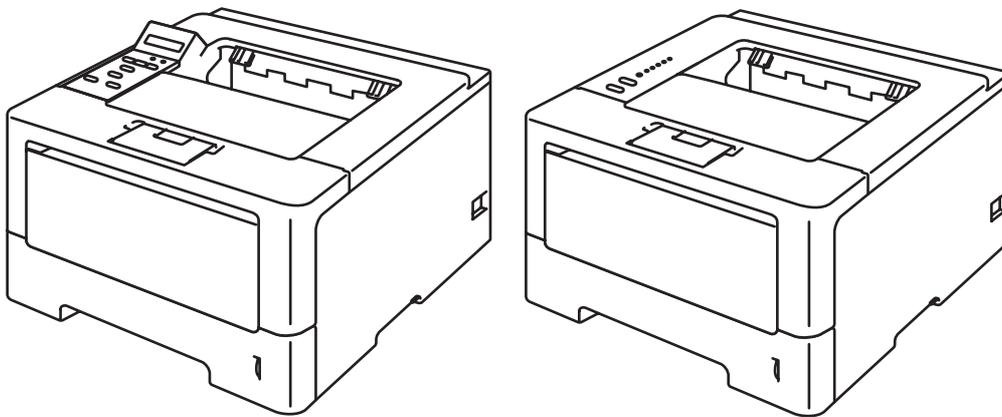




Brother Laser Printer

SERVICE MANUAL

MODEL:
HL-5440D/5450DN/5450DNT
HL-5470DW/5470DWT
HL-6180DW/6180DWT



Read this manual thoroughly before maintenance work.
Keep this manual in a convenient place for quick and easy reference at all times.

Feb 2012
SM-PRN084
84UD*
(1)

The function comparative table for models as described in this Service Manual are shown below.

Model	HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
LCD/LED	LED	LED	LED	LCD	LCD
Wired/Wireless LAN	N/A	Wired	Wired	Wired/Wireless	Wired/Wireless
Parallel port	✓	N/A	N/A	N/A	N/A
Paper Tray 1	250 sheets	250 sheets	250 sheets	250 sheets	250 sheets
Paper Tray 2	Option (500 sheets)	Option (500 sheets)	Standard Equipment (500 sheets)	Option (500 sheets)	Standard Equipment (500 sheets)

Model	HL-6180DW	HL-6180DWT
LCD/LED	LCD	LCD
Wired/Wireless LAN	Wired/Wireless	Wired/Wireless
Parallel port	N/A	N/A
Paper Tray 1	500 sheets	500 sheets
Paper Tray 2	Option (500 sheets)	Standard Equipment (500 sheets)

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REGULATION

■ Declaration of Conformity (Europe only) (HL-5470DW / HL-6180DW(T) only)

We, Brother Industries, Ltd. of 15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561 Japan declare that this product is in compliance with the essential requirements of Directives 1999/5/EC and 2009/125/EC.

The Declaration of Conformity (DoC) is available on our Website.

Please go to <http://solutions.brother.com/>.

- choose region (eg. Europe)
- choose country
- choose your model
- choose “Manuals”
- choose Declaration of Conformity (Select Language when required.)

■ Declaration of Conformity (Europe only) (HL-5440D / HL-5450DN(T) only)

We, Brother Industries, Ltd. of 15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561 Japan declare that this product is in compliance with the essential requirements of Directives 2004/108/EC, 2006/95/EC and 2009/125/EC.

The Declaration of Conformity (DoC) is available on our Website.

Please go to <http://solutions.brother.com/>.

- choose region (eg. Europe)
- choose country
- choose your model
- choose “Manuals”
- choose Declaration of Conformity (Select Language when required.)

■ **IEC60825-1:2007 Specification
(For 220-240V models only)**

This product is a Class 1 laser product as defined in IEC60825-1:2007 specifications.
The label shown below is attached in countries where required.

This product has a Class 3B Laser Diode which emits invisible laser radiation in the Laser Unit. The Laser Unit should not be opened under any circumstances.



Internal laser radiation

Wave Length: 775 - 810 nm

Output: 15 mW max.

Laser Class: Class 3B

 **WARNING**

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

■ **Disconnect Device**

 **CAUTION**

This product must be installed near an electrical socket that is easily accessible. In case of emergencies, you must disconnect the power cord from the electrical socket to shut off power completely.

■ **Wiring Information (U.K. only)**

If you need to replace the plug fuse, fit a fuse that is approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug that does not have a cover. If in any doubt, call a qualified electrician.

Warning -This product must be earthed.

The wires in the mains lead are coloured in line with the following code:

- Green and Yellow: Earth
- Blue: Neutral
- Brown: Live

■ **LAN Connection (Network models only)**

 **CAUTION**

DO NOT connect this product to a LAN connection that is subject to over-voltages.

■ **Radio Interference**

This product complies with EN55022 (CISPR Publication 22)/Class B.

■ **Recycling Information in accordance with the WEEE (2002/96/EC) and Battery (2006/66/EC) Directives**



Product mark



Battery mark

European Union only

The product/battery is marked with one of the above recycling symbols. It indicates that at the end of the life of the product/battery, you should dispose of it separately at an appropriate collection point and not place it in the normal domestic waste stream.

■ **Federal Communications Commission (FCC) Declaration of Conformity (USA only)**

Responsible Party: Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911 USA
Tel: (908) 704-1700

declares, that the products

Product name: HL-5440D/HL-5450DN/HL-5470DW/HL-5470DWT/
HL-6180DW/HL-6180DWT

Model numbers: HL-54/HL-61

Product option: LT-5400

comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Call the dealer or an experienced radio/TV technician for help.

(Wireless network models only)

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

 **Important**

- Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.
- A shielded interface cable should be used to ensure compliance with the limits for a Class B digital device.

■ **Industry Canada Compliance Statement (Canada only)**

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

(1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

■ **Laser Safety (For 110-120V models only)**

This equipment is certified as a Class 1 laser product as defined in IEC60825-1:2007 specifications under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the equipment does not produce hazardous laser radiation.

Since radiation emitted inside the equipment is completely confined within protective housings and external covers, the laser beam cannot escape from the product during any phase of user operation.

■ **FDA Regulations (For 110-120V models only)**

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the product indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
BROTHER TECHNOLOGY (SHENZHEN) LTD.
NO6 Gold Garden Ind., Nanling Nanwan, Longgang, Shenzhen, China
This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

MANUFACTURED:
BROTHER INDUSTRIES (VIETNAM) LTD.
Phuc Dien Industrial Zone Cam Phuc Commune, Cam giang Dist Hai Duong Province, Vietnam
This product complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

 **WARNING**

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous invisible radiation exposure.

Internal laser radiation

Max. Radiation Power: 15 mW

Wave Length: 775 - 810 nm

Laser Class: Class 3B

■ **For use in the USA or Canada only**

These products are made for use in the USA and Canada only.

We cannot recommend using them overseas because the power requirements of your product may not be compatible with the power available in foreign countries. Using USA or Canada models overseas is at your own risk and may void your warranty.

■ **International ENERGY STAR® Qualification Statement**

The purpose of the International ENERGY STAR® Program is to promote the development and popularization of energy-efficient office equipment.

As an ENERGY STAR® Partner, Brother Industries, Ltd. has determined that this product meets the ENERGY STAR® specifications for energy efficiency.



SAFETY INFORMATION

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injuries.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injuries.

Important

Important indicates a potentially hazardous situation which, if not avoided, may result in damage to property or loss of product functionality.

 Prohibition icons indicate actions that must not be performed.

 Electrical Hazard icons alert you to possible electrical shock.

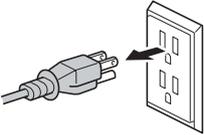
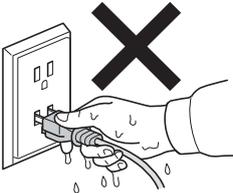
 Fire Hazard icons alert you to the possibility of fire.

 Hot Surface icons warn you not to touch product parts that are hot.

Note Notes tell you how you should respond to a situation that may arise or give tips about how the operation works with other features.

■ **To use the Machine Safely**

Please keep these instructions for later reference and read them before attempting any maintenance. If you do not follow these safety instructions, there is a possibility of a fire, electrical shock, burn or suffocation.

 WARNING
 ELECTRICAL HAZARDS Failure to follow the warnings in this section may create the risk of an electrical shock. In addition, you could create an electrical short, which may create the risk of a fire.
 There are high voltage electrodes inside the product. Before you access the inside of the product, including for routine maintenance such as cleaning, make sure you have unplugged the power cord from the AC power outlet, as well as Ethernet (RJ-45) cables (Network models only) from the product. Never push objects of any kind into this product through cabinet slots, since they may touch dangerous voltage points or short out parts.

 DO NOT handle the plug with wet hands.

 DO NOT use this product during an electrical storm.
 Always make sure the plug is fully inserted. DO NOT use the product or handle the cord if the cord has become worn or frayed.
  DO NOT allow this product to come into contact with water.
  This product should be connected to an AC power source within the range indicated on the rating label. DO NOT connect it to a DC power source or inverter.

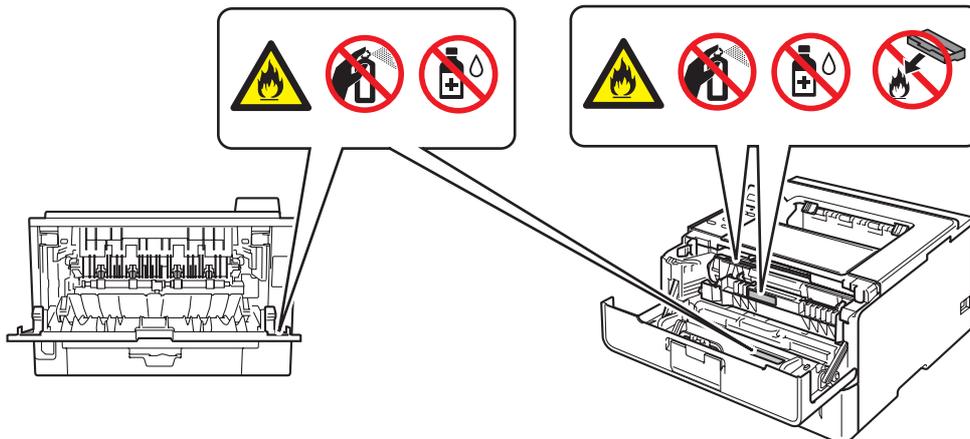


Power Cord Safety:

- This product is equipped with a 3-wire grounded plug. This plug will only fit into a grounded power outlet. This is a safety feature. **DO NOT** defeat the purpose of the grounded plug.
- Use only the power cord supplied with this product.
- **DO NOT** allow anything to rest on the power cord. **DO NOT** place this product where people can walk on the cord. **DO NOT** place this product in a position where the cord is stretched or strain is otherwise put on the cord. Doing so may cause the cord to become worn or frayed.
- We do not advise using an extension cord.
- If an extension cord is used with this product, make sure that the total ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating.
Also, make sure that the total of all products plugged into the AC power outlet does not exceed 15 amperes. **DO NOT** plug one extension cord into another.



- **DO NOT** put a toner cartridge or a toner cartridge and drum unit assembly into a fire. It could explode, resulting in injuries.
- **DO NOT** use flammable substances, any type of spray, or an organic solvent/liquid containing alcohol or ammonia to clean the inside or outside of the product. Doing so could cause a fire or electrical shock. Instead, use only a dry, lint-free cloth.



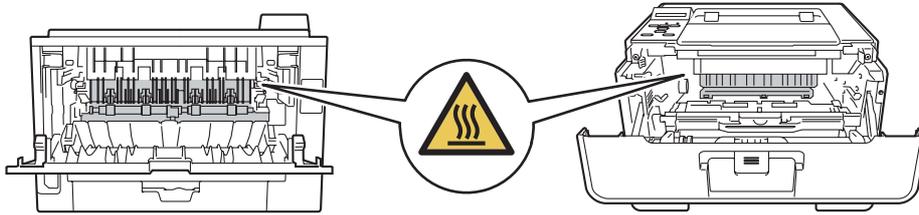
DO NOT attempt to operate this product with a paper jam or with stray pieces of paper inside the product. Prolonged contact of the paper with the drum unit could cause a fire.



DO NOT use a vacuum cleaner to clean up scattered toner. Doing this might cause the toner dust to ignite inside the vacuum cleaner, potentially starting a fire. Please carefully clean the toner dust with a dry, lint-free soft cloth and dispose of it according to local regulations.

 **HOT SURFACE**

After you have just used the product, some internal parts of the product will be extremely hot. Wait at least 10 minutes for the product to cool down before you touch the internal parts of the product.



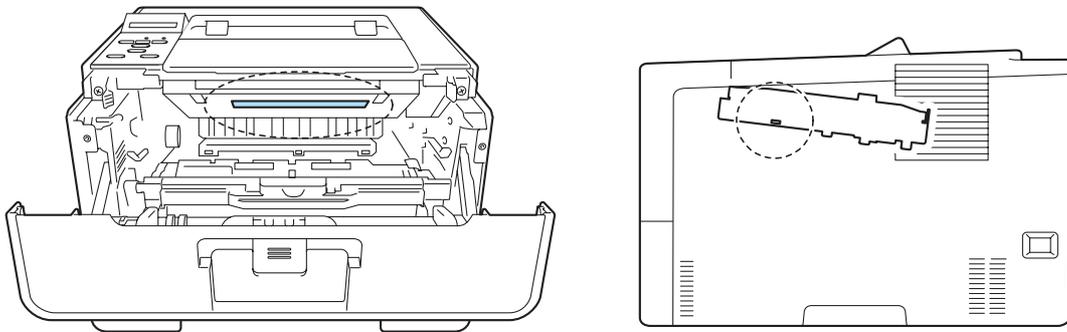
■ **Caution for Laser Product (WARNHINWEIS für Laser drucker)**

CAUTION: When the machine during servicing is operated with the cover open, the regulations of VBG 93 and the performance instructions for VBG 93 are valid.

CAUTION: In case of any trouble with the laser unit, replace the laser unit itself. To prevent direct exposure to the laser beam, do not try to open the enclosure of the laser unit.

ACHTUNG: Im Falle von Störungen der Lasereinheit muß diese ersetzt werden. Das Gehäuse der Lasereinheit darf nicht geöffnet werden, da sonst Laserstrahlen austreten können.

<Location of the laser beam window>



■ Additional Information

When servicing the optical system of the machine, be careful not to place a screwdriver or other reflective object in the path of the laser beam. Be sure to take off any personal accessories such as watches and rings before working on the machine. A reflected beam, though invisible, can permanently damage the eyes.

Since the beam is invisible, the following caution label is attached on the laser unit.



CHAPTER 1

SPECIFICATIONS

CHAPTER 1 SPECIFICATIONS

This chapter lists the specifications of each model.

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1. SPECIFICATIONS LIST

1.1 General

Model		HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Print method		Electrophotographic Laser Printer				
Resolution		1200 x 1200 dpi, HQ1200 (2400 x 600 dpi) quality, 600 x 600 dpi				
Print speed	One-sided	Up to 38/40 ppm (A4/Letter size)				
	Two-sided	18/18 sides per minute (9/9 sheets per minute) (A4/Letter size)				
Warm-up time	From Sleep mode	Less than 1 second at 73.4F / 50% (23°C / 50%)				
	From Power OFF → ON	Less than 25 seconds at 73.4F / 50% (23°C / 50%)				
First print time	From Ready mode	Less than 8.5 seconds at 73.4F (23°C) / 115V or 230V				
	From Sleep mode	Less than 10 seconds at 73.4F (23°C) / 115V or 230V				
CPU		StarSapphire 400 MHz				
Memory	Standard	64 MB			128 MB	
	Option	N/A	Up to 256 MB (DDR2 16 bit, 144 pin)			
Interface		Parallel (IEEE1284) Hi-Speed USB 2.0	Hi-Speed USB 2.0 10Base-T/100Base-TX		Hi-Speed USB 2.0 10Base-T/100Base-TX IEEE 802.11b/g/n (Infrastructure Mode / Adhoc Mode)	
Power consumption	Peak	Average: Approximately 1200 W				
	Printing	Average: Approximately 716 W (for U.S.A.), 665 W (for Europe, Asia, China, Oceania)				
	Printing (Quiet Mode)	Average: Approximately 348 W (for U.S.A.), 332 W (for Europe, Asia, China, Oceania)				
	Ready	Average: Approximately 5.0 W (for U.S.A.), 4.7 W (for Europe, Asia, China, Oceania)				
	Sleep, Wireless LAN: ON	N/A			Average: Approximately 2.9 W (for U.S.A.), 2.8 W (for Europe, Asia, Oceania)	
	Deep Sleep	Average: Approximately 0.7 W	Average: Approximately 0.6 W		Average: Approximately 0.6 W (for U.S.A.), 0.7 W (for Europe, Asia, Oceania)	
	Auto Power Down Mode	Approximately 0.4 W (only for Europe and GULF)	Approximately 0.41 W (only for Europe and GULF)		Approximately 0.5 W (only for Europe and GULF)	

Specifications are subject to change without notice.

Model			HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Noise level	Sound pressure	Printing	LpAm = 59 dB (A)				
		Printing (Quiet Mode)	LpAm = 54 dB (A)				
		Ready	LpAm = 34 dB (A)				
	Sound power	Printing	LWAd = 6.79 B (A)				
		Printing (Quiet Mode)	LWAd = 6.4 B (A)				
		Ready	LWAd = 4.70 B (A)	LWAd = 4.63 B (A)	LWAd = 4.70 B (A)	LWAd = 4.63 B (A)	
Environment	Temperature	Operating: 10 to 32.5°C Storage: 0 to 40°C					
	Humidity	Operating: 20 to 80% Storage: 10 to 90% (without condensation)					
Dimensions (W x D x H)	Carton Size	499 x 478 x 380 mm (19.6 x 18.8 x 15.0 inch)	664 x 503 x 671 mm (26.1 x 19.8 x 26.4 inch)	499 x 478 x 380 mm (19.6 x 18.8 x 15.0 inch)	664 x 503 x 671 mm (26.1 x 19.8 x 26.4 inch)		
	Machine Size	371 x 384 x 245 mm (14.6 x 15.1 x 9.6 inch)	371 x 384 x 375 mm (14.6 x 15.1 x 14.8 inch)	371 x 384 x 257 mm (14.6 x 15.1 x 10.1 inch)	371 x 384 x 387 mm (14.6 x 15.1 x 15.2 inch)		
Weights	Without Carton, With toner/drum	10.4 kg / 22.9 lb	10.5 kg / 23.1 lb	13.6 kg / 29.9 lb	10.5 kg / 23.1 lb	13.6 kg / 30.4 lb	
LCD Size		N/A			1.87 x 0.20 inch (16 characters x 1 line)		

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT
Print method		Electrophotographic Laser Printer	
Resolution		1200 x 1200 dpi, HQ1200 (2400 x 600 dpi) quality, 600 x 600 dpi	
Print speed	One-sided	Up to 40/42 ppm (A4/Letter size)	
	Two-sided	18/18 sides per minute (9/9 sheets per minute) (A4/Letter size)	
Warm-up time	From Sleep mode	Less than 1 second at 73.4F / 50% (23°C / 50%)	
	From Power OFF → ON	Less than 25 seconds at 73.4F / 50% (23°C / 50%)	
First print time	From Ready mode	Less than 8.5 seconds at 73.4F (23°C) / 115V or 230V	
	From Sleep mode	Less than 10 seconds at 73.4F (23°C) / 115V or 230V	
CPU		StarSapphire 400 MHz	
Memory	Standard	128 MB	
	Option	Up to 256 MB (DDR2 16 bit, 144 pin)	

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT	
Interface		Hi-Speed USB 2.0 10Base-T/100Base-TX/1000Base-T IEEE 802.11b/g/n (Infrastructure Mode / Adhoc Mode)		
Power consumption	Peak	Average: Approximately 1200 W		
	Printing	Average: Approximately 727 W (for U.S.A.), 701 W (for Europe, Asia, China, Oceania)		
	Printing (Quiet Mode)	Average: Approximately 342 W (for U.S.A.), 340 W (for Europe, Asia, China, Oceania)		
	Ready	Average: Approximately 4.9 W		
	Sleep, Wireless LAN: ON	Average: Approximately 2.9 W		
	Deep Sleep	Average: Approximately 0.7 W (for U.S.A.), 0.8 W (for Europe, Asia, China, Oceania)		
	Auto Power Down Mode	Approximately 0.5 W (only for Europe and GULF)		
Noise level	Sound pressure	Printing	LpAm = 59 dB (A)	
		Printing (Quiet Mode)	LpAm = 54 dB (A)	
		Ready	LpAm = 34 dB (A)	
	Sound power	Printing	LWAd = 6.83 B (A)	LWAd = 6.80 B (A)
		Printing (Quiet Mode)	LWAd = 6.4 B (A)	
		Ready	LWAd = 4.56 B (A)	LWAd = 4.50 B (A)
Environment	Temperature	Operating: 10 to 32.5°C Storage: 0 to 40°C		
	Humidity	Operating: 20 to 80% Storage: 10 to 90% (without condensation)		
Dimensions (W x D x H)	Carton Size	499 x 478 x 411 mm (19.6 x 18.8 x 16.2 inch)	664 x 503 x 702 mm (26.1 x 19.8 x 27.6 inch)	
	Machine Size	371 x 384 x 288 mm (14.6 x 15.1 x 11.3 inch)	371 x 384 x 418 mm (14.6 x 15.1 x 16.5 inch)	
Weights	Without Carton, With toner/drum	11.5 kg / 25.4 lb	14.6 kg / 32.1 lb	
LCD Size		1.87 x 0.20 inch (16 characters x 1 line)		

Specifications are subject to change without notice.

<Computer requirements>

Computer Platform & Operating System Version		Processor Minimum Speed	Minimum RAM	Recommended RAM	Hard Disk Space to install	Supported PC Interface *2
Windows® Operating System *1	Windows® XP Home Edition	Intel® Pentium® II or equivalent	128 MB	256 MB	80 MB	USB, 10Base-T/100Base-TX (Ethernet), 1000Base-T (Gigabit Ethernet) *3, Wireless 802.11b/g/n
	Windows® XP Professional					
	Windows® XP Professional x64 Edition	64-bit (Intel® 64 or AMD 64) supported CPU	256 MB	512 MB		
	Windows Vista®	Intel® Pentium® 4 or equivalent 64-bit (Intel® 64 or AMD 64) supported CPU	512 MB	1 GB		
	Windows® 7		1 GB (32-bit) 2 GB (64-bit)	1 GB (32-bit) 2 GB (64-bit)		
	Windows Server® 2003	Intel® Pentium® III or equivalent	256 MB	512 MB		
	Windows Server® 2003 x64 Edition	64-bit (Intel® 64 or AMD 64) supported CPU				
	Windows Server® 2008	Intel® Pentium® 4 or equivalent 64-bit (Intel® 64 or AMD 64) supported CPU	512 MB	2 GB		
	Windows Server® 2008 R2	64-bit (Intel® 64 or AMD 64) supported CPU				
Macintosh Operating System	OS X 10.5.8	PowerPC® G4/G5 Intel® Processor	512 MB	1 GB	80 MB	
	OS X 10.6.x	Intel® Processor	1 GB	2 GB		
	OS X 10.7.x		2 GB			

*1 Microsoft® Internet Explorer® 6.0 or greater.

*2 Third party USB ports are not supported.

*3 1000Base-T is available for HL-6180DW(T).

Specifications are subject to change without notice.

1.2 Network Connectivity

Model		HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Wired network	Network node type	N/A	NC-8300h			
	Network type	N/A	10Base-T/100Base-TX (Ethernet)			
	Network security	N/A	APOP, POP before SMTP, SMTP-AUTH, SSL/TLS (IPPS, HTTPS, SMTP, POP), SNMP v3 802.1x (EAP-MD5, EAP-FAST, PEAP, EAP-TLS, EAP-TTLS), Kerberos			
Wireless network	Network node type	N/A			NC-7900w	
	Network type	N/A			IEEE 802.11b/g/n	
	Communication mode	N/A			Infrastructure, Adhoc	
	Network security	N/A			APOP, POP before SMTP, SMTP-AUTH, SSL/TLS (IPPS, HTTPS, SMTP, POP), SNMP v3 802.1x (LEAP, EAP-FAST, PEAP, EAP-TLS, EAP-TTLS), Kerberos	

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT
Wired network	Network node type	NC-8300h	
	Network type	10Base-T/100Base-TX (Ethernet), 1000Base-T (Gigabit Ethernet)	
	Network security	APOP, POP before SMTP, SMTP-AUTH, SSL/TLS (IPPS, HTTPS, SMTP, POP), SNMP v3 802.1x (EAP-MD5, EAP-FAST, PEAP, EAP-TLS, EAP-TTLS), Kerberos	
Wireless network	Network node type	NC-7900w	
	Network type	IEEE 802.11b/g/n	
	Communication mode	Infrastructure, Adhoc	
	Network security	APOP, POP before SMTP, SMTP-AUTH, SSL/TLS (IPPS, HTTPS, SMTP, POP), SNMP v3 802.1x (LEAP, EAP-FAST, PEAP, EAP-TLS, EAP-TTLS), Kerberos	

Specifications are subject to change without notice.

1.3 Service Information

Model		HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Machine life		300,000 pages (A4/Letter size) or 5 years				
MTBF		4,000 hours				
MTTR		0.5 hours				
Maximum monthly volume		Up to 50,000 pages				
Periodical maintenance parts	Fuser Unit	100,000 pages				
	Laser Unit	100,000 pages				
	Paper Feeding Kit 1	100,000 pages				
	Paper Feeding Kit 2	100,000 pages				
	MP Paper Feeding Kit	50,000 pages				

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT
Machine life		300,000 pages (A4/Letter size) or 5 years	
MTBF		4,000 hours	
MTTR		0.5 hours	
Maximum monthly volume		Up to 100,000 pages	
Periodical maintenance parts	Fuser Unit	100,000 pages	
	Laser Unit	100,000 pages	
	Paper Feeding Kit 1	100,000 pages	
	Paper Feeding Kit 2	100,000 pages	
	MP Paper Feeding Kit	50,000 pages	

Specifications are subject to change without notice.

1.4 Supplies

Model		HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Toner cartridge	Starter Toner *1	Approximately 3,000 pages (for U.S.A., Asia, China) 2,000 pages (for Europe, Oceania)	Approximately 3,000 pages (for U.S.A., Europe, Asia, China) 2,000 pages (for Oceania)	Approximately 3,000 pages		
	Standard Toner	Approximately 3,000 pages				
	High Yield Toner	Approximately 8,000 pages				
	Super High Yield Toner	Approximately 12,000 pages (for China)	N/A	Approximately 12,000 pages (for Asia)	N/A	
When printing A4/Letter size one sided pages in accordance with ISO/IEC 19752. Shelf life: 2 years without opening (6 months after opening)						
Drum unit	Life expectancy: Approximately 30,000 pages/drum unit The life expectancy varies according to the use condition. Shelf life: 2 years					
The shelf life of toner cartridge and drum unit is guaranteed under the normal condition as below; (Temperature) Normal condition: 0 to 40°C * Storage condition at the temperature of 40 to 50°C: Up to 5 days * Storage condition at the temperature of -20 to 0°C: Up to 5 days (Humidity) Normal condition: 35 to 85% (without condensation) * Storage condition at the humidity of 85 to 95%: Up to 5 days (without condensation) * Storage condition at the humidity of 10 to 35%: Up to 5 days (without condensation)						

*1 Toner supplied with the machine.

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT
Toner cartridge	Starter Toner *1	Approximately 3,000 pages (except for Europe) 8,000 pages (for Europe)	
	Standard Toner	Approximately 3,000 pages	
	High Yield Toner	Approximately 8,000 pages	
	Super High Yield Toner	Approximately 12,000 pages	
When printing A4/Letter size one sided pages in accordance with ISO/IEC 19752. Shelf life: 2 years without opening (6 months after opening)			
Drum unit		Life expectancy: Approximately 30,000 pages/drum unit The life expectancy varies according to the use condition. Shelf life: 2 years	
The shelf life of toner cartridge and drum unit is guaranteed under the normal condition as below; (Temperature) Normal condition: 0 to 40°C * Storage condition at the temperature of 40 to 50°C: Up to 5 days * Storage condition at the temperature of -20 to 0°C: Up to 5 days (Humidity) Normal condition: 35 to 85% (without condensation) * Storage condition at the humidity of 85 to 95%: Up to 5 days (without condensation) * Storage condition at the humidity of 10 to 35%: Up to 5 days (without condensation)			

*1 Toner supplied with the machine.

Specifications are subject to change without notice.

1.5 Paper

1.5.1 Paper handling

Model		HL-5440D	HL-5450DN	HL-5450DNT	HL-5470DW	HL-5470DWT
Paper Input	Paper tray 1	250 sheets				
	Paper tray 2	500 sheets (Option)		500 sheets (Standard equipment)	500 sheets (Option)	500 sheets (Standard equipment)
	MP tray	50 sheets				
Paper Output	Face-down	150 sheets (80 g/m ²)				
	Face-up	1 sheet (straight paper path)				
Duplex		Yes				

Specifications are subject to change without notice.

Model		HL-6180DW	HL-6180DWT
Paper Input	Paper tray 1	500 sheets	
	Paper tray 2	500 sheets (Option)	500 sheets (Standard equipment)
	MP tray	50 sheets	
Paper Output	Face-down	150 sheets (80 g/m ²)	
	Face-up	1 sheet (straight paper path)	
Duplex		Yes	

Specifications are subject to change without notice.

1.5.2 Media specifications

Model		All models
Paper Input	Paper tray 1	Plain Paper, Thin Paper, Recycled Paper
	Paper tray 2	Plain Paper, Thin Paper, Recycled Paper
	MP tray	Plain Paper, Thin Paper, Thick Paper, Thicker Paper, Recycled Paper, Bond paper, Labels, Envelopes, Env. Thin, Env. Thick
	Duplex	Plain Paper, Thin Paper, Recycled Paper
Media weight	Paper tray 1	60 to 105 g/m ² (16 to 28 lb)
	Paper tray 2	60 to 105 g/m ² (16 to 28 lb)
	MP tray	60 to 163 g/m ² (16 to 43 lb)
	Duplex	60 to 105 g/m ² (16 to 28 lb)
Media size	Paper tray 1	A4, Letter, B5 (ISO/JIS), A5, A5 (Long Edge), B6 (ISO), A6, Executive, Legal ^{*1} , Folio
	Paper tray 2	A4, Letter, B5 (ISO/JIS), A5, B6 (ISO), Executive, Legal ^{*1} , Folio
	MP tray	Width: 76.2 to 215.9 mm (3 to 8.5 inch), Length: 127 to 355.6 mm (5 to 14 inch)
	Duplex	Letter, Legal, Folio (for U.S.A.) A4 (for Europe, Asia, Oceania, China)

*1 Legal size paper and Folio size paper are not available in some regions outside the USA and Canada.

Specifications are subject to change without notice.

1.5.3 Type and size of paper

The printer loads paper from the installed paper tray or the manual feed slot.

The names for the paper trays in the printer driver as follows:

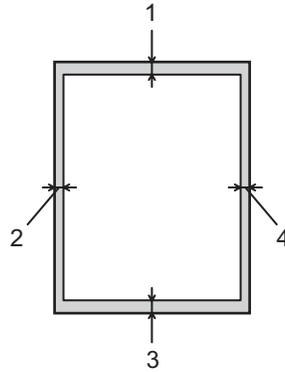
The name for the paper trays	The name for the paper trays in the printer driver
Paper tray 1 (T1)	Tray 1
Paper tray 2 (T2)	Tray 2
MP tray	MP Tray
Duplex	DX

Specifications are subject to change without notice.

1.6 Printable Area

The figure below shows maximum unprintable areas.

The unprintable areas may vary depending on the paper size or settings in the application you are using.



Usage	Document Size	Top (1) Bottom (3)	Left (2) Right (4)
Print	Letter	4.23 mm (0.16 inch)	6.35 mm (0.25 inch)
	A4	4.23 mm (0.16 inch)	6.01 mm (0.24 inch)

Specifications are subject to change without notice.

CHAPTER 2

TROUBLESHOOTING

CHAPTER 2 TROUBLESHOOTING

This chapter details error messages and codes which the incorporated self-diagnostic function of the machine will display if any error or malfunction occurs. If any error message appears, refer to this chapter to find which parts should be checked or replaced.

The latter half of this chapter provides sample problems which could occur in the main sections of the machine and related troubleshooting procedures. These will help service personnel identify and repair other similar defective sections.

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1. INTRODUCTION

Troubleshooting is a collection of solution procedures that service personnel should follow if an error or malfunction occurs in the machine. It is difficult to determine troubleshooting procedures for all possible problems that may occur in the future. Therefore, this chapter describes typical problem cases and recovery procedures for these. These will help service personnel identify and repair other similar defective sections.

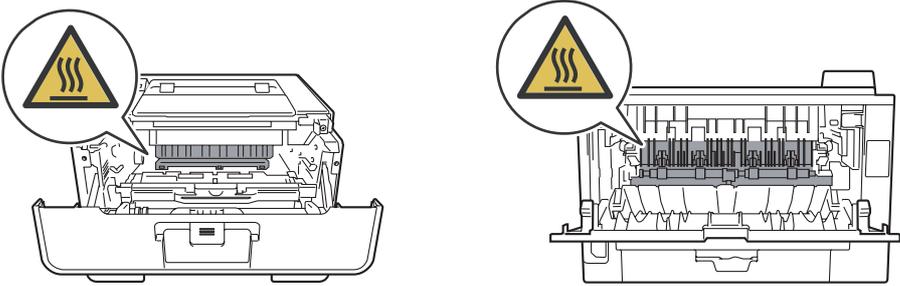
1.1 Precautions

Be sure to observe the following precautions to prevent any secondary problems occurring during troubleshooting:

- (1) Be sure to unplug the AC cord before removing any covers or PCBs, adjusting the machine, or conducting continuity tests using a tester.
- (2) Do not hold the cable when connecting or disconnecting the cable. Be sure to hold the connector.
- (3) Static electricity generated and stored on your body may damage electronic parts. Before handling the PCBs, touch a metal section of the machine to discharge static electricity.
When transporting PCBs, be sure to wrap them in conductive sheets.
When replacing the PCBs, wear a grounding wrist band and perform replacement on a conductive mat. Also take care not to touch the conductor sections on the flat cables.
- (4) Be sure to always observe all warnings.

WARNING

Hazard labels as shown below are attached to the machine. Fully understand the descriptions on the hazard labels and observe them during troubleshooting. Take extreme care not to remove or damage the hazard labels.



WARNING

DO NOT use any flammable spray or flammable solvent such as alcohol, benzene, or thinner in or around the machine. Otherwise a fire or electric shock may result.



- (5) After repair is completed, check that the repaired sections, including those removed once and then remounted, operate normally.

1.2 Checks before Commencing Troubleshooting

Check the following items before commencing repairs on the machine.

■ Operating environment

- (1) The machine is placed on a flat, stable surface.
- (2) The machine is used in a clean environment where the temperature is between 10°C (50°F) and 32.5°C (90.5°F) and the relative humidity is maintained between 20% and 80%.
- (3) The machine is not exposed to direct sunlight, excessive heat, moisture, or dust.
- (4) Hold the machine level while moving it.

■ Power supply

- (1) Power described on the rating label attached on the machine is supplied. Power fluctuation should be within $\pm 10\%$ of the rated voltage.
- (2) The AC input power supply is within the regulated value.
- (3) The cables and harnesses are connected correctly.
- (4) The fuses are not blown.

■ Paper

- (1) The recommended type of paper is being used. (Refer to "[1.5.2 Media specifications](#)" in [Chapter 1](#).)
- (2) The paper is not damp.
- (3) Short-grained paper or acid paper is not used.

■ Consumable parts

- (1) The drum unit (including the toner cartridge) is set correctly.

■ Others

(1) Condensation

When the machine is moved to a warm room from a cold location, condensation may occur inside the machine, causing various problems as listed below.

- Condensation on the surface of optical devices such as the lens, reflecting mirror and protection glass may cause light print image.
- If the exposure drum is cold, the electrical resistance of the photosensitive layer is increased, making it impossible to obtain the correct print density.
- Condensation on the charge unit may cause corona charge leakage.
- Condensation on the plate or separation pad may cause paper feed problems.

If condensation has formed in the machine, leave the machine for at least two hours until it reaches room temperature.

If the drum unit is unpacked soon after it is moved to a warm room from a cold location, condensation may occur inside the unit which may cause printing failure. Leave the drum unit for one or two hours until it reaches room temperature, and then unpack it.

(2) Low temperature

The motor may not operate normally under a low temperature environment because too much load is applied to each drive. In this case, increase the room temperature.

■ Cleaning

Use a soft lint-free cloth.

WARNING

DO NOT use any flammable spray or flammable solvent such as alcohol, benzine, or thinner to clean the machine. **DO NOT** use these articles near the machine.



2. OVERVIEW

2.1 Cross-section Drawing

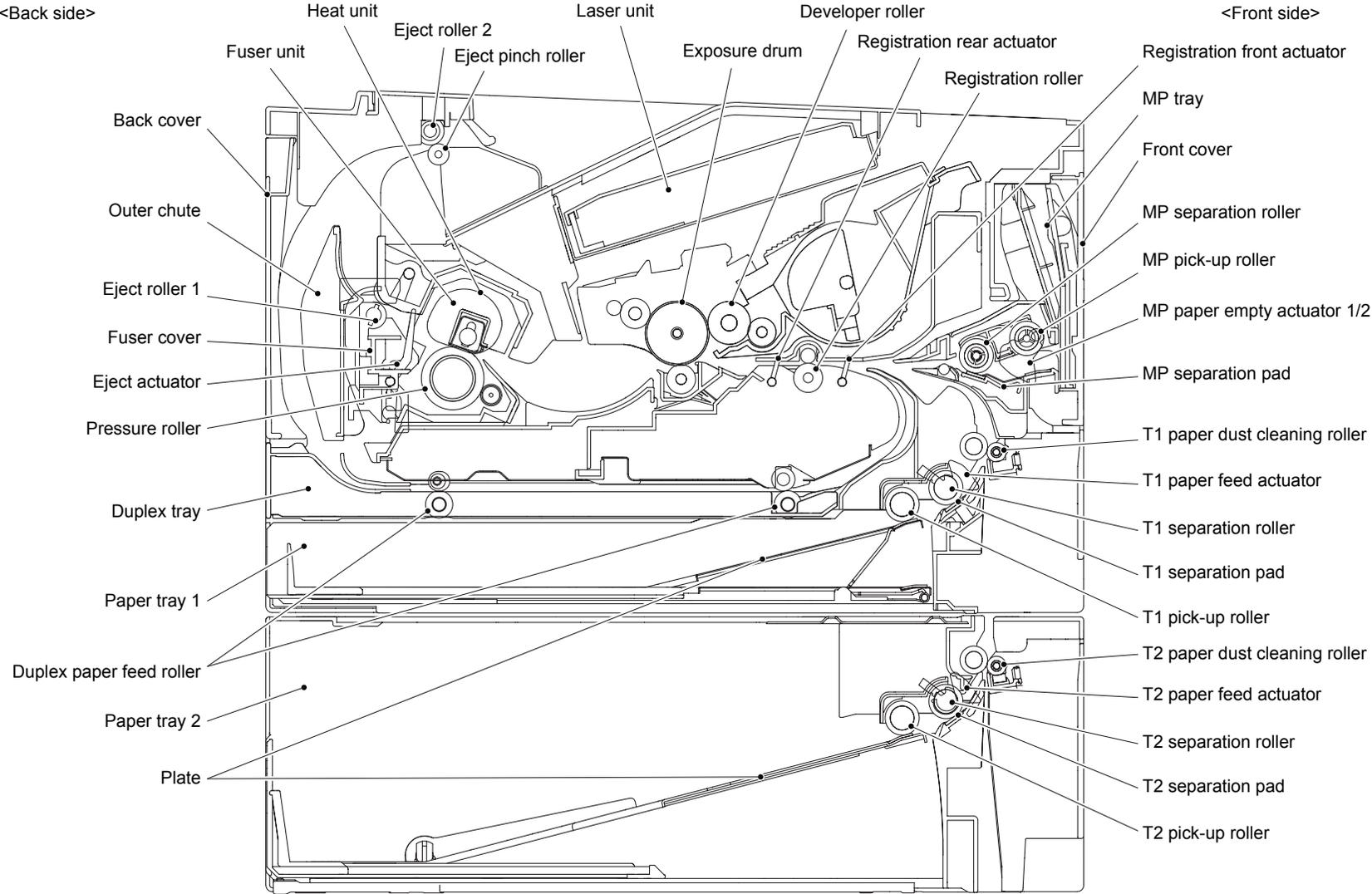


Fig. 2-1

2.2 Paper Feeding

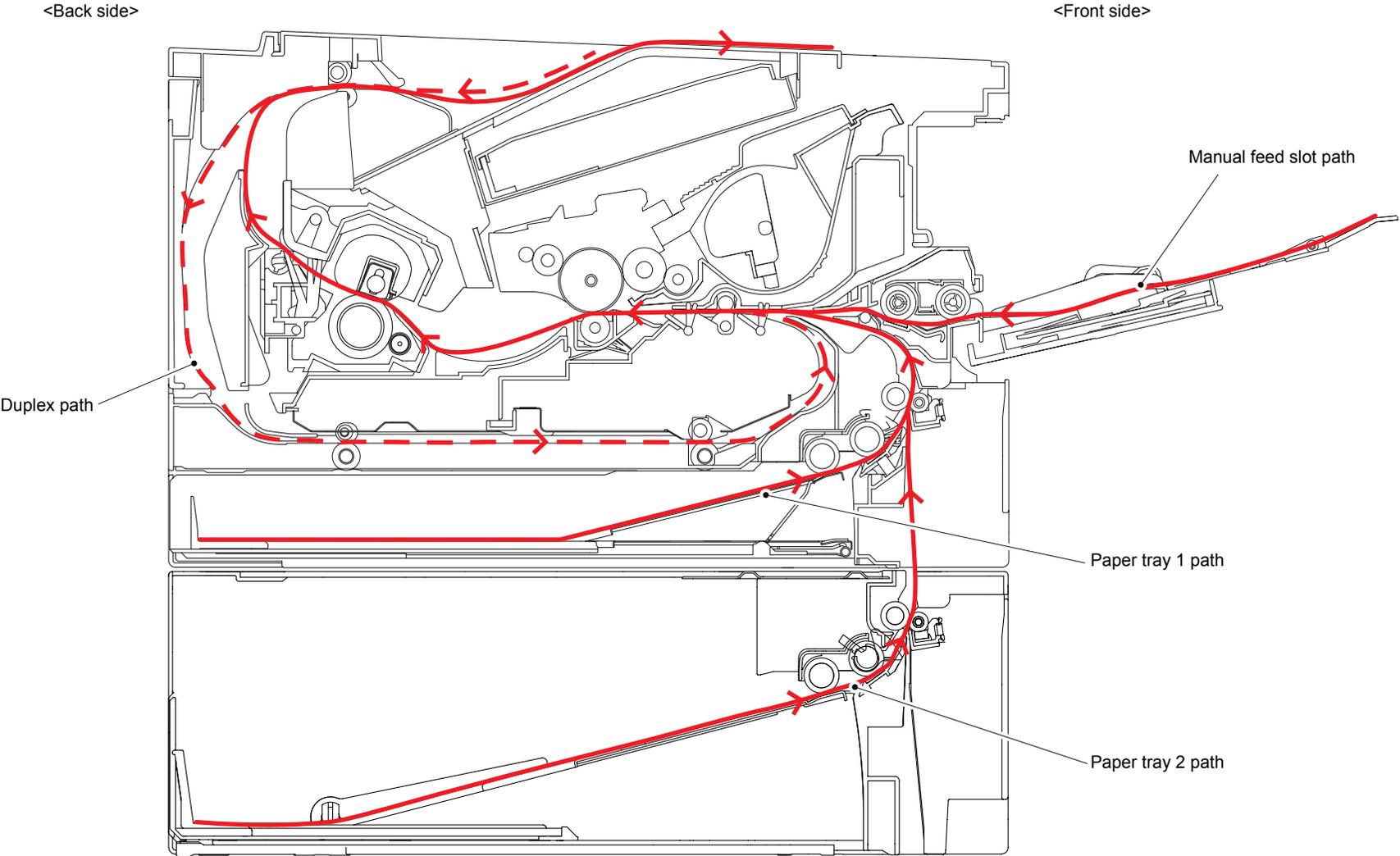


Fig. 2-2

2.3 Operation of Each Part

Part name	Operation
T1 pick-up roller	Picks up the paper from paper tray 1.
T1 separation roller / T1 separation pad	Separates the paper fed from paper tray 1 into single sheets.
T1 paper feed actuator (T1 paper feed sensor)	Detects paper tray 1. Detects a paper jam at the front section of the machine. Detects the rear edge of the paper to determine the feed timing of the next sheet of paper.
Registration front actuator (Registration front sensor)	Detects the front edge of the paper to control the registration roller drive. Detects a paper jam at the front section of the machine.
Registration roller	Corrects the paper alignment when the paper makes contact with the stopped registration roller. Feeds the paper after correction.
Registration rear actuator (Registration rear sensor)	Detects the front edge of the paper to adjust the writing start position. Detects a paper jam at the center section of the machine. Detects the front and rear edges of the paper to determine the paper size.
Heat unit Pressure roller	Fuses the toner transferred to the paper by heat and pressure, and feeds the paper to the eject roller.
Eject actuator (Eject sensor)	Determines whether the paper is ejected from the fuser unit. Detects the rear edge of the paper in duplex printing mode to adjust the eject roller change timing. Detects a paper jam at the rear section of the machine. Determines whether the fuser cover is open when the back cover is open.
Eject roller 1	Feeds the paper ejected from the fuser unit to eject roller 2.
Eject roller 2	Feeds the paper ejected from eject roller 1 to the output tray. In duplex printing mode, rotates conversely after the paper is fed a short distance to feed the paper to the duplex tray.
Duplex paper feed roller	Feeds the paper passing through the duplex tray to the registration roller.
MP pick-up roller	Picks up the paper from the MP tray.
MP separation roller / MP separation pad	Separates the paper fed from the MP tray into single sheets.
MP paper empty actuator 1/2 (MP paper empty sensor)	Detects the paper in the MP tray.
T2 pick-up roller	Picks up the paper from paper tray 2.
T2 separation roller / T2 separation pad	Separates the paper fed from paper tray 2 into single sheets.
T2 paper feed actuator (T2 paper feed sensor)	Detects paper tray 2. Detects a paper jam at the front section of paper tray 2. Determines whether the paper was fed.
Back cover sensor	Detects open back cover or incorrect setting of the duplex tray. (Cannot determine which case applies.)
Front cover sensor	Detects open front cover.
T2 connect sensor	Detects connection of paper tray 2.

Part name	Operation
Toner sensor	Detects the toner remaining in the cartridge. When the toner is below the specified level, the user is notified that the toner cartridge needs replacing soon.
New toner sensor	Detects the toner volume when a new toner cartridge is set. (Does not react to the starter toner cartridge even if it is new.) When a new toner cartridge is detected, the developer roller counter and the developing bias voltage value are reset, and the toner cartridge replacement counter increases by one.

2.4 Block Diagram

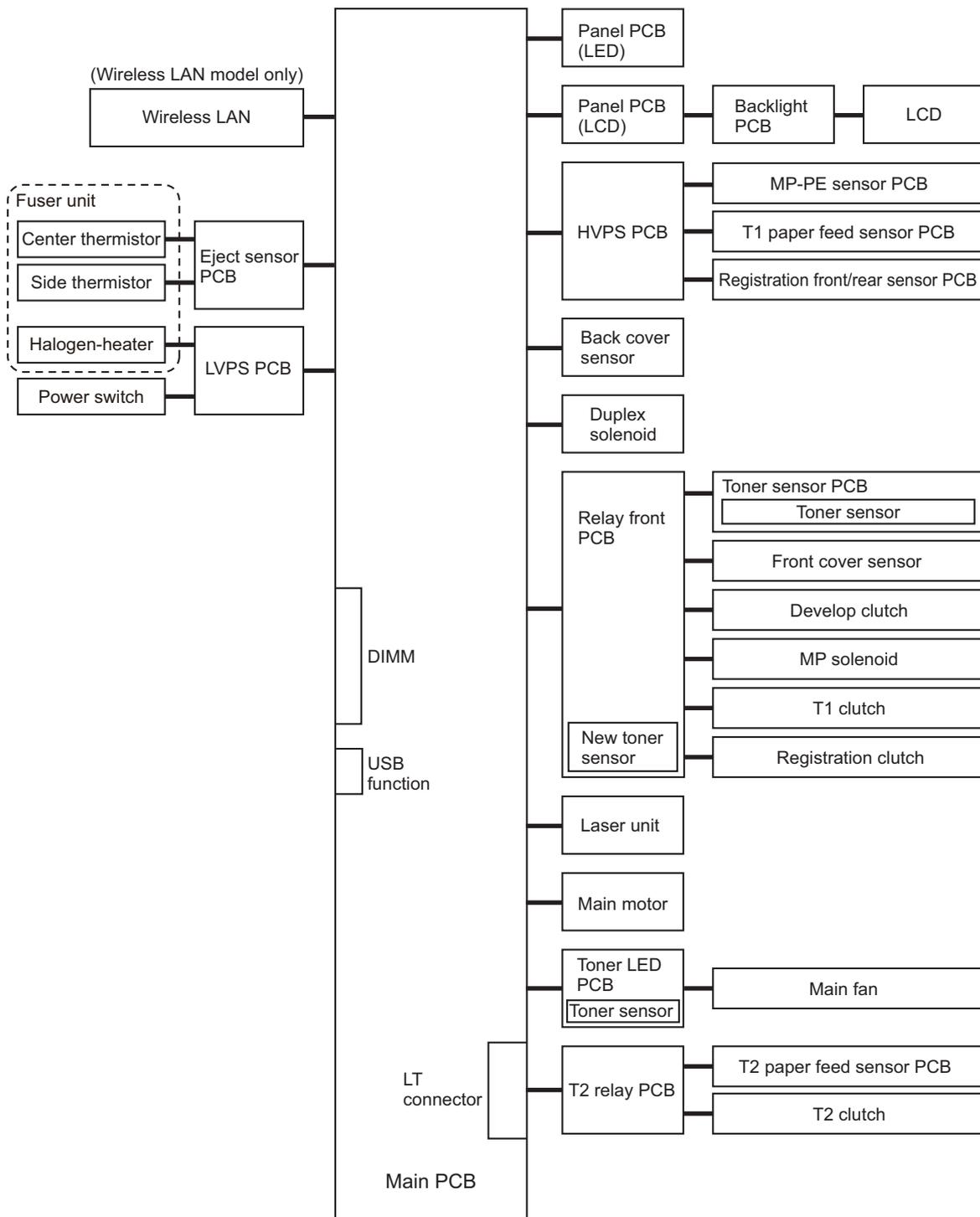


Fig. 2-3

2.5 Main Components

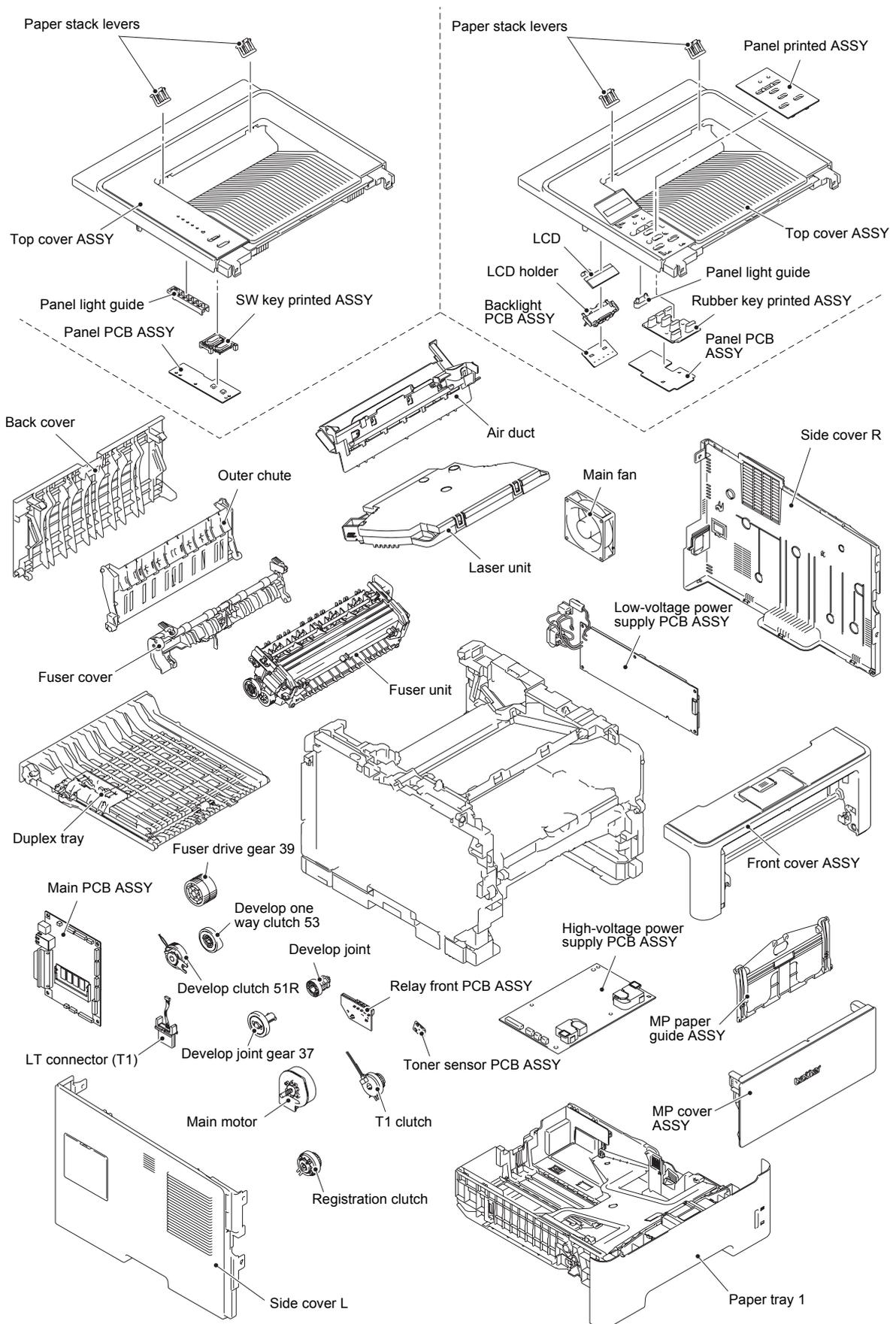


Fig. 2-4

3. ERROR INDICATIONS

This machine includes a self-diagnosis function. If the machine does not work normally it judges that an error has occurred, and indicates the corresponding error message on the LCD, which in turn helps the service men to quickly find out the problem.

3.1 Error Codes

The errors with a mesh background in the table below do not occur in the normal operation. They might occur due to noise around the installation site, change of the power supply voltage, and failures in the software.

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
0B00	An unidentified error occurred.	2-28	2900	An unidentified error occurred.	2-30
0C01 0C02 0C03 0C04	Log registration failed.	2-28	2A00	An unidentified error occurred.	2-30
0D00	Data cannot be saved because storage data area in the memory is full.	2-28	2B00	An unidentified error occurred.	2-30
0E00	An unidentified error occurred.	2-29	2C00	An unidentified error occurred.	2-30
0F00	The back cover sensor detected that the cover was open in duplex printing mode.	2-29	2D00	An unidentified error occurred.	2-30
1000	An unidentified error occurred.	2-29	2E00	An unidentified error occurred.	2-30
1100	An unidentified error occurred.	2-29	2F00	An unidentified error occurred.	2-30
1200	An unidentified error occurred.	2-29	3000	An unidentified error occurred.	2-30
1600	An unidentified error occurred.	2-29	3100	An unidentified error occurred.	2-30
1700	An unidentified error occurred.	2-29	3200	An unidentified error occurred.	2-30
1800	An unidentified error occurred.	2-29	3300	An unidentified error occurred.	2-30
1900	An unidentified error occurred.	2-29	3400	An unidentified error occurred.	2-30
1A00	An unidentified error occurred.	2-29	3500	An unidentified error occurred.	2-30
1B00	An unidentified error occurred.	2-29	3600	An error occurred in the high-voltage power supply PCB.	2-30
1C00	An unidentified error occurred.	2-29	3700	An unidentified error occurred.	2-30
1D00	An unidentified error occurred.	2-29	3800	An unidentified error occurred.	2-30
1E00	The number of rotations of the drum unit is reaching the life limit.	2-30	3900	An unidentified error occurred.	2-30
1F00	An unidentified error occurred.	2-30	3A00	An unidentified error occurred.	2-30
2000	An unidentified error occurred.	2-30	3B00	An error occurred during access to the DRAM in the main PCB.	2-31
2100	An unidentified error occurred.	2-30	3C00	An unidentified error occurred.	2-31
2200	An unidentified error occurred.	2-30	3D00	An unidentified error occurred.	2-31
2300	An unidentified error occurred.	2-30	3E00	An unidentified error occurred.	2-31
2400	An unidentified error occurred.	2-30	3F00	An unidentified error occurred.	2-31
2500	An unidentified error occurred.	2-30	4000	An unidentified error occurred.	2-31
2600	An unidentified error occurred.	2-30	4200	An unidentified error occurred.	2-31
2700	An unidentified error occurred.	2-30	4300	An unidentified error occurred.	2-31
2800	An unidentified error occurred.	2-30	4400	The toner sensor detected that the toner cartridge was not set.	2-31

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
4500	An unidentified error occurred.	2-31	5B00	An unidentified error occurred.	2-35
4600	An unidentified error occurred.	2-31	5C00	An unidentified error occurred.	2-35
4700	An unidentified error occurred.	2-31	5D00	An unidentified error occurred.	2-35
4800	An unidentified error occurred.	2-31	5E00	An unidentified error occurred.	2-35
4900	An unidentified error occurred.	2-31	5F00	An unidentified error occurred.	2-35
4A00	An unidentified error occurred.	2-31	6000	An unidentified error occurred.	2-35
4B00	An unidentified error occurred.	2-31	6100	An unidentified error occurred.	2-35
4C00	An unidentified error occurred.	2-31	6200	An unidentified error occurred.	2-35
4D00	An unidentified error occurred.	2-31	6300	The toner sensor detected no toner remaining or the number of rotations of the developer roller has reached the upper limit.	2-36
4E00	An unidentified error occurred.	2-31	6400	An unidentified error occurred.	2-36
4F00	An unidentified error occurred.	2-31	6500	An unidentified error occurred.	2-36
5000	The number of rotations of the drum unit has reached the life limit. (Printing does not stop.)	2-32	6600	An unidentified error occurred.	2-36
5100	Printable pages set for the MP paper feeding kit have reached the limit. (Printing does not stop.)	2-32	6700	The toner sensor detected that the toner remaining has fallen below the specified level or the developer roller counter has exceeded the specified value.	2-36
5200	Printable pages set for paper feeding kit 1 have reached the limit. (Printing does not stop.)	2-32	6800	An unidentified error occurred.	2-36
5300	Printable pages set for paper feeding kit 2 have reached the limit. (Printing does not stop.)	2-32	6900	An unidentified error occurred.	2-36
5400	Printable pages set for the fuser unit have reached the limit. (Printing does not stop.)	2-32	6A00	The center thermistor of the fuser unit has not reached the specified temperature within the specified time.	2-37
5500	Printable pages set for the laser unit have reached the limit. (Printing does not stop.)	2-33	6B00	The center thermistor of the fuser unit has not reached the specified temperature within the specified time.	2-37
5600	The eject sensor detected that the fuser cover was open.	2-33	6C00	The center thermistor of the fuser unit detected a temperature higher than the specified value.	2-37
5700	The registration front sensor does not detect paper pass within the specified time after the first side was printed in duplex printing mode.	2-34	6D00	After the heat unit was heated normally, the center thermistor of the fuser unit detected a temperature lower than the specified value.	2-37
5800	Any of error codes 6A00 to 6F00, 7600, 7800, DD00, DE00, or E200 (fuser unit error) occurred when the power switch was turned ON or sleep mode was released.	2-35	6E00	The center thermistor of the fuser unit detected that the heat unit was not heated.	2-37
5900	Rechecking the error after the power switch was turned OFF and then ON again because an error was detected by the center thermistor of the fuser unit. (This message is displayed for approximately 15 minutes when the machine is restarted after error code 5800 has occurred.)	2-35	6F00	The center thermistor or the side thermistor of the fuser unit detected a temperature error.	2-37
5A00	An unidentified error occurred.	2-35	7000	An unidentified error occurred.	2-38

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
7100	Detected an error in the synchronized signal of the polygon motor for the laser unit.	2-38	8300	Detected discharge when the number of rotations of the drum has exceeded twice the life limit.	2-40
7200	Cannot detect the signal from the beam detecting sensor for the laser unit.	2-38	8400	The eject sensor remains ON (paper pass detected) for more than the specified time even after the registration rear sensor detected the end of paper pass.	2-41
7300	An unidentified error occurred.	2-38	8500	The T1 paper feed sensor detected that paper tray 1 was not set.	2-41
7400	An unidentified error occurred.	2-38	8600	An unidentified error occurred.	2-42
7500	The side thermistor of the fuser unit detected a temperature higher than the specified value.	2-38	8700	An unidentified error occurred.	2-42
7600	The center thermistor of the fuser unit detected a temperature rise greater than the specified value within the specified time.	2-39	8800	The eject sensor does not detect paper pass after the registration rear sensor detected the end of paper pass.	2-42
7800	The center thermistor of the fuser unit detected a temperature fall greater than the specified value within the specified time.	2-39	8900	The registration front sensor detected that the paper fed was smaller than or larger than the specified size in duplex printing mode.	2-42
7A00	Cannot detect the synchronized signal of the main motor. The speed of the main motor does not stabilize within the specified time.	2-39	8A00	The registration front sensor does not detect paper pass within the specified time after the T1 paper feed sensor detected paper pass.	2-43
7B00	An unidentified error occurred.	2-40	8B00	The registration front sensor does not detect paper pass within the specified time after the T2 paper feed sensor detected paper pass.	2-43
7C00	An unidentified error occurred.	2-40	8C00	The registration front sensor does not detect paper pass within the specified time after the paper was picked up from the MP tray.	2-44
7D00	Detected discharge that may be attributable to dirty corona wire on the drum unit.	2-40	8D00	When the power switch was turned ON, the eject sensor detected paper pass or detected that the fuser cover was open.	2-44
7E00	An unidentified error occurred.	2-40	8E00	An unidentified error occurred.	2-44
7F00	An unidentified error occurred.	2-40	8F00	An unidentified error occurred.	2-44
8000	An unidentified error occurred.	2-40	9000	When printing from the MP tray, the size of paper set in the MP tray does not match the size specified by the driver.	2-45
8100	An unidentified error occurred.	2-40	9100	When printing from paper tray 1, the size of paper set in paper tray 1 does not match the size specified by the driver.	2-45
8200	An unidentified error occurred.	2-40	9200	When printing from paper tray 2, the size of paper set in paper tray 2 does not match the size specified by the driver.	2-45

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
9300	When printing from the MP tray, the MP paper empty sensor detected that there was no paper set in the MP tray.	2-45	AB00	An unidentified error occurred.	2-49
9400	When printing from paper tray 1, the T1 paper feed sensor detected that there was no paper set in paper tray 1.	2-46	AC00	An unidentified error occurred.	2-49
9500	When printing from paper tray 2, the T2 paper feed sensor detected that there was no paper set in paper tray 2.	2-46	AD00	An unidentified error occurred.	2-49
9600	When printing with the tray designation set to AUTO, the MP paper empty sensor, T1 paper feed sensor and T2 paper feed sensor all detected that there was no paper set in the MP tray, paper tray 1 and paper tray 2.	2-47	AE00	An unidentified error occurred.	2-49
9700	An unidentified error occurred.	2-47	AF00	An unidentified error occurred.	2-49
9800	An unidentified error occurred.	2-47	B000	An unidentified error occurred.	2-49
9900	Printing on a paper size not supported for duplex printing was attempted from the driver.	2-47	B100	An unidentified error occurred.	2-49
9A00	There is no paper set in the MP tray when feeding from the MP tray is designated from the driver.	2-48	B200	An unidentified error occurred.	2-49
9B00	An unidentified error occurred.	2-48	B300	An unidentified error occurred.	2-49
9C00	An unidentified error occurred.	2-48	B400	An unidentified error occurred.	2-49
9D00	An unidentified error occurred.	2-48	B500	An unidentified error occurred.	2-49
9E00	An unidentified error occurred.	2-48	B600	An unidentified error occurred.	2-49
9F00	An unidentified error occurred.	2-48	B700	An unidentified error occurred.	2-49
A000	An unidentified error occurred.	2-48	B800	An unidentified error occurred.	2-49
A100	The front cover sensor detected that the front cover was open.	2-49	B900	An unidentified error occurred.	2-49
A200	An unidentified error occurred.	2-49	BA00	An unidentified error occurred.	2-49
A300	An unidentified error occurred.	2-49	BB00	An unidentified error occurred.	2-49
A400	An unidentified error occurred.	2-49	BC00	An unidentified error occurred.	2-49
A500	An unidentified error occurred.	2-49	BD00	An unidentified error occurred.	2-49
A600	An unidentified error occurred.	2-49	BE00	An unidentified error occurred.	2-49
A700	An unidentified error occurred.	2-49	BF00	An unidentified error occurred.	2-49
A800	An unidentified error occurred.	2-49	C000	The new toner sensor could not detect the new toner cartridge correctly.	2-49
A900	An unidentified error occurred.	2-49	C100	An unidentified error occurred.	2-50
AA00	An unidentified error occurred.	2-49	C200	An unidentified error occurred.	2-50

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
C300	An unidentified error occurred.	2-50	DD00	Fuser unit error (except error codes 6A00 to 6F00, 7600, 7800, DE00, and E200)	2-51
C400	An unidentified error occurred.	2-50	DE00	When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature lower than the specified temperature.	2-52
C500	An unidentified error occurred.	2-50	DF00	An unidentified error occurred.	2-52
C600	An unidentified error occurred.	2-50	E000	An error occurred in the ROM check sum.	2-52
C700	There is insufficient memory to expand PC-print data.	2-50	E100	Program error	2-52
C800	The memory size allotted for Secure Print was exceeded when saving Secure Print data.	2-50	E200	When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature higher than the specified temperature.	2-53
C900	Detected that DIMM was faulty or was mounted incorrectly.	2-50	E300	An unidentified error occurred.	2-53
CA00	An unidentified error occurred.	2-51	E400	An unidentified error occurred.	2-53
CB00	An unidentified error occurred.	2-51	E600	Write error in the EEPROM of the main PCB	2-53
CC00	An unidentified error occurred.	2-51	E700	An unidentified error occurred.	2-54
CD00	An unidentified error occurred.	2-51	E800	An unidentified error occurred.	2-54
CE00	An unidentified error occurred.	2-51	E900	An unidentified error occurred.	2-54
CF00	An unidentified error occurred.	2-51	EA00	An unidentified error occurred.	2-54
D000	An unidentified error occurred.	2-51	EB00	An unidentified error occurred.	2-54
D100	An unidentified error occurred.	2-51	EC00	Detected a main fan failure.	2-54
D200	An unidentified error occurred.	2-51	ED00	Communication between the wireless LAN PCB and the main PCB cannot be established at machine startup.	2-54
D300	An unidentified error occurred.	2-51	EE00	Detected communication failure after communication between the wireless LAN PCB and the main PCB was established.	2-54
D400	An unidentified error occurred.	2-51	EF00	The supplied power is unstable.	2-55
D500	An unidentified error occurred.	2-51	F000	Malfunction of the flash memory on the main PCB	2-55
D600	An unidentified error occurred.	2-51	F100	An unidentified error occurred.	2-55
D700	An unidentified error occurred.	2-51	F200	An unidentified error occurred.	2-55
D800	An unidentified error occurred.	2-51	F300	An unidentified error occurred.	2-55
D900	An unidentified error occurred.	2-51	F400	An unidentified error occurred.	2-55
DA00	An unidentified error occurred.	2-51	F500	An unidentified error occurred.	2-55
DB00	An unidentified error occurred.	2-51	F600	An unidentified error occurred.	2-55
DC00	An unidentified error occurred.	2-51	F800	An unidentified error occurred.	2-55

Error codes	Problem	Refer to:	Error codes	Problem	Refer to:
F900	The country code was not entered correctly.	2-56	FD00	An unidentified error occurred.	2-56
FA00	An unidentified error occurred.	2-56	FE00	An unidentified error occurred.	2-56
FB00	An unidentified error occurred.	2-56	FF00	An unidentified error occurred.	2-56
FC00	An unidentified error occurred.	2-56			

3.2 Error Messages

The error messages displayed on the LCD of the machine and their description are shown in the table below.

Error Message	Description	Error codes	Refer to:
Access Denied	Failed to authenticate the print limit ID when PC-print was executed.	---	2-73
Cartridge Error	The new toner sensor could not detect the new toner cartridge correctly.	C000	2-49
Connection Error	Multiple access points were found as a result of the access point search.	---	2-74
Connection Fail	Connection failed although the access point was found as a result of the access point search.	---	2-74
Cooling Down	The side thermistor of the fuser unit detected a temperature higher than the specified value.	7500	2-38
Cover is Open	The front cover sensor detected that the front cover was open.	A100	2-49
	The eject sensor detected that the fuser cover was open.	5600	2-33
	When the power switch was turned ON, the eject sensor detected paper pass or detected that the fuser cover was open.	8D00	2-44
DIMM Error	Detected that DIMM was faulty or was mounted incorrectly.	C900	2-50
Drum End Soon	The number of rotations of the drum unit is reaching the life limit.	1E00	2-30
Drum Error	Detected discharge that may be attributable to dirty corona wire on the drum unit.	7D00	2-40
Drum Stop	Detected discharge when the number of rotations of the drum has exceeded twice the life limit.	8300	2-40
Duplex Disabled	The back cover sensor detected that the cover was open in duplex printing mode.	0F00	2-29
Fuser Error	An error occurred in the fuser unit when the power switch was turned ON or sleep mode was released.	5800 5900 6A00 6B00 6C00 6D00 6E00 6F00 7600 7800 DD00 DE00 E200	2-35 2-35 2-37 2-37 2-37 2-37 2-37 2-37 2-39 2-39 2-51 2-52 2-53
Ignore Data	Detected undecodable data during printing. Received undecodable PS data.	---	2-73
Jam Duplex	The registration front sensor does not detect paper pass within the specified time after the first side was printed in duplex printing mode.	5700	2-34
Jam Inside	The eject sensor does not detect paper pass after the registration rear sensor detected the end of paper pass.	8800	2-42

Error Message	Description	Error codes	Refer to:
Jam MP Tray	The registration front sensor does not detect paper pass within the specified time after the paper was picked up from the MP tray.	8C00	2-44
Jam Rear	The eject sensor remains ON (paper pass detected) for more than the specified time even after the registration rear sensor detected the end of paper pass.	8400	2-41
Jam Tray 1	The registration front sensor does not detect paper pass within the specified time after the T1 paper feed sensor detected paper pass.	8A00	2-43
Jam Tray 2	The registration front sensor does not detect paper pass within the specified time after the T2 paper feed sensor detected paper pass.	8B00	2-43
Log Access Error	Log registration failed.	0C01 0C02 0C03 0C04	2-28
Machine Error F9	The country code was not entered correctly.	F900	2-56
Manual Feed	There is no paper set in the MP tray when feeding from the MP tray is designated from the driver.	9A00	2-48
No Paper	When printing from the MP tray, the MP paper empty sensor detected that there was no paper set in the MP tray.	9300	2-45
	When printing from paper tray 1, the T1 paper feed sensor detected that there was no paper set in paper tray 1.	9400	2-46
	When printing from paper tray 2, the T2 paper feed sensor detected that there was no paper set in paper tray 2.	9500	2-46
	When printing with the tray designation set to AUTO, the MP paper empty sensor, T1 paper feed sensor and T2 paper feed sensor all detected that there was no paper set in the MP tray, paper tray 1 and paper tray 2.	9600	2-47
No Toner	The toner sensor detected that the toner cartridge was not set.	4400	2-31
No Tray	The T1 paper feed sensor detected that paper tray 1 was not set.	8500	2-41
Out of Memory	There is insufficient memory to expand PC-print data.	C700	2-50
	The memory size allotted for Secure Print was exceeded when saving Secure Print data.	C800	2-50
	The program cannot be updated due to insufficient memory.	---	2-79
Replace Drum	The number of rotations of the drum unit has reached the life limit. (Printing does not stop.)	5000	2-32
Replace Fuser	Printable pages set for the fuser unit have reached the limit. (Printing does not stop.)	5400	2-32
Replace Laser	Printable pages set for the laser unit have reached the limit. (Printing does not stop.)	5500	2-33
Replace PF Kit MP	Printable pages set for the MP paper feeding kit have reached the limit. (Printing does not stop.)	5100	2-32
Replace PF Kit1	Printable pages set for paper feeding kit 1 have reached the limit. (Printing does not stop.)	5200	2-32
Replace PF Kit2	Printable pages set for paper feeding kit 2 have reached the limit. (Printing does not stop.)	5300	2-32

Error Message	Description	Error codes	Refer to:
Replace Toner	The toner sensor detected no toner remaining or the number of rotations of the developer roller has reached the upper limit.	6300	2-36
Self-Diagnostic	Rechecking the error after the power switch was turned OFF and then ON again because an error was detected by the center thermistor of the fuser unit. (This message is displayed for approximately 15 minutes when the machine is restarted after error code 5800 has occurred.)	5900	2-35
Size Error DX	The registration front sensor detected that the paper fed was smaller than or larger than the specified size in duplex printing mode.	8900	2-42
	Printing on a paper size not supported for duplex printing was attempted from the driver.	9900	2-47
Size Mismatch	When printing from the MP tray, the size of paper set in the MP tray does not match the size specified by the driver.	9000	2-45
	When printing from paper tray 1, the size of paper set in paper tray 1 does not match the size specified by the driver.	9100	2-45
	When printing from paper tray 2, the size of paper set in paper tray 2 does not match the size specified by the driver.	9200	2-45
Storage Full	Data cannot be saved because storage data area in the memory is full.	0D00	2-28
Toner Low	The toner sensor detected that the toner remaining has fallen below the specified level or the developer roller counter has exceeded the specified value.	6700	2-36

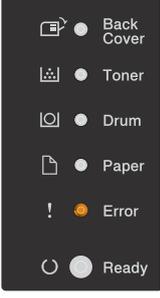
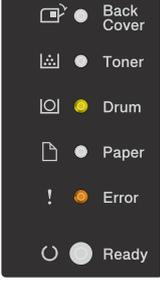
3.3 LED Display (LED Model)

3.3.1 LED display when operator call occurs

Determine the message details according to the LED display on the control panel. Refer to the page shown in the "Refer to:" column in the table below to take appropriate measures. Most errors are automatically cleared after measures are taken. If not automatically cleared, press the [Go] button to reset the machine.

LED status in the table below:  Unlit  Lit  Flashing

LED	Type of problem	Error codes	Refer to:
	Printable pages set for the MP paper feeding kit, paper feeding kit 1, or paper feeding kit 2 have reached the limit. (Printing does not stop.)	5100 5200 5300	2-32 2-32 2-32
	Printable pages set for the fuser unit have reached the limit. (Printing does not stop.)	5400	2-32
	Printable pages set for the laser unit have reached the limit. (Printing does not stop.)	5500	2-33
	The toner sensor detected that the toner remaining has fallen below the specified level or the developer roller counter has exceeded the specified value.	6700	2-36
	The number of rotations of the drum unit is reaching the life limit.	1E00	2-30
	The number of rotations of the drum unit has reached the life limit. (Printing does not stop.)	5000	2-32

LED	Type of problem	Error codes	Refer to:
	The side thermistor of the fuser unit detected a temperature higher than the specified value.	7500	2-38
	Ready state under a low temperature environment.	—	—
	The front cover sensor detected that the front cover was open.	A100	2-49
	The eject sensor detected that the fuser cover was open.	5600	2-33
	The back cover sensor detected that the cover was open in duplex printing mode.	0F00	2-29
	The toner sensor detected that the toner cartridge was not set.	4400	2-31
	The toner sensor detected no toner remaining or the number of rotations of the developer roller has reached the upper limit.	6300	2-36
	The new toner sensor could not detect the new toner cartridge correctly.	C000	2-49
	Detected discharge when the number of rotations of the drum has exceeded twice the life limit.	8300	2-40

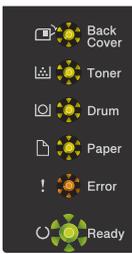
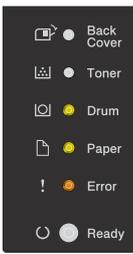
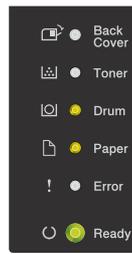
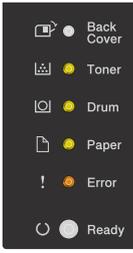
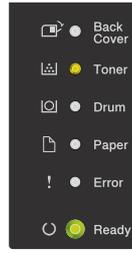
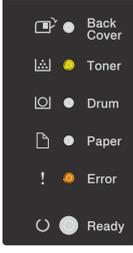
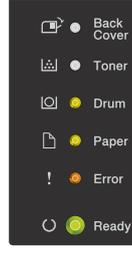
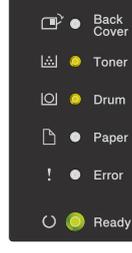
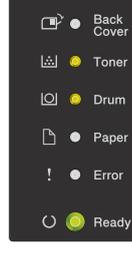
LED	Type of problem	Error codes	Refer to:
	When printing from the MP tray, paper tray 1, or paper tray 2, the size of paper set in the MP tray, paper tray 1 or paper tray 2 does not match the size specified by the driver.	9000 9100 9200	2-45 2-45 2-45
	Printing on a paper size not supported for duplex printing was attempted from the driver.	9900	2-47
	The T1 paper feed sensor detected that paper tray 1 was not set.	8500	2-41
	The eject sensor does not detect paper pass after the registration rear sensor detected the end of paper pass.	8800	2-42
	The registration front sensor detected that the paper fed was smaller than or larger than the specified size in duplex printing mode.	8900	2-42
	The registration front sensor does not detect paper pass within the specified time after the T1 or T2 paper feed sensor detected paper pass.	8A00 8B00	2-43 2-43
	The registration front sensor does not detect paper pass within the specified time after the paper was picked up from the MP tray.	8C00	2-44
	When the power switch was turned ON, the eject sensor detected paper pass or detected that the fuser cover was open.	8D00	2-44
		When printing with the tray designation set to AUTO, the MP paper empty sensor, T1 paper feed sensor and T2 paper feed sensor all detected that there was no paper set in the MP tray, paper tray 1 and paper tray 2.	9600
When printing from the MP tray, the MP paper empty sensor detected that there was no paper set in the MP tray.		9300	2-45
When printing from paper tray 1 or 2, the T1 or T2 paper feed sensor detected that there was no paper set in paper tray 1 or 2.		9400 9500	2-46 2-46
There is no paper set in the MP tray when feeding from the MP tray is designated from the driver.		9A00	2-48
	There is insufficient memory to expand PC-print data.	C700	2-50
	Log registration failed.	0C01 0C02 0C03 0C04	2-28

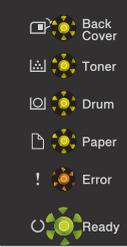
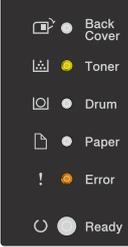
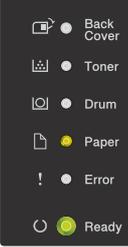
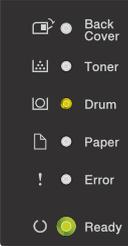
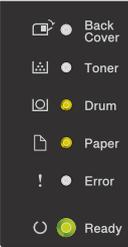
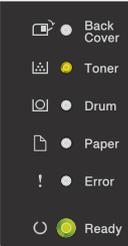
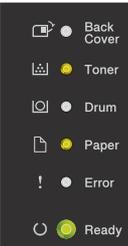
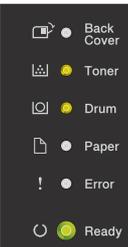
LED	Type of problem	Error codes	Refer to:
	The registration front sensor does not detect paper pass within the specified time after the first side was printed in duplex printing mode.	5700	2-34
	The eject sensor remains ON (paper pass detected) for more than the specified time even after the registration rear sensor detected the end of paper pass.	8400	2-41
	Detected discharge that may be attributable to dirty corona wire on the drum unit.	7D00	2-40
	Detected that DIMM was faulty or was mounted incorrectly.	C900	2-50
	An error occurred during access to the DRAM in the main PCB.	3B00	2-31
	An error occurred in the ROM check sum.	E000	2-52
	Program error	E100	2-52

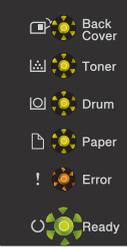
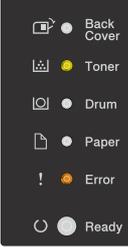
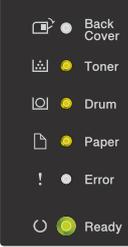
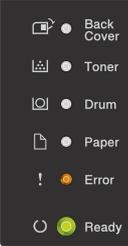
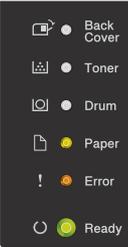
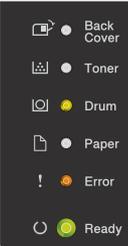
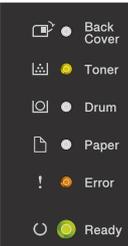
3.3.2 LED display when service call occurs

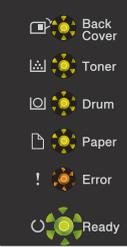
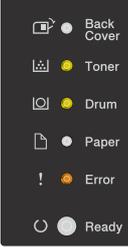
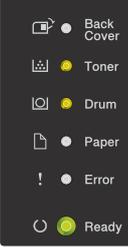
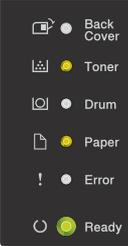
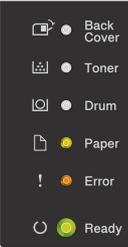
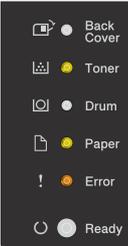
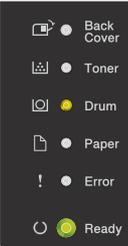
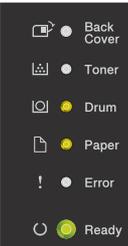
When a service call occurs, the six LEDs flash. Pressing the [Go] and [Cancel] buttons simultaneously allows you to identify the location of the problem based on the combination of the LED status: lit, flashing or unlit.

