Mono Laser MFP

ProXpress M456x series
SL-M4560FX, SL-M4562FX

(Ver 1.00)

SERVICE MANUAL

Mono Laser MFP

SL-M4560FX SL-M4562FX

Contents

Refer to the service manual in the GSPN (see the rear cover) for more information.

Contents

1. Precautions

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

1.1. Safety warning

1) Only to be serviced by a factory trained service technician.

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

2) Use only Samsung replacement parts.

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

3) Laser Safety Statement

   The printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class I(1) laser products, and elsewhere is certified as a Class I laser product conforming to the requirements of IEC/EN 60825-1:2014. 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.

   - Wavelength: 800 nm
   - Beam divergence
     - Parallel: 11 degrees
     - Perpendicular: 35 degrees
   - Maximum power of energy output: 12 mW

WARNING

Never operate or service the product with the protective cover removed from Laser/Scanner assembly. The reflected beam, although invisible, can damage your eyes.

When using this product, these basic safety precautions should always be followed to reduce risk of fire, electric shock, and personal injury.

4) Lithium battery not replaceable by user

1.2. Caution for safety

1.2.1. Toxic material

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

1) Please keep imaging unit and toner cartridge away from children. The toner powder contained in the imaging unit and toner cartridge may be harmful, and if swallowed, you should contact a doctor.

1.2.2. Electric shock and fire safety precautions

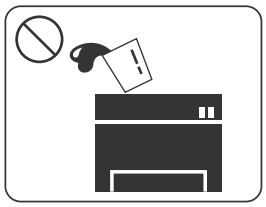
Failure to follow the following instructions could cause electric shock or potentially cause a fire.

1) Use only the correct voltage, failure to do so could damage the product and potentially cause a fire or electric shock.

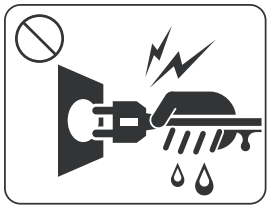
2) Use only the power cable supplied with the product. Use of an incorrectly specified cable could cause the cable to overheat and potentially cause a fire.

3) Do not overload the power socket, this could lead to overheating of the cables inside the wall and could lead to a fire.

4) Do not allow water or other liquids to spill into the product, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the product, these could cause a short circuit leading to an electric shock or fire hazard.

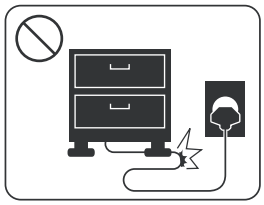


5) Never touch the plugs on either end of the power cable with wet hands, this can cause electric shock. When servicing the product, remove the power plug from the wall socket.



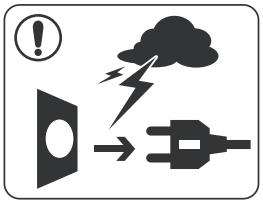
6) Use caution when inserting or removing the power cord. When removing the power cord, grip it firmly and pull. The power cord must be inserted completely, otherwise a poor contact could cause overheating leading to a fire.

7) Take care of the power cable. Do not allow it to become twisted, bent sharply around corners or power cable may be damaged. Do not place objects on top of the power cable. If the power cable is damaged it could overheat and cause a fire. Exposed cables could cause an electric shock. Replace the damaged power cable immediately, do not reuse or repair the damaged cable. Some chemicals can attack the coating on the power cable, weakening the cover or exposing cables causing fire and shock risks.

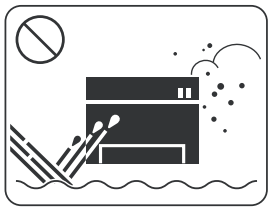


8) Ensure that the power sockets and plugs are not cracked or broken in any way. Any such defects should be repaired immediately. Take care not to cut or damage the power cable or plugs when moving the machine.

9) Use caution during thunder or lightning storms. Samsung recommends that this machine be disconnected from the power source when such weather conditions are expected. Do not touch the machine or the power cord if it is still connected to the wall socket in these weather conditions.

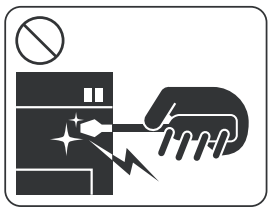


10) Avoid damp or dusty areas, install the product in a clean well ventilated location. Do not position the machine near a humidifier or in front of an air conditioner. Moisture and dust built up inside the machine can lead to overheating and cause a fire or cause parts to rust.



11) Do not position the product in direct sunlight. This will cause the temperature inside the product to rise possibly leading to the product failing to work properly and in extreme conditions could lead to a fire.

12) Do not insert any metal objects into the machine through the ventilator fan or other part of the casing, it could make contact with a high voltage conductor inside the machine and cause an electric shock.



13) When replacing the SMPS board, please wait 5 minutes after unplugging the power cord, then replace it. You can get a shock by the electric discharge.

1.2.3. Handling precautions

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

1) Ensure the product is installed on a level surface, capable of supporting its weight. Failure to do so could cause the product to tip or fall.

2) The product contains many rollers, gears and fans. Take great care to ensure that you do not catch your fingers, hair or clothing in any of these rotating devices.

3) Do not place any small metal objects, containers of water, chemicals or other liquids close to the product which if spilled could get into the machine and cause damage or a shock or fire hazard.

4) Do not install the machine in areas with high dust or moisture levels, beside on open window or close to a humidifier or heater. Damage could be caused to the product in such areas.

5) Do not place candles, burning cigarettes, etc on the product, These could cause a fire.

6) Ensure that the machine is installed and used in proper area to meet the temperature and humidity specifications.

   - If the machine is stored at below zero Celsius for a long time, do not use the machine instantly after movement. It can malfunction. Take care of the machine storage. If the machine is stored at below zero Celsius for a long time, keep the machine at room temperature and install it.

1.2.4. Assembly and Disassembly precautions

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

2) Ensure that power is disconnected before servicing or replacing any electrical parts.

3) Disconnect interface cables and power cables.

4) Only use approved spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct.

5) When removing or re-fitting any parts do not use excessive force, especially when fitting screws into plastic.

6) Take care not to drop any small parts into the machine.

7) Handling of the OPC Drum

   - The OPC Drum can be irreparably damaged if it exposed to light. Take care not to expose the OPC Drum either to direct sunlight or to fluorescent or incandescent room lighting. Exposure for as little as 5 minutes can damage the surface of the photoconductive properties and will result in print quality degradation. Take extra care when servicing the product. Remove the OPC Drum and store it in a black bag or other lightproof container. Take care when working with the Covers (especially the top cover) open as light is admitted to the OPC area and can damage the OPC Drum.

   - Take care not to scratch the green surface of OPC Drum Unit. If the green surface of the Drum Cartridge is scratched or touched the print quality will be compromised.

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 unit to cool down before disassembly.

2) Do not put fingers 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.). If do, you can get harm.

3) When you move the printer, use safe lifting and handling techniques.

   This printer is heavy. 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.

   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.

1.4. Caution for Data Loss

To prevent loss of customers data the SVC engineer provides end-user with relevant information in advance.

2. Product Specifications and Description

2.1. Product Overview

[SL-M4560FX]

[SL-M4562FX]

- **Printing Speed (Mono)**
  - Up to 45 ppm in A4 (47 ppm in Letter)
- **Processor**
  - Quad core CPU 1.5 GHz
- **Memory**
  - 3GB
- **7 inch IR Touch Screen Panel**
- **320 GB HDD**
- **ADF Unit**
  - SL-M4560FX : A4 DSDF
  - SL-M4562FX : Legal DSDF

2.2. Specifications

Product Specifications are subject to change without notice.

2.2.1. General Specification

Item		Specification
Processor	CPU	Quad core CPU 1.5 GHz
User Interface	Operational Panel	7" IR Touch-Screen LCD
	LED	2 EA (Power / Status)
	Key / Button	1 EA (Power)
Memory	Total (with Android OS)	3 GB
	Expansion (Optional)	N/A
Storage	Standard	320 GB HDD (User Available Space: 279 GB)
Interface	USB (Device)	Hi-Speed USB 2.0
	USB (Host)	Hi-Speed USB 2.0
	USB (EDI)	Yes
	Wired LAN	Std (Ethernet 10/100/1000 Base TX)
	Additional Wired LAN Support	N/A
	Wireless LAN	Option (IEEE 802.11b/g/n)
	NFC	Option (Active)
Warmup Time	From Sleep	Less than 23 sec
	Power Off	Less than 25 sec
Power Consumption	Ready	less than 30W
	Normal operation	900W
	Max/Peak	900W
	Sleep	1.8W
	Power Off	0.45W
	TEC	2.9KWh/week
Default Sleep Delay Time		1 min
Max. Sleep Delay Time		60 min
Power Requirement	Input Voltage	Europe : AC 220~240V / 50Hz / 5A
		USA : AC 100~127V / 60Hz / 10A
		Korea : AC 220~240V / 50/60Hz / 5A

Item		Specification
Acoustic Noise Level (Sound Power / Pressure)	Printing Simplex / Duplex	Less than 54 dBA (Sound Pressure)
	Copying	Less than 57 dBA (Sound Pressure) (@Tray1 DSDF copy)
	Standby	Less than 30 dBA (Sound Pressure, Background Noise Only)
	Sleep	Background Noise Level
Dimension (W x D x H)	Set (mm) (without any options)	• SL-M4560FX : 433 X 459.5 X 573.8 mm • SL-M4562FX : 531.2 X 459.5 X 625.3mm
Weight	Set (Kg) (with supplies / without any options)	• SL-M4560FX : 29.08 Kg • SL-M4562FX : 30.56 Kg
Reliability & Service	Recommended Monthly Print Volume (Max)	15,000 Images
	Max Monthly Duty Cycle	200,000 Images
Temperature	Operating	10 to 32 °C (50 to 90 °F)
	Storage	-20 to 40 °C (-4 to 104 °F)
Humidity	Operating	20 to 80% RH
	Storage	10 to 90% RH

2.2.2. Print Specifications

Item		Specification
Print Speed	Simplex	45 ppm in A4 (47 ppm in Letter)
	Duplex (Simplex to Duplex)	30 ipm in A4 (31 ipm in Letter)
FPOT	From Ready	As fast as 6.5 sec
	From Sleep	Less than 23 sec
	From Coldboot	Less than 36 sec
Resolution	Optical	Up to 1,200 x 600 dpi
	Enhanced	Up to 1,200 x 1,200 dpi effective output (1,200 x 600 x 2 bit)
Printer Languages		PCL5e / PCL6 / PostScript3 / PDF Direct V1.7
Font	PCL	111 Scalable Fonts (Include OCR-A / OCR-B) / 1 Bitmap
	Postscript3	136 Scalable Fonts
Client OS Support	Windows	XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit), 2008 Server R2 (64 bit), Windows 8 (32/64 bit), Windows 8.1 (32/64 bit), Windows Server 2012 (64 bit), Windows Server 2012 R2 (64 bit), Windows 10 (32/64 bit)
	Linux	• RedHat Enterprise Linux 5, 6 • Fedora 12, 13, 14, 15, 16, 17, 18, 19, 20 • OpenSuSE 11.2, 11.3, 11.4, 12.1, 12.2, 12.3, 13.1 • Ubuntu 10.04, 11.04, 11.10, 12.04, 12.10, 13.04, 13.10, 14.04 • SuSE Linux Enterprise Desktop 10, 11 • Debian 6, 7 • Mint 13, 14, 15, 16
	UNIX	• Sun Solaris 9,10,11 (x86, SPARC) • HP-UX 11.0, 11i v1, 11i v2, 11i v3 (PA-RISC, Itanium) • IBM AIX 5.1, 5.2, 5.3, 5.4, 6.1, .7.1 (PowerPC)
	Mac OS	Mac OS: X 10.6 - 10.11
Network Protocol		TCP/IPv4, IPv6, DHCP, BOOTP, AutoIP, DNS, DDNS, WINS, Standard TCP/IP, LPR/LPD, IPP, ThinPrint, Google Cloud Print, AirPrint, WSD print, FTP print, HTTP, SNMP (v1/2c/3), Telnet, SLP, Bonjour, UPnP (SSDP), WSD Discovery, SMTP, SNTP
Duplex Print		Built-in
Direct Print		Yes
Max. Print Area		• Ltr : 208 x 270 mm (8.18" x 10.6") • A4 : 201 x 289 mm (7.91" x 11.37")
Print Features		Direct Print / Secure Print

2.2.3. Scan specification

Item		Specification
Scan Speed	B/W (Lineart, Halftone)	• Duplex : up to 60 ipm (@ 300 dpi) • Simplex : up to 40 ipm (@ 300 dpi)
	Gray	• Duplex : up to 60 ipm (@ 300 dpi) • Simplex : up to 40 ipm (@ 300 dpi)
	Color	• Duplex : up to 60 ipm (@ 300 dpi) • Simplex : up to 40 ipm (@ 300 dpi)
Color Mode		Mono / Gray / Color
Compatibility		• Windows : TWAIN • Mac : TWAIN / ICDM • Linux : SANE
Scan method		Color CISM
Resolution	Optical (ADF)	Up to 600 x 600 dpi
	Optical (Platen)	Up to 600 x 600 dpi
	Enhanced (ADF)	Up to 4,800 x 4,800 dpi
	Enhanced (Platen)	Up to 4,800 x 4,800 dpi
File Formats		TIFF / JPEG / PDF / XPS PDF (Compact PDF / PDF/A / PDF Encryption / Searchable PDF / Digital signature PDF)
Scan Destinations		Email, FTP, SMB, USB, BOX, WSD, PC, I-Fax
Scan Multi Destinations		Yes
Communication Protocol		SMTP / MIME (Base 64)
Scan Size	ADF	Max. 216 mm x 356 mm (8.5" x 14")
	Platen	• M4560FX : Max. 216 mm x 297 mm (8.5" x 11.7") • M4562FX : Max. 216 mm x 356 mm (8.5" x 14")
Scan Original Types		Text / Text,Photo / Photo

2.2.4. Copy specification

Item		Specification
Copy Speed	SDMC (Single Document Multiple Copy)	45 cpm in A4 (47 cpm in Letter)
	MDMC (Multiple Document Multiple Copy)	40 cpm in A4 (41 cpm in Letter)
FCOT	From Ready	• Less than 6.5 sec @ Platen • Less than 7.5 sec @ DSDF
	From Sleep	• Less than 23.0 sec @ Platen • Less than 24.0 sec @ DSDF
	From Coldboot	• Less than 36.0 sec @ Platen • Less than 37.0 sec @ DSDF
Resolution	DSDF	• Scan: 600 x 600 dpi (Optical) • Printing : up to 600 x 600 x 4 bit
	Platen	• Scan: 600 x 600 dpi (Optical) • Printing : up to 600 x 600 x 4 bit
Reduce / Enlarge	DSDF	25 - 400 %
	Platen	25 - 400 %
Preset	Reduction	25% / 50% / 70% A4→A5 / 78% Legal→Letter / 81% B5→A5 / 86% A4→B5
	Enlargement	104% Executive→Letter / 141% A5→A4 / 150% / 200% / 400%
Darkness Control		11 Levels
Sharpness Control		11 Levels
Contrast Control		11 Levels
Multi Copy		1 - 9999
Duplex Copy		Built-in
Copy Original Type		Text / Text/Photo /Photo
Copy Features		N-Up / Booklet / Book Copy / Poster Copy / Image Repeat / Watermark / Stamp / Overlay / Erase Edge / Image Shift / Covers / Background Adjustment / Mirror Image / Negative Image / Build Job / Proof Copy / ID Copy / Save to Box / Copy to Edge

2.2.5. Fax specification

Item		Specification
Compatibility		ITU-T G3 / Super G3
Communication System		PSTN / PABX
Modem Speed		33.6 Kbps
TX Speed		3 Sec (Mono / Standard / ECM-MMR / MemoryTx / ITU-T G3 No.1 Chart)
Scan speed	Standard	5 Sec / LTR
	Fine	5 Sec / LTR
	S.Fine	6 Sec / LTR
Resolution (Mono)	Std	203 x 98 dpi
	Fine	203 x 196 dpi
	S.Fine	300 x 300 dpi
	Ultra Fine	600 x 600 dpi
Compression Method		MH / MR / MMR / JBIG
Fax Memory (Standard / Max.)		HDD Shared MB/Shared pages
Dual Lines		N/A
Fax Features	Handset	No
	On hook Dial	Yes
	Search	Yes (Address Book)
	1-Touch Dial	No
	Speed Dial	2000 locations
	TAD I/F	Yes
	Tone/Pulse	Yes
	Pause	Yes
	Auto Redial	Yes
	Last Number Redial	Yes
	Distinctive Ring	Yes
	Caller ID	Yes
	External Phone Interface	Yes
	Fax Forward to E-Mail	Yes
	Fax to PC	No
	Broadcasting	545 Locations
	Delayed Fax	Yes
	Color Fax	No

2.2.6. Paper Handling specification

Item		Specification
Input Capacity	Standard	550-sheet cassette Tray (20 lb or 75 g/m²) (520 Sheets @ 80 g/m²)
	Multipurpose	100-sheet MP tray (80 g/m²)
	Other Options	550-sheet cassette Tray (20 lb or 75 g/m²) (520 Sheets @ 80 g/m²)
	Maximum	2,300 Sheet Cassette Tray (550 Std + 100 MP + 3 x 550 SCF) (@ 75 g/m²) (2,180 @ 80 g/m²)
Standard Cassette Tray	Capacity	550 sheets @ 20 lb (75 g/m²) (520 Sheets @ 80 g/m²)
	Media sizes	A4 / Letter / Legal / Oficio / Folio / JIS B5 / ISO B5 / Executive / A5 / Statement / A6 / PostCard 4x6 / Envelope B5 / Envelope Monarch / Envelope No 10 / Envelope DL / Envelope C5 / Envelope C6 / Custom
	Media types	Plain Paper / Thin Paper / Bond / Punched / Pre-Printed / Recycled / Envelope / Label / CardStock / Letterhead / Thick / Color / Archive / Cotton
	Media weight	• Supported Weight : 60 - 163 g/m² (16 - 43 lb) • Thin Paper (60 - 69 g/m²) • Plain Paper (70 - 90 g/m²) • Thick Paper (91 - 105 g/m²) • Bond Paper (105 - 120 g/m²) • Cardstock (106 - 163 g/m²)
	Sensing	• H/W Install Detect: Yes • Paper Empty & Low Level Detect: Yes • Paper Type Detect: No • Paper Size Detect: Yes
MP(Multipurpose) Tray	Capacity	• Plain Paper: 100 sheets
	Media sizes	Min : 76.2 mm x 127 mm (3" x 5") Max : 216 mm x 356 mm (8.5" x 14.0")
	Media type	Plain / Thin / Bond / Pre-printed / Recycled / Envelope / Label / Cardstock / Thick / Cotton / Color / Archive / Thicker / Punched / Letterhead
	Media weight	• Supported Weight : 60 - 220 g/m² (16 ~ 59 lb) • Thin Paper (60 - 69 g/m²) • Plain Paper (70 - 90 g/m²) • Thick Paper (91 - 105 g/m²) • Bond Paper (105 - 120 g/m²) • Cardstock (106 - 163 g/m²) • Thicker Paper (164 - 220 g/m²)
	Sensing	• Paper Empty Detect: Yes • Paper Type Detect: No • Paper Size Detect: No

Item		Specification
DSDF (Dual Scan Document Feeder)	Capacity	50 sheets (21lb, 80 g/m²)
	Duplex Document Scanning	Yes
	Document Size	• Width: 105 ~ 216 mm (4.1" ~ 8.5") • Length : 148 ~ 356 mm (5.8" ~ 14")
	Sensing	• Paper empty detect : Yes • Paper width detect : No • Paper length detect : No
Output Capacity	Stacking Capacity (Face Down)	500 sheets @ 20 lb (75 g/m²)
	Output Full sensing	Yes
Printing size	Max. Size	216 x 356 mm (8.5" x 14")
	Min. Size	76 x 127 mm (3" x 5")
	Margin(T/B/L/R)	T/B/L/R : 1 mm
Duplex Printing	Support	Built-in
	Media sizes	A4, Letter, Legal, Oficio, Folio
	Media types	Plain, Thin, Thick, Recycled, Pre-Printed, Punched, Letterhead, Bond
	Media weight	16~32 lb (60 ~ 120 g/m²)

2.2.7. Software and solution specification

Item		Specification
Application	Anyweb Print	Windows
	Easy Printer Manager	Windows / Mac
	Easy Color Manager	N/A
	Easy Document Creator	Windows
	Net PC Fax	Windows
	Direct Printing Utility	Windows
	Easy Deployment Manager	Windows
	Easy Eco Driver	Windows
	Universal Printer Driver	Windows
	Universal Scan Driver	Windows
Mobile Printing	GCP (Google Cloud Print)	Yes
	AirPrint	No
Solution	Fleet Management	Fleet Admin Pro, CounThru
	Output Management	Printing Security Pro
	Document Management	SmarThru Workflow 3
	Cloud	SCP
Security	Authentication (Local)	Yes
	Authentication (Network)	Yes (Kerberos / SMB / LDAP)
	IP Address Filtering	IPv4 Filtering / IPv6 Filtering / MAC Filtering
	HDD Overwrite (Standard)	AIO(Automatic Image Overwrite), MIO (Manual Image Overwrite), SIO (Scheduled Image Overwrite)
	HDD Overwrite (Max. Overwrites)	9
	Secure Print	Yes
	Encrypted Secure Print	Yes
	Encrypted PDF Mode (Encrypted Scanning)	Yes
	IP Sec	Yes
	Smart Card Authentication	N/A
	Others	Watermark

2.2.8. Supplies

Items		Model Name	Life	Remark
Toner Cartridge	Initial	-	7,000 pages	
	Extra High Yield	MLT-D303E	40,000 pages	
Imaging Unit		MLT-R303	100,000 pages	

NOTE

Toner Cartridge yield : Declared yield value in accordance with ISO/IEC 19752. The number of pages may be affected by operating environment, printing interval, graphics, media type and media size.

Imaging Unit yield : Based on simplex 3 average letter/A4-size pages per print job and 5% coverage. Actual Yield may vary based on other factors such as device speed, media type, media size, toner coverage, tray source, average print job complexity, ratio of simplex / duplex printing and operating environment.

2.2.9. Maintenance Parts

Items	Part Code	Life	Remark
Fuser Unit	JC91-01177A (220V) JC91-01176A (110V)	150,000 pages	
Transfer Roller Assy	JC93-00393A	200,000 pages	
Tray 1 Roller (Pick up/Forward)	JC97-02259A	200,000 pages	
Tray 1 Reverse roller	JC97-02259A	100,000 pages	
Pick up/ Forward roller (for Tray2~4)	JC97-02259A	200,000 pages	
Reverse roller (for Tray2~4)	JC97-02259A	100,000 pages	
MP Roller	JC73-00295A	100,000 pages	
MP Reverse roller	JC73-00328A	100,000 pages	
DSDF pick up roller (DSDF-SUB PICK UP)	JC97-04801A	100,000 page	For SL-M4560FX
DSDF separation roller (DSDF-SEPARATION)	JC97-04813A	100,000 page	For SL-M4560FX
DSDF pick up roller (A/S ASSY-PICK UP HOUSING)	JC82-00378A	100,000 pages	For SL-M4562FX
DSDF separation roller (A/S ASSY-SEPARATE ROLLER)	JC82-00380A	100,000 pages	For SL-M4562FX

NOTE

Depending on the print patterns and job mode used, the lifespan may differ.

2.2.10. Option

Option List

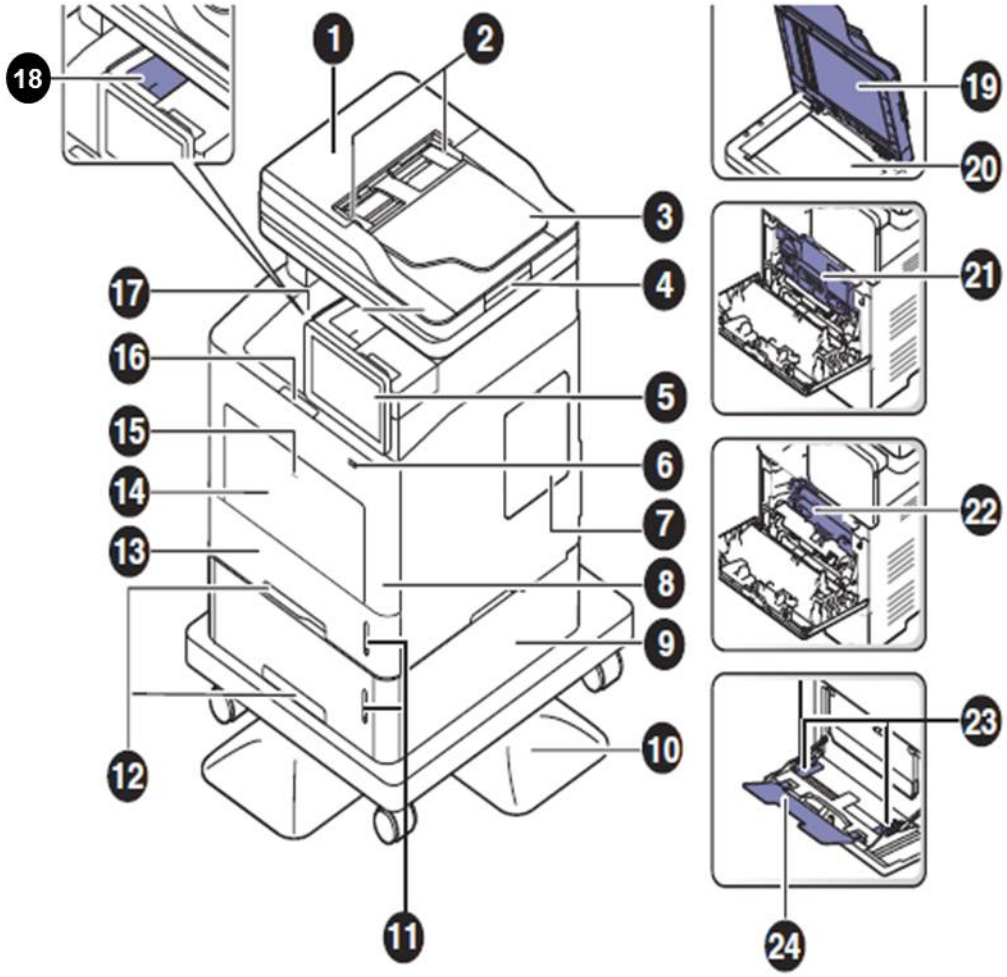
Item	Model	Remark
Second Cassette Feeder	SL-SCF4500	550 Sheets (@75gsm)
Stand	SL-DSK003S	-
Wireless LAN	SL-NWE001X	Wireless + NFC

Option Specification

Model	Item	Specification
Second Cassette Tray(Feeder)	Model Name	SL-SCF4500
	Capacity	550 Sheets (@75gsm) (520sh @80gsm)
	Media Sizes	A4 / Letter / Legal / Oficio / Folio / JIS B5 / ISO B5 / Executive / A5 / Statement / Custom
	Media types	Plain / Thin / Recycled / Thick / Archive / Bond / Cardstock
	Media weight	• Supported Weight: 60 - 163 g/m² (16 - 43 lb) • Thin Paper (60 - 70 g/m²) • Plain Paper (70 - 90 g/m²) • Thick Paper (91 - 105 g/m²) • Bond Paper (105 - 120 g/m²) • Cardstock: (106 - 163 g/m²)
	Sensing	• H/W Install Detect : Yes • Paper Empty : Yes • Paper Type Detect : No • Paper Size Detect : No
	Dimension (W x D x H)	433 x 459.3 x 145.8 mm
	Weight	9.8 kg (21.6 lb)
Stand	Model Name	SL-DSK003S
	Dimension (W x D x H)	480 x 553 x 120 mm
	Weight	13.3 kg (29.3 lb)
Wireless LAN	Model Name	SL-NWE001X (Wireless + NFC)

2.3. System Configuration

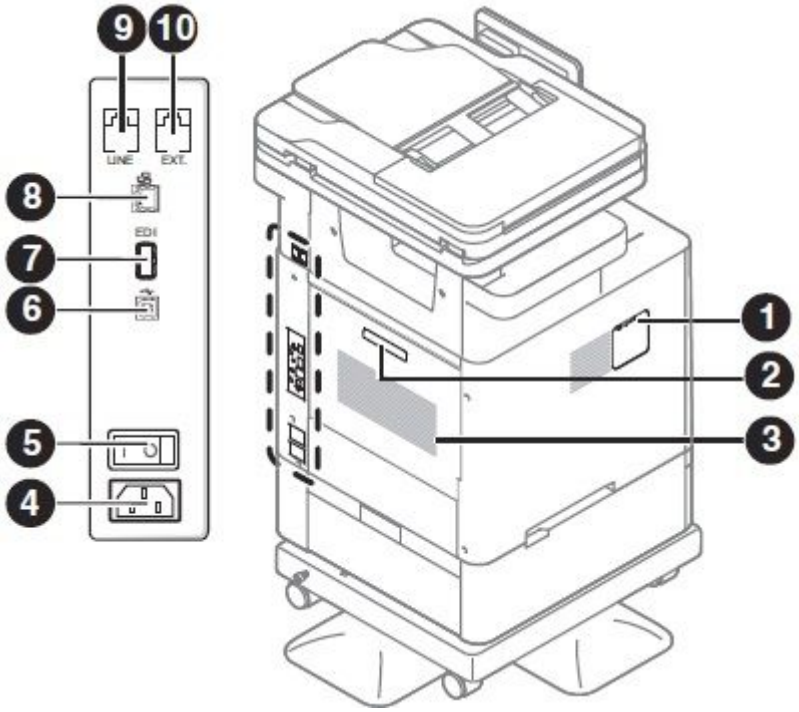
1) Front View



1	Dual Scan Document Feeder (DSDF) cover
2	Dual Scan Document Feeder (DSDF) width guide
3	Dual Scan Document Feeder (DSDF) input tray
4	Dual Scan Document Feeder (DSDF) output tray
5	Control panel
6	USB memory port
7	Control board cover
8	Front cover
9	Optional tray
10	Stand
11	Paper level indicator
12	Tray handle
13	Tray 1

14	Multi-purpose tray
15	Push-release of multi-purpose tray
16	Front cover release button
17	Output tray
18	Output support tray
19	Dual Scan Document Feeder (DSDF)
20	Scanner glass
21	Toner cartridge
22	Imaging unit
23	Paper width guides on a multi-purpose tray
24	Multi-purpose support tray

2) Rear View

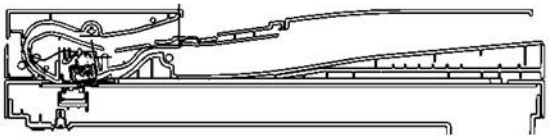


1	Wireless/NFC kit port cover
2	Rear cover handle
3	Rear cover
4	Power receptacle
5	Power-switch
6	USB port

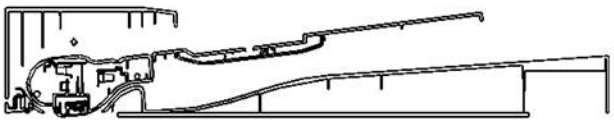
7	EDI port for card reader
8	Network port
9	Telephone line socket (LINE)
10	Extension telephone socket (

3) System Layout

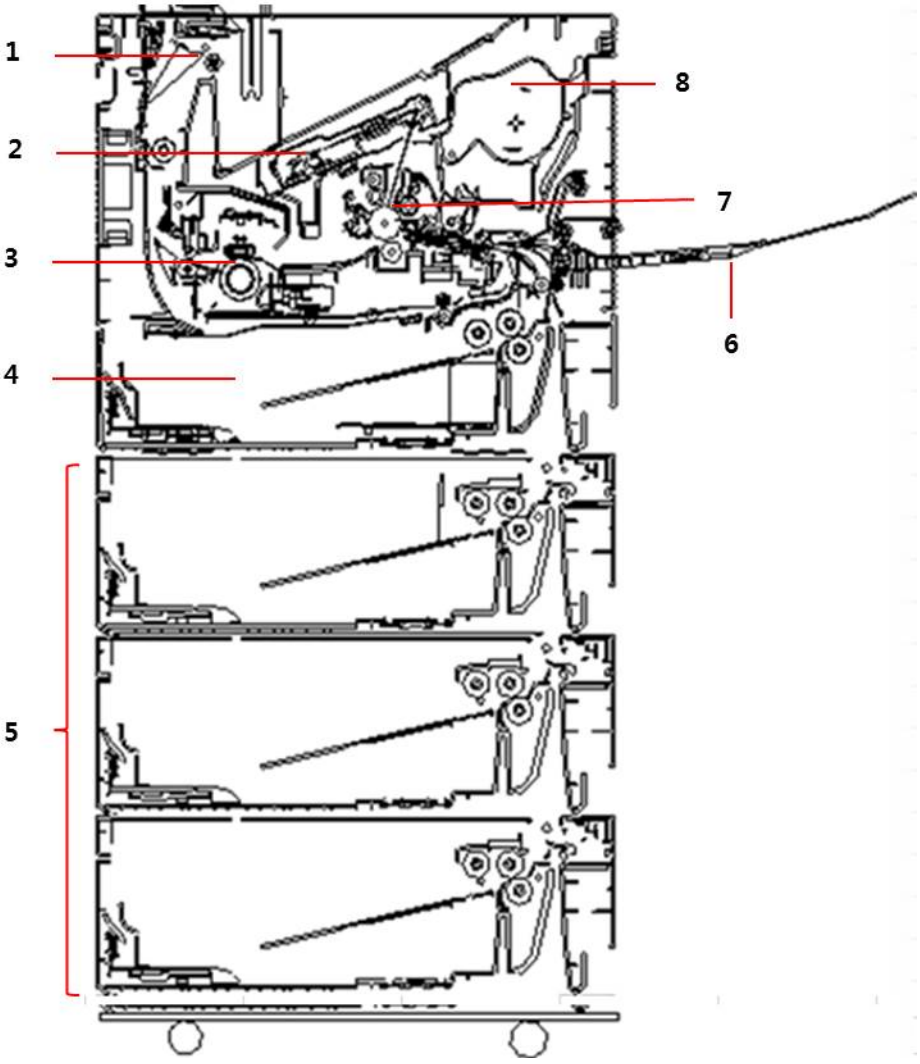
[A4 DSDF : M4560]



[Legal DSDF : M4562]



[Engine]

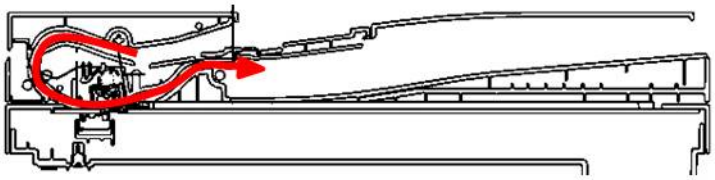


1	Exit
2	LSU
3	Fuser Unit
4	Tray1
5	Optional Tray

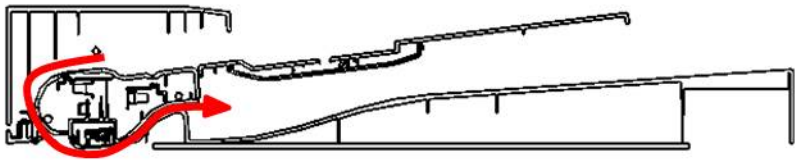
6	MP tray
7	Imaging Unit
8	Toner Cartridge

Paper Path

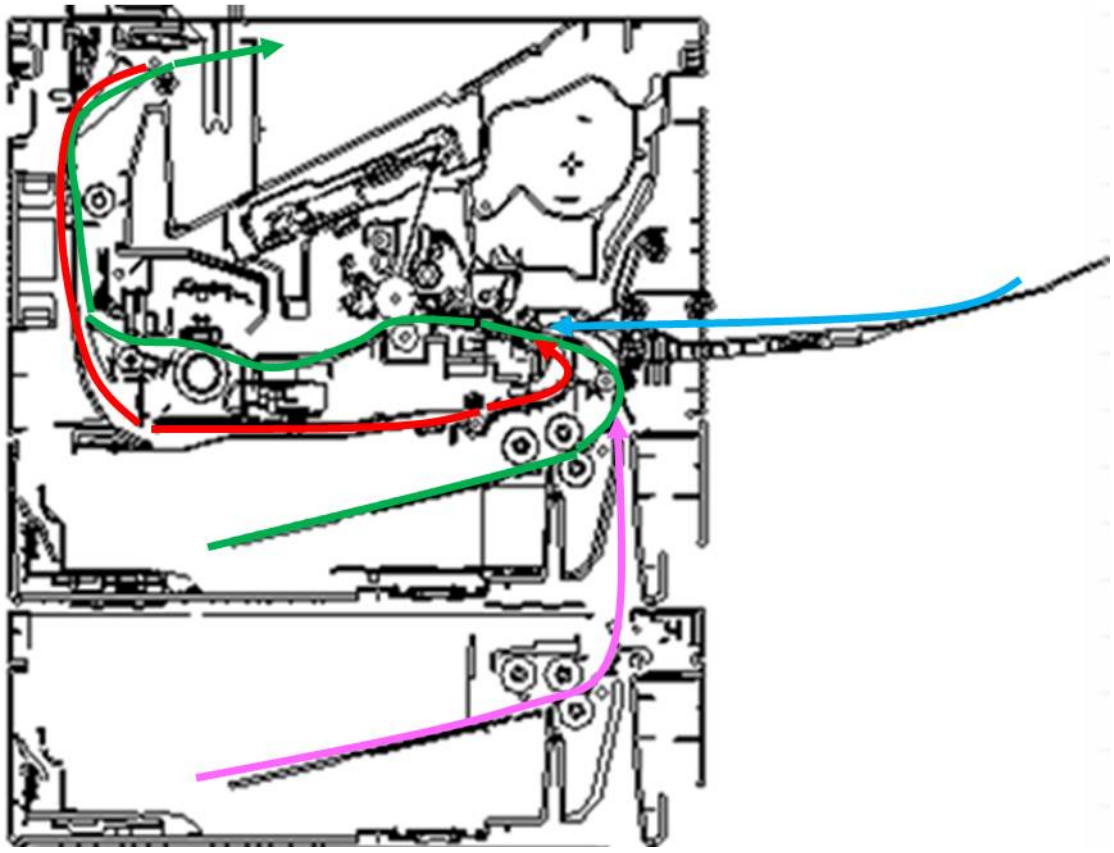
[A4 DSDF : M4560]



[Legal DSDF : M4562]



