F-116 / F-116P

Field Engineering Manual
U.S.A. version 1.1

Muratec America, Inc.
3301 East Plano Parkway, Ste. 100
Plano, TX 75074
(469) 429-3300 (tel)
(469) 429-3465 (fax)
www.muratec.com

Contents

chapter 1 Precautions

chapter 2 Product Overview

chapter 3 Maintenance and Disassembly

Contents

chapter 4 Alignment and Troubleshooting

Contents

attached *Exploded Views & Parts List*

* Avaiable on the Muratec Technical Support web site.

1. Precautions

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

1.1 Safety Warning

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

(2) Use only manufacturer recommended replacement parts
There are no user serviceable parts inside the printer. 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.

(3) Laser Safety Statement
The Printer 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 con-forming to the requirements of IEC 825. Class I laser products are not considered to be hazardous. The laser system and printer 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 printer 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 injury to persons.

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.

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 Drum cartridge and Toner Cartridge away from children. The toner powder contained in the Drum cartridge and Toner Cartridge may be harmful and if swallowed you should contact a doctor “Material Safety Data” sheets are available online at www.muratec.com.

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 printer and potentially cause a fire or electric shock.
(2) Use only the power cable supplied with the printer. 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 printer, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the printer 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 printer remove the power plug from the wall socket.
(6) Use caution when inserting or removing the power connector. The power connector must be inserted completely, add comma otherwise a poor contact could cause overheating possibly leading to a fire. When removing the power connector grip it firmly and pull, ensure the power switch is turned off first.
(7) Take care of the power cable. Do not allow it to become twisted, bent sharply round corners or other 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 or exposed cables could cause an electric shock. Replace a 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 lightening storms. It is recommended 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 printer in a clean well ventilated location. Do not position the machine near a humidifier, or in front of an air conditioner. Damp and dust build up inside the machine can lead to overheating and cause a fire, or cause parts to rust.
(11) Do not position the printer in direct sunlight. This will cause the temperature inside the printer to rise possibly leading to the printer 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.

1.2.3 Handling Precautions

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

(1) Ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall.
(2) The printer 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 printer 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 printer in such areas.
(5) Do not place candles, burning cigarettes, etc on the printer, These could cause a fire.

1.2.4 Assembly / Disassembly Precautions

Replace parts carefully, always use authorized 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 printer 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 mainboard or network card is replaced.
(2) Ensure that power is disconnected before servicing or replacing any electrical parts.
(3) Disconnect printer 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 mins can damage the surface. Photoconductive properties and will result in print quality degradation. Take extra care when servicing the printer. 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.

1.2.5 Disregarding this warning may cause bodily injury

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

(2) Do not put finger or hair into the rotating parts.
When operating a printer, do not put hand or hair into the rotating parts (Paper feeding entrance, motor, fan, etc.).

(3) When you move the printer.
This printer weighs 8.9convert to lbs including toner cartridge and cassette. Use safe lifting and handling techniques. Use the lifting handles located on each side of the machine. Back injury could be caused if you do not lift carefully.

(4) Ensure the printer is installed safely.
The printer weighs 8.9convert to lbs, ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall possibly causing personal injury or damaging the printer.

(5) Do not install the printer on a sloping or unstable surface. After installation, double check that the printer is stable.

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.

2. Product specification and feature

2.1 Product Specifications

2.1.1 Product Overview

F-116P : Fax, Copy, Print, Scan
F-116 : Fax, Copy

1. Print Speed (F-116P only)
   • 19 ppm in Letter

2. Copy Speed
   • 19 ppm in Letter

3. Processor
   • Chorus2 66 Mhz

4. Interfaces
   • One USB port

6. Toner cartridge
   • Initial : 1K starter cartridge
   • Replacement : 2.5K cartridge

2.1.2 Specifications

• Product Specifications are subject to change without notice. See below for product specifications.

2.1.2.1 General Specifications

Item		F-116	F-116P
Major Features		Fax, Copier, Phone	Fax, Copier, Print, Scan, Phone
Size (W*D*H) with Hand Set		293.7 x 391.2 x 360 mm	293.7 x 391.2 x 360 mm
Weight (Inculding Toner Cartridge)		8.9 change to lbs	8.9 change to lbs
I/O Interface		USB - Firmware update only	USB.1.1 & USB2.0 Compliant
MPU		66MHz CPU (Chorus-2)	66MHz CPU (Chorus-2)
Toner Cartridge	yield	Initial Starter : 1K standard pages Replacement: 2.5K standard pages * Declared cartridge yield in accordance with ISO/IEC 19752.	Initial Starter : 1K standard pages Replacement: 2.5K standard pages * Declared cartridge yield in accordance with ISO/IEC 19752.
Power Consumption	Average operating mode	Less than 380 W	Less than 380 W
	Ready mode	Less than 65 W	Less than 65 W
	Power save mode	Less than 8 W	Less than 8 W
	Power off mode	Less than 1 W under	Less than 1 W under
Power Supply	Input Voltage	Low Voltage : 110 ~ 127VAC,50/60HZ 4.0A	Low Voltage : 110 ~ 127VAC, 50/60HZ 4.0A
		High Voltage : 220 ~240VAC,50/60HZ,2.5A	High Voltage : 220 ~240VAC, 50/60HZ,2.5A
	Input Frequency	50 / 60Hz(+/- 3Hz)	50 / 60Hz(+/- 3Hz)
Noise	Printing	N/A	50 dBA
	Copy	50 dBA	50 dBA
	Standby	26 dBA	26 dBA
Operating System	Window	N/A	Win 2000 /XP / 2003 / Vista /2008
	Mac	N/A	Mac OS 10.3 ~ 10.6
	Linux	N/A	Fedora 2,3,4,5,6,7,8,9 openSuSE 9.1,9.2,9.3,10.0,10.1,10.2, 10.3,11.0 Ubuntu 6.04,6.10,7.04,7.10,8.04 Mandriva 10,10.1,2005,2006,2007,2008 Debian 3.1,4.0 Redhat Enterprise Linux WS 4,5 SuSE Linux Enterprise Desktop 9,10
WHQL	MFP	N/A	SPL & WIA driver (2000, XP, 2003, Vista and 2008)

Item		F-116	F-116P
Driver	Printer	N/A	GDI
	TWAIN, WIA	N/A	Yes
	PSU	N/A	Yes
	SmarThru4	N/A	Yes
	Smart Panel	N/A	Yes
Warm Up Time	From Ready Mode	Less than 9 seconds	Less than 9 seconds
Max. Monthly Volume (Duty Cycle)	Print	10,000 pages	10,000 pages
	ADF	2,000 pages	2,000 pages
Average Monthly Print Volume		Print : 500 pages, ADF : 500 pages	Print : 500 pages, ADF : 500 pages
Machine Life		50,000 pages	50,000 pages
Temperature	Operating	10~32 change to degrees F	10~32 change to degrees F
	Non Operating	-20~40 change to degrees F	-20~40 change to degrees F
Humidity	Operating	10~80%	10~80%
	Non Operating	10~95%	10~95%
Device Memory	Standard / Max.	16MB	16MB
	Type	SDRAM	SDRAM
	Expand Memory Slot	NO	NO
	Compression Technology	YES	YES

2.1.2.2 Print Specifications

Item		F-116	F-116P
Print Speed		N/A	19ppm/Ltr
Print Emulation		N/A	GDI (SPL)
Auto Emulation Sensing		N/A	YES
Power Save		N/A	Yes (1/5/10/15/30/45min.)
Resolution		N/A	600x600dpi
Memory		N/A	4MB
FPOT	From Stand by	N/A	Less than 9 seconds
	From Cold Status	N/A	Less than 30 seconds
Duplex Print		N/A	N/A
Printable Area		N/A	208 x 273 mm (Letter)
Halftone(Gray Scale)		N/A	256levels

2.1.2.3 Scan Specifications

Item		F116	F116P
Scan Method		N/A	Color CIS
Scan Speed through ADF	Gray Mode	N/A	72 sec
	Color 300dpi	N/A	Yes
	Color 75dpi	N/A	Yes
Resolution	Optical	N/A	600*600dpi
	Enhanced	N/A	600dpi
Halftone		N/A	256 level
Scan Size	Max. Document Width	N/A	Max.216mm(8.5")
	Effiective Scan Width	N/A	Max 216mm(Ltr),210mm(A4)
Scan-to Application		N/A	Yes
		N/A	Yes
Scan Mode	Color	N/A	Yes
	Mono	N/A	1bit for Linearity, 8 Bit for Gray scale

2.1.2.4 Copy Specifications

Item		F-116	F-116P
Copy Quality Mode	Text	600x300 dpi	600x300 dpi
	Mixed	600x300 dpi	600x300 dpi
	Photo	600x600 dpi	600x600 dpi
FCOT	Stand by	Less than 9 seconds	Less than 9 seconds
	From Cold Status	Less than 30seconds	Less than 30seconds
Copy Speed (SDMC : Single Document Multiple Copy MDMC : Multi Document Multiple Copy)	SDMC at all mode	19cpm/Ltr, 18cpm/A4	19cpm/Ltr, 18cpm/A4
	MDMC at Text (600x300dpi)	10cpm/Ltr	10cpm/Ltr
	MDMC at Photo Mode (600x600dpi)	5cpm/Ltr	5cpm/Ltr
Resolution		Scan : 600x600 dpi, Print : 600x600 dpi	Scan : 600x600 dpi, Print : 600x600 dpi
Zoom Range		50% to 200%	50% to 200%
Multi Copy		1~99	1~99
Preset		Yes	Yes
Darkness Control		3 level (Light,/Normal /Dark)	3 level (Light,/Normal /Dark)
Copy Mode(=Original Type)		Text, Mixed , Photo	Text, Mixed , Photo

2.1.2.5 Telephone Specifications

Item		F116	F-116P
Handset		Yes	Yes
On hook Dial		Yes	Yes
Search		Yes (Address Book)	Yes (Address Book)
1-Touch Dial		20	20
Speed Dial		250 locations (0~249)	250 locations (0~249)
TAD I/F		Yes	Yes
Tone/Pulse		Yes	Yes
Pause		Yes	Yes
Auto Redial		Yes	Yes
Last Number Redial		Yes	Yes
Distinctive Ring		Yes	Yes
Caller ID		Yes	Yes
External Phone Interface		Yes	Yes
Report & List Print out	Tx/Rx Journal	Yes	Yes
	Confirmation	Yes	Yes
	Help List	Yes	Yes
	Auto Dial List	Yes	Yes
Sound Control	Ring Volume	Yes (Off, Low, Med, High)	Yes (Off, Low, Med, High)
	Key Volume	Yes (On, Off)	Yes (On, Off)
	Alarm Volume	Yes (On, Off)	Yes (On, Off)
	Handset Volume	Yes (Normal, Loud) * USA /KOREA Only	Yes (Normal, Loud) * USA /KOREA Only
	Speaker	Yes (On, Off, Comm)	Yes (On, Off, Comm)

2.1.2.6 Fax Specifications

Item		F-116	F-116P
Compatibility		ITU-T G3	ITU-T G3
Communication System		PSTN/PABX	PSTN/PABX
Modem Speed		33.6K bps	33.6K bps
TX Speed		3 sec	3 sec
Compression		MH/MR/MMR	MH/MR/MMR
ECM		Yes	Yes
Resolution	Std	203 x 98dpi	203 x 98dpi
	Fine	203 x 196dpi	203 x 196dpi
	S.Fine	203 x 392dpi	203 x 392dpi
Scan Speed(ADF)	Std	6 sec/LTR	6 sec/LTR
	Fine	6 sec/ LTR	6 sec/ LTR
Rx fax duplex print out		No	No
Receive Mode		Fax, TEL, Auto (Tel/Fax), TAM (Ans/Fax), DRPD	Fax, TEL, Auto (Tel/Fax), TAM (Ans/Fax), DRPD
Memory	Capacity	7MB	7MB
	Optional Memory	No	No
	Max locations to store to 1 Group Dial	269 locations	269 locations
	Fax Forward	Yes (On/Off)	Yes (On/Off)
	Broadcasting	299 locations	299 locations
	Cover page	No	No
	Delayed fax	Yes	Yes
	Memory RX	Yes	Yes
Functions	Voice Request	No	No
	TTI	Yes	Yes
	RTI	Yes	Yes
	Polling	No (Rx Poll only)	No (Rx Poll only)
	Earth/Recall	No	No
	Auto Reduction	Yes	Yes
	F/W Remote upgrade	No	No
Junk Fax barrier		Yes	Yes
Secure Receive		Yes	Yes
Memory Back-up		Yes, Max. 72 hours	Yes, Max. 72 hours

2.1.2.7 Paper Handling

Item		F-116	F-116P
Capacity (20lbs)	Main Tray	250 sheets	250 sheets
	Bypass	N/A	Single Sheet
Optional Cassette		N/A	N/A
Output Capacity		Face Down: 100Sheets/20lb	Face Down: 100Sheets/20lb
		Face Down: 1 Sheet	Face Down: 1 Sheet
Output Control		Face down/Face up	Face down/Face up
Paper Size	Main Tray	A4, Letter, Legal Folio, Executive, B5, A6, Oficio, ISOB5, JISB5	A4, Letter, Legal Folio, Executive, B5, A6, Oficio, ISOB5, JISB5
	Bypass	+No.10 Env, DL Env, C5 Env, C6 EnvMonarch Env	+No.10 Env, DL Env, C5 Env, C6 EnvMonarch Env
Paper Weight	Main Tray	16~32 lb xerographic bond	16~32 lb xerographic bond
	Bypass	16~43 lb xerographic bond	16~43 lb xerographic bond
Paper Path	Standard output	Bottom to Middle Front (FIFO)	Bottom to Middle Front (FIFO)
	Straight Through	N/A	Face up, Single Sheet
Paper Size	Max	216 x 356mm (8.5"x14")	216 x 356mm (8.5"x14")
	Min	76 x 127mm	76 x 127mm
ADF	Paper Weight	16~24lb (0.075m ~ 0.12mm thickness)	16~24lb (0.075m ~ 0.12mm thickness)
	Capacity	30 sheets (20lb)	30 sheets (20lb)
	Document Size Width	148mm - 216mm (5.8" - 8.5")	148mm - 216mm (5.8" - 8.5")
	Document Size Length	148mm - 355mm (5.8" – 14") @ ADF	148mm - 355mm (5.8" – 14") @ ADF

2.1.2.8 Maintenance Parts

Item	Image	Part code	Life
Pick up Unit			50,000 Pages
Pad Unit (Cassette)			50,000 Pages
Transfer Roller			50,000 Pages
Fuser Unit			50,000 Pages
Pad Unit (ADF)			10,000 Pages

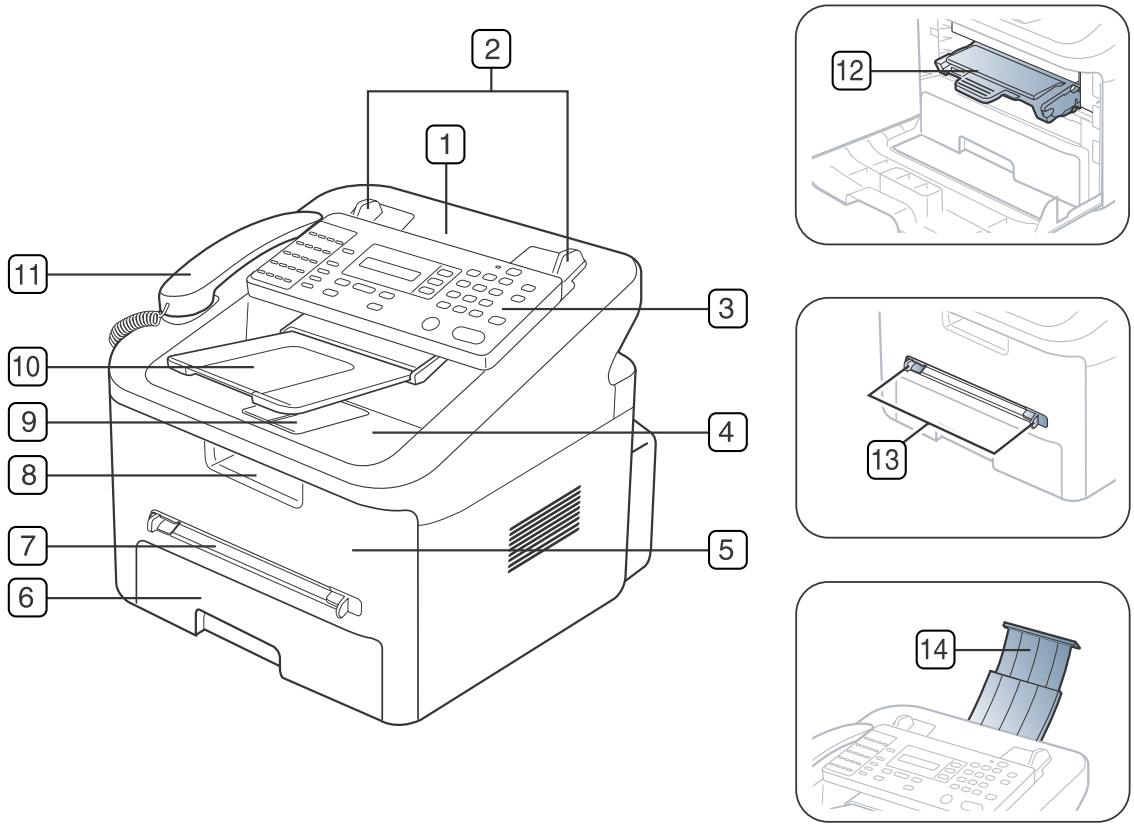
2.1.3 Model Comparison Table

Model		F-116P (Muratec)	LJ-M1319f (HP)	MFC-7225N (Brother)
Type		4-in-1 (Print, Scan, Copy, Fax)		
Image				
RTS		’10. Jan	'08. Mar	'05. Jun
Print	Speed (Ltr)	19ppm	18ppm	20ppm
	Resolution	600 x 600 dpi	1,200 x 1,200 dpi	2,400 x 600 dpi
	Emulation	SPL	GDI	PCL, PS3
	FPOT	10 sec from ready	8.5 sec from sleep	10 sec from ready
Copy	Speed(LTR)	19ppm	18ppm	20ppm
	Resolution	600 x 600 dpi	600 x 600 dpi	600 x 600 dpi
Scan	Mode	Scan To PC	Scan To PC	Scan To PC
	Resolution (optical)	600 x 600 dpi	1,200 x 1,200 dpi	200 x 400 dpi
	Resolution (Enhanced)	4,800 x 4,800 dpi	19,200 x 19,200 dpi	Up to 1,200 dpi
Fax	Modem Speed	33.6 Kbps	33.6 Kbps	33.6 Kbps
	Memory	7 MB	500 pages	600 pages
Paper	Input Capacity	250 Cassette	250 MP	250 Cassette
	ADF Capacity	30 sheets	30 sheets	30 sheets
General	Interface	Compatible with USB 2.0	High speed USB 2.0	Parallel, USB& N/W
Toner	Yield	2.5K (1K starer)	2K (1K)	2.5K (1.5K)

2.2 System Overview

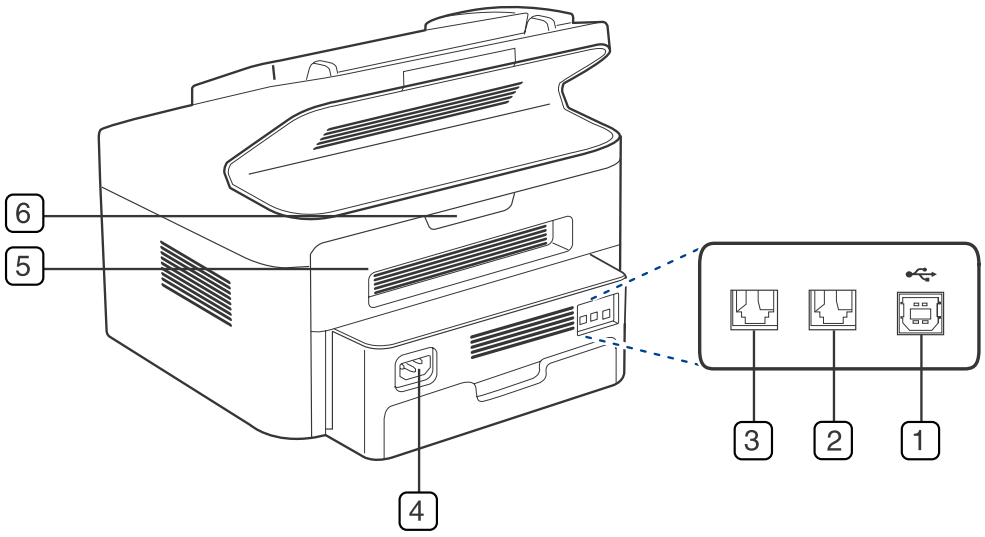
This chapter describes the functions and operating principal of the main component.

2.2.1 Front View



1	Document feeder	**6**	Tray 1	**11**	Handset
2	Document width guides	**7**	Manual tray	**12**	Toner cartridge
3	Control panel	**8**	Front door handle	**13**	Manual tray paper width guides
4	Output tray	**9**	Output support	**14**	Document input tray
5	Front door	**10**	Document output tray		

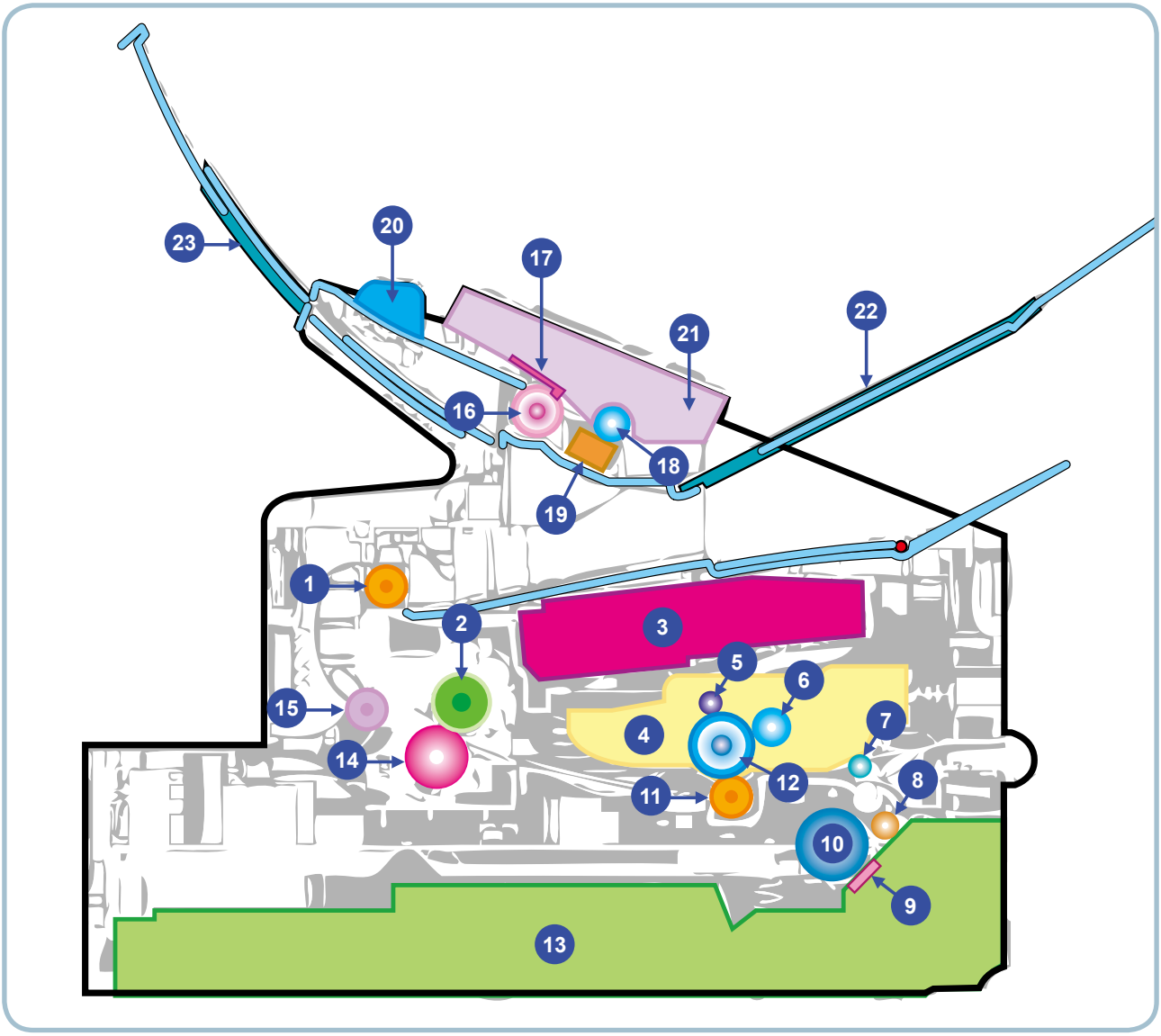
2.2.2 Rear View



1	USB port	**4**	Power receptacle
2	Extension telephone socket (EXT)	**5**	Rear door
3	Telephone line socket	**6**	Rear door handle

2.2.3 System Layout

This model is consisted of the Engine parts and F/W, and said engine parts is consisted of the mechanical parts comprising Frame, Feeding, Developing, Driving, Transferring, Fusing, Cabinet and H/W comprising the main control board, power board, operation panel, PC Interface.



1	Top out-bin delivery roller	**9**	Separation Pad	**17**	ADF rubber
2	Fusing roller	**10**	Pick up roller	**18**	White roller
3	LSU	**11**	Transfer roller	**19**	CIS
4	Toner Cartridge	**12**	OPC	**20**	Guide DOC
5	Primary charging roller	**13**	Cassette	**21**	OPE
6	Developer roller	**14**	Pressure roller	**22**	Tray ADF output
7	Registration/ Multipurpose pick up roller	**15**	Fuser Exit roller	**23**	Tray ADF input
8	Feed roller	**16**	ADF roller		

2.2.3.1 Feeding Part

It is consists of a basic cassette, an MP tray for supplying different types of media (envelope, label, special paper) and parts related to paper transferring.

1) Separation method

Paper is separated by the friction pad mounted to the center of the cassette.

2) Basic cassette

It takes a center loading method and applies 'friction pad separating method.'
Both the side guide and the rear guide can be adjusted for for various types of papers from A5 to legal size paper.
It has a paper existence sensing function (Capacity: 250 sheets (75g/㎡, 20lb paper standard), paper arranging function, various size papers accepting function.
In the front side, there is a paper level indicator.

3) Pick- up roller

It initializes paper transport out of the cassette. The Pickup Roller is driven by a solenoid.

4) Registration roller

It has a paper registration [skew correction] function, paper transferring function, paper detecting function, jam removing
function, and so on.

5) MP tray

It has a paper registration [skew correction] function, paper transferring function, jam removing function, and so on.
It uses manual feed method to feed 1 sheet of paper and 1 envelope.

2.2.3.2 Transfer Assy

- The transfer roller delivers the toner from the OPC drum to the paper.
- There is no PTL Ass'y.
- Life Span : Print over 50,000 sheets (in15~30 change to degrees F)

2.2.3.3 Driver Assy

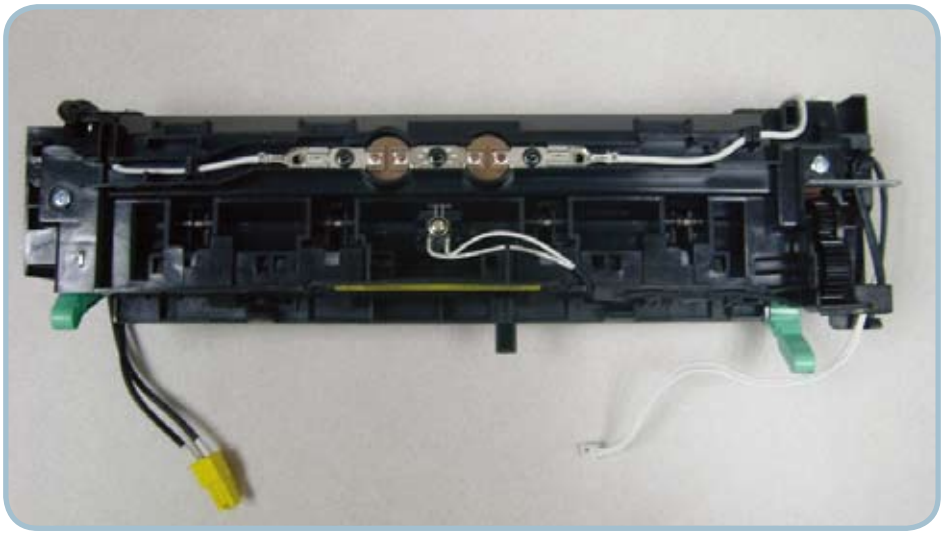
- The driving device is consisted of step motor, OPC, Pick- up, Feed, gear block all mounted as an assembly.

• Driving Frequency: Step Motor : 2200rpm(1650 Clock)

• It is a power delivery unit by gearing: Motor → Pickup/Feeder/Developer/Fuser/Duplex

2.2.3.4 Fuser

It is consists of a halogen lamp, heat roller, pressure roller, thermistor and thermostat. It fuses the toner on to the paper by heat and pressure to complete the printing job.



1) Thermostat

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

- Thermostat Type : Non- Contact type THERMOSTAT
- Control Temperature : 170℃ ± 5℃

2) Thermistor

It is a temperatrue detecting sensor.

- Temperature Resistance : 7 kΩ (180℃)

3) 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.

4) 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.

5) Halogen Lamp

- Voltage 120 V : 115 ± 5 %
  220 V : 230 ± 5 %
- Capacity : 750 Watt ± 25 W

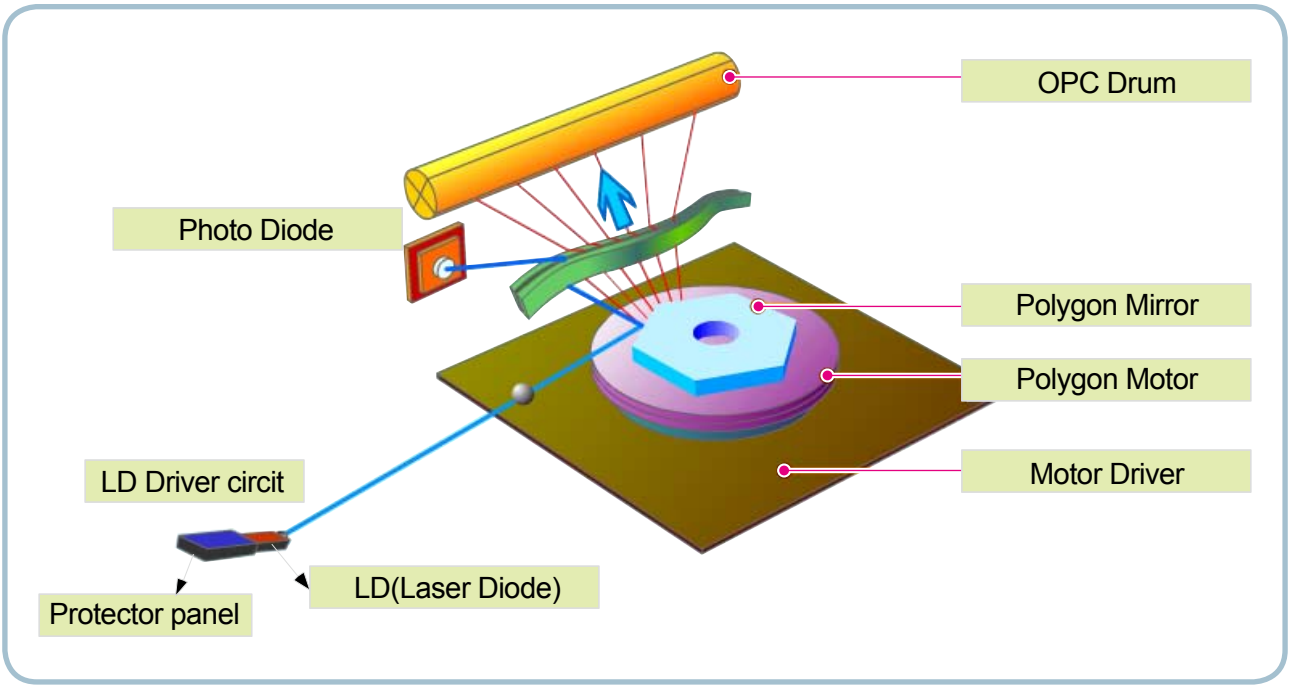
6) Items for safety

Protecting device for overheating
- 1st protection device: Hardware cuts off when overheated
- 2nd protection device: Software cuts off when overheated
- 3rd protection device: Thermostat cuts off main power.

Safety device
- A fuser power is cut off when a front cover is opened
- Maintain a temperature of fuser cover's surface under 80℃ for user, and attach a caution label at where customer can see easily when customer open a rear cover.

2.2.3.5 LSU (Laser scanning unit)

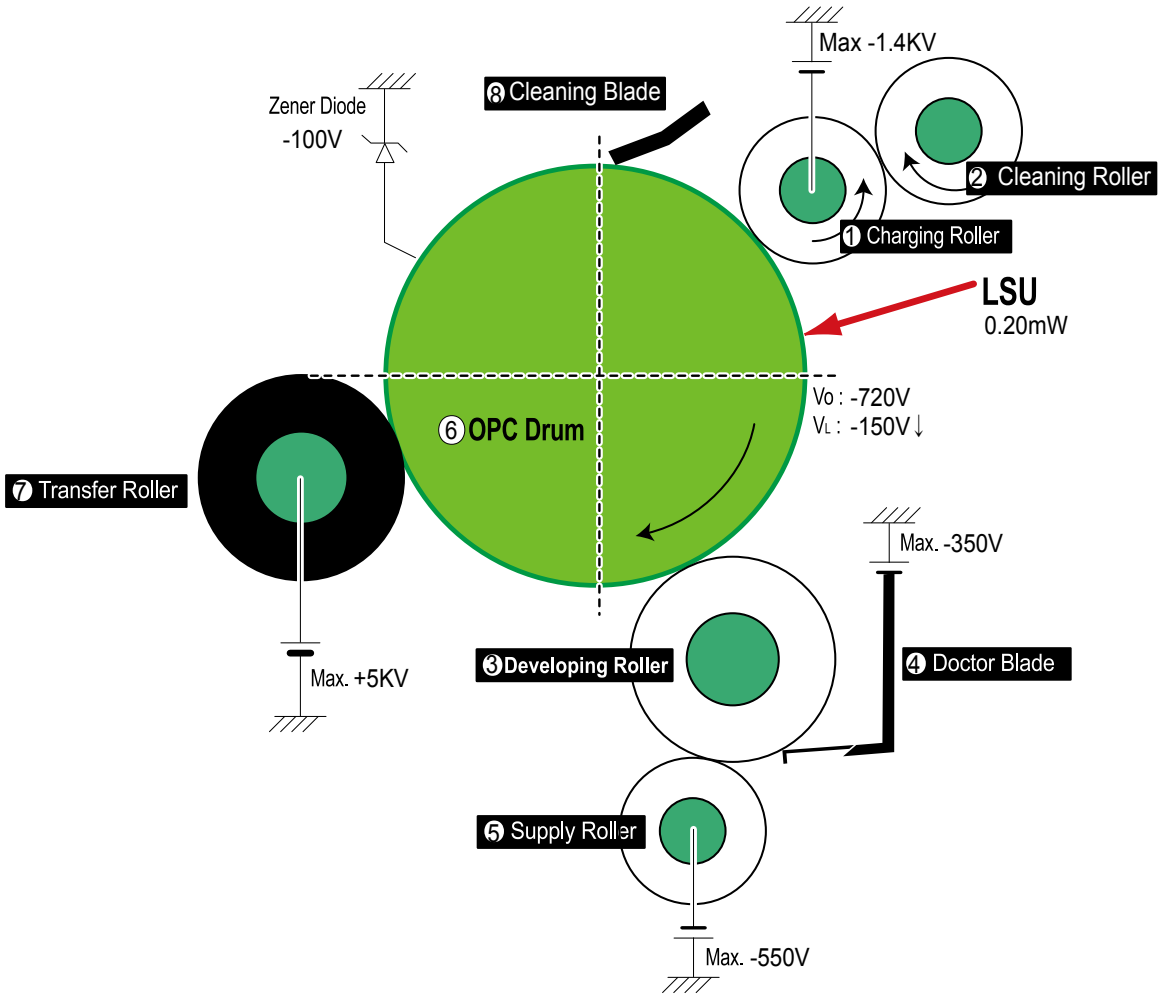
It is the core part of the LBP which switches the video data received to the controller to the electrostatic latent image on the OPC drum by controlling laser beam, exposing OPC drum, by use of a polygon mirror. of polygon mirror. The OPC drum is synchronized with the paper feeding speed. The /HSYNC signal is created when the laser beam from LSU reaches the end of the polygon mirror, and the signal is sent to the controller. The controller detects the /HSYNC signal to adjust the vertical line of the image on paper. The /HSYNC signal is used to synchronize the image data with the left margin of the paper. The one side of the polygon mirror is one line for scanning.



2.2.3.6 Toner Cartridge

By using the electronic photo process, it creates a visual image. In the toner cartridge, the OPC unit and the developing unit are contained in one assembly. The OPC unit houses the OPC drum and charging roller, and the toner cartridge unit has toner, supply roller, developing roller and blade (Doctor blade)

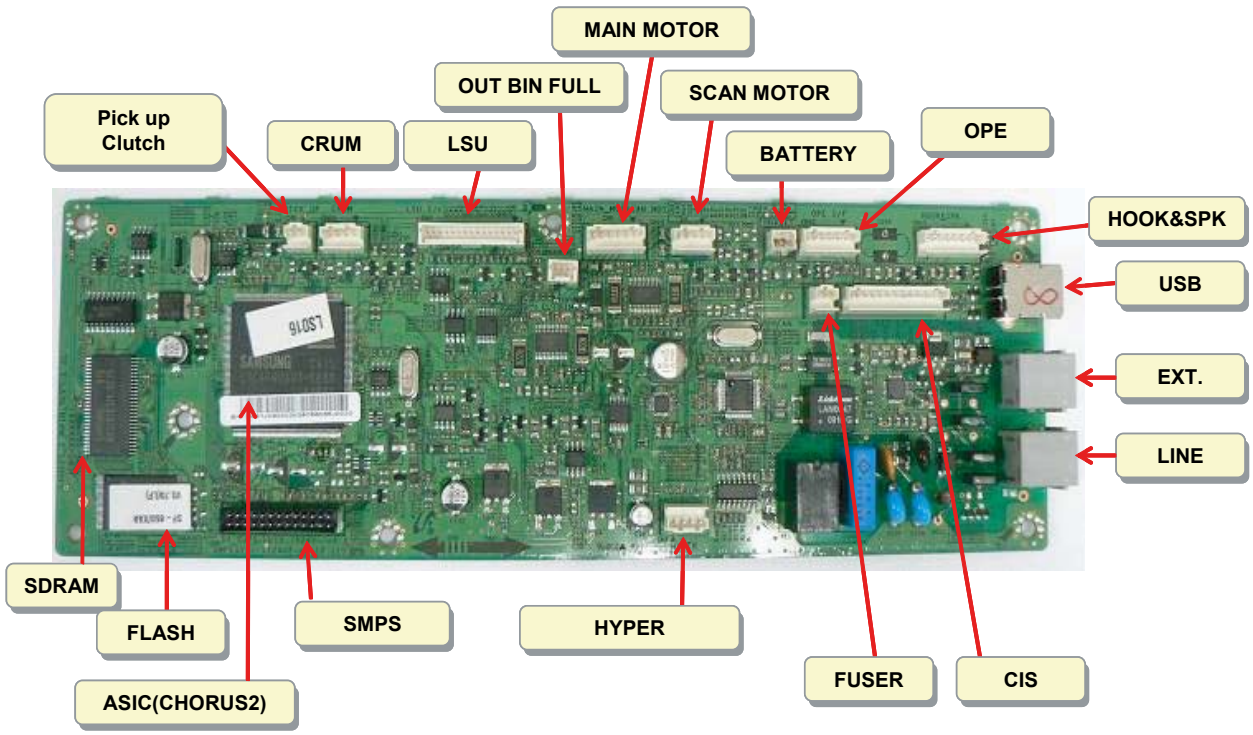
- Developing Method : Non magnetic 1 element contacting method
- Toner : Non magnetic 1 element shatter type toner
- Charging capacity : - 39.1 ±3 μC/g
- Average OD : 8.0 ±0.5㎛ (Toner)
- Toner Qty : 30gf / 40gf / 80gf (Initial : 1k / Sales : 2.5k)
- The life span of toner : 1k / 2.5k sheets (ISO 19752 Pattern / Letter standard)
- Toner Residual Sensor : Dot count with CRUM(CRU Monitor)
- OPC Cleaning : Collect the toner by using cleaning blade
- Handling of wasted toner : Waste [residual] toner is cleaned off the drum by means of a cleaning blade.
- OPC Drum Protecting Shutter : None
- Classifying device for toner cartridge: ID is classified by CRUM.



2.2.4 Engine H/W Specifications

2.2.4.1 Main PBA

The Engine and the Printer Controller function are housed into one Main Board called Main PBA. The CPU is functioned as the bus control, I/O handling, drivers, and PC interface. The main board sends the Current Image of Video data to the LSU and manages the electrophotography for printing. The CPU on Main PBA manages the circuits for the motors: paper feed, paper path, clutches, pre- transfer lamp, current control to driver components, and fan driving. The signals from the paper feed jam sensor and paper empty sensor are directly inputted to the main board.



1) CPU

Use S3C46Q0X 16/32-bit RISC micro controller, Chorus 2,which is exclusive controller to execute Printer & FAX Function and to execute operation block by flash memory within system program, and to control whole system.

