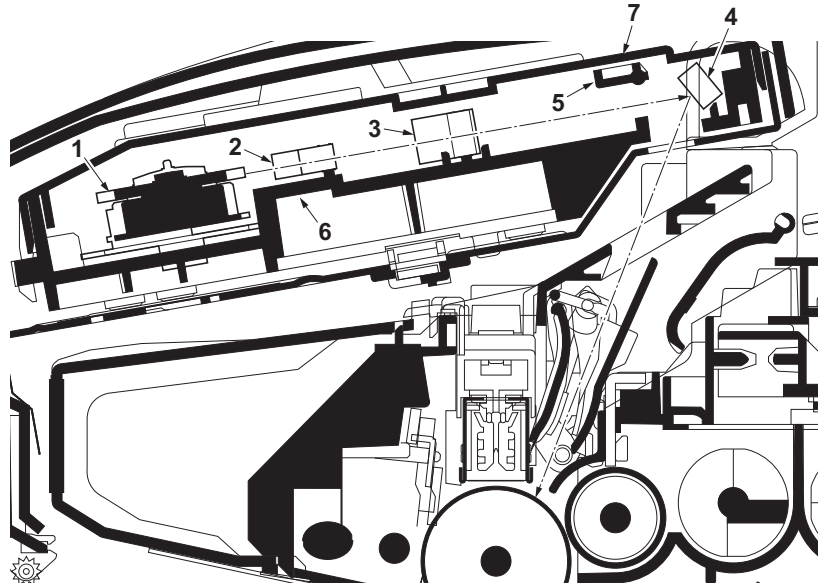


Figure 2-1-10 Laser scanner unit

- (1) Polygon motor (mirror)
- (2) F-θ lens
- (3) F-θ lens
- (4) LSU mirror
- (5) LSU shutter
- (6) LSU frame
- (7) LSU cover

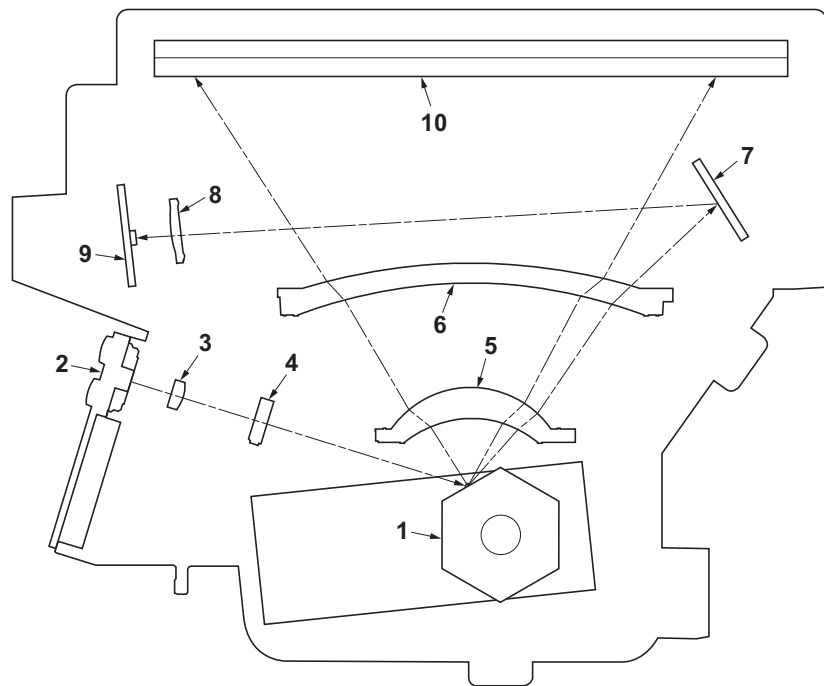


Figure 2-1-11 Laser scanner unit

- (1) Polygon motor (mirror)
- (2) Laser diode (APC PWB)
- (3) Collimator lens
- (4) Cylindrical lens
- (5) F- θ lens
- (6) F- θ lens
- (7) PD mirror
- (8) SOS lens
- (9) Pin photo diode sensor (PD PWB)
- (10) LSU mirror

2-1-4 Developing section

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

The developing roller is applied with the AC-weighted, positive DC power source. Toner on the magnet sleeve is given a positive charge. The positively charged toner is then attracted to the areas of the drum which was exposed to the laser light. (The gap between the drum and the magnet sleeve is approximately 0.32 mm.) The non-exposed areas of the drum repel the positively charged toner as these areas maintain the positive charge.

The developing roller is also AC-biased to ensure contrast in yielding by compensating the toner's attraction and repelling action during development.

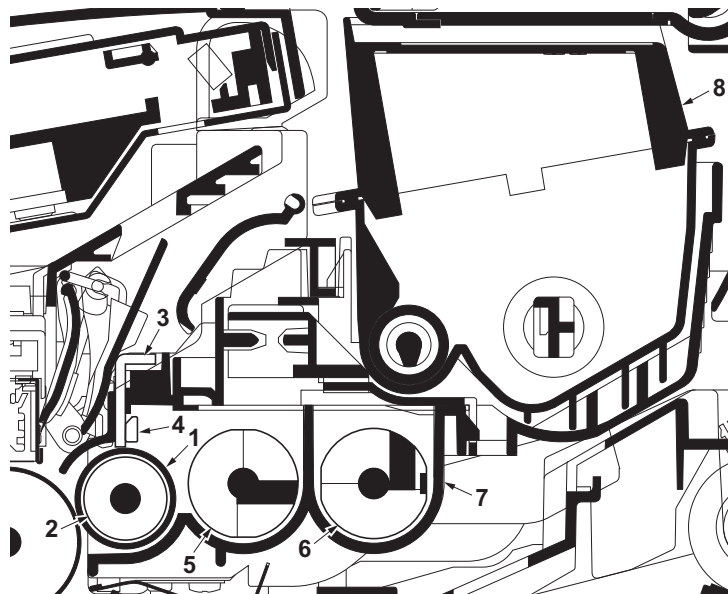


Figure 2-1-12 Developing unit and toner container

- | | |
|----------------------|---------------------|
| (1) Magnet sleeve | (5) DLP screw A |
| (2) Magnet roller | (6) DLP screw B |
| (3) Developing blade | (7) DLP case |
| (4) Blade magnet | (8) Toner container |

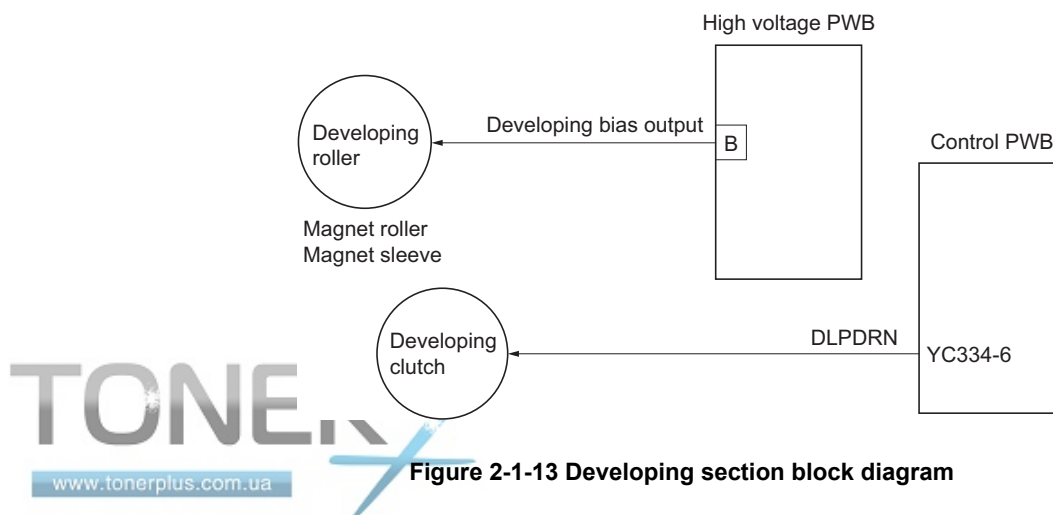


Figure 2-1-13 Developing section block diagram

2-1-5 Transfer/separation section

The transfer/separation section consists of the transfer roller, discharger brush and paper chute guide. A high voltage generated by the high voltage PWB is applied to the transfer roller for transfer charging. Paper after transfer is separated from the drum.