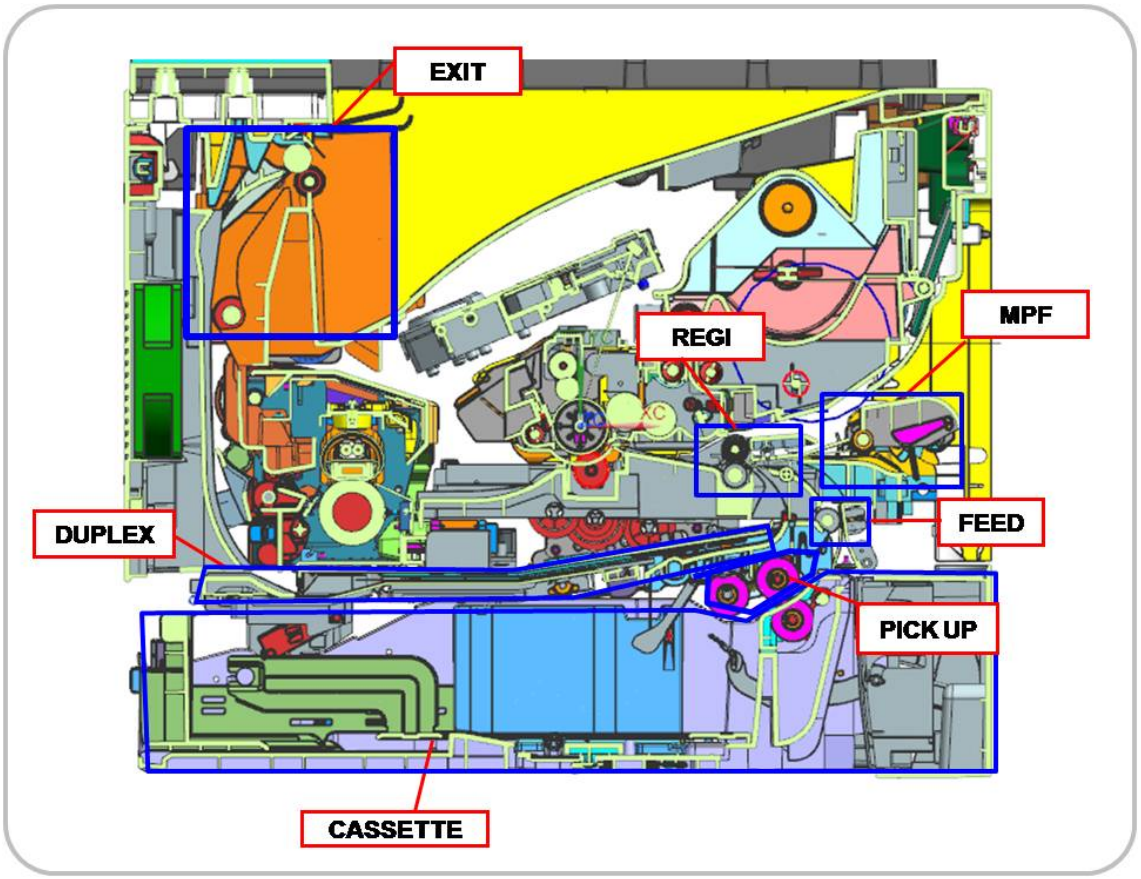
[Engine]



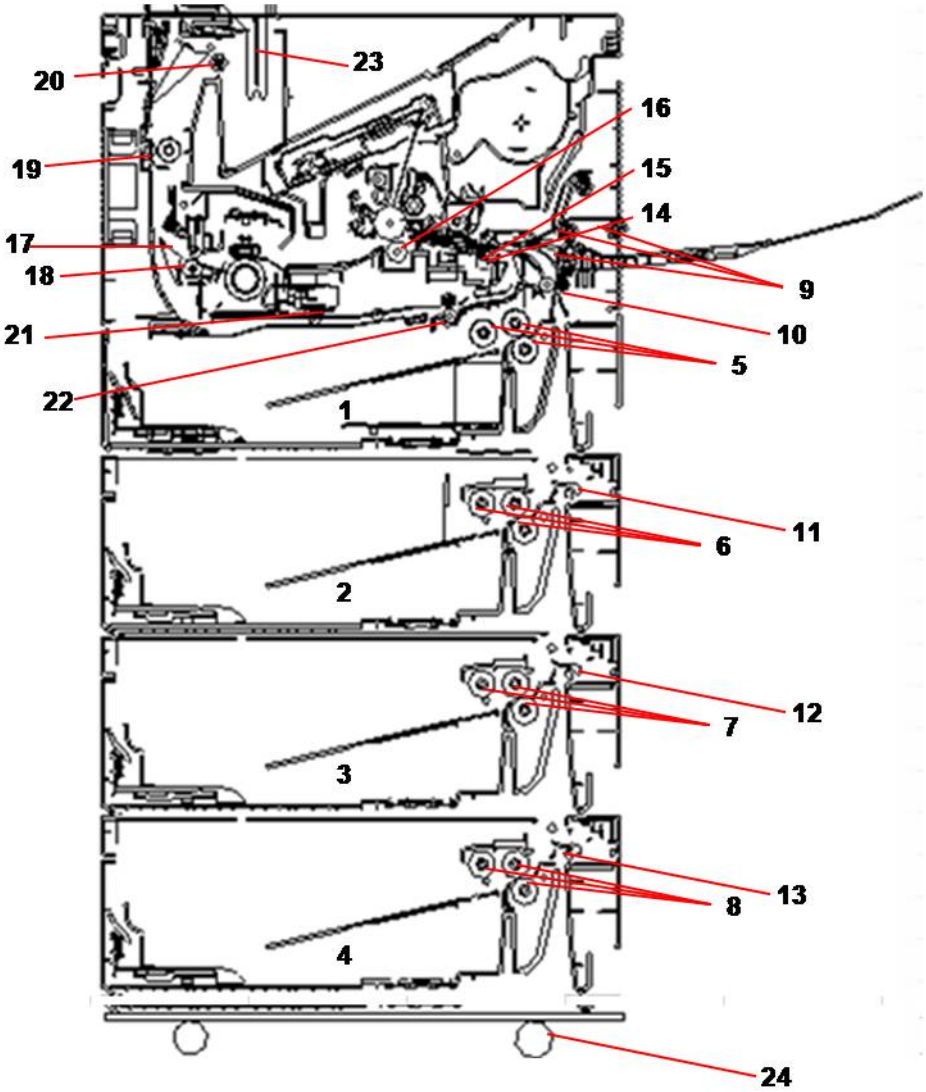
2.4. Feeding System

2.4.1. Feeding System Overview

The feeding system picks up a paper from the cassette or MP tray and transports it to the machine inside. It mainly consists of the cassette, pick up roller, feed roller, registration roller, transfer roller unit, exit unit, and drive unit.



[Feeding System Component]



No.	Description
1	Tray 1 Paper tray
2	Tray 2 Paper tray
3	Tray 3 Paper tray
4	Tray 4 Paper tray
5	Tray 1 pick up / reverse / forward rollers
6	Tray 2 pick up / reverse / forward rollers
7	Tray 3 pick up / reverse / forward rollers
8	Tray 4 pick up / reverse / forward rollers
9	MP Tray pick up / reverse / forward rollers
10	Tray 1 feed roller
11	Tray 2 feed roller
12	Tray 3 feed roller
13	Tray 4 feed roller

No.	Description
14	Registration sensor
15	Registration roller
16	Transfer roller
17	Exit sensor
18	Exit roller 1
19	Exit roller 2
20	Exit roller 3
21	Duplex drive roller
22	Duplex sensor
23	Main bin full sensor
24	Stand

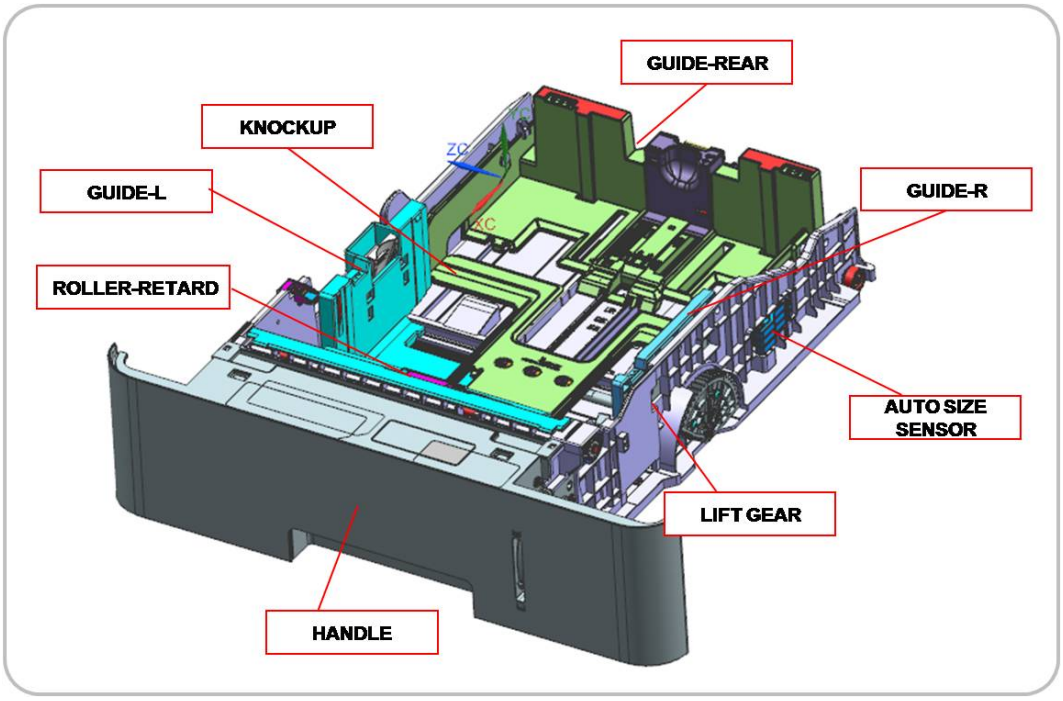
- **Pick-Up roller (Tray 1,2,3,4 and MP Tray)**
  - This roller picks up the paper from the tray.
- **Forward roller (Tray 1,2,3,4 and MP Tray)**
  - This roller is placed against the reverse roller. It transports the paper from the pick up roller to feed roller.
- **Reverse roller (Tray 1,2,3,4 and MP Tray)**
  - This roller is placed against the forward roller and transports only one sheet to the feed roller. When two sheets of paper or more are transported from the pick up roller, the load of the torque limiter of the reverse roller is heavier than the frictional force between the sheets. As a result, the reverse roller is stopped and the lower paper does not advance any further.
- **Feed roller**
  - This roller transports the paper sent from the forward/reverse roller to the registration roller.
- **Registration roller**
  - This roller aligns the leading edge of the paper and transports the paper to the transfer roller Assy.

2.4.2. Cassette

The cassette stores papers.

Paper size is set using the paper guide in tray.

Basic Cassette (Tray1)

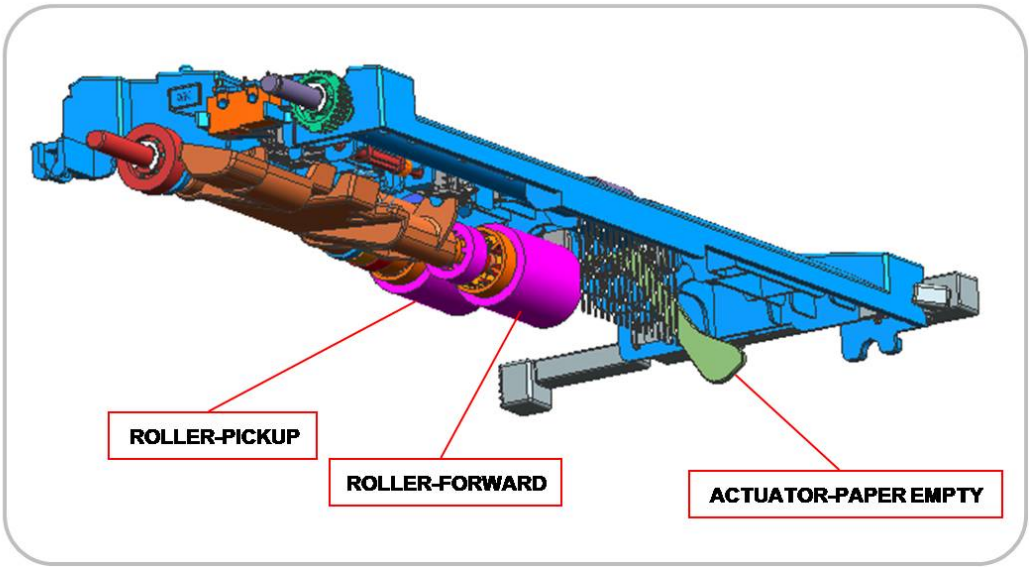


- **Specification**

  1) Structure : Drawer Type
  2) Paper separation : Reverse roller type
  3) Capacity : 550 Sheets (75 g/m² paper standard)
  4) Paper
     - Plain paper : A6, Statement, A5, Executive, B5, A4, Letter, Folio, Officio, Legal
     - Auto detect: A5, Executive, B5, A4, Letter, Folio, Legal (7 Types)
     - Special Paper : Envelop, Label, Cardstock
  5) Weight : plain paper 60 ~ 163 g/m²
  6) Plate knock up lift type : Lift Motor + Up Limit Sensor

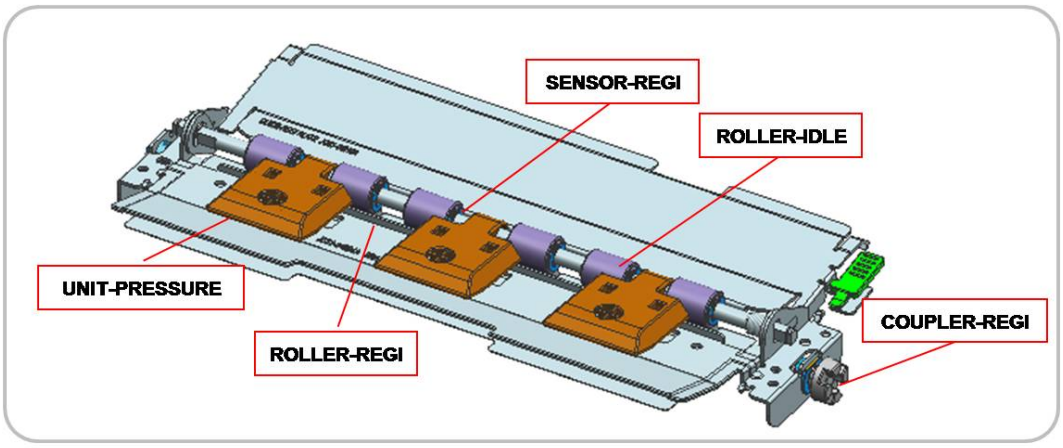
2.4.3. Pick-Up Unit

When pickup takes place, the pickup roller transports the paper. The KNOCK-UP moves up by the elevating motor and the pick up roller comes into contact with the paper. The forward roller and the reverse roller serve to make sure that a single sheet of paper is moved to the paper path, and the paper is moved as far as the registration roller by the work of the vertical path roller.



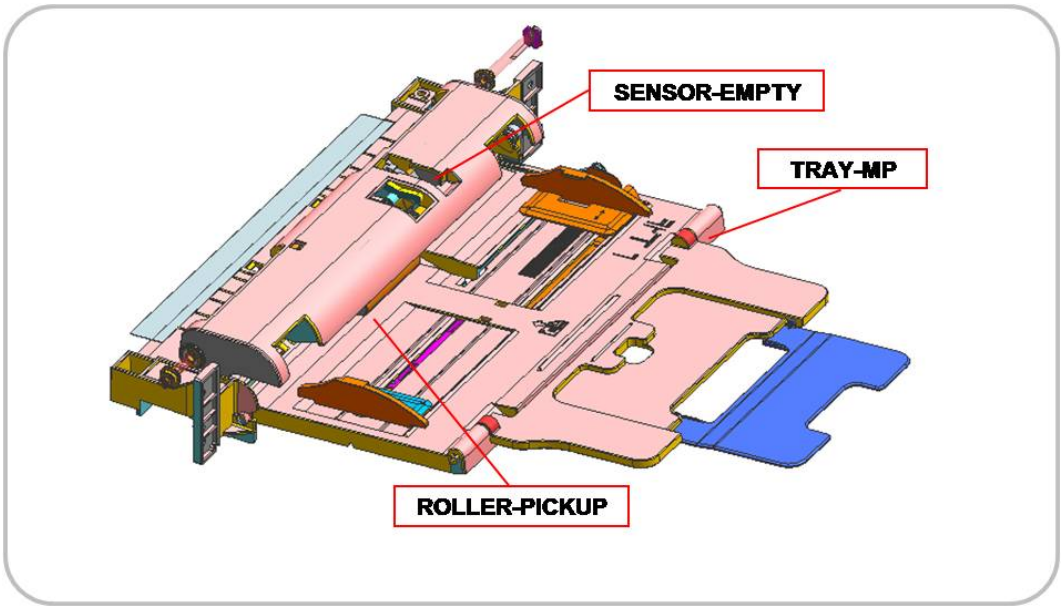
2.4.4. Registration Unit

The registration (Regi.) roller is driven by the Main Drive Motor. The registration clutch is located between the registration roller and the main motor, and controls the leadedge paper timing with that of the leadedge toned image on the OPC Drum.



2.4.5. MPF(Multi-Purpose Feeder) Unit

The MPF Unit allows feeding of specialty media stock, envelopes, and custom size paper.



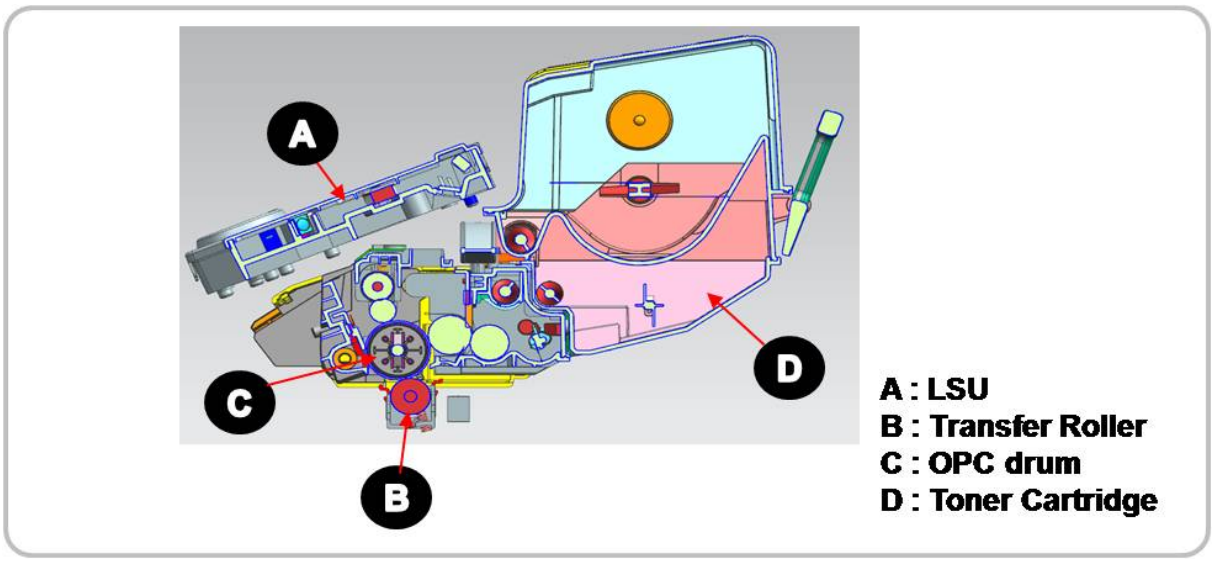
■ Specification

1) Tray capacity : 100 sheets (75g/m² standard paper)
2) Media Size : Max 8.5”×14” (215.9×355.67) / Min 3”×5” (76.2x127)
3) Media weight : Plain paper 60 ~ 220g/m²

2.5. Image Creation

2.5.1. Printing process overview

This machine uses a toner cartridge, a imaging unit, transfer roller, and two laser beams in the LSU for mono printing.



The imaging unit consists of a drum unit and developer unit. The drum unit consists of an OPC drum, charge roller, cleaning roller, and cleaning blade. The developer unit consists of the dev. roller, supply roller, Dr.blade, and agitator.

The OPC drum is charged with a negative voltage by the charge roller and is exposed by the light from the LSU (Laser Scanning unit).

The light produced by a laser creates a latent image by discharging on the surface of the OPC drum. The negatively charged toners are attracted to the latent image due to the electric field. The toner(real image) on the OPC drum are moved to the paper by the positive bias applied to the transfer roller.

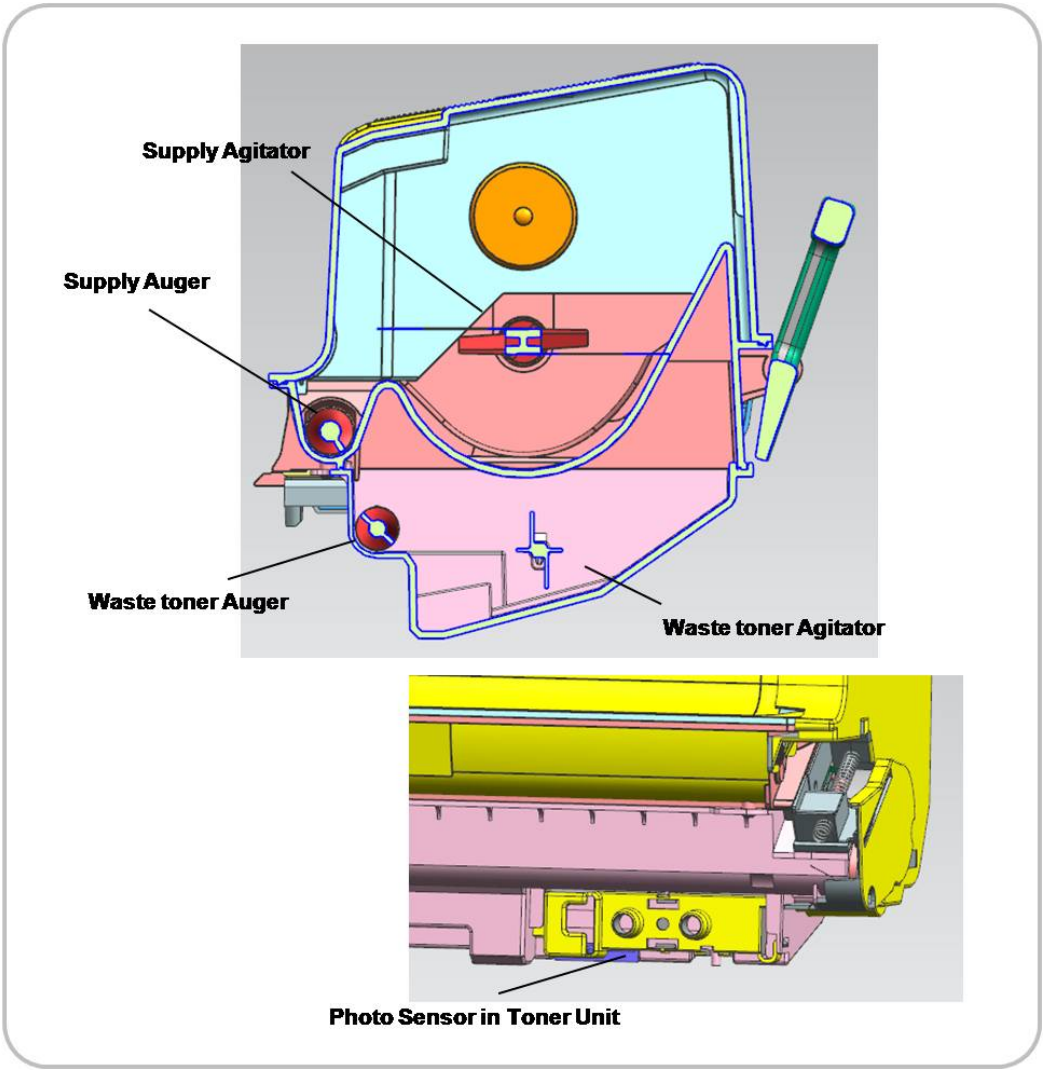
1) **OPC drum charge** : The charge roller gives the OPC drum a negative charge.
2) **Laser exposure** : Light produced by a laser diode(LD) hits the charged OPC drum through the lens and mirrors. The machine controls the laser beam on/off for the latent image.
3) **Development** : The developing roller carries the negatively charged toner to the latent image on the OPC drum surface.
4) **Transfer :** The negatively charged toner is transferred to the paper by transfer voltage.
5) **Cleaning for OPC drum** : The cleaning brush and blade remove remaining toner on the OPC drum surface after image transfer to the paper.
6) **Quenching for OPC drum** : Quenching is done by illuminating the whole area of the OPC drum with the laser at the end of every job.

2.5.2. Toner Cartridge

The toner cartridge supplies toner.

The photo sensor in the toner cartridge detects the toner level. If it is defective, a serious image defect can happen.

The CRUM chip stores the toner cartridge information.



2.5.3. Imaging Unit

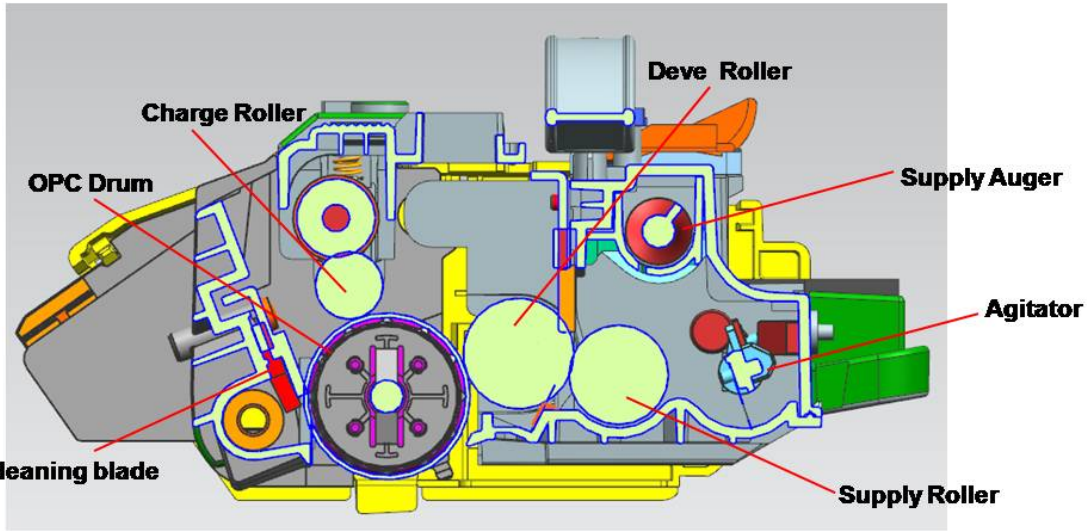
The imaging unit is an integrated type. The Imaging Unit consists of the drum, developer, and Drum Cleaning Sections. Each section is constructed together at the time of production and is not designed to be disassembled. Therefore the Imaging Unit must be ordered as an assembled part. Since it is a "Sales Option", please order though our sales channel.

The OPC drum diameter is 30 mm (circumference: about 94.2 mm).

The deve roller must keep the regular Nip to prevent the image defect. The Nip Ring is used for this.

After the image is moved to transfer roller, the remaining toner on the OPC drum is removed by the cleaning blade.

The imaging unit has a CRUM that stores the series number and maintenance count information.

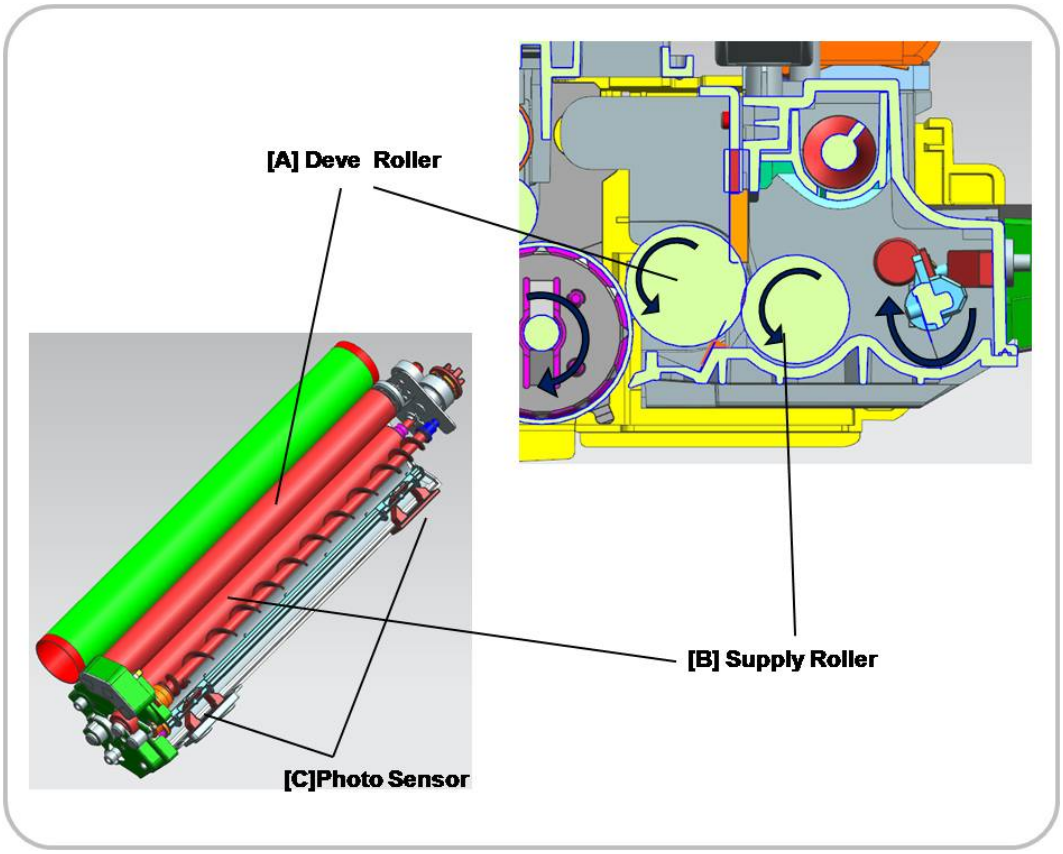


2.5.3.1. Development

This machine uses a one-component development system and has a imaging unit (which is included in the drum unit).

The new unit contains 20g of toner that is supplied to the supply roller by the agitator. And then the toner is supplied to the deve roller by the supply roller. After the toner exits from the Dr.blade, it forms a developer brush. Then toner is attracted to the surface of the OPC Drum only in areas the corresponds to the image area. The diameter of the deve roller is 20 mm.

The upper auger function to supply the toner to the both sides regularly.

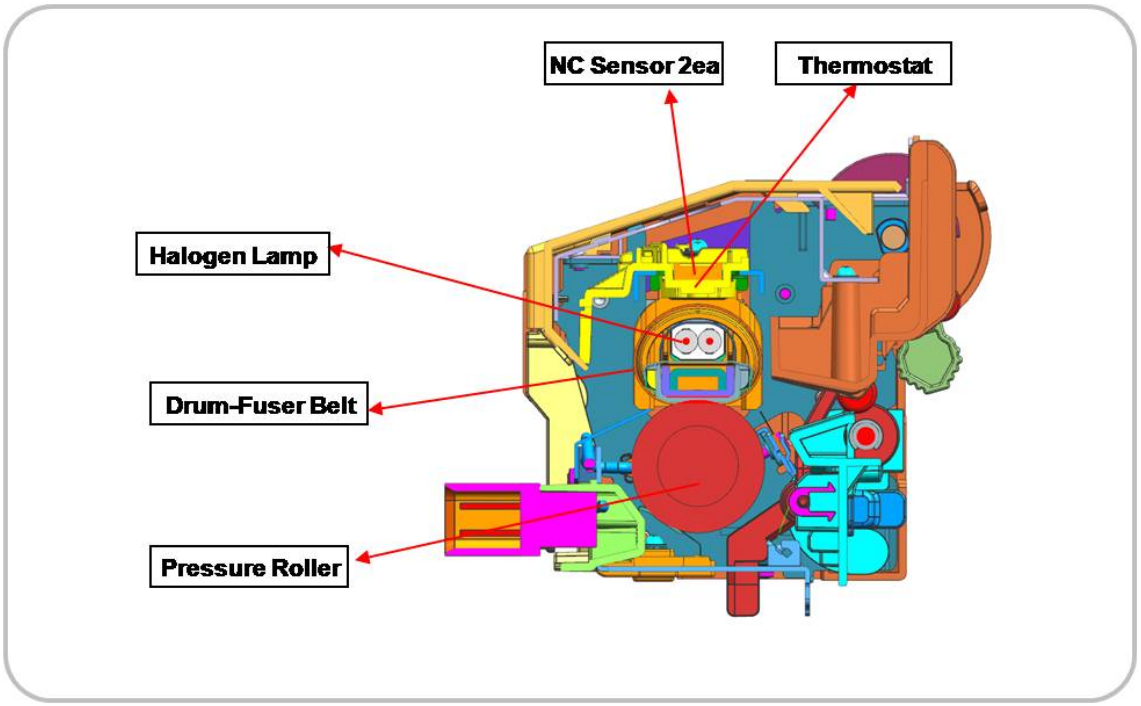


2.6. Fuser unit

This section describes the fuser unit structure and the image fusing process.

2.6.1. Fuser unit overview

This model uses two Heater Lamps which provides for a much faster warm-up time than that of a conventional fusing system, therefore it fits in the category of an instant fusing system.



1) **Drum-fuser belt**

   The drum-fuser belt is made of 3 thin layers that can be heated by the halogen lamp inside more quickly. The drum-fuser belt contains 2 fusing lamps. One lamp, center heating lamp, heats the center and the other lamp, side heating lamp, heats the ends in the axial direction.

2) **Pressure Roller**

   The pressure roller is made of soft silicone rubber, which flatten slightly creates the fusing nip.

3) **NC sensor**

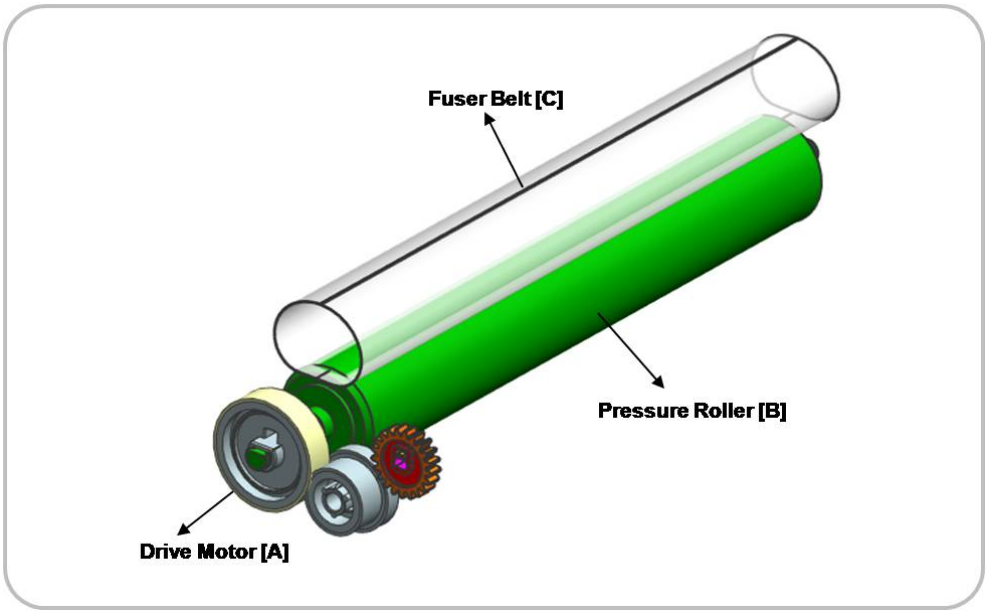
   NC sensors (non-contact type thermistors) are located in the front area and the side area of the drum-fuser belt and controls the temperature. They protects the fusing system from overheating.

4) **Thermostat**

   Thermostats cut off the power supply to the halogen lamp by opening the circuit when the fuser belt becomes abnormally hot as a result of problems such as NC sensor malfunction. These thermostats are used to prevent abnormal operation.

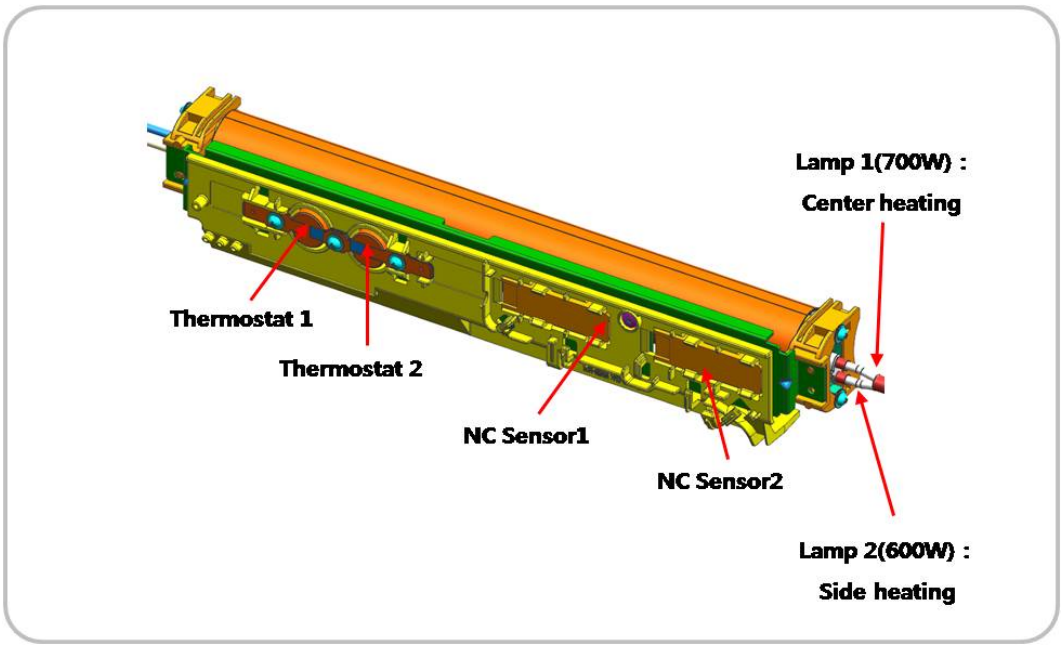
2.6.2. Fuser unit drive

The Drive Motor [A] drives the Pressure roller [B] through the gear train. The fuser belt [C] is driven by contact with the pressure roller.



2.6.3. Fuser unit temperature control

When the main switch turns on, the CPU turns on the fusing lamp. The lamp stays on until the NC sensors detect the standby temperature. Then the CPU raises the temperature up to the printing temperature.



■ Overheat Protection

The CPU cuts power to the fusing lamp in the following cases :

- The Fuser Belt temperature is detected by the NC sensor, and if it detects an overheat condition it will shut down power to the Fuser.
- The heating temperature is detected by a thermistor and if resistance is so low that the Main Board detects an overheat condition; it will disable the Control Circuit for the Fuser on the Main Board.

The following components are used when thermistor overheat protection fails :

- Two thermostats for the fuser belt are on the neutral side of the AC line of the fusing lamp.
- If either one of the thermostats detect temperatures that become higher than 190°C, it opens and cuts power to both fusing lamp.