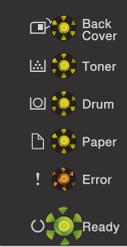
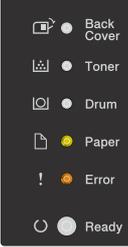
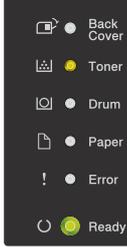
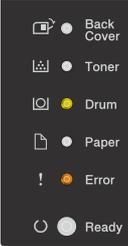
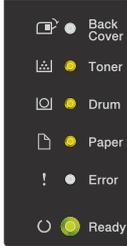
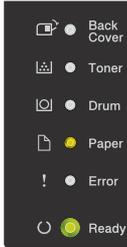
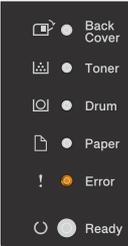
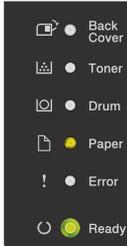
In the event that a service call occurs, instruct end users to turn the power switch OFF and then ON again after several seconds. If the service call still occurs, follow the table below to identify the location of the problem and take appropriate measures.

LED	Press [Go] and [Cancel] simultaneously once	Press [Go] and [Cancel] simultaneously twice	Type of problem	Error codes	Refer to:
			An error occurred in the high-voltage power supply PCB.	3600	2-30
			The supplied power is unstable.	EF00	2-55
			Any of error codes 6A00 to 6F00, 7600, 7800, DD00, DE00, or E200 (fuser unit error) occurred when the power switch was turned ON or sleep mode was released.	5800	2-35
			Rechecking the error after the power switch was turned OFF and then ON again because an error was detected by the center thermistor of the fuser unit. (This message is displayed for approximately 15 minutes when the machine is restarted after error code 5800 has occurred.)	5900	2-35

LED	Press [Go] and [Cancel] simultaneously once	Press [Go] and [Cancel] simultaneously twice	Type of problem	Error codes	Refer to:
			The center thermistor of the fuser unit has not reached the specified temperature within the specified time.	6A00	2-37
			The center thermistor of the fuser unit has not reached the specified temperature within the specified time.	6B00	2-37
			The center thermistor of the fuser unit detected a temperature higher than the specified value.	6C00	2-37
			After the heat unit was heated normally, the center thermistor of the fuser unit detected a temperature lower than the specified value.	6D00	2-37
			The center thermistor of the fuser unit detected that the heat unit was not heated.	6E00	2-37
			The center thermistor or the side thermistor of the fuser unit detected a temperature error.	6F00	2-37

LED	Press [Go] and [Cancel] simultaneously once	Press [Go] and [Cancel] simultaneously twice	Type of problem	Error codes	Refer to:
			The center thermistor of the fuser unit detected a temperature rise greater than the specified value within the specified time.	7600	2-39
			The center thermistor of the fuser unit detected a temperature fall greater than the specified value within the specified time.	7800	2-39
			Fuser unit error (except error codes 6A00 to 6F00, 7600, 7800, DE00, and E200)	DD00	2-51
			When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature lower than the specified temperature.	DE00	2-52
			When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature higher than the specified temperature.	E200	2-53

LED	Press [Go] and [Cancel] simultaneously once	Press [Go] and [Cancel] simultaneously twice	Type of problem	Error codes	Refer to:
			Write error in the EEPROM of the main PCB	E600	2-53
			Malfunction of the flash memory on the main PCB	F000	2-55
			Fuser unit error (except error codes 6A00 to 6F00, 7600, 7800, DE00, and E200)	DD00	2-51
			Communication between the wireless LAN PCB and the main PCB cannot be established at machine startup.	ED00	2-54
			Detected communication failure after communication between the wireless LAN PCB and the main PCB was established.	EE00	2-54

LED	Press [Go] and [Cancel] simultaneously once	Press [Go] and [Cancel] simultaneously twice	Type of problem	Error codes	Refer to:
			Cannot detect the synchronized signal of the main motor. The speed of the main motor does not stabilize within the specified time.	7A00	2-39
			Detected an error in the synchronized signal of the polygon motor for the laser unit.	7100	2-38
			Cannot detect the signal from the beam detecting sensor for the laser unit.	7200	2-38
			The main PCB detected a main fan failure.	EC00	2-54

4. TROUBLESHOOTING

4.1 Error Cause and Remedy

■ Error code 0B00

This error does not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ Error code 0C01/0C02/0C03/0C04

Log Access Error.

Log registration failed.

<User Check>

- Follow the User's Guide to set the network again.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ Error code 0D00

Storage Full

Data cannot be saved because storage data area in the memory is full.

<User Check>

- Print the Storage Print Data.
- Expand DIMM.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 0E00**

This error does not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 0F00**

Duplex Disabled

The back cover sensor detected that the cover was open in duplex printing mode.

<User Check>

- Close the back cover.
- Set the duplex tray.

Step	Cause	Remedy
1	Connection failure of the back cover sensor harness	Check the connection of the back cover sensor harness, and reconnect it if necessary.
2	Back cover sensor attachment failure	Reattach the back cover sensor.
3	Broken rib (on the right inside the back cover) where the back cover switch is pressed	Replace the back cover.
4	Damaged duplex tray	Replace the duplex tray.
5	Back cover sensor failure	Replace the back cover switch harness ASSY.
6	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 1000 to 1D00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 1E00**

Drum End Soon

The number of rotations of the drum unit is reaching the life limit.

Step	Cause	Remedy
1	Replace the drum unit with a new one and reset the drum counter. If the error display is not cleared, the main PCB is faulty.	Replace the main PCB ASSY.

■ **Error codes 1F00 to 3500**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 3600**

Print Unable 36

An error occurred in the high-voltage power supply PCB.

Step	Cause	Remedy
1	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 3700 to 3A00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 3B00**

Print Unable 3B

An error occurred during access to the DRAM in the main PCB.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 3C00 to 4300**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 4400**

No Toner

The toner sensor detected that the toner cartridge was not set.

<User Check>

- Set the toner cartridge.

Step	Cause	Remedy
1	Toner sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
2	Relay front PCB failure	Replace the relay front PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 4500 to 4F00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5000**

Replace Drum

The number of rotations of the drum unit has reached the life limit. (Printing does not stop.)

<User Check>

- Prepare the drum unit.

Step	Cause	Remedy
1	Replace the drum unit with a new one and reset the drum counter. If the error display is not cleared, the main PCB is faulty.	Replace the main PCB ASSY.

■ **Error code 5100**

Replace PF KitMP

Printable pages set for the MP paper feeding kit have reached the limit. (Printing does not stop.)

Error code 5200

Replace PF Kit1

Printable pages set for paper feeding kit 1 have reached the limit. (Printing does not stop.)

Error code 5300

Replace PF Kit2

Printable pages set for paper feeding kit 2 have reached the limit. (Printing does not stop.)

Step	Cause	Remedy
1	Abrasion of the MP paper feeding kit, paper feeding kit 1 or paper feeding kit 2	Replace the MP paper feeding kit, paper feeding kit 1 or paper feeding kit 2.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5400**

Replace Fuser

Printable pages set for the fuser unit have reached the limit. (Printing does not stop.)

Step	Cause	Remedy
1	End of life of the fuser unit	Replace the fuser unit.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5500**

Replace Laser

Printable pages set for the laser unit have reached the limit. (Printing does not stop.)

Step	Cause	Remedy
1	End of life of the laser unit	Replace the laser unit.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5600**

Cover is Open

The eject sensor detected that the fuser cover was open.

<User Check>

- Close the fuser cover.

Step	Cause	Remedy
1	Eject actuator attachment failure	Reattach the eject actuator.
2	Eject actuator spring attachment failure	Reattach the eject actuator spring.
3	Eject actuator and/or fuser cover failure	Replace the fuser cover.
4	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5700**

Jam Duplex

The registration front sensor does not detect paper pass within the specified time after the first side was printed in duplex printing mode.

<User Check>

- Remove the paper jammed in the duplex paper feed system.
- Use A4 or Letter-size paper.
- Check that the thickness of the paper is 60 to 105 g/m².

Step	Cause	Remedy
1	Foreign object in the duplex paper feed system	Remove the foreign object.
2	Outer chute coming off	Reattach the outer chute.
3	Connection failure of the duplex solenoid harness	Check the connection of the duplex solenoid harness, and reconnect it if necessary.
4	Duplex gears attachment failure	Reattach the duplex gears.
5	Duplex tray failure	Replace the duplex tray.
6	Duplex solenoid failure	Replace the duplex solenoid.
7	Damaged duplex gears	Replace the main frame L ASSY.
8	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 5800**

Fuser Error

Any of error codes 6A00 to 6F00, 7600, 7800, DD00, DE00, or E200 (fuser unit error) occurred when the power switch was turned ON or sleep mode was released.

Error code 5900

Self-Diagnostic

Rechecking the error after the power switch was turned OFF and then ON again because an error was detected by the center thermistor of the fuser unit.

(This message is displayed for approximately 15 minutes when the machine is restarted after error code 5800 has occurred.)

Step	Cause	Remedy
1	Connection failure of the fuser unit harnesses	Check the connection of fuser unit harnesses, and reconnect them if necessary.
2	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
3	Fuser unit failure	Replace the fuser unit.
4	Eject sensor PCB failure	Refer to " 1.3.8 Check sensor operation (function code: 32) " in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
5	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
6	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- Turn OFF the power switch. After the fuser unit has cooled sufficiently, turn ON the power switch again and leave the machine for ten minutes. This problem may then be cleared.

■ **Error codes 5A00 to 6200**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 6300**

Replace Toner

The toner sensor detected no toner remaining or the number of rotations of the developer roller has reached the upper limit.

<User Check>

- Replace the toner cartridge.

Step	Cause	Remedy
1	Toner sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
2	Relay front PCB failure	Replace the relay front PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 6400 to 6600**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 6700**

Toner Low

The toner sensor detected that the toner remaining has fallen below the specified level or the developer roller counter has exceeded the specified value.

Step	Cause	Remedy
1	Toner sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
2	Relay front PCB failure	Replace the relay front PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 6800 and 6900**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 6A00**

Fuser Error / Print Unable 6A

The center thermistor of the fuser unit has not reached the specified temperature within the specified time.

Error code 6B00

Fuser Error / Print Unable 6B

The center thermistor of the fuser unit has not reached the specified temperature within the specified time.

Error code 6C00

Fuser Error / Print Unable 6C

The center thermistor of the fuser unit detected a temperature higher than the specified value.

Error code 6D00

Fuser Error / Print Unable 6D

After the heat unit was heated normally, the center thermistor of the fuser unit detected a temperature lower than the specified value.

Error code 6E00

Fuser Error / Print Unable 6E

The center thermistor of the fuser unit detected that the heat unit was not heated.

Error code 6F00

Fuser Error / Print Unable 6F

The center thermistor or the side thermistor of the fuser unit detected a temperature error.

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Connection failure of the center or side thermistor harness of the fuser unit	Check the connection of the center or side thermistor harness of the fuser unit, and reconnect it if necessary.
2	Connection failure of the heater harness of the fuser unit	Check the connection of the heater harness of the fuser unit, and reconnect it if necessary.
3	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
4	Connection failure of the low-voltage power supply PCB harness	Check the connection of the low-voltage power supply PCB harness, and reconnect it if necessary.
5	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
6	Fuser unit failure	Replace the fuser unit.
7	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
8	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7000**

This error does not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7100**

Print Unable 71

Detected an error in the synchronized signal of the polygon motor for the laser unit.

Error code 7200

Print Unable 72

Cannot detect the signal from the beam detecting sensor for the laser unit.

<User Check>

- Turn OFF the power switch. Leave the machine in a well-ventilated location at normal temperature to remove condensation.

Step	Cause	Remedy
1	Connection failure of the laser unit flat cable	Check the connection of the laser unit flat cable, and reconnect it if necessary.
2	Laser unit failure	Replace the laser unit.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 7300 and 7400**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7500**

Cooling Down

The side thermistor of the fuser unit detected a temperature higher than the specified value.

Step	Cause	Remedy
1	Eject sensor PCB failure	Replace the eject sensor PCB ASSY.
2	Side thermistor failure	Replace the fuser unit.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7600**

Fuser Error / Print Unable 76

The center thermistor of the fuser unit detected a temperature rise greater than the specified value within the specified time.

Error code 7800

Fuser Error / Print Unable 78

The center thermistor of the fuser unit detected a temperature fall greater than the specified value within the specified time.

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Connection failure of the center or side thermistor harness of the fuser unit	Check the connection of the center or side thermistor harness of the fuser unit, and reconnect it if necessary.
2	Connection failure of the heater harness of the fuser unit	Check the connection of the heater harness of the fuser unit, and reconnect it if necessary.
3	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
4	Connection failure of the low-voltage power supply PCB harness	Check the connection of the low-voltage power supply PCB harness, and reconnect it if necessary.
5	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
6	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
7	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7A00**

Print Unable 7A

Cannot detect the synchronized signal of the main motor. The speed of the main motor does not stabilize within the specified time.

Step	Cause	Remedy
1	Connection failure of the main motor harness	Check the connection of the main motor harness, and reconnect it if necessary.
2	Main motor failure	Replace the main motor ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 7B00 and 7C00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 7D00**

Drum Error

Detected discharge that may be attributable to dirty corona wire on the drum unit.

<User Check>

- Slide the green tag of the drum unit left and right two to three times to clean the corona wire.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 7E00 to 8200**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8300**

Drum Stop

Detected discharge when the number of rotations of the drum has exceeded twice the life limit.

<User Check>

- Replace the drum unit with a new one, and reset the drum counter.

Step	Cause	Remedy
1	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8400**

Jam Rear

The eject sensor remains ON (paper pass detected) for more than the specified time even after the registration rear sensor detected the end of paper pass.

<User Check>

- Remove the paper jammed in the rear section of the machine.

Step	Cause	Remedy
1	Foreign object in the rear of the machine	Remove the foreign object.
2	Eject actuator caught in some sections of the machine	Reattach the eject actuator.
3	Eject sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- Do not use a sharp tool such as tweezers or screwdriver to remove the jammed paper.

■ **Error code 8500**

No Tray

The T1 paper feed sensor detected that paper tray 1 was not set.

<User Check>

- Set paper tray 1 correctly.

Step	Cause	Remedy
1	T1 paper feed actuator caught in some sections of the machine	Reattach the T1 paper feed actuator.
2	T1 paper feed sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the T1 paper feed sensor PCB ASSY.
3	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 8600 and 8700**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8800**

Jam Inside

The eject sensor does not detect paper pass after the registration rear sensor detected the end of paper pass.

<User Check>

- Remove the paper jammed inside the machine.

Step	Cause	Remedy
1	Foreign object inside the machine	Remove the foreign object.
2	Eject actuator caught in some sections of the machine	Reattach the eject actuator.
3	Eject sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8900**

Size Error DX

The registration front sensor detected that the paper fed was smaller than or larger than the specified size in duplex printing mode.

<User Check>

- Use A4 or Letter-size paper.

Step	Cause	Remedy
1	Registration front actuator caught in some sections of the machine	Reattach the registration front actuator.
2	Registration front sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the registration front/rear sensor PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8A00**

Jam Tray 1

The registration front sensor does not detect paper pass within the specified time after the T1 paper feed sensor detected paper pass.

Error code 8B00

Jam Tray 2

The registration front sensor does not detect paper pass within the specified time after the T2 paper feed sensor detected paper pass.

<User Check>

- Remove the paper jammed in the front section of the machine.
- Adjust the paper guide according to the paper size.
- Check that the thickness of the paper is 60 to 105 g/m².
- Check that there is not too much paper set in the tray.

Step	Cause	Remedy
1	Foreign object in the front of the machine	Remove the foreign object.
2	Registration front actuator caught in some sections of the machine	Reattach the registration front actuator.
3	Connection failure of the registration front/rear sensor harness	Check the connection of the registration front/rear sensor harness, and reconnect it if necessary.
4	Registration front sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the registration front/rear sensor PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8C00**

Jam MP Tray

The registration front sensor does not detect paper pass within the specified time after the paper was picked up from the MP tray.

<User Check>

- Remove the paper jammed in the MP tray.

Step	Cause	Remedy
1	Foreign object in the MP tray	Remove the foreign object.
2	Registration front actuator caught in some sections of the machine	Reattach the registration front actuator.
3	Connection failure of the registration front/rear sensor harness	Check the connection of the registration front/rear sensor PCB harness, and reconnect it if necessary.
4	Abrasion of the MP paper pick-up roller	Replace the MP paper feeding kit.
5	Registration front sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the registration front/rear sensor PCB ASSY.
6	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 8D00**

Cover is Open

When the power switch was turned ON, the eject sensor detected paper pass or detected that the fuser cover was open.

<User Check>

- Close the fuser cover.
- Remove the paper jammed in the fuser cover.

Step	Cause	Remedy
1	Eject actuator caught in some sections of the machine	Reattach the eject actuator.
2	Eject actuator failure	Replace the fuser cover.
3	Eject sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 8E00 and 8F00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9000**

Size Mismatch

When printing from the MP tray, the size of paper set in the MP tray does not match the size specified by the driver.

Error code 9100

Size Mismatch

When printing from paper tray 1, the size of paper set in paper tray 1 does not match the size specified by the driver.

Error code 9200

Size Mismatch

When printing from paper tray 2, the size of paper set in paper tray 2 does not match the size specified by the driver.

<User Check>

- Match the size of the paper set in each tray to the driver instruction, or match the driver instruction to the size of the paper set in each tray.

Step	Cause	Remedy
1	Registration rear actuator caught in some sections of the machine	Reattach the registration rear actuator.
2	Registration rear sensor failure	Replace the registration front/rear sensor PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9300**

No Paper

When printing from the MP tray, the MP paper empty sensor detected that there was no paper set in the MP tray.

<User Check>

- Set the paper in the MP tray.

Step	Cause	Remedy
1	MP paper empty actuator 1 or 2 caught in some sections of the machine	Reattach the MP paper empty actuator 1 or 2.
2	MP paper empty actuator 1 or 2 failure	Replace the MP paper empty actuator 1 or 2.
3	MP paper empty sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the MP paper empty sensor PCB ASSY.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9400**

No Paper

When printing from paper tray 1, the T1 paper feed sensor detected that there was no paper set in paper tray 1.

<User Check>

- Set the paper in paper tray 1.

Step	Cause	Remedy
1	Connection failure of the T1 paper feed sensor harness	Check the connection of the T1 paper feed sensor PCB harness, and reconnect it if necessary.
2	T1 paper feed actuator caught in some sections of the machine	Reattach the T1 paper feed actuator.
3	T1 paper feed actuator is bent or has failed	Replace the T1 paper feed actuator.
4	T1 paper feed sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the T1 paper feed sensor PCB ASSY.
5	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
6	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9500**

No Paper

When printing from paper tray 2, the T2 paper feed sensor detected that there was no paper set in paper tray 2.

<User Check>

- Set the paper in paper tray 2.

Step	Cause	Remedy
1	Connection failure of the T2 paper feed sensor harness	Check the connection of the T2 paper feed sensor harness, and reconnect it if necessary.
2	T2 paper feed actuator caught in some sections of the machine	Reattach the T2 paper feed actuator.
3	T2 paper feed actuator failure	Replace the T2 paper feed actuator.
4	T2 paper feed sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the T2 paper feed sensor PCB ASSY.
5	T2 relay PCB failure	Replace the T2 relay PCB ASSY.
6	LT connector failure	Replace the LT connector
7	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9600**

No Paper

When printing with the tray designation set to AUTO, the MP paper empty sensor, T1 paper feed sensor and T2 paper feed sensor all detected that there was no paper set in the MP tray, paper tray 1 and paper tray 2.

<User Check>

- Set the paper in any tray.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 9700 and 9800**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9900**

Size Error DX

Printing on a paper size not supported for duplex printing was attempted from the driver.

<User Check>

- Set A4 or Letter-size paper in the tray specified by the driver.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code 9A00**

Manual Feed

There is no paper set in the MP tray when feeding from the MP tray is designated from the driver.

Step	Cause	Remedy
1	MP paper empty actuator 1 or 2 caught in some sections of the machine	Reattach the MP paper empty actuator 1 or 2.
2	Failure of MP paper empty actuator 1 or 2	Replace the MP paper empty actuator 1 or 2.
3	MP paper empty sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the MP paper empty sensor PCB ASSY.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes 9B00 to A000**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code A100**

Cover is Open

The front cover sensor detected that the front cover was open.

<User Check>

- Close the front cover.

Step	Cause	Remedy
1	Connection failure of the front cover sensor harness	Check the connection of the front cover sensor harness, and reconnect it if necessary.
2	Connection failure of the relay front harness	Check the connection of the relay front harness, and reconnect it if necessary.
3	Front cover sensor attachment failure	Reattach the front cover sensor.
4	Broken rib (inside the front cover) where the front cover sensor is pressed	Replace the front cover.
5	Front cover sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the relay front PCB ASSY.
6	Relay front PCB failure	Replace the relay front PCB ASSY.
7	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes A200 to BF00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code C000**

Cartridge Error

The new toner sensor could not detect the new toner cartridge correctly.

<User Check>

- Set the toner cartridge to the machine correctly.

Step	Cause	Remedy
1	The power switch was turned OFF or the front cover was opened while a new toner cartridge is being detected.	Reset the developer roller counter. (Refer to "1.4.21 Reset developer roller counter 1, 2, 3 or 4 (Common to all models)" in Chapter 5.)

■ **Error codes C100 to C600**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code C700**

Out of Memory

There is insufficient memory to expand PC-print data.

<User Check>

- Print the print data stored in the memory.
- Expand DIMM.

Error code C800

Out of Memory

The memory size allotted for Secure Print was exceeded when saving Secure Print data.

<User Check>

- Print the Secure Print data stored in the memory.
- Expand DIMM.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code C900**

DIMM Error

Detected that DIMM was faulty or was mounted incorrectly.

<User Check>

- Replace DIMM.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes CA00 to DC00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code DD00**

Print Unable DD

Fuser unit error (except error codes 6A00 to 6F00, 7600, 7800, DE00, and E200)

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Connection failure of the center or side thermistor harness of the fuser unit	Check the connection of the center or side thermistor harness of the fuser unit, and reconnect it if necessary.
2	Connection failure of the heater harness of the fuser unit	Check the connection of the heater harness of the fuser unit, and reconnect it if necessary.
3	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
4	Connection failure of the low-voltage power supply PCB harness	Check the connection of the low-voltage power supply PCB harness, and reconnect it if necessary.
5	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
6	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
7	Fuser unit failure	Replace the fuser unit.
8	Main PCB failure	Replace the main PCB ASSY.

■ **Error code DE00**

```
Print Unable DE
```

When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature lower than the specified temperature.

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Connection failure of the side thermistor harness of the fuser unit	Check the connection of the side thermistor harness of the fuser unit, and reconnect it if necessary.
2	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
3	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
4	Fuser unit failure	Replace the fuser unit.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error code DF00**

This error does not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

```
---
```

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code E000**

```
Print Unable E0
```

An error occurred in the ROM check sum.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code E100**

```
Print Unable E1
```

Program error

Step	Cause	Remedy
1	Firmware install failure	Install the latest firmware.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code E200**

```
Print Unable E2
```

When the center thermistor of the fuser unit is higher than the idle temperature, the side thermistor detected a temperature higher than the specified temperature.

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Connection failure of the side thermistor harness of the fuser unit	Check the connection of the side thermistor harness of the fuser unit, and reconnect it if necessary.
2	Connection failure of the eject sensor PCB harness	Check the connection of the eject sensor PCB harness, and reconnect it if necessary.
3	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
4	Fuser unit failure	Replace the fuser unit.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes E300 and E400**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

```
---
```

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code E600**

```
Print Unable E6
```

Write error in the EEPROM of the main PCB

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes E700 to EB00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

```
---
```

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code EC00**

```
Print Unable EC
```

Detected a main fan failure.

Step	Cause	Remedy
1	Connection failure of the main fan harness	Check the connection of the main fan harness, and reconnect it if necessary.
2	Connection failure of the toner LED PCB harness	Check the connection of the toner LED PCB harness, and reconnect it if necessary.
3	Main fan failure	Replace the main fan.
4	Toner LED PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner LED PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Error code ED00**

```
Print Unable ED
```

Communication between the wireless LAN PCB and the main PCB cannot be established at machine startup.

Step	Cause	Remedy
1	Connection failure of the wireless LAN PCB harness	Check the connection of the wireless LAN PCB harness, and reconnect it if necessary.
2	Wireless LAN PCB failure	Replace the wireless LAN PCB.
3	Main PCB failure	Replace the main PCB ASSY.

■ **Error code EE00**

```
Print Unable EE
```

Detected communication failure after communication between the wireless LAN PCB and the main PCB was established.

Step	Cause	Remedy
1	Wireless LAN PCB failure	Replace the wireless LAN PCB.
2	Main PCB failure	Replace the main PCB ASSY.

■ **Error code EF00**

```
Print Unable EF
```

The supplied power is unstable.

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY, and then reset the irregular power supply detection counter.
2	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- The irregular power supply detection error (error code EF00) occurs when there is a large distortion in the power supply voltage supplied to the machine. In this case, if the same power supply is used, the same error may occur even when the low-voltage power supply PCB ASSY is replaced. Ask the user to review the installation environment.

■ **Error code F000**

```
Print Unable F0
```

Malfunction of the flash memory on the main PCB

<User Check>

- Turn OFF the power switch. After several seconds, turn ON the power again and check that this error is reset.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error codes F100 to F800**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

```
---
```

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

■ **Error code F900**

Machine Error F9

The country code was not entered correctly.

Step	Cause	Remedy
1	Power switch was turned OFF while "PARAMETER INIT" is displayed during execution of function code 74.	Reenter the country code. (Refer to "1.3.16 Setting by country (function code: 74)" in Chapter 5.)

■ **Error codes FA00 to FF00**

These errors do not usually occur during normal use. The possible causes are noise around the installation site, fluctuation of the power supply voltage, and failures in the software.

An unidentified error occurred.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

4.2 Troubleshooting for Paper Feeding Problems

End users can solve problems related to paper feeding as long as they follow the User Check items. If the problem still cannot be solved, implement each procedure according to the step number in the tables below.

4.2.1 Multiple sheets of paper are fed

<User Check>

- Check that the paper is set in each paper tray correctly.
- Check that there is not too much paper set in each tray.
- Reverse the paper in each paper tray or rotate the paper 180°.
- Check that the thickness of the paper is 60 to 105 g/m². (60 to 163 g/m² for MP tray)
- Flip through the paper and reset it in the tray.

Step	Cause	Remedy
1	Abrasion of the separation pad or separation roller	Replace the paper feeding kit for the corresponding paper tray.

4.2.2 Paper becomes wrinkled

<User Check>

- Check that the paper is set in each paper tray correctly.
- Reverse the paper in each paper tray or rotate the paper 180°.
- Adjust the paper guide according to the paper size.
- Check that the thickness of the paper is 60 to 105 g/m². (60 to 163 g/m² for MP tray)
- Check that the paper is not damp.
- Check that there is no dust stuck to the fuser unit.

Step	Cause	Remedy
1	Fuser unit failure	Replace the fuser unit.

4.2.3 Paper is fed at an angle

<User Check>

- Check that the paper is set in each paper tray correctly.
- Adjust the paper guide according to the paper size.
- Check that the thickness of the paper is 60 to 105 g/m². (60 to 163 g/m² for MP tray)
- Check that there is not too much paper set in each tray.

Step	Cause	Remedy
1	Registration clutch failure	Replace the registration clutch.
2	Main PCB failure	Replace the main PCB ASSY.

4.2.4 Duplex printing is not possible

<User Check>

- Close the back cover completely.
- Set the paper tray correctly.
- Check that the face-up mode is not selected.
- Set the driver setting to duplex printing.
- Use A4 or Letter-size paper.
- Set the duplex tray correctly.

Step	Cause	Remedy
1	Eject actuator caught in some sections of the machine	Reattach the eject actuator.
2	Back cover failure	Replace the back cover.
3	Duplex tray failure	Replace the duplex tray.
4	Back cover sensor failure	Replace the back cover switch harness ASSY.
5	Duplex solenoid failure	Replace the duplex solenoid.
6	Main PCB failure	Replace the main PCB ASSY.
7	Damaged duplex gears	Replace the main frame L ASSY.

4.2.5 Paper is curled

<User Check>

- Select "Reduce Paper Curl" in the driver.
- Check that the thickness of the paper is 60 to 105 g/m². (60 to 163 g/m² for MP tray)

4.2.6 Only single surface is printed in duplex printing mode

<User Check>

- Rotate the paper 180° in the paper tray, and retry printing.
- Flip through the paper and reset it in the tray.
- Set the driver setting to duplex printing.
- Use A4 or Letter-size paper.

Step	Cause	Remedy
1	Duplex solenoid failure	Replace the duplex solenoid.
2	Main PCB failure	Replace the main PCB ASSY.

4.3 Troubleshooting for Image Defects

4.3.1 Image defect examples

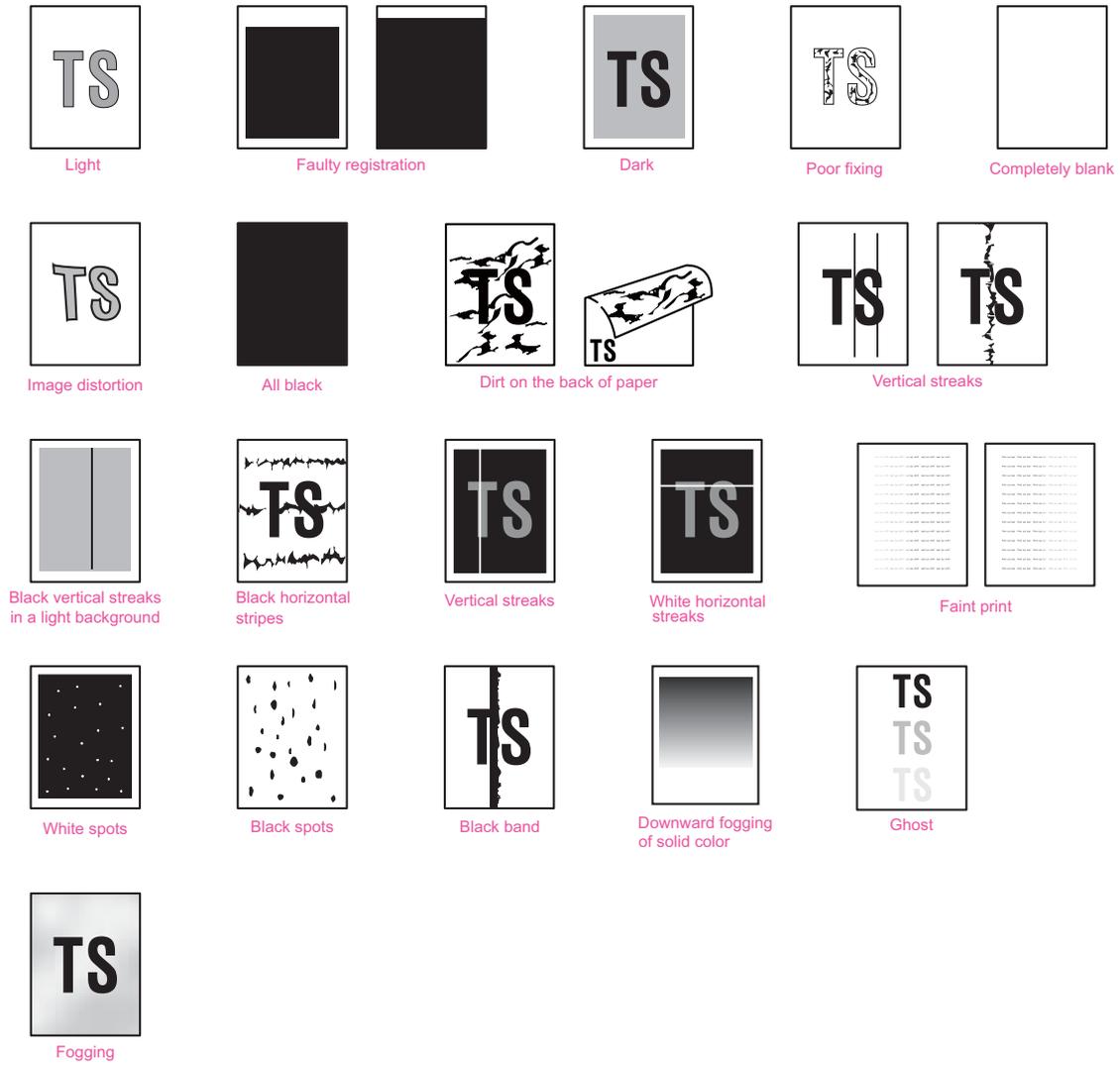
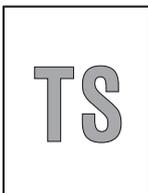


Fig. 2-5

4.3.2 Troubleshooting according to image defect

End users can solve problems related to image defects as long as they follow the User Check items. If the problem still cannot be solved, implement each procedure according to the step number in the tables below.

■ Light



<User Check>

- Check the usage environment of the machine. Using the machine in high temperature and humidity or low temperature and humidity conditions can cause this problem.
- If the whole page is light, toner save mode may be ON. Turn OFF the toner save mode.
- Adjust the density using the Density Adjustment.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Toner volume determination failure when a new toner cartridge is detected	Reset the developer roller counter. (Refer to "1.4.21 Reset developer roller counter 1, 2, 3 or 4 (Common to all models)" in Chapter 5.)
3	Connection failure of the develop clutch 51R harness	Reconnect the develop clutch 51R harness.
4	Develop clutch 51R failure	Replace the develop clutch 51R.
5	Fuser unit failure	Replace the fuser unit.
6	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
7	Laser unit failure	Replace the laser unit.
8	Main PCB failure	Replace the main PCB ASSY.

■ Electrodes location of the toner cartridge and drum unit

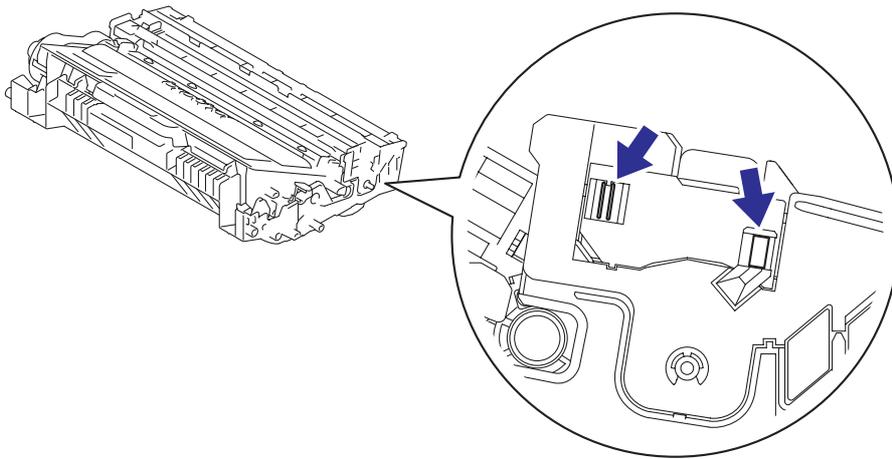


Fig. 2-6

■ Electrodes location of the machine

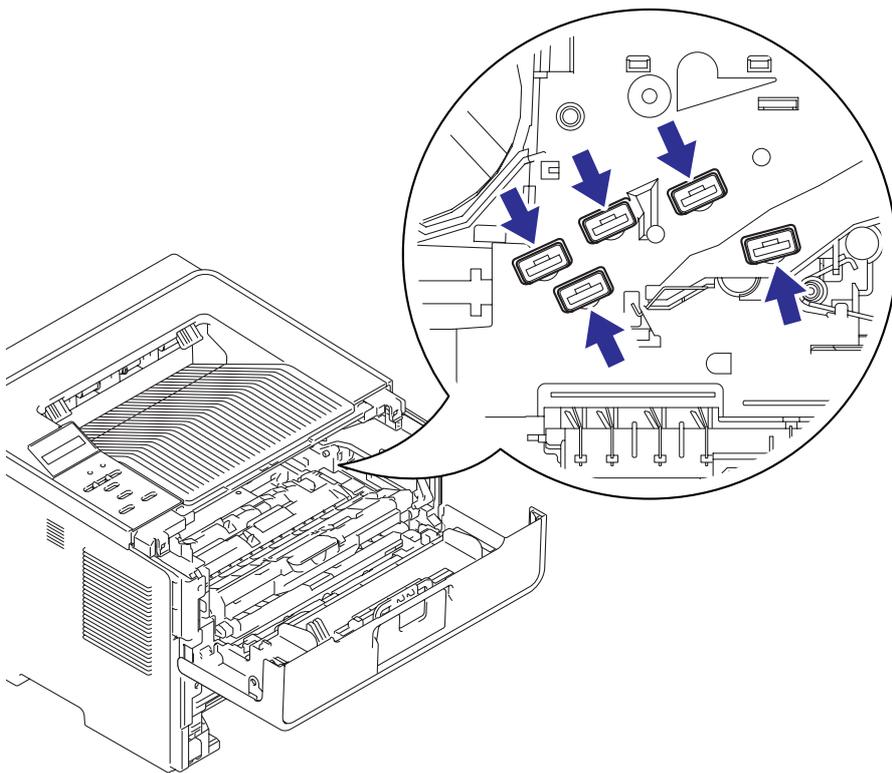
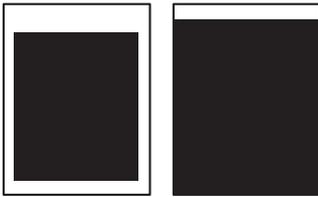


Fig. 2-7

■ **Faulty registration**



<User Check>

- Check that the appropriate paper type is selected in the driver.

Step	Cause	Remedy
1	Adjusted value of the laser unit is incorrect.	Refer to "2.1 Entering Adjusted Value of Laser Unit" in Chapter 4, and enter the adjusted value of the laser unit again.
2	Registration rear actuator caught in some sections of the machine	Reattach the registration rear actuator.
3	Laser unit failure	Replace the laser unit.

■ **Dark**

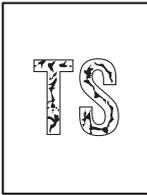


<User Check>

- Check the usage environment of the machine. Using the machine in high temperature and humidity conditions can cause this problem.
- Clean the corona wire.
- If a new toner cartridge has been set, check whether it was replaced with a used toner cartridge.
- Adjust the density using the Density Adjustment.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
3	Laser unit failure	Replace the laser unit.
4	Main PCB failure	Replace the main PCB ASSY.

■ **Poor fixing**



<User Check>

- Check the usage environment of the machine. Using the machine in high temperature and humidity or low temperature and humidity conditions can cause this problem.
- Select "Improve Toner Fixing" in the driver.
- Clean the corona wire.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Fuser unit failure	Replace the fuser unit.
2	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
3	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
4	Laser unit failure	Replace the laser unit.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Completely blank**

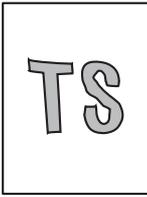


<User Check>

- Clean the corona wire.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit and those of the machine	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Laser unit attachment failure	Reattach the laser unit.
3	Laser unit failure	Replace the laser unit.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Image distortion**



Step	Cause	Remedy
1	Laser unit attachment failure	Attach the laser unit correctly, and firmly tighten the screws.
2	Harness connection failure	Check the connection of all harnesses. If faulty, reconnect them.
3	Dirt on high-voltage electrodes and electrodes of the machine	Clean the high-voltage electrodes and electrodes of the machine.
4	Laser unit earth plate attachment failure (not grounded correctly)	Retighten the screws to secure the laser unit earth plate.
5	Laser unit failure	Replace the laser unit.
6	Main PCB failure	Replace the main PCB ASSY.

■ **All black**

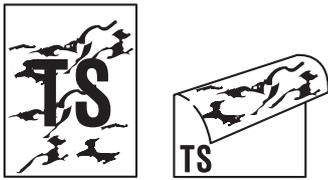


<User Check>

- Clean the corona wire.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit and those of the machine, and dirt on grounding wire	Clean the electrodes of the drum unit and those of the machine, and the grounding wire. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Connection failure of the laser unit flat cable	Reconnect the laser unit flat cable correctly.
3	Earth plate contact failure	Check the attachment of the laser unit earth plate, and retighten the screws.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
5	Laser unit failure	Replace the laser unit.
6	Main PCB failure	Replace the main PCB ASSY.

■ **Dirt on the back of paper**

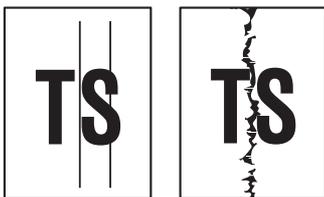


<User Check>

- This problem may disappear after printing multiple sheets of paper.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on paper feed system	Wipe off the dirt.
2	Dirt on the fuser unit	Replace the fuser unit.

■ **Vertical streaks**



<User Check>

- Clean inside the machine and the corona wire of the drum unit.
- Return the corona wire cleaning tab to the [▲] position.
- This problem may disappear after printing multiple sheets of paper.
- Refer to the User's Guide to remove the dirt from the exposure drum using a cotton applicator.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.
- Clean the eject pinch roller.

Step	Cause	Remedy
1	Dirt on paper feed system	Wipe off the dirt on the sections shown in the illustration below.
2	Earth wires or earth plate attachment failure (not grounded correctly)	Retighten the screws to secure the earth wires or earth plate.
3	Scratches or dirt on the heat unit	Replace the fuser unit.

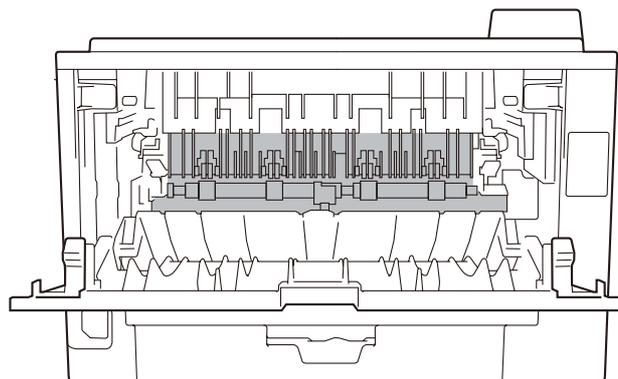
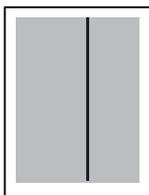


Fig. 2-8

CAUTION:

- If the machine prints the same pattern continuously, especially a pattern including vertical streaks, black vertical streaks may appear on the paper because the electrostatic performance of the exposure drum has lowered temporarily.

■ **Black vertical streaks in a light background**



<User Check>

- Clean inside the machine and the corona wire of the drum unit.
- Refer to the User's Guide to remove the dirt from the exposure drum using a cotton applicator.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on paper feed system	Wipe off the dirt.
2	Scratches or dirt on the heat unit	Replace the fuser unit.
3	Foreign object in the laser unit	Replace the laser unit.

■ **Black band**



<User Check>

- Clean inside the machine and the corona wire of the drum unit.
- Return the corona wire cleaning tab to the [▲] position.
- The paper tray earth spring on the machine side may be dirty. Clean it with a dry cloth.
- Replace the toner cartridge with a new one.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	Tray earth spring is bent.	Replace the paper tray.

■ **Vertical streaks**



<User Check>

- Check that there is no dust in the clearance between the toner cartridge and the drum frame.
- Replace the toner cartridge with a new one.
- Check the usage environment of the machine. Using the machine in high temperature and humidity or low temperature and humidity conditions can cause this problem.
- Check that the paper is not damp.
- Turn ON the power switch, and leave the machine for a while.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	Laser unit failure	Replace the laser unit.

■ **White horizontal streaks**



<User Check>

- This problem may disappear after printing multiple sheets of paper. When the machine has not been used for long periods, try printing several sheets of paper.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit and those of the machine	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Dirt on electrodes of the toner cartridge and those of the machine	Clean the electrodes of the toner cartridge and those of the machine. (Refer to Fig. 2-6, Fig. 2-7.)
3	Fuser unit failure	Replace the fuser unit.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.

■ Black horizontal stripes



<User Check>

- Clean inside the machine and the corona wire of the drum unit.
- The paper tray earth spring on the machine side may be dirty. Clean it with a dry cloth.
- This problem may disappear after printing multiple sheets of paper.
- When the horizontal stripes appear at intervals of 45.3 mm, replace the toner cartridge with a new one.
- When the horizontal stripes appear at intervals of 94.2 mm, replace the drum unit with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit and those of the machine	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Dirt on electrodes of the toner cartridge and those of the machine	Clean the electrodes of the toner cartridge and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
3	Earth wires or earth plate attachment failure (not grounded correctly)	Retighten the screws to secure the earth wires or earth plate.
4	Tray earth spring is bent.	Replace the paper tray.
5	Scratches or dirt on the heat unit (horizontal stripes at intervals of 104 mm)	Replace the fuser unit.
6	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.

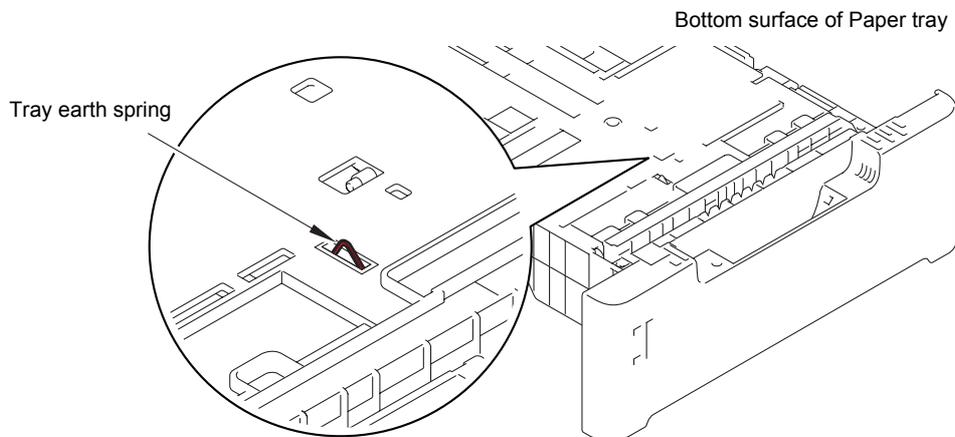


Fig. 2-9

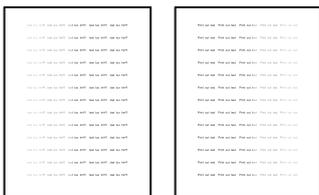
CAUTION:

- Image defects which appear periodically may be caused by failure of rollers. Refer to the table below and determine the cause based on the diameter of the rollers or the pitch at which defects appear in the image.

Diameter of rollers and pitch which appears in the image

No.	Part name	Diameter	Pitch at which defects appear in the image
1	Developer roller	∅ 20 mm	45.3 mm
2	Exposure drum	∅ 30 mm	94.2 mm
3	Heat unit in the fuser unit	—	104 mm
4	Pressure roller in the fuser unit	∅ 30 mm	94.2 mm

■ **Faint print**

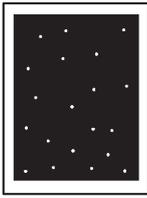


<User Check>

- Check that the machine is installed on a level surface.
- Replace the toner cartridge with a new one.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	Relay front PCB failure	Replace the relay front PCB ASSY.
2	Toner sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
3	Laser unit failure	Replace the laser unit.
4	Main PCB failure	Replace the main PCB ASSY.

■ White spots



<User Check>

- Turn ON the power switch, and open the front cover and the back cover. Leave the machine for a while to remove condensation.
- Select "Improve Toner Fixing" in the driver.
- When the white spots appear at intervals of 45.3 mm, replace the toner cartridge with a new one.
- Refer to the User's Guide to remove the dirt from the exposure drum using a cotton applicator.
- When the white spots appear at intervals of 94.2 mm, replace the toner cartridge with a new one.

Step	Cause	Remedy
1	Dirt on the paper dust cleaning roller of the paper tray	Refer to the illustration below to clean the paper dust cleaning roller.
2	Dirt on electrodes of the drum unit and those of the machine	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
3	Dirt on electrodes of the toner cartridge and those of the machine	Clean the electrodes of the toner cartridge and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
4	Relay front PCB failure	Replace the relay front PCB ASSY.
5	Toner sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
6	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
7	Main PCB failure	Replace the main PCB ASSY.

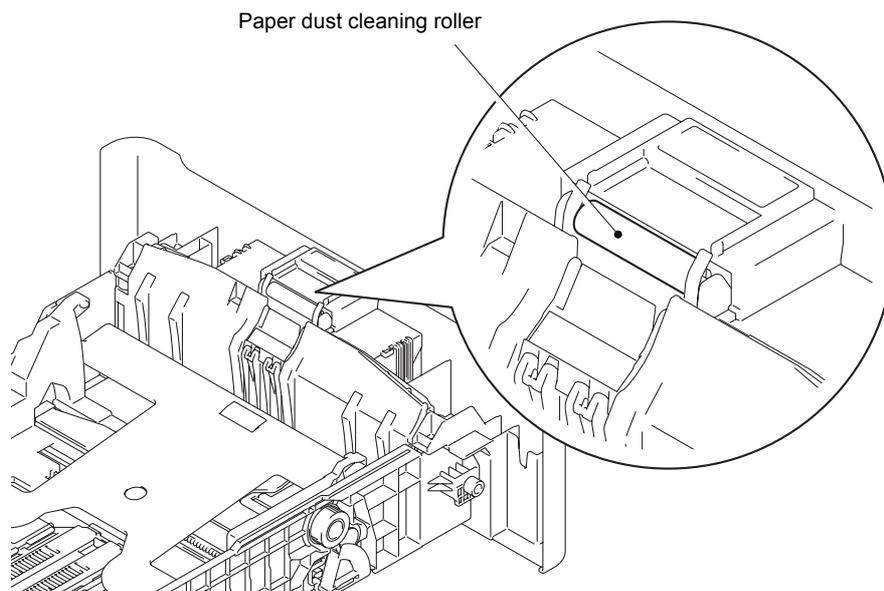
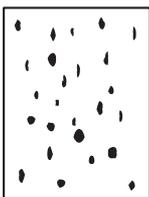


Fig. 2-10

■ **Black spots**



<User Check>

- When the black spots appear at intervals of 45.3 mm, replace the toner cartridge with a new one.
- Refer to the User's Guide to remove the dirt from the exposure drum using a cotton applicator.
- When the black spots appear at intervals of 94.2 mm, replace the drum unit with a new one.

Step	Cause	Remedy
1	Dirt on electrodes of the drum unit and those of the machine	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	Dirt on electrodes of the toner cartridge and those of the machine	Clean the electrodes of the toner cartridge and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
3	Scratches or dirt on the heat unit (horizontal stripes at intervals of 104 mm), or dirt on the pressure roller	Replace the fuser unit.
4	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

■ **Downward fogging of solid color**



<User Check>

- Replace the toner cartridge with a new one.

Step	Cause	Remedy
1	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
2	Main PCB failure	Replace the main PCB ASSY.

■ Ghost



<User Check>

- Check the usage environment of the machine. Using the machine in high temperature and humidity or low temperature and humidity conditions can cause this problem.
- Check that the appropriate paper type is selected in the driver.
- Select "Reduce Ghosting" in the driver.
- Select "Improve Toner Fixing" in the driver.
- Replace the drum unit with a new one.

Step	Cause	Remedy
1	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
2	Main PCB failure	Replace the main PCB ASSY.

■ Fogging



<User Check>

- Check the usage environment of the machine. Using the machine in high temperature and humidity or low temperature and humidity conditions can cause this problem.
- This problem may disappear after printing multiple sheets of paper.
- Replace the drum unit with a new one.
- Replace the toner cartridge with a new one.
- Do not use acid paper.

Step	Cause	Remedy
1	Relay front PCB failure	Replace the relay front PCB ASSY.
2	Toner sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the toner sensor PCB ASSY.
3	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- This problem tends to occur when the life of the drum unit or toner cartridge is expiring.

4.4 Troubleshooting for Software Problems

End users can solve problems related to software, for instance, printing is not possible from a computer although the test print and Printer Settings print can be performed from the machine, as long as they follow the User Check items. If the problem still cannot be solved, follow each procedure according to the step number in the tables below.

4.4.1 Cannot print data

<User Check>

- Check that the USB cable, LAN cable, or parallel cable is not damaged.
- When using an interface switch, check that the correct machine is selected.
- Check the relevant section in the User's Guide.
- Check the driver setting.
- Retry ID setting for Secure Print.
- Reset the machine to the default settings. (Refer to the User's Guide.)

Step	Cause	Remedy
1	Machine connection	For Macintosh, check the Product ID*. When it is wrong, install the firmware.
2	Main PCB failure	Replace the main PCB ASSY.

* Check the Product ID on a Macintosh according to the following procedure:

- (1) Select "About This Mac" from the "Apple" menu.
- (2) Press the "More Info..." button in the "About This Mac" dialogue box.
- (3) Select "USB" at the bottom of "Hardware" in the "Content" on the left side of the screen.
- (4) Select "HL-XXXX" in the "USB Device Tree".
- (5) Check the "Product ID" under "HL-XXXX".

Product ID (hexadecimal)

- HL-5440D : 004Ah
- HL-5450DN : 004Bh
- HL-5470DW : 004Ch
- HL-6180DW : 004Dh

4.5 Troubleshooting for Network Problems

4.5.1 Cannot print via network connection

<User Check>

- Check the relevant section in the Network Setting Guide.
- Check the network connection.
- Reset the network. (Refer to the User's Guide.)

Step	Cause	Remedy
1	Connection failure of the wireless LAN PCB harness	Reconnect the wireless LAN PCB harness.
2	Wireless LAN PCB failure	Replace the wireless LAN PCB.
3	Deformed LAN terminal pin Main PCB failure	Replace the main PCB ASSY.

4.5.2 Cannot connect to access point

<User Check>

- Check the wireless LAN settings.
- Check the access point settings.
- Change the machine installation location.

4.6 Troubleshooting for Control Panel Problems

4.6.1 Nothing is displayed on the LCD

Step	Cause	Remedy
1	AC cord failure	Replace the AC cord.
2	Connection failure of the panel harness	Check the connection of the panel harness, and reconnect it if necessary.
3	Connection failure of the backlight harness	Check the connection of the backlight harness, and reconnect it if necessary.
4	Connection failure of the LCD harness	Check the connection of the LCD harness, and reconnect it if necessary.
5	LCD failure	Replace the LCD.
6	Backlight PCB failure	Replace the backlight PCB ASSY.
7	Panel PCB failure	Replace the panel PCB ASSY.
8	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
9	Main PCB failure	Replace the main PCB ASSY.

4.6.2 LEDs are not activated

Step	Cause	Remedy
1	AC cord failure	Replace the AC cord.
2	Connection failure of the panel harness	Check the connection of the panel harness, and reconnect it if necessary.
3	Panel PCB failure	Replace the panel PCB ASSY.
4	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

4.6.3 Control panel is inoperable

<User Check>

- Check that the function lock is not set.

Step	Cause	Remedy
1	Panel unit attachment failure	Reattach the panel unit.
2	Connection failure of the panel harness	Check the connection of the panel harness, and reconnect it if necessary.
3	Rubber key failure	Replace the rubber key printed ASSY.
4	Panel PCB failure	Replace the panel PCB ASSY.
5	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
6	Main PCB failure	Replace the main PCB ASSY.

4.7 Troubleshooting for Toner and Drum Problems

4.7.1 New toner is not detected

<User Check>

- Be sure to set a new toner cartridge.

Step	Cause	Remedy
1	New toner actuator caught in some sections of the machine	Reattach the new toner actuator.
2	Connection failure of the relay front PCB harness	Reconnect the relay front PCB harness.
3	New toner sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the relay front PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

4.7.2 Cartridge error (toner cartridge cannot be detected)

Failed to determine whether the toner cartridge is new or old

Step	Cause	Remedy
1	The power switch was turned OFF or the front cover was opened while a new toner cartridge is being detected.	Reset the developer roller counter. (Refer to "1.4.21 Reset developer roller counter 1, 2, 3 or 4 (Common to all models)" in Chapter 5.)
2	New toner actuator coming off	Reattach the new toner actuator.
3	New toner sensor failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the relay front PCB ASSY.

4.7.3 Drum error

<User Check>

- Clean the corona wire of the drum unit.
- Replace the drum unit with a new one, and reset the drum counter.

Step	Cause	Remedy
1	Dirt (dust) on electrodes of the drum unit	Clean the electrodes of the drum unit and those of the machine. (Refer to Fig. 2-6 or Fig. 2-7.)
2	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
3	Main PCB failure	Replace the main PCB ASSY.

4.8 Troubleshooting for Fuser Unit Problems

4.8.1 Fuser unit failure

Step	Cause	Remedy
1	Harness connection failure between fuser unit and eject sensor PCB	Check the harness connection between the fuser unit and the eject sensor PCB, and reconnect it if necessary.
2	Harness connection failure between fuser unit and low-voltage power supply PCB	Check the harness connection between the fuser unit and the low-voltage power supply PCB, and reconnect it if necessary.
3	Connection failure of the eject sensor harness	Check the connection of the eject sensor harness, and reconnect it if necessary.
4	Eject sensor PCB failure	Refer to "1.3.8 Check sensor operation (function code: 32)" in Chapter 5 to check the sensor operation. If the sensor operation is faulty, replace the eject sensor PCB ASSY.
5	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
6	Fuser unit failure	Replace the fuser unit.
7	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- Turn the power switch OFF and then ON again. Leave the machine for ten minutes. This problem may then be cleared.
- The machine may recover from the error, when fuser unit inspection print is conducted after the following operation: Open the cover, and turn the power switch ON while pressing the [Go] button, then press the [Go] button one time, and then press the [Go] button three times. However, conducting this operation while the heater has not yet cooled may cause the fuser unit to melt. Be careful.

4.9 Troubleshooting for Laser Unit Problems

4.9.1 Laser unit failure

<User Check>

- Turn ON the power switch, and open the front cover and the back cover. Leave the machine for a while to remove condensation.

Step	Cause	Remedy
1	Earth plate contact failure	Check the contact of the laser unit earth plate, and retighten the screws.
2	Connection failure of the laser unit flat cable	Check the proper connection of the laser unit flat cable, and reconnect it if necessary.
3	Laser unit failure	Replace the laser unit.
4	Main PCB failure	Replace the main PCB ASSY.

4.10 Troubleshooting for PCB Problems

4.10.1 Main PCB failure

<User Check>

- Turn the power switch OFF and then ON again.
- Install the latest firmware.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

4.10.2 High-voltage power supply PCB failure

Step	Cause	Remedy
1	Connection failure of the high-voltage power supply PCB harness	Check the harness connection between the high-voltage power supply PCB and the main PCB ASSY, and reconnect it if necessary.
2	Contact failure of electrode terminals of the high-voltage power supply PCB	Clean the electrode terminals of the high-voltage power supply PCB.
3	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
4	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

4.10.3 Low-voltage power supply PCB failure

Step	Cause	Remedy
1	Connection failure of the low-voltage power supply PCB harness	Check the connection of the low-voltage power supply PCB harness, and reconnect it if necessary.
2	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY, and reset the irregular power supply detection counter.
3	Main PCB failure	Replace the main PCB ASSY.

CAUTION:

- The irregular power supply detection error (error code EF00) occurs when there is a large distortion in the power supply voltage supplied to the machine. In this case, if the same power supply is used, the same error may occur even when the low-voltage power supply PCB ASSY is replaced. Ask the user to review the installation environment.

The following LED status also indicates that this error is current: When the Back Cover, Toner, Drum, Paper, Error and Ready LEDs flash, press the [Go] button. The Toner, Drum, Paper and Error LEDs remain lit. Press the [Go] button again, and the Toner and Ready LEDs remain lit.

4.11 Troubleshooting for Other Problems

4.11.1 Machine is not turned ON

<User Check>

- Connect the AC cord correctly.

Step	Cause	Remedy
1	Connection failure of the panel PCB harness	Check the connection of the panel PCB harness, and reconnect it if necessary.
2	Panel PCB failure	Replace the panel PCB ASSY.
3	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

4.11.2 Main fan does not rotate

Step	Cause	Remedy
1	Connection failure of the main fan harness	Check the connection of the main fan harness, and reconnect it if necessary.
2	Connection failure of the toner LED PCB harness	Check the connection of the toner LED PCB harness, and reconnect it if necessary.
3	Main fan failure	Replace the main fan.
4	Main PCB failure	Replace the main PCB ASSY.

4.11.3 Main motor failure

Step	Cause	Remedy
1	Connection failure of the main motor harness	Check the connection of the main motor harness, and reconnect it if necessary.
2	Main motor failure	Replace the main motor ASSY.
3	Low-voltage power supply PCB failure	Replace the low-voltage power supply PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

4.11.4 Unusual noise is generated from the machine

<User Check>

- Check that the covers are closed correctly.
- Set the duplex tray correctly.
- Set the paper trays correctly.

Step	Cause	Remedy
1	Possible cause differs depending on the location. Identify the location with the problem.	When the location with the problem is identified, check for any foreign object around that location.
2	Insufficient grease on parts	Re-grease the parts.
3	Bent or defective part	Replace the part.

CHAPTER 3

DISASSEMBLY/REASSEMBLY

CHAPTER 3 DISASSEMBLY/REASSEMBLY

This chapter describes procedures for disassembling and reassembling the machine with related notes.

The provided disassembly order flow enables you to take in the disassembly procedure of related part at a glance.

At the start of disassembling, you can check the disassembly order flow which guides you through a shortcut to get to the part.

This chapter also covers screw tightening torques and lubrication points where the specified lubrication should be applied when the machine is assembled.

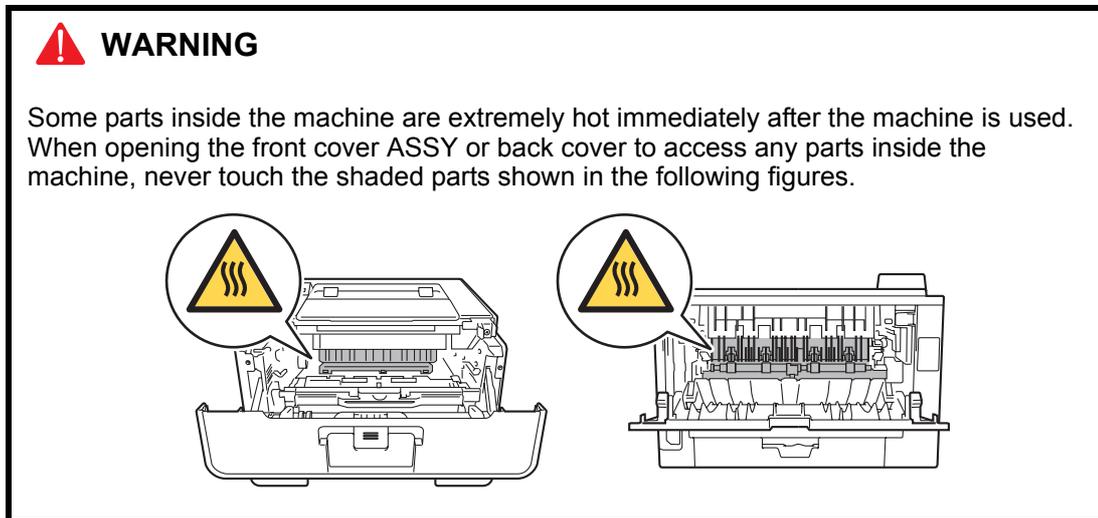
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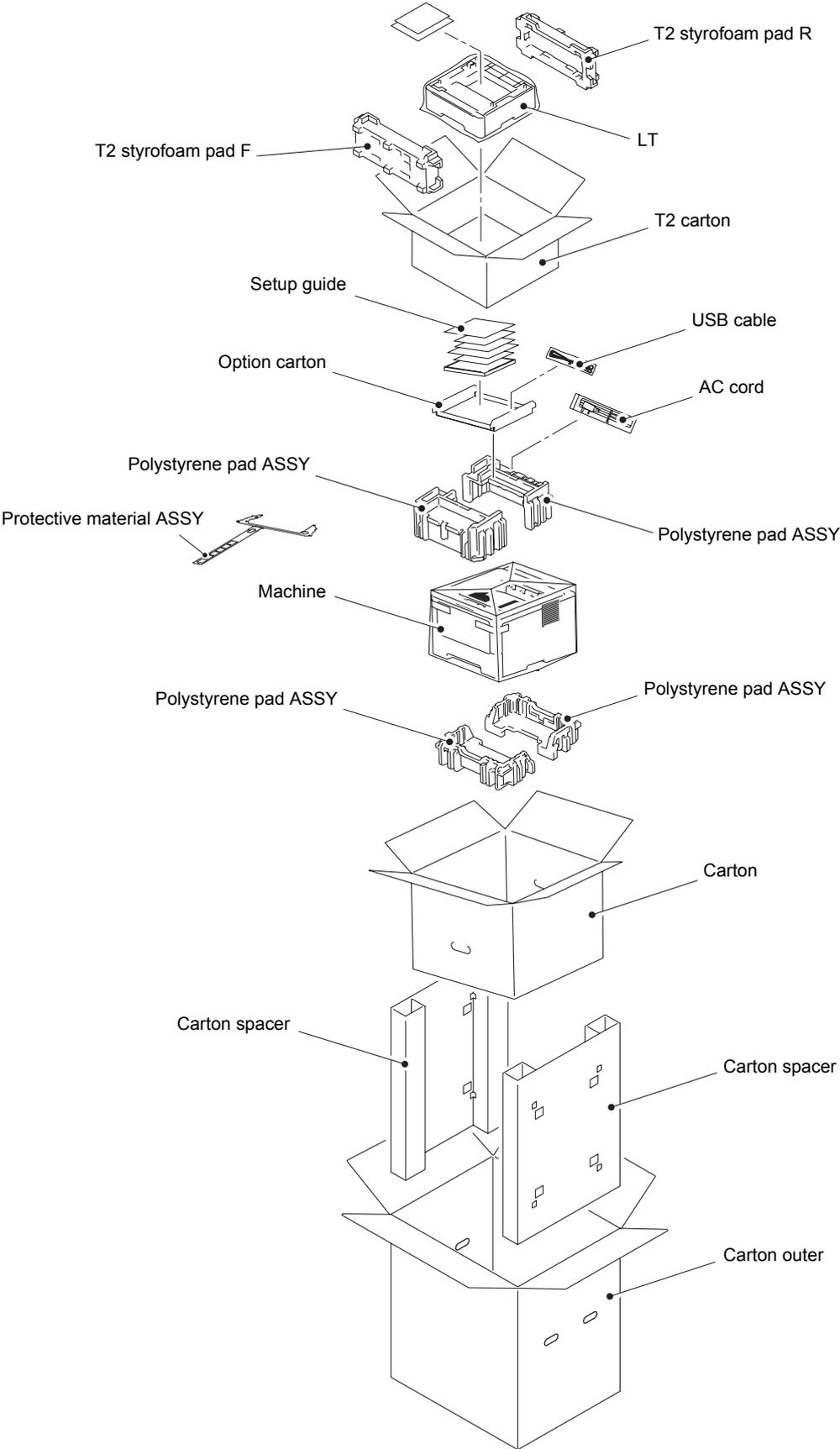
1. SAFETY PRECAUTIONS

To avoid creating secondary problems by mishandling, follow the warnings and precautions below during maintenance work.



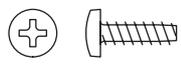
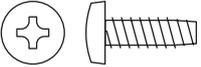
- Be careful not to lose screws, washers, or other parts removed.
- Be sure to apply grease to applicable positions specified in this chapter.
- When using soldering irons or other heat-generating tools, take care not to accidentally damage parts such as wires, PCBs and covers.
- Static electricity charged in your body may damage electronic parts. When transporting PCBs, be sure to wrap them in conductive sheets.
- When replacing the PCB and all the other related parts, put on a grounding wrist band and perform the job on a static mat. Also take care not to touch the conductor sections on the flat cables or on the wire harness.
- After disconnecting flat cables, check that each cable is not damaged at its end or shortcircuited.
- When connecting flat cables, do not insert them at an angle. After insertion, check that the cables are not at an angle.
- When connecting or disconnecting harnesses, hold the connector body, not the cables. If the connector is locked, release it first.
- After a repair, check not only the repaired portion but also harness treatment. Also check that other related portions are functioning properly.
- Violently closing the front cover without mounting the toner cartridge and the drum unit can damage the machine.
- After assembly, it is recommended to conduct dielectric strength test and continuity test.
- When mounting the power switch, check that the tabs are secured to the frame firmly and that the harness is not caught in the frame.
- When mounting the inlet, check that the inlet is housed in the frame completely and that the harness is not caught in the frame.
- The insulation sheet should not be damaged.

2. PACKING

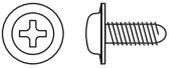


3. SCREW CATALOGUE

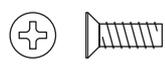
Taptite bind B

Taptite bind B M3x10	
Taptite bind B M4x12	

Taptite cup S

Taptite cup S M3x8 SR	
--------------------------	---

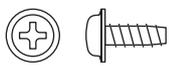
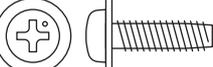
Taptite flat B

Taptite flat B M3x10	
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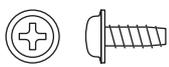
Screw pan (S/P washer)

Screw pan (S/P washer) M3x12 DB	
------------------------------------	---

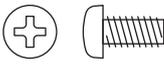
Taptite pan

Taptite pan B M3x8	
Taptite pan B M4x14	

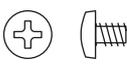
Taptite cup B

Taptite cup B M3x8	
Taptite cup B M4x12	

Screw pan

Screw pan M3x6	
Screw pan M4x8	

Screw bind

Screw bind M3x4	
--------------------	---

4. SCREW TORQUE LIST

Note:

- For verifying the shape of each screw, refer to "3.SCREW CATALOGUE" in this chapter.

Location of screw		Screw type	Q'ty	Tightening torque N.m (kgf.cm)
T1 tray cover		Taptite bind B M4x12	2	0.8±0.1(8±1)
Side cover L		Taptite cup B M4x12	2	0.8±0.1(8±1)
Side cover R		Taptite cup B M4x12	2	0.8±0.1(8±1)
Main shield cover plate	HL-5440D	Taptite cup S M3x8 SR	0	0.5±0.1(5±1)
	HL-5450DN/5450DNT/ 5470DW/5470DWT		4	
	HL-6180DW/6180DWT		3	
Top cover ASSY		Taptite cup B M4x12	2	0.8±0.1(8±1)
Panel PCB ASSY (LED model)		Taptite pan B M3x8	3	0.4±0.05(4±0.5)
Top cover		Taptite cup B M4x12	4	0.8±0.1(8±1)
Fuser unit line cover R		Taptite bind B M4x12	1	0.8±0.1(8±1)
Fuser unit line cover L		Taptite pan B M4x14	1	0.8±0.1(8±1)
Fuser unit		Taptite pan B M4x14	1	0.8±0.1(8±1)
Main PCB ASSY		Taptite cup S M3x8 SR	4	0.5±0.1(5±1)
Parallel interface (HL-5440D only)		Screw pan M3x6	2	0.5±0.1(5±1)
Laser unit		Taptite cup S M3x8 SR	4	0.8±0.05(8±0.5)
Scanner earth plate		Taptite cup S M3x8 SR (Fastening side of scanner plate)	1	0.8±0.1(8±1)
		Taptite cup S M3x8 SR (LV shield plate side)	1	0.5±0.1(5±1)
LV shield plate cover		Taptite cup S M3x8 SR	3	0.5±0.1(5±1)
		Taptite bind B M4x12	1	0.8±0.1(8±1)
		Screw pan M4x8	1	0.5±0.1(5±1)
Inlet		Taptite flat B M3x10	1	0.5±0.1(5±1)
FG harness		Screw pan M4x8	1	0.5±0.1(5±1)
Low-voltage power supply PCB ASSY		Taptite cup S M3x8 SR	1	0.5±0.1(5±1)
		Taptite bind B M4x12	2	0.8±0.1(8±1)
Under bar earth plate R		Taptite cup S M3x8 SR	1	0.5±0.1(5±1)
	Under bar (Front right side)	Taptite bind B M4x12	1	0.8±0.1(8±1)
LV shield plate		Taptite bind B M4x12	1	0.8±0.1(8±1)
Hold cover 1		Taptite bind B M4x12	1	0.8±0.1(8±1)
Toner LED PCB ASSY		Taptite pan B M3x8	1	0.5±0.1(5±1)
Hold cover 2		Taptite bind B M4x12	2	0.8±0.1(8±1)

Location of screw		Screw type	Q'ty	Tightening torque N.m (kgf.cm)
Under bar earth plate L		Taptite cup S M3x8 SR	1	0.8±0.1(8±1)
	Under bar (Front left side)	Taptite bind B M4x12	1	
Under bar (Rear side) (HL-6180DW/6180DWT only)		Taptite bind B M4x12	2	0.8±0.1(8±1)
Main frame L ASSY		Taptite cup S M3x8 SR	3	0.8±0.1(8±1)
		Taptite bind B M4x12	4	0.8±0.1(8±1)
Drive sub ASSY	HL-5440D	Taptite bind B M4x12	8	0.8±0.1(8±1)
		Taptite cup S M3x8 SR	1	0.5±0.1(5±1)
	Except for HL-5440D	Taptite bind B M4x12	9	0.8±0.1(8±1)
Main motor ASSY		Taptite cup S M3x8 SR	4	0.8±0.1(8±1)
Main motor cover		Taptite bind B M3x10	2	0.5±0.1(5±1)
MP solenoid		Taptite bind B M3x10	1	0.5±0.1(5±1)
Main PCB shield calking ASSY		Taptite bind B M4x12	4	0.8±0.1(8±1)
Duplex solenoid		Taptite bind B M3x10	1	0.5±0.1(5±1)
Bottom frame L		Taptite bind B M4x12	3	0.8±0.1(8±1)
Base plate		Taptite bind B M4x12	4	0.8±0.1(8±1)
		Screw pan (S/P washer) M3x12 DB	2	0.45±0.05(4.5±0.5)
High-voltage power supply PCB ASSY		Taptite bind B M4x12	2	0.8±0.1(8±1)
T1 paper feed actuator holder ASSY		Taptite bind B M3x10	1	0.5±0.1(5±1)
Main frame R		Taptite bind B M4x12	5	0.8±0.1(8±1)
MP feed frame		Taptite bind B M3x10	2	0.5±0.1(5±1)
MP paper empty sensor PCB ASSY		Taptite bind B M3x10	1	0.5±0.1(5±1)
T2 tray cover		Taptite bind B M4x12	2	0.8±0.1(8±1)
T2 side cover L		Taptite bind B M4x12	1	0.8±0.1(8±1)
T2 side cover R		Taptite bind B M4x12	1	0.8±0.1(8±1)
T2 front cover ASSY		Taptite cup S M3x8 SR	1	0.8±0.1(8±1)
Under bar (Two)		Taptite bind B M4x12	4	0.8±0.1(8±1)
T2 frame R unit		Taptite cup S M3x8 SR	2	0.8±0.1(8±1)
		Taptite bind B M4x12	2	0.8±0.1(8±1)
T2 paper feed frame unit		Taptite cup S M3x8 SR	3	0.8±0.1(8±1)
T2 front beam		Taptite bind B M4x12	2	0.8±0.1(8±1)
T2 paper feed actuator holder ASSY		Taptite bind B M3x10	1	0.5±0.1(5±1)
T2 back cover		Taptite bind B M4x12	2	0.8±0.1(8±1)

5. LUBRICATION

Lubricating oil type (Maker name)	Lubrication point		Quantity of lubrication
FLOIL BG-10KS (Kanto Kasei)	Fuser drive gear 39	10 places	1.5 mm dia. ball
	Develop one way clutch 53	5 places	
	Develop clutch 51R	1 places	
	Develop joint gear 37	4 places	

■ Fuser drive gear 39

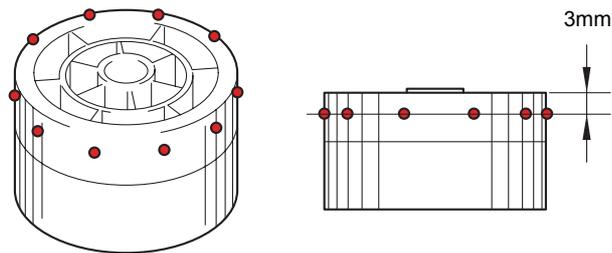


Fig. 3-1

■ Develop one way clutch 53

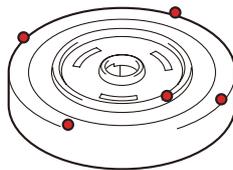


Fig. 3-2

■ Develop clutch 51R

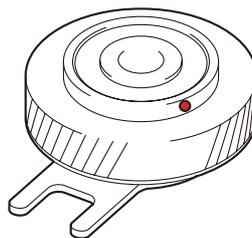


Fig. 3-3

■ Develop joint gear 37

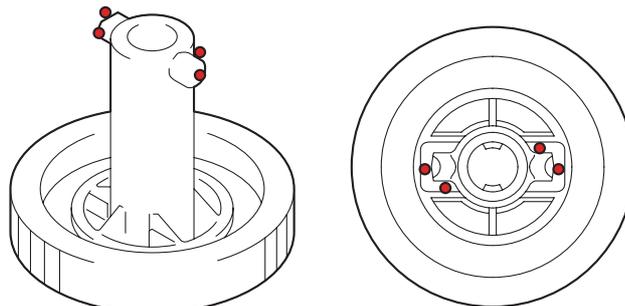


Fig. 3-4

6. OVERVIEW

<Layout view>

<Development view>

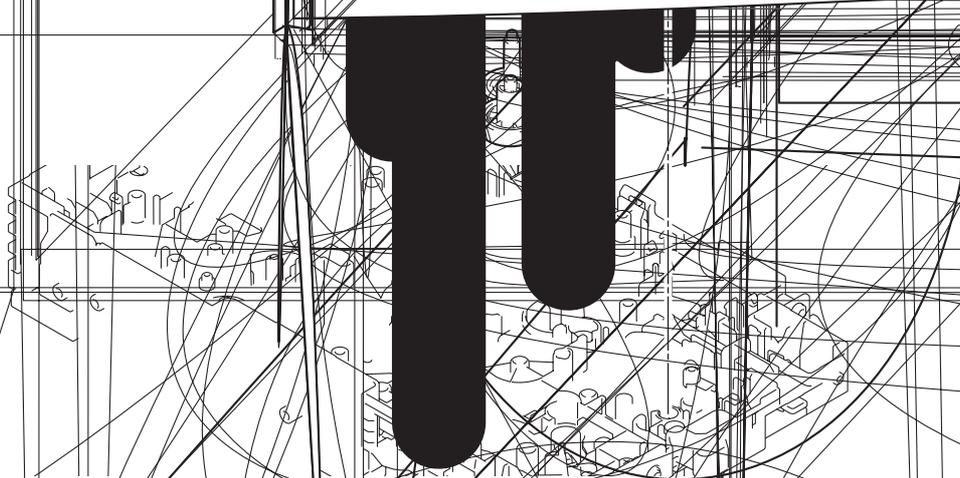


Fig. 3-6

Note:

- When handling gears, make sure that frame L faces up. Otherwise all gears come off.