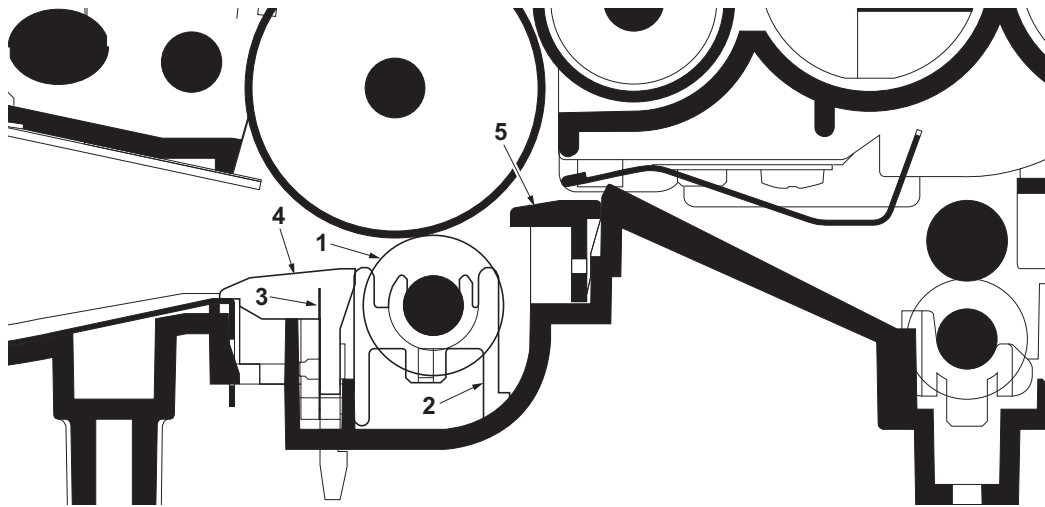


Figure 2-1-14 Transfer/separation section

- (1) Transfer roller
- (2) Transfer bushes
- (3) Discharger brush
- (4) DC brush holder
- (5) Paper chute guide

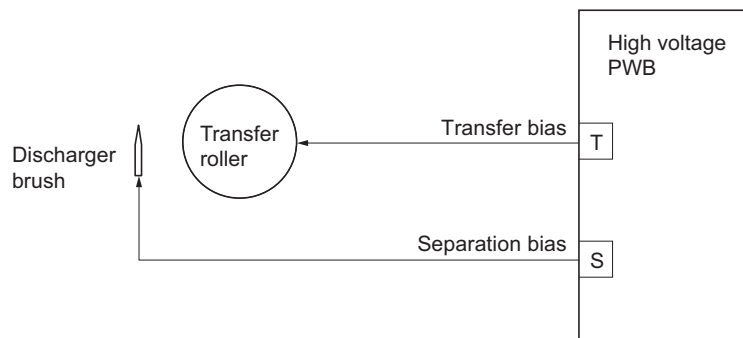


Figure 2-1-15 Transfer/separation section block diagram

2-1-6 Cleaning section

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

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

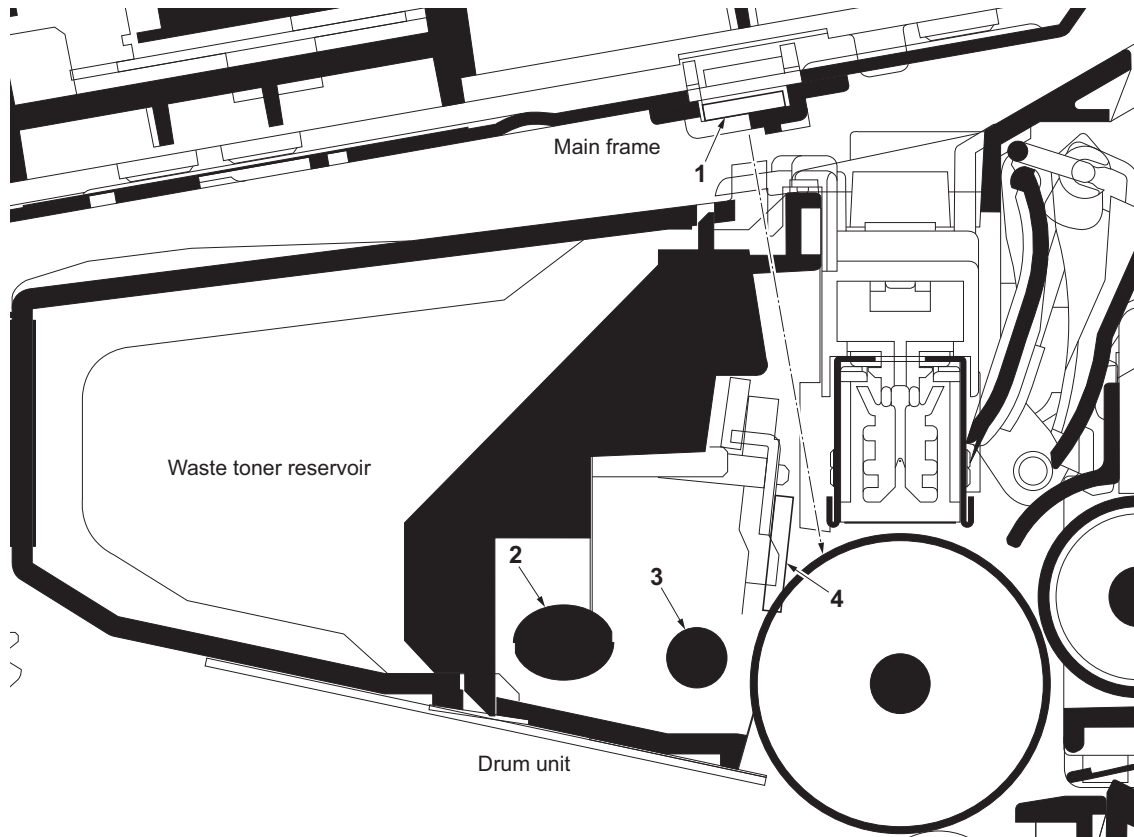


Figure 2-1-16 Cleaning section

- (1) Eraser lamp (PWB)
- (2) Sweep roller
- (3) Toner conveying roller
- (4) Cleaning blade

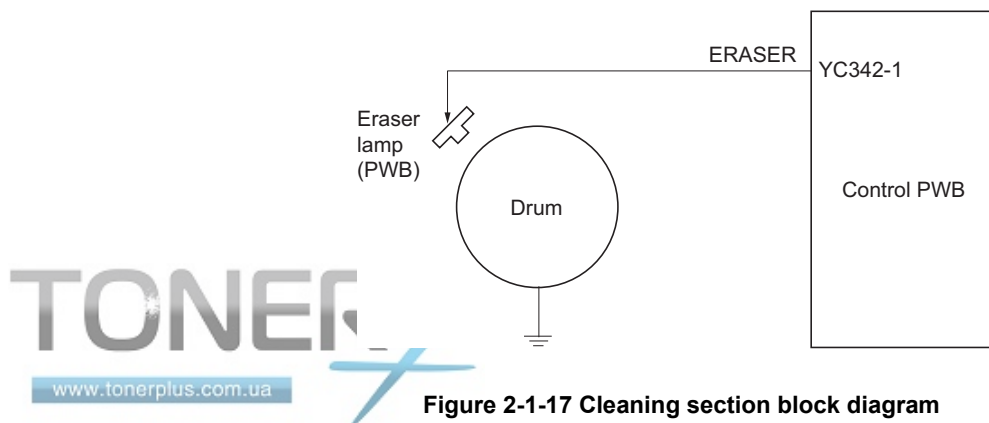


Figure 2-1-17 Cleaning section block diagram

2-1-7 Fuser section

The toner on the paper is molten and pressed into the paper as it passes between the heat roller and the press roller in the fuser unit. The heat roller has a heater lamp inside which continuously turns on and off by the fuser thermistor to maintain the constant temperature onto the heat roller surface. The heat roller is resin coated by fluorine to prevent toner from accumulating on the roller after a long run. Care must be taken while handling the heat roller not to scratch the roller surface as doing so may result in print problems. Fuser temperature is optimized to the paper type. The heat roller has four separators (claws) which are continuously in contact with its surface. These separators (claws) prevent the paper on which toner has been fused from being wound around the heat roller causing paper jam. The press roller is made of the heat-resistant silicon rubber. This roller is used to strongly press the paper towards the heat roller by means of press springs. The temperature of the heat roller is constantly monitored by the control PWB using the fuser thermistor. Should the temperature of the heat roller exceed the predetermined value, the fuser thermal cutout is activated to effectively disconnect the heater lamp from power.

