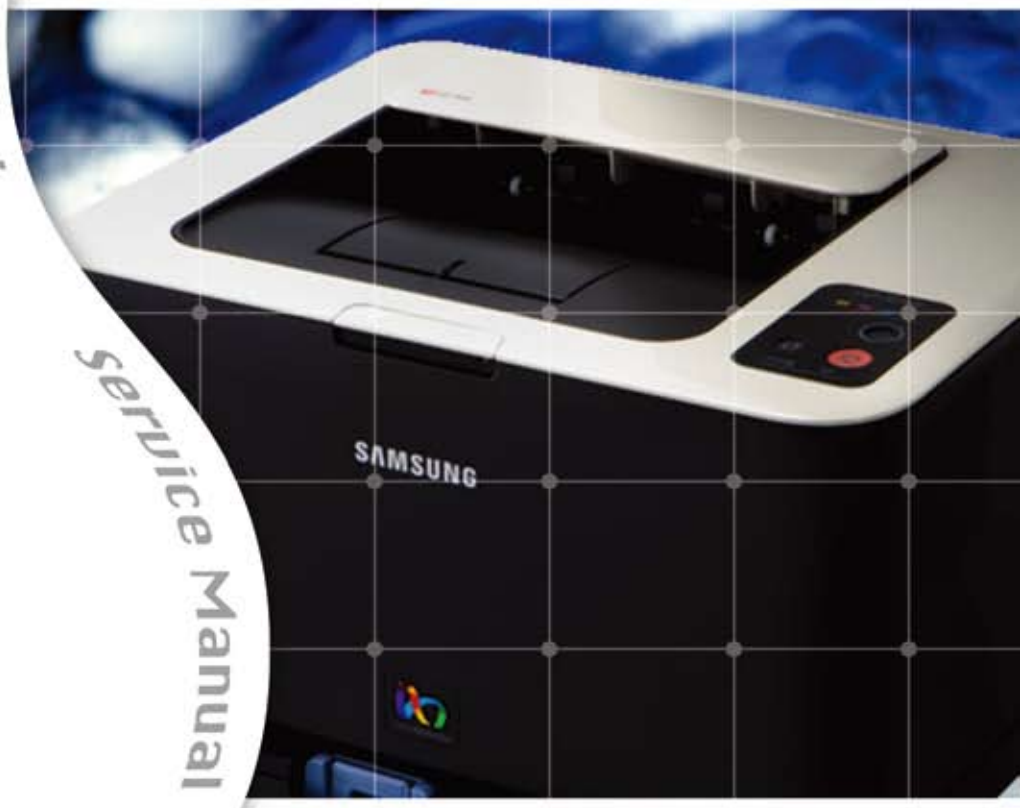
SAMSUNG

Service Manual



Color Laser Printer

CLP-320/325 Series

CLP-320/325/326/320N/321N/325W

The keynote of Product

- Model series : CLP-320/325
  CLP-320N/CLP-321N(Network model)
  CLP-325W (Wireless model)
- Speed(Color/Mono) : 4/16 ppm(A4). 4/17ppm(Let)
- Printing resolution : Max. 2,400 x 600 dpi
- Emulation : SPL-C / PCL-6(Network Model)
- Memory : 32MB (USB Model)
  256MB (Network/Wireless Model)
- Processor : Jupiter5(360MHz,CLP-320/325/320N/325W)
- Interface : IEEE 802.3,Ethernet(10/100Mbps)
  Wireless: IEEE 802.11b/g(Only wireless model)
- Toner Cartridge
  - Initial : 1K Toner(K), 0.7K Toner(C,M,Y, each)
  - Sales : 1.5K Toner(K), 1K toner(C, M, Y each)
- Printer Life : 100,000 pages
  Monthly Max. Duty : 20,000 pages/month

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attached Parts Catalog

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1. Precautions

In order to prevent accidents and damages to the equipment please read the precautions listed below carefully before servicing the product and follow them closely.

1.1 Safety warning

(1) Only to be serviced by a factory trained service technician.
High voltages and lasers inside this product are dangerous. This product should only be serviced by a factory trained service technician.

(2) Use only Samsung replacement parts.
There are no user serviceable parts inside the product. Do not make any unauthorized changes or additions to the product as these could cause the product to malfunctions and create an electric shocks or fire hazards.

(3) Laser Safety Statement
The product is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class 1(1) laser products, and elsewhere, it is certified as a Class I laser product conforming to the requirements of IEC 825. Class I laser products are not considered to be hazardous. The laser system and product are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

Warning >> Never operate or service the product with the protective cover removed from Laser/Scanner assembly. The reflected beam, although invisible, can damage your eyes.
When using this product, these basic safety pre-cautions should always be followed to reduce risk of fire, electric shock, and personal injury.

CAUTION - INVISIBLE LASER RADIATION WHEN THIS COVER OPEN. DO NOT OPEN THIS COVER.

VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GE...FFNET. NICHT DEM STRAHL AUSSETZEN.

ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS DÔOUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.

ATTENZIONE - RADIAZIONE LASER INVISIBILE IN CASO DI APERTURA. EVITARE LÔESPOSIZIONE AL FASCIO.

PRECAUCION - RADIACION LASER IVISIBLE CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.

ADVARSEL. - USYNLIG LASERSTRLNING VED BNING, NR SIKKERHEDSBRYDERE ER UDE AF FUNKTION. UNDG UDSAETTELSE FOR STRLNING.

ADVARSEL. - USYNLIG LASERSTRLNING NR DEKSEL PNES. STIRR IKKE INN I STRLEN. UNNG EKSPONERING FOR STRLEN.

VARNING - OSYNLIG LASERSTRLNING NR DENNA DEL R ...PPNAD OCH SPRREN R URKOPPLAD. BETRAKTA EJ STRLEN. STRLEN R FARLIG.

VARO! - AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NKYMTT...MLLE LASER-STEILYLLE L KATSO STEESEEN.

注 意 - 严禁渴开此盖, 以免激光泄露灼伤

주 의 - 이 덮개를 열면 레이저광에 노출될 수 있으므로 주의하십시오.

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1.2 Caution for safety

1.2.1 Toxic material

This product contains toxic materials that could cause illness if ingested.

(1) If the LCD control panel is damaged, it is possible for the liquid inside to leak. This liquid is toxic. Contact with the skin should be avoided. Wash any splashes from eyes or skin immediately and contact your doctor. If the liquid gets into the mouth or is swallowed, see a doctor immediately.
(2) Please keep imaging unit and toner cartridge away from children. The toner powder contained in the imaging unit and toner cartridge may be harmful, and if swallowed, you should contact a doctor.

1.2.2 Electric shock and fire safety precautions

Failure to follow the following instructions could cause electric shock or potentially cause a fire.

(1) Use only the correct voltage, failure to do so could damage the product and potentially cause a fire or electric shock.
(2) Use only the power cable supplied with the product. Use of an incorrectly specified cable could cause the cable to overheat and potentially cause a fire.
(3) Do not overload the power socket, this could lead to overheating of the cables inside the wall and could lead to a fire.
(4) Do not allow water or other liquids to spill into the product, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the product, these could cause a short circuit leading to an electric shock or fire hazard.
(5) Never touch the plugs on either end of the power cable with wet hands, this can cause electric shock. When servicing the product, remove the power plug from the wall socket.
(6) Use caution when inserting or removing the power connector. When removing the power connector, grip it firmly and pull. The power connector must be inserted completely, otherwise a poor contact could cause overheating possibly leading to a fire.
(7) Take care of the power cable. Do not allow it to become twisted, bent sharply around corners or wise damaged. Do not place objects on top of the power cable. If the power cable is damaged it could overheat and cause a fire. Exposed cables could cause an electric shock. Replace the damaged power cable immediately, do not reuse or repair the damaged cable. Some chemicals can attack the coating on the power cable, weakening the cover or exposing cables causing fire and shock risks.
(8) Ensure that the power sockets and plugs are not cracked or broken in any way. Any such defects should be repaired immediately. Take care not to cut or damage the power cable or plugs when moving the machine.
(9) Use caution during thunder or lightning storms. Samsung recommends that this machine be disconnected from the power source when such weather conditions are expected. Do not touch the machine or the power cord if it is still connected to the wall socket in these weather conditions.
(10) Avoid damp or dusty areas, install the product in a clean well ventilated location. Do not position the machine near a humidifier or in front of an air conditioner. Moisture and dust built up inside the machine can lead to overheating and cause a fire or cause parts to rust.
(11) Do not position the product in direct sunlight. This will cause the temperature inside the product to rise possibly leading to the product failing to work properly and in extreme conditions could lead to a fire.
(12) Do not insert any metal objects into the machine through the ventilator fan or other part of the casing, it could make contact with a high voltage conductor inside the machine and cause an electric shock.

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1.2.3 Handling precautions

The following instructions are for your own personal safety to avoid injury and so as not to damage the product.

(1) Ensure the product is installed on a level surface, capable of supporting its weight. Failure to do so could cause the product to tip or fall.
(2) The product contains many rollers, gears and fans. Take great care to ensure that you do not catch your fingers, hair or clothing in any of these rotating devices.
(3) Do not place any small metal objects, containers of water, chemicals or other liquids close to the product which if spilled could get into the machine and cause damage or a shock or fire hazard.
(4) Do not install the machine in areas with high dust or moisture levels, beside on open window or close to a humidifier or heater. Damage could be caused to the product in such areas.
(5) Do not place candles, burning cigarettes, etc on the product, These could cause a fire.

1.2.4 Assembly / Disassembly precautions

Replace parts carefully and always use Samsung parts. Take care to note the exact location of parts and also cable routing before dismantling any part of the machine. Ensure all parts and cables are replaced correctly. Please carry out the following procedures before dismantling the product or replacing any parts.

(1) Check the contents of the machine memory and make a note of any user settings. These will be erased if the main board or network card is replaced.
(2) Ensure that power is disconnected before servicing or replacing any electrical parts.
(3) Disconnect interface cables and power cables.
(4) Only use approved spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct.
(5) When removing or re-fitting any parts do not use excessive force, especially when fitting screws into plastic.
(6) Take care not to drop any small parts into the machine.
(7) Handling of the OPC Drum
- The OPC Drum can be irreparably damaged if it exposed to light.
  Take care not to expose the OPC Drum either to direct sunlight or to fluorescent or incandescent room lighting. Exposure for as little as 5 minutes can damage the surface of the photoconductive properties and will result in print quality degradation. Take extra care when servicing the product. Remove the OPC Drum and store it in a black bag or other lightproof container. Take care when working with the Covers (especially the top cover) open as light is admitted to the OPC area and can damage the OPC Drum.
- Take care not to scratch the green surface of OPC Drum Unit.
  If the green surface of the Drum Cartridge is scratched or touched the print quality will be compromised.

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1.2.5 Disregarding this warning may cause bodily injury

(1) Be careful with high temperature components.
The fuser unit works at a high temperature. Use caution when working on the product. Wait for the fuser to cool down before disassembly.

(2) Be careful when working around the rotating parts.
When operating a product, keep all bodily items and clothing away from moving parts [e.g. fingers, hair, tie, etc.] (Paper feeding entrance, motor, fan, etc.).

(3) When moving the product :
- When transporting/installing the equipment, employ four persons and be sure to hold the lifting handles.
- Be sure not to hold the movable parts or units (e.g. the control panel, DADF) when transporting the equipment.
- Be sure to use a dedicated outlet with 110V/220V power input.
- The equipment must be grounded for safety.
- Select a suitable place for installation. Avoid excessive heat, high humidity, dust, vibration and direct sunlight.
- Provide proper ventilation since the equipment emits a slight amount of ozone.
- The equipment must be installed near the socket outlet and must be accessible.
- Be sure to fix and plug in the power cable securely after the installation so that no one trips over it.

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1.3 ESD precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices” or ESDs. Examples of typical ESDs are: integrated circuits,some field effect transistors, and semiconductor “chip” components.
The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

Caution >>Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
3. Use only a grounded tip soldering iron to solder or desolder ESDs.
4. Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

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2. Product spec and feature

2.1 Product Specifications

2.1.1 Product Overview

Item	Descriptions
Basic Model	CLP-320/325
Series Model	CLP-320N : Network Model CLP-325W : Wireless Model
Main Specification	1. Speed • Up to 16 ppm in A4 (17 ppm in Letter) • Up to 4 ppm in A4 (4 ppm in Letter) 2. Printing Resolution • Max. 2400x600 dpi effective output 3. Processor • Jupiter5 (360MHz,CLP-320/325/320N/325W) 4. Printer Language Emulations • SPL-C (CLP-320/325/320N/325W), PCL-6 (320N/325W) 5. Memory • FLASH ROM - 2MB : CLP-320/325 - 32MB : CLP-320N/325W • DDR2 SDRAM - 32MB : CLP-320/325 - 256MB : CLP-320N/325W • EEPROM memory - CLP-325 (8KB) - CLP-325W (64KB) - CLP-320N (32KB) 6. Interfaces • One USB port (CLP-320/325/320N/325W) • One 10/100 Base T network connector (CLP-320N/325W) • One IEEE802.11b/g/n (CLP-325W) 7. Control Panel • No LCD,3 keys ,7single LEDs and 1 dual LEDs 8. Toner cartridge • Black : 1K (initial) / 1.5K (sales) • Color : 0.7K (initial) / 1K (sales) 9. Color • There are two kinds of colors. (Gray and Black)

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2.1.2 Prouduct Specification

Specifications are correct at the time of printing. Product specifications are subject to change without notice. See below for product specifications.

2.1.2.1 General Print Engine

Item		CLP-320/325	CLP-320N/CLP-325W
Print Speed	Simplex	B&W : 17ppm@Letter	B&W : 17ppm@Letter
		16ppm@A4	16ppm@A4
		Color : 4ppm@A4,.Letter	Color : 4ppm@A4,.Letter
	Duplex	NA	NA
Print Emulation		SPL-C	PCL-6
Auto Emulation Sensing		NA	NA
Font	Type	NA	NA
	Number	NA	NA
Power Save		Yes (5/10/15/30/60/120min.)	Yes (5/10/15/30/60/120min.)
Resolution	Normal	Up to 2400X600dpi Class (Default 1200x600 dpi)	Up to 2400X600dpi Class (Default 1200x600 dpi)
		Optical: 600x600 Dpi	Optical: 600x600 Dpi
	RET	NA	NA
Toner Save		NA	NA
FPOT	From Ready	Less than 26 sec (Color)	Less than 26 sec (Color)
		Less than 14 sec (B&W)	Less than 14 sec (B&W)
	From Idle	Less than 57 sec (Color)	Less than 57 sec (Color)
		Less than 45 sec (B&W)	Less than 45 sec (B&W)
	From Cold Boot	Less than 57 sec (Color)	Less than 57 sec (Color)
		Less than 45 sec (B&W)	Less than 45 sec (B&W)
Duplex Print		NA	NA
Printable Area		210 x 297 mm (A4)	210 x 297 mm (A4)
		216 x 279 mm (Letter)	216 x 279 mm (Letter)
		216 x 355.6 mm (Legal)	216 x 355.6 mm (Legal)
Print Margin		Side Margin: 4.23±2mm	Side Margin: 4.23±2mm
		Top Margin: 4.23±3mm	Top Margin: 4.23±3mm

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2.1.2.2 Controller & S/W

Item		CLP-320/325	CLP-320N/CLP-325W
MPU		Jupiter5 (360Mhz)	Jupiter5 (360Mhz)
Memory	Standard / Max.	256MB/256MB	256MB/256MB
	Type	DDR2 SDRAM (32MB)	DDR2 SDRAM (256MB)
	Expand Memory Slot & Type	NA	NA
	Compression Technology	YES	YES
Supporting OS		Microsoft Windows: 2000/2003/XP(Include 64bit),Vista MacOS:10.3 ~ 10.6 Linux(Printer only)OS: Red Hat 8~9, Fedora Core 1~4 Mandrake 9.2~10.1 SuSE 8.2~9.2	Microsoft Windows: 2000/2003/XP(Include 64bit),Vista MacOS:10.3 ~ 10.6 Linux(Printer only)OS: Red Hat 8~9, Fedora Core 1~4 Mandrake 9.2~10.1 SuSE 8.2~9.2
Default Driver		SPL-C	SPL-C
Driver feature		Microsoft Windows: -Watermark -N-up printing -Poster printing -Manual Dulpex -Quality(Best,Normal,Draft) -Color mode(Color, Gray scale) -Device Color Support -Color Management Support [Mac] -N-up printing -Quality(Best,Normal,Draft) -Color mode(Color, Gray scale) [Linux] - N-up printing -Quality(Best,Normal,Draft) [Common] -N/W Install during driver install	Microsoft Windows: -Watermark -N-up printing -Poster printing -Manual Dulpex -Quality(Best,Normal,Draft) -Color mode(Color, Gray scale) -Device Color Support -Color Management Support [Mac] -N-up printing -Quality(Best,Normal,Draft) -Color mode(Color, Gray scale) [Linux] - N-up printing -Quality(Best,Normal,Draft) [Common] -N/W Install during driver install
WHQL		Windows 2000 including vista	Windows 2000 including vista

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Item	CLP-320/325	CLP-320N/CLP-325W
Language Locallization	[Windows] - Korean,English,French,Germa N,Italian,Spanish,Russian,Dutch, E.Portuguese,B.Portuguese,Fi Nish,Swedish,Norwegian,Danish S.Chinese,T.Chinese,Polish, Hungarian,Greek,Czech,Turkish [Mac] - Korean,English,French,GermaN, Italian,Spanish, S.Chinese, T.Chinese, E.Portuguese, Dutch [Linux] - English Only	[Windows] - Korean,English,French,Germa N,Italian,Spanish,Russian,Dutch, E.Portuguese,B.Portuguese,Fi Nish,Swedish,Norwegian,Danish S.Chinese,T.Chinese,Polish, Hungarian,Greek,Czech,Turkish [Mac] - Korean,English,French,GermaN, Italian,Spanish, S.Chinese, T.Chinese, E.Portuguese, Dutch [Linux] - English Only
Smart Panel	USB	320N : USB/Network 325W : USB/Network/Wireless Network
	Default Install	Default Install
Network Management	NA	Set IP.SWAS &SWS (Linux, Mac not support, SWAS&SWS need I explorer 5.0 or Higher) NA Management
Smart Thru	NA	Smart Thru 4

2.1.2.3 Interface

Item		CLP-320/325	CLP-320N/CLP-325W
Interface	Parallel	NA	NA
	USB	USB 2.0	USB 2.0
	Network	NA	Ethernet 10/100 base Tx
	Wireless	NA	802.11 b/g (only 325W)
Network Interface	Protocol	NA	TCP/IP,IPP,SNMPv2
	Network OS	NA	- Microsoft Windows: 98/ME/2000/XP(32/64Bit) 2003 Server(32/64Bit)/ Vista - Mac OS: 10.3,10.4(Printing OnTCP/IP) - Linux OS: Red Hat 8~9, Fedora Core 1~4 Mandrake 9.2~10.1 & Suse 8.2~9.2 - Unix HP-UX, Solaris,SunOS SCO UNIX
User Interface	LCD	NA	NA
	OP UI	Key 3 EA, LED 8EA	Key 3 EA, LED 8EA
	Sound UI	NA	NA

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2.1.2.4 Paper Handling

Item		CLP-320/325	CLP-320N/CLP-325W
Capacity	Cassette	130 Sheets @ 80 g/㎡ Envelop : 5 Sheets Transparency : 1 Sheets Label, thick paper : 5 Sheets GlossyPhoto220 g/㎡ : 1 Sheets	130 Sheets @ 80 g/㎡ Envelop : 5 Sheets Transparency : 1 Sheets Label, thick paper : 5 Sheets GlossyPhoto220 g/㎡ : 1 Sheets
	MP Tray	NA	NA
	Option Cassette	80 Sheets @ 80 g/㎡ Envelop : 5 Sheets Transparency : 1 Sheets Label , thick paper : 5 Sheets GlossyPhoto220 g/㎡ : 1 Sheets	80 Sheets @ 80 g/㎡ Envelop : 5 Sheets Transparency : 1 Sheets Label , thick paper : 5 Sheets GlossyPhoto220 g/㎡ : 1 Sheets
Output Capacity		Face Down: 100Sheets/20lb Envelop ; 5 Sheets Transparency ; 1 Sheets Label , thick paper ; 10 Sheets	Face Down: 100Sheets/20lb Envelop ; 5 Sheets Transparency ; 1 Sheets Label , thick paper ; 10 Sheets
Output Full Sensing		No	No
Duplex		Manual Duplex	Manual Duplex
Paper Type	Cassette	A4, A5,A6, Letter, Legal, Executive, Folio, ISO B5, JIS B5	A4, A5,A6, Letter, Legal, Executive, Folio, ISO B5, JIS B5
		Transparency;(Mono Print Only)	Transparency;(Mono Print Only)
	MP Tray	NA	NA
	Option Tray	NA	NA
Paper Weight	Cassette	16~43 lb. (60 to 163g/㎡)	16~43 lb. (60 to 163g/㎡)
Paper Path	Standard output	Bottom to Top Front (FIFO)	Bottom to Top Front (FIFO)
	Straight Through	NA	NA
Paper Size	Max	216 x 355.6mm(8.5”x14”)	216 x 355.6mm(8.5”x14”)
	Min	76 x 160mm(3”x6.3”)	76 x 160mm(3”x6.3”)
Jam Rate	Cassette	1/3,000	1/3,000
Multi-Feed Rate	Cassette	1/1,500	1/1,500
Printing Skew	Top	1.5/201.4mm (Cassette)	1.5/201.4mm (Cassette)
	Side	2.0/270.4mm (Cassette)	2.0/270.4mm (Cassette)

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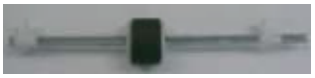
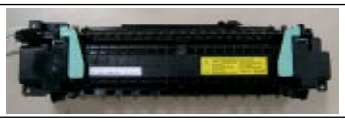
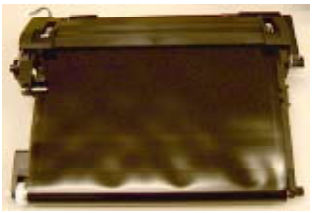
2.1.2.5 Consumables

Item	Image	Pages Printed	Part number	Remark
Black Toner cartridge		Approx. Initial : 1,000 Pages* Sales : 1,500 Pages*	CLT-K407S, CLT-K4072S (Black)	CRU
Color Toner cartridge		Approx. Initial : 700 Pages* Sales : 1,000 Pages*	CLT-C407S, CLT-C4072S (Cyan) CLT-M407S, CLT-M4072S (Magenta) CLT-Y407S, CLT-Y4072S (Yellow)	
Imagine unit		Approx. 24000 images*	CLT-R407	
Waste Toner		Approx. 10,000 images	CLT-W409	
Pick-up roller		Approx. 50,000 pages	JC97-03028A	FRU
Fuser unit		Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC91-00978A (220V) JC91-00997A (110V)	
T2 roller		Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC95-01197A	
ITB		Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC96-05874A	

* Average A4-/letter-sized page count based on Std. ISO 19798 of individual colors on each page.
  Usage conditions and print patterns may cause results to vary.

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2.1.2.6 Reliability & Service

Item	CLP-320/325	CLP-320N/CLP-325W
Max Monthly Duty	20,000 image (Color: 16,000/ Mono: 4,000)	20,000 image (Color: 16,000/ Mono: 4,000)
SET Life Cycle	100,000image or 5 years whichever comes first	100,000image or 5 years whichever comes first
MTBF	40,000 images (color 32,000 images and black 8,000 images : total 40,000 image)	40,000 images (color 32,000 images and black 8,000 images : total 40,000 image)
MTTR	<30 min.	<30 min.
Real-time Clock	No	No
System record	Total image count Total page count (color/mono) Imaging unit Information Transfer roller life Transfer belt life Toner information Tray roller life	Total image count Total page count (color/mono) Imaging unit Information Transfer roller life Transfer belt life Toner information Tray roller life
Minimum System Requirement	Pentium-Ⅱ 400MHZ, 64MB RAM, 300MB HDD, Internet Explorer 5.0	Pentium-Ⅱ 400MHZ, 64MB RAM, 300MB HDD, Internet Explorer 5.0

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2.1.2.7 Environment

Item		CLP-320/325	CLP-320N/CLP-325W
Power Consumption	Ready	Less than 160W	Less than 160W
	Average	Less than 350W (Currency:5A(110V)/3A(220V)	Less than 350W (Currency:5A(110V)/3A(220V)
	Max/Peak	700W/1KW	700W/1KW
	Sleep/Power off	Less than 5W/0.45W	Less than 8W/0.45W (325W) Less than 6W (320N)
Power Supply	Input Voltage	AC 110V~127V, AC 220V~240V AC 120V/AC 220V(EXP version)	AC 110V~127V, AC 220V~240V AC 120V/AC 220V(EXP version)
	Input Frequency	50 / 60Hz(+/- 3Hz)	50 / 60Hz(+/- 3Hz)
Noise	Printing	Mono : 46dBA Color : 48dBA	Mono : 46dBA Color : 48dBA
	Standby	Background noise level	Background noise level
	Sleep	Background noise level	Background noise level
Warm Up Time	From Cold Status (At rated volt)	Less than 35 seconds	Less than 35 seconds
Temperature	Operating	10~32.5℃	10~32.5℃
	Storage (Un-Packed)	5~35℃	5~35℃
	Storage (Packed)	-20~50℃	-20~50℃
Humidity	Operating	20 ~ 80% RH	20 ~ 80% RH
	Storage (Un-Packed)	20 ~ 80% RH	20 ~ 80% RH
	Storage (Packed)	10~90% RH	10~90% RH
Altitude		Normal: 0~3000ft (0~1000m)	Normal: 0~3000ft (0~1000m)
		High: 3001~6600ft(~2000m)	High: 3001~6600ft(~2000m)
		Higher: 6601~9900ft(~3000m)	Higher: 6601~9900ft(~3000m)
		Highest;9901~13000ft(~4000m)	Highest;9901~13000ft(~4000m)

2.1.2.8 Accessory

Item		CLP-320/325	CLP-320N/CLP-325W
Quick setup guide		Yes	Yes
Owner's manual		Yes	Yes
S/W CD ROM		1 : for Driver	1 : for Driver
			2 : for Network
S/W	1 CD for Driver, SmarThru 4	1 CD for Driver, SmartThru 4, EUG	1 CD for Driver, SmartThru 4, EUG
Toner Cartridge		4 EA (0.7K/0.5K yield ISO 19752 5% Coverage)	4 EA (0.7K/0.5K yield ISO 19752 5% Coverage)
Power Cable		1 EA	1 EA
Printer Cable		1 EA	1 EA

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2.1.3 Model Comparison Table

	Samsung	Samsung	HP
	CLP-325/325W	CLP-315/315W	CP-1215
Image			
Print speed (M/C)	16/4ppm	16/4ppm	12/8ppm
FPOT	14/26 sec	14/26 sec	24/30 sec
Resolution	Up to 2400 dpi	Up to 2400 dpi	2400 HP ImageREt
CPU	375 MHz	375 MHz	264 MHz
Std Memory	32 MB (256 MB)	32 MB	16 MB (16MB)
Emulation	PCL6(325W), SPL-C	SPL-C	GDI
Duplex	Manual	Manual	Manual
Paper Handling	130 CST	150 CST	150 CST
Output	80 sheet	80 sheet	125
Noise	45dB/ 47dB (Color/Black)	45dB/ 47dB (Color/Black)	47dB
Max. Monthly Duty	20,000	20,000	25,000
Size	388 x 313 x 243	388 x 314 x 237	398.7 x 452 x 253
Weight	11kg (TBD)	11kg	17.6 kg
Interface	USB 2.0, Wireless(325W)	USB 2.0, Wireless(315W)	USB 2.0
Toner	1.5K/1K (1K/0.7K)	1.5K/1K (1K/0.7K)	2.2K/1.4K(0.75K)
Etc	1W Soft Power Print Screen Button (325) DLNA Printing (325W) WPS Button (325W)		9 LED

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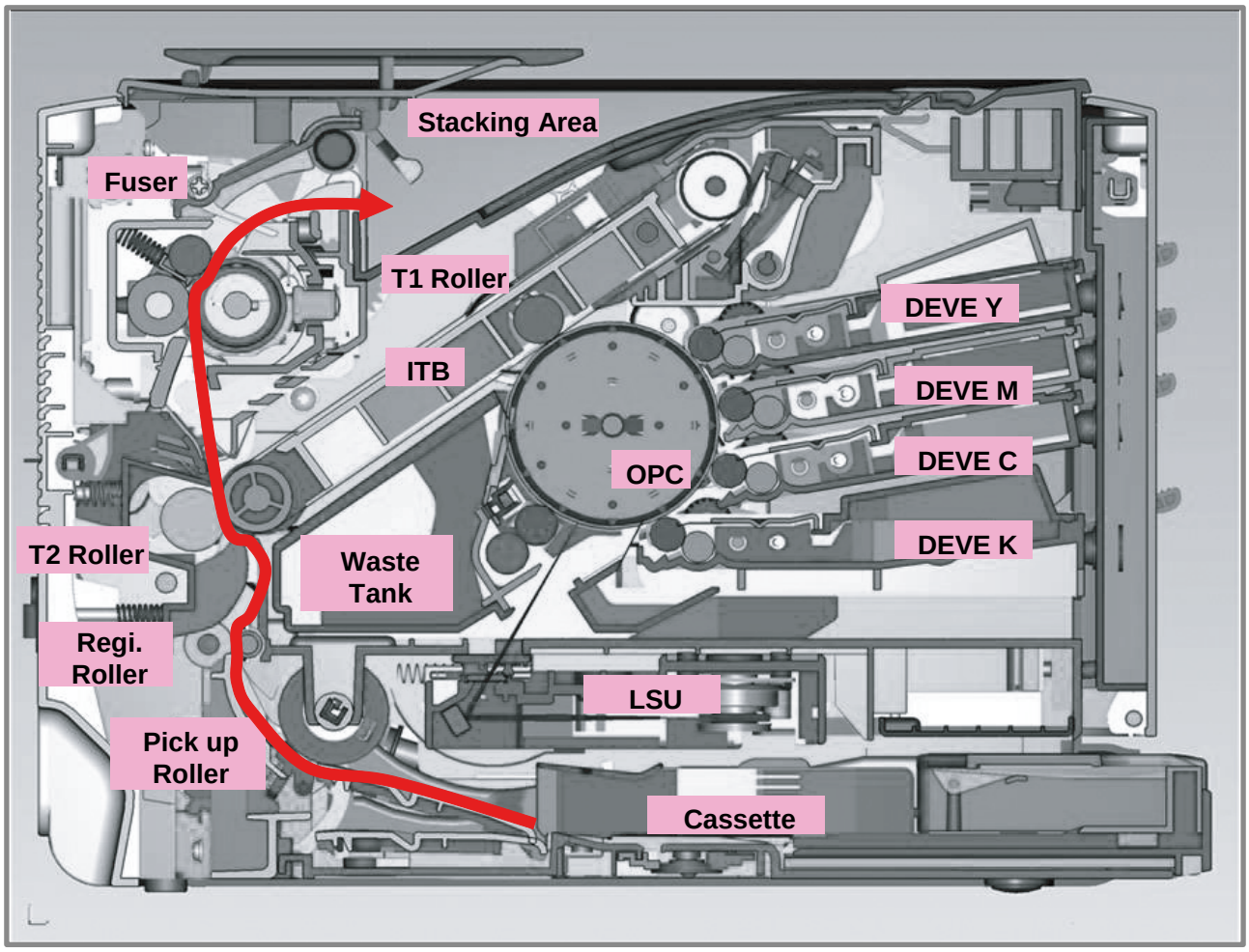
2.2 System Overview

This chapter describes the functions and operating principles of the main components.

2.2.1 System Structure

The Printer function consists of the Engine part and the Main Controller part, and the Engine part consists of the Mechanical part comprising a Frame, Feeding, Developing, Driving, Transferring, Fusing, and Cabinet and the Electrical part comprising a SMPS, a HVPS, a LSU, and some facilities in the Main Controller to control the Engine part for printing.

2.2.1.1 Main Parts of System



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① **Cassette**

- Feeding Method : Cassette Type
- Feeding Standard : Center Loading
- Feeding Capacity : Cassette 150 Sheets(75g/㎡, 20lb Pa per Standard)
- No Manual Feeder
- Paper Detecting Sensor : Photo Sensor (Empty, Registration, Exit)
- Paper Size Sensor : None

② **LSU(Laser Scan Unit)**

The LSU unit is controlled by video controller. It scans the video data received from video controller with laser beam by using the rotation principle of the polygon mirror to create the latent image on the OPC drum. It is the core part of LBP.
The OPC drum rotates as the same speed as the paper feeding speed. It creates the /HSYNC signal and sends it to the engine when the laser beam of the LSU reaches the end of the polygon mirror, and the engine detects the /HSYNC signal to arrange the vertical line of the image on the paper. After detecting the /HSYNC signal, the image data is sent to the LSU to arrange the its margin on the paper.

- Consisted of LD(Laser Diode) and Polygon Motor Control.

Error	Phenomenon
Polygon Motor Error	The Rotation of Polygon Motor can not reach stable
Hsync Error	Though the rotation of Polygon Motor reach stable, the signal of Hsync is not occurred

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③ **2nd Transfer Ass'y**

- The life span: Print over 100,000 sheets (in 15~30)
- Specification: Similar to CLP-300 Series

④ **Fuser Ass'y**

This unit consists of Heat Roller, a Thermostat and a Thermistor. It melts and fuses the toner, transferred by the transfer roller onto the paper, by applying pressure and high temperature to complete printing job.

* Heat Lamp : Kunckle Type
* Fusing system : 3-Roll Fusing type
  - Heat roller : Pipe type (Lamp inside)
  - Pressure roller
  - Pressure roller Shaft
* Thermistor - Temperature-Measuring Device
* Thermostat - Critical Temperature-Detecting Device
* The life span – 100k(black)/color(25k)

Thermostat

When a heat lamp is overheated, a Thermostat cuts off the main power to prevent over-heating.
- Non-Cotact type Thermostat

Heat roller

The heat roller transfers the heat from the lamp to apply a heat on the paper. The surface of a heat roller is coated with Teflon, so toner does not stick to the surface.

Pressure roller

A pressure roller mounted under a heat roller is made of a silicon resin, and the surface also is coated with Teflon. When a paper passes between a heat roller and a pressure roller, toner adheres to the surface of a paper permanently.

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⑤ & ⑥ **ITB(Intermediate Transfer Belt) & 1st Transfer Roller**

- The life span: Print over Approx. 50,000 pages(B&W) / 12,500 pages (Color)
- The ITB unit includes 1st Transfer Roller

⑦ & ⑧ **OPC(Organic Photo-Conductor) & Developer**

- The life span: Print over 50,000 Images (Both)
- Imagine Unit consists of 4 kinds of Developer , OPC, and Deve. Main Frame

⑨ **Toner Kits**

- The life span: Color -> 1000 images (Std. ISO 19798 Print-Out)
  Black -> 1500 images (Std. ISO 19798 Print-Out)

⑩ **Driver Ass'y**

- It is a power delivery unit by gearing
- By driving the motor, it supplies the power to the feeding unit, the fusing unit, and the distributing unit.
- The Main Motor is similar to CLP-310 Series Main Motor.