<Name of gears>

1	LY4409	Develop one way clutch 53	8	LY4336	MP drive gear 18
2	LY4411	Develop low idle gear 41	9	LY4407	Develop shaft gear 22
3	LY4410	Develop gear 50R/42R/19	10	LY4412	Paper feed drive gear 39/17
4	LY4406	Develop high/idle gear 39L			
5	LY4408	Develop clutch 51R	11	LY4403	T1 idle gear 37
6	LY4405	Develop idle gear 53	12	LY4398	L1 drive gear 29
7	LY4394	MP sector gear 53/57	13	LY4404	T1 gear 19/42

* These parts are subject to change without notice.

<Layout view>

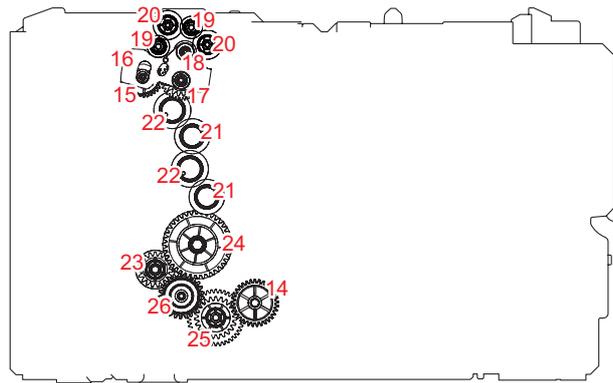


Fig. 3-7

<Development view>

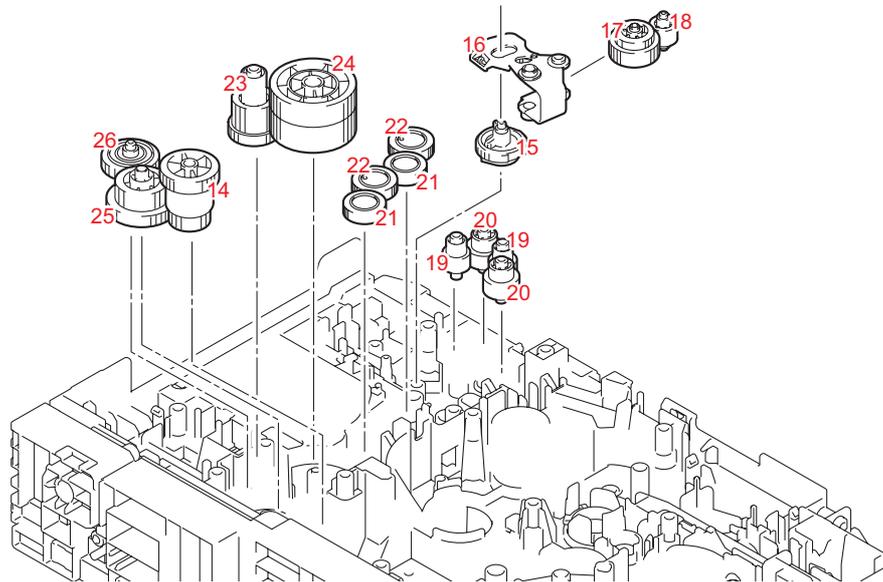


Fig. 3-8

Note:

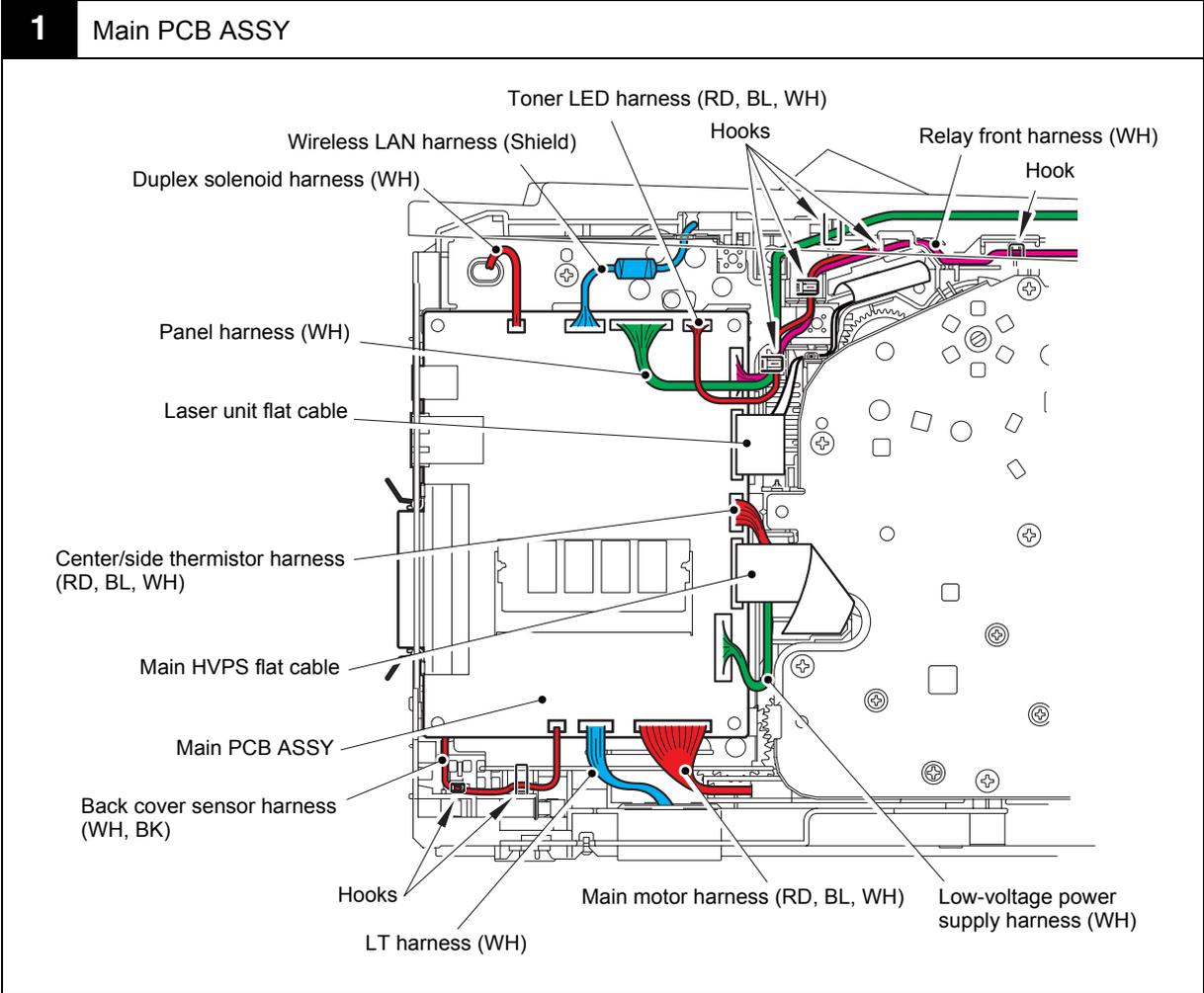
- When handling gears, make sure that frame L faces up. Otherwise all gears come off.

<Name of gears>

14	LY4448	Fuser gear 22/33	21	LY4436	Eject idle gear 19
15	LY4438	Eject sector gear 33	22	LY4435	Eject idle gear 20
16	LY4444	Eject switch arm	23	LY4451	Duplex gear 27/19
17	LY4439	Eject gear 32/17	24	LY4450	Fuser drive gear 39
18	LY4442	Eject pendulum gear 17	25	LY4447	Fuser gear 23/40
19	LY4441	Eject idle gear 17	26	LY4449	Fuser pendulum gear 25
20	LY4440	Eject idle gear 23			

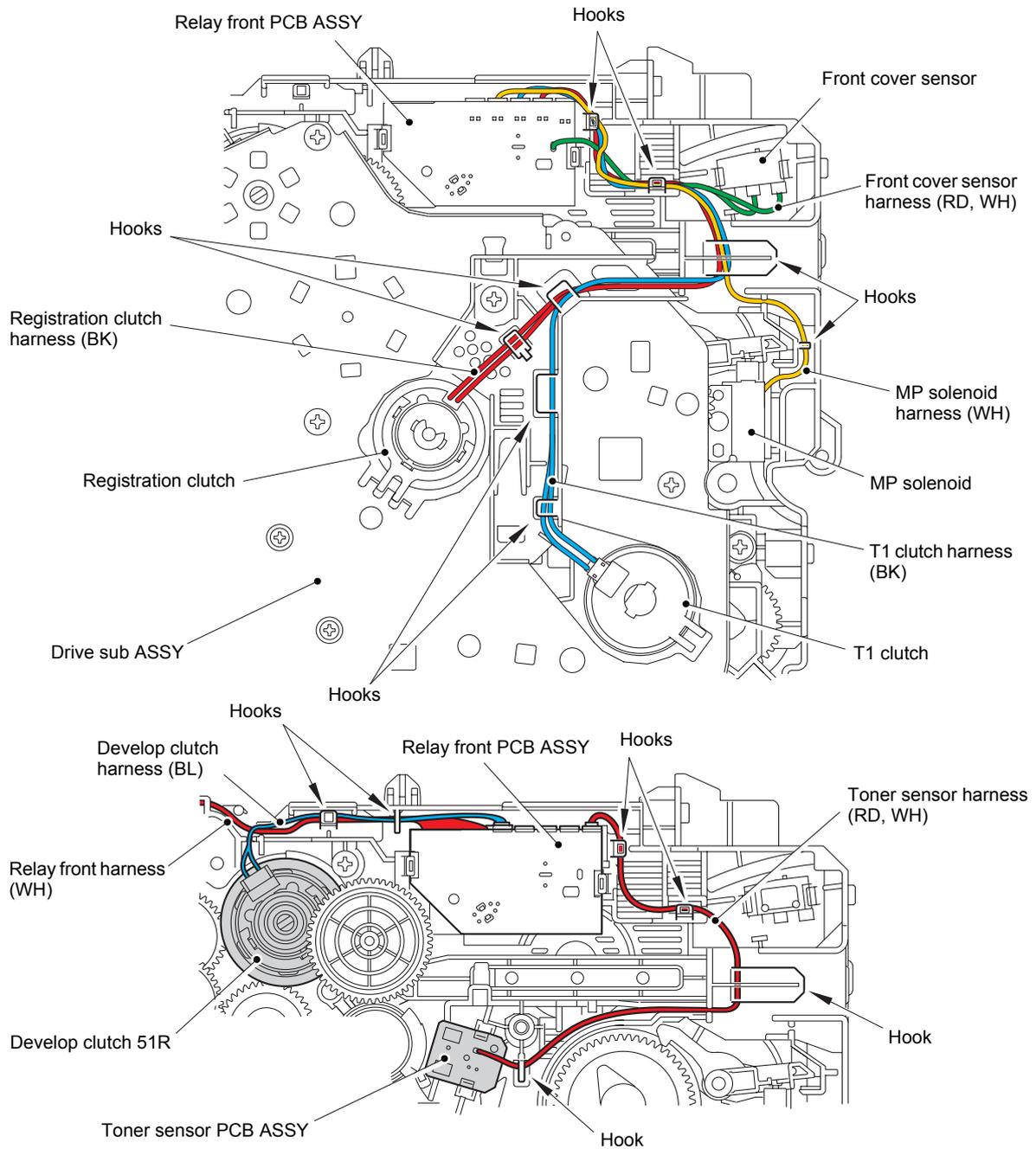
* These parts are subject to change without notice.

7. HARNESS ROUTING

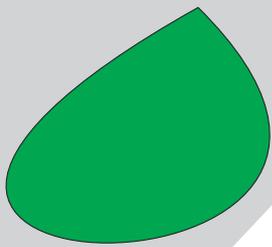
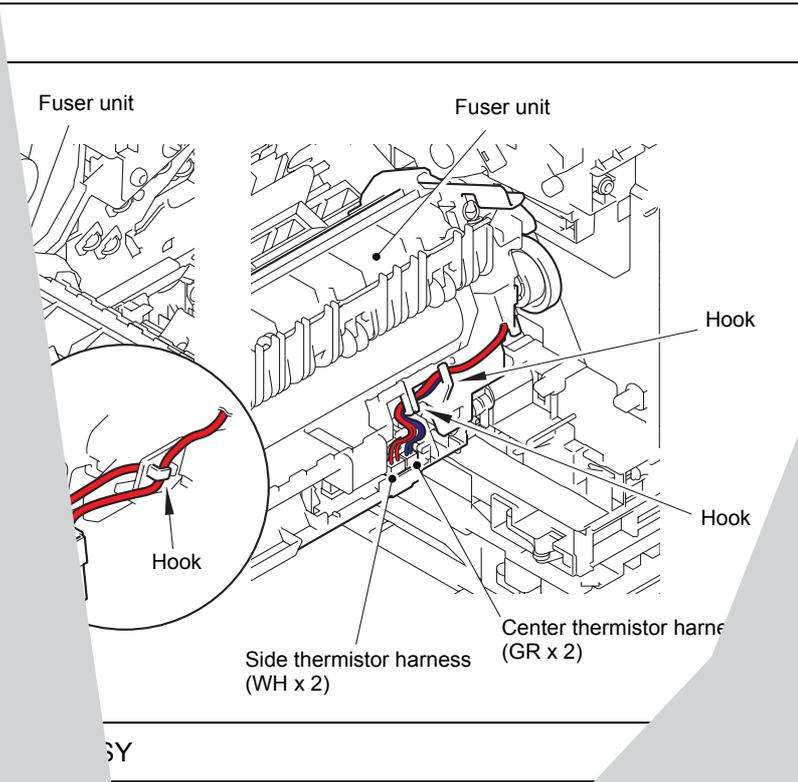


Harness colors may be changed for any reason.

2 Relay front PCB ASSY

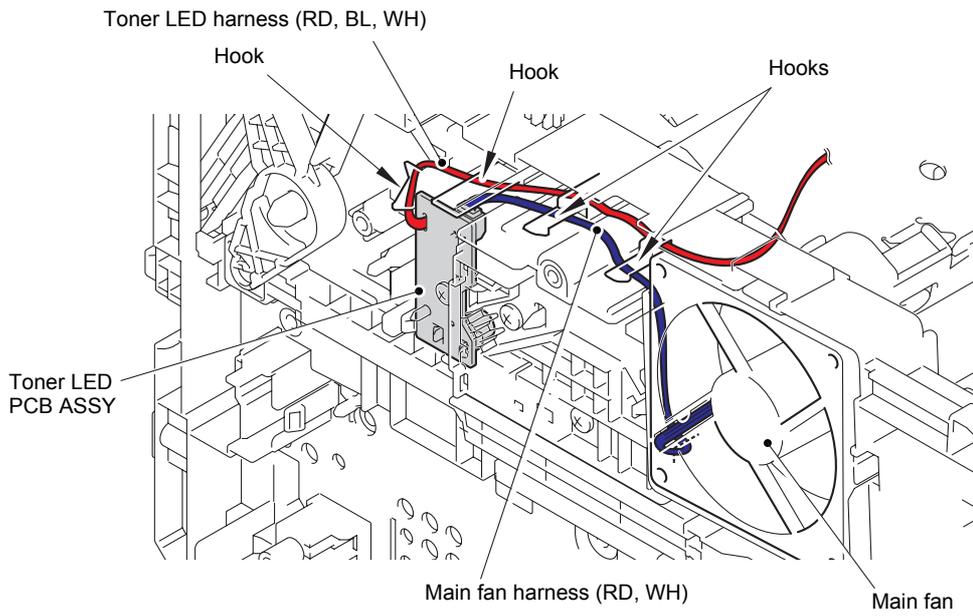


Harness colors may be changed for any reason.

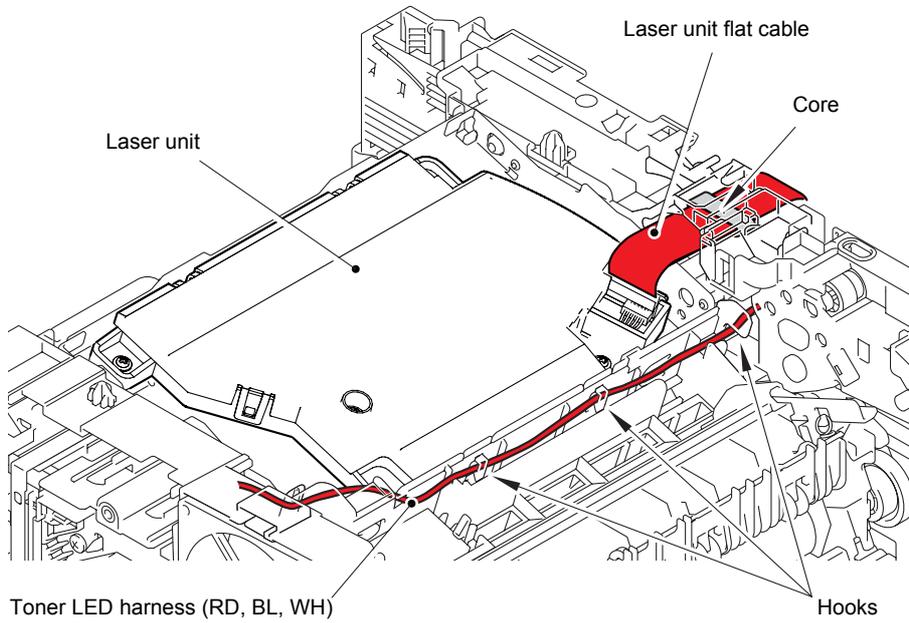


harness colors may be ch

5 Toner LED PCB ASSY/Main fan

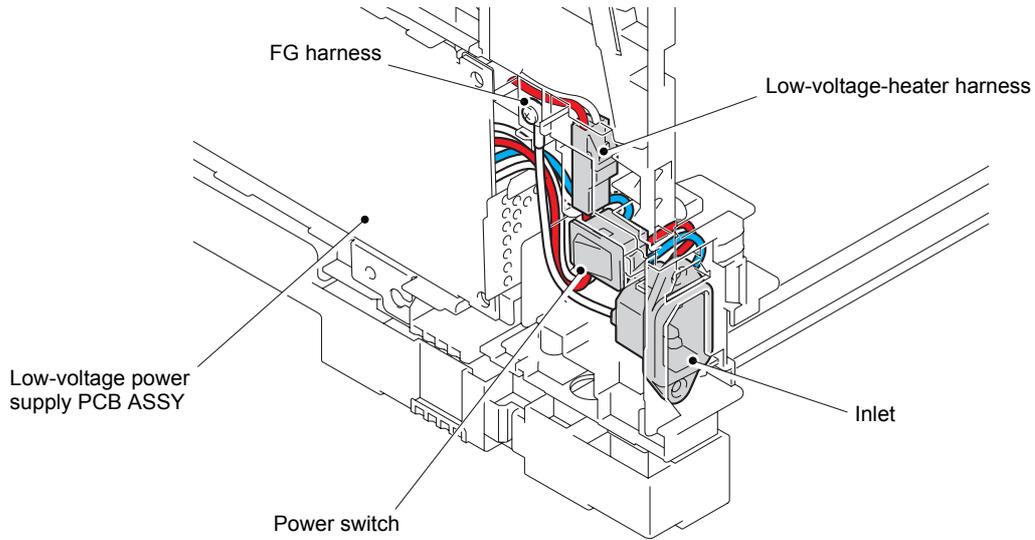


6 Laser unit



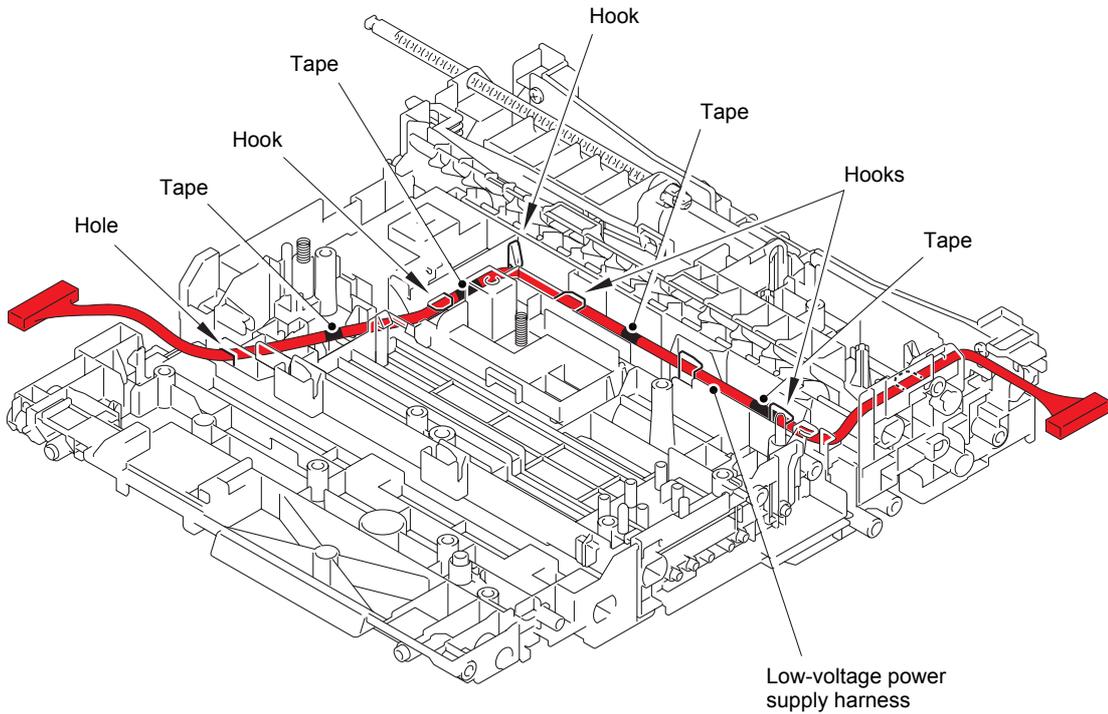
Harness colors may be changed for any reason.

7 Low-voltage power supply PCB ASSY



Note:

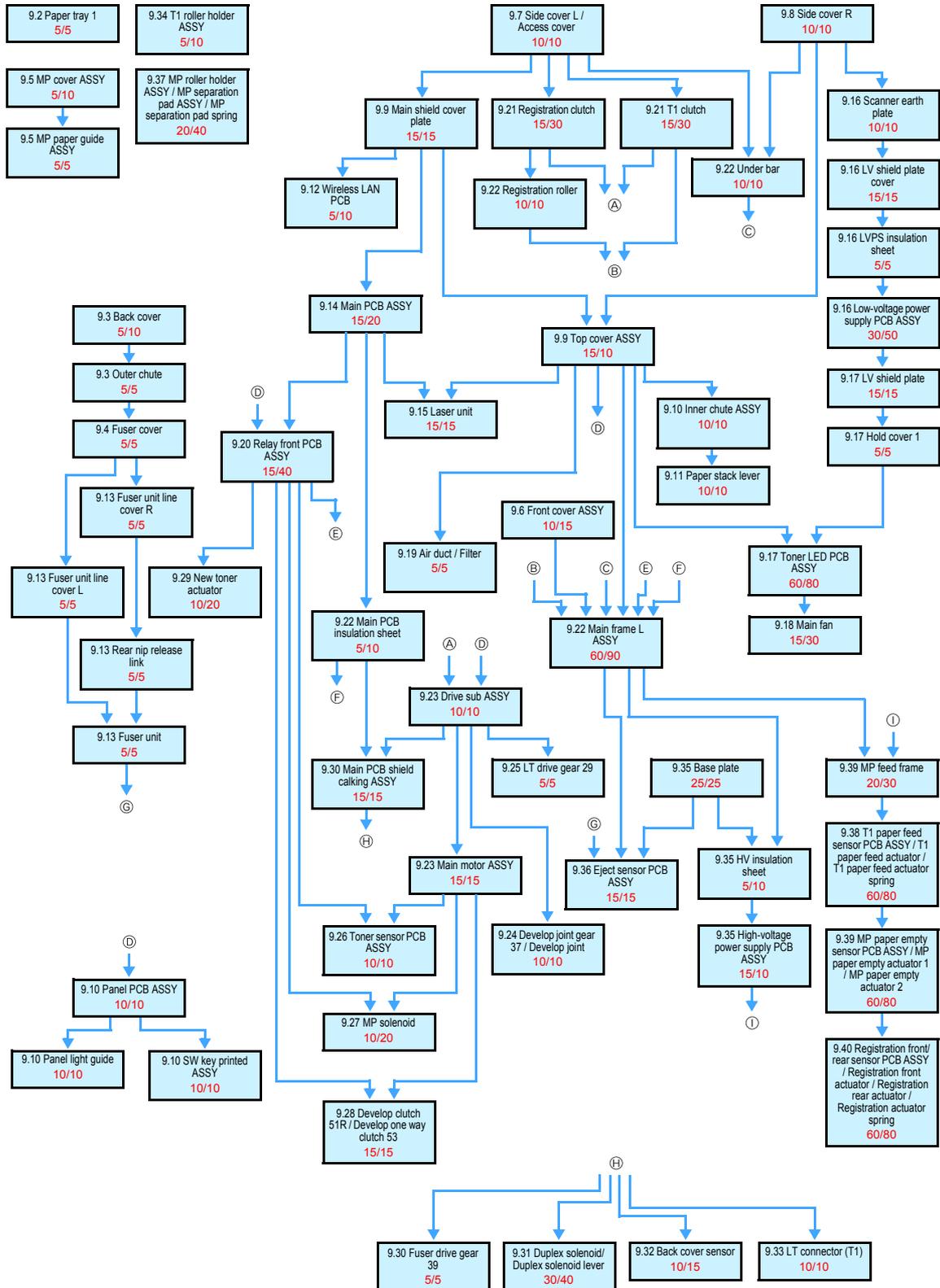
- Attach the FG harness outermost over the heater harness.



Harness colors may be changed for any reason.

8. DISASSEMBLY FLOW CHART

Disassembly / Re-Assembly (second)



9. DISASSEMBLY PROCEDURE

9.1 Preparation

■ Disconnecting Cables and Removing Accessories

Prior to proceeding with the disassembly procedure,

- (1) Disconnect the following:
 - AC cord
 - USB cable (if connected)
 - LAN cable (if connected)
 - Parallel cable (if connected)
- (2) Remove the following:
 - Paper tray 1
 - Toner cartridge and drum unit
 - Duplex tray
 - LAN port cap

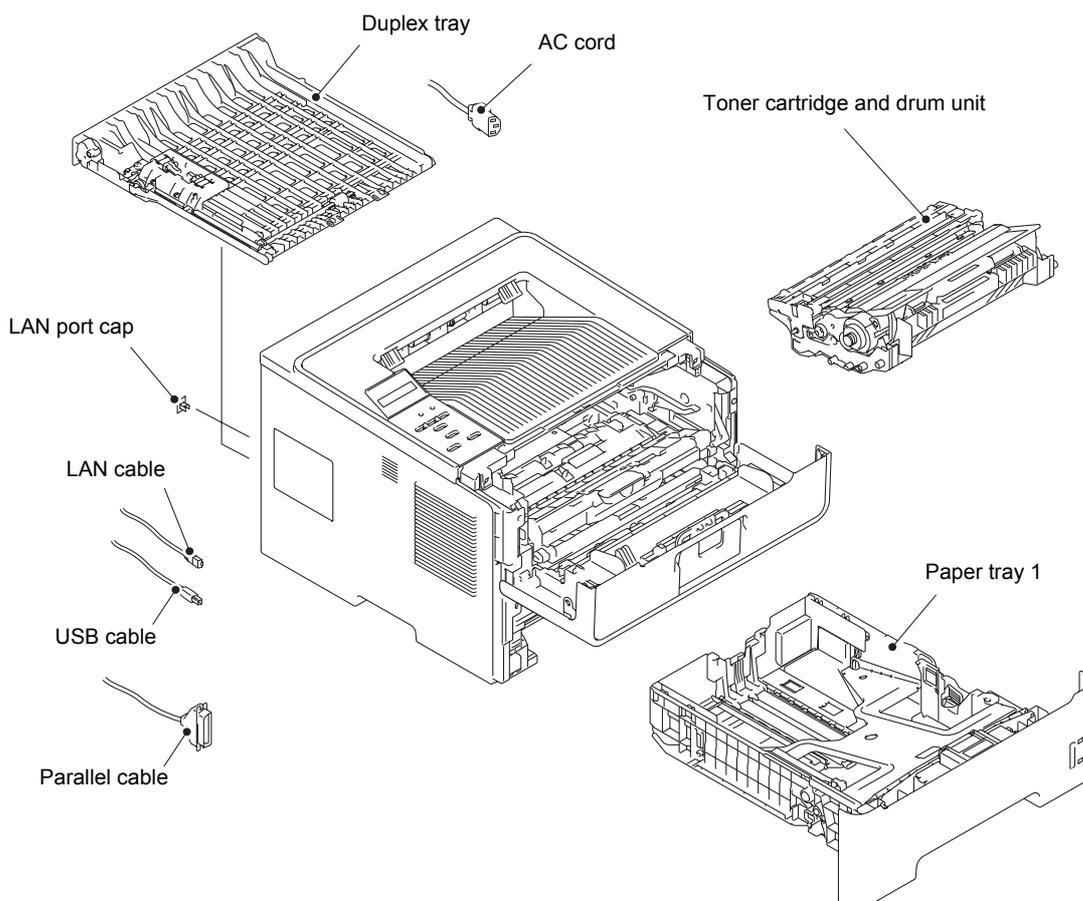


Fig. 3-9

9.2 Paper tray 1

Note:

- Paper tray 1 (250 sheets, 500 sheets): T1
Paper tray 2 (500 sheets): T2
- The illustration shows paper tray 1 (500 sheets).

- (1) Remove the two taptite bind B M4x12 screws from the paper tray 1.
- (2) Lift the plate to remove "A" on the T1 tray indicator from the plate, remove the four bosses, and then remove the T1 tray cover from the paper tray 1.

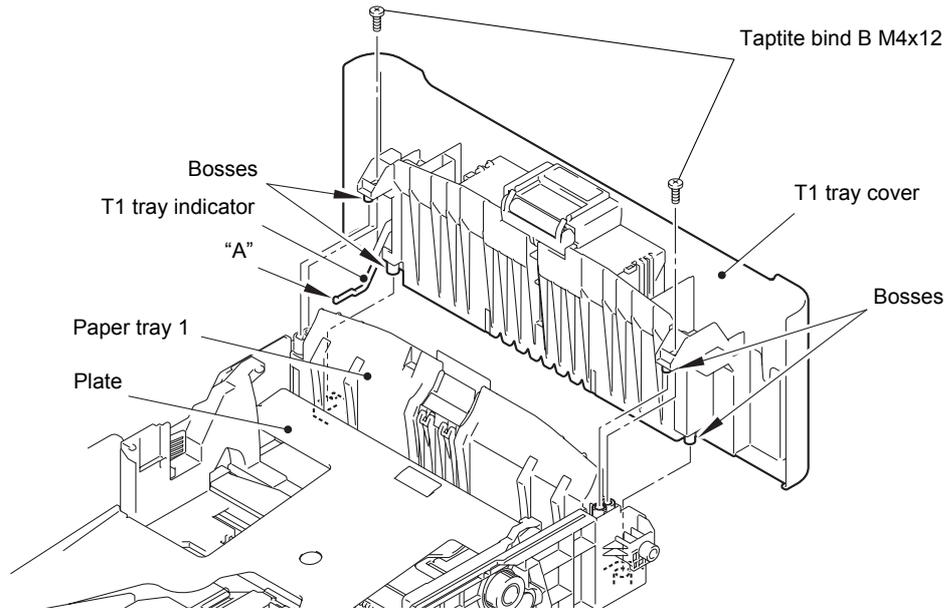


Fig. 3-10

- (3) Release the two hooks on the T1 separation pad ASSY from the paper tray 1.
- (4) Push both arms of the T1 separation pad ASSY in the direction of the arrows to remove both pins, and then remove the T1 separation pad ASSY from the paper tray 1.
- (5) Remove the T1 separation pad spring from the T1 separation pad ASSY.

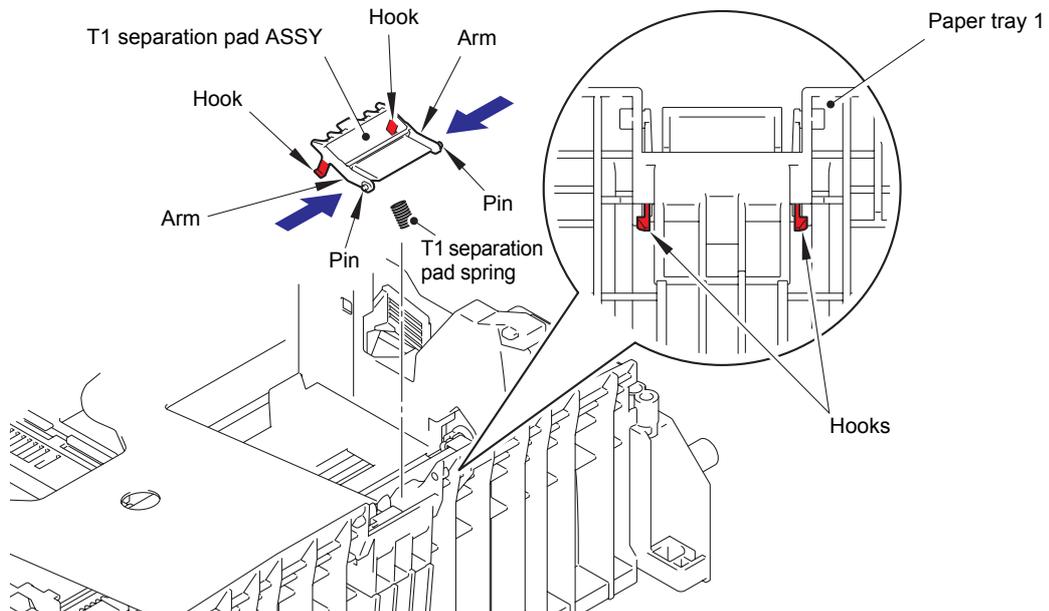


Fig. 3-11

- (6) Push the hook on the lift gear Z27M10 (or lift gear Z48M10) while lifting the plate-up plate, and remove the lift gear Z27M10 (or lift gear Z48M10) from the paper tray 1.
250 sheets: Lift gear Z27M10
500 sheets: Lift gear Z48M10
- (7) Remove the gear Z22M10 and the idle gear Z18M10 from the paper tray 1.

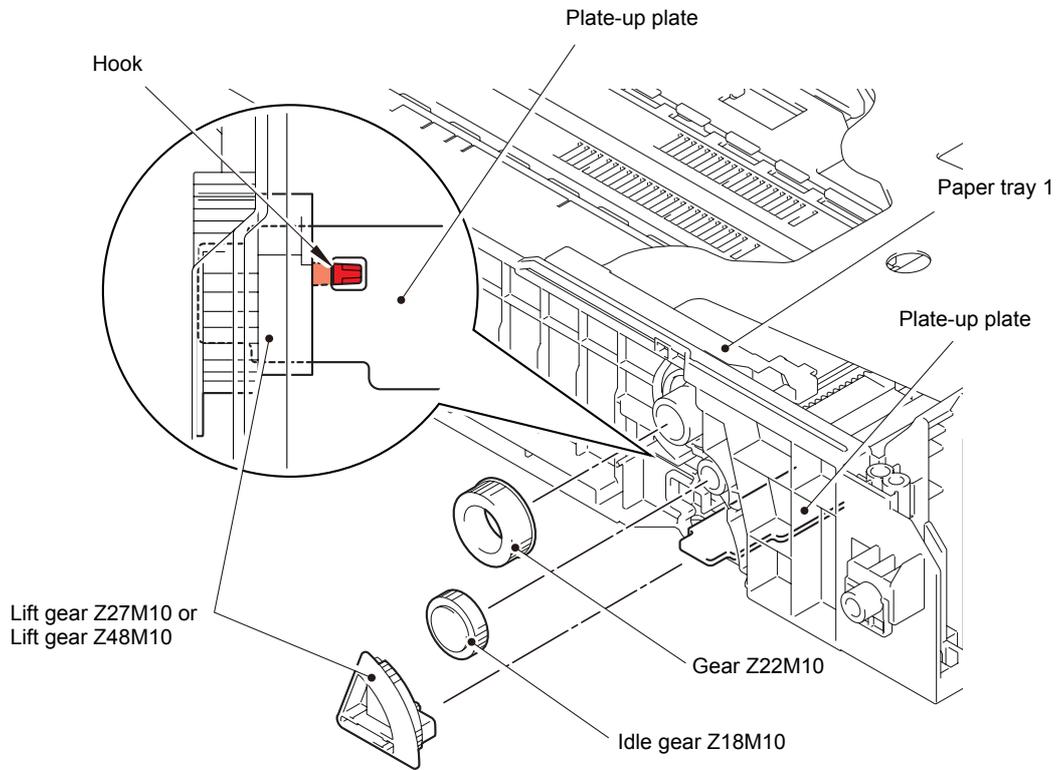


Fig. 3-12

9.3 Back cover / Outer chute

- (1) Open the back cover.
- (2) Push both ribs of the back cover in the direction of the arrows, and remove the two bosses on the outer chute.

Note:

- Be careful not to damage the ribs inside the back cover.

Assembling Note:

- When attaching the back cover to the machine, push the back cover into the machine while lifting the rear of the machine.

- (3) Remove the back cover from the machine.
- (4) Open the outer chute on the machine in the direction of the arrow.

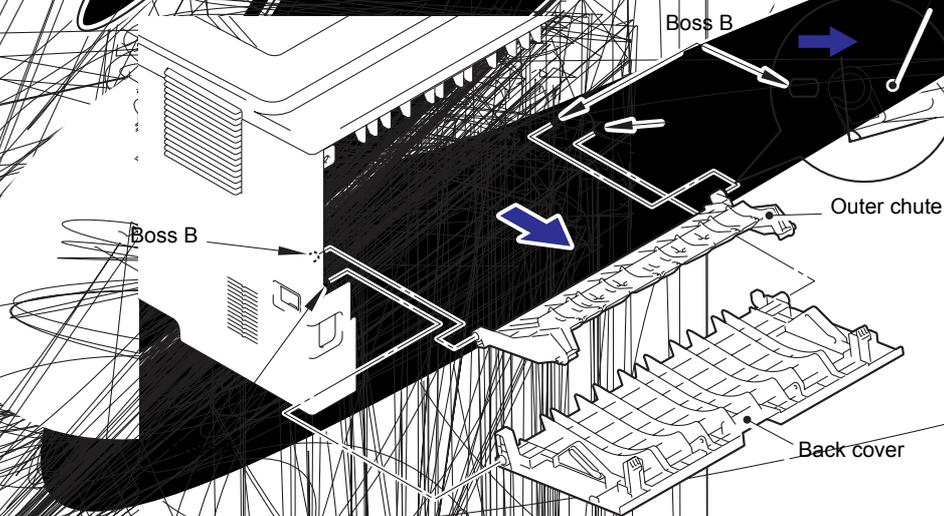


Fig. 3-14

9.4 Fuser cover

- (1) Push the two knobs on the fuser cover, and pull the fuser cover down in the direction of the arrow.
- (2) Remove the fuser cover from the bosses on the fuser unit, and remove the fuser cover from the machine.

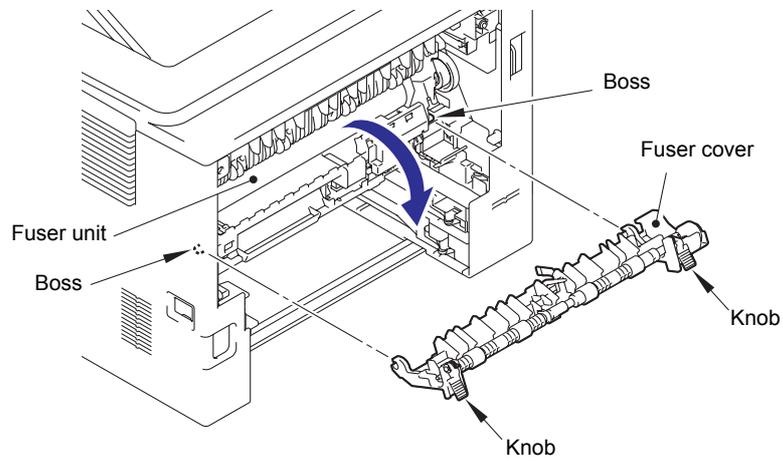


Fig. 3-15

9.5 MP cover ASSY

- (1) Open the MP cover ASSY.
- (2) Remove the two hooks on the MP paper guide ASSY from the two bosses on the front cover ASSY.

Note:

- When removing the MP paper guide ASSY from the bosses on the front cover ASSY, pull it out strongly in the direction of arrow 2.

- (3) Remove the two bosses on the MP cover ASSY, and remove the MP cover ASSY from the front cover ASSY.

Note:

- Remove the MP cover ASSY while pushing "A" on the front cover ASSY in the direction of arrow 3.

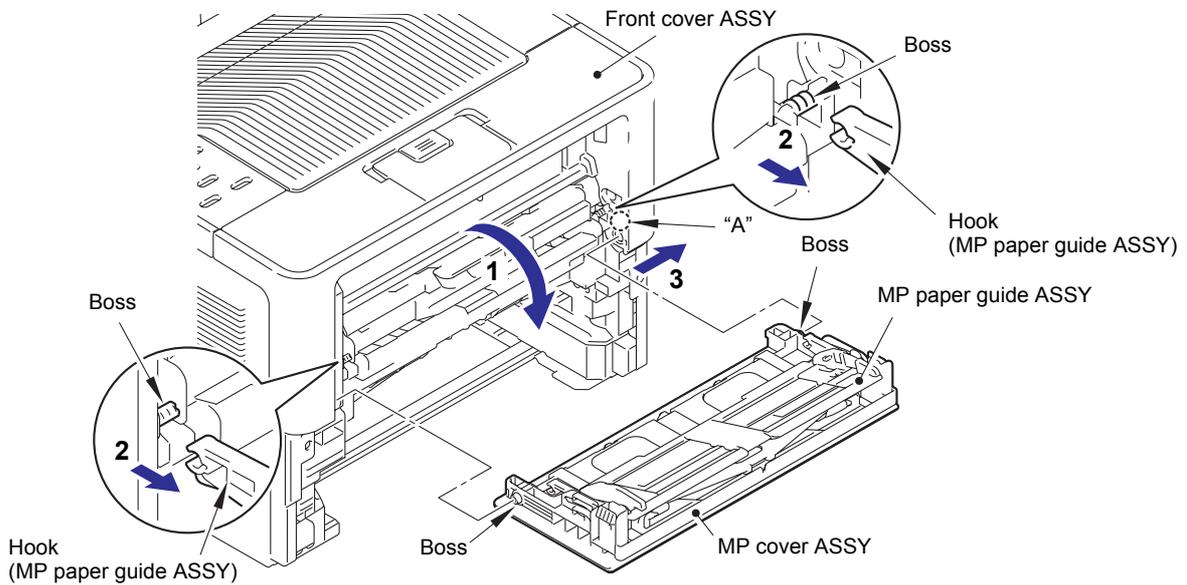


Fig. 3-16

- (4) Slide the left side of the MP paper guide ASSY in the direction of arrow 4, remove boss B from the guide on the MP cover ASSY, and then remove the MP paper guide ASSY from the MP cover ASSY.

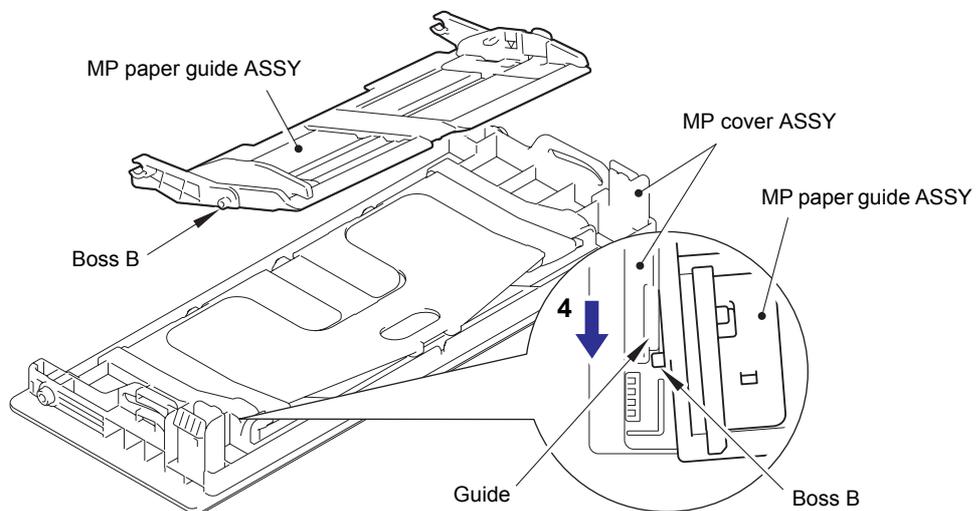


Fig. 3-17

9.6 Front cover ASSY

- (1) Push the front cover release button, and open the front cover ASSY.
- (2) Release the two hooks, and remove the develop joint link from the front cover ASSY.
- (3) Release the hook, and remove the nip release link from the front cover ASSY.

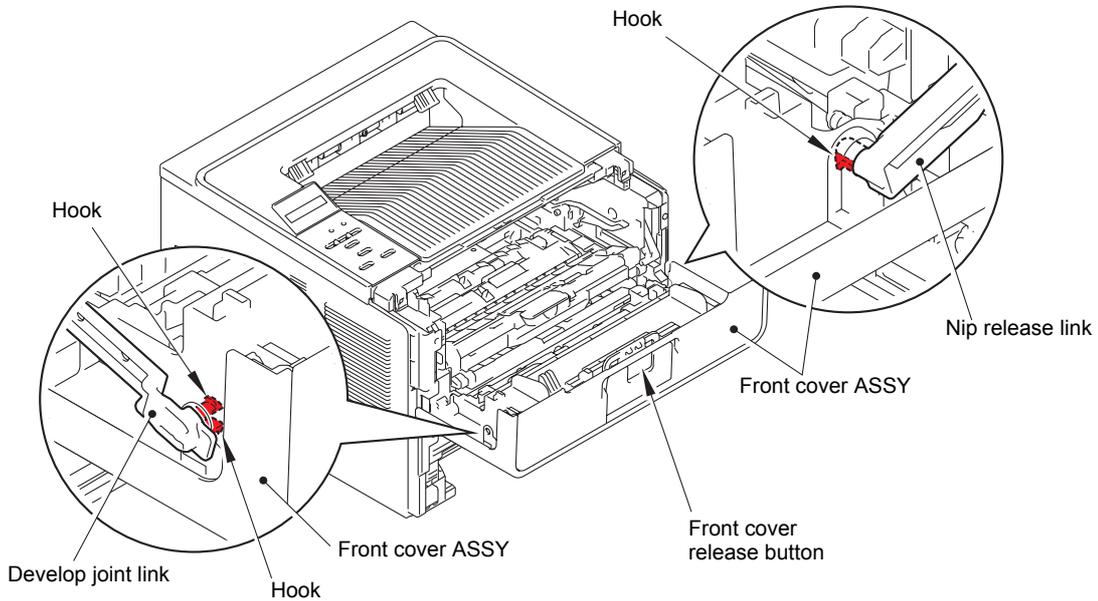


Fig. 3-18

- (4) Remove the two bosses, and remove the front cover ASSY from the machine.

Note:

- When removing the front cover ASSY, push "A" on the front cover ASSY in the direction of arrow 4a, and slide the front cover ASSY in the direction of arrow 4b to remove it.

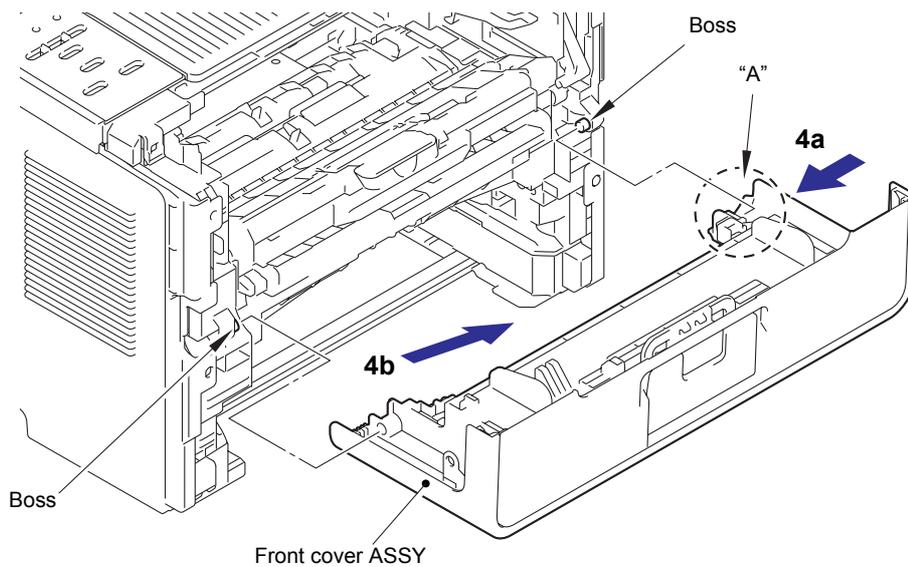


Fig. 3-19

- (5) Remove the two bosses, and remove the paper stopper from the front cover ASSY.

ne

9.8 Side cover R

- (1) Remove the taptite cup B M4x12 screw from the front side of the side cover R.
- (2) Remove the taptite cup B M4x12 screw from the back side of the side cover R.
- (3) Keep the two front hooks held down, and rotate the side cover R in the direction of arrow 3b while pushing it in the direction of arrow 3a. Release the remaining five hooks, and remove the side cover R from the machine.

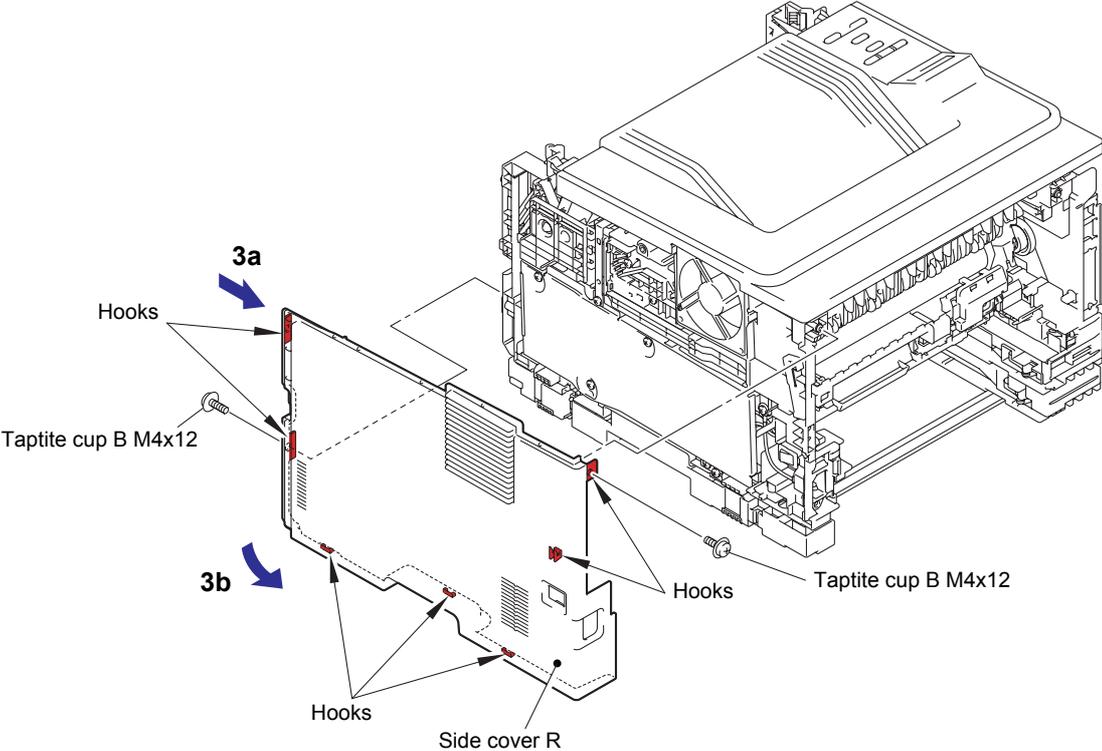


Fig. 3-21

9.9 Top cover ASSY

- (1) Remove the four taptite cup S M3x8 SR screws, and remove the main shield cover plate from the machine.

Note:

- HL-5440D is not equipped with a main shield cover plate.

- (2) Disconnect the panel harness from the main PCB ASSY, and release the panel harness from the securing fixtures.

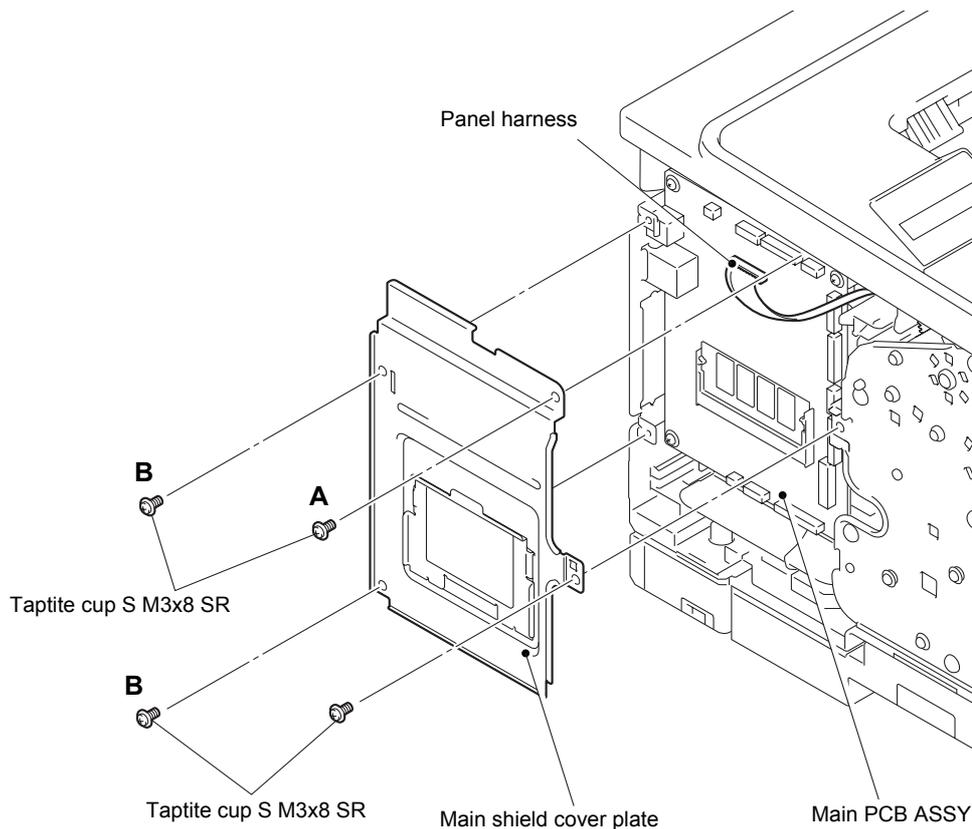


Fig. 3-22

Note:

- Use of screws A and B differs depending on the model.

Model	A	B
HL-5440D	Not used	Not used
HL-5450DN/5450DNT/5470DW/5470DWT	Used	Used
HL-6180DW/6180DWT	Not used	Used

Harness routing: Refer to "1.Main PCB ASSY".

- (3) Remove the two Taptite cup B M4x12 screws from the front side of the top cover ASSY.
- (4) Release the six hooks. Lift the front side of the top cover ASSY, and pull the top cover ASSY in the direction of the arrow to remove it from the machine.

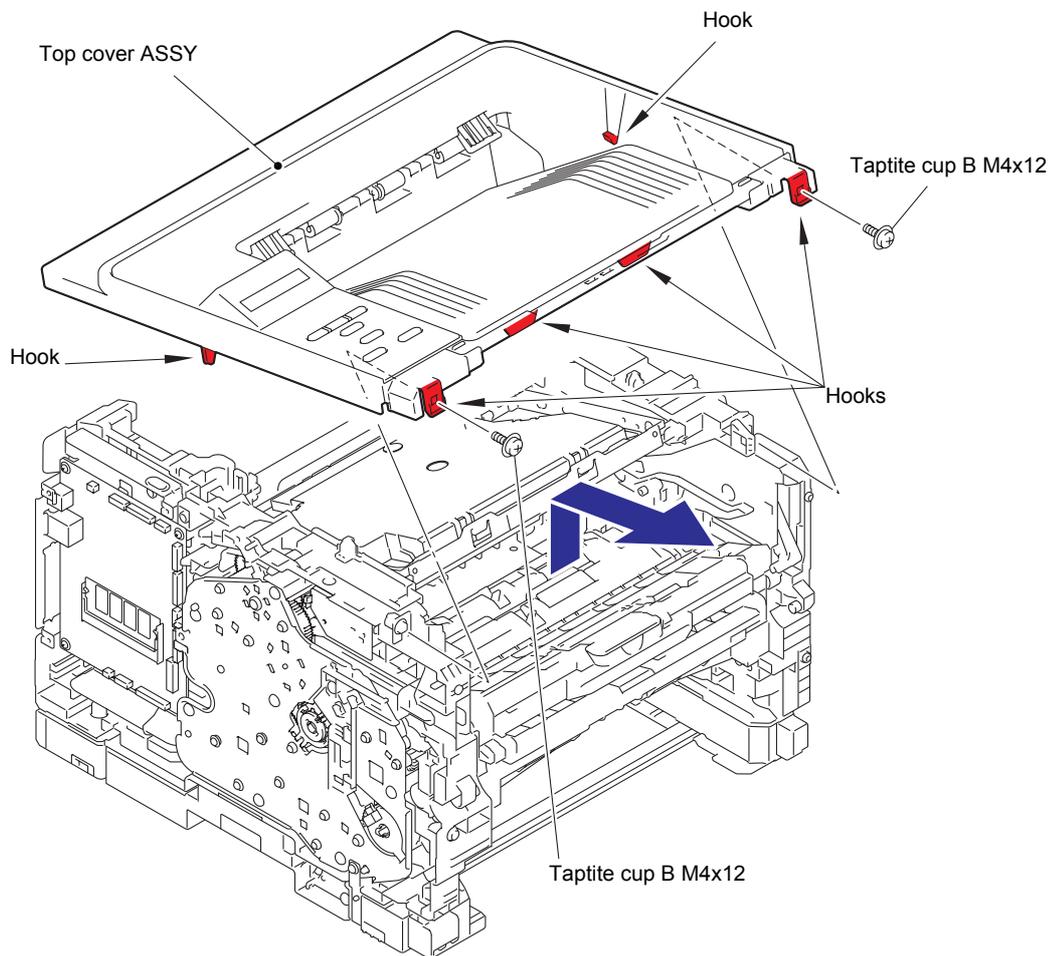


Fig. 3-23

9.10 Control panel

■ LED model

- (1) Release the panel harness from the securing fixtures.
- (2) Remove the three taptite pan B M3x8 screws, and remove the panel PCB ASSY from the top cover ASSY.
- (3) Remove the panel light guide from the top cover ASSY.
- (4) Remove the SW key printed ASSY from the top cover ASSY.
- (5) Remove the two taptite bind B M4x12 screws "a", and remove the inner chute ASSY from the top cover ASSY.
- (6) Remove the two taptite bind B M4x12 screws "b", release the six hooks, and remove the top cover base from the top cover ASSY.

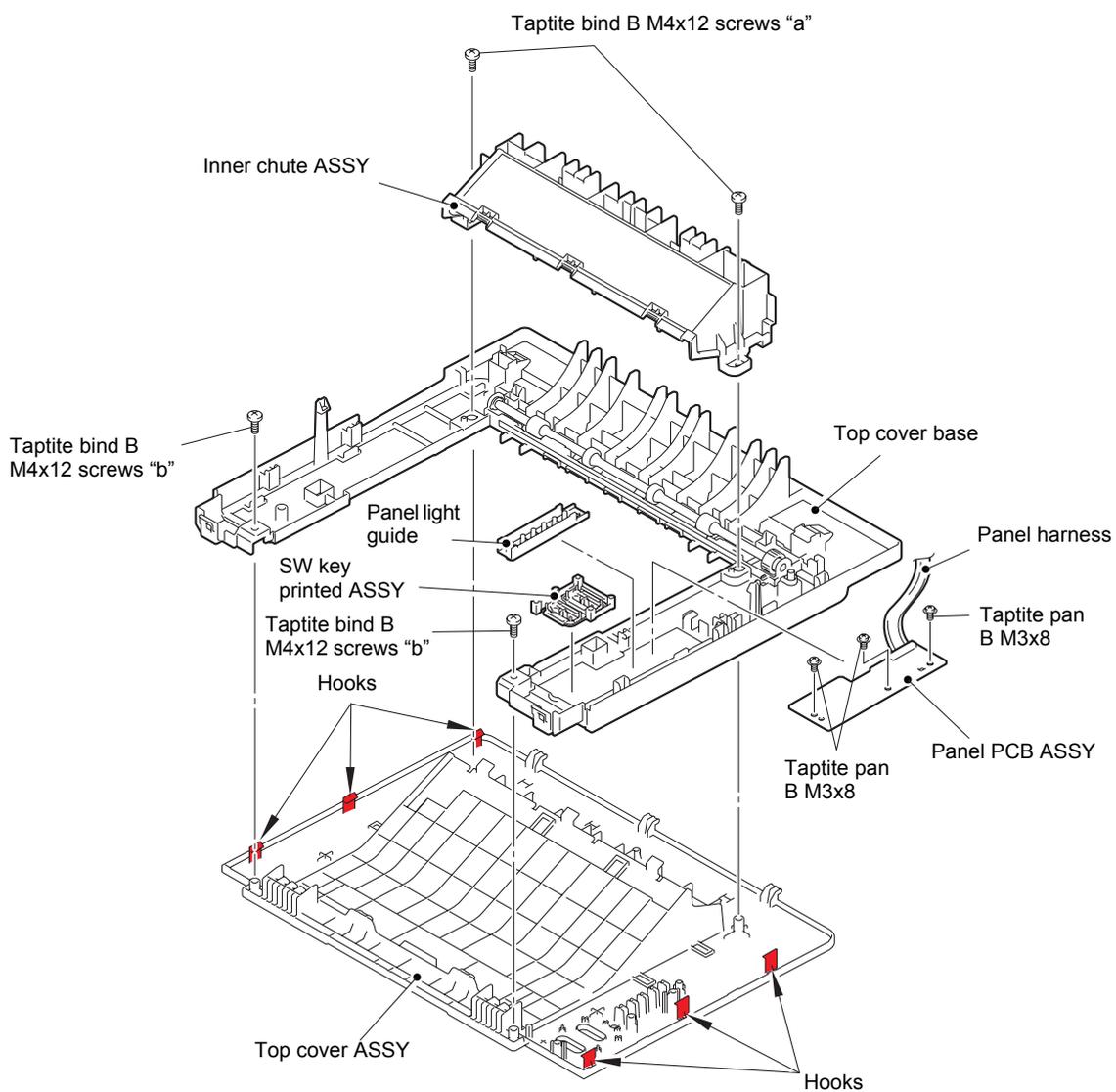


Fig. 3-24

Harness routing: Refer to "1.Main PCB ASSY".

■ LCD model

- (1) Release the panel harness from the securing fixtures.
- (2) Disconnect the backlight harness from the panel PCB ASSY, release the four hooks, and remove the panel PCB ASSY from the top cover base.
- (3) Remove the rubber key printed ASSY and the panel light guide.
- (4) Remove the two taptite bind B M4x12 screws "a", and remove the inner chute ASSY from the top cover ASSY.
- (5) Disconnect the LCD harness, release the two hooks, and remove the backlight PCB ASSY from the LCD holder.
- (6) Remove the two taptite bind B M4x12 screws "b", release the seven hooks, and remove the top cover base from the top cover ASSY.

Note:

- After disconnecting the flat cable(s), check that the end of each cable is not damaged or short-circuited.
- When connecting the flat cable(s), insert it straight. After insertion, check that the cable is not at an angle.

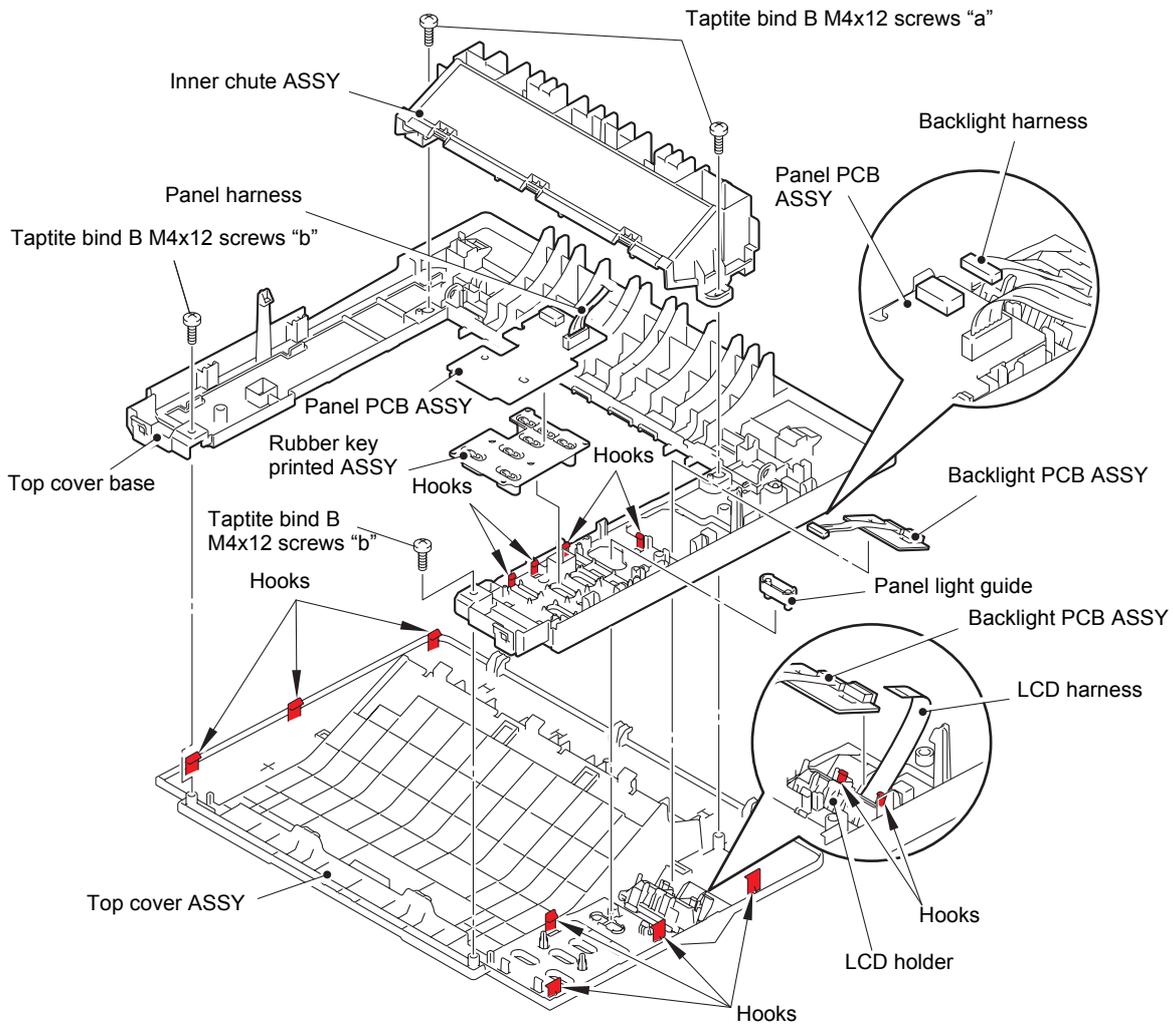


Fig. 3-25

Harness routing: Refer to "1.Main PCB ASSY".

- (7) Release the four hooks to remove the panel printed ASSY from the top cover ASSY.
- (8) Release the two hooks to remove the LCD holder from the top cover ASSY.
- (9) Release the two hooks to remove the LCD from the LCD holder.

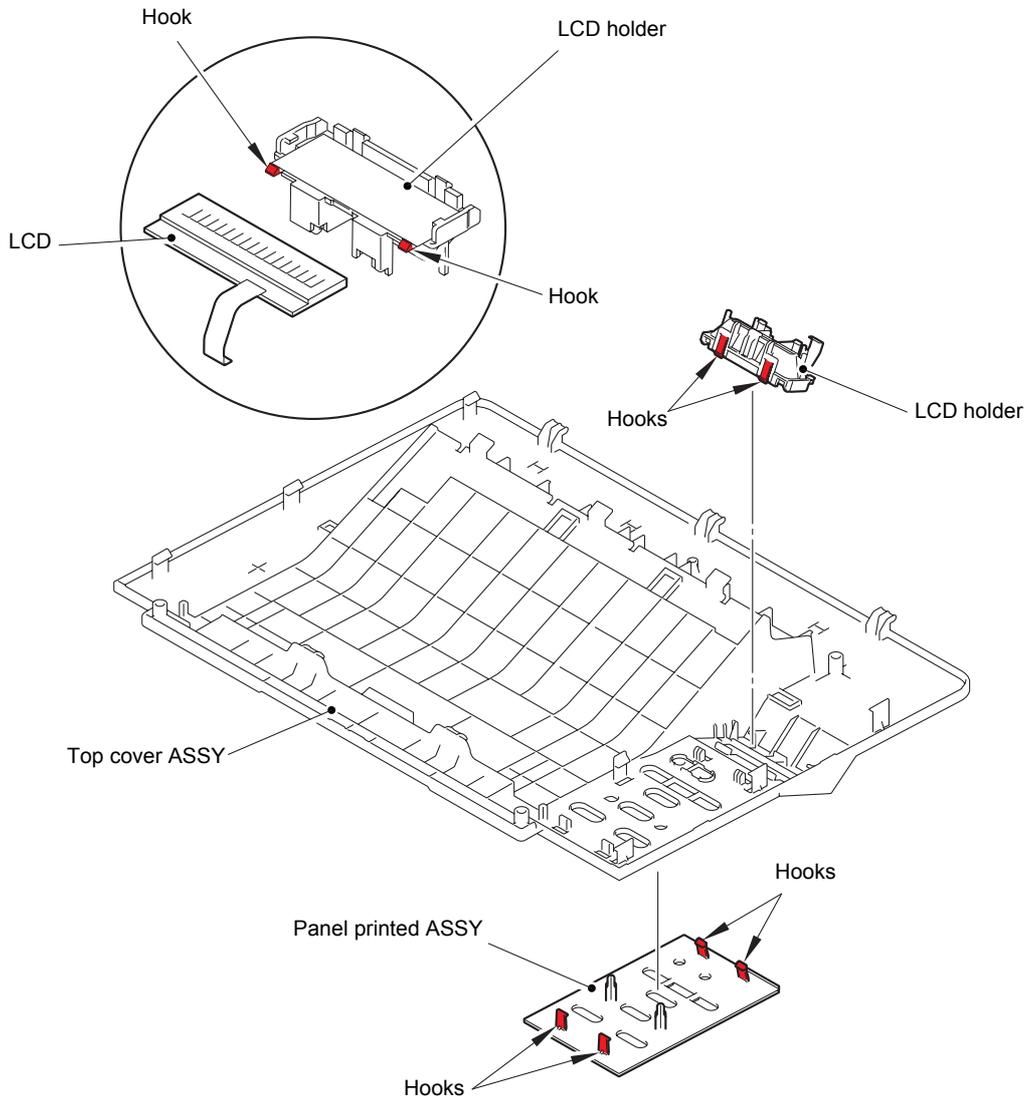


Fig. 3-26

9.11 Paper stack lever

(1) Remove the two paper stack levers from the top cover ASSY.

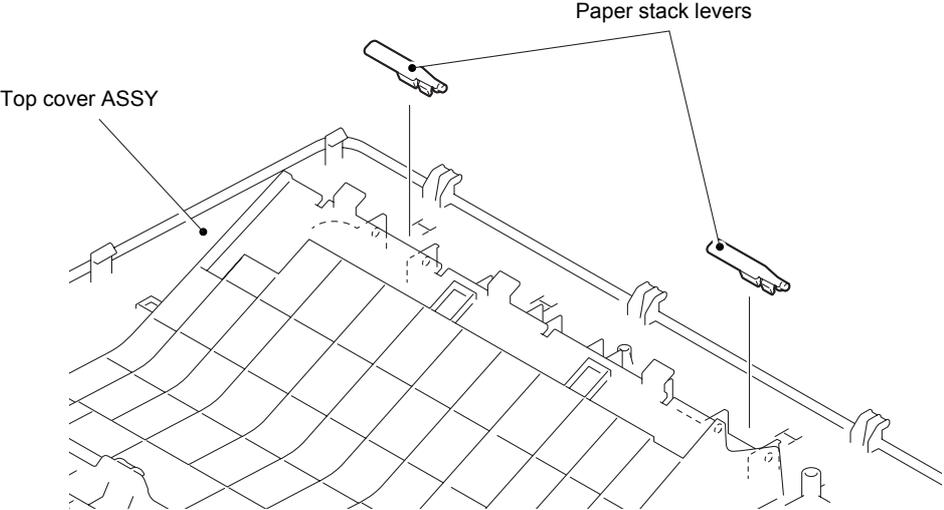


Fig. 3-27

9.12 Wireless LAN PCB (Wireless Network model only)

- (1) Disconnect the wireless LAN harness from the wireless LAN PCB.
- (2) Release the hook to remove the wireless LAN PCB from the machine.

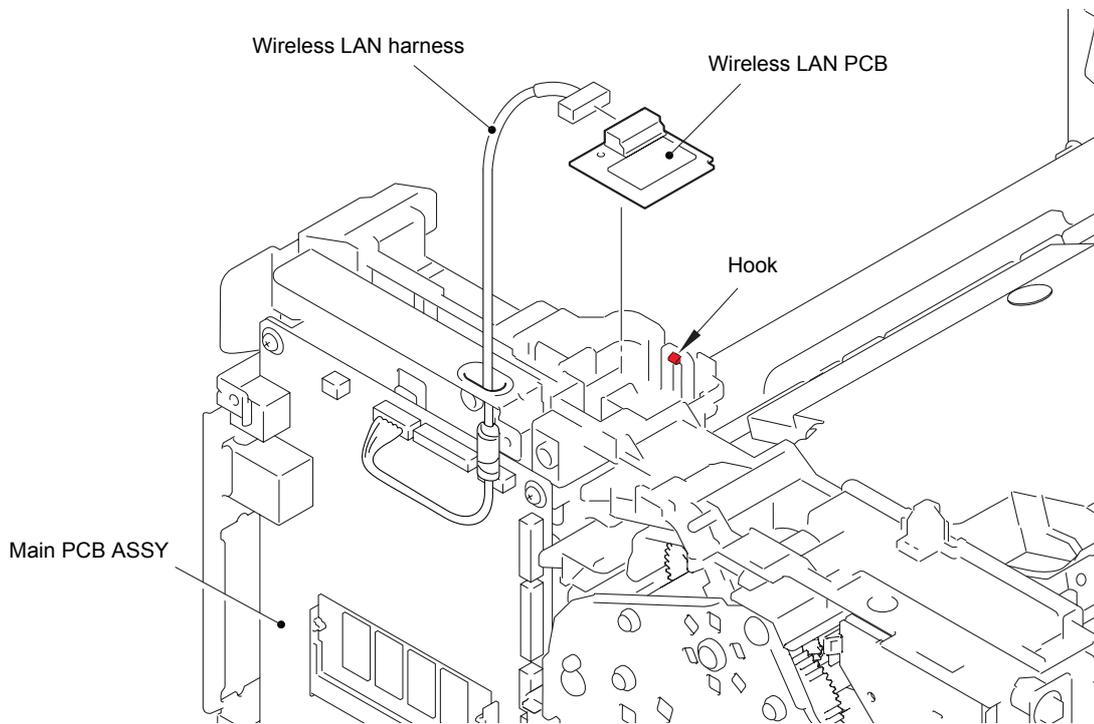
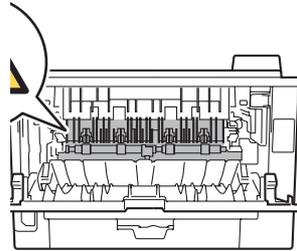


Fig. 3-28

Harness routing: Refer to "1.Main PCB ASSY".

mediately after the machine is used.
s any parts inside the machine,
figures.



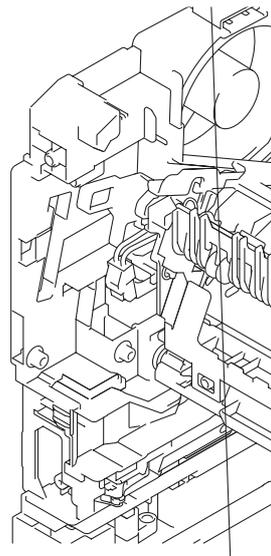
is attached, keep the front cover

use the hook to remove the fuser unit

3.

moving the rear nip release link.

se the hook to remove the fuser unit



- (4) Release the heater harness of the fuser unit from the guide on the main frame R, and disconnect the heater harness from the low-voltage-heater harness.

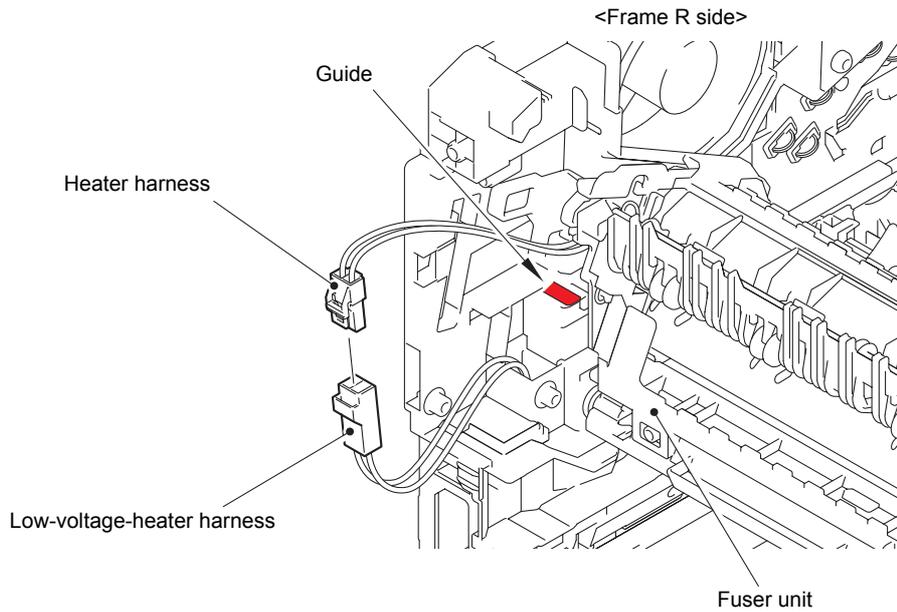


Fig. 3-30

Harness routing: Refer to "3.Fuser unit".