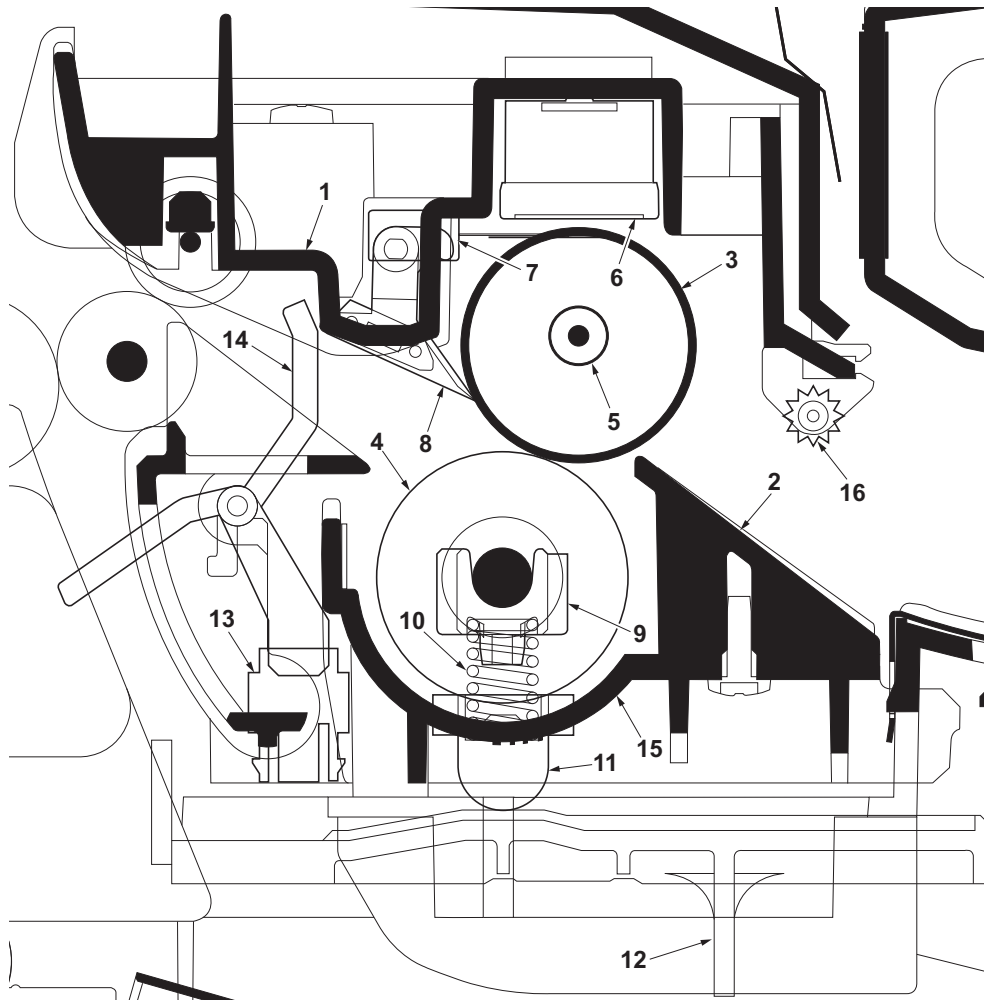


Figure 2-1-18 Fuser section

- | | |
|--------------------------|-----------------------------|
| (1) Upper fuser frame | (9) Fuser bushes |
| (2) Lower fuser frame | (10) Press springs |
| (3) Heat roller | (11) Press spring holders |
| (4) Press roller | (12) Fuser lever L (R) |
| (5) Fuser heater lamp | (13) Exit sensor |
| (6) Fuser thermal cutout | (14) Actuator (exit sensor) |
| (7) Fuser thermistor | (15) Fuser guide |
| (8) Separators | (16) Fuser guide pulley |

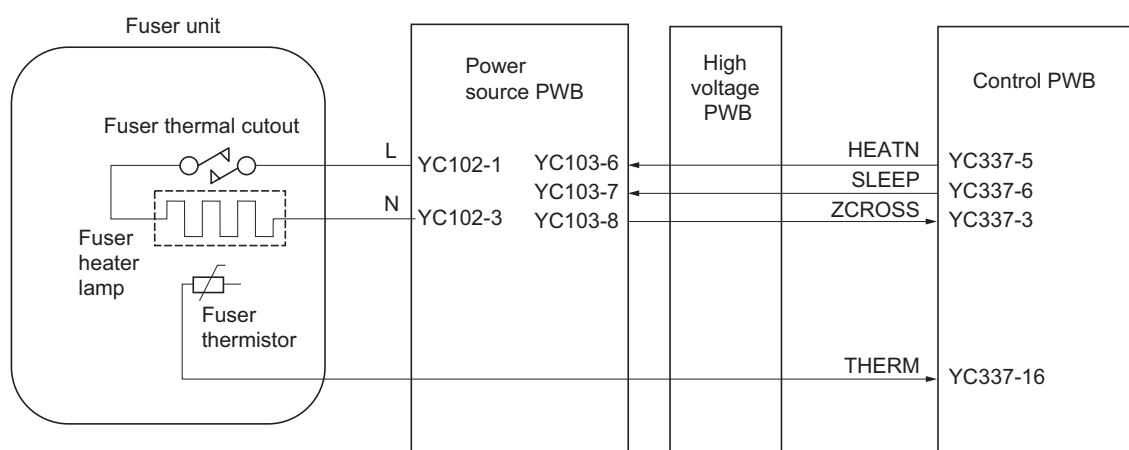


Figure 2-1-19 Fuser section block diagram

2-1-8 Paper exit section

The paper exit section transports the paper which passed the fuser unit towards the top tray. The paper which passed through the fuser unit turns on the actuator (exit sensor) in the fuser unit, and is led by the guide comprised of the rear cover, frame and the FD cover guide, finally reaching the FD roller. The paper is delivered to the top tray by the rotation of the FD roller.

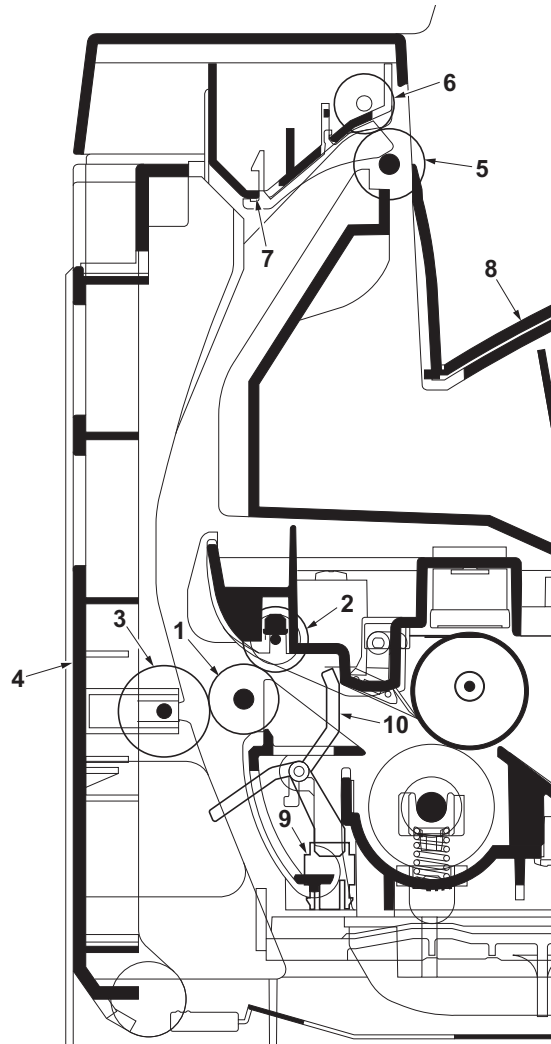


Figure 2-1-20 Paper exit section

- (1) Exit roller
- (2) Fuser exit pulley
- (3) Middle pulley
- (4) Rear cover
- (5) FD roller
- (6) Exit pulley
- (7) FD cover
- (8) Top tray
- (9) Exit sensor
- (10) Actuator (exit sensor)

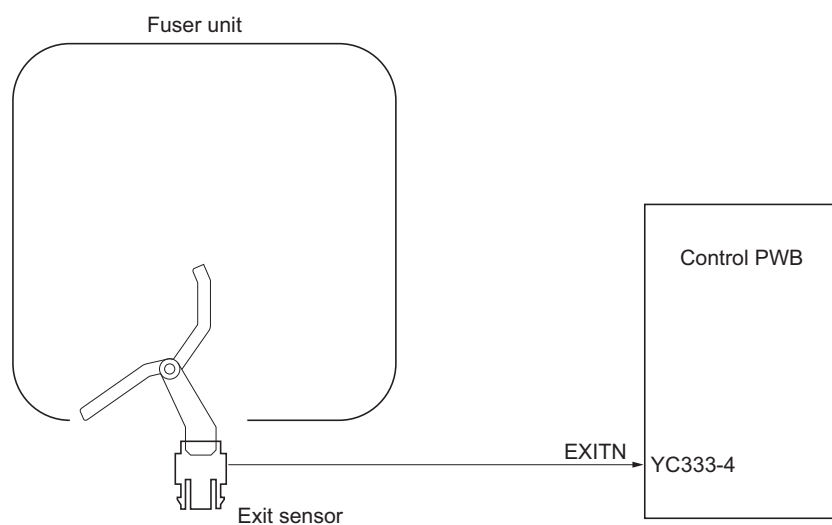


Figure 2-1-21 Paper exit section block diagram

2-1-9 Duplex/conveying section

The duplex/conveying section consists of conveying path which sends the paper sent from the paper exit section to the paper feed/conveying section when duplex printing.