⑪ **Wireless PBA (Only CLP-325W)**

- CLP-325W model has a Wireless PBA to use wireless network.

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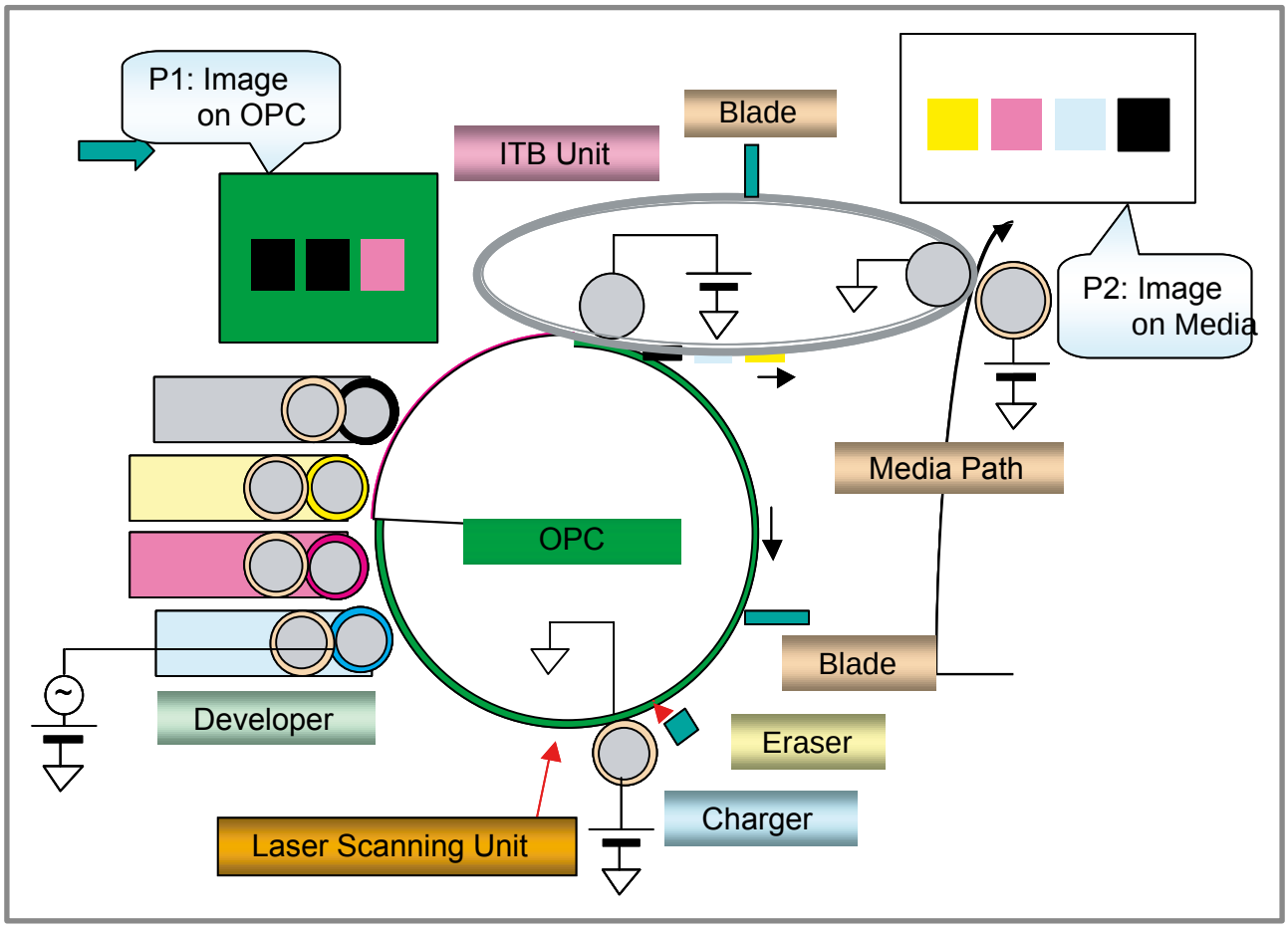
2.2.1.2 EP Process

- Structure of EP Process



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① Charging

- Conductive Roller charging
- Applied voltage : -1.1kV
- Charge acceptance : -520V
- OPC coating thickness : 21um
- OPC diameter : Φ60mm
- Eraser system

1. Organic Photoconductor is charged to uniform voltage by conductive roll charging method
2. No ozone is produced because corona is not used
3. Charger roll is cleaned with cleaning roll
4. Toner remained on OPC after T1 process is cleaned by cleaning blade and retrieved into waste toner box by auger and belt driving mechanism

② Exposing

- One polygon motor (6 facet)
- Single beam LD (1ea)
- LD wavelength : 785nm
- Polygon motor rpm : 29685
- LSU energy : 0.25uJ/cm^2
- OPC exposed potential : -50V

1. Exposing is implemented by laser striking on to OPC with uniform potential
2. Laser beam is modulated according to image to be printed that is from PC
3. Latent Image is formed on OPC, which is developed with toner

③ Developing

- Non-magnetic, mono component
- Non-contact development
- Developing bias : DC + AC
- AC peak to peak : 1.5 ~ 2.0kV
- Roller diameter : Φ10mm
- Process speed ratio : 1.2 (OPC=1.0)
- Color order : Y -> M -> C -> K

1. Only latent image formed by exposing process is developed with toner
2. AC + DC Voltage is being used to develop toner into latent image on OPC because non-contact developing method is adopted
3. Y, M, C, and K Images are sequentially developed onto OPC and transferred onto Intermediate Transfer Belt (hereafter ITB) to form a color image on ITB
4. Toner Bottles are used to supply toner into developer compartment
5. Toner level is being sensed to control toner supply from toner bottle to developer

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④ Transfer 1

- Multi-pass transfer
- Indirect transfer
- Transfer voltage : 0.5 ~ 2.0kV (controllable)
- Roller diameter : Φ14mm
- Transfer unit life : 100K images

1. Developed Image on OPC is transferred onto ITB by T1 Process
2. T1 Voltage is positive which attract toner to ITB
3. 4 times of T1 process is required to make a color image on ITB, which means multi-pass process
4. ITB has a hole as a fiducial mark for timing. Engine control for color image is synchronous with it, ITB Home Sensing Signal

⑤ Transfer 2

- Indirect transfer
- Transfer voltage : 1 ~ 4.0kV (controllable)
- Roller diameter : Φ18.6mm
- Transfer unit life : 100 K images

1. Color image formed on ITB is transferred onto media by T2 process
2. T2 voltage is also positive to get color image moved onto media
3. Toner remained on ITB after T2 process is cleaning by ITB cleaning blade and collected and
4. Transported and retrieved into waste toner box by auger and belt driving system
5. T2 Roll is engaged when color image is being transferred onto media. Otherwise it is disengaged. Clutch is used for driving T2 Roll engagement and disengagement

⑥ Fusing

- 3 Roll system
  -> short warm-up time (35sec)
- Post Pressure Roll

1. Color Image on media is melted down and fixed into media by fusing process

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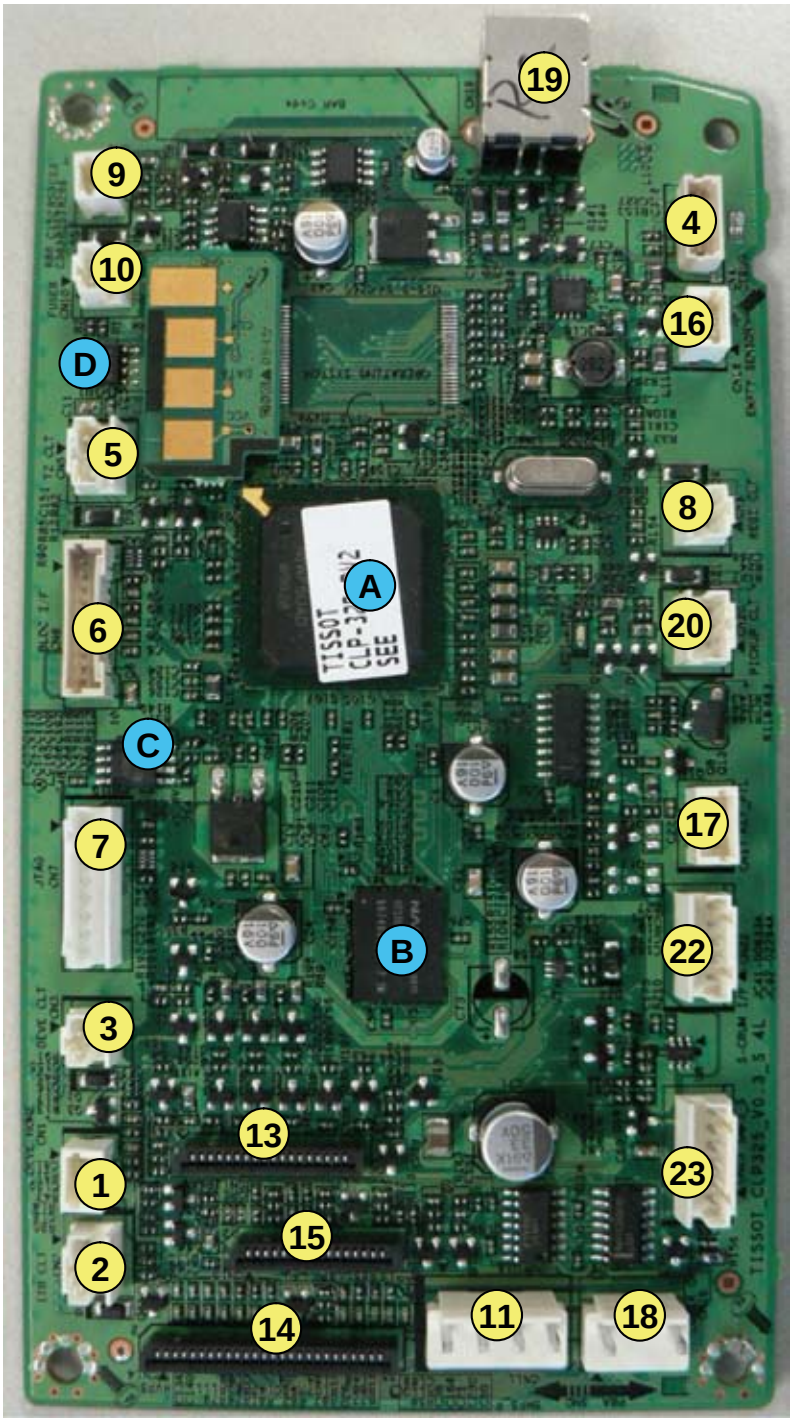
2.2.2 Main PBA Description

2.2.2.1 Main Controller PBA

- CLP-320/325



NO.	NAME
1	Deve home CON.(3P)
2	ITB CLT(3P)
3	Deve CLT(2P)
4	Debug(4P)
5	T2 CLT(3P)
7	BLDC I/F(10P)
8	JTAG (8P)
9	Regi CLT.(2P)
10	Fuser CLT(2P)
12	Fuser(2P)
13	SMPS_P(4P)
14	OPE & ITB (18P)
15	HVPS(26P)
16	LSU Con.(16P)
17	Empty Sensor (3P)
18	Key PTL(4P)
19	Cover OPEN (2P)
20	USB (4P)
21	Pickup CLT. (3P)
22	S-CRUM I/F (5P)
23	SMPS_S (6P)
A	CPU(Jupiter5)
B	DDR2 (32MB)
C	Serial FLASH(2MB)
D	EEPROM

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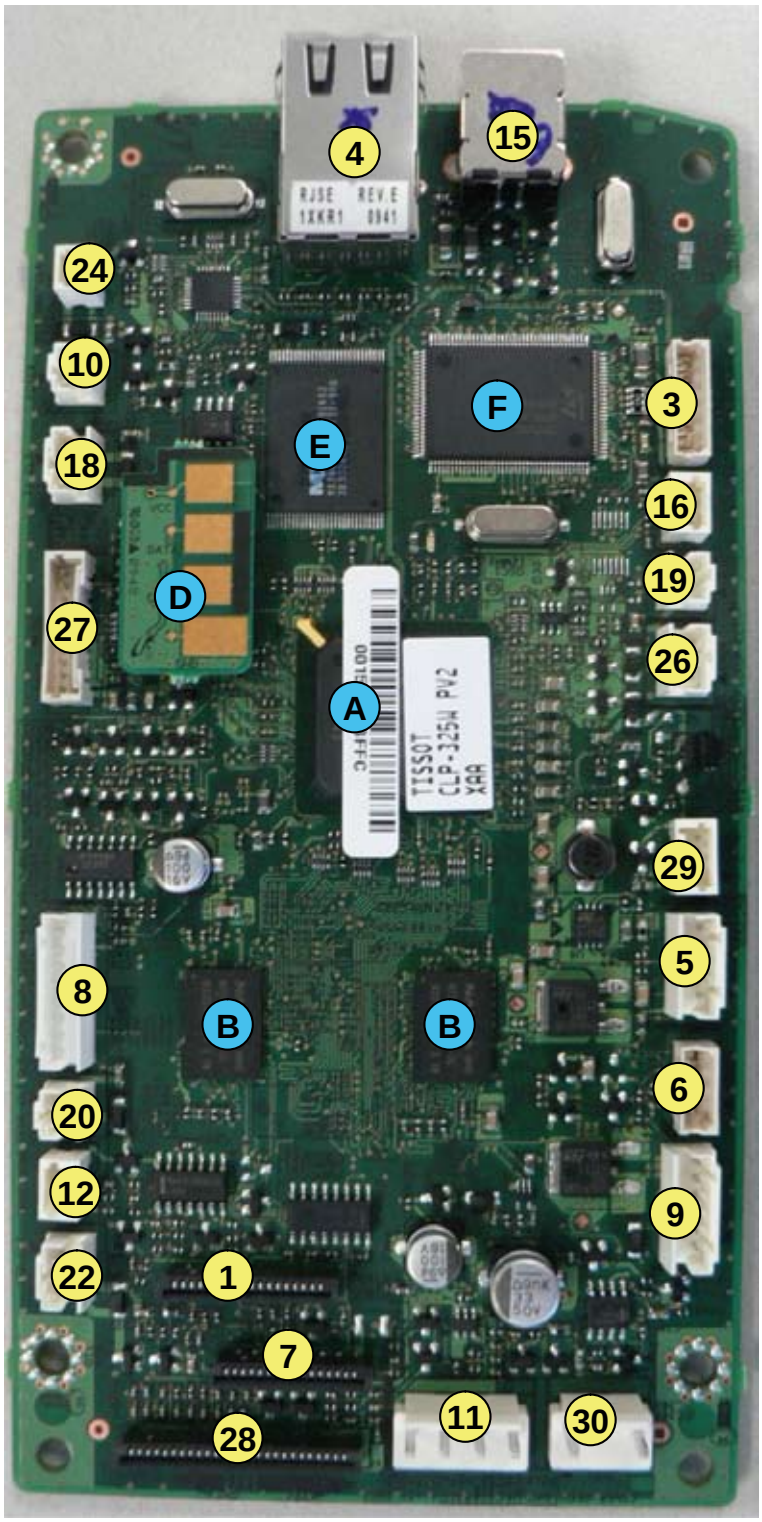
- CLP-320N/325W



NO.	NAME
1	OPE & ITB (18P)
3	W-LAN (6P) (W Only)
4	Ethernet (8P)
5	S-CRUM I/F (5P)
6	Debug(4P)
7	LSU Con.(16P)
8	JTAG (8P)
9	SMPS_S (6P)
10	Fuser(2P)
11	SMPS_P(4P)
12	Deve home CON.(3P)
15	USB (4P)
16	Empty (3P)
18	T2 CLT(3P)
19	Regi CLT.(2P)
20	Deve CLT(2P)
22	ITB CLT(3P)
24	Fuser CLT(2P)
26	Pickup CLT. (3P)
27	BLDC I/F(10P)
28	HVPS(26P)
29	Key PTL(4P)
30	Cover OPEN (2P)
A	CPU(Jupiter5)
B	DDR2 (64MB X 2)
C	Nor FLASH(32MB)
D	EEPROM (Under PBA)
E	PHY Chip
F	USB IC(W Only)

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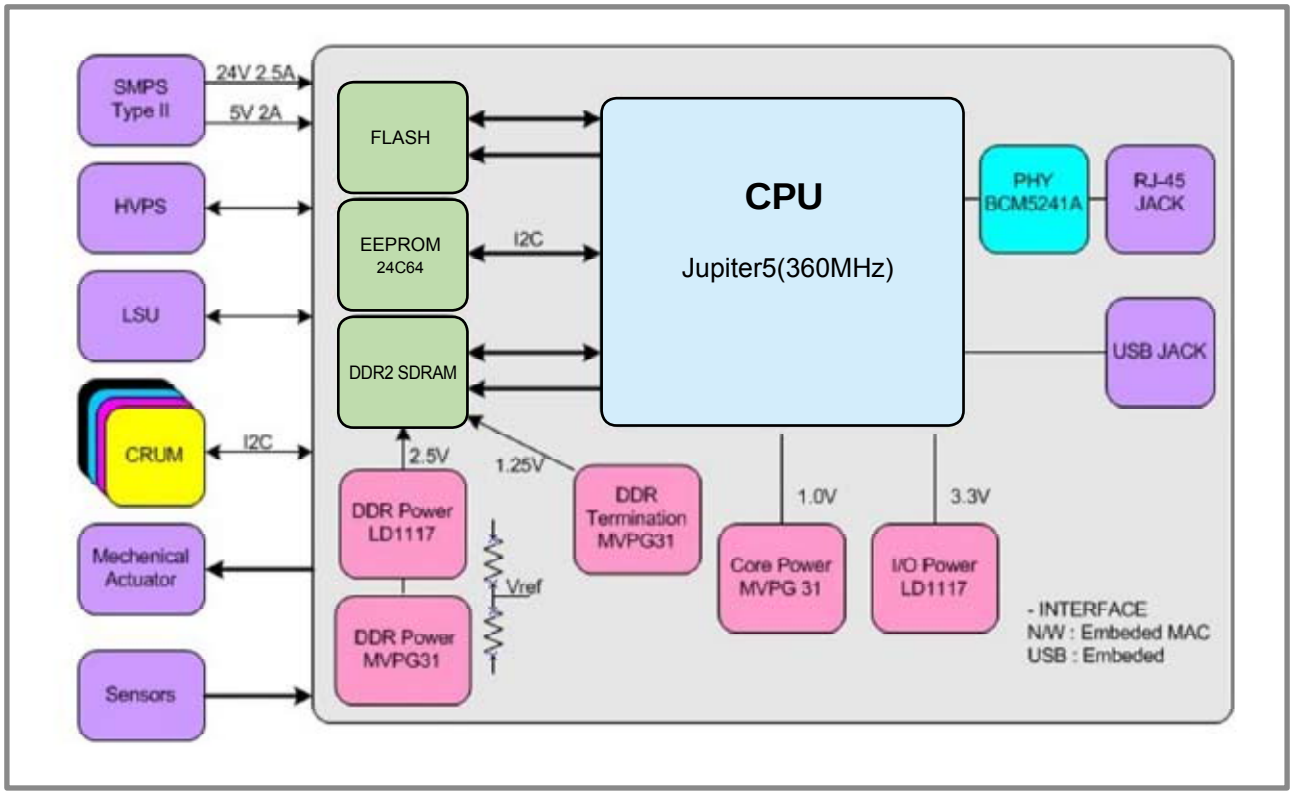
2.2.2.3 Main PBA Description



Jupiter5
A Proprietary SoC, Jupiter5, executes and controls all jobs and functions to be required for printing. To do these all jobs, the Jupiter5 incorporates all H/W blocks as follows.

- CPU Core ARM 926ESJ, I/D-Cache 16/16KB , Up to 400MHz
- System Bus Internally 32-bit width, Up to 120MHz
- MEM Controller DDR1/2, 16-bit width, 166MHz, 4-Bank, 128MB Space/bank
- ROM Controller 16-bit width, 4-bank, 16MB Space/bank
- CODEC Controller JBIG 4-ch Decoder and 2-ch Encoder, 1-ch JPEG
- Image Processor Processing Scan Image
- MAC Controller 10/100Mbps Full IEEE 802.3 Compatibility
- USB Controller USB2.0, Device or Host
- UART Controller
- I2C Controller
- Interrupt Controller
- Misc. Controller ADC, DAC, PWM, Step Motor Control and so on
- Voltage Core 1.0V, I/O 3.3V
- Package 416PBGA

Flash Memory
Used to store System Programs including the Operating System.

- Type NOR Flash
- Bus 16-bit width
- Size : 2MB (CLP-320/325)
  32MB (CLP-320N/325W)

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System Memory
Used as a Printing buffer for printing, a Scan buffer for scanning, a ECM Buffer for System Working Area.

- Type DDR2 SDRAM
- Bus 16-bit 166MHz
- Size 32MB (320/325) / 256MB(320N/325W)

CRU Control
Used to store the printing and operating information into a Security EEPROM in 4 CRUs, Y,M,C and K Imaging Cartridge, respectively by the CHORUS3.

- Access I2C Bus Ch.2 400KHz
- Security Size 2K-bit

System Information Control
Used to store the system operating information needed at printing into a EEPROM in the Main Controller by the CHORUS3.

- Access I2C Bus Ch.1 400KHz
- EEPROM Size 64Kbit

OPE Interface
Used to control the OPE by the CHORUS3. Through CHORUS3's GPIO pins, all LEDs and Keys in the OPE are controlled.

I/O Port
Used to receive or transmit some data from/to the Host.

- USB Device USB2.0 High speed 480Mbps
- Network Ethernet 10/100-Base Tx

(note) The Network only equipped at CLP-320N/325N, not CLP-320/325.

Engine Control
Used to control all parts to be required at printing by the CHORUS 3.

- Sensors Paper Empty
  Paper Registration
  Waste Toner Bottle
  Paper Exit
  Temperature sensors
  Etc.
- Clutches(Solenoid) Paper Pick Up
  Paper Registration
  Etc.
- Motor 1 BLDC
- LSU
- Fuser Control the Fuser's temperature
- HVPS Control the high voltage outputs
- ADC Reading the Fuser's temperature and the high voltage outputs' feedback
- Cover Open Sensing

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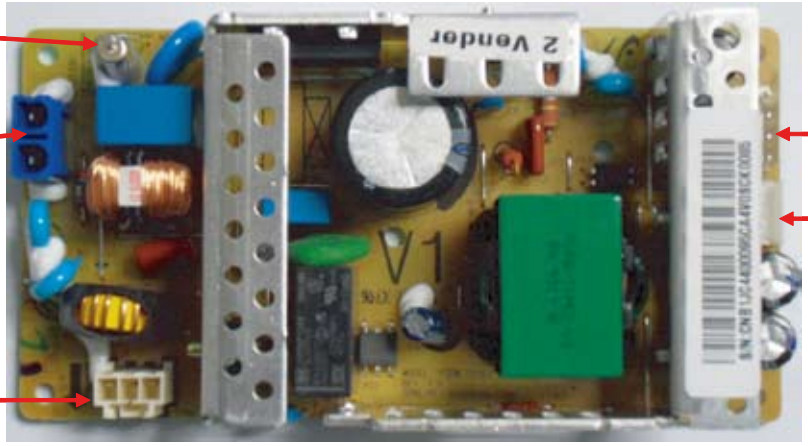
2.2.2.4 SMPS(Switching Mode Power Supply) PBA

SMPS is the power source of the entire system. It is assembled by an independent module, so it is possible to use for common use. It is mounted at the side of the set. It is consisted of the SMPS part which supplies the DC Power for driving the system and the AC Heater control part which supplies the AC Power to the Fuser. The SMPS has two DC output channels, +5V and +24V.



AC Input

Input Rated Voltage	AC 110V~127V, AC 220V~240V AC 120V/AC 220V(EXP version)
Input fluctuating range	AC 99V~135V, AC 198V~264V
Rated Frequency	50/60 Hz
Frequency Fluctuating	47~63 Hz
Input Current	< 4.0Arms, 2.0Arms

Rated Output Power

No	Item	CH1	CH2	Remark
1	Channel Name	+5V	+24.0V	
2	Connector Pin	CON 3 5V Pin: 1 GND Pin: 2	CON 3 24V Pin: 3 GND Pin: 4	
3	Rated Output	+5V ±5% (4.75~5.25V)	+24V ±10% (21.6~26.4V)	
4	Max. Output Current	2 A	2.5 A	
5	Peak Loading Current	2.2 A	2.7 A	1ms
6	Ripple Noise	<100mVp-p	<500mVp-p	
7	Maximum Output	10.2W	60W	
8	Peak Output	11W	64.8W	1ms
9	Protection for loading shortage and overflowing current	Shut down or Fuse Protection	Shut down or Output Voltage Drop	

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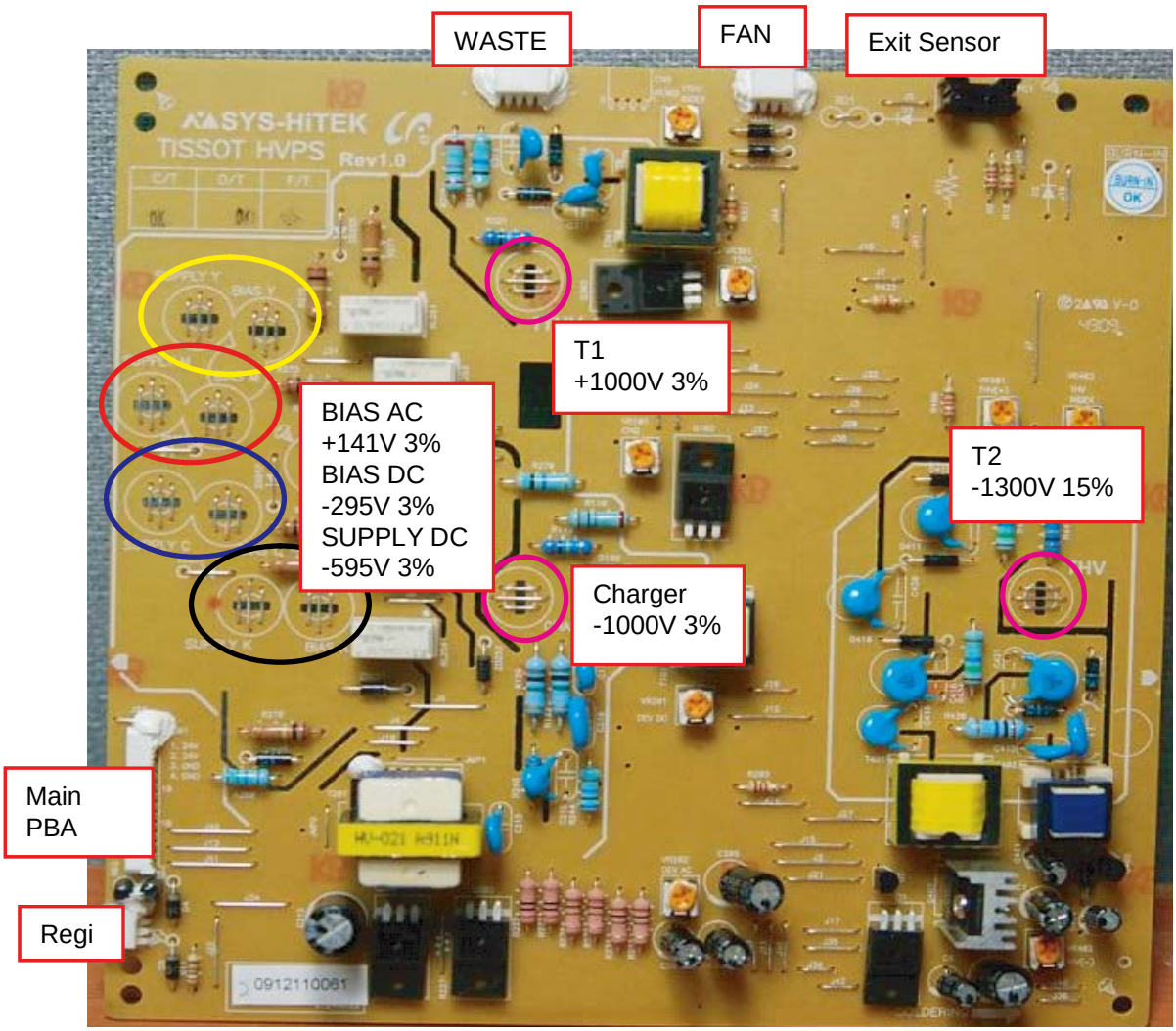
2.2.2.5 HVPS(High Voltage Power Supply) PBA

The HVPS creates the high voltages for T1(+), T2(+,-), Charger(-), DEV, and SUPPLY and then, supplies these voltages to the Developer part for making best condition to print. The HVPS part takes the 24V and outputs the high voltages and then, the high voltages are supplied to the Toner, OPC Cartridge, and Transfer Belt and Roller.



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1) Charger Voltage : Charger

- Function: voltage that charges OPC surface up to -500V~ -800V.
- Output voltage: -1.0KV ~ -2.0KV DC 3%
- Error type: if the voltage fails to be output to Charger Roll, OPC surface will not be charged, and the toner on the developer roller will be transferred to OPC Drum, printing black paper.

2) 1st Transfer High Voltage : T1(+)

- Function: voltage necessary for transferring toner developed on OPC Drum surface onto ITB.
- Output voltage: Max +2.0KV 3%(Duty variable, no load)
- ERROR type: if T1(+) output fails, the toner on OPC drum will not be transferred to ITB normally and the image will be blurred.

3) 2nd Transfer High Voltage : T2(+)

- Function: voltage used to transfer the toner primarily transferred on ITB again onto paper.
- Output voltage: Max +5.0KV 3%(Duty variable, no load)
- ERROR type: if T2(+) output fails, the toner on ITB will not be transferred to paper normally and the image will be blurred.

4) T2 Cleaning Voltage : Clean : T2(-)

- Function: prevent reverse side of paper from being dirtied, by recovering the negatively charged toner remaining at Transfer Roller and sending it onto ITB.
- Output voltage: with no feedback control, output fixed voltage(-1300V 15%)
- ERROR type: reverse side of paper will be dirtied.

5) Supplying Voltage : Supply AC+DC(-)

- Function: voltage that makes toner to develop on the area exposed by LSU by means of potential difference, output will be the voltage of AC+DC overlapped form.
- Output voltage: AC 600V ~ 2000V p-p 1.5%
  DC -50V ~ -600V DC 3%
- ERROR type: 1. if supply is GND, density will be extremely low.
  2. if supply is floating (for insecure terminal contact), density will be down so slightly that it is impossible to make out with naked eyes.

6) Developing Voltage : Deve AC+DC(-)

- Function: voltage that supplies toner to Developing Roller
- Output voltage: AC 250V ~ 1650Vp-p 1.5% (supply voltage is connected to ZENER Diode 350V)
  DC -50V ~ -600V DC 3%
- ERROR type: 1. if Deve is GND, density will be extremely down.
  2. if Deve is floating (for insecure terminal contact), density will be extremely down.

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2.2.3 CRUM

The CLP-320N engine will be equipped with electronics that can read and write data into NVRAMs otherwise known as CRUMs that reside within 1) C, M, Y, K Toner cartridges.
The CRUM has a company ID, and electronics logo.
The toner CRUM also identifies the type of toner cartridge (Standard or High Capacity). The CRUMs contain fixed data such as the low warning point, specified life point, and hard stop point (on toner)
and also store the current life count (pages count, pixels count, images count) and % of usage (gas gauge) data.

■ In the case of Refill Toner Install

1) Perception of Refill Cartridge (when power is on or the cover is closed)
   End of Life / life span data initialization -> judge to be Refill Cartridge
   End of Life / life exhausted (simple refill) -> stop printing caused by life exhaustion

2) Operating
   It is impossible to control appropriate development parameters, for there s no toner specification data.
   It runs with the setting of default development parameter. (Image quality will be degraded, for the lack of appropriate respond to the change of time and environment.)

■ Process after CRU life expiration

1) Record the information of End of Life.
2) Clear some information of Operation Area.
   -> Supplier/Model Name/MFC date/Serial Number (Manufacture Information)
   -> Let cartridge refiller initialize manufacture information and life span information.

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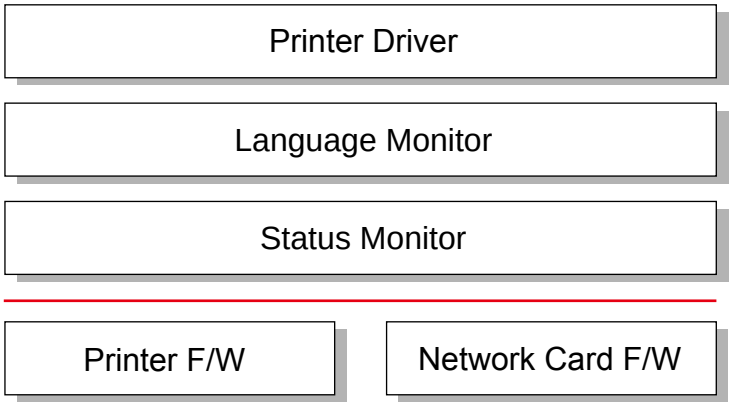
2.3 S/W Structure and Descriptions

2.3.1 Architecture

The belt CRUM interface board is a transmission belt CRUM interface board of the photoelectric Dry Color Laser Printer, mounted on the printer body, making it possible to physically combine the body and the belt CRUM board.



2.3.2 Language Monitor

Language Monitor is a part of the Printer Driver and the Windows Spool System. The main roll of the Language Monitor is that sends a job start message to the Status Monitor. Therefore the Status Monitor can start polling to get the printer status.
The second roll is that sends the job information such as User ID and Job ID to the Status Monitor and the Printer F/W. Hence the Status Monitor can stop polling because the Printer F/W informs the Status Monitor that printing job is complete.

2.3.3 Status Monitor

Status Monitor has no user interface. It shows only HTML help when any error occurs during printing jobs.