- 1.8V internal, 3.3V external (I/O boundary) microprocessor with 4KByte Cache
- Image Processor
- On-chip clock generator with PLL
- Memory & External Bank Control
- DMA Control (5-channel)
- Interrupt Control
- 2-port USB Host /1- port USB Device (ver 1.1) Interface Control
- Parallel Port Interface Control
- UART (2 Channel)
- Synchronous Serial Interface Control
- Timer (4 Channel)
- Watch Dog Timer
- Power control: Normal, Slow, Idle, Stop and SL_IDLE mode
- A/D Converter (10-bit, 2 Channel)
- General I/O Port Control
- Tone Generator
- RTC with calendar function

2) Flash Memory

Record System Program, and download System Program by PC INTERFACE.
FAX for Journal List, and Memory for One Touch Dial, Speed Dial List.

- Size : 2MB (16Mbit)
- Access Time: 70nsec

3) SDRAM

Is used as Swath Buffer in Printing, Scan Buffer in Scanning, ECM Buffer in FAX receiving and System Working Memory Area

- Size: 16MB (128Mbit)

4) Sensor Input Circuit

■ Paper Empty Sensing & Paper Width Sensor

When a printing job comes to the CPU, the CPU initializes the pickup action regardless of the state of the sensor. If paper is then detected by the Feed Sensor, the paper will then be recognized as e.g. invoice paper even though the Paper Empty Sensor was on. If no paper is detected by the Feed Sensor, then the CPU will recognize that a “Paper Empty” condition exists and displays the RED warning light on the OPE PBA.
When a printing job comes to the CPU, the CPU initializes the pickup action regardless of the state of the sensor. If paper is then detected by the Feed Sensor, the paper will then be recognized as e.g. invoice paper even though the Paper Empty Sensor was on. If no paper is detected by the Feed Sensor, then the CPU will recognize that a “Paper Empty” condition exists and displays the RED warning light on the OPE PBA.

■ Regi Sensing

The registration sensor (Regi Sensor, a photo interrupter) informs the CPU that paper is registered at the registration rollers, and waiting for proper leadedge schronization with the image on the drum.

■ Paper Feeding/With Toner Cartridge Sensing

When the leadedge of the paper is detected by the Feed Sensor (photo interrupter), it begins the development process of the drum after a predetermined time.
The toner cartridge detection is monitored by the CRUM sensors. If all of the CRUM sensors are off, the CPU knows the cartridge is not in the machine, and takes appropriate action by turning on the out of toner light. If the CRUM sensors do not detect that the correct cartridge is inserted, the CPU will display the toner cartridge is invalid, it will show invalid sign on a LED.

■ Paper Exit Sensing

The Paper Exit Sensor is mounted on the Fuser Unit exit side, and is used to ensure that paper has indeed exited the machine. If the on/off time of exit sensor is abnormal, then a JAM2 is informed. The LED on the display will turn on a RED warning color.

■ Cover Open Sensing

The Cover Open Sensor is located on the HVPS. When the front cover is opened, all +24VS is shut off. Then the customer will be notified on the display that the door is open [“door open”] and the red will turn on.

■ DC FAN / SOLENOID Driving

DC Fans and Clutches are driven by turning on noise when these driver components de-energize. which is controlled by CPU. The diode in the Fan and Clutch driving circuits protects TR driven from noise when these driver components de-energize.

■ Motor Driving

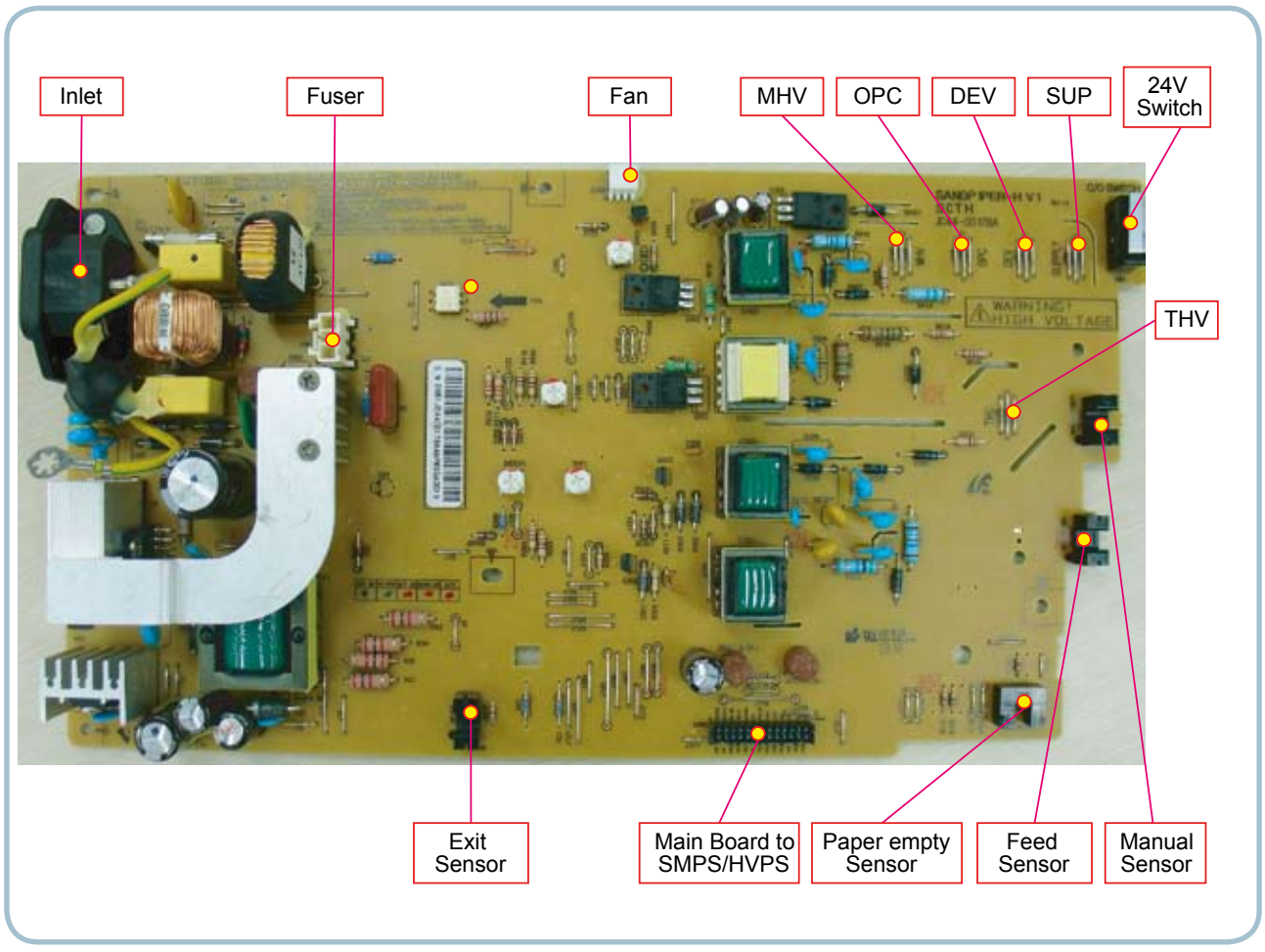
The main motor driving circuits are located on the BLDC Motor Ass’y Unit. Main Controller has the interfacing circuits. There is motor driver IC on the Motor Control Board to control the BLDC Motor assembly unit.

2.2.4.2 HVPS and SMPS Board

The HVPS Board and SMPS Board housed in one board.

The HVPS board creates the high voltage of THV/MHV/Supply/Dev and supplies it to the developer portion takes the 24V and outputs the high voltage for THV/MHV/BIAS, and supplied to the high voltage, OPC cartridge, and transfer roller for optimum latent image and toner transfer quality. The HVPS portion takes the 24V and outputs the high voltage for THV/MHV/BIAS, and supplied to the high voltage, OPC cartridge, and transfer roller for optimum latent image and toner transfer quality.

It is the power source of entire system. It is assembled by an independent module, so it is possible to use for common use. It is mounted on the side of the machine.
It is consisted of the SMPS and AC to power the Fuser Unit. which supplies the DC power for driving the system, and AC to power the Fuser Unit. SMPS has two output channels, which Which are +5V and +24V.



■ HVPS Board

• Transfer High Voltage (THV+)

- Input Voltage : 24 V DC ± 15%
- Output Voltage : MAX +5.0KV ± 5 %,(Duty Variable, no loading)
  - 1.2KV ±15% (when cleaning,200 ㏁)
- Input contrast of the Voltage stability degree : under ± 3 % (fluctuating input 21.6V~26.4V)
  Loading contrast : ± 3 % or less
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 100 ms Max
- Fluctuating transfer voltage with environmental various : 0 ~ 5 KV
- Environment Recognition Control Method : The THV- PWM ACTIVE is transfer active signal.
  It detects the resistance by recognizing the voltage value, F/B, while permits the environmental recognition voltage.
- Output Voltage Control Method : Transfer Output Voltage is outputted and controlled by changing Duty of THVPWM Signal.

• Charge Voltage (MHV)

- Input Voltage : 24 V DC ± 15%
- Output Voltage : - 1.0KV ~ - 1.8KV DC ± 3%
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 30 MΩ ~ 1000 MΩ
- Output Control Signal(MHV- PWM) : CPU is HV output when PWM is Low

• Cleaning Voltage (THV-)

- The (+) Transfer Voltage is not outputted because the THV PWM is controlled with high.
- The (-) Transfer Voltage is outputted because the THV- Enable Signal is controlled with low
- The output fluctuation range is big because there is no Feedback control.

• Developing Voltage (DEV)

- Input Voltage : 24 V DC ± 15%
- Output Voltage: - 200V ~ - 600V DC ±3%
- Output Voltage Fluctuation range: PWM Control
- Input contrast of the output stability degree : ± 3 % or less
  Loading contrast : ± 3 % or less
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10MΩ ~ 1000 MΩ
- Output Control Signal (BIAS- PWM) : the CPU output is HV output when PWM is low.

• Supply

- Output Voltage : - 400 V ~ - 800V DC ±50 V(ZENER using, DEV)
- Input contrast of the output stability degree : under ± 5 %
  Loading contrast : ± 5 % or less
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10 MΩ ~ 1000 MΩ
- Output Control Signal (BIAS- PWM) : the CPU is HV output when PWM is low.

■ SMPS Board

◆ AC Input

Input Rated Voltage	AC 220V ~ 240V AC 110V ~ 127V
Input Voltage fluctuating range	AC 198V ~ 264V AC 99V ~ 135V
Rated Frequency	50/60 Hz
Frequency Fluctuating range	47 ~ 63 Hz
Input Current	Under 4.0Arms / 2.0Arms (But, the status when e-coil is off or rated voltage is inputted/outputted)

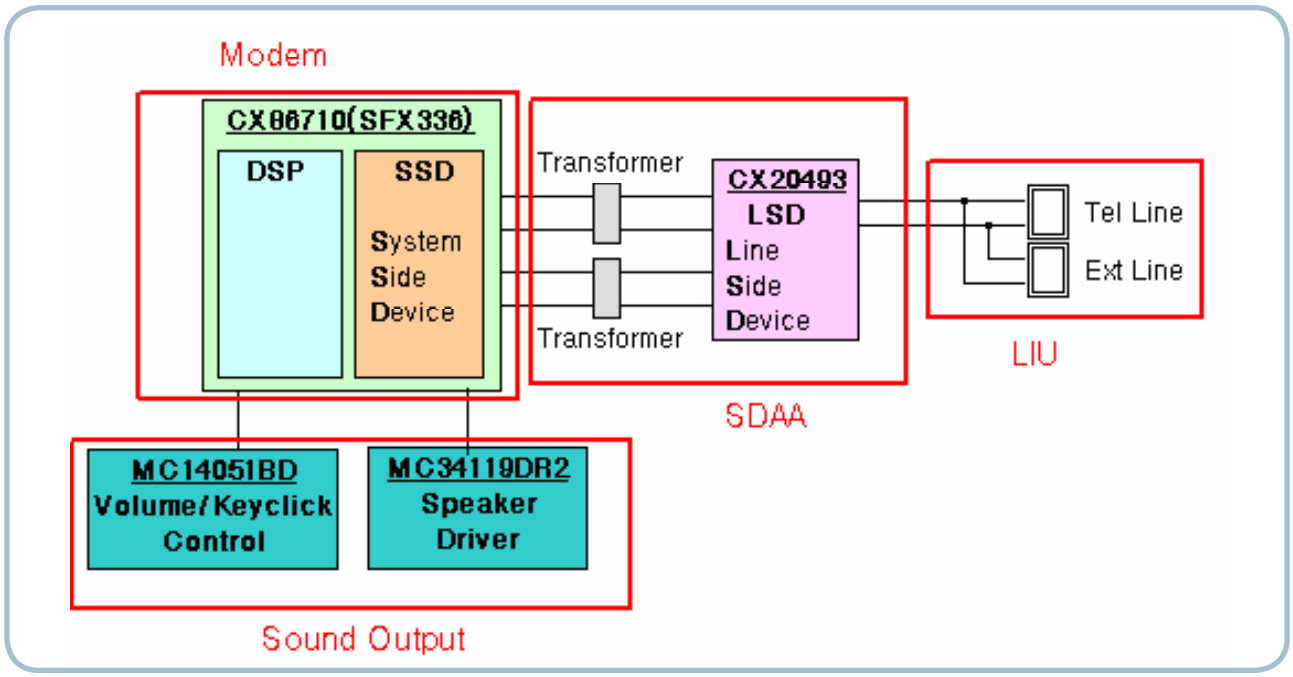
◆ Rated Output Power

NO	ITEM	CH1	CH2	Remark
1	CHANNEL NAME	+5.0V	+24.0V	
2	CONNECTOR PIN	CON 3 5V PIN : 11,13,15 GND PIN : 12,14,16	CON 3 24V PIN : 3,5,7,9 GND PIN : 4,6,8,10	
3	Rated Output	+5.1V ± 5% (4.845 ~ 5.355V)	+24V ± 10% (21.6 ~ 26.4V)	
4	Max. Output Current	2.0 A	2.5 A	
5	Peak Loading Current	2.4 A	2.7 A	1ms
6	RIPPLE NOISE Voltage	Under 100mVp-p	Under 500mVp-p	
7	Maximum output	10W	60W	
8	Peak output	12W	64.8W	1ms
9	Protection for loading shortage and overflowing current	Shut down or Fuse Protection	Shut down or Output Voltage Drop	

2.2.4.3 Fax

Our fax feature is based on Conexant DAA (Data Access Arrangement) Solution, and is controlled by a dual Chip Set Solution.

- CX86710 (SFX336) : This Modem Chip adds SSD (System Side Device) for interfacing between LSD and DIB of FM336Plus Core
- CX20493 (LSD) : This Modem Chip LIU (Line Interface Unit) is controlled by SSD and satisfies each PSTN requirement by modulating the internal configuration with connecting Tel Line.



2.2.4.4 Scan

1) Pictorial signal input part: output signal of CIS passes through MP Cap change to ADC at LAFE1001, and defined signal between LAFE1001 and JUPITER5 processes the Image signal. When AFE accepts each pixel, CDS (Correlated Double Sampling) technique which samples arm-level twice is used on each pixel by the CIS signal.

2) The image processing portion is read by CIS Pixel data in 1200dpi Line and processed using an Error Diffusion Algorithm on Text mode and Photo mode. When scanning at machine and/or on PC Scan, the data is stored in a Scan Buffer without algorithm.
Shading and Gamma Correction are executed immediately in every mode, then processing is executed later.

* Scan Image Control Specification
① Minimum Scan Line Time : 0.75ms(300dpi)
② Scan Resolution : Max. 1200DPI
③ Scan Width : 216mm
④ main function
- Internal 10bit ADC
- White Shading Correction
- Gamma Correction
- CIS Interface
- 256 Gray Scale

3) CIS Operating Part : CISM Image sensor use +3.3V and LEDs uses +12V
- CIS Maximum Operating Frequency : 4MHz
- CIS Line time : 0.75ms
- White Data output Voltage : 1.0Vmin (Color mode : 300dpi, 0.75ms/line)
- Maximum LED Current : 45~60 mA Max.(+12V)

2.2.5 Engine F/W Contol Algorithm

2.2.5.1 Feeding

If feeding from a cassette, the drive to the pickup roller is controlled by a solenoid. The on/off time the solenoid is controlled by Main PBA. The Paper Jam protocols are as follows:

Item	Description
JAM 0	- After picking up, paper cannot be entered due to paper is not fed. - After picking up, paper does not reach the Feed Sensor in after a predetermined time due to paper slippage, etc. - If the Feed Sensor does not detect paper after a predetermined time following the initialization of another take-up retry. ** It is a status that the leading edge of the paper doesn't pass the feed sensor.* - Even though the paper reaches to the feed sensor, the feed sensor doesn't be ON. ** It is a status that the leading edge of the paper already passes the feed sensor.*
JAM 1	- The trailing edge of the paper must clear the Feed Sensor after predetermined time. (The feed sensor cannot be OFF) - The leading edge of the paper must detect the Exit Sensor within a predetermined after leaving the Feed Sensor. (The exit sensor cannot be ON) ** The paper exists between the feed sensor and the exit sensor.*
JAM 2	- The trailing edge of the paper must clear the Exit Sensor after predetermined time.

2.2.5.2 Transfer

The charging, developing and the transfer voltages are controlled by PWM (Pulse Width Modulation). Each output voltage may change due to the PWM duty. The transfer voltage admitted when the paper passes the transfer roller is decided by environment recognition. The resistance value of the transfer roller is changed due to the surrounding environment through AD converter. The voltage value for impressing to the transfer roller is decided by this value change.

2.2.5.3 Fusing

The temperature change of the heat roller's surface is changed to the resistance value through the thermistor. The Heat Roller temperate (warmup) is measured by converting the resistance of the thermistor to a measurable DC voltage value. The AD converter changes it to a digital value so it knows when it has reach its proper fusing temperature. The AC power to the fuser lamp is controller by comparing the target temperature to the value from the thermistor. If the value from the thermistor is out of controlling range an error will occur and power disabled. The table below lists the types of Fuser Errors that can occur:

• Open Heat Error

During warmup, if the Fuser Unit does not reach its proper operating temperature within a predetermined time an "Open Heat Error will occur. An error message will be displayed on the Control Panel alerting the customer. The engine stops all functions and keeps it at the error state until the issue is resoled by a qualified technician.

• Low Heat Error

After initial warmup had been achieved, if the Fuser Unit at any time does not reach its proper operating temperature within a predetermined time an "Low Heat Error will occur. An error message will be displayed on the Control Panel alerting the customer. The engine stops all functions and keeps it at the error state until the issue is resoled by a qualified technician.

• Over Heat Error

If the Fuser Unit at any time exceeds the specified range [too hot] for proper operating temperature an "Over Heat Error will occur. An error message will be displayed on the Control Panel alerting the customer. The engine stops all functions and keeps it at the error state until the issue is resoled by a qualified technician.

2.2.5.4 LSU

LSU receives the image data from PVC or HPVC and makes the latent image on OPC surface.
It uses the single beam, LD.
The errors related to LSU are as follows:

- **By LReady :** When the printing is started, the engine drives the polygon motor of LSU. After the specified time is elapsed, if the motor is not in a ready status, the engine detects the error that the polygon motor is not in a ready status. If this error happens, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system and the error message is displayed at LCD window to inform the error status to the customer.

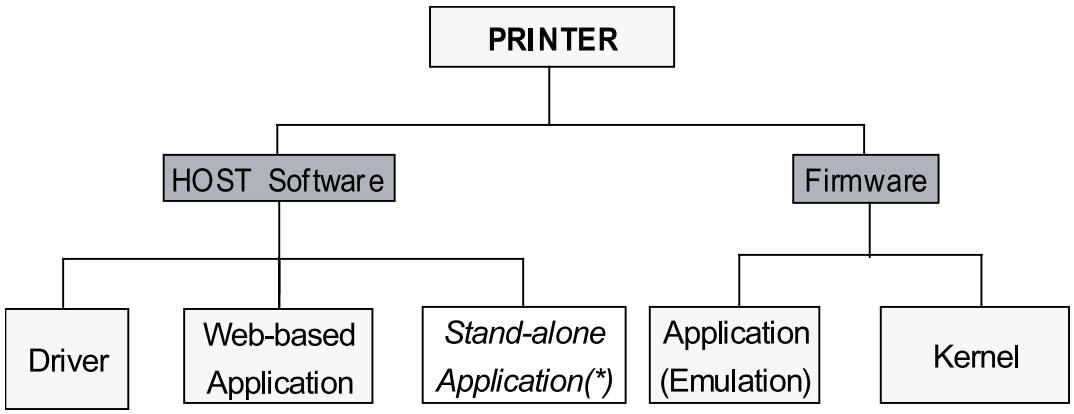
- **By Hsync :** When the polygon motor is ready, the LSU sends out the signal called Hsync and it is used to synchronize with each image line. So, if the engine does not detect consecutively the signal for a fixed time, it defines the Hsync Error. If this error happens, the engine stops all functions and keeps it at the error state. Also, the engine informs the error status of the main system and then the error message is displayed at LCD window to inform the error status to the customer.
  LSU Error Recovery: If the LReady or Hsync error occurs the paper is exited with no image on it. The engine mode is changed to recovery mode and the engine informs the main system of the engine mode. And the engine checks the LSU error. If the error doesn't happen, the printing job will be proceeding.

2.2.6 S/W Descriptions

2.2.6.1 Overview

The software system is constructed as follows:
1) The Host Software is an application software that can operate in a Windows and/or Web Environment.
2) The Firmware portion is an Embedded software controlling the print job.

2.2.6.2 Architecture

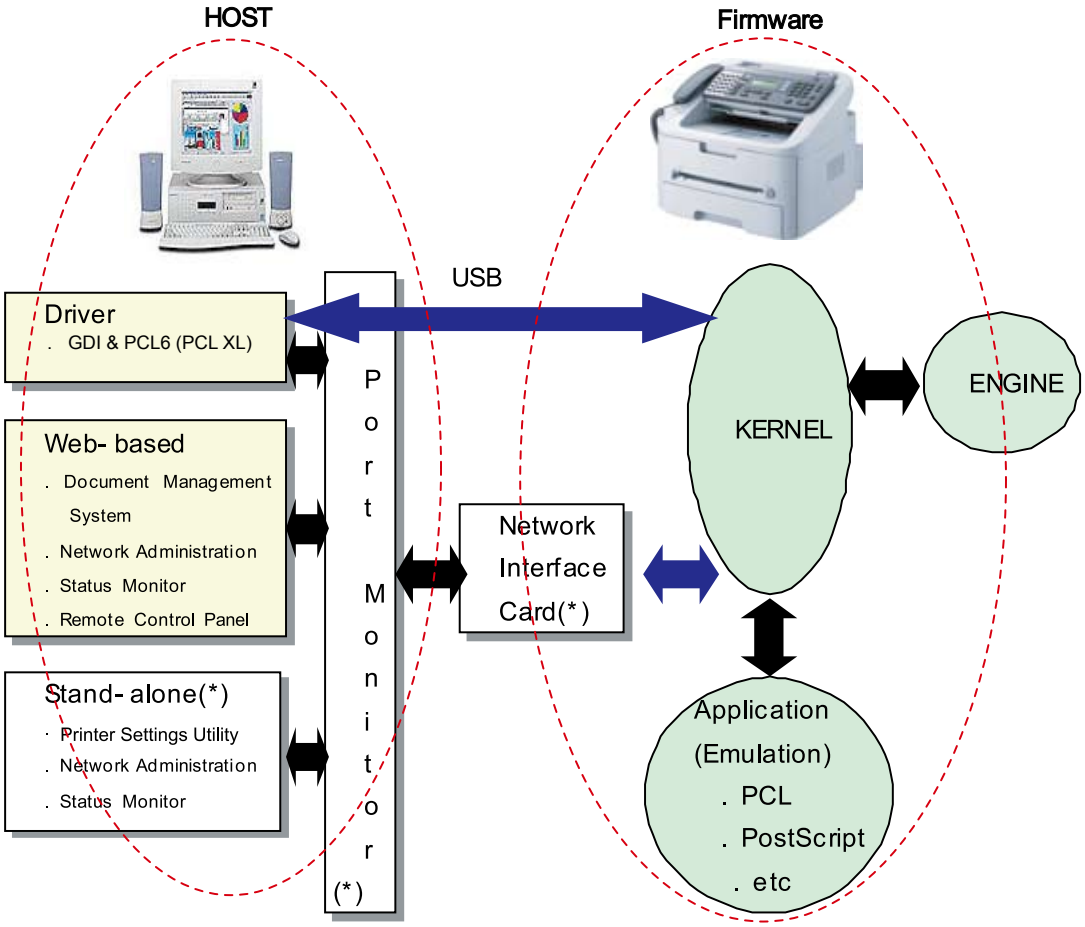


☞ (*) is job for common S/W team

Host Software is made up of:
1. Graphic User Interface that offers the various editing functions to user in Host.
2. Driver that translates the received document to a Printing Command Language which the printer can understand and transfers data to spooler.
3. Stand-alone Application that offers the various printing application, PSU(Printer Settings Utility), Printer Status Monitor, Network Management in Window system.
4. Web-based-Application that offers the same functions as Stand-alone Application and RDC(Remote Diagnosis Control) in Web environment.

Firmware is made up of:
1. Application (Emulation) that is a interpreter translate data received from Host to a printing language (PCL, PS, GDI, etc.) to be able to allow the user to take same output as original composed in Host.
2. Kernel that control and management the whole procedure include of Control flow and Printing Job before transfer to Engine system.

2.2.6.3 Data and Control Flow



Note: (*) is role of N/W I/F

Provided below is a detail explanation of the Block Diagram above.

Host Side is made up of:

1. The Print Driver that is Windows application softwares translate printed data to one of printer languages and creates spooler file.
2. Web-based Application offer a varity of additional functions for the printer; management of printing job, printer administration, Status monitor to monitoring the printer status by real time in Web, independent environment on OS.
3. Stand-alone Application that is a similar Window software as same as above 2,
4. Port Monitor that manages the network communication between spooler and Network Interface Card, or various additional application and Network Interface Card,(this is, at first, make communication logical port, manage the data, transfer them from spooler to network port, and offer the result of printing).

Firmware Side is made up of:

1. Network Interface Card is that relay the communication between Host and kernel using various network protocols.
2. Kernel manages the flow control of emulation procedure, receiving data from Host or Network card and printing with engine & rendering job.
3. Emulation interprets the various output data from selected emulation.
4. Engine prints rendered bit-map data to paper with required size and type by Kernel.

Job Spooling function for Multi-User, Multi-Printing that is occurred in Network printing and various additional printing functions, this Kernel use max. 10 Queuing systems in a memory.

In Printing, the two procedures are:

(1) Case of using USB Port
- After user starts to print document to PCL string or compressed GDI bit-map data; the driver translates all graphic data and sends the data to host spooler. The spooler then sends the data stream to the printer via USB port.
- Kernel receives this data from the Host, and then selects the emulation fit to data and start selected one. After emulation job ends. Kernel sends the output bit-map data to Engine using Printer Video Controller (by clock type for LSU).
- Engine print the received data to required paper with the sequential developing process.

(2) Network Interface Card
- After the user starts to print document to PCL string or compressed GDI bit-map data, the drive translate the graphic data and send data to host spooler.
- If so, Port monitor managing network port receives data from spooler and sends a data stream to the Network Interface Card.
- Network interface card receives it and send to Kernel part.
- Kernel receives this data from Host, and selects emulation fit to data and start selected one. After emulation job ends. Kernel sends the output bit-map data to the Engine using Printer Video Controller (by clock type for LSU).
- Engine print the received data to required paper with the sequential developing process.

The additional printing function are realized in:

(1) Web environment
(2) Window environment.

In addition, Kernel informs the printing and printer status to end-user making the printing job with the Status Monitor.

3. Disassembly and Reassembly

3.1 Precautions when replacing parts

3.1.1 Precautions when assembling and disassembling

* Use only approved 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.

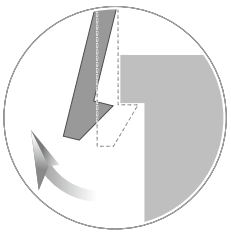
>> Precautions when replacing PBA

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. Release carefully to prevent damage.
To remove such parts, press the hook end of the latch away from the part to which it is latched.

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.

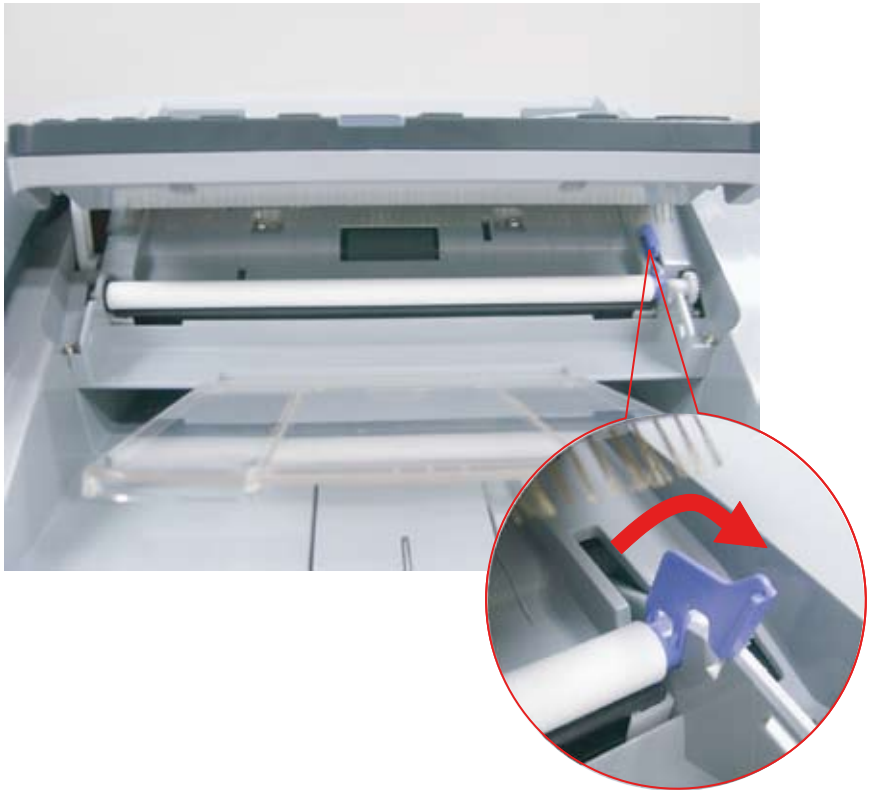
■ F-116 Series

Part Code	Location	Description	Qty
6003-000196	CASSETTE	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	2
6003-000261		SCREW-TAPTYPE;BH,+,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000264		SCREW-TAPTYPE;PWH,+,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000196	FUSER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	1
6003-000269		SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	5
6003-000282		SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	4
6006-001078		SCREW-TAPTYPE;PH,+,WSP,B,M3,L10,ZPC(WHT),SWRCH18A	1
6002-000308	FRAME-LOWER	SCREW-TAPTYPE;PH,+,-,B,M2.6,L6,ZPC(WHT),SWRCH18A,-	4
6003-000196		SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	29
6003-000282		SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	2
6003-000269	DRIVE MAIN-BRACKET	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	5
6003-000264	FRAME BASE-PICK UP	SCREW-TAPTYPE;PWH,+,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000282	LSU	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	9
6003-000282	LSU-SUB COVER	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	2
6003-000264	COVER-FRONT(650P)	SCREW-TAPTYPE;PWH,+,-,B,M3,L6,ZPC(WHT),SWRCH18A,-	3
6003-000282	CARTRIDGE-TONER KIT	SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	4
6003-000196	ADF FRAME-MAIN	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	6
6003-000196	ADF FRAME-LOWER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	6
6003-000269	DRIVE ADF	SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	1
6003-000196	ADF FRAME-UPPER	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	4
6003-000282		SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	1
6003-000196	MAINLINE	SCREW-TAPTYPE;PWH,+,B,M3,L10,NI PLT,SWRCH18A	23
6003-000269		SCREW-TAPTYPE;BH,+,-,S,M3,L6,ZPC(WHT),SWRCH18A,-	12
6003-000282		SCREW-TAPTYPE;BH,+,-,B,M3,L8,ZPC(BLK),SWRCH18A,-	2
6003-000301		SCREW-TAPTYPE;BH,+,S,M4,L6,ZPC(WHT),SWRCH18A	1

3.3 White Roller

1. Open the OPE Unit.

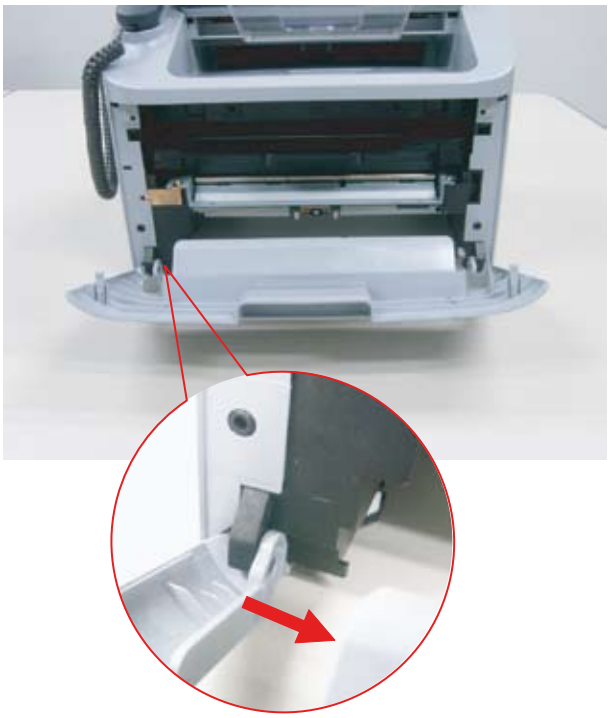
2. Pull the lever up on the right end of the white roller.
   Then lift the roller out.



3.4 Front Cover

1. Take out the Cassette.

2. Open the front cover.
   Unlatch the front cover from the Frame assy.



3.5 Rear cover

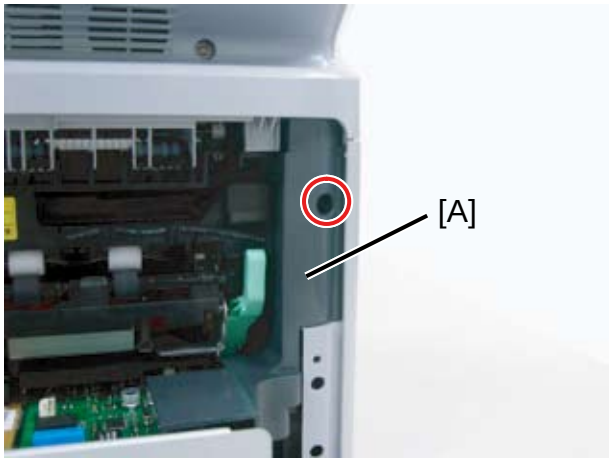
Remove 4 screws securing the rear cover and remove it.

3.6 Scan Ass'y

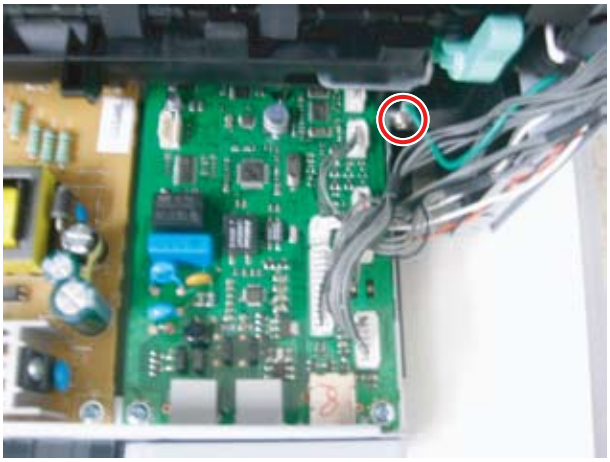
1. Before removing Scan Ass'y, remove the rear cover.

2. Open the front cover.
   And remove 2 screws from the front.

3. Remove the harness cover [A] from the rear after removing 1 screw.



4. Remove all connectors and 1 screw.

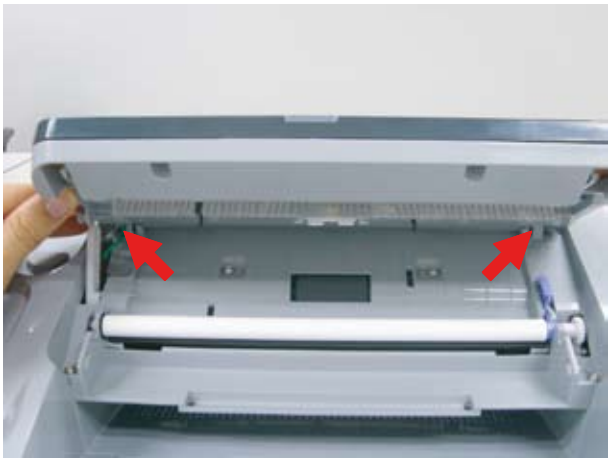


5. Remove 1 screw.
   Then lift the Scan Assy up.

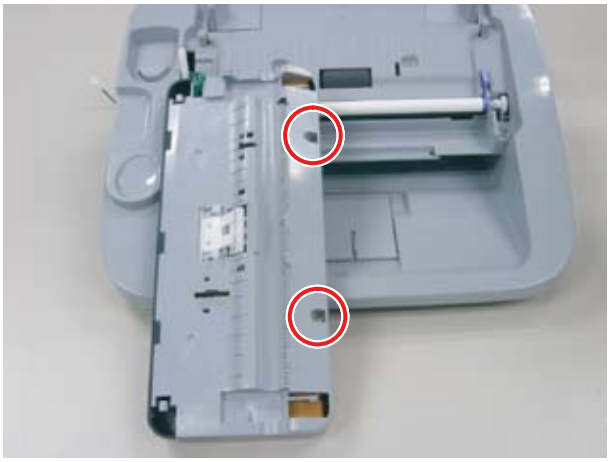
3.6.1 OPE unit

1. Open the OPE unit. And release the latch from holder.

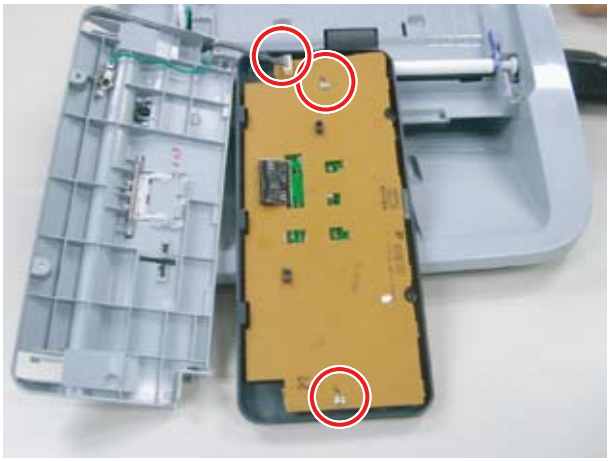
2. Carefully release the latches from both side of OPE unit.



3. Remove 2 screws.

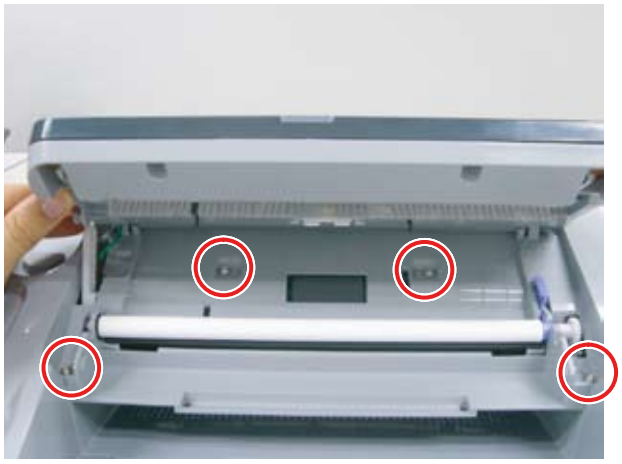


4. Open the OPE bottom cover.
   Release the OPE PBA after removing 1 connector and 2 screws.

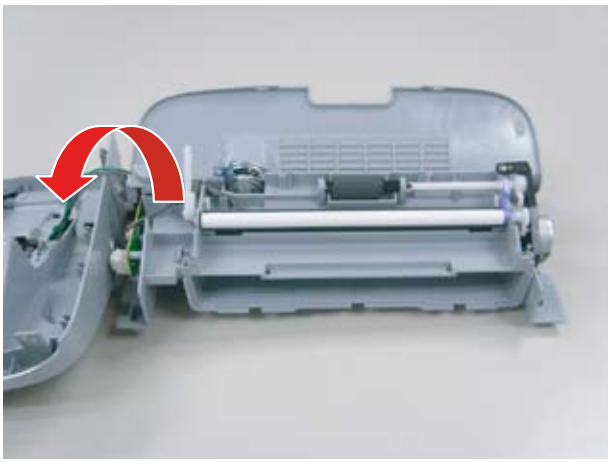


3.6.2 Scan Drive unit

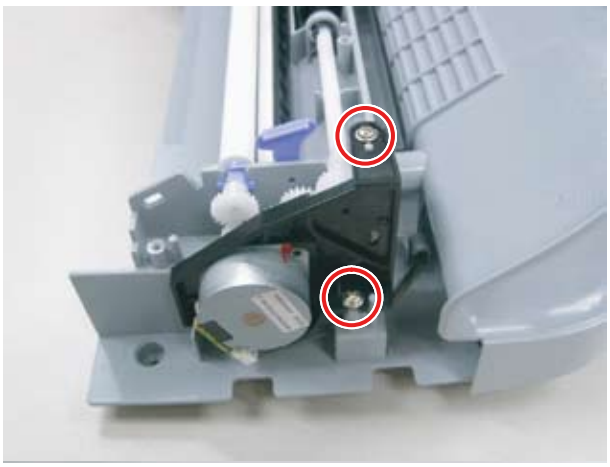
1. Remove the OPE unit. (Refer to 3.6.1)
   Then remove 4 screws.