- (5) Remove the fuser unit ground spring from the fuser unit.
- (6) Release the center thermistor harness and the side thermistor harness of the fuser unit from the guide, and disconnect these harnesses from the eject sensor PCB ASSY.

Note:

- When disconnecting the harness, hold the top of the PCB connector to prevent the PCB connector being damaged.

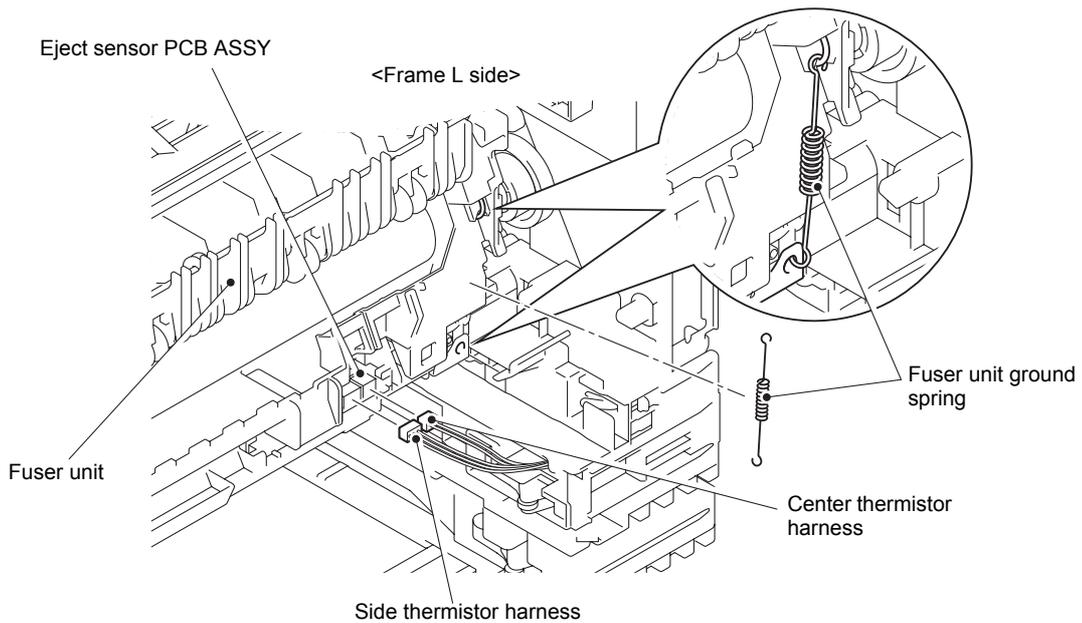


Fig. 3-31

Harness routing: Refer to "3.Fuser unit".

(7) Remove the taptite pan B M4x14 screw, and remove the fuser unit from the machine.

Note:

- Make sure that the front cover is closed when removing the fuser unit.

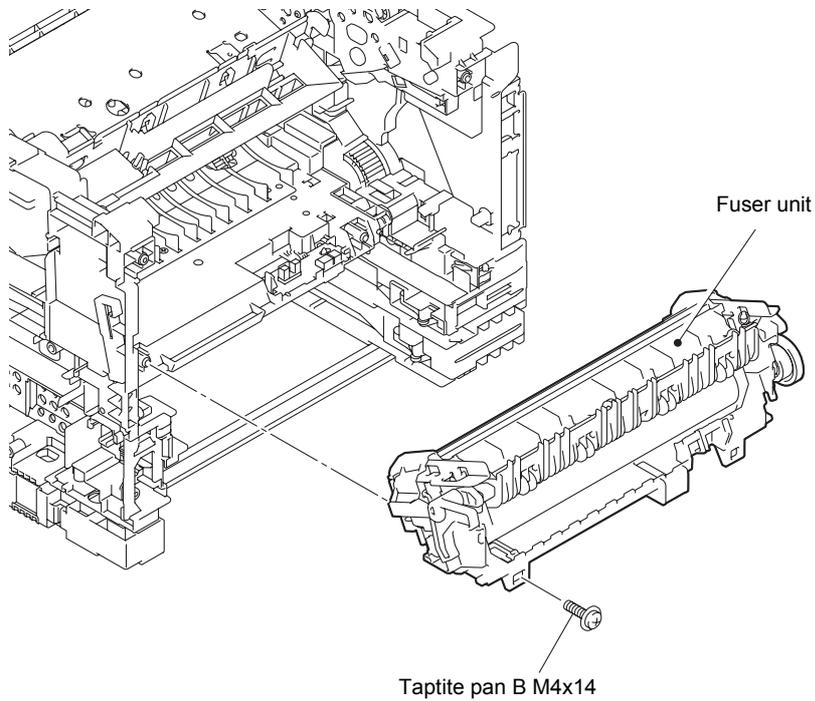


Fig. 3-32

Assembling Note:

- Check that the heater harness is housed in frame L as shown in the illustration below. Otherwise the harness may be caught in some sections of the machine, and may catch fire.

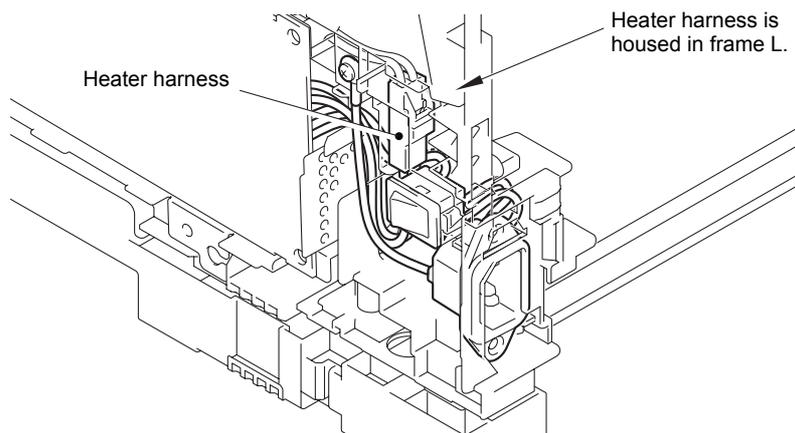


Fig. 3-33

9.14 Main PCB ASSY

(1) Disconnect all harnesses and flat cables from the main PCB ASSY.

Note:

- After disconnecting the flat cable(s), check that the end of each cable is not damaged or short-circuited.
- When connecting the flat cable(s), insert it straight. After insertion, check that the cable is not at an angle.
- Only HL-5440D is equipped with a parallel interface.

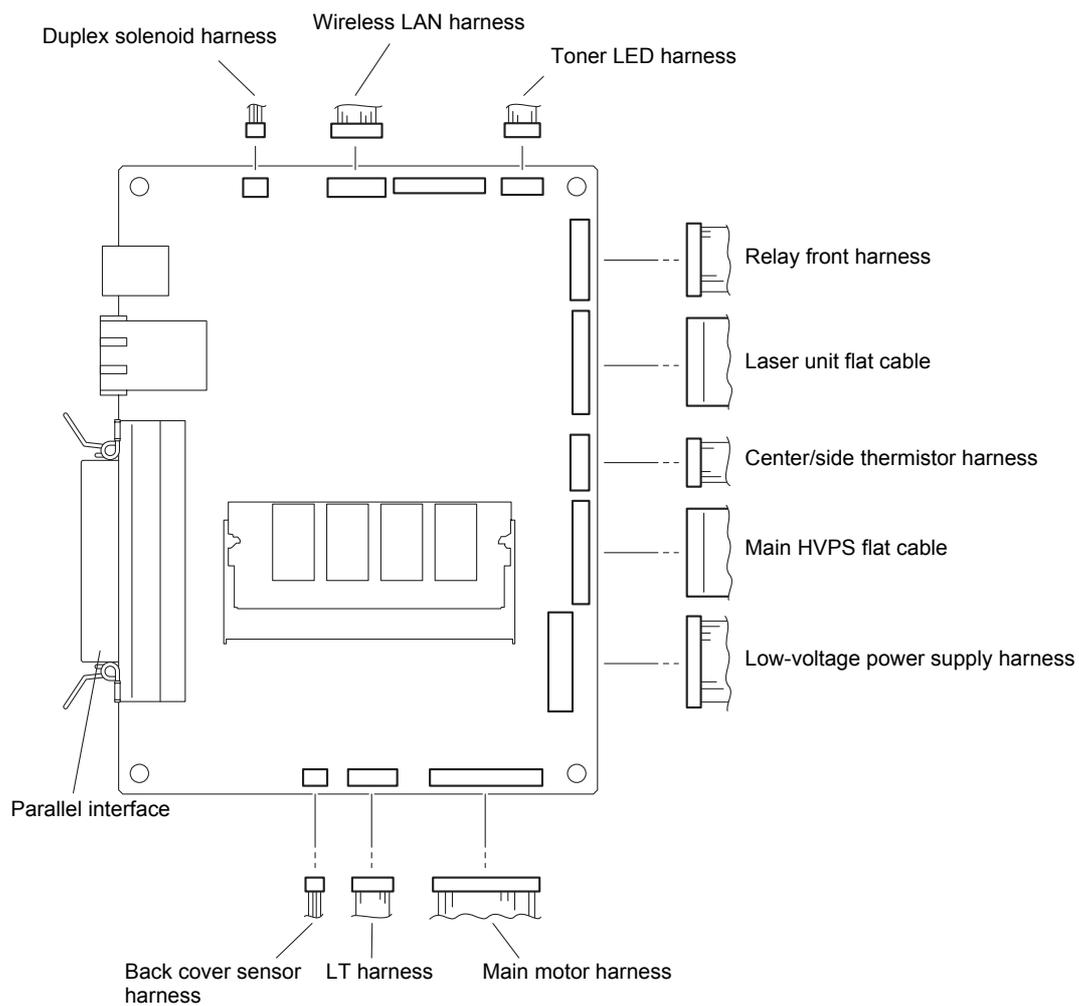


Fig. 3-34

Harness routing: Refer to "1.Main PCB ASSY".

- (2) Remove the four taptite cup S M3x8 SR screws, and remove the main PCB ASSY from the machine.

Note:

- For HL-5440D, remove the two screw pan M3x6 screws on the parallel interface, and remove the main PCB ASSY.

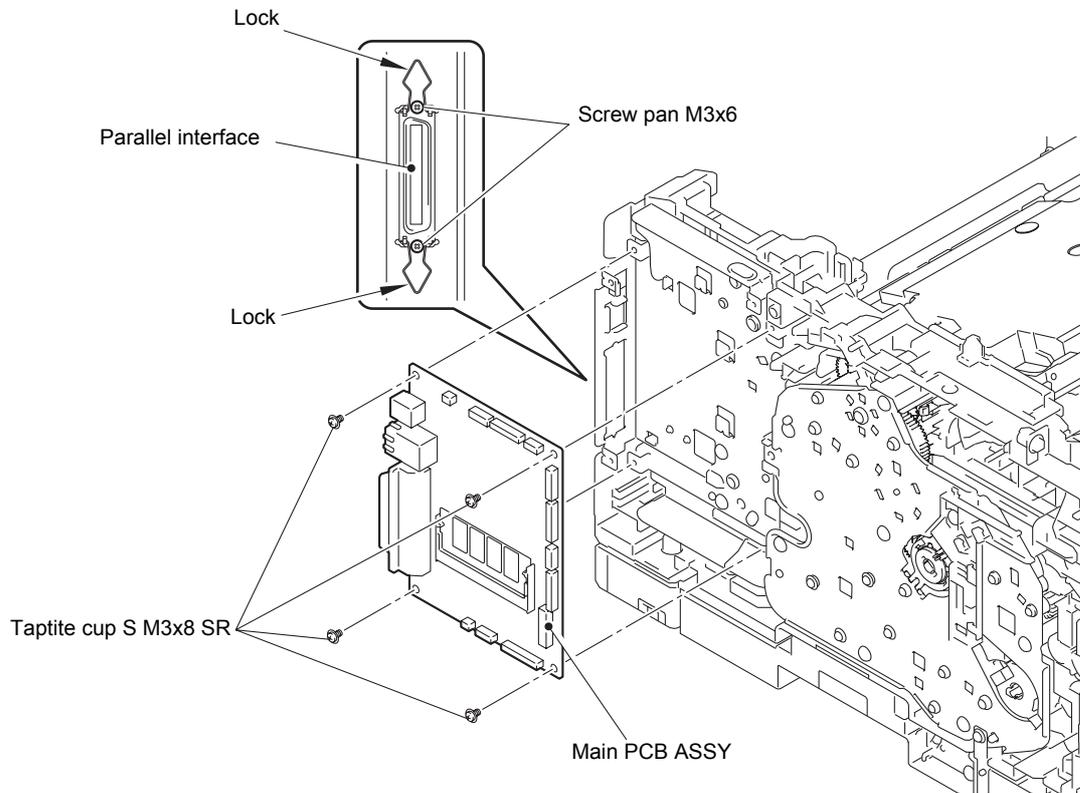


Fig. 3-35

Assembling Note:

- For HL-5440D, raise the two locks for the parallel interface to the upright position, and then attach the main PCB ASSY.

9.15 Laser unit

- (1) Disconnect the laser unit flat cable from the laser unit.
- (2) Remove the four taptite cup S M3x8 SR screws, and remove the laser unit from the machine.

Note:

- Be careful not to touch the lens of the laser unit.

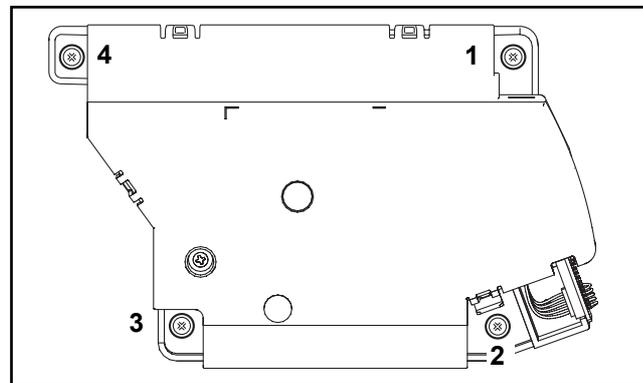
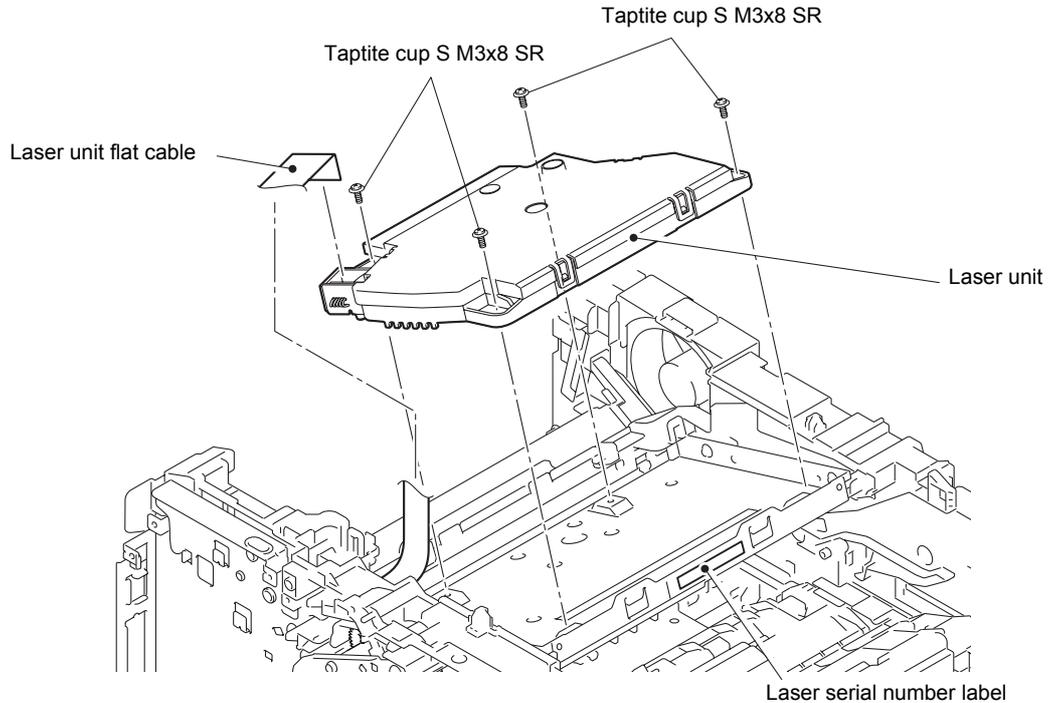


Fig. 3-36

Harness routing: Refer to "1.Main PCB ASSY" and "6.Laser unit".

Assembling Note:

- When attaching the laser unit, tighten the screws in the following order: upper right, lower right, lower left and upper left.
- When connecting the flat cable(s), insert it straight. After insertion, check that the cable is not at an angle.
- After replacing the laser unit, attach the laser serial number label of the new laser unit on the scanner plate as shown in the illustration above.

9.16 Low-voltage power supply PCB ASSY

- (1) Remove the two taptite cup S M3x8 SR screws, and remove the scanner earth plate from the machine.
- (2) Remove the three taptite cup S M3x8 SR screws, taptite bind B M4x12 screw and screw pan M4x8, washer spring 2-4, washer 5, and remove the LV shield plate cover from the machine.
- (3) Remove the LVPS insulation sheet (small, black) and the LVPS insulation sheet (big, semi-transparent) from the machine.

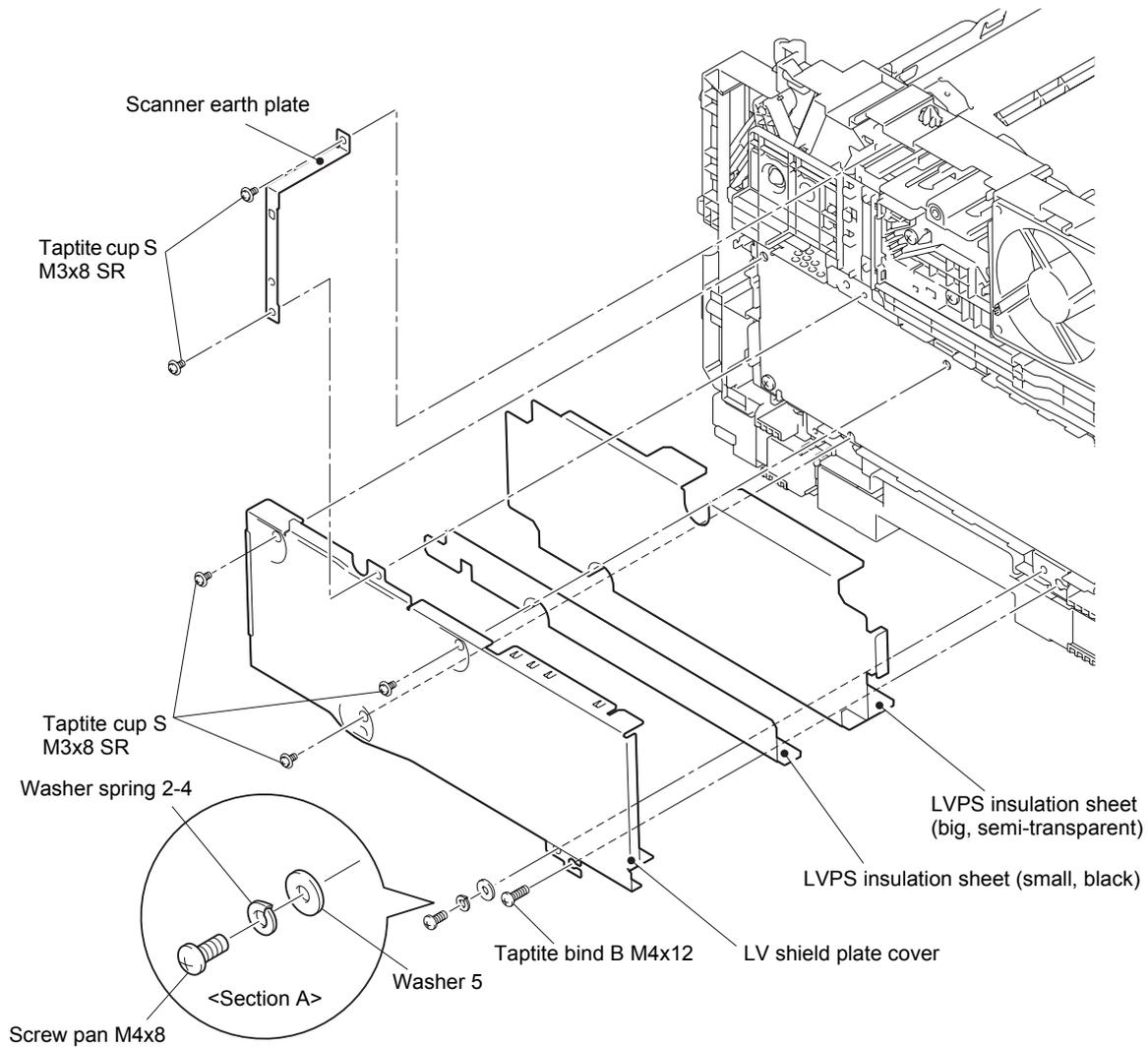


Fig. 3-37

- (4) Remove the taptite flat B M3x10 screw from the inlet.
- (5) Remove the screw pan M4x8, washer spring 2-4, washer 5, and remove the FG harness from the machine.
- (6) Remove the inlet and the power switch from the machine.

Note:

- When removing the power switch, use a flathead screwdriver or similar tool to lift the edge of the power switch to remove it.

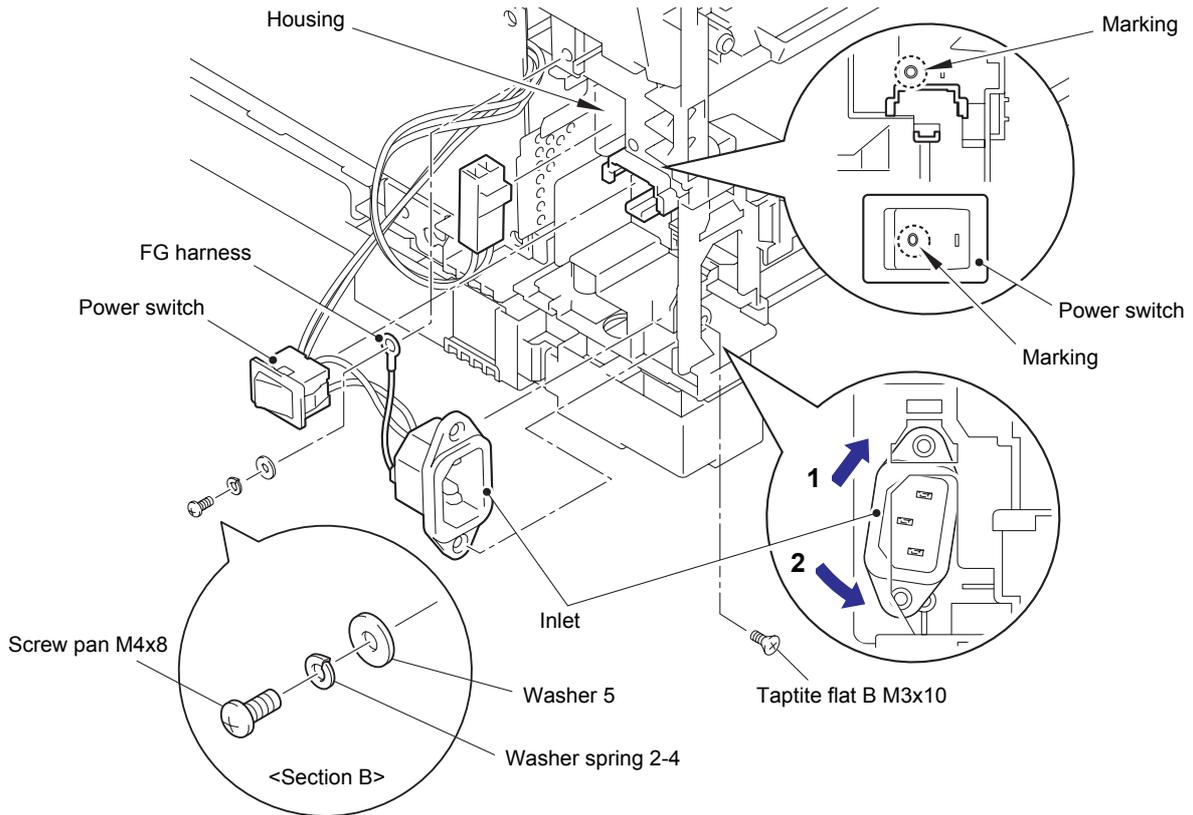
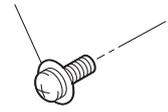
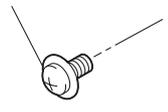
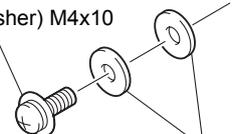
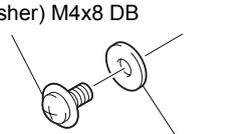


Fig. 3-38

Assembling Note:

- When attaching the power switch, align the marking on the power switch with the marking on the machine.
- Attach the inlet as shown in the illustration above.
- Insert the inlet harness into the housing of the machine.
- For the screws shown in section A and section B, there are two other combinations (see below) in addition to the combination shown in the illustration above. Be sure to use the screw and washer provided with the machine.

<Section A>	
Screw pan (S/P washer) M4x10 	Screw pan (washer) M4x8 DB 

<Section B>	
Screw pan (S/P washer) M4x10  Washer 5	Screw pan (washer) M4x8 DB  Washer 5

- (7) Remove the taptite cup S M3x8 SR screw and the two taptite bind B M4x12 screws to remove the low-voltage power supply PCB ASSY from the machine, and disconnect the low-voltage power supply harness from the low-voltage power supply PCB ASSY.

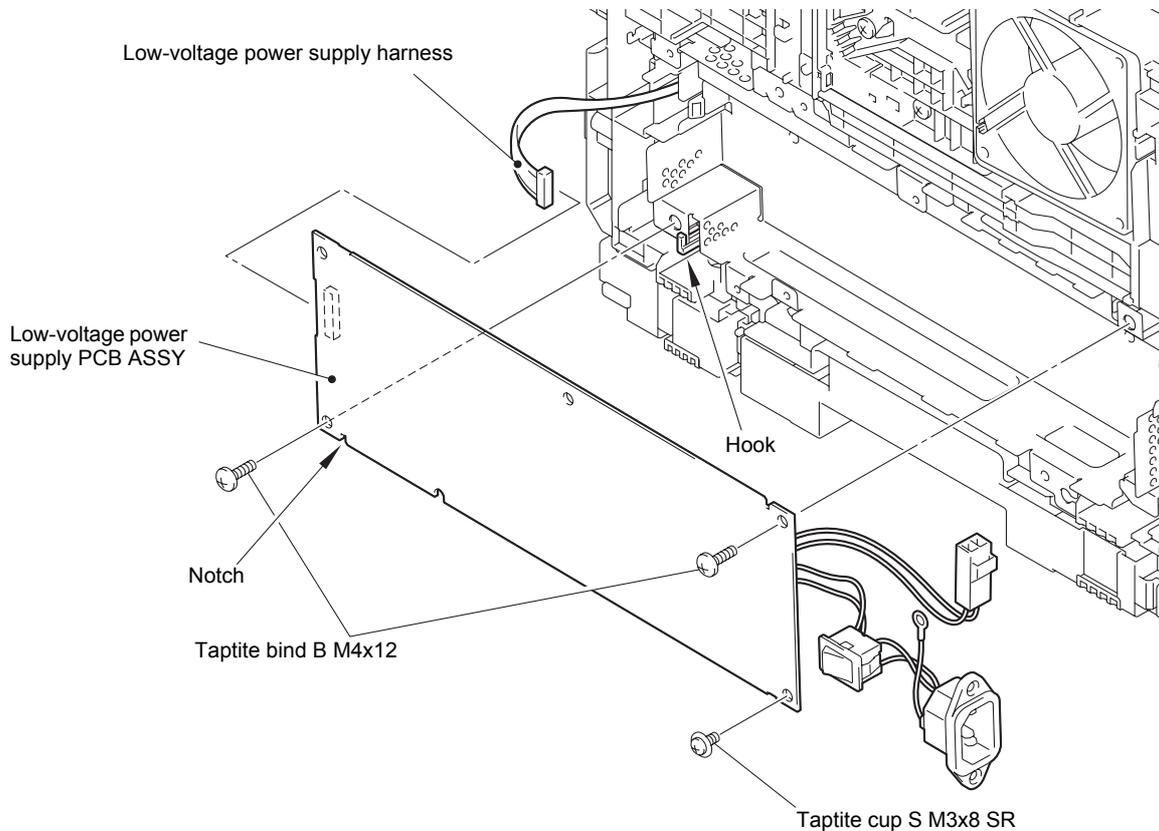


Fig. 3-39

Assembling Note:

- When attaching the low-voltage power supply PCB ASSY, engage the notch on the low-voltage power supply PCB ASSY with the hook on the machine.
- Check that the heater harness is housed in frame L as shown in the illustration below. Otherwise the harness may be caught in some sections of the machine, and may catch fire.

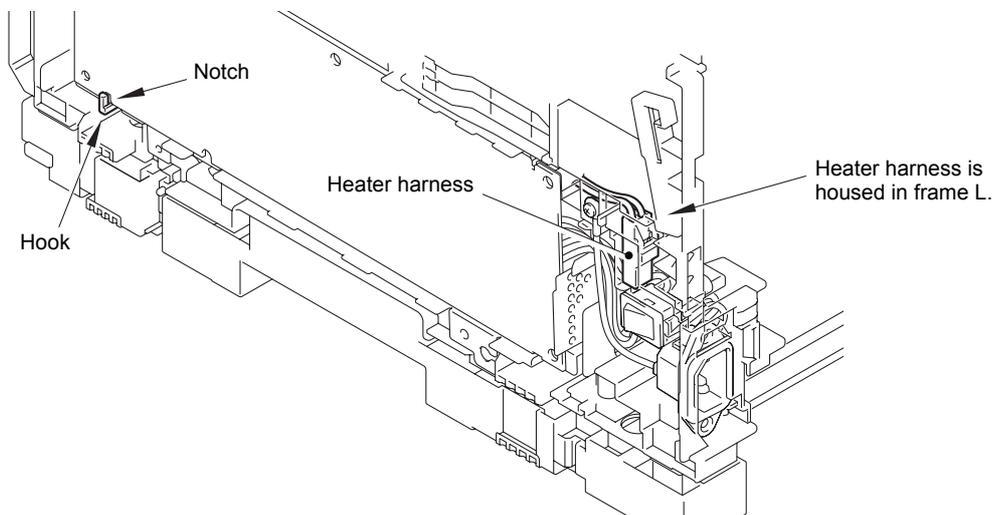


Fig. 3-40

9.17 Toner LED PCB ASSY

- (1) Remove the LV shield plate ground spring from the LV shield plate and the machine.
- (2) Remove the taptite cup S M3x8 SR screw, and lift the under bar earth plate R from the LV shield plate.
- (3) Remove the taptite bind B M4x12 screw, and release the two hooks to remove the LV shield plate from the machine.

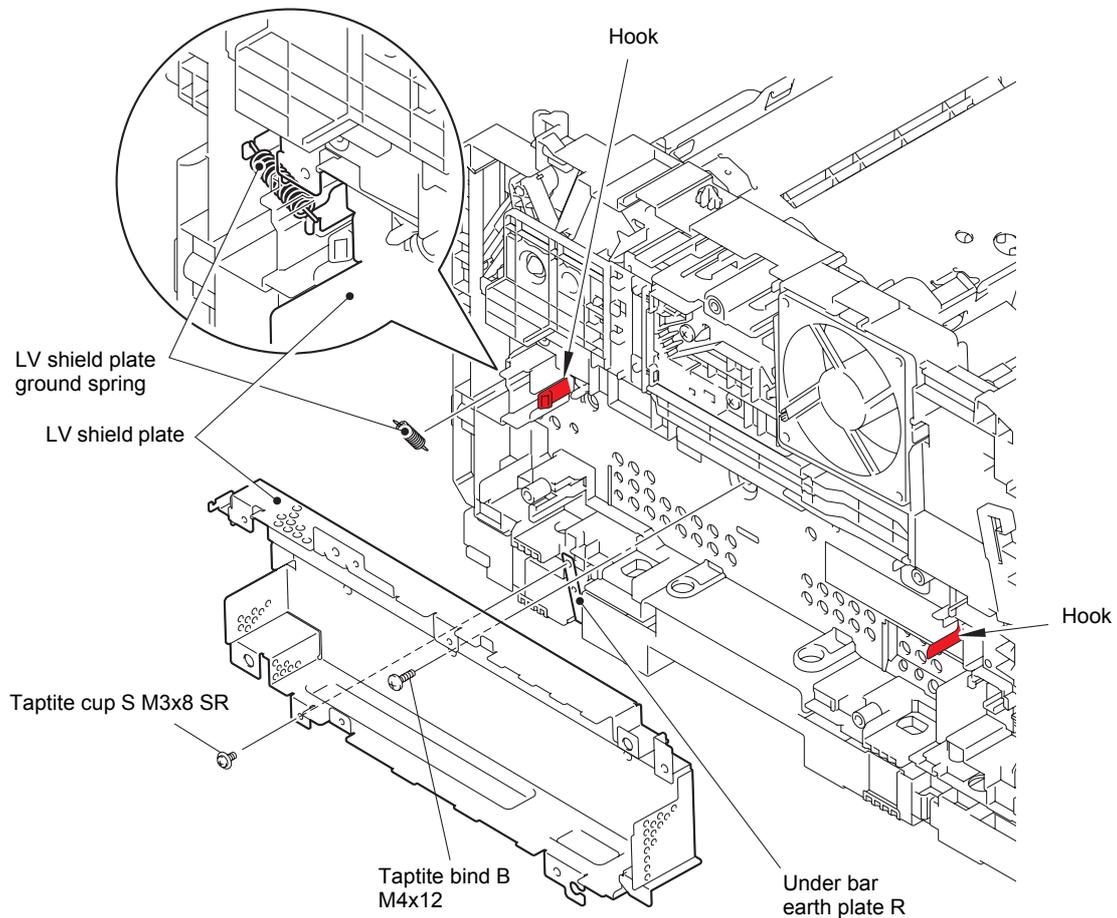


Fig. 3-41

- (4) Remove the tapite bind B M4x12 screw, and release the hook to open the back side of the hold cover 1. Then remove the hold cover 1 from the machine in the direction of the arrow.
- (5) Release the toner LED harness from the securing fixtures.
- (6) Remove the tapite pan B M3x8 screw, and pull out "A" on the pinch ground spring from the toner LED PCB ASSY. Release the two hooks, disconnect the main fan harness from the toner LED PCB ASSY while lifting the toner LED PCB ASSY, and remove the toner LED PCB ASSY from the machine.
- (7) Remove the pinch ground spring from the machine.

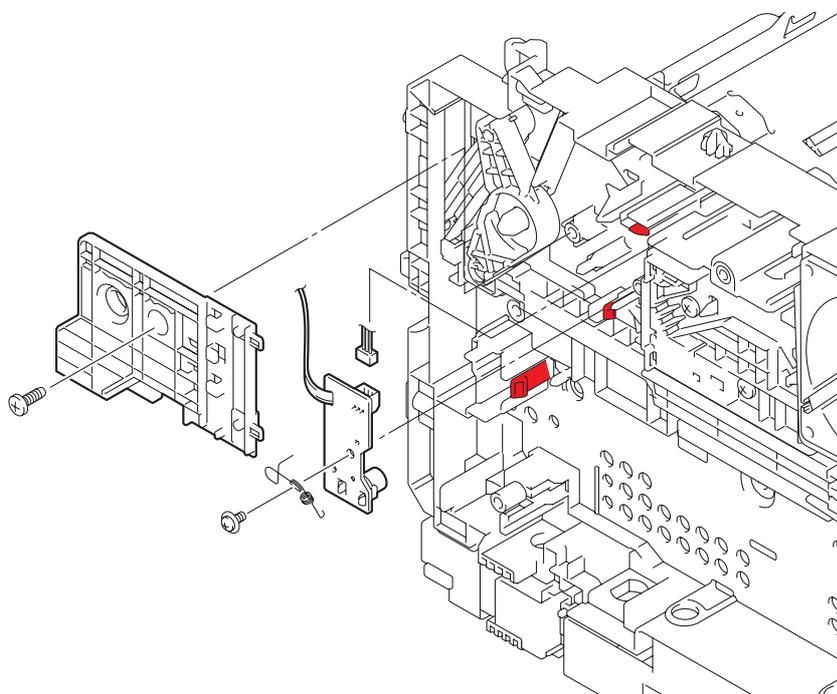


Fig. 3-42

Harness routing: Refer to "1.Main PCB ASSY" and "5.Toner LED PCB ASSY/Main fan".

Assembling Note:

- Engage "B" on the pinch ground spring with the spring on the machine.

9.18 Main fan

- (1) Slide the straight cam in the direction of arrow 1a to remove the boss on the nip release link from the groove on the straight cam. Then slide the straight cam in the direction of arrow 1b to remove it from the machine.

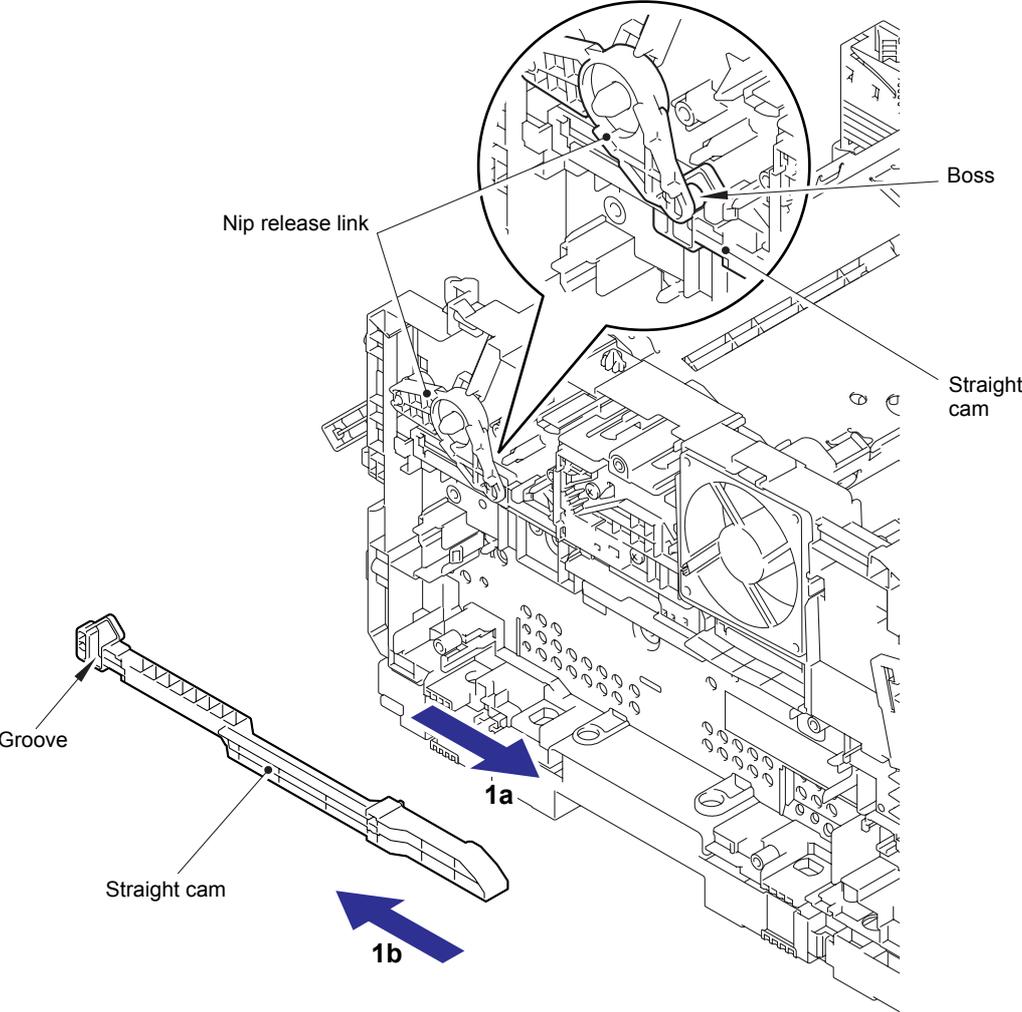


Fig. 3-43

- (2) Remove the two taptite bind B M4x12 screws, and release the hook to open the upper side of the hold cover 2.
- (3) Release the main fan harness from the securing fixtures, and remove the main fan from the machine.

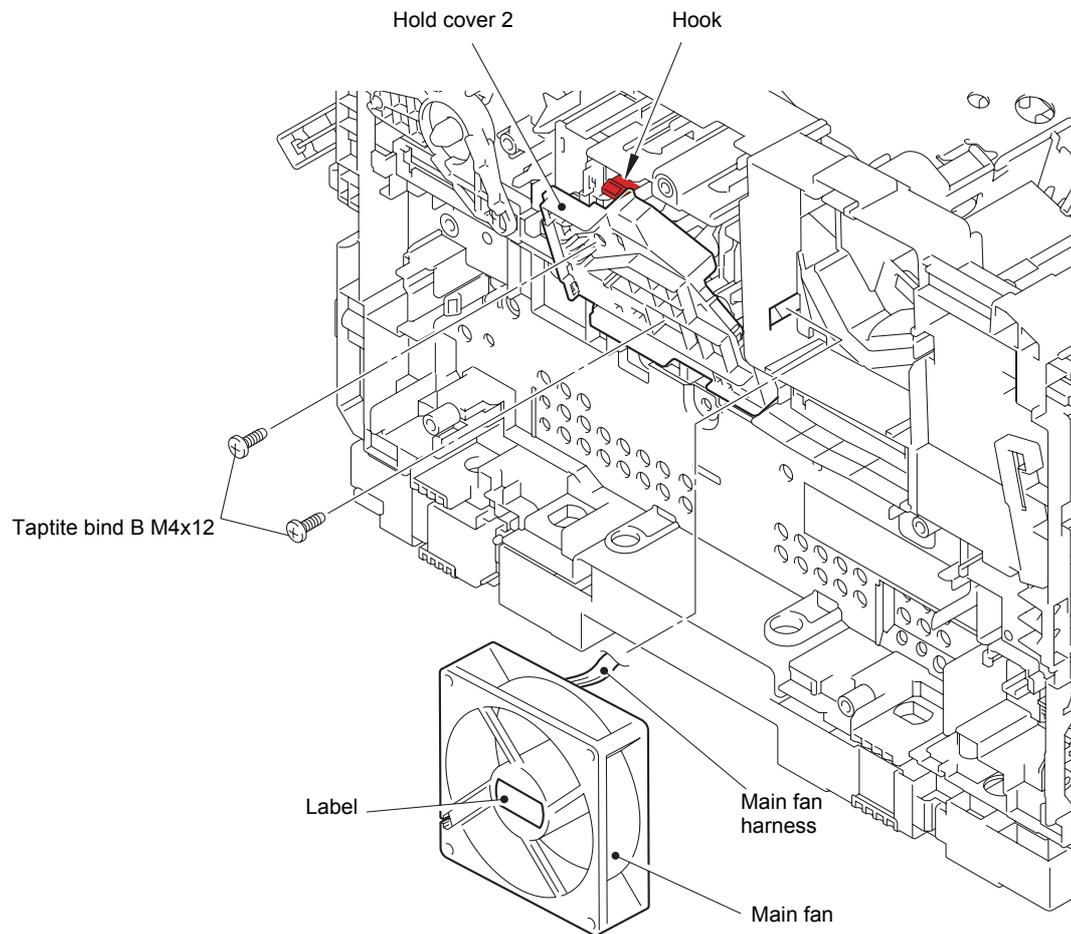


Fig. 3-44

Harness routing: Refer to [“5.Toner LED PCB ASSY/Main fan”](#).

Assembling Note:

- Attach the main fan so that the surface with the label faces out.

9.19 Air duct / Filter

- (1) Release the hook, and remove the filter from the air duct.
- (2) Push the two pins of the air duct to release the pins, and pull the air duct in the direction of the arrow to remove it from the machine.

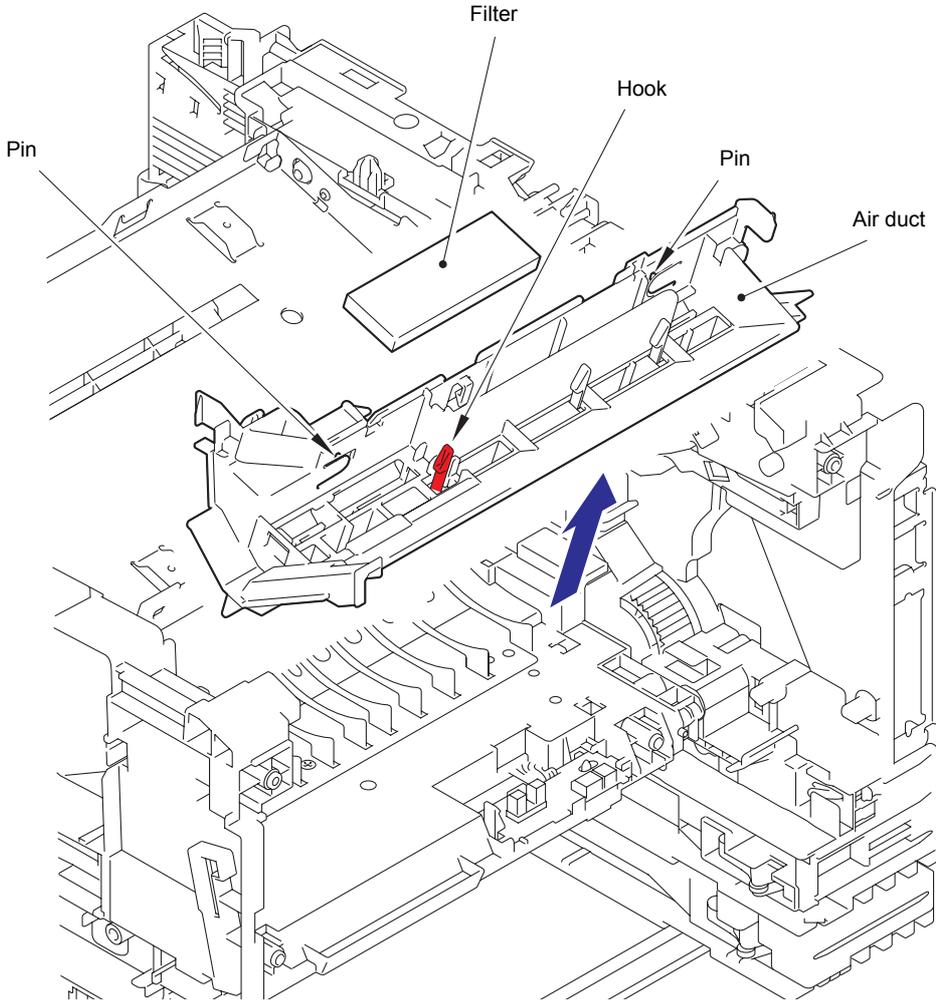


Fig. 3-45

9.20 Relay front PCB ASSY

- (1) Release the relay front harness from the securing fixtures.
- (2) Release the two hooks to remove the front cover sensor from the machine, and then release the front cover sensor harness from the hook.

Note:

- When removing the front cover sensor, push it from the rear to remove it.

- (3) Remove the two hooks to remove the relay front PCB ASSY from the machine, and release all harnesses from hook A.
- (4) Disconnect all harnesses from the relay front PCB ASSY.

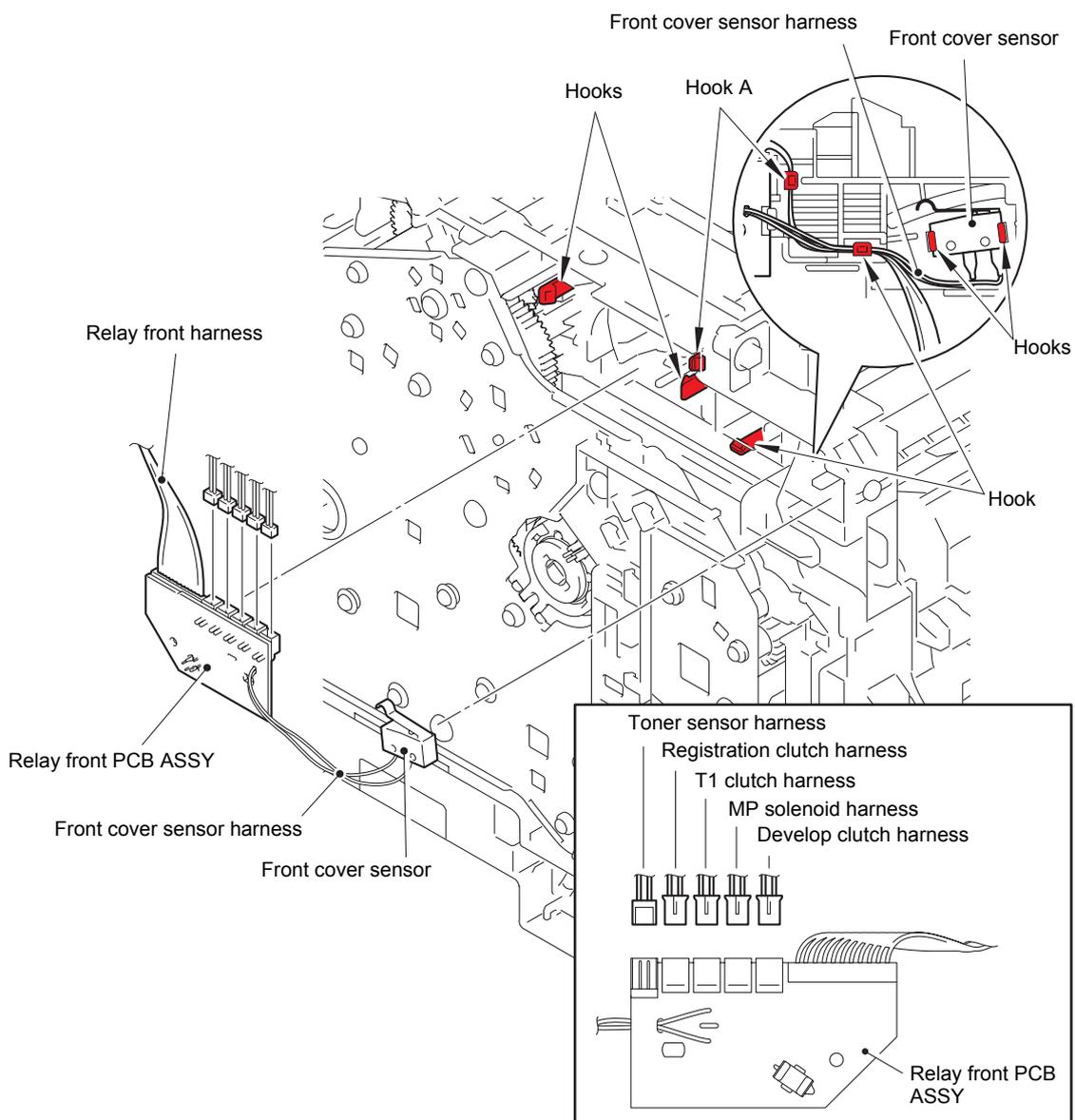


Fig. 3-46

Harness routing: Refer to "1.Main PCB ASSY" and "2.Relay front PCB ASSY".

9.21 Registration clutch / T1 clutch

- (1) Release the registration clutch harness and the T1 clutch harness from the securing fixtures.
- (2) Remove collar 6, and remove the registration clutch from the machine.
- (3) Release the hook, and remove the T1 clutch from the machine.

Note:

- Be careful not to damage the hook on the T1 clutch.

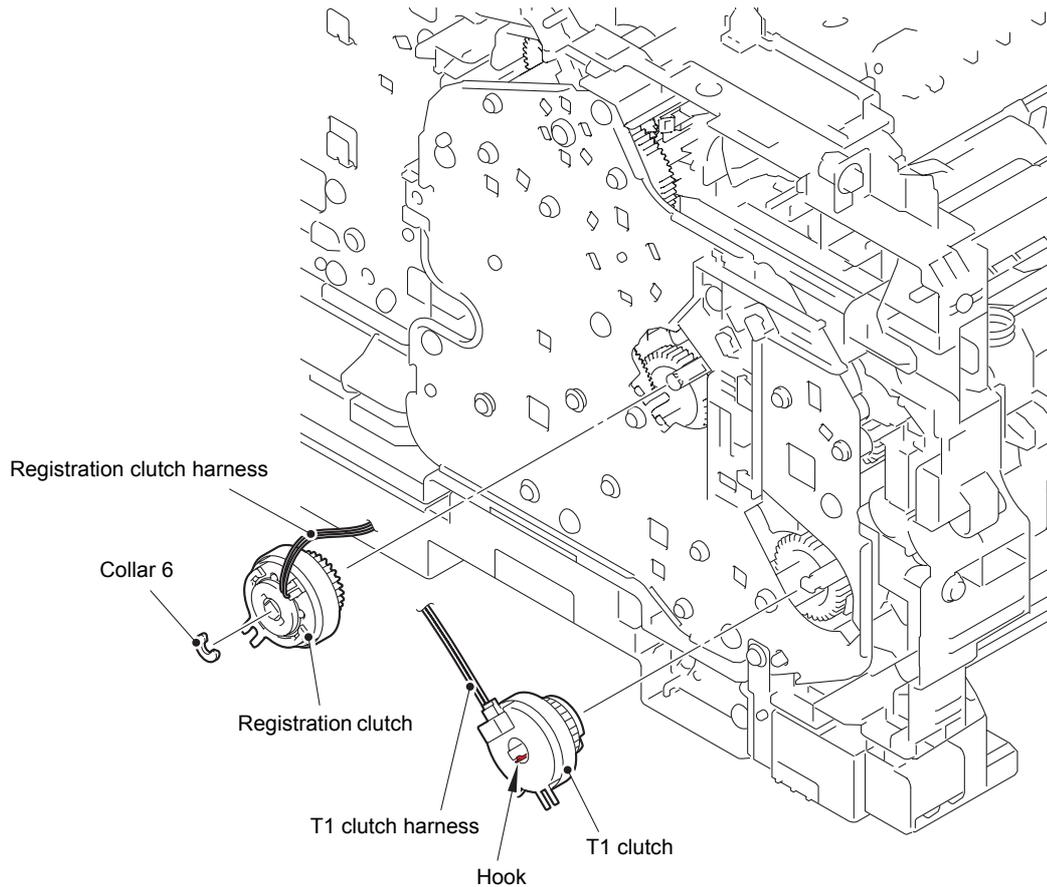


Fig. 3-47

Harness routing: Refer to "2.Relay front PCB ASSY".

9.22 Main frame L ASSY

- (1) Remove the two taptite bind B M4x12 screws, and remove the rear under bar from the machine.

Note:

- Only HL-6180DW/6180DWT is equipped with a rear under bar.

- (2) Remove the two taptite bind B M4x12 screws, and remove the front under bar and the under bar earth plate R.
- (3) Remove the taptite cup S M3x8 SR screw, and remove the under bar earth plate L from the machine.
- (4) Remove the main PCB insulation sheet (transparent) and the main PCB insulation sheet (black) from the machine.
- (5) Turn the registration roller bushing of the registration roller to the position as shown in the illustration below, and pull out the registration roller from the machine.

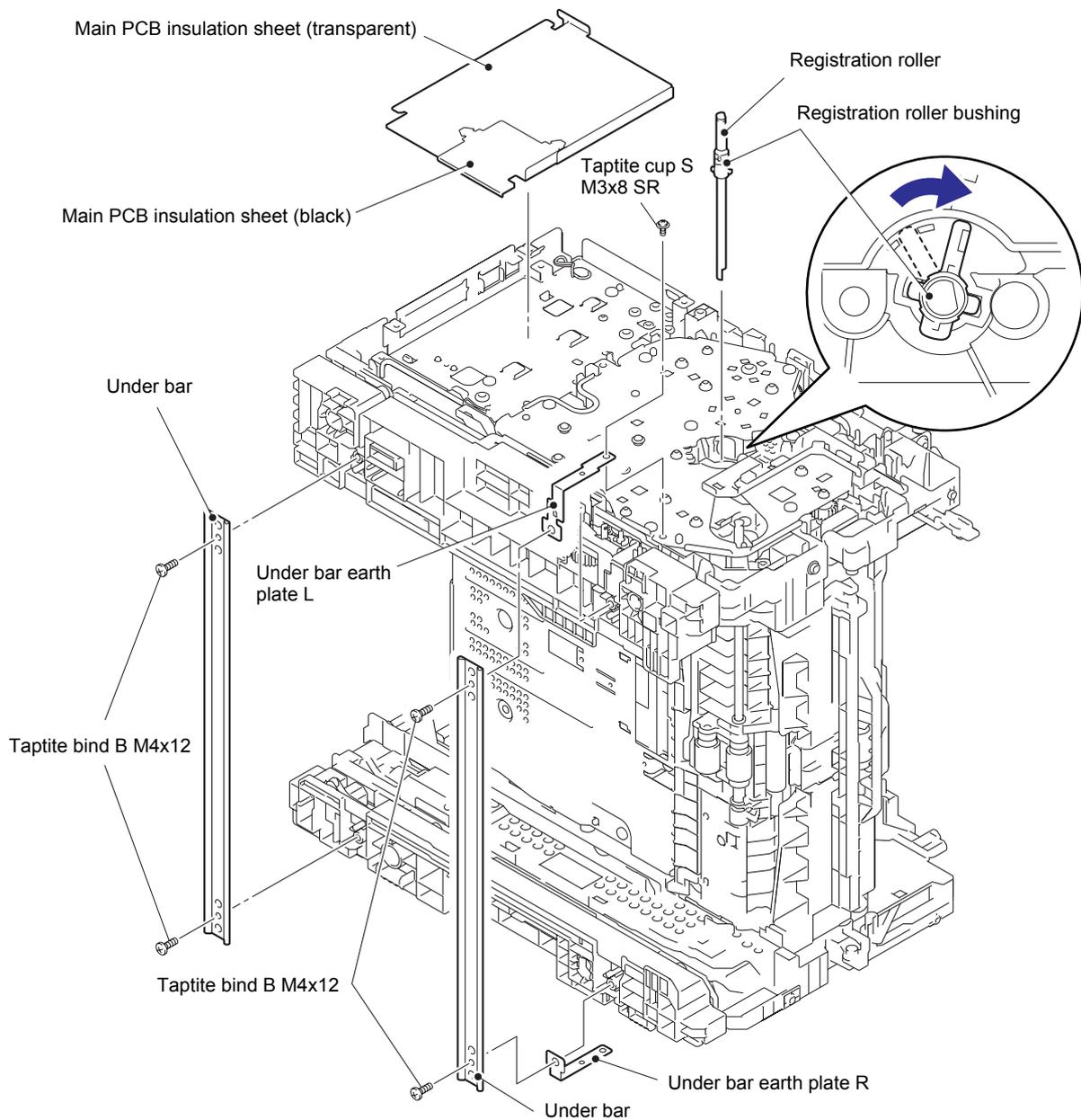


Fig. 3-48

- (6) Remove the three taptite cup S M3x8 SR screws and four taptite bind B M4x12 screws, and remove the main frame L ASSY from the machine. Then pull out the low-voltage power supply harness, the eject sensor harness and the main HVPS flat cable from the main frame L ASSY.

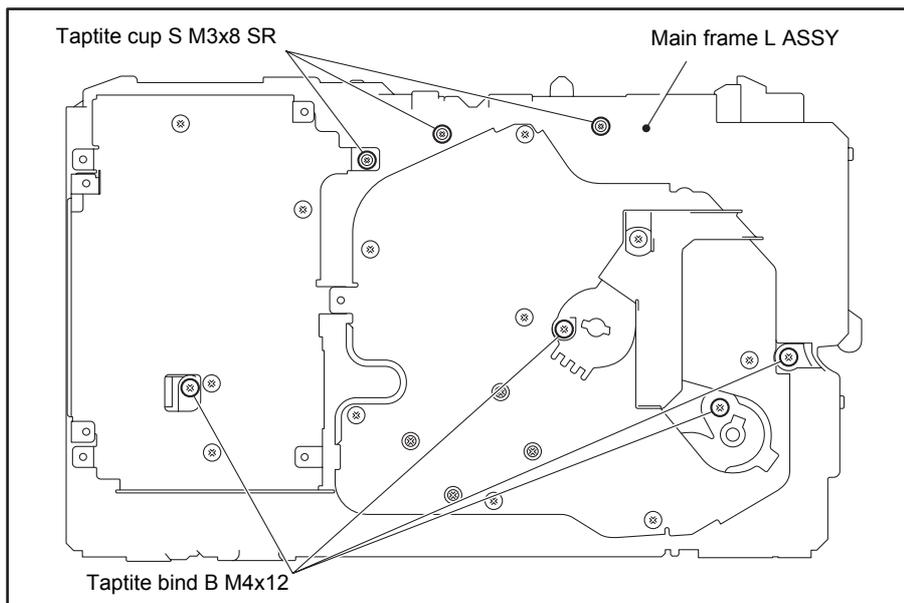
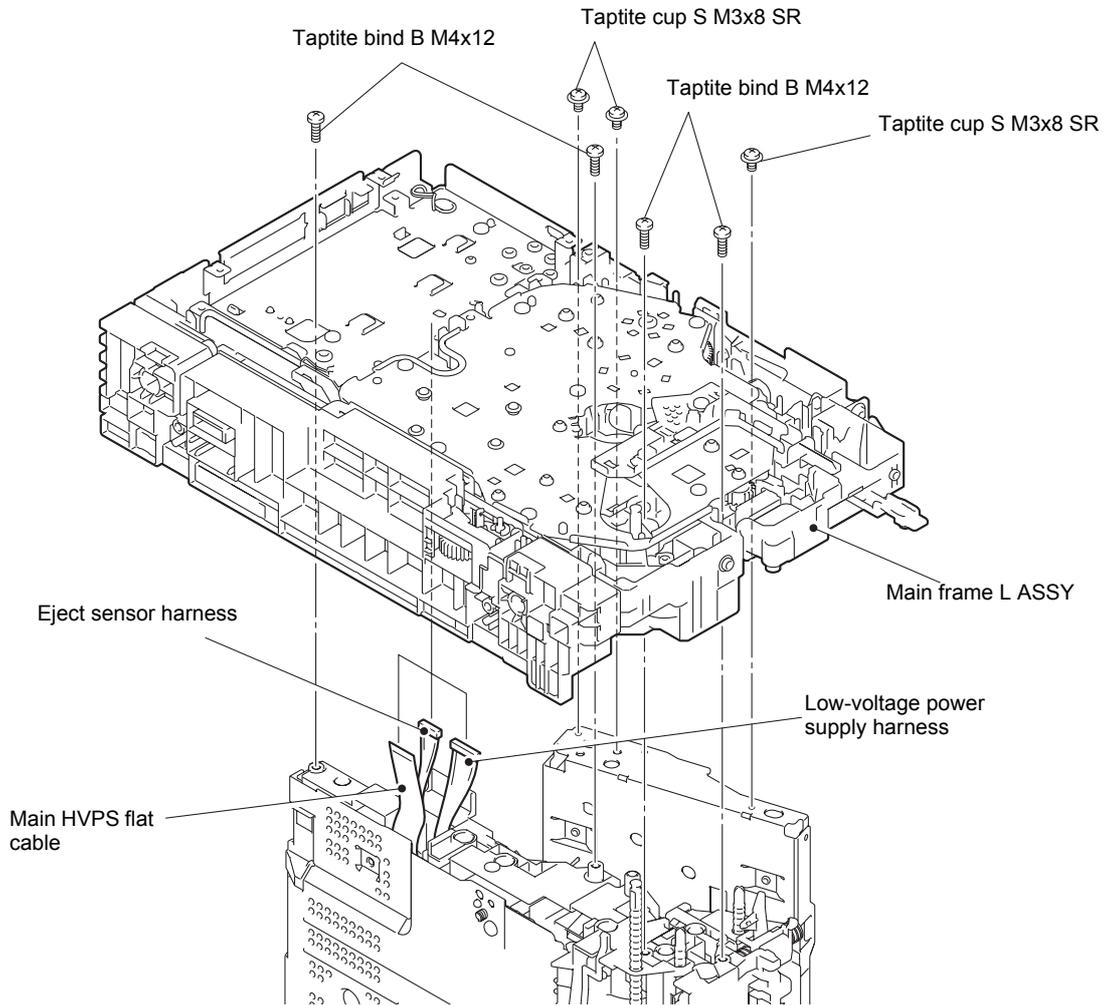


Fig. 3-49

9.23 Main motor ASSY

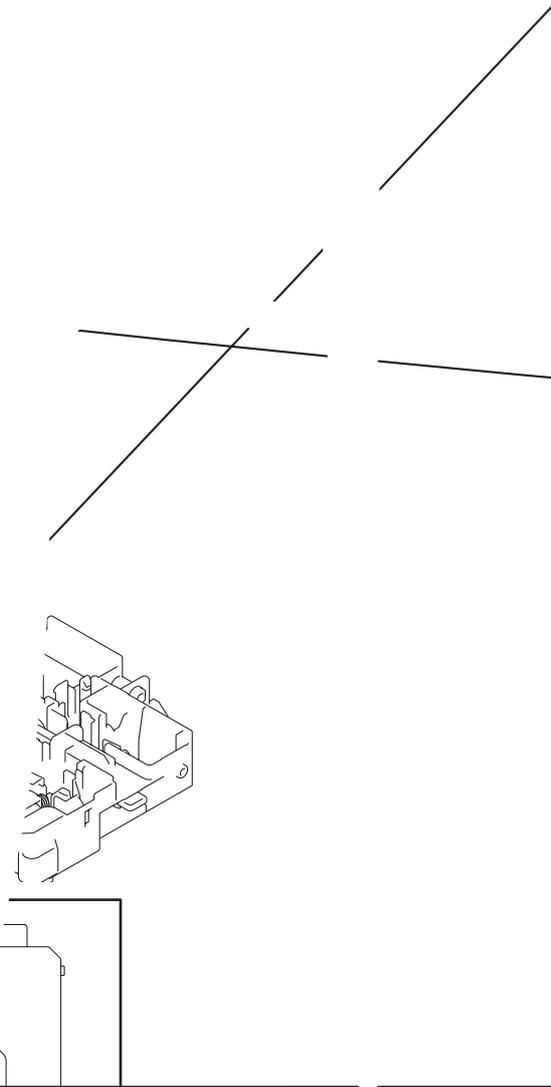
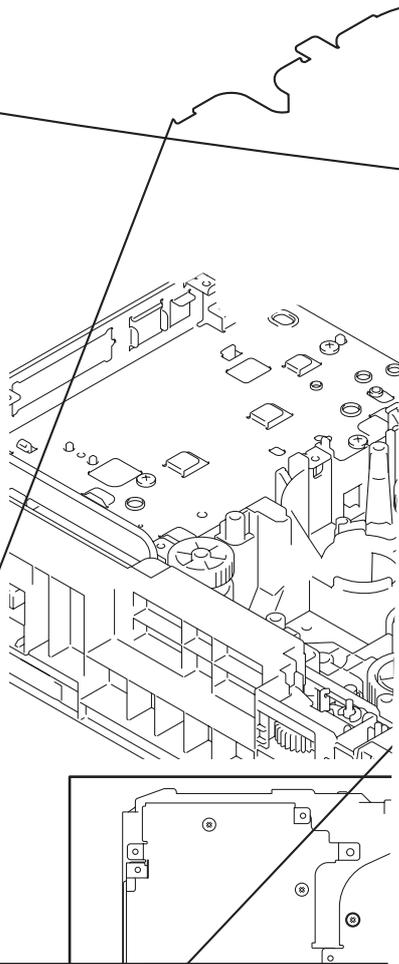
- (1) Remove the eight taptite bind B M4x12 : the main frame L ASSY.
For HL-5440D, screw A (taptite cup S M

Note:

- When removing the drive sub ASSY, drive sub ASSY.

→ the drive sub ASSY from
moved.

→ the shaft of the



Note:

- Do not allow the metallic gear shaft of the main motor ASSY and drive sub ASSY to face down. Failure to observe this may cause the steel plate to bend.

- (2) Remove the four taptite cup S M3x8 SR screws, and remove the main motor ASSY and the main motor cover from the drive sub ASSY.
- (3) Remove the fuser gear 35/83R and the DRM gear 32/83R from the main motor ASSY.

Note:

- Be careful not to damage the gear teeth.

- (4) Disconnect the main motor harness from the main motor ASSY.
- (5) Remove the two taptite bind B M3x10 screws, and remove the main motor ASSY from the main motor cover.

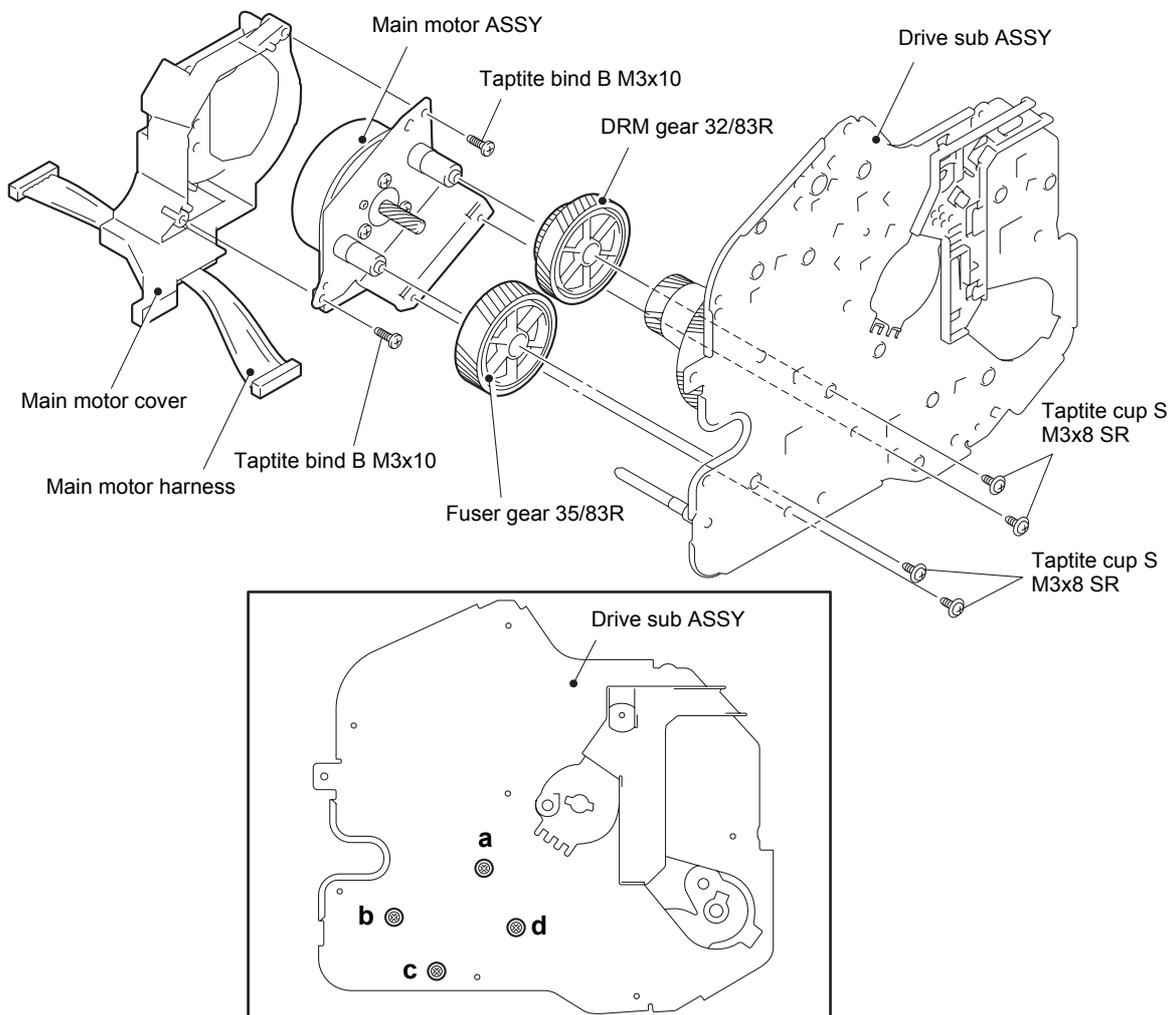


Fig. 3-51

Assembling Note:

- When securing the main motor cover with screws, tighten the screws in the sequence of the alphabetical characters engraved on the drive sub ASSY.

9.24 Develop joint gear 37 / Develop joint

- (1) Tilt the develop joint to remove it from the drive sub ASSY, and then remove the develop joint spring from the drive sub ASSY.

Note:

- When removing the develop joint, be careful not to damage the hooks.

- (2) Pull out the develop joint gear 37 from the drive sub ASSY.

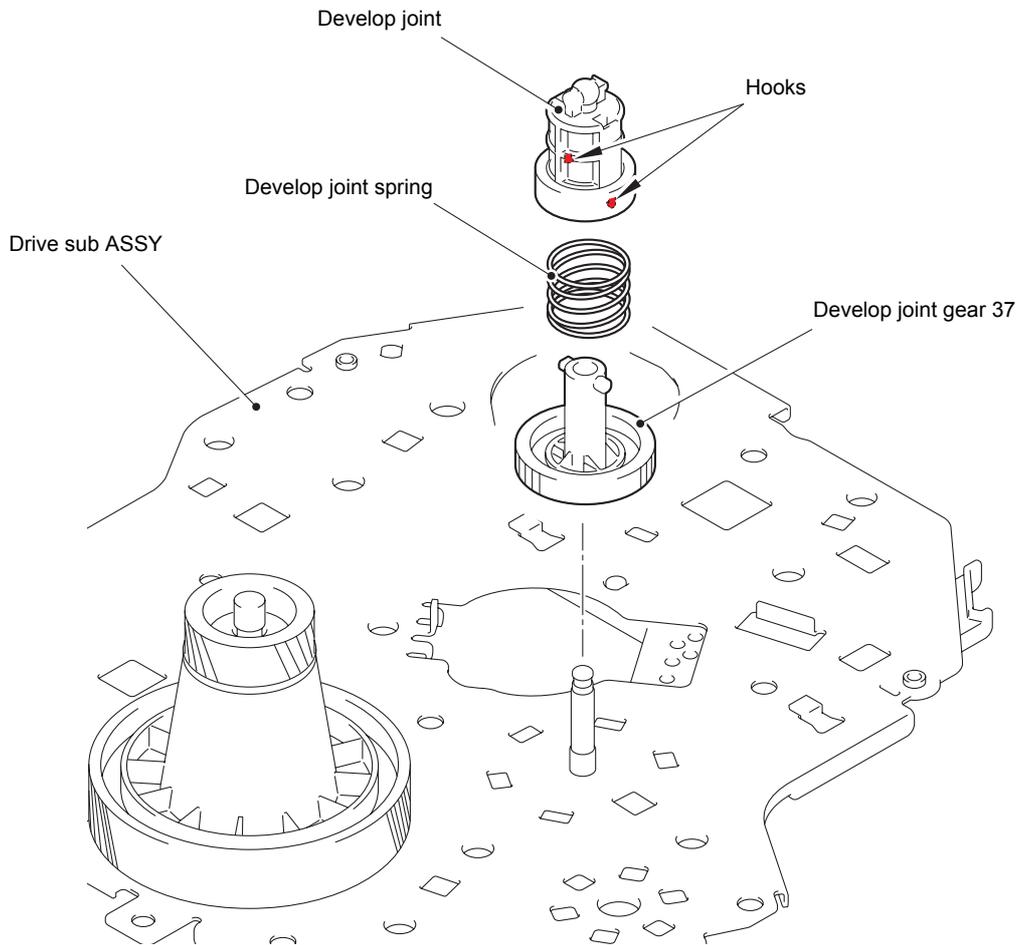


Fig. 3-52

9.25 LT drive gear 29

- (1) Pull out the LT drive gear 29 from the main frame L ASSY.

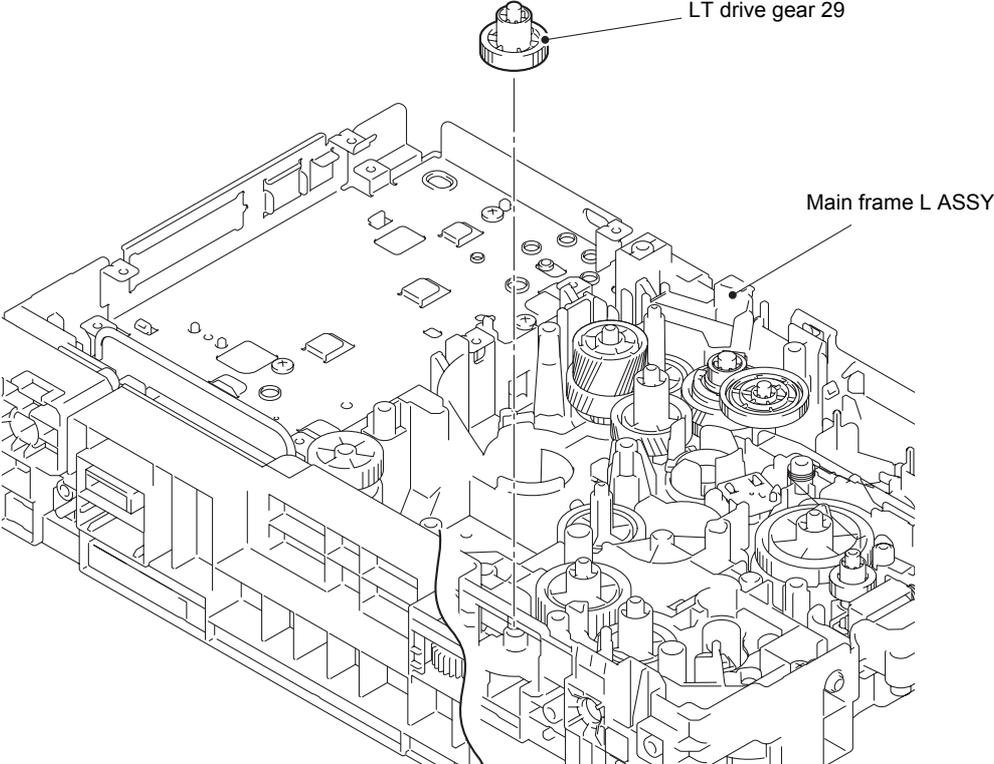


Fig. 3-53

9.26 Toner sensor PCB ASSY

- (1) Remove the MP sector gear spring from the main frame L ASSY.
- (2) Release the toner sensor harness from the securing fixtures.
- (3) Release the two hooks to remove the toner sensor PCB ASSY from the main frame L ASSY.
- (4) Release the two hooks to remove the toner LED holder from the toner sensor PCB ASSY.