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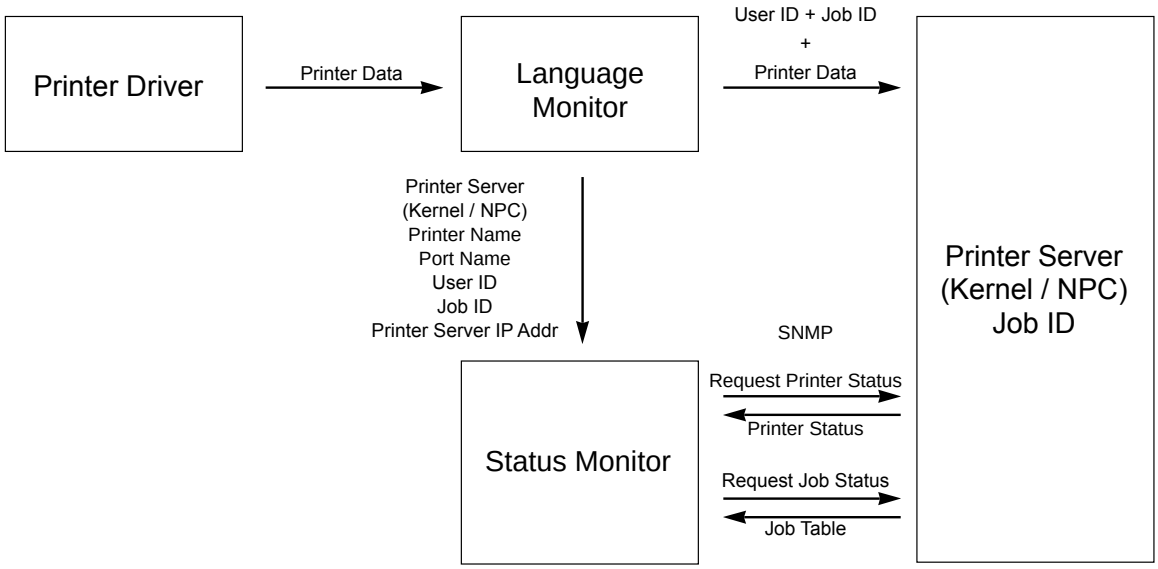
2.3.4 Network Interface



Status Monitor Data Flow

After polling is started, Status Monitor has to know when it stops the polling. For this reason, the Network Printer Server should inform of completing job when the printing job is finished.
When Status Monitor requests a job status, the Printer Server returns the job table that contains user id, job id, and job status (printing or complete or canceled).

2.3.5 Printer Driver <-> Status Monitor

The Printer Driver and the Status Monitor can set/get some data to the system registry to share the Status Monitor information such as the polling interval.
When the user wants to set the option of the Status Monitor manually, he or she can set it using the Printer Driver User Interface. So, if the user set option that the Status Monitor is disabled, the Status Monitor can's show HTML Help to the user although the error has occurred while printing.

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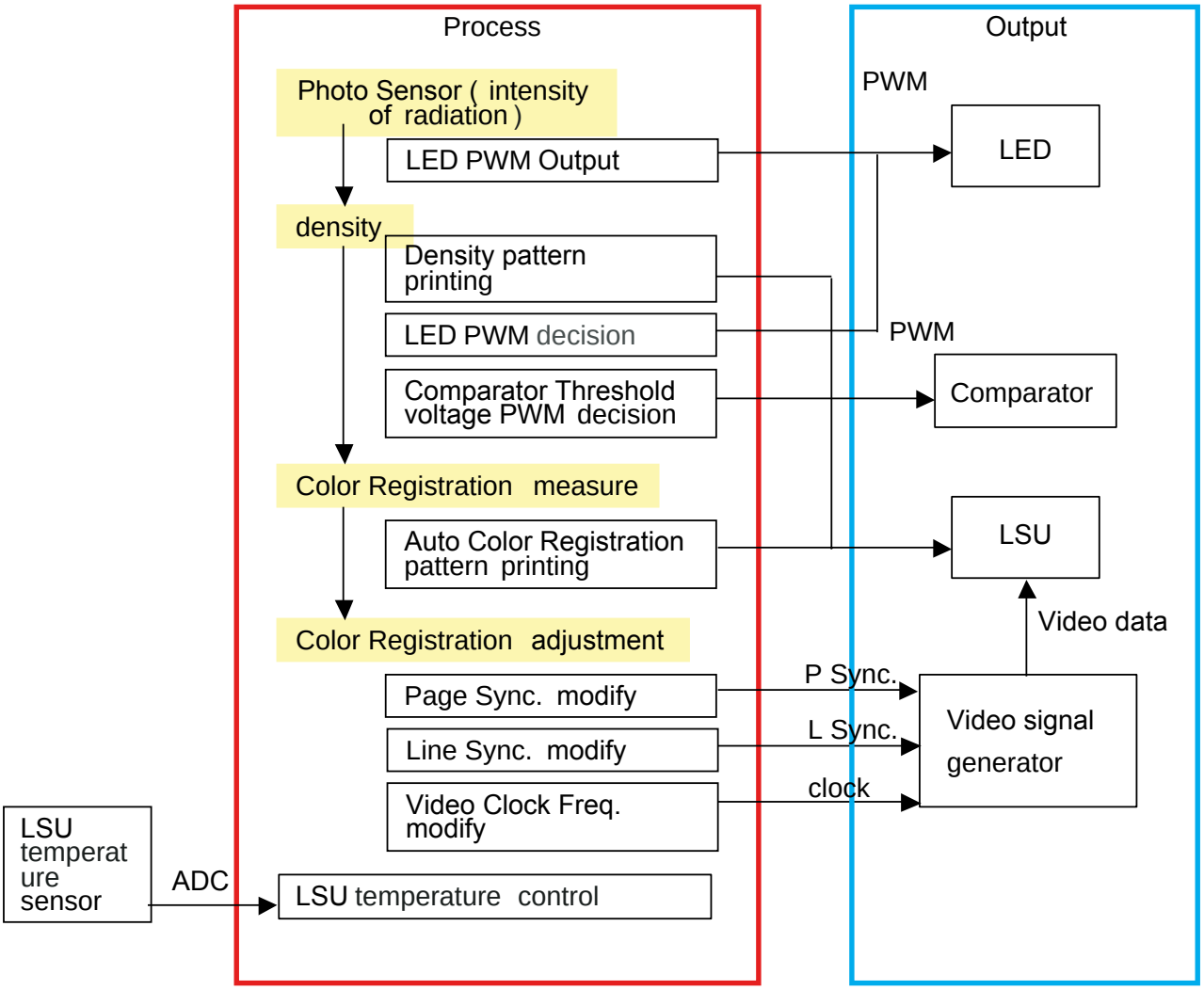
2.3.6 System F/W Flow



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2.3.7 CRUM Overview

- Stands for “Customer Replaceable Unit Monitor”

- EEPROM, SAMSUNG CRUM is used for CRUM Memory.

- CRUM stores various information on consumables (including consumables’ life).

- In CLP-32x Series, total four CRUM’s are used
  (four on toner cartridges)

CRUM stores the following information

• Model Name
• Supplier ID
• Serial Number
• Company ID
• MFG Date
• Capacity
• Page Count
  - Toner Cartridge and Transfer Belt
  - Indicates how many pages are printed by using the consumable
• Dot Count
  - Toner Cartridge Only
  - Indicates how many dots are printed by using the toner cartridge
• Image Count
• Model ID

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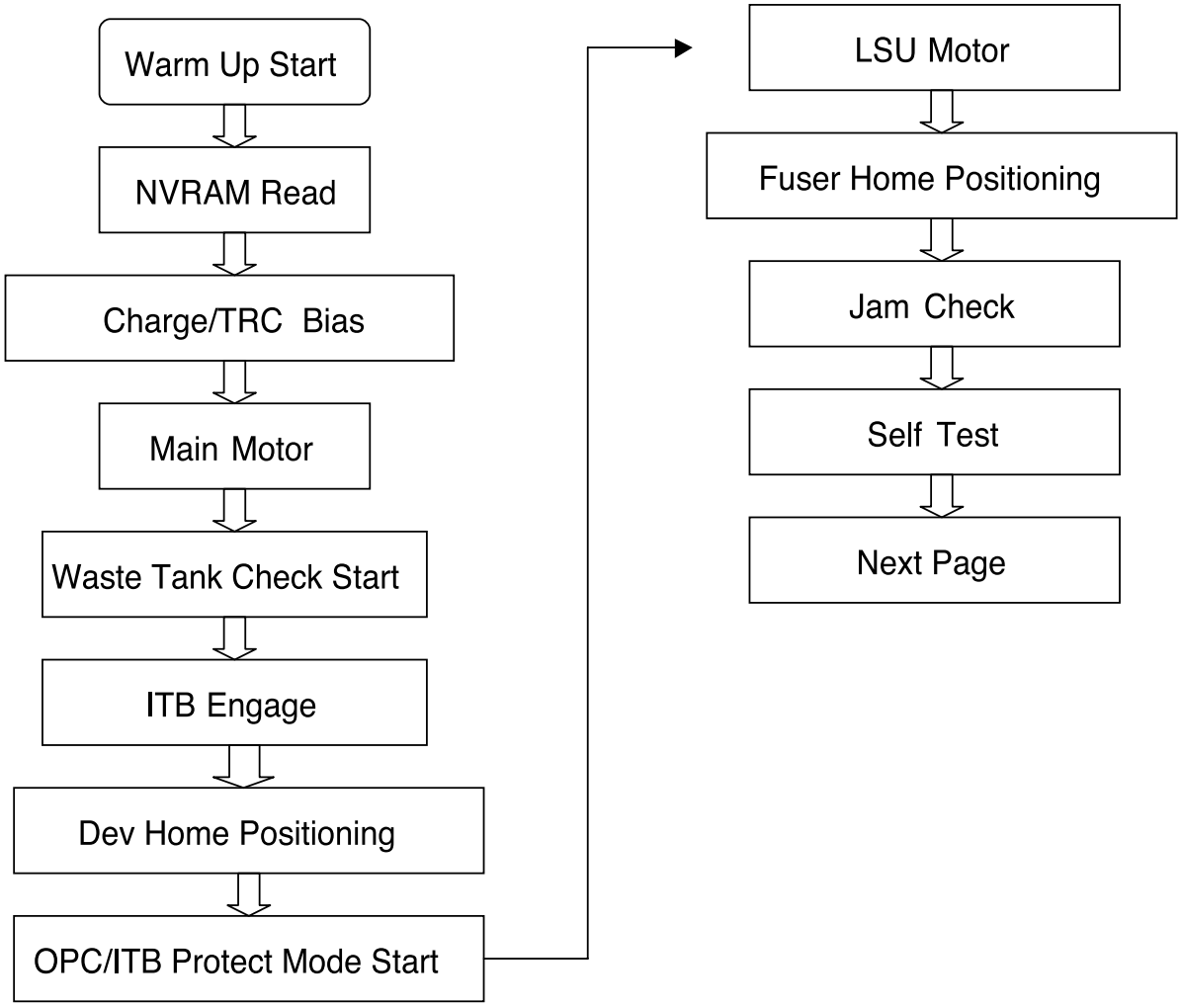
2.3.8 Initailize Flow



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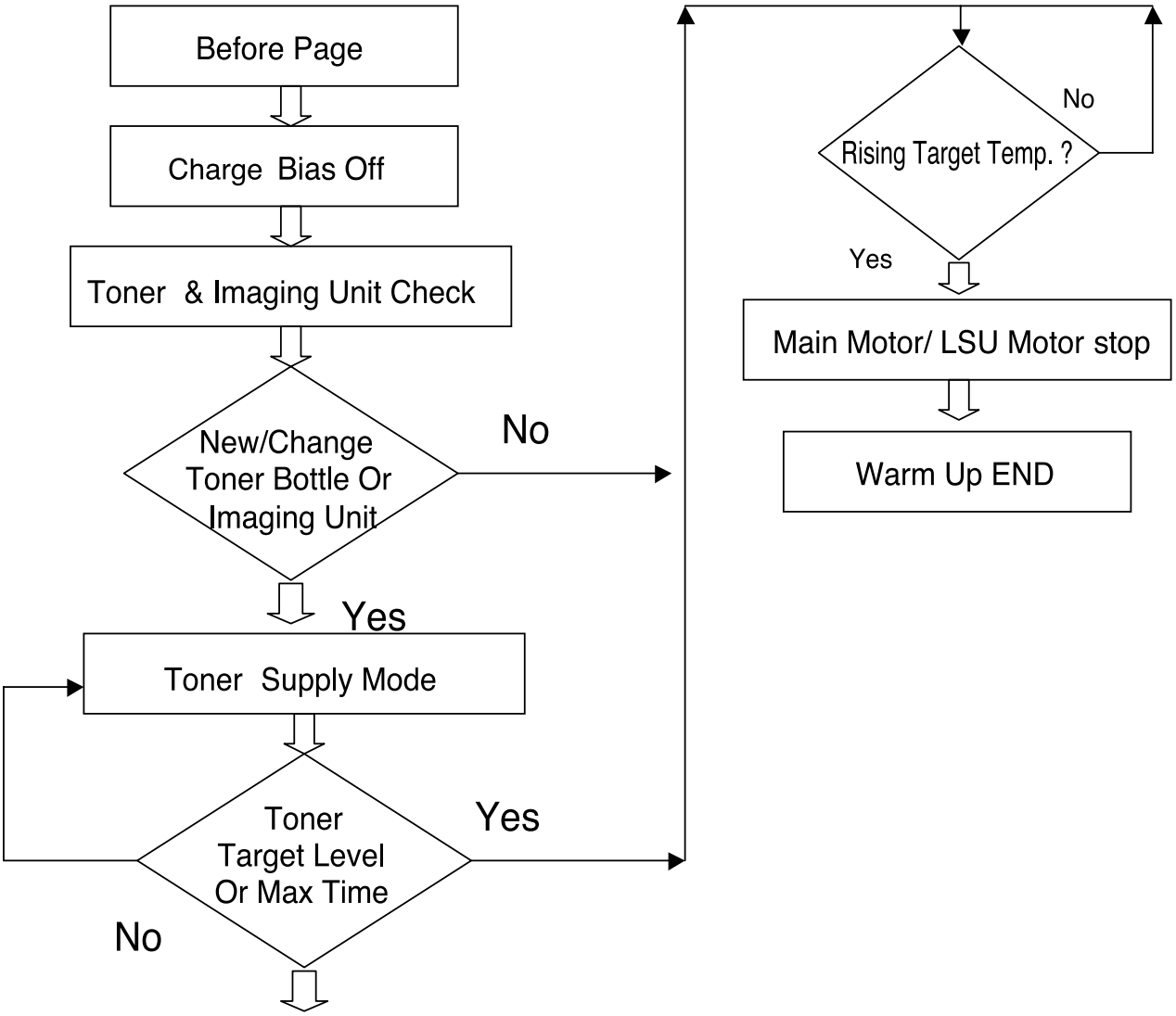

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3. Disassembly and Reassembly

3.1 Precautions when replacing parts

3.1.1 Precautions when assembling and disassembling

* Use only approved Samsung spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct. Failure to do so could result in damage to the machine, circuit overload, fire or electric shock.
* Do not make any unauthorized changes or additions to the printer, these could cause the printer to malfunction and create electric shock or fire hazards.
* Take care when dismantling the unit to note where each screw goes. There are 19 different screws. Use of the wrong screw could lead to system failure, short circuit or electric shock.
* Do not disassemble the LSU unit. Once it is disassembled dust is admitted to the mirror chamber and will seriously degrade print quality. There are no serviceable parts inside.
* Regularly check the condition of the power cord, plug and socket. Bad contacts could lead to overheating and firfe. Damaged cables could lead to electric shock or unit malfunction.

3.1.2 Preautions when handling PBA

Static electricity can damage a PBA, always used approved anti-static precautions when handling or storing a PBA.

>> Precautions when moving and storing PBA

1. Please keep PBA in a conductive case, anti-static bag, or wrapped in aluminum foil.
2. Do not store a PBA where it is exposed to direct sunlight.

>> Precautions when replacing PBA

1. Disconnect power connectors first, before disconnecting other cables
2. Do not touch any soldered connections, connector terminals or other electronic parts when handling insulated parts.

>> Precautions when checking PBA

1. Before touching a PBA, please touch other grounded areas of the chassis to discharge any static electrical charge on the body.
2. Take care not to touch the PBA with your bare hands or metal objects as you could create a short circuit or get an electric shock. Take extra care when handling PBAs with moving parts fitted such as sensors, motors or lamps as they may get hot.
3. Take care when fitting, or removing, screws. Look out for hidden screws. Always ensure that the correct screw is used and always ensure that when toothed washers are removed they are refitted in their original positions.

3.1.3 Releasing Plastic Latches

Many of the parts are held in place with plastic latches.
The latches could easily break if forced; release them carefully.
To remove such parts, press the hook end of the latch away from the part to unlatch.

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3.2 Parts for Maintenance and Repair

3.2.1 Replacement interval for parts with a limited life

Some of the parts in this printer have a limited life, shorter than that of the whole machine. These parts must be replaced periodically.
The table below shows the interval at which these parts should be replaced.
The table shows the life of each part, and is measured when using A4 paper. When servicing a machine always check the status of these parts using the control panel and ensure that parts are replaced at the appropriate times otherwise a general degradation in print quality will occur.

Item	Pages Printed	Part number	Remark
Black Toner cartridge	Approx. Initial : 1,000 Pages* Sales : 1,500 Pages*	CLT-K407S, CLT-K4072S (Black)	CRU
Color Toner cartridge	Approx. Initial : 700 Pages* Sales : 1,000 Pages*	CLT-C407S, CLT-C4072S (Cyan) CLT-M407S, CLT-M4072S (Magenta) CLT-Y407S, CLT-Y4072S (Yellow)	
Imagine unit	Approx. 24000 images*	CLT-R407	
Waste Toner	Approx. 10,000 images	CLT-W409	
Pick-up roller	Approx. 50,000 pages	JC97-03028A	FRU
Fuser unit	Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC91-00978A (220V) JC91-00997A (110V)	
T2 roller	Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC95-01197A	
ITB	Approx. 50,000 pages(B&W) / 12,500 pages (Color)	JC96-05874A	

* Average A4-/letter-sized page count based on Std. 19752 of individual colors on each page. Usage conditions and print patterns may cause results to vary.
** Image counts based on one color on each page. If you print documents in full color (Cyan, Magenta, Yellow, Black), the life of this item will be reduced by 25%.

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3.2.2 Printer Cleaning

A printer should be regularly cleaned, especially if it is used in a dusty environment. This will ensure that print quality remains high and failure due to contamination of printing services is less likely to occur.

* Clean the printer with a soft, lint free, cloth dipped in a “Recommended cleaner” “Recommended cleaner” can be purchased from our service center. (where available)
* Do not touch the transfer roller when cleaning the inside of the printer. Grease and oils from the skin will contaminate the surface and reduce print quality.
* Do not touch transfer roller when cleaning inside of machine. If transfer roller gets dirty, printing quality could be low.
* Please refer to the User Manual for cleaning instructions.

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3.3 Information Related to Disassembly and Assembly.

3.3.1 Special service parts

Never disassemble or adjust the items mentioned, a stock of these items should be maintained.

1) Disassembly of the LSU unit

There are no serviceable parts inside the LSU. Alignment of the mirrors is critical.
Opening the LSU will allow dust into the laser and significantly reduce print quality.
It is very dangerous to operate or service a machine with the LSU open or system interlocks disabled. Exposure to laser radiation can cause blindness.

2) Disassembly of the ITB unit

Do not disassemble the ITB. The alignment of the home sensor is critical and is set up in the factory on a special jig.
Incorrect re-assembly will cause print quality degradation.

3) Care of the Toner cartridge

Toner cartridges contain an extremely fine powder. Please keep toner cartridges away from children. The toner powder contained in the toner cartridge may be harmful and if swallowed you should contact a doctor. Take care not to spill toner - spillages should be cleaned with a vacume cleaner and washed in cold water (hot water sets the toner). Do not touch the developer roller surface as contamination will reduce print quality. Take care not to damage the roller's surface when installing or removing a toner cartridge.

4) Disassembly of DEVE drive ass'y and the main drive ass'y

The alignment of the drive mechanism is critical and it has been set up in factory using a jig and a driving gear. It is adjusted for the best gearing alignment. If the motor is disassembled alignment would not be maintained and this could cause operational noise and image problems: image alignment and toner distribution may be affected.

5) Disassembly of terminal parts

Do not adjust the variable resistors on the PBA. They have been already adjusted in the factory.

6) Disassembly of the fuser unit

- The fuser melts toner onto the paper at a high temperature: therefore, you need to take special care not to get burned by a hot fuser. When removing the fuser from a set that has recently been operating you need to take extra care.
- Do not touch an AC line (Copper contact) on a main frame even after removing the fuser.

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3.3.2 Screws used in the printer

The screws listed in the table below are used in this printer. Please ensure that, when you disassemble the printer, you keep a note of which screw is used for which part and that, when reassembling the printer, the correct screws are used in the appropriate places.

Sec_Code	Location	Description	Qty
6003-000196	FUSER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	7
6003-000282	FUSER	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	3
6001-000130	DRIVE	SCREW-MACHINE;BH,+,M3,L6,ZPC(WHT),SWRCH18A	1
6002-000440	DRIVE	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(BLK),SWRCH18A	24
6003-000301	DRIVE	SCREW-TAPTYPE;BH,+,S,M4,L6,ZPC(WHT),SWRCH18A	1
6003-000152	FRAME MAIN	SCREW-TAPTYPE;PH,+,-,B,M2,L10,ZPC(WHT),SWRCH18A,-	2
6003-000196	EXIT	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000196	FRAME	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	15
6003-000196	GUIDE PICKUP	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	GUIDE-RAIL	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	PBA-OPE(T)	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000269	FRAME MAIN	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000301	FRAME MAIN	SCREW-TAPTYPE;BH,+,S,M4,L6,ZPC(WHT),SWRCH18A	1
6003-000196	COVER-FRONT	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6002-000440	COVER-REAR	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(BLK),SWRCH18A	1
6003-000196	COVER-TOP	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000261	COVER-TOP	SCREW-TAPTYPE;BH,+,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000282	LSU	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	10
6003-000282	ELA UNIT-LSU LD	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	2
6002-000308	CARTRIDGE TONER Y	SCREW-TAPTYPE;PH,+,-,B,M2.6,L6,ZPC(WHT),SWRCH18A,-	8
6002-000308	CARTRIDGE TONER M	SCREW-TAPTYPE;PH,+,-,B,M2.6,L6,ZPC(WHT),SWRCH18A,-	8
6002-000308	CATRIDGE TONER C	SCREW-TAPTYPE;PH,+,-,B,M2.6,L6,ZPC(WHT),SWRCH18A,-	8
6002-000308	CARTRIDGE TONER K	SCREW-TAPTYPE;PH,+,-,B,M2.6,L6,ZPC(WHT),SWRCH18A,-	8
6003-000282	CARTRIDGE DRUM	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	10
6001-000485	CARTRIDGE-TRANSFER	SCREW-MACHINE;PH,+,-,M2.6,L4,ZPC(WHT),SWRCH18A,FP,-	1
6003-000282	CARTRIDGE-TRANSFER	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	12
6003-000196	COVER-HARNESS	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000196	COVER-RIGHT	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000196	COVER-TOP	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000196	DRIVE	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	7
6003-000196	FUSER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	HARNESS-GND	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000196	HOUSING-HARNESS	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000196	HVPS	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	5
6003-000196	LSU	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	3
6003-000196	MAIN-PBA	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000196	WLAN	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000269	MAIN LINE	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	4

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■ Harness Connection table

No	CONNECTION		PIN	SEC Code
1	Main B'd	LSU	16-(10+5)	JC39-00867A
2	Main	HVPS	26-26	JC39-00866A
3	Main	OPE PANEL	4-4	JC39-00868A
4	SMPS	INLET S/W	2-2	JC39-00908A
5	Main B'd	SMPS	16-16	JC39-00894A
6	Main B'd	Sensor(Deve Home)	3-3	JC39-00895A
7	Main B'd	Sensor(Empty)	3-3	JC39-00896A
8	Main B'd	BLDC	10-10	JC39-00899A
9	Main B'd	Cover S/W	2-2	JC39-00900A
10	Main B'd	Eraser Lamp OPC KEY	4-(2+2)	JC39-00901A
11	Main B'd	ITB Home Sen I/F	7-5	JC39-00902A
12	ITB Home Sen I/F	ITB Home Sensor TEMP(Inner)	5-(3+2)	JC39-00903A
13	Main	Temp(out)	2-2	JC39-00905A
14	SMPS	FUSER	2	JC39-00907A
15	FUSER	FUSER	1-1	JC39-00500A
16	Main B'd Bracket	Fuser Ass'y GND	1-1	JC39-00496A
17	HVPS	GND WIRE	1-2	JC39-00904A
18	Main	CRUM-JOINT	4-4	JC39-00906A
19	HVPS	EXIT	3-3	
20	HVPS	Sensor(Regi)	3-3	JC39-00897A
21	HVPS	Waste Toner Sensor	4-4	JC39-00898A
22	HVPS B'd	Sensor (ITB Tension /OPC Waste)	7-(4+3)	
23	Main B'd	Wireless LAN PBA	6(5)	JC39-00970A

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3.4 Disassembly Procedure

The description of disassembly and reassembly in this manual is listed according to the disassembly procedures. If you find the certain unit or Assy, please consult the name of unit under the picture.

3.4.1 Cover

1. Take out the Cassette.

2. Open the front cover. Remove 2 screws.

3. Lift the top cover up.

4. Remove 1 screw from the rear.

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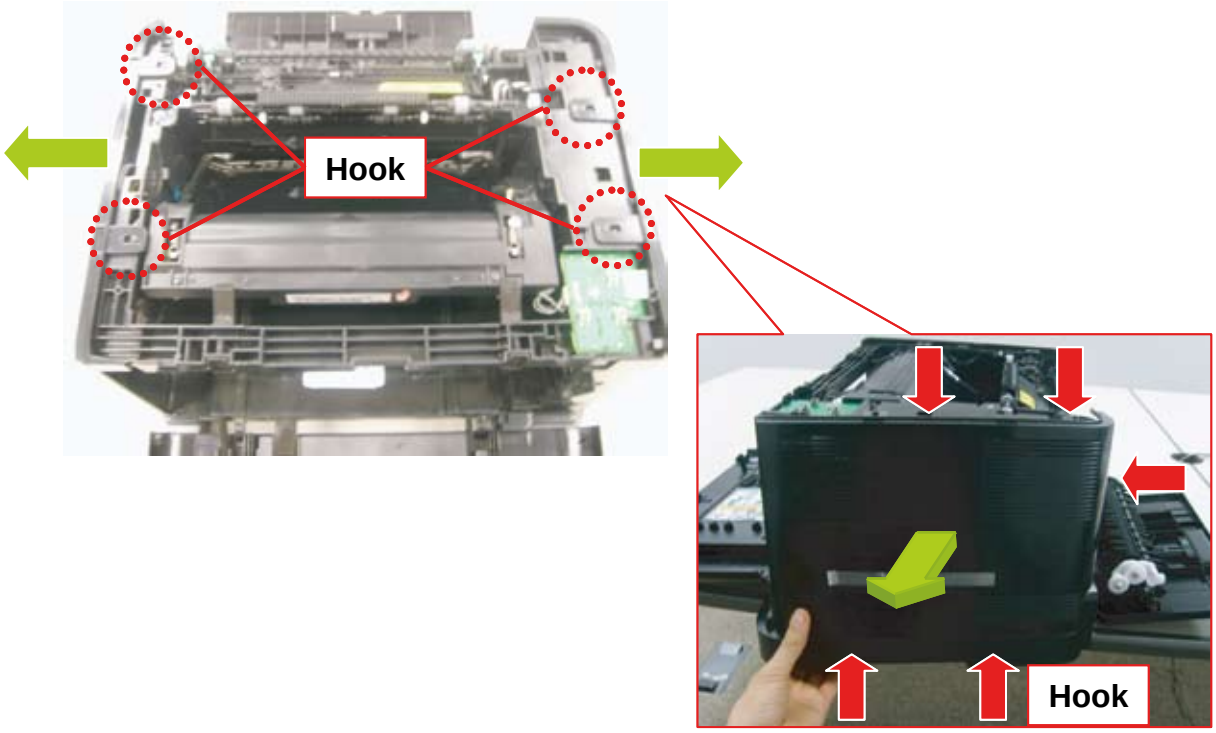
5. Remove the left / right cover by releasing the hooks from the top/bottom/right/left.



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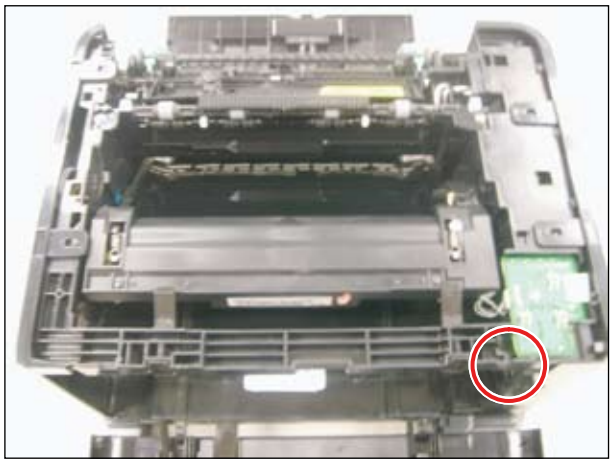
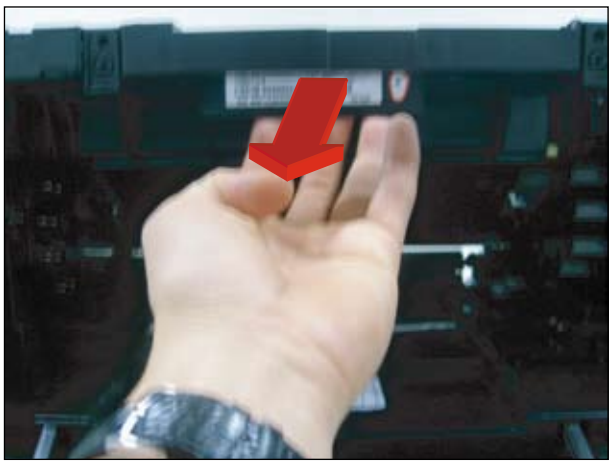
3.4.2 ITB

1. Remove the top cover. (Refer to 3.4.1)

2. Unplug the connector from OPE PBA.

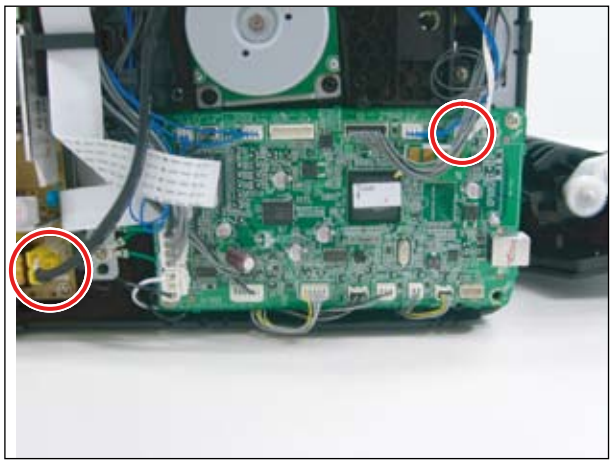


3. Hold the ITB handle. Pull out the ITB to the direction of arrow.



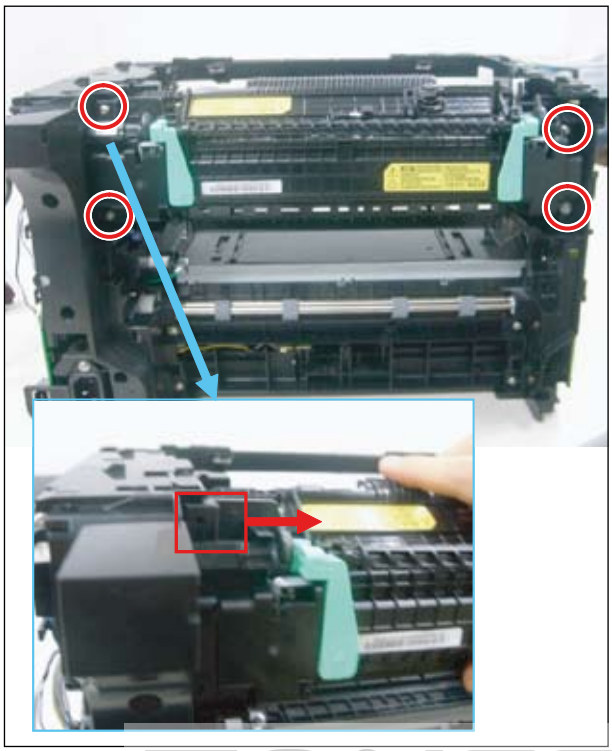
3.4.3 Fuser unit

1. Remove the right cover.
   Unplug 2 connector on the main PBA as shown below.



Caution - The fuser is very hot. So turn the printer off and wait until the printer to cool before replacing it.

2. Remove the 4 screw.
   Move the shaft to the right as shown below. And remove the Fuser unit.



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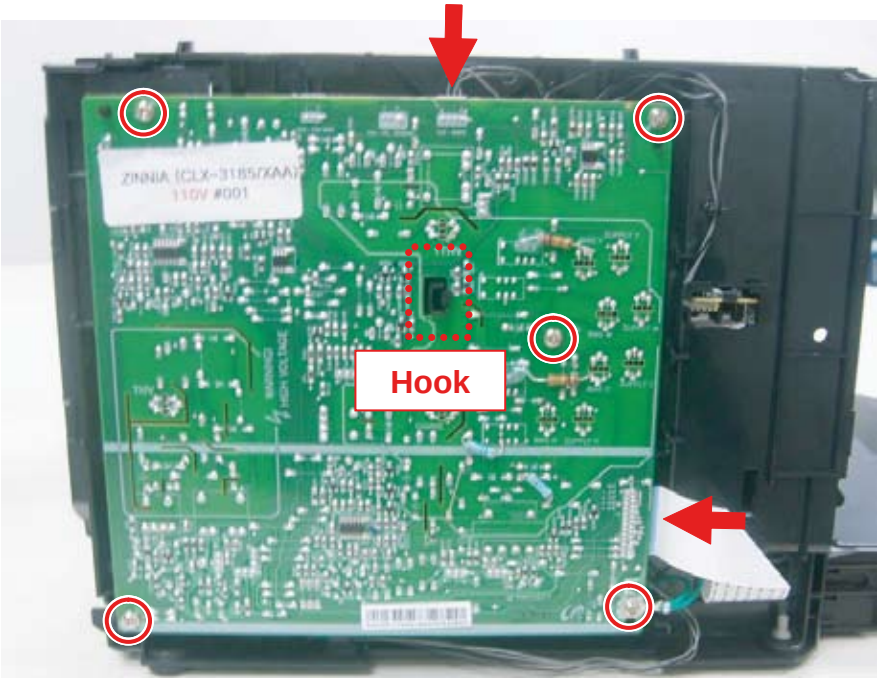
3.4.4 HVPS board

1. Remove the left cover (Refer to 3.4.1).

2. Remove the 5 screws and unplug the 2 connectors, 1 flat cable.

3. Remove the one hook of the center.

4. Release the HVPS board.



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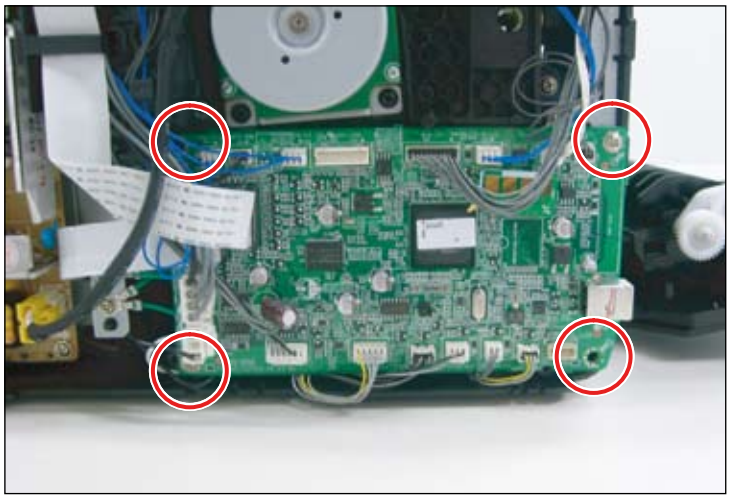
3.4.5 Main PBA

1. Remove the right cover. (Refer to 3.4.1)

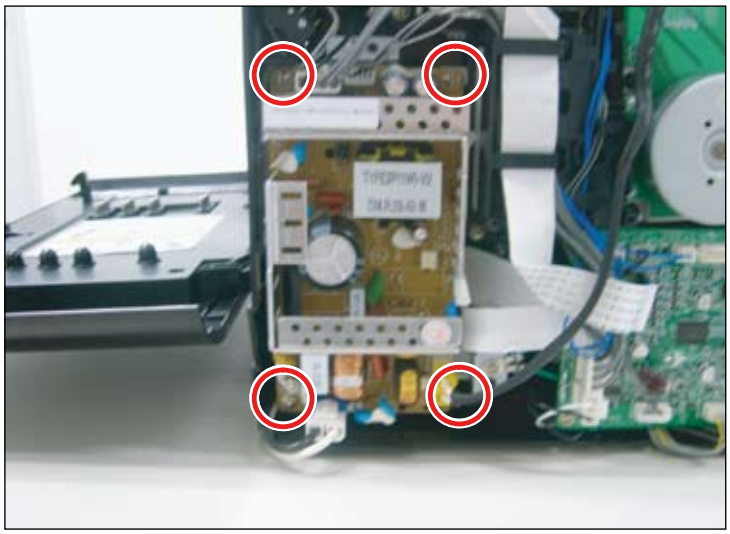
2. Unplug the all connectors. Remove 4 screws. And release the main PBA.