2.7. Laser Scanning Unit (LSU)

2.7.1. Laser Scanning Unit Overview

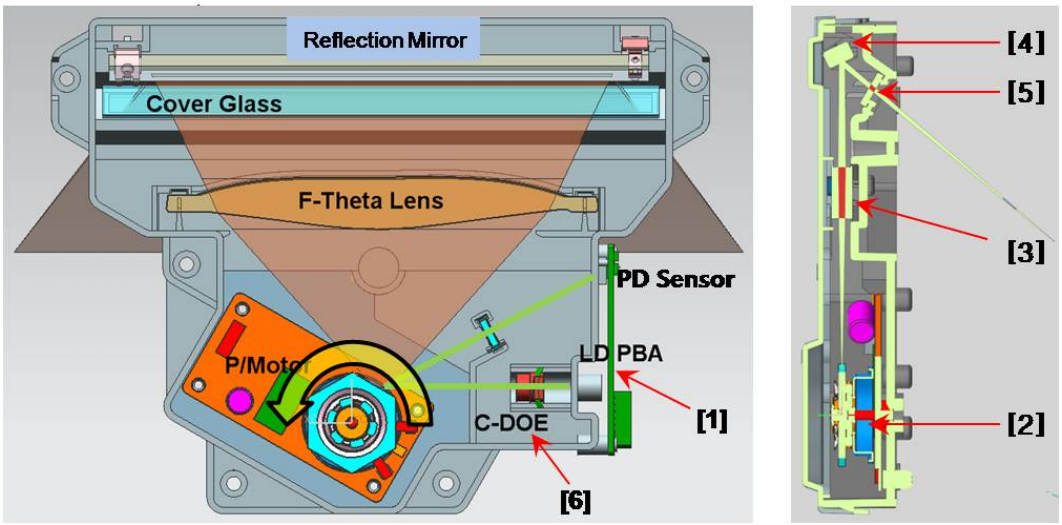
The Laser Scanning Unit (LSU) consists of one polygon motor and one LD (Laser Diode), and forms a latent image on the surface of OPC drum. For this process, there is a C-DOE lens, F-Theta Lens, reflective mirror (that changes laser beam path), the cover glass for protecting the LSU from contamination. Also, LD PBA is located to the front for interface.

The PD sensor located in LD PBA detects the scanning start line and generates the horizontal sync signal (Hsync).

The picture below shows the main components for LSU.

NOTE

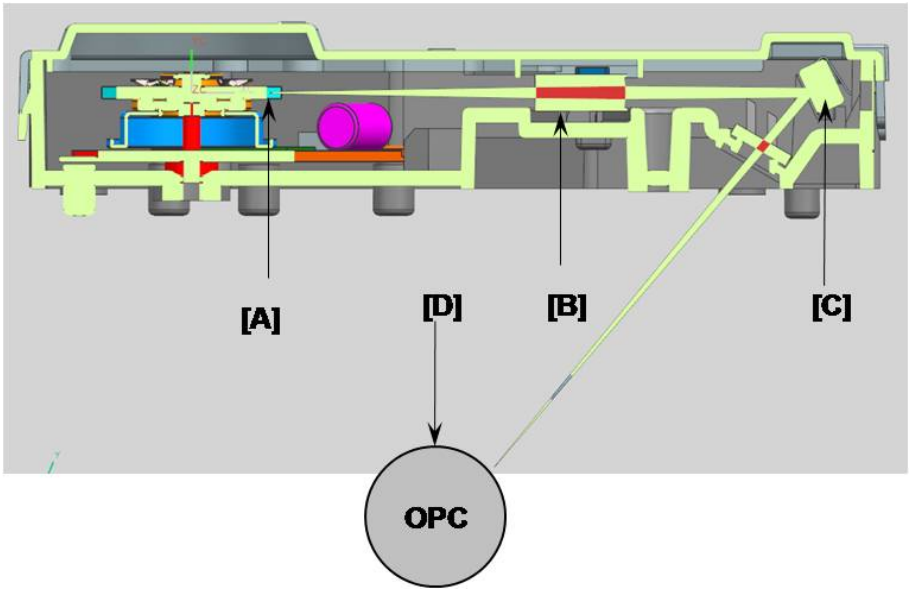
The LSU is the optical precision device. Please handle it carefully and do not remove the cover.



1	LD PBA
2	P/Mirror Motor
3	F- Lens
4	Reflect Mirror
5	Cover glass
6	C-DOE Lens

- **Information**
  - Part Code : JC97-03877A [LSU]

2.7.2. Laser Scanning Optical path



The laser beam is reflected from the mirror [A] and passes through F-theta lens. And then its direction is changed by the reflection mirror [C]. It is transferred to OPC.

The polygon motor speed is controlled by the main CPU.

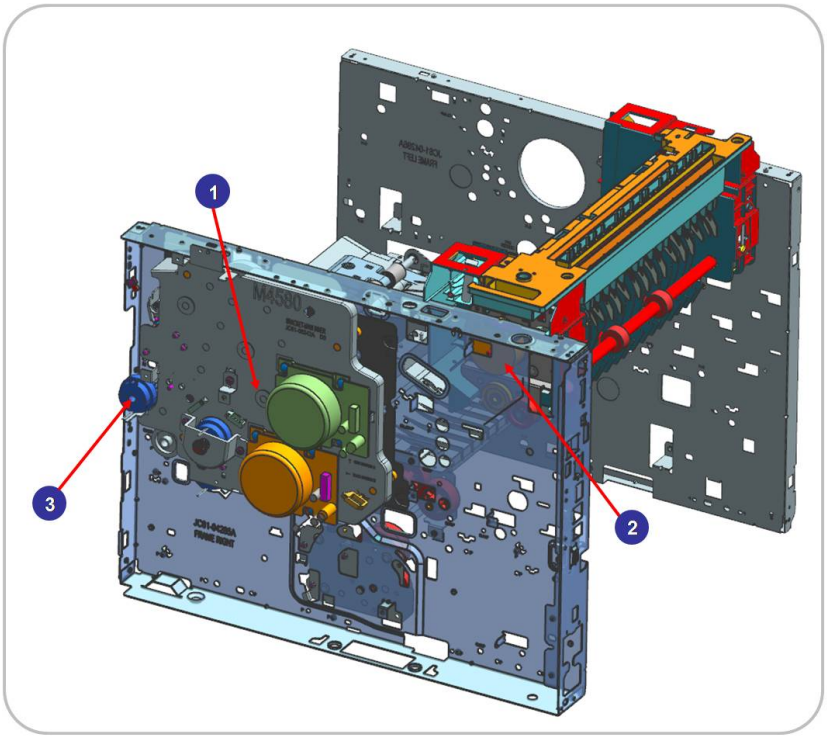
The LD unit generating the laser beam has the dual beam laser diode with 780nm wavelength. It is controlled by the LD drive IC.

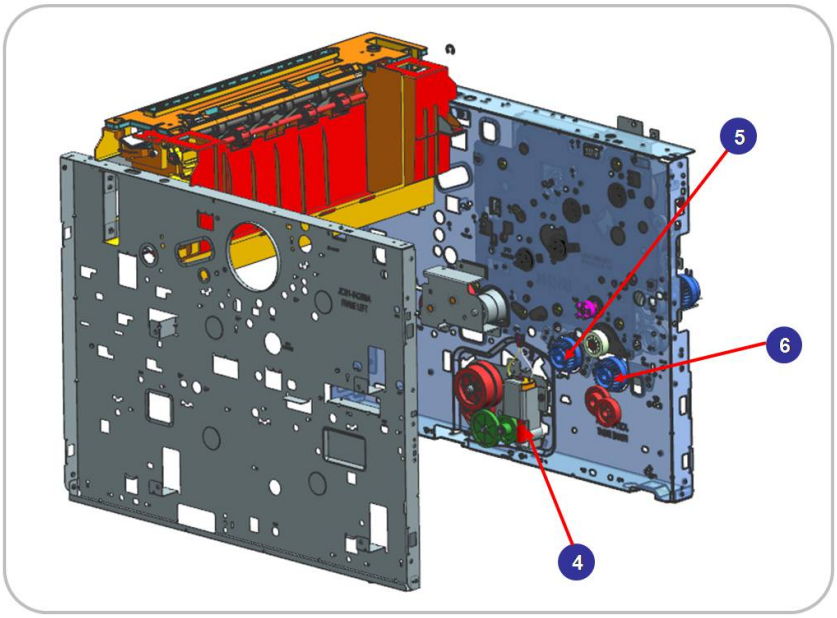
Item	Specification
LD Unit	• Laser Diode : Dual Beam • Driving IC for Dual LD
P/Motor speed	32,055 rpm
Process Speed	271.40 mm/sec
H/W interface	• LD Harness : 14 Pin FFC • P/Motor Harness : 5 Pin FFC

2.8. Drive System

2.8.1. Drive Motors

The following diagram displays the locations of the printer drive motors.

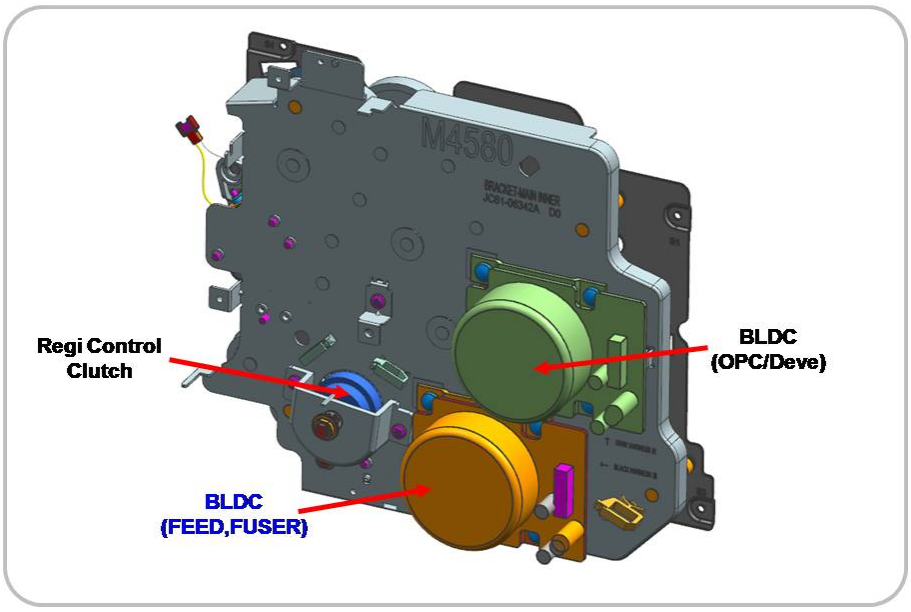




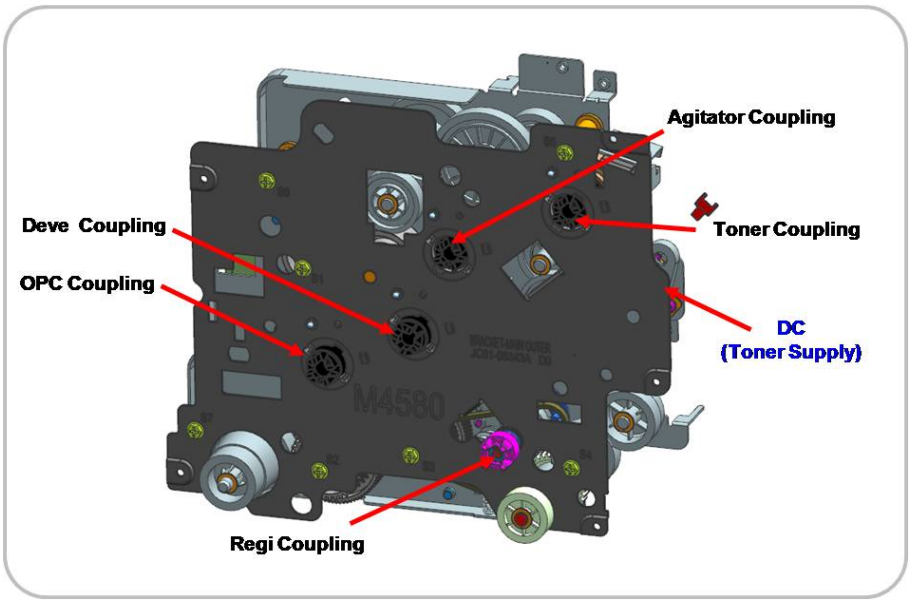
No.	Motor	Motor type	Qty	Function
1	DRIVE MAIN	BLDC motor	1	OPC, Deve driving
		BLDC motor	1	Feed and Fuser driving
		DC motor	1	Toner supply
		E-clutch	1	Regi. shaft driving
2	DRIVE EXIT	PM-STEP	1	Exit roller driving
		E-clutch	1	Fuser pressure control
3	MP	E-clutch	1	MP pick-up shaft driving
4	DRIVE FEED	DC motor	1	Cassette elevating driving
5	DUPLEX	E-clutch	1	Duplex driving
6	PICK UP	E-clutch	1	PICK-UP

2.8.2. Main Drive Unit

Front View

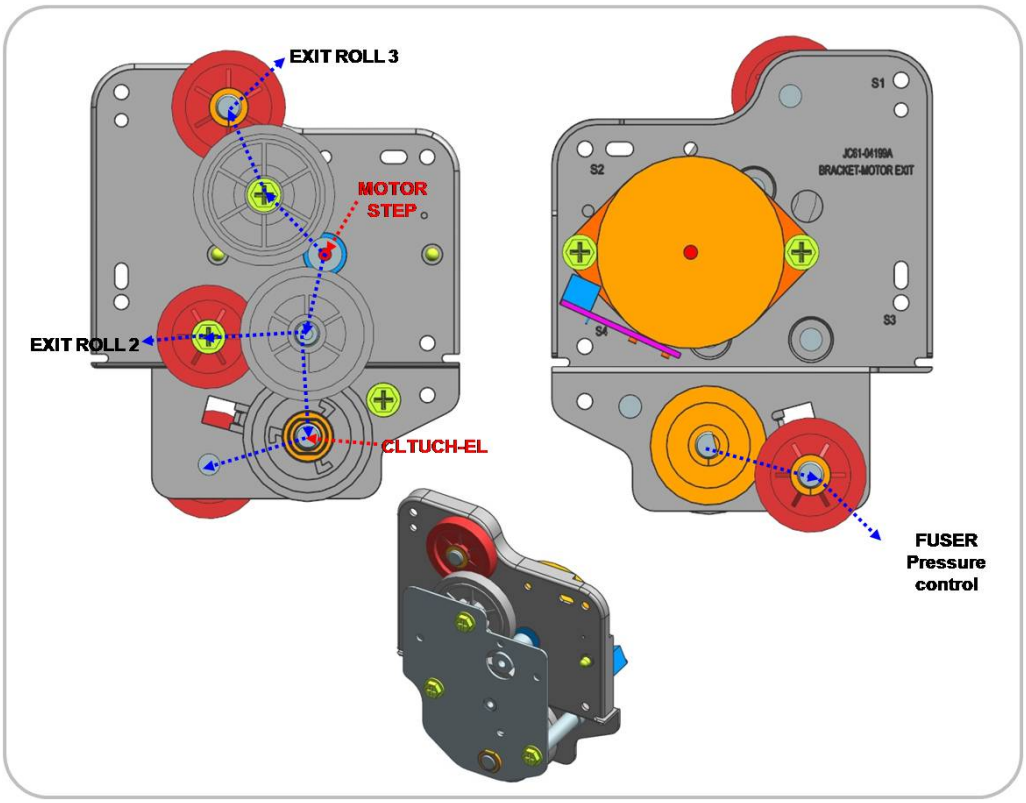


Rear View



- **Information**
  - Part Code : JC93-00923A [DRIVE MAIN]

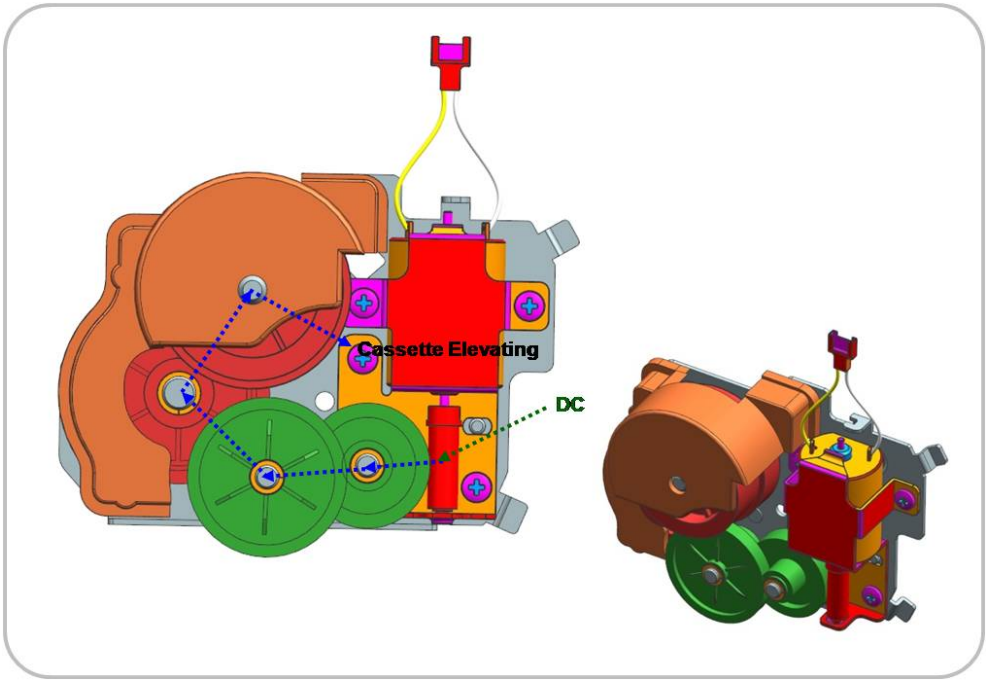
2.8.3. Exit Drive Unit



- **Information**
  - Part Code : JC93-00349B [DRIVE EXIT]

Power Train	• Simplex/Duplex : Driving by STEP motor • Tray 1 : E-clutch
• Step motor → Gear → Gear → Exit Roller 3 driving • Step motor → Gear → Gear → Exit Roller 2 driving • Step motor → Gear → E-Clutch → Gear → Gear → Fuser pressure driving	

2.8.4. Tray Lifting Drive Unit



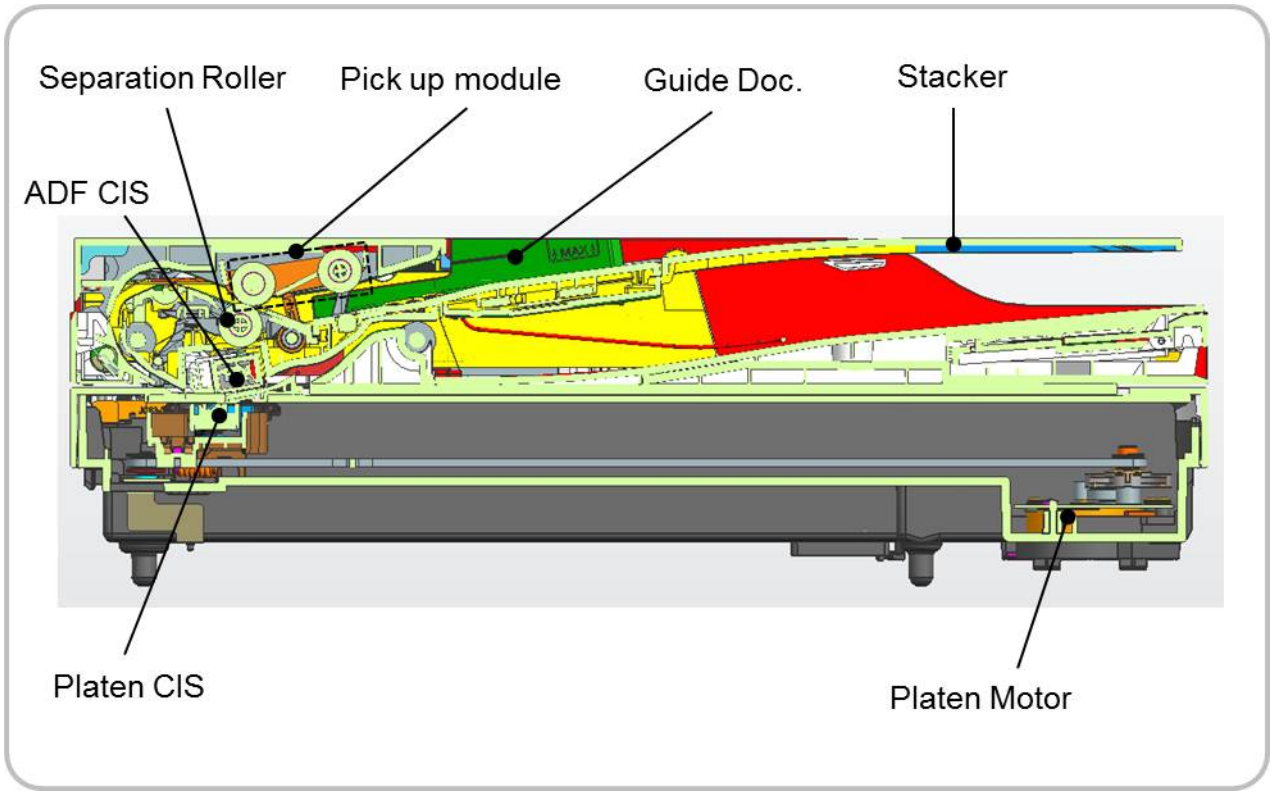
- **Information**
  - Part Code : JC93-00350A [DRIVE-FEED]

Power Train	• Tray lifting : DC motor
• DC motor → Gear → Gear → Gear → Gear → Tray lifting	

2.9. Scanner System

The paper surface is exposed by the platen CIS or ADF CIS and the reflected light is passed to the CIS sensor. The function of the CIS sensor is to change from the optical image data to the electrical (analog) signal. The analog signal is converted to the digital signal, and then the image process executes to make an image.

This machine uses the digitalized CIS for scan processing. This machine supports the dual scanning by using a platen CIS and a document feeder CIS.



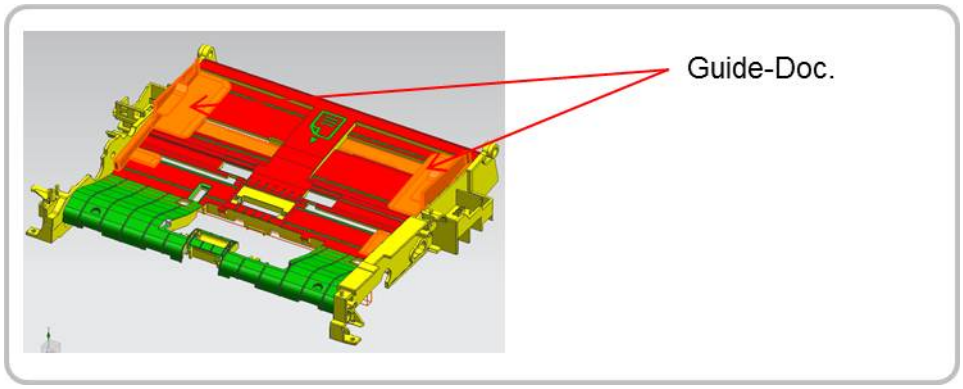
Scanner System Components

The following shows the construction and purpose of the scanning system :

1) **Guide Document**

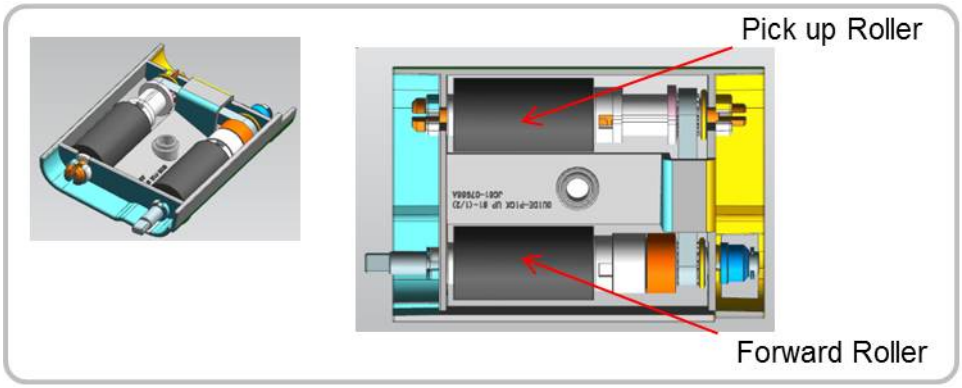
   The guide document aligns the original when scanning or copying from DSDF unit.

   This supports LGL, LTR, A4, A5, A6 size papers.



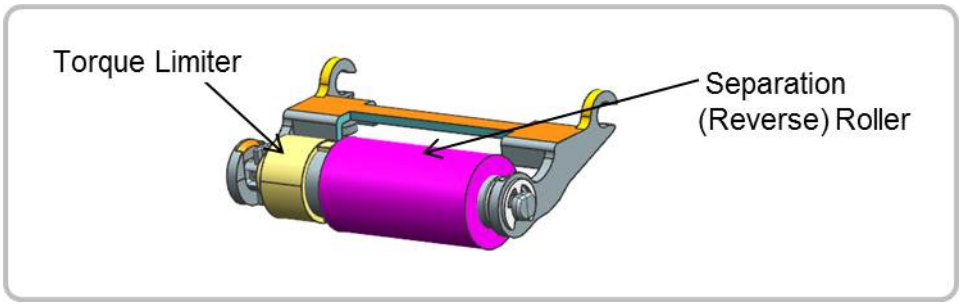
2) **Pickup Module**

The pickup module feeds the originals from the ADF Paper Feed Tray to the DSDF paper path; and a Separation Roller separates the underlining sheets of originals prevent multisheet feeding. When the unit's lifespan has expired, the module must be replaced as a complete assembly. The lifespan is 100,000 original feeds.



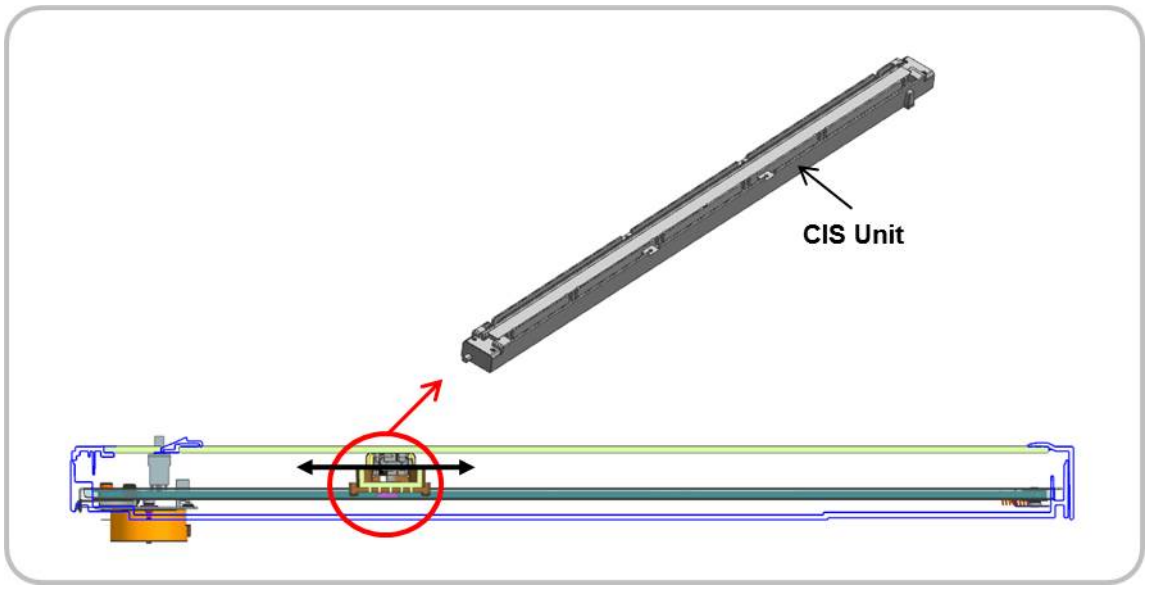
3) **Separation(Reverse) roller**

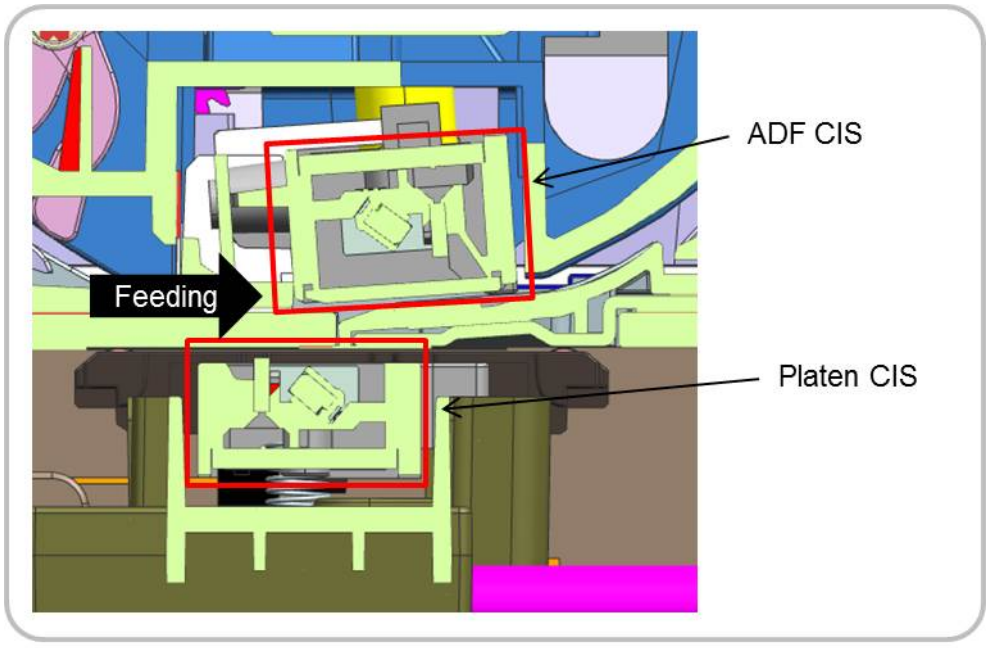
This machine uses the reverse roller system for the paper separation of the document feeder. The features of this system are the high yield, high reliability, lower noise in comparison to the pad system.



4) **CIS (Contact Image Sensor)**

CIS is a device to read the document on the scan glass. It consists of the R/G/B light source, subminiature Lens Array, and sensor. The light from the light source is illuminated on the document through the scan glass. This reflected light is sent to the Lens Array, the CIS sensor detects this and it is converted to color or mono electrical signal. The converted signal is used to scan image or print through image process.

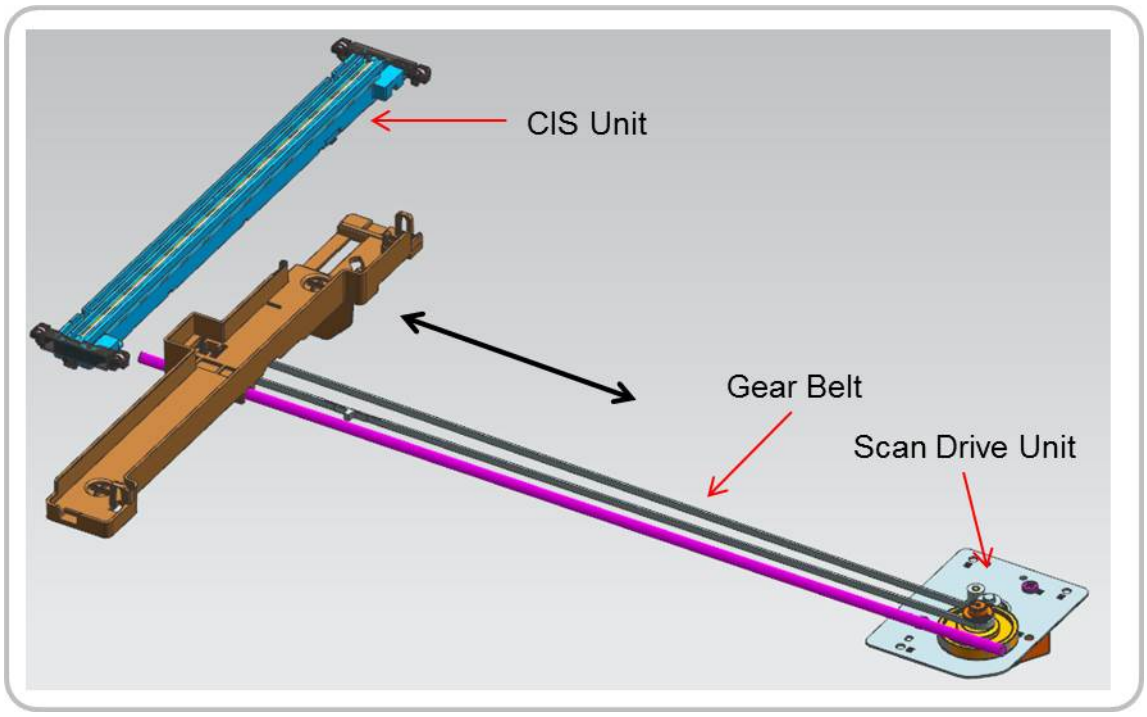




[Dual Scanning System]

5) **Scan Drive Unit**

The scan drive unit consists of a step motor, retardation gear, and gear-belt. The CIS unit is moved by the gear-belt. The document image is scanned by the CIS movement.

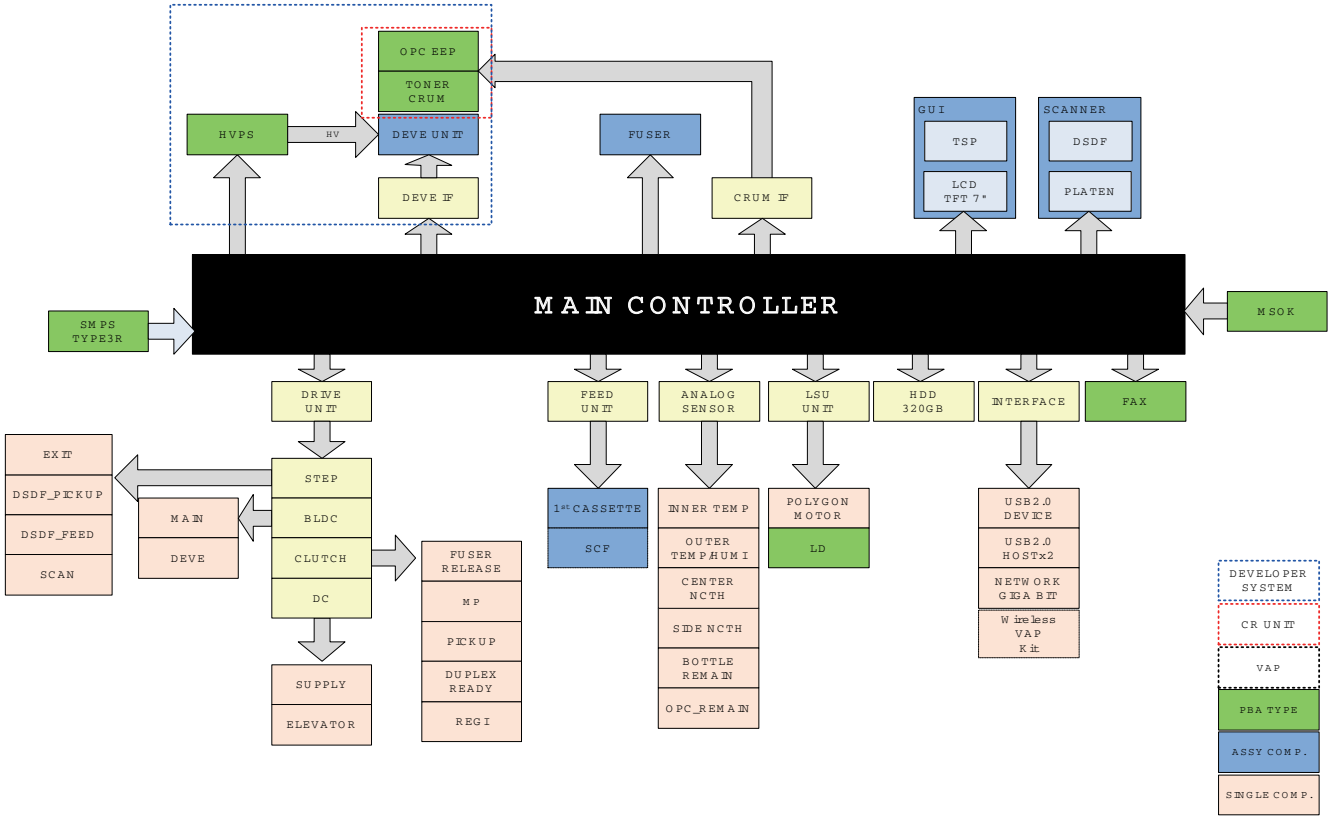


2.10. Hardware Configuration

M456x series Electrical Circuit System consists of the following :

- Main board
- OPE board
- DSDF board
- SMPS board
- Fuser Drive Board (FDB)
- HVPS board

Diagram of the M456x Series Electrical Circuit



SL-M456x series has a system board of integrated engine controller and video controller.