2. Open the Scan Cover.



3. Remove 2 screws.



4. Unplug the connector. Then release the scan drive unit.

3.6.3 ADF roller

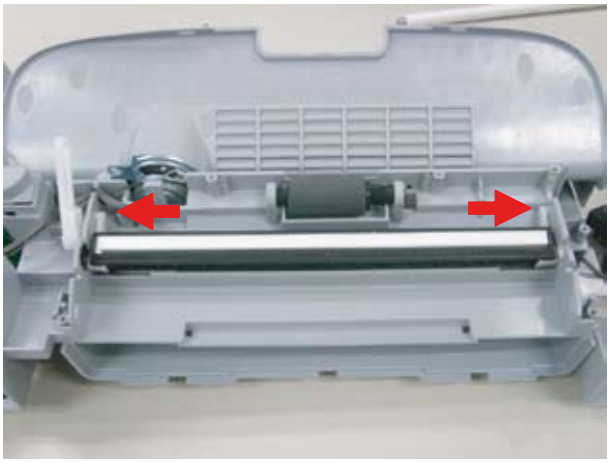
1. Remove the Scan Drive unit.

2. Release the ADF roller as shown below.

3.6.4 CIS

1. Remove the white roller.

2. Release the CIS after unlatching both side holder.

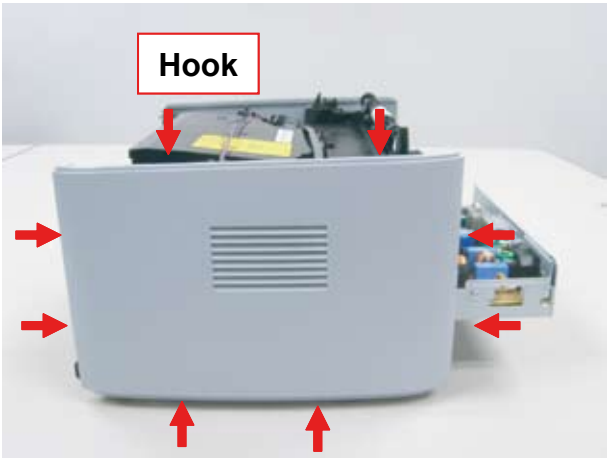


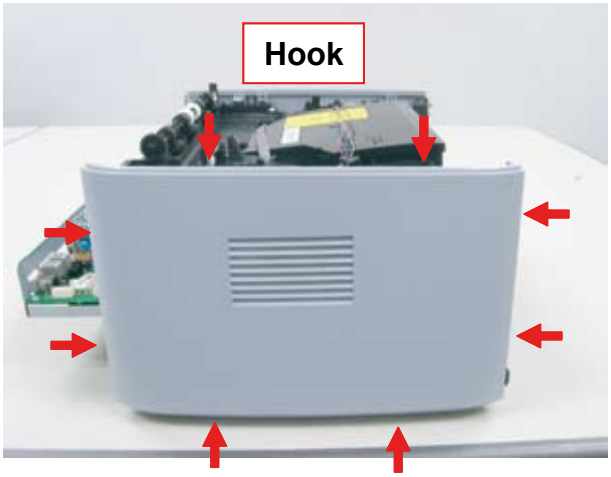
3.7 Right/Left Cover

1. Remove the front cover and rear cover. (Refer to 3.4, 3.5)

2. Remove the Scan Assy. (Refer to 3.6)

3. Remove the Left/ Right cover by removing hooks of right/left/top/bottom side.





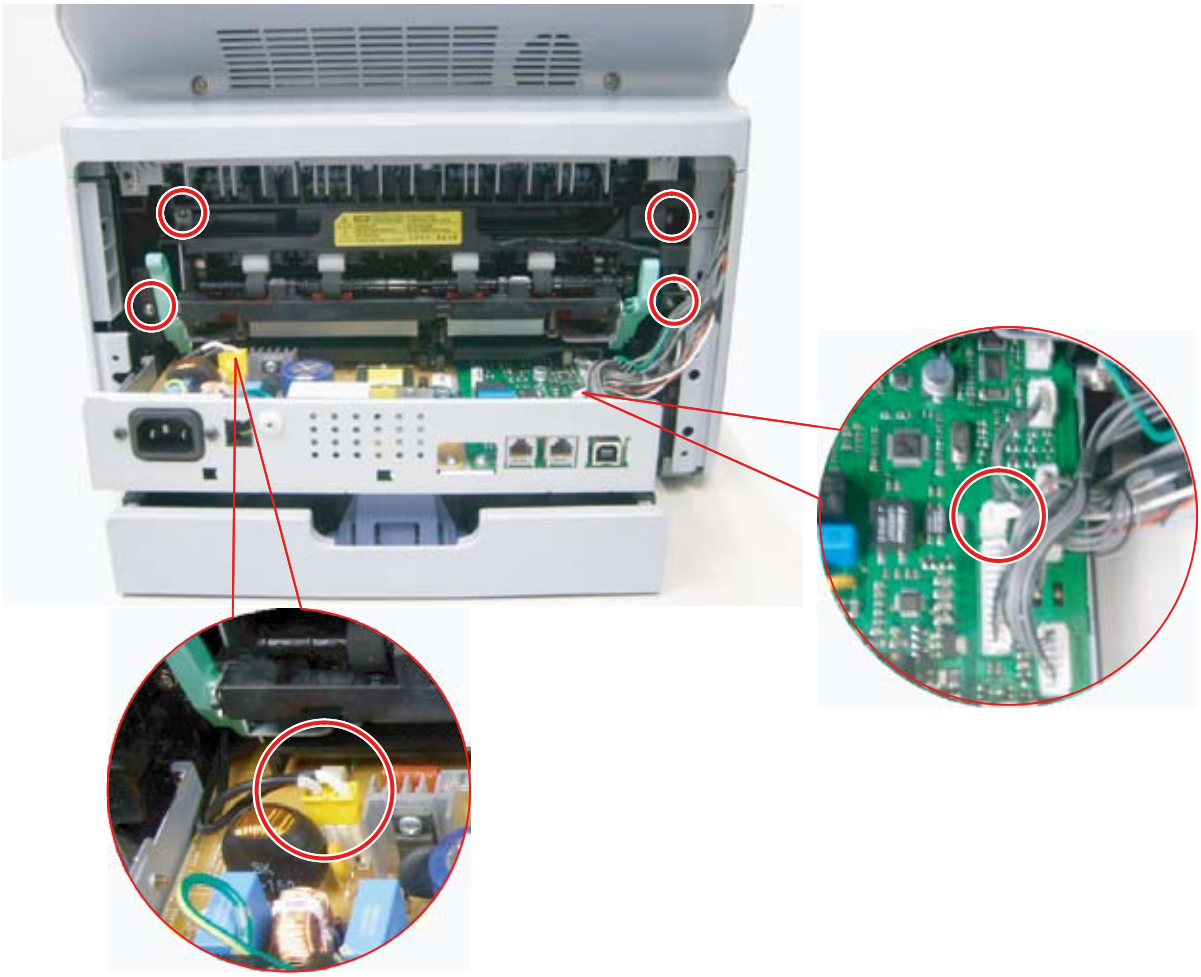
3.8 Fuser Unit

1. Remove the rear cover.

2. Remove 4 screws.

3. Unplug the 2 connectors from SMPS board and Main board.

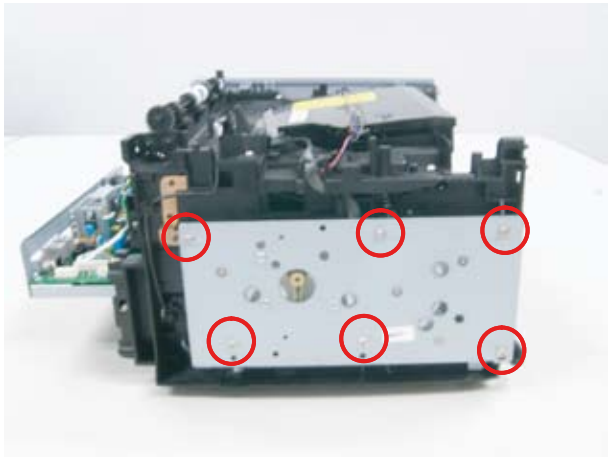
4. Take off the Fuser unit.



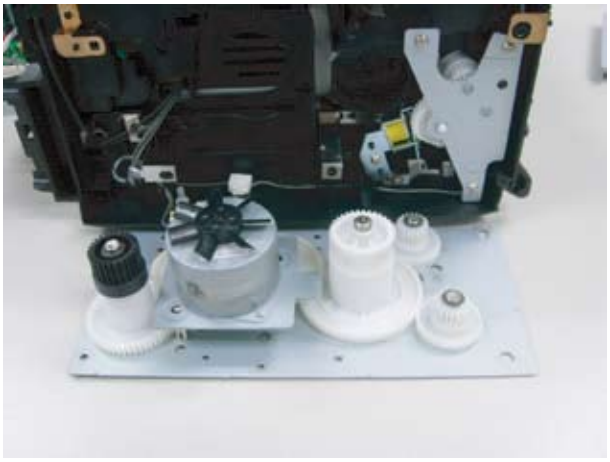
3.9 Drive unit

1. Remove the Rear cover/ Scan Assy / Left cover.

2. Remove 6 screws.



3. Take off the Drive Unit after removing 1 connector.



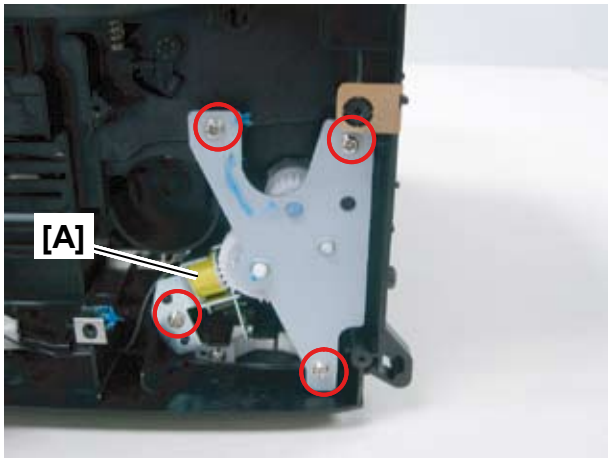
3.10 Solenoid

1. Remove the Drive unit (refer to 3.9)

2. Remove the solenoid connector on Main PBA. (refer to 3.1.14)

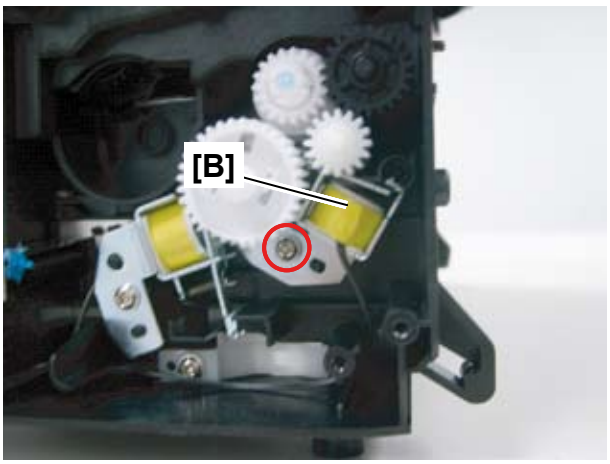
3. Take off the solenoid [A] after removing 1 screw.

4. To remove the solenoid [B], take off the bracket after removing 3 screws.



5. Remove the gears.

6. Take off the solenoid [B] after removing 1 screw.

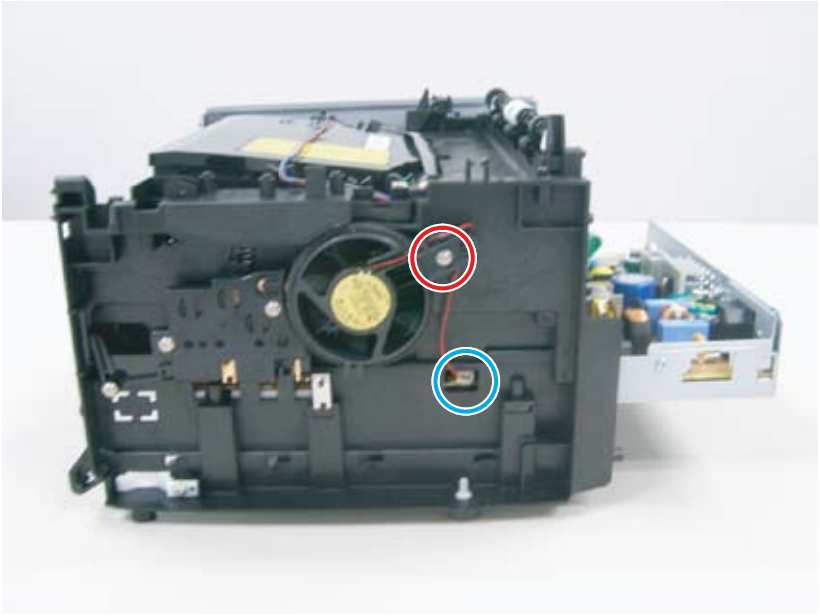


3.11 FAN

1. Remove the right cover.

2. Remove 1 screw and 1 connector.

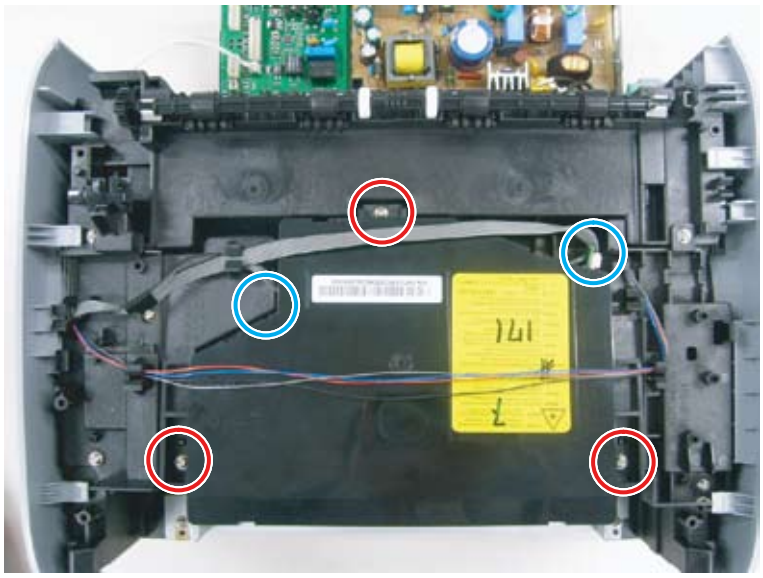
3. Take off the FAN.



3.12 LSU

1. Remove the Rear cover/ Scan Ass'y

2. Lift the LSU unit off by removing 3 screws and 2 connectors.

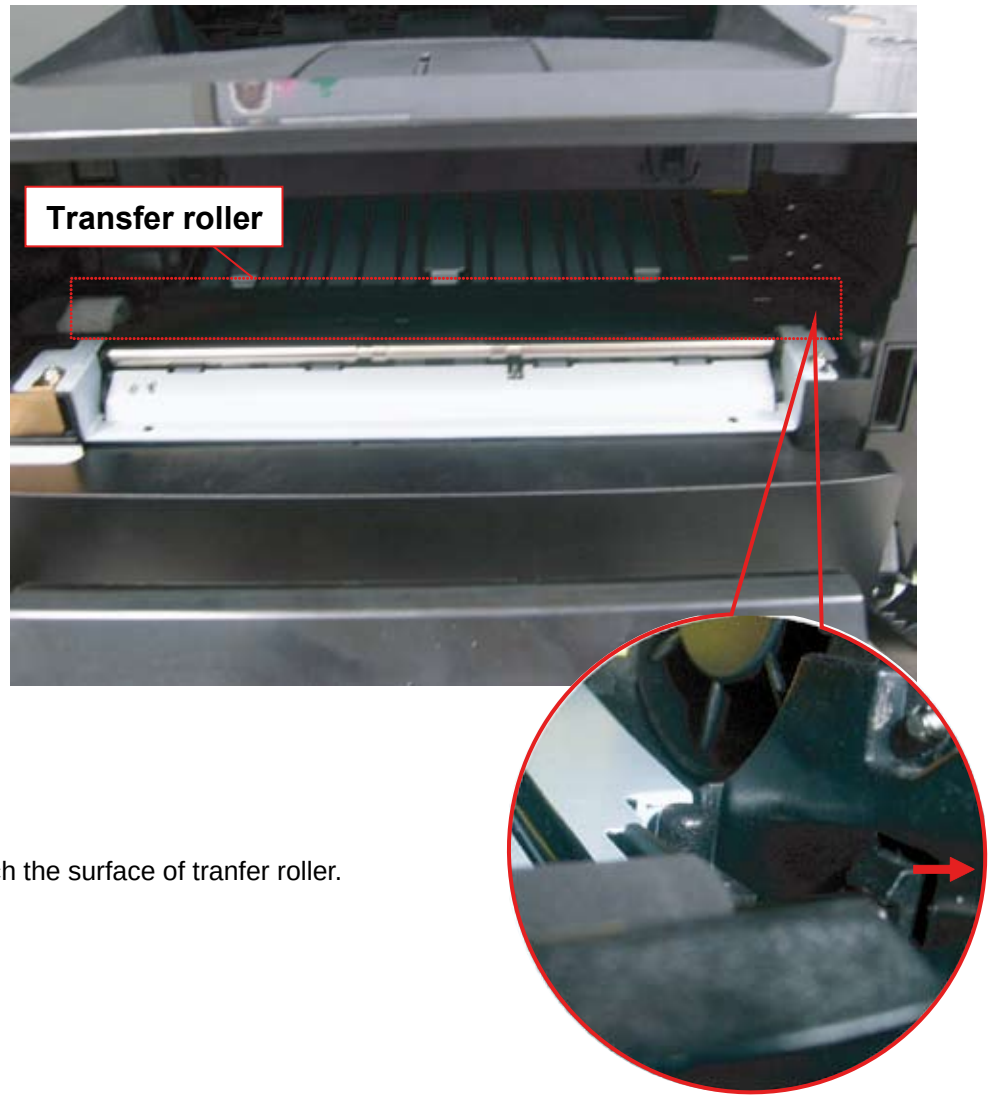


3.13 Transfer Roller

1. Open the front cover.

2. Take out the toner cartridge.

3. Take off the transfer roller by release its right shaft from hook.



Caution
Don't touch the surface of tranfer roller.

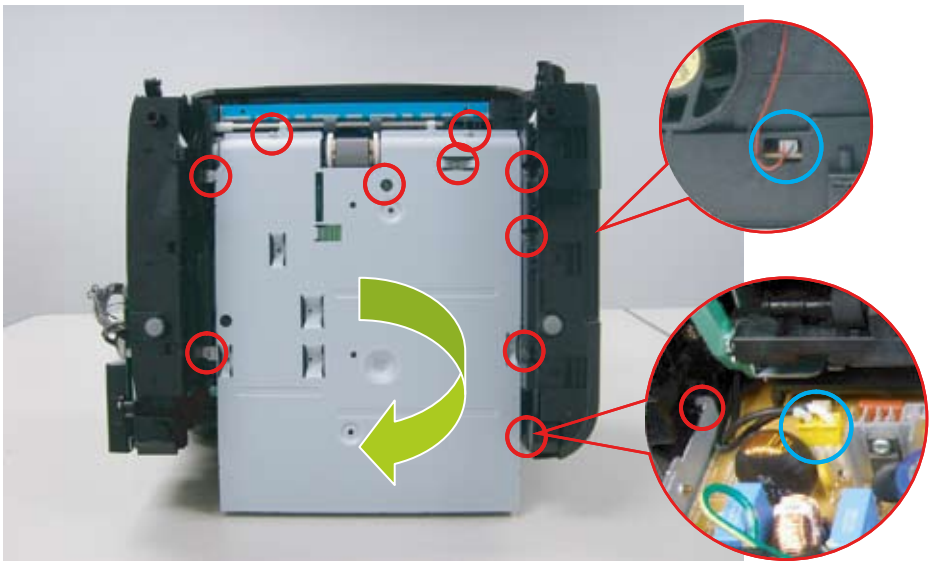
3.14 Main PBA and SMPS/HVPS board

1. Take out the Cassette unit.

2. Remove Front cover / Rear cover / Scan Ass'y / Right cover. (refer to 3.4~3.7)

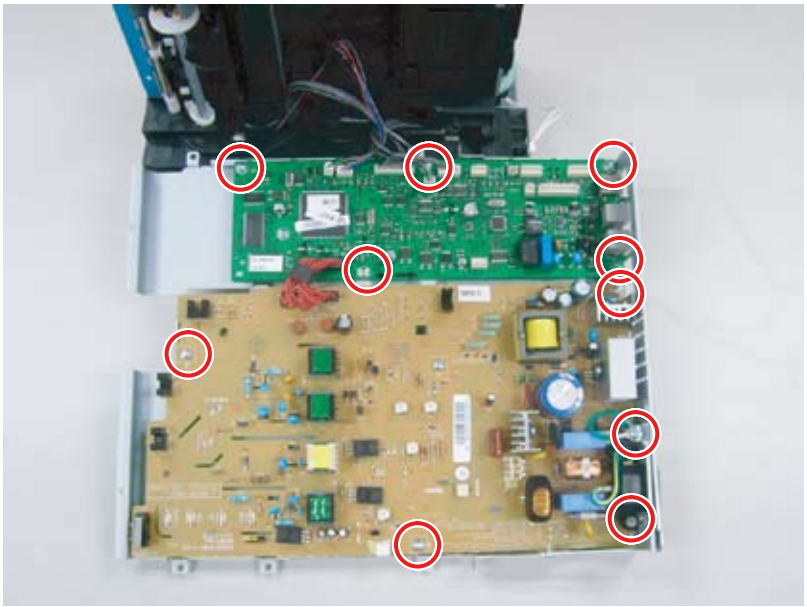
3. Remove 10 screws (bottom x 9 , rear x 1) and 2 connector. (SMPS x 1 , Fan x 1)

4. Turn the board shield over.



5. Remove 5 screw and unplug all connectors on Main PBA. Then release the Main PBA.

6. Remove 5 screw and unplug all connectors on SMPS/HVPS board. Then release the SMPS/HVPS board.

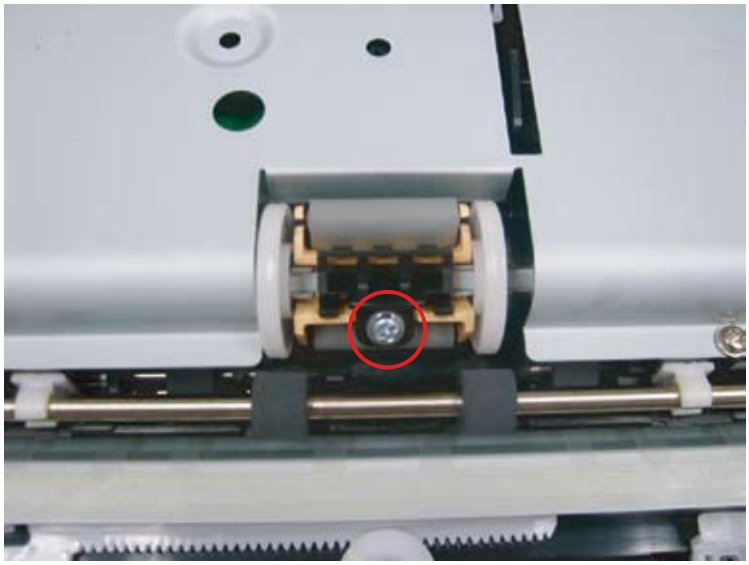


3.15 Pick up roller

1. Take out the Cassette unit.

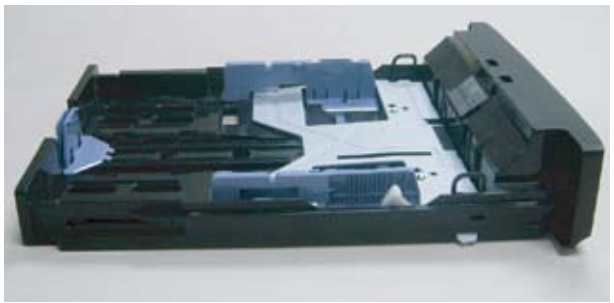
2. Turn the printer over.

3. Take off the pick up roller after removing 1 screw.

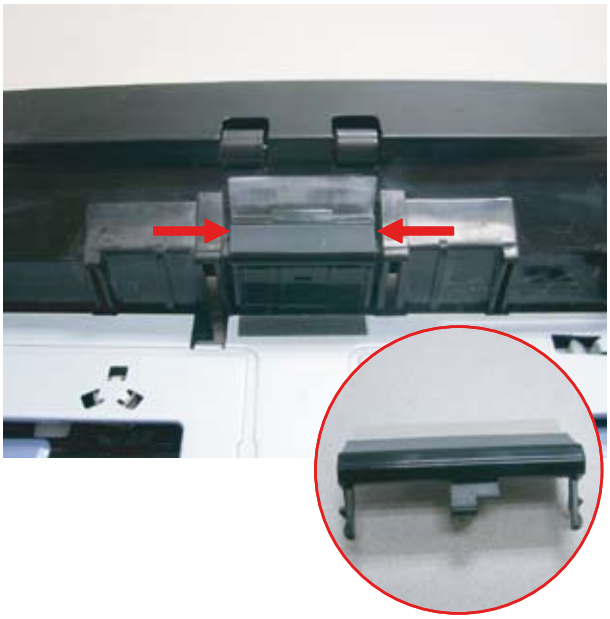


3.16 Cassette holder pad

1. Take out the Cassette unit.



2. Take off the holder pad by unhooking both latches.



4. Alignment and Troubleshooting

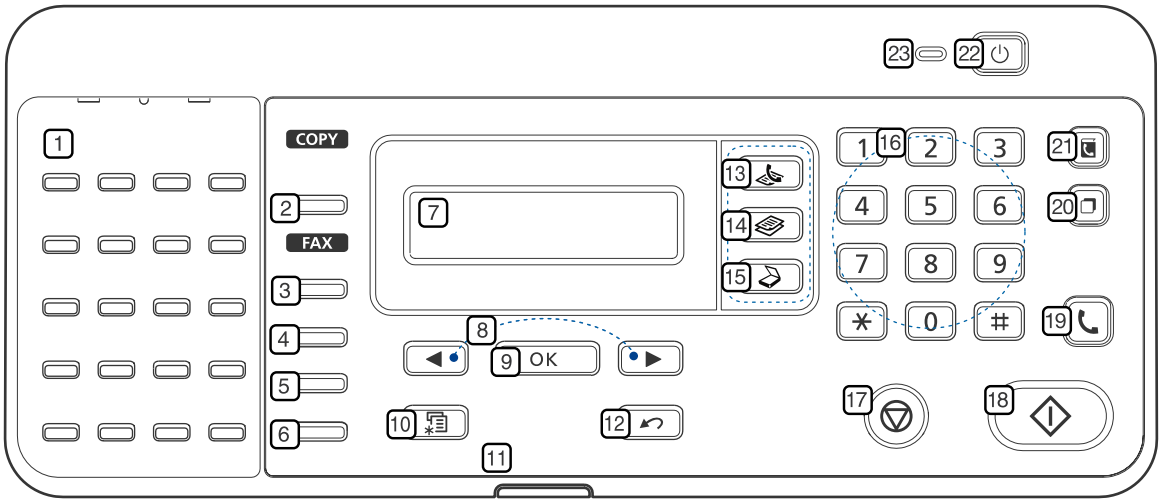
4.1 Alignment and Adjustments

This chapter describes the main functions for servicing the equipment, such as the product maintenance proper repair procedures, jam removal procedures, and so on.

4.1.1 Control Panel

■ F-116 Series

This control panel may differ from your machine depending on its model.



1	**one-touch dial**	Stores frequently-dialed fax number.
2	**Reduce/Enlarge**	Makes a copy smaller or larger than the original.
3	**Delay Send**	Allows you to send a fax at a later time when you will not be present.
4	**Multi Send**	Allows you to send a fax to multiple destinations.
5	**Receive Mode**	Converts the fax receiving mode.
6	**Resolution**	Adjusts the resolution of the documents for the current fax job.
7	**Display**	Shows the current status and prompts during an operation.
8	◀ ▶ **Arrow**	Scroll through the options available in the selected menu, and increase or decrease values.
9	**OK**	Confirms the selection on the screen.

10	**Menu**	Enters Menu mode and scrolls through the available menus.
11	**Status**	Shows the status of your machine.
12	**Back**	Sends you back to the upper menu level.
13	**(Fax)**	Activates fax mode.
14	**(Copy)**	Activates copy mode.
15	**(Scan)**	Activates scan mode.
16	**Numeric keypad**	Dials fax number, and enters the number value for document copies or other options.
17	**Stop/Clear**	Stops an operation at any time. The pop-up window appears on the screen showing the current job that the user can stop or resume.
18	**Start**	Starts a job.
19	**On Hook Dial**	Performs same as you hold a handset under the telephone line is engaged.
20	**Redial/Pause**	In standby mode, redials the last number. Also in edit mode, inserts a pause into a fax number.
21	**Address Book**	Allows you to store frequently used fax numbers or search for stored fax numbers.
22	**(power)**	Turns the machine on or off.
23	**power LED**	Shows whether the machine is turned on or off.

4.1.2 Understanding the Status LED

The color of the status LED indicates the machine's current status.

STATUS		DESCRIPTION
Off		• The machine is off-line. • The machine is in power saver mode. When data is received, or any button is pressed, it switches to on-line automatically.
Green : Online	Blinking	• When the backlight slowly blinks, the machine is receiving data from the computer. • When the backlight blinks rapidly, the machine is printing data.
	On	The machine is on-line and can be used.
Red : Error	Blinking	• A minor error has occurred and the machine is waiting for the error to be cleared. Check the display message. When the problem is cleared, the machine resumes. • Small amount of toner is left in the cartridge. The estimated cartridge life[a] is nearing its replacement interval. Prepare a new cartridge for replacement. You may temporarily increase the printing quality by redistributing the toner.
	On	• A toner cartridge has almost reached its estimated cartridge life[a]. It is recommended to replace the toner cartridge. • A paper jam has occurred. • The cover is opened. Close the cover. • There is no paper in the tray. Load paper in the tray. • The machine has stopped due to a major error. Check the display message.

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 19752. The number of pages produced will be affected by the percent of imaged area of your original. The operating environment, printing interval, media type, and media size, may also affect the number of pages produced by your cartridge. Some amount of toner may remain in the cartridge even when Toner Empty appears on the display and the printer stops printing.

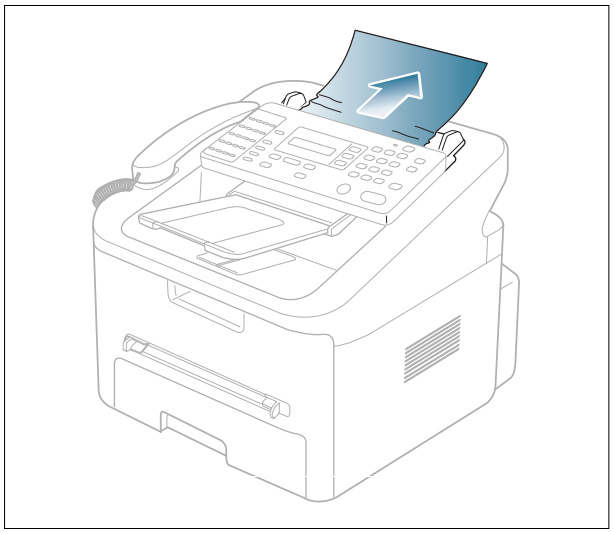
4.1.3 JAM Removal

4.1.3.1 Clearing Original Document Jams

When an original jams while passing through the document feeder, a warning message appears on the display screen.

Input Misfeed

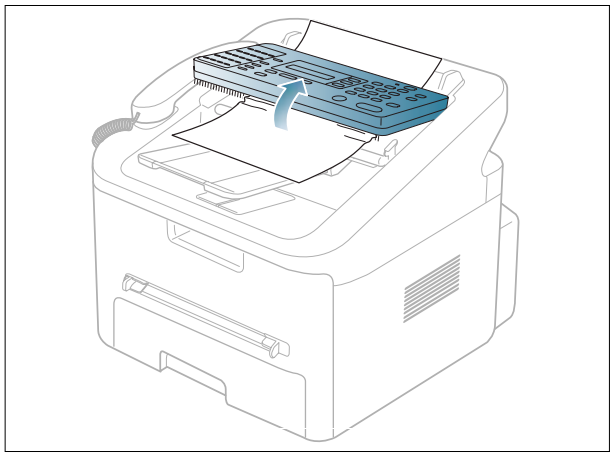
1. Remove any remaining originals from the document feeder.
2. Pull the jammed document gently out of the document feeder.



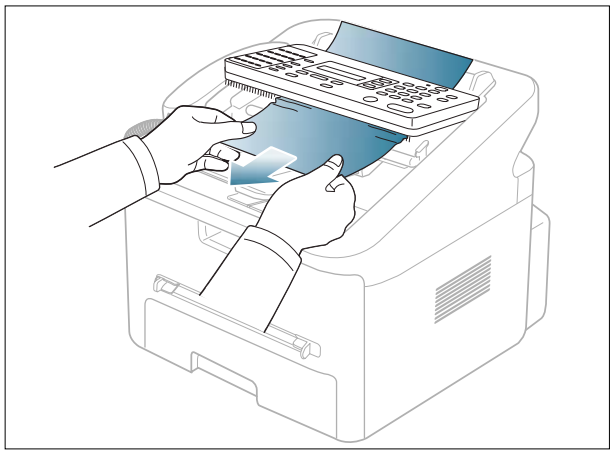
3. Load the documents back into the document feeder.

Exit Misfeed

1. Remove any remaining originals from the document feeder.
2. Open the control panel by gripping it on the bottom edge and pulling it.



3. Pull the document gently out of the document feeder.



4. Close the control panel. Then load the documents back into the document feeder.

Note: Ensure the number of originals you place in the ADF does not exceed its tray capacity.

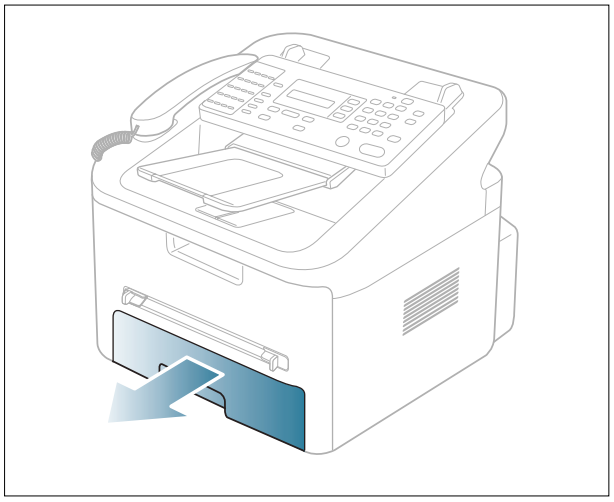
4.1.3.2 Clearing paper jams

When a paper jam occurs, a warning message appears on the display.
To resume printing after clearing paper jams, you must open and close the front door.

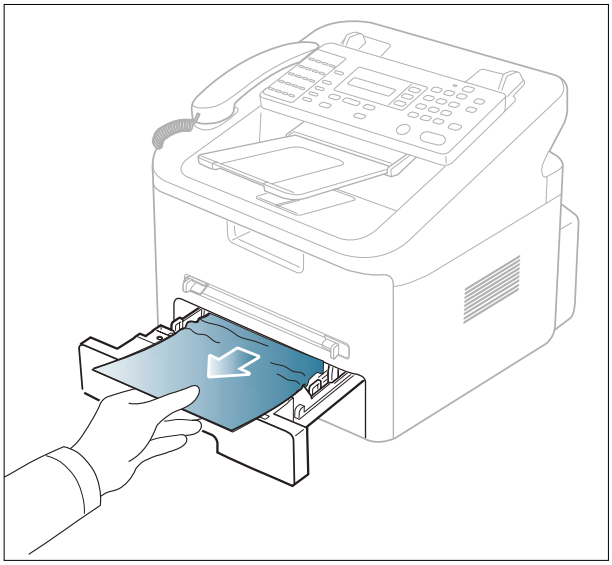
In tray 1

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

2. Pull out tray 1.



3. Inspect tray and clear any damaged sheets.

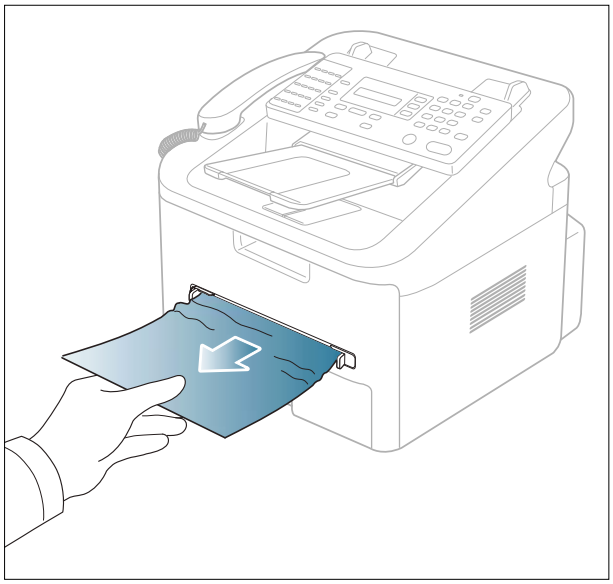


If the paper does not move when you pull, or if you do not see the paper in this area, check the fuser area around the toner cartridge.

4. Insert tray 1 back into the machine until it snaps into place. Printing automatically resumes.

In the manual tray

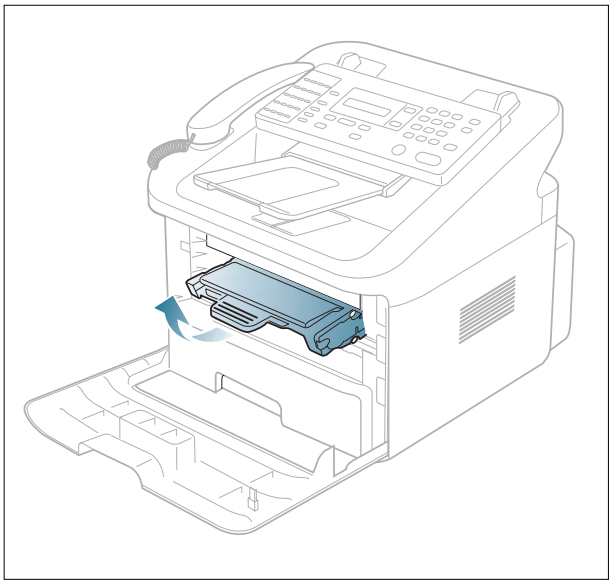
1. If the paper is not feeding properly, pull the paper out of the machine.



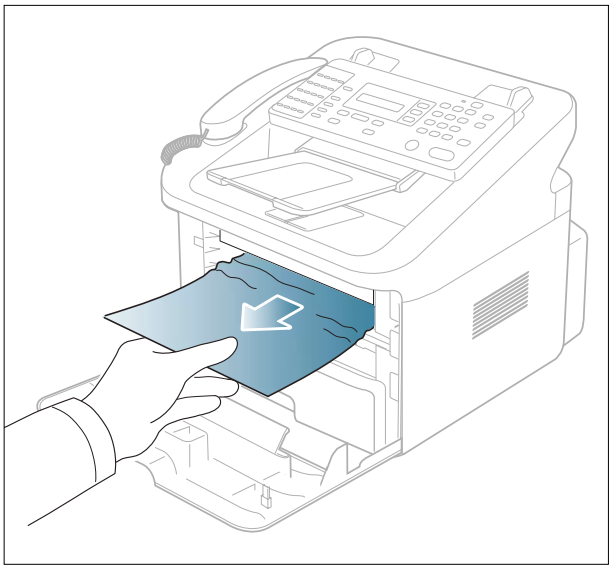
2. Open and close the front door to resume printing.

Inside the machine

1. Open the front door and pull the toner cartridge out, lightly pushing it down.



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

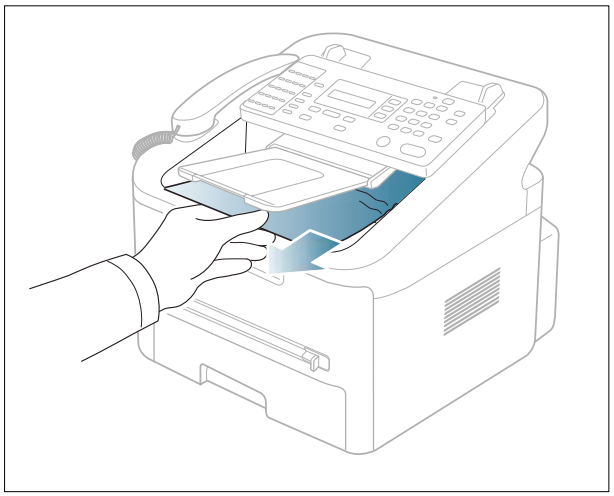


3. Replace the toner cartridge and close the front door. Printing automatically resumes.

In exit area

1. Open and close the front door. The jammed paper is automatically ejected from the machine. If you do not see the jammed paper, go to next step.

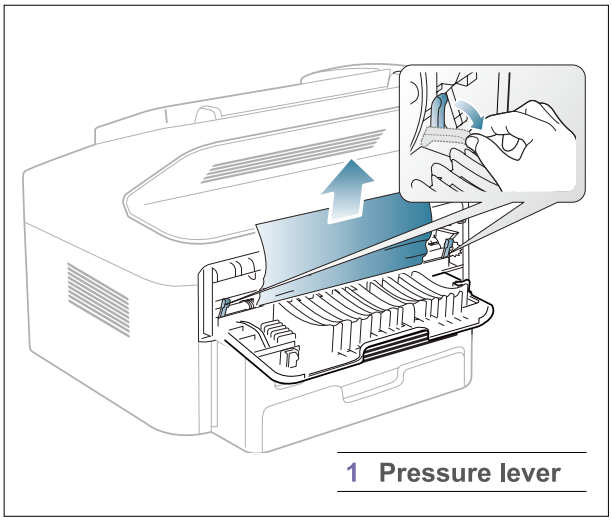
2. Gently pull the paper out of the output tray.