3.4.6 SMPS board

1. Remove the right cover. (Refer to 3.4.1)

2. Unplug the all connectors. Remove 4 screws. And release the SMPS board.



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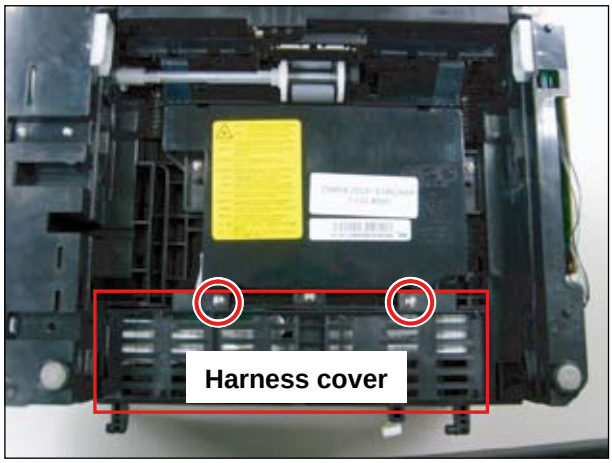
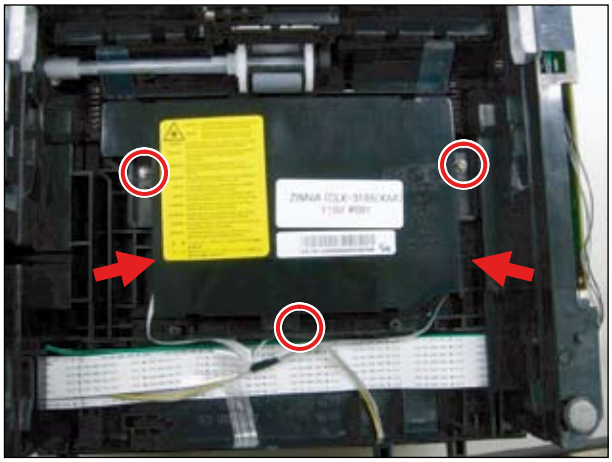
3.4.7 LSU

1. To remove the LSU from the bottom of the SET, first remove the harness cover after remove the 2 screws. And remove the 3 screws.

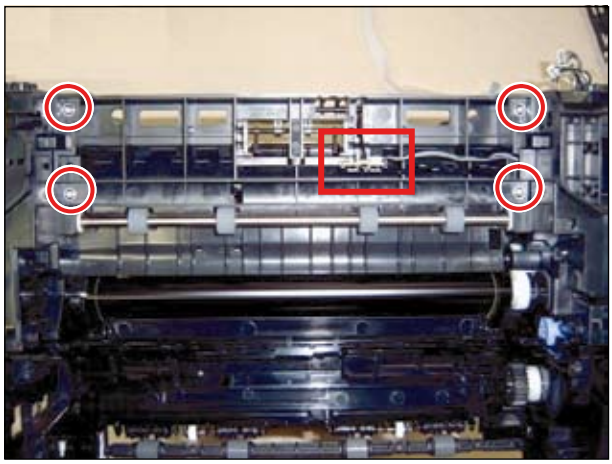


2. Release the LSU unit after remove the 2 Flat cable.

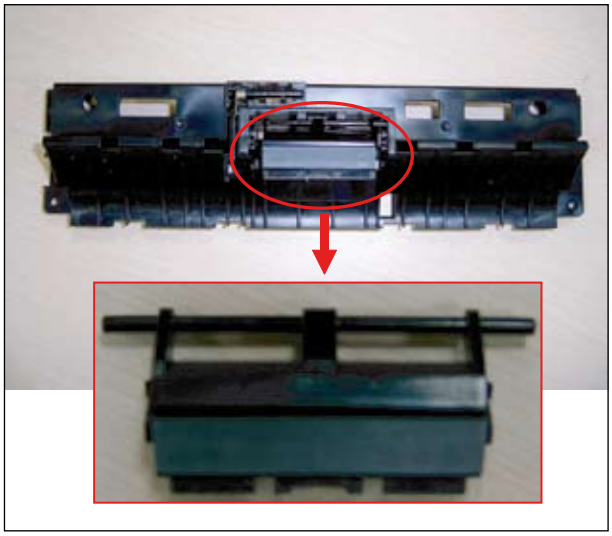


3.4.8 Holder Pad

1. Remove the sub PBA. And release the Guide Pick up unit after remove the 4 screws.



2. Release the holder pad after remove the hook of both side.



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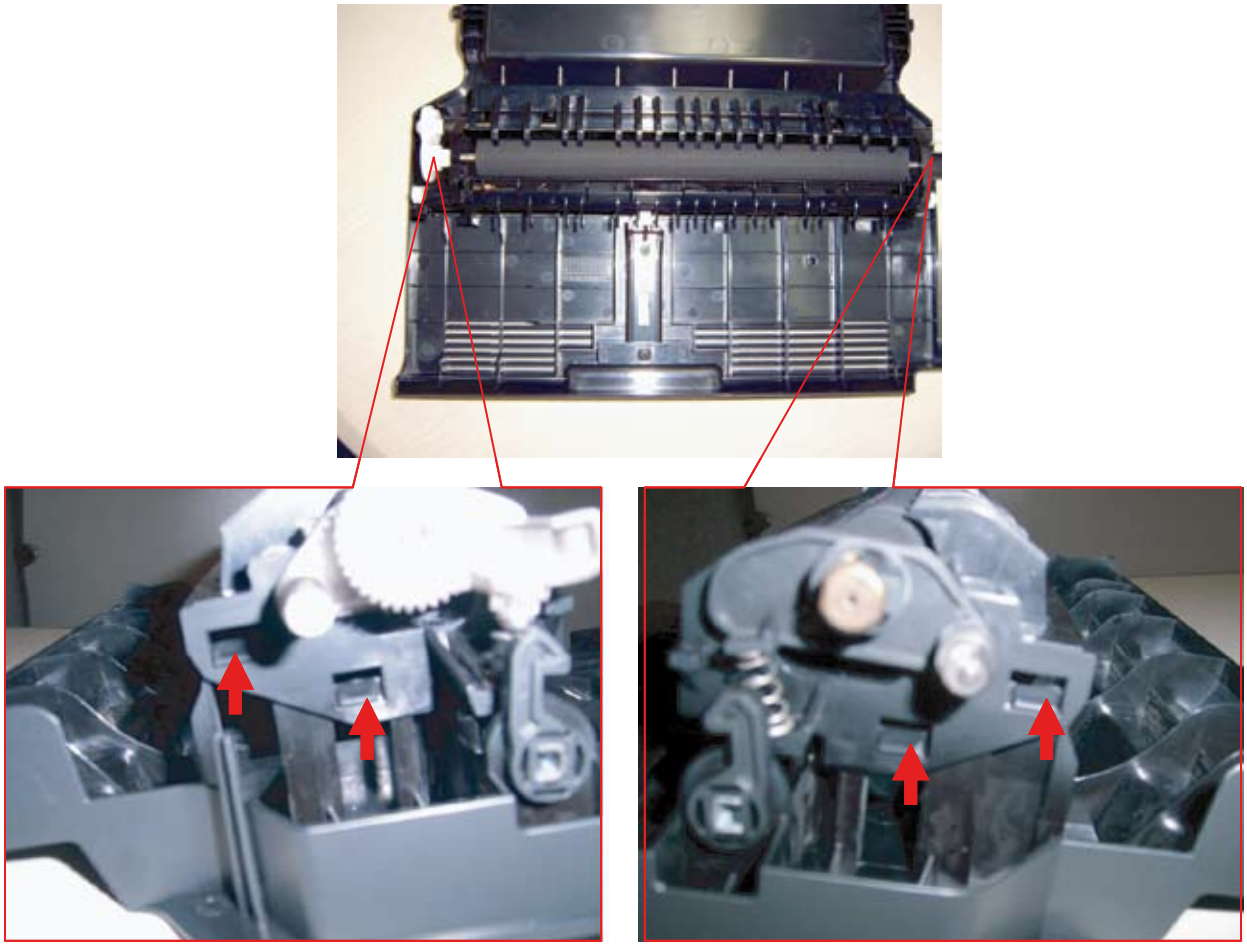
3.4.9 Transfer roller

1. Open the rear cover.

2. Remove the transfer roller Assy by pushing the hooks from the left/right.



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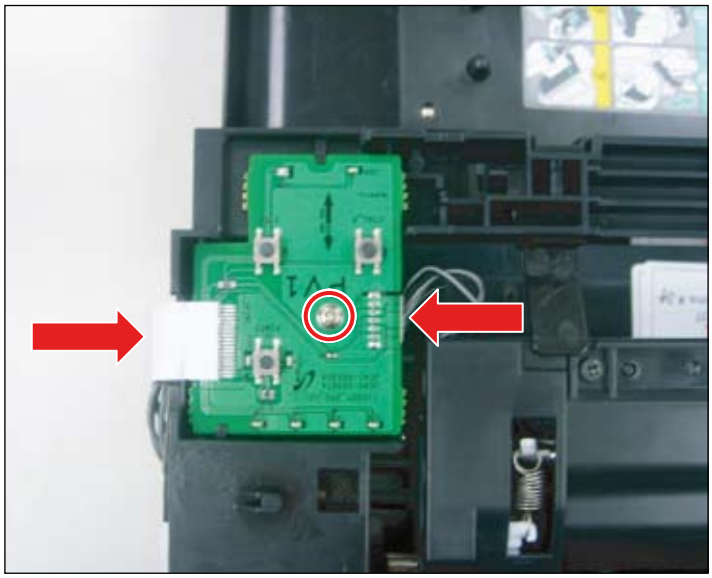
3.4.10 OPE PBA

1. Open the front cover. Remove 2 screws. Lift the top cover up.

2. Remove 1 screw. Unplug 2 connectors. Release the OPE PBA.



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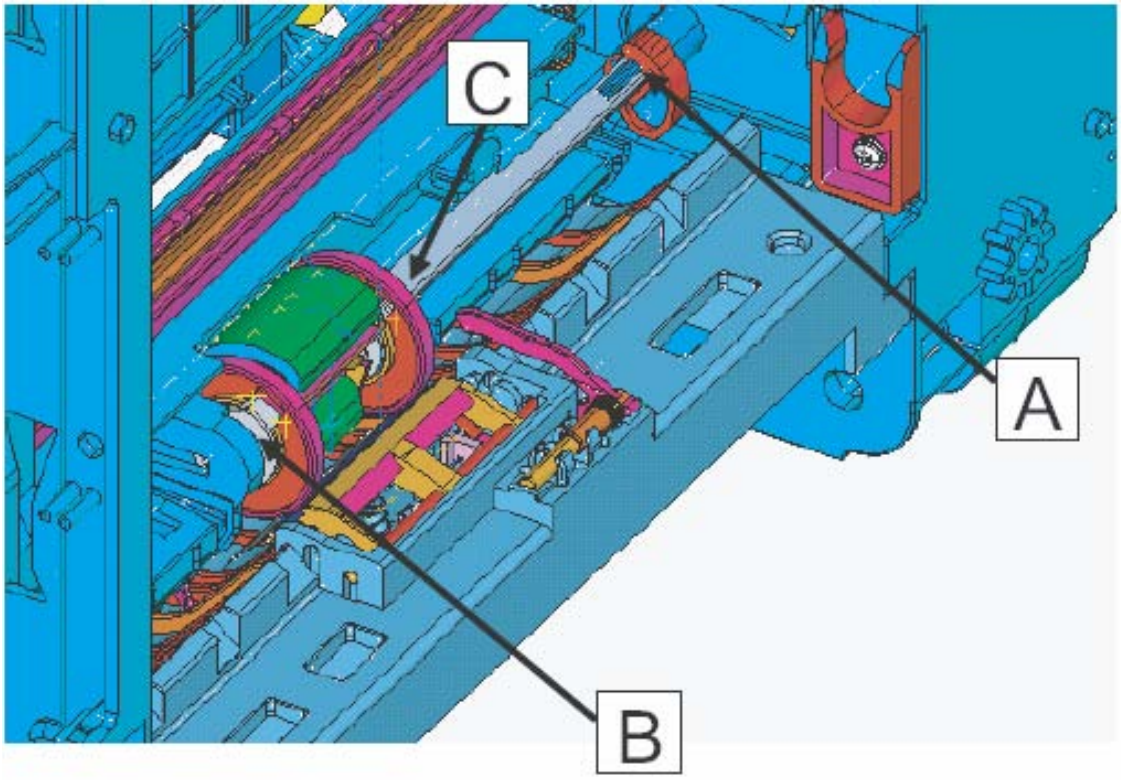
3.4.11 Pick up roller

Before disassembling, remove the Guide Pick up unit. (refer to 3.4.8)

1. Remove the hook from the position A and push to the left side.
2. Separate the Pick up roller Ass'y after release the position B.
3. Remove the hook of the part C, B in sequence.
4. Separate the Pick up rubber.



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4. Alignment & Troubleshooting

4.1 Alignment and Adjustments

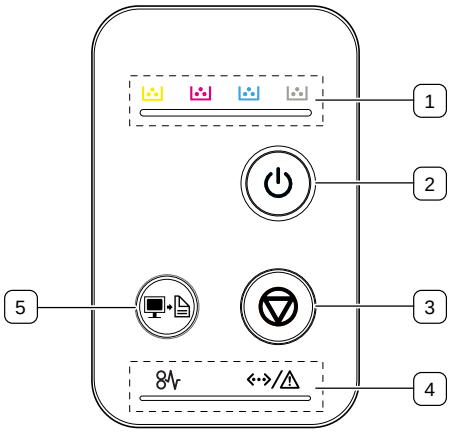
This chapter describes the main functions for service, such as the product maintenance method, the test output related to maintenance and repair, Jam removing method, and so on.
It includes the contents of manual.

4.1.1. Control Panel

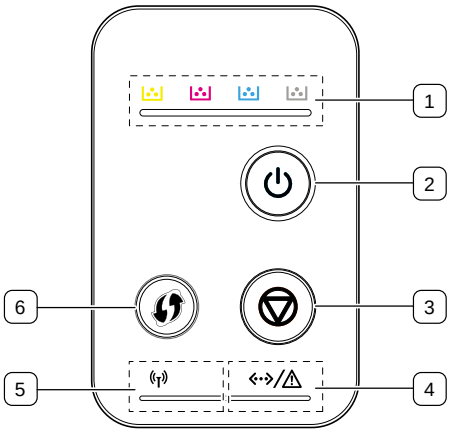
4.1.1.1 Overview

- The CLP-320/325 series printers do not have LCD panel which is used in other color model printers. On the contrary to other models of color printers, they show the status of the printer only with their LEDs.
- The CLP-320/325 series printers have 3 keys and 6 LEDs. The 'User Interface' module handles the processing of the 'Key Press' and 'LED control' at different states of the machine.

[1]



[2]



[1] CLP-320(K)/CLP-321/CLP-325(K)/ CLP-326/CLP-320N(K)/CLP-321N

1	Toner colors	Shows the status of each toner cartridge.
2	Power	You can turn the power on and off with this button.
3	Cancel	Stops an operation at any time and there are more functions.
4	Status LED	Shows the status of your machine.
5	Print Screen[a]	Prints the displayed screen of your monitor.
	Demo Print[b]	Prints a demo page.

a. CLP-320(K)/CLP-321/CLP-325(K)/ CLP-326 only.
b. CLP-320N(K)/CLP-321N only.

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[2] CLP-325W(K)

1	Toner colors	Shows the status of each toner cartridge.
2	Power	You can turn the power on and off with this button.
3	Cancel	Stops an operation at any time and there are more functions.
4	Status LED	Shows the status of your machine.
5	Wireless	Shows the status of wireless network. When the LED on, the machine is connected wirelessly.
6	WPS	If your wireless access point supports WPS (Wi-Fi Protected Setup™), you can configure the wireless network connection easily without a computer.

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4.1.1.2 Understanding the control panel

■ Status/Toner colors LEDS

LED	STATUS	TONER COLORS LED	DESCRIPTION
Online/ Error	Off	All LEDs off	The machine is off-line.
	Solid green	All LEDs off	The machine is on-line and can receive data from a computer.
	Slowly blinking green	All LEDs off	When the Status LED blinks green slowly, the machine is receiving data from a computer.
	Quickly blinking green	All LEDs off	When the Status LED blinks green quickly, the machine is printing data.
	Solid green	Corresponding LED blinks red	Each toner cartridge is near the end of its life.
		Corresponding LED blinks red successively	The machine is warming up.
	Solid red	All LEDs off	• The cover is open. Close the cover. • There is no paper in the tray. Load paper in the tray. • The machine has stopped due to a major error. • The machine is experiencing system problems requiring service, such as LSU error, fuser error, or ITB error. Contact the service representative.
		Corresponding LED is solid red	• A toner cartridge has almost reached its estimated cartridge life[a]. It is recommended to replace the toner cartridge. • The machine cannot recognize the status of toner cartriges and the supplies information. Open and close the cover and check if the machie can operate properly. If the problem persists, turn the power off and on.
	Blinks red	Corresponding LED is solid red	• A minor error has occurred and the machine is waiting for the error to be cleared. When the problem is cleared, the machine resumes. • A small amount of toner is left in the cartridge. The estimated cartridge lifea of toner is close. Prepare a new cartridge for replacement. You may temporarily increase the printing quality by redistributing the toner in the cartridge.
Jam	Lights orange	All LEDs off	A paper jam has occurred.

a. Estimated cartridge life means the expected or estimated toner cartridge life, which indicates the average capacity of print-outs and is designed pursuant to ISO/IEC 19798. The number of pages may be affected by operating environment, printing interval, graphics, media type and media size. Some amount of toner may remain in the cartridge even when red LED is on and the printer stops printing.

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■ Wireless LED

WIRELESS LED STATUS		DESCRIPTION
Blue	Off ( )	Wireless network is disconnected.
	On ( )	Wireless network is connected.
	Slowly blinks ( )	The machine starts connecting to a wireless network.
	Quickly blinks ( )	• The machine is connecting to access point (or wireless router). • Wireless network connection is being disconnected.

4.1.1.3 Introducing the useful buttons

■ Print screen button (CLP-320(K)/CLP-321/CLP-325(K)/ CLP-326 only.)

By pressing the Print screen button, you can do the following functions.

FUNCTION	DESCRIPTION
Printing the active window	Press this button and the green LED will start blinking. When the green LED stops blinking, release the button.
Printing the whole monitor screen	Press this button and the green LED will start blinking. Release the button while it's blinking.

■ Demo print button (CLP-320N(K)/CLP-321N only.)

It prints a demo page by pressing this button only. The printed page shows the color print quality potential and overall print characteristics of the machine.

■ Cancel button

By pressing the Cancel button, you can do the following functions.

FUNCTION	DESCRIPTION
Printing demo page	In ready mode, press and hold this button for about 2 seconds until the status LED blinks slowly, and release.
Printing configuration sheets	In ready mode, press and hold this button for about 5 seconds until the status LED blinks quickly, and release.
Canceling print job	Press cancel button during printing. The red LED blinks while the print job is cleared from both the machine and the computer and then the machine returns to ready mode. This may take some time depending on the size of the print job.

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Configuration

Configuration Report

Model Name : CLP-320 Series
Machine Serial Number :

[Product Information]
- Installed Date : 2009-11-26
- Memory Size : 256 Mbytes
- Firmware Versions
  - Firmware Version : V1.01.00.62.W Jan-12-2009
  - Engine Version : 0.00.84(55)
  - Network Version : V4.00.70.3 01-09-2010
  - PCL5Ce Version : PCL5Ce 5.95 10-13-2009
  - PCLXL Version : PCL6 6.51 01-11-2010
  - XPI Version : XPI_V0.84.00 12-14-2009
  - SPLC Version : SPL-C 5.46 12-08-2009
- Quality Control Versions
  - EP Version : V1.5.1M
  - Fuser Version : V0.5M
  - TR1 Version : V0.8M
  - TR2 Version : V1.6M
  - PWM Version : V2.3
  - PRINT Version : V6.57

[Product Setting]
- Language : English
- Host Name : SEC0015994154B8
- Contact : Administrator
- Location :
- Power Save : 15 Min
- MAC Address : 00:15:99:41:54:B8
- IP Address : 192.0.0.100

[Paper Setting]
- Media Name : Tray 1
- Paper Type : Plain Paper
- Paper Size : A4

[Print Setting]
- Auto Continue : On
- Altitude Adjustment : Normal

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supplies info

Supplies Information Report

Model Name : CLP-320 Series
Machine Serial Number :

[General Information]

Firmware/Engine Version	:	V1.01.00.62.W Jan-12-2009 0.00.84
Total Page Count	:	147/5 Page(s) (color/mono)
Total Image Count	:	615 Image(s)

[Consumables Life]

Fuser Life	:	549 Page(s)
Transfer Roller Life	:	147 Page(s)
Tray Roller Life	:	152 Page(s)
Transfer Belt Life	:	615 Image(s)

[Toner Information]

		Yellow	Magenta	Cyan	Black
Toner Remaining	:	3% (P88)	88% (P4)	2% (P92)	92% (P4)
Page Count	:	55 Page(s)	151 Page(s)	53 Page(s)	154 Page(s)
Serial No.	:	CRUM-09112663120	CRUM-09120376441	CRUM-09120474628	CRUM-09120374164
Supplier	:	SAMSUNG(EXP)	SAMSUNG(EXP)	SAMSUNG(EXP)	SAMSUNG(EXP)
Product Date	:	2009.11.26	2009.12.03	2009.12.04	2009.12.03
Last Used Date	:	2009.11.26	2009.11.26	2009.11.26	2010.01.12
First Installed Date	:	2009.11.26	2009.11.26	2009.11.26	2009.11.30

[Imaging-Unit Information]

Remaining	:	98%
Image Count	:	615 Image(s)
Last Used Date	:	2009.11.26
First Installed Date	:	2009.11.26

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network

Network Configuration Report

Model Name : CLP-320 Series
Machine Serial Number :

General Information
- Host Name : SEC0015994154B8
- Contact : Administrator
- Location :
- MAC Address : 00:15:99:41:54:B8
- IP Address : 192.0.0.100

TCP/IP Information
- IP Assignment : STATIC
- IP Address : 192.0.0.100
- SubNet Mask : 255.255.255.0
- Default Gateway : 192.0.0.1

IPv6 Information
- IPv6 Activate : On
- Link-Local Address : FE80::215:99FF:FE41:54B8/64
- Stateless Address :
- Stateful Address :
- Manual Address :
- DHCPv6 Config : Router
- Router Prefix :

IPP Information
- IPP Protocol : Enabled
- Printer URI : http://192.0.0.100:631
- Authentication Scheme : None

Raw TCP/IP Printing Information
- Raw TCP/IP Printing : Enabled
- Port Number : 9100

LPD Information
- LPD Printing : Enabled
- Port Number : 515

SLP Information
- SLP Protocol : Enabled
- SLP Multicast TTL : 255
- Port Number : 427

IP Filtering Information
- IP Filtering : Disabled
- IPv6 Filtering : Enabled

Wireless Information
- SSID : Superman
- BSSID : 00:00:00:00:00:00
- Link Status : Not Connected
- Current Channel : 0
- Link Quality :
- Operation Mode : Ad-Hoc

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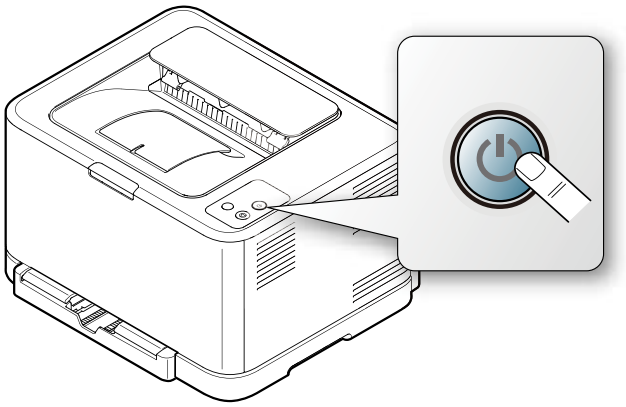
■ WPS button (CLP-325W(K) only.)

This feature automatically detects which WPS (Wi-Fi Protected Setup™) mode your access point uses. By pushing a button on the wireless LAN router / access point and the machine, you can setup the wireless network and security settings.

■ Power button

This button must be used to turn the machine on/off.

Turning on the machine
1.Plug in the power cord.
2.Press Power button on the control panel.



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4.1.2 Jam Removal

TIPS FOR AVOIDING PAPER JAMS

By selecting the correct media types, most paper jams can be avoided. When a paper jam occurs, refer to the guidelines below

- Ensure that the adjustable guides are positioned correctly.
- Do not overload the tray. Ensure that the paper level is below the paper capacity mark on the inside of the tray.
- Do not remove paper from the tray while your machine is printing.
- Flex, fan, and straighten paper before loading.
- Do not use creased, damp, or highly curled paper.
- Do not mix paper types in a tray.
- Use only recommended print media.
- Ensure that the recommended side of the print media is facing up in the tray.

4.1.2.1 Clearing Paper Jams

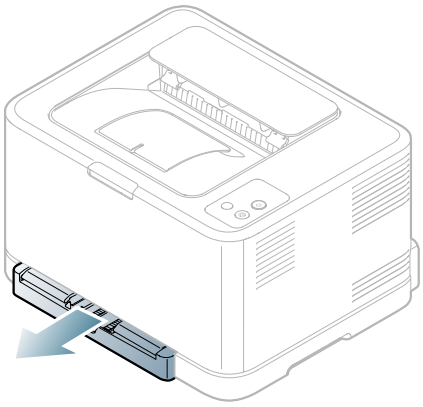
NOTE: *To avoid tearing the paper, pull the jammed paper out slowly and carefully. Follow the instructions in the following sections to clear the jam.*

If a paper jam occurs, the status LED on the control panel lights orange. Find and remove the jammed paper. If paper is jammed in the paper feed area, follow the next steps to release the jammed paper.

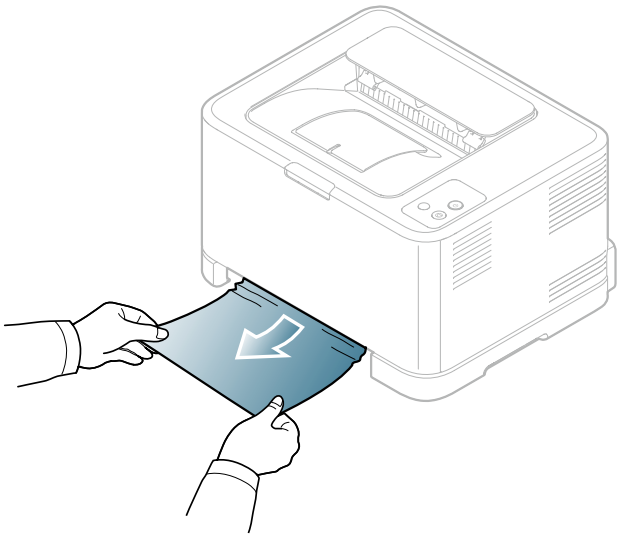
In the tray

1. Open and close the front cover. The jammed paper is automatically ejected from the machine. If the paper does not eject, go to the next step.

2. Pull out the tray.



3. Remove the jammed paper by gently pulling it straight out.



If the paper does not eject when you pull, or if you do not see the paper in this area, check the fuser area around the toner cartridge.

4. Insert the tray back into the machine until it snaps into place. Printing automatically resumes.

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Inside the machine

1. Open and close the front cover. The jammed paper is automatically ejected from the machine. If the paper does not eject, go to the next step.

2. To remove the jammed paper, open the rear cover.

3. Carefully remove the jammed paper by pulling in the direction as shown below. Most of the jammed paper can be removed in this step.

   If the paper does not eject when you pull, or if you do not see the paper in this area, check the paper exit area.

4. Close

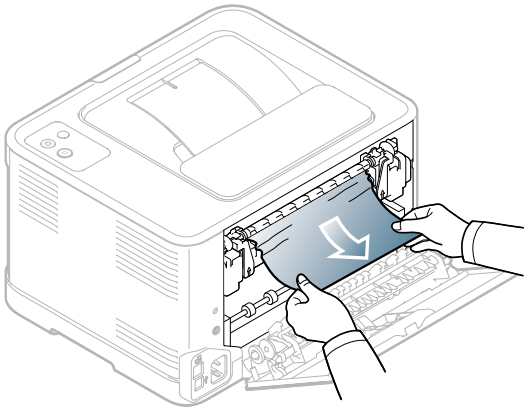
In the paper exit area

1. Gently pull the paper out the output tray.

   If you do not see the jammed paper or if there is any resistance when you pull, stop and go to the next step.

2. To remove the jammed paper, open the rear cover.

3. Carefully remove the paper by pulling in the direction as shown below. Most of the jammed paper can be removed in this step.



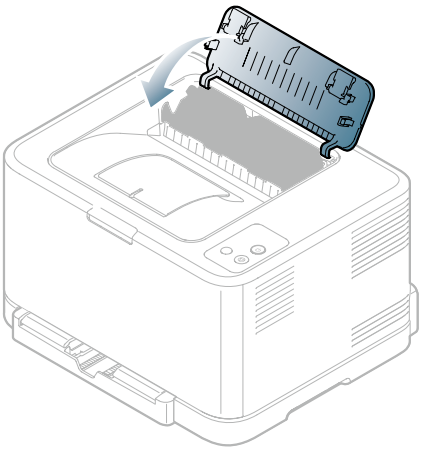
If you cannot find the jammed paper, of if there is any resistance removing the paper, go to the next step.

4. Push the fuser levers upwards.

5. Open the top cover and inner cover.

6. Holding the inner cover open, carefully take the jammed paper out the machine. The inner cover will then close automatically.

7. Close the top cover. Make sure that it is securely closed.

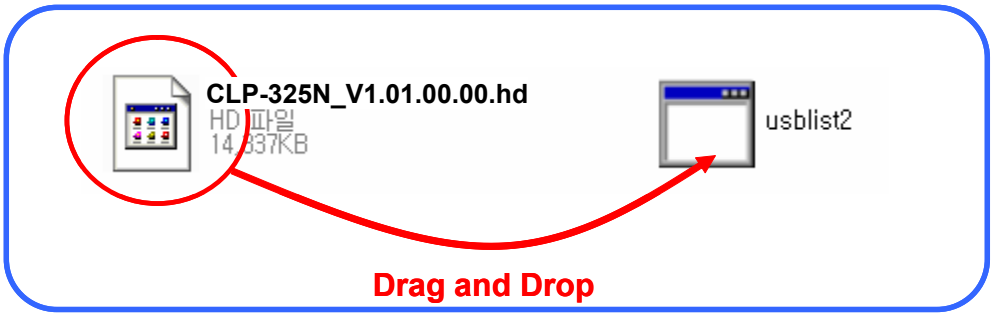


8. Push the fuser levers downwards.

9. Open and then close the rear cover or front cover to resume printing.

4.1.3 Firmware upgrade

1) Connect PC and printer with USB cable.
2) Turn on the power of printer. (Ready Status)
3) Download the firmware file.
   Unzip the file.
   Drag the f/w file and Drop down on the usblist2.exe.
   And then f/w update will be started automatically.



4) Please wait until end reboot.

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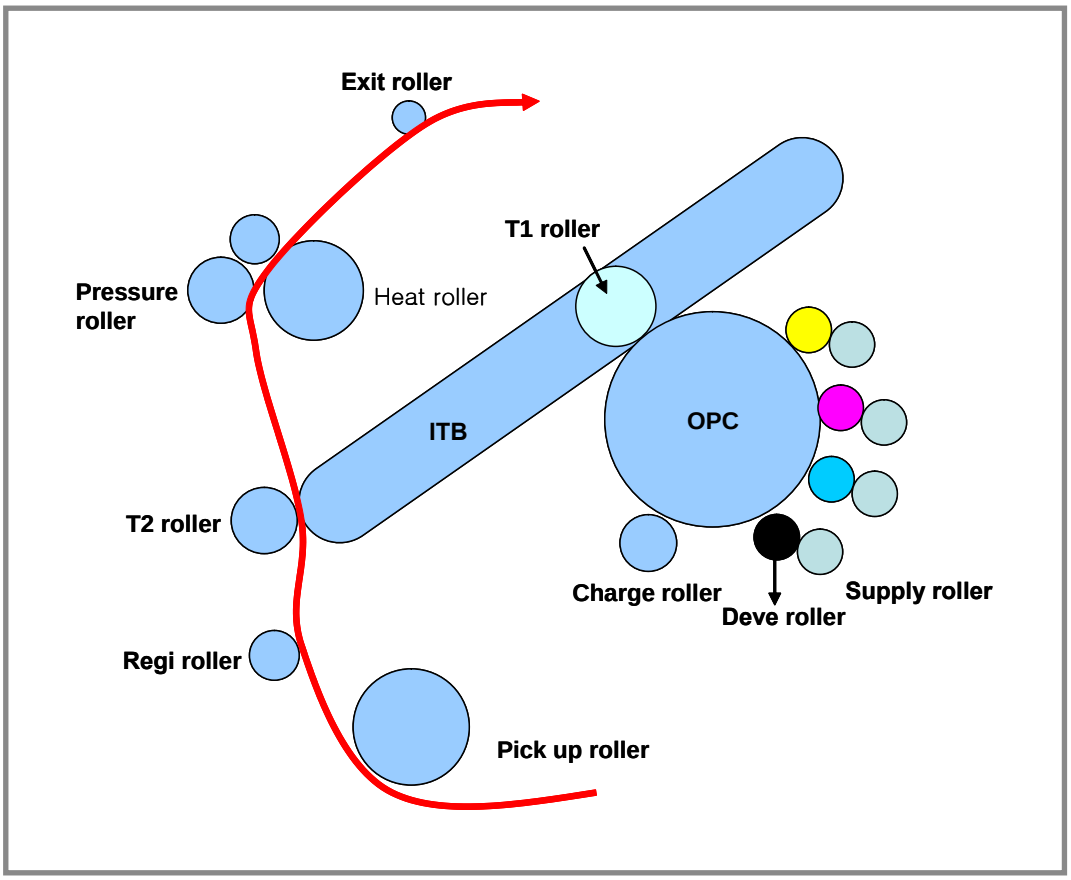
4.1.4 Periodic Defective Image

If an image defects appears at regular intervals on the printed-paper, it is due to a faulty or damaged roller. Refer to the table below and check the condition of the appropriate roller.