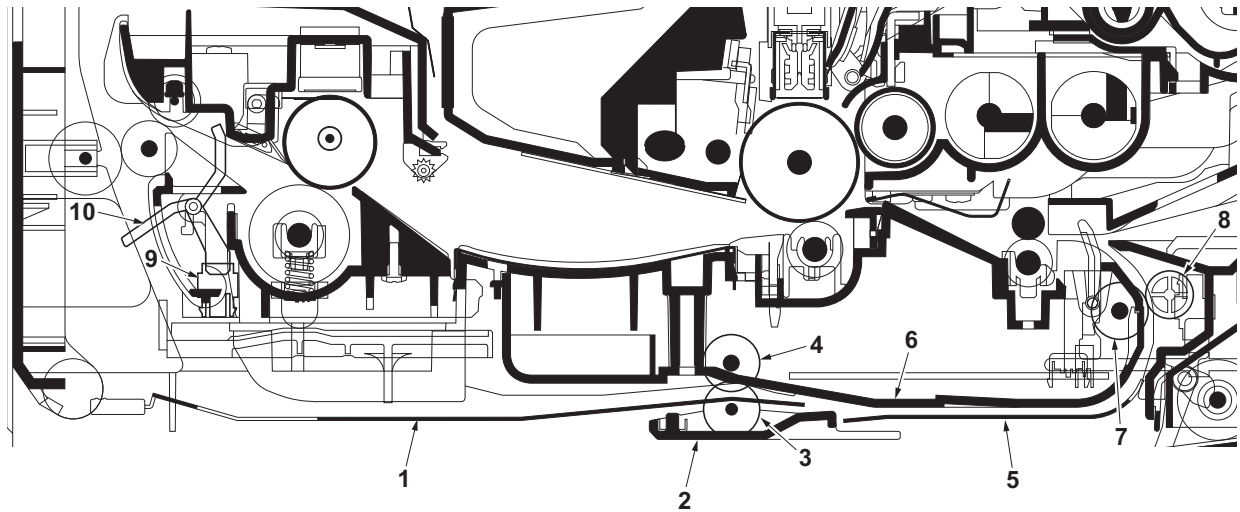


Figure 2-1-22 Duplex/conveying section

- (1) DU cover B
- (2) DU holder
- (3) Middle pulley B
- (4) DU roller
- (5) DU cover A
- (6) Lower base cover
- (7) Feed roller
- (8) Feed pulley
- (9) Exit sensor
- (10) Actuator (exit sensor)

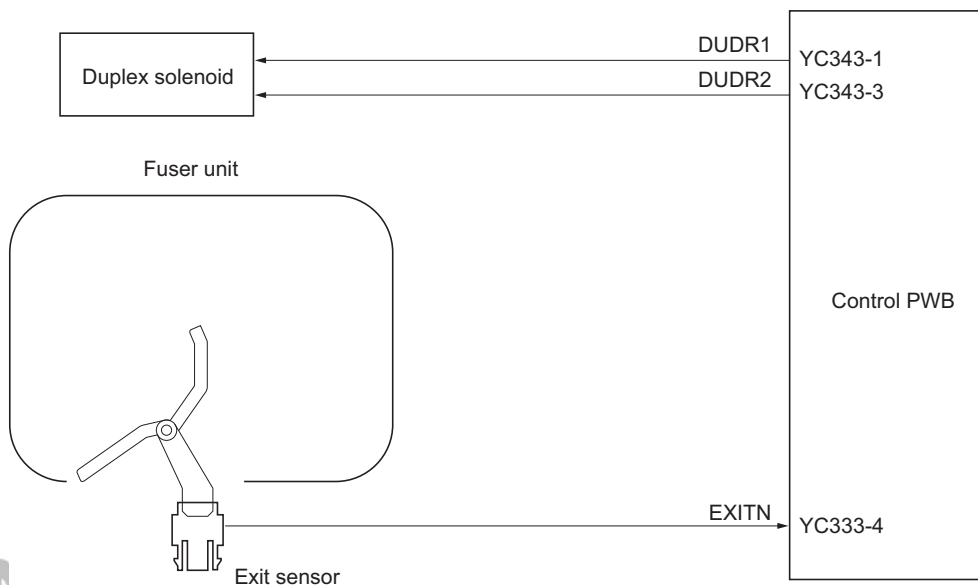


Figure 2-1-23 Duplex/paper conveying section block diagram

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2-2-1 Electrical parts layout