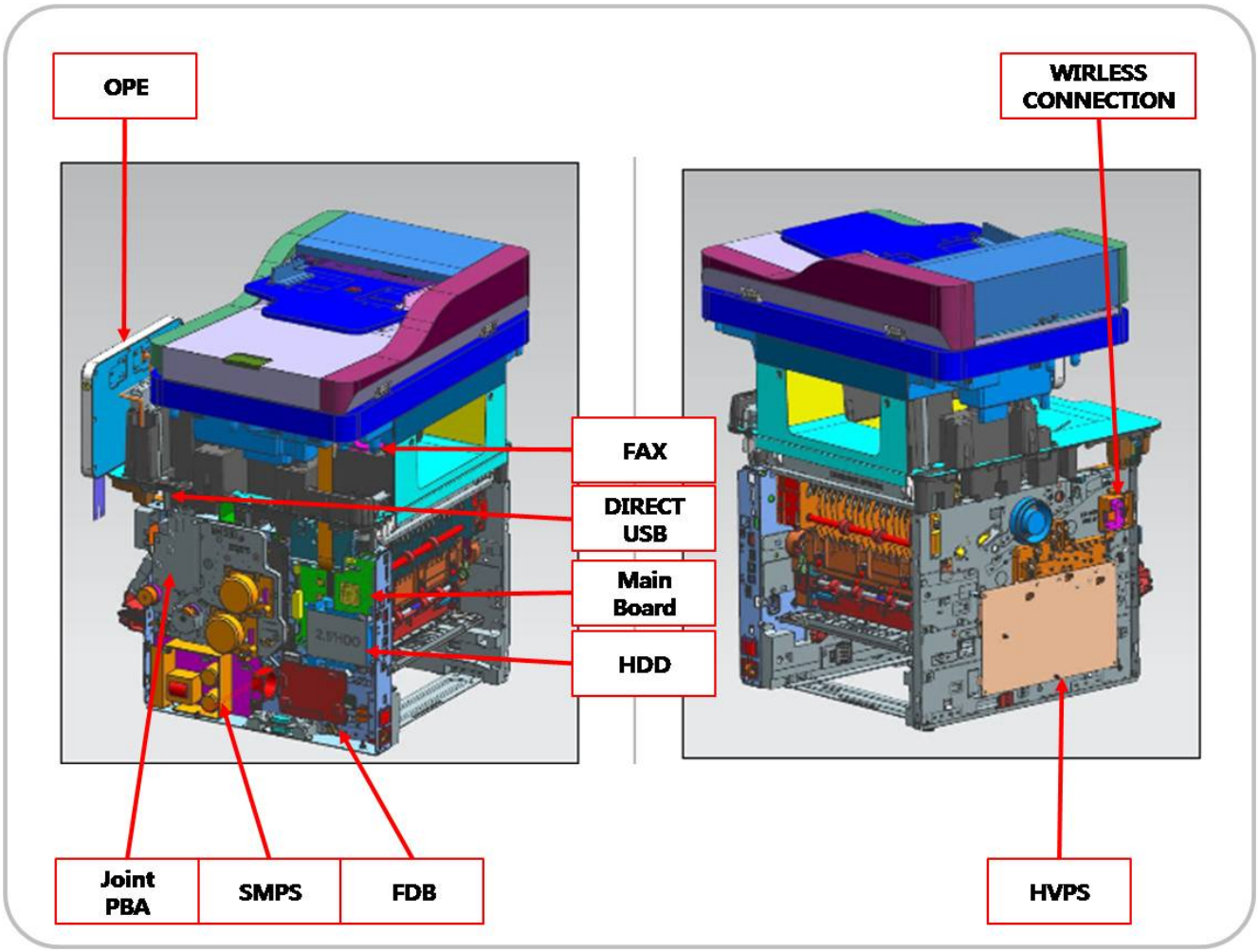
The engine controller controls all modules required to print, that is, LSU, HVPS, fan, fuser, motor etc. It communicates with the video control block inside CPU for printing. And it has the interface for all video sync signals to print out the video data.

The video controller receives print data from the host through network or USB Port. It takes this information and generates printable video bitmap data.

The main board is adopted 1.5GHz Quad Core CPU that is integrated with engine and video controller. It has 3GB DDR3 memory.

Circuit Board Locations

The following diagrams show the locations of the printer circuit boards:



2.10.1. Main board

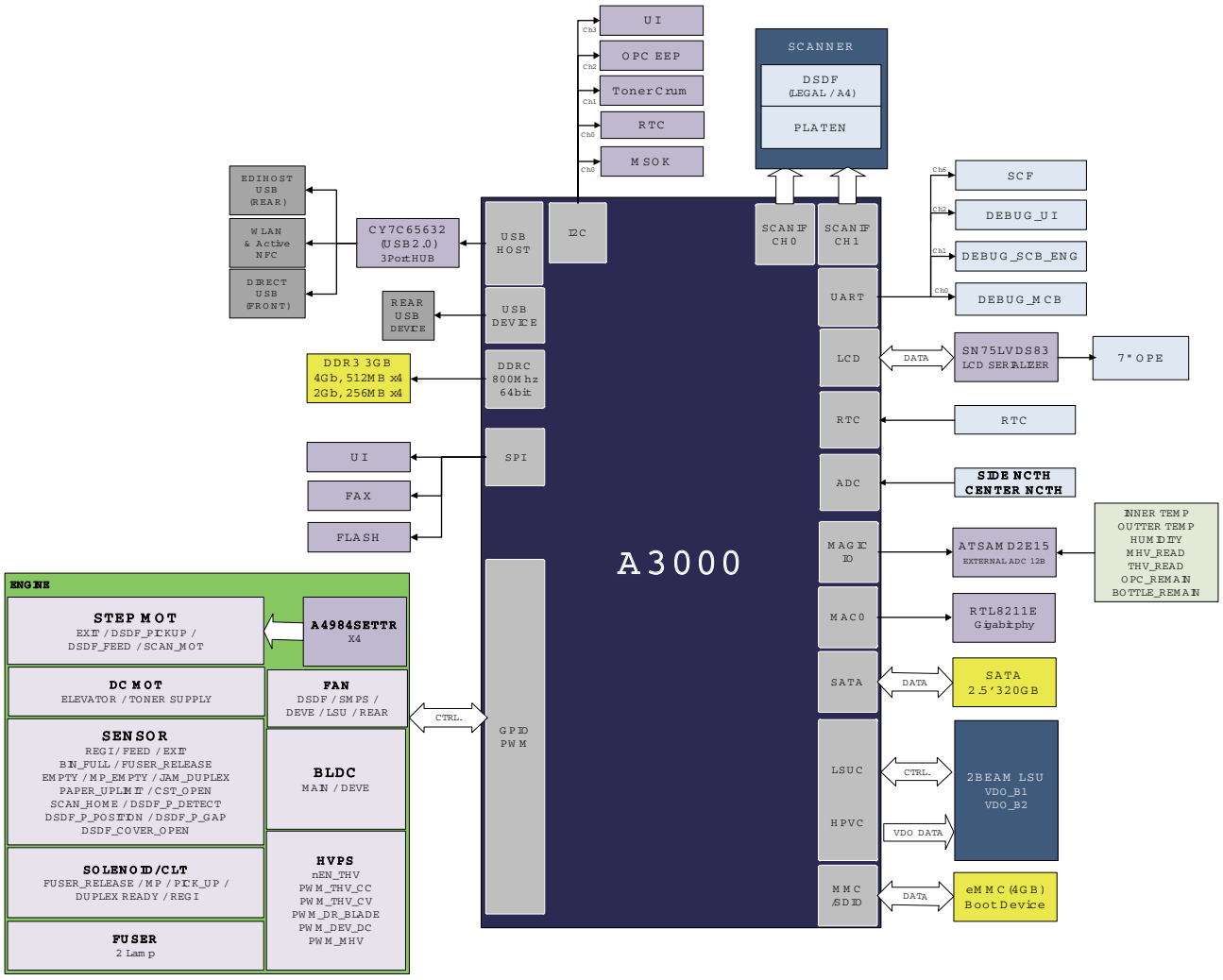
The main processor in main board is adopted 1.5GHz Quad Core CPU that is integrated with engine and video controller. It has 3GB DDR3 memory.

Boot adopted the 4GB eMMC and 320GB SATA HDD is used for data storage and supporting 7 inch OPE.

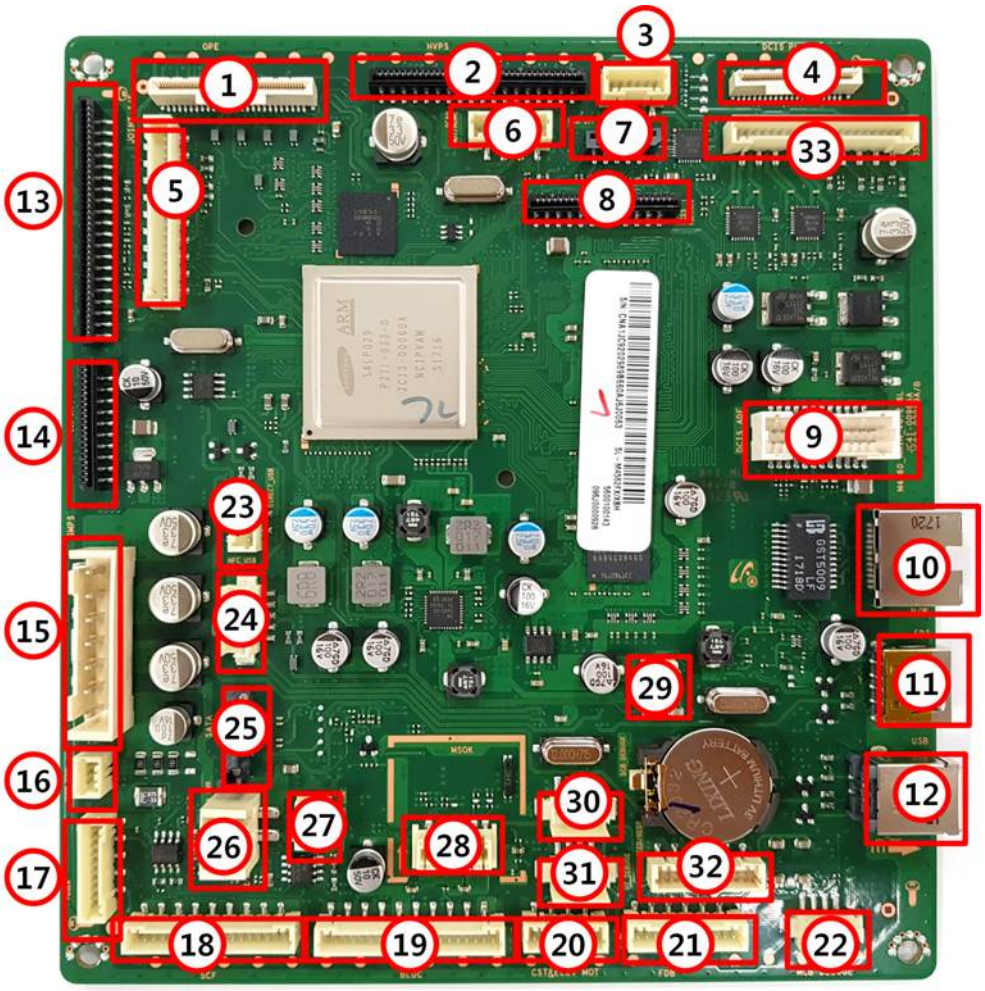
USB is the embedded type and wired network supports gigibit ethernet. And wireless network is optional.

The SCF is connected to the main board by UART.

[Main Board Diagram]



[Main Board Connection Information]



- **Connection**

1	OPE
2	HVPS
3	STEP EXIT
4	DCIS ADF A4
5	CRUM/TONER REMAIN
6	SCAN Mot/Home
7	FAX I/F
8	DCIS PLATEN
9	DCIS ADF Legal
10	NETWORK
11	EDI

12	USB
13	JOINT IF
14	LSU
15	SMPS POWER
16	SMPS SIGNAL
17	FUSER
18	SCF
19	BLDC
20	CST&ELVE MOT
21	FDB / Humidity / Temperature Sensor
22	MCB DEBUG

23	DIRECT USB
24	WLAN
25	SATA Signal
26	SATA Power
27	Paper Low Sensor
28	MSOK
29	CPU FAN
30	SCB DEBUG
31	UI Debug
32	Feed / Regi. Sensor
33	DSDF

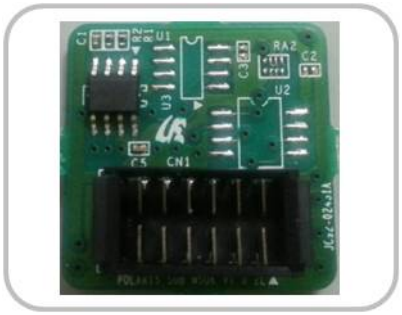
- **Information**
  - Part Code
    - M4560(A4) : JC92-02985A
    - M4562(LGL) : JC92-02985B
  - Part Name : PBA-MAIN

2.10.2. MSOK

MSOK PBA consists of a EEPROM(256K-bit) that is stored for all system operation information like a system parameter, device status, tech information, and service information.

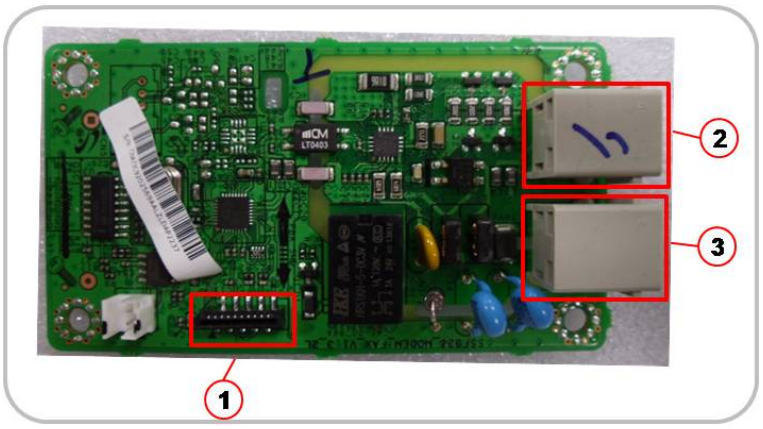
NOTE

When a main board needs to be exchanged, the MSOK PBA should be re-installed to the new main board to retain the system information.



2.10.3. Fax Card

The fax(modem) card is used to transfer and receive the fax data through a telephone line. This PBA is controlled by the main board and has two connectors, connectors, one for the telephone line connection and the other for an external phone connection.



- **Information**
  - Part Code : JC92-02569A
  - PBA name : PBA-LIU
- **Connection**

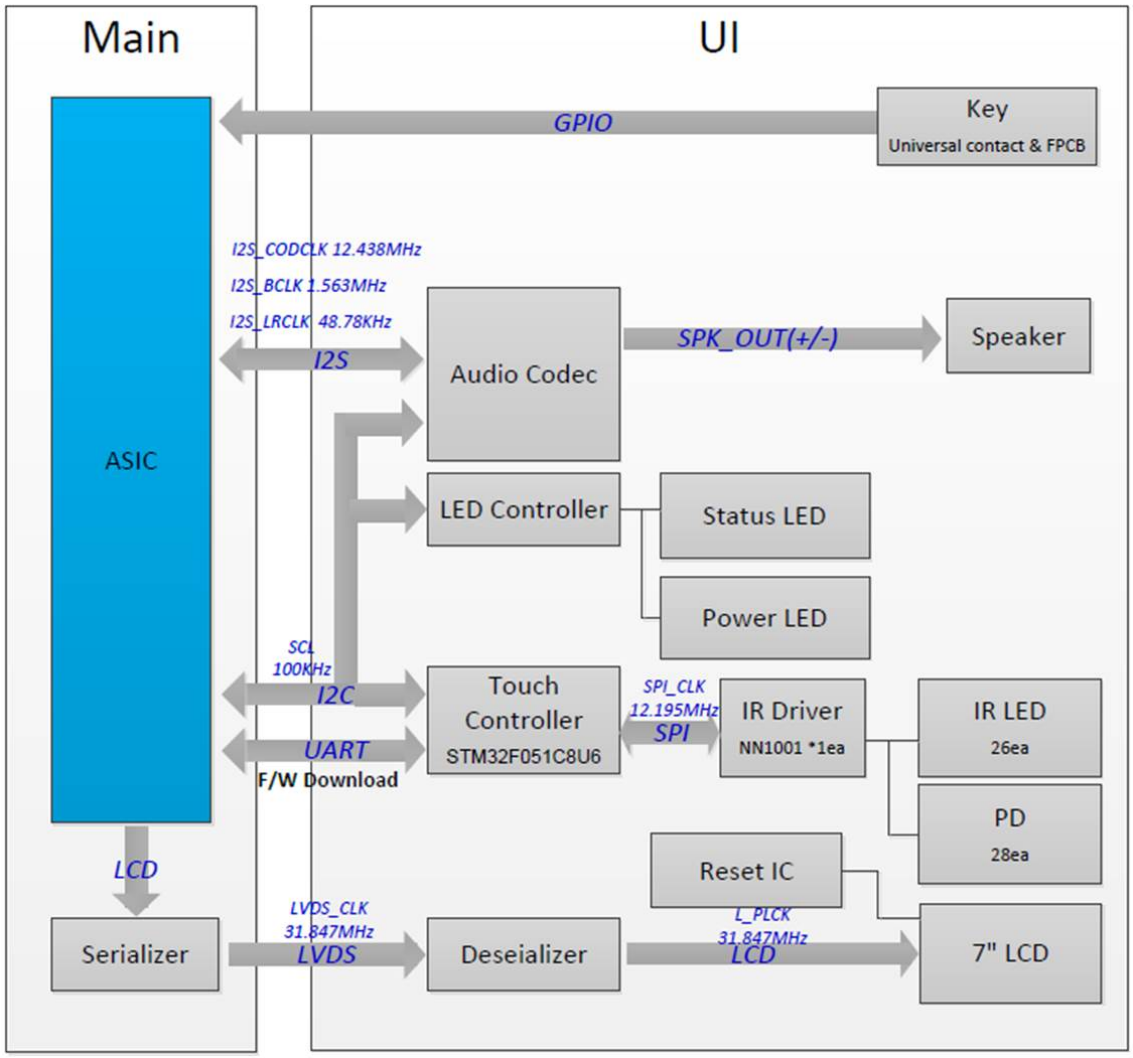
1	Fax Joint Interface Connector
2	Tel Line Interface Connector
3	External Phone Interface Connector

2.10.4. OPE

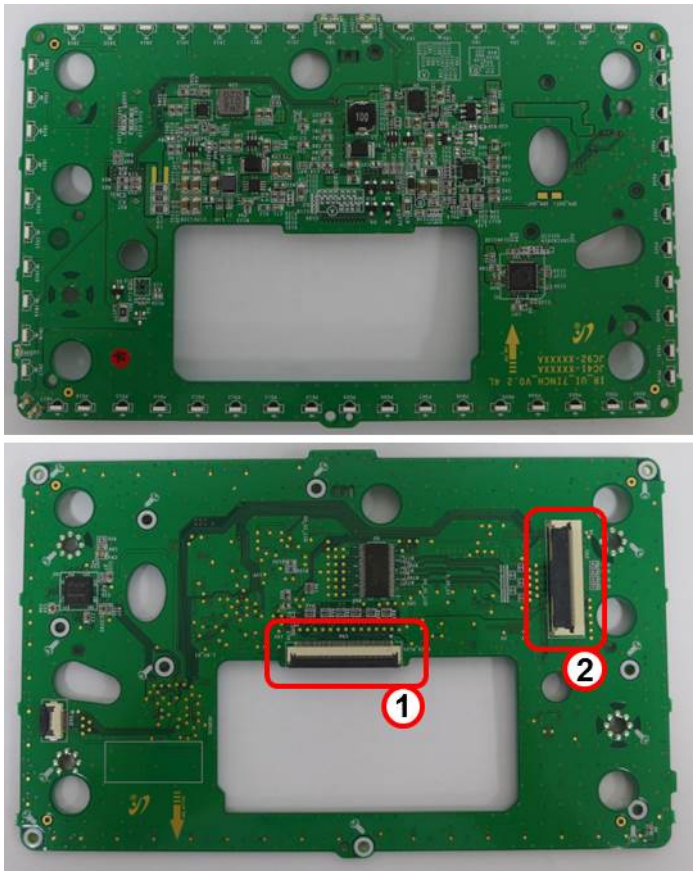
The OPE Unit is an IR TSP type consisting of infrared red LED, light guide, and 7 inch LCD touch panel.

The IR type is used to interface with users through the touch screen.

[OPE controller diagram]



[OPE MAIN PBA]

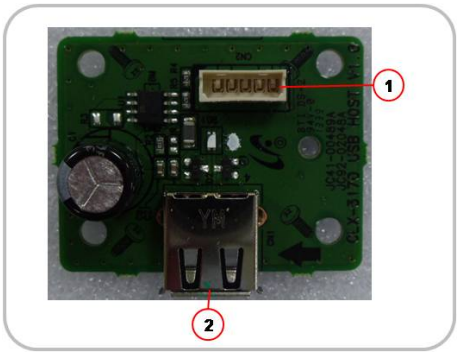


- **Information**
  - Part Code : JC92-02955A
  - Part Name : PBA-OPE
- **Connection**

No	Function	Connection
1	7” LCD Interface	Connect to 7” LCD
2	Main Interface	Connect to Main PBA (Thru OPE Sub PBA)

2.10.5. USB Host PBA

USB Host PBA is used to interface with main board, external USB memory, NFC, wireless.



- **Information**
  - Part Code : JC92–02048A
  - Part Name : PBA-USB HOST
- **Connection for Direct USB**

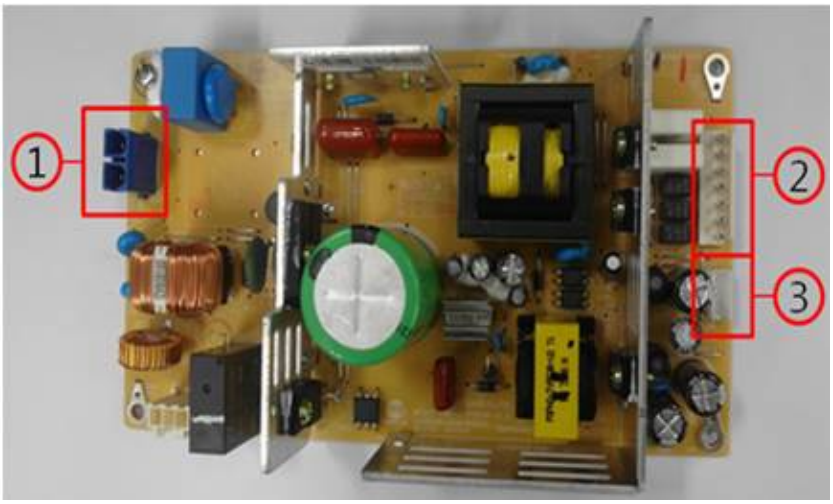
1	Main Board Interface Connector
2	External USB connection

- **Connection for Option**

1	Main Board Interface Connector
2	Option Connection (NFC & Wireless)

2.10.6. SMPS board

SMPS (Switching Mode Power Supply) board supplies electric power to the main board and other boards. The voltage provided includes +5V, and +24V from a 110V/220V power input. It has safety protection modes for over current and overload.



- **Specification**

  General Input / Output Voltage

  1) AC 110V (93.5V ~ 137V)
  2) AC 220V (187V ~ 275V)
  3) Output Current
     - +5V : 4.0A
     - +24V : 6.0A
  4) Output Power
     - DC 5V : 20W
     - DC 24V : 144W
     - FDB : 1300W

- **Information**

	110V	220V
Part Code	JC44-00222F	JC44-00223G
Part Name	PSPN2-TYPE3R-V1 A	PSPN2-TYPE3R-V2 A

- **Connection**

1	Input_AC
2	OUTPUT_DC(to Main PBA)
3	SMPS Control Signal (from main board)

- **Input / Output connector**
  - **AC Input Connector (CON1)**

Description	PIN NAME	PIN ASSIGN
AC Input	AC_L	1
	AC_N	2

  - **DC Output Connector (CON3)**

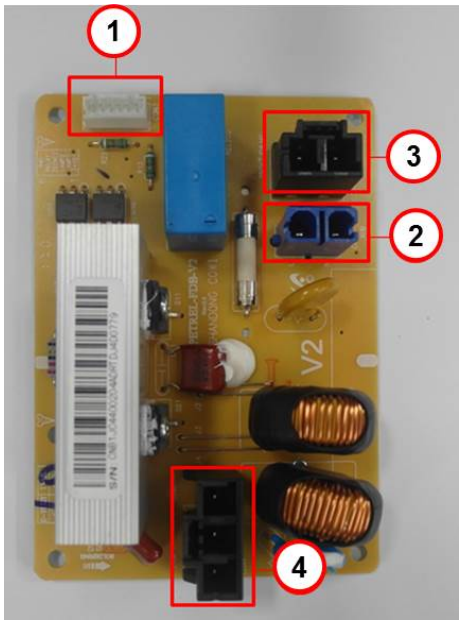
Description	PIN NAME	PIN ASSIGN
Power	+5V1	1
5V Ground	GND	2
Power	+24V1	3
24V Ground	GND	4
Power	+24V2	5
24V Ground	GND	6
Power	+24V3	7

  - **Signal Connector (CON4)**

Description	PIN NAME	PIN ASSIGN
Ground	GND	1
SMPS Control	24V_ON_OFF	2
NC	NC	3
NC	NC	4
NC	NC	5

2.10.7. Fuser Drive Board (FDB)

This board supplies 110V/220V power to the heat lamp. It help keep the stable power control.



- **Specfication**
  - Output Power : 1300W
  - AC Lamp1 : 700W
  - AC Lamp2 : 600W
- **Information**

	110V	220V
Part Code	JC44-00203A	JC44-00204A
Part Name	FDB V1	FDB V2

- **Connection**

1	Fuser_Control Signal
2	OUTPUT_AC(to SMPS)
3	INPUT_AC
4	OUTPUT_AC(to AC Lamp1,2)

- **Input / Output connector**
  - **AC Input Connector (CON2)**

Description	PIN NAME	PIN ASSIGN
AC Input	AC_L	1
AC Input	AC_N	2

  - **AC Output Connector (CON3)**

Description	PIN NAME	PIN ASSIGN
AC Output	AC_L	1

Description	PIN NAME	PIN ASSIGN
AC Output	AC_N	2

- **AC Output Connector (CON4)**

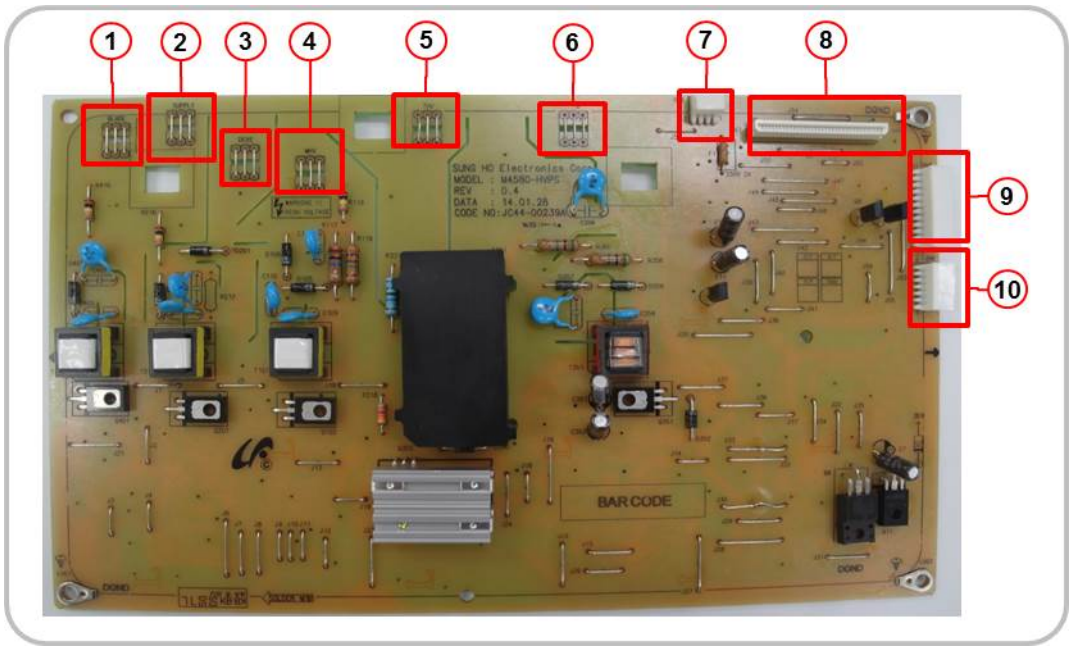
Description	PIN NAME	PIN ASSIGN
AC OUTPUT (to Lamp)	LAMP1	1
	LAMP2	2
	COMMON	3

- **Signal Connector (CON1)**

Description	PIN NAME	PIN ASSIGN
Power	24VS1	1
Lamp1 Control Signal	LAMP1	2
Lamp2 Control Signal	LAMP2	3
Phase_Control Signal	ZC(NC)	4
FDB ON_OFF	RELAY	5
Ground	GND	6

2.10.8. HVPS board

HVPS(High Voltage Power Supply) board generates high-voltage channels, which include THV, MHV, DEVE DC, Fuser-bias, SAW.

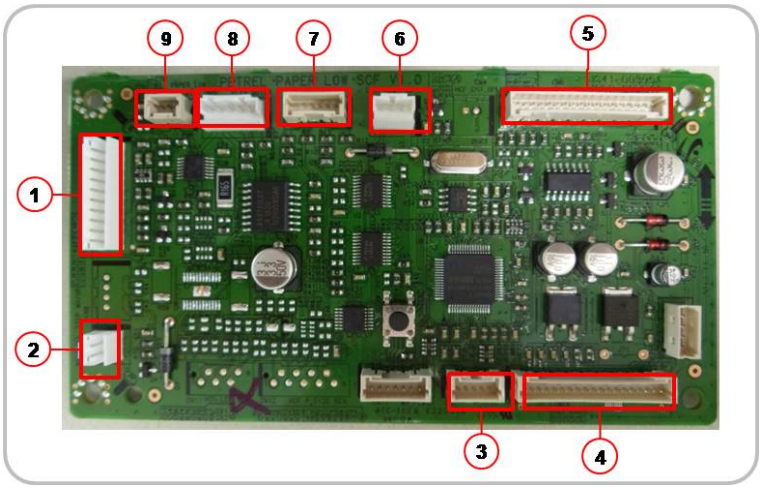


- **Information**
  - Part Code : JC44–00239A
  - Part Name : HVPS
- **Connection**

1	DR.BLADE
2	SUPPLY
3	DEVE
4	MHV
5	THV
6	SAW
7	LSU Fan
8	HVPS Input
9	Rear fan / Rear cover open sensor / Bin-Full sensor
10	Exit sensor / Fuser release sensor

2.10.9. SCF board

SCF board controls the optional cassette. It consists of a controller(S3F443FX), motor drive IC for controlling the feeding timing with the main board.

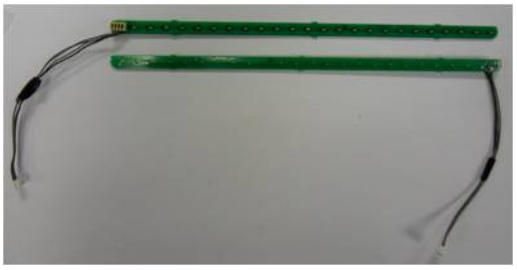


- **Information**
  - Part Code : JC92-02754A
  - PBA Name : PBA-SCF
- **Connection**

1	BLDC motor
2	Main solenoid
3	Paper size sensor
4	IF lower
5	IF upper
6	Regi solenoid
7	Paper empty sensor
8	Elevator motor
9	Paper low sensor

2.10.10. Eraser PBA

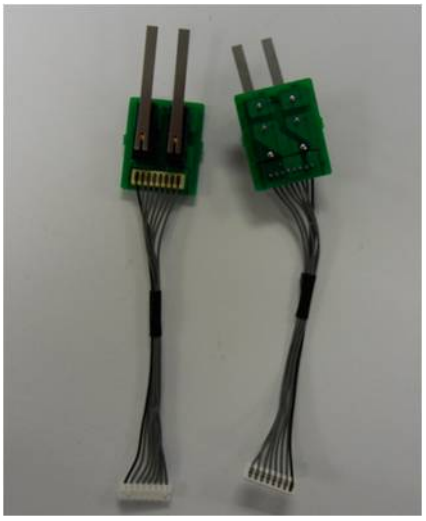
Eraser PBA is comprised of many LED components. Each LED is used for erasing negative charges on the surface of the drum after printing.



- **Information**
  - Part Code : JC92-02373A
  - Part Name : PBA-ERASER

2.10.11. Cover-Open PBA

This board cuts off and supply DC power when the front cover is opened or closed. It has the 24V power interlock function for safety.



- **Information**
  - Part Code : JC92-02371A
  - Part Name : PBA-COVER OPEN SENSOR
- **Connection**

1	5VS
2	5V
3.4.5	24VS1
6.7.8	24V1

2.10.12. Deve_Toner Crum Joint PBA

The Deve Crum Joint PBA is the interface PBA between the Imaging Unit and the system.

- **Information**
  - Part Code : JC92-02163A
  - Part Name : PBA-DEVE CRUM JOINT

2.10.13. Toner Remain Sensor PBA

This board detects the toner supply status for the toner cartridge and imaging unit.

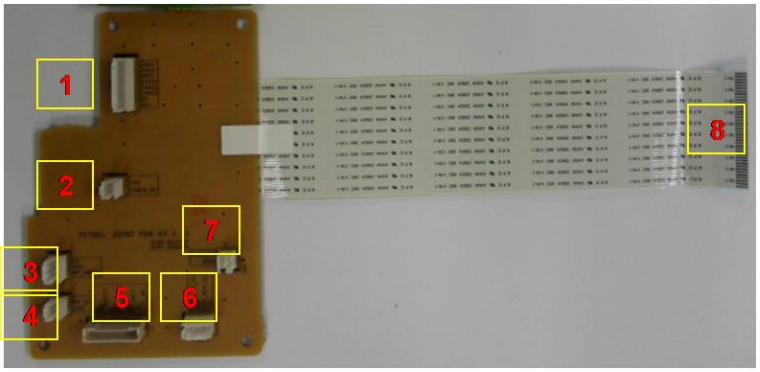
It checks the toner supply level through the optical path and send the information to the main board.

When the toner level is low, the main board controls the toner supply motor for toner supplement.

- **Information**
  - Part Code : JC92-02752A
  - Part Name : PBA-TONER REMAIN SENSOR

2.10.14. Joint PBA

The Joint PBA provides the interface for clutch, sensor and motors.



- **Connection**

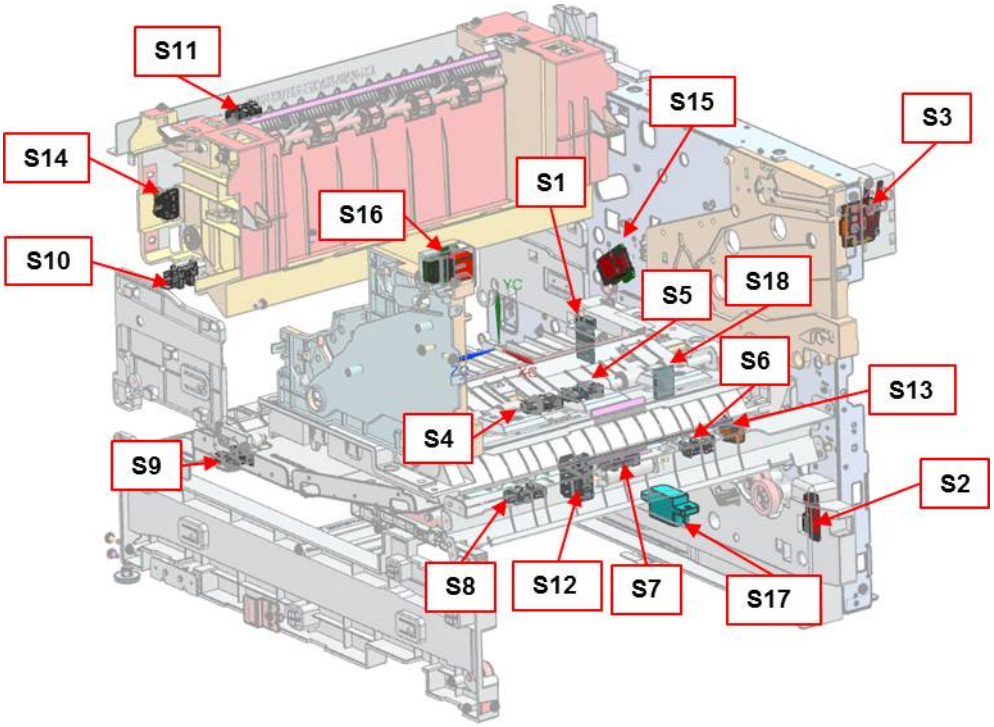
1	Cover-Open IF
2	Toner DC Motor IF
3	MP Sensor IF
4	MP Clutch IF
5	Paper Senor IF
6	Pickup & Dulpex Clutch IF
7	Regi Clutch IF
8	Main IF FFC Cable

- **Information**
  - Part Code : JC92–02374A
  - Part Name : PBA-JOINT

2.10.15. CRUM PBA

The CRUM PBA includes CRU memory for toner cartridge life cycle counting.

2.10.16. Sensor Location



No.	Description		Controller	Function
S1	SENSOR-HUMIDITY	JC32-00015A	PBA-MAIN • SL-M4560 : JC92-02989A • SL-M4562 : JC92-02989B	Humidity detection
S2	PHOTO INTERRUPTER (Paper volume sensor)	0604-001381		
S3	SWITCH FRONT COVER	JC92-02371A		
S4	PHOTO INTERRUPTER (Regi sensor)	0604-001325		Paper detection
S5	PHOTO INTERRUPTER (Feed sensor)	0604-001325		Paper detection
S6	PHOTO INTERRUPTER (Duplex Rdy sensor)	0604-001325		
S7	PHOTO INTERRUPTER (Up-limit sensor)	0604-001325		Paper detection
S8	PHOTO INTERRUPTER (Paper Empty sensor)	0604-001325		Paper detection
S9	PHOTO INTERRUPTER (Exit sensor)	0604-001325		Paper detection
S10	PHOTO INTERRUPTER (Envelope sensor)	0604-001325		Pressure control for envelope
S11	PHOTO INTERRUPTER (Bin Full sensor)	0604-001325		Bin-Full detection
S12	SENSOR-PAPER SIZE	JC34-00001A		Paper size detection
S13	SWITCH-LIMIT UPPER	JC39-01443A		
S14	CONNECTOR-REAR COVER	JC39-01431A		
S15	PBA-DEVE CRUM	JC92-02163A		
S16	PBA-DEVE CRUM	JC92-02163A		

No.	Description		Controller	Function
S17	CONNECTOR-SCF	JC39-01441A		
S18	SENSOR-INNER TEMPERATURE	1404-001417		

3. Disassembly and Reassembly

3.1. Precautions when replacing parts

3.1.1. Precautions when assembling and disassembling

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

3.1.2. Precautions when handling PBA

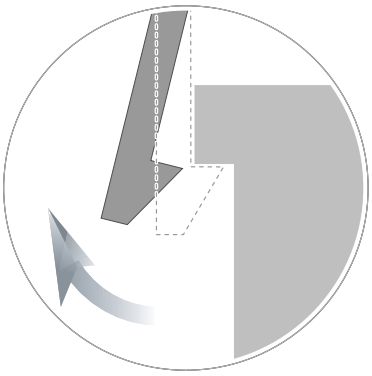
Static electricity can damage a PBA, always used approved anti-static precautions when handling or storing a PBA.

- **Precautions when moving and storing PBA**
  1) Please keep PBA in a conductive case, anti-static bag, or wrapped in aluminum foil.
  2) Do not store a PBA where it is exposed to direct sunlight.
- **Precautions when replacing PBA**
  1) Disconnect power connectors first, before disconnecting other cables.
  2) Do not touch any soldered connections, connector terminals or other electronic parts when handling insulated parts.
- **Precautions when checking PBA**
  1) Before touching a PBA, please touch other grounded areas of the chassis to discharge any static electrical charge on the body.
  2) Take care not to touch the PBA with your bare hands or metal objects as you could create a short circuit or get an electric shock. Take extra care when handling PBAs with moving parts fitted such as sensors, motors or lamps as they may get hot.
  3) Take care when fitting, or removing, screws. Look out for hidden screws. Always ensure that the correct screw is used and always ensure that when toothed washers are removed they are refitted in their original positions.

3.1.3. Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully.