No	Roller	Period	Phenomenon
1	OPC Drum	188.5mm	White and Black Spots
2	Charge Roller	37.7mm	Black Spot and line and Periodic Band
3	Supply Roller	47.5mm	Periodic Band by little difference of density
4	Developing Roller	26.0mm	White Spot, Horizontal black band
5	1st Transfer Roller	43.8mm	Ghost, Damaged Image by abnormal tranfer
6	2nd Transfer Roller	54.64mm	Ghost, Damaged Image by abnormal tranfer
7	Pressure Roller	50.3mm	Background
8	Heat Roller	86.4mm	Black Spots or Vertical Black Band



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4.1.5 Using the smart pane program

Smart Panel is a program that monitors and informs you of the machine status, and allows you to customize the machine's settings. For Windows and Macintosh, Smart Panel is installed automatically when you install the machine software. For Linux, you can download Smart Panel from the Samsung website.

■ Understanding Smart Panel

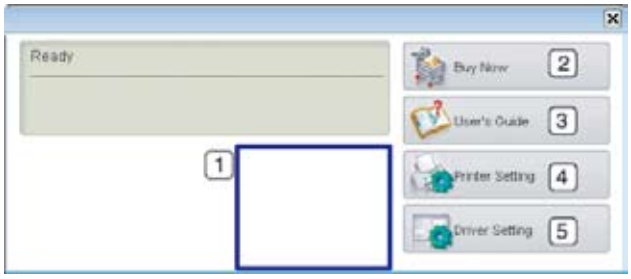
If an error occurs while printing, you can check the error from the Smart Panel.
You can also launch Smart Panel manually. Double-click the Smart Panel icon on the Windows task bar (in Windows), or Notification Area (in Linux). You can also click it on the status bar (in Mac OS X).

Windows		Double-click this icon in Windows.
Macintosh		Click this icon in Mac OS X.
Linux		Click this icon in Linux.

Or, if you are a Windows user, you can launch it from the Start menu, select Programs or All Programs > Samsung Printers > your printer driver name > Smart Panel.

If you have already installed more than one Samsung machine, first select the correct machine model you want in order to access the corresponding Smart Panel.
Right-click (in Windows or Linux) or click (in Mac OS X) the Smart Panel icon and select your machine.

The Smart Panel program displays the current status of the machine, the estimated level of toner remaining in the toner cartridge(s), and various other types of information. You can also change settings.



1	Toner Level	View the level of toner remaining in the toner cartridge(s). The machine and the number of toner cartridge(s) shown in the above window may differ depending on the machine in use. Some machines do not have this feature.
2	Buy Now	Order replacement toner cartridge(s) online.
3	User's Guide	View the User's Guide. This button changes to Troubleshooting Guide when error occurs. You can directly open the troubleshooting section in the user's guide.

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4	Printer Setting	Configure various machine settings in the Printer Settings Utility window. Some machines do not have this feature. If you connect your machine to a network, the SyncThru™ Web Service window appears instead of the Printer Settings Utility window.
5	Driver Setting	Set all of the machine options you need in the Printer Preferences window. This feature is available only for Windows.

■ Changing the Smart Panel Program Settings

Right-click (in Windows or Linux) or click (in Mac OS X) the Smart Panel icon and select Options. Select the settings you want from the Options window.

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4.1.6 How to use EDC (Engine Diagnostic Control) Mode

EDC Mode is feature that allows the engineer to check the condition of the print engine. It can check the operating condition of the motors, sensors, solenoids and clutches, measure the High Voltage from the HVPS and check the operation of the fuser and LSU.

4.1.6.1 Enterence

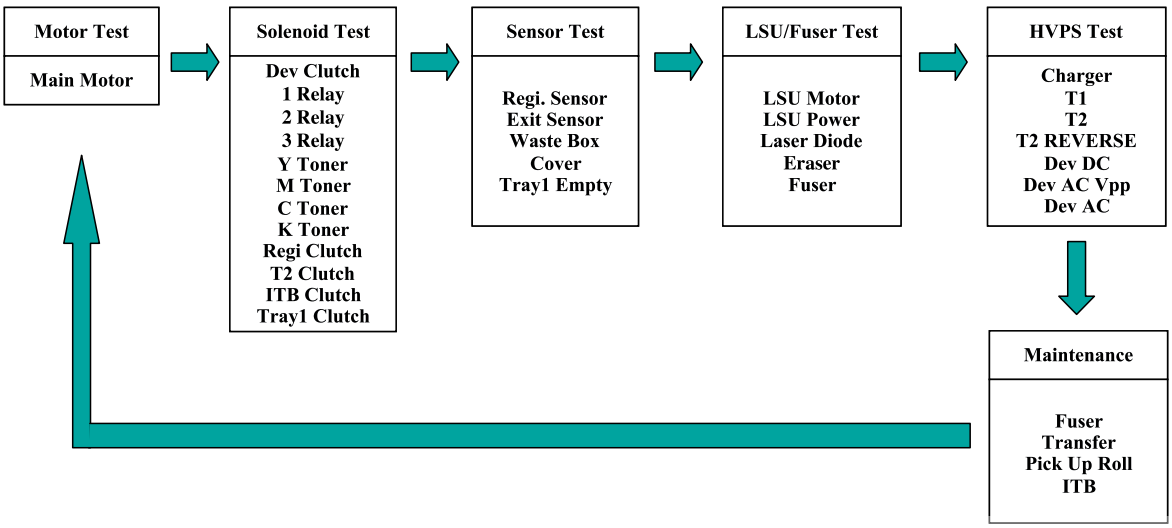
When trying to check the CLP-320N EDC Mode, additional EDC execution program needed.

[Procedure of EDC Mode operation]
a) First, turn on the Power of Printer, wait until Ready state
b) In this state, Run the EDC program on the computer
c) After that, click the menu of screen
d) Then <Motor Test> appears on the initial screen
e) Should you get out of this program, press Exit of screen

4.1.6.2 Keys

Key	Discription
Exit	Close program
Update LCD	Update value (ex : sensor value)
Menu	Move to the top menu
Left/Right arrow	Move test item
Enter	Start testing or select Sub-item
Upper level	Stop testing or the upper menu

4.1.6.3 EDC Map



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4.1.6.3(a) Motor Test

Item	Discription
Main Motor	If motor lock signal is normal, “Successed” message will be displayed. When motor lock signal is abnormal, “failed” message will be displayed. When “Upper Level” is pushed, “off” message will be displayed.

4.1.6.3(b) Solenoid Test

Item	Discription
Dev Clutch	When “select” key is pushed, “Dev Clutch ON” message will be displayed. “Upper Level” is pushed, ”Dev Clutch Off” message will be displayed.
Relay 1	When “select” key is pushed, “1 Relay ON” message will be displayed. “Upper Level” is pushed, ”1 Relay Off” message will be displayed on.
Relay 2	When “select” key is pushed, “2 Relay ON” message will be displayed. “Upper Level” is pushed, ”2 Relay Off” message will be displayed.
Relay 3	When “select” key is pushed, “3 Relay ON” message will be displayed. “Upper Level” is pushed, “3 Relay Off” message will be displayed.
Y Toner	When “select” key is pushed, “Y Toner ON” message will be displayed. “Upper Level” is pushed, “Y Toner Off” message will be displayed.
M Toner	When “select” key is pushed, “M Toner ON” message will be displayed. “Upper Level” is pushed, “M Toner Off” message will be displayed.
C Toner	When “select” key is pushed, “C Toner ON” message will be displayed. “Upper Level” is pushed, “C Toner Off” message will be displayed.
K Toner	When “select” key is pushed, “K Toner ON” message will be displayed.“Upper Level” is pushed, “K Toner Off” message will be displayed.
Regi Clutch	When “select” key is pushed, “REGI Clutch ON” message will be displayed. “Upper Level” is pushed, “REGI Clutch Off” message will be displayed.
T2 Clutch	When “select” key is pushed, “T2 Clutch ON” message will be displayed. “Upper Level” is pushed, “T2 Clutch Off” message will be displayed.
ITB Clutch	When “select” key is pushed, “ITB Clutch ON” message will be displayed. “Upper Level” is pushed, “ITB Clutch Off” message will be displayed.
Tray1 Clutch	When “select” key is pushed, “Tray1 Clutch ON” message will be displayed. “Upper Level” is pushed, “Tray1 Clutch Off” message will be displayed.
Tray2 Clutch	When “select” key is pushed, “Tray1 Clutch ON” message will be displayed. “Upper Level” is pushed, “Tray1 Clutch Off” message will be displayed.
Regi. Sensor	If actuator is checked by sensor, “Without Paper” message will be displayed. if not, “With Paper” message will be.
Exit Sensor	If actuator is checked by sensor, “Without Paper” message will be displayed. if not, “With Paper” message will be.
Waste Box	If waste Box exists , “Installed” message will be displayed. If not, “Not Installed” message will be.

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Item	Discription
Cover	If cover is opened, " Opened“ message will be displayed. If not, "Closed" message will be.
Tray1 Empty	If paper exists in the tray, "With Paper" will be displayed. If not, "Without Paper" message will be.
Tray2 Empty	If paper exists in the tray, "With Paper" will be displayed. If not, "Without Paper" message will be.

4.1.6.3(b) Solenoid Test

Item	Discription
LSU Motor	If LSU motor lock signal is normal, "Successed" message will be displayed. When LSU motor lock signal is abnormal , “failed” message will be displayed. When “Upper Level” is pushed, “off” message will be displayed.
LSU Power	When “select” key is pushed, “LSU Power On” message will be displayed. If not, “LSU Power Off” message will be.
Laser Diode	When select key is pushed, Laser Diode On message will be displayed. If not, Laser Diode Off message will be.
Eraser	When select key is pushed, Eraser On message will be displayed . If not, Eraser Off message will be.
Fuser	When select key is pushed, Fuser On message will be displayed. If not, Fuser Off message will be.

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4.1.6.3(d) HVPS Test

Item	Discription
Charger	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
T1	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
T2	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
T2 REVERSE	When “select” key is pushed, “T2 REVERSE On” message will be displayed. If not, “T2 REVERSE Off“ will be.
Dev DC	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
Dev AC Vpp	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
Dev AC	When “select” key is pushed, “DUTY : x%*” message will be displayed. And then Left/Right arrow is selected, x% is increased or decreased. And “DUTY : x%” message will be displayed. * is disappeared. And then “select” key is pushed, x%*” message will be displayed. When “Upper Level” is pushed, * is disappeared.
Charger	Duty : 50% -> “-789V”, Range : -81V ~ -1689V
T1	Duty : 50% -> “1159V”, Range : 122V ~ 2188V
T2	Duty : 50% -> “2552V”, Range : 264V ~ 4730V
Supply DC	Duty : 50% -> “-269V”, Range : -1V ~ -591V
AC, Vpp	Duty : 50%-> “1210V” , Range : 800V ~ 2160V

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4.1.6.3(e) Maintenance

Item	Discription
Fuser	When “select” key is pushed, “Initialized” message will be displayed. When “Upper Level” is pushed, “Off” message is disappeared.
Transfer	When “select” key is pushed, “Initialized” message will be displayed. When “Upper Level” is pushed, “Off” message is disappeared.
FCF Pick Up Roll	When “select” key is pushed, “Initialized” message will be displayed. When “Upper Level” is pushed, “Off” message is disappeared.
SCF Pick Up Roll	When “select” key is pushed, “Initialized” message will be displayed. When “Upper Level” is pushed, “Off” message is disappeared.
ITB	When “select” key is pushed, “Initialized” message will be displayed. When “Upper Level” is pushed, “Off” message is disappeared.

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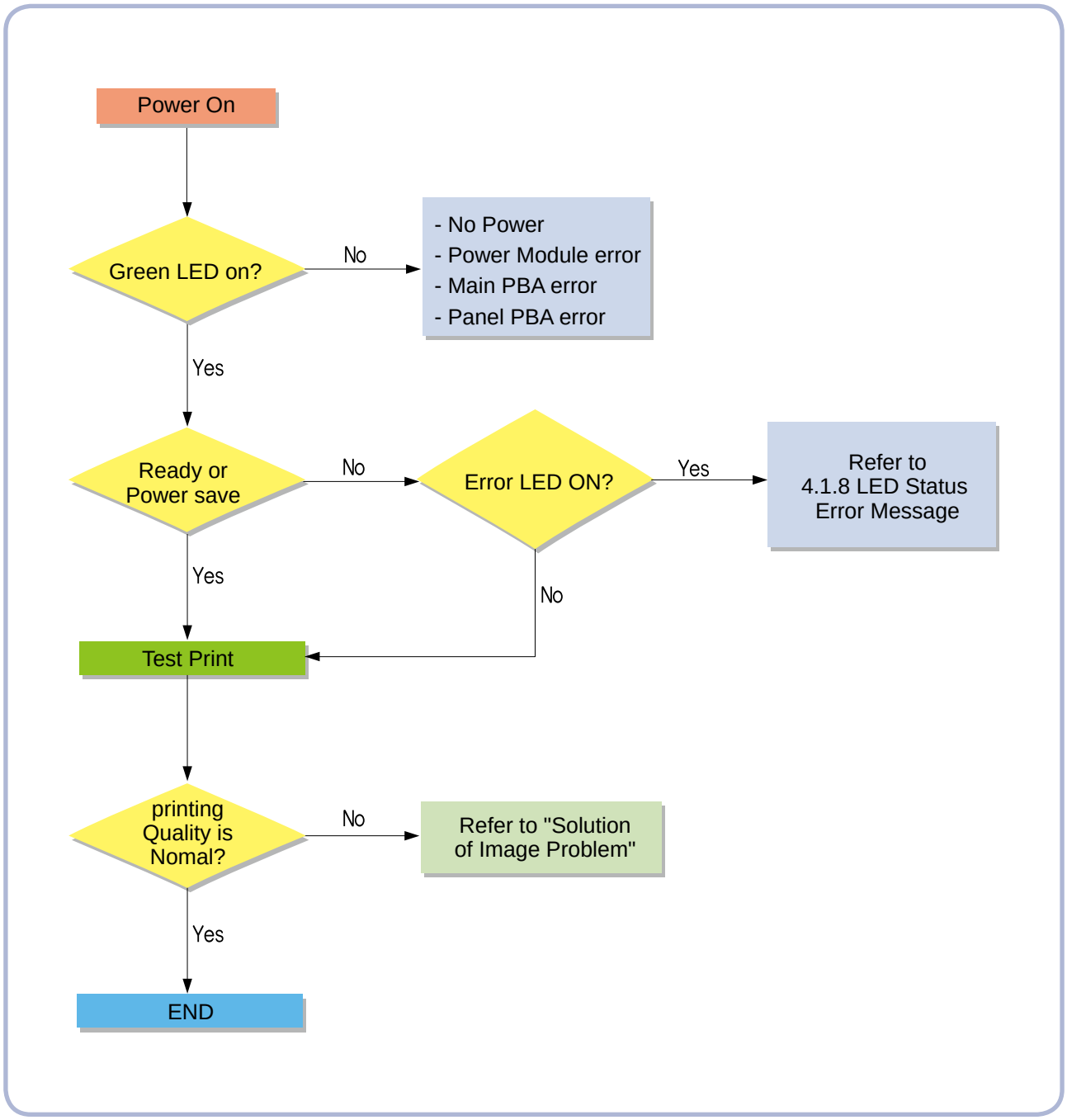
4.2 Troubleshooting

4.2.1 Procedure of Checking the Symptoms

Before attempting to repair the printer first obtain a detailed description of the problem from the customer.



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4.2.2 Troubleshooting Checklist

If the printer is not working properly, consult the following checklist. If the printer does not pass a step, follow the corresponding troubleshooting suggestions.

Status	Response
Make sure that the Status LED on the control panel is green and “Ready” is shown on the Smart Panel program window.	• If the Status LED is off, check the power cord connection. Check the power switch. Check the power source by plugging the power cord into another outlet. • If the Status LED blinks or lights red, solve the problems.
Print a demo page to verify that the printer is feeding paper correctly.	• If a demo page does not print, check the paper supply in the paper tray. • If the paper jams in the printer, go to “Clearing Paper Jams”
Check the demo page to see if it is printed correctly.	If there is a print quality problem, go to “Solving Print Quality Problems”
Print a short document from a software application to verify that the computer and printer are connected and communicating correctly.	• If the page does not print, check the cable connection between the printer and the computer. • Check the print queue or print spooler to see if the printer has been paused. • Check the software application to ensure that you are using the proper printer driver and communication port. If the page is interrupted during printing, go to “Solving General Printing Problems”
If completing the checklist does not resolve the printer problem, check the following troubleshooting sections.	• See “Solving General Printing Problems” • See “Solving Print Quality Problems” • See “Common Windows Problems” • See “Common Macintosh Problems” • See “Common Linux Problems”

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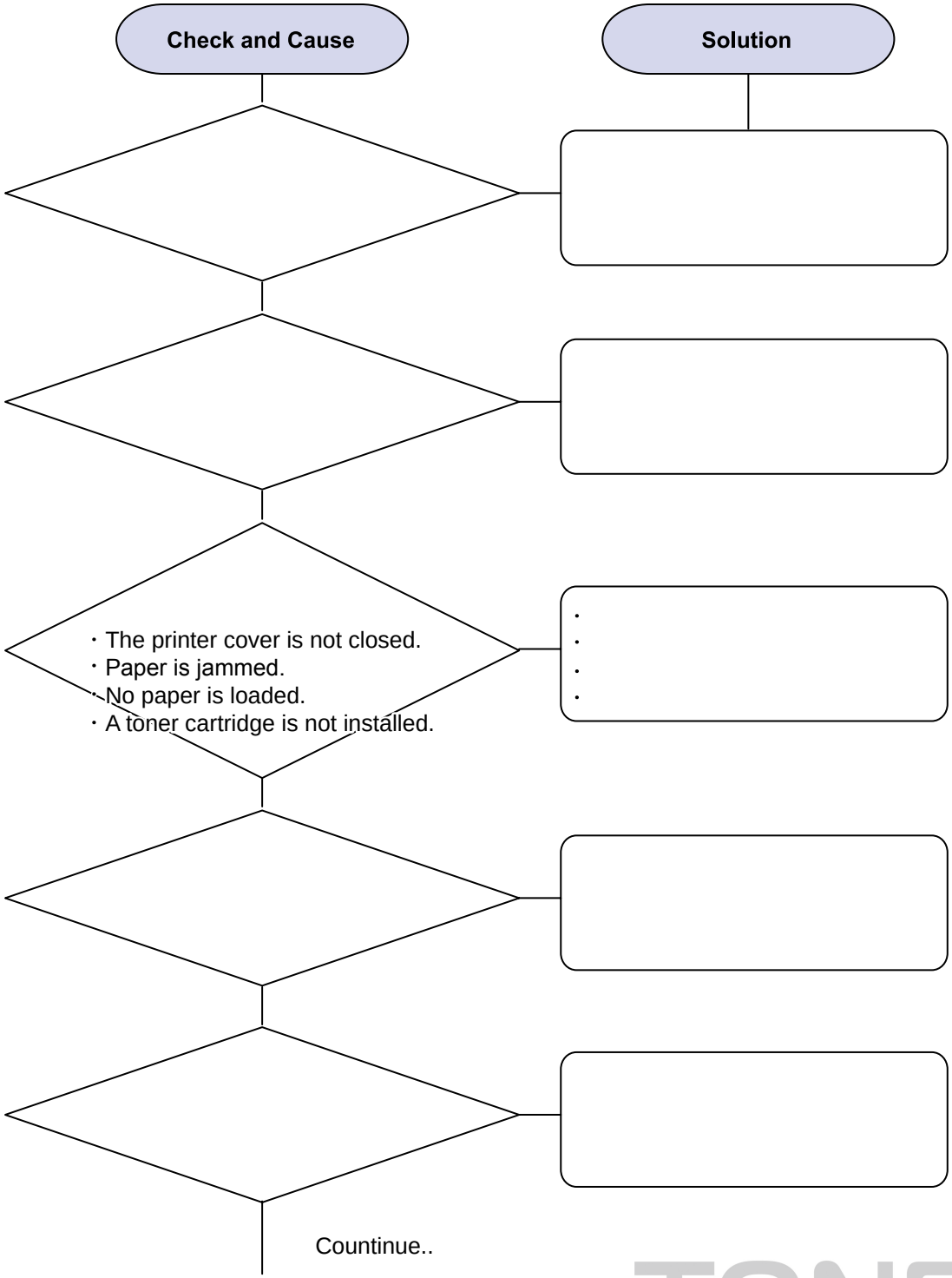
4.2.3 Solving General Printing Problems

For problems with the operation of your printer, refer to the table for suggested solutions..

Description	The printer does not print.



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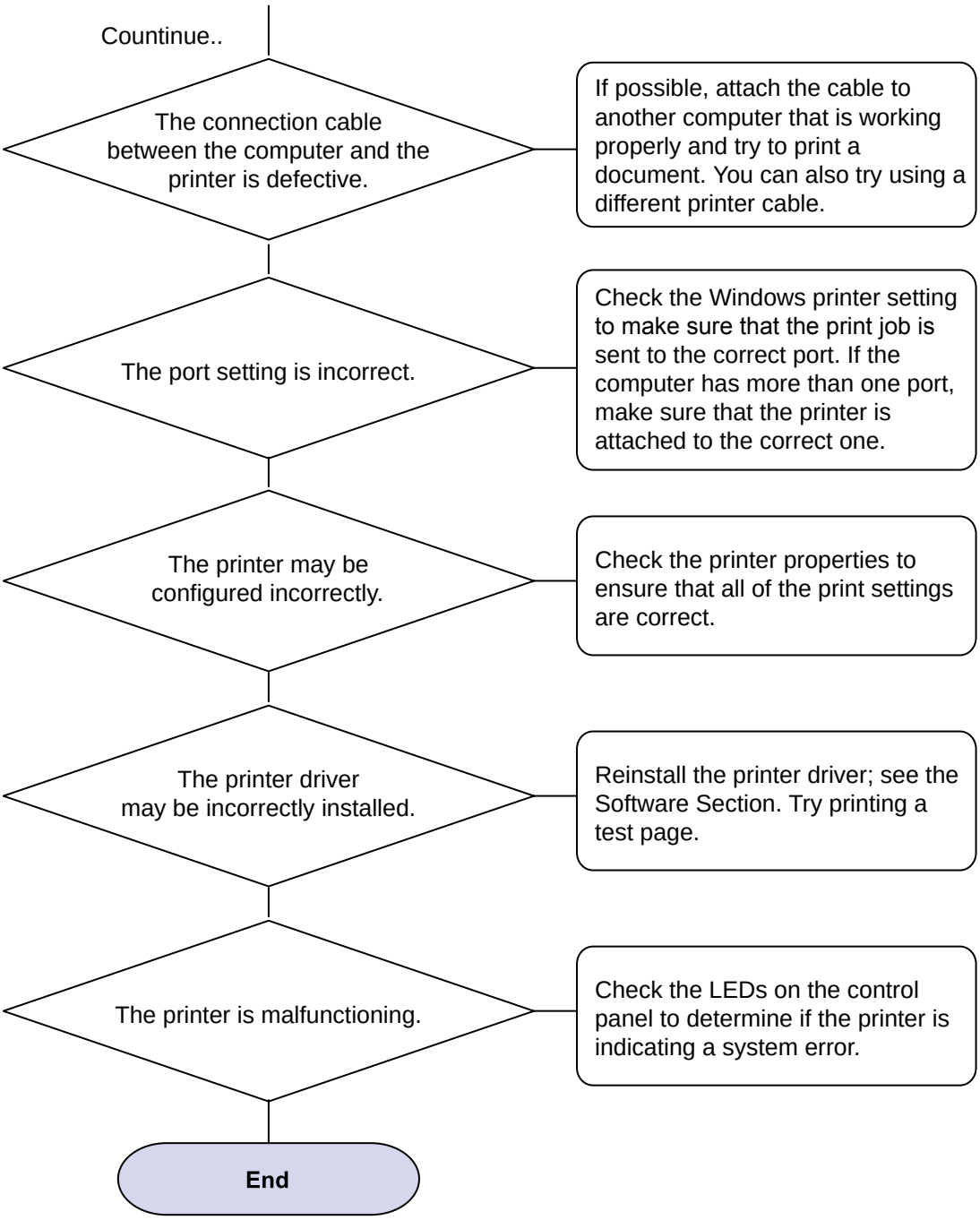

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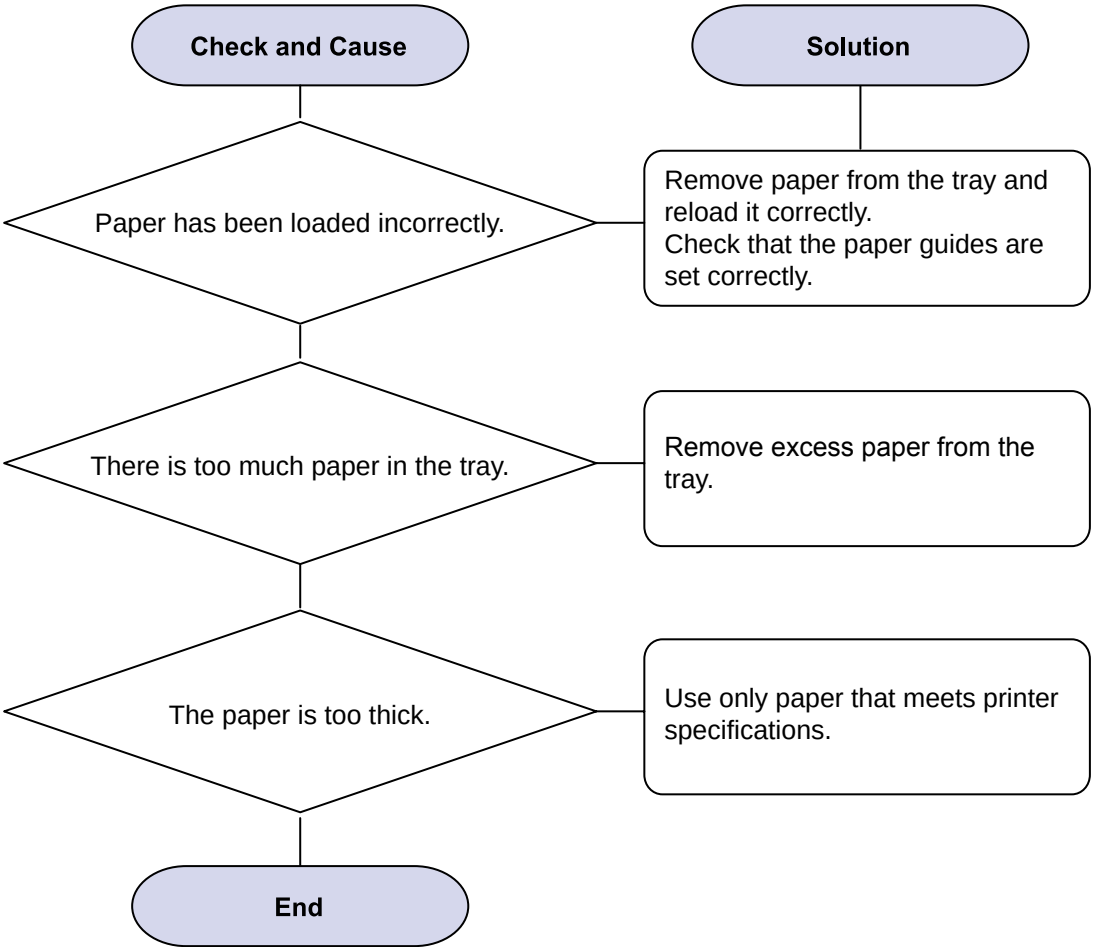
Description Paper does not feed into the printer..



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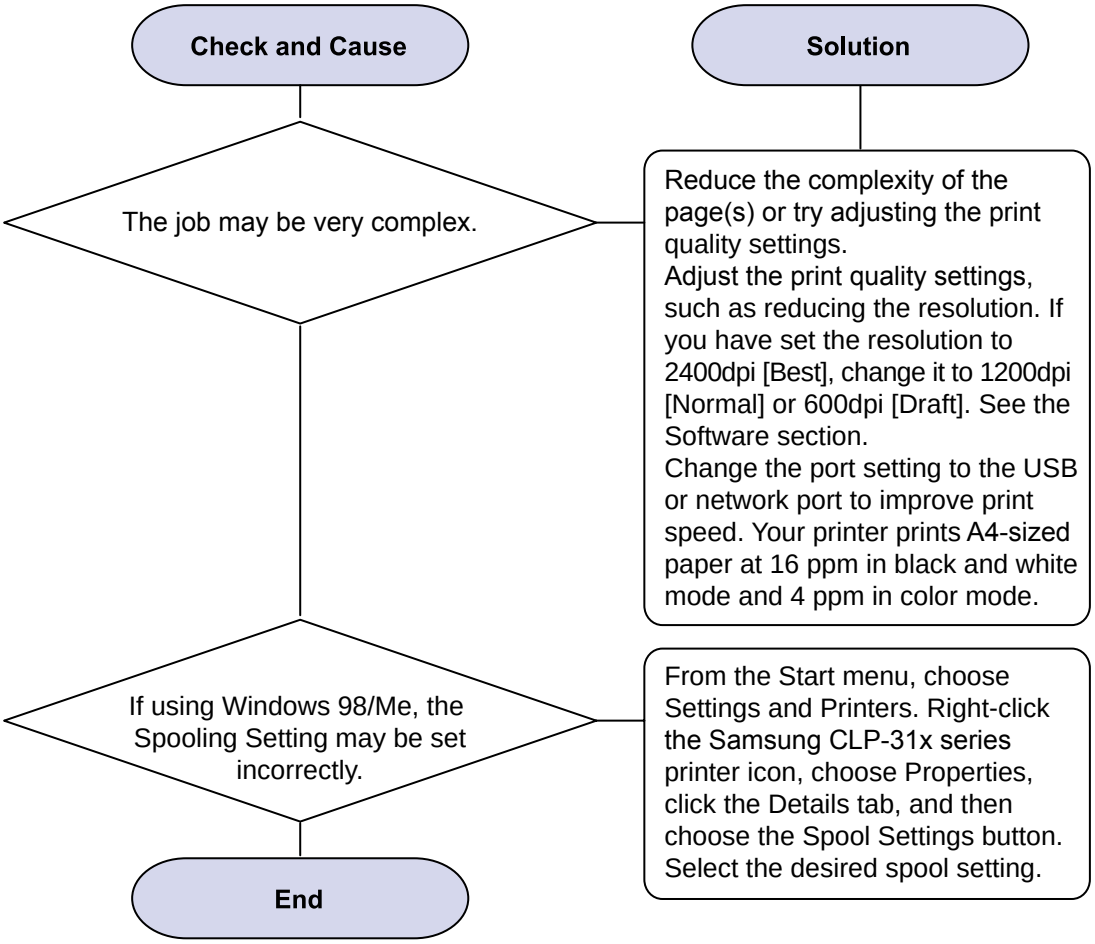
Description A print job is extremely slow.



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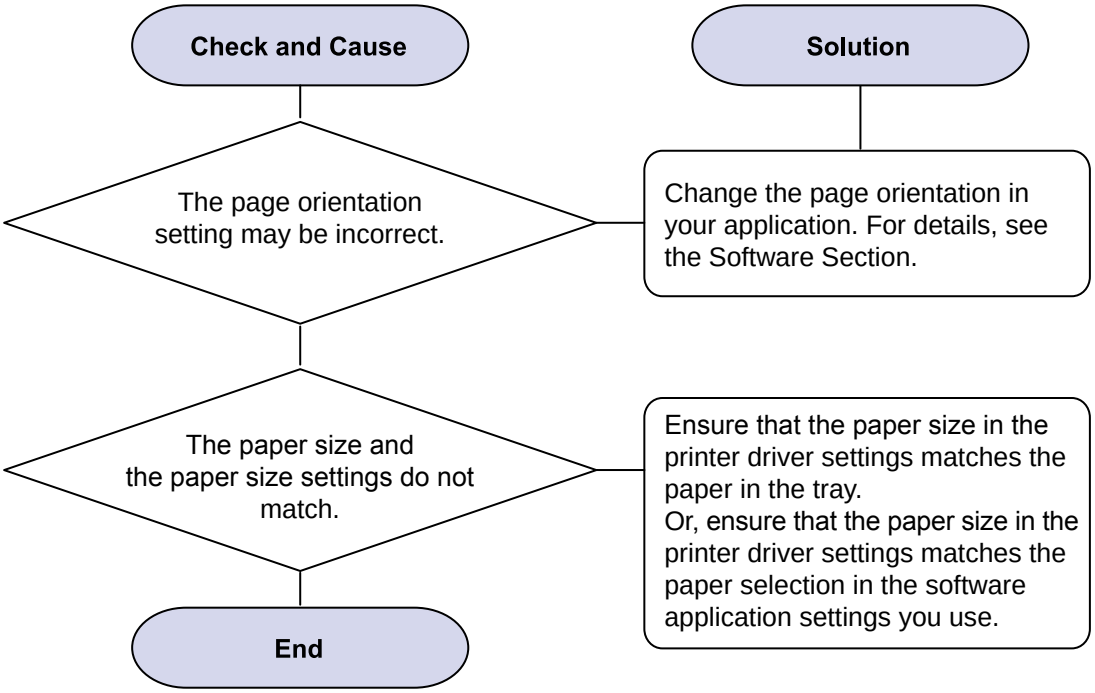
Description Half the page is blank.