(1) PWBs

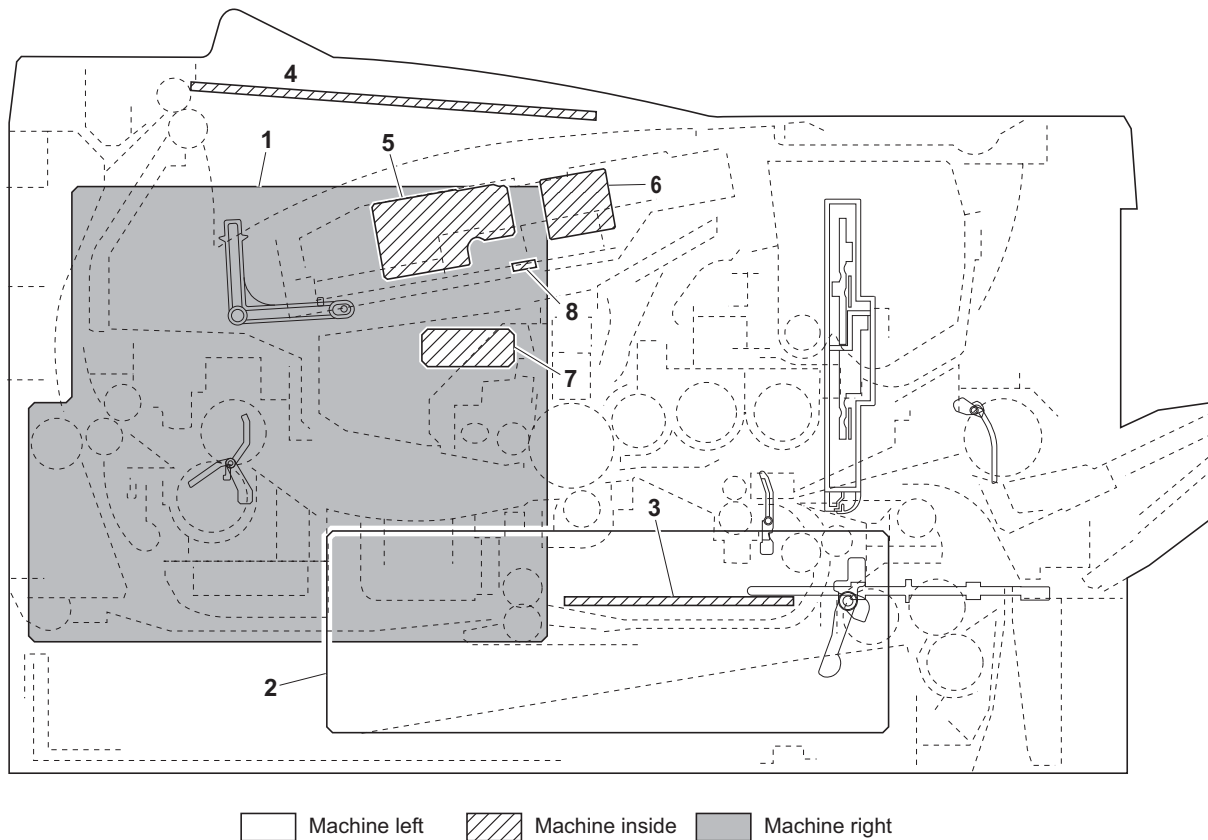


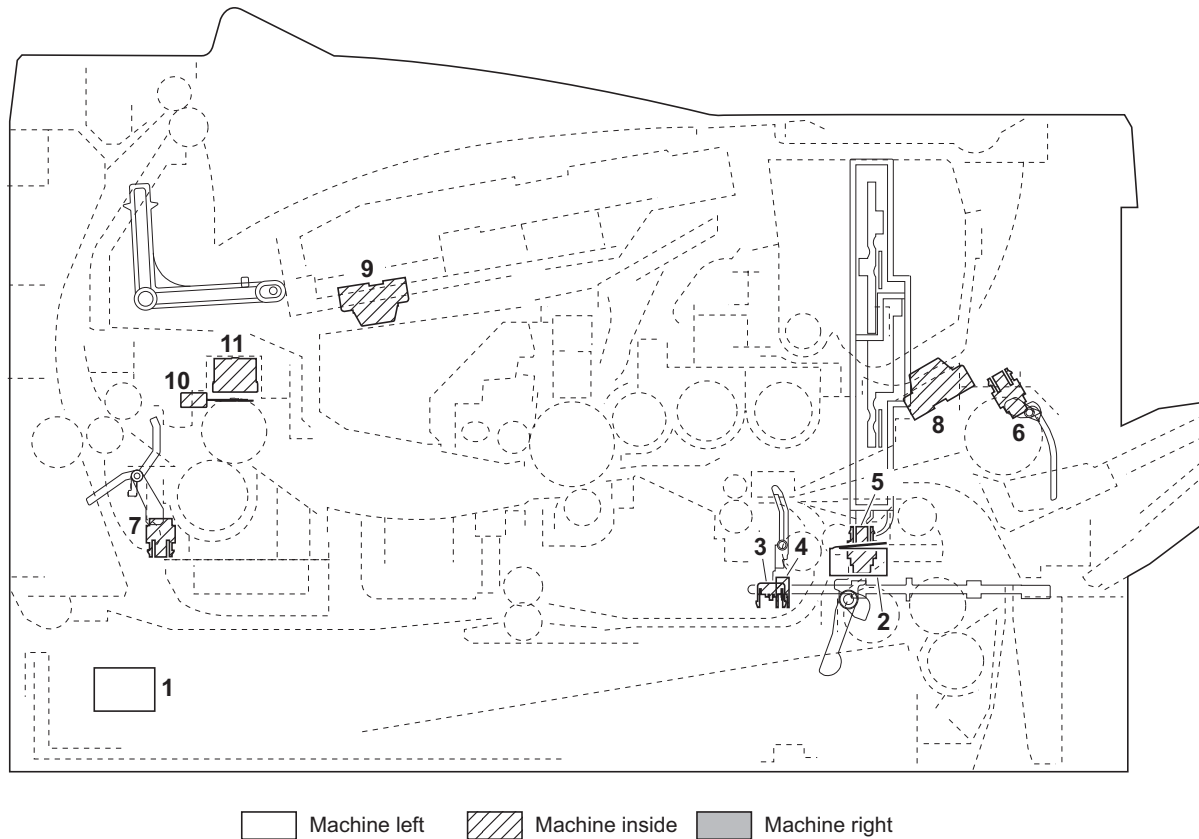
Figure 2-2-1 PWBs

- | | |
|------------------------------|--|
| 1. Control PWB | Main controller: Controls the software such as the print data processing and provides the interface with computers.
Engine: Controls printer hardware such as high voltage/bias output control, paper conveying system control, and fuser temperature control, etc. |
| 2. Power source PWB..... | After full-wave rectification of AC power source input, switching for converting to 24 V DC for output. Controls the fuser heater lamp. |
| 3. High voltage PWB..... | Generates main charging, developing bias, transfer bias and separation charger bias. |
| 4. Operation panel PWB | Consists the LCD, LED indicators and key switches. |
| 5. APC PWB | Generates and controls the laser beam. |
| 6. PD PWB..... | Controls horizontal synchronizing timing of laser beam. |
| 7. Zener PWB | Adjusts the drum surface potential. |
| 8. Eraser lamp PWB | Eliminates the residual electrostatic charge on the drum. |

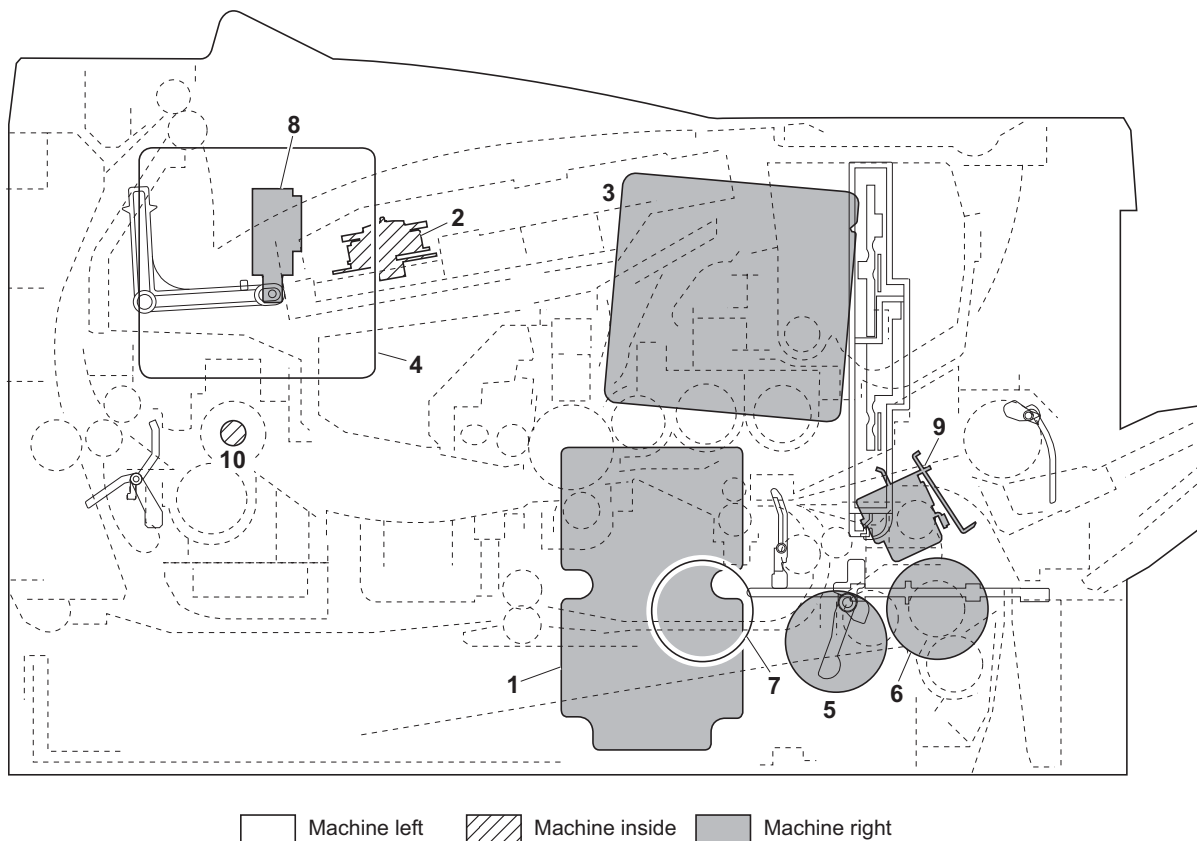
List of correspondences of PWB names

No.	Name used in service manual	Name used in parts list
1	Control PWB	PARTS PWB CONTROL SP
2	Power source PWB	SWITCHING REGULATOR 120V SWITCHING REGULATOR 230V
3	High voltage PWB	PARTS HIGH VOLTAGE UNIT SP
4	Operation panel PWB	PARTS PWB LCD SP
5	APC PWB	-
6	PD PWB	-
7	Zener PWB	-
8	Eraser lamp PWB	-

(2) Switches and sensors

**Figure 2-2-2 Switches and sensors**

- | | |
|-------------------------------|--|
| 1. Power switch..... | Turns ON/OFF the AC power source. |
| 2. Interlock switch | Shuts off 24 V DC power line when the top cover is opened. |
| 3. Cassette switch..... | Detects open/close cassette. |
| 4. Registration sensor..... | Detects the timing of primary paper feed. |
| 5. Paper sensor..... | Detects the presence of paper in the cassette. |
| 6. MP paper sensor..... | Detects the presence of paper on the MP tray. |
| 7. Exit sensor | Detects paper jam in the fuser or duplex conveying section. |
| 8. Toner sensor | Detects the quantity of toner in a toner container. |
| 9. Waste toner sensor..... | Detects when the waste toner reservoir (Drum unit) is full. |
| 10. Fuser thermistor..... | Measures the heat roller temperature. |
| 11. Fuser thermal cutout..... | Shuts off the power source to the fuser heater lamp when the heat roller reaches extremely high temperature. |

(3) Other electrical components**Figure 2-2-3 Other electrical components**

1. Main motor Drives the paper feed/conveying section and fuser unit.
2. Polygon motor Drives the polygon mirror.
3. Right cooling fan motor Cools the interior of machine.
4. Left cooling fan motor Cools the interior of machine.
5. Registration clutch Controls the secondary paper feed.
6. Paper feed clutch Controls the paper cassette paper feed.
7. Developing clutch Controls the toner feed.
8. Duplex solenoid Controls the paper conveying at the duplex conveying section.
9. MP paper feed solenoid Controls the MPF bottom plate of the MP tray.
10. Fuser heater lamp Heats the heat roller.