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

3. Open the rear door.

4. Pull the pressure levers down and remove the paper.

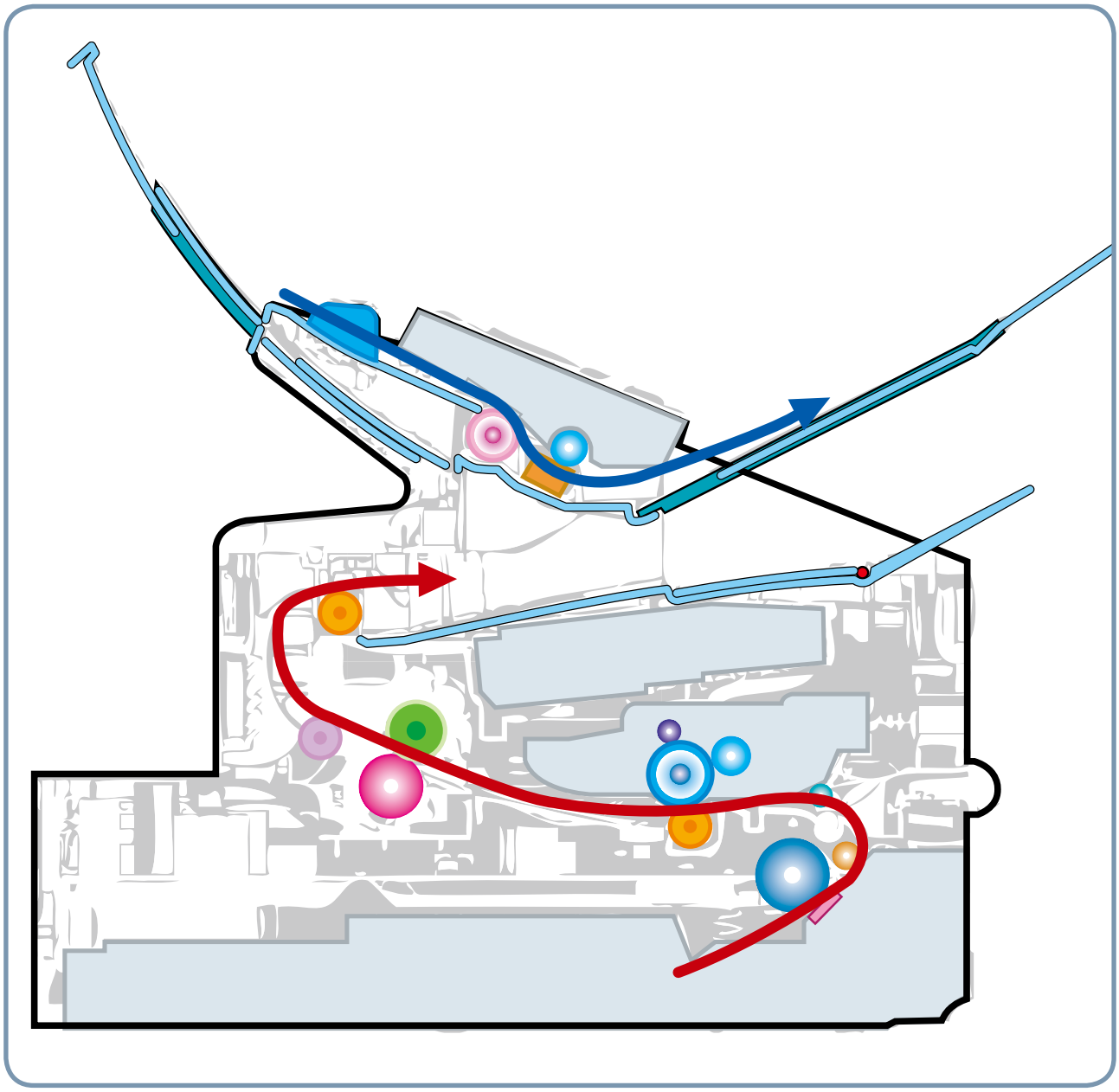


5. Return the pressure levers to their original position.

6. Close the rear door.

7. Open and close front door, printing automatically resumes.

4.1.4 Paper Path



4.1.5 Menu Map

The control panel provides access to various menus to set up the machine or use the machine's functions. These menus can be accessed by pressing Menu. To select 1st level menu, press the menu button or numeric button.

1st Level		2nd Level	3rd Level	Default
1. Paper Setting ◀ Paper Type ▶	Paper Type	Plain/Thick/Thin/ Cotton/Colored/ Pre-Printed/ Recycled/Envelope/ Transparency/Label/ Cardstock/Bond/ Archive		Plain Paper
	Paper Size	Tray Paper	Letter, Legal, A4, Executive, Folio, A5, JIS B5, A6, ISO B5, Oficio	Letter
		Manual Feed	Letter, Legal, A4, Executive, Folio, A5, JIS B5, A6, ISO B5, Oficio	Letter
2. Copy Setup ◀ Default-Change ▶	Default-Change	Darkness	Light/Normal/Dark	Normal
		Original Type	Text, Photo, Text/ Photo	TEXT
		Reduce/Enlarge	[Original(100%)]	100%
			[LGL→LTR(78%)]	
			[LGL→A4(83%)]	
			[A4→LTR(94%)]	
			[EXE→LTR(104%)]	
			50%	
			150%	
			200%	
			[Custom:50-200%]	
		No. of Copies	[1-99]	1
	Timeout	15,30,60,180Sec, Off		30sec
	CopyCollated	On,Off		Off
	Darkness	Light/Normal/Dark		Normal
	Original Type	Text, Photo, Text/Photo		TEXT

1st Level		2nd Level	3rd Level	Default
3. Fax Setup ◀ Ring to Answer ▶	Ring to Answer	1~7		1
	Darkness	Light/Normal/Dark		Normal
	Redial Term	1~15 Min		3 minutes
	Redials	0~13 times		7 times
	MSG Confirm	On, Off, On-Error		On-Error
	Image TCR	On, Off		On
	Auto Report	On, Off		On
	Auto Reduction	On, Off		On
	Discard Size	0~30mm		20mm
	Receive Code	0~9		9
	DRPD Mode	set		
4. Fax Feature ◀ Delay Fax ▶	Delay Fax	Fax:		
	Priority Fax	Fax:		
	Add Page	Yes, No		
	Cancel Job	Yes, No		
	Delay Rx Poll	Enter Number		
		Enter Name		
		Poll Code		
5. Advanced fax ◀ Send Forward ▶	Send Forward	On		
		Off		Off
	RCV Forward	On	Start Time/ End Time	
			Print Local Copy	
		Off		Off
	Toll Save	On	Start Time	
		Off	End Time	
	Junk Fax Setup	On	Fax:	
		Off		Off
	Secure Receive	On,Off, Print		Off
	Prefix Dial	FAX: xxxxx (5 digits)		
	Stamp RCV Name	On, Off		Off
	Caller ID	On, Off		Off
	ECM Mode	On, Off		On

1st Level		2nd Level	3rd Level	Default
6. Reports ◀ Phone Book ▶	Phone Book			
	Sent Report			
	RCV Report			
	System Data			
	Scheduled Jobs			
	MSG Confirm			
	Junk Fax List	10 ea		
7. Sound/Volume ◀ Speaker ▶	Speaker	On, Off, Comm.		Comm.
	Ringer	Off, Low,Med,High		Med
	Key Sound	On, Off		Off
	Alarm Sound	On, Off		On
8. Machine Setup ◀ Machine ID ▶	Machine ID	Fax:		
		ID:		
	Date & Time	00-00-0000		
		00:00(AM)		
	Clock Mode	12, 24 hours		12hours
	Dial Mode	Tone,Pulse		Tone
	Language	[English/French/ SPANISH / PORTUGUESE / GERMAN /ITALIAN / DUTCH /RUSSIAN / Norwegian/Finnish/ Danish/Swedish/ Turkish] -13 Languages		English
	Toner Save	On		Off
		Off		
	Power Save	On	5/10/15/30/45	
		Off		
	USB Mode	Fast, Slow		Fast
	Clear Toner	On		Off
		Off		

1st Level		2nd Level	3rd Level	Default
9. Maintenance ◀ Clean Drum ▶	Clean Drum	On		On
		Off		
	Notify Toner	On		
		Off		
	Clear Memory	Clear All Mem.		
		Paper setting		
		Copy Setup		
		Fax Setup		
		Fax Feature		
		Advanced Fax		
		Sound/Volume		
		Machine Setup		
		Sent Report		
		RCV Report		
		Phone Book		
	Adjust Shading	On		
		Off		
	TonerLow Alert	On		On
		Off		

4.1.6 Tech Mode

In service (tech) mode, the technician can check the machine and perform various test to isolate the cause of a malfunction. While in Tech mode, the machine still performs all normal operations.

To enter the Tech Mode

To enter the Tech Mode, press the buttons as following

“ Menu → # → 1 → 9 → 3 → 4 → Menu”

And the LCD briefly displays ‘Tech Mode’, the machine has entered service tech mode.
After entering the tech mode, select the item you want by using the “ ◀, ▶, OK ” buttons on control panel.

■ Tech mode Menu Map

Depth1	Depth2	Depth3
Data Setup	Send Level	-9~-15
	Modem Speed	33.6, 28.8, 14.4, 12.0, 9.6, 4.8
	Error Rate	5%, 10%
	Dial Mode	Tone,Pulse
	Notify Toner	Customer No.
		Customer Name
		Service No.
		Serial No.
		Customer Name
		Service No.
		Serial No.
	Clear All Mem.	
	Clear Count	Total Page Count
		FLT Scan CNT
		ADF Scan Count
		Used Toner CNT
	Flash Upgrade	Local
	Silence Time	Off/ 12 Sec/Unlimited
	TonerLow %	[1-30]%:__
	Test Param Set	[00-50]
Machine Test	Switch Test	
	Modem Test	
	Dram Test	
	Rom Test	
	Pattern Test	
	Dial Test	
	Shading Test	
Report	Protocol	
	System Data	
	Error Info	
	Shading Data	
	Supplier Info	

Data Setup

Send Level
You can set the level of the transmission signal. Typically, the Tx level should be under -12 dBm.
Caution : The Send Fax Level is set at the best condition from factory. Never change settings arbitrarily.

Dial Mode
This function can choose dial method.
*Default : Dial (Dial/Pulse)

Modem Speed
You can set the maximum modem speed.However, outbound communication is switched automatically to match the standard of the receiving fax. Therefore, when communicating with a lower speed modem, the outbound communication speed will be set to low. This will allow for better transmission/reception by the receiving fax.

Error Rate
When the error rate is about exceed the set value, the Baud rate automatically adjusts to 2400 bps. This ensures that the error rate remains below the set value.You can select the rate between 5% and 10%.

Clear All Memory
The function resets the system to factory default settings.This function is used to reset the system to the initial value when the product was functioning normally. All the values are returned to the default values, and all the information, which was set by the user, will be erased.
NOTICE : Always perform a memory clear after replacing the main board. Otherwise, the system may not operate properly.

Toner Low %
The function is to set up the time to inform toner low status. This function can provide user convenience for replacing the toner cartridge.

Clear Count
This function resets Total Page Count, Flatbed Scan Count, ADF Scan Count.

Notify Toner

Silence Time

Test Param Set
You can set the parmeter for handset standard.
Caution : The parameter value is set at the best condition in the shipment from factory.

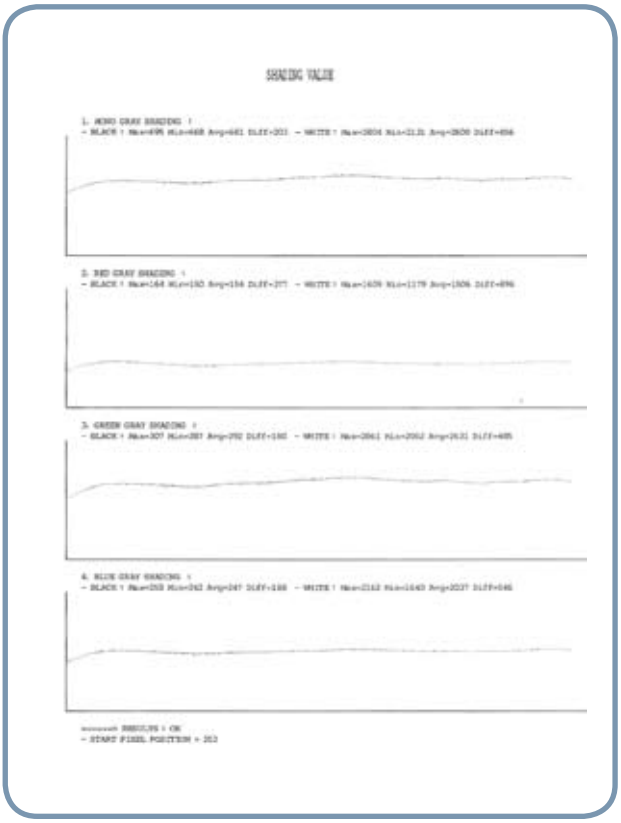
Machine Test

Switch Test
Use this feature to test all keys on the operation control panel. The result is displayed on the LCD window each time you press a key.

Modem Test
Use this feature to hear various transmission signals to the telephone line from the modem and tocheck the modem. If no transmission signal sound is heard, it means the modem part of the mainboard malfunctioned.

Dram Test
Use this feature to test the machine's DRAM. The result appears in the LCD display.If all memory is working normally, the LCD shows << O K >>ROM TEST
Use this feature to test the machine'S ROM. The result and the software version appear in the LCD display.
• FLASH VER : 1.00 V
• ENGINE VER :1.00V

Shading Test
This function is to get the optimum scan quality out of the CCD(ChargeCoupled Device).
If the copy image quality is poor, perform this function to check the condition of the CCD unit.



Report

PROTOCOL LIST

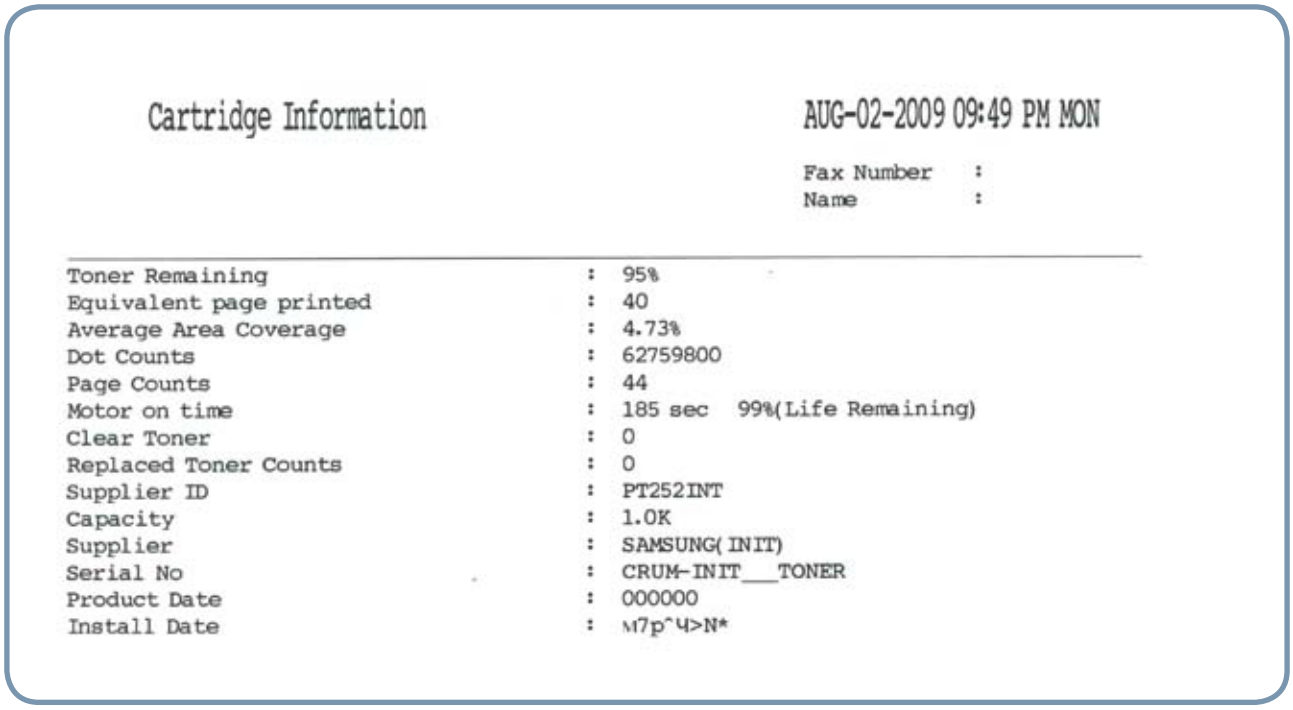
This list shows the sequence of the CCITT group 3 T.30 protocol during the most recent sending or receiving operation.
If a communication error occurs, use this report to check for send and receive errors.

SYSTEM DATA

This list provides a list of the user system data settings and tech mode settings.

SUPPLIES INFO

This report shows the status of toner cartridge. This report includes toner remaining, average area coverage, installed date etc.



Cartridge Information

AUG-02-2009 09:49 PM MON

Fax Number :
Name :

Toner Remaining	:	95%
Equivalent page printed	:	40
Average Area Coverage	:	4.73%
Dot Counts	:	62759800
Page Counts	:	44
Motor on time	:	185 sec 99%(Life Remaining)
Clear Toner	:	0
Replaced Toner Counts	:	0
Supplier ID	:	PT252INT
Capacity	:	1.0K
Supplier	:	SAMSUNG(INIT)
Serial No	:	CRUM-INIT___TONER
Product Date	:	000000
Install Date	:	м7p^Ч>N*

4.1.7 EDC Mode

The EDC Mode is used to independently control and test each sensor and driver component, so as to more easily service the printer.

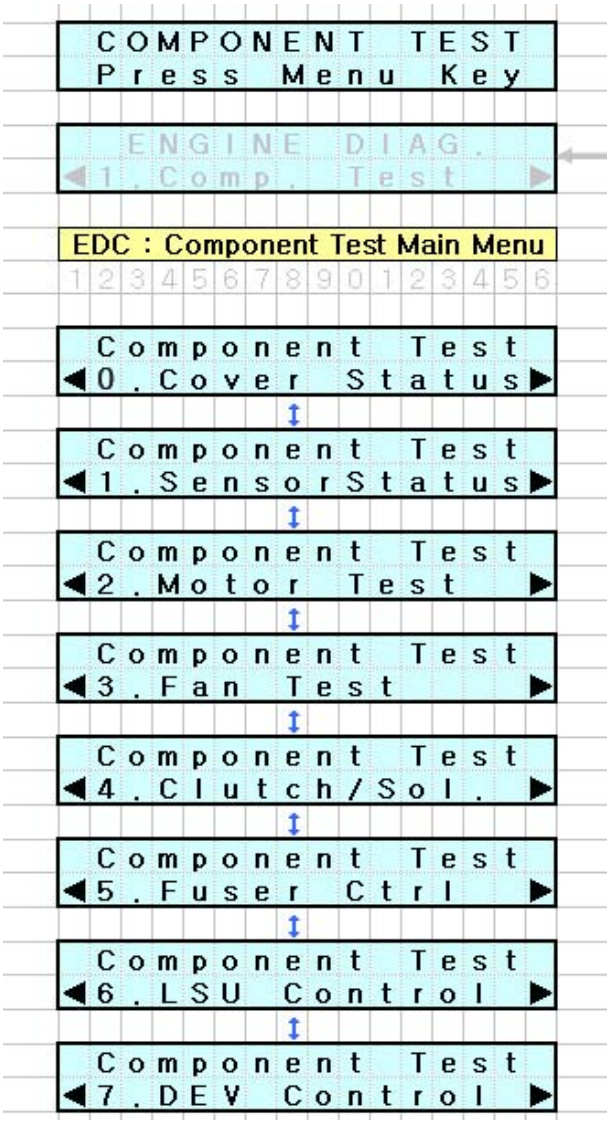
■ Method to enter

1. After turn on the system power, check the “Ready” message on the LCD.

2. To enter the EDC Mode, Push the buttons outlined below in the order outlined.
   “Menu → Stop → Left arrow → Back → OK → Right arrow”

3. The message **“COMPONENT TEST Press Menu Key”** display on the LCD.

4. To get out of the EDC Mode, Press the “Stop” key



■ EDC Mode Menu

0. Cover Status

Item	Description
Front Cover	When the front cover opened, “Open” message display LCD. If the front cover closed, “Closed” message display LCD.

1. Sensor Status

Item	Description
Regi/Feed/Exit Sensor	Manually open and close the actuator of the sensor [Regi, Feed, and/or Exit Sensor] you wish to check, the message “Without Paper” and “With Paper” message will be displayed.
Empty	Manually open and close the actuator of the Empty Sensor, the message “Present” and “Empty” message will be displayed.

2. Fan Test

Item	Description
Fuser Fan	If “OK” key is pushed after “ON” displayed, fan will be run. Fuser fan will auto - stop after 10 seconds and ”OFF” message will be displayed.

3. Clutch Test

Item	Description
Pick up Clutch	When “OK” key is pushed after ”ON” message displayed, clutch turns on. Pick Up Clutch will be turn off after 3 seconds and ”OFF” message will be displayed.
Regi Clutch	When “OK” key is pushed after ”ON” message displayed, clutch turns on. Pick Up Clutch will be turn off after 3 seconds and ”OFF” message will be displayed.

4. Fuser Ctrl

Item	Description
Temp Control	Fuser on and off. “ON” is selected, fuser will be active and display the fuser temperature [XXX] but “OFF” is selected, fuser will be stop.
Fuser Temp.	Fuser temperature displayed on LCD (example: [170])

5. LSU Control

Item	Description
LD Power	When “OK” key is pushed after ”ON” message displayed, ”OFF” message will be displayed after 10 seconds
LSU Motor	If “OK” key is pushed after “ON” displayed, motor will be run. LSU motor will auto - stop after 10 seconds and ”OFF” message will be displayed.
LSU Ready	If “OK” key is pushed after “ON” displayed, motor will be run. ”1” message will be displayed.
Hsync	If “OK” key is pushed after “ON” displayed, motor will be run. ”1” message will be displayed.

6. DEV Control

Item	Description
THV (+)	If “OK” key is pushed after “ON” displayed, THV (+) will be turned on.
THV (-)	If “OK” key is pushed after “ON” displayed, THV (-) will be turned on.
Dev Bias	If “OK” key is pushed after “ON” displayed, Dev Bias will be turned on.
MHV Bias	If “OK” key is pushed after “ON” displayed, MHV Bias will be turned on.

■ ACRONYMS

- DEV – Developing High Voltage
- EDC – Embedded Diagnostic Control
- F/W – Firmware
- HVPS – High Voltage Power Supply
- H/W – Hardware
- LD – Laser Diode
- LSU – Laser Scanning Unit
- MHV – Main High Voltage (Charge Voltage)
- OPC – Optical Photo Conductor
- SCF – Second Cassette Feeder
- THV – Transfer High Voltage

4.1.8 Firmware upgrade and replacing the main PBA.

♦ USB and Network port are used to update the firmware.
Network applications (SWAS, SWS) can be used to update the firmware.

♦ Normal Update

Send ROM file via USB, network port in Ready state.
It will automatically update and reset.

♦ Special Mode Update

1. Power On While Pressing “Stop / Clear” Button.
   - It displays download mode message.

2. Send ROM file via USB.

3. It will automatically update and reset.

Note

* You can refer to the F/W Version Info. by pressing Menu → # → 1 → 9 → 3→ #

* You have to perform factory clearing
(Menu → # → 1 → 9 → 3 → 4 → Start) after updating ROM file.

Notice : If you perform a “Factory Clearing”, all of count values and data saved in MFP will be cleared.

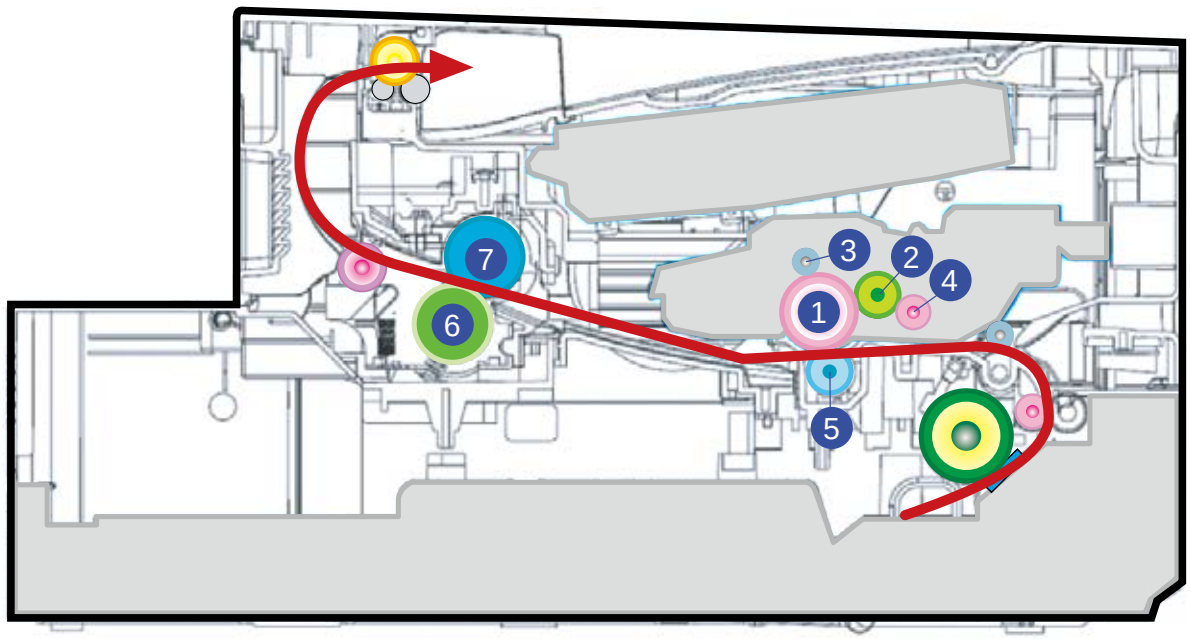
♦ Caution when replacing the Main PBA

1. After replacing the new main PBA, press “ Menu → # →1 → 9 → 3 → Start“
2. When [Clear Memory] message appears, press “(OK)“ button.
   And then select the country relative to your product.
3. After initialization, turn the machine off then on.
4. Enter the Tech mode. Execute “Shading test” in “Machine test“ to check the CIS shading data

4.1.9 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.

Roller	Period (mm)	Phenomenon	Defective part
OPC Drum	75.6mm	White and Black Spots	Toner Cartridge
Developing Roller	35mm	White spot, Horizontal black band	
Charging Roller	37.5mm	Black Spot and line and periodic band	
Supply Roller	49mm	Periodic Band by little difference of density	
Transfer Roller	47mm	Ghost, Damaged image by abnormal transfer	Transfer roller
Pressure Roller	75.4mm	Background	Fuser
Fusing Roller	77.5mm	Black spot and image ghost	



1	OPC	5	Tranfer roller
2	Developing Roller	6	Pressure roller
3	Charging roller	7	Fusing roller
4	Supply Roller		

4.1.10 Error Message

Messages appear on the control panel display to indicate the machine's status or errors. Refer to the tables below to understand the messages' and their meaning, and correct the problem as is necessary.

Checking display messages

• If a message is not in the table, reboot the power and try the printing job again.
• Some messages may not appear in the display depending on the options or models.
• [error number] indicates the error number.
• [tray type] indicates the tray number.
• [media type] indicates the media type.
• [media size] indicates the media size.
• [color] indicates the color of toner or imaging unit.

LCD Display	Descriptions	Solutions
Document Jam	When Document Jam occurred at ADF module, this is displayed on LCD.	Clear the JAM.
[Door Open]	The front cover is not securely latched.	Close the front door.
[No Paper] **Add Paper**	When there is no paper in CASSETTE Tray, machine displays this message on LCD.	Load paper in the paper tray.
[Paper Jam 0] **Open/Close Door**	When the machine encountered paper jam in pick-up area, Machine displays on the LCD.	Clear the JAM. (Refer to JAM removal)
[Paper Jam 1] **Open/Close Door**	When the machine encountered paper jam in paper exit of Machine, machine displays on LCD.	Clear the JAM. (Refer to JAM removal)
[Paper Jam 2] **Check Inside**	When the machine encountered paper jam in paper exit of Machine, machine displays on the LCD.	Clear the JAM. (Refer to JAM removal)
[COMM. Error]	When the machine has problem in communication, it displayed on the LCD. Machine displays this in case of Transmission. Machine displays this in case of fax handshaking step of Reception.	Ask the sender to try again.
[Line Error]	When the machine has problem in case of Fax Data reception step.	Try again. If the problem persists, wait an hour or so for the line to clear and try again. Or, turn the ECM on.

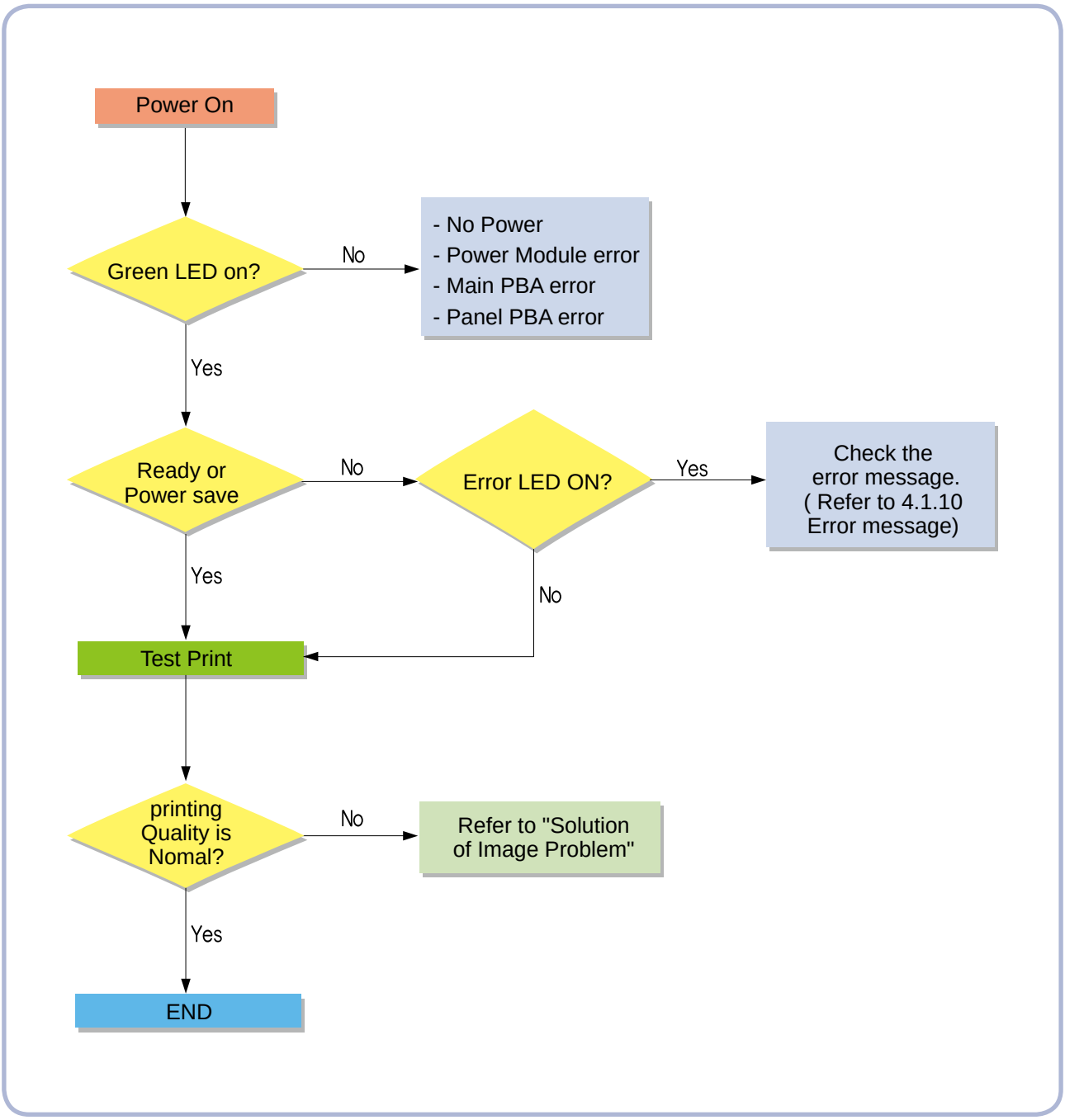
LCD Display	Descriptions	Solutions
[No Answer]	The remote fax machine has not answered after several redial attempts.	Try again. Make sure that the remote machine is operational.
[Incompatible]	The remote machine does not have the requested feature, such as a delayed transmission. It also occurs if the remote machine does not have enough memory space to complete the operation you are attempting.	Reconfirm the remote machine's features.
Line Busy	The remote person did not answer or the line is already engaged.	Try again after a few minutes.
Power Failure	Power has turned off then on and the machine's memory has not been saved.	You need to start again the job which you were trying to do before the power failure.
[Stop Pressed]	The Stop/Clear button is pressed during a copy or fax operation.	Try again.
Memory Full	The memory is full.	Delete unnecessary documents, retransmit after more memory becomes available or split the transmission into more than one operation.
CRU Fuse Error	When the machine failed in installing the new toner cartridge.	Open the front door and take out the toner cartridge. Then re-install it.
[Hsync Error] **Or** **[LSU Error]**	When the machine has encountered the LSU could not reach the READY state.	Enter the EDC mode.(Refe to EDC mode). And check the LSU Control Test. If the LSU is defective, replace it.
[Toner Low]	Small amount of toner is left in the cartridge. The estimated cartridge life of toner is close.	Prepare a new cartridge for replacement. You may temporarily increase the printing quality by redistributing the toner.
Replace Toner	Small amount of toner is left in the cartridge.	Replace the toner cartridge.
[Bypass Jam]	When the machine detected the non-feeding from BYPASS tray.	Clear the JAM.
Group Not Available	You have tried to select a group location number where only a single location number can be used, such as when adding locations for a broadcasting operation.	Just use a one-touch or speed dial number or dial a number manually using the number keypad
Retry Redial ?	The machine is waiting for a specified time interval to redial a previously busy station.	You can press OK to immediately redial, or Stop/Clear to cancel the redial operation.

LCD Display	Descriptions	Solutions
NO. Not Assigned	The one-touch or speed dial location you tried to use has no number assigned to it	Dial the number manually using the number keypad or assign the number.
Load Document	You have attempted to set up a copy or fax operation with no document loaded.	Load a document and try again.
Cancel ? **1:Yes 2:No**	Your machine's memory has become full while documents were being loaded into memory.	To cancel the fax job, press the No 1 button Yes. If you want to send the pages already stored, press the No 2 button No. You should send the remaining pages later when the memory is available.
Operation Not Assigned	You are doing in the Add/Cancel operation, but there is no jobs waiting.	Check the display to see if there is any scheduled job. The display should indicate them in standby mode, for example, Delay Fax.
[Low Heat Error]	Temperature could not reach certain level.	Refer to the flow chart of the fuser problem.
Open Heat Error	The thermistor has been disconnected.	Refer to the flow chart of the fuser problem.
[Over Heat]	Temperature has gone up very high degree.	Refer to the flow chart of the fuser problem.
[Jam 1] or **[No Cartridge]**	There is no Cartridge in MFP.	Install the toner cartridge.
Toner Exhausted **Replace Toner**	The cartridge is out of toner.	Replace the toner cartridge.
Toner Empty **Replace Toner**	Toner is empty, replace or order for new toner.	Replace the toner cartridge.
Non Muratec Cartridge	When NON-Muratec cartridge is inserted in MFP.	Replace the toner cartridge.

4.2 Troubleshooting

4.2.1 Procedure of Checking the Symptoms

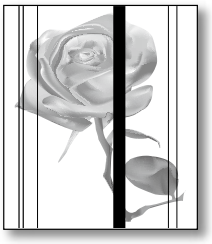
Before attempting to repair the printer first obtain a detailed description of the problem from the customer.

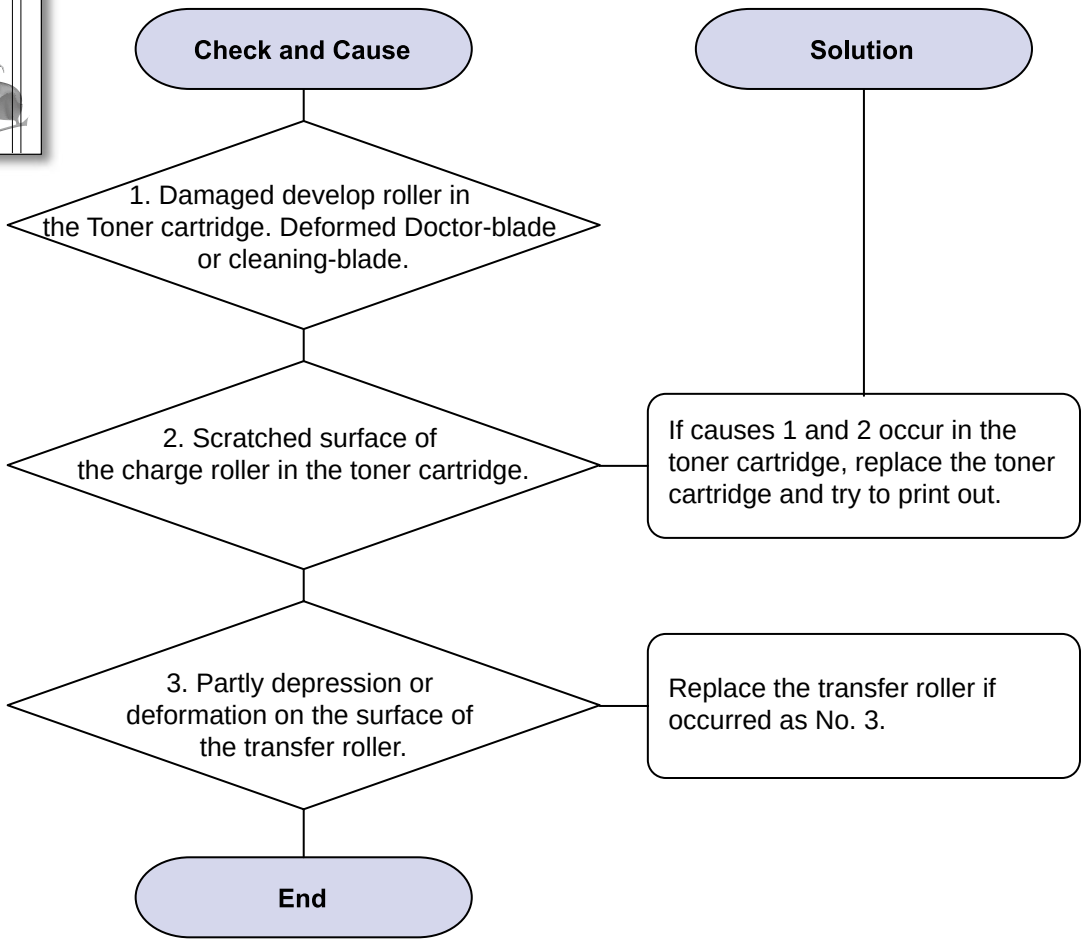


4.2.2 The cause and solution of Bad image

1) Vertical Black Line and Band

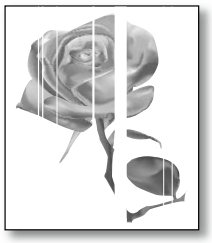
Description : 1. Straight thin black vertical line occurs in the printing.
2. Dark black vertical band occur in the printing.