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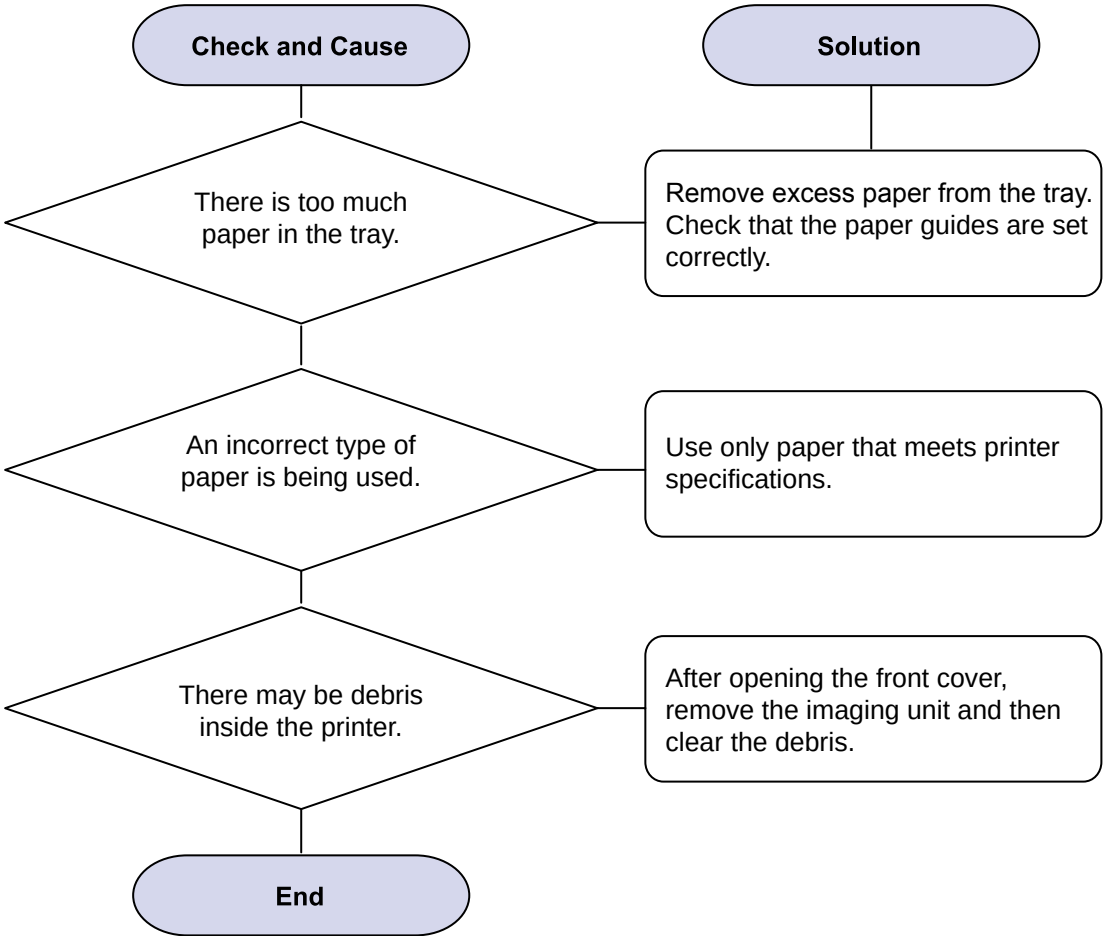
Description The paper keeps jamming.



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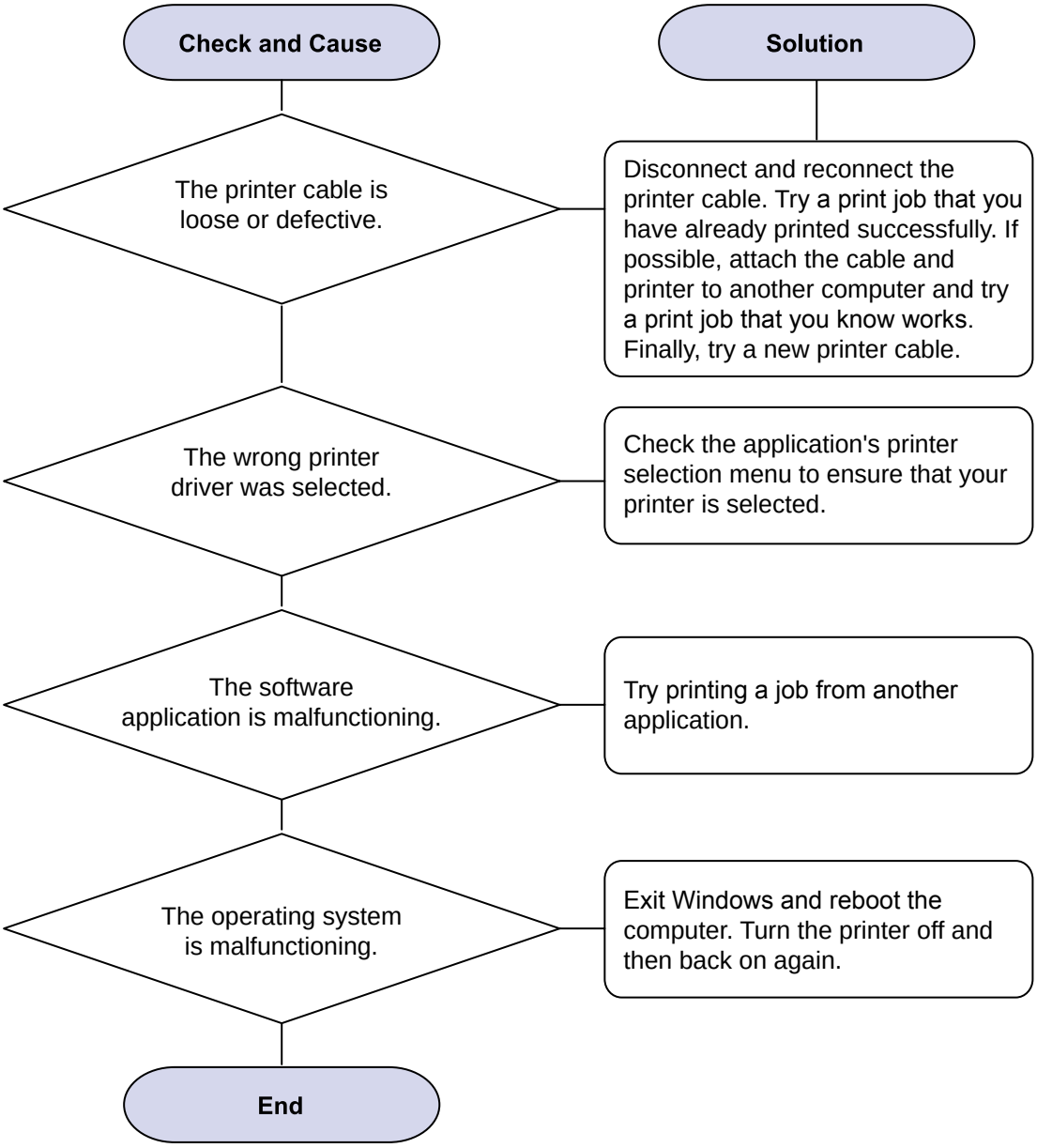
Description	The printer prints, but the text is wrong, garbled, or incomplete.



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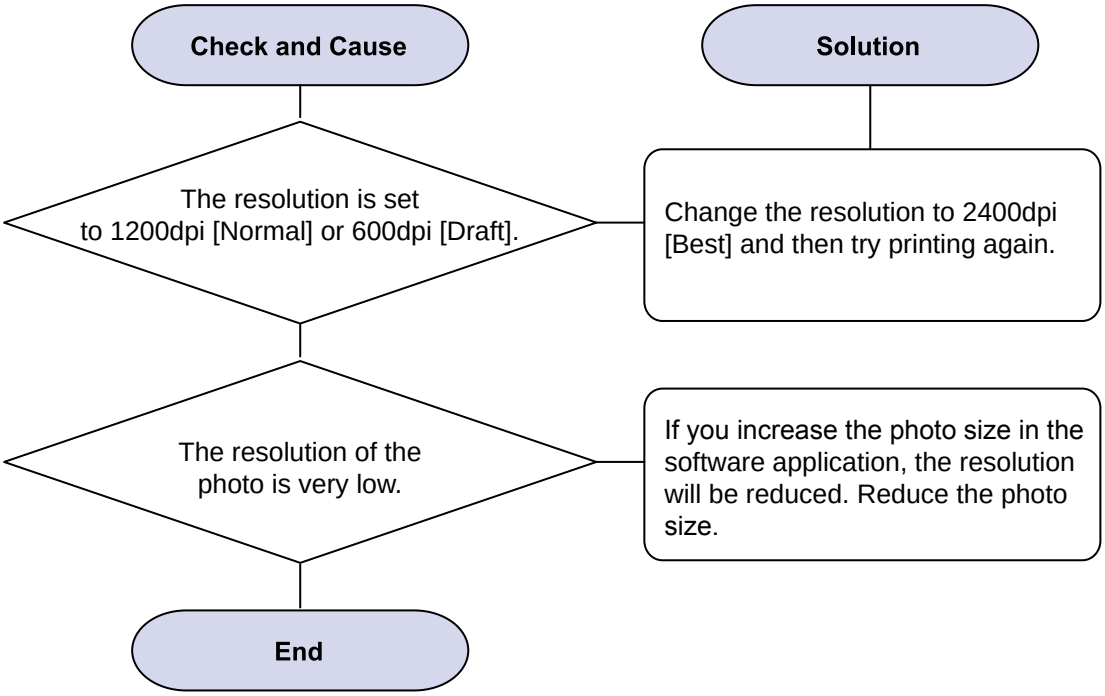
Description	The print quality of photos is not good. Images are not clear.



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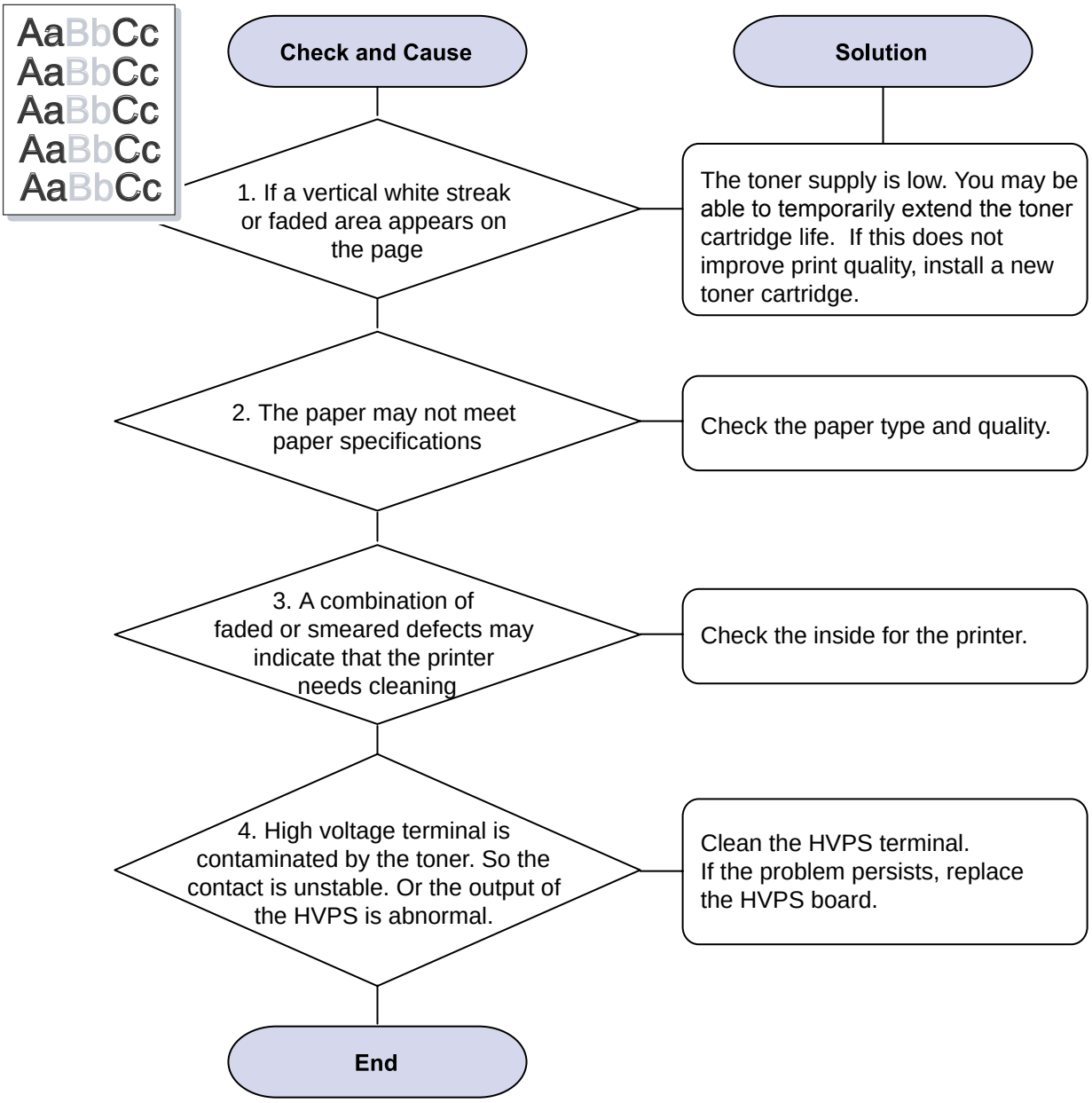
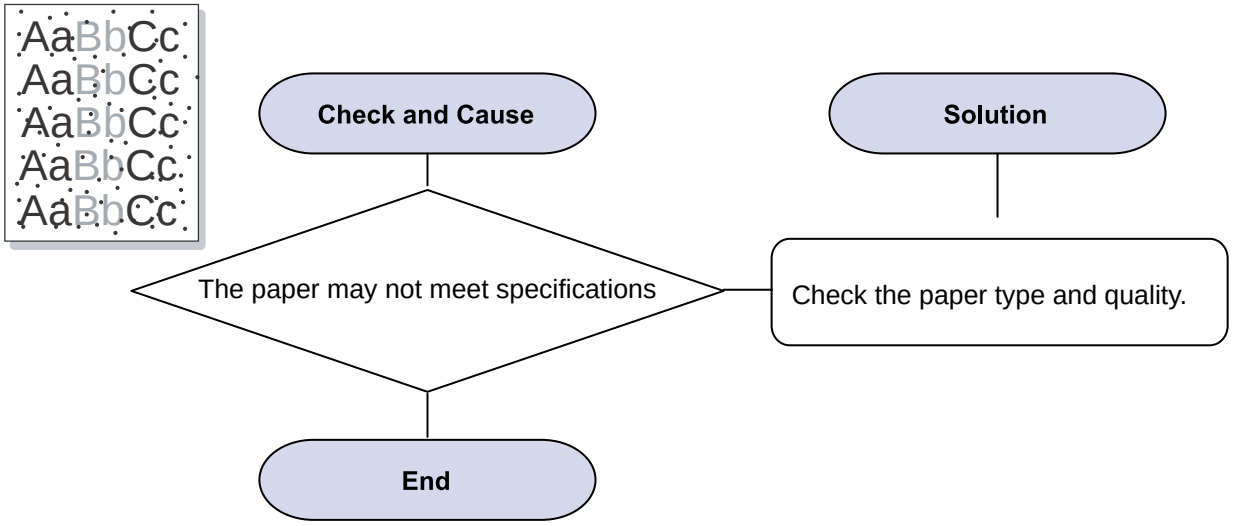
4.2.4 Solving Print Quality Problems

Dirt inside of the printer or improper paper loading may reduce print quality. See the table below to troubleshoot problems.

1) Light or faded print



2) Toner specks



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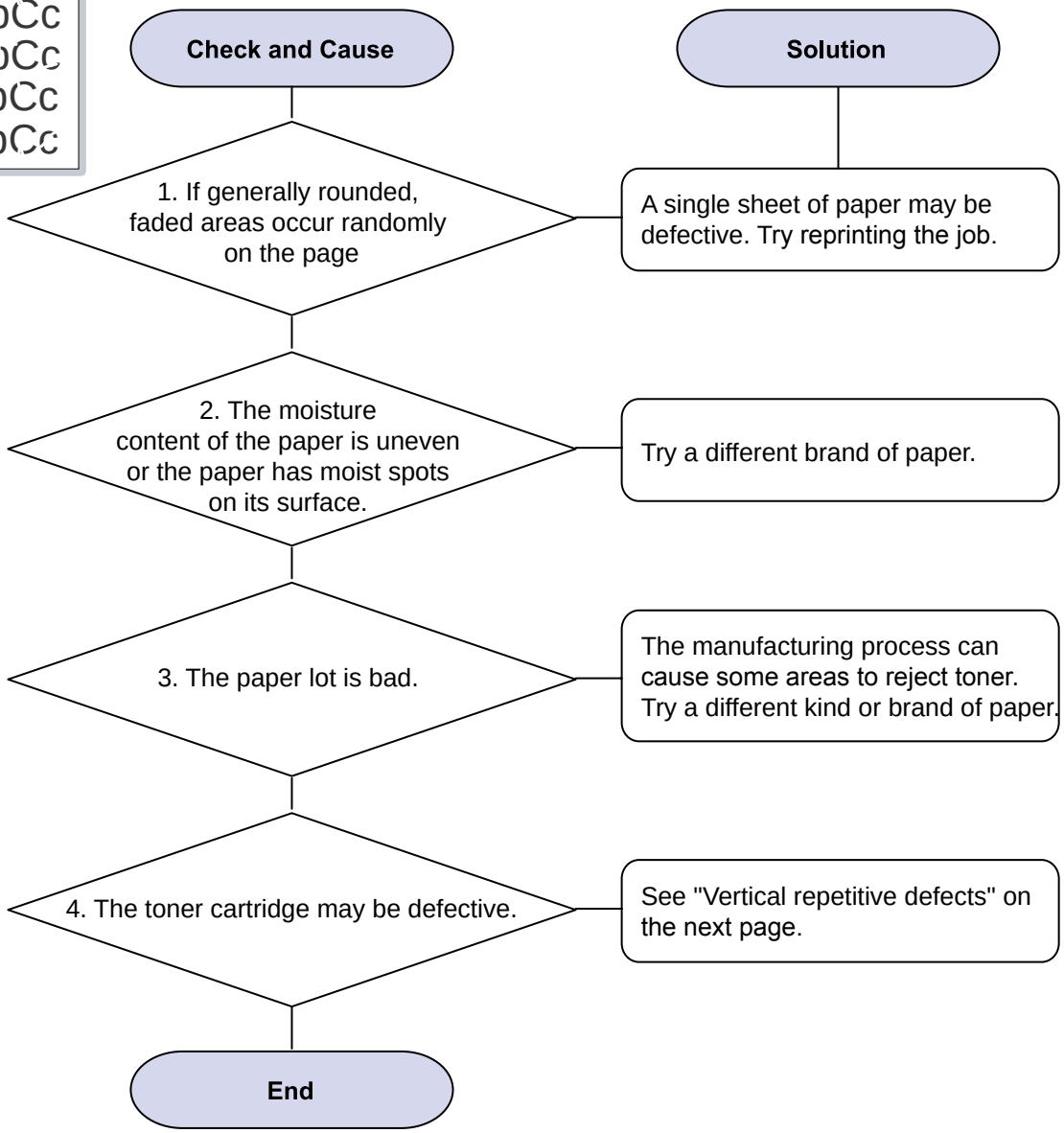
3) Dropouts



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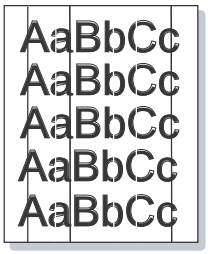
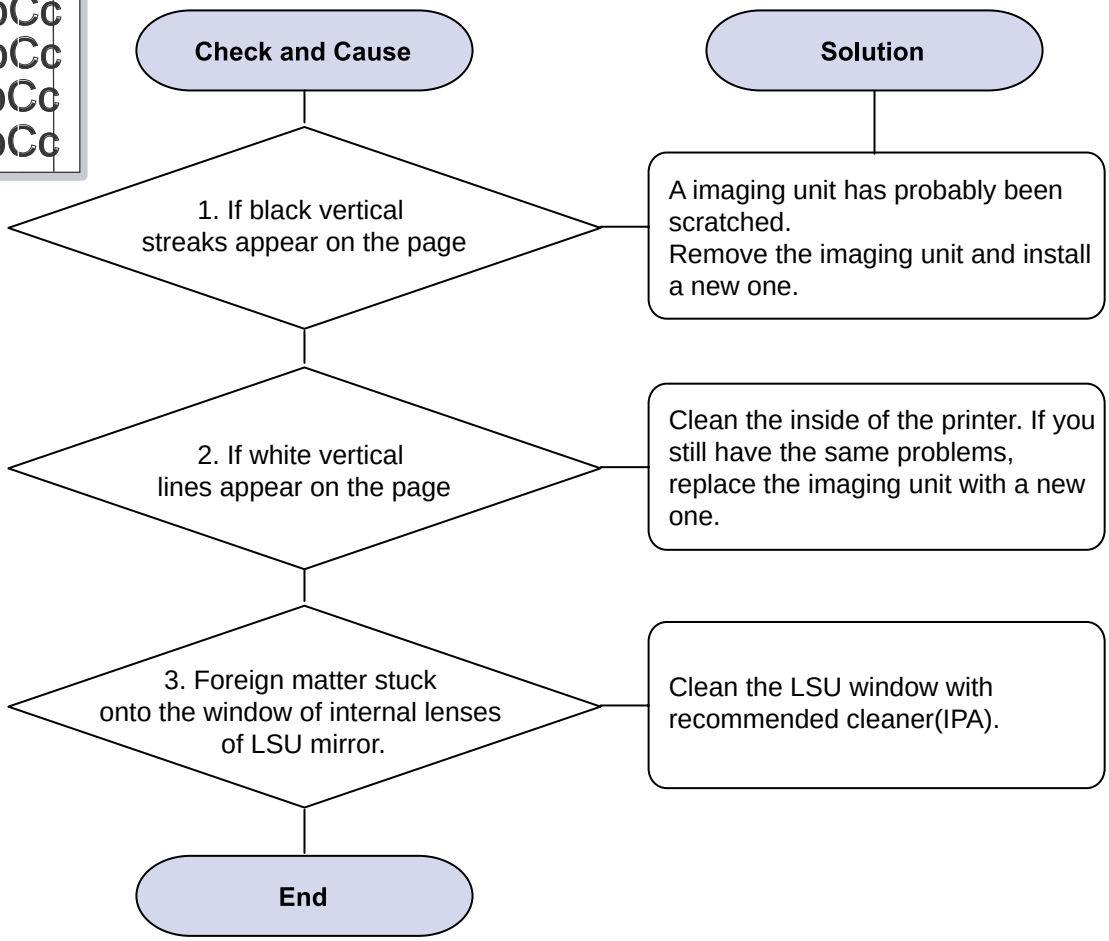
4) Vertical lines





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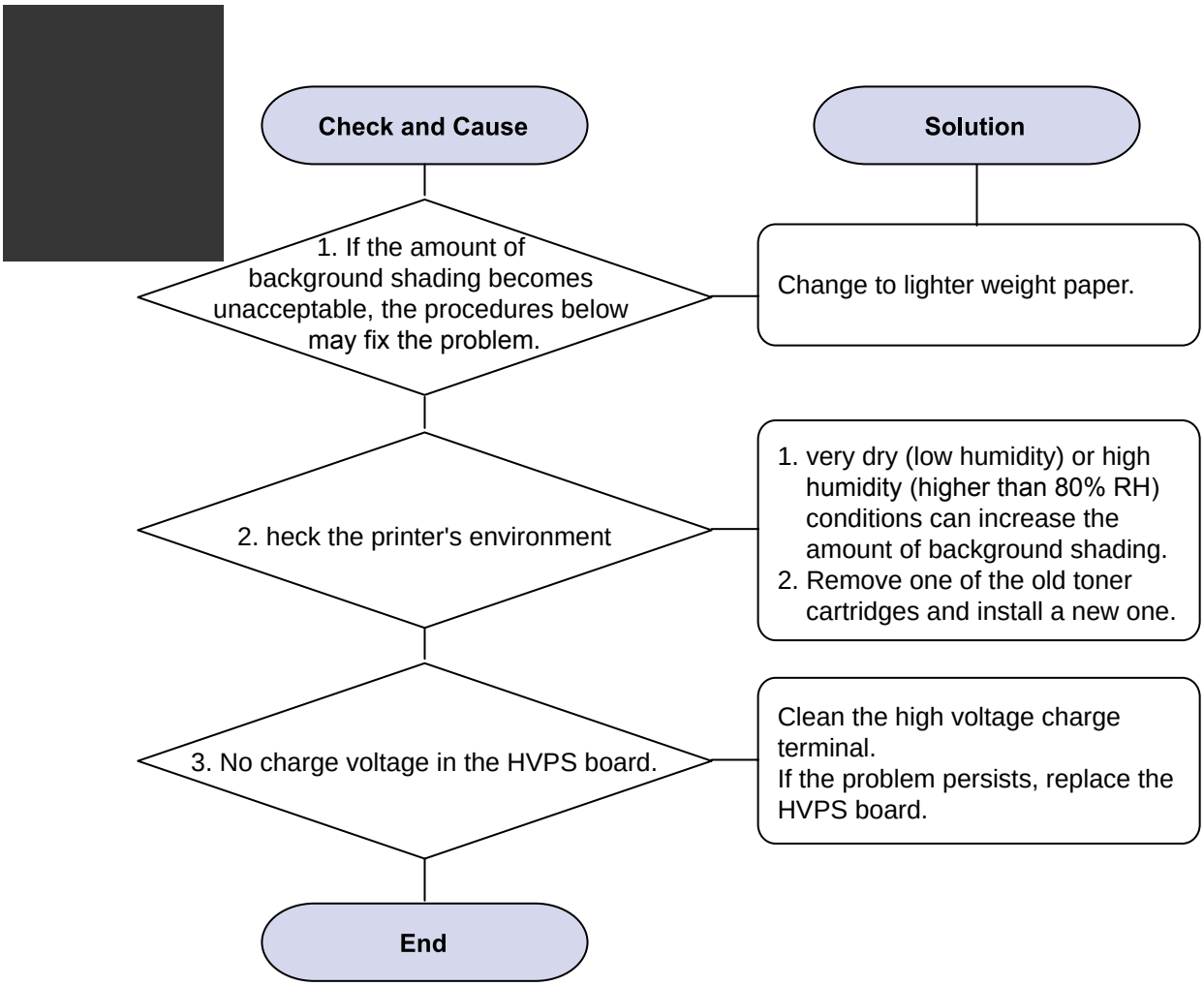
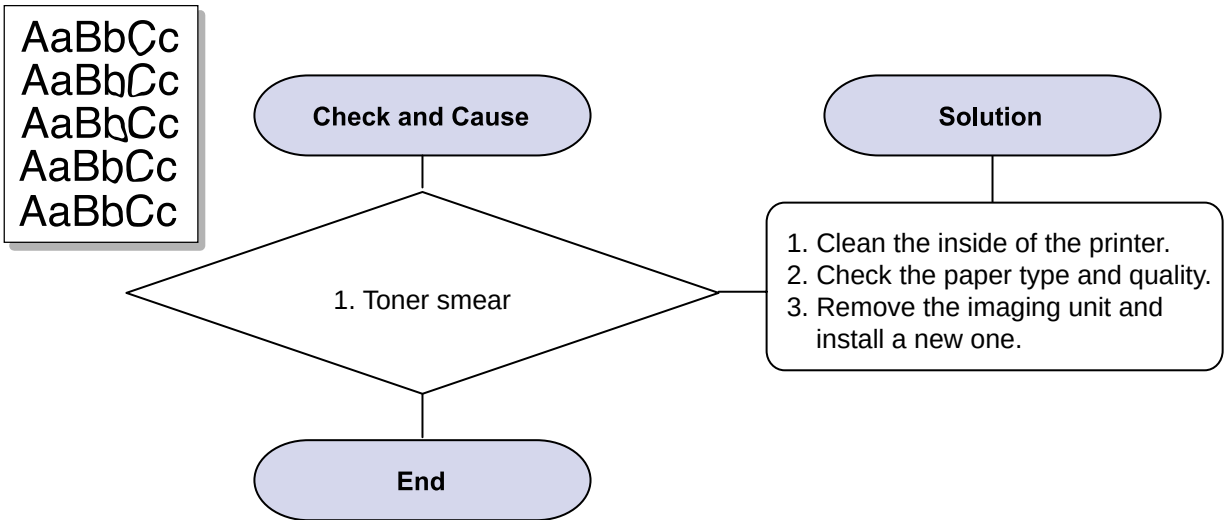
5) Color or Black background



6) Toner smear



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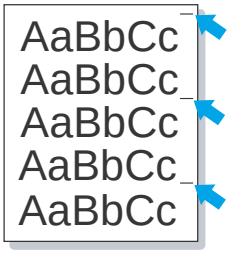
7) Vertical repetitive defects



Check and Cause

Solution

1. If marks repeatedly appear on the printed side of the page at even intervals

Clean the inside of the printer. After cleaning the inside of the printer, if you still have the same problems, install a new toner cartridge of the problem color.

2. Parts of the printer may have toner on them.

If the defects occur on the back of the page, the problem will likely correct itself after a few more pages.

3. The fusing assembly may be damaged.

Contact a service representative.

End

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8) Background scatter

Check and Cause	Solution
1. Background scatter results from bits of toner distributed on the printed page.	The paper may be too damp. Try printing with a different batch of paper. Do not open packages of paper until necessary so that the paper does not absorb too much moisture.
2. If background scatter occurs on an envelope.	Change the printing layout to avoid printing over areas that have overlapping seams on the reverse side. Printing on seams can cause problems.
3. If background scatter covers the entire surface area of a printed page	Adjust the print resolution through your software application or via the printer properties window.

End

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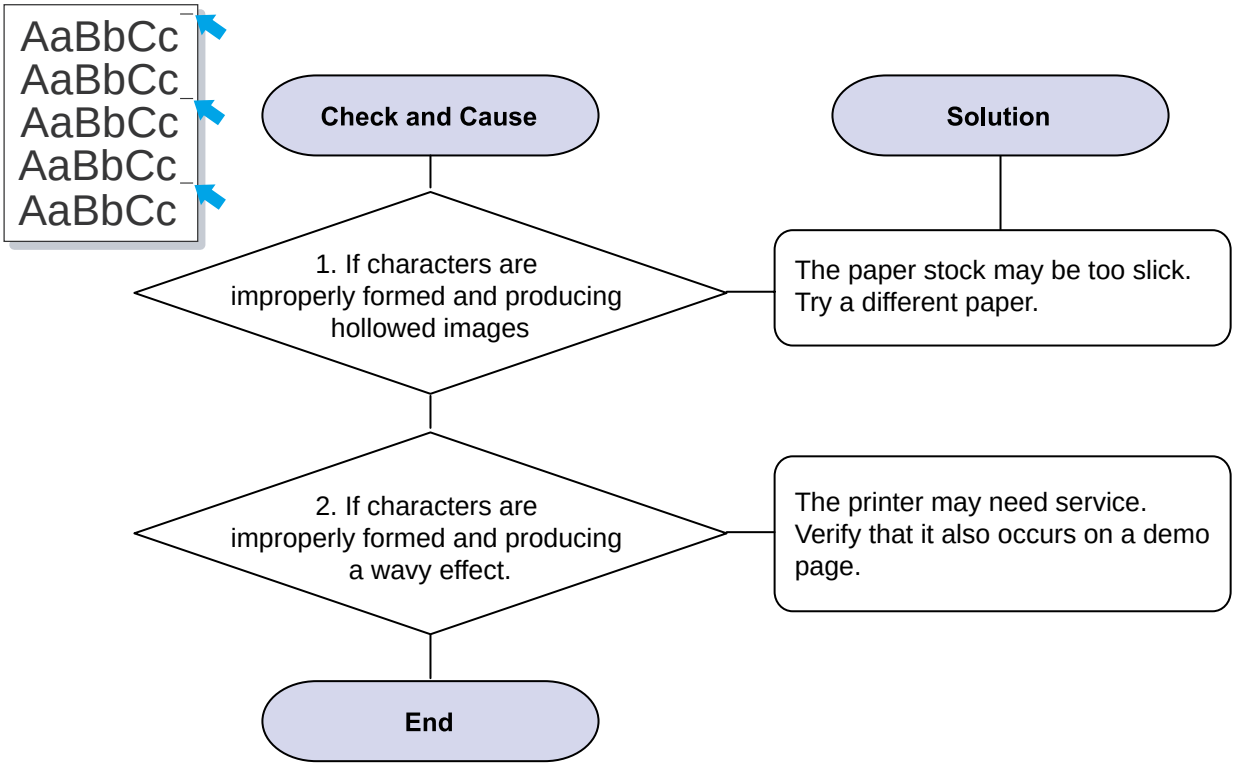
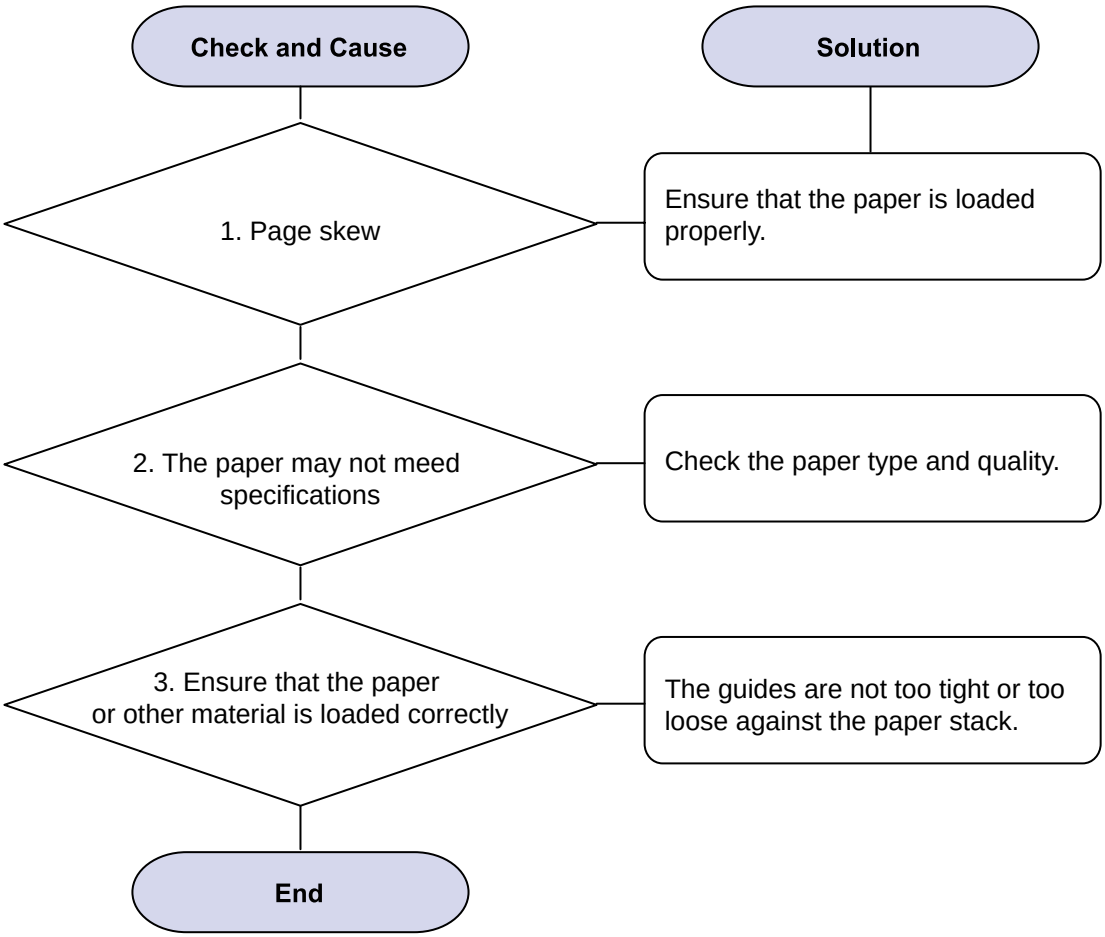
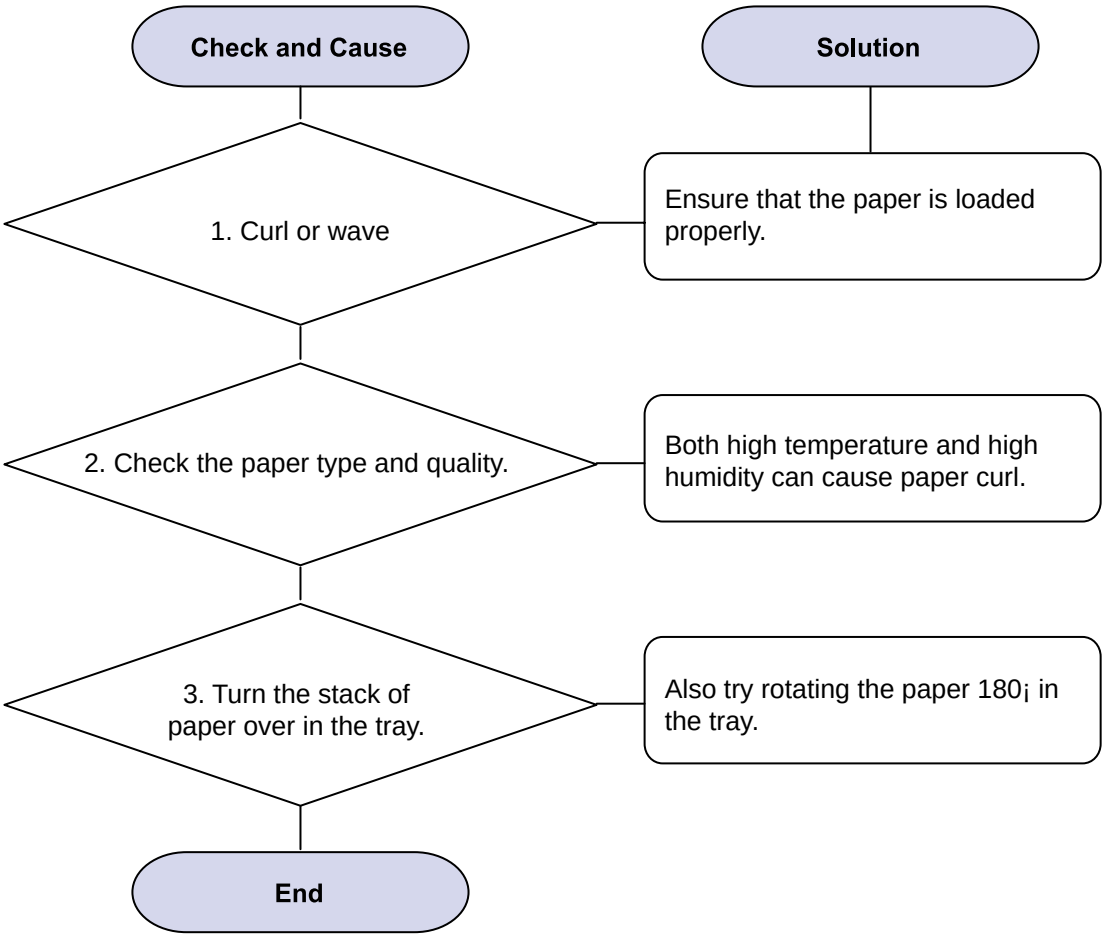
9) Misformed characters



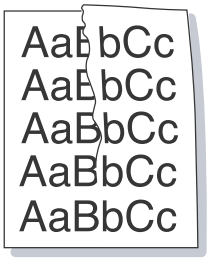
10) Page skew


Check and Cause
Solution
1. Page skew
Ensure that the paper is loaded properly.
2. The paper may not meed specifications
Check the paper type and quality.
3. Ensure that the paper or other material is loaded correctly
The guides are not too tight or too loose against the paper stack.
End

11) Curl or wave



12) Wrinkles or creases



Check and Cause

Solution

1. Wrinkles or creases

Ensure that the paper is loaded properly.