2-3-1 Power source PWB

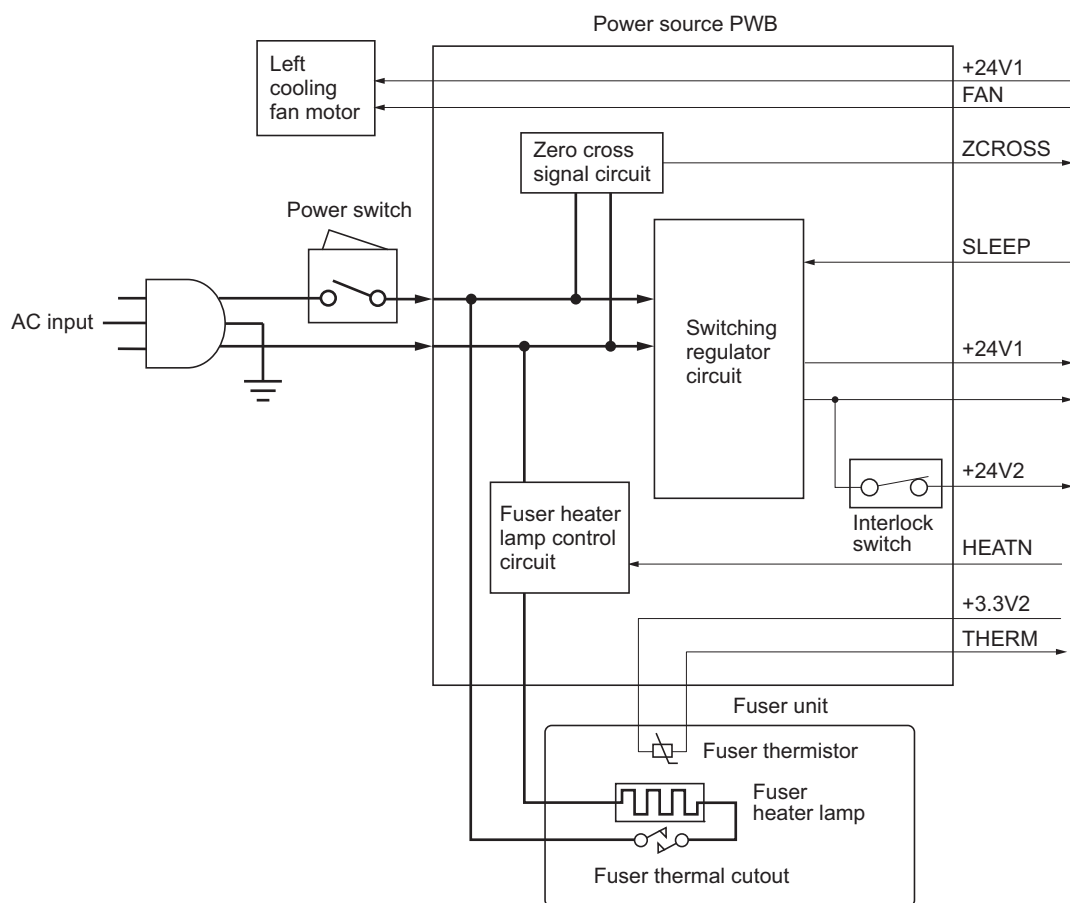


Figure 2-3-1 Power source PWB block diagram

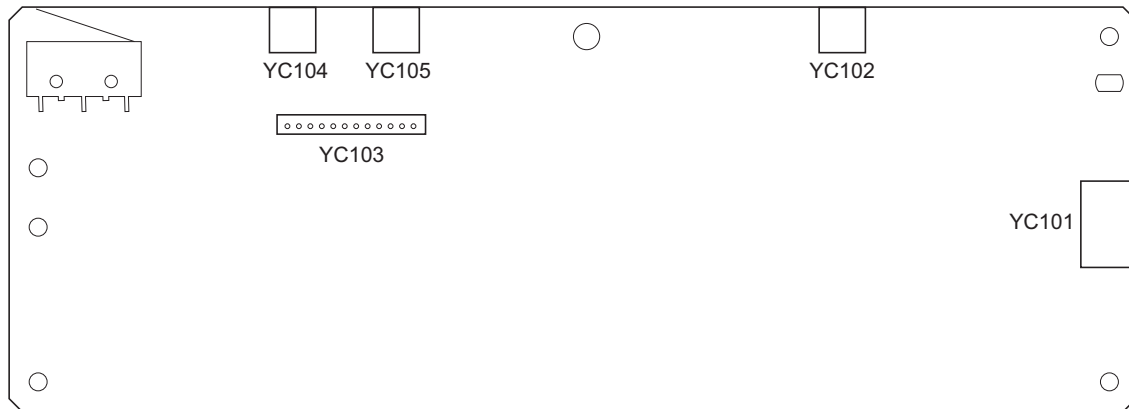


Figure 2-3-2 Power source PWB silk-screen diagram

Connector	Pin	Signal	I/O	Voltage	Description
YC101	1	LIVE	I	120 V AC 220 - 240 V AC	AC power input
Connected to the AC inlet	2	NEUTRAL	I	120 V AC 220 - 240 V AC	AC power input
YC102	1	HEATER COM	O	120 V AC 220 - 240 V AC	Fuser heater lamp output
Connected to the fuser heater lamp	2	N.C.	-	-	Not used
	3	HEATER LIVE	O	120 V AC 220 - 240 V AC	Fuser heater lamp output
YC103	1	+24V1	O	24 V DC	24 V DC power source
Connected to the high voltage PWB	2	SGND	-	-	Ground
	3	FAN	I	0/24 V DC	Left cooling fan motor: On/Off
	4	THERM	O	Analog	Fuser thermistor detection voltage
	5	+3.3V2	I	3.3 V DC	3.3 V DC power source
	6	HEATN	I	0/3.3 V DC	Fuser heater lamp: On/Off
	7	SLEEP	I	0/3.3 V DC	Sleep mode signal: On/Off
	8	ZCROSS	O	0/3.3 V DC (pulse)	Zero cross signal
	9	+24V2	O	24 V DC	24 V DC power source (via interlock switch)
	10	+24V2	O	24 V DC	24 V DC power source (via interlock switch)
	11	PGND	-	-	Ground
	12	PGND	-	-	Ground
YC104	1	+24V1	O	24 V DC	24 V DC power source
Connected to the left cooling fan motor	2	FAN	O	0/24 V DC	Left cooling fan motor: On/Off
YC105	1	+3.3V2	O	3.3 V DC	3.3 V DC power source
Connected to the fuser thermistor	2	THERM	I	Analog	Fuser thermistor detection voltage