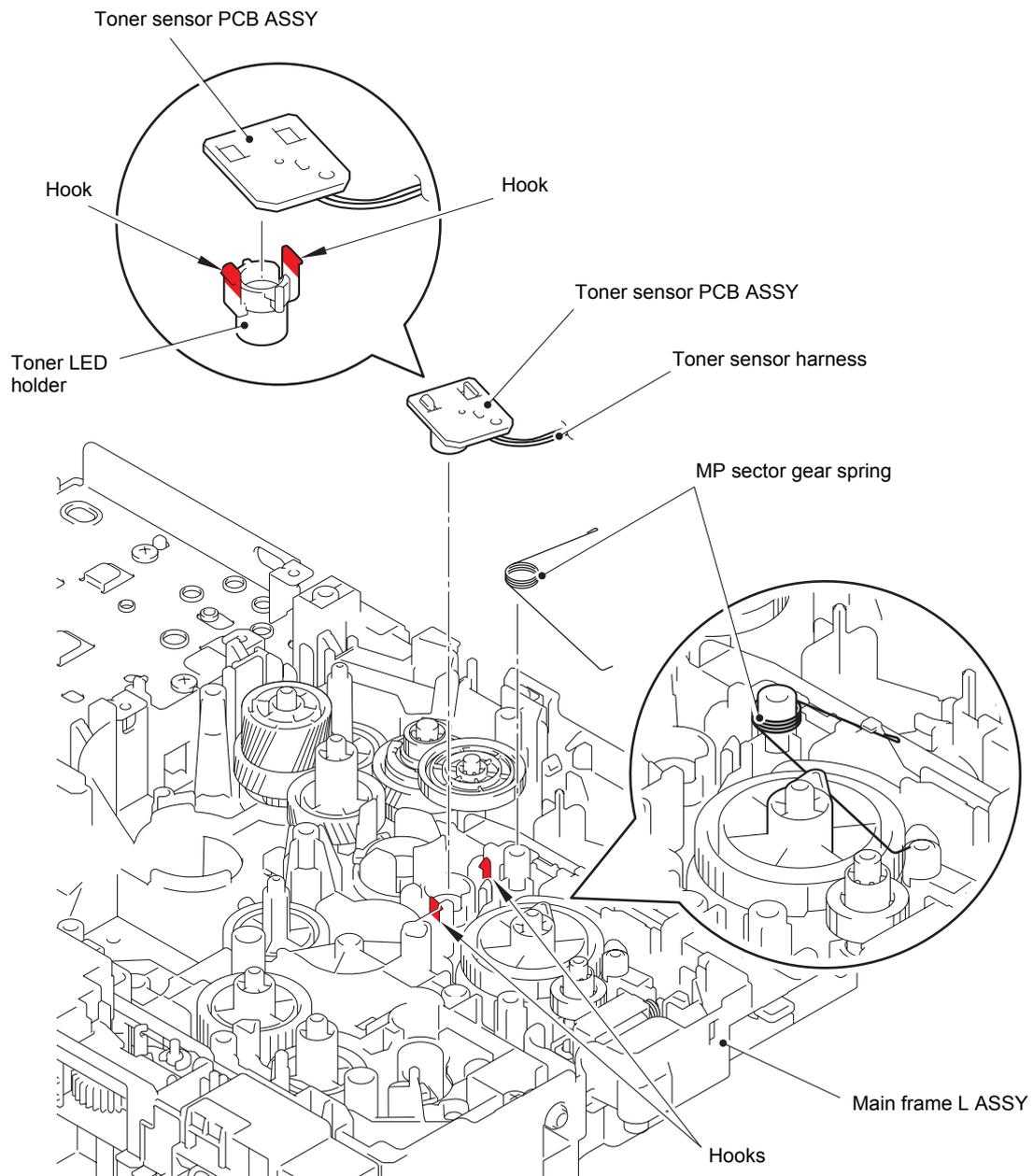


Fig. 3-54

Harness routing: Refer to "2.Relay front PCB ASSY".

9.27 MP solenoid

- (1) Remove the MP drive gear 18 from the main frame L ASSY.
- (2) Release the MP solenoid harness from the securing fixtures.
- (3) Remove the taptite bind B M3x10 screw, and remove the MP solenoid and the MP solenoid lever from the main frame L ASSY.
- (4) Remove the MP solenoid lever and the MP solenoid spring from the MP solenoid.

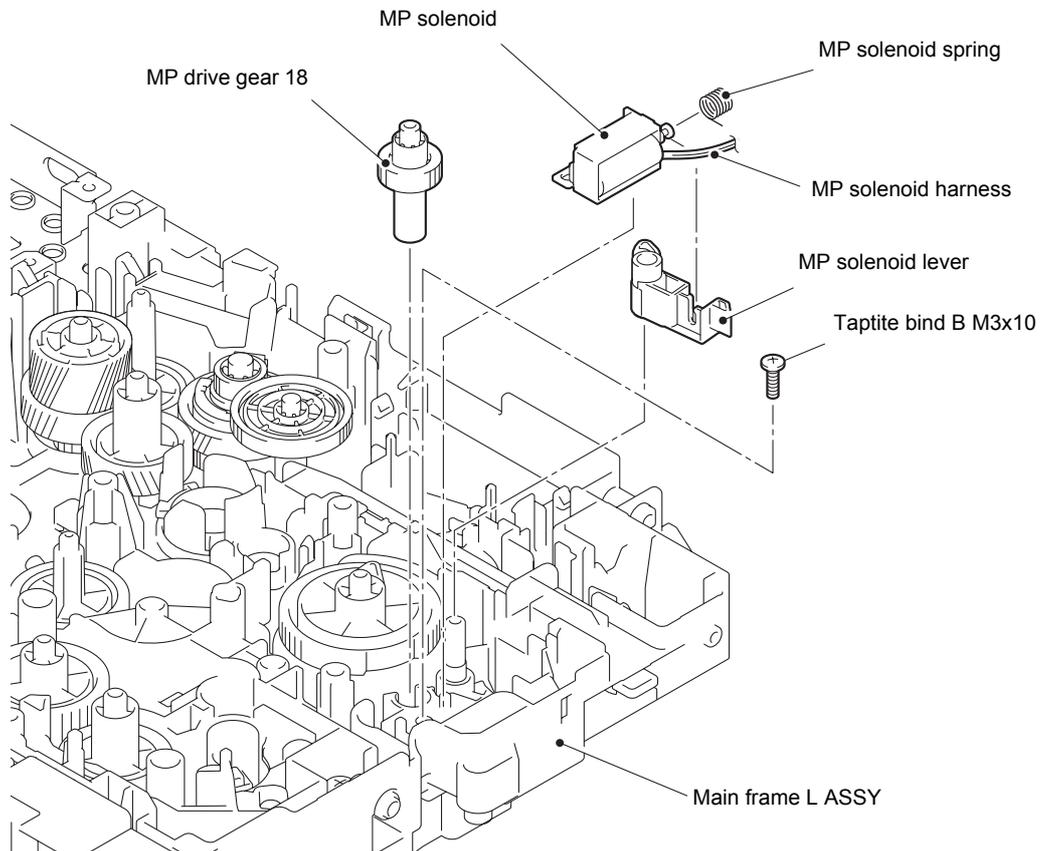


Fig. 3-55

Harness routing: Refer to "2.Relay front PCB ASSY".

9.28 Develop clutch 51R / Develop one way clutch 53

- (1) Remove the develop idle gear 53 from the main frame L ASSY.
- (2) Remove the develop shaft gear 22 from the main frame L ASSY.
- (3) Release the develop clutch harness from the securing fixtures, and remove the develop clutch 51R from the main frame L ASSY.
- (4) Remove the develop one way clutch 53 from the main frame L ASSY.

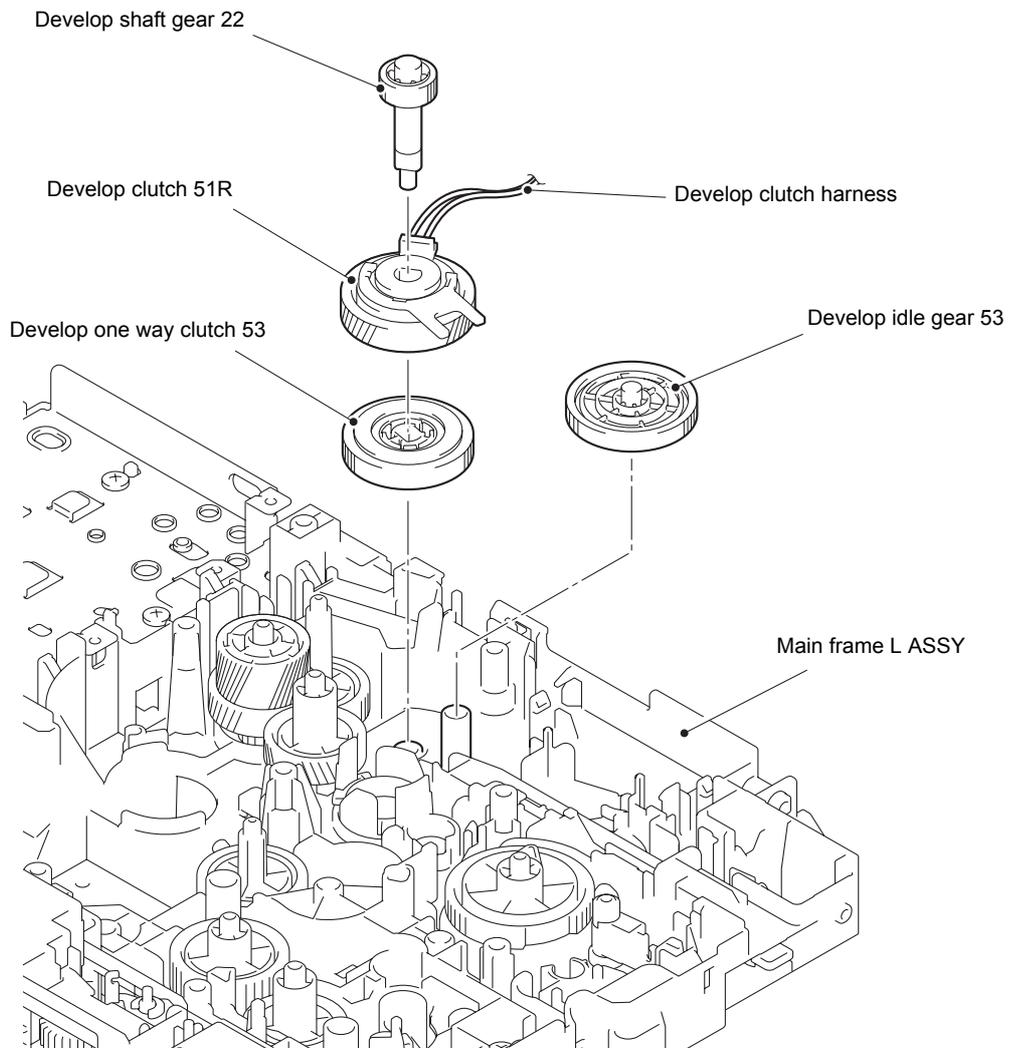


Fig. 3-56

Harness routing: Refer to "2.Relay front PCB ASSY".

Assembling Note:

- Attach the develop one way clutch 53 so that it faces as shown in the illustration above.

9.29 New toner actuator

- (1) Remove "A" on the new toner actuator spring from the main frame L ASSY. Turn the new toner actuator in the direction of the arrow, and release the hook to remove the new toner actuator from the main frame L ASSY.
- (2) Remove the new toner actuator spring from the new toner actuator.

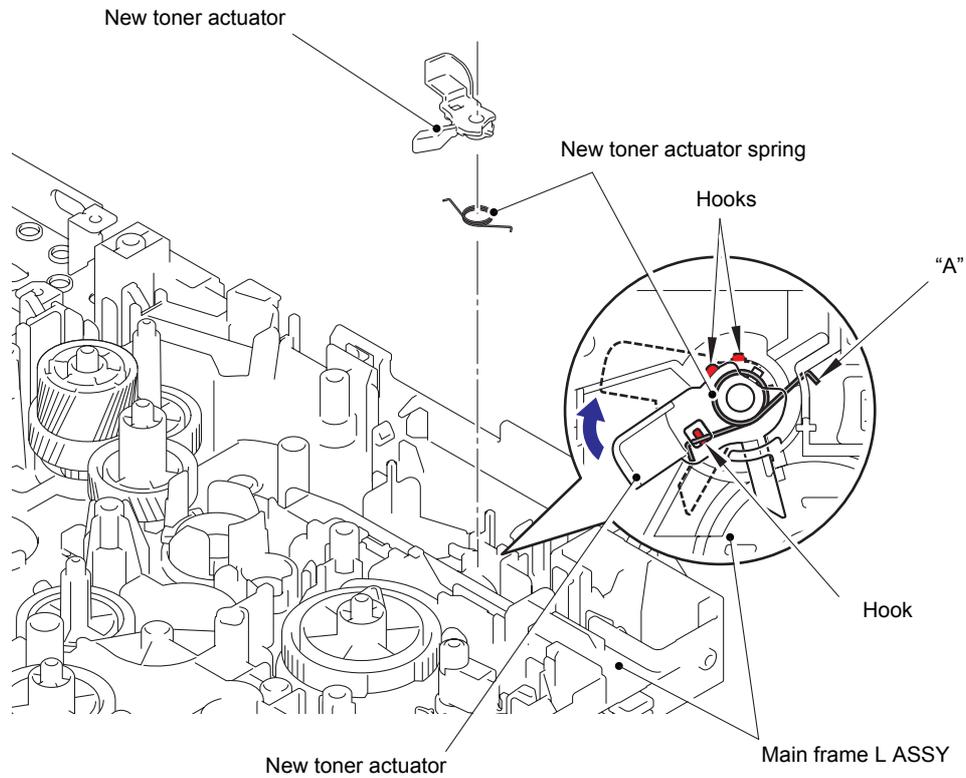


Fig. 3-57

Assembling Note:

- When attaching the new toner actuator, pay attention to the direction, referring to the illustration above.

9.30 Fuser drive gear 39

- (1) Remove the four Taptite bind B M4x12 screws, and release the two hooks to remove the main PCB shield calking ASSY from the main frame L ASSY. Then pull out the duplex solenoid harness from the main PCB shield calking ASSY.

Note:

- Do not allow the metallic gear shaft of the main PCB shield calking ASSY to face down. Failure to observe this may cause the steel plate to bend.

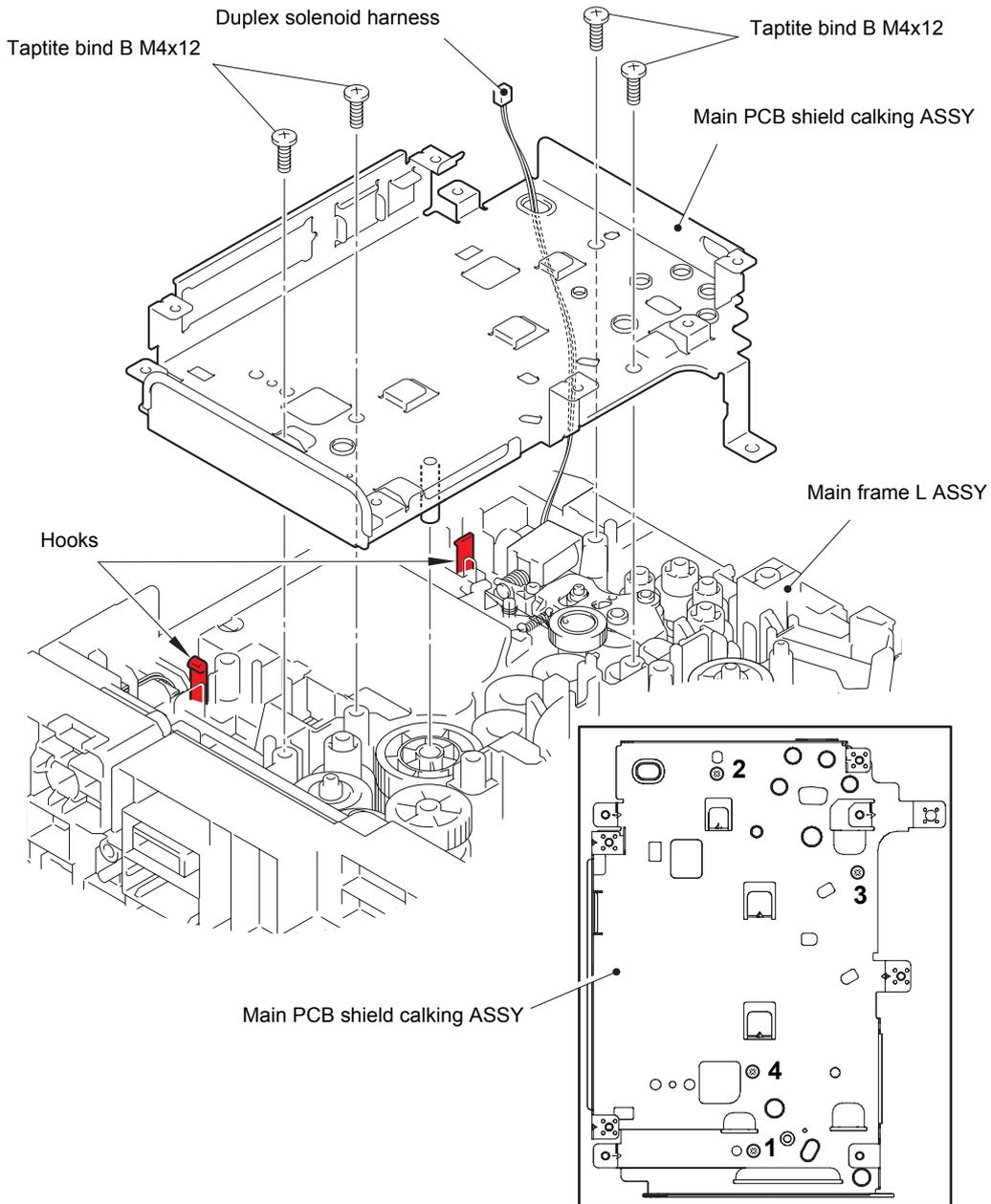


Fig. 3-58

Assembling Note:

- When securing the main PCB shield calking ASSY with screws, tighten the screws in the sequence of the numbers engraved on the main PCB shield calking ASSY.

(2) Remove the fuser drive gear 39 from the main frame L ASSY.

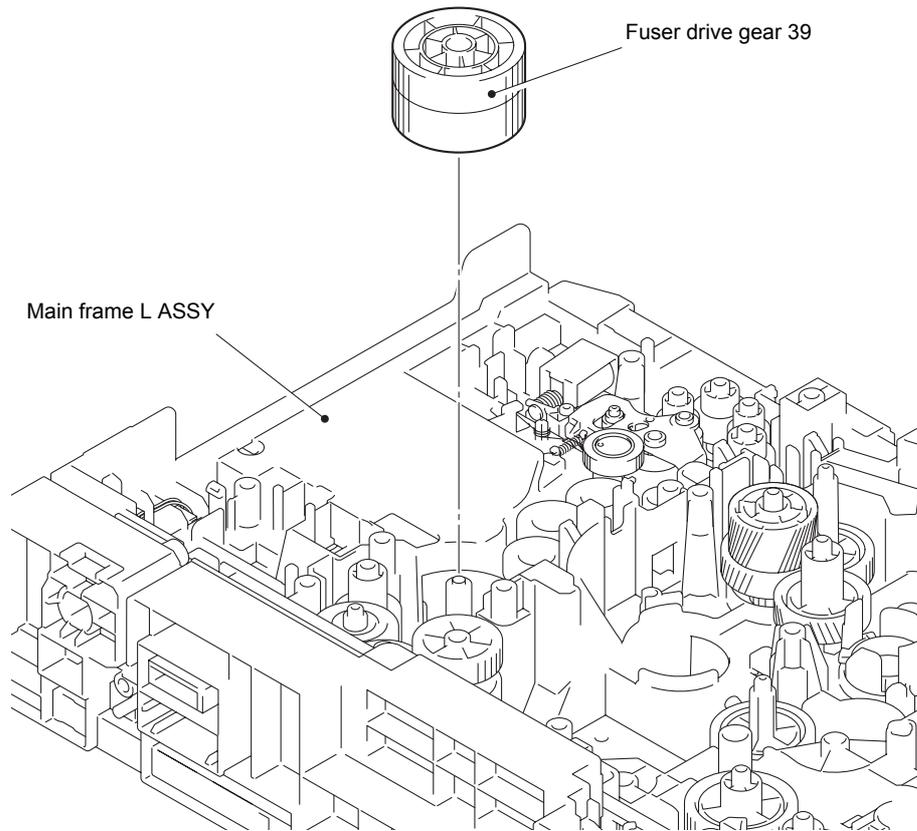


Fig. 3-59

9.31 Duplex solenoid

- (1) Remove the eject idle gear 20 from the main frame L ASSY.
- (2) Remove the eject switch arm spring from the main frame L ASSY.
- (3) Remove the eject switch arm from the main frame L ASSY.
- (4) Remove the eject sector gear spring from the main frame L ASSY.
- (5) Remove the eject sector gear from the main frame L ASSY.
- (6) Remove the taptight bind B M3x10 screw, and remove the duplex solenoid and the duplex solenoid lever from the main frame L ASSY. Then remove the duplex solenoid lever from the duplex solenoid.
- (7) Remove the duplex solenoid spring from the duplex solenoid.

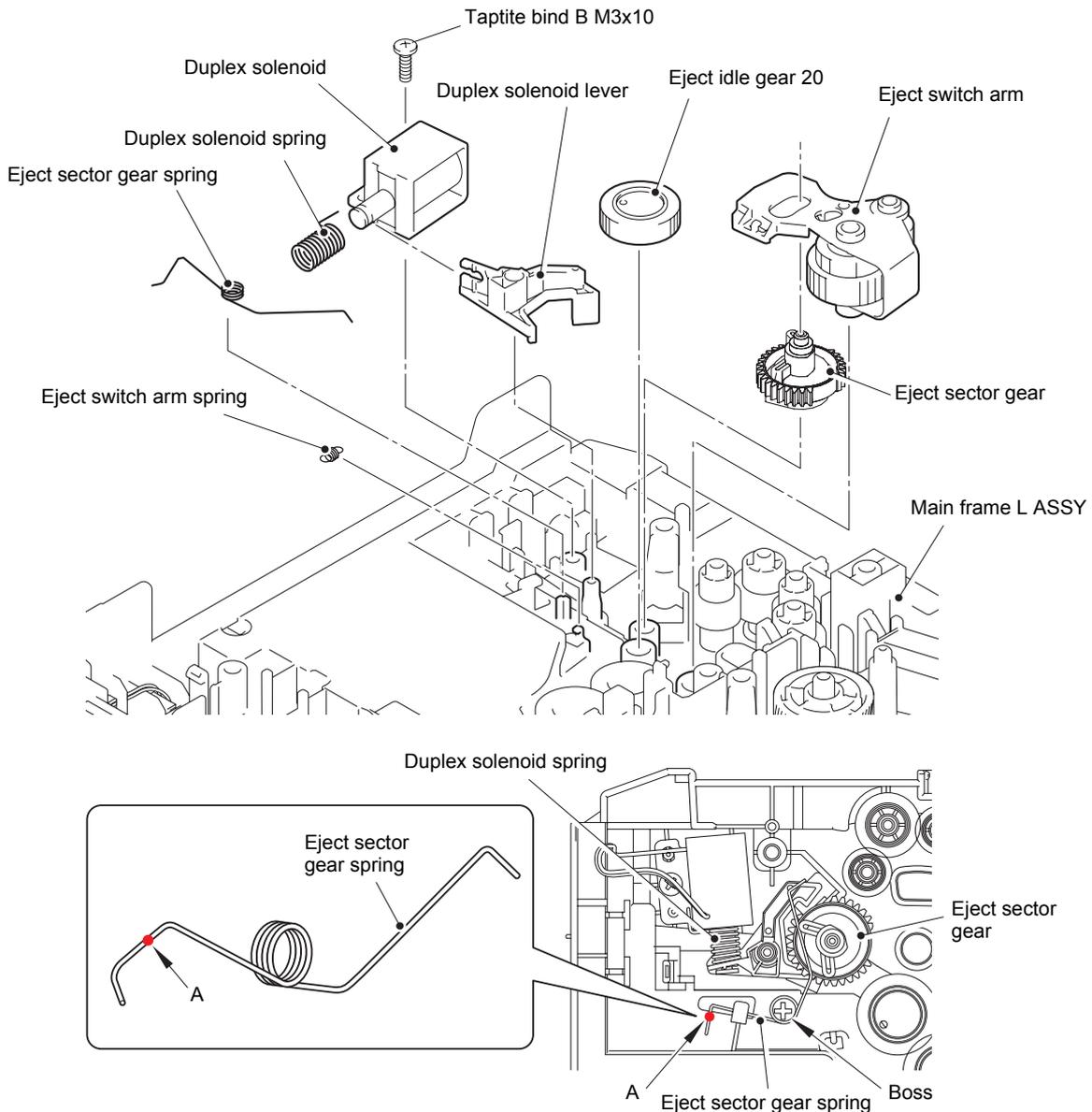


Fig. 3-60

Assembling Note:

- When attaching the eject sector gear spring and the duplex solenoid spring, pay attention to the direction, referring to the illustration above.

9.32 Back cover sensor

- (1) Release the back cover sensor harness from the securing fixtures.
- (2) Release the two hooks, and remove the back cover sensor from the main frame L ASSY.

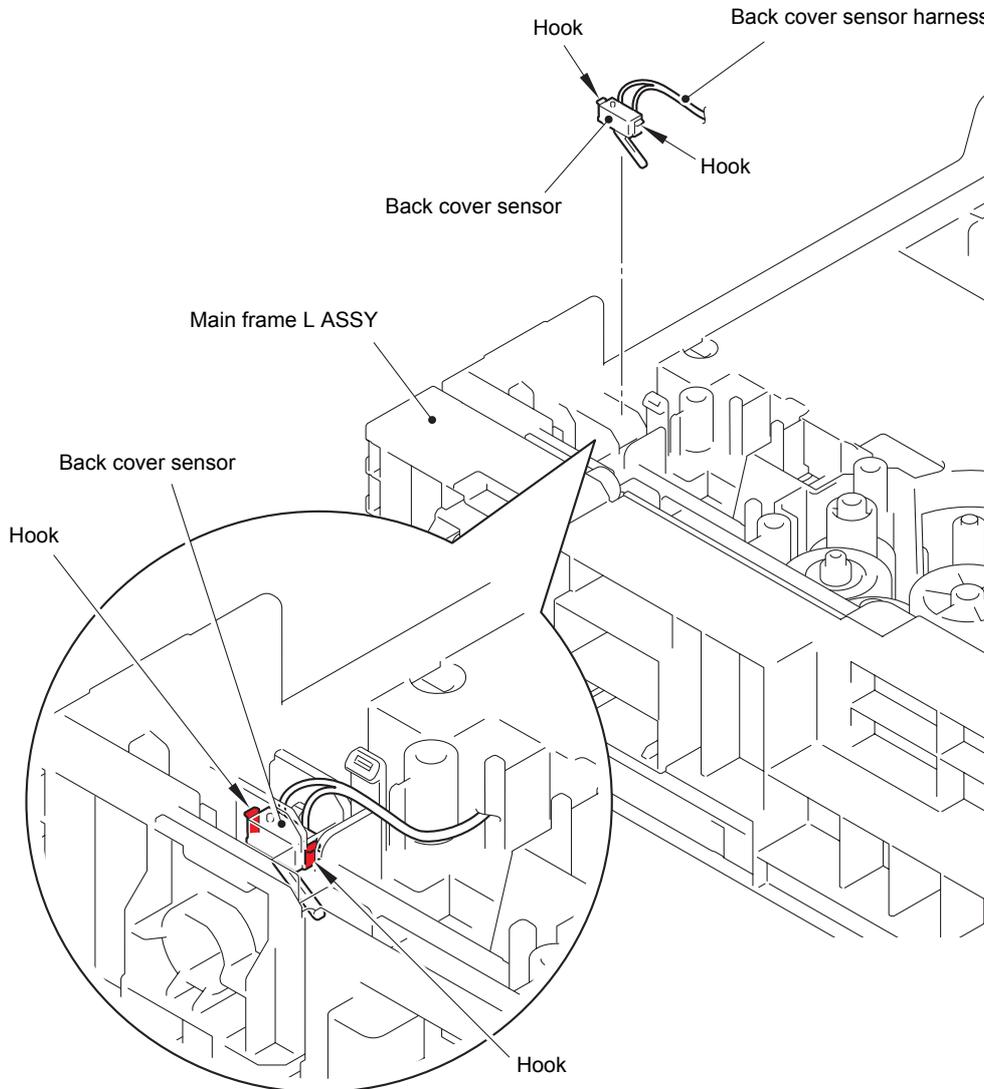


Fig. 3-61

Harness routing: Refer to "1.Main PCB ASSY".

Assembling Note:

- When attaching the back cover sensor, insert it at an angle from the right side.

9.33 LT connector (T1)

- (1) Remove the three taptite bind B M4x12 screws, and remove the bottom frame L from the main frame L ASSY. Then pull out the LT harness from the main frame L ASSY.
- (2) Release the two hooks to remove the LT connector (T1) from the bottom frame L.

Note:

- When the bottom frame L is not used in the machine, remove the LT connector (T1) from the main frame L ASSY.

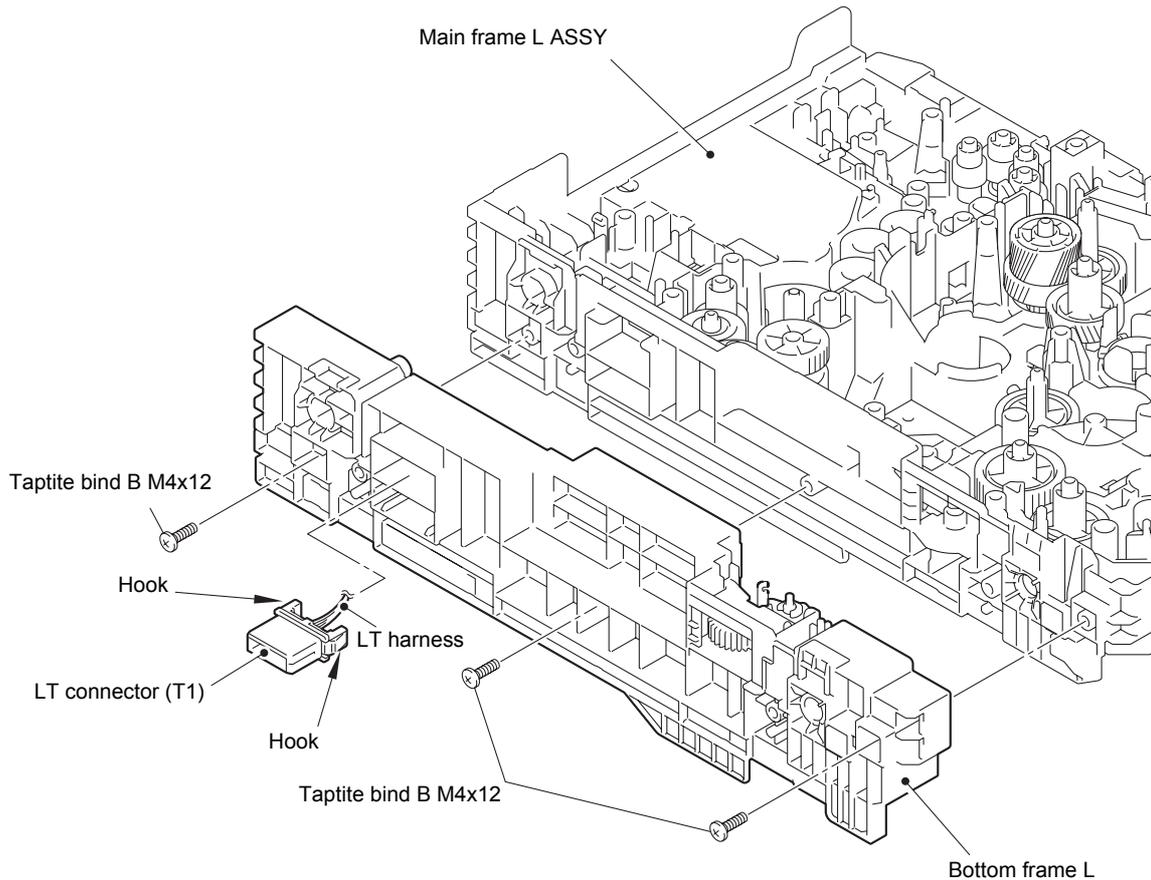


Fig. 3-62

9.34 T1 roller holder ASSY

- (1) Push the T1 lift arm in the direction of arrow 1, and remove the boss on the T1 roller holder ASSY from the T1 lift arm.
- (2) Turn the T1 roller holder ASSY in the direction of arrow 2a, and slide it in the direction of arrow 2b to remove it from the T1 separation roller shaft. Then remove the T1 roller holder ASSY from the machine.

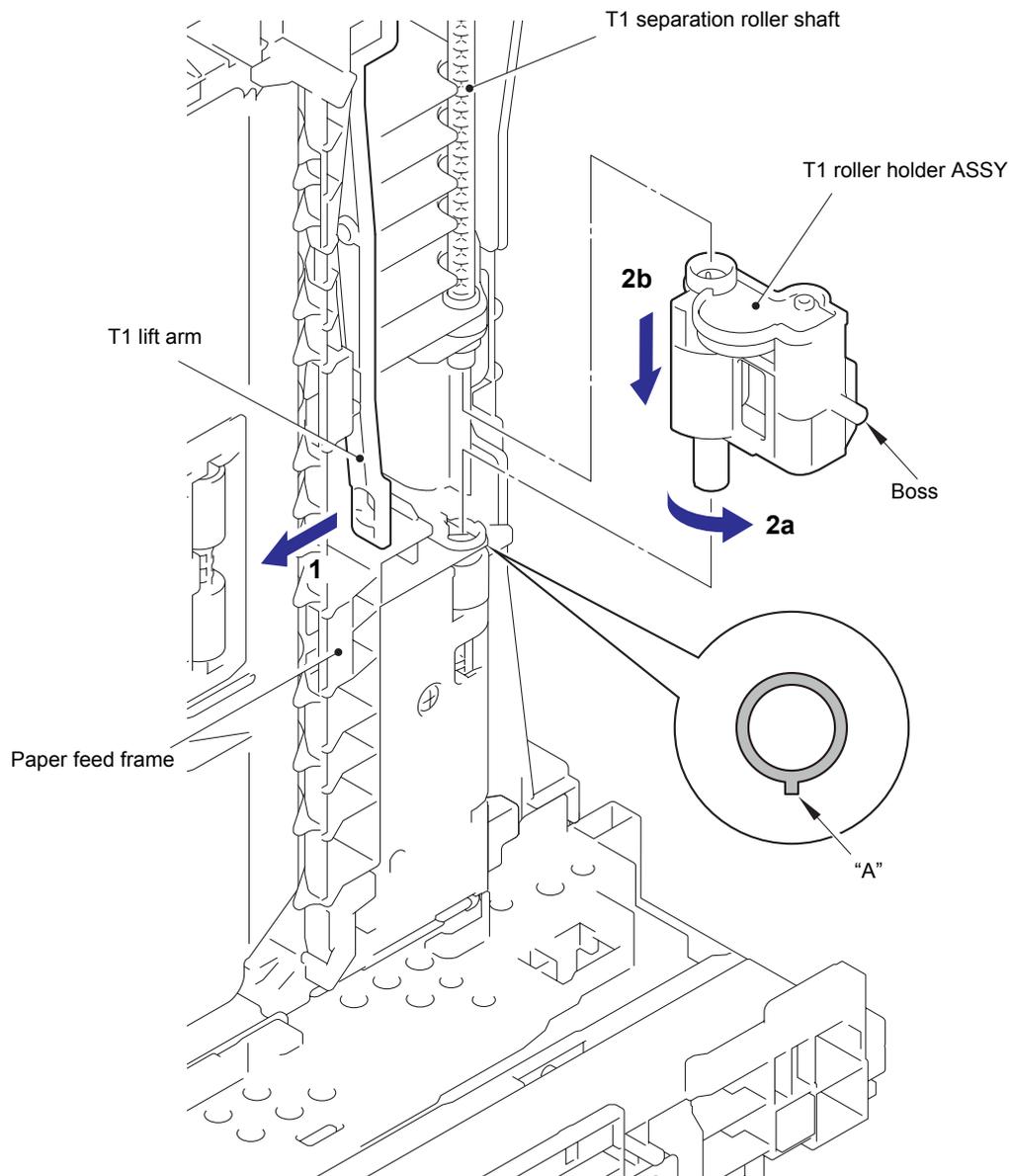


Fig. 3-63

Assembling Note:

- When attaching the T1 roller holder ASSY, engage "A" on the shaft of the T1 roller holder ASSY with the hole on the paper feed frame, and insert the shaft into the hole.

9.35 High-voltage power supply PCB ASSY

- (1) Remove the four taptite bind B M4x12 screws and the two screw pan (S/P washer) M3x12 DB screws. Slightly lift the base plate and slide it in the direction of the arrow to remove it from the machine.

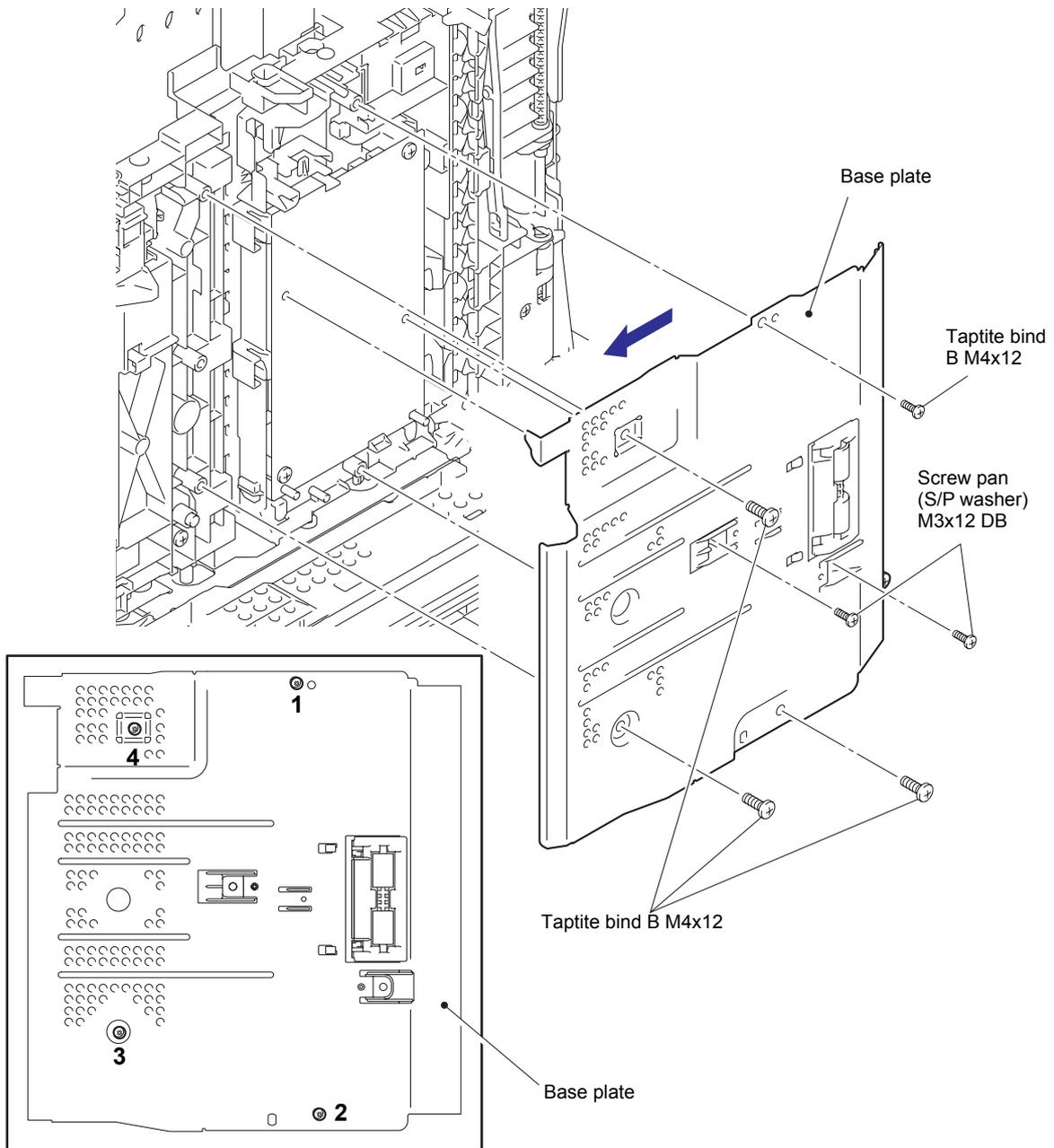


Fig. 3-64

Assembling Note:

- Carefully attach the base plate, avoiding harnesses and flat cables get caught in the base plate.
- When securing the base plate with screws, tighten the screws in the sequence of the numbers engraved on the base plate.

- (2) Open the HV insulation sheet. Remove the two taptite bind B M4x12 screws, and release the two hooks. Lift the HV insulation sheet and the high-voltage power supply PCB ASSY, and remove the feed ground spring from the machine.

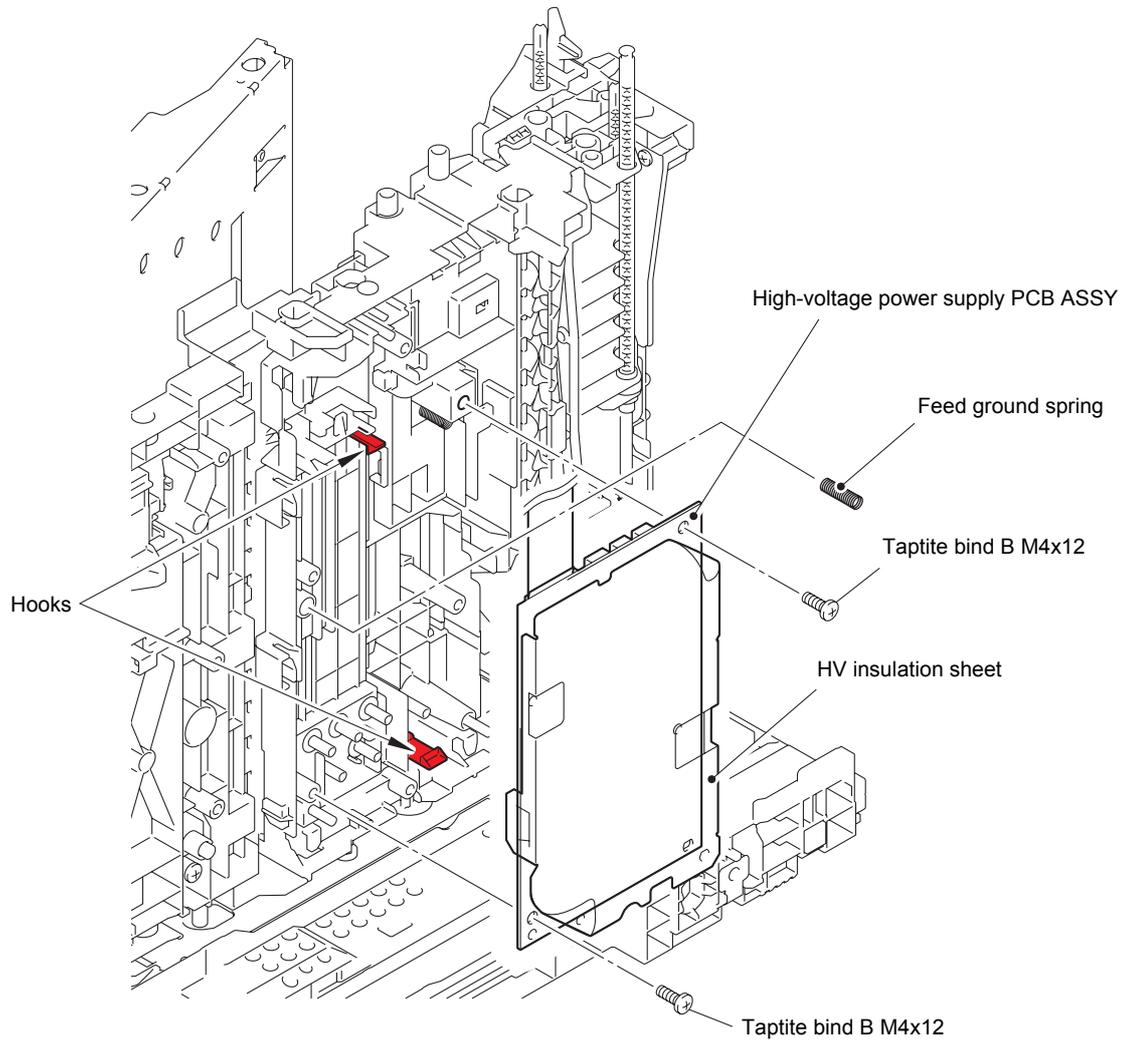


Fig. 3-65

- (3) Disconnect the registration front/rear sensor harness, the T1 paper feed sensor harness and the MP paper empty sensor harness from the high-voltage power supply PCB ASSY, and remove the high-voltage power supply PCB ASSY from the machine.
- (4) Disconnect the main HVPS flat cable from the high-voltage power supply PCB ASSY.

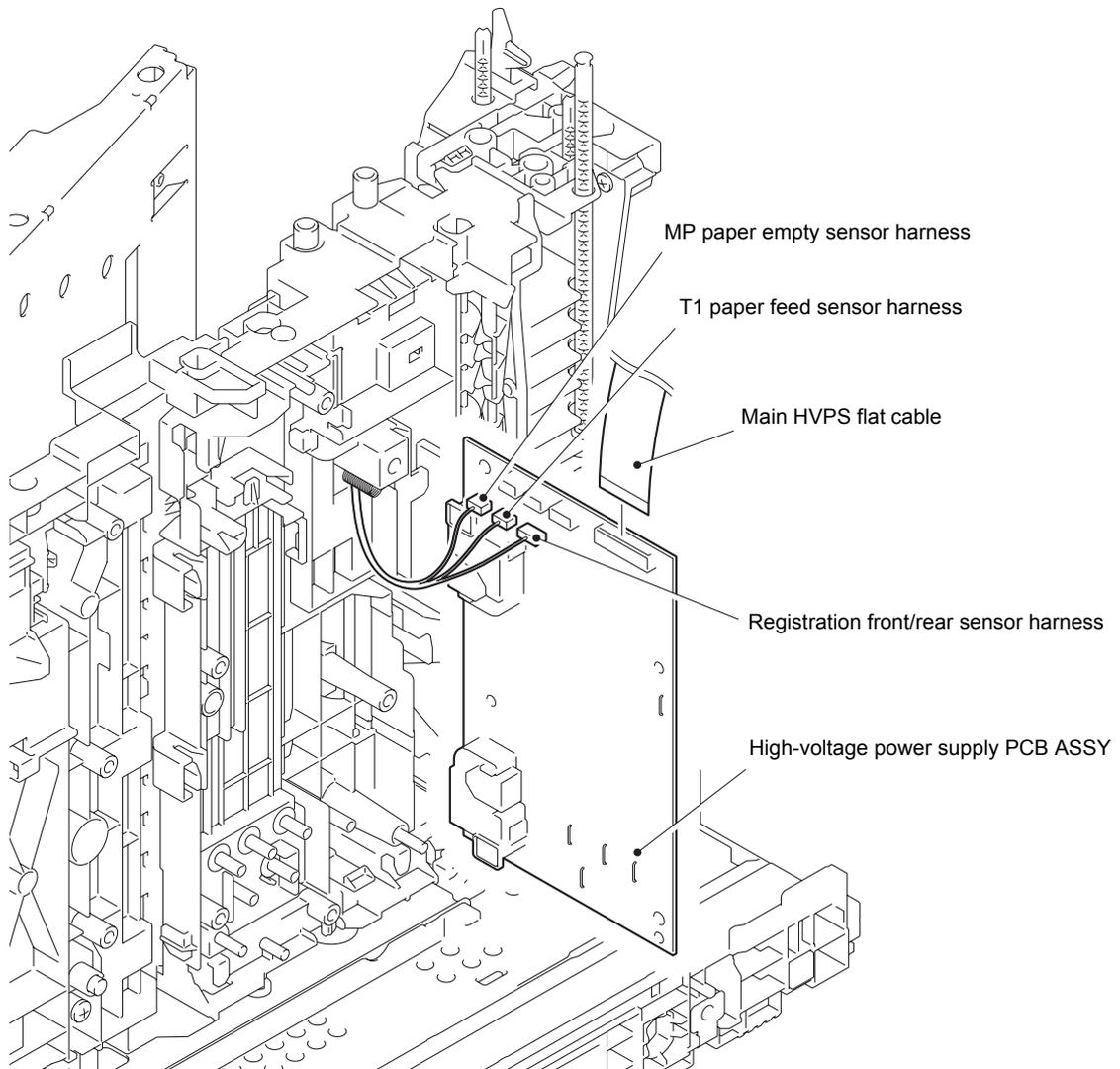


Fig. 3-66

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

9.36 Eject sensor PCB ASSY

- (1) Release the eject sensor harness from the securing fixtures.
- (2) Release the hook, and remove the eject sensor PCB ASSY from the machine.

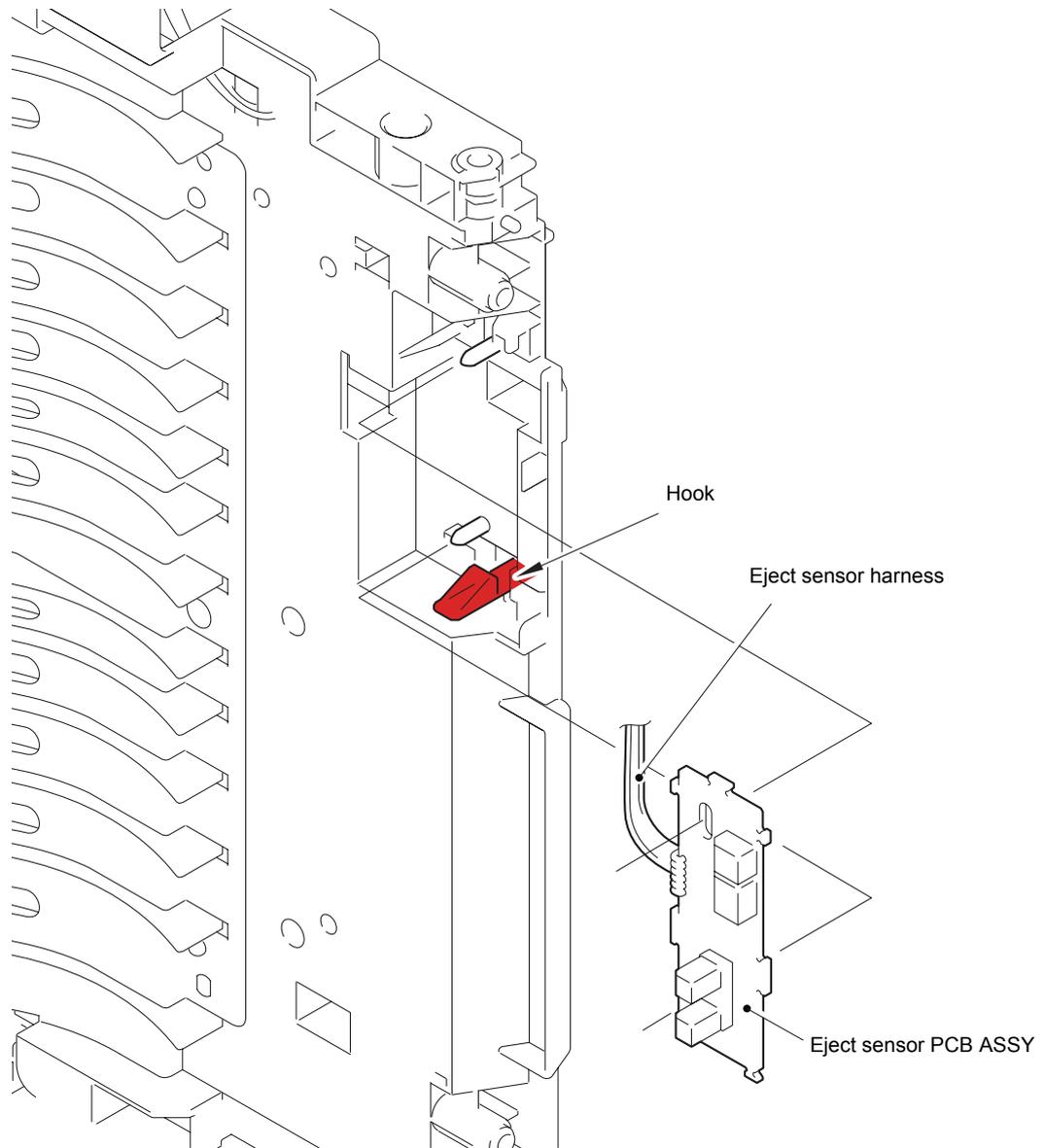


Fig. 3-67

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

9.37 MP roller holder ASSY / MP separation pad ASSY / MP separation pad spring

- (1) Open the MP roller cover. Release the hook on the MP holder bushing, and slide the MP holder bushing in the direction of arrow 1 to remove it from the machine.
- (2) Slide the MP roller holder ASSY in the direction of arrow 2a to remove it from the MP separation roller shaft. Then push the MP lift arm in the direction of arrow 2b to remove the MP roller holder ASSY from the machine.
- (3) Push the MP lift arm in the direction of arrow 2b. Raise the MP separation pad ASSY to the 50-degree position, and remove it from the machine in the direction of arrow 3.
- (4) Bend the MP separation pad spring inward to remove it from the machine.

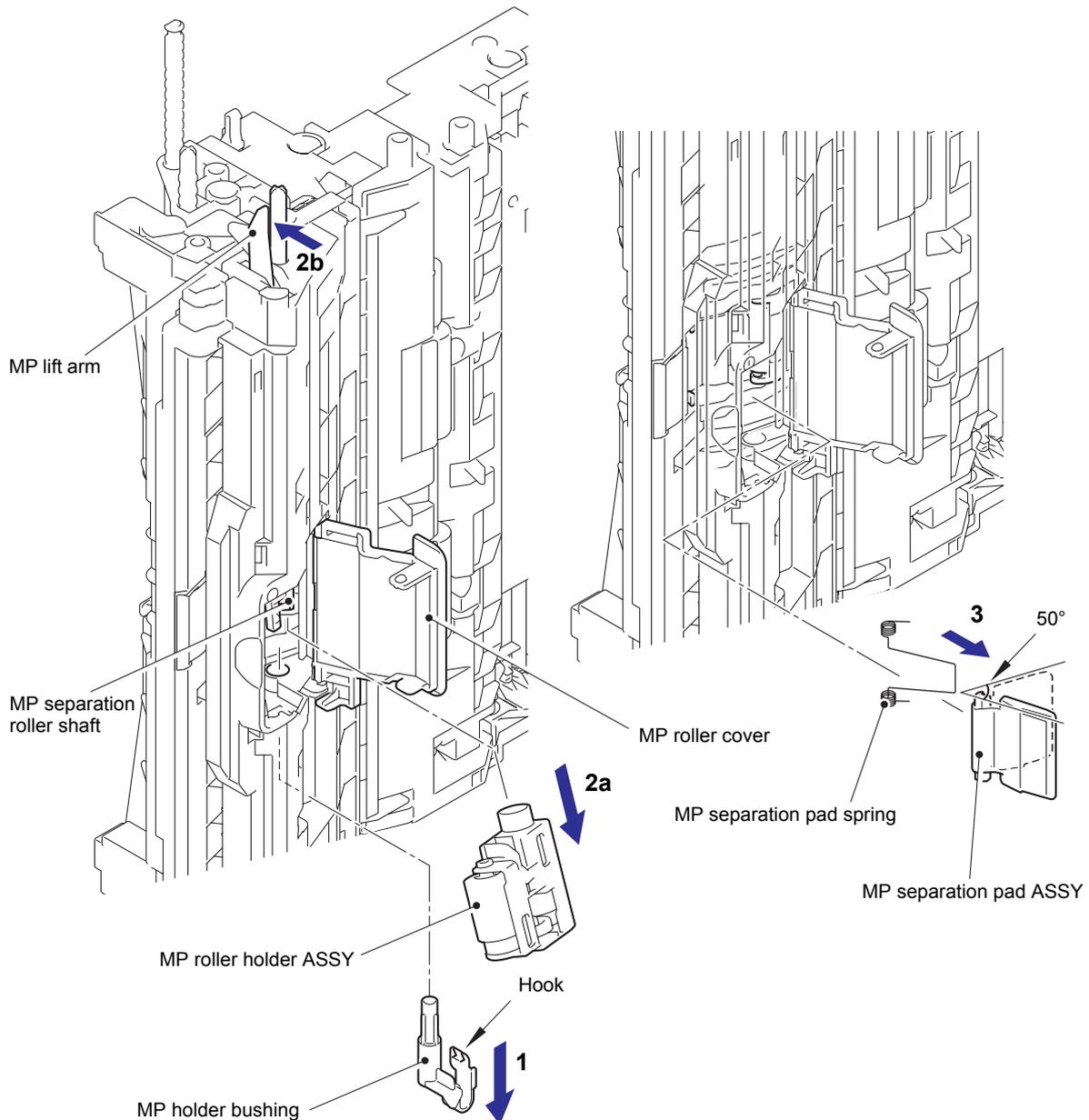


Fig. 3-68

Assembling Note:

- Attach the MP roller holder ASSY while pushing the MP separation pad ASSY.

9.38 T1 paper feed sensor PCB ASSY / T1 paper feed actuator / T1 paper feed actuator spring

- (1) Release the T1 paper feed sensor harness (white connector) from the securing fixtures.
- (2) Remove the taptite bind B M3x10 screw, and release the hook to remove the T1 paper feed actuator holder ASSY from the machine.

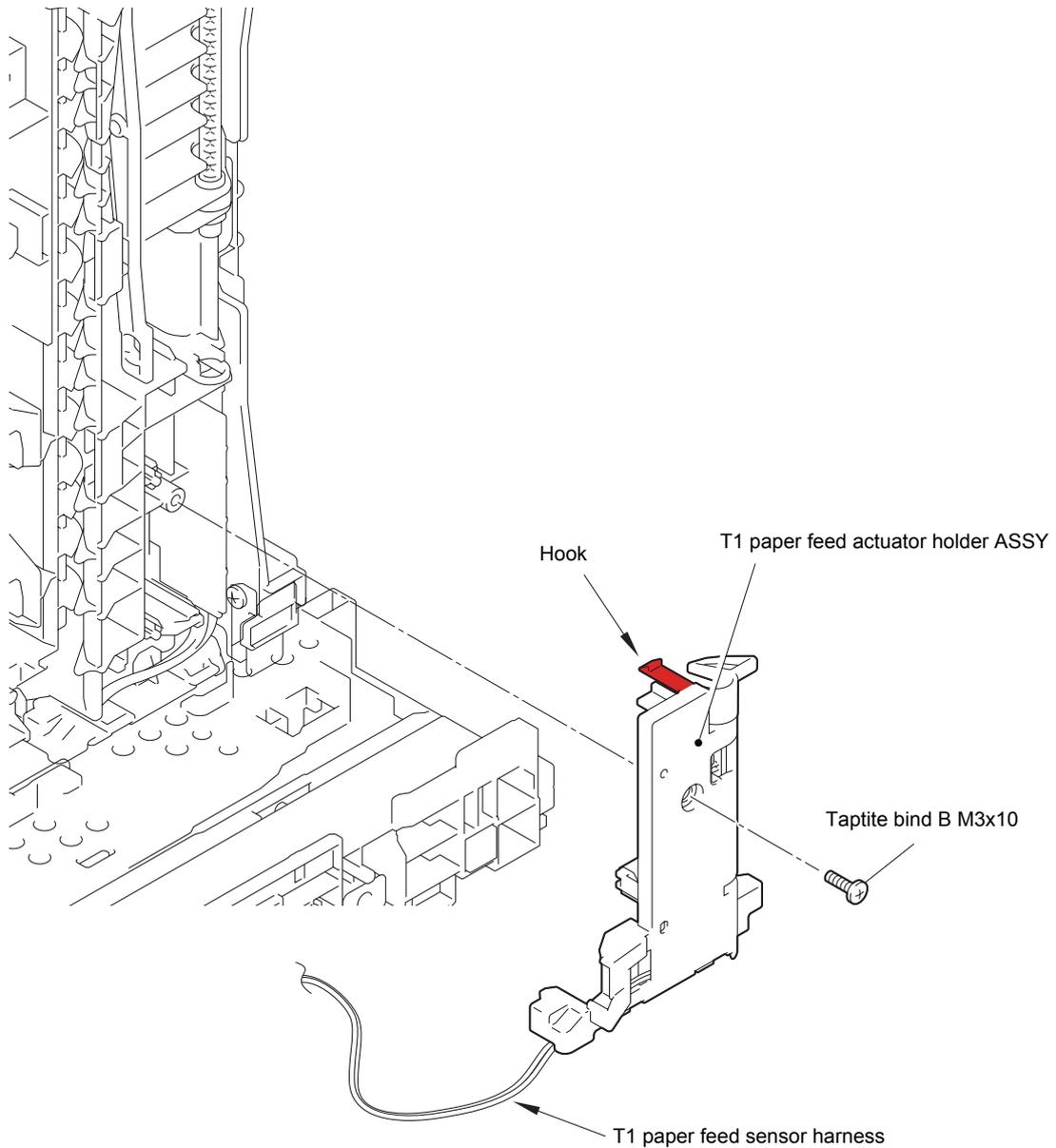


Fig. 3-69

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

- (3) Turn the T1 paper feed actuator in the direction of arrow 3a, and push the hook on the T1 paper feed actuator holder to slide the T1 paper feed actuator in the direction of arrow 3b to remove it from the T1 paper feed actuator holder.
- (4) Remove the T1 paper feed actuator spring from the T1 paper feed actuator.
- (5) Release the T1 paper feed sensor harness from the T1 paper feed actuator holder, and then release the hook to remove the T1 paper feed sensor PCB ASSY from the T1 paper feed actuator holder.

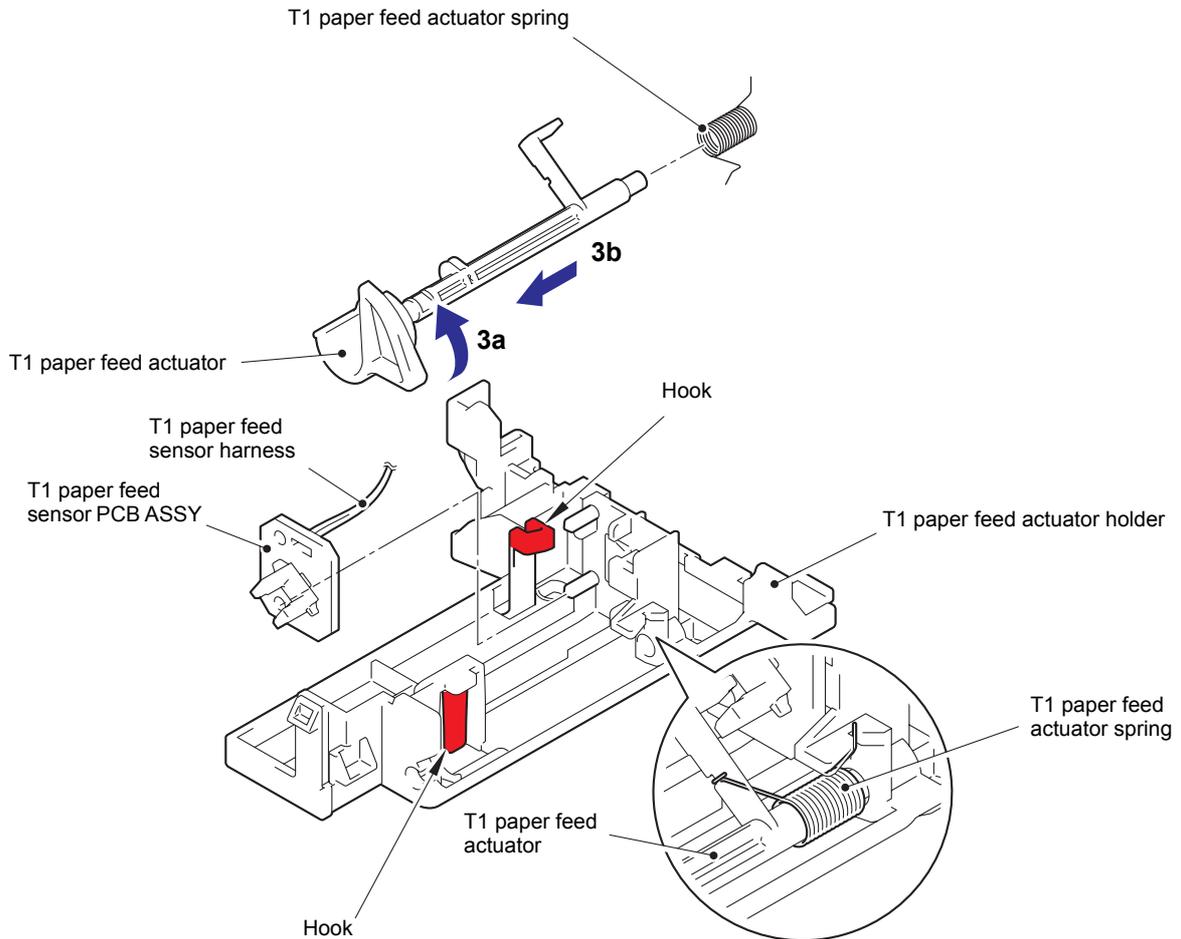


Fig. 3-70

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

9.39 MP paper empty sensor PCB ASSY / MP paper empty actuator 1 / MP paper empty actuator 2

- (1) Remove the five taptite bind B M4x12 screws, and remove the main frame R from the machine. Then pull out the low-voltage power supply harness from the main frame R.

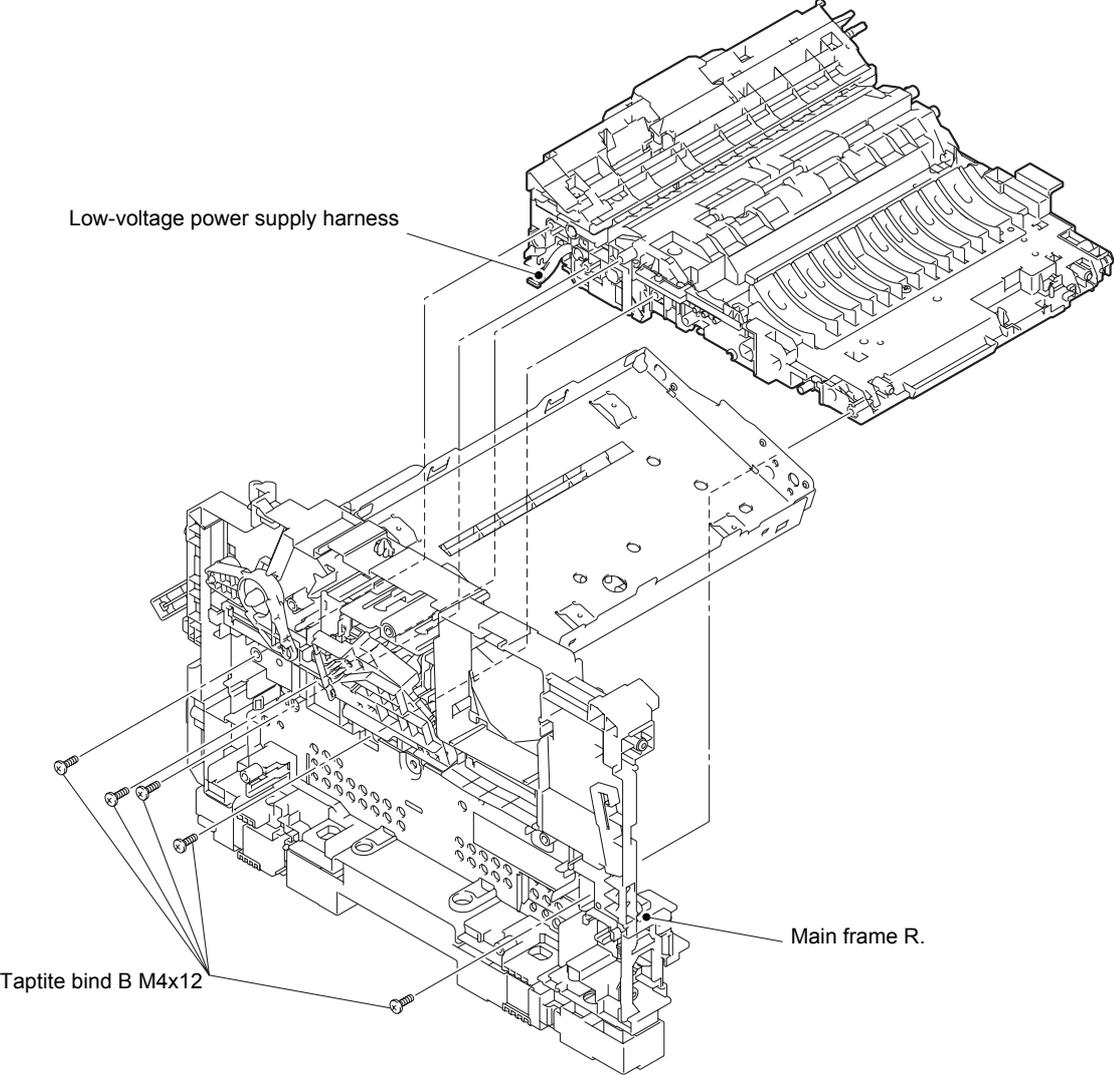


Fig. 3-71

- (2) Release the MP paper empty sensor harness from the paper feed frame ASSY.
- (3) Remove the two tapite bind B M3x10 screws, and release the two hooks to remove the MP feed frame from the paper feed frame ASSY. Then pull out the MP paper empty sensor harness from the paper feed frame ASSY.
- (4) Remove the MP lift arm spring from the paper feed frame ASSY.

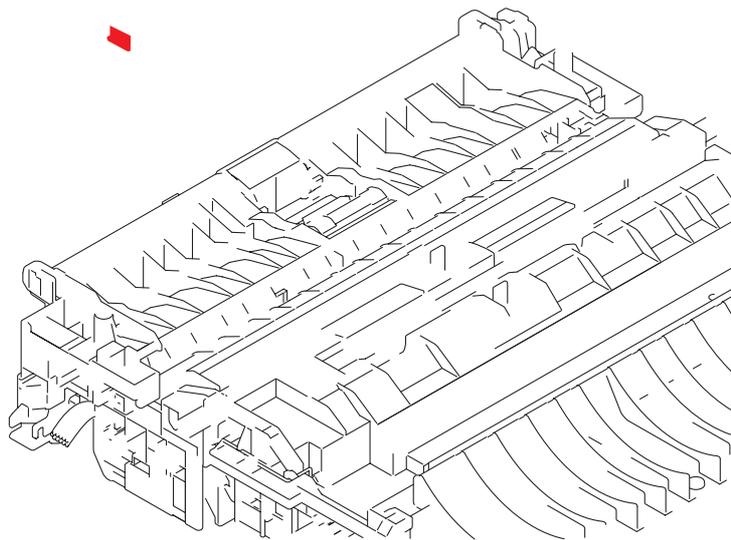


Fig. 3-72

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

- (5) Turn MP paper empty actuator 2 in the direction of arrow 5a, and push the hook in the direction of arrow 5b to slide MP paper empty actuator 1 in the direction of arrow 5c to remove it from the MP feed frame in the direction of arrow 5d.
- (6) Turn MP paper empty actuator 2 in the direction of arrow 5a, and remove it from the MP feed frame in the direction of arrow 6.
- (7) Remove the Taptite bind B M3x10 screw, and remove the MP paper empty sensor PCB ASSY from the MP feed frame.

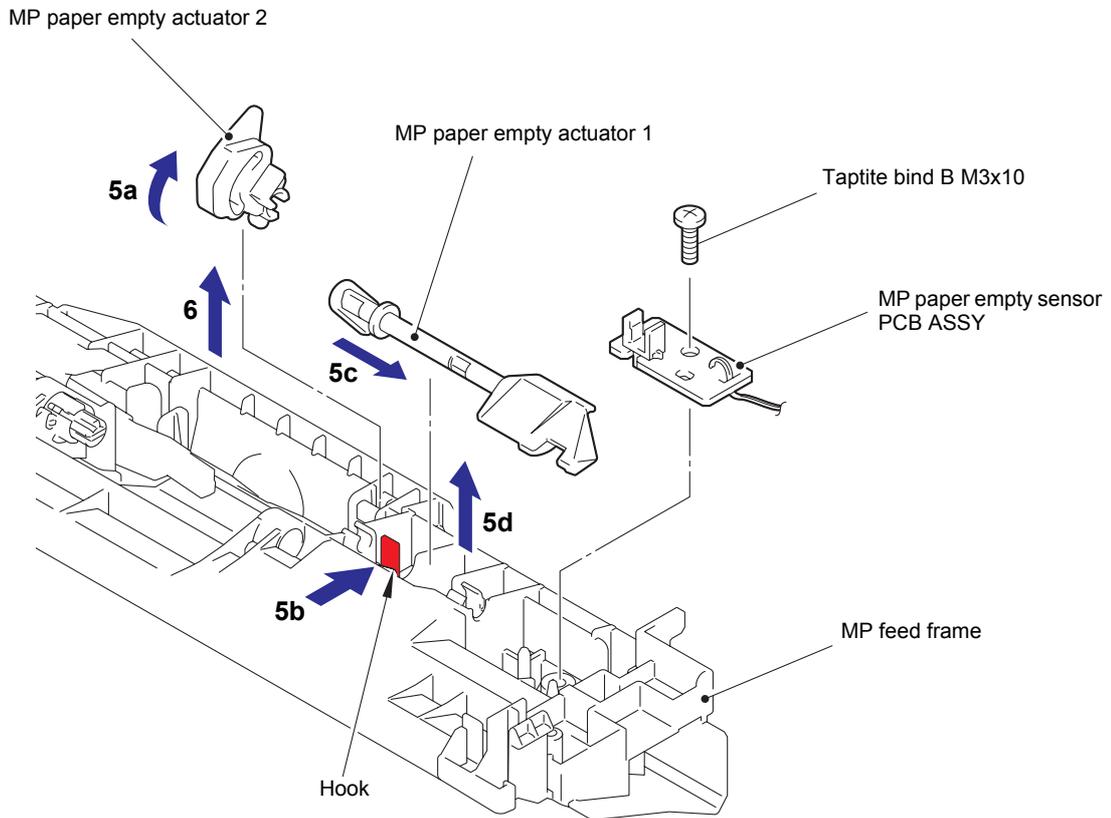


Fig. 3-73

Assembling Note:

- Insert the end of MP paper empty actuator 1 into the groove on MP paper empty actuator 2.

9.40 Registration front/rear sensor PCB ASSY / Registration front actuator / Registration rear actuator / Registration actuator spring

- (1) Release the low-voltage power supply harness from the securing fixtures.
- (2) Release the two hooks, and remove the paper feed frame from the feed chute.

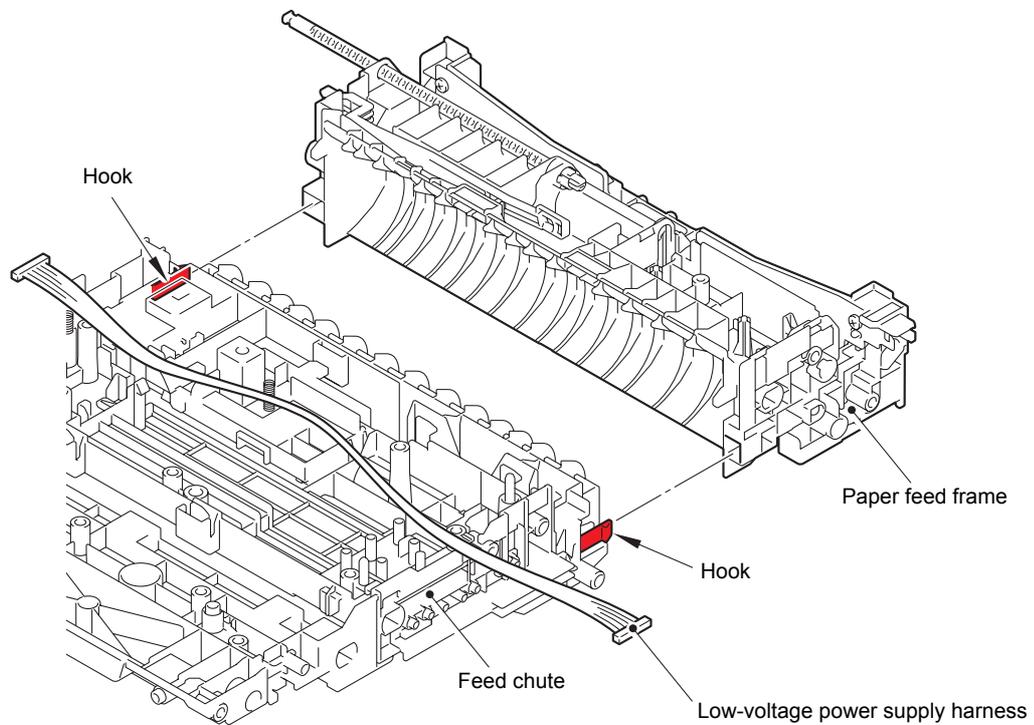


Fig. 3-74

Harness routing: Refer to [“7.Low-voltage power supply PCB ASSY”](#).

- (3) Remove the earth registration spring from the hook on the feed chute, and remove the earth registration spring from the feed chute.
- (4) Remove the electrode TR from the hook on the registration actuator holder ASSY, and remove the electrode TR from the registration actuator holder ASSY.
- (5) Release the hook, and remove the registration actuator holder ASSY from the feed chute.

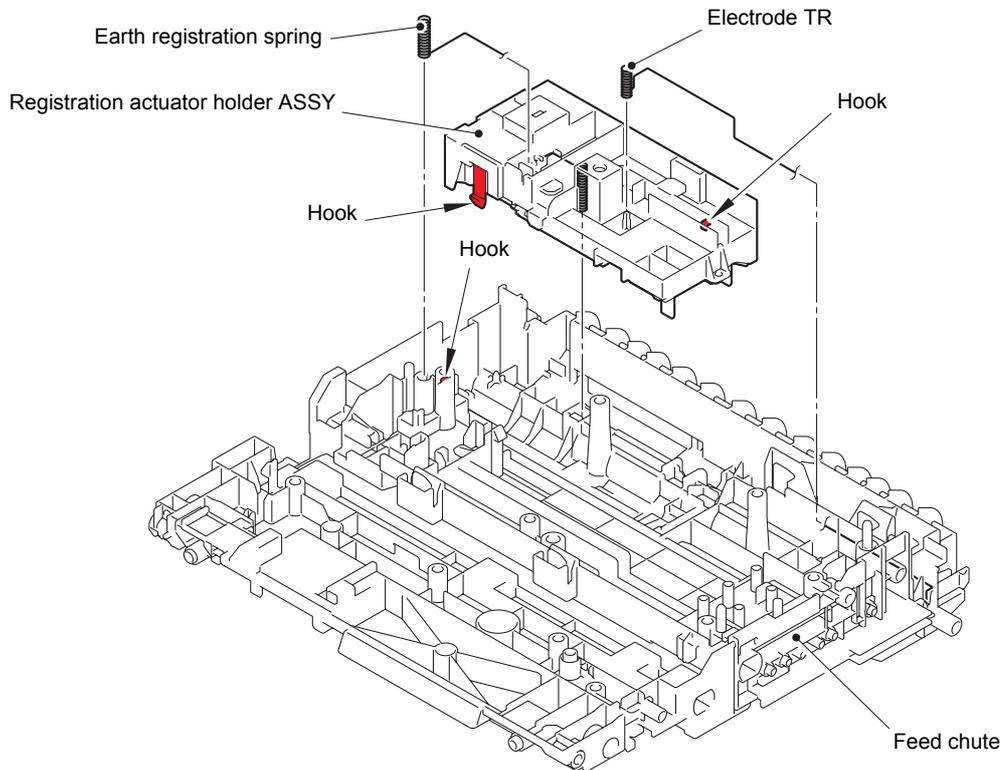


Fig. 3-75

- (6) Remove the registration actuator spring from the registration front actuator and the registration actuator holder ASSY.
- (7) Turn the registration front actuator to remove it from the guide, and then slide it in the direction of the arrow to remove it from the registration actuator holder ASSY.
- (8) Remove the registration actuator spring from the registration rear actuator and the registration actuator holder ASSY.
- (9) Turn the registration rear actuator to remove it from the guide, and then slide it in the direction of the arrow to remove it from the registration actuator holder ASSY.
- (10) Release the registration front/rear sensor harness from the securing fixtures, and then release the hook to remove the registration front/rear sensor PCB ASSY from the registration actuator holder ASSY.