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

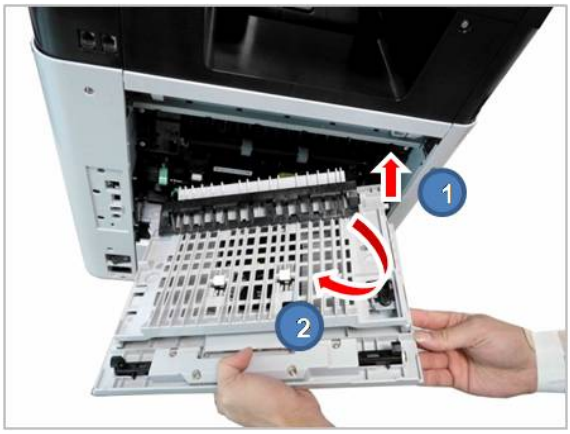


3.2. Replacing the maintenance part

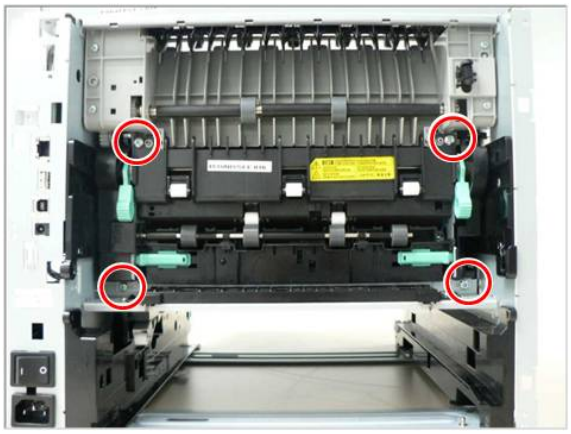
3.2.1. Fuser Unit

1. Turn the machine off.
2. Open the rear cover.

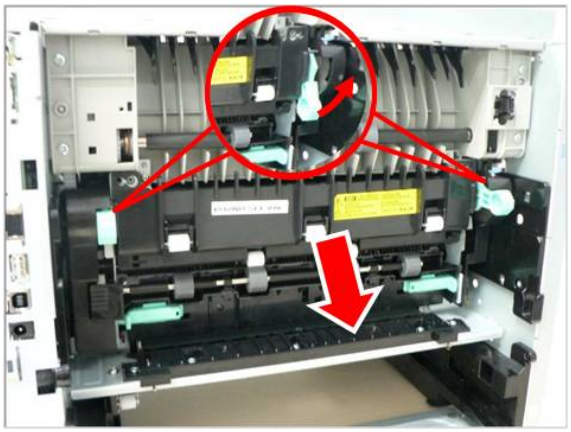
3. While opening the rear cover at a 45° angle, lift up the right side of the rear cover, Then take off the rear cover.



4. Remove 4 screws.



5. Lift up both levers. Then release the fuser unit.



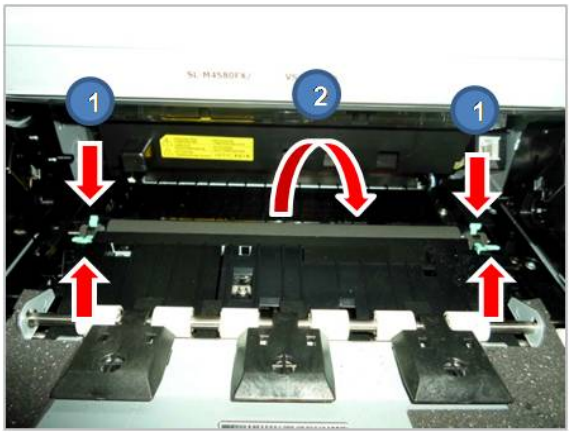
CAUTION

The fuser area is hot. Take care when removing paper from the machine.

3.2.2. Transfer Roller

1. Turn the machine off.
2. Open the front cover. Remove the toner cartridge and imaging unit.

3. Release the transfer roller Assy while pushing the both side holder to the direction of arrow.

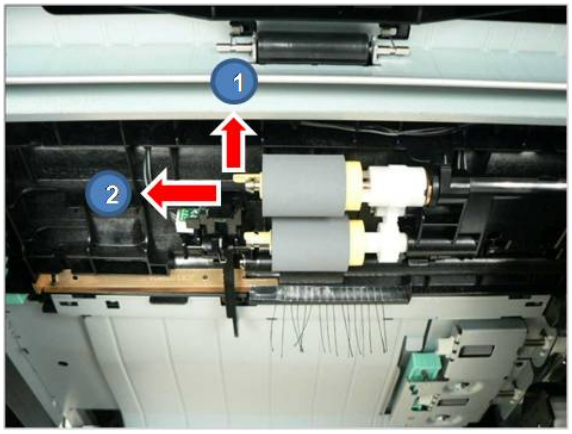


4. Insert the toner cartridge and imaging unit.
5. Close the front cover.
6. Turn the machine on.

3.2.3. Pick-Up_Forward roller

1. Remove the cassette.

2. Lift small tap, then remove the pick up / forward roller.



NOTE

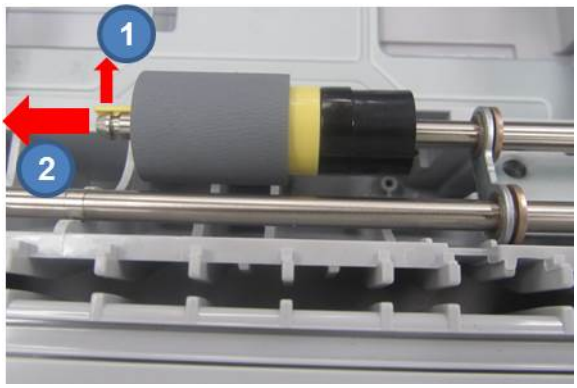
When replacing these rollers, it is recommended that you replace all rollers at the same time.

3.2.4. SCF Separation Roller

1. Remove the SCF cassette.

2. Open the separation roller cover.

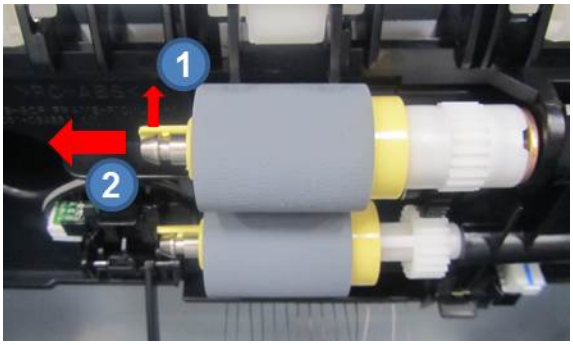
3. Lift small tap, then remove the separation roller.



3.2.5. SCF Pick-up Roller and Forward Roller

1. Remove the cassette.

2. Lift small tap, then remove the pick up and forward roller.

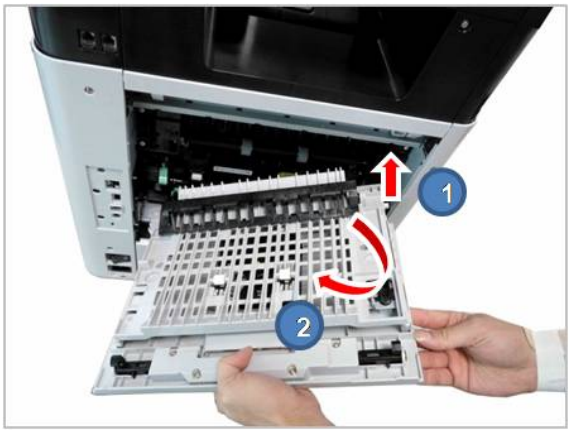


3.3. Replacing the main SVC part

3.3.1. Rear Cover

1. Open the rear cover.

2. While opening the rear cover at a 45° angle, lift up the right side of the rear cover, Then take off the rear cover.

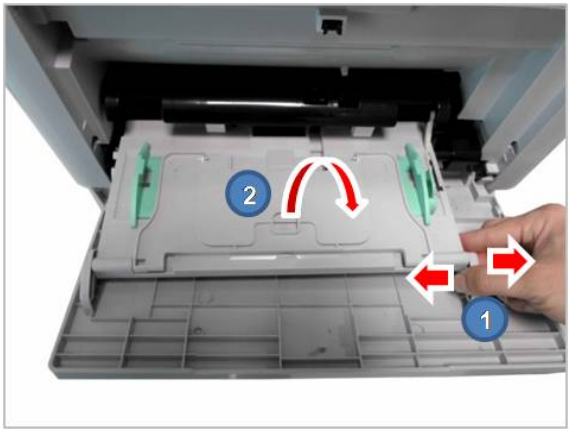


3.3.2. Front Cover

1. Remove the cassette. Open the MP tray.

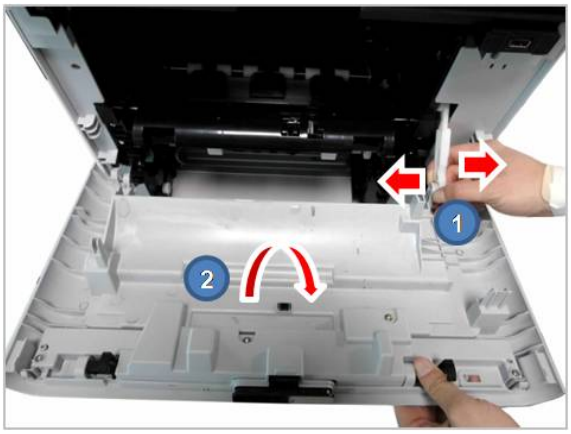
2. Release the linker from the right of the MP tray.

3. Remove the MP tray by releasing the hook of the COVER-MP.



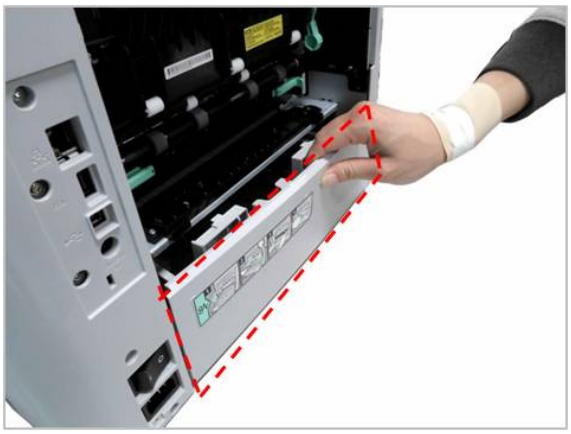
4. Remove the COVER-MP.

5. Release the linker from the right of the front cover. Then remove the front cover.



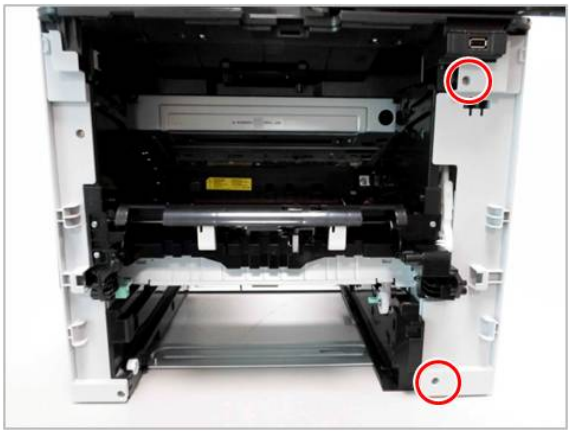
3.3.3. Right_Left Cover

1. Remove the toner cartridge, imaging unit, and cassette.
2. Remove the rear cover. (Refer to 3.3.1.)
3. Pull and release the Rear-dummy cover.



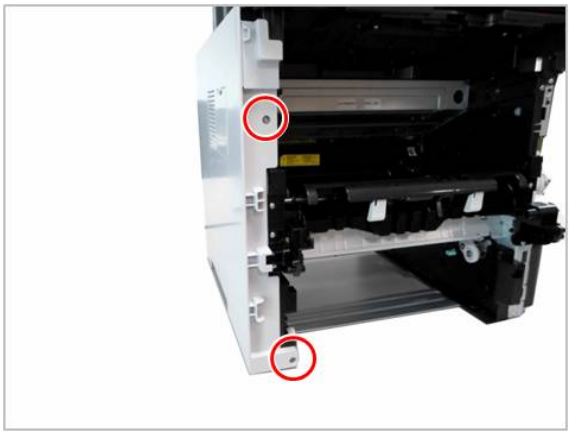
4. Remove 3 screws from the rear.

5. Remove 2 screws from the front.

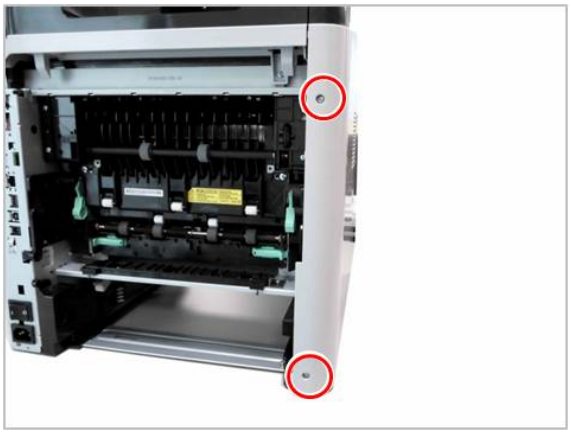


6. Release the right cover.

7. Remove 2 screws from the front.



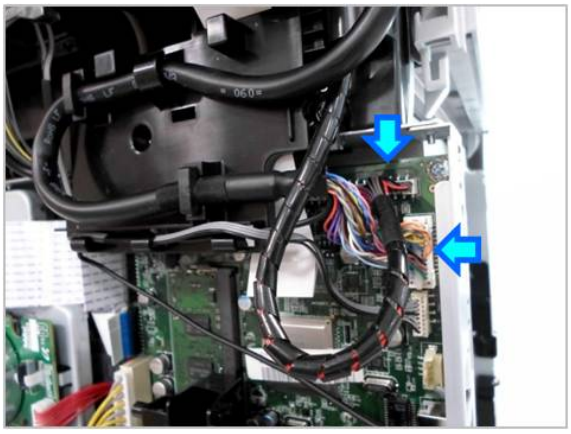
8. Remove 2 screws from the rear.



9. Release the left cover.

3.3.4. DSDF Unit

1. Remove the right cover. (Refer to 3.3.3.)
2. Unplug the DSDF cables on the main board. Release the cable from the harness guide.



3. Remove 1 screw for ground wire.

4. Lift up and release the DSDF unit.

NOTE

Shading Test for DSDF Unit must be carried out, after replacing the DSDS unit or DSDF CIS. (Refer to 4.5.5.3)

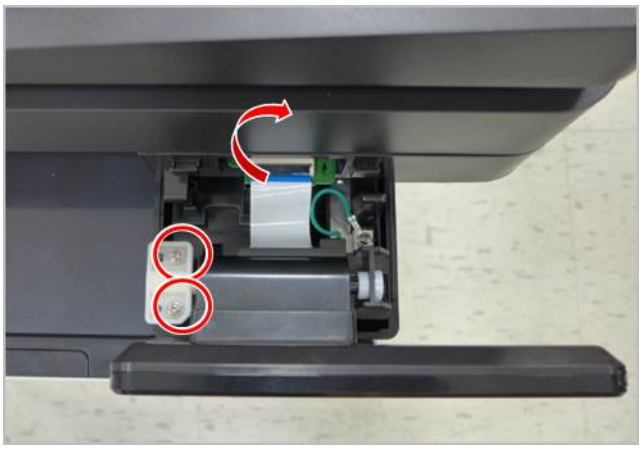
3.3.5. OPE Unit

1. Remove the right cover. (**Refer to 3.3.3.**)
2. Remove 1 screw-hole cap and 1 screw.

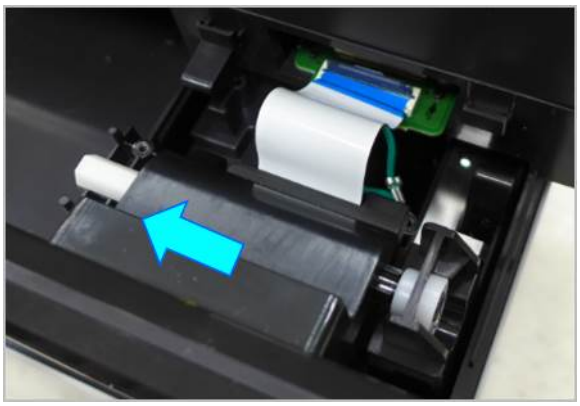
3. Remove 1 screw-hole cap and 1 screw.

4. Remove the cover.

5. Remove 2 screws and unplug the harness.

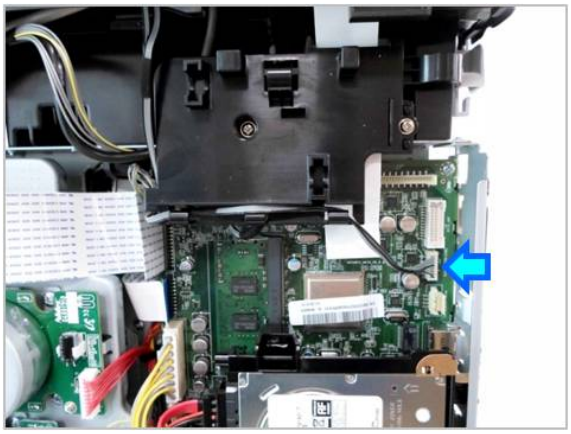


6. Push the OPE Unit to the left and release it.



3.3.6. Platen Unit

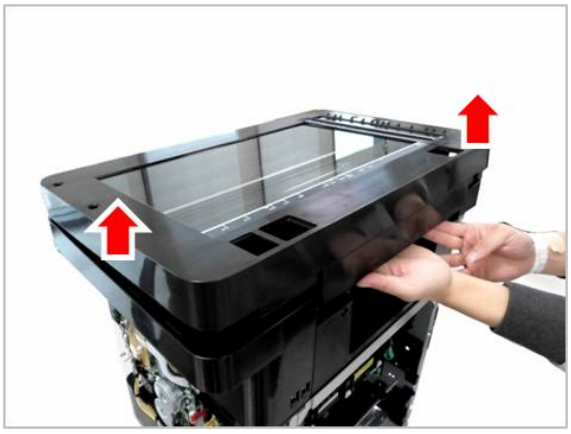
1. Remove the right cover. (Refer to 3.3.3.)
2. Unplug the platen cable on the main board.



3. Remove 4 screw-caps. Then remove 4 screws.

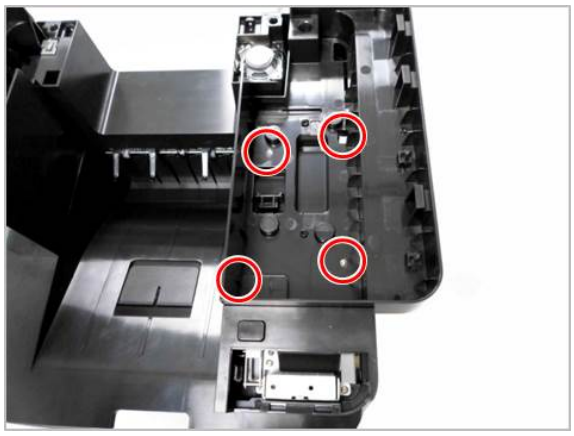
4. Remove 2 screws from the rear.

5. Lift up and release the platen unit.

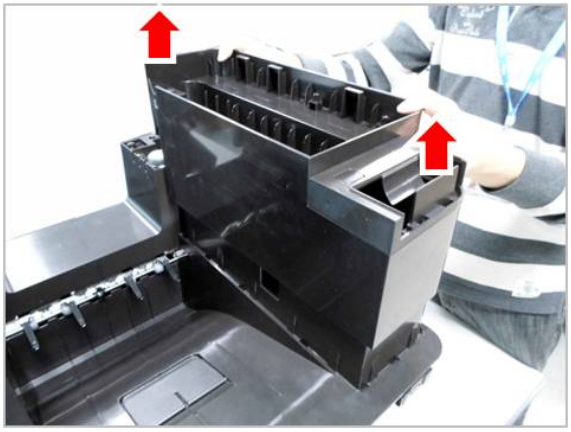


3.3.7. Middle Cover

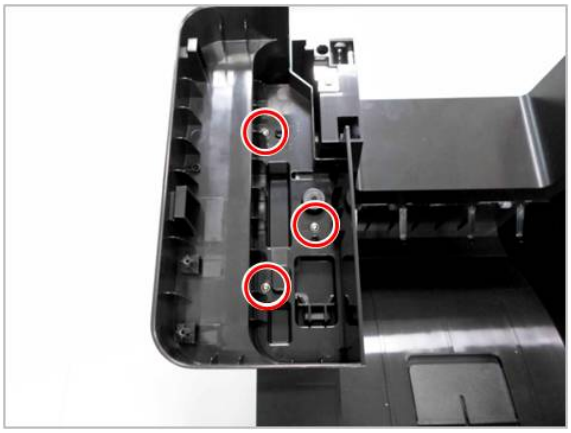
1. Remove the platen unit. (Refer to 3.3.6.)
2. Remove 4 screws securing the Cover-Middle Upper R.



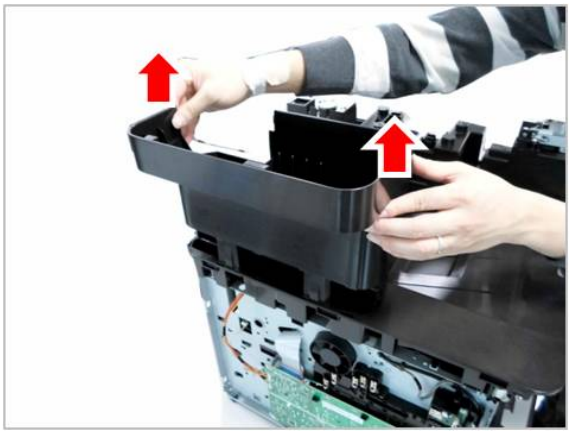
3. Lift up and release the Cover-Middle Upper R.



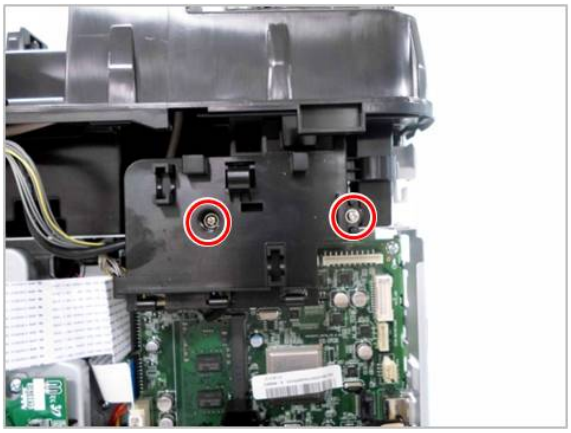
4. Remove 3 screws securing the Cover-Middle Upper L.



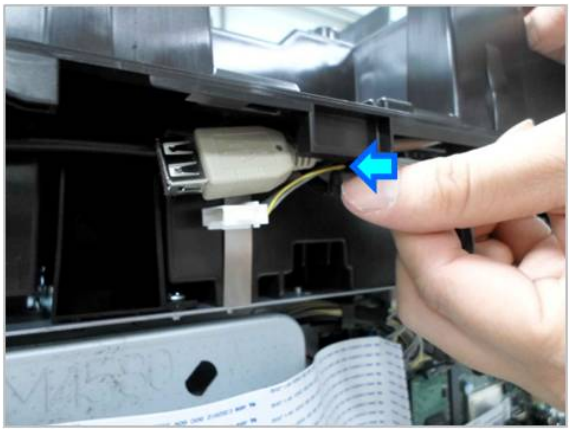
5. Lift up and release the Cover-Middle Upper L.



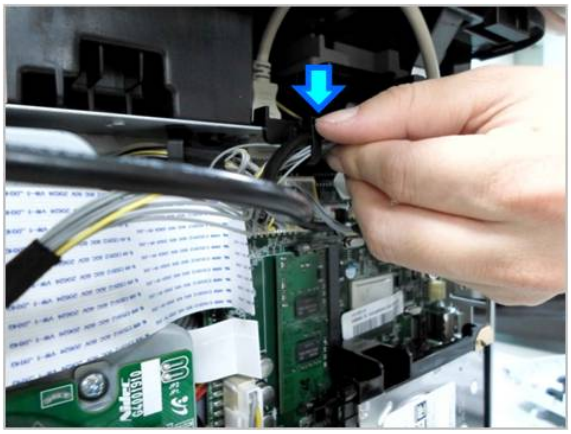
6. Remove the harness guide after removing 2 screws.



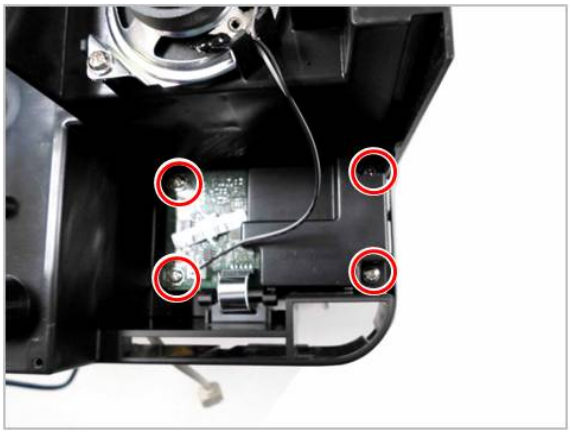
7. Release the OPE cables.



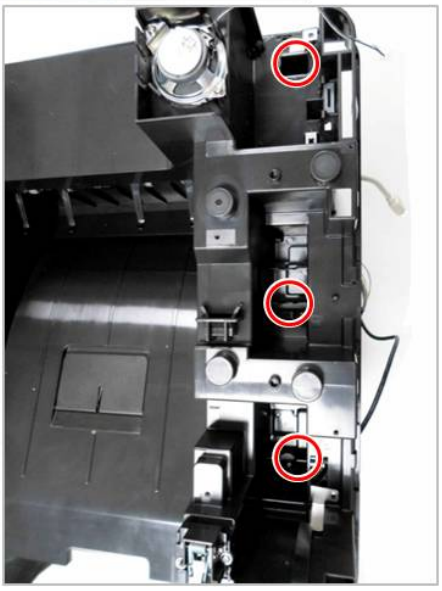
8. Open the harness clamp.



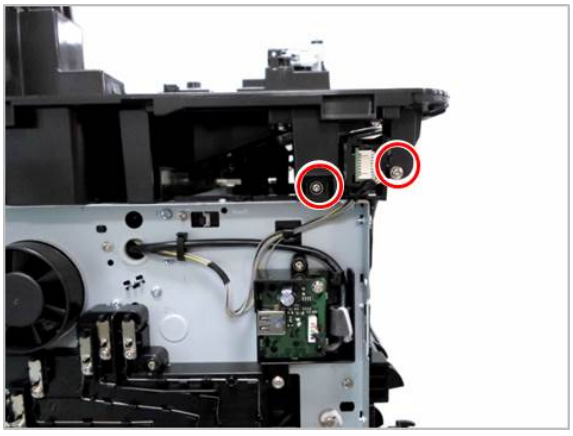
9. Remove the fax board after removing 4 screws.



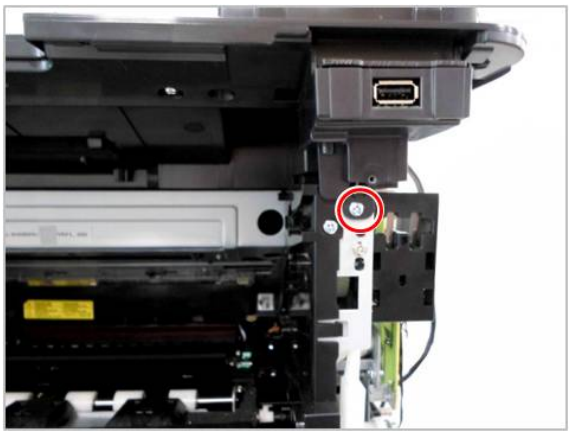
10. Remove 5 screws from the top of the middle cover.



11. Remove 2 screws from the left side of the middle cover.

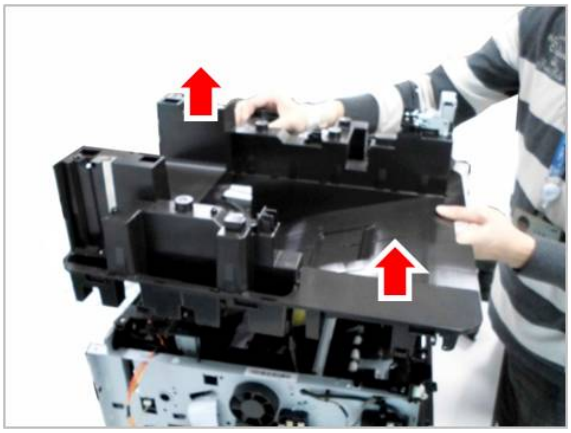


12. Remove 1 screw from the front side of the middle cover.



13. Remove 1 screw from the rear side of the middle cover.

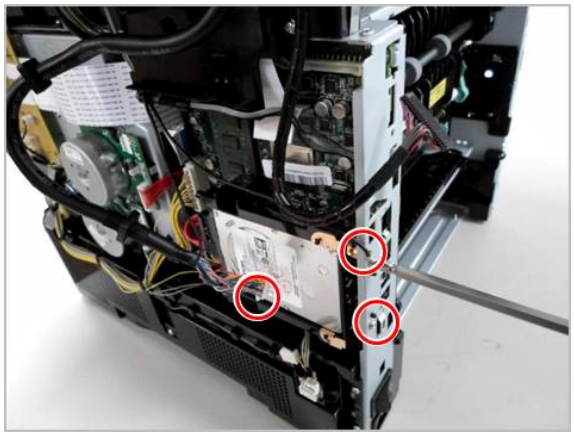
14. Lift up and release the middle cover.



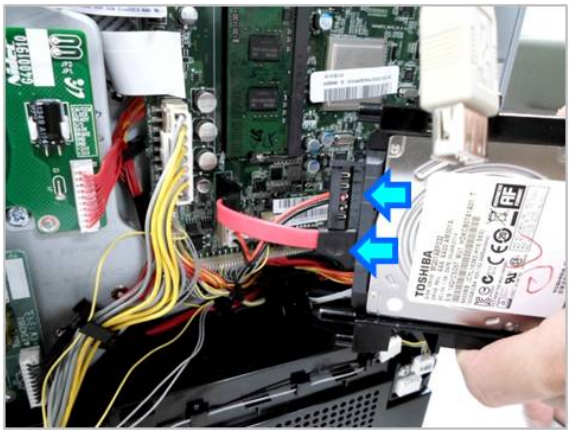
3.3.8. HDD (Hard Disk Drive)

1. Remove the right cover. (Refer to 3.3.3.)

2. Remove 3 screws.

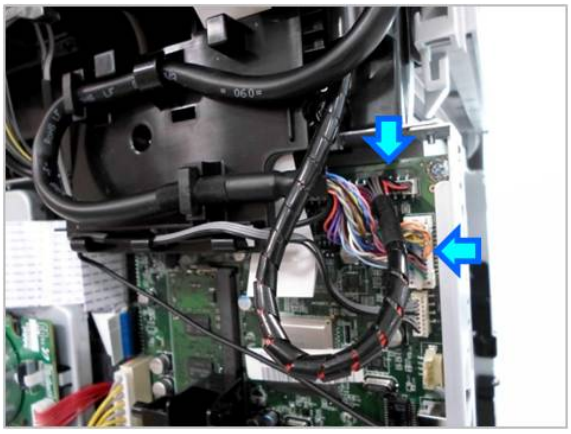


3. Unplug 2 cables. Then remove the HDD Assy.

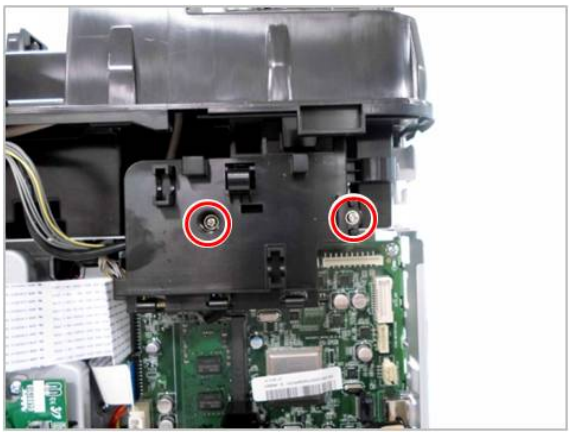


3.3.9. Main Board

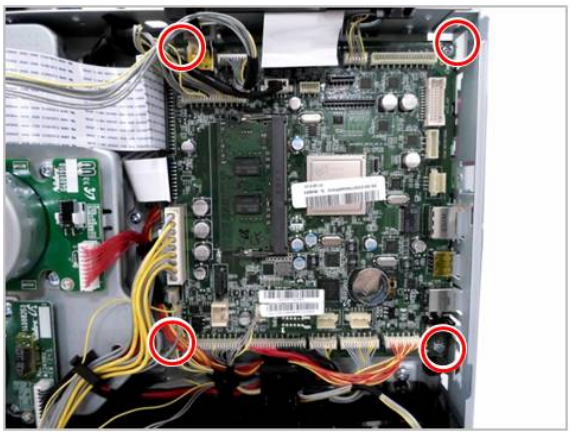
1. Remove the right cover. (Refer to 3.3.3.)
2. Remove the HDD. (Refer to 3.3.7.)
3. Unplug all cables on main board. Then release the cables from the harness guide.



4. Remove the harness guide after removing 2 screws.



5. Remove 4 screws. Then release the main board.

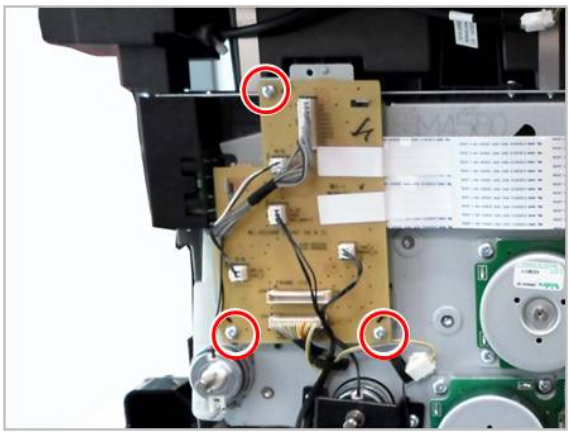


NOTE

- When a main board needs to be exchanged, the MSOK PBA should be re-installed to the new main board to retain the system information.
- Shading Test for DSDF Unit must be carried out, after replacing the main board. (Refer to 4.5.5.3)

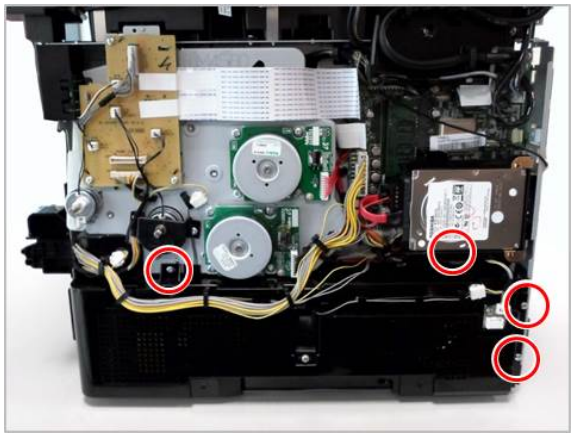
3.3.10. Joint PBA

1. Remove the rear cover. (Refer to 3.3.3.)
2. Unplug all cables on the joint PBA.
3. Remove 4 screws. Then release the joint PBA.

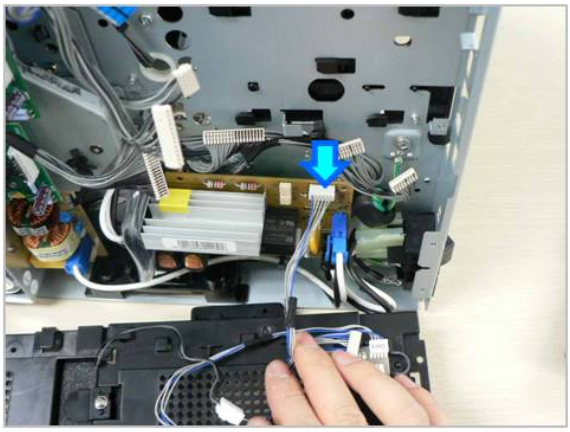


3.3.11. SMPS and FDB (Fuser Drive Board)

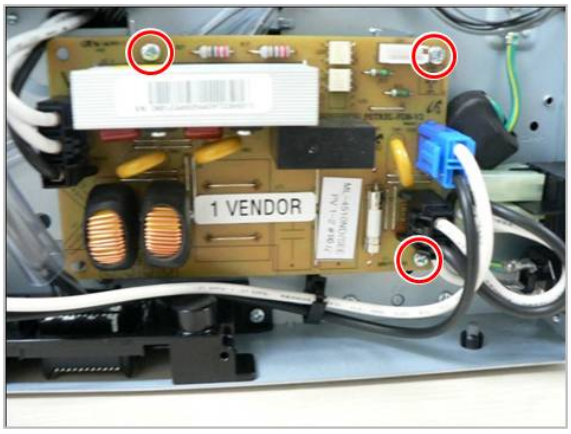
1. Remove the right cover. (Refer to 3.3.3.)
2. Remove 4 screws.



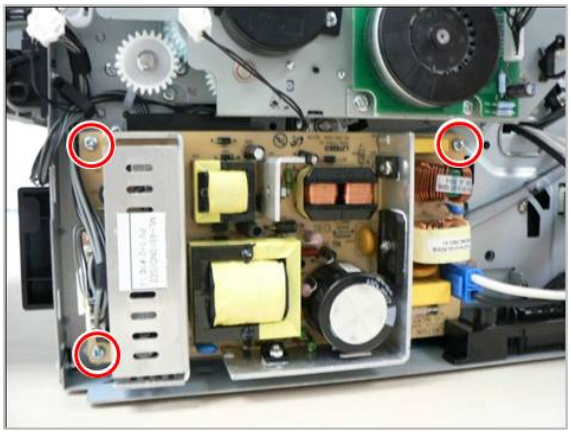
3. Unplug the cable. Then release the SMPS cover.