2. The paper may not meed specifications

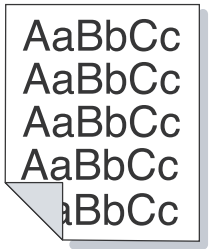
Check the paper type and quality.

3. Turn the stack of paper over in the paper tray.

Also try rotating the paper 180¡ in the tray.

End

13) Back of printouts aredirty



Check and Cause	Solution
1. Does character exist less than 2% per a page, and hasn't it been used long time?	The toner cartridge is basically designed to print 3,000 sheets with 5% image. If it prints more than 3,000 sheets (around 5,000 sheets) with 2% image, a background can be occurred.
2. Does recycle paper be used?	The B/S is not guaranteed if using recycle paper.
3. Has the life span of the developer ended?	Replace the developer when the life span of it has been ended.
4. Is the movement (Up and Down) of the transfer roller smooth?	Clean the bushing part of the transfer roller.
5. Is the HVPS normal?	If the problem is still not solved, replace the developer.

End

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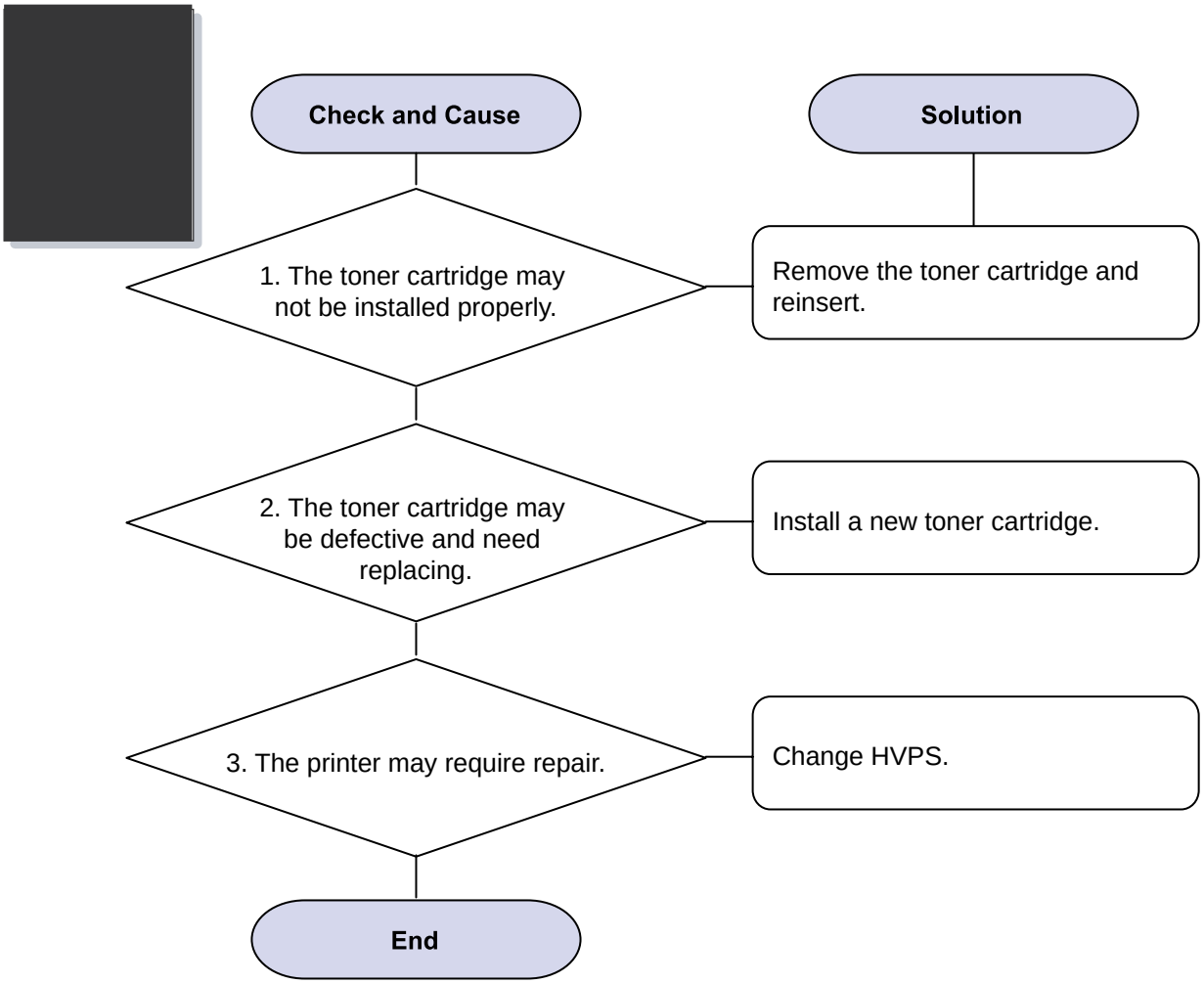
14) Solid Color or Black pages



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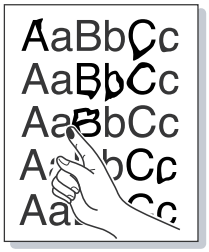
15) Loose toner



Check and Cause	Solution
1. Loose toner	Clean the inside of the printer.
2. The paper may not meed specifications	Check the paper type and quality.
3. The Toner Cartridge may be defective and need replacing.	Install a new toner cartridge.
4. If the problem persists, the printer may require repair.	Contact a service representative.

End

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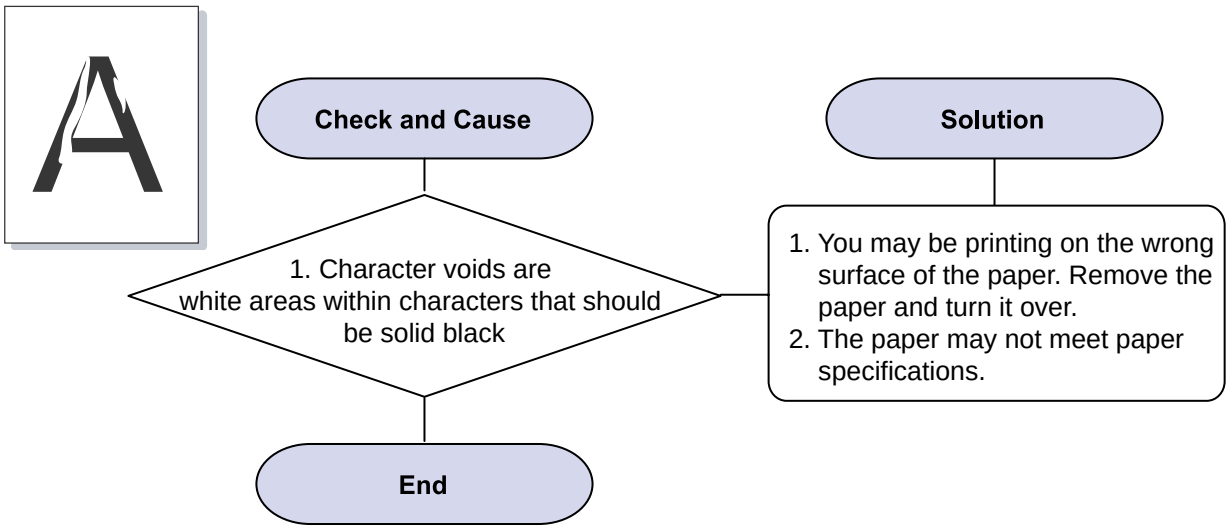
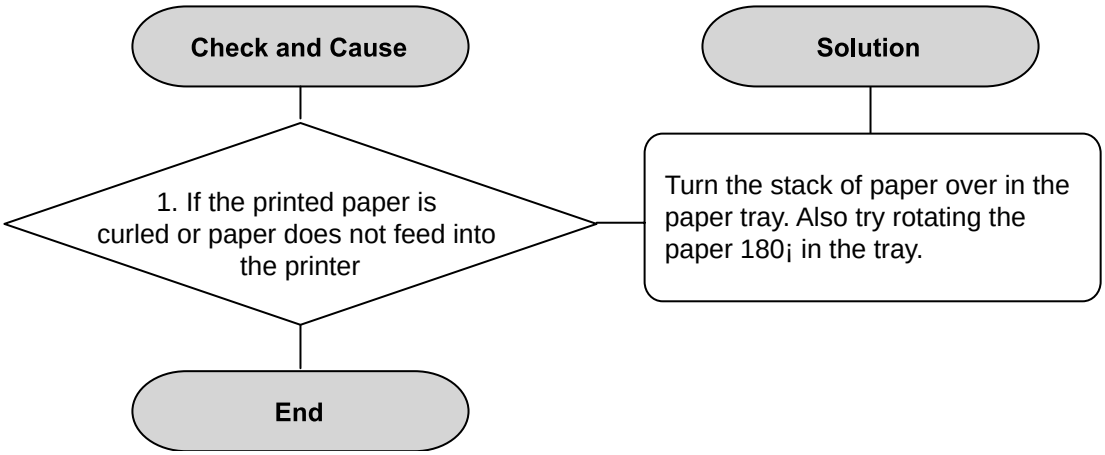
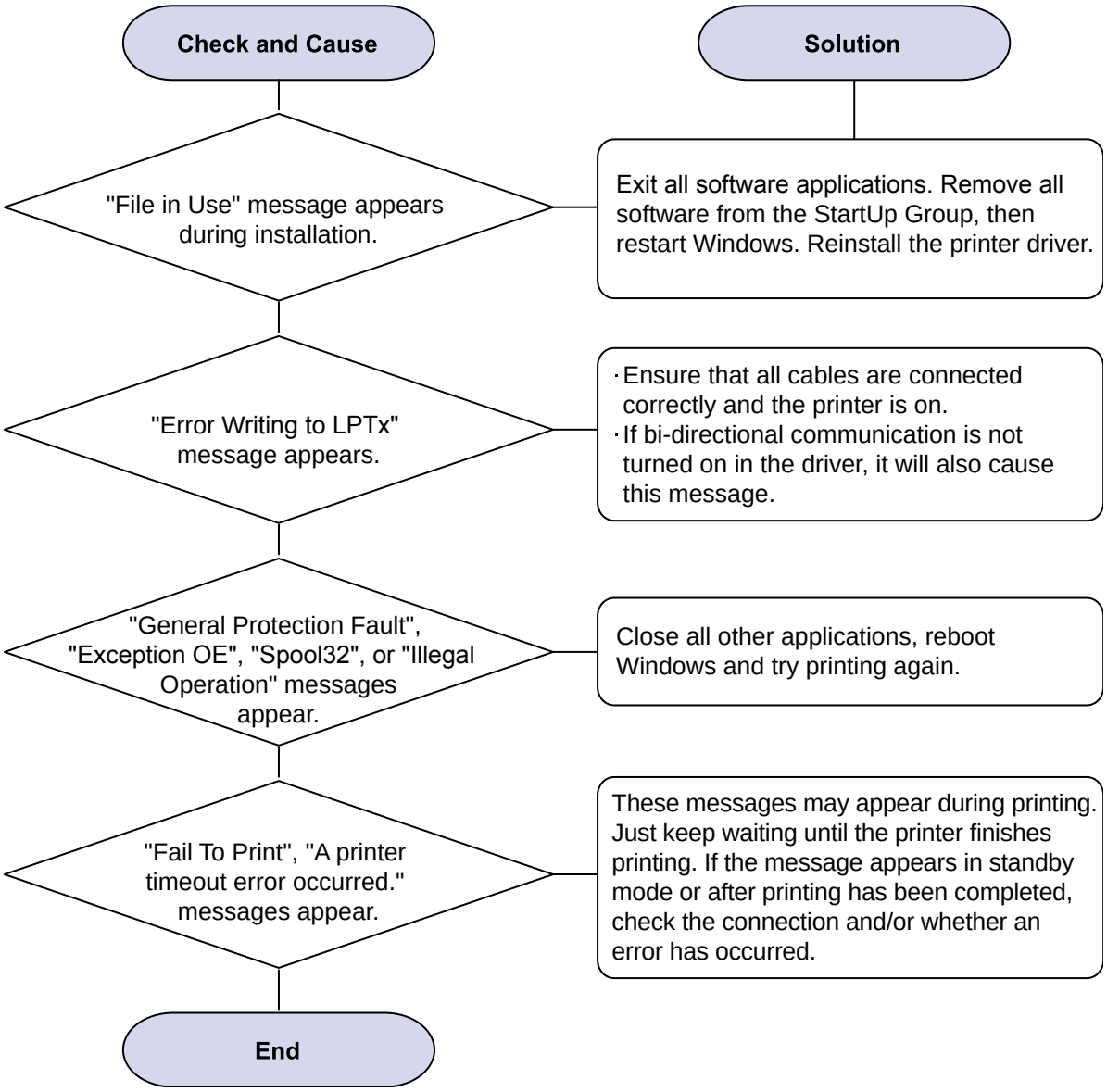
16) Character Voids



& X U O


Check and Cause
Solution
1. If the printed paper is curled or paper does not feed into the printer
Turn the stack of paper over in the paper tray. Also try rotating the paper 180¡ in the tray.
End

4.2.5 Common Windows Problems



NOTE: *Refer to the Microsoft Windows 98/Me/NT 4.0/2000/2003/XP User's Guide that came with your PC for further information on Windows error messages.*

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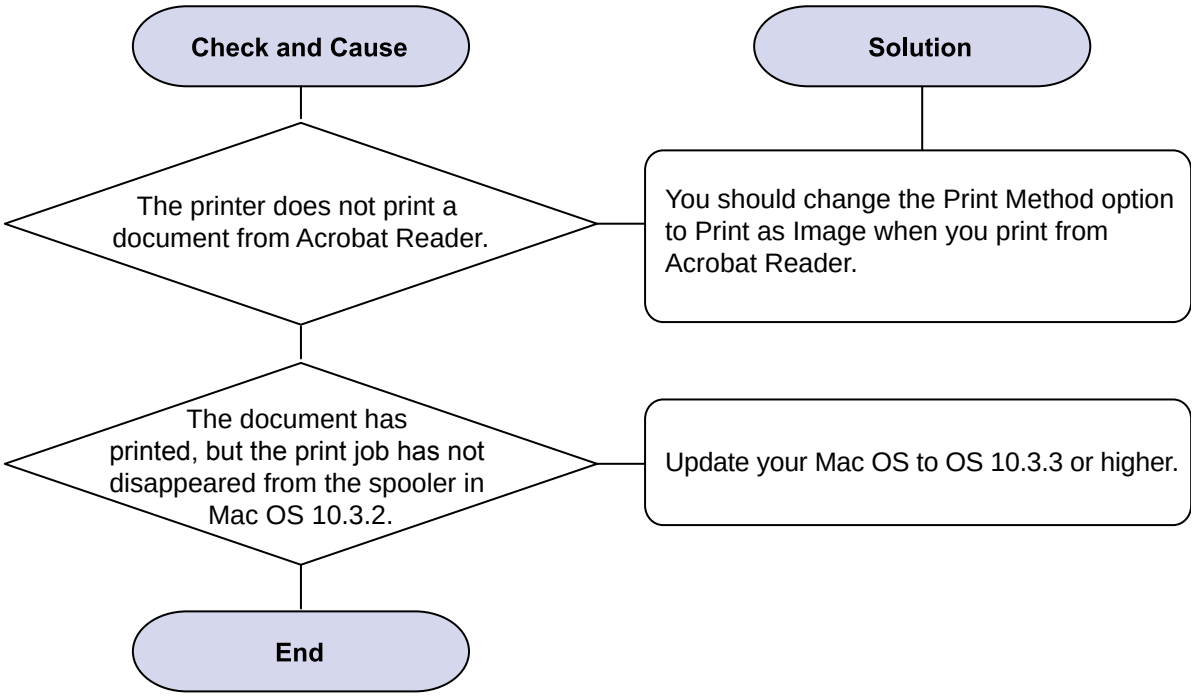
4.2.6 Common Macintosh Problems



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4.2.7 Common Linux Problems

Check and Cause	Solution
I can't change settings in the configuration tool.	You need to have administrator privileges to be able to change global settings.
I am using the KDE desktop but the configuration tool and LLPR won't start.	You may not have the GTK libraries installed. These usually come with most Linux distributions, but you may have to install them manually. Refer to your distribution's installation manual for more details about installing additional packages.
I just installed this package but can't find entries in the KDE/ Gnome menus.	Some versions of the KDE or GNOME desktop environments may require that you restart your session for the changes to take effect.
I can't make a printer the system default.	In some conditions, it may not be possible to change the default queue. This happens with some variants of LPRng, especially on recent RedHat systems that use the "printconf" database of queues. When using printconf, the /etc./printcap file is automatically refreshed from the database of printers managed by the system (usually through the "printtool" command), and the queues in /etc./printcap.local are appended to the resulting file. The default queue in LPRng is defined as the first queue in /etc./printcap, and therefore it is not possible for the Linux Printer Package to change the default when some queues have otherwise been defined using printtool. LPD systems identify the default queue as the one named "lp". Thus, if there is already a queue by this name, and if it doesn't have an alias, then you won't be able to change the default. To work around this, you can either delete the queue or rename it by manually editing the /etc./printcap file.

Continue..

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The N-up setting does not work correctly for some of my documents.

The N-up feature is achieved through post-processing of the PostScript data that is sent to the printing system. However, such post-processing can only be adequately achieved if the PostScript data conforms to the Adobe Document Structing Conventions. Problems may arise when using N-up and other features that rely on post-processing if the document being printed isn't compliant.

I am using BSD lpr (Slackware, Debian, older distributions) and some options chosen in LLPR don't seem to take effect.

Legacy BSD lpr systems have a hard limitation on the length of the option string that can be passed to the printing system. As such, if you selected a number of different options, you may have exceeded the length of the options and some of your choices won't be passed to the programs responsible for implementing them. Try to select fewer options that deviate from the defaults, to save on memory usage.

I am trying to print a document in Landscape mode, but it prints rotated and cropped.

Most Unix applications that offer a Landscape orientation option in their printing options will generate correct PostScript code that should be printed as is. In that case, you need to make sure that you leave the LLPR option set to its default Portrait setting, to avoid unwanted rotations of the page that would result in cropped output.

Some pages come out all white (nothing is printed), and I am using CUPS.

If the data being sent is in Encapsulated PostScript (EPS) format, some earlier versions of CUPS (1.1.10 and before) have a bug preventing them from being processed correctly. When going through LLPR to print, the Printer Package will work around this issue by converting the data to regular PostScript. However, if your application bypasses LLPR and feeds EPS data to CUPS, the document may not print correctly.

I can't print to an SMB (Windows) printer.

To be able to configure and use SMB-shared printers (such as printers shared on a Windows printer), you need to have a correct installation of the SAMBA package that enables that feature. The "smbclient" command should be available and usable on your system.

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My application seems to be frozen while LLPR is running.

Most Unix applications will expect a command like the regular "lpr" command to be non-interactive and thus return immediately. Since LLPR is waiting for user input before passing the job on to the print spooler, very often the application will wait for the process to return, and thus will appear to be frozen (its windows won't refresh). This is normal and the application should resume functioning correctly after the user exits LLPR.

How do I specify the IP address of my SMB server?

It can be specified in the "Add Printer" dialogue of the configuration tool, if you don't use the CUPS printing system. Unfortunately, CUPS currently doesn't allow you to specify the IP address of SMB printers, so you will have to be able to browse the resource with SAMBA in order to be able to print.

Some documents come out as white pages when printing.

Some versions of CUPS, especially those shipped with Mandrake Linux before the 8.1 release, have some known bugs when processing PostScript output from some applications. Try upgrading to the latest version of CUPS (at least 1.1.14). Some RPM packages for the most popular distributions are provided as a convenience with this Linux Printing Package.

I have CUPS and some options (such as N-up) seem to be always enabled even though I don't choose them in LLPR.

There may be some local options defined in your ~/ . lpoptions file, which are manipulated by the lpoptions command. These options are always used if not overridden by LLPR settings. To get rid of all options for a printer, run the following command, replacing "printer" with the name of the queue:
lpoptions -x printer

I configured a printer to print to a file, but I get "Permission denied" errors.

Most printing systems will not run as the super-user but as a special user (usually "lp"). Therefore, make sure that the file you have chosen to print to is accessible to the user owning the spooler daemon.

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Continue..

On my PCL (or GDI) printer, I sometimes get error messages printing instead of my document.

Unfortunately, some Unix applications may generate non-compliant PostScript output that may not be supported by Ghostscript, or even the printer itself in PostScript mode. You can try to capture the output to a file and view the results with Ghostscript (gv or ghostview will allow you to do so interactively) and see if you get error messages. However, since the application is probably at fault, contact your software vendor to inform them of the issue.

Some color images come out all black.

This is a known bug in Ghostscript (until GNU Ghostscript version 7.05) when the base color space of the document is indexed color space and it is converted through CIE color space. Because Postscript uses CIE color space for Color Matching System, you should upgrade Ghostscript on your system to at least GNU Ghostscript version 7.06 or later. You can find recent Ghostscript versions at www.ghostscript.com.

End

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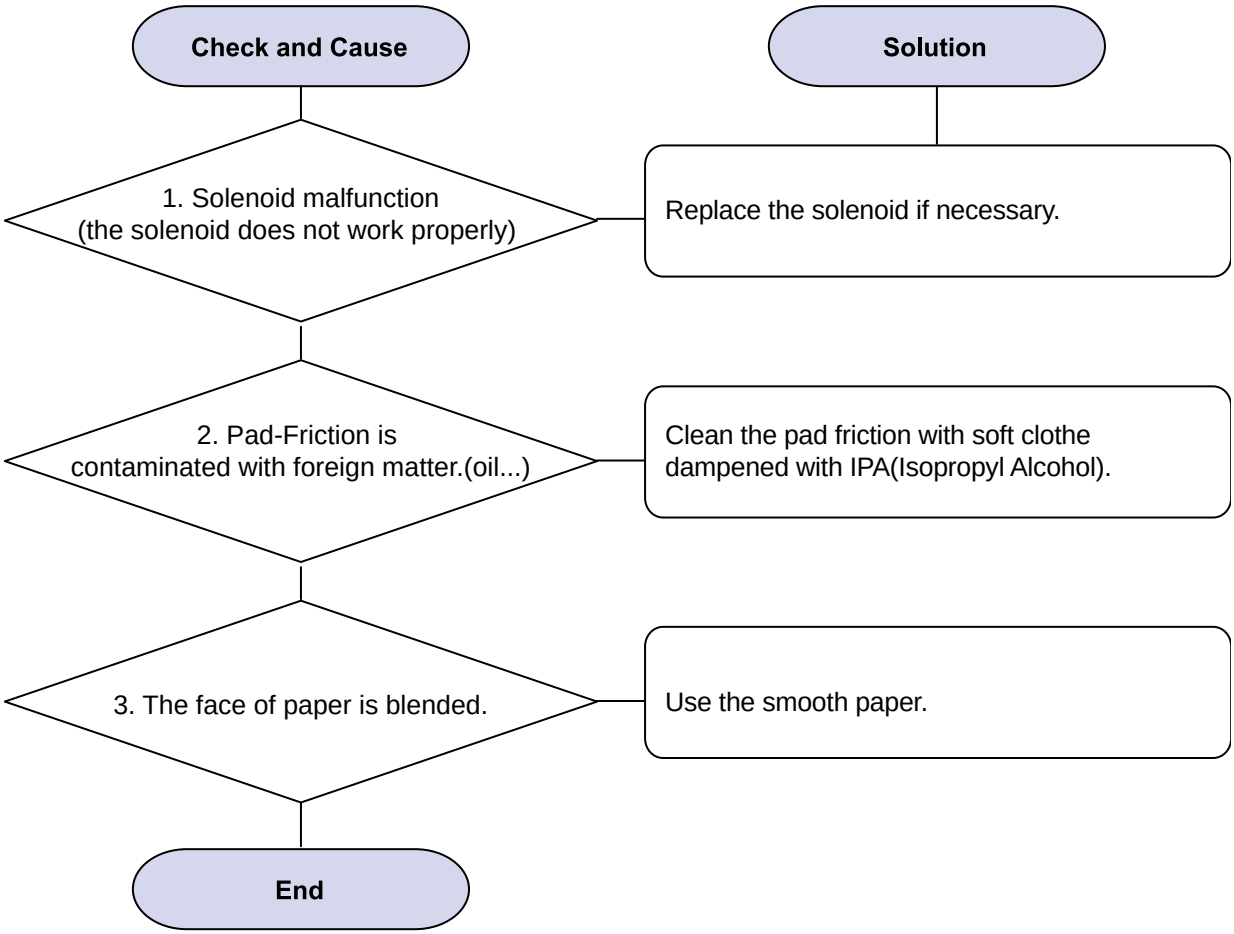
4.2.8 Major Problems Trouble shooting

1) Multi-Feeding

Description	Multiple sheets of paper are fed at once.



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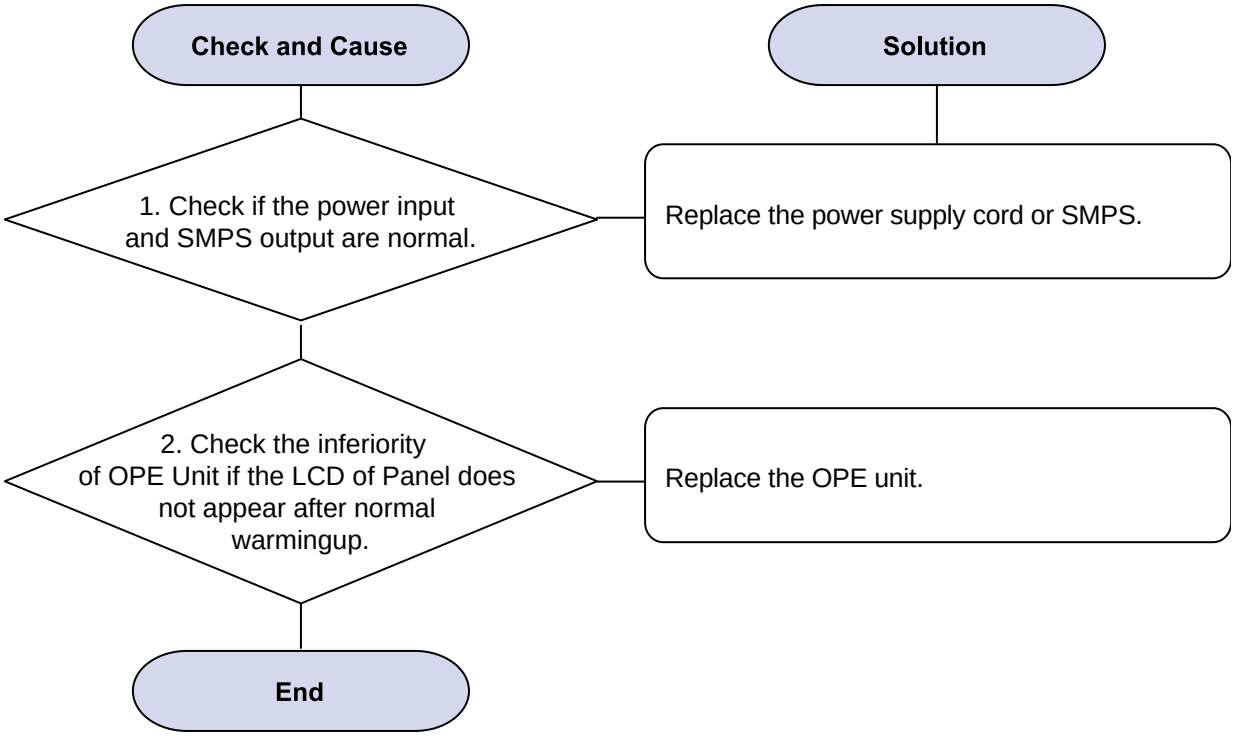
2) No Power

Description	When system power is turned on, The LCD and status LED on the operator panel do not come on.