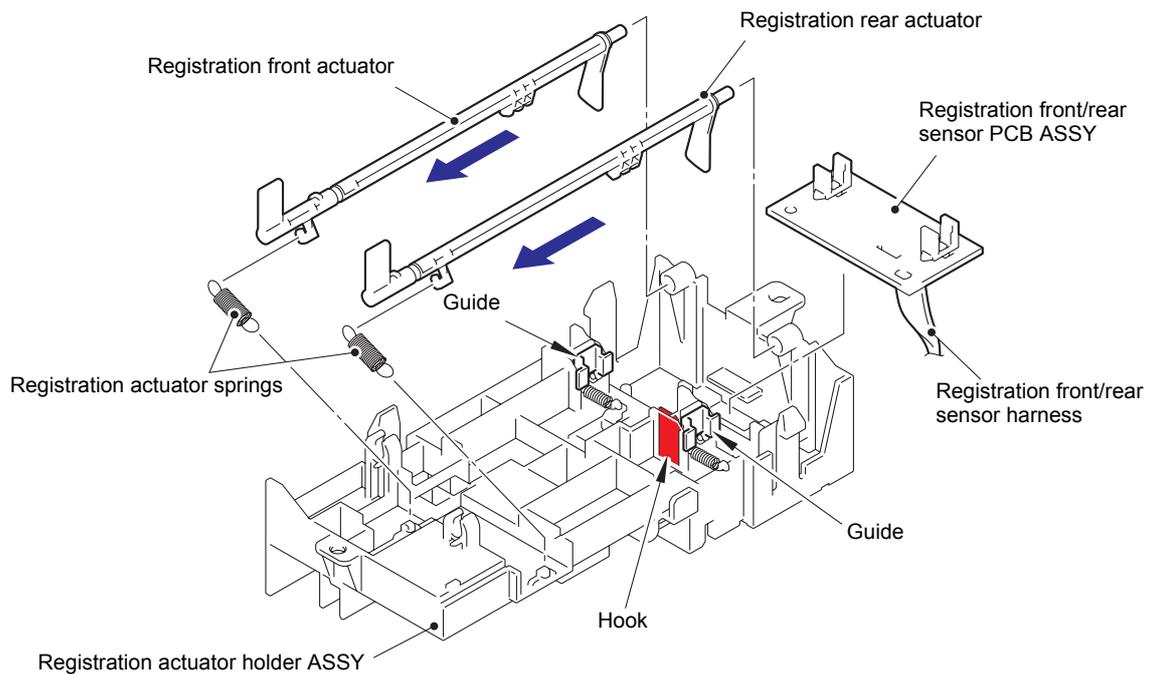


Fig. 3-76

Harness routing: Refer to "4.High-voltage power supply PCB ASSY".

10. DISASSEMBLY PROCEDURE (LT UNIT)

10.1 Paper tray 2

- (1) Remove the two taptite bind B M4x12 screws from paper tray 2.
- (2) Lift the plate to remove "A" on the T2 tray indicator from the plate, remove the four bosses, and remove the T2 tray cover from paper tray 2.

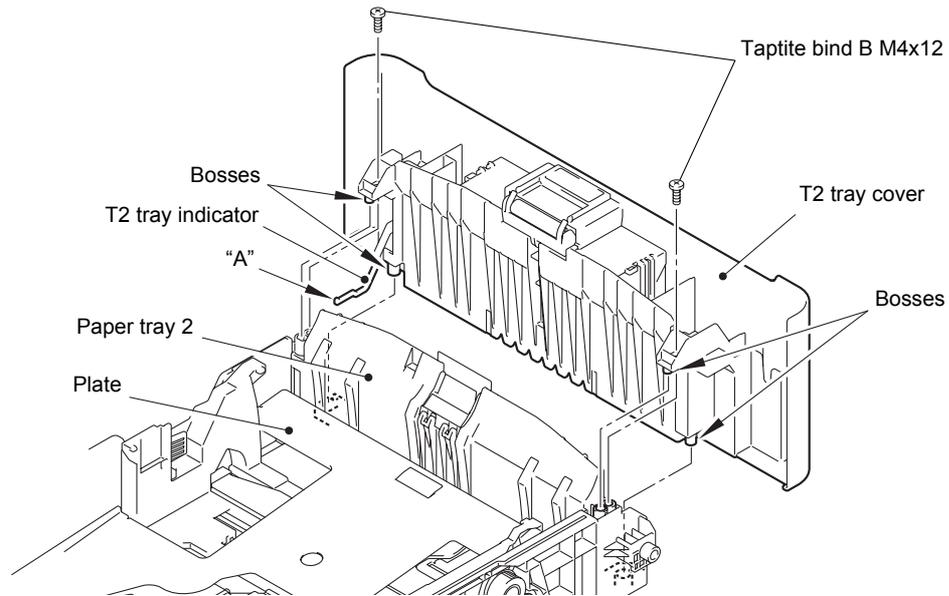


Fig. 3-77

- (3) Release the two hooks on the T2 separation pad ASSY from paper tray 2.
- (4) Push both arms of the T2 separation pad ASSY in the direction of the arrows to remove both pins, and remove the T2 separation pad ASSY from paper tray 2.
- (5) Remove the T2 separation pad spring from the T2 separation pad ASSY.

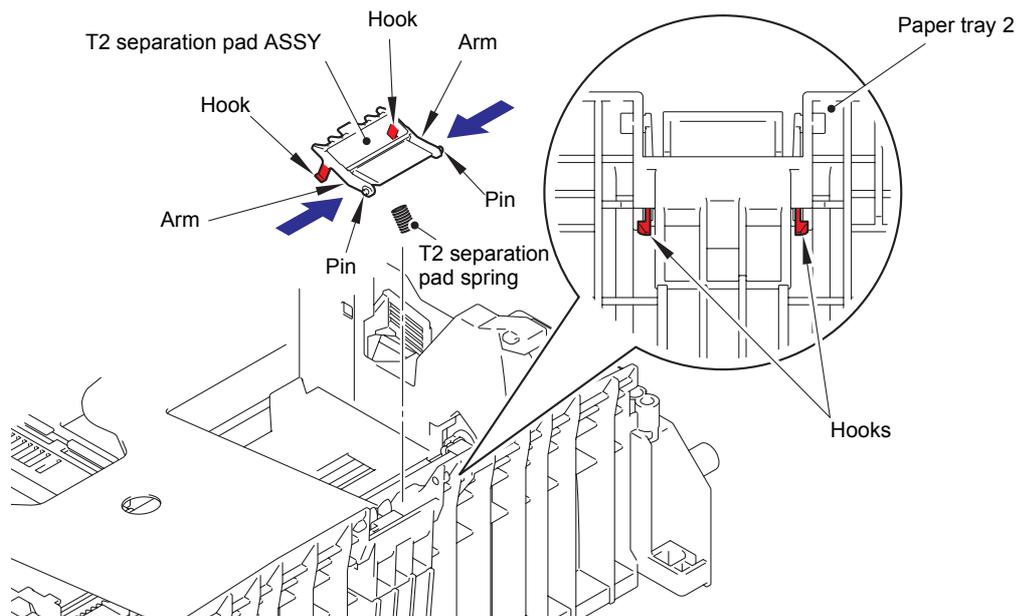


Fig. 3-78

- (6) Push the hook on the lift gear Z48M10 while lifting the plate-up plate, and remove the lift gear Z48M10 from paper tray 2.
- (7) Remove the gear Z22M10 and the idle gear Z18M10 from paper tray 2.

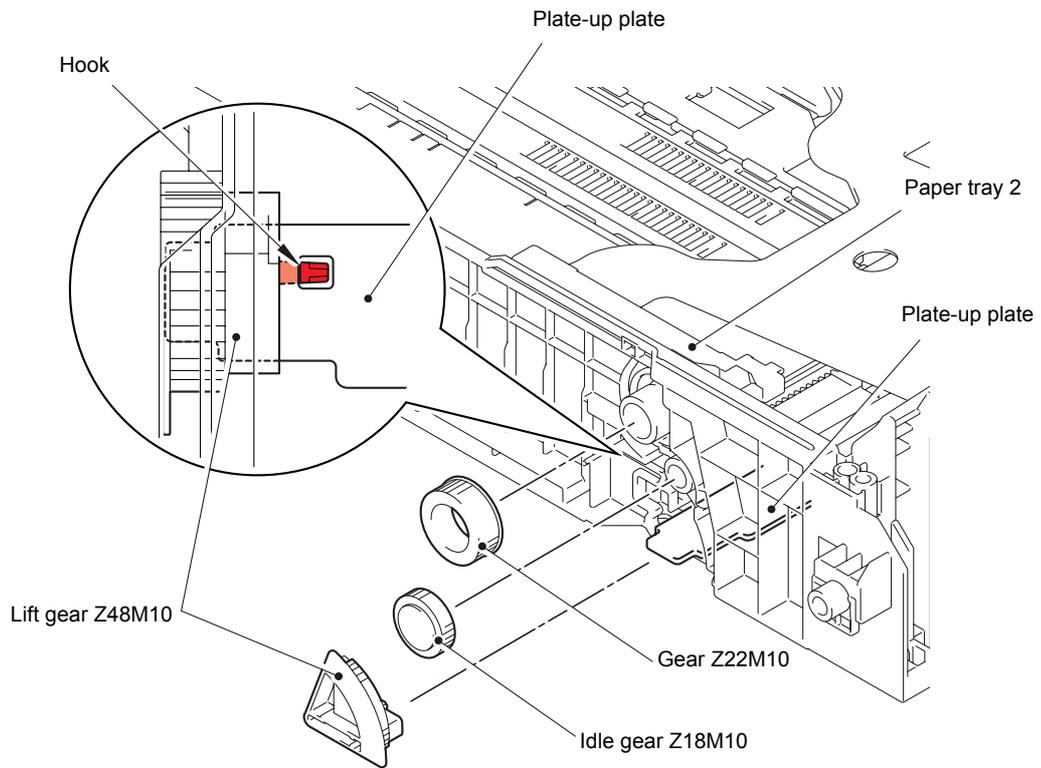


Fig. 3-79

10.2 T2 roller holder ASSY

- (1) Push the T2 lift arm in the direction of arrow 1a, and remove the boss on the T2 roller holder ASSY from the T2 lift arm. Then turn the T2 roller holder ASSY in the direction of arrow 1b.

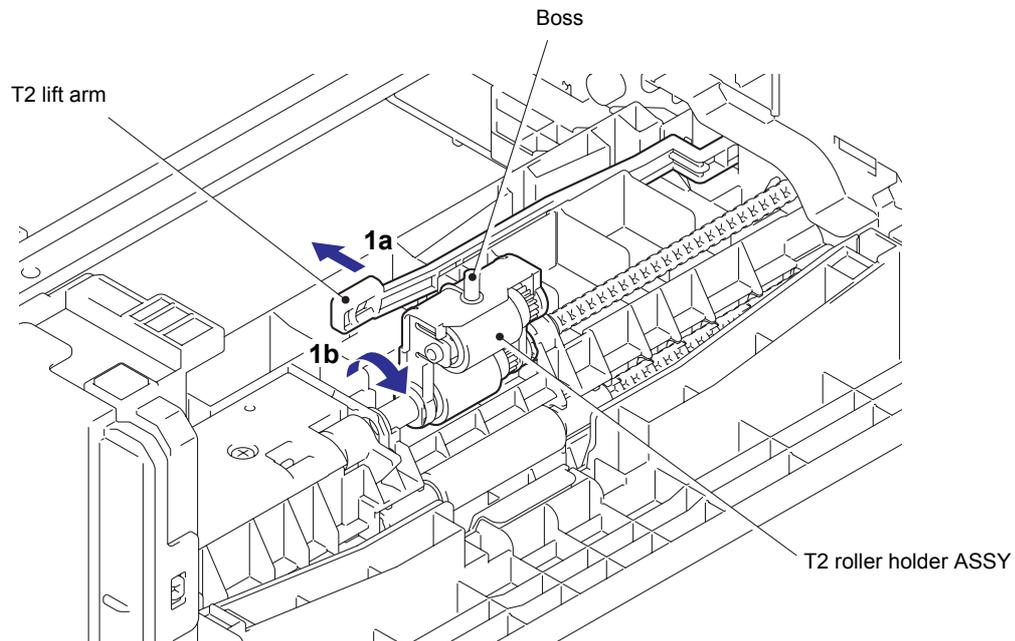


Fig. 3-80

- (2) Slide the T2 roller holder ASSY in the direction of arrow 2 to remove it from the T2 separation roller shaft.
- (3) Lift the right side of the T2 roller holder ASSY in the direction of arrow 3a, and pull the T2 roller holder ASSY in the direction of arrow 3b to remove it from the LT unit.

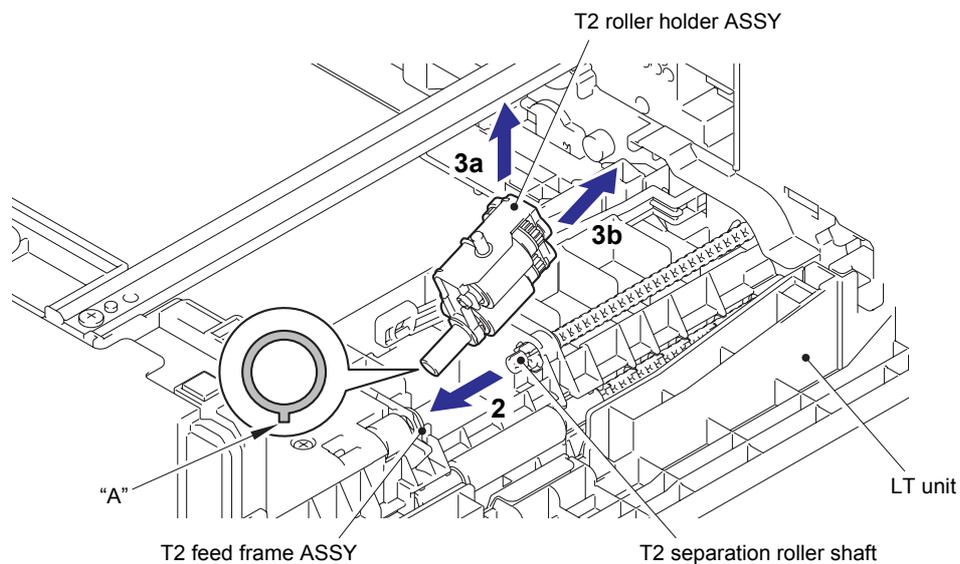


Fig. 3-81

Assembling Note:

- When attaching the T2 roller holder ASSY, engage "A" on the shaft of the T2 roller holder ASSY with the hole on the T2 feed frame ASSY, and insert the shaft into the hole.

10.3 T2 side cover L

- (1) Remove the taptite bind B M4x12 screw from the front side of the T2 side cover L.
- (2) Release the two front hooks, two top hooks and four bottom hooks, and remove the T2 side cover L from the LT unit.

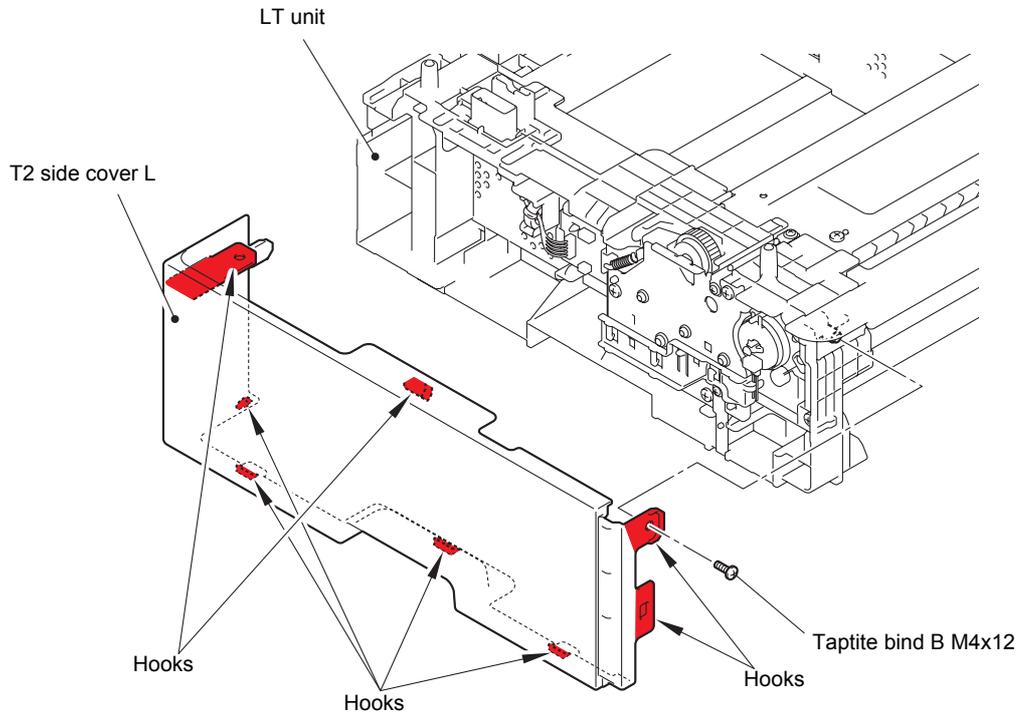


Fig. 3-82

10.4 T2 side cover R

- (1) Remove the taptite bind B M4x12 screw from the front side of the T2 side cover R.
- (2) Release the two front hooks, two top hooks and four bottom hooks, and remove the T2 side cover R from the LT unit.

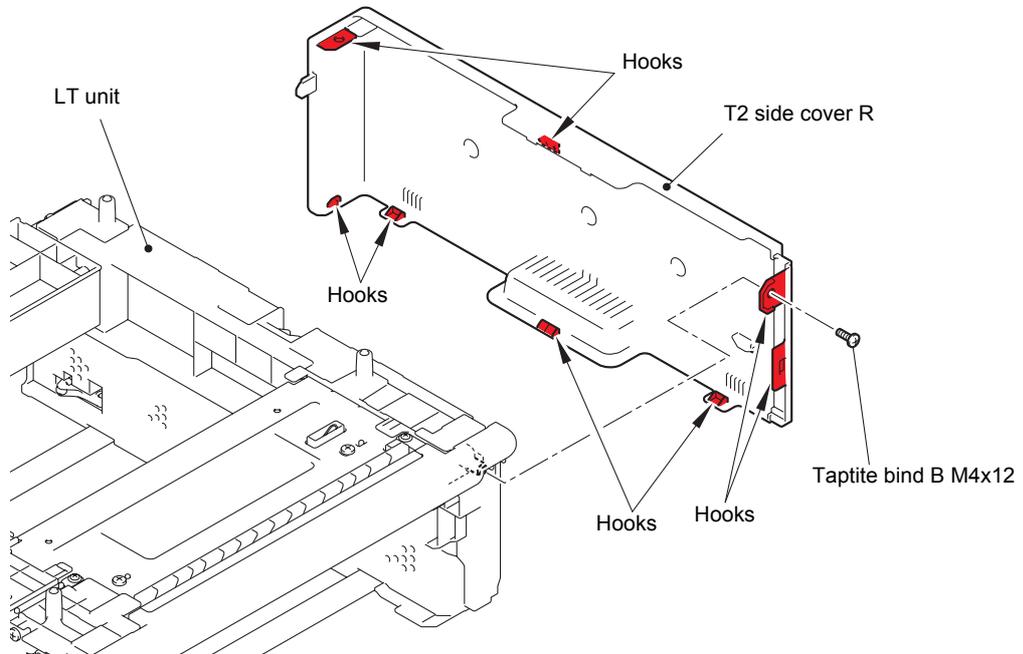


Fig. 3-83

10.5 T2 front cover ASSY

- (1) Remove the taptite cup S M3x8 SR screw from the T2 front cover ASSY.
- (2) Release the two hooks on the T2 front cover ASSY, and remove the T2 front cover ASSY from the LT unit.

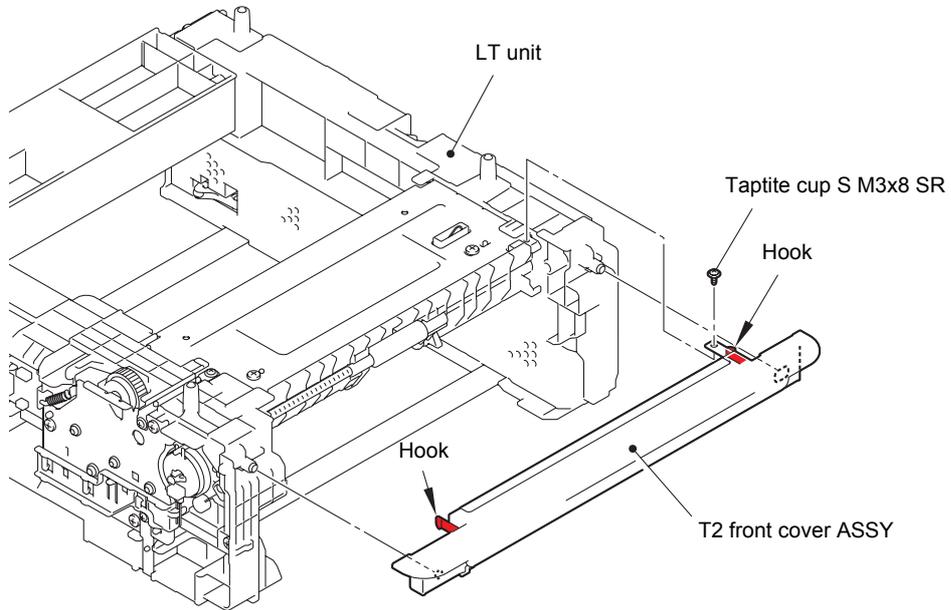


Fig. 3-84

10.6 T2 relay PCB ASSY

- (1) Disconnect all harnesses from the T2 relay PCB ASSY.

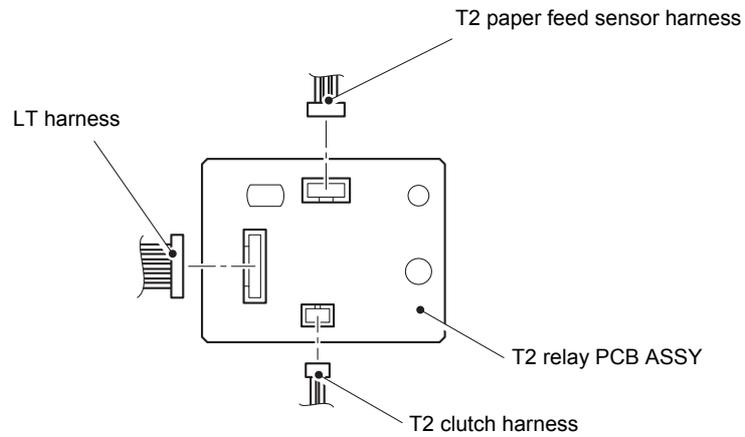


Fig. 3-85

- (2) Release the hook to remove the core of the LT connector ASSY (T2) from the LT unit.
- (3) Release the hook to remove the T2 relay PCB ASSY from the LT unit.

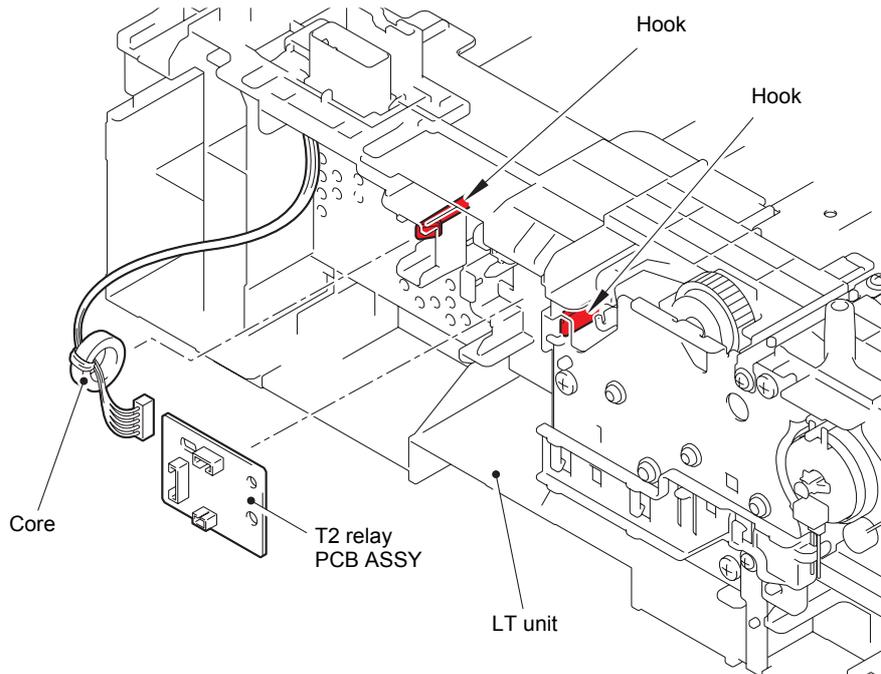


Fig. 3-86

10.7 T2 clutch

- (1) Release the T2 clutch harness from the securing fixtures.
- (2) Release the hook on the T2 clutch, and remove the T2 clutch from the LT unit.

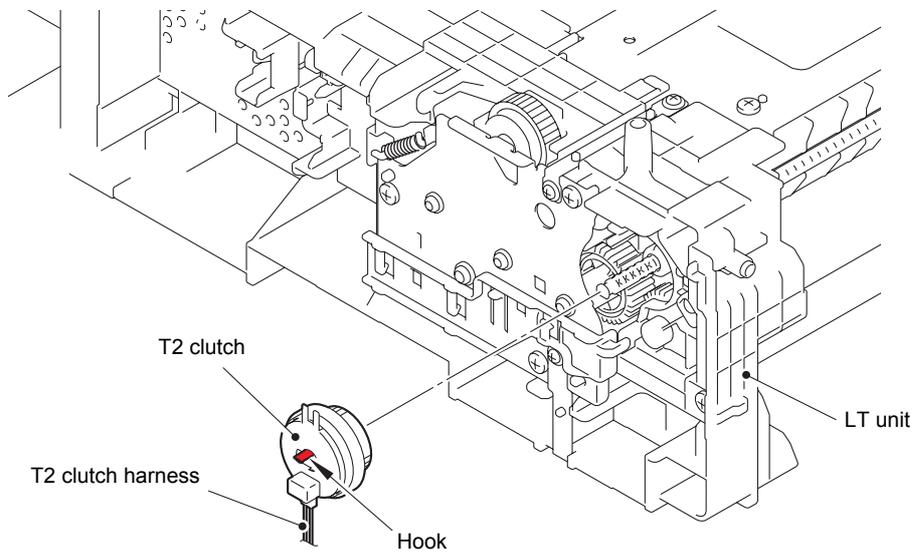


Fig. 3-87

10.8 T2 paper feed sensor PCB ASSY

- (1) Remove the four taptite bind B M4x12 screws securing the two under bars, and remove the two under bars from the LT unit.

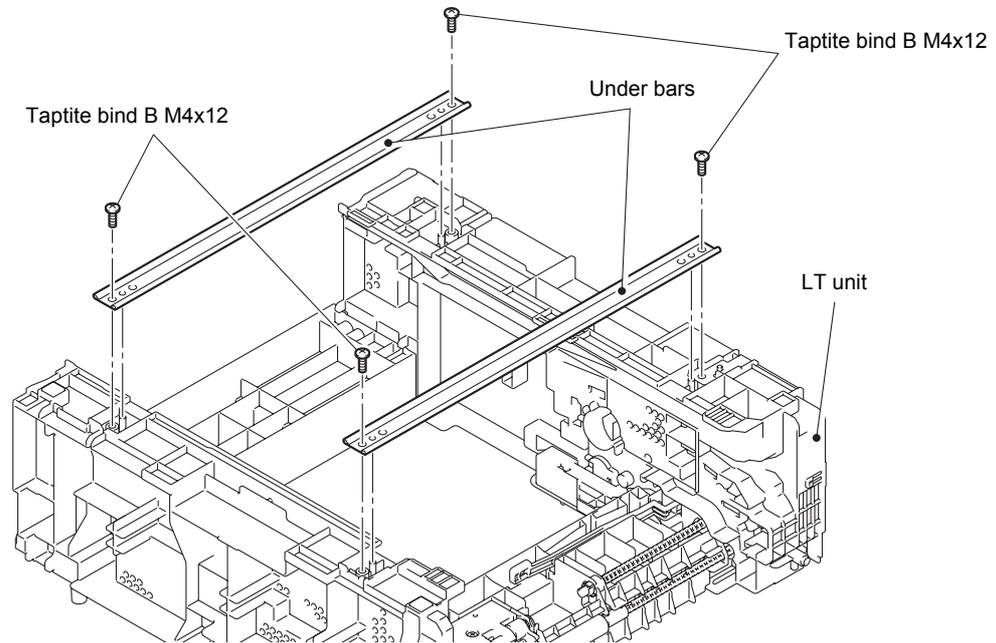


Fig. 3-88

- (2) Remove the two taptite cup S M3x8 SR screws and the two taptite bind B M4x12 screws, and remove the T2 frame R unit from the LT unit.

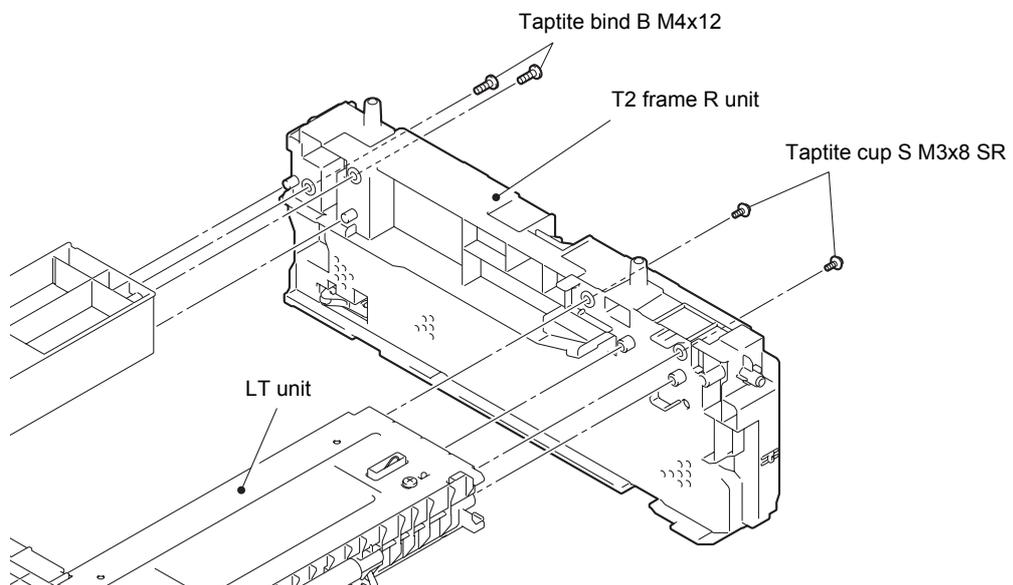


Fig. 3-89

- (3) Remove the three taptite cup S M3x8 SR screws, and remove the T2 paper feed frame unit from the LT unit. Then pull out the T2 paper feed sensor harness from the LT unit.

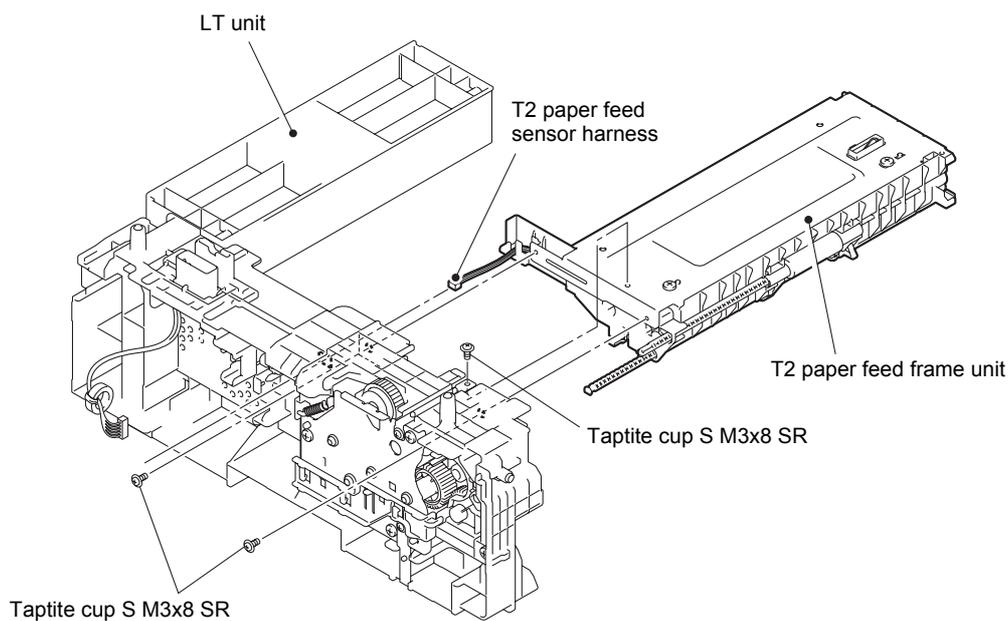


Fig. 3-90

- (4) Remove the two taptite bind B M4x12 screws, and remove the T2 front beam from the T2 paper feed frame unit.
- (5) Release the T2 paper feed sensor harness from the securing fixtures.

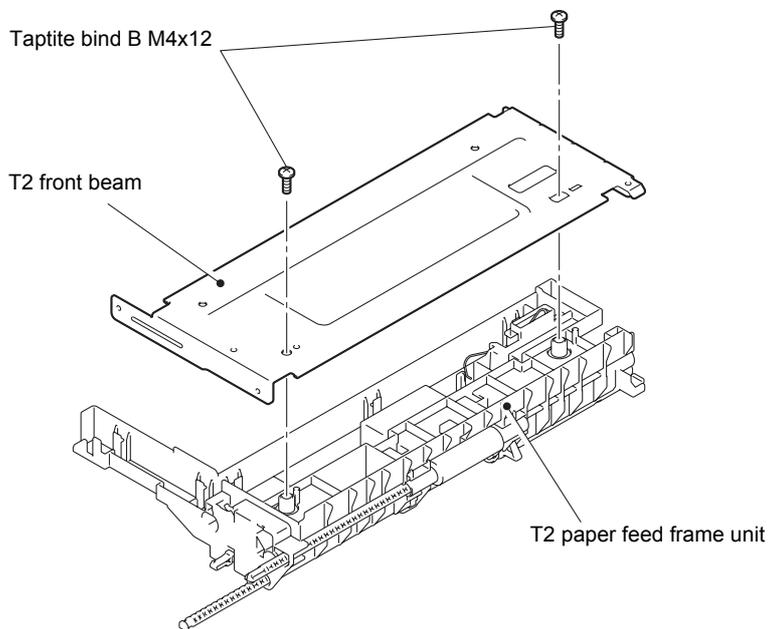


Fig. 3-91

- (6) Remove the taptite bind B M3x10 screw, and release the hook to remove the T2 paper feed actuator holder ASSY from the T2 paper feed frame unit. Then pull out the T2 paper feed sensor harness from the T2 paper feed frame unit.

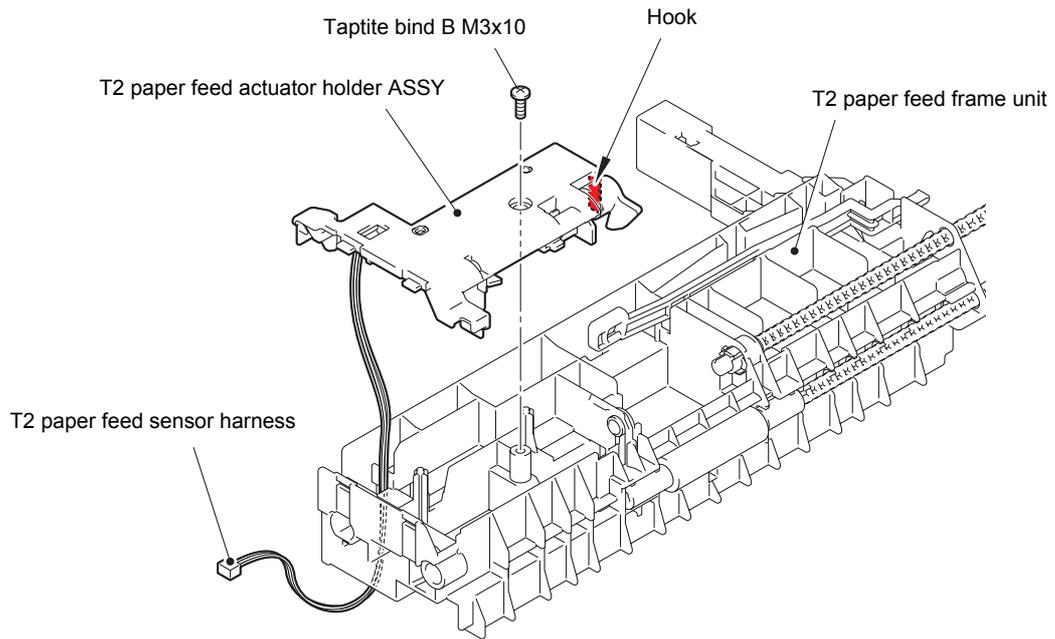


Fig. 3-92

- (7) Turn the T2 paper feed actuator in the direction of arrow 7a, and push the hook on the T2 paper feed actuator holder ASSY to slide the T2 paper feed actuator in the direction of arrow 7b to remove it from the T2 paper feed actuator holder ASSY.
- (8) Remove the T2 paper feed actuator spring from the T2 paper feed actuator.
- (9) Release the T2 paper feed sensor harness from the T2 paper feed actuator holder ASSY, and then release the hook to remove the T2 paper feed sensor PCB ASSY from the T2 paper feed actuator holder ASSY.

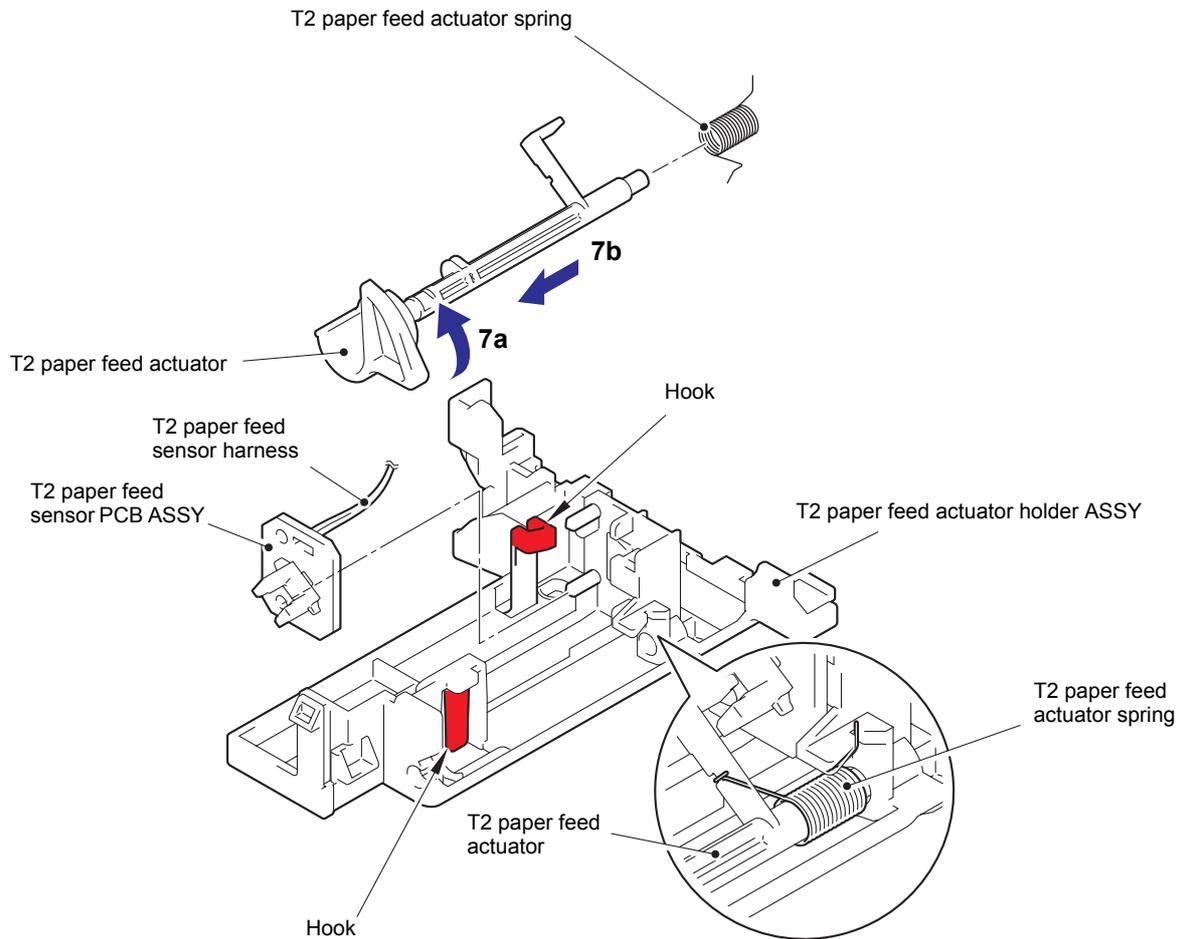


Fig. 3-93

10.9 T2 back cover

- (1) Remove the two taptite bind B M4x12 screws, and remove the T2 back cover from the LT unit.

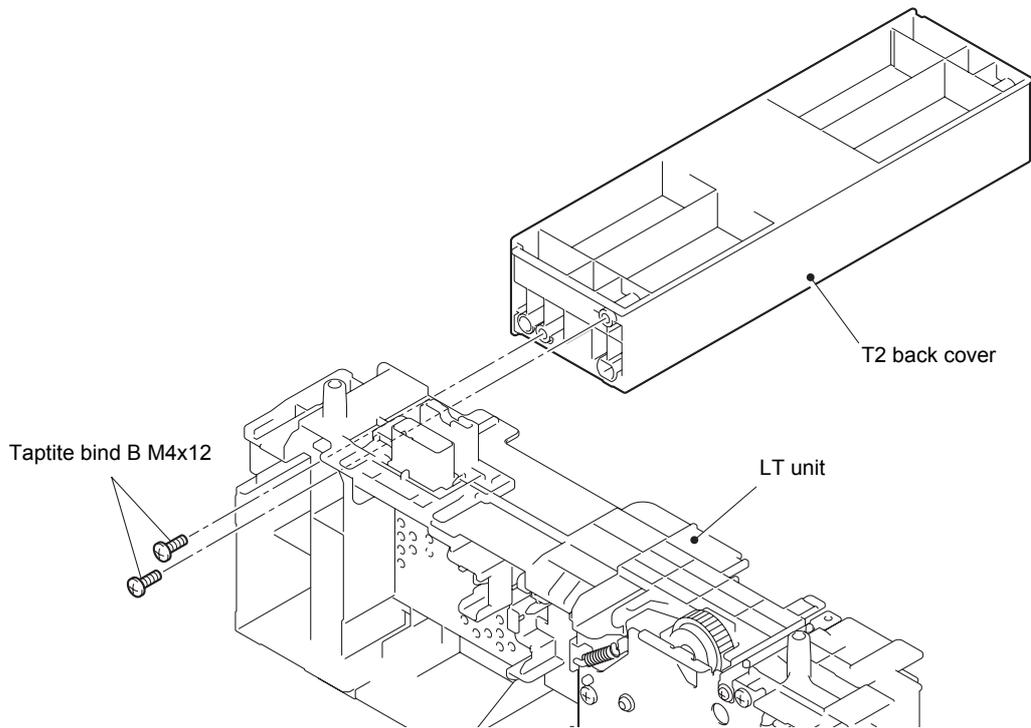


Fig. 3-94

10.10 LT connector ASSY (T2)

- (1) Release the two hooks, and remove the LT connector ASSY (T2) from the LT unit.

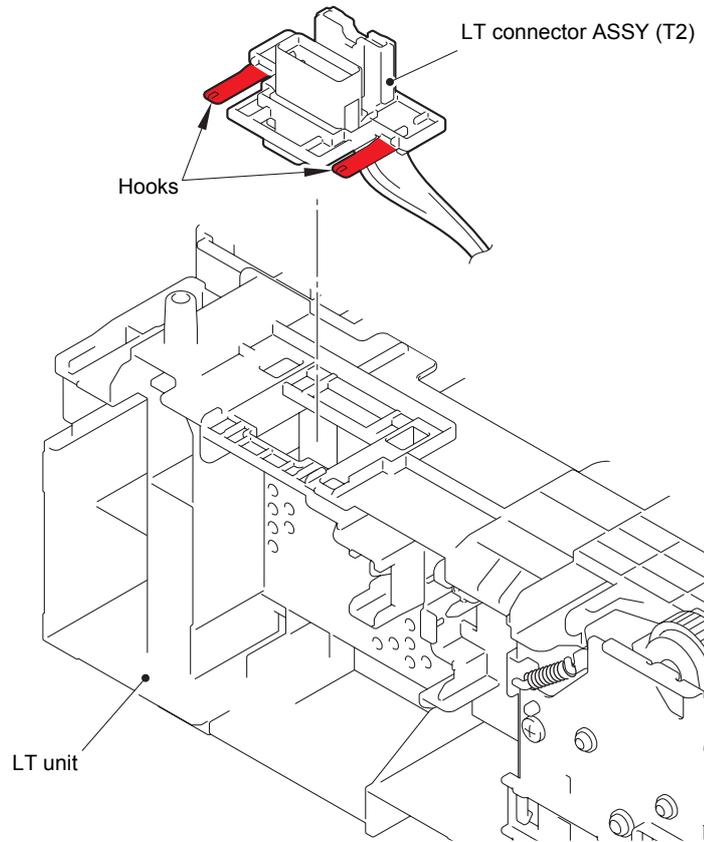


Fig. 3-95

CHAPTER 4

ADJUSTING AND UPDATING SETTINGS AS REQUIRED AFTER PARTS REPLACEMENT

CHAPTER 4 ADJUSTING AND UPDATING SETTINGS AS REQUIRED AFTER PARTS REPLACEMENT

This chapter describes adjustments and updating of settings, which are required if the main PCB ASSY and some other parts have been replaced.

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1. IF YOU REPLACE THE MAIN PCB ASSY

<What to do after replacement>

- Installing firmware (sub firmware, main firmware)
- Setting default paper size
- Setting serial number and entering adjusted value of laser unit

■ What you need to prepare

- (1) One USB cable
- (2) Create a temporary folder on the C drive of the computer (Windows® XP or higher).
- (3) Service setting tool (BrUsbsn.zip)
Copy this file into the temporary folder created on the C drive. Extract the copied file and double-click "BrUsbsn.exe" to start it.
- (4) Download utility (FILEDG32.EXE)
Copy this into the temporary folder created on the C drive.
- (5) Maintenance driver (MaintenanceDriver.zip)
When the maintenance driver is not installed, copy this into the temporary folder created on the C drive, and extract the copied file. Refer to "[APPENDIX 3 INSTALLING MAINTENANCE DRIVER](#)" for the installation procedure.
- (6) Firmware

Sub firmware (E.g.) LZXXXX_\$.upd	LZXXXX: First six digits of the part number of the firmware \$: Alphabetic character representing the revision version of the firmware (Not provided for HL-5440D)
Main firmware (E.g.) LZXXXX_\$.upd	LZXXXX: First six digits of the part number of the firmware \$: Alphabetic character representing the revision version of the firmware

1.1 Installing Firmware (Sub Firmware, Main Firmware)

1.1.1 Checking firmware version

Check whether the firmware installed on the main PCB ASSY is the latest version. If it is the latest version, there is no need to install the firmware. If it is not, be sure to install the firmware to the main PCB ASSY as described in "[1.1.2 Installing firmware](#)" in this chapter.

<How to check firmware version>

LED model

Press the [Go] button three times with the front cover closed to print the "Printer Settings", and check the firmware version.

LCD model

Press the [▲] or [▼] button in the initial state of maintenance mode to display "MAINTENANCE 25" on the LCD, and press the [OK] button. The firmware version information is displayed.

1.1.2 Installing firmware

LED model

- (1) Turn OFF the power switch of the computer and the machine.
- (2) Connect the computer to the machine with the USB cable.
- (3) Open the front cover. Press and hold the [Go] button and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button.
- (4) Check that all LEDs go out. Then, press the [Go] button four times. After several seconds, the Back Cover, Toner, Drum, Paper and Error LEDs flash once, and then go out. The machine enters firmware installing mode.
- (5) Close the front cover.
- (6) Turn ON the power switch of the computer.
- (7) Open the temporary folder and double-click "FILEDG32.EXE" to start it, and select the "Brother Maintenance USB Printer".
- (8) Drag and drop the sub firmware (LZXXXX_\$_upd) in the same folder onto the "Brother Maintenance USB Printer" icon. The sub firmware file is loaded to the machine, and installing to the flash ROM starts.

LCD model

- (1) Turn OFF the power switch of the computer and the machine.
- (2) Connect the computer to the machine with the USB cable.
- (3) Press and hold the [Go] and [Cancel] buttons simultaneously, and turn ON the power switch of the machine. Check that "■■■■■■■■■■■■■■■■■■■■" is displayed on the LCD, and then release the buttons. Close the front cover.
- (4) Turn ON the power switch of the computer.
- (5) Open the temporary folder and double-click "FILEDG32.EXE" to start it, and select the "Brother Maintenance USB Printer".
- (6) Drag and drop the sub firmware (LZXXXX_\$_upd) in the same folder onto the "Brother Maintenance USB Printer" icon. The sub firmware file is loaded to the machine, and installing to the flash ROM starts.
- (7) "Program Updating" is displayed on the LCD during installing. When installing is completed, the machine restarts and returns to the ready state automatically. Do not disconnect the USB cable or turn OFF the power switch of the computer until installing is completed.
- (8) Turn OFF the power switch of the machine, and then repeat steps (3) to (7) to reinstall the main firmware.

- | | |
|--|--|
| <p>(9) The Ready LED flashes randomly during installing. When installing is completed, the machine restarts and returns to the ready state automatically. Do not disconnect the USB cable or turn OFF the power switch of the computer until installing is completed.</p> <p>(10) Turn OFF the power switch of the machine, and then repeat steps (3) to (8) to reinstall the main firmware.</p> <p>(11) Turn OFF the power switch of the machine.</p> | <p>(9) Turn OFF the power switch of the machine.</p> |
|--|--|

Note:

- Be sure to reinstall the sub firmware and then the main firmware in this order.

1.2 Setting Default Paper Size

LED model

- (1) Copy the "SET_COUNTRYCODE.pjl" file of the relevant model to the desired location.
- (2) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button.
- (3) Check that all LEDs go out. Then, press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.
- (4) Double-click "FILEDG32.EXE" to start it. Drag and drop the PJL file modified in step (3) onto the "Brother Maintenance USB Printer" icon.
- (5) Wait for five seconds, and then turn OFF the power switch of the machine.

LCD model

Perform settings for a country as described in ["1.3.16 Setting by country \(function code: 74\)"](#) in Chapter 5.

1.3 Setting Serial Number and Entering Adjusted Value of Laser Unit

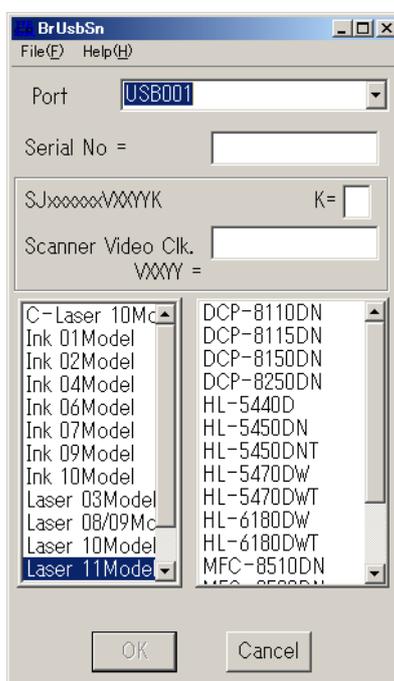
LED model

- (1) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button. Check that all LEDs go out, and then press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.

LCD model

- (1) While the machine is in the ready state, press the [OK] and [Go] buttons in this order. Then press the [▲] button four times, and the machine enters maintenance mode.

- (2) Connect the computer to the machine with the USB cable.
- (3) Double-click the "brusbsn.exe" file that was copied to the temporary folder to start it.



- (4) Click "Laser 11Model".
- (5) In the [Port] field, select the port number assigned to the Brother Maintenance USB Printer. If the port number is unknown, follow the steps below to check it.
 - 1) Click [Start], [Settings], and [Printers and Faxes]. The Printers and Faxes window appears.
 - 2) Right-click the Brother Maintenance USB Printer icon.
 - 3) Click [Properties]. The Brother Maintenance USB Printer Properties window appears.
 - 4) Click the [Ports] tab. The Brother Maintenance USB Printer port number is displayed.
- (6) Enter the serial number (15 digits) of the machine in the [Serial No] field.

- (7) Enter the number (last digit) on the laser serial number label attached to the location shown in the illustration below in the [K=□] field.

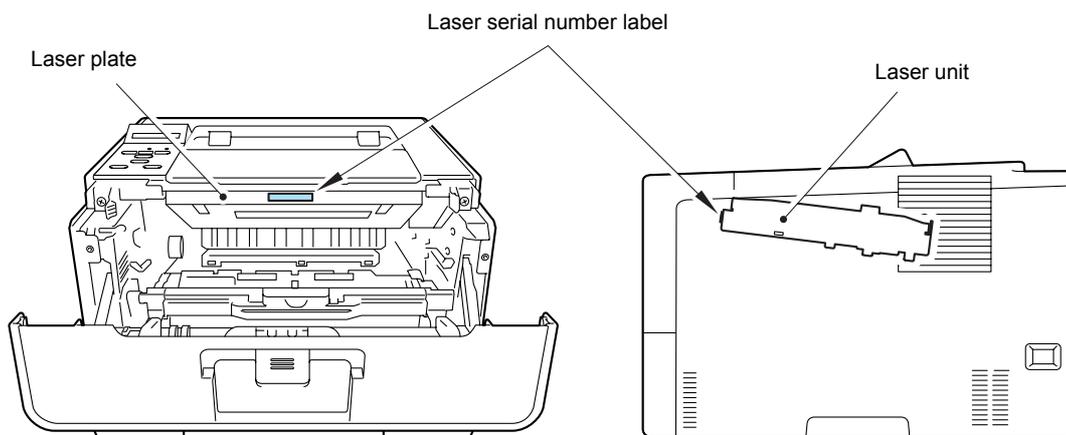


Fig. 4-1

- (8) Enter the numbers (from sixth last digit to second last digit) on the laser serial number label in the [Scanner Video Clk] field.
- (9) Click the [OK] button. The serial number and the adjusted value of the laser unit are written to the machine.
- (10) Turn OFF the power switch of the machine.

2. IF YOU REPLACE THE LASER UNIT

<What to do after replacement>

- Entering adjusted value of laser unit

■ What you need to prepare

- (1) One USB cable
- (2) Create a temporary folder on the C drive of the computer (Windows® XP or higher).
- (3) Service setting tool (BrUsbsn.zip)
Copy this file into the temporary folder created on the C drive. Extract the copied file and double-click "BrUsbsn.exe" to start it.
- (4) Download utility (FILEDG32.EXE)
Copy this into the temporary folder created on the C drive.
- (5) Maintenance driver (MaintenanceDriver.zip)
When the maintenance driver is not installed, copy this into the temporary folder created on the C drive, and extract the copied file. Refer to "[APPENDIX 3 INSTALLING MAINTENANCE DRIVER](#)" for the installation procedure.

2.1 Entering Adjusted Value of Laser Unit

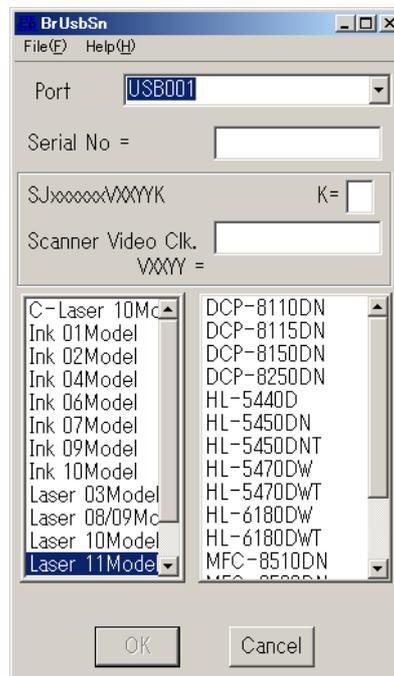
LED model

- (1) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button. Check that all LEDs go out, and then press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.

LCD model

- (1) While the machine is in the ready state, press the [OK] and [Go] buttons in this order. Then press the [▲] button four times, and the machine enters maintenance mode.

- (2) Connect the computer to the machine with the USB cable.
- (3) Double-click the "brusbsn.exe" file that was copied to the temporary folder to start it.



- (4) Click "Laser 11Model".
- (5) In the [Port] field, select the port number assigned to the Brother Maintenance USB Printer. If the port number is unknown, follow the steps below to check it.
 - 1) Click [Start], [Settings], and [Printers and Faxes]. The Printers and Faxes window appears.
 - 2) Right-click the Brother Maintenance USB Printer icon.
 - 3) Click [Properties]. The Brother Maintenance USB Printer Properties window appears.
 - 4) Click the [Ports] tab. The Brother Maintenance USB Printer port number is displayed.
- (6) Enter the serial number (15 digits) of the machine in the [Serial No] field.

- (7) Enter the number (last digit) on the laser serial number label attached to the location shown in the illustration below in the [K=□] field.

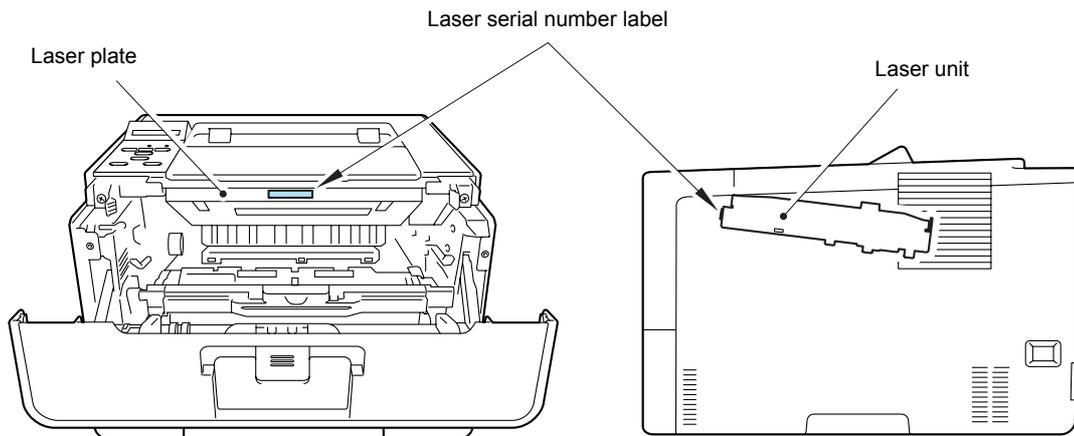


Fig. 4-2

- (8) Enter the numbers (from sixth last digit to second last digit) on the laser serial number label in the [Scanner Video Clk] field.
- (9) Click the [OK] button. The serial number and the adjusted value of the laser unit are written to the machine.
- (10) Turn OFF the power switch of the machine.

3. IF YOU REPLACE THE LOW-VOLTAGE POWER SUPPLY PCB ASSY

<What to do after replacement>

- Resetting irregular power supply detection counter

■ What you need to prepare

- (1) One USB cable
- (2) Create a temporary folder on the C drive of the computer (Windows® XP or higher).
- (3) Download utility (FILEDG32.EXE)
Copy this into the temporary folder created on the C drive.
- (4) Maintenance driver (MaintenanceDriver.zip)
When the maintenance driver is not installed, copy this into the temporary folder created on the C drive, and extract the copied file. Refer to "[APPENDIX 3 INSTALLING MAINTENANCE DRIVER](#)" for the installation procedure.
- (5) Irregular power supply detection counter PJI file (SQWAVE.PJI)

3.1 Resetting Irregular Power Supply Detection Counter

The irregular power supply detection counter increases by one when the machine detects irregular power supply. When the counter reaches the limit and the irregular power supply detection error is displayed, replace the low-voltage power supply PCB ASSY, which may have been damaged by repeated irregular power supply, and reset the irregular power supply detection counter. In this case, if the same power supply is used, the same error may occur even when the low-voltage power supply PCB ASSY is replaced. Ask the user to review the installation environment.

LED model

- (1) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button. Check that all LEDs go out, and then press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.

LCD model

- (1) While the machine is in the ready state, press the [OK] and [Go] buttons in this order. Then press the [▲] button four times, and the machine enters maintenance mode.

- (2) Connect the computer to the machine with the USB cable.
- (3) Double-click "FILEDG32.EXE" on the computer to start it, and select the "Brother Maintenance USB Printer".
- (4) Drag and drop the "SQWAVE.PJI" file onto the "Brother Maintenance USB Printer" icon.
- (5) Turn OFF the power switch of the machine.

4. IF YOU REPLACE THE HIGH-VOLTAGE POWER SUPPLY PCB ASSY

<What to do after replacement>

- After replacement, the new high-voltage power supply PCB ASSY is no longer compatible with the main PCB. Therefore, initialize the pre-discharge detection parameters.

■ What you need to prepare

- (1) One USB cable
- (2) Create a temporary folder on the C drive of the computer (Windows® XP or higher).
- (3) Download utility (FILEDG32.EXE)
Copy this into the temporary folder created on the C drive.
- (4) Maintenance driver (MaintenanceDriver.zip)
When the maintenance driver is not installed, copy this into the temporary folder created on the C drive, and extract the copied file. Refer to "APPENDIX 3 INSTALLING MAINTENANCE DRIVER" for the installation procedure.
- (5) Pre-discharge detection parameter initialization PJI file
PREDISCHAGESSET_RESET.pji

4.1 Initializing Pre-discharge Detection Parameters

LED model

- (1) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button. Check that all LEDs go out, and then press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.

LCD model

- (1) While the machine is in the ready state, press the [OK] and [Go] buttons in this order. Then press the [▲] button four times, and the machine enters maintenance mode.

- (2) Connect the computer to the machine with the USB cable.
- (3) Double-click "FILEDG32.EXE" on the computer to start it, and select the "Brother Maintenance USB Printer".
- (4) Drag and drop the "PREDISCHAGESSET_RESET.pji" file onto the "Brother Maintenance USB Printer" icon.
- (5) Turn OFF the power switch of the machine.

5. IF YOU REPLACE ANY PERIODIC REPLACEMENT PARTS

<What to do after replacement>

- Resetting counter of periodic replacement parts

■ What you need to prepare

- (1) One USB cable
- (2) Create a temporary folder on the C drive of the computer (Windows® XP or higher).
- (3) Download utility (FILEDG32.EXE)
Copy this into the temporary folder created on the C drive.
- (4) Maintenance driver (MaintenanceDriver.zip)
When the maintenance driver is not installed, copy this into the temporary folder created on the C drive, and extract the copied file. Refer to "APPENDIX 3 INSTALLING MAINTENANCE DRIVER" for the installation procedure.
- (5) Periodic parts resetting PJI file

5.1 Resetting Counter of Periodic Replacement Parts

<How to use periodic parts resetting PJI file>

LED model

- (1) Open the front cover. Press and hold the [Go] button, and turn ON the power switch of the machine. Check that the Back Cover, Toner, Drum, Paper and Error LEDs light, and release the [Go] button. Check that all LEDs go out, and then press the [Go] button for at least two seconds. The Paper LED lights, and the machine enters maintenance mode.

LCD model

- (1) While the machine is in the ready state, press the [OK] and [Go] buttons in this order. Then press the [▲] button four times, and the machine enters maintenance mode.

- (2) Connect the computer to the machine with the USB cable.
- (3) Double-click "FILEDG32.EXE" on the computer to start it, and select the "Brother Maintenance USB Printer".
- (4) Drag and drop the periodic parts resetting PJI file onto the "Brother Maintenance USB Printer" icon.
- (5) Turn OFF the power switch of the machine.

<Method to reset using machine's built-in function> (only for LCD models)

- (1) Press the [Go] and [+] buttons in ready mode. "Drum Unit" is displayed on the LCD.
- (2) Press the [▲] or [▼] button to display the part that has been replaced.
- (3) Press the [OK] button. "▲Reset ▼Exit" is displayed on the LCD.
- (4) Press the [▲] button. "Accepted" is displayed on the LCD, and the counter for the corresponding periodic replacement parts is reset.
- (5) Turn OFF the power switch of the machine.

CHAPTER 5

SERVICE FUNCTIONS

CHAPTER 5 SERVICE FUNCTIONS

Describes the maintenance mode which is exclusively designed for the purpose of checking the settings and adjustments using the buttons on the control panel. This chapter also covers not-disclosed-to-users function menus, which activate settings and functions or reset the parts life.

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1. MAINTENANCE MODE

Maintenance mode is exclusively designed for checking, setting and adjusting the machine using the buttons on the control panel.

LCD models are equipped with the same maintenance mode functions as those of the color printer. Using these functions, you can conduct operational checks of sensors or test printing, display the log information or error codes, and change the worker switches (WSW) etc. Although LED models are not equipped with the above maintenance mode functions, they are equipped with conventional maintenance mode functions using the [Go] button. Conventional mode functions are also available on LCD models.

1.1 How to Enter Maintenance Mode

1.1.1 Method of entering end-user accessible maintenance mode

Basically, the maintenance mode functions should only be accessed by service personnel. However, end users are allowed to use some of these functions under the guidance of service personnel over the phone. For the maintenance mode functions for LCD models, end users can only use the functions shaded in the table on page 5-3 (function codes 09, 12, 25, 28, 45, 77, 80, 82, and 91). For the maintenance mode functions using the [Go] button, end users can use the functions shown in the "List of end-user accessible maintenance mode functions" on page 5-4.

<Operating Procedure>

■ How to enter end-user accessible maintenance mode (LCD models)

- (1) Press the [OK], [Go], and [OK] buttons in this order while the machine is in the ready state. "0" is displayed on the LCD.
- (2) Press the [▲] or [▼] button several times until the desired maintenance mode function is displayed on the LCD, and then press the [OK] button.
Each time the selected maintenance mode function is completed, the machine returns to the ready state automatically.
For function codes 12, 25, 28, 45, 80, and 82, pressing the [Cancel] button returns the machine to the ready state.

■ How to enter end-user accessible maintenance mode using [Go] button (LED models)

- (1) Close the front cover while the power switch is turned OFF. Press and hold the [Go] button, and turn ON the power switch.
- (2) The Back Cover, Toner, Drum, Paper and Error LEDs light.
Release the [Go] button, and check that all LEDs go out.
- (3) Press the [Go] button for the assigned number of times to select the function. (While you are pressing the [Go] button, the Ready LED remains lit.)
Check that all LEDs light for one second.

1.1.2 Method of entering maintenance mode for service personnel

<Operating Procedure>

■ How to enter maintenance mode for service personnel (LCD models)

- (1) Press the [OK] button and then the [Go] button while the machine is in the ready state. Then, press the [▲] button four times to enter maintenance mode.
- (2) "■■ MAINTENANCE ■■" is displayed on the LCD to indicate that the machine has moved into the initial state of maintenance mode. The machine is ready to accept entry via the buttons.
- (3) To select any of the maintenance mode functions shown in the list on the [next page](#), press the [▲] or [▼] button until the desired function code is displayed on the LCD, and then press the [OK] button.

■ How to enter maintenance mode for service personnel using [Go] button (LED models)

- (1) Open the front cover while the power switch is turned OFF. Press and hold the [Go] button, and turn ON the power switch.
- (2) The Back Cover, Toner, Drum, Paper and Error LEDs light. Release the [Go] button, and check that all LEDs go out.
- (3) Press the [Go] button for the assigned number of times to enter maintenance mode. (While you are pressing the [Go] button, the Ready LED remains lit.) Check that the Back Cover, Toner, Drum, Paper and Error LEDs light. (Remain lit.)
- (4) Press the [Go] button again for the assigned number of times to select the function. (While you are pressing the [Go] button, the Ready LED remains lit.) Check that the Back Cover, Toner, Drum, Paper and Error LEDs go out after one second.

1.2 List of Maintenance Mode Functions

1.2.1 List of maintenance mode functions for LCD models

Function code	Function	Refer to:
01	Initialize EEPROM parameters	1.3.1 (5-6)
09	Print test pattern	1.3.2 (5-7)
10	Set worker switches (WSW)	1.3.3 [1] (5-8)
11	Print worker switch (WSW) setting data	1.3.3 [2] (5-9)
12	Check LCD operation	1.3.4 (5-10)
13	Check control panel button operation	1.3.5 (5-11)
25	Display software version	1.3.6 (5-12)
28	Set One Push Demo function	1.3.7 (5-13)
32	Check sensor operation	1.3.8 (5-14)
33	Display LAN connection status	1.3.9 (5-16)
40	Print Dump List	1.3.10 (5-17)
45	Change USB No. return value / Adjust left-end print start position on second side when duplex printing / Change ON/OFF setting for Deep Sleep function	1.3.11 (5-18)
67	Continuous print test	1.3.12 (5-20)
69	Print frame pattern (single-side printing)	1.3.13 (5-22)
70	Print frame pattern (duplex printing)	1.3.14 (5-24)
71	Print solid pattern	1.3.15 (5-26)
74	Setting by country	1.3.16 (5-27)
77	Print maintenance information	1.3.17 (5-29)
78	Check fan operation	1.3.18 (5-31)
80	Display machine log information	1.3.19 (5-32)
82	Display machine error code	1.3.20 (5-34)
91	Initialize EEPROM parameters	1.3.1 (5-6)
99	Quit maintenance mode	1.3.21 (5-34)

The maintenance mode functions shaded in the table can be used by end users.

1.2.2 List of maintenance mode functions using [Go] button for LED models

<List of end-user accessible maintenance mode functions>

Front cover	No. of times [Go] button is pressed to enter maintenance mode	No. of times [Go] button is pressed to select function	Function	Refer to:
Close	0	1	Test printing	5-35
		2	Print font list	5-36
		3	Change USB No. return value	5-36
		4	HEX Dump mode	5-36
		5	Test printing	5-35
		6	Network Reset	5-36
		7	Test printing	5-35
		8	Factory Reset	5-36
		9	Test printing	5-35
		10	Settings Reset	5-36
		11	Test printing	5-35
		12	Engine error ignore mode	5-37
		13	One Push print recovery mode	5-37
		14 or more	Test printing	5-35

<List of maintenance mode functions for service personnel>

Front cover	No. of times [Go] button is pressed to enter maintenance mode	No. of times [Go] button is pressed to select function	Function	Refer to:
Open	1	1	Check sensor operation	5-38
		2	Print continuous lattice pattern	5-39
		3	Print fuser unit inspection	5-39
		4	Print EEPROM Dump	5-40
		5	Check RAM	5-40
		6	Print machine quality inspection pattern 1	5-41
		7	Change ON/OFF setting for duplex printing	5-42
		8	Change A4/Letter setting for paper size	5-42
		9	Engine error ignore mode	5-37
		10	Print machine quality inspection pattern 2	5-43
		11 or more	Returns to the ready state	

(Continued from previous page)

Front cover	No. of times [Go] button is pressed to enter maintenance mode	No. of times [Go] button is pressed to select function	Function	Refer to:
Open	2	1	Maintenance printing	5-44
		2	Print maintenance data and frame pattern	5-46
		3	Print Network Configuration	5-47
		4	Change ON/OFF setting for sleep function	5-47
		5	Reset developer roller counter 1 (Starter)	5-47
		6	Reset developer roller counter 2 (Standard)	5-47
		7	Reset developer roller counter 3 (HighCapa)	5-47
		8	Reset developer roller counter 4 (SuperHighCapa)	5-47
		9	USB speed lock mode	5-47
		10	Change Ready LED light intensity in sleep mode	5-48
		11 or more	Returns to the ready state	
	3	1	Factory Use (disabled)	
		2	Factory Use (disabled)	
		3	Factory Use (disabled)	
		4	Factory Use (disabled)	
		5	Factory Use (disabled)	
		6	Factory Use (disabled)	
		7	Factory Use (disabled)	
		8	Factory Use (disabled)	
		9	Factory Use (disabled)	
		10	Factory Use (disabled)	
		11	Factory Use (disabled)	
		12	Factory Use (disabled)	
		13 or more	Returns to the ready state	
	4		Firmware Installing mode	5-48
	5		Factory Use (disabled)	
	6	1 or more	Returns to the ready state	
7		Override firmware Installing mode		
8	1 or more	Returns to the ready state		
2 seconds or longer		Enter maintenance mode for service personnel	5-48	

1.3 Details of Maintenance Mode Functions for LCD Models

1.3.1 Initialize EEPROM parameters (function code: 01, 91)

<Function>

This function is to initialize the setting values for operation parameters, user switches, and worker switches (WSW) registered in the EEPROM. Entering function code 01 initializes most EEPROM areas. Entering function code 91 initializes only the specified areas as shown in the table below.

Data item \ Function code	01	91
Printer switch (counter information)	Areas not to be initialized	Areas not to be initialized
Error history		
MAC address		
Password for control panel operation lock	Areas to be initialized	Areas to be initialized
Secure function lock		
Worker switches		
User switches		
LAN setting		
Emulation setting		

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 01" (or "Maintenance 91") on the LCD.
- (2) Press the [OK] button. "PARAMETER INIT" is displayed on the LCD.
- (3) When initializing parameters is completed, the machine returns to the initial state of maintenance mode.

1.3.2 Print test pattern (function code: 09)

<Function>

This function is to print a test pattern (print quality check sheet) to check any missing image and print quality.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 09" on the LCD.
- (2) Press the [OK] button to print the test pattern.
- (3) When printing the test pattern is completed, the machine returns to the initial state of maintenance mode.

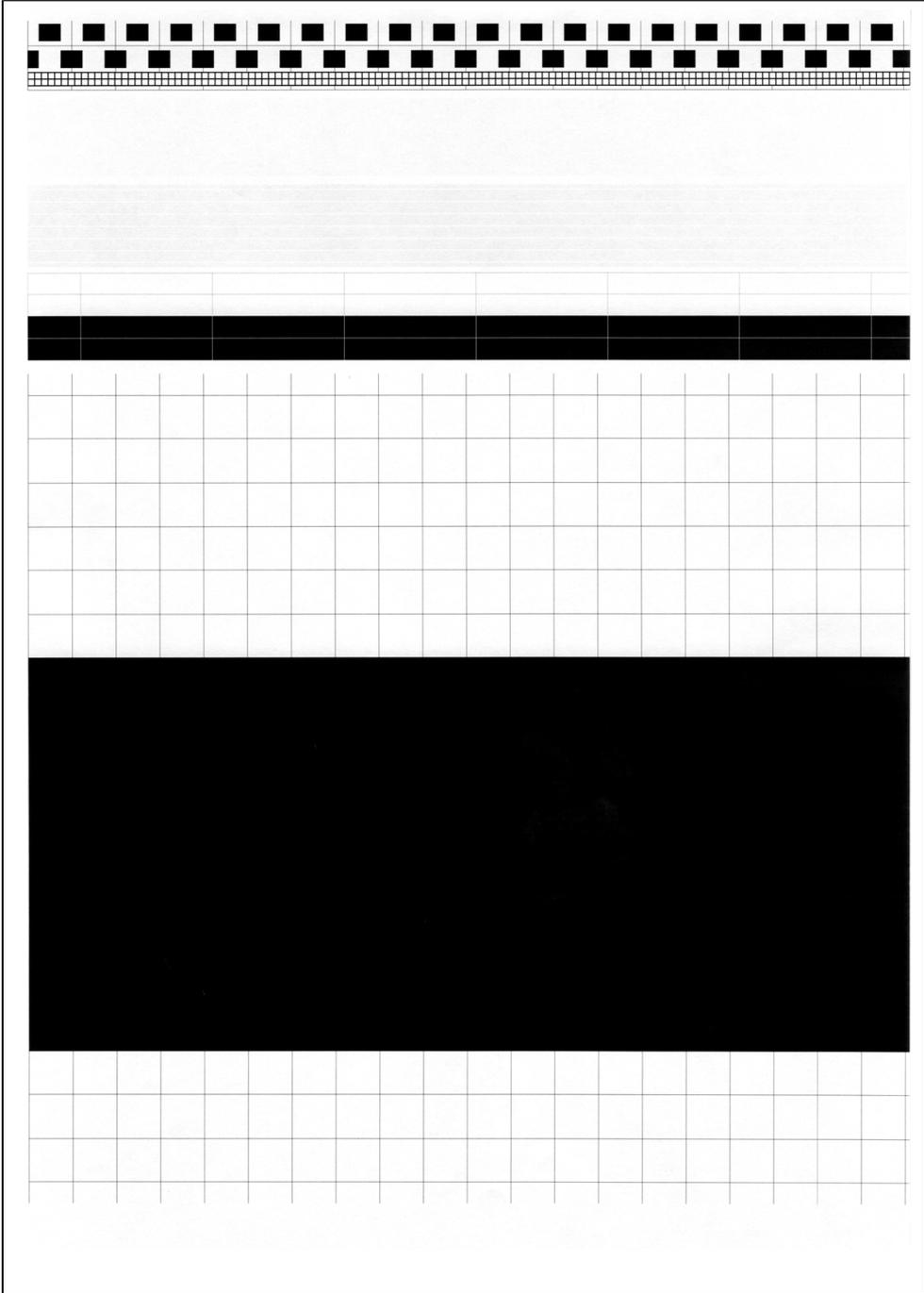


Fig. 5-1

1.3.3 Set worker switches (WSW) and print worker switch setting data (function code: 10, 11)

[1] Set worker switches (WSW) (function code: 10)

<Function>

The worker switches shown in the table below can be used to set the function to satisfy various requirements. The switch setting can be changed using the buttons on the control panel.

The worker switches are factory set to conform with the laws and regulations of the country the machine is shipped to. Do not change these settings unless necessary.

■ Worker switches available

WSW No.	Function
WSW48	Change USB High/Full Speed
WSW55	Change the interval for correcting the developing bias voltage value
WSW56	Function setting 1
WSW59	Change ON/OFF setting for USB serial number sending
WSW63	Change time display method, Demo print type, and ON/OFF for Israeli font support
WSW64	Set the language / default paper size
WSW65	Set the default media type / media type support range
WSW78	Stop printing when life of drum unit has expired

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 10" on the LCD.
- (2) Press the [OK] button. "WSW00" is displayed on the LCD, indicating that the machine is ready for worker switch number entry.
- (3) Press the [▲] or [▼] button to display the worker switch number for which you want to change the setting on the LCD.
- (4) Press the [OK] button. The display shown below appears on the LCD.

Selector No. 1 Selector No. 8
 ↓ ↓
 WSWXX = 0 0 0 0 0 0 0 0

- (5) Pressing the [▲] button sets "1" and pressing the [▼] button sets "0". Press either button to set the numerical value for selector No. 1. The underline cursor moves to the next digit.
- (6) Repeat step (5) until numerical values are entered up to selector No. 8.
- (7) Press the [OK] button. The new selector setting value is stored in the EEPROM, and the machine returns to the ready state for worker switch number entry ([WSW00]).
- (8) When worker switch setting is completed, press the [Cancel] button to return the machine to the initial state of maintenance mode.

Note:

- To cancel operation and return to the initial state of maintenance mode, press the [Cancel] button.
- If there is no entry for one minute or longer, the machine returns to the initial state of maintenance mode automatically, regardless of the display status.

[2] Print worker switch (WSW) setting data (function code: 11)

<Function>

This function is to print the setting items of the worker switches and the set details.

<Operation Procedure>

- (1) Press the [\blacktriangle] or [\blacktriangledown] button in the initial state of maintenance mode to display "Maintenance 11" on the LCD.
- (2) Press the [OK] button. "PRINTING" is displayed on the LCD and the CONFIGURATION LIST shown below is printed.
- (3) When printing is completed, the machine returns to the initial state of maintenance mode.