2-3-2 Control PWB

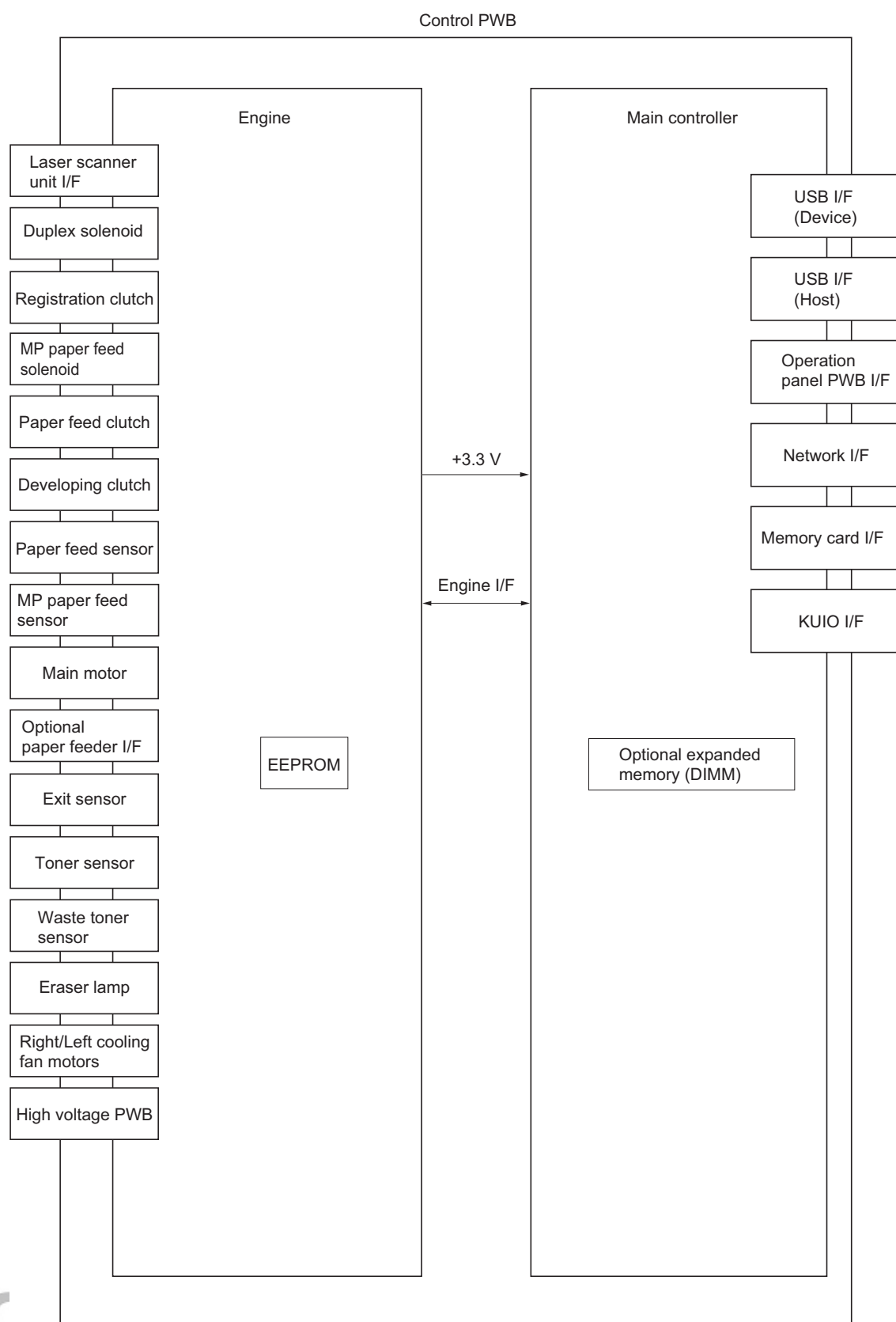


Figure 2-3-3 Control PWB block diagram

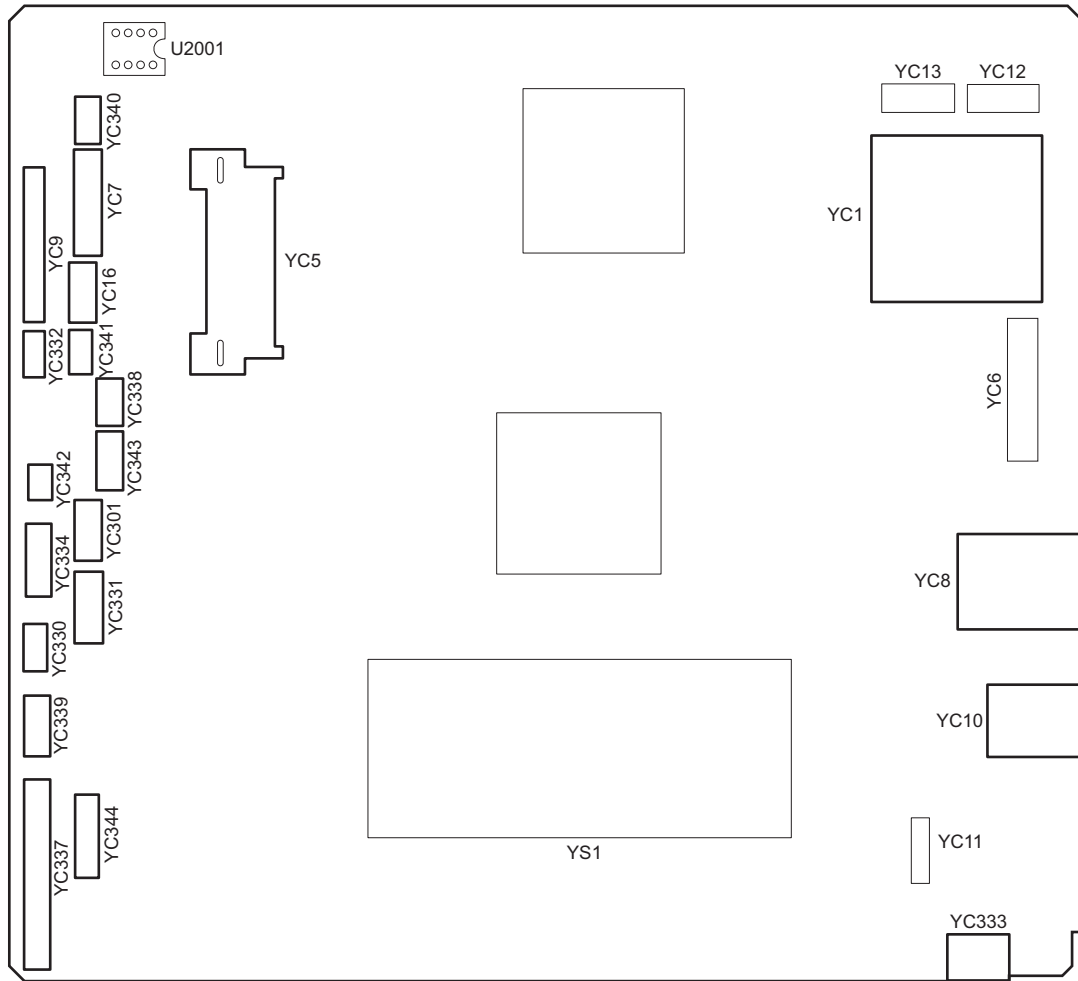


Figure 2-3-4 Control PWB silk-screen diagram

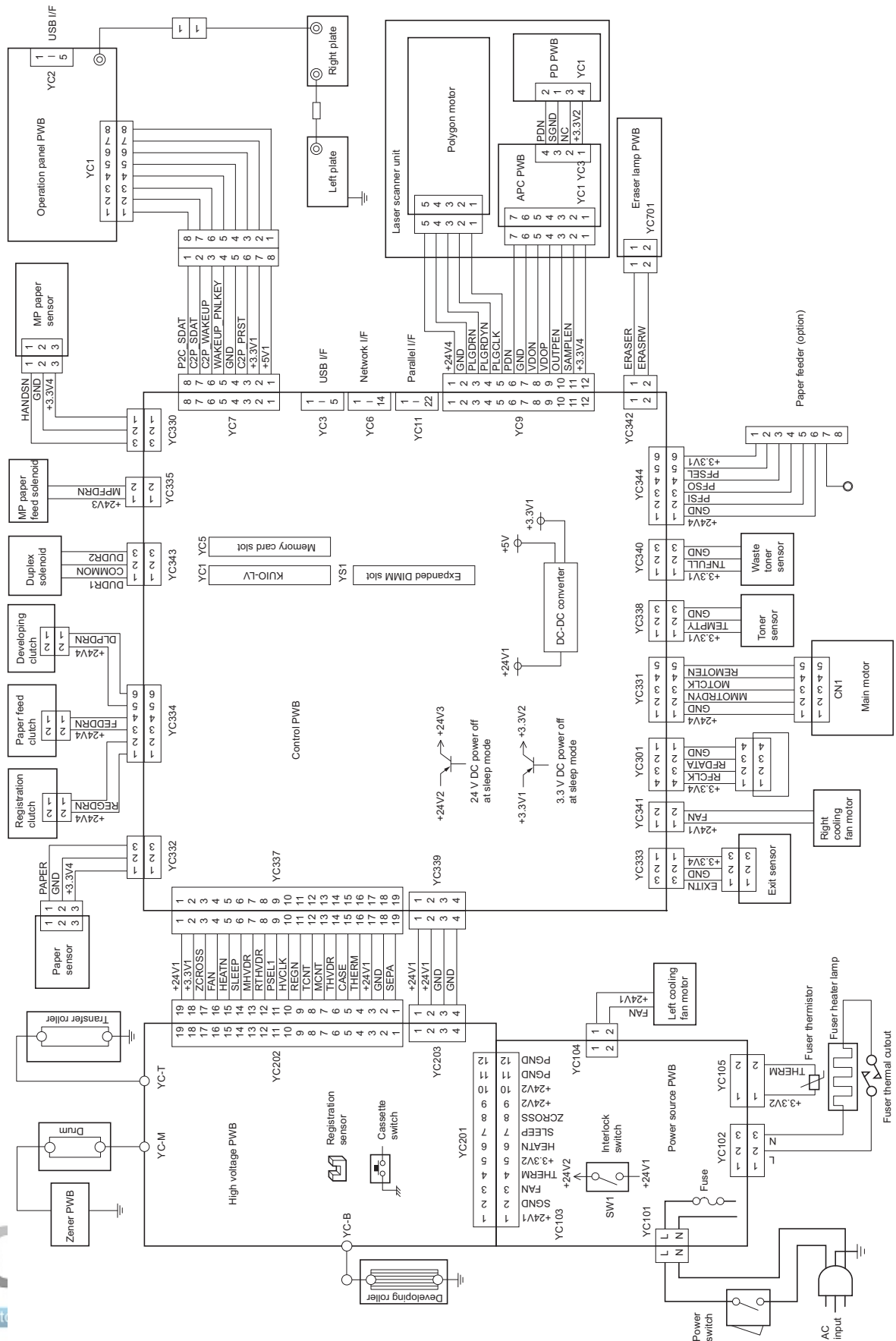
Connector	Pin	Signal	I/O	Voltage	Description
YC7	1	+5V1	O	5 V DC	5 V DC power source
Connected to the operation panel PWB	2	+3.3V1	O	3.3 V DC	3.3 V DC power source
	3	FPRSTN	O	3.3/0 V DC	Operation panel PWB reset signal
	4	GND	-	-	Ground
	5	WAKEUP_PNL KEY	I	3.3/0 V DC	WAKEUP KEY : On/Off
	6	C2P_WAKEUP	O	3.3/0 V DC (pulse)	Operation panel PWB data signal
	7	C2P_SDAT	O	0/3.3 V DC (pulse)	Operation panel PWB data signal
	8	P2C_SDAT	O	0/3.3 V DC (pulse)	Operation panel PWB data signal
YC9	1	+24V4	O	24 V DC	24 V DC power source
Connected to the laser scanner unit	2	GND	-	-	Ground
	3	PLGDRN	O	0/3.3 V DC	Polygon motor: On/Off
	4	PLGRDYN	I	0/3.3 V DC	Polygon motor ready signal
	5	PLGCLK	O	0/3.3 V DC (pulse)	Polygon motor clock signal
	6	PDN	I	0/3.3 V DC (pulse)	Horizontal synchronizing signal
	7	GND	-	-	Ground
	8	VDON	O	0/3.3 V DC (pulse)	Video data signal (+)
	9	VDOP	O	0/3.3 V DC (pulse)	Video data signal (-)
	10	OUTPEN	O	0/3.3 V DC	Laser output enable signal
	11	SAMPLEN	O	0/3.3 V DC	Sample/hold timing switching signal
	12	+3.3V4	O	3.3 V DC	3.3 V DC power source
YC330	1	+3.3V2	O	3.3 V DC	3.3 V DC power source
Connected to the MP paper sensor	2	GND	-	-	Ground
	3	HANDSN	I	0/3.3 V DC	MP paper sensor: On/Off
YC331	1	+24V4	O	24 V DC	24 V DC power source
Connected to the main motor	2	GND	-	-	Ground
	3	MMOTRDYN	I	0/3.3 V DC	Main motor ready signal
	4	MMOTCLK	O	0/3.3 V DC (pulse)	Main motor clock signal
	5	REMOTEN	O	0/3.3 V DC	Main motor: On/Off
YC332	1	+3.3V4	O	3.3 V DC	3.3 V DC power source
Connected to the paper sensor	2	GND	-	-	Ground
	3	PAPER	I	0/3.3 V DC	Paper sensor: On/Off
YC333	1	NC	-	-	Not used
Connected to the exit sensor	2	+3.3V4	O	3.3 V DC	3.3 V DC power source
	3	GND	-	-	Ground
	4	EXITN	I	0/3.3 V DC	Exit sensor: On/Off