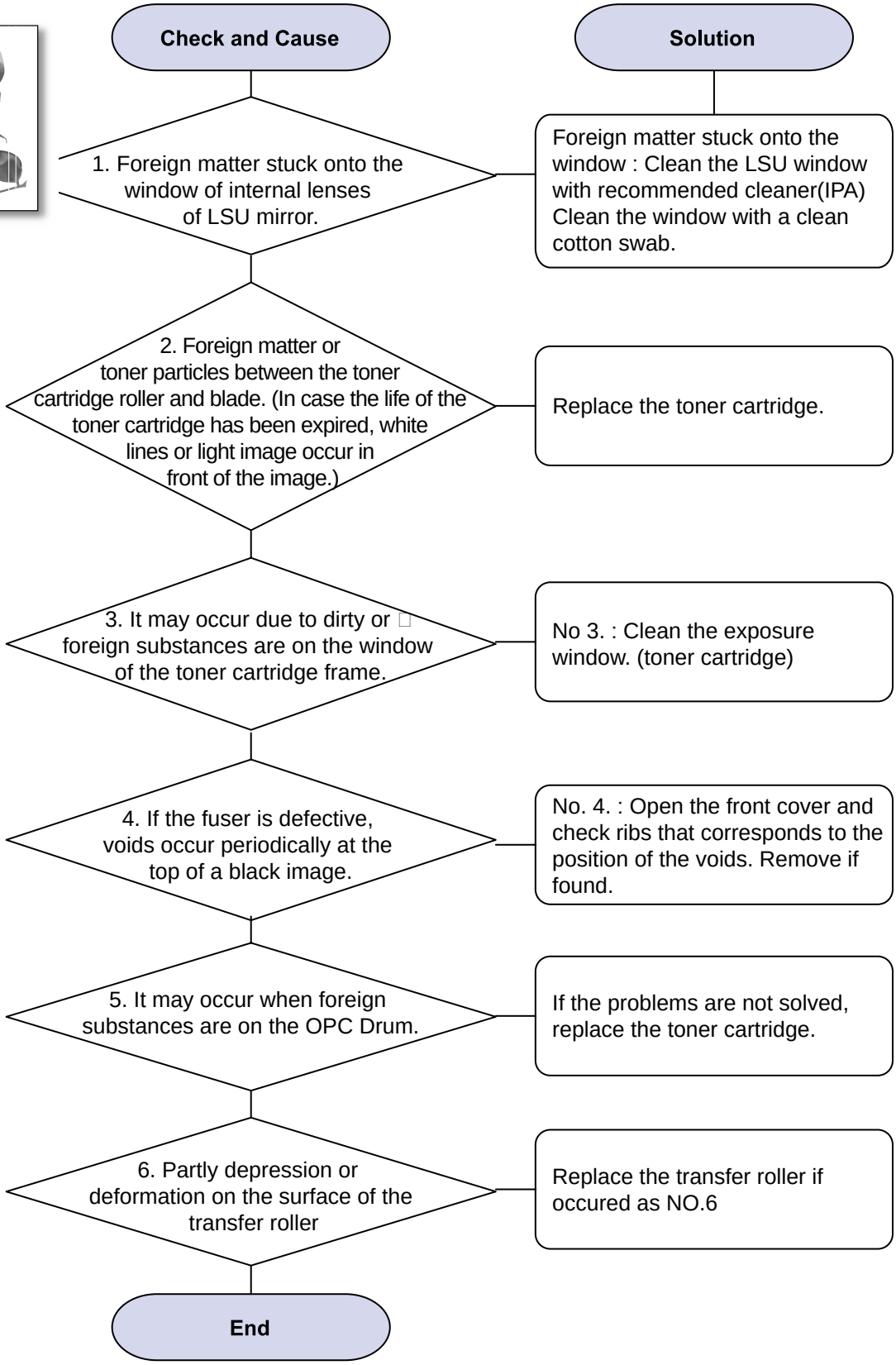




2) Vertical White Line

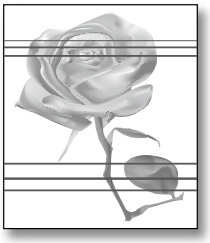
Description : White vertical voids in the image.

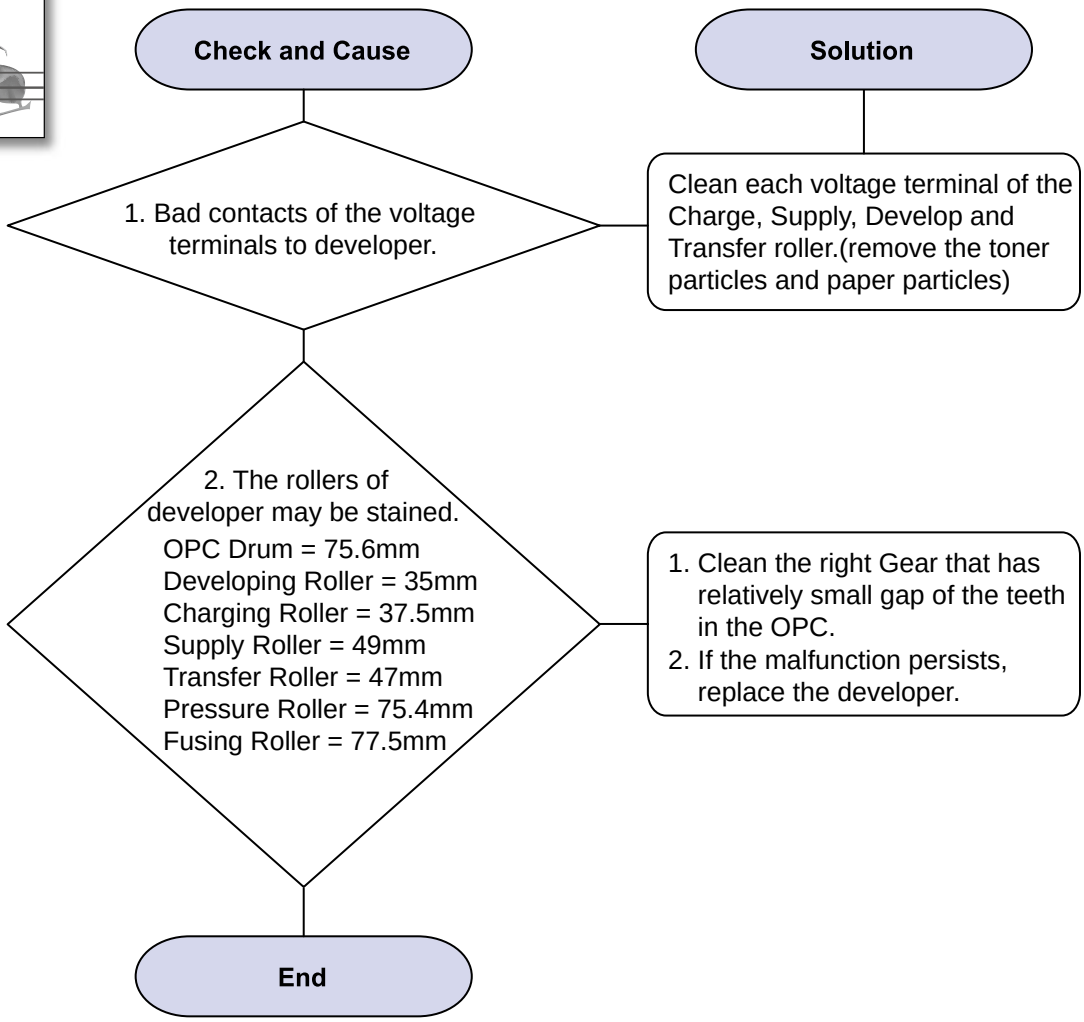




3) Horizontal Black Band

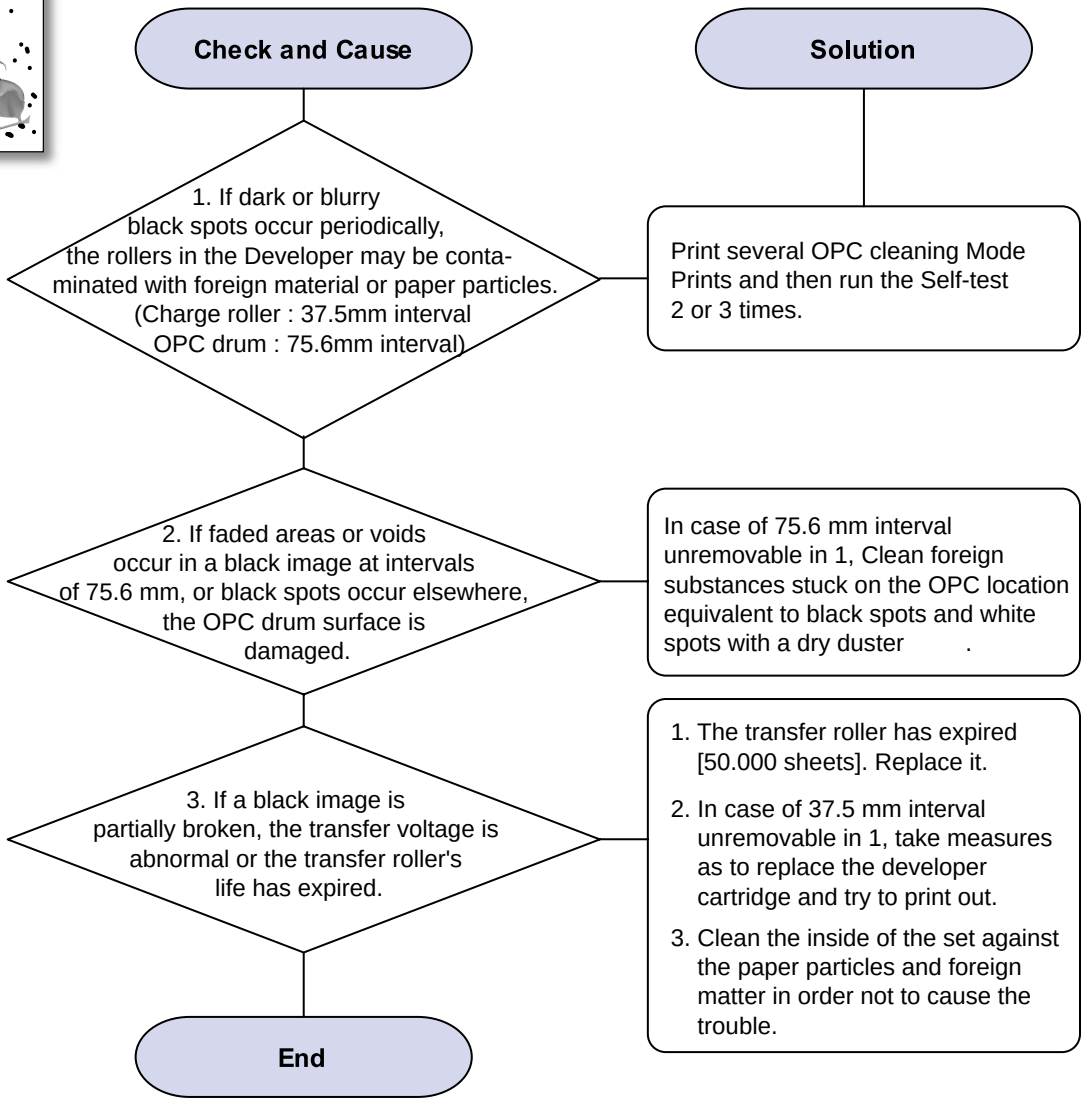
Description : Dark or blurry horizontal stripes occur in the printing periodically. (They may not occur periodically.)





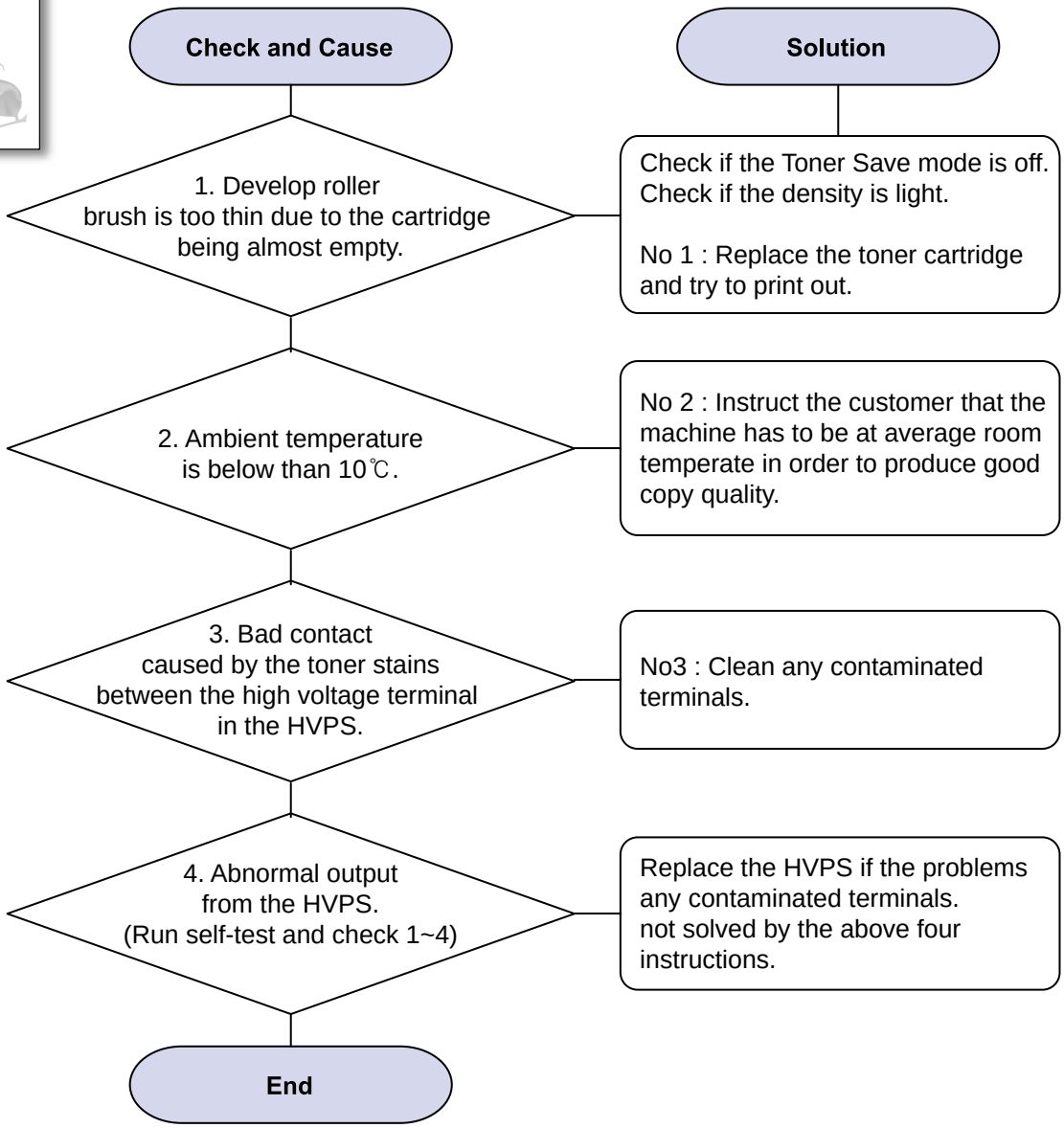
4) Black/White Spot

Description : 1. Dark or blurry spots occur periodically in the printing
2. White spots occur periodically in the printing



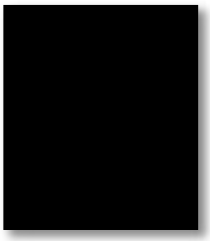
5) Light Image

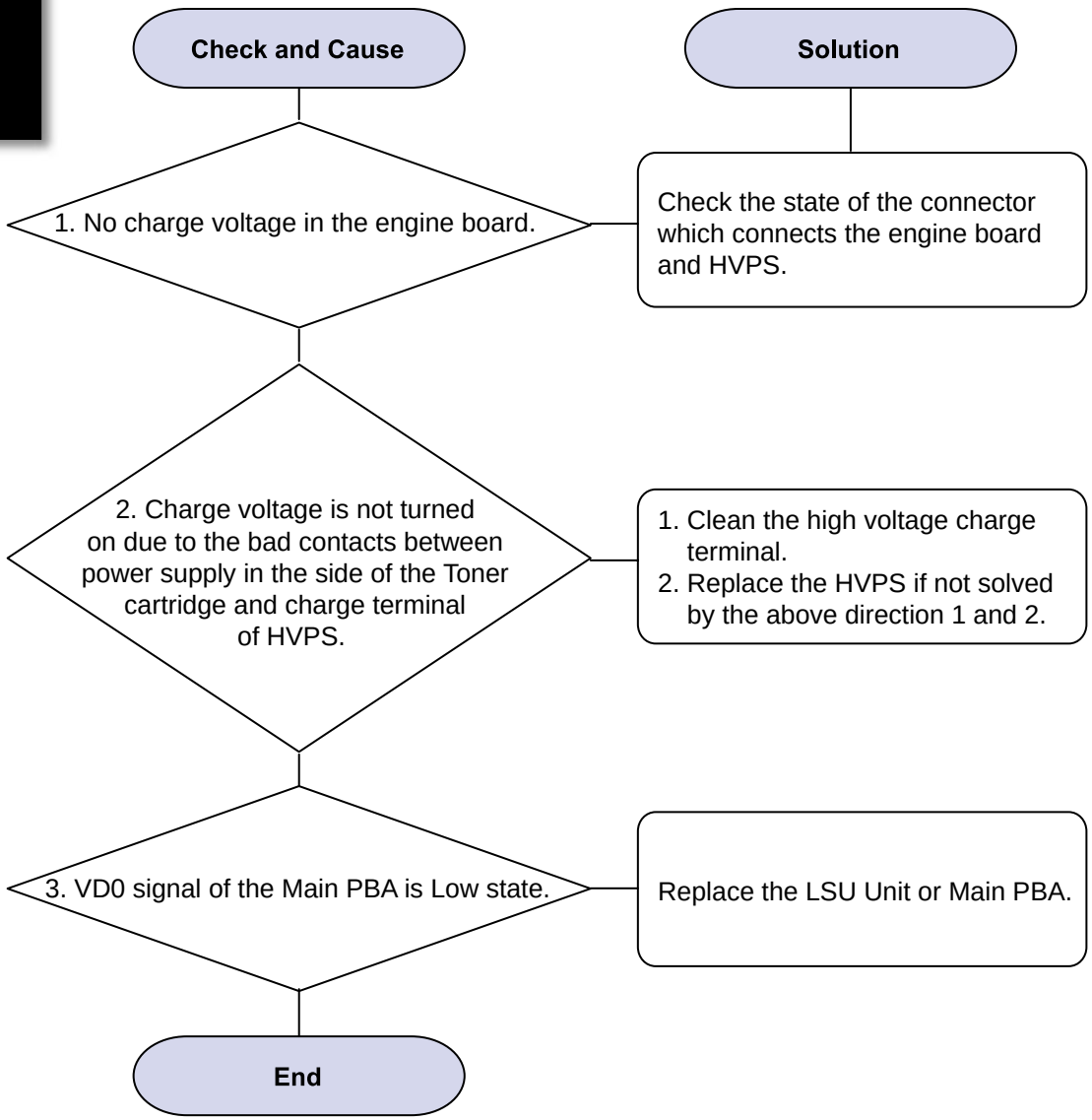
Description : The printed image is light, with no ghost.



6) Dark Image or a Black Page

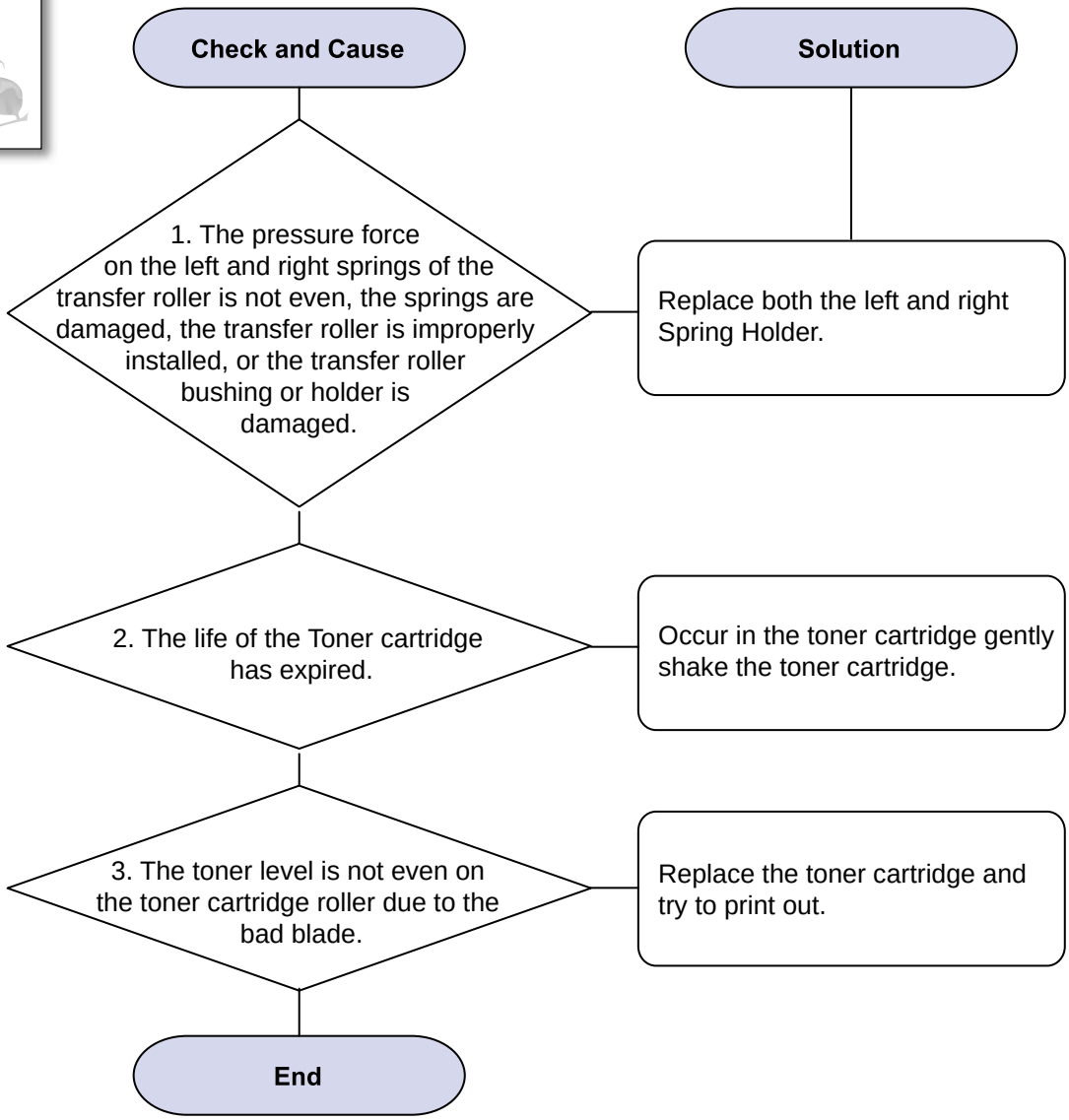
Description : The printed image is dark.





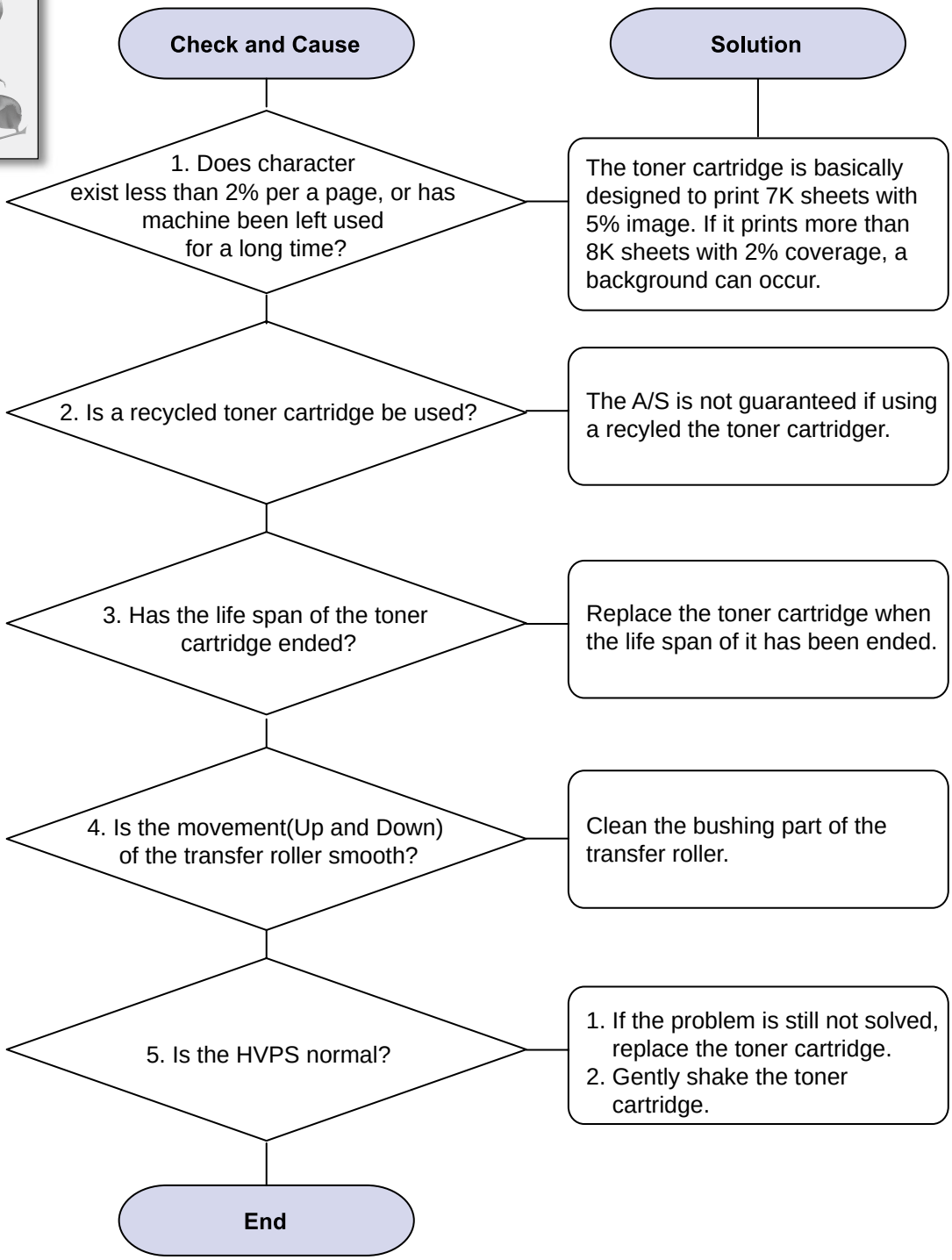
7) Uneven Density

Description : Print Density is uneven between left and right.



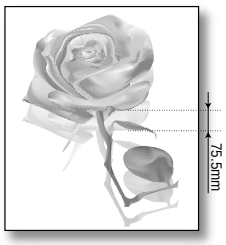
8) Background

Description : Light dark background appears in whole area of the printing.



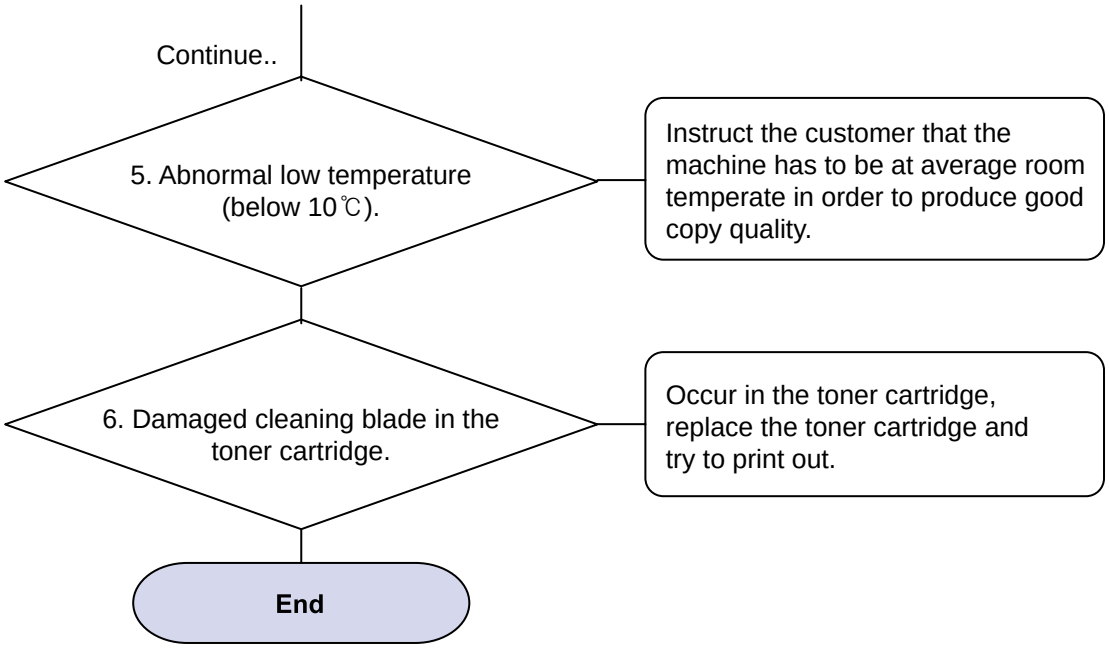
9) Ghost (1)

Description : Ghost occurs at 75.5 mm intervals of the OPC drum in the whole printing.



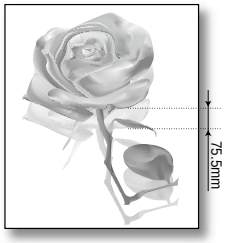
Check and Cause	Solution
1. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the electrode of the Toner cartridge.	Clean any contaminated terminals.
2. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the one in the HVPS board.	Occur in the toner cartridge, replace the toner cartridge and try to print out.
3. The life of toner cartridge is expired.	Replace the engine board if not solved by the above directions 1-2.
4. Transfer roller lifetime(50K sheets) has expired.	If not solved by the direction 3, check the transfer roller lifetime and replace it.

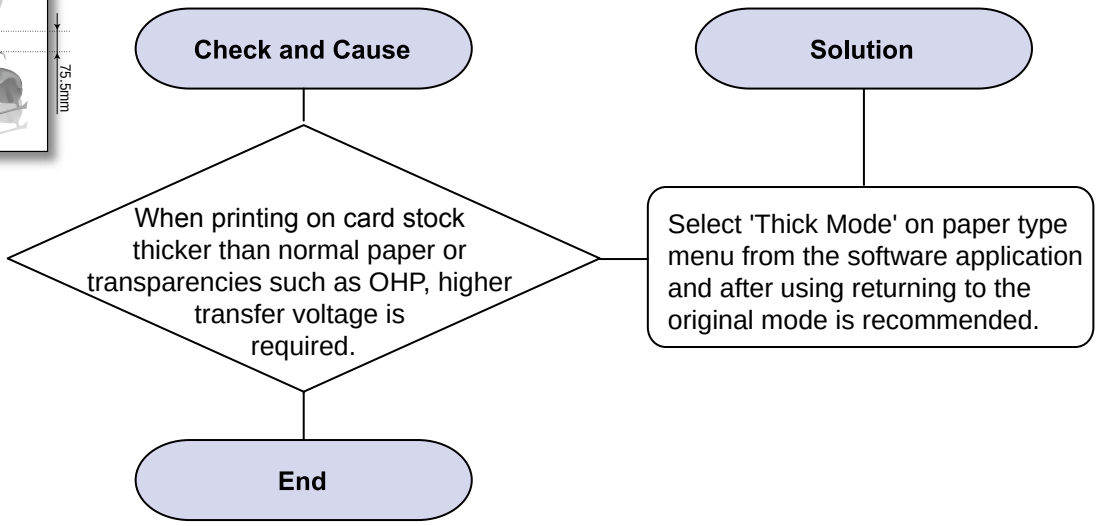
Continue..


Continue..
5. Abnormal low temperature (below 10℃).
Instruct the customer that the machine has to be at average room temperate in order to produce good copy quality.
6. Damaged cleaning blade in the toner cartridge.
Occur in the toner cartridge, replace the toner cartridge and try to print out.
End

10) Ghost (2)

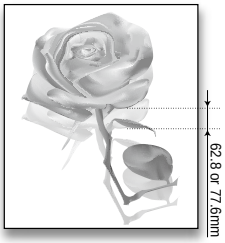
Description : Ghost occurs at 75.5 mm intervals of the OPC drum in the whole printing. (When printing on card stock or transparencies using manual feeder)

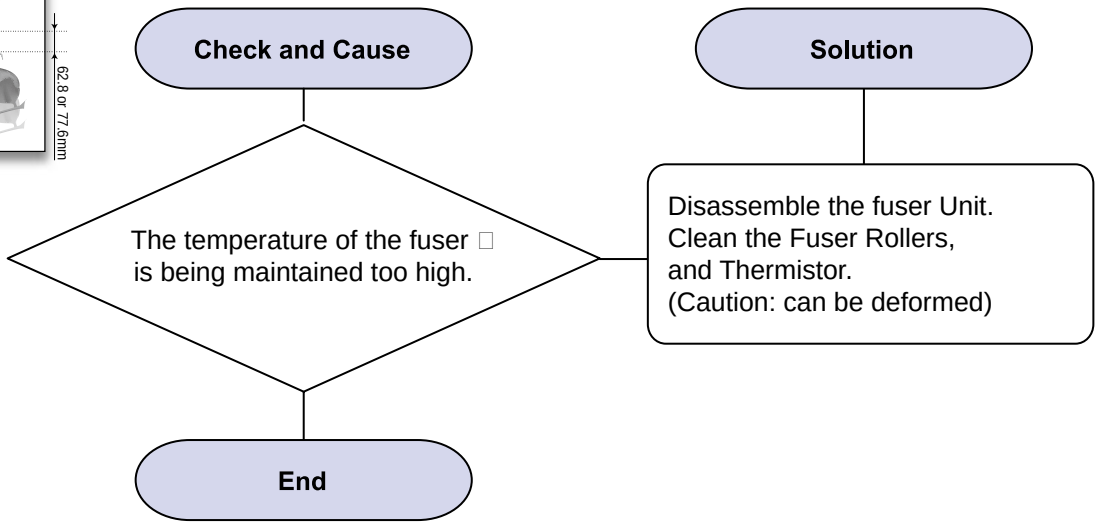




11) Ghost (3) : Fuser

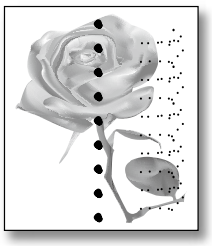
Description : Ghost occurs at 62.8 mm or 77.6mm intervals.

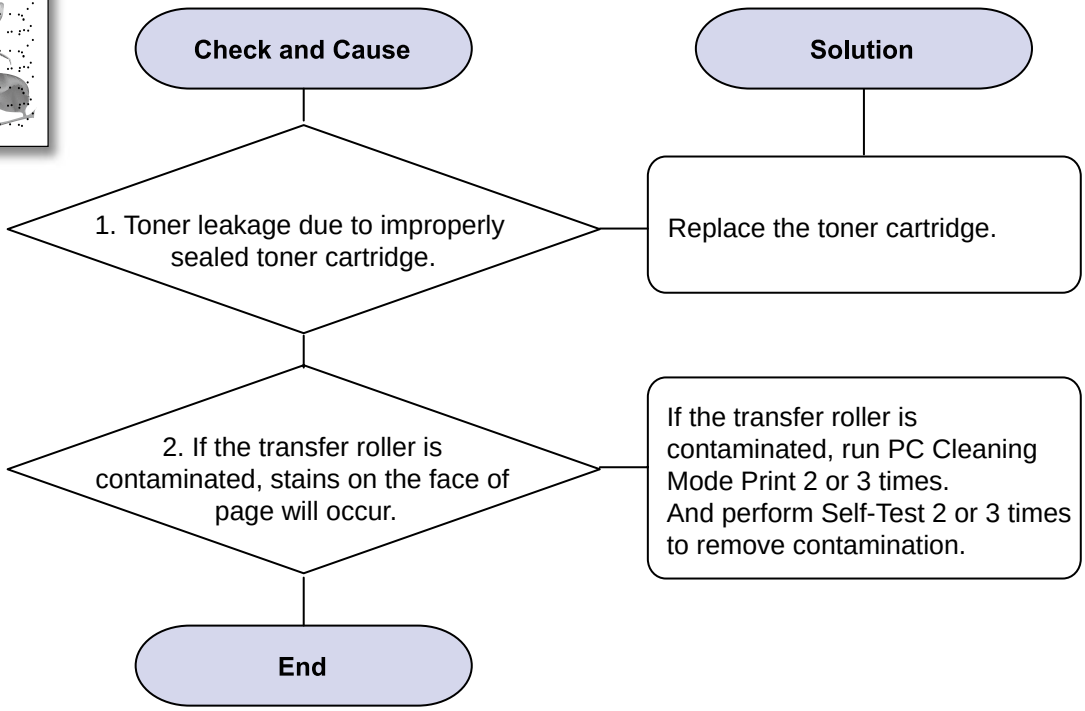




12) Stains on the Face of Page

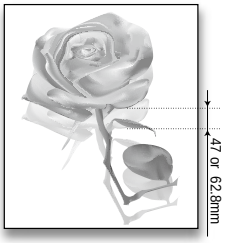
Description : The background on the face of the printed page is stained.

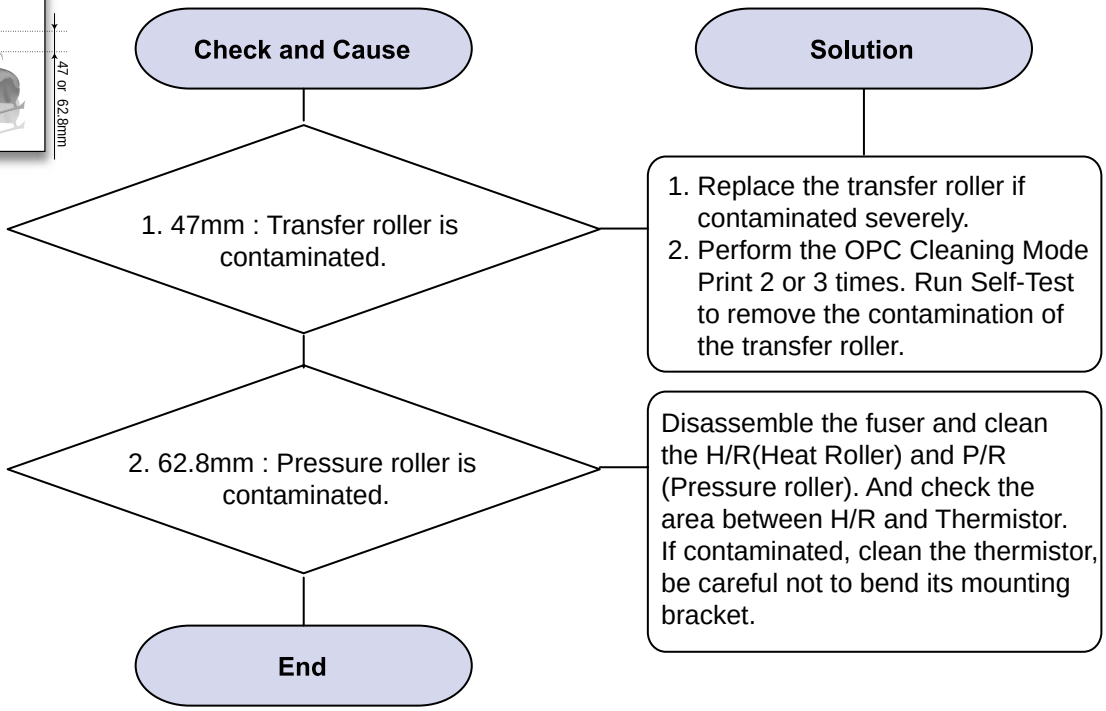




13) Stains on Back of Page

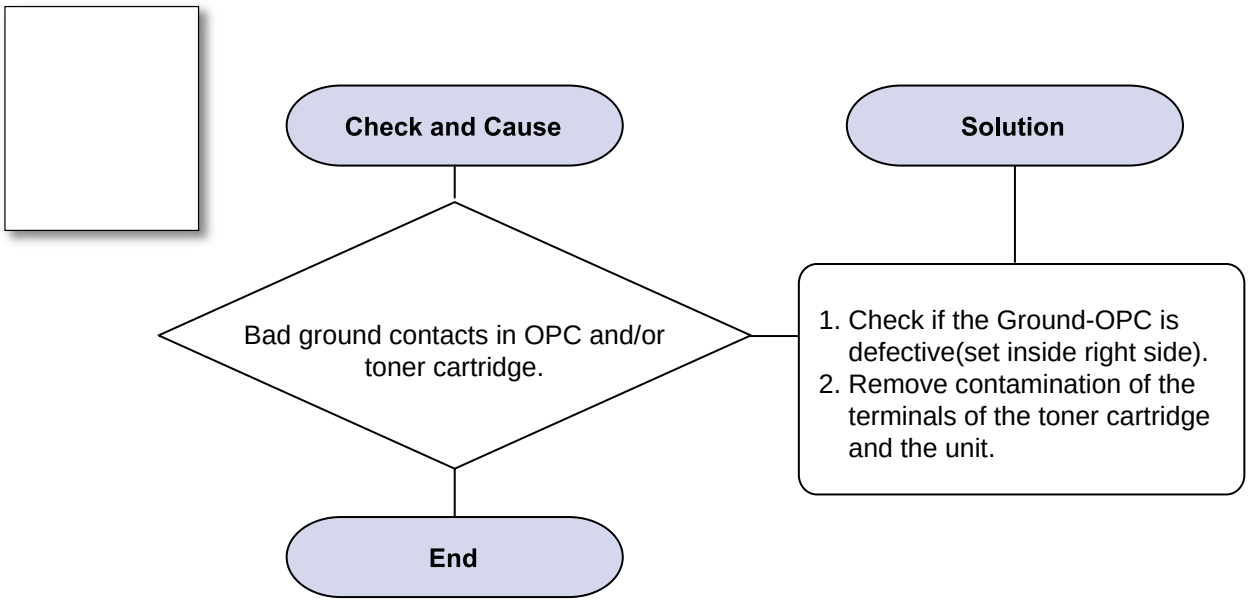
Description : The back of the page is stained at 47 mm or 62.8mm intervals.