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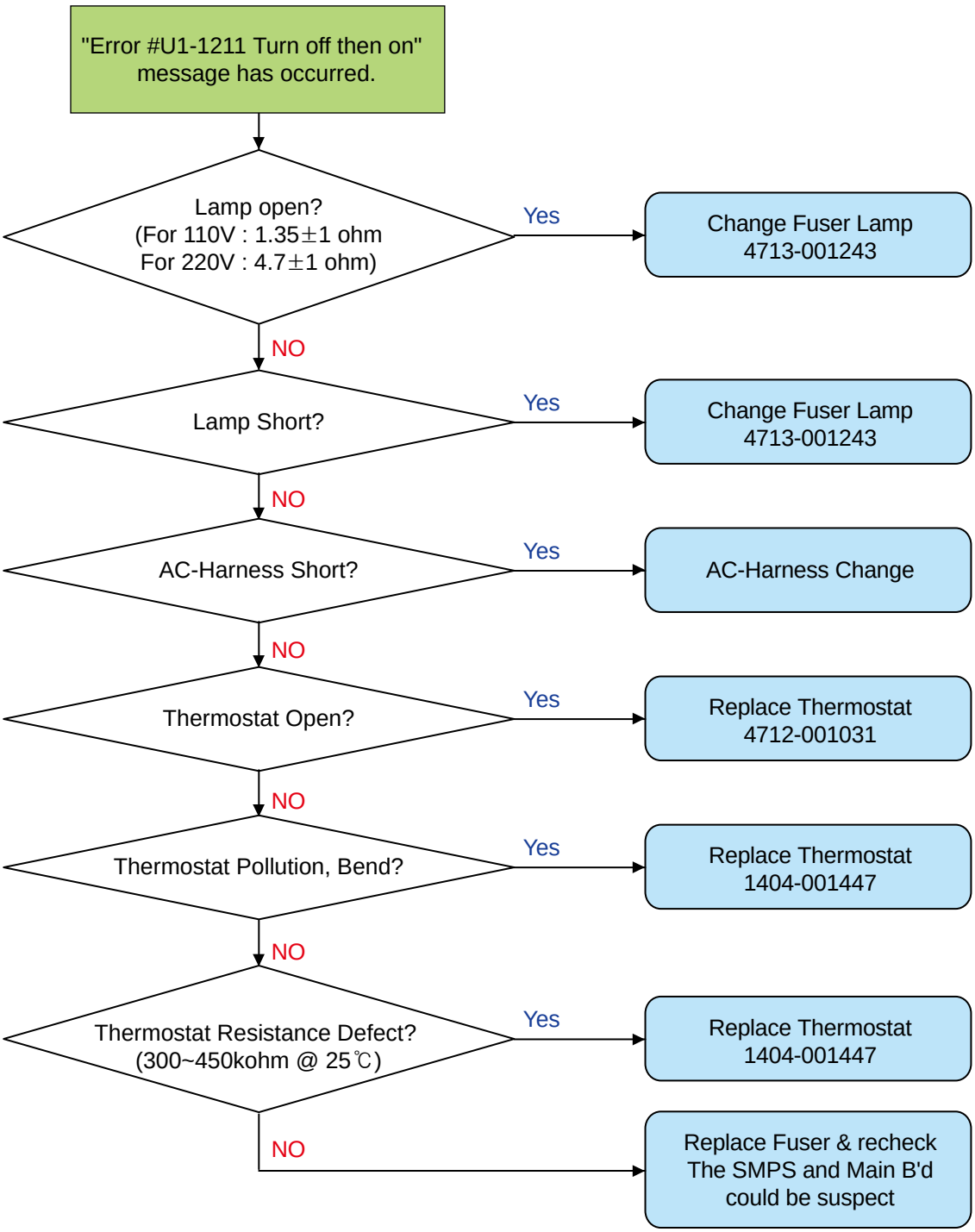
3) Fuser error

a) Low heat error



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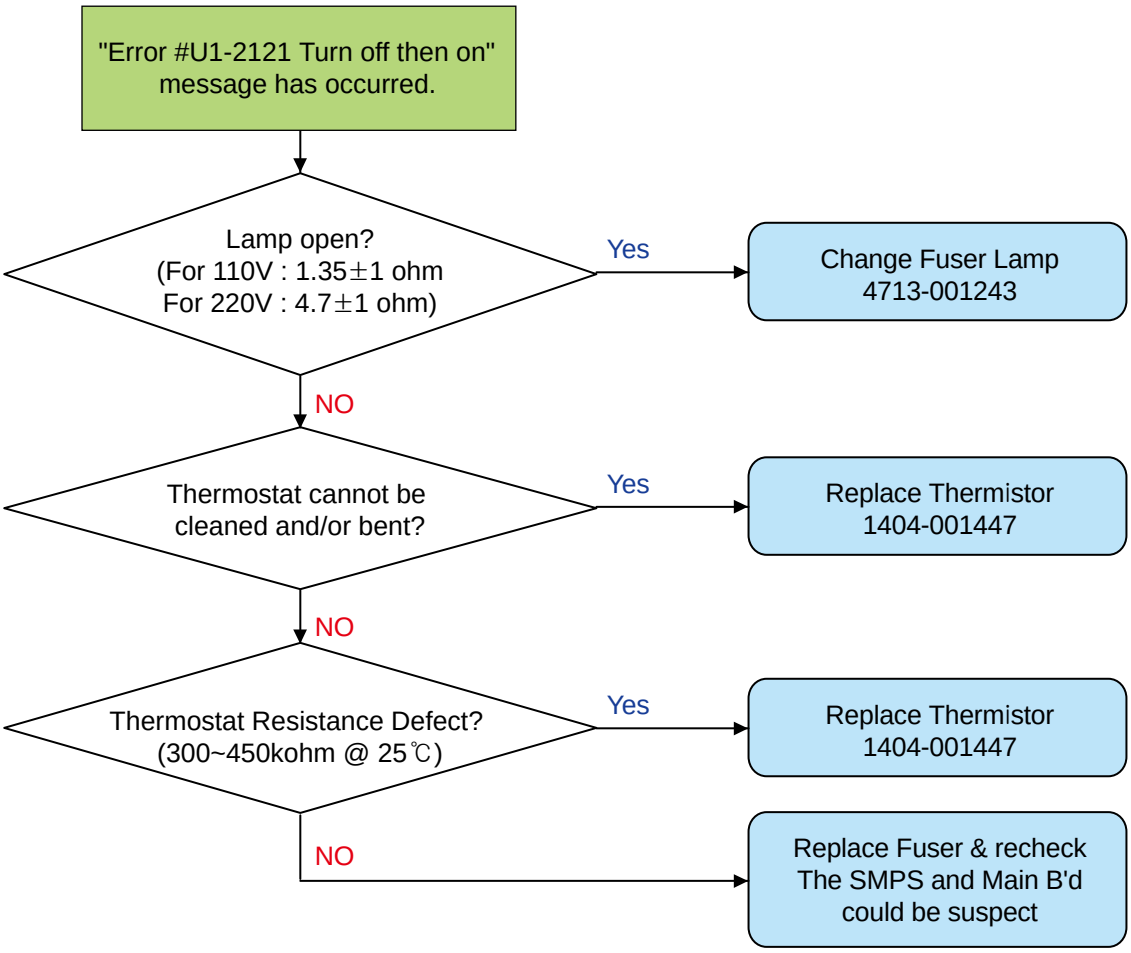
b) Low heat error



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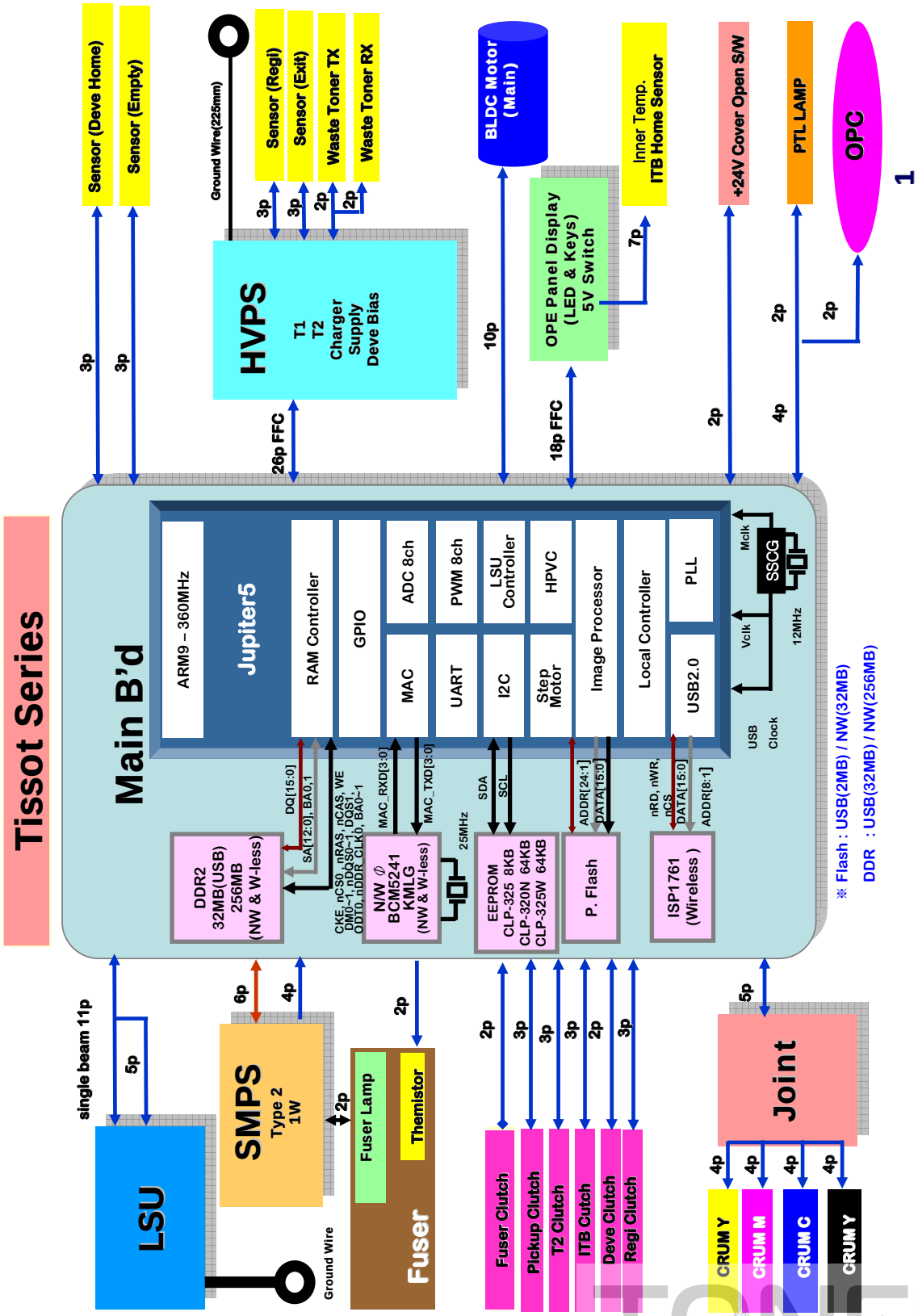
5. System Diagram

5.1 Block Diagramg



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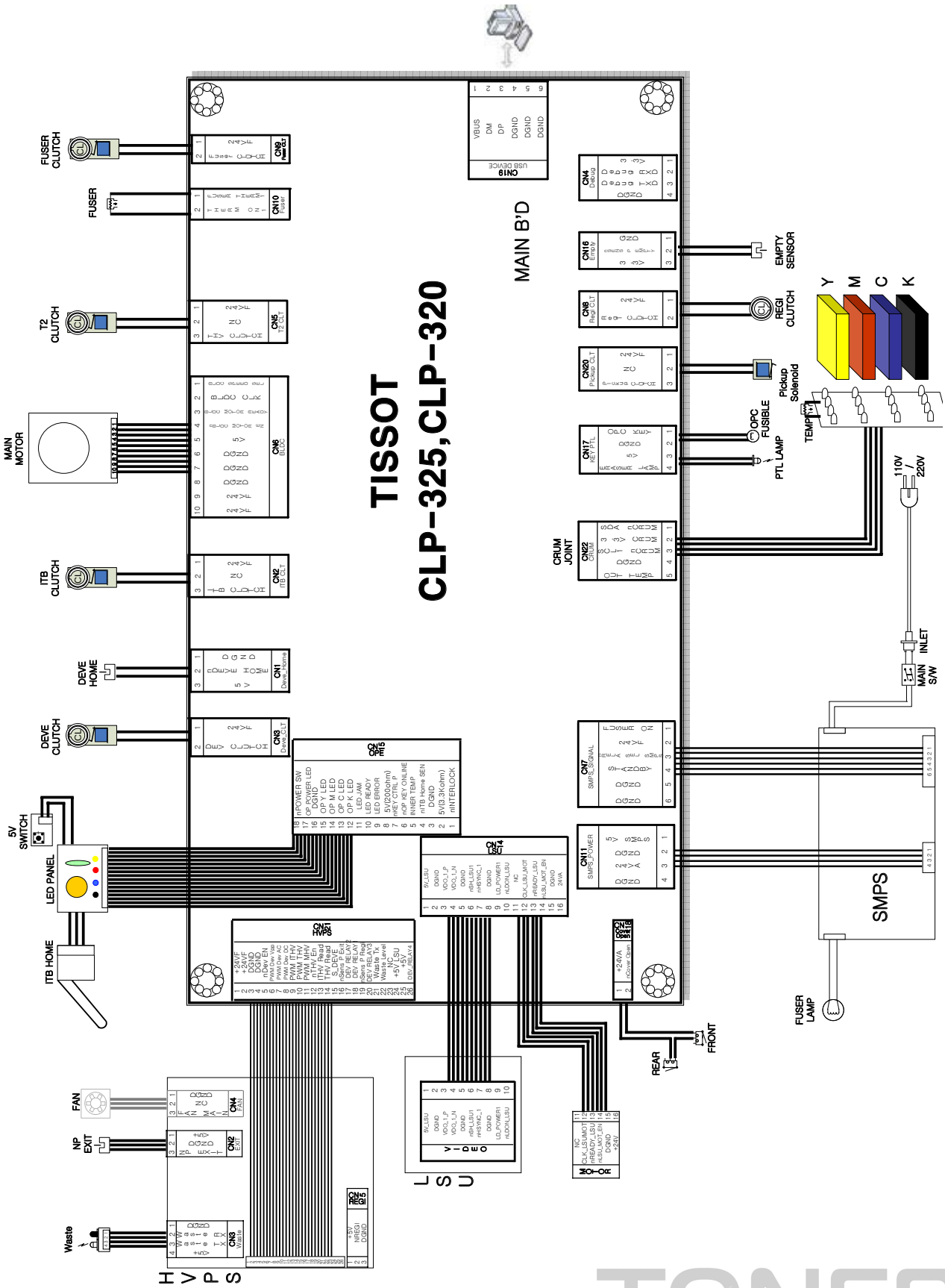
5.2 Connection Diagramg(CLP-325/320)



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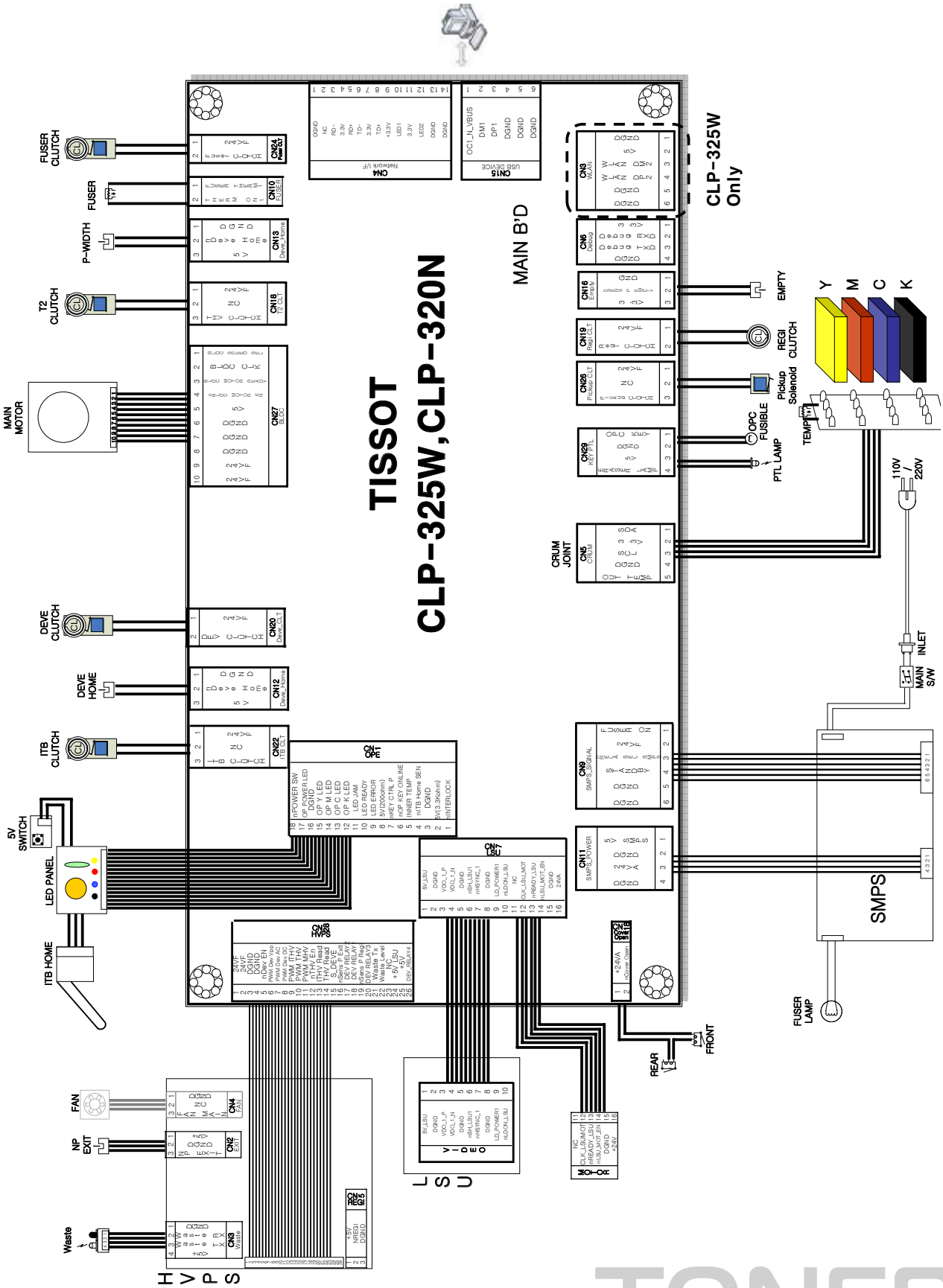
Connection Diagramg(CLP-325W/320N)



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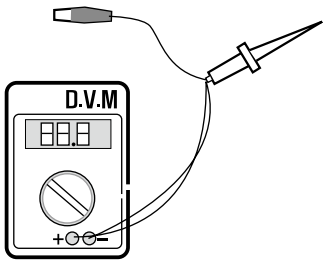
6. Reference Information

This chapter contains the tools list, list of abbreviations used in this manual, and a guide to the location space required when installing the printer. A definition of tests pages and Wireless Network information definition is also included.

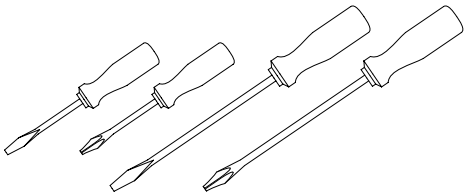
6.1 Tools for Troubleshooting

The following tools are recommended safe and easy troubleshooting as described in this service manual.

- **DVM(Digital Volt Meter)**
  Standard : Indicates more than 3 digits.



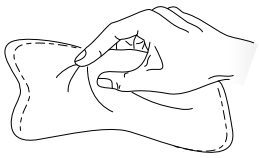
- **Driver**
  Standard : "-" type, "+" type (M3 long, M3 short, M2 long, M2 short).



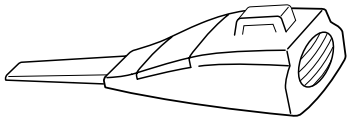
- **Tweezers**
  Standard : For general home use, small type.

- **Cotton Swab**
  Standard : For general home use, for medical service.

- **Cleaning Equipments**
  Standard : An IPA(Isopropyl Alcohol)dry wipe tissue or a gentle neutral detergent and lint-free cloth.

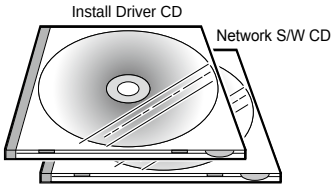


- **Vacuum Cleaneraner**



- **Brush**

- **Software (Driver) installation CD ROM**



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6.2 Acronyms and Abbreviations

The table below explains the abbreviations and acronyms used in this service manual. Where abbreviations or acronyms are used in the text please refer to this table.

ADC	Analog-to-Digital-Conversion
AP	Access Point
AC	Alternating Current
ASIC	Application Specific Integrated Circuit
ASSY	Assembly
BIOS	Basic Input Output System
BLDC Motor	Brushless DC Motor
CLBP	Color Laser Beam Printer
CMOS	Complementary Metal Oxide Semiconductor
CMYK	Cyan, Magenta, Yellow, Black
CN	Connector
CON	Connector
CPU	Central Processing Unit
CTD Sensor	Color Toner Density Sensor
dB	Decibel
dBA	A-Weighted decibel
dBm	Decibel milliwatt
DC	Direct Current
DCU	Diagnostic Control Unit
DIMM	Dual In-line Memory Module
DPI	Dot Per Inch
DRAM	Dynamic Random Access Memory
DVM	Digital Voltmeter
ECP	Enhanced Capability Port
ECU	Engine Control Unit
EEPROM	Electronically Erasable Programmable Read Only Memory
EMI	Electro Magnetic Interference
EP	Electro photographic
EPP	Enhanced Parallel Port
F/W	Firmware
FCF/FCT	First Cassette Feeder/First Cassette Tray
FISO	Front-In, Side-Out
FPOT	First Print out Time
GDI	Windows Graphic Device Interface
GIF	Graphic Interchange Format
GND	Ground
HBP	Host Based Printing
HDD	Hard Disk Drive
HTML	Hyper Text Transfer Protocol
HV	High Voltage
HVPS	High Voltage Power Supply
I/F	Interface
I/O	Input and Output
lb	Pound(s)
IC	Integrated Circuit
ICC	International Color Consortium
IDE	Intelligent Drive Electronics or ntegrated Drive Electronics
IEEE	Institute of Electrical and Electronics Engineers. Inc
IOT	Image Output Terminal (Color printer, Copier)
IPA	Isopropy Alcohol
IPC	Inter Process CommunicationEPP Enhanced parallel Port
IPM	Images Per Minute
ITB	Image Transfer Belt
LAN	local area network
LBP	Laser Beam Printer
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSU	Laser Scanning Unit
MB	Megabyte
MHz	Megahertz
MPBF	Mean Prints Between Failure
MPF/MPT	Multi Purpose Feeder/Multi Purpose Tray
NIC	Network Interface Card
NPC	Network Printer Card
NVRAM	Nonvolatile Random Access Memory
OPC	Organic Photo Conductor
PBA	Printed Board Assembly
PCL	Printer Command Language , Printer Control Language

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PCI	Peripheral Component Interconnect by Intel 1992/6/22, is a local bus standard developed by Intel and introduced in April, 1993 : A60, B60 Pins
PCL5Ce	Printer Command Language 5Ce-Color
PCL6	Printer Command Language 6
PDF	Portable Document Format
PDL	Page Description Language
Ping	Packet internet or Inter-Network Groper
PPD	Postscript Printer Discription
PPM	Page Per Minute
PS	Post Script
PS3	Post Script Level3
PTL	Pre-Transfer Lamp
PTB	Paper-Transfer Belt
PWM	Pulse Width Moduration
Q?y	Quantity
RAM	Random Access Memory
RCP	Remote Control Panel
ROM	Read Only Memory
SCF/SCT	Second Cassette Feeder/Second Cassette Tray
SMPS	Switching Mode Power Supply
SPGP	Samsung Printer Graphic Processor
SPL	Samsung Printer Language
SPL-C	Samsung Printer Language-Color
Spool	Simultaneous Peripheral Operation Online
SRS	Software Requirment Specification
SURF	Surface Rapid Fusing
SW	Switch
sync	Synchronous or Synchronization
T1	ITB
T2	Transfer Roller
TRC	Toner Reproduction Curve
PnP	Universal Plug and Play
U.I.	User Interface
URL	Uniform Resource Locator
USB	Universal Serial Bus
VCCI	Voluntary Control Council for Interference Information Technology Equipment
WECA	Wireless Ethernet Compatibility Alliance
Wi-Fi	Wireless Fidelity

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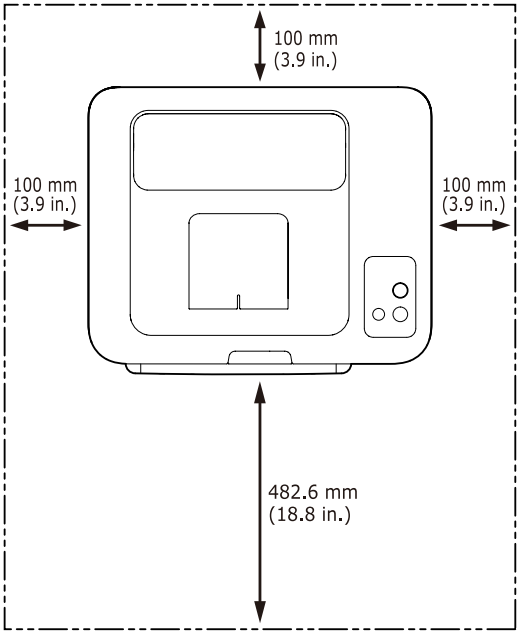
6.3 Select a location for the printer

• Leave enough room to open the printer trays, covers, and allow for proper ventilation. (see diagram below)

• Provide the proper environment :
- A firm, level surface
- Away from the direct airflow of air conditioners, heaters, or ventilators
- Free of extreme fluctuations of temperature, sunlight, or humidity
- Clean, dry, and free of dust



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6.4 A4 ISO 19798 Standard Pattern

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30 November 2005

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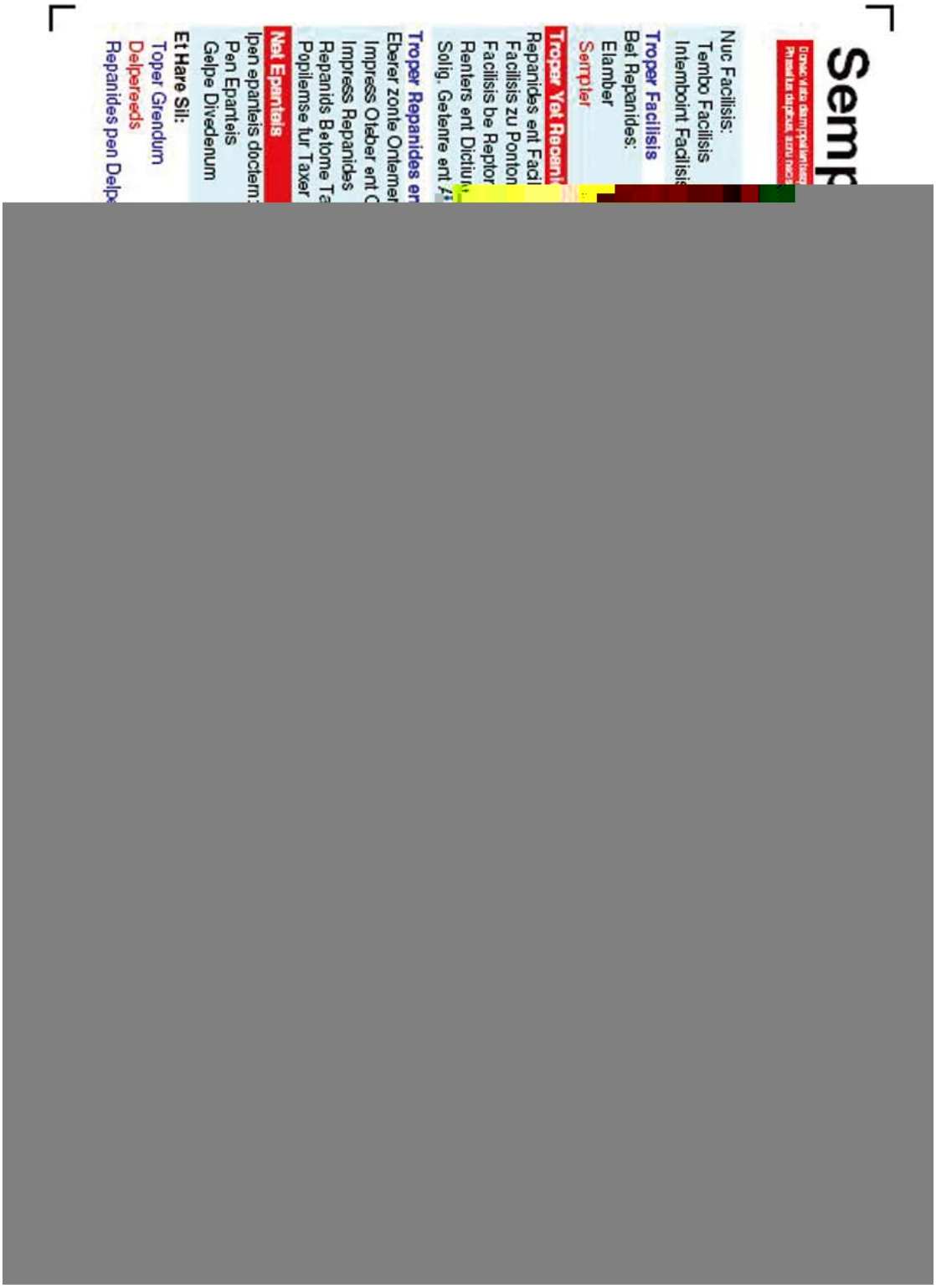

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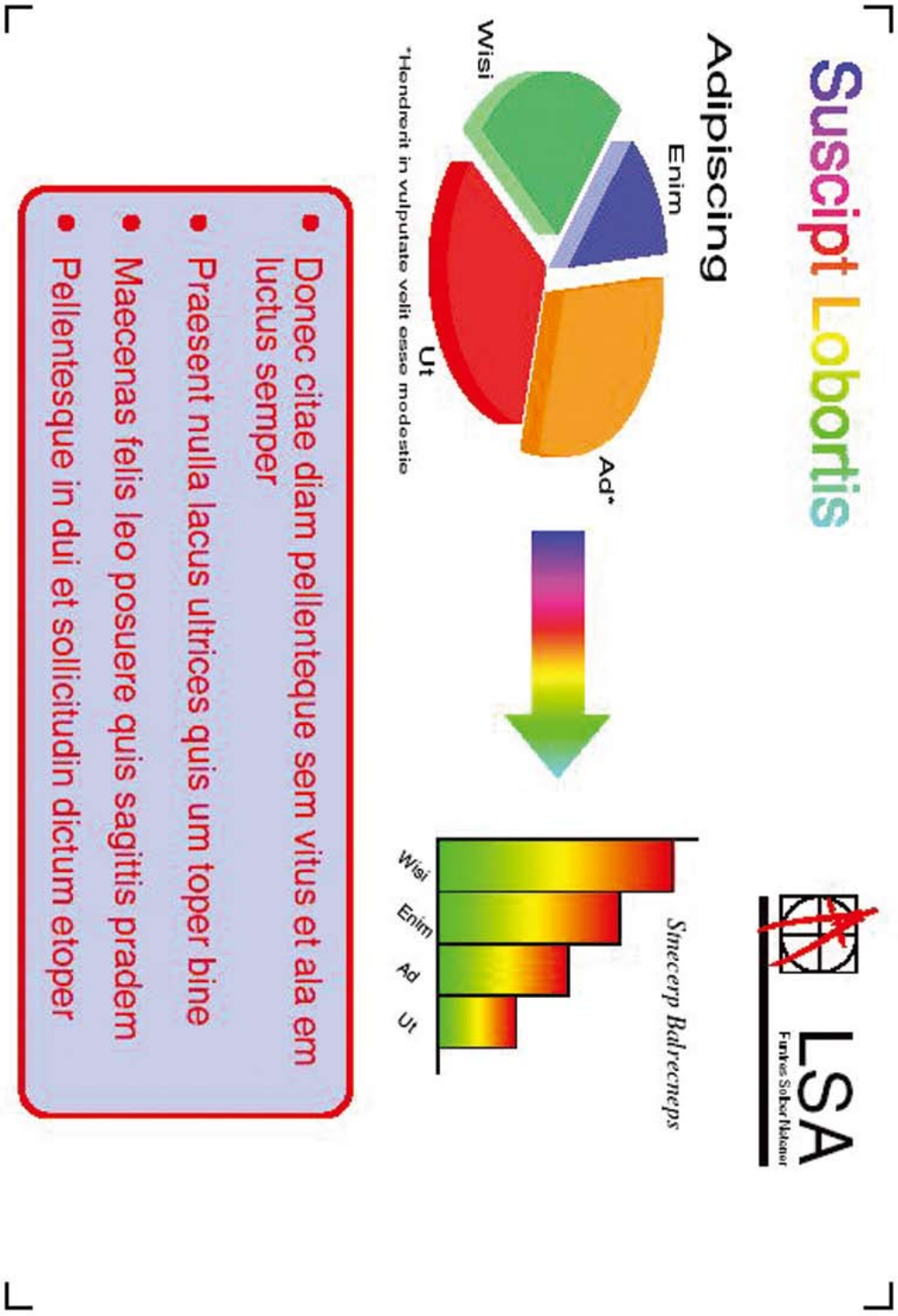

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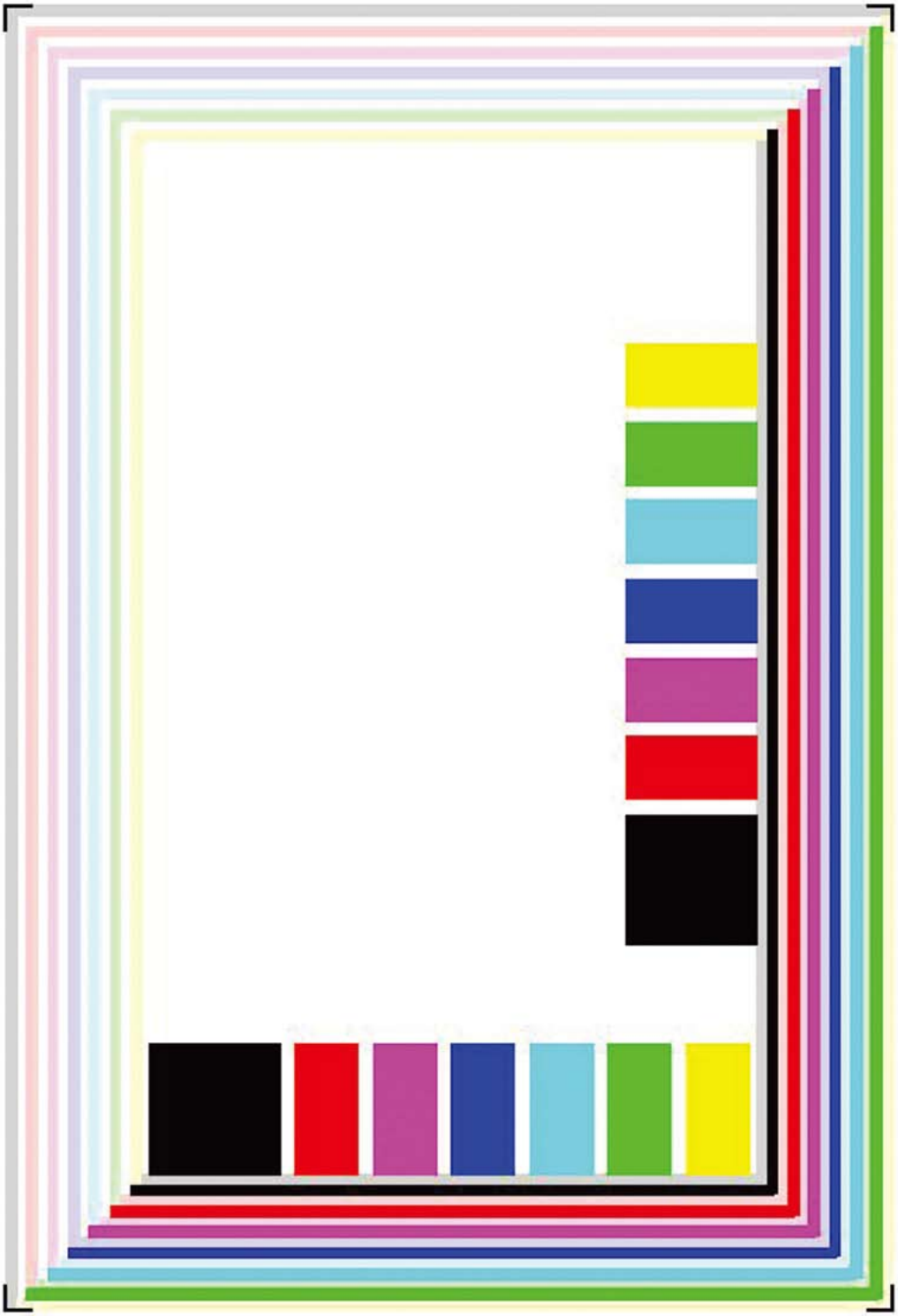

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