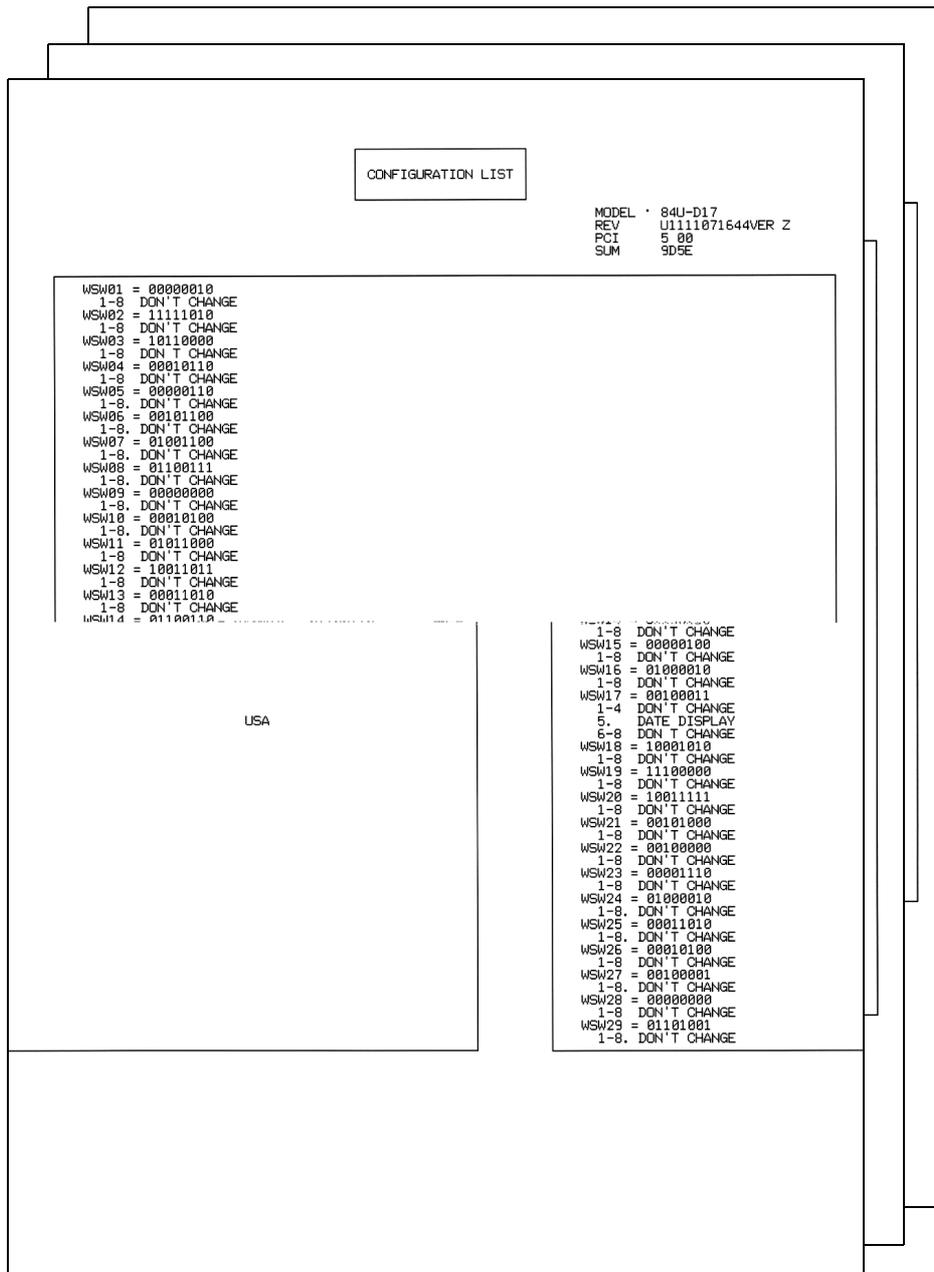


Fig. 5-2

1.3.4 Check LCD operation (function code: 12)

<Function>

This function is to check that the LCD on the control panel is operating normally.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 12" on the LCD.
The display shown below appears on the LCD.
- (2) Press the [OK] button.
The display shown below appears on the LCD.
Each press of the [Go] button cycles through the display as shown in the figure below.
- (3) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode, regardless of the display status.

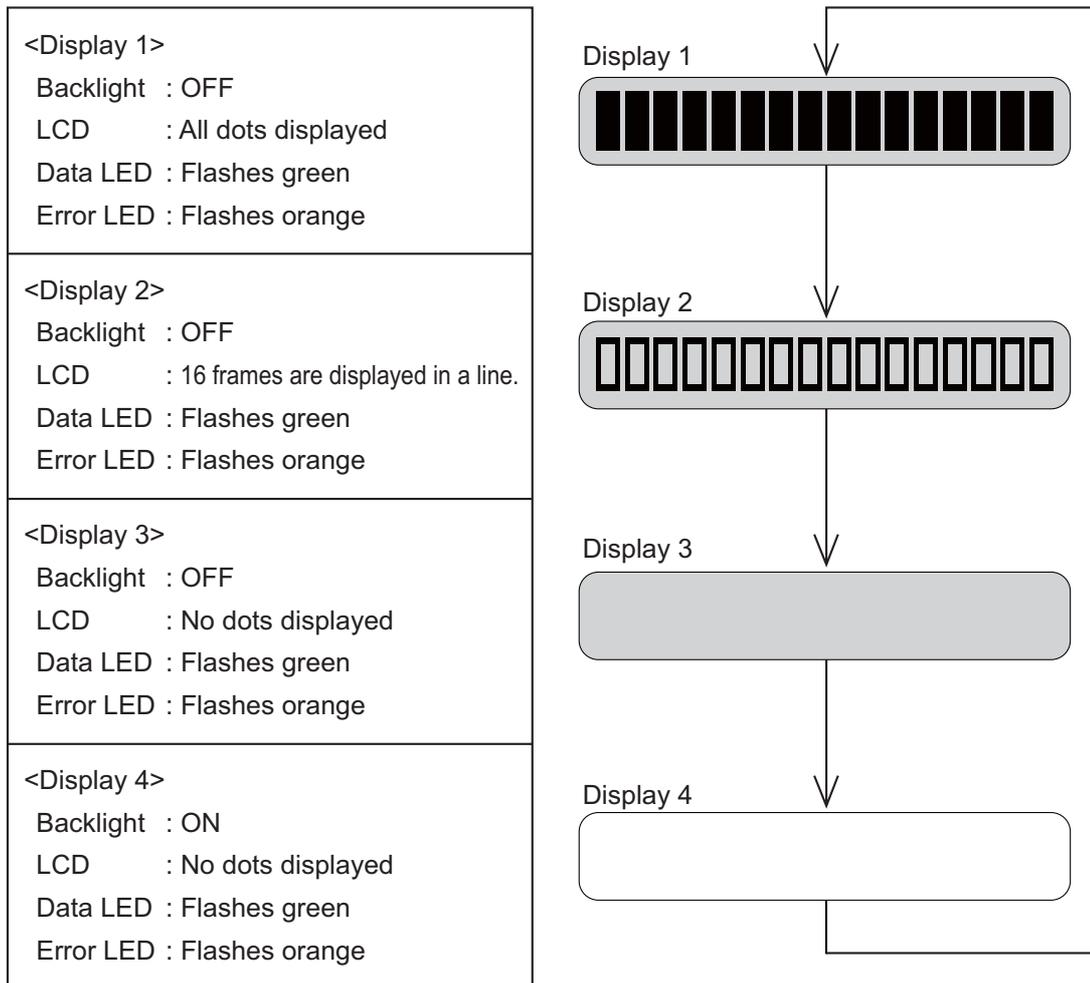


Fig. 5-3

1.3.5 Check control panel button operation (function code: 13)

<Function>

This function is to check that the buttons on the control panel operate normally.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 13" on the LCD.
- (2) Press the [OK] button. "00" is displayed on the LCD.
- (3) Press the buttons according to the numbers provided on the figure below. Each time the button is pressed, the corresponding figure is displayed on the LCD in decimal notation. Check that the number displayed on the LCD matches the number assigned to the button that has been pressed. If the buttons are pressed in the incorrect order, "INVALID OPERATE" is displayed on the LCD. Pressing the [Cancel] button returns to the state immediately before the incorrect button was pressed.
- (4) When button operation is normal, the machine returns to the initial state of maintenance mode when the last button is pressed. To cancel operation and return to the initial state of maintenance mode, press the [Cancel] button.

■ Order of pressing buttons



Fig. 5-4

1.3.6 Display software version (function code: 25)

<Function>

This function is to check the version information of the firmware or programs, or check sum information.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 25" on the LCD.
- (2) Press the [OK] button. The version information as shown in the table below is displayed on the LCD.
- (3) Pressing the [Go], [▲] or [▼] button changes the display item.
- (4) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

LCD	Description
MAIN:Ver1.00 (A)	Main firmware version information ((A): Revision information)
SUB1 :Ver1.00 (P) * ¹	Sub firmware version information ((P): Identifier for PCL/PS) * ²
ENG :Ver1.00	Engine firmware version information
NET :Ver1.00	Network program version information (Displayed only for network-supported models)
B1112312359:1234 * ¹	Boot program creation date
U1112312359:1234 * ¹	Main firmware creation date
D1112312359:1234 * ¹	Demo firmware creation date
P1112312359:1234 * ¹	Sub firmware creation date
ROM Check Sum	Check sum self-diagnosis function * ³

*¹ How to display the check sum information

You can check the check sum information by pressing the [OK] button while each version is displayed. When the [OK] button is pressed again, the LCD returns to the version display. Pressing the [Go], [▲] or [▼] button changes the display item.

*² (P) indicates that the firmware supports PCL/PS.

*³ There are two types of check sum information that can be checked with this function.

This function checks if these two types of check sum information match each other. When the [OK] button is pressed while "ROM Check Sum" is displayed, check is automatically conducted for each ROM of each software part. When the check sum matches, "OK" is displayed on the LCD. When all ROMs result in OK, "ROM Check Sum OK" is displayed at the end, and the operation is finished. When the check sum of any ROM does not match, "NG" is displayed, and the display stops.

1.3.7 Set One Push Demo function (function code: 28)

<Function>

This function is to implement Demo printing by pressing the [Go] button, and is mainly used for sales promotion at dealers. This function is disabled once printing is performed from the computer. Change the setting to enable the function.

OnePushDemo = ON (enabled)

OnePushDemo = OFF (disabled)

The setting currently selected is marked "*".

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 28" on the LCD.
- (2) Press the [OK] button. "OnePushDemo=ON*" is displayed on the LCD.
When the current setting is OFF, "OnePushDemo=ON" (without "*") is displayed on the LCD.
- (3) Press the [▲] or [▼] button to display "OnePushDemo=ON" when enabling this function or "OnePushDemo=OFF" when disabling this function.
- (4) Press the [OK] button. The setting currently displayed is saved, and the machine returns to the initial state of maintenance mode.
- (5) To cancel operation and return to the initial state of maintenance mode, press the [Cancel] button.

Note:

- Once the One Push Demo function is enabled, this will not be disabled even when printing is performed from the computer as long as the power switch is not turned OFF. However, if the power switch is turned OFF and then ON again after the One Push Demo function was enabled, this function will be disabled when printing is performed from the computer.

1.3.8 Check sensor operation (function code: 32)

<Function>

This function is to check that the sensors are operating normally.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 32" on the LCD.
- (2) Press the [OK] button. The sensor operating conditions defined in the table below are applied. For example, when paper tray 2 is set, "C1C2T2TNNT*" (1st group) is displayed on the LCD. When paper tray 2 is not set, "C1****TNNT*" is displayed.
- (3) Pressing the [Go] button displays the next group.
The table below summarizes the displays on the LCD, sensor names and detection status.

	LCD	Sensor names	Detection status (displayed / not displayed)
Group 1	C1	T1 paper feed sensor	Paper tray 1 closed / Paper tray 1 open
	C2	T2 paper feed sensor	Paper tray 2 closed / Paper tray 2 open
	T2	T2 connect sensor	Paper tray 2 connected / Paper tray 2 not connected
	TN	Toner sensor	Beam obstructed / Beam not obstructed
	NT	New toner sensor	Sensor pressed / Sensor not pressed
Group 2	CV	Front cover sensor	Front cover closed / Front cover open
	RC	Back cover sensor	Back cover closed / Back cover open
	PO	Eject sensor	No paper / Paper set
	RM	Registration front sensor	No paper / Paper set
	RA	Registration rear sensor	No paper / Paper set
	MP	MP paper empty sensor	No paper / Paper set

- (4) Change the conditions subject to sensor detection and check that the display on the LCD changes depending on the sensor status. For example, feed the paper through the registration front or rear sensor, open the front cover or back cover, remove the toner cartridge, create paper jam at the exit, supply paper from the MP tray, or set the paper tray.
- (5) Operate the sensor from OFF to ON as below to check the operation of the corresponding solenoid or clutch.

Sensor operation	Solenoid/clutch operation
Change T1 paper feed sensor from OFF to ON.	The T1 clutch remains ON for the specified time.
Change MP paper empty sensor from OFF to ON.	The MP solenoid remains ON for the specified time.
Change registration front sensor from OFF to ON.	The duplex solenoid remains ON for the specified time.
Change registration rear sensor from OFF to ON.	The registration clutch remains ON for the specified time.
Change new toner sensor from OFF to ON.	The develop clutch 51R remains ON for the specified time.

- (6) When the [Cancel] button is pressed, this operation is finished, and the machine returns to the initial state of maintenance mode.

■ Location of sensors

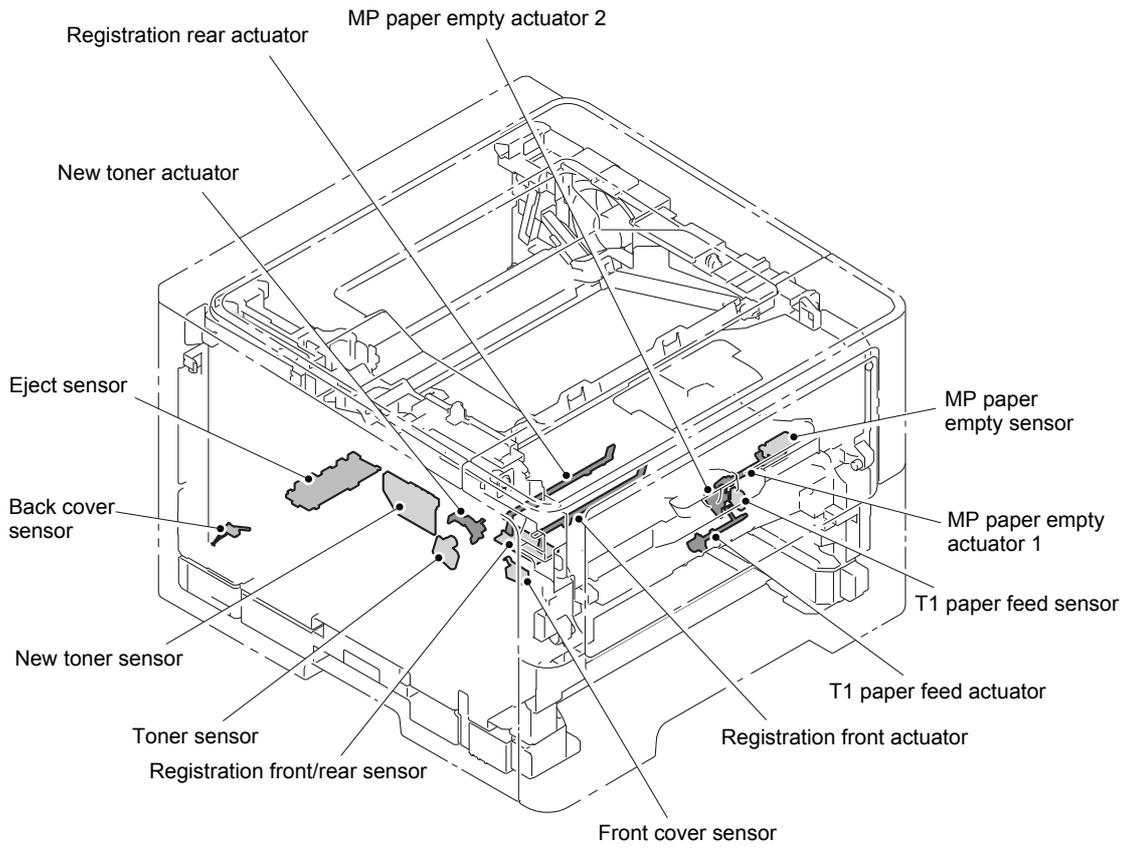


Fig. 5-5

1.3.9 Display LAN connection status (function code: 33)

<Function>

This function is to check the connection status of the wired LAN.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 33" on the LCD.
- (2) Press the [OK] button. The wired LAN connection status as shown in the table below is displayed on the LCD.
- (3) Pressing the [▲] or [▼] button changes the display item.
- (4) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

LCD	Wired LAN connection status
Active 1000B-FD	1000B-FD
Active 1000B-HD	1000B-HD
Active 100B-FD	100B-FD
Active 100B-HD	100B-HD
Active 10B-FD	10B-FD
Active 10B-HD	10B-HD
Inactive	Not connected

1.3.10 Print Dump List (function code: 40)

<Function>

This function is to print the EEPROM information.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 40" on the LCD.
- (2) Press the [OK] button. "E2PDUMP ENGN ALL" is displayed on the LCD.
- (3) Press the [▲] or [▼] button to select the information to be printed.
- (4) Press the [OK] button. "E2PDUMP PRINTING" is displayed on the LCD, and printing starts.
- (5) When the EEPROM information has been printed, the machine returns to the initial state of maintenance mode.
- (6) When the [Cancel] button is pressed during printing, printing is stopped and the machine returns to the initial state of maintenance mode.

LCD	Description
E2PDUMP ENGN ALL	Print all values stored in E2PROM for the engine controller (1-page printing)
E2PDUMP MAIN TOP	Print values stored in E2PROM for the first 1 kbyte for the main controller (1-page printing)
E2PDUMP MAIN BTM	Print values stored in E2PROM for the last 1 kbyte for the main controller (1-page printing)
E2PDUMP MAIN ALL	Print all values stored in E2PROM for the main controller (8-page printing)

1.3.11 Change USB No. return value / Adjust left-end print start position on second side when duplex printing / Change ON/OFF setting for Deep Sleep function (function code: 45)

■ Change USB No. return value

<Function>

When the operating system (OS) installed on the computer is Windows Vista®, and the machine is connected to this computer using USB2.0FULL, the OS may not be able to obtain the USB device serial number depending on the computer and USB device. If the serial number cannot be obtained, the number of devices increases each time the device is connected to the computer. To avoid this problem, setting this function to "USBNo.=ON" can fix the USB No. return value to "0".

(The same function as that described in "1.4.3 Change USB No. return value" in this chapter)

LCD	Description
USBNo. = ON	Returns the serial number of the machine. (Default)
USBNo. = OFF	Returns "0".

The setting currently selected is marked "*" at the end of the display.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 45" on the LCD.
- (2) Press the [OK] button. "USBNo." is displayed on the LCD.
- (3) Press the [OK] button. "USBNo.=ON" is displayed on the LCD.
- (4) Press the [▲] or [▼] button to display "USBNo.=ON" when fixing the serial number return value to "0" or "USBNo.=OFF" when not fixing it.
- (5) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the initial state of maintenance mode.
- (6) Turn OFF the power switch.

Note:

- The setting is applied after the power switch is turned OFF and then ON again.

■ Adjust left-end print start position on second side when duplex printing

<Function>

In the event that the left-end print start position deviates on the second side when duplex printing, use this function to adjust the position left and right.

The adjustable range is -100 to 750 (unit: 300 dpi). (Shifted to left when the value is negative)

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 45" on the LCD.
- (2) Press the [OK] button. "USBNo." is displayed on the LCD.
- (3) Press the [▲] or [▼] button to display "DX.XAdjust" on the LCD.
- (4) Press the [OK] button. "DX.XAdjust=***" is displayed on the LCD. (The value currently set is displayed for **.)
- (5) To shift the writing start position to the left, press the [▼] button to decrease the value. To shift the position to the right, press the [▲] button to increase the value.
- (6) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the initial state of maintenance mode.

■ **Change ON/OFF setting for Deep Sleep function when Deep Sleep function is enabled and machine has Storage Data (Secure)**

<Function>

When the machine has the Storage Data (Secure) available, use this function to set whether to permit the machine to enter Deep Sleep mode.

LCD	Description
DpSlp.StrDt = ON	The Deep Sleep function is activated even when the machine has Storage Data (Secure) available. (Default)
DpSlp.StrDt = OFF	The Deep Sleep function is not activated when the machine has Storage Data (Secure) available.

The setting currently selected is marked "*" at the end of the display.

Note:

- This function is effective when the Deep Sleep function is enabled (ON).

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 45" on the LCD.
- (2) Press the [OK] button. "USBNo." is displayed on the LCD.
- (3) Press the [▲] or [▼] button to display "DpSlp.StrDt" on the LCD.
- (4) Press the [OK] button. "DpSlp.StrDt=ON" is displayed on the LCD.
- (5) Display "DpSlp.StrDt=ON" on the LCD when permitting the machine to enter Deep Sleep mode, or "DpSlp.StrDt=OFF" when not permitting it.
- (6) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the initial state of maintenance mode.

1.3.12 Continuous print test (function code: 67)

<Function>

This function is to conduct paper feed and eject tests while printing patterns.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 67" on the LCD.
- (2) Press the [OK] button. "SELECT: K 100%" is displayed on the LCD.
- (3) Refer to the table below (print pattern), and press the [▲] or [▼] button to select the print pattern.
- (4) Press the [OK] button. "SELECT: A4" is displayed on the LCD.
- (5) Refer to the table below (paper size), and press the [▲] or [▼] button to select the paper size.
- (6) Press the [OK] button. "SELECT: TRAY1" is displayed on the LCD.
- (7) Refer to the table below (print type), and press the [▲] or [▼] button to select the print type.
- (8) Press the [OK] button. "PAPER FEED TEST" is displayed on the LCD, and printing test pattern starts using the selected conditions.
- (9) When the [Cancel] button is pressed, test pattern printing is stopped, and the machine returns to the initial state of maintenance mode.

Print pattern

LCD	Description
SELECT: K 100%	100% solid printing (continuous printing)
SELECT: K 1%	1% intermittent pattern printing (500-page printing)
SELECT: K 5%	5% intermittent pattern printing (500-page printing)
SELECT: Lattice	Lattice printing (continuous printing)

Paper size

LCD	Description
SELECT: A4	A4
SELECT: LETTER	Letter

Print type

LCD	Description
SELECT: TRAY1	Single-side printing from paper tray 1
SELECT: TRAY2	Single-side printing from paper tray 2
SELECT: MP	Single-side printing from MP tray
SELECT: TRAY1 DX	Duplex printing from paper tray 1
SELECT: TRAY2 DX	Duplex printing from paper tray 2
SELECT: MP DX	Duplex printing from MP tray

Note:

- Duplex printing only supports 5% intermittent pattern printing. Single-side printing applies to other patterns even when duplex printing is specified.

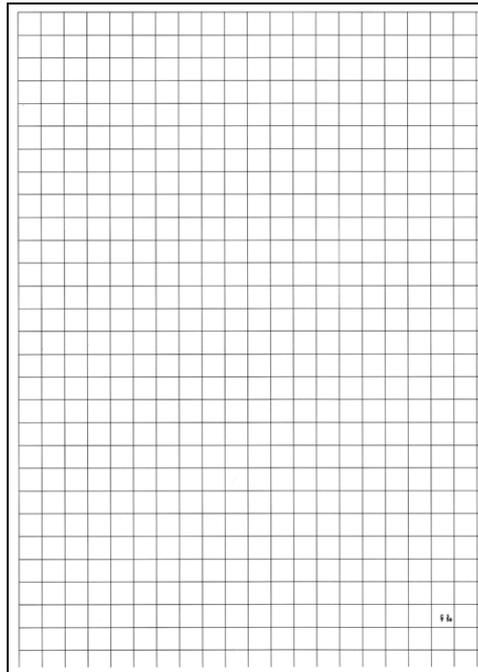
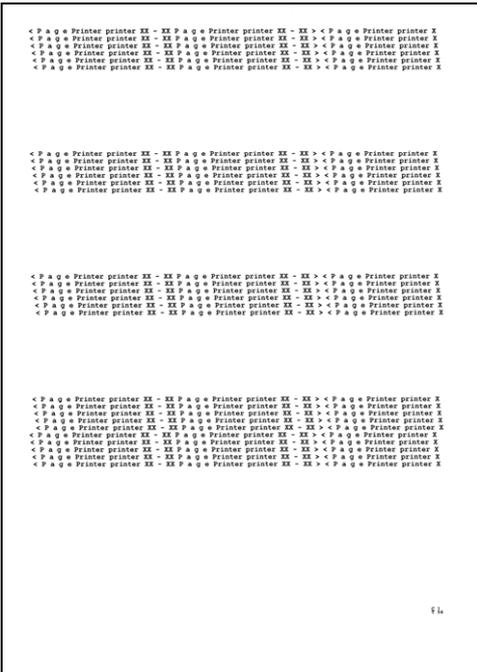
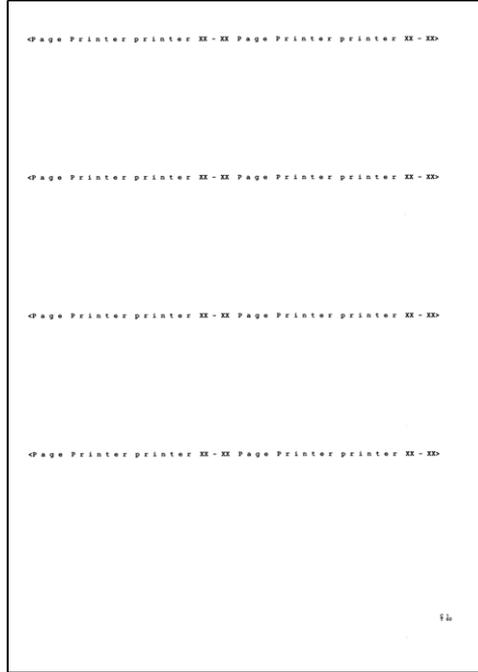
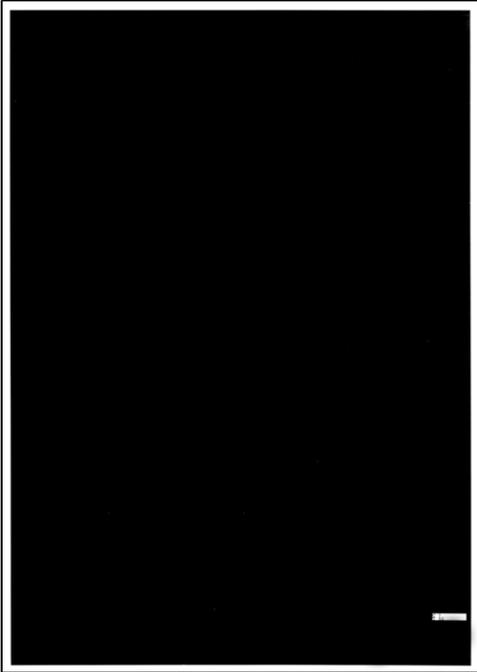


Fig. 5-6

1.3.13 Print frame pattern (single-side printing) (function code: 69)

<Function>

This function is to print the frame pattern on a single side of the paper to check for printing flaws.

<Operation Procedure>

Be sure to set the Letter size paper for test pattern printing before commencing the following procedure.

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 69" on the LCD.
- (2) Press the [OK] button. "PRINTING" is displayed on the LCD, and the frame pattern is printed on a single side of the paper.
- (3) When printing is completed, "WAKU SX" is displayed on the LCD.
If printing fails, printing is stopped with displaying any of the errors shown in the table below.
To retry printing, refer to the "Remedy" in the table below to eliminate the error cause, and press the [Go] button.
"WAKU SX" is displayed on the LCD. Press the [OK] button.
"PRINTING" is displayed on the LCD, and the frame pattern is printed on a single side of the paper.
- (4) To print the frame pattern again, press the [OK] button.
- (5) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

Error display

LCD	Remedy
Replace Toner	Replace the toner cartridge.
Cover is Open	Close the front cover.
No Paper	Set paper and close the paper tray.
Jam Tray1	Remove the jammed paper and close the paper tray.
Jam Rear	Remove the jammed paper and close all covers.

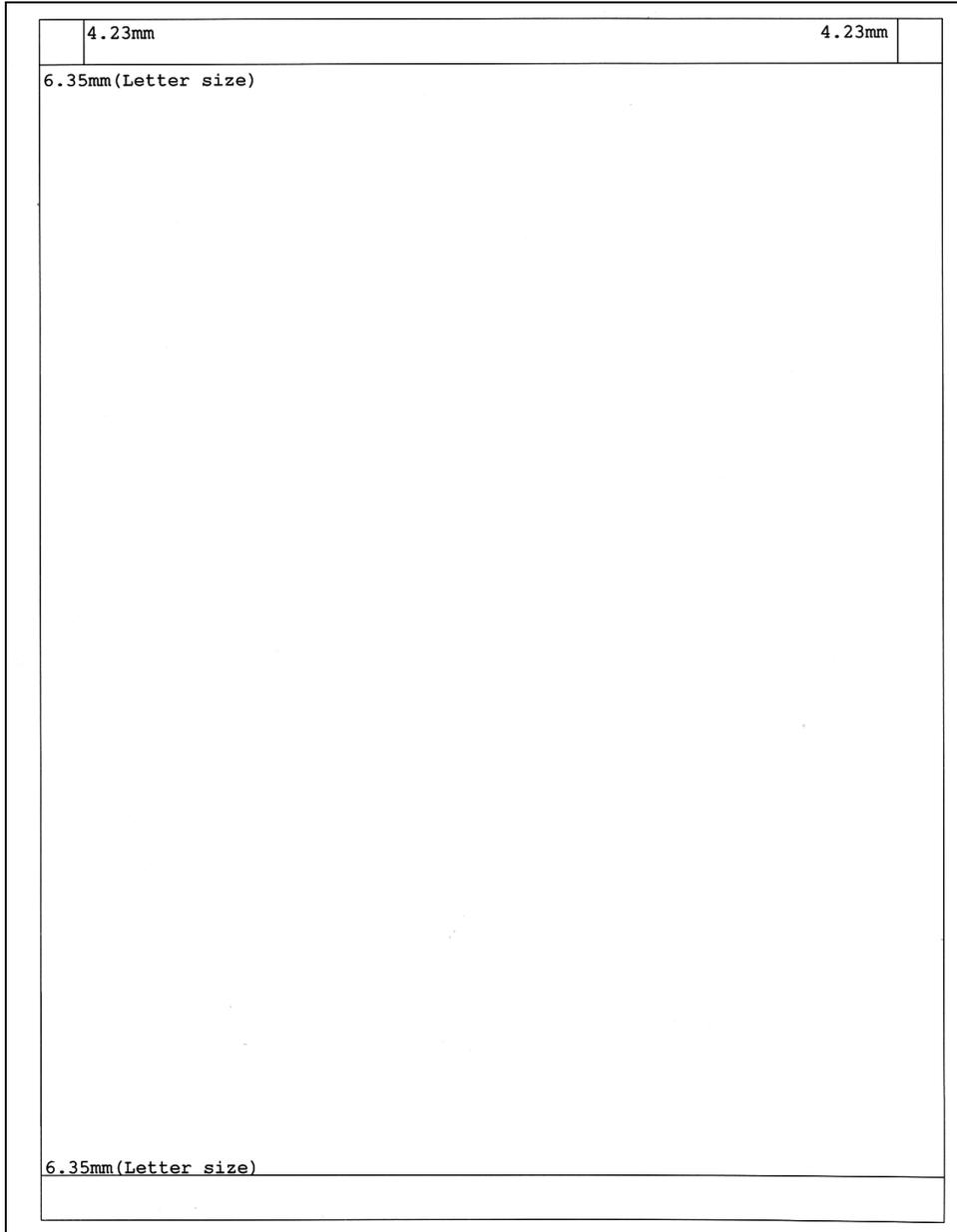


Fig. 5-7

1.3.14 Print frame pattern (duplex printing) (function code: 70)

<Function>

This function is to print the frame pattern on both sides of the paper and check for printing flaws.

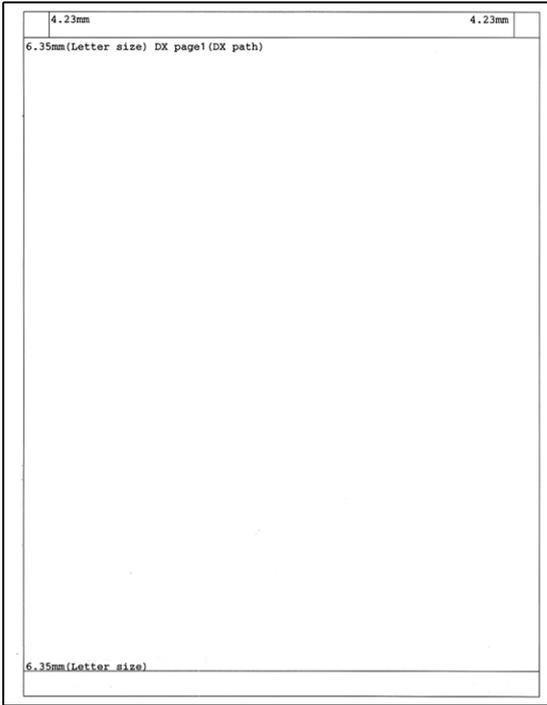
<Operation Procedure>

Be sure to set the Letter size paper for test pattern printing before commencing the following procedure.

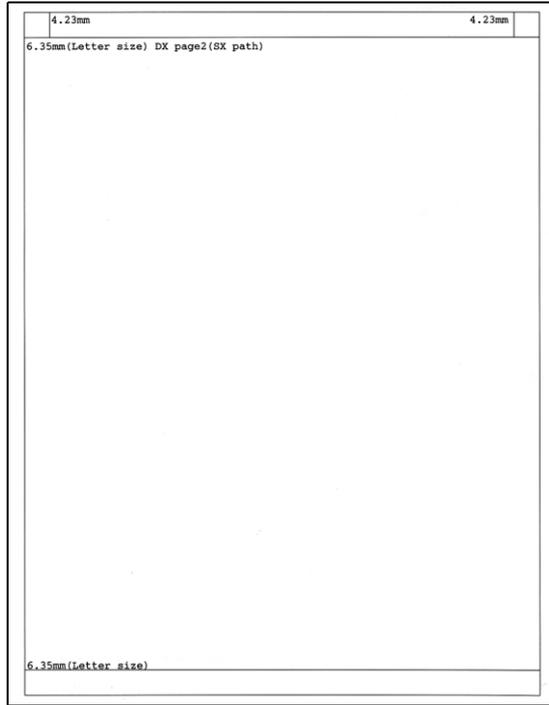
- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 70" on the LCD.
- (2) Press the [OK] button. "PRINTING" is displayed on the LCD, and the frame pattern is printed on both sides of the paper.
- (3) When printing is completed, "WAKU DX" is displayed on the LCD.
If printing fails, printing is stopped with displaying any of the errors shown in the table below. To retry printing, refer to the "Remedy" in the table below to eliminate the error cause, and press the [Go] button.
"WAKU DX" is displayed on the LCD. Press the [OK] button.
"PRINTING" is displayed on the LCD, and the frame pattern is printed on both sides of the paper.
- (4) To print the frame pattern again, press the [OK] button.
- (5) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

Error display

LCD	Remedy
Replace Toner	Replace the toner cartridge.
Cover is Open	Close the front cover.
No Paper	Set paper and close the paper tray.
Jam Tray1	Remove the jammed paper and close the paper tray.
Jam Rear	Remove the jammed paper and close all covers.



(First side)



(Second side)

Fig. 5-8

1.3.15 Print solid pattern (function code: 71)

<Function>

This function is to print the solid pattern to check whether the developer roller or exposure drum is dirty or damaged.

<Operation Procedure>

Be sure to set the Letter size paper for test pattern printing before commencing the following procedure.

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 71" on the LCD.
- (2) Press the [OK] button. "K_100%" is displayed on the LCD.
- (3) Press the [▲] or [▼] button to display "K_100%" on the LCD when printing the black solid pattern or "W_100%" when printing the white solid pattern.
- (4) Press [OK] button. "PRINTING" is displayed on the LCD, and printing test pattern starts. If printing fails, printing is stopped with displaying any of the errors shown in the table below. To retry printing, refer to the "Remedy" in the table below to eliminate the error cause, and press the [Go] button.
"K_100%" or "W_100%" is displayed on the LCD. Press the [OK] button.
"PRINTING" is displayed on the LCD, and printing test pattern starts.
- (5) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

Error display

LCD	Remedy
Replace Toner	Replace the toner cartridge.
Cover is Open	Close the front cover.
No Paper	Set paper and close the paper tray.
Jam Tray1	Remove the jammed paper and close the paper tray.
Jam Rear	Remove the jammed paper and close all covers.

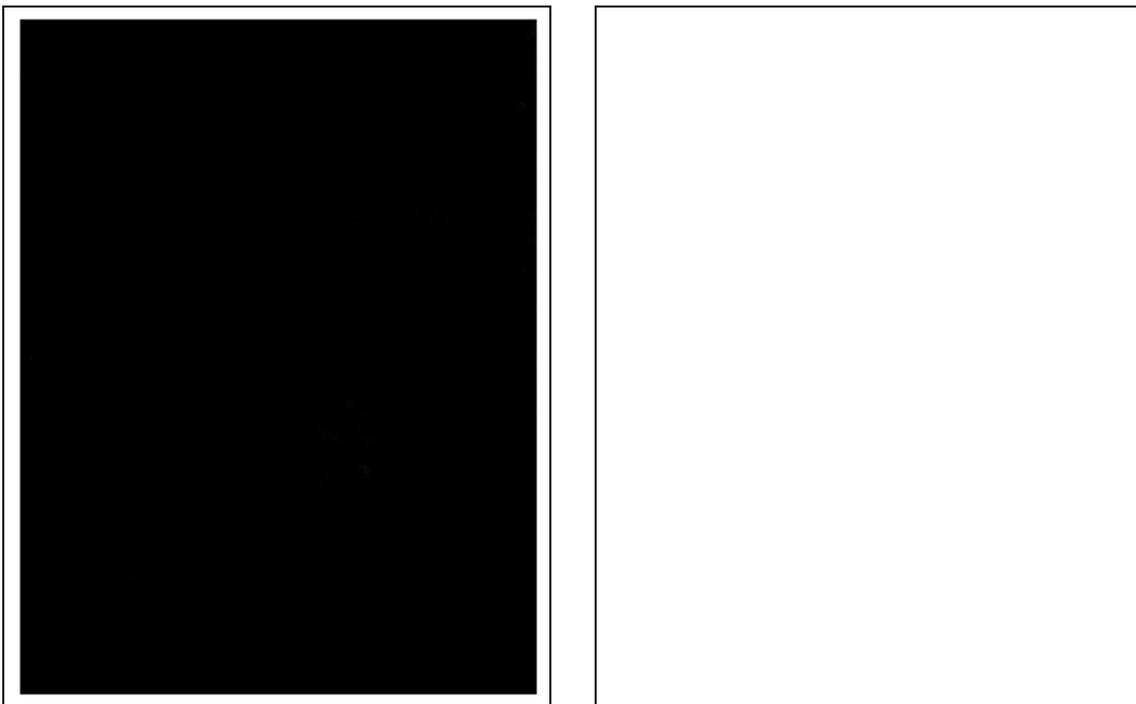


Fig. 5-9

1.3.16 Setting by country (function code: 74)

<Function>

This function is to customize the machine according to language, function settings, and worker switch settings.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 74" on the LCD.
- (2) Press the [OK] button. The country code currently set is displayed on the LCD.
- (3) Enter the first two digits of the country code.
Press the [▲] or [▼] button to select the numerical value for the first digit, and press the [OK] button. The cursor moves to the second digit.
Press the [▲] or [▼] button to select the numerical value for the second digit, and press the [OK] button. The cursor moves to the fourth digit.
- (4) Enter the last two digits of the country code.
Press the [▲] or [▼] button to select the numerical value for the third and fourth digits (invalid numbers are skipped), and press the [OK] button.
- (5) Press the [Go] button. The new setting is saved, and "PARAMETER INIT" is displayed on the LCD. The machine then returns to the initial state of maintenance mode.
- (6) When the [Cancel] button is pressed during setting, the machine returns to the initial state of maintenance mode without saving any changes that have been made.

Note:

- If there is no entry for a minute or longer, the machine returns to the initial state of maintenance mode automatically, regardless of the display status.

<Country code list>

Country	HL- 5470DW/ 5470DWT	HL- 5472DW/ 5472DWT	HL- 6182DW/ 6180DWT	HL- 6182DW/ 6182DWT
U.S.A.	0101	—	4201	—
Canada	0102	—	4202	—
Brazil	—	0142	—	4242
Argentina	0136	—	4236	—
Chile	0136	—	—	—
Germany	0104	—	4204	—
U.K.	0104	—	4204	—
France	0104	—	4204	—
Iberia	0104	—	4204	—
Italy	0104	—	4204	—
Switzerland	0104	—	4204	—
Pan-nordic	0104	—	4204	—
Russia	0104	—	4204	—
CEE	0104	—	4204	—
Oceania	0106	—	4206	—
Gulf	4106	—	4206	—
Singapore	4106	—	4206	—
Philippines	—	—	4236	—
Taiwan	4123	—	—	—
Korea	4106	—	4206	—
India	—	—	4245	—
China	—	—	4220	—

1.3.17 Print maintenance information (function code: 77)

<Function>

This function is to print the maintenance information, such as remaining amount of consumables, the number of replacements, and counter values (refer to the next page). The details to be printed are almost the same as the second page of Printer Settings.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 77" on the LCD.
- (2) Press the [OK] button. Printing maintenance information starts.
- (3) When printing is completed, the machine returns to the initial state of maintenance mode.

```
MAINTENANCE
-----
HL-6180DW series   Serial No.=X12345C1J000219   Model=84U-D17   Country=4201   SW CheckSum=0F /NG
Main ROM: Ver.0.72 U1111071644   ROM ChkSum: 9D5E   3200000165   01
Sub ROM: Ver.0.72 P1111071554   USB Prod.ID: 004D   OKNG   030000
Boot ROM: B1108231102   0005000100000000
Engine ROM: 0.56   7412000000000000   00000002
RAM Size = 128Mbyte

Remaining life of :
*Toner Cartridge: 78%   **Drum Unit: 29723 (100%)   Fuser Unit: 99922 (100%)
PF Kit MP: 50000 (100%)   Laser Unit: 99922 (100%)
PF Kit 1: 99932 (100%)

<Device Status>
Total Page Count: 78

***Average Coverage(Total): 8.49%
***Average Coverage(Current)*: 8.49%

<Drum Information>
Drum Page Count: 277
Drum Count: 4169

<Developing Roller Count: 7666>

<Total Pages Printed>
MP Tray: 0   Duplex: 10
Tray 1: 68

<Total Pages Printed>
A4/Letter: 75
Legal/Folio: 0
B5/Executive: 0
Envelope: 0
A5: 0
Others: 3

<Total Pages Printed>
Plain/Thin/Recycled: 73
Thick/Thicker/Bond: 0
Envelope/Env.Thick/Env.Thin: 0
Label: 0
Hagaki: 0

<Total Paper Jams: 1>
Jam MP Tray: 0   Jam Rear: 0
Jam Tray 1: 0   Jam Duplex: 1
Jam Inside: 0

<Power On Time: 4 hours>
<Power On Count: 53>

<Error History (last 10 errors)>
1: 5700:Jam Duplex   Page: 74
2: 7D00:Drum Error   Page: 60
3:
4:
5:
6:
7:
8:
9:
10:

<Replace Count>
Toner Cartridge: 0
Drum Unit: 0   PF Kit MP: 0
Fuser Unit: 0   PF Kit 1: 0
Laser Unit: 0

<Total Pages Printed>
Current Toner: 78
Previously Used Toner: 0

<Developing Bias: 467V>

<Engine Sensor Log>
KO: 000000/000000   MN: 000000/000000
RS: 000000/000000   EJ: 000000/000000

<Status Log>
80 30 01 80 11 01 80 16 07 80 07 01
80 16 07 80 07 01 80 11 01 80 16 07
80 07 01 80 07 01

* Remaining life will vary depending on the types of documents printed.
** Based on A4/Letter printing.
*** Calculated coverage.
```

Fig. 5-10

Display information

1	Model name	21	Remaining life of laser unit
2	Serial number	22	Total printed pages
3	Model code	23	Accumulated average coverage
4	Check sum for WSW, PSW, USW, and FSW	24	Average coverage by the toner cartridge which is currently used
5	Main firmware version	25	Drum page count
6	Sub firmware version	26	Rotations of the drum
7	Boot firmware version	27	Rotations of the developer roller
8	Engine firmware version	28	Total printed pages per tray
9	ROM size	29	Total printed pages per paper size
10	ROM check sum	30	Total printed pages per paper type
11	USB ID code	31	Paper jams that have occurred in each section in the machine
12	Information such as main PCB, wireless LAN, and One Push Demo function	32	Total power distribution time
13	The number of main PCB inspections, high-voltage inspections, discharge errors, fuser unit errors, and polygon motor errors	33	The number of times that the power is turned ON
14	Not necessary for maintenance	34	Machine error log
15	Not necessary for maintenance	35	The number of times that consumables have been replaced
16	Estimated remaining toner amount	36	Pages printed with the current toner cartridge and previous toner cartridge
17	Remaining life of drum unit	37	Developing bias voltage value
18	Remaining life of MP paper feeding kit	38	Engine sensor operation status ^{*1}
19	Remaining life of paper feeding kit 1	39	Engine error log
20	Remaining life of fuser unit		

^{*1} KO : T1 paper feed sensor OFF time / T1 paper feed sensor ON time
 MN : Registration front sensor OFF time / Registration front sensor ON time
 RS : Registration rear sensor OFF time / Registration rear sensor ON time
 EJ : Eject sensor OFF time / Eject sensor ON time

1.3.18 Check fan operation (function code: 78)

<Function>

This function is to check that the main fan is operating normally. The rotation speed is changed among three settings: 100%, 50% and OFF.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 78" on the LCD.
- (2) Press the [OK] button. "F 100" is displayed on the LCD, and the main fan operates at 100% rotation speed.
If the main fan is faulty, "NG" is displayed on the LCD.
- (3) Press the [Go] button. "F 50" is displayed on the LCD, and the main fan operates at 50% rotation speed.
- (4) Press the [Go] button. "F 0" is displayed on the LCD, and the main fan stops.
- (5) Press the [Go] button. "F 100" is displayed on the LCD, and the status returns to step (2).
Each press of the [Go] button repeats from steps (2) to (4).
- (6) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

1.3.19 Display machine log information (function code: 80)

<Function>

This function is to display the log information on the LCD.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 80" on the LCD.
- (2) Press the [OK] button. "USB:*****" is displayed on the LCD.
(The machine serial number is displayed for *****.)
- (3) Each press of the [Go] button changes the display item.
- (4) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

Display information

LCD	Description
USB:000G8J000166	Serial number
MAC:008077112233	MAC address
PCB:911309123456	Main PCB serial number
KTN_ERM:87% *4	Estimated remaining toner amount detected by toner sensor
KTN_RRM:67% *4	Estimated remaining toner amount based on the rotations of developer roller
DRUM_PG:00000000	Printed pages for drum
PFMP_PG:00000000	Pages fed from MP paper feeding kit
PFK1_PG:00000000	Pages fed from paper feeding kit 1
PFK2_PG:00000000	Pages fed from paper feeding kit 2
FUSR_PG:00000000	Printed pages for fuser unit
LASR_PG:00000000	Printed pages for laser unit
TTL_PG:00000000	Total printed pages
KCVRGUSI:4.32%	Average coverage by the toner cartridge which is currently used
KCVRGACC:3.47%	Accumulated average coverage
DRUM:00000000	Rotations of the drum
KTN_RND: 00000000	Rotations of the developer roller
MP_PG:00000000	Pages printed from MP tray
TR1_PG:00000000	Pages printed from paper tray 1
DX_PG:00000000	Duplex printed pages
TR2_PG:00000000	Pages printed from paper tray 2
A4+LTR:00000000	Printed pages of A4 size and Letter size paper
LG+FOL:00000000	Printed pages of Legal size and Folio size paper
B5+EXE:00000000	Printed pages of B5 size and EXE size paper
ENVLOP:00000000	Printed envelopes
A5 :00000000	Printed pages of A5 size paper
OTHER :00000000	Printed pages of other types of paper
PLTNRE:00000000	Total printed pages of plain, thin, and recycled paper
TKTRBD:00000000	Total printed pages of thick, ultra-thick, and bond paper
ENVTYP:00000000	Total printed pages of envelope, thick envelope, and thin envelope

LCD	Description
LABEL:00000000	Printed labels
HAGAKI:00000000	Printed post cards
TTL_JAM:00000000	Total paper jams that have occurred
MP_JAM:00000000	Paper jams that have occurred in the MP tray
TR1_JAM:00000000	Paper jams that have occurred in paper tray 1
IN_JAM:00000000	Paper jams that have occurred in the machine
RE_JAM:00000000	Paper jams that have occurred at the ejecting section or back cover
DX_JAM:00000000	Paper jams that have occurred when duplex printing
TR2_JAM:00000000	Paper jams that have occurred in paper tray 2
POWER:00000375	Total power distribution time
PWRCNT:00000000	The number of times that the power is turned ON
MACERR_01:0000 *1	Machine error log (last ten errors)
KTN_CH:0000 *2	The number of times that the toner cartridge has been replaced
DRUM_CH:0000 *2	The number of times that the drum unit has been replaced
FUSR_CH:0000 *2	The number of times that the fuser unit has been replaced
LASER_CH:0000 *2	The number of times that the laser unit has been replaced
PFMP_CH:0000 *2	The number of times that the MP paper feeding kit has been replaced
PFK1_CH:0000 *2	The number of times that paper feeding kit 1 has been replaced
PFK2_CH:0000 *2	The number of times that paper feeding kit 2 has been replaced
KTN_PG1:000000	Pages printed with the current toner cartridge
KTN_PG2:000000	Pages printed with the previous toner cartridge
KDEV_BIAS:400V	Developing bias voltage value
ENGERR01:000000 *3	Engine error log (past ten errors)
HODN_ER:0000	The number of discharge errors
FUSR_ER:0000	The number of fuser unit errors
MTLK_ER:0000	The number of laser unit polygon motor errors
DEVSTATUS__01:00 *4	Log for design analysis

*1 When the [OK] button is pressed while the machine error is displayed, the LCD changes to "PGCNT:*****". The total printed pages at the error occurrence is displayed for "*****".

*2 When the [OK] button is pressed while the number of times the part has been replaced is displayed, the LCD changes to "DATE_XX:*****". The abbreviation of each part is displayed for "XX" and the latest replacement date is displayed for "*****".

*3 When the [OK] button is pressed while the engine error is displayed, the LCD changes to "TM:***** BT: ***". The minutes that has passed from the previous error is displayed for "TM", and the number of times that the power is turned ON is displayed for "BT".

*4 When the [OK] button is pressed while this item is displayed, the LCD changes to "PGCNT:*****". The total printed pages at the error occurrence is displayed for "*****".

1.3.20 Display machine error code (function code: 82)

<Function>

This function is to display the latest error code on the LCD.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 82" on the LCD.
- (2) Press the [OK] button. "Machine Error XXXX" is displayed on the LCD.
- (3) When the [Cancel] button is pressed, the machine returns to the initial state of maintenance mode.

1.3.21 Quit maintenance mode (function code: 99)

<Function>

This function is to quit maintenance mode.

<Operation Procedure>

- (1) Press the [▲] or [▼] button in the initial state of maintenance mode to display "Maintenance 99" on the LCD.
- (2) Press the [OK] button. The machine quits maintenance mode and returns to the ready state.

1.4.2 Print font list

This function is to print the font list.

1.4.3 Change USB No. return value

When the operating system (OS) installed on the computer is Windows Vista® and the machine is connected to this computer using USB2.0FULL, the OS may not be able to obtain the USB device serial number depending on the computer and USB device. If the serial number cannot be obtained, the number of devices increases each time the device is connected to the computer. This problem can be avoided by fixing the USB No. return value to "0". The setting applied is reversed each time this mode is entered.

(The same function as that described in "1.3.11 Not-disclosed-to-users functions (function code: 45) / Change USB No. return value" in this chapter)

The setting currently applied can be determined by pressing the [Go] button three times and checking the LED status after several seconds.

LED display	Return value setting
Toner LED lights for one second.	Returns the serial number of the machine. (Default) → Returns "0".
Drum LED lights for one second.	Returns "0". → Returns the serial number of the machine.

1.4.4 HEX Dump mode

In this mode, the machine prints the print data sent from the computer as HEX (hexadecimal) data without performing emulation. This mode is used to analyze any defects in the print data that is sent.

1.4.5 Network Reset / Factory Reset / Settings Reset

Entering each of these modes resets the items summarized in the table below.

Data item	Network Reset	Factory Reset	Settings Reset
Counter information			
Error log			
Worker switches			
User switches	*1	✓	✓
Function setting			✓
Macro			✓
Font			✓
MAC address			
LAN setting	✓		✓
Emulation setting		✓	✓

*1 Resets only "WLAN enable".

1.4.6 Engine error ignore mode

When an engine error occurs and the machine cannot be recovered unless the main PCB is replaced, using this function enables the machine to start, ignoring the engine error, to retrieve the EEPROM data.

1.4.7 One Push print recovery mode

The One Push Demo function allows you to perform Demo printing by pressing the [Go] button (mainly used for sales promotion at dealers). However, the One Push Demo function is disabled once printing is performed from the computer. Entering this mode allows you to restore the One Push Demo function. After restoration, however, the contents of Demo printing will be the same as those of test printing.

■ **Maintenance mode functions for service personnel**

1.4.8 Check sensor operation

This function is to check whether the sensors or electromagnetic clutch are operating normally. While sensor operation is being checked, the Ready LED flashes one to three times each time the sensor or switch status changes from ON to OFF or OFF to ON.

Operate the sensor OFF to ON as below to check the operation of the corresponding solenoid or clutch.

Sensor operation	Solenoid/clutch operation
Change T1 paper feed sensor from OFF to ON.	The T1 clutch remains ON for the specified time.
Change MP paper empty sensor from OFF to ON.	The MP solenoid remains ON for the specified time.
Change registration front sensor from OFF to ON.	The duplex solenoid remains ON for the specified time.
Change registration rear sensor from OFF to ON.	The registration clutch remains ON for the specified time.
Change new toner sensor from OFF to ON.	The develop clutch 51R remains ON for the specified time.

<Operation Procedure>

Activate the sensors or electromagnetic clutch shown in the illustration below, and check that the Ready LED flashes. When the status changes consecutively, the Ready LED also flashes consecutively. When checking of the T2 paper feed sensor and new toner sensor is completed, the Toner LED lights.

■ **Location of sensors**

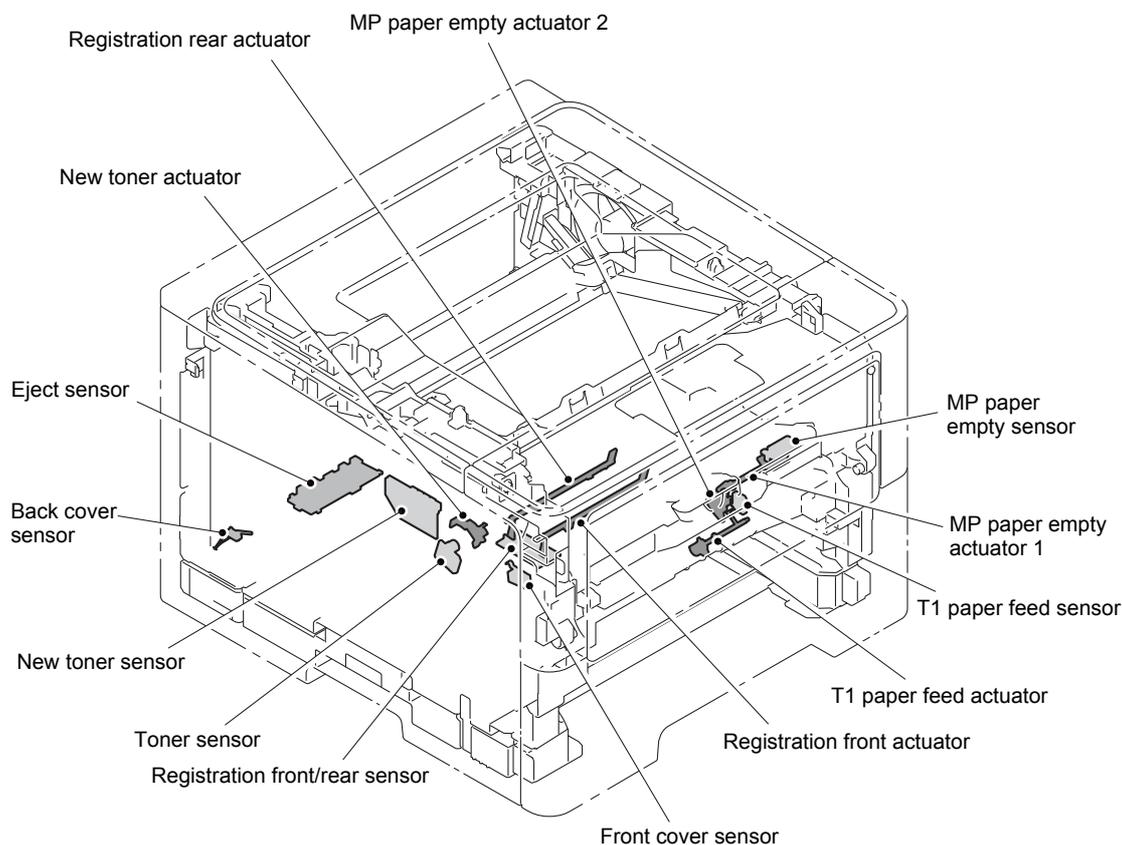


Fig. 5-12

1.4.9 Print continuous lattice pattern

This function is to print a lattice pattern continuously. When the power switch is turned OFF and then ON again or the [Cancel] button is pressed, the machine returns to the ready state.

1.4.10 Print fuser unit inspection

This function is to print a lattice pattern, gray pattern and black pattern on separate pages to inspect the fuser unit. When completed, the machine returns to the ready state automatically.

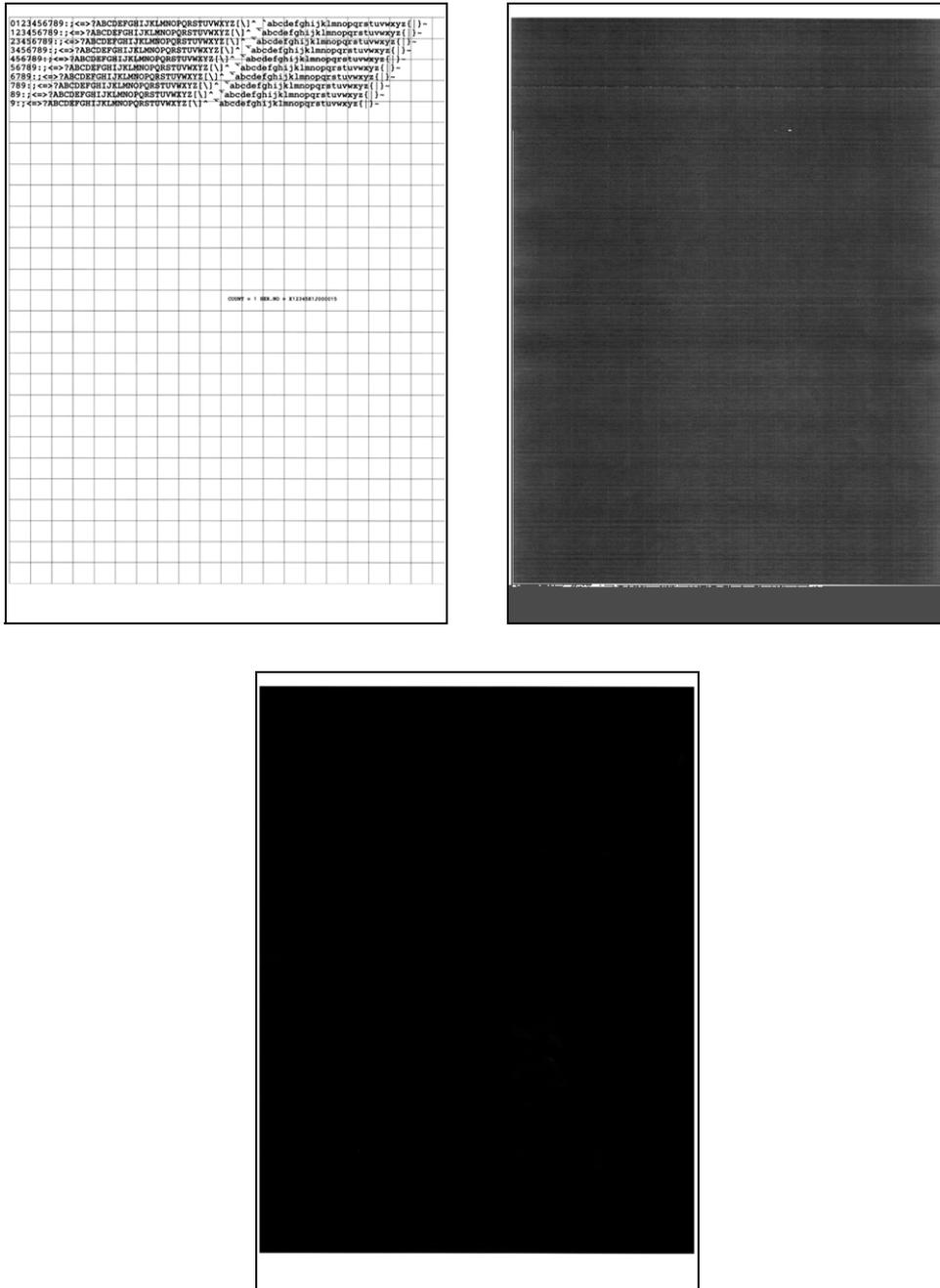


Fig. 5-13

1.4.11 Print EEPROM Dump

This function is to print all of the current EEPROM data. When completed, the machine returns to the ready state automatically.

(The same function as E2PDUMP MAIN ALL described in "1.3.10 Print Dump List (function code: 40)" in this chapter)

1.4.12 Check RAM

This function is to check the entire RAM, instead of the partial RAM check normally performed.

When the check result is not acceptable, all LEDs flash. When acceptable, the Ready LED flashes once and the Error LED flashes for the specified time, and then the Ready LED flashes permanently. When the power switch is turned OFF and then ON again, the machine returns to the ready state.

1.4.13 Print machine quality inspection pattern 1

This function is to print five patterns to inspect quality. The fifth pattern is printed continuously until the function is canceled by pressing the [Cancel] button.

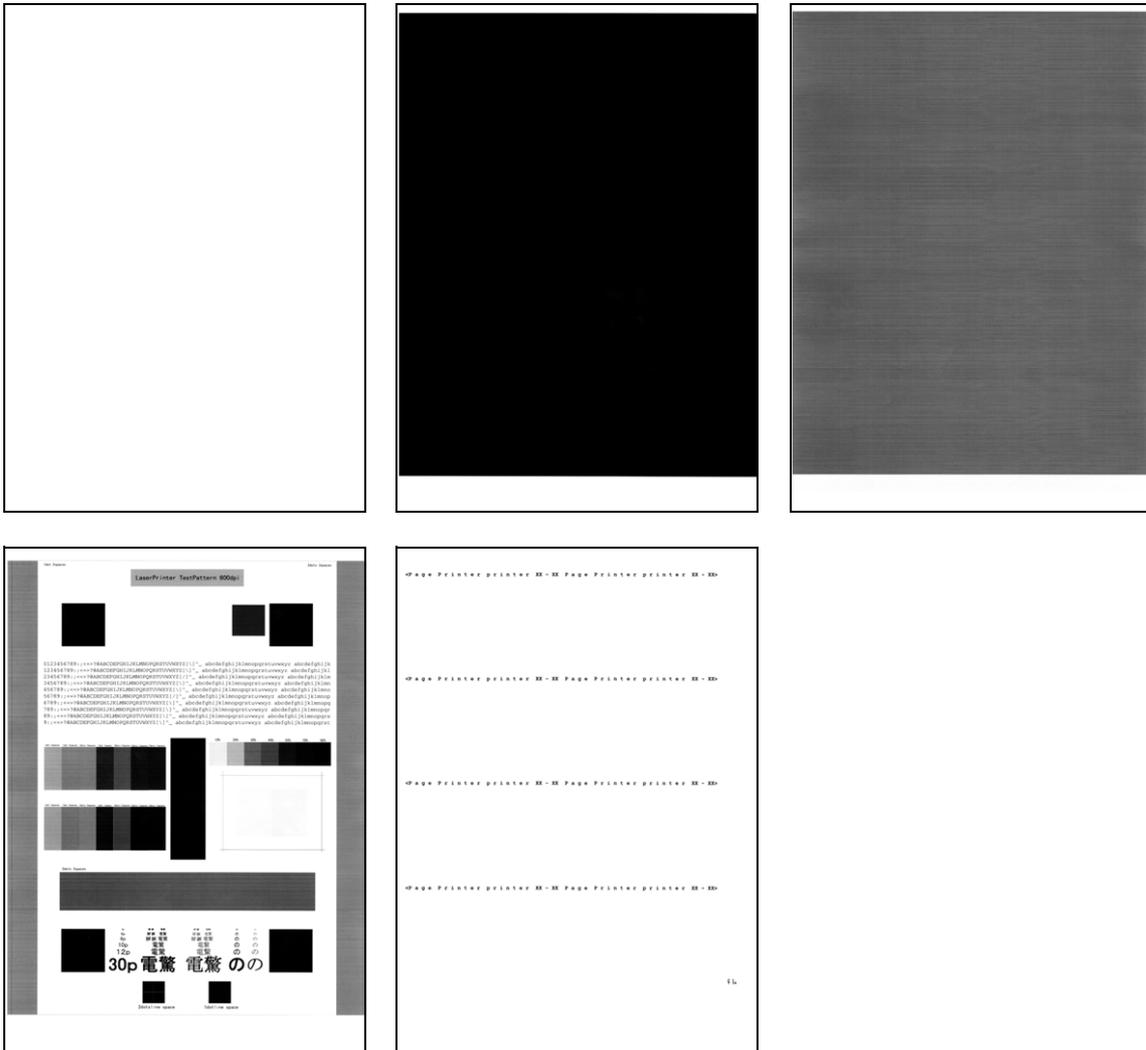


Fig. 5-14

1.4.14 Change ON/OFF setting for duplex printing

This function allows you to change the duplex printing setting to ON or OFF. The setting applied is reversed each time this mode is entered.

The setting currently applied can be determined by pressing the [Go] button seven times and checking the LED status after several seconds. When the setting is completed, the machine returns to the ready state.

LED display	Duplex printing setting
Toner and Drum LEDs light for one second.	Duplex printing OFF → Duplex printing ON
LED does not light.	Duplex printing ON → Duplex printing OFF

1.4.15 Change A4/Letter setting for paper size

This function allows you to change the default paper size setting to A4 or Letter. The setting applied is reversed each time this mode is entered.

The setting currently applied can be determined by pressing the [Go] button eight times and checking the LED status after several seconds. When the setting is completed, the machine returns to the ready state.

LED display	Default paper size setting
Toner and Drum LEDs light alternately for one second.	A4 → Letter
LED does not light.	Letter → A4

1.4.17 Maintenance printing

This function is to print maintenance information, such as the remaining amount of consumables, the number of replacements, and counter values (refer to the [next page](#) for details).

(The same function as that described in "1.3.17 Print maintenance information (function code: 77)" in this chapter)

```

MAINTENANCE
-----
HL-5440D series      Serial No.=X12345K1J000015  Model=84U-D01  Country=0004  SW CheckSum=FF /OK
Main ROM: Ver.0.42 U1109151129  ROM ChkSum: 218D          310167  00
Boot ROM: B1108221405          USB Prod.ID: 004A          OKOK    000000
Engine ROM: 0.46                00000080000000000000
RAM Size = 64Mbyte              0000000020000001          00000080

Remaining life of :
*Toner Cartridge: 97%          **Drum Unit: 29973 (100%)  Fuser Unit: 99973 (100%)
PF Kit MP: 50000 (100%)      Laser Unit: 99973 (100%)
PF Kit 1: 99977 (100%)

<Device Status>
Total Page Count: 27

Page: 2
Page: 2
Page: 2

PF Kit MP: 0
PF Kit 1: 0

N: 000000/000000
J: 000000/000000

01 0A 80 D1 0A
00 00 80 11 01

<Error History (last 10 errors)>
1: EF00:Print Unable EF          Page: 5
2: 5900:Self-Diagnostic         Page: 2
3: 5800:Fuser Error
4: 5900:Self-Diagnostic
5: 5800:Fuser Error
6:
7:
8:
9:
10:

***Average Coverage(Total): 19.08%
***Average Coverage(Current)*: 19.08%

<Drum Information>
Drum Page Count: 27
Drum Count: 368

<Developing Roller Count: 552>

<Total Pages Printed>
MP Tray: 1          Duplex: 1
Tray 1: 25

<Total Pages Printed>
A4/Letter: 27
Legal/Folio: 0
B5/Executive: 0
Envelope: 0
A5: 0
Others: 0

<Total Pages Printed>
Plain/Thin/Recycled: 27
Thick/Thicker/Bond: 0
Envelope/Env.Thick/Env.Thin: 0
Label: 0
Hagaki: 0

<Total Paper Jams: 0>
Jam MP Tray: 0          Jam Rear: 0
Jam Tray 1: 0          Jam Duplex: 0
Jam Inside: 0

<Power On Time: 4 hours>
<Power On Count: 24>

<Replace Count>
Toner Cartridge: 0
Drum Unit: 0
Fuser Unit: 0
Laser Unit: 0

<Total Pages Printed>
Current Toner: 27
Previously Used Toner:

<Developing Bias: 477V>

<Engine Sensor Log>
KO: 000000/000000
RS: 000000/000000

<Status Log>
80 07 01 80 11 01 80
80 F0 00 80 F0 00 80
80 F0 00 80 F0 00

* Remaining life will vary depending on the types of documents printed.
** Based on A4/Letter printing.
*** Calculated coverage.

```

Fig. 5-16

Display information

1	Model name	21	Remaining life of laser unit
2	Serial number	22	Total printed pages
3	Model code	23	Accumulated average coverage
4	Check sum for WSW, PSW, USW, and FSW	24	Average coverage by the toner cartridge which is currently used
5	Main firmware version	25	Drum page count
6	Sub firmware version	26	Rotations of the drum
7	Boot firmware version	27	Rotations of the developer roller
8	Engine firmware version	28	Total printed pages per tray
9	ROM size	29	Total printed pages per paper size
10	ROM check sum	30	Total printed pages per paper type
11	USB ID code	31	Paper jams that have occurred in each section in the machine
12	Information such as main PCB, wireless LAN, and One Push Demo function	32	Total power distribution time
13	The number of main PCB inspections, high-voltage inspections, discharge errors, fuser unit errors, and polygon motor errors	33	The number of times that the power is turned ON
14	Not necessary for maintenance	34	Machine error log
15	Not necessary for maintenance	35	The number of times that consumables have been replaced
16	Estimated remaining toner amount	36	Pages printed with the current toner cartridge and previous toner cartridge
17	Remaining life of drum unit	37	Developing bias voltage value
18	Remaining life of MP paper feeding kit	38	Engine sensor operation status ^{*1}
19	Remaining life of paper feeding kit 1	39	Engine error log
20	Remaining life of fuser unit		

^{*1} KO : T1 paper feed sensor OFF time / T1 paper feed sensor ON time
 MN : Registration front sensor OFF time / Registration front sensor ON time
 RS : Registration rear sensor OFF time / Registration rear sensor ON time
 EJ : Eject sensor OFF time / Eject sensor ON time

1.4.18 Print maintenance data and frame pattern

This function is to print maintenance data on the first side and print the frame pattern on the second side in duplex printing mode. Short Bind is automatically applied to duplex printing in this mode. When printing is completed, the setting applied prior to Short Bind is restored.

```

MAINTENANCE
-----
HI-5440D serIem Serial No.:X12345X1200015 Model#640-001 Country#004 SW Checksum#FF/OK
Main ROM: Ver.0.42 U1109151129 ROM ChkSum: 218D 310167 00
Boot ROM: B1108221405 USB Prod.ID: 004A OKOK 000000
Engine ROM: 0.46 0000000000000000
RAM Size = 64Mbyte 000000020000001 00000080

Remaining life of :
**Drum Unit: 29972 (100%) Fuser Unit: 99972 (100%)
*Toner Cartridge: 97% PF Kit MP: 50000 (100%) Laser Unit: 99972 (100%)
PF Kit 1: 99976 (100%)

<Device Status>
Total Page Count: 28
***Average Coverage(Total): 18.52%
***Average Coverage(Current): 18.52%
<Drum Information>
Drum Page Count: 28
Drum Count: 395
<Developing Roller Count: 590>
<Total Pages Printed>
MP Tray: 1 Duplex: 1
Tray 1: 26
<Total Pages Printed>
A4/Letter: 28
Legal/Folio: 0
ES/Executive: 0
Envelope: 0
A5: 0
Others: 0
<Total Pages Printed>
Plain/Thin/Recycled: 28
Thick/Thicker/Bond: 0
Envelope/Env.Thick/Env.Thin: 0
Label: 0
Hagaki: 0
<Total Paper Jams: 0>
Jam MP Tray: 0 Jam Rear: 0
Jam Tray 1: 0 Jam Duplex: 0
Jam Inside: 0
<Power On Time: 4 hours>
<Power On Count: 25>

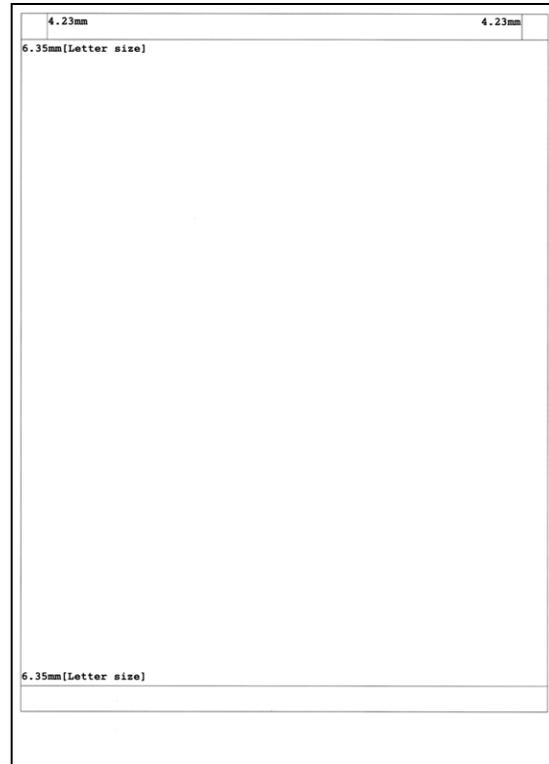
<Error History (last 10 errors)>
1: E700:Print Unable EF Page: 5
2: 5900:Self-Diagnostic Page: 2
3: 5800:Fuser Error Page: 2
4: 5900:Self-Diagnostic Page: 2
5: 5800:Fuser Error Page: 2
6:
7:
8:
9:
10:

<Replace Count>
Toner Cartridge: 0
Drum Unit: 0 PF Kit MP: 0
Fuser Unit: 0 PF Kit 1: 0
Laser Unit: 0
<Total Pages Printed>
Current Toner: 28
Previously Used Toner: 0
<Developing Bias: 476V>
<Engine Sensor Log>
MD: 000000/000000 MN: 000000/000000
RS: 000000/000000 EJ: 000000/000000
<Status Log>
80 07 01 80 11 01 80 D1 0A 80 D1 0A
80 F0 00 80 F0 00 80 F0 00 80 11 01
80 F0 00 80 F0 00

* Remaining life will vary depending on the types of documents printed.
** Based on A4/Letter printing.
*** Calculated coverage.

```

(First side)



(Second side)

Fig. 5-17

1.4.19 Print Network Configuration

This function is to print the wired or wireless network setting information. (Network items of Printer Settings are printed.)

When this function is used for a model without LAN or when the LAN function is disabled through the PjL setting, a test pattern is printed.

1.4.20 Change ON/OFF setting for sleep function

This function allows you to change the sleep function setting to ON or OFF.

Each time this mode is entered, all LEDs light for one second and the setting applied is reversed. When the setting is completed, the machine returns to the ready state.

1.4.21 Reset developer roller counter 1, 2, 3 or 4 (Common to all models)

This function allows you to manually perform the same operation as when the toner cartridge is replaced with a new one. The purpose of this function is to provide an error resetting method in the event that the toner life was not cleared because the new toner cartridge was not detected by the machine for any reason.

Reset developer roller counter 1: Execute when replacing with Starter Toner.

Reset developer roller counter 2: Execute when replacing with Standard Toner.

Reset developer roller counter 3: Execute when replacing with High Yield Toner.

Reset developer roller counter 4: Execute when replacing with Super High Yield Toner.

1.4.22 USB speed lock mode

This function allows you to change the USB speed setting to Lock to FULL or Automatic change (HIGH/FULL). The setting applied is reversed each time this mode is entered.

(The same function as WSW48 described in "1.3.3 Set worker switches (WSW) (function code: 10)" in this chapter)

The setting currently applied can be determined by pressing the [Go] button nine times and checking the LED status after several seconds. When the setting is completed, the machine returns to the ready state.

LED display	USB speed setting
Toner LED lights for one second.	Automatic change (default) → Lock to FULL
Drum LED lights for one second.	Lock to FULL → Automatic change

1.4.23 Change Ready LED light intensity in sleep mode

This function is to set the Ready LED status in sleep mode whether to turn it OFF completely or light it at low light intensity. The setting applied is reversed each time this mode is entered.

The setting currently applied can be determined by pressing the [Go] button ten times and checking the LED status after several seconds. (Although all LEDs light after several seconds after the [Go] button is pressed ten times, determine the setting by the status of the Ready LED.) When the setting is completed, the machine returns to the ready state.

LED display	Ready LED light intensity setting in sleep mode
Ready LED lights at low intensity for one second.	Completely OFF (default) → Light at low intensity
Ready LED lights at 100% intensity for one second.	Light at low intensity → Completely OFF

1.4.24 Firmware Installing mode

This mode is used to Install the firmware (sub firmware, main firmware).

Refer to "[1.1 Installing Firmware \(Sub Firmware, Main Firmware\)](#)" in [Chapter 4](#) for the detailed procedure.

1.4.25 Enter maintenance mode for service personnel

Drivers of the same number of virtual USB devices are required for the computer to recognize the USB-connected terminals. If the machine is connected to the computer at each time any repair work is performed, virtual USB devices of the same number of the repaired machines are automatically configured on the computer. To prevent numerous virtual USB devices from being configured, entering maintenance mode for service personnel enables your computer to identify multiple terminals via one single virtual USB device.

Enter this mode when using the download utility or service setting tool by installing the maintenance driver.

2. PRINTER SETTINGS

2.1 Printing Printer Settings

Printer Settings can be printed. The title, model name and serial number are printed on all pages.

<Operation Procedure>

LED model

- (1) Press the [Go] button three times while the machine is in the ready state. Printing starts.
- (2) When printing is completed, the machine returns to the ready state.

- LED model

LCD model

- (1) Press the [OK] button three times while the machine is in the ready state. Printing starts.