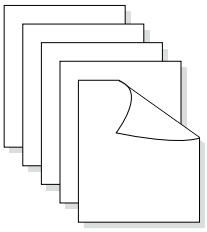
14) Blank Page Print out (1)

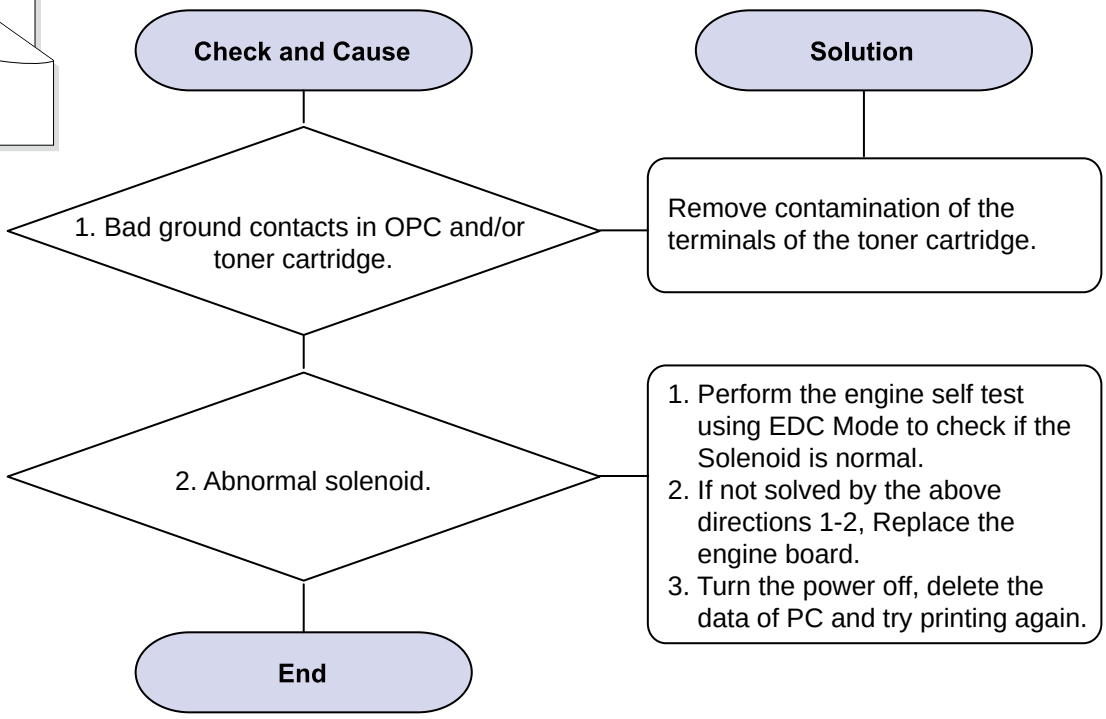
Description : Blank page is printed.



15) Blank Page Print out (2)

Description : 1. Blank page is printed.
2. One or several blank pages are printed.
3. When the printer turns on, several blank pages print.

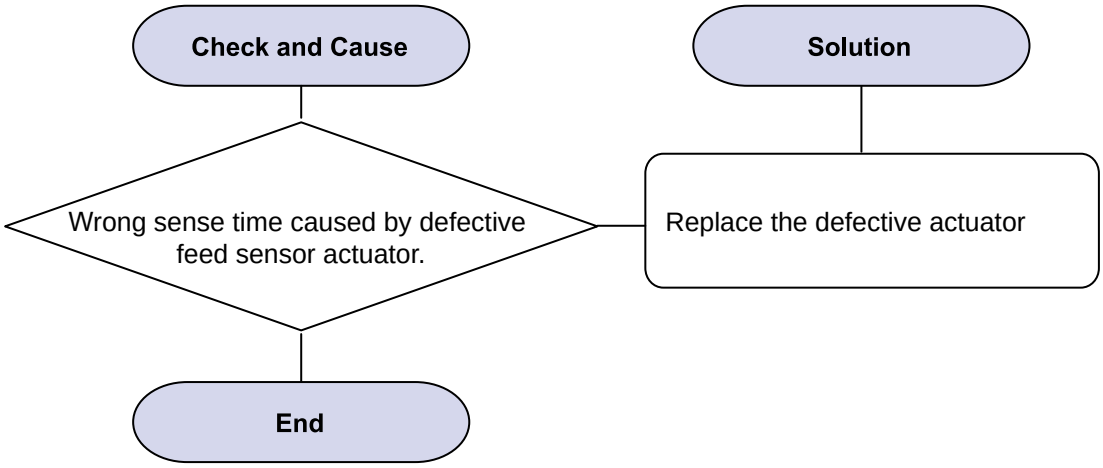




4.2.3 The cause and solution of the bad discharge

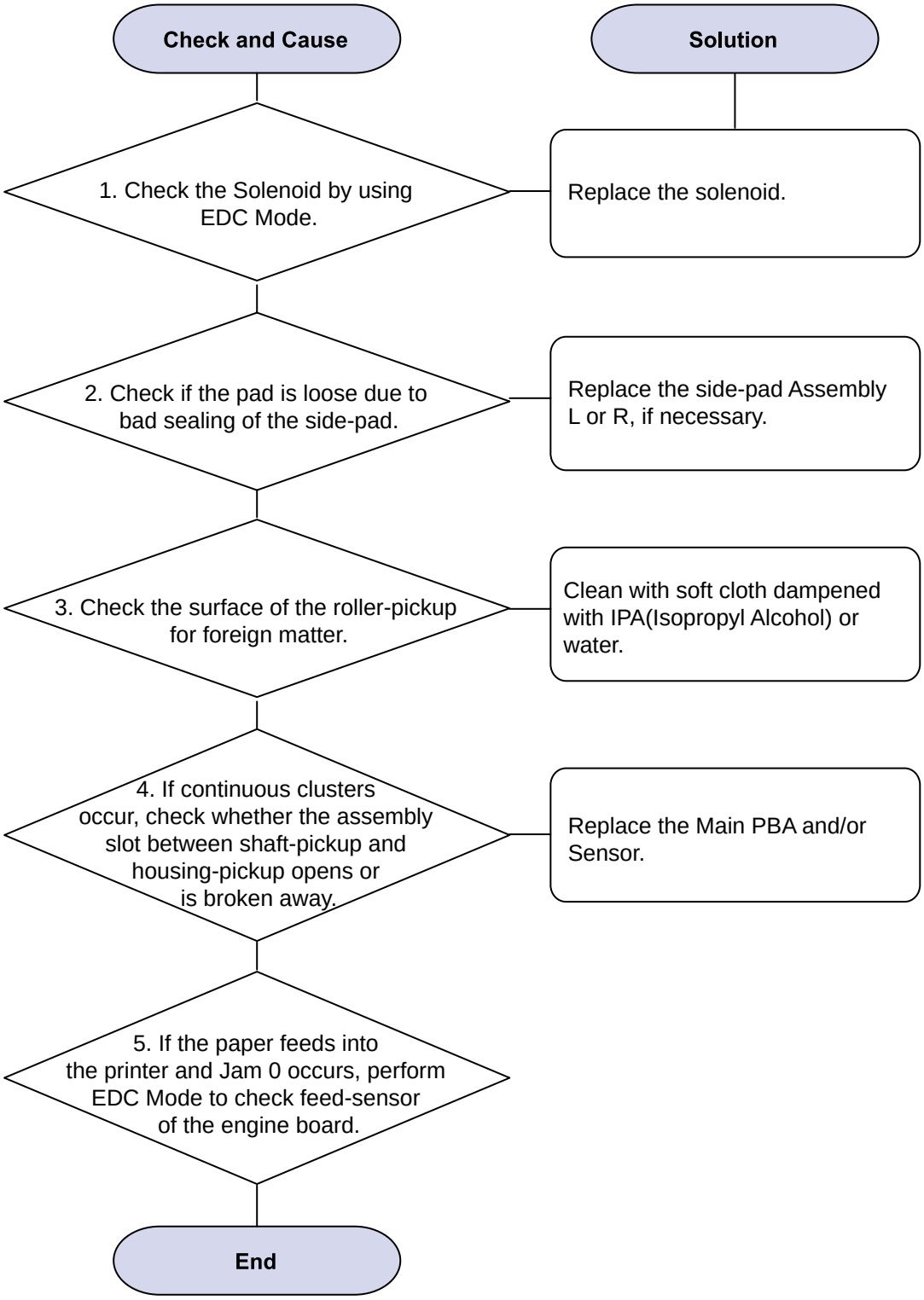
1) Wrong Print Position

Description : Printing begins at wrong position on the paper.



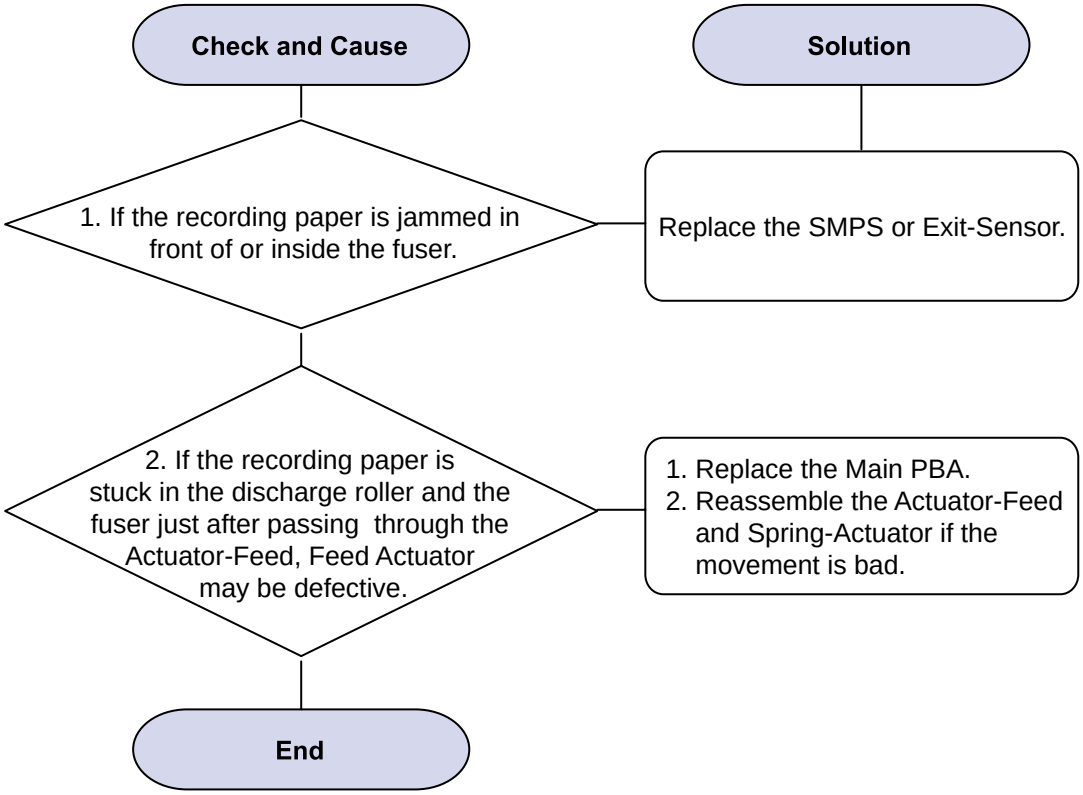
2) JAM 0

Description : 1. Paper is not exited from the cassette.
2. Jam-0 occurs when the paper feeds into the printer



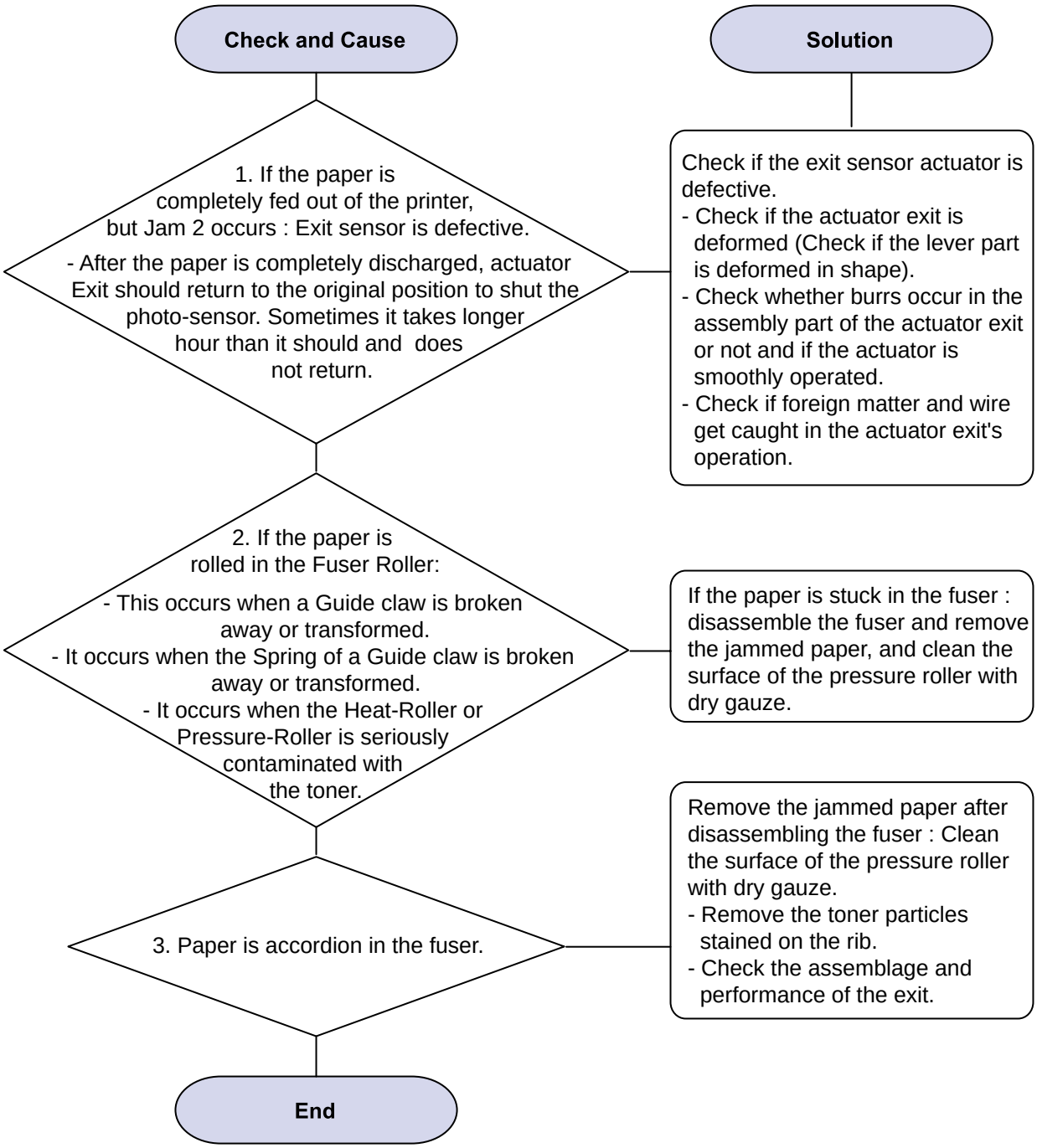
3) JAM 1

Description : 1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



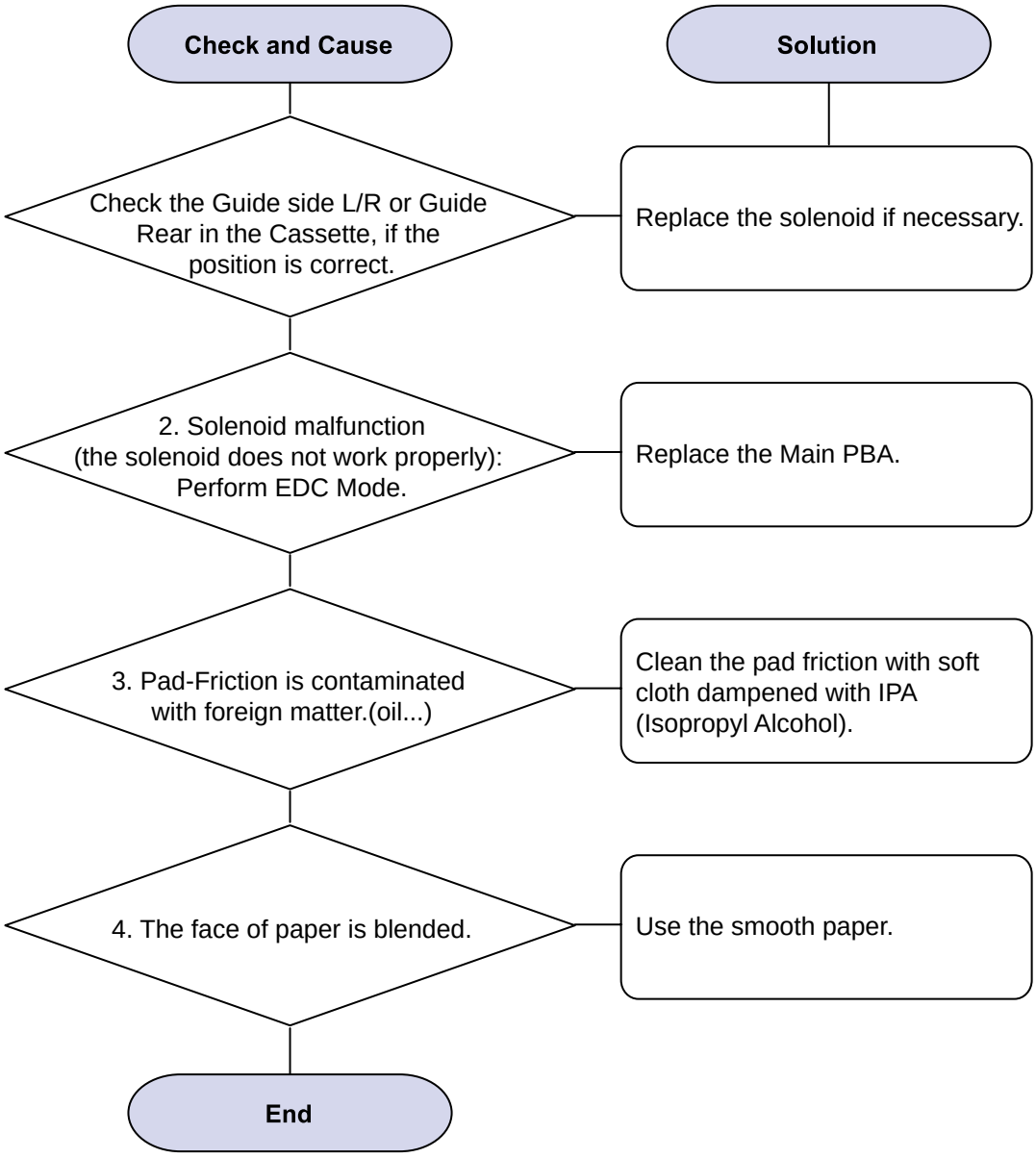
4) JAM 2

Description : 1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



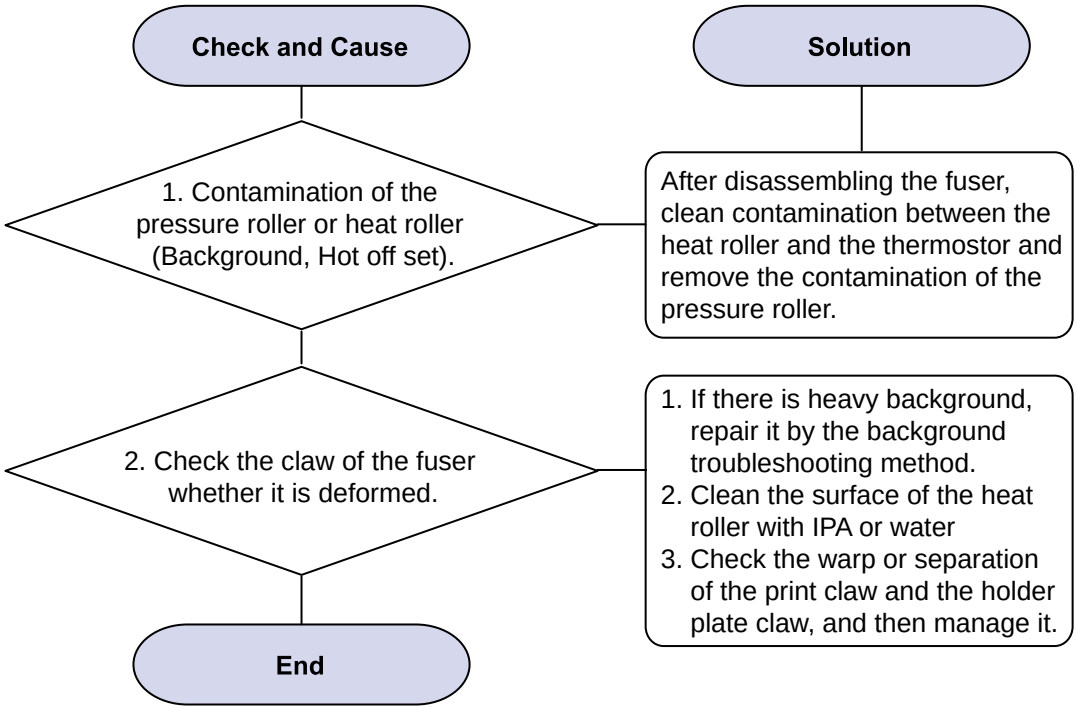
5) Multi-Feeding

Description : Multiple sheets of paper are fed at once.



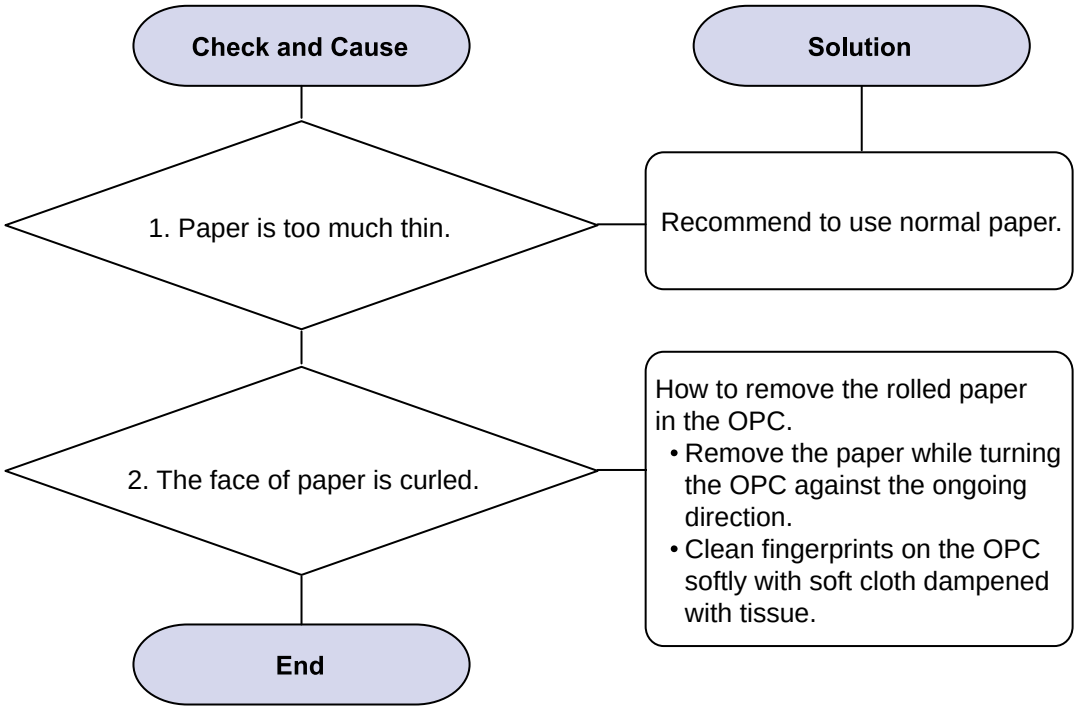
6) Paper rolled in the fuser

Description : If contaminated at intervals of 77.6mm on the back of a paper.



7) Paper rolled on the OPC Drum

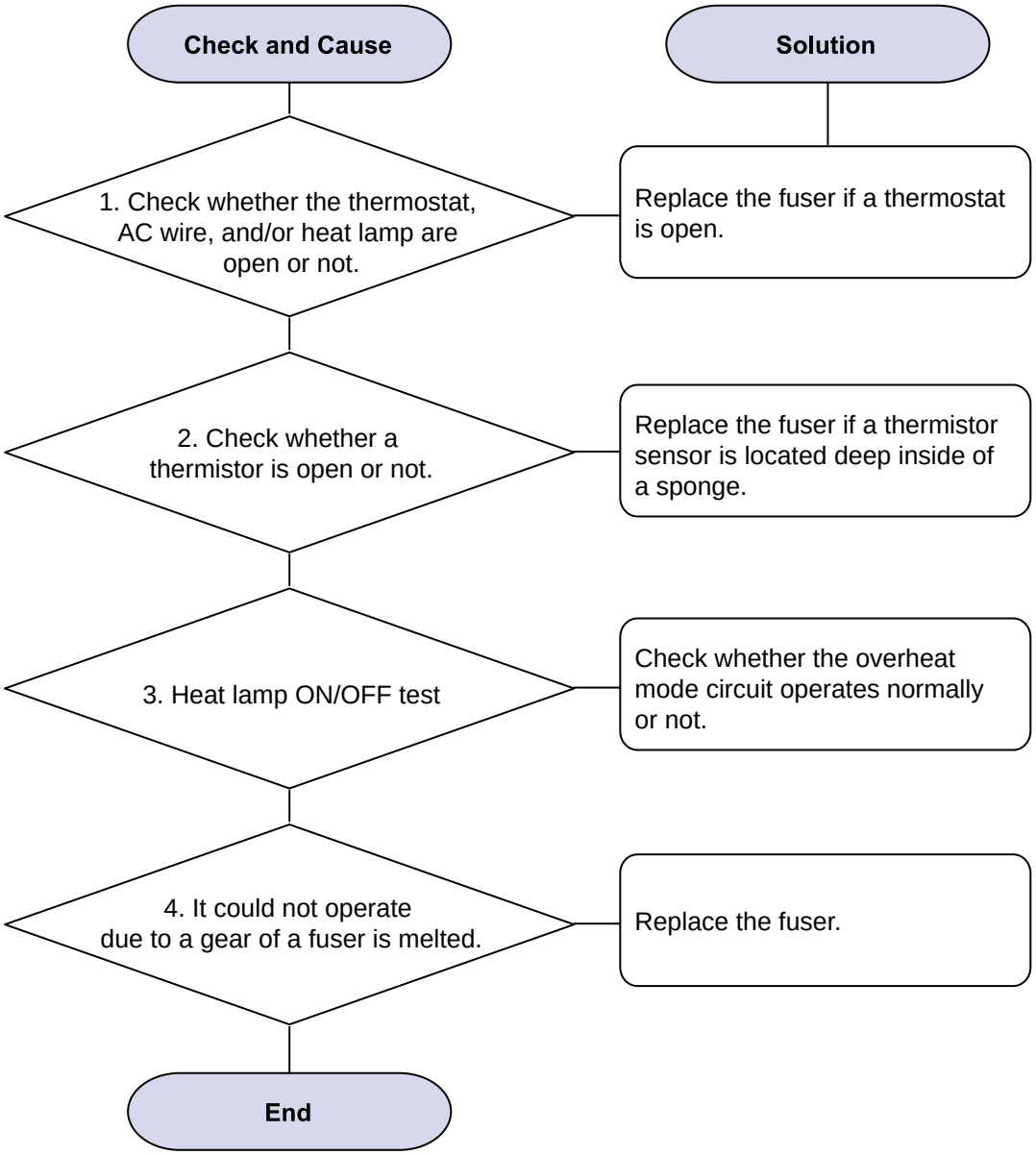
Description : Paper is rolled up in the OPC.



4.2.4 The cause and solution of the malfunction

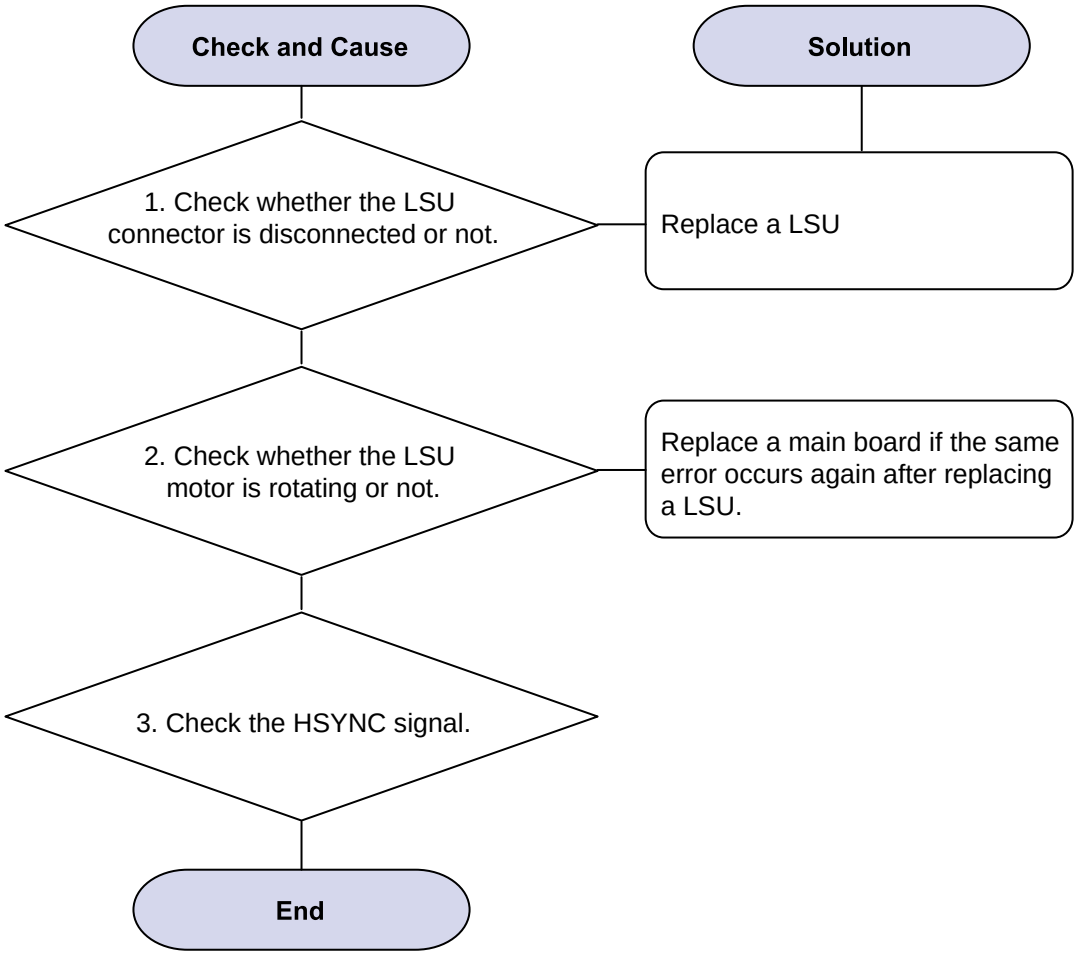
1) Fuser Error

Description : Fuser error is displayed on LCD



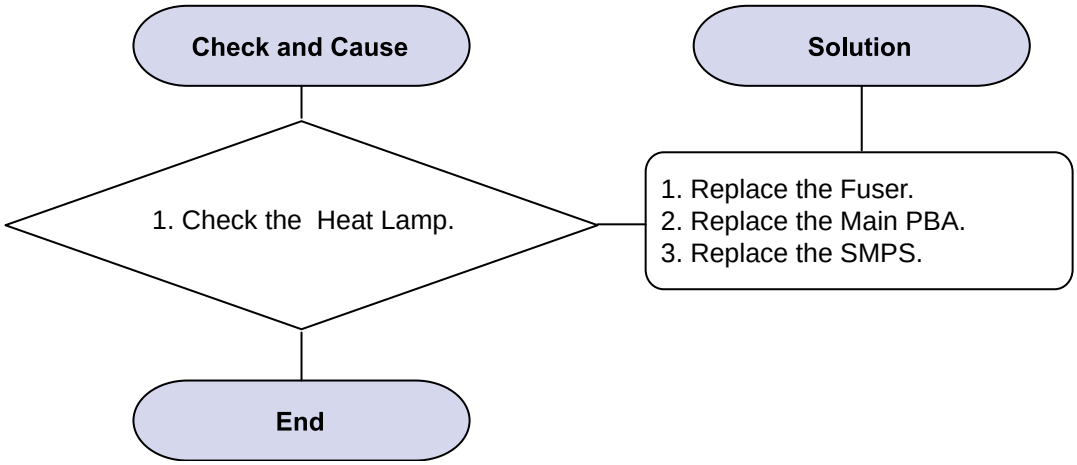
2) LSU Error

Description : "PMOTOR ERROR/HSYNC ERROR'



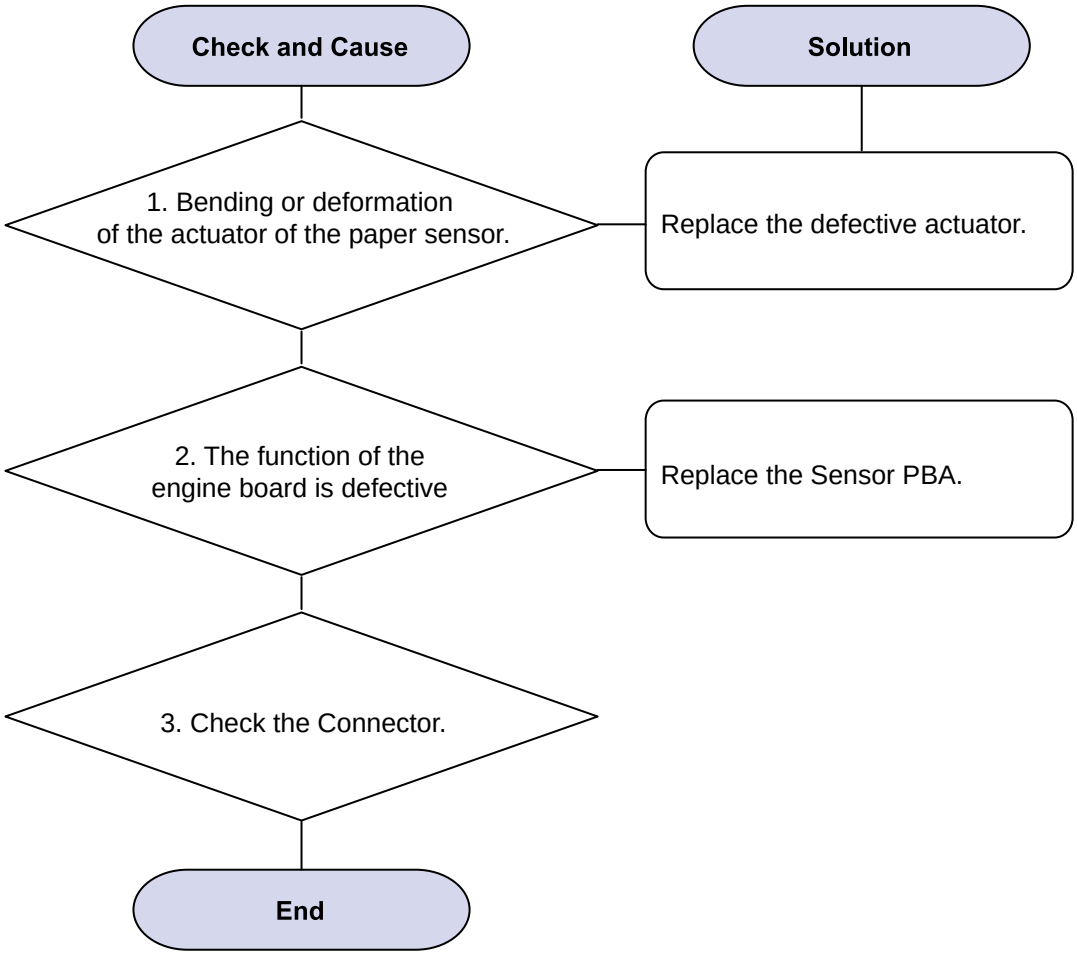
3) Not function of the gear of the fuser due to melting away

Description : The motor breaks away from its place due to gear melting away.



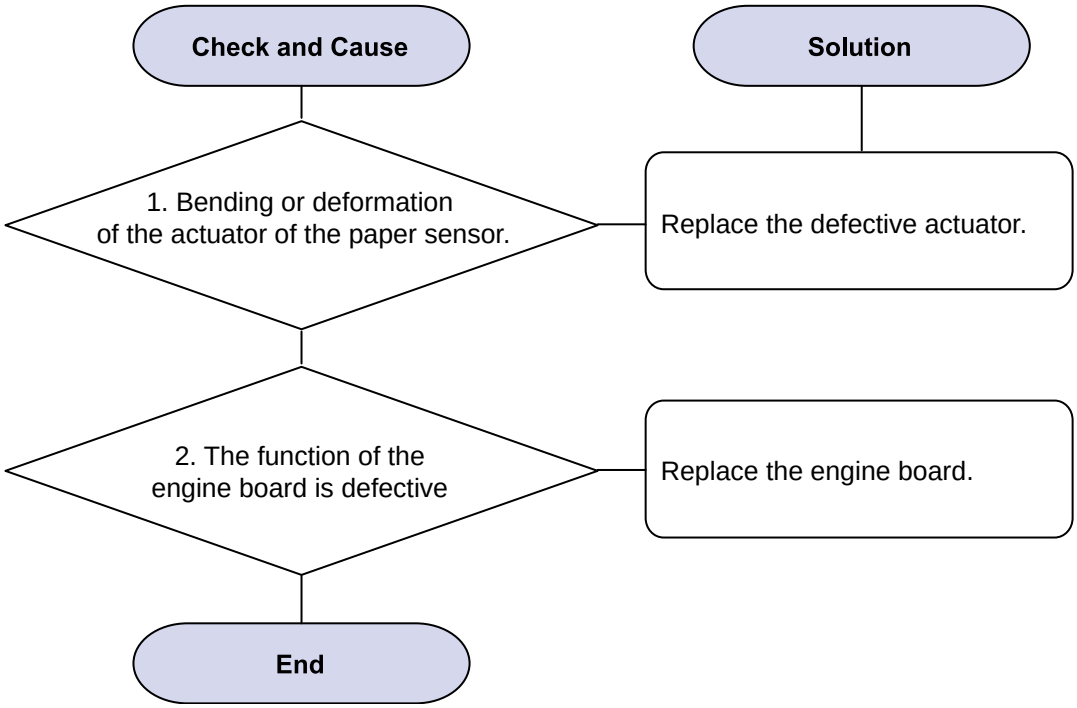
4) Paper Empty

Description : Paper empty error message is displayed on LCD when paper is loaded in the cassette.



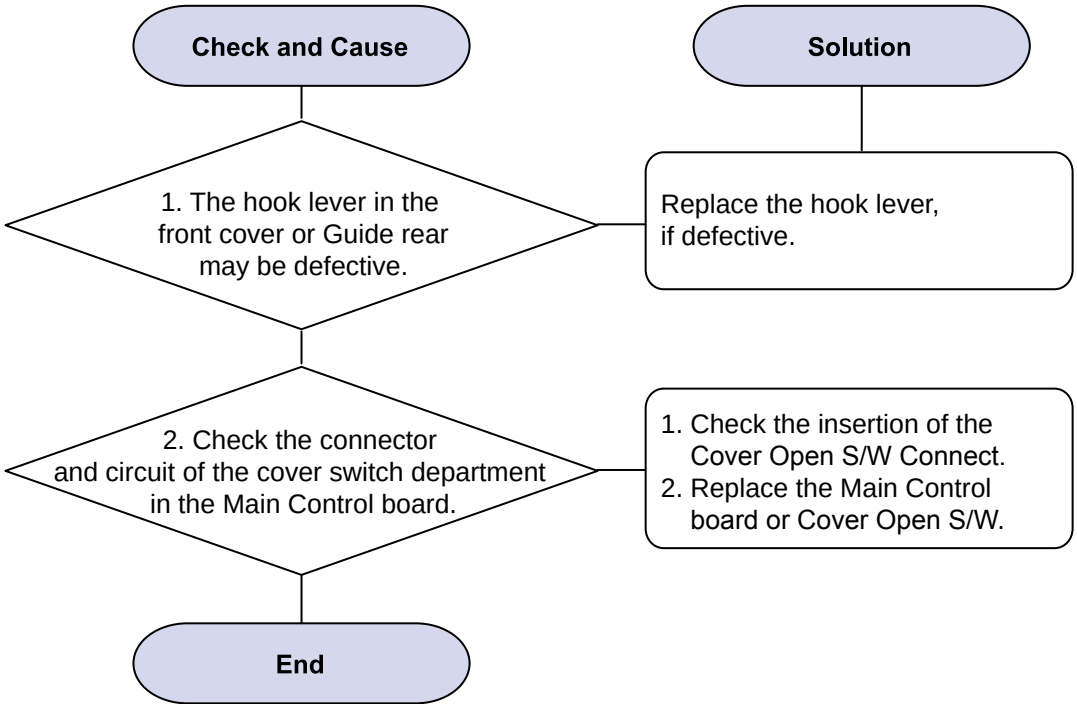
5) Paper Empty without indication

Description : Paper empty error message does not display when the paper cassette is empty.



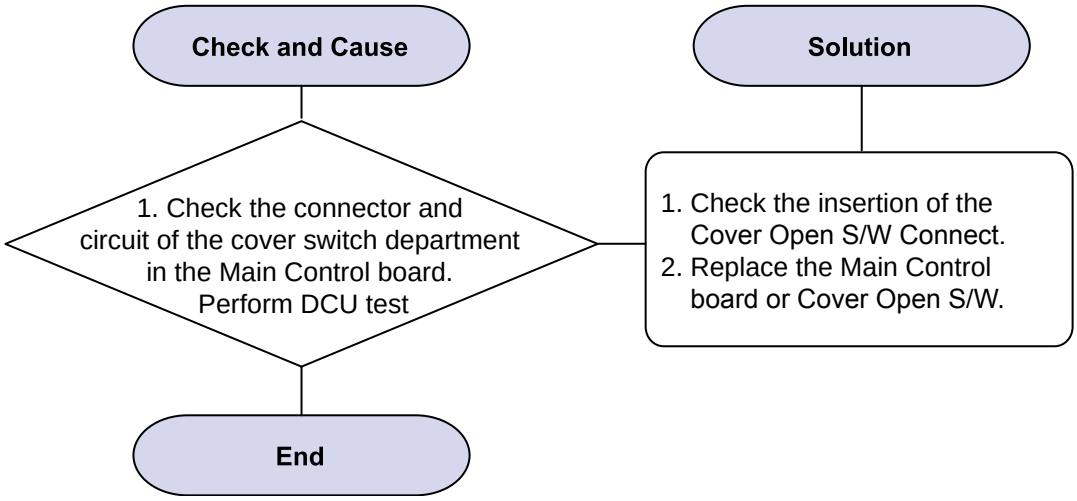
6) Cover Open

Description : The ERROR lamp is on even when the print cover is closed.