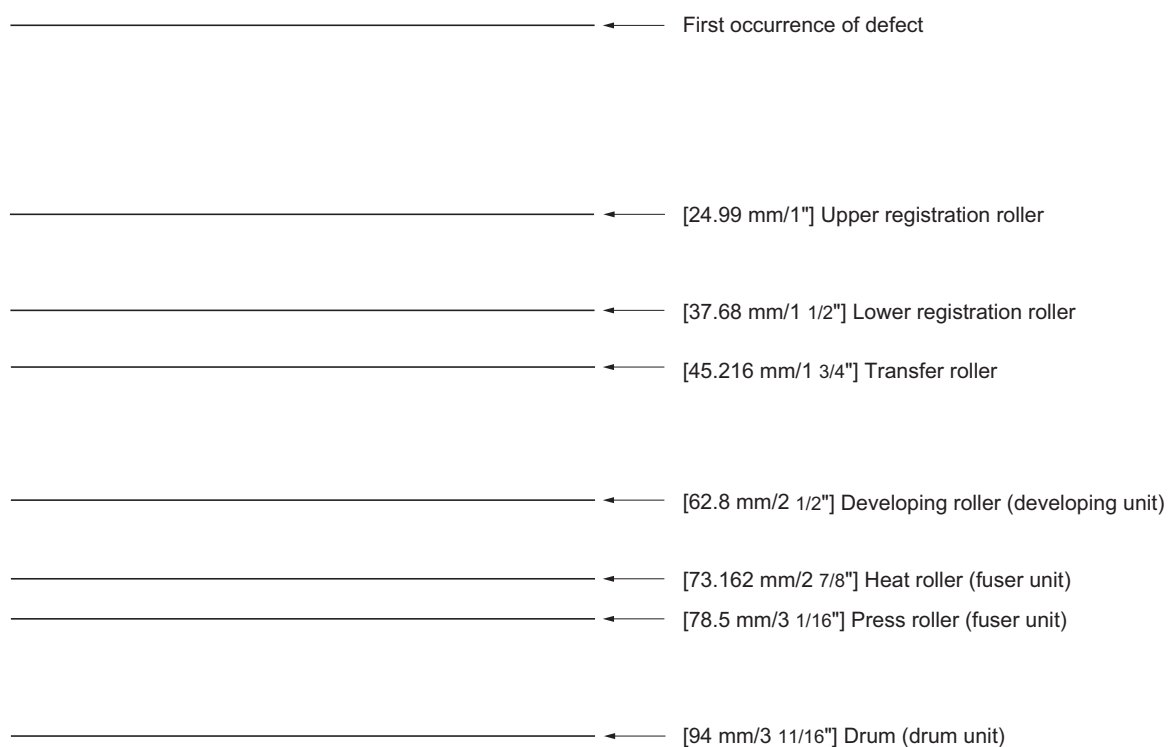
Connector	Pin	Signal	I/O	Voltage	Description
YC334 Connected to the registration clutch, paper feed clutch and developing clutch	1	+24V4	O	24 V DC	24 V DC power source
	2	REGDRN	O	0/24 V DC	Registration clutch: On/Off
	3	+24V4	O	24 V DC	24 V DC power source
	4	FEDDRN	O	0/24 V DC	Paper feed clutch: On/Off
	5	+24V4	O	24 V DC	24 V DC power source
	6	DLPDRN	O	0/24 V DC	Developing clutch: On/Off
YC335 Connected to the MP paper feed solenoid	1	+24V4	O	24 V DC	24 V DC power source
	2	MPFDRN	O	0/24 V DC	MP paper feed solenoid: On/Off
YC337 Connected to the high voltage PWB	1	+24V1	I	24 V DC	24 V DC power source
	2	+3.3V1	O	3.3 V DC	3.3 V DC power source
	3	ZCROSS	I	0/3.3 V DC (pulse)	Zero cross signal
	4	FAN	O	0/24 V DC	Left cooling fan motor: On/Off
	5	HEATN	O	0/3.3 V DC	Fuser heater lamp: On/Off
	6	SLEEP	O	0/3.3 V DC	Sleep mode signal: On/Off
	7	MHVDR	O	0/3.3 V DC	Main charger output signal: On/Off
	8	RTHVDR	O	0/3.3 V DC	Transfer (reverse) bias output signal: On/Off
	9	PSEL1	O	0/3.3 V DC	Transfer (reverse) bias control signal: On/Off
	10	HVCLK	O	0/3.3 V DC (pulse)	Developing bias clock signal
	11	REGN	I	0/3.3 V DC	Registration sensor: On/Off
	12	TCNT	O	PWM	Transfer current control signal
	13	MCNT	O	PWM	Main charger output control signal
	14	THVDR	O	0/3.3 V DC	Transfer bias output signal: On/Off
	15	CASE	I	Analog	Cassette switch: On/Off
	16	THERM	I	Analog	Fuser thermistor detection voltage
	17	+24V1	O	24 V DC	24 V DC power source
	18	GND	-	-	Ground
	19	SEPA	O	0/3.3 V DC	Separation bias output signal: On/Off
YC338 Connected to the toner sensor	1	+3.3V1	O	3.3 V DC	3.3 V DC power source
	2	EMPTY	I	0/3.3 V DC	Toner quantity detection signal
	3	GND	-	-	Ground
YC339 Connected to the high voltage PWB	1	+24V1	I	24 V DC	24 V DC power source
	2	+24V1	I	24 V DC	24 V DC power source
	3	GND	-	-	Ground
	4	GND	-	-	Ground
YC340 Connected to the waste toner sensor	1	+3.3V1	O	3.3 V DC	3.3 V DC power source
	2	TNFULL	I	0/3.3 V DC	Waste toner full detection signal
	3	GND	-	-	Ground

Connector	Pin	Signal	I/O	Voltage	Description
YC341	1	+24V1	O	24 V DC	24 V DC power source
Connected to the right cooling fan motor	2	FAN	O	0/24 V DC	Right cooling fan motor: On/Off
YC342	1	ERASER	O	0/24 V DC	Eraser lamp: On/Off
Connected to the eraser lamp	2	ERASRW	O	24 V DC	24 V DC power source
YC343	1	DUDR1	O	0/24 V DC	Duplex solenoid (activate): On/Off
Connected to the duplex solenoid	2	COMMON	O	24 V DC	24 V DC power source
	3	DUDR2	O	0/24 V DC	Duplex solenoid (return): On/Off
YC344	1	+24V4	O	24 V DC	24 V DC power source
Connected to the optional paper feeder 1	2	GND	-	-	Ground
	3	PFSI	I	0/3.3 V DC (pulse)	Serial communication data input signal
	4	PFSO	O	0/3.3 V DC (pulse)	Serial communication data output signal
	5	PFSEL	O	0/3.3 V DC	Paper feeder selection signal
	6	+3.3V1	O	3.3 V DC	3.3 V DC power source

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(1) Wiring diagram



(2) Repetitive defects gauge

* : The repetitive marks interval may vary depending on operating conditions.

(3) Maintenance parts list

Maintenance part name		Part No.	Alternative part No.
Name used in service manual	Name used in parts list		
Maintenance kit (120 V specifications) (100,000 images)	MK-172/MAINTENANCE KIT DK-170 DV-172(U)	1702LZ7US0	072LZ7US
Maintenance kit (230 V specifications) (100,000 images)	MK-170/MAINTENANCE KIT DK-170 DV-170(E)	1702LZ8NL0	072LZ8NL
Maintenance kit (240 V specifications) (100,000 images)	MK-174/MAINTENANCE KIT DK-170 DV-174(AO)	1702LZ8AS0	072LZ8AS

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