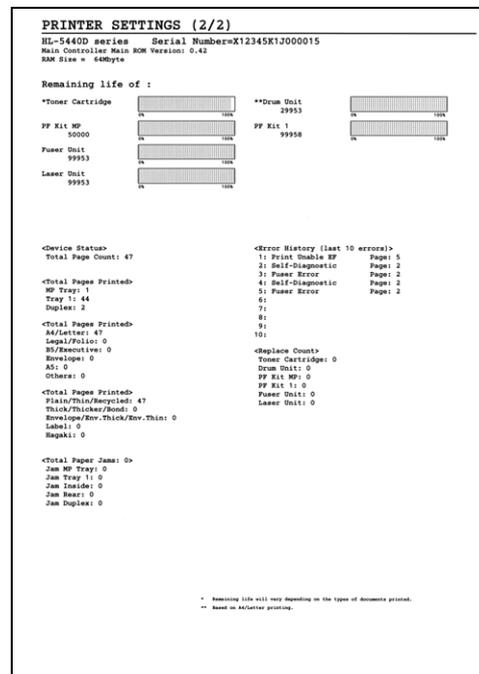
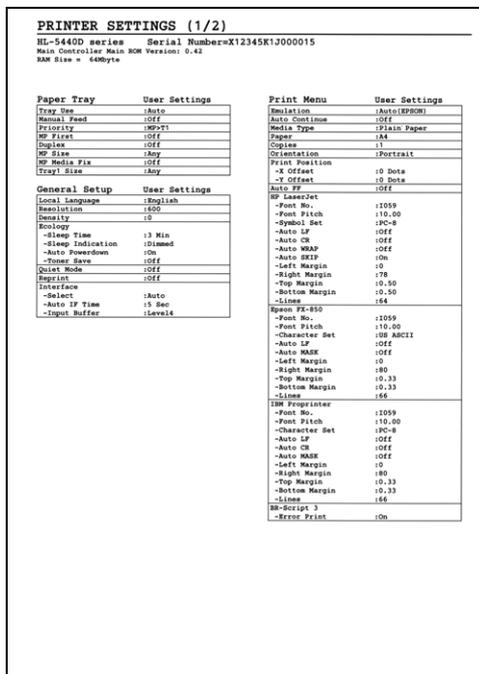


Fig. 5-18

■ Printer Settings (1st page)

Various machine settings are output. Display items are shown only when the conditions are satisfied.

■ Printer Settings (2nd page)

The machine information and maintenance information are output in the following order:

(1) Machine information

Display items are output in the following order.

1) Main Controller Main ROM Version (main controller firmware version)

2) NET ROM Version (network model only)

3) RAM Size (MB)

(2) Maintenance information

1) Consumables information

The percentage of the printable pages until the end of life relative to the total printable pages (remaining ratio) is displayed using numerical values and a band graph.

The example shown here is for the drum unit.

The part name and the remaining life are displayed from the top of the left column. One grid of the band graph indicates 2% in the remaining life.



Fig. 5-20

The following consumables are displayed.

- Toner cartridge
- Drum unit

■ **Life of toner cartridge**

<Method of detecting toner volume>

Toner volume is monitored by the toner sensor and by the number of rotations of the developer roller. When the toner sensor detects that the toner has run out or when the number of rotations of the developer roller reaches the limit, "Replace Toner" is displayed for LCD models, or the Toner LED and Error LED light for LED models.

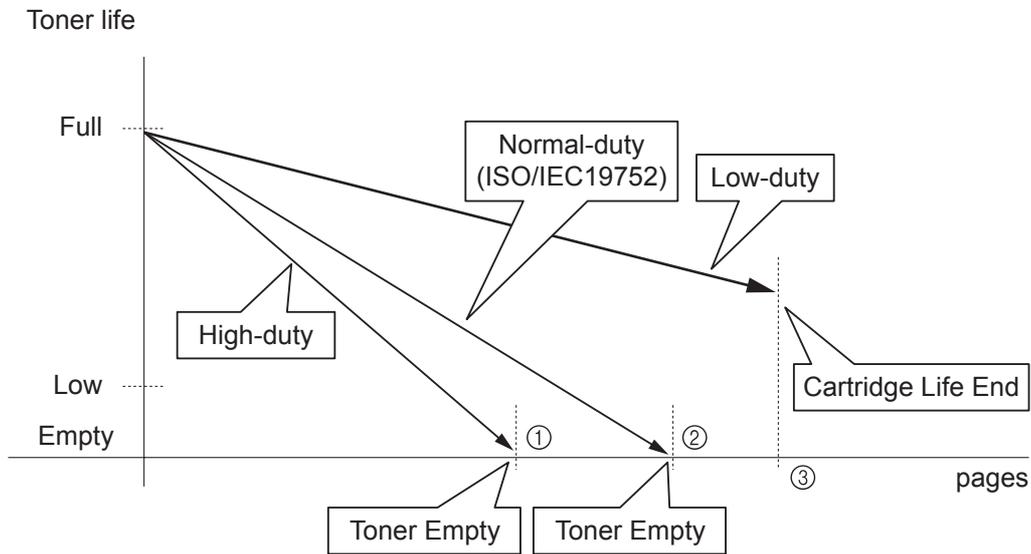
- Detection by toner sensor

The machine is equipped with a function to detect the remaining toner by checking the level at which the toner in the cartridge obstructs light from the transmission light sensor.

- Detection by number of rotations of developer roller

The machine is equipped with a function to detect the limit of the number of rotations of the developer roller before the roller becomes abraded and unusable.

<Relationship between printable pages of toner cartridge and remaining toner>



Memo:

- When the number of rotations of the developer roller reaches the limit, a message prompting the user to replace the toner cartridge appears even if some toner remains.

The table below shows the life of toner cartridges, assuming that the print pattern specified by ISO/IEC 19752 is printed. (Point ② in the figure above)

Toner cartridge	Printable pages
Starter	2,000
Standard	3,000
High	8,000
Super high	12,000

To avoid problems caused by abrasion of the developer roller surface or deterioration of the toner sealing, the machine prohibits printing when the number of rotations of the developer roller reaches the limit, displaying a message prompting the user to replace the toner cartridge before the toner runs out. The table below shows the limit of the number of rotations of the developer roller.

Toner cartridge	Limit for rotations of developer roller
Starter	42,000
Standard	54,000
High	102,000
Super high	144,000

<Life of toner cartridge>

The life of the toner cartridge based on the number of rotations of the developer roller (point ③ on the [previous page](#)) varies depending on the average number of pages printed per job (see the table below). The number of printable pages is larger when performing continuous printing in one job because deterioration of the developer roller is lower.

Number of rotations of developer roller per A4-size page

Page		No. of rotations
First page	40/42PPM model (A4/Letter)	15.5
	38/40PPM model (A4/Letter)	15.5
Second page and after (when performing continuous printing)	40/42PPM model (A4/Letter)	7.6
	38/40PPM model (A4/Letter)	7.95

Number of rotations of developer roller per operation

Operation	No. of rotations
Warm-up operation after power ON or opening/closing cover	12
Paper tray lift-up operation	8.8
Fuser unit warm-up operation	3.5
Fuser unit warm-up operation (max.) (in environment of low voltage power supply and low temperature)	31.5

* The number of rotations varies according to individual differences in machines and installation environment. The above data is for reference.

Note:

- The figures provided on this page are as of February 2012. These values are subject to change without prior notice.

<Relationship between average number of pages printed per job and life of toner cartridges>
(40/42PPM model)

Average pages printed (page/job)	1	2	3	4	5	6	7	8
Cartridge life (Starter)	2710	3636	4104	4386	4575	4710	4812	4891
Cartridge life (Standard)	3484	4675	5277	5640	5882	6056	6187	6288
Cartridge life (High)	6581	8831	9967	10653	11111	11439	11686	11878
Cartridge life (Super high)	9290	12468	14072	15039	15686	16150	16498	16769

Performing the following operations deteriorates the developer roller: warm-up operation after power ON or opening/closing cover, paper tray lift-up operation, and fuser unit warm-up operation. Therefore, if these operations are performed frequently, the life of toner cartridges becomes shorter. (The table below shows the worst-case scenario where warm-up operation after power ON and fuser unit warm-up operation (max.) are performed before printing.)

<Life of toner cartridge when warm-up operation after power ON and fuser unit warm-up operation (max.) are performed before printing>
(40/42PPM model)

Average pages printed (page/job)	1	2	3	4	5	6	7	8
Cartridge life (Starter)	712	1261	1698	2054	2349	2598	2811	2995
Cartridge life (Standard)	915	1622	2183	2641	3020	3340	3614	3850
Cartridge life (High)	1729	3063	4124	4988	5705	6309	6826	7273
Cartridge life (Super high)	2441	4324	5822	7042	8054	8907	9637	10267

Note:

- The above two data applies to 40/42PPM models (A4/Letter). For 38/40PPM models, data for continuous printing is different due to difference in the printing speed.

■ **Life of drum unit**

<How to read the life of drum unit>

- The band graph indicates 100% initially, and then gradually decreases.
- When the band graph indicates 10%, the machine displays a message prompting the user to replace the drum.

<How to determine the end of life of drum unit>

The end of life of the drum unit is determined based on the "drum counter" or the "number of drum rotations", whichever is larger.

The drum counter is based on the total number of pages printed on each drum unit. The drum counter must be reset every time you replace the drum unit with a new one (refer to <How to reset drum counter> on the [next page](#)). Basically, the counter value is equal to the assured number of printable pages of the drum unit. However, if the power switch is turned ON/OFF frequently or the number of pages printed per job is small, only the number of drum rotations increases, and the "page count based on the number of drum rotations" may exceed the "drum counter" based on the total number of pages printed.

Calculation of the page count based on the number of drum rotations shown below.

<How to calculate the page count>

The number of drum rotations for the first page: 12.2

The number of drum rotations per page for the second page and later (continuous printing): 3.8

Page count based on the number of drum rotations = {Number of drum rotations for the first page + [Number of drum rotations per page for the second page and later x (Number of pages in continuous printing - 1)]} / 15

(The divisor "15" is assumed value of the number of drum rotations per page when end users use machines.)

(The number of drum rotations per page is fewer in continuous printing.)

Example: Start printing when machine is in ready state

Continuous pages printed	Page count based on number of drum rotations (pages)
1 page	$[12.2 + \{3.8 \times (1 - 1)\}] / 15 = 0.8$
2 pages	$[12.2 + \{3.8 \times (2 - 1)\}] / 15 = 1.1$
18 pages	$[12.2 + \{3.8 \times (18 - 1)\}] / 15 = 5.1$

When warm-up operation after power ON or opening/closing cover, paper tray lift-up operation, or fuser unit warm-up operation is performed, the number of drum rotations increases. Therefore, if these operations are performed frequently, the life of the drum unit becomes shorter than usual.

The number of drum rotations required for warm-up operation after power ON: 15

Example: When warm-up operation after power ON or opening/closing cover is performed before printing

Continuous pages printed	Page count based on number of drum rotations (pages)
1 page	$[15 + 12.2 + \{3.8 \times (1 - 1)\}] / 15 = 1.8$
2 pages	$[15 + 12.2 + \{3.8 \times (2 - 1)\}] / 15 = 2.1$
18 pages	$[15 + 12.2 + \{3.8 \times (18 - 1)\}] / 15 = 6.1$

The number of drum rotations required for fuser unit warm-up operation (max.): 34.2.

Example: When fuser unit warm-up operation (max.) is performed before printing

Continuous pages printed	Page count based on number of drum rotations (pages)
1 page	$[34.2 + 12.2 + \{3.8 \times (1 - 1)\}] / 15 = 3.1$
2 pages	$[34.2 + 12.2 + \{3.8 \times (2 - 1)\}] / 15 = 3.3$
18 pages	$[34.2 + 12.2 + \{3.8 \times (18 - 1)\}] / 15 = 7.4$

If both the warm-up operation after power ON or opening/closing cover and the fuser unit warm-up operation (max.) are performed, the life of the drum unit becomes much shorter.

Note:

- The figures provided on this page are as of February 2012. These values are subject to change without prior notice.

<How to reset drum counter>

LCD models

- (1) Open the front cover while the machine is in the ready state. Press and hold the [Go] button until "Drum Clear" is displayed on the LCD, and then release the [Go] button.
- (2) Close the front cover. The drum counter is reset, and the machine returns to the ready state.

LED models

- (1) Open the front cover while the machine is in the ready state. Press the [Go] button for at least four seconds until all LEDs light, and then release the [Go] button.
- (2) Close the front cover. The drum counter is reset, and the machine returns to the ready state.

3. OTHER SERVICE FUNCTIONS

3.1 Change ON/OFF Setting for Deep Sleep Mode (LCD model only)

This function allows you to change the Deep Sleep mode setting to ON or OFF.

<Operation Procedure>

- (1) While the machine is in the ready state, press the [▲] or [▼] button to display "General Setup" on the LCD, and press the [OK] button.
- (2) Press the [▲] or [▼] button to display "Ecology" on the LCD, and press the [OK] button.
- (3) Press the [▲] or [▼] button to display "Sleep Time" on the LCD, and press the [OK] button.
- (4) While "**Min" is displayed on the LCD, press the [Cancel] and [▼] buttons simultaneously.
"Deep Sleep" is displayed on the LCD.
- (5) Press the [OK] button. "On *" is displayed on the LCD.
- (6) Press the [▲] or [▼] button to change the setting to On or Off, and press the [Go] button.
- (7) "Accepted" is displayed on the LCD, and the machine returns to the ready mode.

3.2 Change ON/OFF Setting for Sleep Mode (LCD model only)

This function allows you to change the sleep mode setting to ON or OFF.

<Operation Procedure>

■ Change sleep mode from ON to OFF

- (1) While the machine is in the ready state, press the [▲] or [▼] button to display "General Setup" on the LCD, and press the [OK] button.
- (2) Press the [▲] or [▼] button to display "Ecology" on the LCD, and press the [OK] button.
- (3) Press the [▲] or [▼] button to display "Sleep Time" on the LCD, and press the [OK] button.
- (4) Press the [▼] button to display "***Min" on the LCD, and press the [Cancel] and [Secure] buttons simultaneously. "On * " is displayed on the LCD.
- (5) Press the [▲] or [▼] button to change the setting to Off, and press the [Go] button.
- (6) "Accepted" is displayed on the LCD, and the machine returns to the ready mode.

■ Change sleep mode from OFF to ON

- (1) While the machine is in the ready state, press the [▲] or [▼] button to display "General Setup" on the LCD, and press the [OK] button.
- (2) Press the [▲] or [▼] button to display "Ecology" on the LCD, and press the [OK] button.
- (3) Press the [▲] or [▼] button to display "Sleep Time" on the LCD, and press the [OK] button.
- (4) Press the [▲] or [▼] button to display "ON" on the LCD. Press the [Go] button, and "***Min" is displayed on the LCD.

3.3 Reset Periodic Replacement Parts (LCD model only)

This function is used to reset the corresponding counter after a periodic replacement part has been replaced correctly or to reset an error caused due to a consumable part being replaced by the user via an incorrect procedure.

<Operation Procedure>

- (1) Press the [Go] and [▲] buttons simultaneously while the machine is in the ready state. "Drum Unit" is displayed on the LCD.
- (2) Press the [▲] or [▼] button to display the periodic replacement part for which the counter is to be reset, and press the [OK] button. "▲Reset ▼Exit" is displayed on the LCD.
- (3) Press the [▲] button. "Accepted" is displayed on the LCD and the machine returns to the ready state.

The counters of the following periodic replacement parts can be reset:

- MP paper feeding kit
- Paper feeding kit 1
- Paper feeding kit 2
- Fuser unit
- Laser unit

3.4 Delete User Setting Information (LCD model only)

All of the user setting information can be deleted using the procedure shown below.

<Operation Procedure>

- (1) While the machine is in the ready state, press the [▲] or [▼] button to display "Reset Menu" on the LCD, and press the [OK] button.
- (2) Press the [Cancel] and [▲] buttons simultaneously. "Setting Reset" is displayed on the LCD.
- (3) Press the [OK] button, and "Restart Printer?" is displayed on the LCD. Press the [OK] button again, and "Please wait" is displayed on the LCD. When completed, the machine returns to the ready mode.

3.5 Change USB No. Return Value / Adjust Left-end Print Start Position on Second Side when Duplex Printing / Change ON/OFF Setting for Deep Sleep Function (LCD model only)

(The same function as that described in "1.3.11 Not-disclosed-to-users functions (function code: 45)" in this chapter)

■ Change USB No. return value

When the operating system (OS) installed on the computer is Windows Vista[®], and the machine is connected to this computer using USB2.0FULL, the OS may not be able to obtain the USB device serial number depending on the computer and USB device. If the serial number cannot be obtained, the number of devices increases each time the device is connected to the computer. To avoid this problem, setting this function to "USBNo.=ON" can fix the USB No. return value to "0".

LCD	Description
USBNo. = ON	Returns the serial number of the machine. (Default)
USBNo. = OFF	Returns "0".

The setting currently selected is marked "*" at the end of the display.

(The same function as that described in "1.4.3 Change USB No. return value" in this chapter)

<Operation Procedure>

- (1) While the machine is in the ready state, press the [Go] and [▼] buttons simultaneously. "USBNo." is displayed on the LCD.
- (2) Press the [OK] button. "USBNo.=ON" is displayed on the LCD.
- (3) Press the [▲] or [▼] button to display "USBNo.=ON" when fixing the serial number return value to "0" or "USBNo.=OFF" when not fixing it.
- (4) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the ready state.
- (5) Turn OFF the power switch.

Note:

- The setting is applied after the power switch is turned OFF and then ON again.

■ **Adjust left-end print start position on second side when duplex printing (LCD model only)**

<Function>

In the event that the left-end print start position deviates on the second side when duplex printing, use this function to adjust the position left and right.

The adjustable range is -100 to 750 (unit: 300 dpi). (Shifted to left when the value is negative)

<Operation Procedure>

- (1) While the machine is in the ready state, press the [Go] and [▼] buttons simultaneously. "USBNo." is displayed on the LCD.
- (2) Press the [▲] or [▼] button to display "DX.XAdjust" on the LCD.
- (3) Press the [OK] button. "DX.XAdjust=**" is displayed on the LCD. (The value currently set is displayed for **.)
- (4) To shift the writing start position to the left, press the [▼] button to decrease the value. To shift the position to the right, press the [▲] button to increase the value.
- (5) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the ready state.

■ **Change ON/OFF setting for Deep Sleep function when Deep Sleep function is enabled and machine has Storage Data (Secure) (LCD model only)**

<Function>

When the machine has the Storage Data (Secure) available, use this function to set whether to permit the machine to enter Deep Sleep mode. This function is effective when the Deep Sleep function is enabled (ON).

LCD	Description
DpSlp.StrDt = ON	The Deep Sleep function is activated even when the machine has Storage Data (Secure) available. (Default)
DpSlp.StrDt = OFF	The Deep Sleep function is not activated when the machine has Storage Data (Secure) available.

The setting currently selected is marked "*" at the end of the display.

<Operation Procedure>

- (1) While the machine is in the ready state, press the [Go] and [▼] buttons simultaneously. "USBNo." is displayed on the LCD.
- (2) Press the [▲] or [▼] button to display "DpSlp.StrDt" on the LCD.
- (3) Press the [OK] button. "DpSlp.StrDt=ON" is displayed on the LCD.
- (4) Display "DpSlp.StrDt=ON" on the LCD when permitting the machine to enter Deep Sleep mode, or "DpSlp.StrDt=OFF" when not permitting it.
- (5) Press the [OK] button. "Accepted" is displayed on the LCD, and the machine returns to the ready state.

3.6 Reset Drum Counter (LED model only)

This function is to reset the drum unit counter after the drum unit has been replaced using the correct procedure.

<Operation Procedure>

- (1) Open the front cover while the machine is in the ready mode. Press and hold the [Go] button for at least four seconds. When all LEDs light, release the [Go] button.
- (2) Close the front cover.

Note:

- Resetting operation is ignored when the drum page count has not exceeded 100 pages.

3.7 Change Active/Inactive Setting for Wireless LAN (Wireless Network Model only)

This function allows you to change the wireless LAN setting to Active or Inactive.

<Operation Procedure>

- (1) While the machine is in the ready state, press and hold the [Go] button for ten seconds, continuing even after all LEDs light. The Network Configuration is printed, and the Active/Inactive setting is changed.
- (2) Release the [Go] button.
- (3) Each time this mode is entered, the setting applied is reversed, and the Network Configuration is printed. Whether the wireless LAN is active or inactive is determined based on whether Active (wireless) or Inactive (wired) is described in <Node Type> in the Network Configuration information.
- (4) When the [Go] button is held down for another ten seconds in step (1) without being released (pressed for 20 seconds consecutively), the setting is reversed (returns to the previous setting), and the Network Configuration is printed.
- (5) Even if the [Go] button is held down for more than 20 seconds, the setting will not be changed again.

CHAPTER 6

WIRING DIAGRAM

CHAPTER 6 WIRING DIAGRAM

This chapter provides the wiring diagram for the connections of the PCBs.

CONTENTS

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CHAPTER 7

PERIODICAL MAINTENANCE

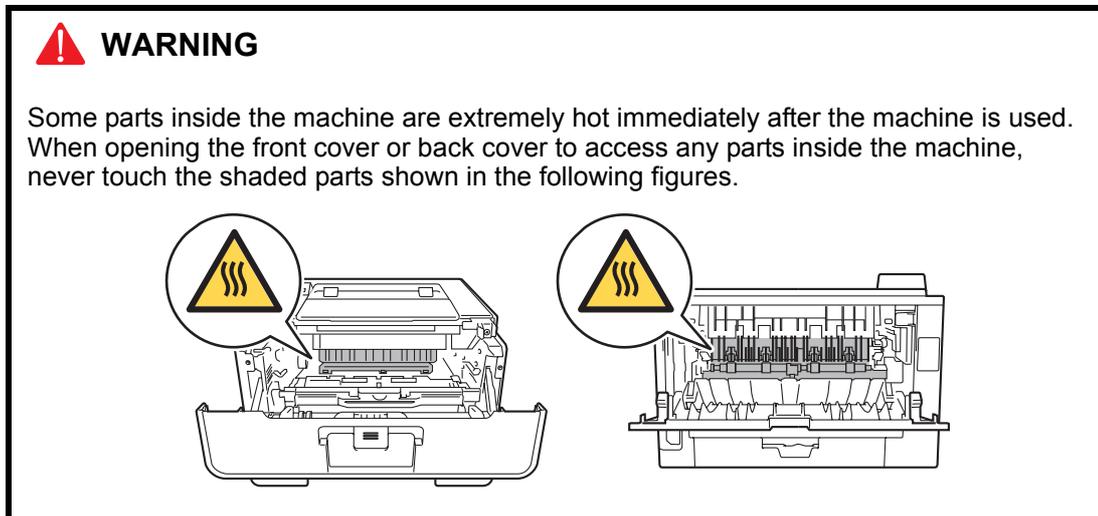
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1. SAFETY PRECAUTIONS

To avoid creating secondary problems by mishandling, follow the warnings and precautions below during maintenance work.



- Be careful not to lose screws, washers, or other parts removed.
- Be sure to apply grease to applicable positions specified in this chapter.
- When using soldering irons or other heat-generating tools, take care not to accidentally damage parts such as wires, PCBs and covers.
- Static electricity charged in your body may damage electronic parts. When transporting PCBs, be sure to wrap them in conductive sheets.
- When replacing the PCB and all the other related parts, put on a grounding wrist band and perform the job on a static mat. Also take care not to touch the conductor sections on the flat cables or on the wire harness.
- After disconnecting flat cables, check that each cable is not damaged at its end or shortcircuited.
- When connecting flat cables, do not insert them at an angle. After insertion, check that the cables are not at an angle.
- When connecting or disconnecting harnesses, hold the connector body, not the cables. If the connector is locked, release it first.
- After a repair, check not only the repaired portion but also harness treatment. Also check that other related portions are functioning properly.
- Violently closing the front cover without mounting the toner cartridge and the drum unit can damage the machine.
- After assembly, it is recommended to conduct dielectric strength test and continuity test.

2. PERIODICAL REPLACEMENT PARTS

2.1 Preparation

Prior to proceeding with the disassembly procedure,

- (1) Disconnect the following:
 - AC cord
 - USB cable (if connected)
 - LAN cable (if connected)
 - Parallel cable (if connected)
- (2) Remove the following:
 - Paper tray 1
 - Toner cartridge and drum unit
 - Duplex tray
 - LAN port cap

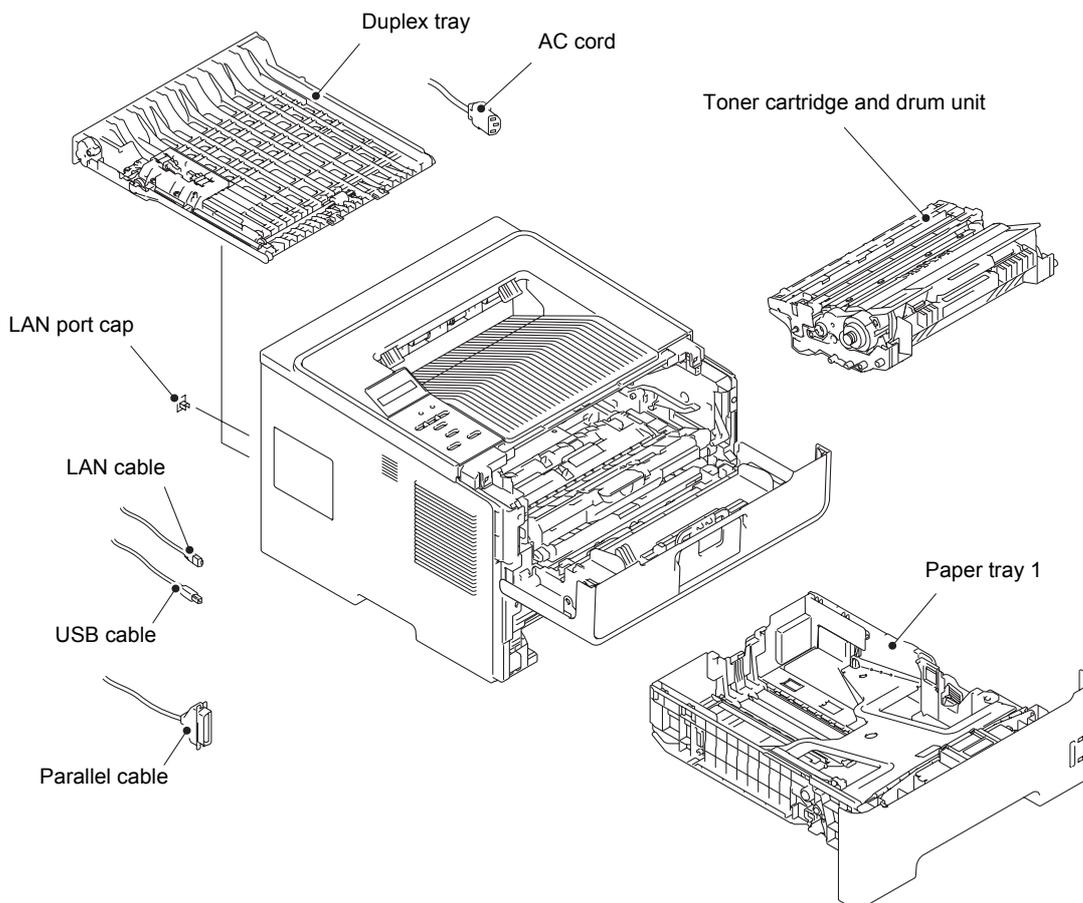


Fig. 7-1

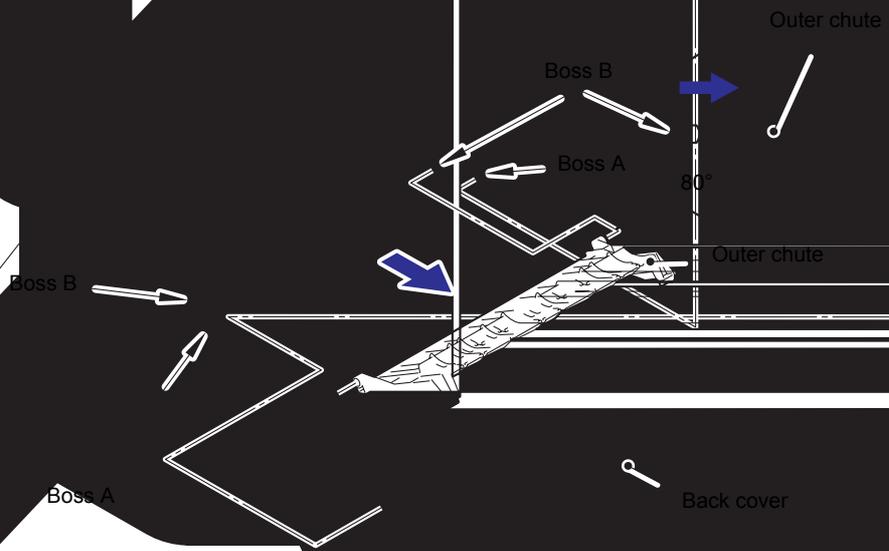
2.2 Fl

(1)

(2)

(3)

(4)



- (5) Push the two knobs on the fuser cover, and pull the fuser cover down in the direction of the arrow.
- (6) Remove the fuser cover from the bosses on the fuser unit, and remove the fuser cover from the machine.

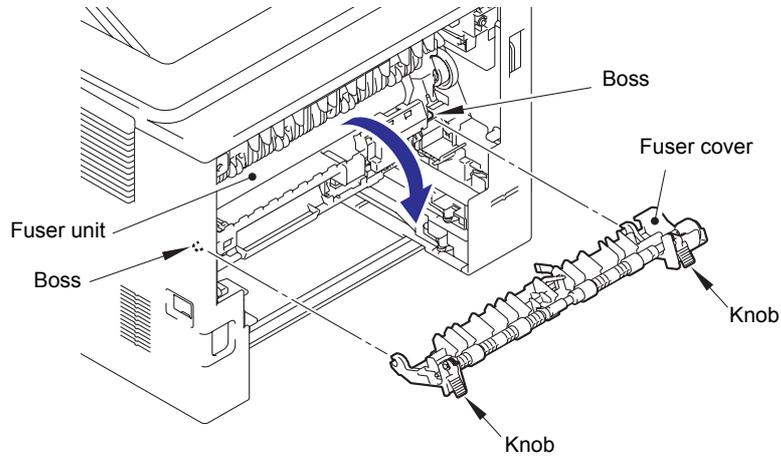


Fig. 7-4

- (7) Remove the taptite bind B M4x12 screw, and release the hook to remove the fuser unit line cover R from the machine.
- (8) Remove the rear nip release link from the machine.

Note:

- Make sure that the front cover is open when removing the rear nip release link.

- (9) Remove the taptite pan B M4x14 screw, and release the hook to remove the fuser unit line cover L from the machine.

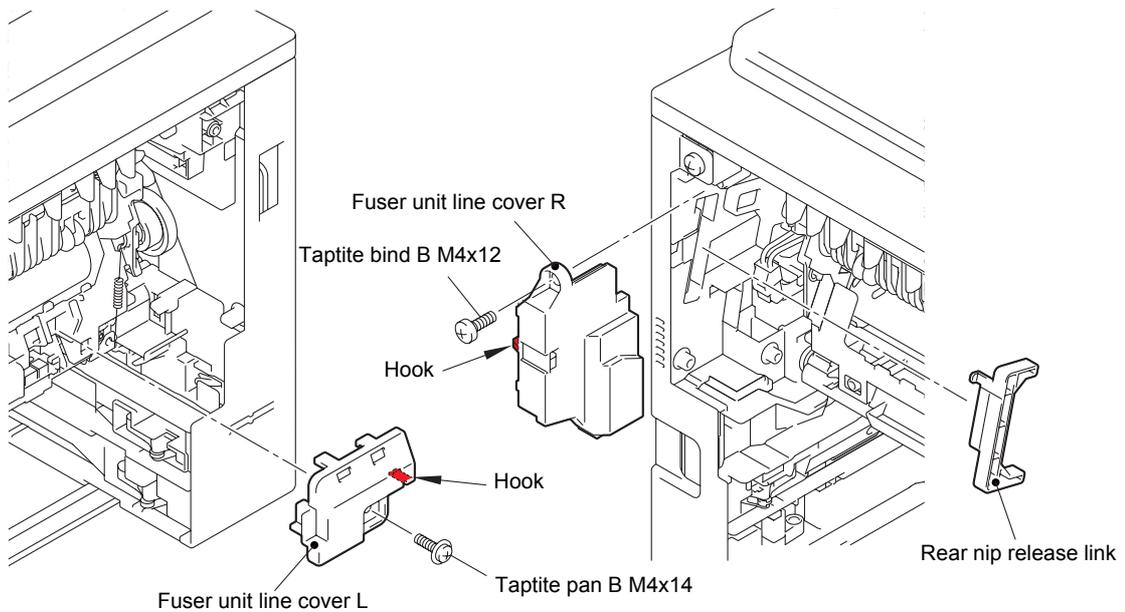


Fig. 7-5

- (10) Release the heater harness of the fuser unit from the guide on the main frame R, and disconnect the heater harness from the low-voltage-heater harness.

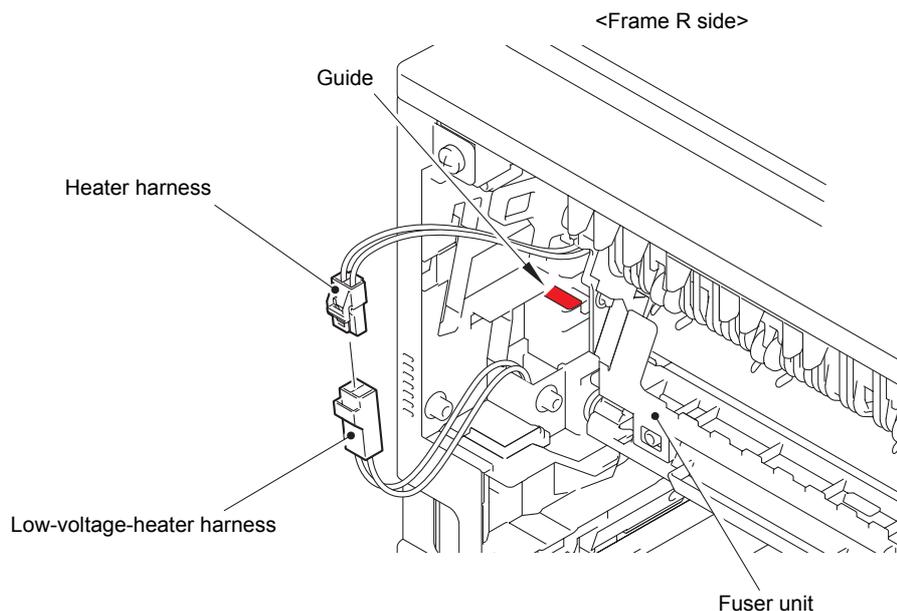


Fig. 7-6

Harness routing: Refer to "3.Fuser unit".

- (11) Remove the fuser unit ground spring from the fuser unit.
 (12) Release the center thermistor harness and the side thermistor harness of the fuser unit from the guide, and disconnect these harnesses from the eject sensor PCB ASSY.

Note:

- When disconnecting the harness, hold the top of the PCB connector to prevent the PCB connector being damaged.

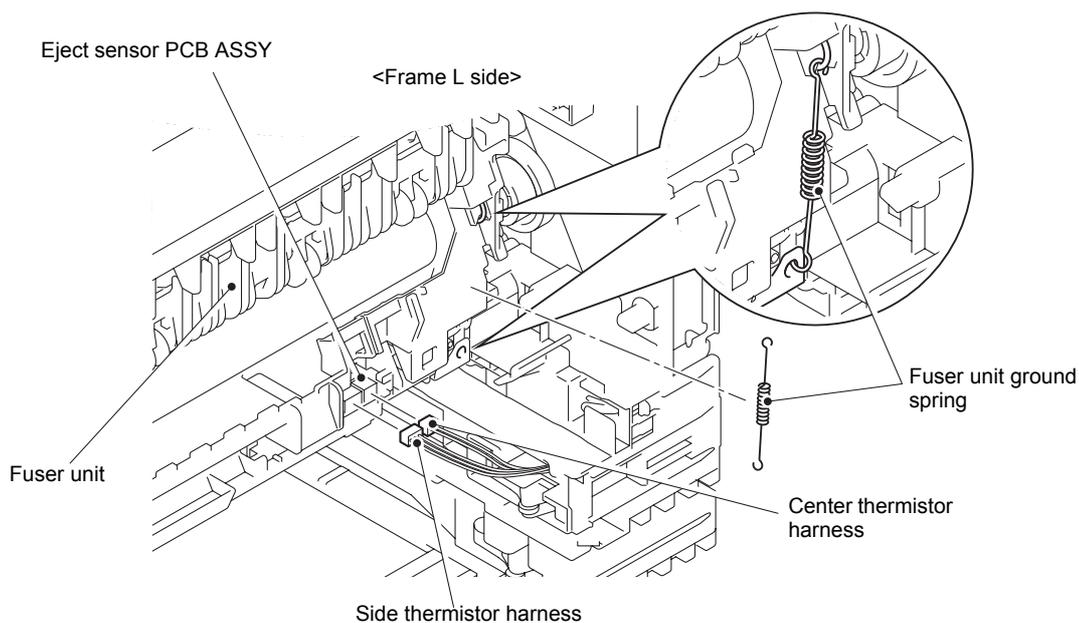


Fig. 7-7

Harness routing: Refer to "3.Fuser unit".

(13) Remove the taptite pan B M4x14 screw, and remove the fuser unit from the machine.

Note:

- Make sure that the front cover is closed when removing the fuser unit.

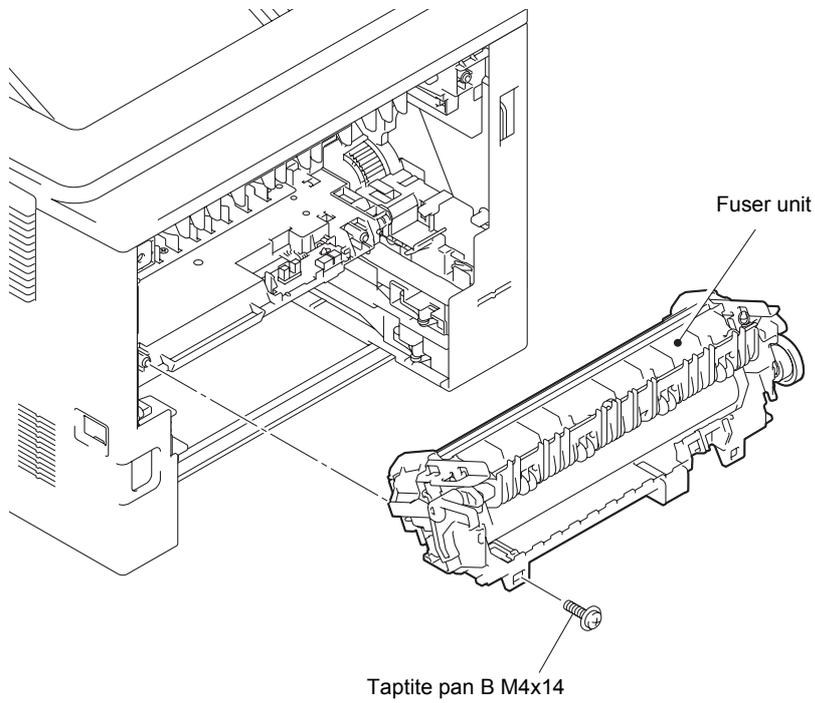
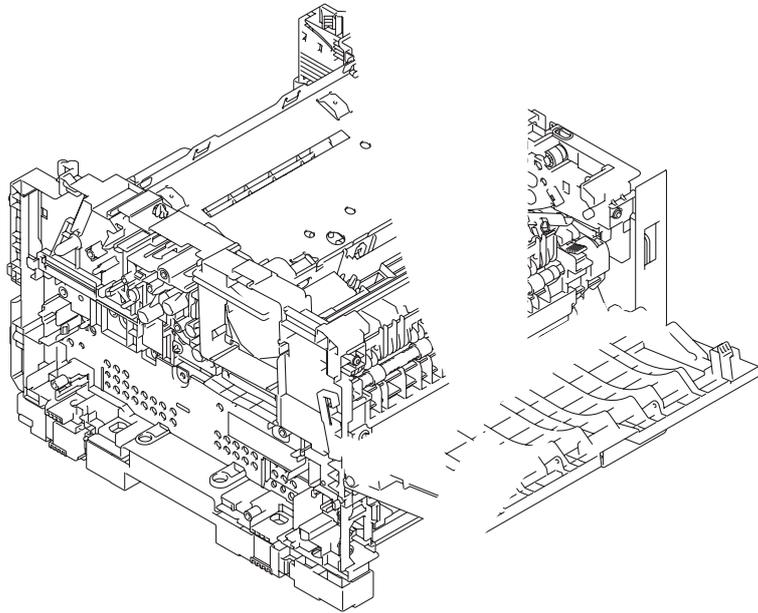


Fig. 7-8

2.3 Laser unit

- (1) Open the back cover.
- (2) Remove the two taptite cup B M4 the side cover R.

the back side of the side cover L and



. 7-9

- (3) Remove the two taptite cup B i2 screws from the front side of the side cover L and the side cover R.

- (4) Push the front cover release button, and open the front cover ASSY.
- (5) Release the seven hooks, and remove the side cover L from the machine.

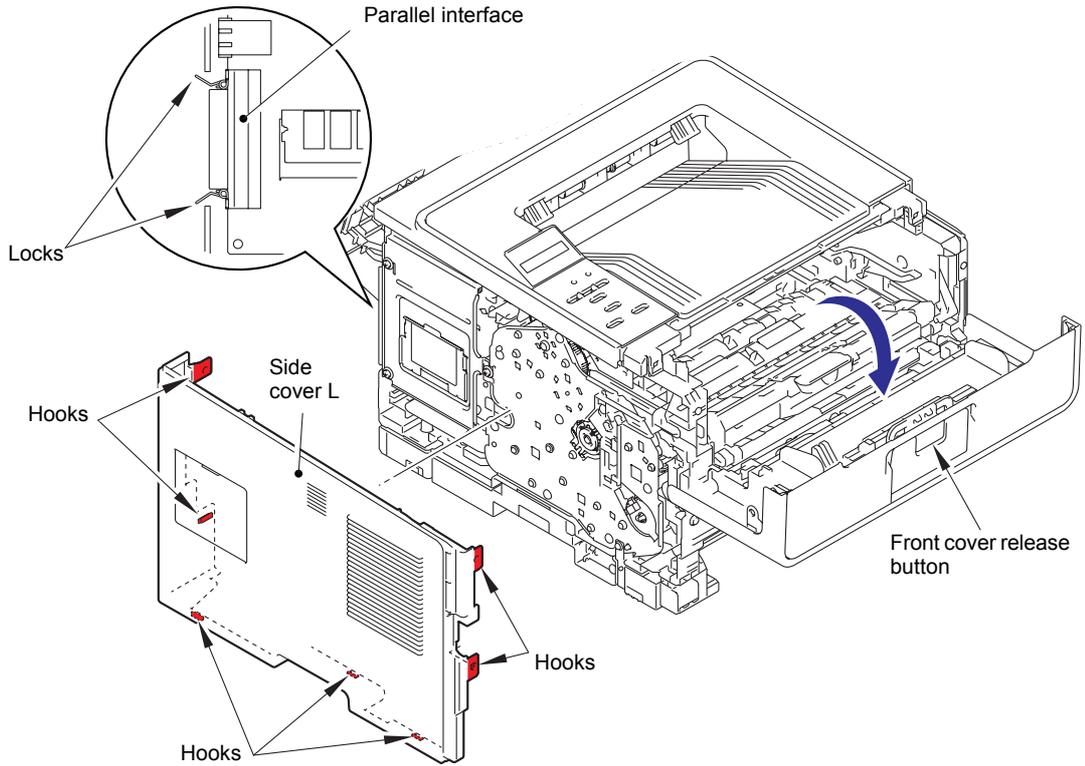


Fig. 7-11

Assembling Note:

- For HL-5440D, raise the two locks for the parallel interface to the upright position, and then attach the side cover L.

- (6) Release the seven hooks, and remove the side cover R from the machine.

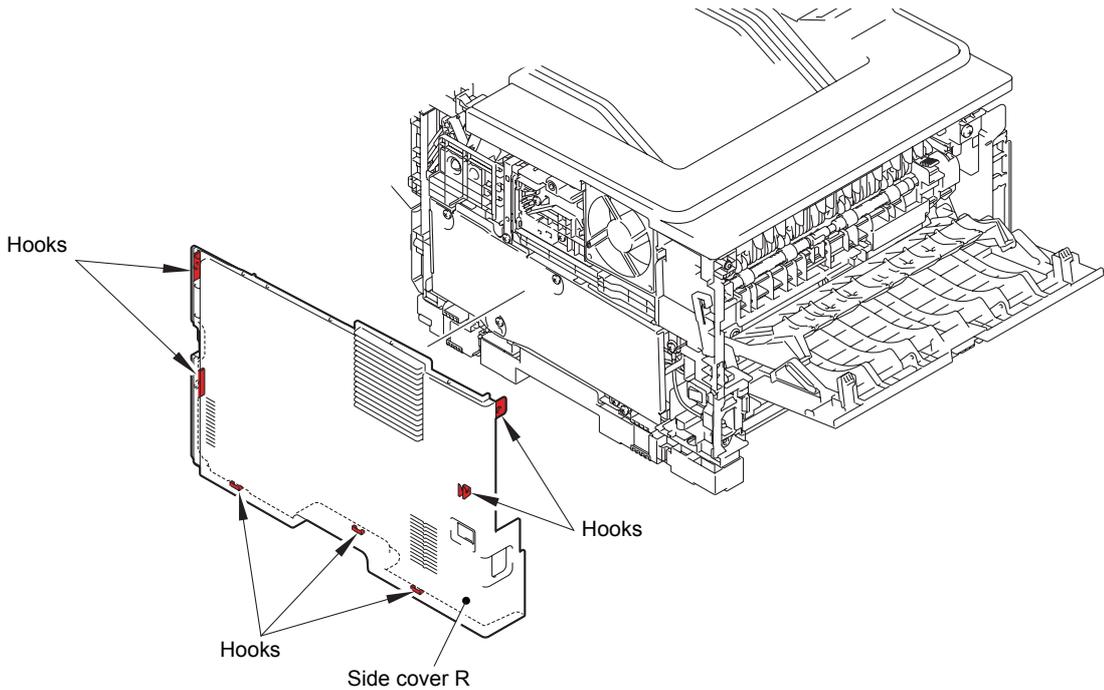


Fig. 7-12

- (7) Remove the four taptite cup S M3x8 SR screws, and remove the main shield cover plate from the machine.

Note:

- HL-5440D is not equipped with a main shield cover plate.

- (8) Disconnect the panel harness from the main PCB ASSY, and release the panel harness from the securing fixtures.

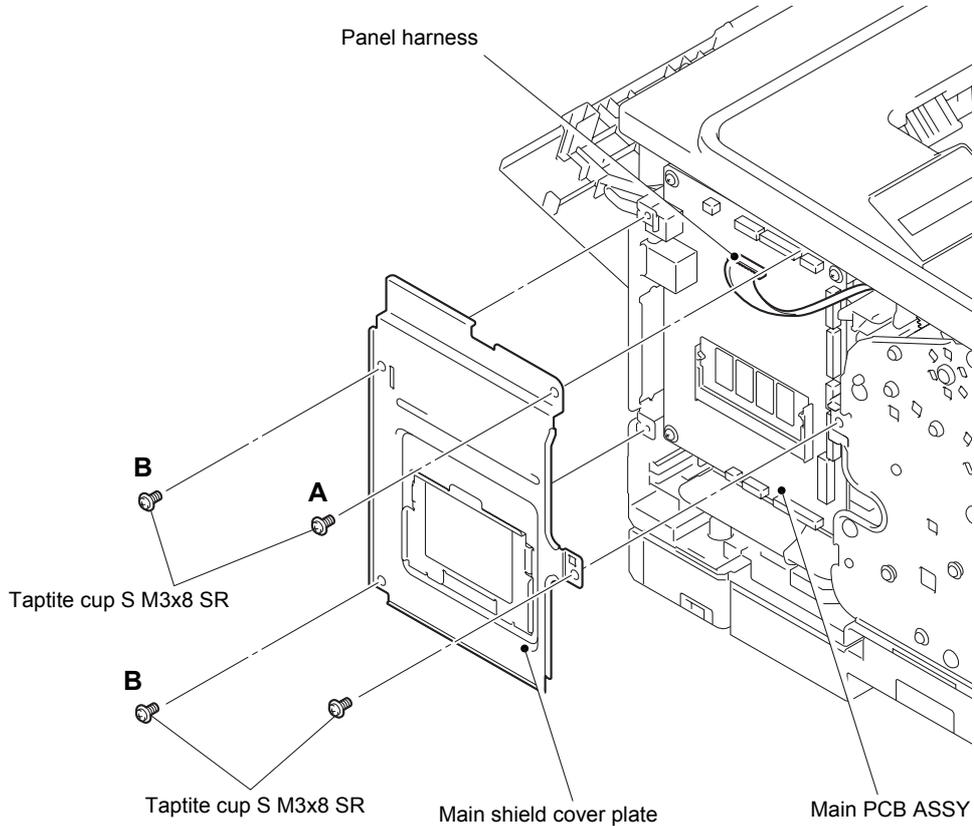


Fig. 7-13

Note:

- Use of screws A and B differs depending on the model.

Model	A	B
HL-5440D	Not used	Not used
HL-5450DN/5450DNT/5470DW/5470DWT	Used	Used
HL-6180DW/6180DWT	Not used	Used

Harness routing: Refer to "1.Main PCB ASSY".

- (9) Remove the two taptite cup B M4x12 screws from the front side of the top cover ASSY.
- (10) Release the six hooks. Lift the front side of the top cover ASSY, and pull the top cover ASSY in the direction of the arrow to remove it from the machine.

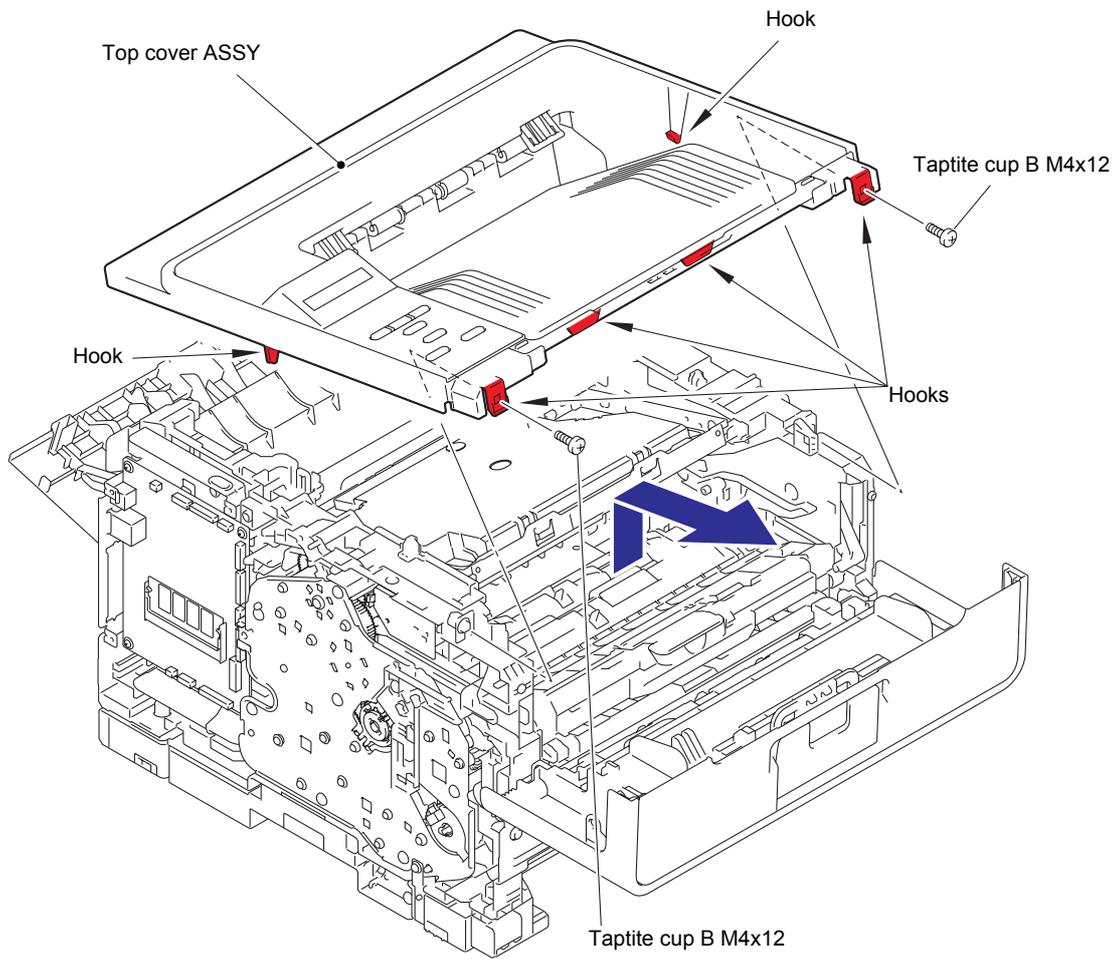


Fig. 7-14

- (11) Disconnect the laser unit flat cable from the laser unit.
- (12) Remove the four taptite cup S M3x8 SR screws, and remove the laser unit from the machine.

Note:

- Be careful not to touch the lens of the laser unit.

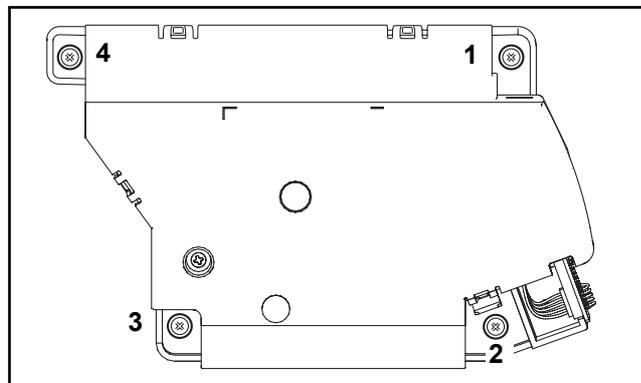
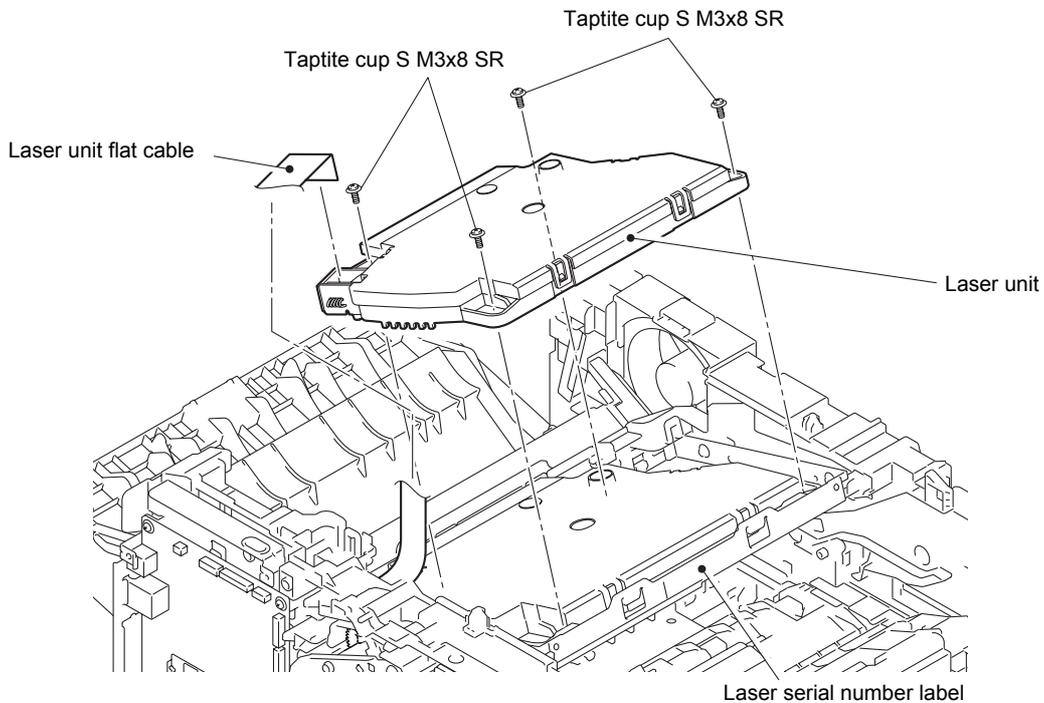


Fig. 7-15

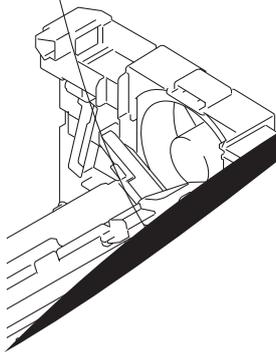
Harness routing: Refer to **"1.Main PCB ASSY"** and **"6.Laser unit"**.

Assembling Note:

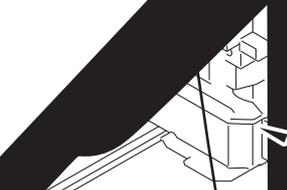
- When attaching the laser unit, tighten the screws in the following order: upper right, lower right, lower left and upper left.
- When connecting the flat cable(s), insert it straight. After insertion, check that the cable is not at an angle.
- After replacing the laser unit, attach the laser serial number label of the new laser unit on the scanner plate as shown in the illustration above.

2.4 MP paper feeding kit

- (1) Push the front cover release button, and
- (2) Open the MP roller cover. Remove the MP roller holder bushing in the direction of arrow 1. Then slide the MP roller holder ASSEMBLY into the MP machine.
- (3) Slide the MP roller holder ASSEMBLY onto the MP separation roller shaft. Then remove the MP roller holder bushing from the MP machine.
- (4) Raise the MP separation pad ASSEMBLY from the MP machine in the direction of arrow 2.
- (5) Bend the MP separation pad spring in the direction of arrow 3.



MP separation
pad ASSY



Front cover release button

Assembling Note:

- Attach the MP roller holder ASSY while p

2.5 Paper feeding kit 1

Note:

- Paper tray 1 (250 sheets, 500 sheets): T1
Paper tray 2 (500 sheets): T2
- The illustration shows paper tray 1 (250 sheets).

- (1) Remove the two taptite bind B M4x12 screws from the paper tray 1.
- (2) Lift the plate to remove "A" on the T1 tray indicator from the plate, remove the four bosses, and then remove the T1 tray cover from the paper tray 1.

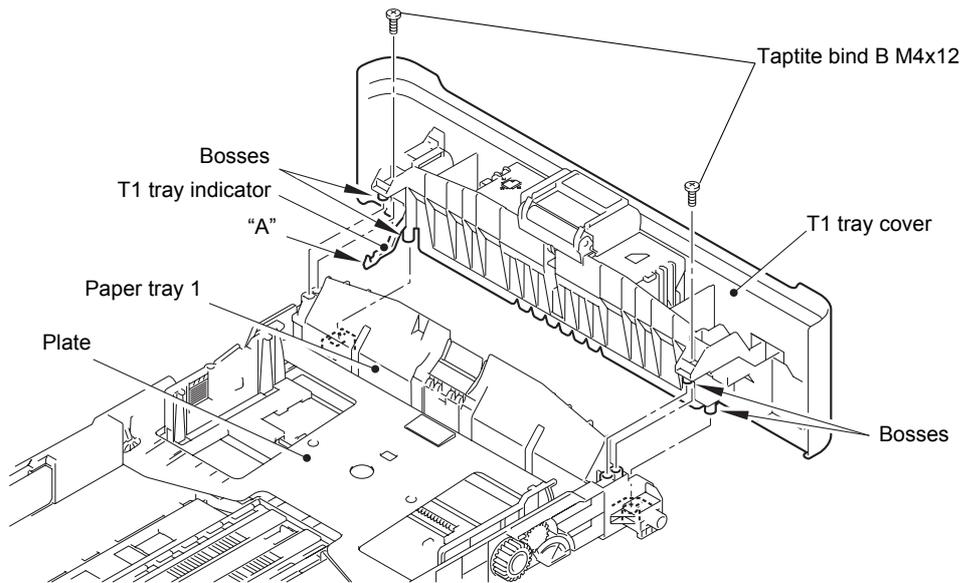


Fig. 7-17

- (3) Release the two hooks on the T1 separation pad ASSY from the paper tray 1.
- (4) Push both arms of the T1 separation pad ASSY in the direction of the arrows to remove both pins, and then remove the T1 separation pad ASSY from the paper tray 1.
- (5) Remove the T1 separation pad spring from the T1 separation pad ASSY.

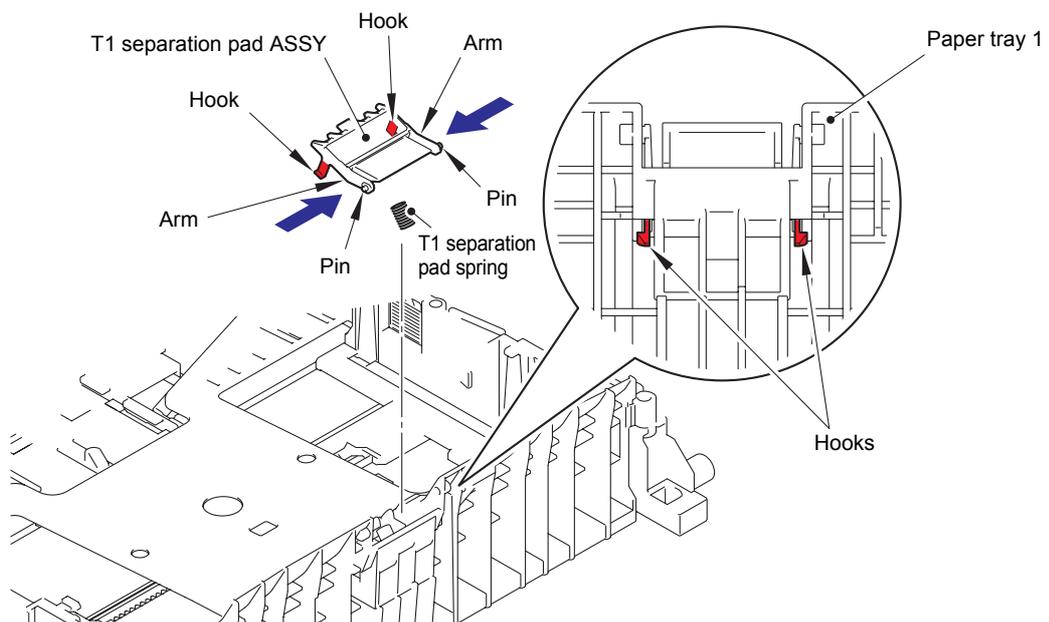


Fig. 7-18

- (6) Push the T1 lift arm in the direction of arrow 6, and remove the boss on the T1 roller holder ASSY from the T1 lift arm.
- (7) Turn the T1 roller holder ASSY in the direction of arrow 7a, and slide it in the direction of arrow 7b to remove it from the T1 separation roller shaft. Then remove the T1 roller holder ASSY from the machine.

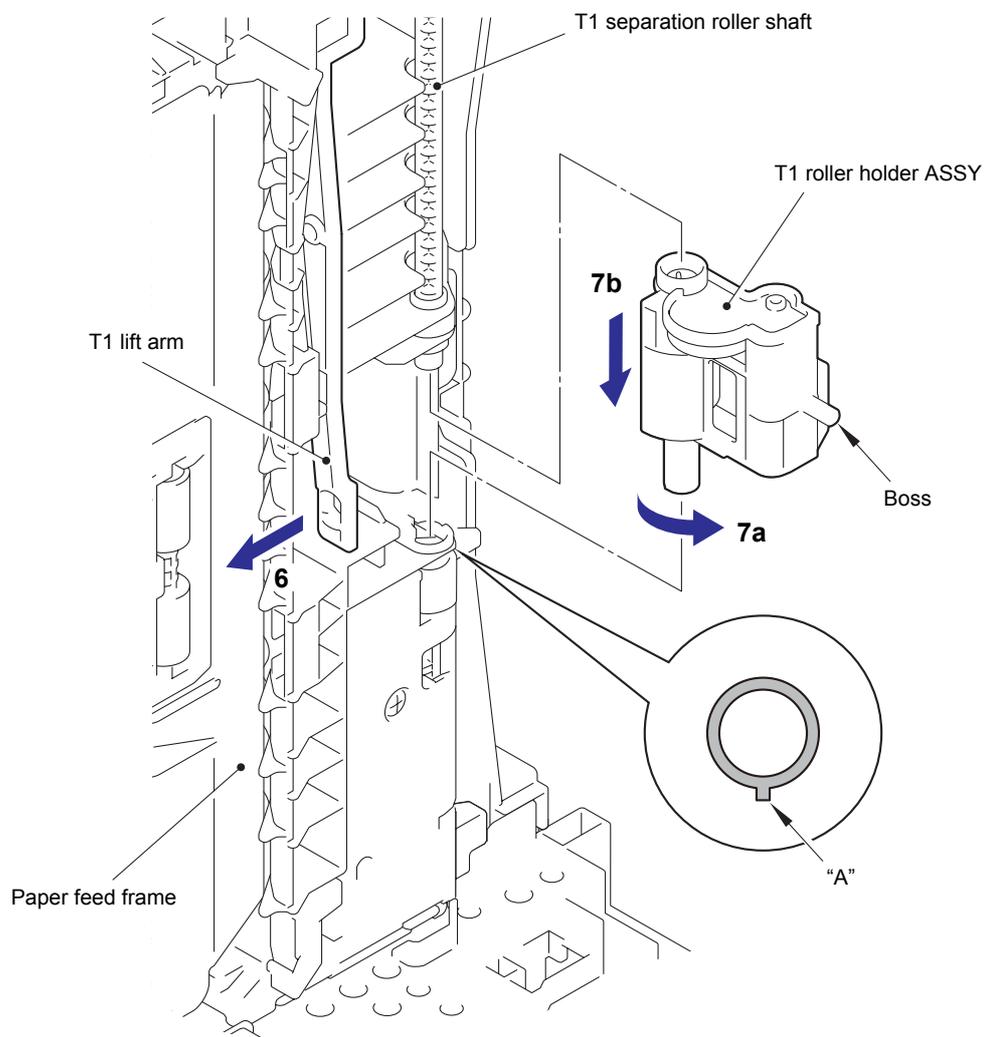


Fig. 7-19

Assembling Note:

- When attaching the T1 roller holder ASSY, engage "A" on the shaft of the T1 roller holder ASSY with the hole on the paper feed frame, and insert the shaft into the hole.

2.6 Paper feeding kit 2

- (1) Remove the two taptite bind B M4x12 screws from the paper tray 2.
- (2) Lift the plate to remove "A" on the T2 tray indicator from the plate, remove the four bosses, and then remove the T2 tray cover ASSY from the paper tray 2.

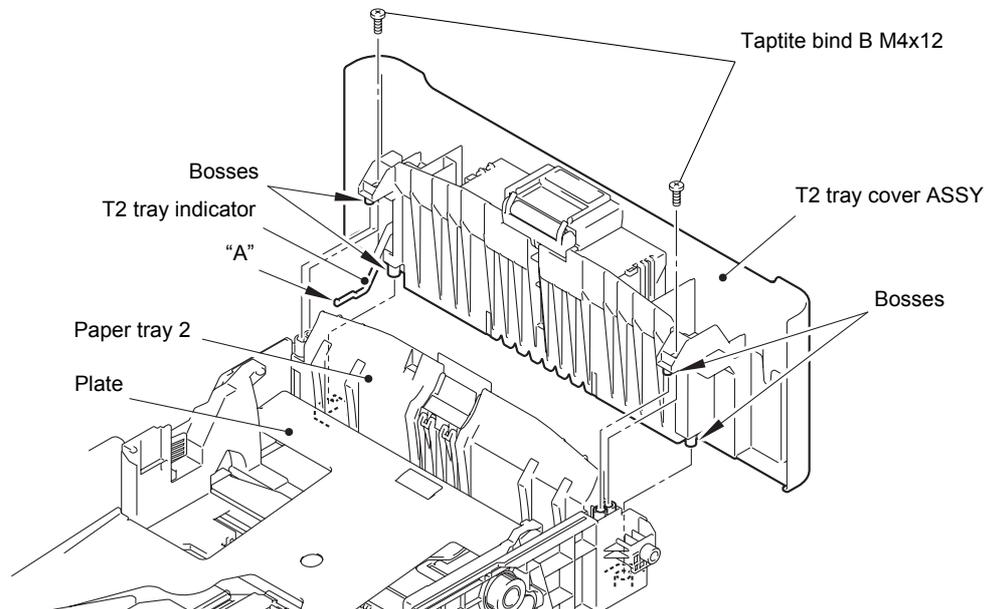


Fig. 7-20

- (3) Release the two hooks on the T2 separation pad ASSY from the paper tray 2.
- (4) Push both arms of the T2 separation pad ASSY in the direction of the arrows to remove both pins, and then remove the T2 separation pad ASSY from the paper tray 2.
- (5) Remove the T2 separation pad spring from the T2 separation pad ASSY.

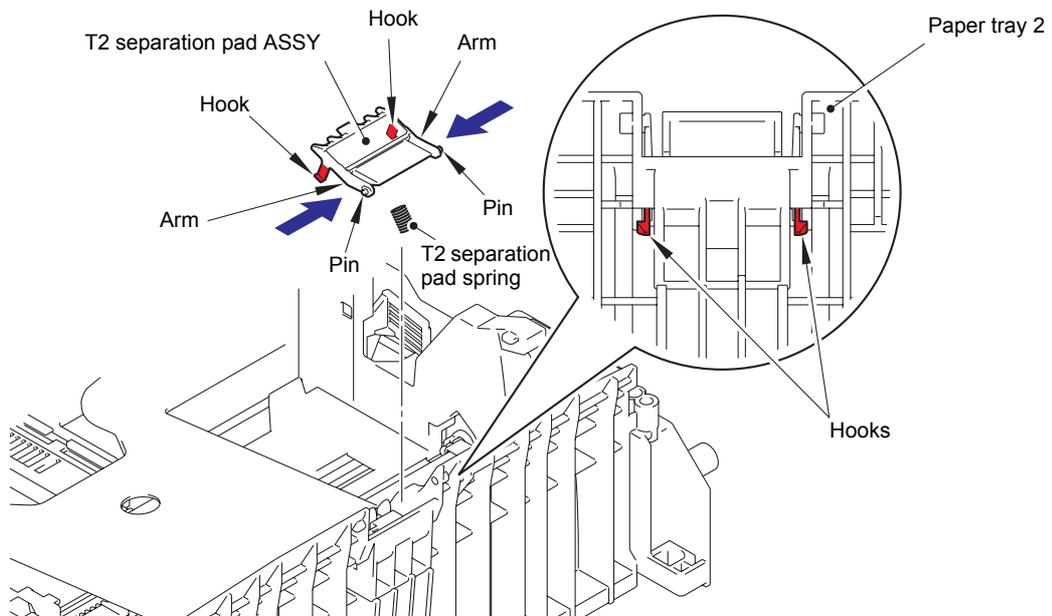


Fig. 7-21

- (6) Push the T2 lift arm in the direction of arrow 6a, and remove the boss on the T2 roller holder ASSY from the T2 lift arm. Then turn the T2 roller holder ASSY in the direction of arrow 6b.

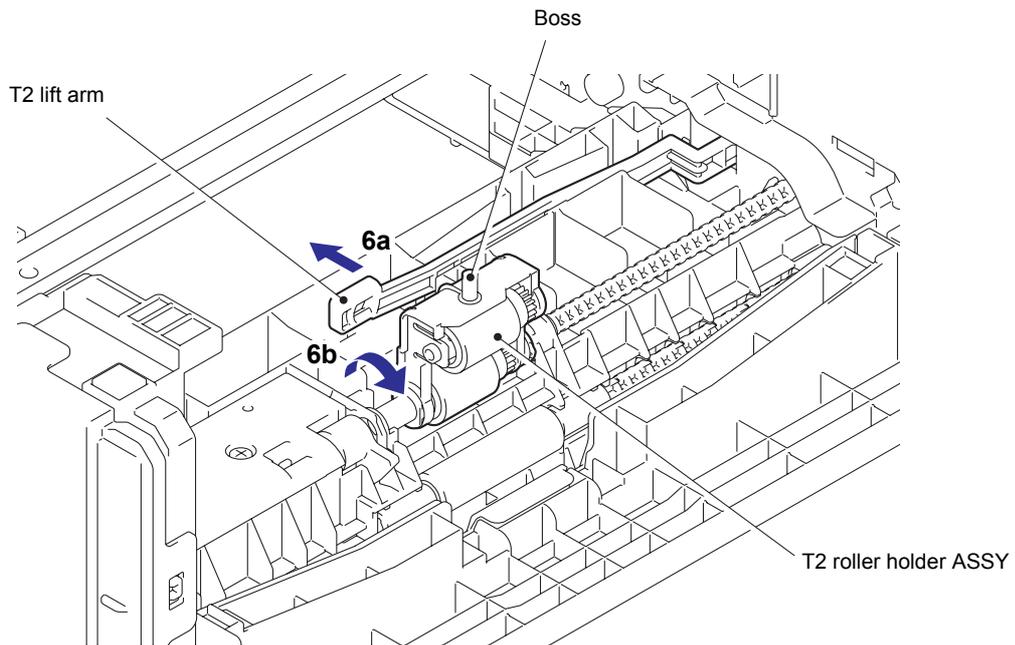


Fig. 7-22

- (7) Slide the T2 roller holder ASSY in the direction of arrow 7 to remove it from the T2 separation roller shaft.
- (8) Lift the right side of the T2 roller holder ASSY in the direction of arrow 8a, and pull the T2 roller holder ASSY in the direction of arrow 8b to remove it from the LT unit.

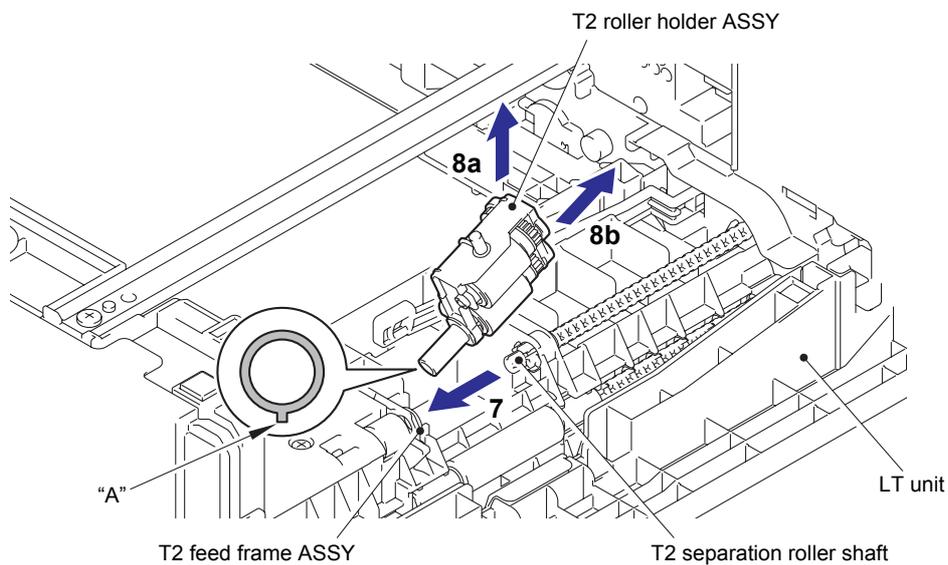


Fig. 7-23

Assembling Note:

- When attaching the T2 roller holder ASSY, engage "A" on the shaft of the T2 roller holder ASSY with the hole on the T2 feed frame ASSY, and insert the shaft into the hole.

APPENDIX 1

SERIAL NUMBERING SYSTEM

APPENDIX 1 SERIAL NUMBERING SYSTEM

■ Serial number label (1 location)

<How to Read>

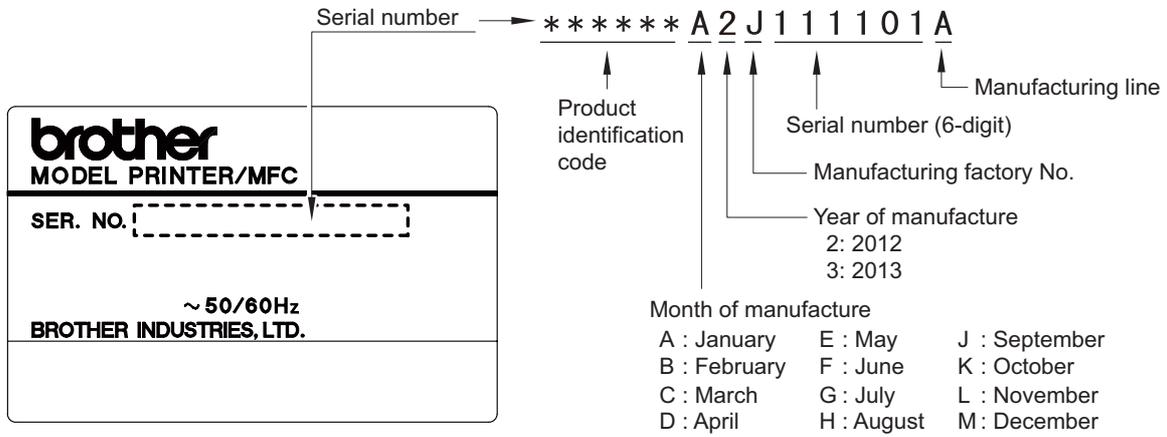


Fig. App. 1-1

<Location>

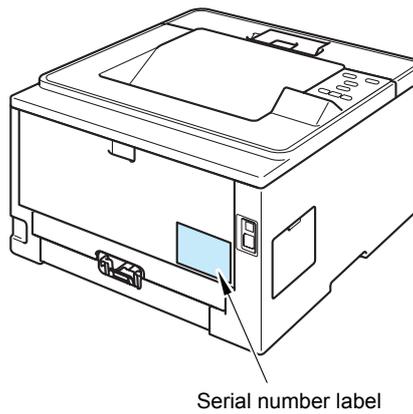


Fig. App. 1-2

APPENDIX 2

DELETING USER SETTING INFORMATION

This appendix provides instructions on how to delete user setting information recorded in the machine.

APPENDIX 2 DELETING USER SETTING INFORMATION

The user setting information for the machine is stored in the main PCB. You can return this to the default settings following the procedure below.

<Operating Procedure>

■ Common to all models

- (1) Press and hold the [Go] button with the front cover of the machine closed, and turn ON the power switch of the machine. Check that all LEDs light.
- (2) Release the [Go] button, and check that all LEDs go out.
- (3) Press the [Go] button ten times.
- (4) When completed, the machine returns to the ready state automatically.

■ LCD model

- (1) Press the [▲] or [▼] button to display the "Reset Menu" on the LCD, and press the [OK] button.
- (2) Press the [▲] and [Cancel] buttons simultaneously. "Setting Reset" is displayed on the LCD.
- (3) Press the [OK] button. When completed, the machine returns to the ready state automatically.

APPENDIX 3

INSTALLING MAINTENANCE DRIVER

APPENDIX 3 INSTALLING MAINTENANCE DRIVER

To identify multiple terminals connected to the computer via USB, the computer needs to configure the corresponding number of virtual USB devices using a driver or software. If you connect multiple machines to your computer, the same number of virtual USB devices will be automatically configured on your computer. To prevent an unlimited number of virtual USB devices from being configured, use the unique driver installation procedure described below to enable your computer to identify multiple terminals via one single virtual USB device.

<Operating Procedure>

- (1) Check that the power switch of the machine is OFF. When the machine is connected to the computer, disconnect the USB cable.
- (2) Turn ON the power switch of the computer.
- (3) Press and hold the [Go] button with the front cover of the machine open, and turn ON the power switch of the machine.
LCD model: "Users mode" is displayed on the LCD.
LED model: The Back Cover, Toner, Drum, Paper and Error LEDs light.
- (4) Release the [Go] button, and check that all LEDs go out.
- (5) Press the [Go] button for two seconds, and the Error LED lights.
- (6) Double-click "maintenance.exe" for the maintenance driver stored in the temporary folder to execute it.
- (7) The Device Driver Installation Wizard startup window appears. Click [Next].
- (8) The WHQL alert window appears three times. Click [Continue Anyway] on each window to continue installation.
- (9) The Device Driver Installation Wizard completion window appears. Click [Finish].
- (10) Connect the machine to your computer using the USB cable.
- (11) The Found New Hardware Wizard startup window appears. Select "Install the software automatically" and click [Next].
- (12) The WHQL alert window appears. Click [Continue Anyway].
- (13) When the driver is installed successfully, the Found New Hardware Wizard completion window appears. Click [Finish].
- (14) Repeat steps (11) to (13) three times to complete the unique driver installation procedure.
- (15) Disconnect the USB cable.
- (16) Turn OFF the power switch of the machine.