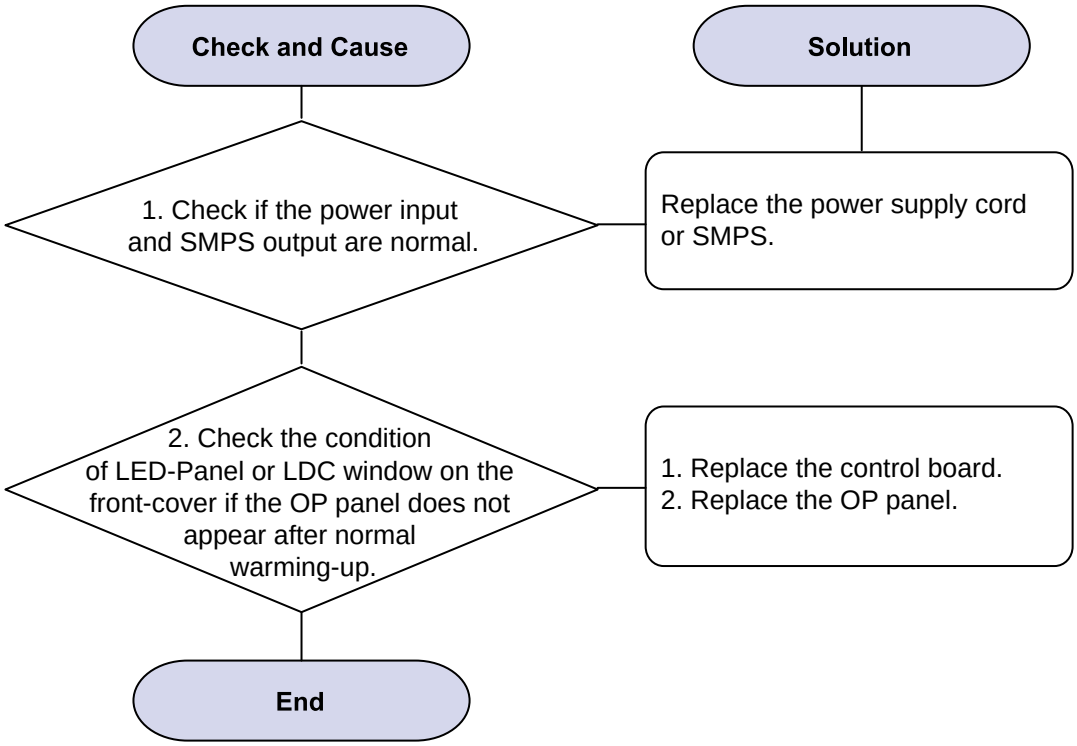
7) No error LED when the cover is open

Description : The Error LED does not come on even when the printer cover is open



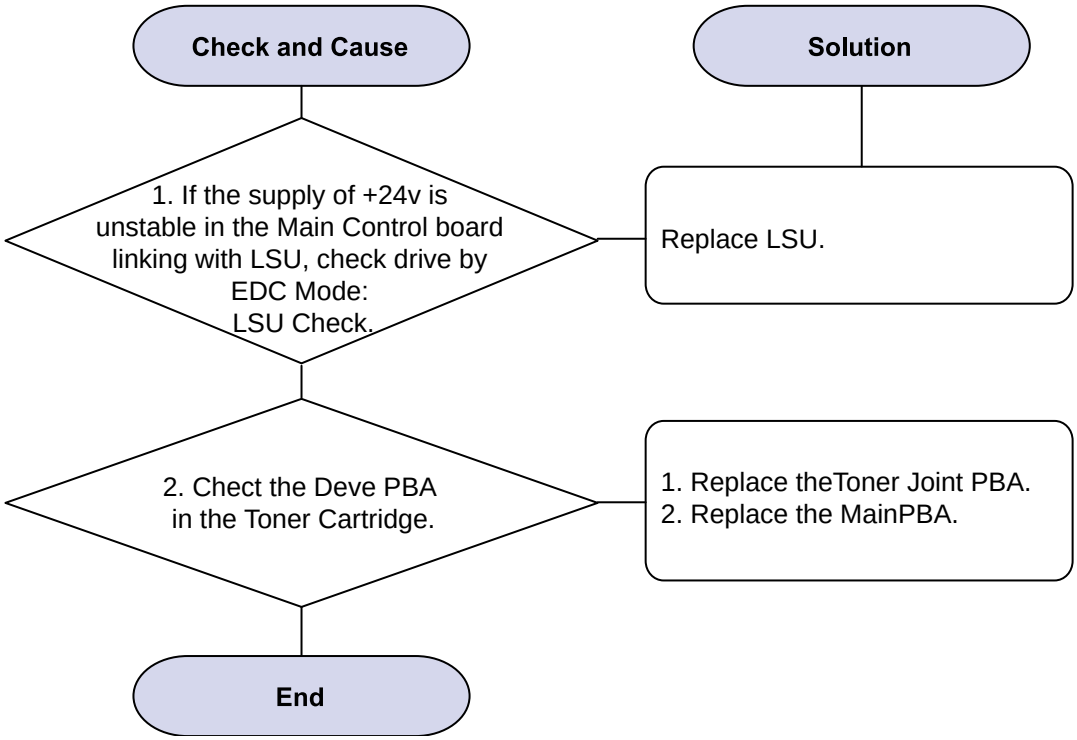
8) No Power

Description : When system power is turned on, all lamps on the operator panel do not come on.



9) Vertical Line Getting Curved

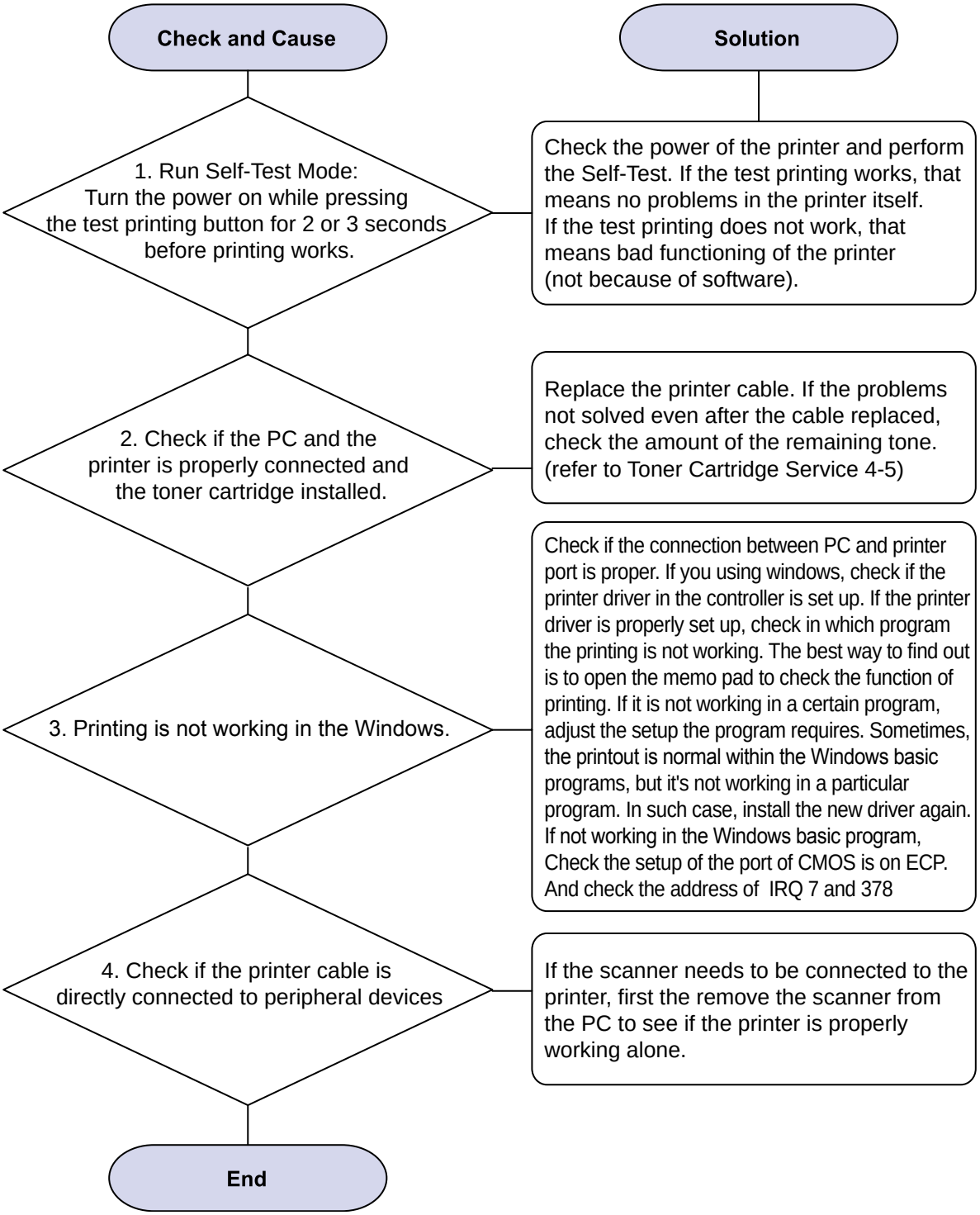
Description : When printing, vertical line gets curved.



4.2.5 The cause and solutions of bad environment of the software

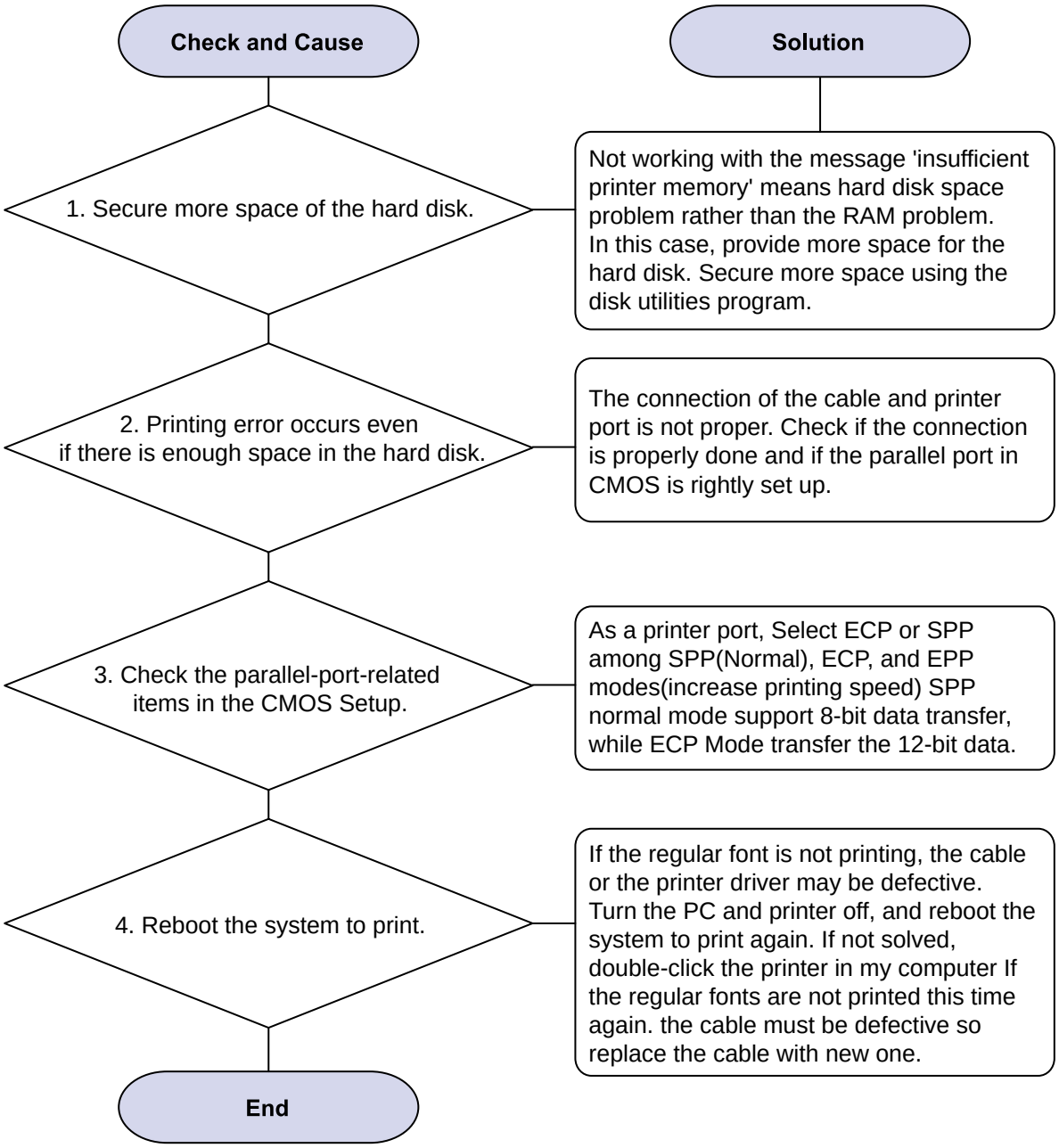
1) The printer is not working (1)

Description : While Power turned on, the printer is not working in the printing mode.



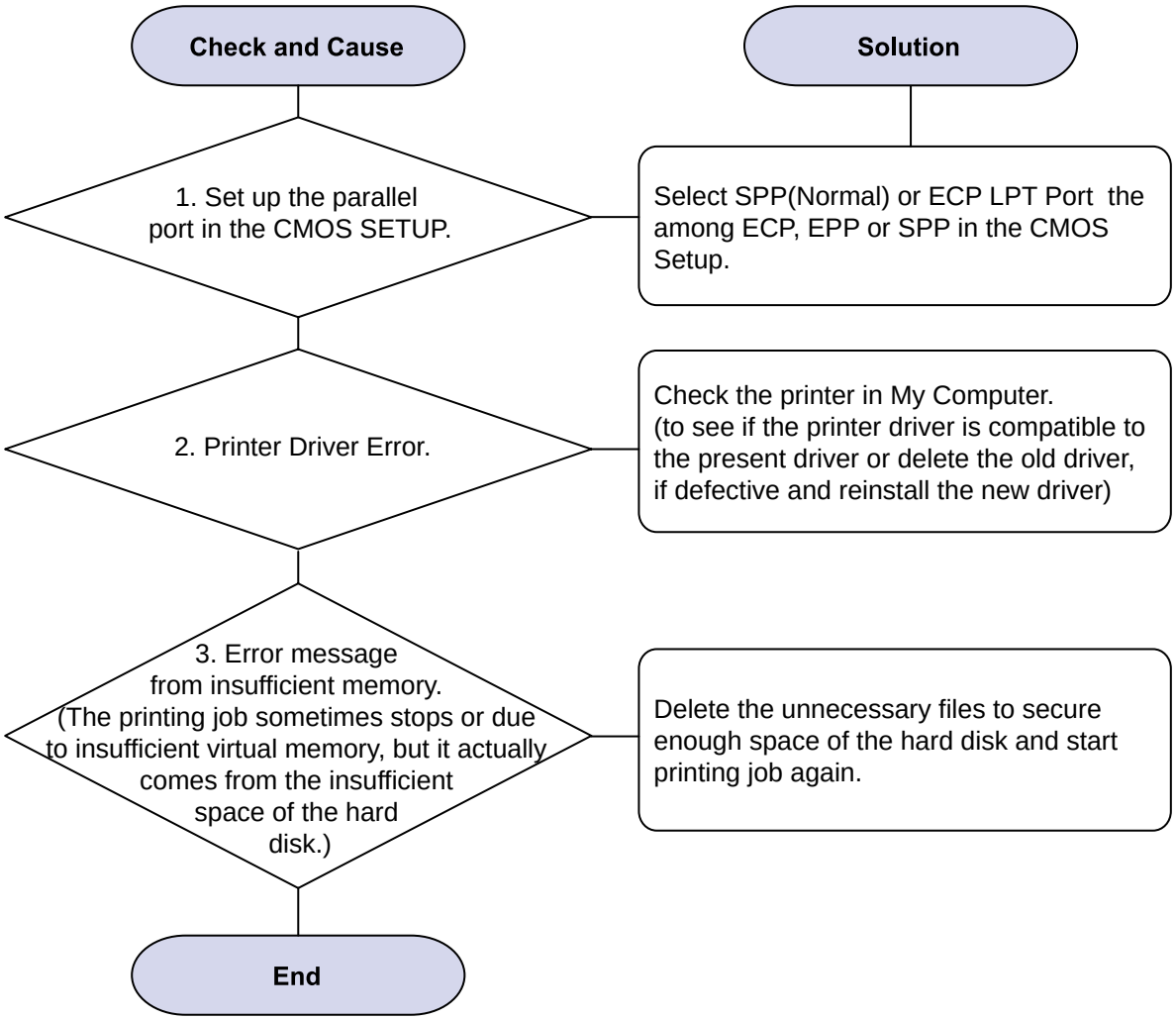
2) The printer is not working (2)

Description : After receiving the printing order, no response at all or the low speed of printing occurs due to wrong setup of the environment rather than malfunction of the printer itself.



3) Abnormal Printing

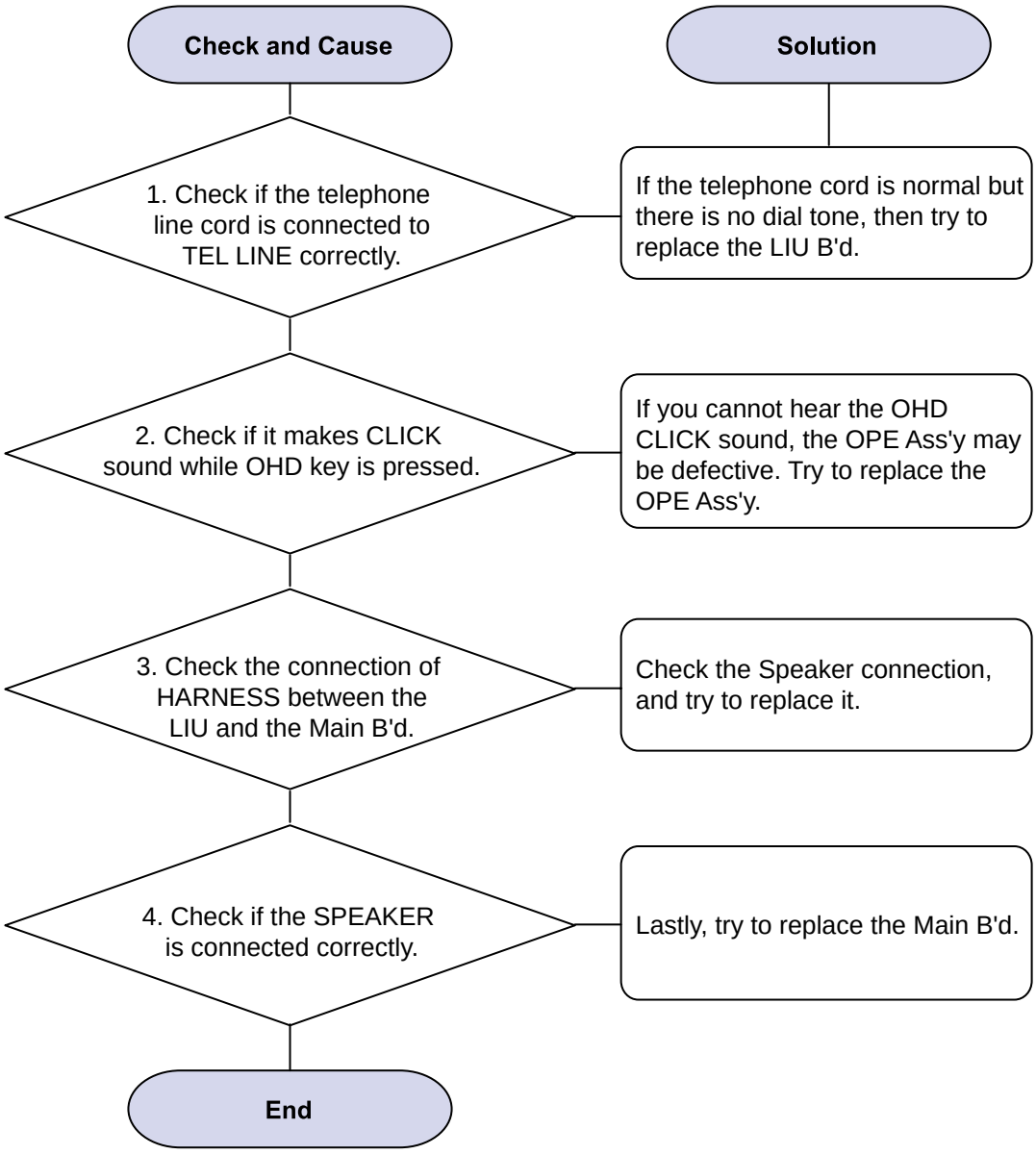
Description : The printer is not working properly even when the cable has no problem (even after the cable is replaced). If the printer will not work at all or the strange fonts are repeated, the printer driver may be defective or wrong setup in the CMOS Setup.



4.2.6 Fax & Phone Problems

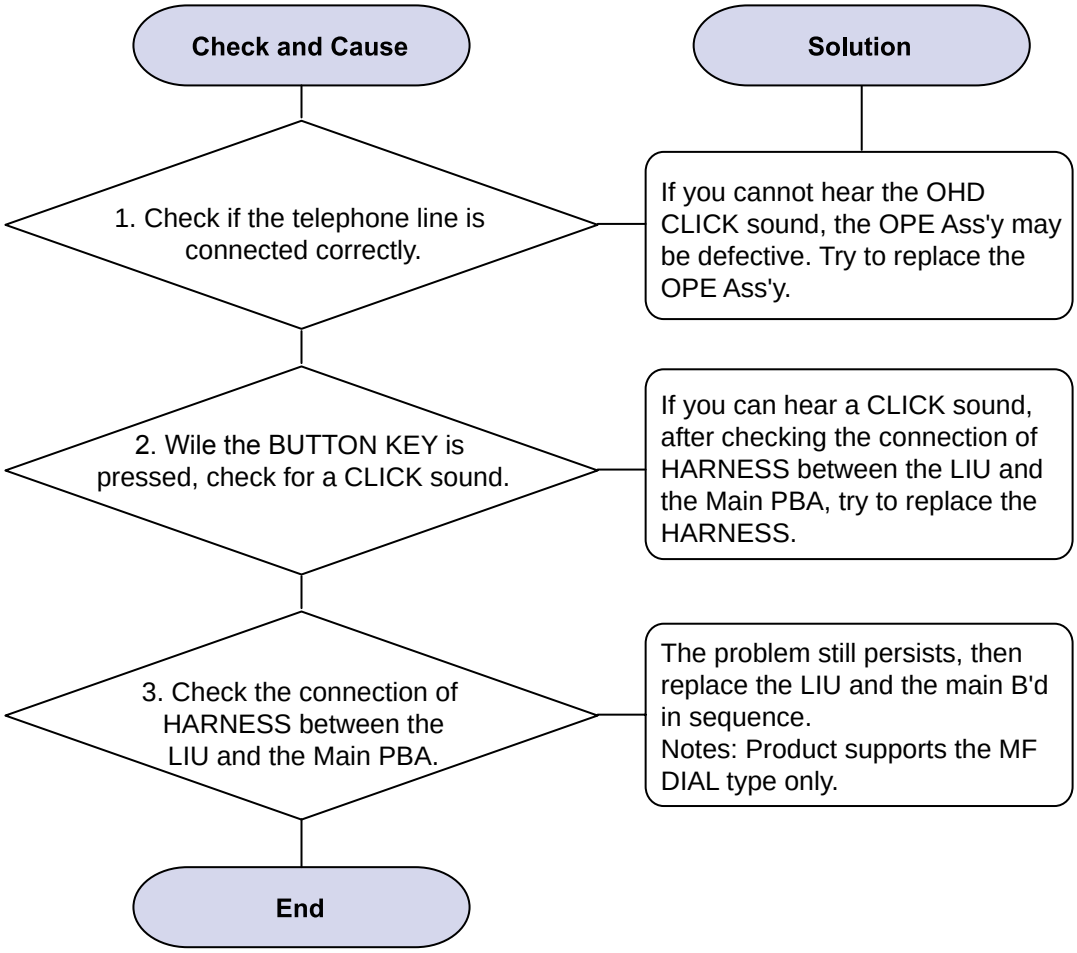
1) No Dial Tone

Description : While on-hook button is pressed, there is no dial tone.



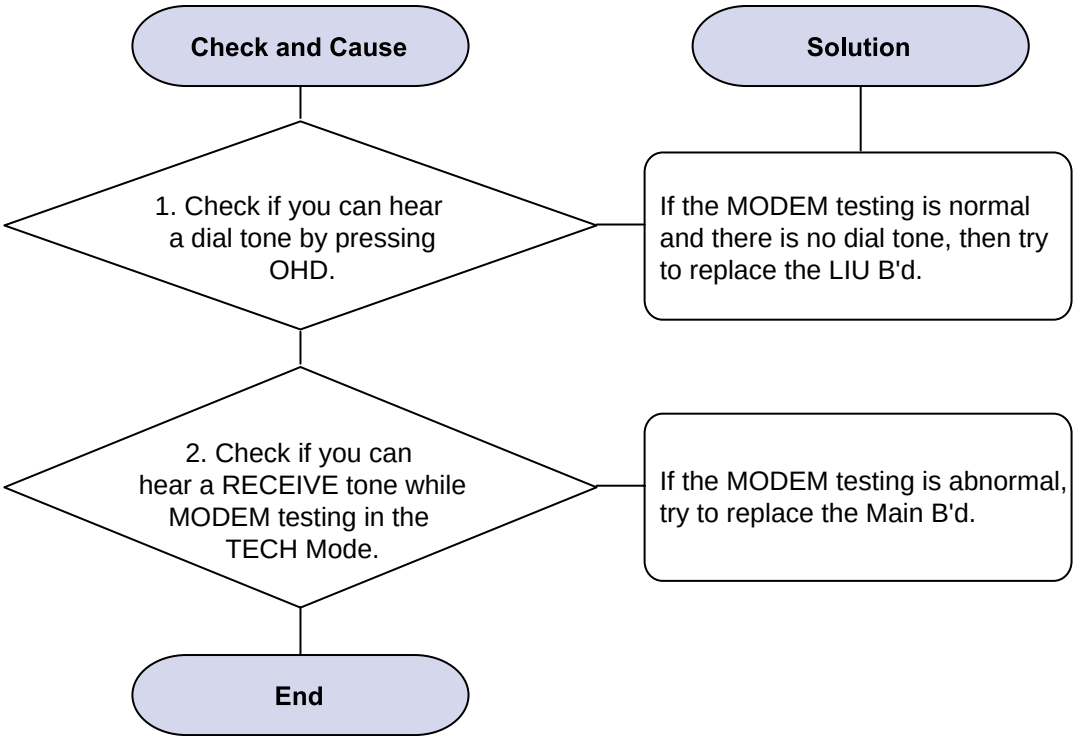
2) Defective MF DIAL

Description : The MF DIAL is not functioning.



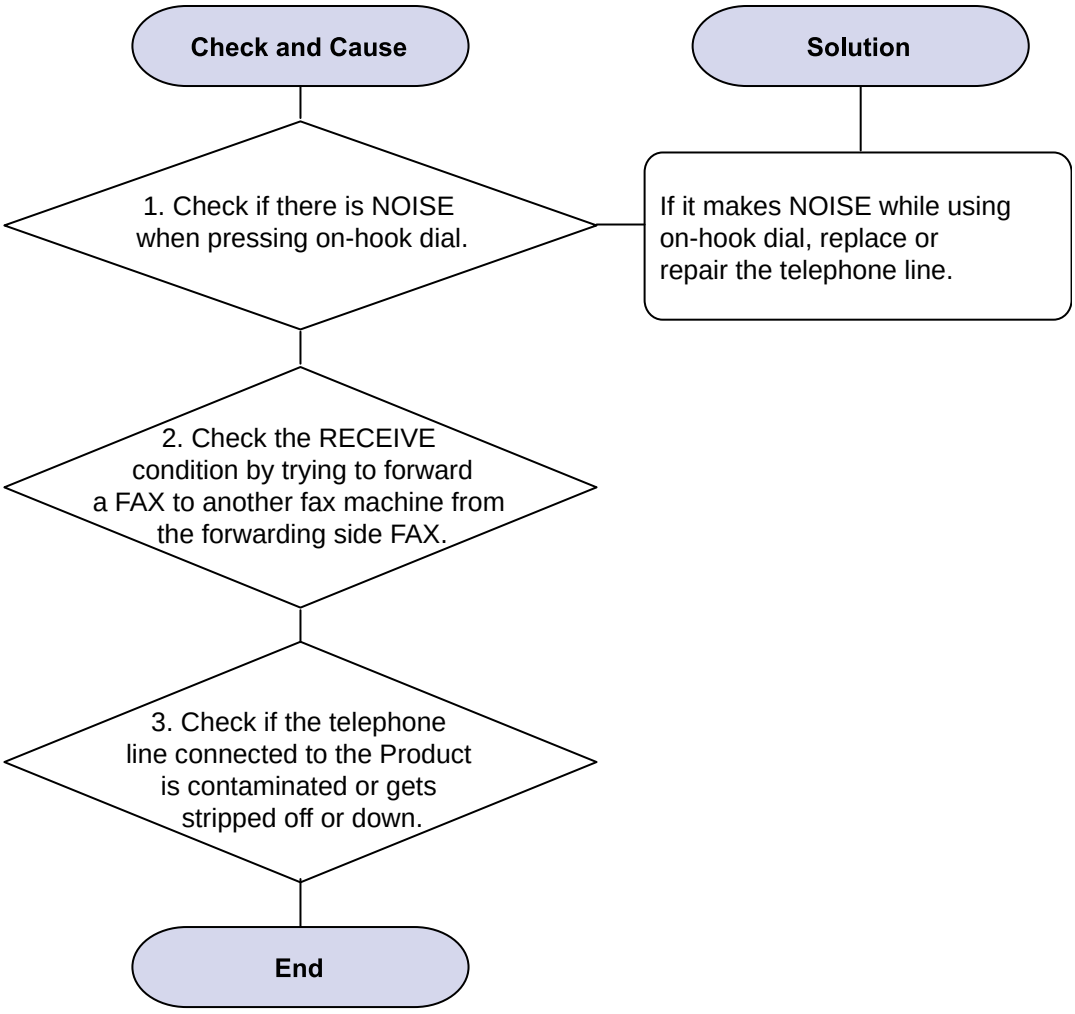
3) Defective FAX FORWARD/RECEIVE

Description : The FAX FORWARD/RECEIVE is not functioning.



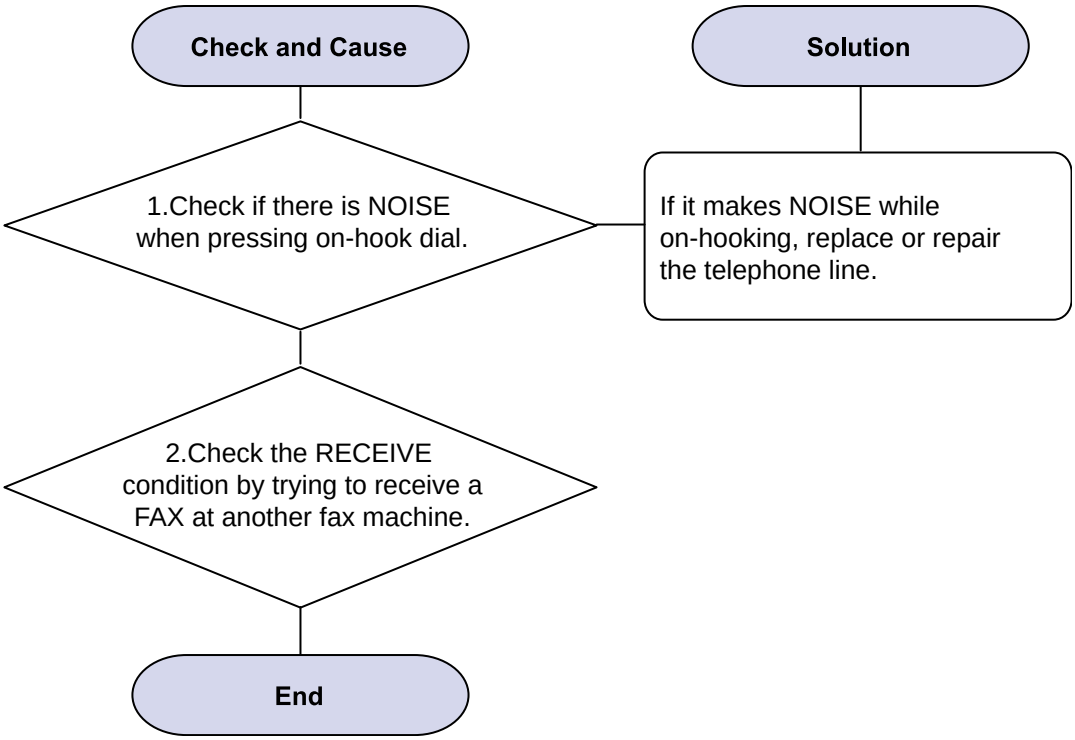
4) Defective FAX FORWARD

Description : RECEIVE is functioning, but FORWARD is not functioning or the received data are broken.



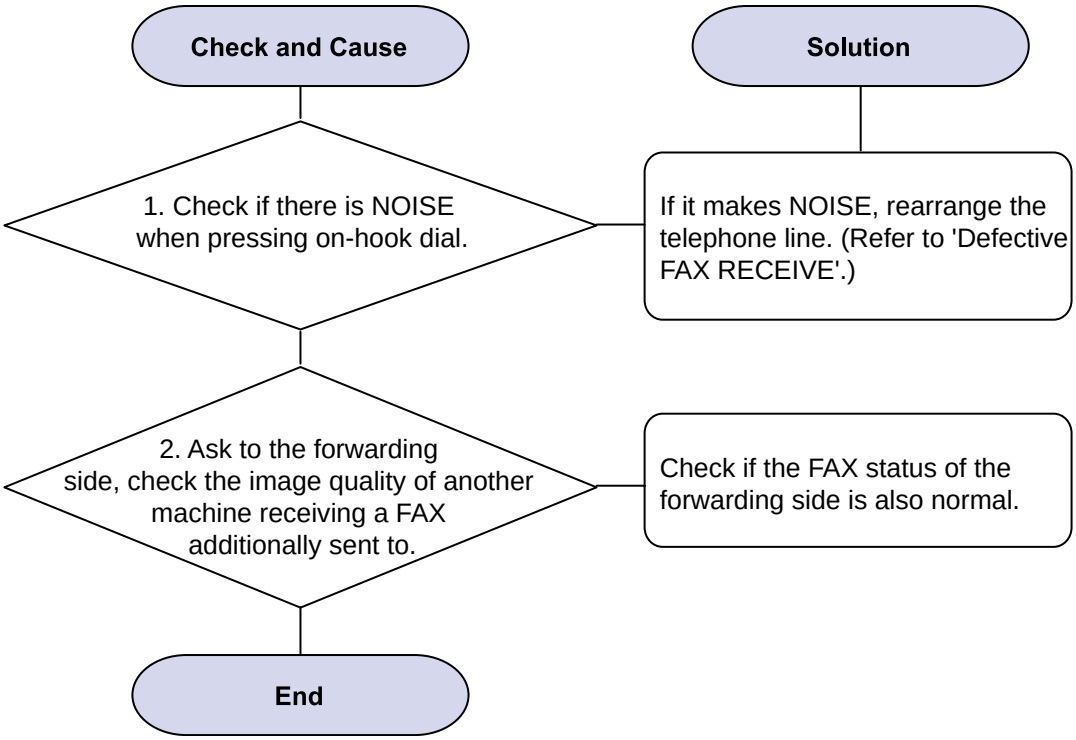
5) Defective FAX RECEIVE (1)

Description : FORWARD is functioning, but RECEIVE is not functioning or the received data are broken.



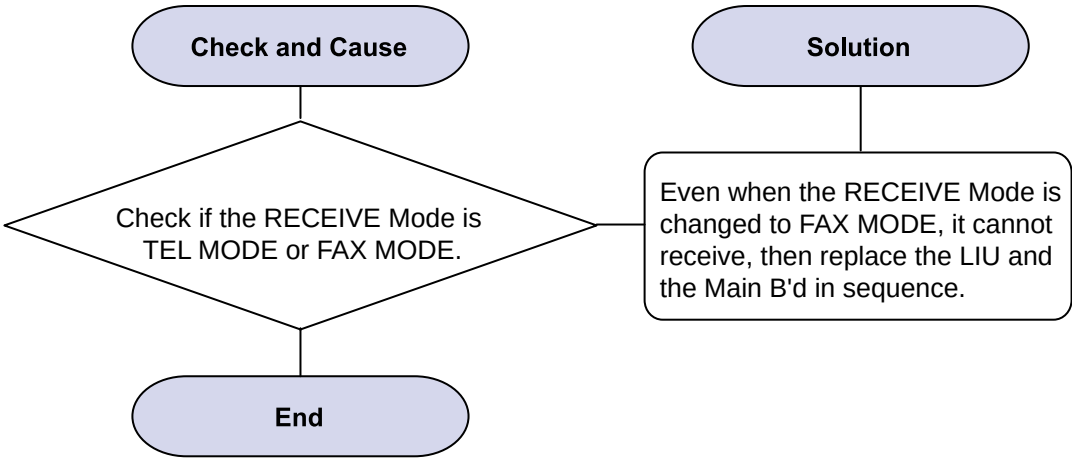
6) Defective FAX RECEIVE (2)

Description : The received data are lengthened or cut in the printing.



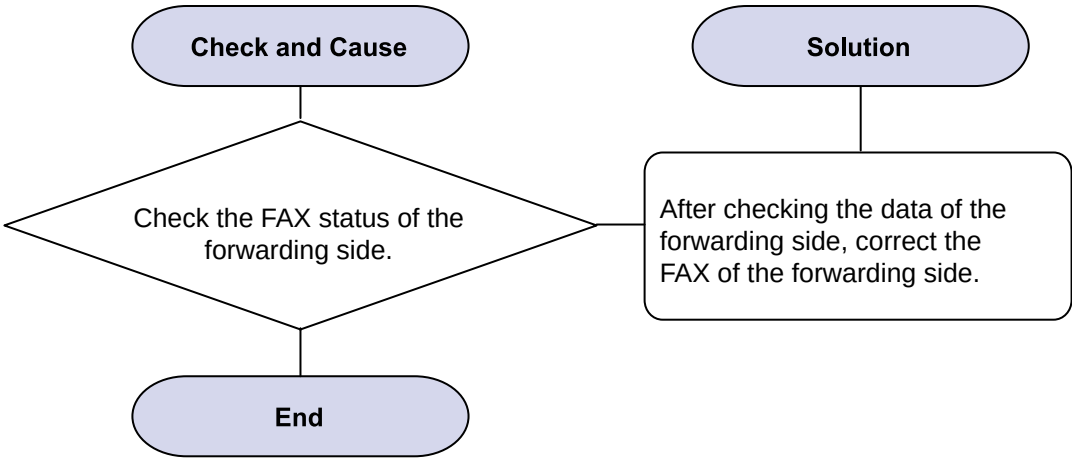
7) Defective FAX RECEIVE (3)

Description : The phone is ringing continuously, but it cannot receive.



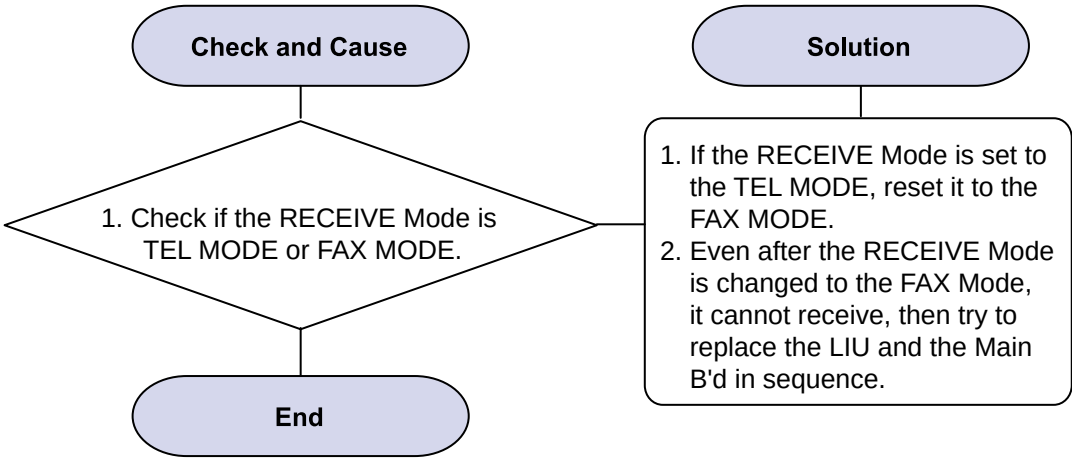
8) Defective FAX RECEIVE (4)

Description : The received data is reduced by more than 50% in the printing.