4. Unplug all cables on FDB. Remove 3 screws. And release the FDB.

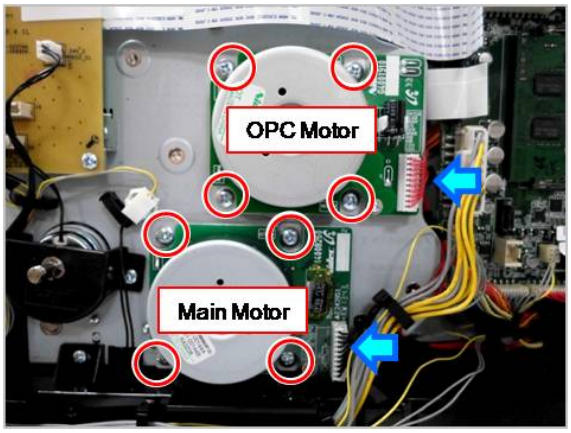


5. Unplug all cables on SMPS. Remove 3 screws. And release the SMPS.



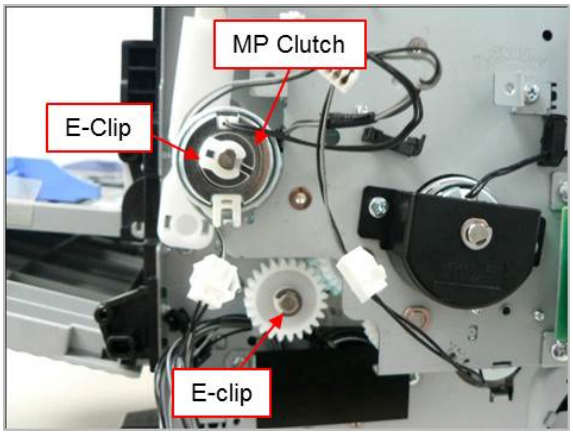
3.3.12. OPC motor and Main motor

1. Remove the right cover. (Refer to 3.3.3.)
2. Unplug the cable on the OPC motor. Remove 4 screws. Then release the OPC motor.

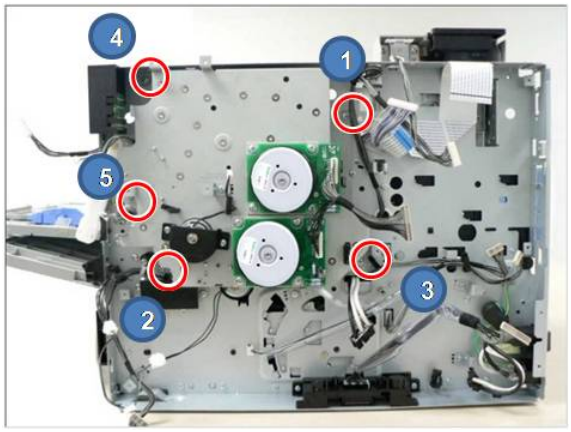


3.3.13. Main Drive Unit

1. Remove the right cover. (Refer to 3.3.3.)
2. Remove the Joint PBA. (Refer to 3.3.10.)
3. Remove the SMPS cover. (Refer to 3.3.11.)
4. Remove the MP clutch after removing the E-clip. And remove the gear after removing the E-clip.



5. Remove 5 screws. Then release the main drive unit.

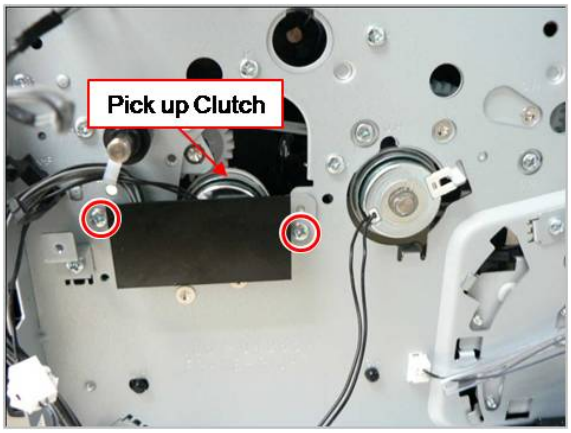


NOTE

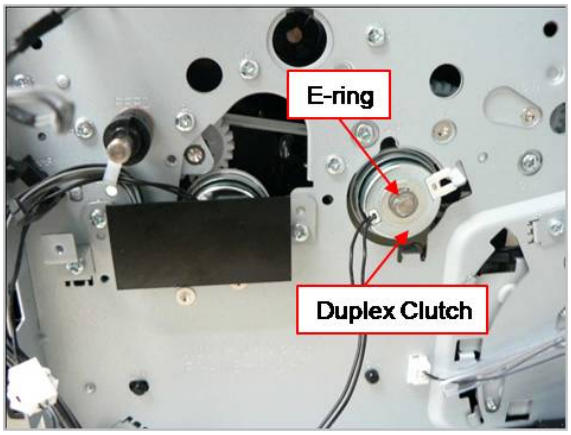
When reassembling the main drive unit, tighten 5 screws in order as shown above.

3.3.14. Duplex clutch and Pick up clutch

1. Remove the right cover. (Refer to 3.3.3.)
2. Remove the main drive unit. (Refer to 3.3.13.)
3. Release the bracket after removing 2 screws. Then, remove the pick up clutch.

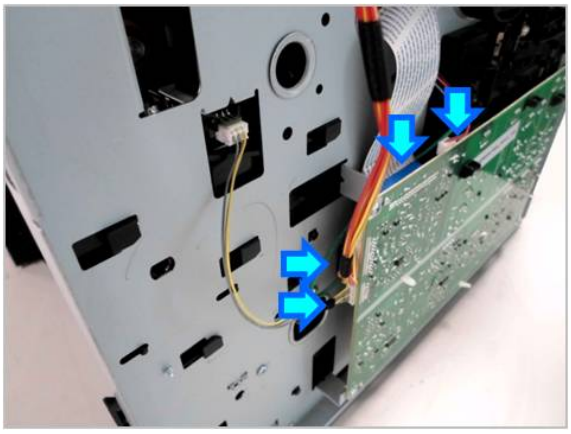


4. Remove the E-ring. Then, remove the duplex clutch.

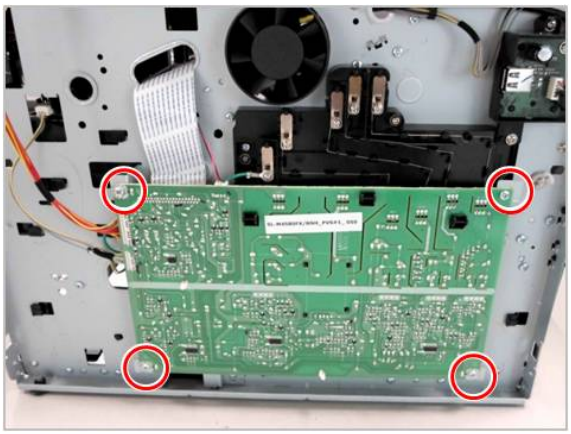


3.3.15. HVPS board

1. Remove the left cover. (Refer to 3.3.3.)
2. Unplug all cables from the HVPS board.



3. Remove 4 screws. Then release the HVPS board.



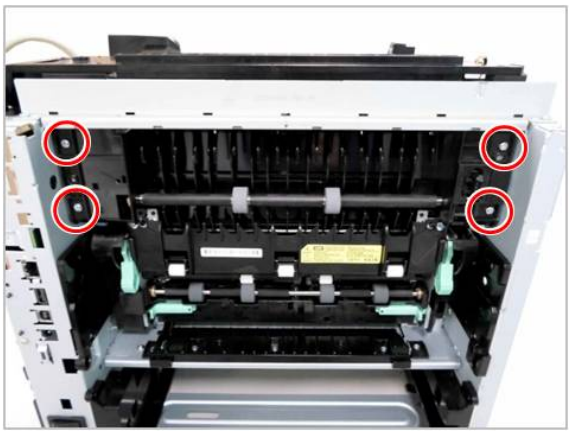
3.3.16. Exit Unit

1. Remove the rear/front/left/right cover. (Refer to 3.3.1~3.)
2. Remove the fuser unit. (Refer to 3.2.1.)
3. Remove the middle cover. (Refer to 3.3.7.)
4. Remove 2 screws. Then release the bracket.

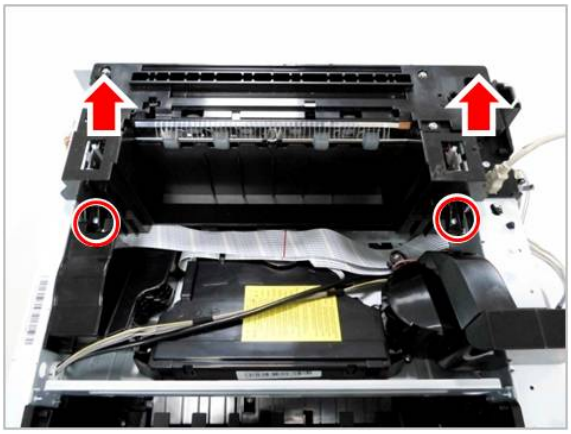
NOTE

When reassembling the exit unit, first tighten these screws to secure the frame and bracket.

5. Remove 4 screws from the rear.

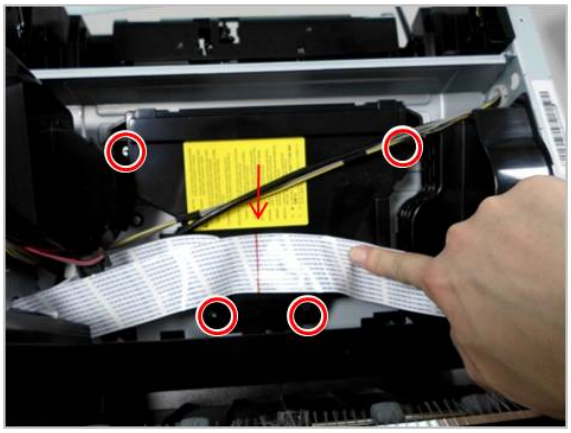


6. Remove 2 screws. Release the Exit unit after pull it to the rear slightly.



3.3.17. LSU

1. Remove the middle cover. (Refer to 3.3.17.)
2. Remove the flat cable on the LSU.
3. Remove 4 screws. Unplug the cable. And release the LSU.

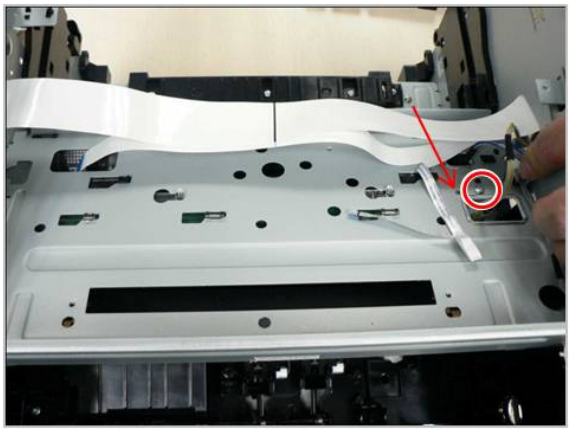


NOTE

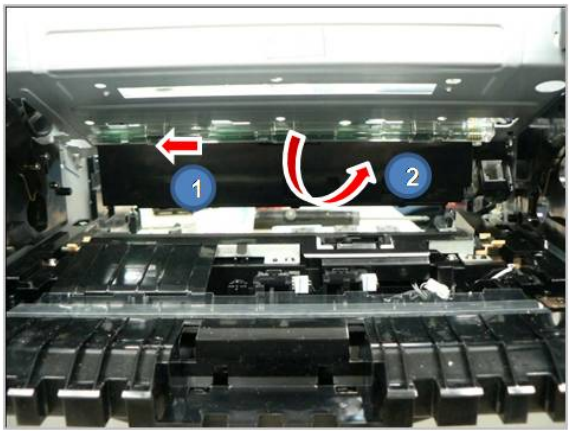
When reassembling the LSU, place the harness center line to the arrow on the LSU.

3.3.18. Eraser Lamp PBA

1. Remove the LSU. (Refer to 3.3.17.)
2. Remove 1 screw and push 1 hook.

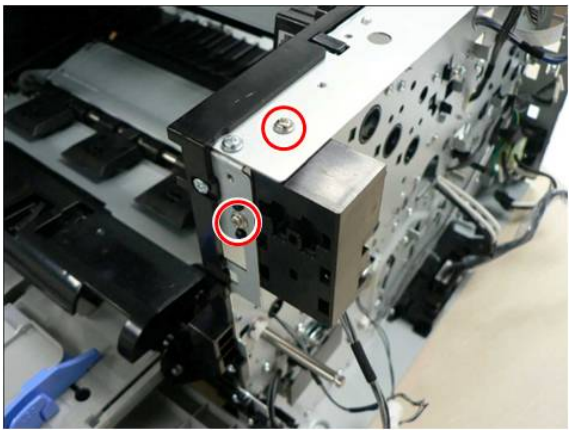


3. Pull the eraser lamp PBA to the left slightly. And then release it.



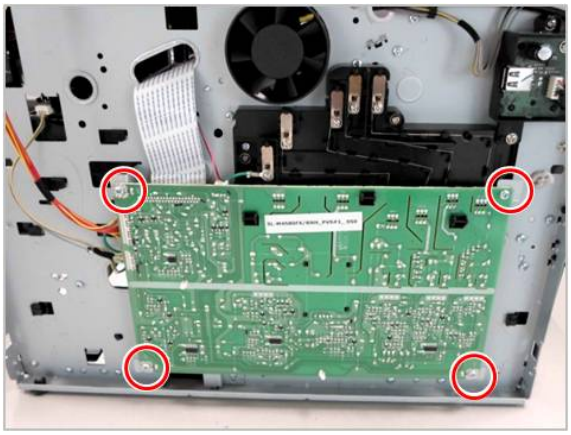
3.3.19. Cover Open PBA

1. Remove the right cover. (Refer to 3.3.3.)
2. Remove the middle cover. (Refer to 3.3.7.)
3. Remove 2 screws. Then release the Cover Open PBA.

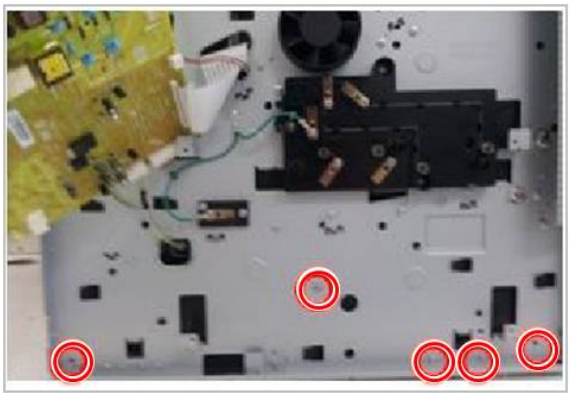


3.3.20. Pick up Assy

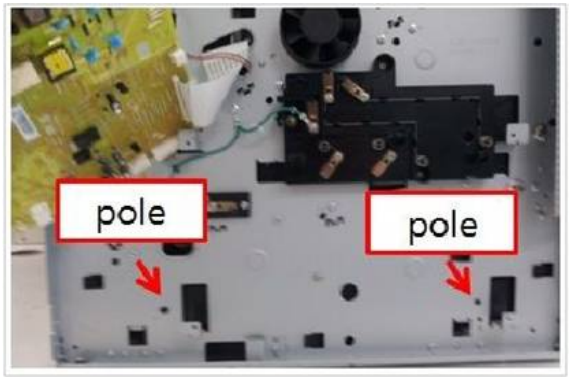
1. Remove the right / left cover. (Refer to 3.3.3.)
2. Remove 4 screws securing the HVPS board.



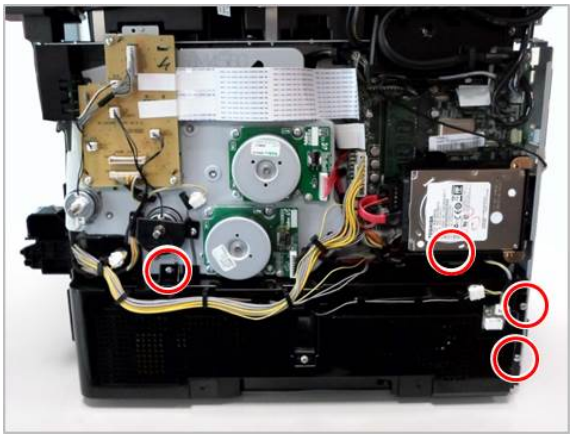
3. Remove 5 screws.



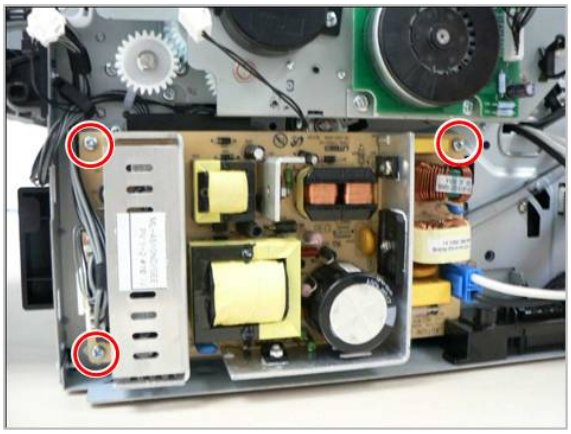
4. Pull and release the Cassette Guide L while pushing its 2 poles.



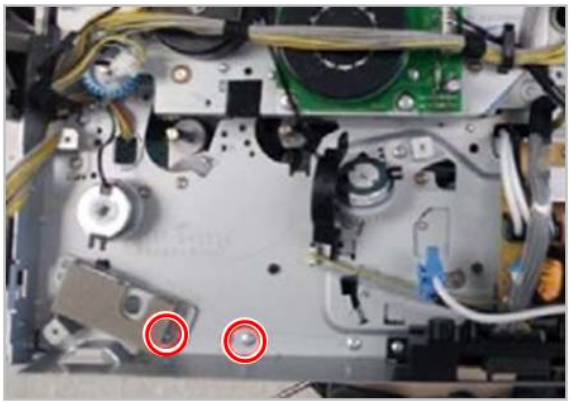
5. Remove 4 screws. Then remove the SMPS cover.



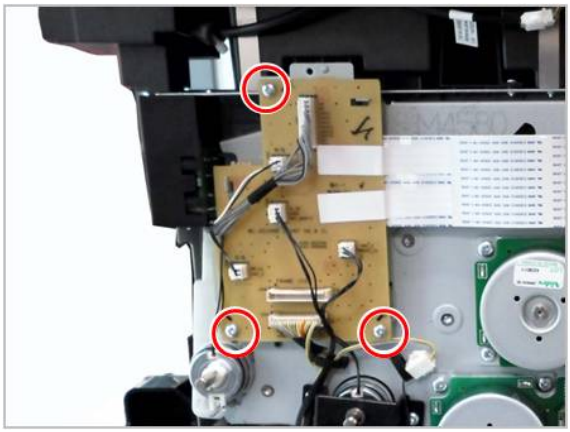
6. Remove 3 screws. Then release the SMPS board.



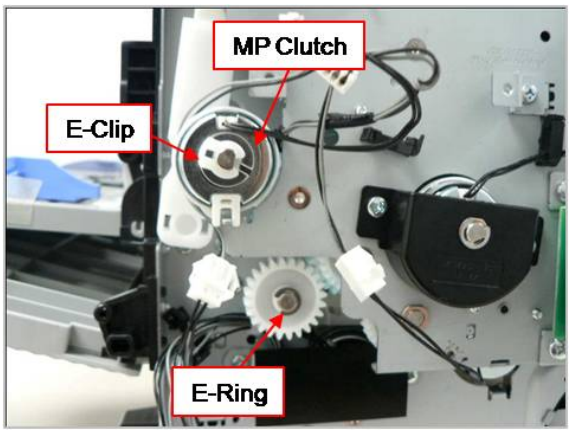
7. Remove 2 screws.



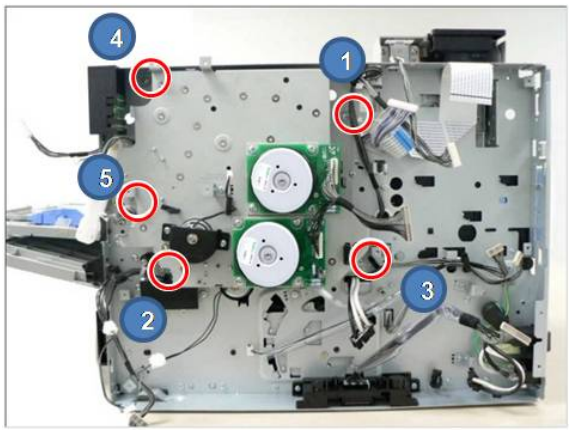
8. Remove the Joint PBA after removing 3 screws.



9. Remove the MP clutch. Remove the gear after removing the E-Ring.



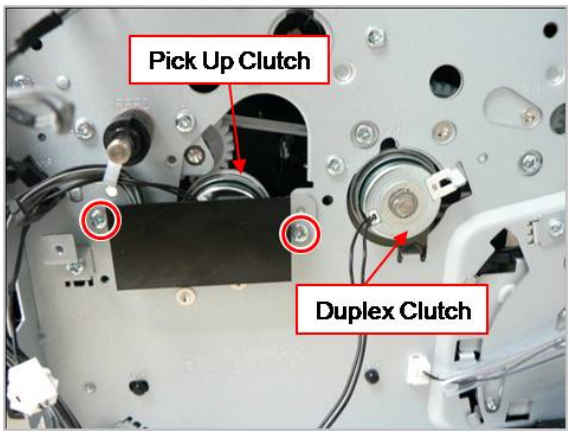
10. Remove the main drive unit after removing 5 screws.



NOTE

When reassembling the main drive unit, tighten 5 screws in order as shown above.

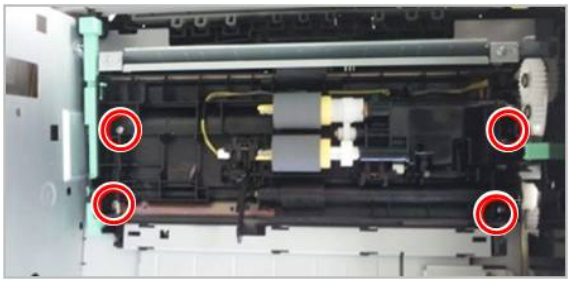
11. Remove the duplex clutch and pick up clutch.



12. Release the duplex belt.

13. Remove 2 washers. Then release 2 gears.

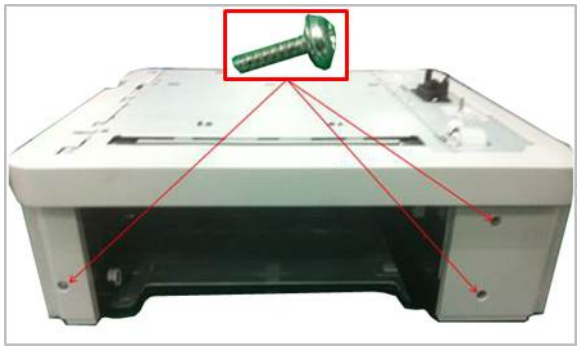
14. Remove 4 screws. Then release the Pick up Assy.



3.3.21. Second Cassette Feeder (Optional Tray)

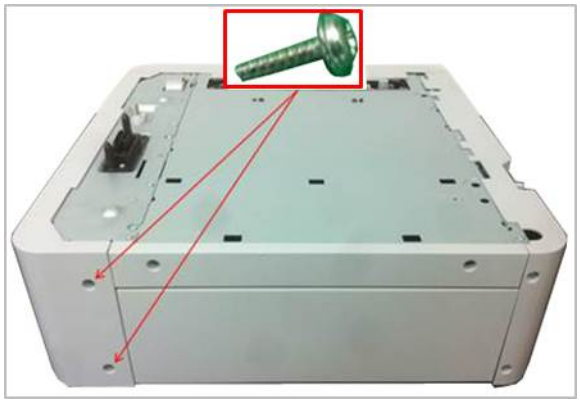
3.3.21.1. PBA-SCF

1. Remove the SCF cassette.
2. Remove 3 screws.

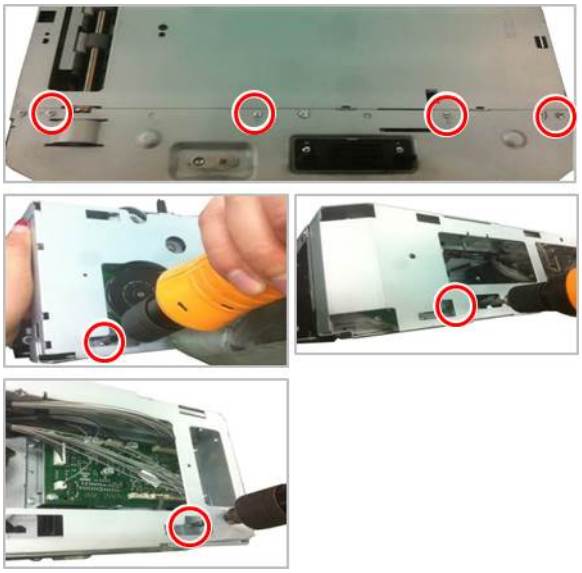


3. Remove the Cover Dummy Front.

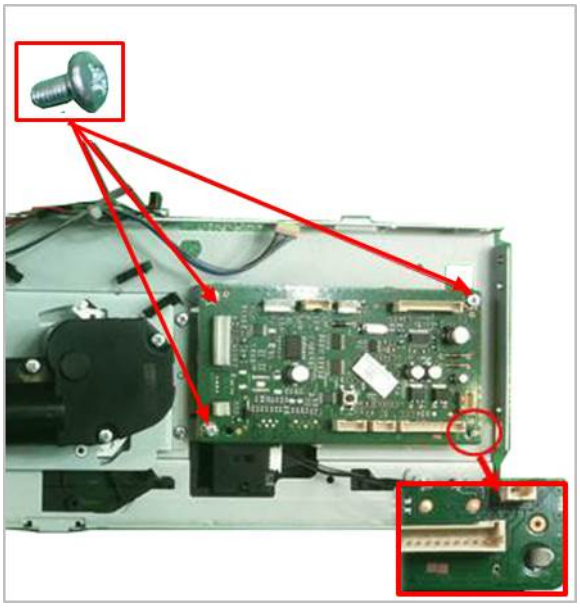
4. Remove 2 screws. Then, remove the Cover-Right.



5. Remove 7 screws. Then, remove the Frame Dummy Right.

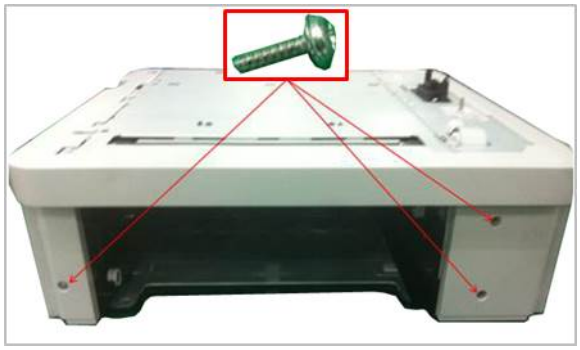


6. Remove 3 screws. Then, release the PBA-SCF.



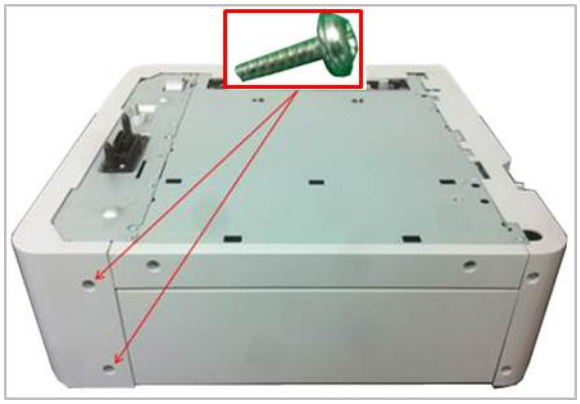
3.3.21.2. Lift Unit

1. Remove the SCF cassette.
2. Remove 3 screws.



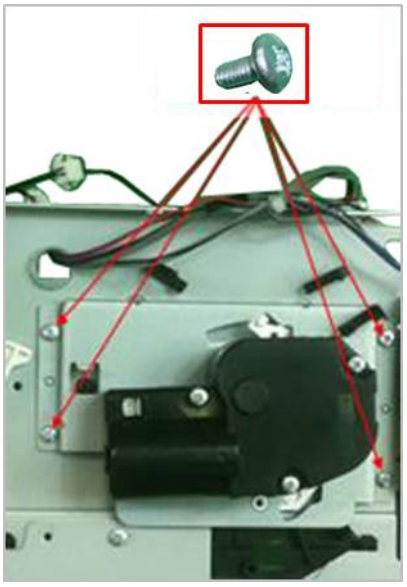
3. Remove the Cover Dummy Front.

4. Remove 2 screws. Then, remove the Cover-Right.



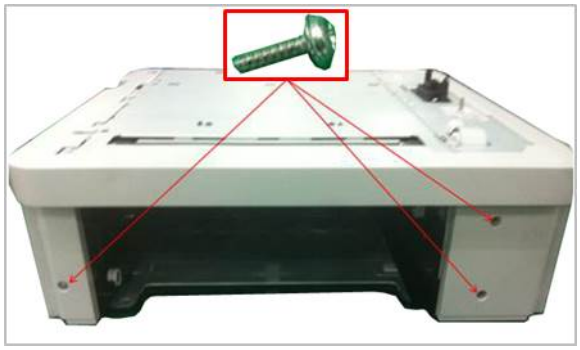
5. Remove 7 screws. Then, remove the Frame Dummy Right.

6. Remove 4 screws. Then, release the Lift Unit.



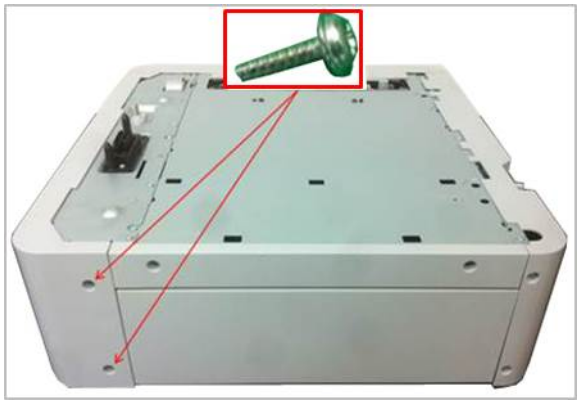
3.3.21.3. Clutch

1. Remove the SCF cassette.
2. Remove 3 screws.

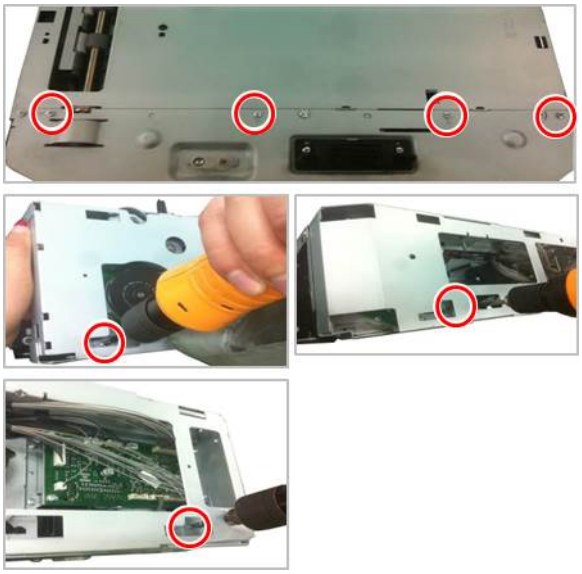


3. Remove the Cover Dummy Front.

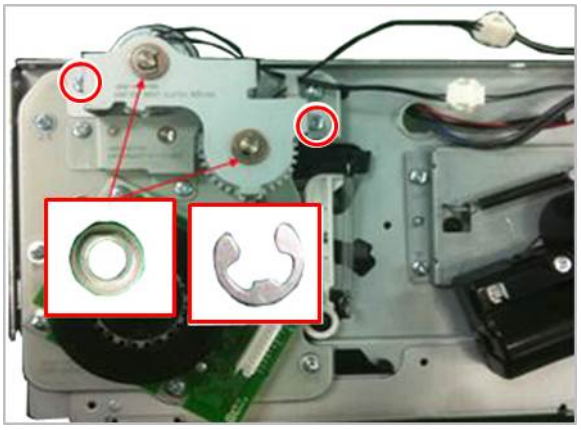
4. Remove 2 screws. Then, remove the Cover-Right.



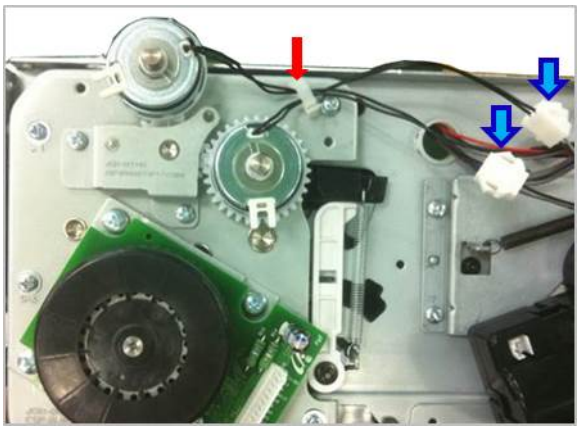
5. Remove 7 screws. Then, remove the Frame Dummy Right.



6. Remove 2 E-RINGs and 2 BUSHs. Remove 2 screws. And then, remove the bracket.

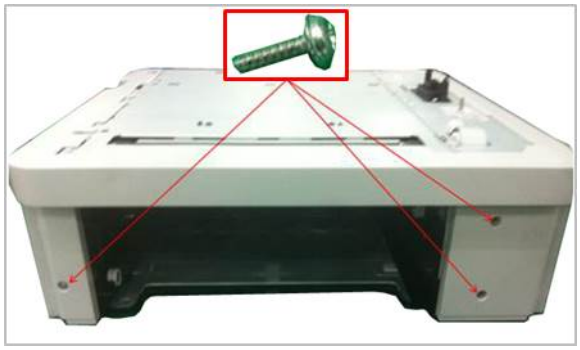


7. Open the harness clamp. Unplug the clutch connector. And then, release the clutch.



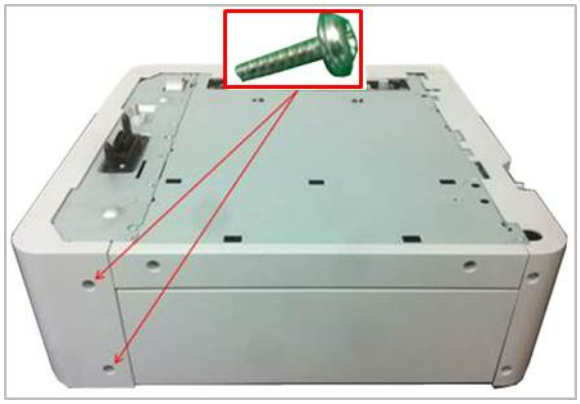
3.3.21.4. Drive Unit

1. Remove the SCF cassette.
2. Remove 3 screws.



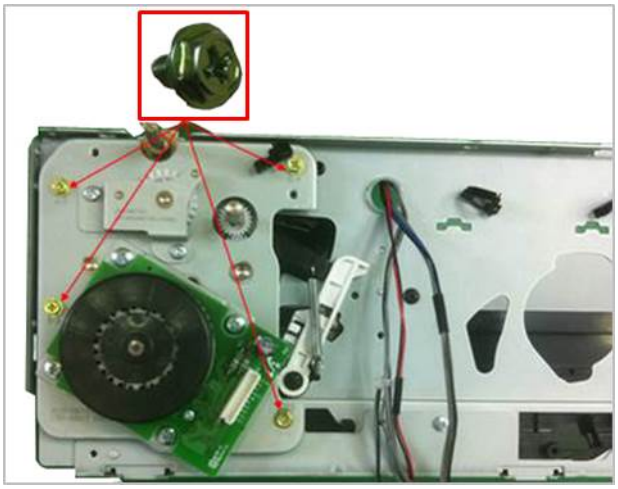
3. Remove the Cover Dummy Front.

4. Remove 2 screws. Then, remove the Cover-Right.



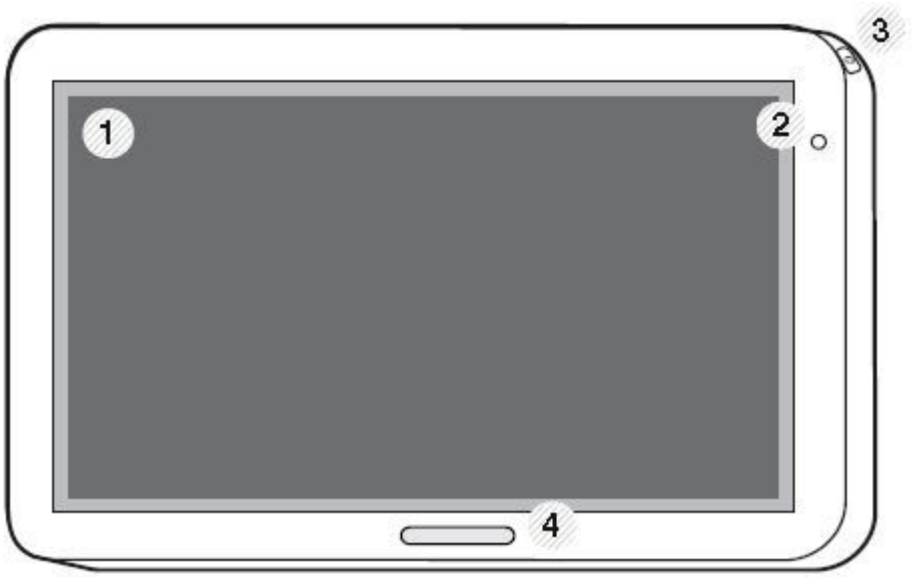
5. Remove 7 screws. Then, remove the Frame Dummy Right.

6. Remove 4 screws. Then, release the Drive Unit.



4. Troubleshooting

4.1. Control panel



1	Display screen	Shows the current machine status and prompts during an operation. You can set menus easily using the display screen.
2	Power LED	Shows the power status of your machine.
3	Power / Wakeup button	Turn the power on or off. When the blue LED is on, the machine is powered on and you can use it. If you turn the machine off, press this button for more than two seconds. Then, confirmation window appears.
4	Status LED	Shows the status of your machine.

4.2. Understanding the status LED

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

NOTE

- To resolve the error, look at the error message and its instructions from the troubleshooting part.
- You also can resolve the error with the guideline from the computers' Samsung Printer Status program window.

Status LED

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.	
Blue	On	The machine is on-line and can be used.	
	Blinking	Fax	The machine is sending or receiving faxes.
		Copy	The machine is copying documents.
		Scan	The machine is scanning documents.
		Print	• When the status LED slowly blinks, the machine is receiving data from the computer. • When the status LED blinks rapidly, the machine is printing data.
Orange	On	• 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. • A paper jam has occurred. • The waste toner container is not installed in the machine or it is full. • A toner cartridge has reached its estimated cartridge life*.	
	Blinking	• A toner cartridge has almost reached its estimated cartridge life*. It is recommended to replace the toner cartridge. • 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.	

NOTE

* 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 may be affected by operating environment, printing interval, media type, and media size. Some amount of toner may remain in the cartridge even when the orange LED is on and the printer stops printing.

Power LED

Status		Description
Off		The machine is off-line.
Blue	On	• The machine is on-line and can be used. • The machine is in power save mode. When data is received, or any screen is pressed, it switches to on-line automatically.

4.3. Updating Firmware

This chapter includes instructions for updating the printer firmware. You can update the printer firmware by using one of the following methods :

- Update the firmware by using the printer control panel
- Update the firmware by using the network.

4.3.1. Updating from the Printer Control Panel

WARNING

Failure to follow these instructions could lead to corruption issues and prevent the proper operation of this printer. Follow all of the instructions carefully.

1) Download the firmware file from the Global Service Partner Network (GSPN) or Technical Support Portal (TSP) website.
2) Unzip the firmware file to a folder on your PC.
3) Copy the firmware file (*.hds or *.par) to a USB flash drive.
4) Plug the USB flash drive into the USB port.
5) Press the button on control panel in this order. (**Settings > Admin Settings > Application Management > Application > Install**)
6) The installation window will list the files on the USB drive. Touch the name of the firmware file to select it.
7) Press the “OK” button after selecting the file.
8) Once the installation is complete, “OK” button will be activated. Press “OK” button.

4.3.2. Updating from the Network

WARNING

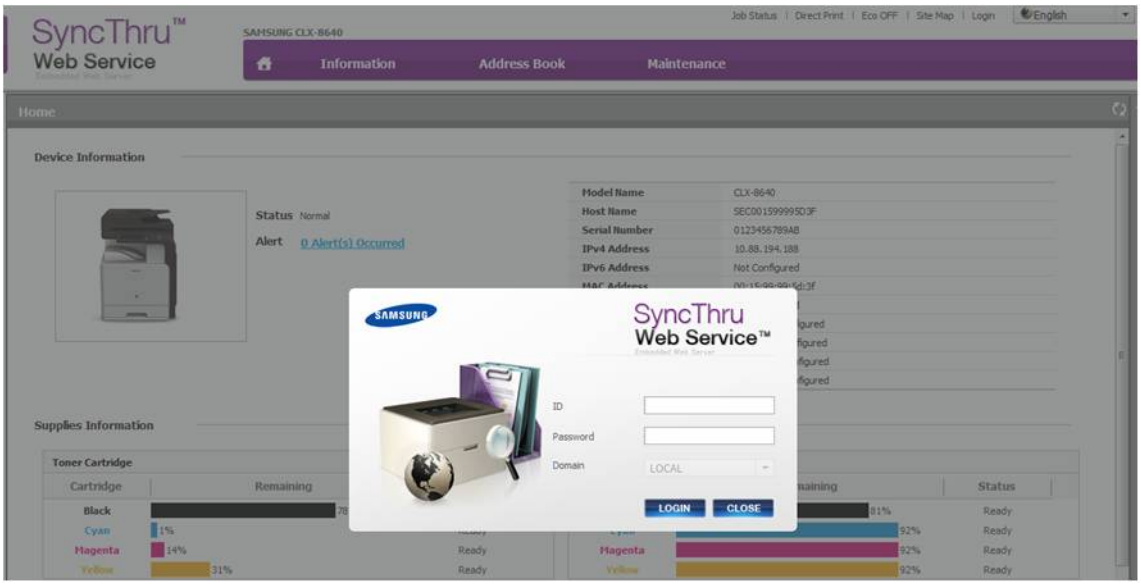
Failure to follow these instructions could lead to corruption issues and prevent the proper operation of this MFP. Follow all of the instructions carefully.

Perform the following procedure to update the MFP firmware from the network.

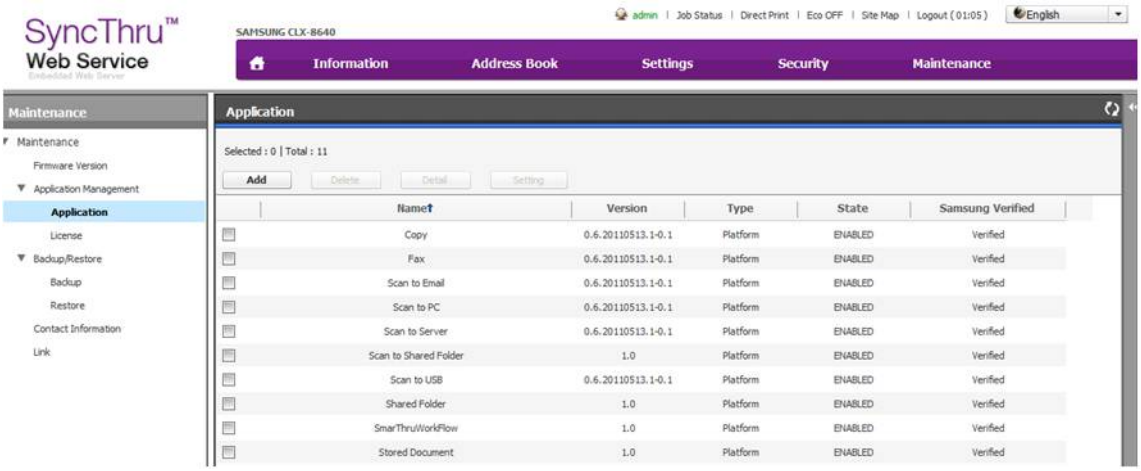
1) Go to the SyncThruWeb Service (SWS) main home page. Login as Admin in Sync Thru Web Service.

NOTE

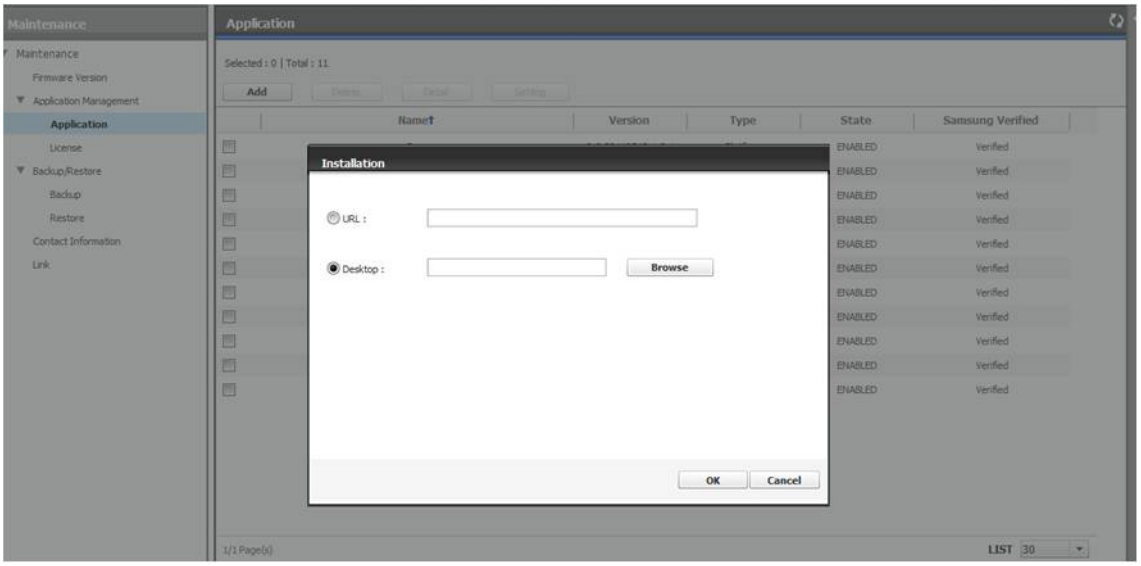
Login using the Administrator ID and Password established during initial machine setup.



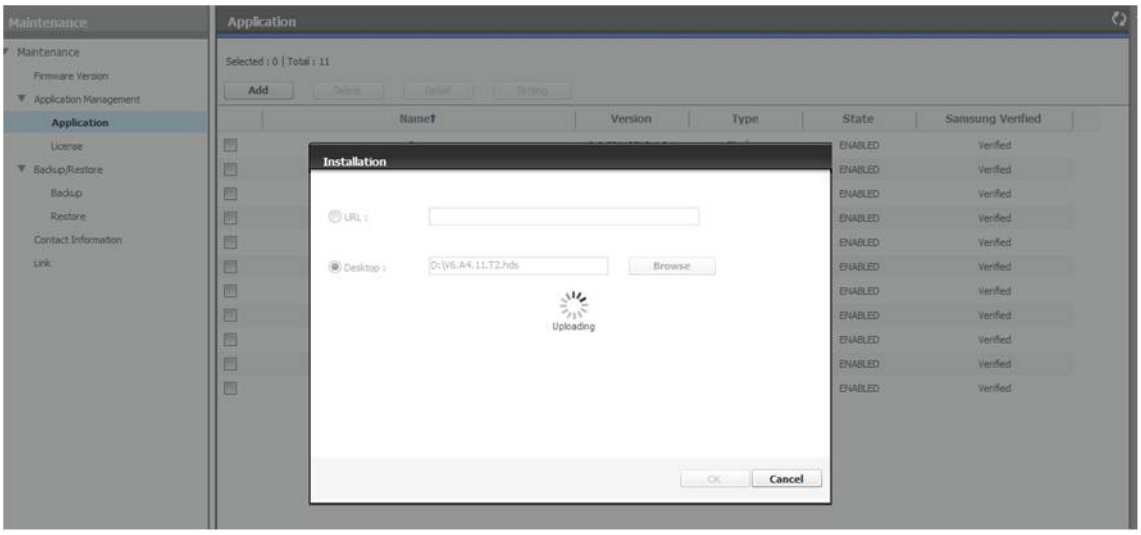
2) Click on **Maintenance > Application Management > Application > Add**.



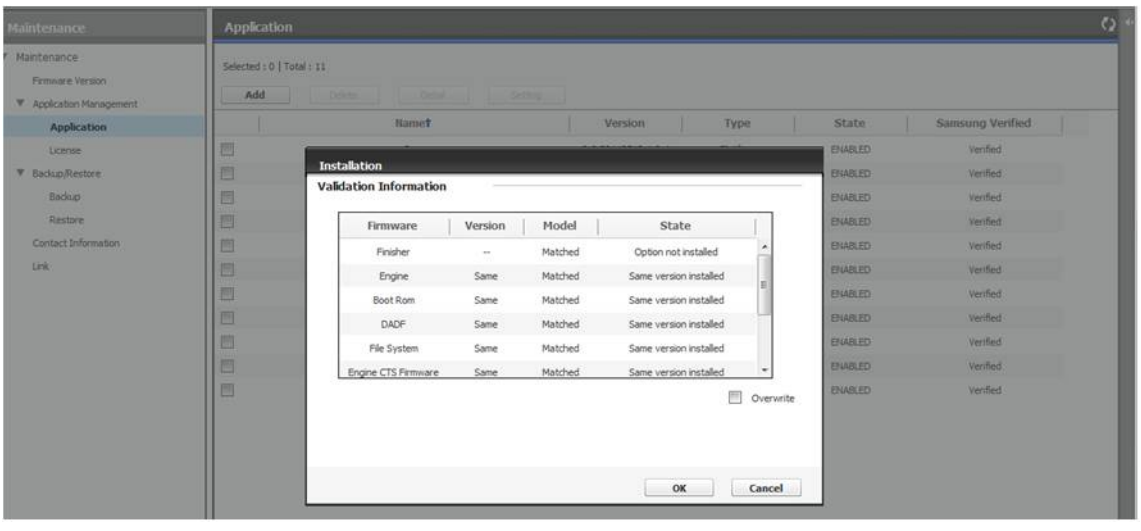
3) Choose installation file (F/W file) by browsing the file system and click [**OK**].



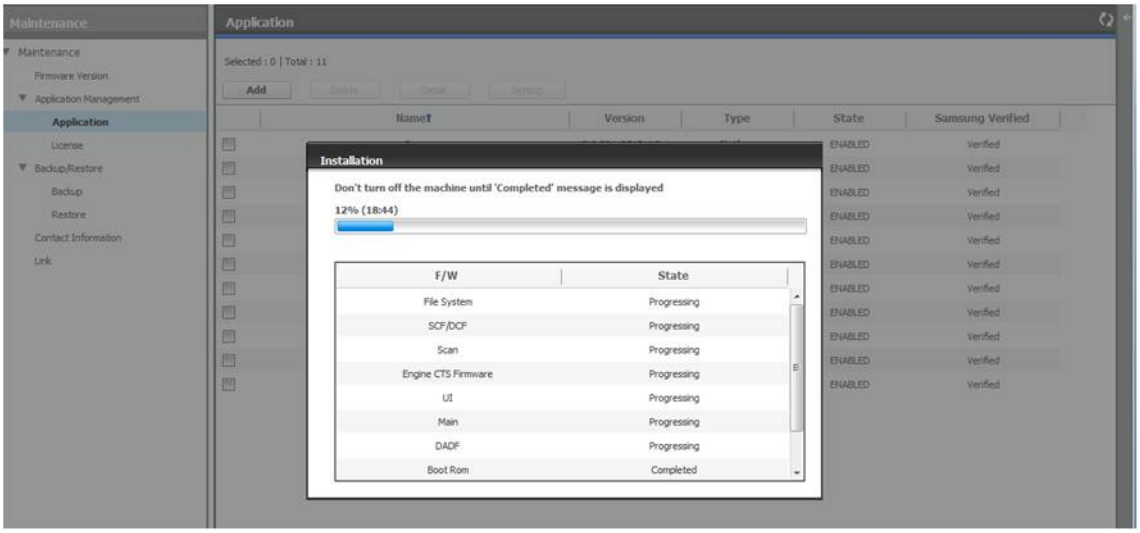
4) The uploading step will start.



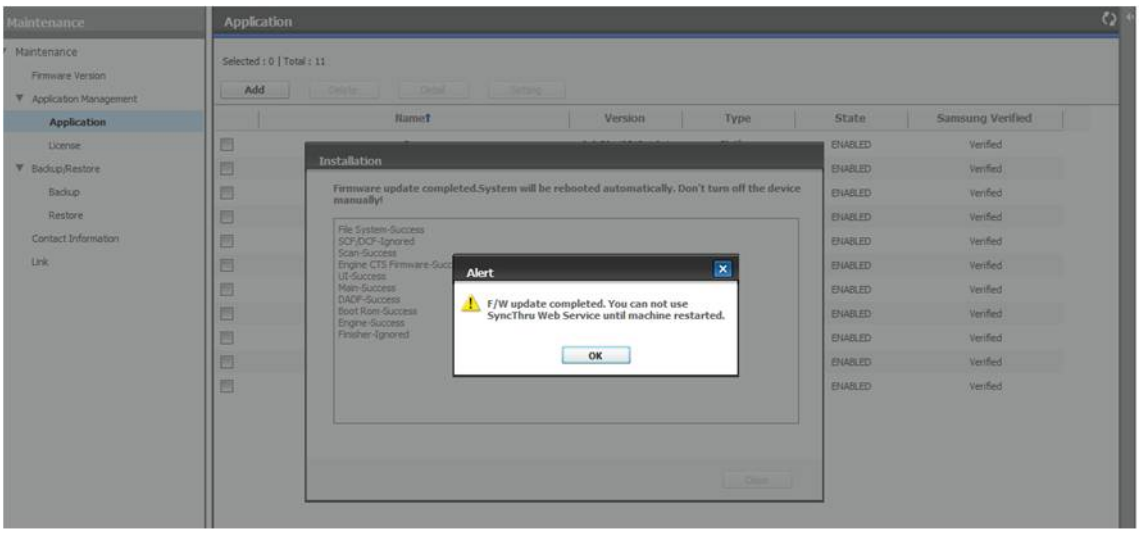
5) After uploading the f/w file on MFP, validation information will appear. Check the [**Overwrite**] check-box if you want to force the firmware update even if the firmware version to be installed is lower or same with the currently installed firmware in the device. Press [**OK**] to start the firmware upgrade.



6) The firmware update will start.



7) Once the installation is complete, the machine power-off and power-on automatically.



4.4. JAM removal

4.4.1. Clearing original document jams

When an original jams while passing through the Dual scan document feeder(DSDF), a warning message appears on the display screen.

CAUTION

To avoid tearing the document, remove the jammed document slowly and gently.

NOTE

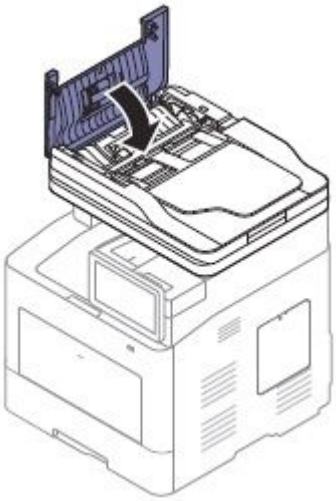
To prevent document jams, use the scanner glass for thick, thin, or mixed paper-type originals.

Original paper jam in front of scanner

1) Open the DSDF cover.

2) Gently remove the jammed paper from the DSDF.

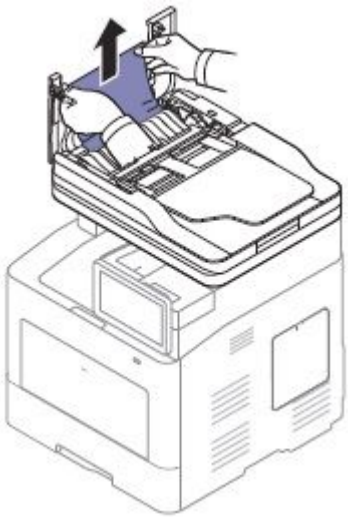
3) Close the DSDF cover.



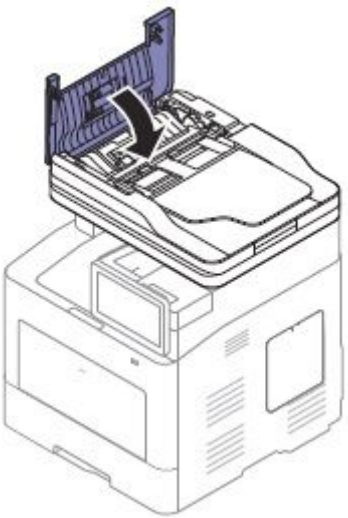
Original paper jam inside of scanner

1) Open the DSDF cover.

2) Gently remove the jammed paper from the DSDF.

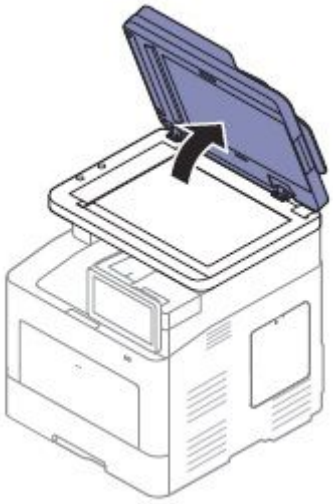


3) Close the DSDF cover.

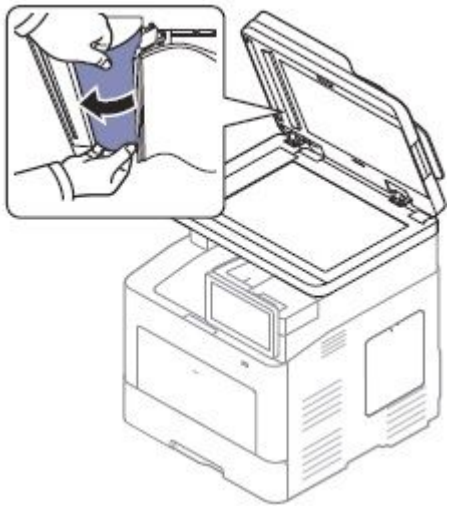


If you do not see the paper in this area, stop and go to next step:

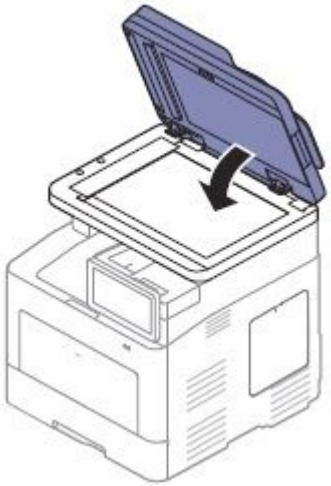
4) Open the DSDF.



5) Grasp the misfeed paper, and remove the paper from the feed area by carefully pulling it using both hands.

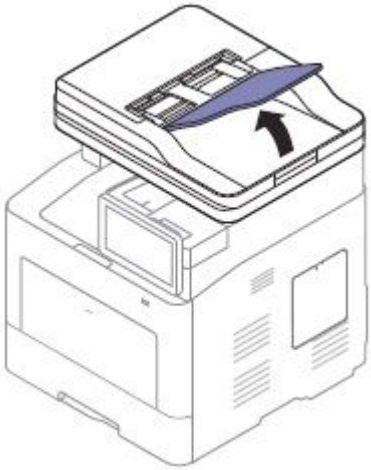


6) Close the DSDF.

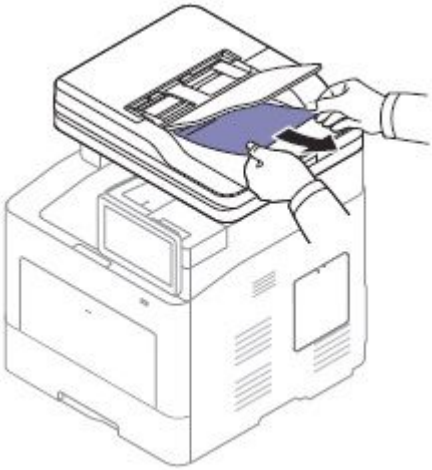


Original paper jam in exit area of scanner

1) Open the DSDF input tray.



2) Gently remove the jammed paper from the DSDF.



3) Close the DSDF input tray.

4.4.2. Clearing paper jams

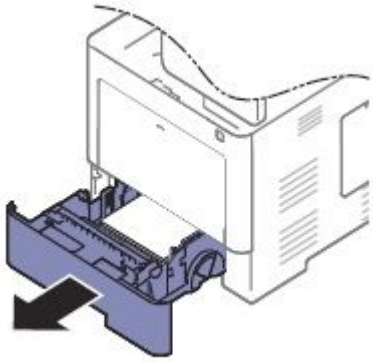
When a paper jam occurs, a warning message appears on the display screen.

NOTE

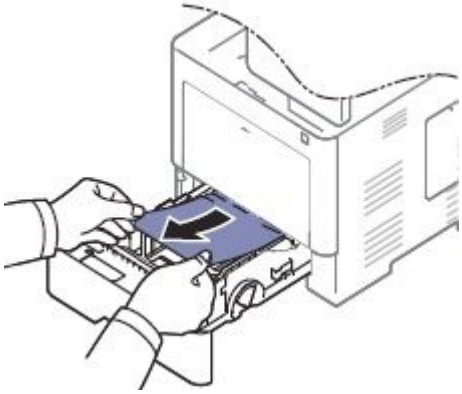
To avoid tearing the paper, pull the jammed paper out slowly and gently. Follow the instructions in the following sections to clear the jam.

Paper jam in tray 1

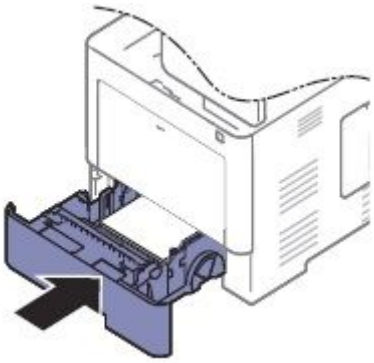
1) Pull out tray 1.



2) Remove the jammed paper from the machine.

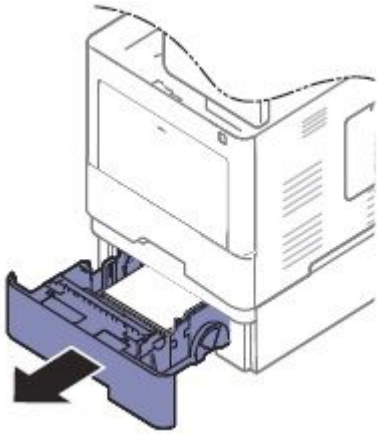


3) Insert the tray 1.

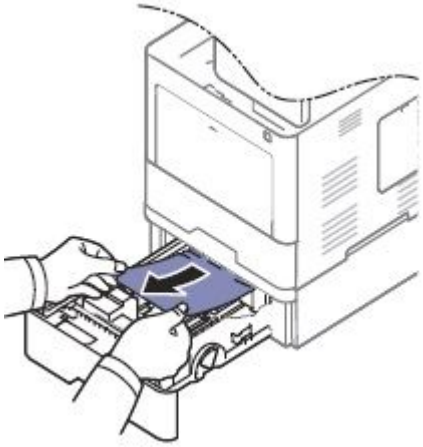


Paper jam in optional tray

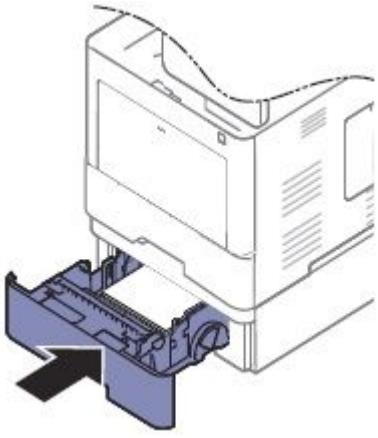
1) Pull out tray 2.



2) Remove the jammed paper from the machine.

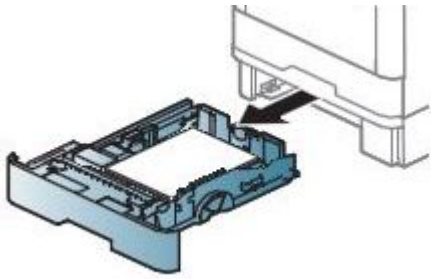


3) Insert tray 2.

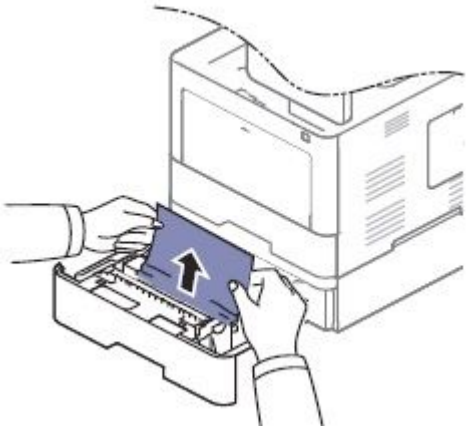


If you do not see the paper in this area, stop and go to next step:

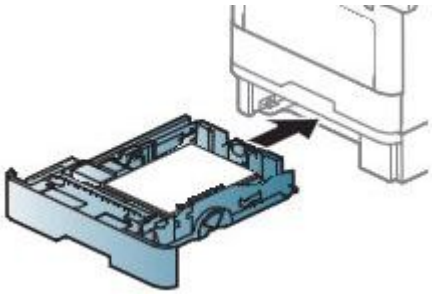
4) Pull out tray 2.



5) Remove the jammed paper by gently pulling it straight out.

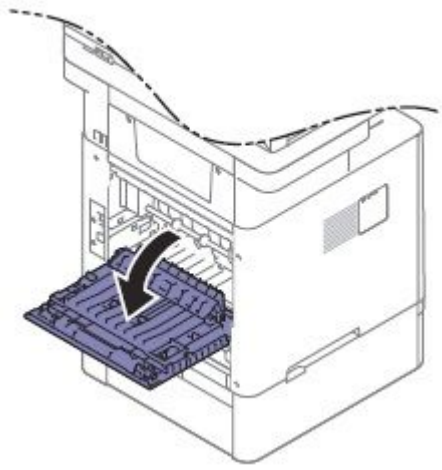


6) Insert the tray 2.

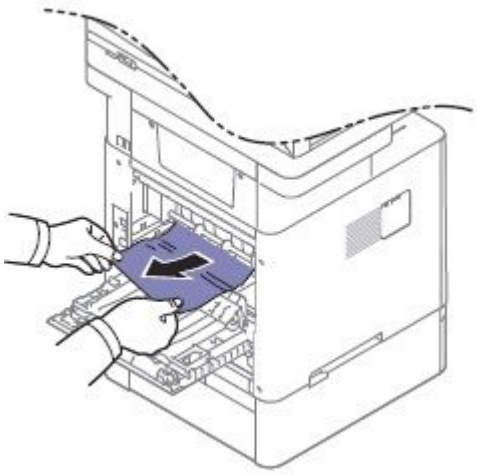


If you do not see the paper in this area, stop and go to next step:

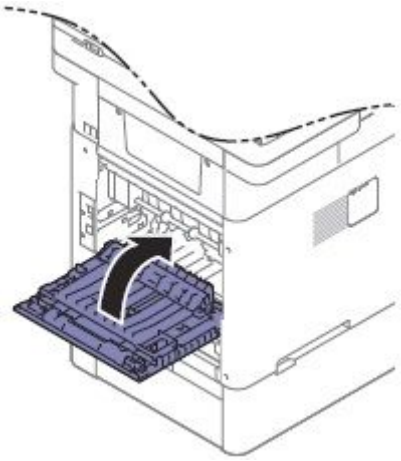
7) Open the rear cover.



8) Remove the jammed paper by gently pulling it straight out.

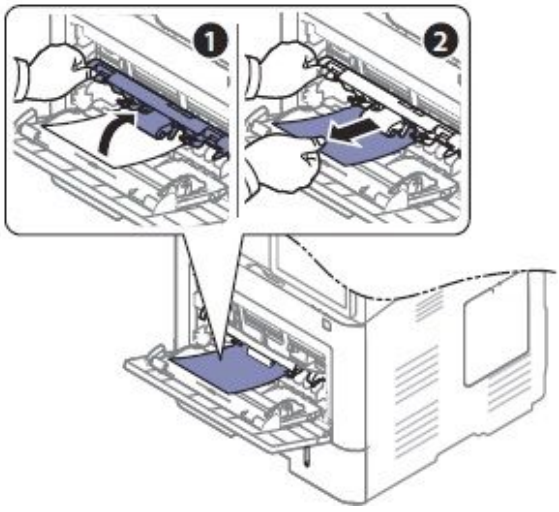


9) Close the rear cover.



Paper jam in the multi-purpose tray

1) Remove the jammed paper while lifting up the MP cover.

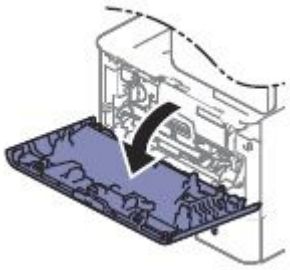


Paper jam inside the machine

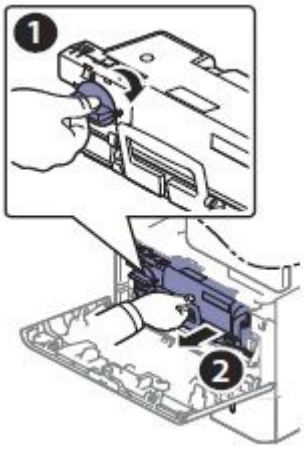
CAUTION

The fuser area is hot. Take care when removing paper from the machine.

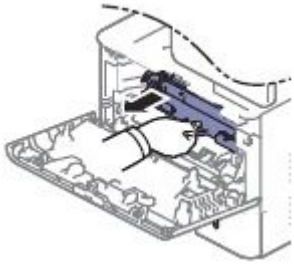
1) Open the front cover.



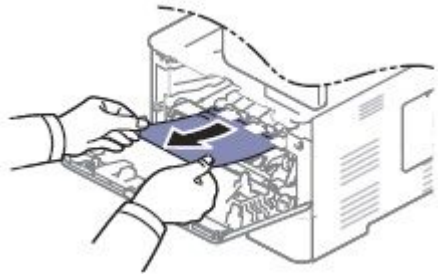
2) Remove the toner cartridge.



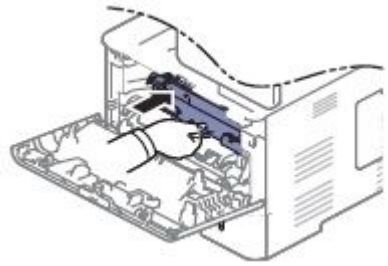
3) Remove the imaging unit.



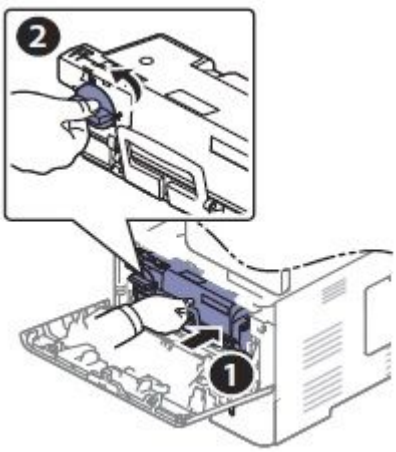
4) Remove the jammed paper by gently pulling it straight out.



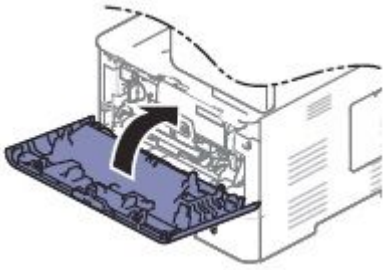
5) Insert the imaging unit.



6) Insert the toner cartridge.

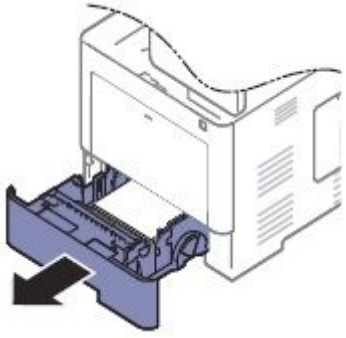


7) Close the front cover.



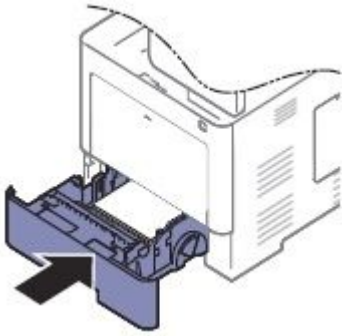
If you do not see the paper in this area, stop and go to next step:

8) Pull out the tray 1.



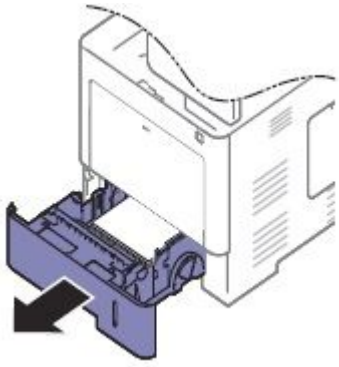
9) Remove the jammed paper by gently pulling it straight out.

10) Insert the tray 1.

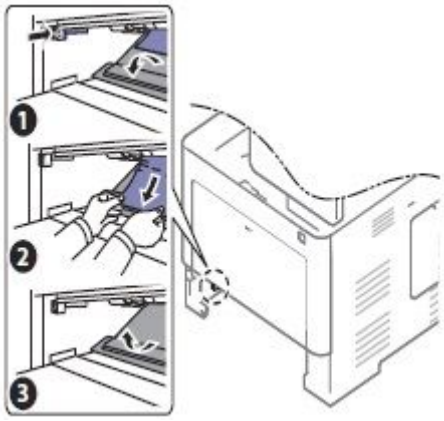


If you do not see the paper in this area, stop and go to next step:

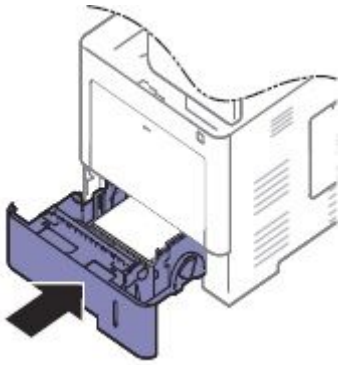
11) Pull out the tray 1.



12) Remove the jammed paper by gently pulling it straight out.



13) Insert the tray 1.

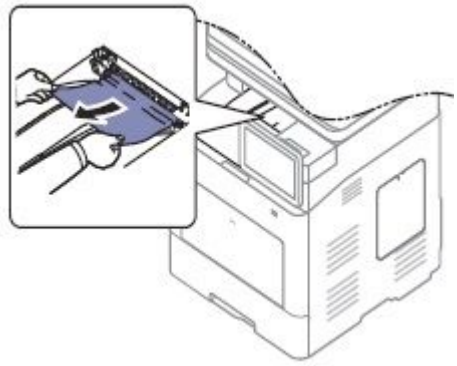


Paper jam in exit area

CAUTION

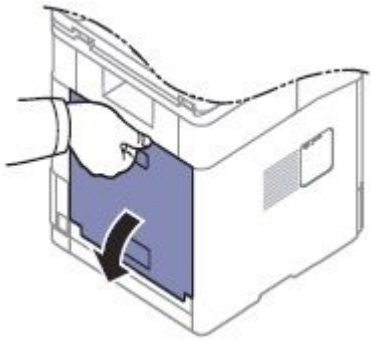
The Fuser area is HOT, please wait until device cools down before accessing this area. Turn power off to cool the machine down. Take care when removing paper from the machine.

1) Gently pull the paper out of the output tray.

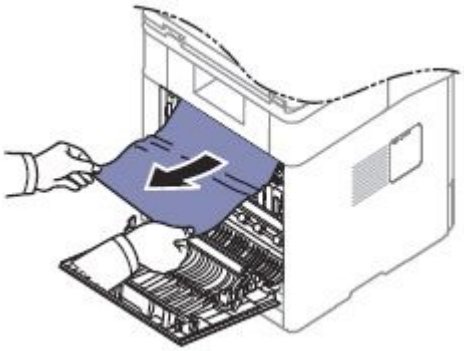


If you do not see the paper in this area, stop and go to next step:

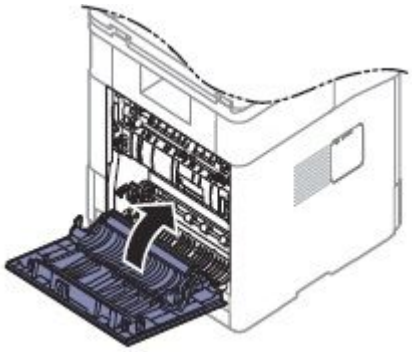
2) Open the rear cover.



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

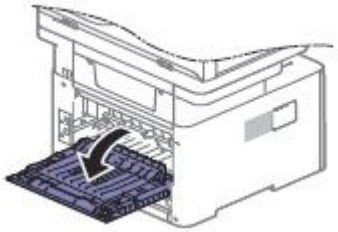


4) Close the rear cover.

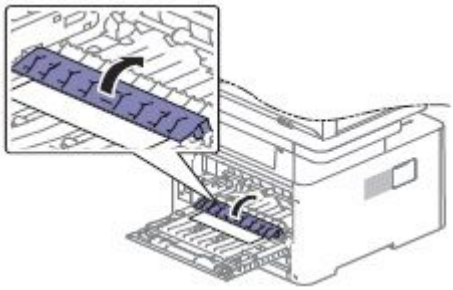


Paper jam in duplex unit area

1) Open the rear cover.

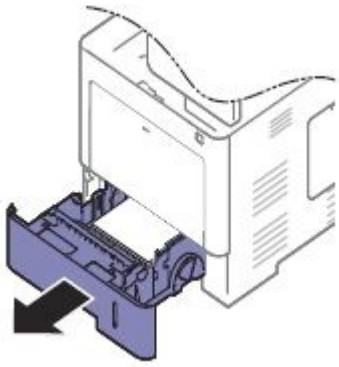


2) Remove the jammed paper by gently pulling it straight out.