9) Defective Automatic Receiving

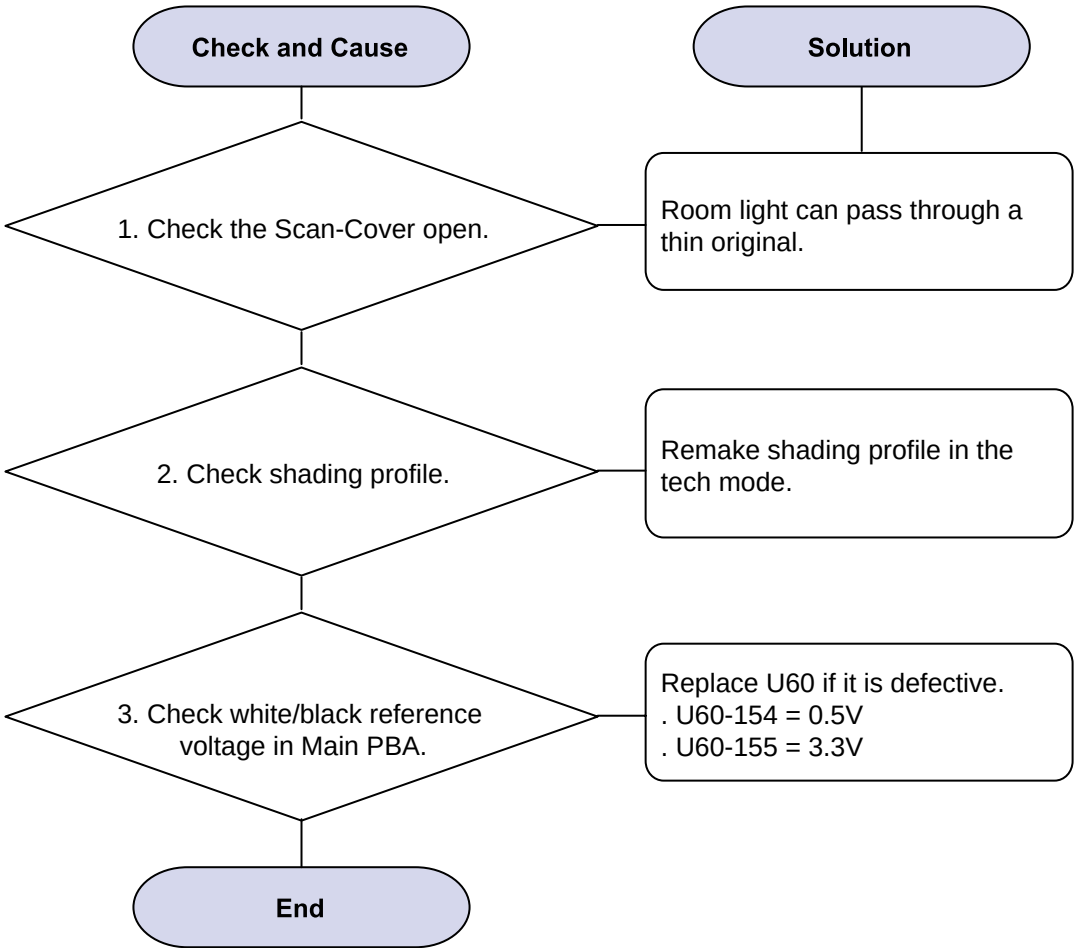
Description : The automatic receiving function is not working.



4.2.7 Copy Problems

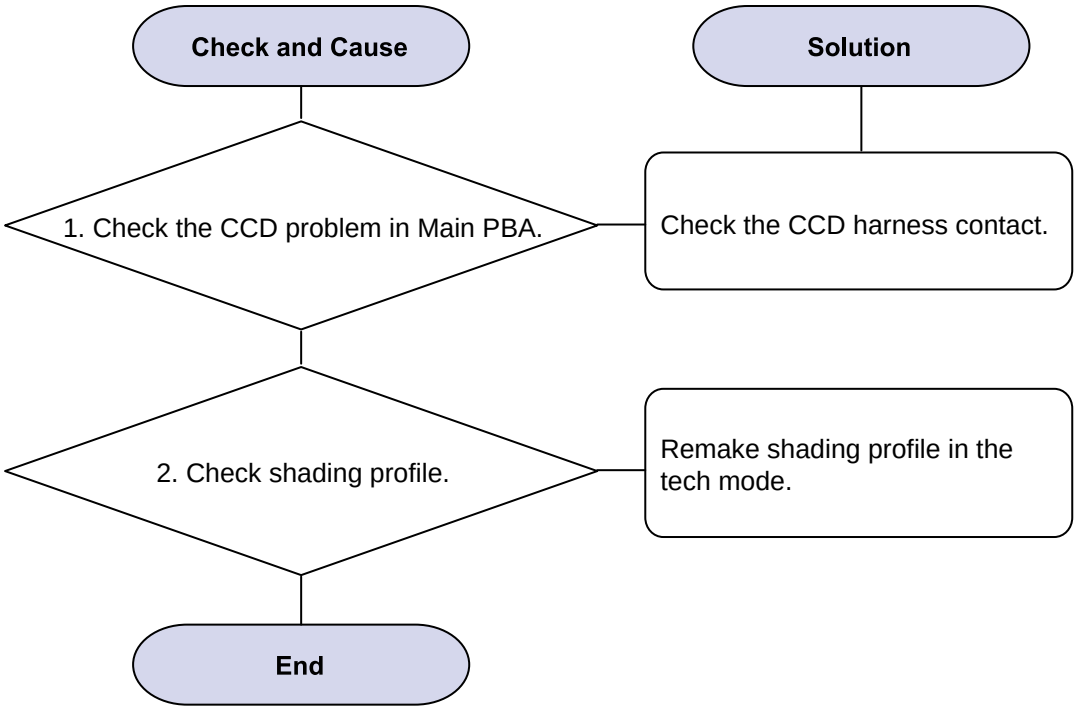
1) Black Copy

Description : Black page is printed out when copy.



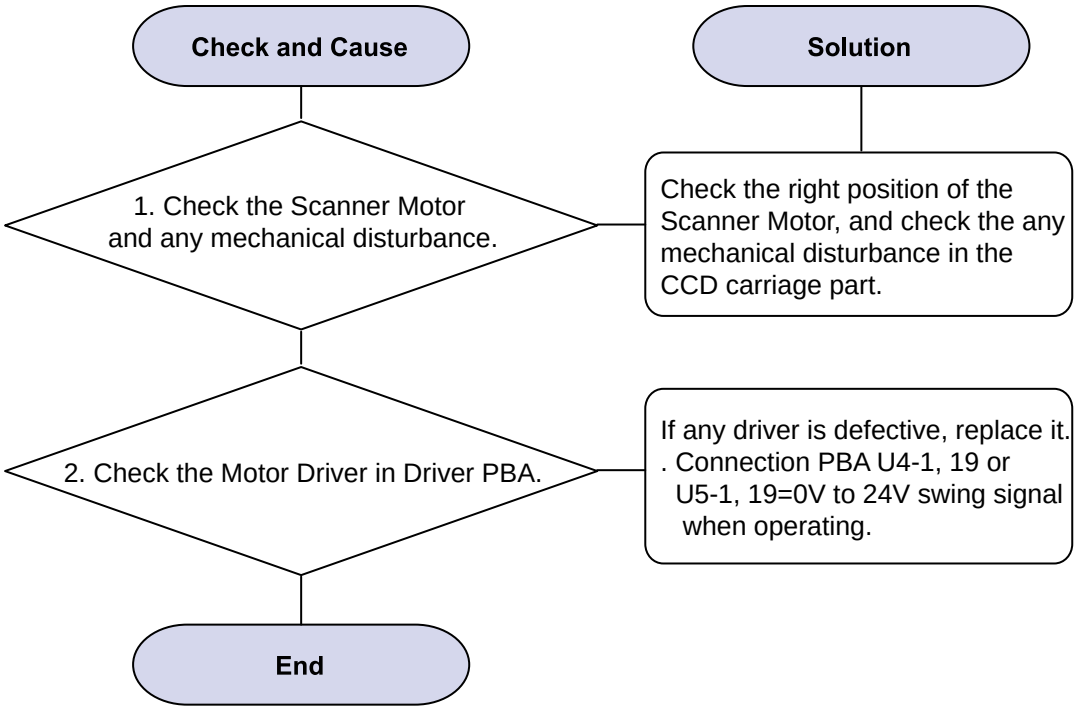
2) White Copy

Description : White page is printed out when Copy.



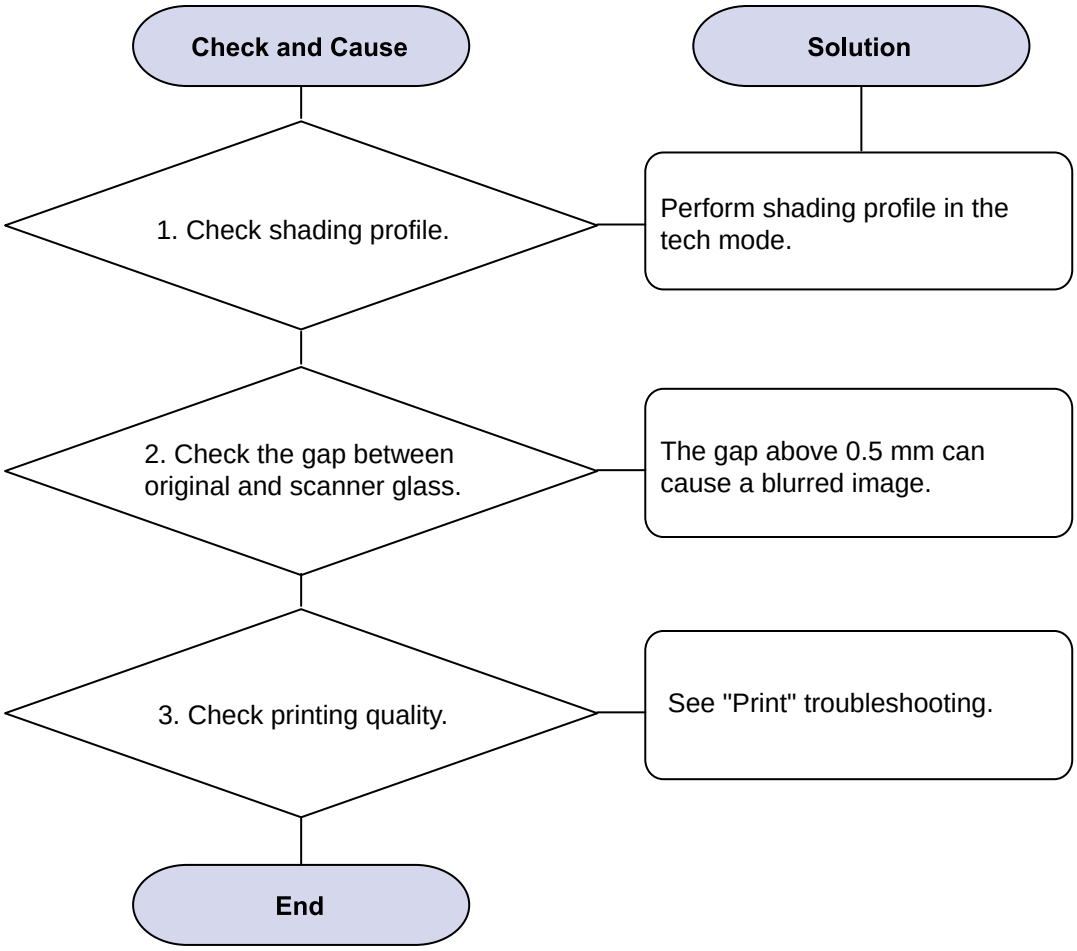
3) Abnormal noise

Description : There is noise when copy.



4) Defective Image Quality

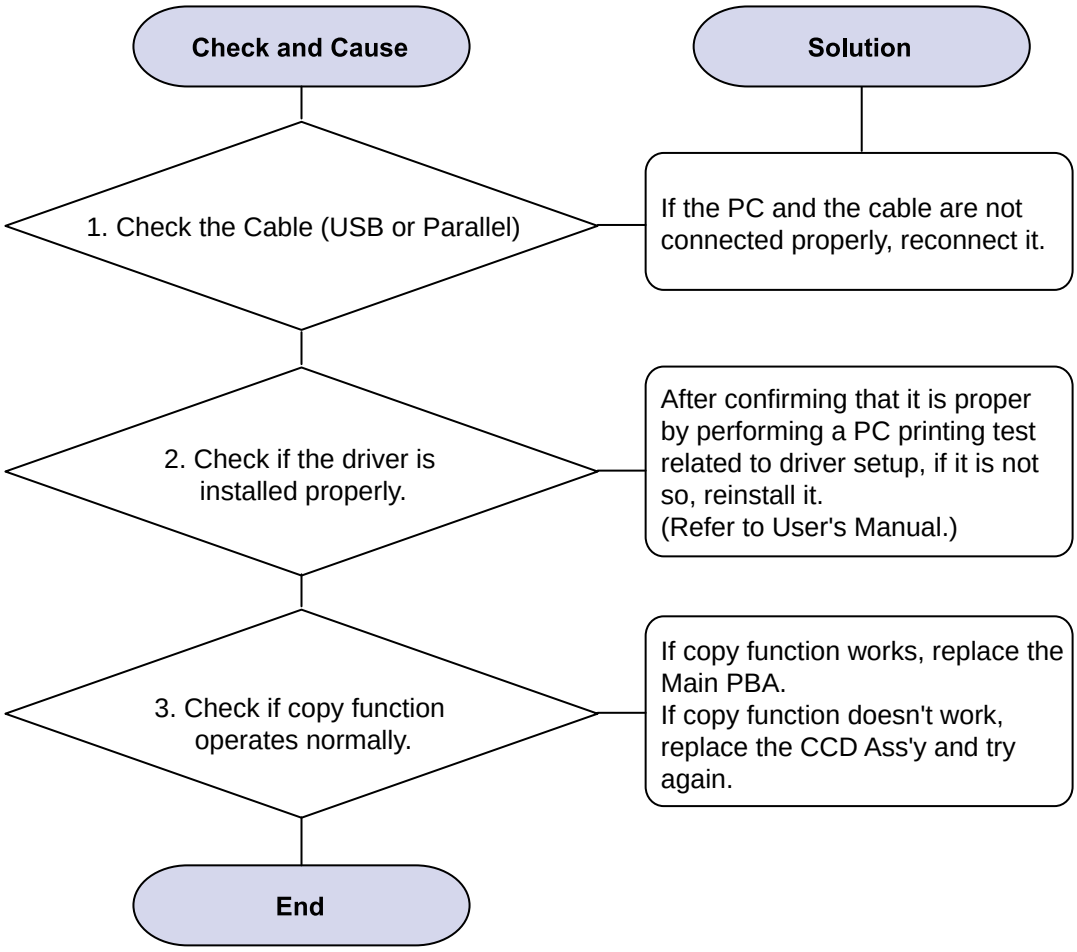
Description : The copied image is light or bad.



4.2.8 Scanning Problems

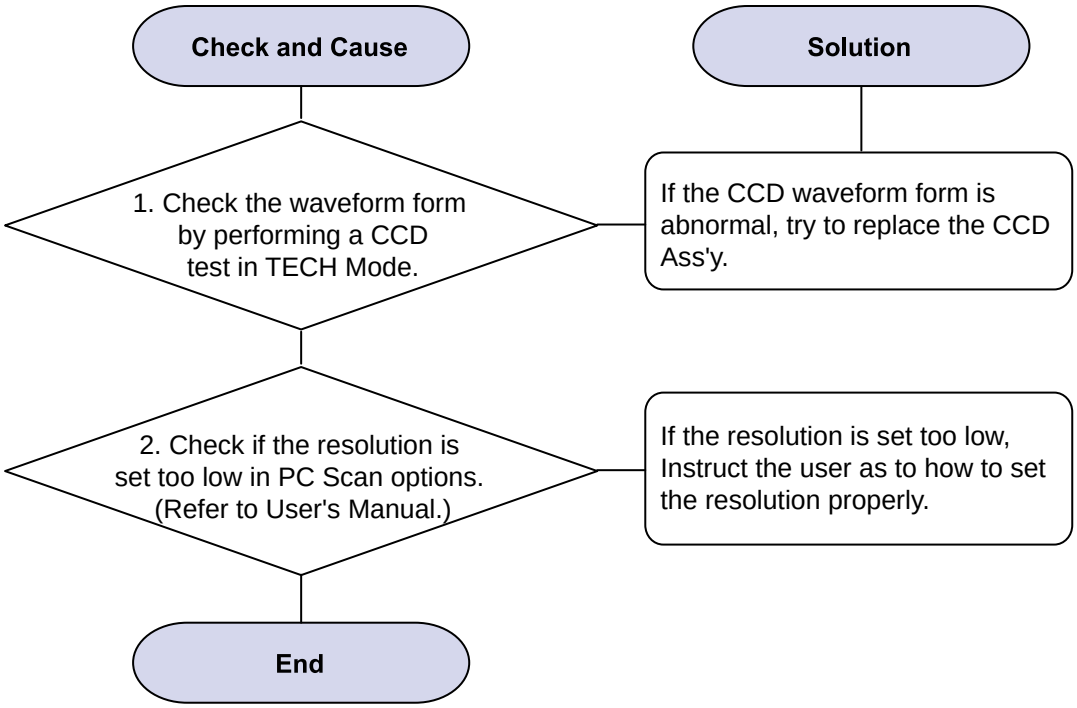
1) Defective PC Scan

Description : The PC Scan is not functioning at all.



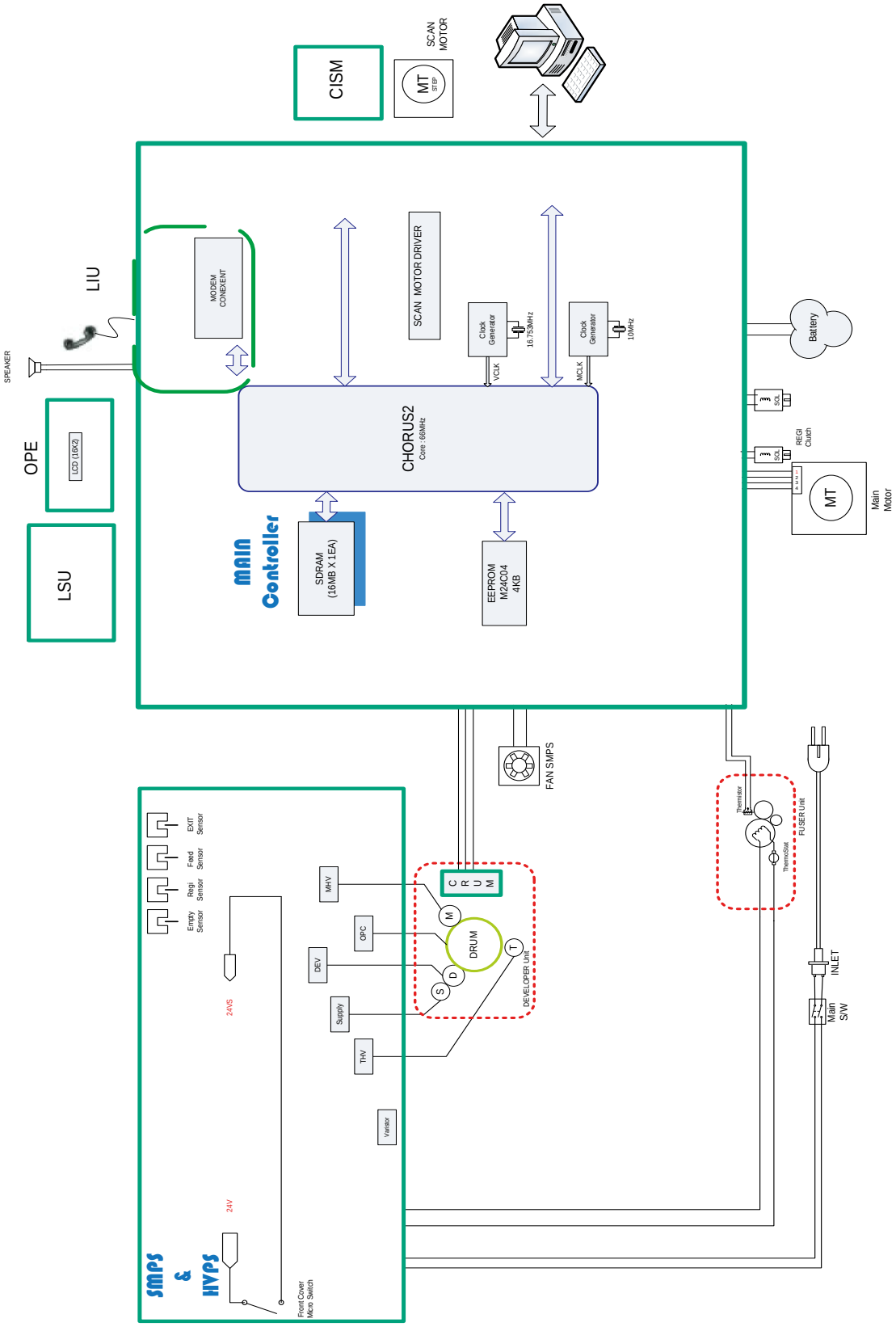
2) Defective Image Quality of PC Scan

Description : The image PC scanned is not clear or bad.

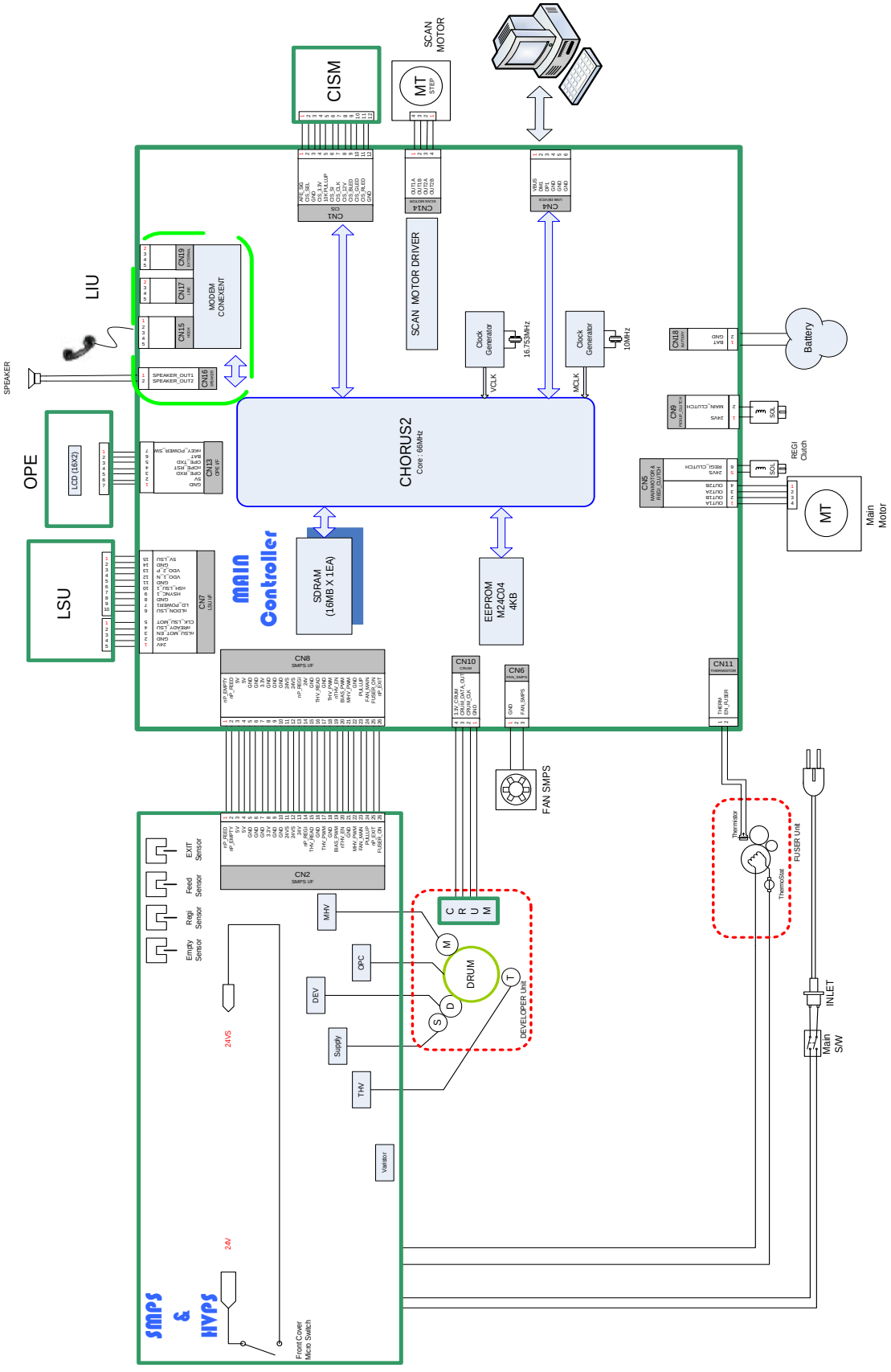


5. System Diagram

5.1 Block Diagram



5.2 Connection Diagram



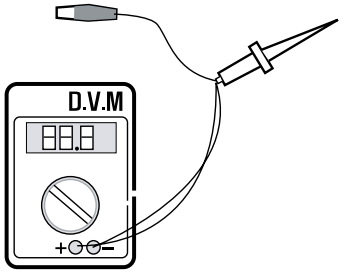
6. Reference Information

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 test pages and Wireless Network information definition is also included.

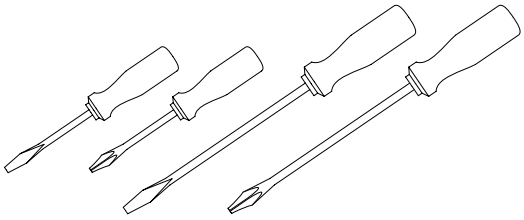
6.1 Tool for Troubleshooting

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

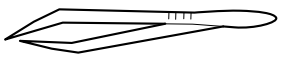
- **DVM (Digital Volt Meter)**
  Standard : Indicates more than 3 digits.



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

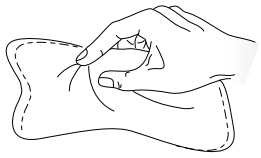


- **Tweezers**
  Standard : For general home use, small type.

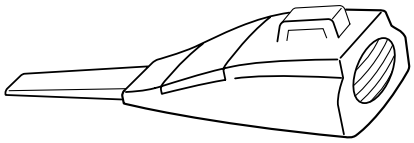


- **Cotton Swab**
  Standard : For general home use, for medical service.

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

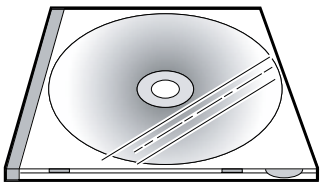


- **Vacuum Cleaner**



- **Spring Hook**
  Standard : For general use

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



6.2 Acronyms and Abbreviations

The table below explains abbreviations used in this service manual.
The contents of this service manual are declared with abbreviations in many parts. Please refer to the table.

6.2.1 Acronyms

ABS	Automatic Background Suppression (a kind of copy feature)	FDI	Foreign Device Interface
		FIA	Foreign Interface Attachment
APF	Automatic Paper Feeder (Tray)	FRU	Field Replaceable Unit
BOOTP	BOOTSTRAP PROTOCOL	FPOT	First Print Out Time
CCD	Charged Coupled Device	GW	GateWay
CIS	Contact Image Sensor	HH	High Temperature, High Humidity (Testing Chamber conditions)
CPM	Copies Per Minute		
CP	Control Panel (= OPE)	HPVC	Halftone Printing Video Controller in the SPGPm (Graphic Processor for Copy)
CQ	Copy Quality		
CRU	Customer Replaceable Unit	IDC	International Data Corp.
CRUM	CRU Memory	IMAP	Internet Message Access Protocol
CW	Center Ware	IPP	Internet Printing Protocols
CWDP	Center Ware Device Discovery Software (SyncThru)	IPM	Images Per Minute
		IPX	Internetwork Packet Exchange
		IQ	Image Quality
CWIS	Center Ware Internet Services	ITU	International Telecommunication Union
DADF	Duplex Auto Document Feeder (= DADH)	JBIG	Joint Binary Image Group (a kind of image data coding method)
DC	Direct Connect	JPEG	Joint Photographic Expert Group (a kind of image data coding method)
DDNS	Dynamic Domain Name System		
DHCP	Dynamic Host Configuration Protocol	LCD	Liquid Crystal Display
DLC	Data Link Control	LEF	Long Edge Feeding
DNS	Domain Name System	LL	Low Temperature, Low Humidity (Testing Chamber conditions)
ECM	Error Correction Mode		
ECP	Enhanced Capability Port	LPR/LPD	Line Printer Daemon Protocols (LPR is a TCP-based protocol)
e-Coil	Extended Coil technology for Rapid (Fast) Fusing.		
		LSU	Laser Scanning Unit
EH&S	Environment, Health, & Safty	LUI	Local User Interface
		MCBF	Mean Copy Between Failure
ESMTP	Extended Simple Mail Transfer Protocol	MDSP	Multiple Document Single Printout
EP	Electro Photography	MFP	Multi-Functional Product
EPC	Electric Pre-Collation	MH	Modified Huffman (a kind of image data coding method)
FCOT	First Copy Out Time		

MIB	Management Information Base
MIME	Multipurpose Internet Mail Extensions
MR	Modified Read (a kind of image data coding method)
MMR	Modified and Modified Read (a kind of image data coding method)
MN std	Multi-National Standard
MSOK	Master SOK (System Operation Key)
MSO	Mixed Size Original
MP	Multi Purpose
MPBF	Mean Print Between Failure
MSI	Multi Sheet Input
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
NCP	Network Control Protocol
NIC	Network Interface Card
NOS	Network Operating System
NN	Normal Temperature, Normal Humidity (Testing Chamber conditions)
NSDR	Non-Shut Down Rate (=USDR)
NW	Network
OD	Optical Density
OHD	On Hook Dial
OSOK	Optional SOK(System Operation Key)
OP	Operational Procedure
PCL	Printer Control Language
PDF	(Adobe) Portable Document Format
PPM	Pages Per Minute
PQ	Print Quality
PS/3	PostScript Level-3
PVC	Printing Video Controller in the SPGPm (Graphic Processor for Printer)
QCD	Quality, Cost, and Delivery
RCP	Remote Control Panel
RT-OS	Real Time Operating System
RX	Receive
S2E	Scan-To-Email
SAD	Solid Area Density
SC	Service Call
SCF	Second Cassette Feeder
SDSP	Single Document Single Printout
SDMP	Single Document Multiple Printout
SDR	Shut Down Rate
SEF	Short Edge Feeding
SIR	Sacrified(or Standard) Image Reference
SOK	System Operation Key
sRGB	Standard RGB (Color Coordinate System)
SNMP	Simple Network Management Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TIFF	(Adobe & Aldus) Tagged Image File Format
TRIM	Technical Retrofit Interim Maintenance
TTM	Time to Market
TX	Transmit
UI	User Interface
UMC	Unit Manufacturing Cost
UMR	Unscheduled Maintenance Ratio
UPnP	Universal Plug and Play
USB	Universal Serial Bus
USDR	Un-Shut Down Rate (=NSDR)
XCMI	Management Information Base
WA	Warranty Action
W x D x H	Width x Depth x Height

6.2.2 Service Parts

ACRONYM	EXPLANATION
ELA HOU-SCANNER ASS'Y	ELA=Electrical Assembly, HOU =Housing
MEA UNIT-COVER PA EXIT ASS'Y	MEA= Mechanical Assembly, PA=Paper
PMO-TRAY EXTENTION MP NE	PMO= Processing Mold MP=Multi-Purpose (Bypass) tray NE=for NEC
MEC-CASSETTE ASS'Y (LETTER)	MEC = Mechanic Combined unit
COVER-M-FRONT	M=Mold
MPR-NAME/PLATE	MPR= Machinery Press,
UNIT-LSU	LSU =Laser Scanning Unit
SMPS-SMPS(V1)+HVPS	SMPS =Switching Mode Power Supply HVPS =High Voltage Power Supply
ELA-OPC UNIT SET	OPC=Organic Photo-Conductive
ELA HOU-MP ASS'Y	MP =Multi-Purpose (Bypass) tray
PBA MAIN-MAIN	PBA =Printed Circuit Board Assembly
PMO-CONNECT PAPER MFP	MFP =Multi-Functional Peripheral
FAN-DC	DC =Direct Current
CBF POWER STITCH GRAY	CBF= Cable Form
MEA UNIT GUIDE CST PA ASS'Y	CST=Cassette (Paper tray), PA=Paper
PBA LIU	PBA =Printed circuit Board Assembly LIU =Line Interface Unit for FAX
SHIELD-P_MAIN LOWER	P=Press
CBF HARNESS-LIU GND	LIU =Line Interface Unit for FAX GND= Ground
PMO-COVER FEED AY	AY=Assembly
PMO-COVER BRKT MOTER	BRKT=Bracket
CBF HARNESS-LSU	LSU =Laser Scanning Unit
IPR-SHIELD SMPS UPPERI	IPR=Iron Press
PMO-BUSHING P/U.MP	P/U=Pickup MP=Multi-Purpose (Bypass) Tray
PMO-HOLDER GEAR TRr	TR= Transfer Roller
SPRING ETC-TR_L	TR_L=Transfer Roller - Left
PMO-CAM JAM REMOVE	PMO-CAM= Processing Mold-CAM
PMO-LOCKER DEVE	DEVE=Developer

ACRONYM	EXPLANATION
SPECIAL SCREW (PANNEL MFP)	MFP =Multi-Functional Peripheral
A/S MATERAL-DUMMY UPPER ASS'Y	A/S=After-Service
MCT-GLASS ADF	MCT= Machinery Cutting ADF=Automatic Document Feeder
PPR-REGISTRATION EDGE(F)	PPR= Processing Press
IPR-HOLDER GLASSI	PR=Iron Press
MCT-GLASS SCANNER (LEGAL)	MCT= Machinery Cutting
CBF HARNESS-OPE	OPE=Operation Panel (Control Panel)
PBA SUB-D_SUB	PBA SUB-D_SUB =>Sub Printed circuit Board Assembly for the D-SUB type electrical connector (D-Sub) a kind of the connector type (shape 'D')
COVER-M-CCD CABLE	M=Mold CCD=Charge Coupled Device
COVER-SCAN LOWER (UMAX)	UMAX=> Supplier's name for CCD module
ICT-INSERT SHAFTI	ICT= Iron Cutting
IPR-BRK SCAN BD	IPR=Iron Press BRK=Bracket BD= Board
CBF SIGNAL-CCD FFC	CCD = Charge Coupled Device FFC =Flexible Flat Cable
COVER-M-OPE	M=Mold OPE=Operation Panel (Control Panel)
KEY-M-COPY	M=Mold
PLATE-M-ALPHA KEY	M=Molde ALPHA=Alphabet
PMO-GUIDE DP SIDE	DP=Duplex
RING-CS	CS= Compress
GEAR-MP/DUP DRV	MP =Multi-Purpose (Bypass) tray DUP DRV = Duplex Driver
IPR-BRKT G DUPI	PR=Iron Press BRKT=BRACKET G= Ground UP=Duplex
PMO-BUSHING TX(B4)	TX=Transmit
PMO-TRAY CASE, MP	MP=Multi-Purpose tray (Bypass tray)

ACRONYM	EXPLANATION
SPRING CS RE	CS=Compress RE=Rear
SPRING CS FR	CS=Compress FR=Front
PMO-BUSHING FINGER, F	F=Front
ICT-SHAFT-EXIT LOWER ID	ID=Idler
SPRING-EXIT ROLL FD	FD=Face Down
PMO-BUSHING_P/U,MP	P/U=Pickup MP =Multi-Purpose (Bypass) tray
PMO-HOLDER CAM MPF	MPF=Multi-Purpose Feeder (=MP)
PMO-GEAR P/U MPF	P/U=Pickup
MFP =Multi-Functional Peripheral	
RPR-RUBBER PICK UP,MP	RPR=Rubber Press
PBA SUB-MP SEN	PBA SUB-MP-SEN =>Sub Printed circuit Board Assembly for the MP-SEN (= Multi-Purpose (Bypass) tray-Sensor)
A/S MATERAL-PICKUP,MP	
FOOT-ML80	
HOLDER CATCH CST MC2	MC2=>McKInley2
IPR-GROUND PLATE A(OPC)	OPC=Organic Photo-Conductive
ELA M/M-AUD SPEAKER	ELA M/M => Electrical Assembly M/M AUD=Audio
CBF HARNESS-OPC GND	OPC GNG=Organic Photo-Conductive-Ground
IPR-GROUND PLATE SCF	SCF=Second Cassette Feeder (Tray2)
PBA SUB-PTL	PBA SUB-PTL=>Sub Printed circuit Board Assembly for the PTL (= Pre Transfer Lamp)
PBA SUB-FEED+P.EMP SEN.	PBA SUB-FEED=>Sub Printed circuit Board Assembly for the feeder EMP SEN=Empty Sensor
MOTOR STEP-MCK2(MAIN)	
GEAR-EXIT/U	EXIT/U=EXIT/Upper
GEAR-RDCN FEED INNER	RDCN=Reduction
CBF-HARNESS-MAIN-THV WIRE	THV =Transfer High Voltage
CBF-HARNESS-MAIN-MHV WIRE	MHV= High Voltage (Charge Voltage)

ACRONYM	EXPLANATION
GEAR-EXIT/U,ID	U=Upper ID=Idler
IPR-TERMINAL FU	FU=Fuser
PMO-BEARING H/R-F	H/R-F=Heat Roller - Front
BEARING-H/R L	H/R-L=Heat Roller -Left
PEX-ROLLER EXIT F_UP	PEX= Processing Extrude F_UP=Face Up
SPRING ETC-P/R	P/R=Pressure Roller
SPRING(R)-CAU-HOT-FU	CAU-HOT-FU = Caution Hot -Fuser
PMO-ARM ACTUATOR	PMO-ARM= Processing Mold Arm
LABEL(R)-HV FUSER	HV=High Voltage (220V)
LABEL(R)-LV FUSER	LV=Low Voltage (110V)
PPR-SPONG SHEET	PPR=Plastic Press
IPR-P_PINCH(SCAN)I	PR-P = Iron Press
ROLLER-REGI	REGI=Registration
PBA SUB-REGI	PBA SUB-REGI => Sub Printed Circuit Board Assembly for the Registration
GROUND-P_SCAN ROLLER	GROUND-P =Ground-Press
IPR-GUARD C/O S/W	C/O = Cover Open S/W= Switch
MEA UNIT-TX STACKER	TX =Transmit
IPR-WASHER SPRING CU	CU=Curve

6.3 The Sample Pattern for the Test

The sample pattern shown in below is the standard pattern used in the factory.
The life of the toner cartridge and the printing speed are measured using the pattern shown below.
(The image is 70% of the actual A4 size).

6.3.1 A4 ISO 19752 Standard Pattern

This test page is reproduced at 70% of the normal A4 size

ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ

Stephen J. Singel
Labanda Sinpat Abarress
Tendar, BSF
URANGLE

LSA
Funtres Solber Netener

23 January 2004

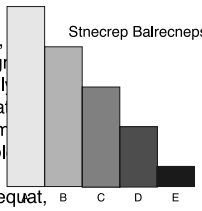
Jonathan Q. Maderia

Inpert Mampem Abaress
2343 Stantin Dawer Lank
Benhibe, SDF

Mr.Maderia:

Nam liber tempor cum soluta nobis eleifend ption cogue nihil consequat, velillum.
Dolore eu zril feugiat nulla acilisis at vero eros accumsan et iusto odio dignis sim qui blandit praesent lutatum ril lobortis nisl ut aliquip exea commodo consequat. Duis autem vel eum ireure dolor in hendreritin vulputate velit esse molestie tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim viniam, quis nostrud exerci tation ullam corpersus cipit lotis nisl ut aliquip ex ea commodo consequat. Lorem ipsum dolor sit.

Amet, consectetuer adipiscing elit, sud diam nonummy nibh veniam, recneps adipiscing elit, sed diam nonummy nibtil laoreet dolore magn aliam erat volutpat. Ut wisi enim minim veniam, quisient nostrud. Sol uta nobis eleifendoptn cogue nihil imerdiet domg id quod mzim plera facer posim aum. Lorem ipsm dolor sit amet, consectuer. Duis autem eum iriure dolor in hendreritin vulputate velit cesse ea commodo mol



Nam liber tempor cum soluta nobis eleifend option cogue nihil consequat, velillum. Dolore eu zril feugiat nulla facilisis at vero eros accumsan et iusto odio dignissim qui blandit praesent.

Singabet,

Stephen J. Singel
Demperta Aminerimum
Labanda Sinpat Abarress

SJS:dwg
FINAL

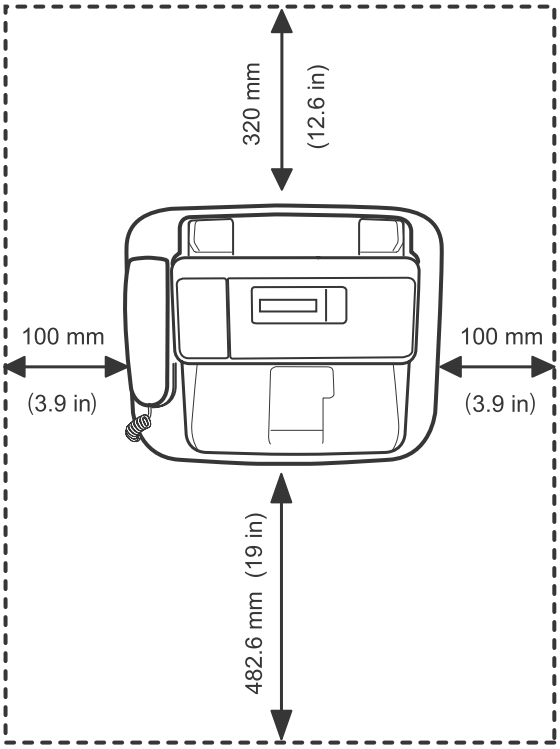
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ

6.4 Selecting a location

Select a level, stable place with adequate space for air circulation. Allow extra space for opening covers and trays.
The area should be well-ventilated and away from direct sunlight or sources of heat, cold, and humidity. Do not set the machine close to the edge of your desk or table.

Clearance space

- Front: 482.6 mm (enough space so that the paper tray can be removed)
- Back: 100 mm (enough space for ventilation)
- Right: 100 mm (enough space for ventilation)
- Left: 100 mm (enough space for ventilation)



Muratec America, Inc.
3301 East Plano Parkway, Ste. 100
Plano, Texas 75074
(469) 429-3300 (Tel)
(469) 429-3465 (Fax)
www.muratec.com