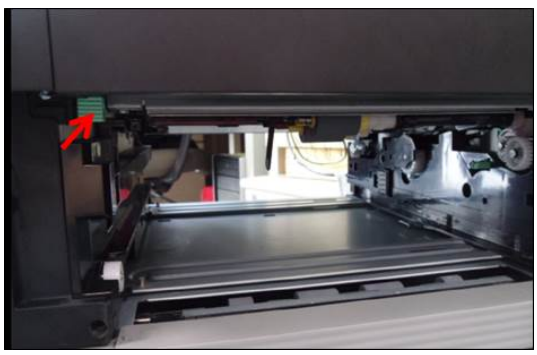


If you do not see the paper in this area, stop and go to next step:

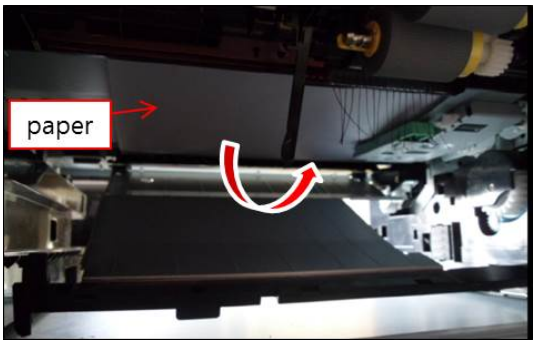
3) Pull out the tray 1.



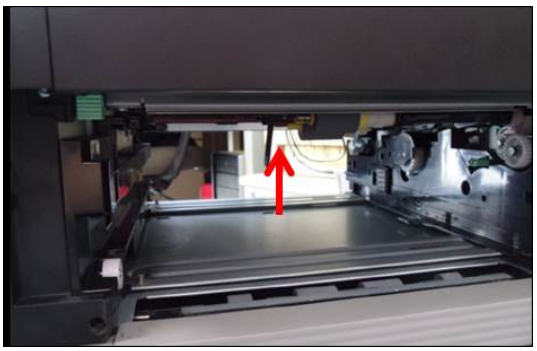
4) Push the duplex jam removal button.



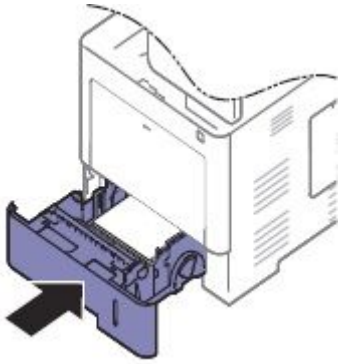
5) Remove the jammed paper by gently pulling it straight out.



6) Close the duplex plate.



7) Insert the tray 1.

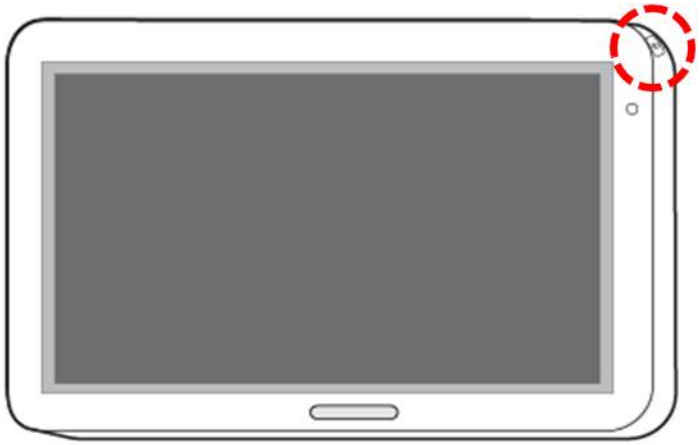


4.5. Service Mode

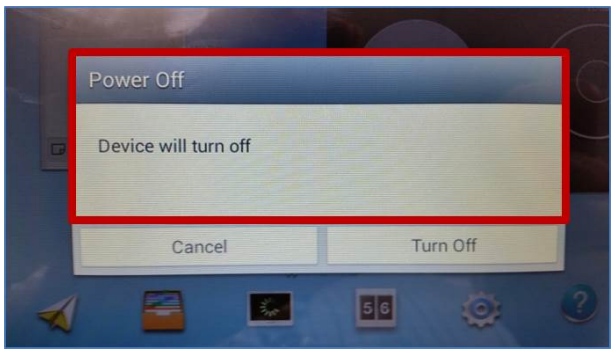
4.5.1. Entering the Service Mode

To enter the service mode,

1) Press "Power button".



2) When the pop-up window is displayed, press pop-up area except “Cancel” and “Turn Off” button until the password window will be displayed.



3) Enter “**1934**” and press the “Done” button.

4.5.2. Service Mode Menu Tree

a) Information Tab

Level 1	Level 2	Level 3	Level 4	Page
Information	General			P.4–22
	Supply Status	Customer Replacement Unit	Toner	P.4–22
		Field Replacement Unit	Imaging Unit	
			Finisher	
			Transfer	
			Fuser	
			Roller	
			ADF Roller	
	Software Version			P.4–22
	Service Hours	Power On Hours		P.4–23
		Power Save Hours		
	Fault Log			P.4–23
	Print Reports	Supplies Information		P.4–23
		Usage Counter		
		Error Information		
		Fax Protocol Dump		
		Job Duty		
		Maintenance		
	Export Reports	RTF Format		P.4–23
		XML Format		
		PDF Format		

b) Maintenance Counts Tab

Level 1	Level 2	Level 3	Level 4	Page
Maintenance Counts	Fault Counts			P.4–24
	Jam Count	Print Jam	Pick-up Jam	P.4–24
			Feed Jam	
			Duplex Jam	
			Exit Jam	
			Finisher Jam	
		Scan Jam	Feed Jam	
			Regi Jam	
			Scan Jam	
			Exit Jam	
			Duplex Regi Jam	
			Duplex Scan Jam	
			Duplex Exit Jam	
	Part Replacement Count	Toner Cartridge		P.4–25
		Imaging Unit		
		Transfer		
		Fuser		
		Roller		
		ADF Roller		

c) Diagnostics Tab

Level 1	Level 2	Level 3	Level 4	Page
Diagnostics	Engine Diagnostics	Engine NVM Initialization		P.4–26
		Engine NVM Read/Write		P.4–26
		Engine Test Routines		P.4–26
	Fax Diagnostics	Fax NVM Read/Write		P.4–30
		Fax Test Routines		P.4–31
	Scanner Diagnostics	Shading Test	Shade and Print Report	P.4–33
			Print Last Shade Report	
			Shade and Print Report (ADF)	
			Print Last Shade Report (ADF)	
		Scanner/ADF Test Routines		P.4–34
	Adjustment	Print Adjustment	Automatic Adjustment	P.4–35
			Image Position	P.4–36
			Print Test Patterns	
		Copy Adjustment	Image Position	P.4–37
		Scan Area Adjustment	Manual Adjustment	P.4–38
		ADF Adjustment	Manual Adjustment	P.4–39
	Print Test Patterns	Skew Pattern		

d) Service Functions

Level 1	Level 2	Level 3	Level 4	Page
Service Functions	Main Memory Clear			P.4–40
	Hard Disk Maintenance	Device Configuration Data Clear		P.4–40
		Temporary & Spool Data Clear		
		User Saved Data & Log Clear		
		All Saved Data Clear		
		HDD Encryption		
	Network Port	Enable Telnet		P.4–40
		Enable OSGI		
		Enable Samba		
		Enable SSH		
		Enable ADB		
	Debug Log	Off / Job Status / Details		P.4–41
	Capture Log	All / Period		P.4–41
	Network Packet Capture			P.4–42
	System Recovery	SYS / ALL		P.4–43
	Clear System Cache			P.4–44
	Hibernation			P.4–44
	Paper Low Warning Message	Off / On		P.4–45
	Part Replacement Alert	Imaging Unit		P.4–45
		Fuser		
		Transfer Unit		
	FDI	Type A / Type B / Type C		P.4–45
	EIUL	Off / On		P.4–45
	SFE			P.4–45

4.5.3. Information

4.5.3.1. General

- **Information > General**

  This menu displays the machine serial number, network information, total printed impressions, and the machine installed date.

4.5.3.2. Supply Status

Customer Replacement Unit (CRU)

- **Information > Supply Status > Customer Replacement Unit**

  This menu displays the machine's customer replacement unit status. Users can select one item in the list to check the information of the selected unit.

Field Replacement Unit (FRU)

- **Information > Supply Status > Field Replacement Unit**

  This menu displays the machine's field replacement unit status. Users can select one item in the list to check the information of the selected unit.

In this menu, there are five columns : Item, Threshold, Status, Count, Maximum Life.

- Status : This shows the current status of the selected item.
  - OK : The current count is smaller than the default warning value
  - Check : The current count is bigger than default warning value
  - OFF : The current count exceeds the max life.
- Count : This shows the current count of the selected item.
- Maximum life : This shows the max capacity of the selected item.

The technician can edit the default warning value within the given threshold.

Selecting some items will enable the reset button to reset the current count to 0 after replacing the unit.

4.5.3.3. Software Version

- **Information > Software Version**

  This menu displays all the version of the software installed in the system in detail.

4.5.3.4. Service Hours

- **Information > Service Hours**

  This menu displays two items, “Power on Hours”, “Power Save Hours”.

  - Power on Hours : It indicates the hours of system power on since the first booting of the system.
  - Power Save Hours : It indicates the hours of system power save since the first booting of the system.

4.5.3.5. Fault Log

- **Information > Fault Log**

  This menu displays faults occurred while the system was operating.

  Pressing clear button will clear all the save fault log of the system.

4.5.3.6. Print Reports

- **Information > Print Reports**

  This menu displays reports which that can be printed from the system. The following reports will be available to print.

  - Supplies Information
  - Usage Counter
  - Error Information
  - Fax Protocol Dump
  - Fax Diagnostics
  - Job Duty
  - Maintenance
  - Toner Event

4.5.3.7. Export Reports

- **Information > Export Reports**

  This menu exports report to usb stick. Configuration, Error Information, Supplies Information, Usage Counter Reports are exported as the form of selected format.

4.5.4. Maintenance Counts

4.5.4.1. Fault Count

- **Maintenance Counts > Fault Count**

This menu displays the fault counts of the system. Technician can select one fault group and press “OK” to see detailed fault descriptions. The detailed fault description window displays engine diagnostic code and descriptions of the fault along with the number of occurrences.

The following list shows the group of the faults defined for the system.

A1 Motor	M1 Input (Trays) System	S5 UI System
A2 Fan	M2 Media Path System	S6 Network System
A3 Sensor	M3 Output (Bins) System	S7 HDD System
C1 Toner Cartridge Unit	M4 Auto Document Feeder System	U1 Fusing Unit
C3 Imaging Unit	S1 Video System	U2 LSU Unit
C7 Fusing unit	S2 Engine System	
H1 Input (Trays) System	S3 Scan System	
H2 Output (Bins) System	S4 Fax System	

4.5.4.2. Jam Count

- **Maintenance Counts > Jam Count**

This menu displays the jam Counts of the system. Users can select one jam group, which indicates the location of jams, and press “OK” to see a detailed jam location along with the occurrence of the jam.

The following table shows the jam groups defined for the system :

Level 1	Level 2
Print Jam	Pick-up Jam
	Feed Jam
	Duplex Jam
	Exit Jam
Scan Jam	Feed Jam
	Regi Jam
	Scan Jam
	Exit Jam
	Duplex Regi Jam
	Duplex Scan Jam
	Duplex Exit Jam

4.5.4.3. Part Replacement Count

- **Maintenance Counts > Part Replacement Count**

This menu displays the replacement Counts for the system parts. Users can select one part group and press “OK” to see the exact name of the part along with the occurrence of the replacement.

The following table shows groups of the replaceable parts of the system.

Unit	Item	Sensing Method
Toner Cartridge	Toner (Black)	Auto Sensing
Imaging Unit	Imaging Unit (Black)	Auto Sensing
Fuser	Fuser	Auto Sensing
Transfer	Transfer Roller	Count Clear
Roller	Tray 1 Roller	Count Clear
	Tray 1 Retard Roller	Count Clear
	Tray 2 Roller	Count Clear
	Tray 2 Retard Roller	Count Clear
	Tray 3 Roller	Count Clear
	Tray 3 Retard Roller	Count Clear
	Tray 4 Roller	Count Clear
	Tray 4 Retard Roller	Count Clear
	MP Roller	Count Clear
	MP Retard Roller	Count Clear
ADF Roller	ADF Roller	Count Clear
	ADF Retard Roller	Count Clear

4.5.5. Diagnostics

4.5.5.1. Engine Diagnostics

Engine NVM Initialization

- Diagnostics > Engine Diagnostics > Engine NVM Initialize
  This menu initializes all engine NVM value to the default.

NVM Read/Write

- **Diagnostics > Engine Diagnostics > NVM Read/Write**

Purpose	To change a configuration value for engine firmware.
Operation Procedure	When the main “NVM Read/Write” window displays, users can navigate through the list of codes with descriptions and saved values. Users can also input a code to the text box to find a configuration value directly. After selecting one value, pressing “Edit” button will open an interface for user input.
Verification	N/A
Specification	N/A
Reference	N/A

Code	NVM Description	Meaning	Default	Max/Min
105-0030	MHV DC Black (MHV Bias Control)	Charger HV Black DC Duty	10	0~20
106-0030	Deve DC Black (Deve Bias Control)	Deve DC Black	10	0~20
106-0124	Black Blade DC	Blade DC Black	10	0~20
107-0030	Transfer1 High Voltage(THV) Black (THV Bias Control)	Transfer1 HV Black Duty	10	0~20
107-0170	Transfer1 High Voltage(THV) Duplex Black (THV Bias Control)	Transfer1 HV Black Duplex Duty	10	0~20
109-0010	Run Temperature offset	Target Temperature during run mode.	10	0~20
110-0070	LD Power Black (LD Light Level Black)	Black LD Power at Normal Speed	10	0~20

Engine Test Routines

- **Diagnostics > Engine Diagnostics > Engine Test Routines**

Purpose	To perform test routines for the engine.
Operation Procedure	When the main Engine Test Routines window displays, users can navigate through the list of routines that display along with their descriptions. Users can also directly input an EDC code to the text box to find a routine. Users can select a maximum of 3 routines at the same time. After selecting one or multiple routines, pressing the “OK” button will open the test window that lists selected routines. Users can start/stop a desired test routine.
Verification	N/A
Specification	N/A
Reference	N/A

Code	Changed Displayed Name	Meaning
100-0000	Main BLDC Motor	Main BLDC Motor is On/Off
100-0010	Main BLDC Motor Ready	Detect if Main BLDC Motor runs at normal speed
100-0061	Black DEV Motor	Black DEV BLDC Motor is On/Off
100-0071	Black DEV Motor Ready	Detect if Black DEV BLDC Motor runs at normal speed
100-0074	Opc Fan Run	Start/Stop Opc Fan run
100-0075	Opc Fan Ready	Detects if Opc Fan runs at normal speed.
100-0120	Exit Motor Forward Fast	Exit Motor Forward Fast On/Off
100-0131	Exit Motor Backward	Exit Motor Forward Backward On/Off
100-0140	Duplex Motor Forward	Duplex Motor Forward On/Off
100-0200	T1 Elevating Motor	T1 Elevate Motor On/Off
100-0260	SMPS Fan Run	Start/Stop SMPS Fan run
101-0000	Bypass Feed Clutch	Engages drive to pick up a paper from bypass Tray(MP Tray).
101-0010	T1 Pick-Up Clutch	Engages drive to pick up a paper from tray1.
101-0020	T2 Pick-Up Clutch	Engages drive to pick up a paper from tray2. (Optional)
101-0030	T3 Pick-Up Clutch	Engages drive to pick up a paper from tray3. (Optional)
101-0040	T4 Pick-Up Clutch	Engages drive to pick up a paper from tray4. (Optional)
101-0050	Registration Clutch	Engages drive to registartion rolls.
101-0060	Duplex Feed Clutch	Engages drive to feed a paper into duplex path.
101-0171	Cover Open Sensor	Detect if the front cover is opened or closed.
101-0190	Out-Bin Full Sensor	Detect when a paper is at Out-Bin Full Sensor
101-0251	FuserGapEnable	FuserGapEnable
102-0000	Tray1 Home Position	Detect when tray1 is closed.
102-0010	T1 Paper Empty Sensor	Detect when paper is in Tray1.
102-0020	T1 Size1 sensor	Detects whether auto size1 sensor of tray1 is high or low.
102-0030	T1 Size2 sensor	Detects whether auto size2 sensor of tray1 is high or low.
102-0040	T1 Size3 sensor	Detects whether auto size3 sensor of tray1 is high or low.
102-0050	T1 Stack Height Sensor	Detects if paper in tray1 is elevated to the sensor.
102-0060	T1 Paper Low Sensor	Detects when the stack height of tray1 is less than 25%.
102-0070	Tray2 Home Position	Detect when tray2 is closed.
102-0080	T2 Paper Empty Sensor	Detect when paper is in tray2.
102-0090	T2 Size1 sensor	Detects whether auto size1 sensor of tray2 is high or low.
102-0100	T2 Size2 sensor	Detects whether auto size2 sensor of tray2 is high or low.
102-0110	T2 Size3 sensor	Detects whether auto size3 sensor of tray2 is high or low.
102-0120	T2 Stack Height Sensor	Detects if paper in tray2 is elevated to the sensor.
102-0140	Tray3 Home Position	Detect when tray3 is closed.

Code	Changed Displayed Name	Meaning
102-0150	T3 Paper Empty Sensor	Detect when paper is in tray3.
102-0160	T3 Size1 sensor	Detects whether auto size1 sensor of tray3 is high or low.
102-0170	T3 Size2 sensor	Detects whether auto size2 sensor of tray3 is high or low.
102-0180	T3 Size3 sensor	Detects whether auto size3 sensor of tray3 is high or low.
102-0190	T3 Stack Height Sensor	Detects if paper in tray3 is elevated to the sensor.
102-0210	Tray4 Home Position	Detect when tray4 is closed.
102-0220	T4 Paper Empty Sensor	Detect when paper is in tray4.
102-0230	T4 Size1 sensor	Detects whether auto size1 sensor of tray4 is high or low.
102-0240	T4 Size2 sensor	Detects whether auto size2 sensor of tray4 is high or low.
102-0250	T4 Size3 sensor	Detects whether auto size3 sensor of tray4 is high or low.
102-0260	T4 Stack Height Sensor	Detects if paper in tray4 is elevated to the sensor.
102-0280	Bypass Paper Empty Sensor	Detects when paper is in Bypass Tray(MP Tray).
102-0290	Feed Sensor	Detect when a paper is at Feed sensor.
102-0300	T2 Feed Sensor (or Door Open)	Detect when a paper is at T2 Feed sensor. (optional)
102-0320	T3 Feed Sensor (or Door Open)	Detect when a paper is at T3 Feed sensor. (optional)
102-0340	T4 Feed Sensor (or Door Open)	Detect when a paper is at T4 Feed sensor. (optional)
102-0360	Regi. Sensor	Detect when a paper is at Regi. sensor.
102-0370	Exit Sensor	Detect when a paper is at Exit. sensor.
102-0380	Duplex Jam1 Sensor	Detect when a paper is at Duplex Jam1 sensor.
102-0440	Rear Cover Sensor	Detect status of Rear cover.
105-0030	Black MHV Bias	Black MHV bias voltage on at normal drive level
105-0070	Black MHV Bias Read	Black Detect what the MHV value is on the MHV Roller
106-0030	Black Dev Bias	Black Dev bias voltage on at normal drive level
106-0100	Black Blade DC	Black Blade DC
107-0030	Black THV Bias	Black THV bias voltage on at normal drive level
107-0031	Black THV(-) Bias	Black THV bias voltage on at normal drive level
107-0070	Black THV Bias Read	Detect what the THV value is on the THV Roller
107-0150	PTL1	Pre Transfer Lamp 1
107-0200	Eraser Abnormal Sensor	Eraser Abnormal Sensor Value
109-0000	Fuser Temperature A	Detects what the temperature A is on fuser.
109-0010	Fuser Temperature B	Detects what the temperature B is on fuser.
109-0012	Inner Temperature	Inner Temperature
109-0013	Outer Temperature	Outer Temperature
109-0014	Huminity	Huminity
109-0020	Fuser Fan Run Ready	Detects if Fuser Fan Motor runs at normal speed.

Code	Changed Displayed Name	Meaning
109-0030	Fuser Motor Forward	Fuser Motor Forward On/Off
109-0040	Fuser Fan Run	Fuser Fan Motor On/Off
109-0050	Fuser Bias	Fuser bias voltage on at normal drive level
109-0052	Fuser Minus Bias	Fuser Minus bias voltage on at normal drive level
109-0110	Fuser Crum Read1	Detect if the life of fuser1 is exhausted.
109-0140	Fuser Gap Home Sensor	Detect if the fuser press is located Home position.
110-0000	LSU Motor1 Run Ready	Detects if LSU motor1 runs at normal speed.
110-0020	LSU Fan1 Run Ready	Detects if LSU Fan Motor runs at normal speed.
110-0060	LSU Motor1 Run	LSU Motor1 On/Off
110-0110	LSU LD Power4	LSU LD4 Power On/Off (black)
110-0120	LSU Fan1 Run	Start/Stop LSU Fan Run
110-0170	LSU HSync4	Detect LSU HSync4 (black)
111-0030	Toner Dispense Motor Black	Toner Dispense(Supply) Motor On/Off
111-0070	Toner Sensor Black	TC sensor in developer tank.
111-0071	Toner Sensor Black2	TC sensor in developer tank.

4.5.5.2. Fax Diagnostics

Fax NVM Read/Write

- **Diagnostics > Fax Diagnostics Fax NVM Read/Write**

Purpose	To change a configuration value for fax firmware.
Operation Procedure	When the main “NVM Read/Write” window displays, users can navigate through the list of configuration values that display along with description. Users can also input a code to the text box to find a configuration value directly. After selecting one value, pressing “Edit” button will open an interface for user input.
Verification	N/A
Specification	N/A
Reference	N/A

Code	Displayed Name	Description
20-200	Pause Dial Time	Pause Time (value * 1000ms)
20-210	Dial Pulse M/B ratio	33 / 66 40 / 60
20-220	Auto Dial Start Pause Time	Pause time before auto-dialing (second)
20-300	Ring On Time	Ring On Time (ms)
20-310	Ring Off Time	Ring Off Time (ms)
20-320	Ring Detection Freq	sets the Call Indication frequency range that will be detected by LIU
20-330	Ring On Max Time	Ring On Max Time (ms)
20-340	Ring Off Max Time	Ring Off Max Time (ms)
20-400	DTMF High-Freq Level	DTMF High-Freq. Level (dBm)
20-410	DTMF Low-Freq Level	DTMF Low-Freq. Level (dBm)
20-420	DTMF Timing	DTMF duration of on/off output (Ms)
20-500	Dial Mode	Select Tone / Pulse
20-520	Error Rate	Adjust Error Rate (Off / 5% / 10% / 20%)
20-530	Dial Tone Detect	detect dial tone prior to sending
20-540	Loop Current Detect	detect if loop current is present prior to sending
20-550	Busy Signal Detect	detect busy signal to allow redials
20-560	TCF Duration	Adjust TCF duration (ms)
20-570	Continuous Frame	disables continuous TX frame command in Phase B. (DCS Only) Set to 0 if fax communication error occurs over VoIP network.
20-800	Modem Speed	Select Modem Start Speed
20-810	Fax Transmission Level	Adjust Fax Transmission Level (dBm)
20-830	Auto Dial Timeout	Adjust Auto Dial Timeout (second)
20-920	CNG Detection Count	CNG Tone Detection check count during ANS/FAX mode.
20-930	Caller ID	This option is needed to guide Caller ID off for user environment.
20-940	Ext. Phone	Ext. Phone Detection Enable/Disable (Default : Enable 1) If disabled, Ext. Phone cannot be detected by the device.

Fax Test Routines

- **Diagnostics > Fax Diagnostics > Fax Test Routines**

Purpose	To perform test routines for the fax machine.
Operation Procedure	When the main Fax Test Routines window displays, users can navigate through the list of routines that display along with description. Users can also input a code to the text box to find a routine directly. After selecting one routine, pressing “OK” button will open the test window that lists selected routine. Users can start/stop a desired test routine.
Verification	N/A
Specification	N/A
Reference	N/A

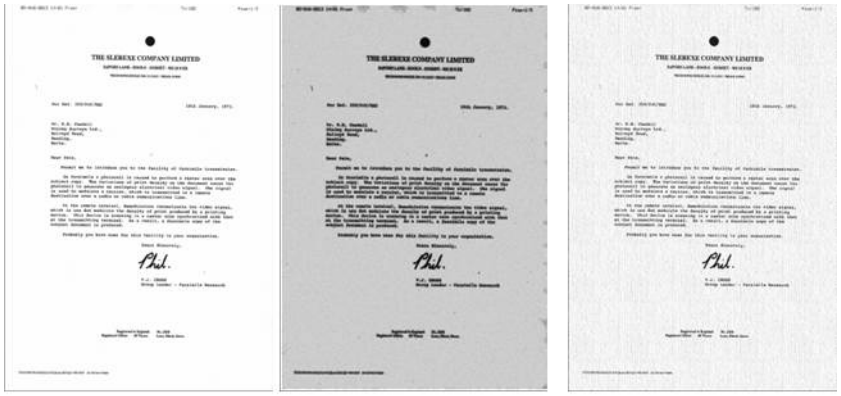
Code	Displayed Name	Description
20-012	Sngl Tone 1100Hz Ln1	Emits single tone 1100Hz on line 1
20-014	Sngl Tone 1650Hz Ln1	Emits single tone 1650Hz on line 1
20-015	Sngl Tone 1850Hz Ln1	Emits single tone 1850Hz on line 1
20-016	Sngl Tone 2100Hz Ln1	Emits single tone 2100Hz on line 1
20-020	DTMF # Line1	Emits DTMF # on line 1
20-021	DTMF * Line1	Emits DTMF * on line 1
20-022	DTMF 0 Line1	Emits DTMF 0 on line 1
20-023	DTMF 1 Line1	Emits DTMF 1 on line 1
20-024	DTMF 2 Line1	Emits DTMF 2 on line 1
20-025	DTMF 3 Line1	Emits DTMF 3 on line 1
20-026	DTMF 4 Line1	Emits DTMF 4 on line 1
20-027	DTMF 5 Line1	Emits DTMF 5 on line 1
20-028	DTMF 6 Line1	Emits DTMF 6 on line 1
20-029	DTMF 7 Line1	Emits DTMF 7 on line 1
20-030	DTMF 8 Line1	Emits DTMF 8 on line 1
20-031	DTMF 9 Line1	Emits DTMF 9 on line 1
20-040	V.21 300 bps Line1	Emits V.21 300 bps Line1
20-041	V.27ter 2400 bps Line1	Emits V.27ter 2400 bps Line1
20-042	V.27ter 4800 bps Line1	Emits V.27ter 4800 bps Line1
20-043	V.29 7200 bps Line1	Emits V.29 7200 bps Line1
20-044	V.29 9600 bps Line1	Emits V.29 9600 bps Line1
20-045	V.17 7200 bps Line1	Emits V.17 7200 bps Line1
20-046	V.17 9600 bps Line1	Emits V.17 9600 bps Line1
20-047	V.17 12000 bps Line1	Emits V.17 12000 bps Line1
20-048	V.17 14400 bps Line1	Emits V.17 14400 bps Line1
20-049	V.34 2400 bps Line1	Emits V.34 2400 bps Line1
20-050	V.34 4800 bps Line1	Emits V.34 4800 bps Line1
20-051	V.34 7200 bps Line1	Emits V.34 7200 bps Line1
20-052	V.34 9600 bps Line1	Emits V.34 9600 bps Line1
20-053	V.34 12000 bps Line1	Emits V.34 12000 bps Line1

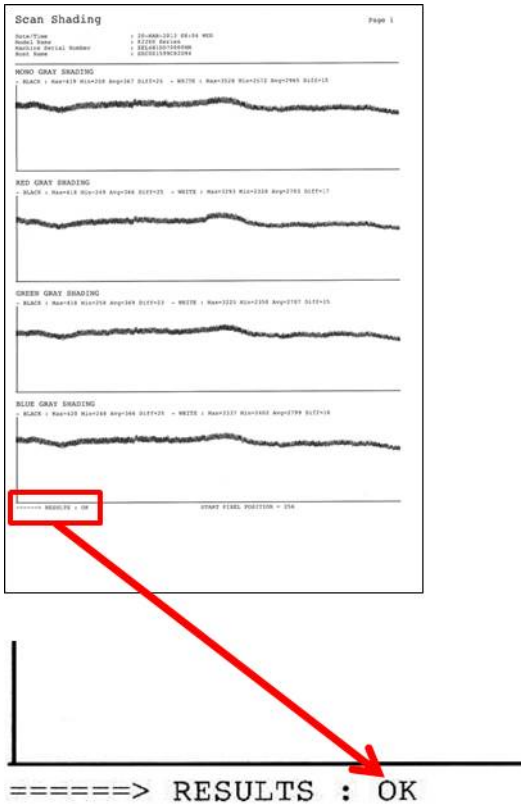
Code	Displayed Name	Description
20-054	V.34 14400 bps Line1	Emits V.34 14400 bps Line1
20-055	V.34 16800 bps Line1	Emits V.34 16800 bps Line1
20-056	V.34 19200 bps Line1	Emits V.34 19200 bps Line1
20-057	V.34 21600 bps Line1	Emits V.34 21600 bps Line1
20-058	V.34 24000 bps Line1	Emits V.34 24000 bps Line1
20-059	V.34 26400 bps Line1	Emits V.34 26400 bps Line1
20-060	V.34 28800 bps Line1	Emits V.34 28800 bps Line1
20-061	V.34 31200 bps Line1	Emits V.34 31200 bps Line1
20-062	V.34 33600 bps Line1	Emits V.34 33600 bps Line1

4.5.5.3. Scanner Diagnostics

Shading Test

- **Diagnostics > Scanner Diagnostics > Shading Test**

Purpose	• To check quality of scanned images, especially defect in optical devices, including lens, mirror, lamp, and etc, are suspected. • To check quality problem as shown below  Normal Image Defected Image Defected Image
Operation Procedure	**[For Platen Unit]** Press "Share and Print report“ to see if the current shading value is correct. Mono, red, green, blue gray shading values will be shown on the printed report. When the previous shading value is needed, press “Print Last Shade Report”. **[For DSDF Unit]** 1) Load the shading sheet on the DSDF tray. 2) Enter SVC mdoe. Select the following menu. (**Diagnostics > Scanner Diagnostics > Shading Test > Shade and Print Report(ADF)**) (When the previous shading value is needed, press “Print Last Shade Report(ADF)”.) 3) Check if RESULTS on the sheet is OK. **NOTE** • When executing DSDF shading, use only exclusive shading sheet(Xerox4200 LTR). • Before executing DSDF shading, DSDF CIS's cleanness should be checked. • Shading Test for ADF Unit must be carried out, after replacing the DSDF unit / Main board or updating the firmware.

Verification	

Scanner/ADF Test Routines

- **Diagnostics > Scanner Diagnostics > Scanner/ADF Test Routines**

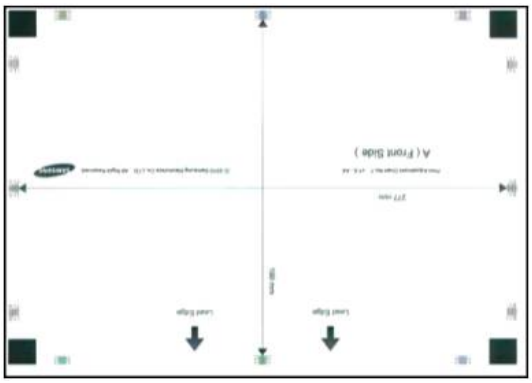
Purpose	To perform test routines for the scanner and ADF.
Operation Procedure	When the main scanner/ADF Test Routines window displays, users can navigate through the list of routines that display along with description. Users can also input a code to the text box to find a routine directly. After selecting one routine, pressing “OK” button will open the test window that lists selected routine. Users can start/stop a desired test routine.
Verification	N/A
Specification	N/A
Reference	Table below

Code	Displayed Name	Value
06-0020	Scanner Platen Motor Forward	Start/Stop
06-0030	Scanner Platen Motor Backward	Start/Stop
06-0040	Scanner Platen Home Position Sensor	High/Low
05-0040	Document Detect Sensor	High/Low
05-0070	Document Scan Read Sensor1	High/Low
05-0110	Document Motor Forward	Start/Stop
05-0111	Document Motor Backward	Start/Stop
05-0130	Document Pickup Motor Forward	Start/Stop
05-0131	Document Pickup Motor Backward	Start/Stop

4.5.5.4. Adjustment

Print Adjustment

- **Diagnostics > Adjustment > Print Adjustment > Automatic Adjustment**

Purpose	To calibrate/adjust the lengths of vertical & horizontal image and image position automatically in print engine.
Operation Procedure	1) Press “Paper Supply” button and select a tray. 2) Press “Paper Size” button and select a paper size of the previously selected tray. 3) Press “Print” button. A test pattern will be printed out.  4) Place the printed pattern on platen. • The words “front side” on the chart face the glass • The arrows face left edge of the platen • Press “Scan 1” 5) Place the printed pattern on platen. • The words “back side” on the chart face the glass • The arrows face left edge of the platen • Press “Scan 2” 6) Press “OK” button. Automatic scanning will occur . 7) Locate the back side of Scanner A/S Chart at the scanner glass again and press “OK” button once more. 8) The system will automatically calculate the proper value based on scanning result of the test pattern. 9) The new values are set to the system.

- **Diagnostics > Adjustment > Print Adjustment > Image Position**

Purpose	Manually adjust printed image position on paper in print engine
Operation Procedure	1) Select a tray required adjustment. 2) Change the adjustment value with ”+”, “-” then press “OK” button to save changes. • Simplex Leading Edge • Simplex Side Edge • Duplex Leading Edge • Duplex Side Edge **NOTE** • Adjustment must be done for each tray (tray1, tray2, tray3, tray4, MP). • It is recommended not to choose “ALL” for tray selection. • It is always better to adjust for a particular tray at each time. • Adjustment range : ± 5.0 mm 3) Print out the test pattern and check if the image is moved as you want. If not, repeat stpe2.

Copy Adjustment

- **Diagnostics > Adjustment > Copy Adjustment > Image Position**

Purpose	Manually adjust copied image position on paper in copy engine
Operation Procedure	**NOTE** Before copy adjustment, 1) Please make sure that initial values of margin adjustment must be the same as values of print adjustment. 2) It is recommended to perform adjustment for each tray at a time. i.e. do not select “All” for tray selection. It often causes confusing for the adjustment. 3) The Procedure for copy adjustment is almost same as “Print Adjustment”. **NOTE** • Adjustment must be done for each tray (tray1, tray2, tray3, tray4, MP). • It is recommended not to choose “ALL” for tray selection. • It is always better to adjust for a particular tray at each time. • Adjustment range : ± 5.0 mm 1) Select a tray required adjustment. 2) Change the adjustment value with ”+”, “-” then press “OK” button to save changes. • Simplex Leading Edge • Simplex Side Edge • Duplex Leading Edge • Duplex Side Edge 3) Print out the test pattern and check if the image is moved as you want. If not, repeat stpe2.

Scan Area Adjustment

- **Diagnostics > Adjustment > Scan Area Adjustment > Manual Adjustment**

Purpose	To correct image position and magnification of scanned images manually.
Operation Procedure	1) Choose one item from the table. There are three items to choose. • Image Position - Leading Edge (Unit : mm, Scale : 0.1, Min/Max : -3.0/+3.0) • Image Position - Side Edge (Unit : mm, Scale : 0.1, Min/Max : -3.0/+3.0) • Magnification - Vertical Direction (Unit : %, Scale: 0.1(0.42mm), Min/Max: 98.5/101.5) 2) Select one item and press the “Edit” button. 3) Change the adjustment value with arrow button. 4) Image Position (a, b) : If the current value is smaller than the specification, press “+”. Otherwise, press “-”. 5) Magnification (c) : If the current value is smaller than the specification, press “-”. Otherwise, press “+”. 6) Press the “OK” button to apply the new value to the system. 7) Scan the Scanner A/S Chart and send it to a PC. Scanning must be occur from the scan glass. 8) To check the image position, compare the position of scale marks (a,b) of the chart to the copy. 9) To check the magnification, compare the length of line “c” of the chart to the copy. **NOTE** Specification • a,b : 10, ± 1.5 mm • c: 190, ± 1.5 mm

ADF Adjustment

- **Diagnostics > Adjustment > ADF Adjustment > Manual Adjustment**

Purpose	To correct image position and magnification of scanned images manually.
Operation Procedure	1) Choose one item from the table. There are three items to choose. • Image Position - Leading Edge (Unit : mm, Scale : 0.1, Min/Max : -3.0/+3.0) • Image Position - Side Edge (Unit : mm, Scale : 0.1, Min/Max : -3.0/+3.0) • Magnification - Vertical Direction (Unit : %, Scale: 0.1(0.42mm), Min/Max: 98.5/101.5) 2) Select one item and press the “Edit” button. 3) Change the adjustment value with arrow button. 4) Image Position (a, b) : If the current value is smaller than the specification, press “+”. Otherwise, press “-”. 5) Magnification (c) : If the current value is smaller than the specification, press “-”. Otherwise, press “+”. 6) Press the “OK” button to apply the new value to the system. 7) Scan the Scanner A/S Chart and send it to a PC. Scanning must be occur from the DSDF. 8) To check the image position, compare the position of scale marks (a,b) of the chart to the copy. 9) To check the magnification, compare the length of line “c” of the chart to the copy. **NOTE** Specification • a,b : 10, ± 1.5 mm • c: 190, ± 1.5 mm

4.5.6. Service Functions

4.5.6.1. Main Memory Clear

- **Service Functions > Main Memory Clear**

This function resets the main memory of the system to the factory default setting. It can be used to reset the system to the initial value when the product is functioning abnormally. All the user configured values return to the default values.

To clear the main memory, users need to select the country of the system locates, and rebooting of the system is required.

4.5.6.2. Hard Disk Maintenance

- **Service Functions > Hard Disk Maintenance > Device Configuration Data Clear**
  - This function formats all device configuration data, for example, user profile, address book, and devices settings, on the hard disk.
- **Service Functions > Hard Disk Maintenance > Temporary and Spool Data Clear**
  - This function formats all temporary and spool data saved on the hard disk.
- **Service Functions > Hard Disk Maintenance > User Saved Data and Log Data Clear**
  - This function formats all the user data, for example, box data, pending secure jobs, font, form, macro, data related applications, and job log, on the hard disk.
- **Service Functions > Hard Disk Maintenance > All Saved Data Clear**
  - This function formats all the data that can be erased with 3 functions above. The function will NOT format the hard disk entirely.
- **Service Functions > Hard Disk Maintenance > Hard Disk Check**
  - This function checks a bad sector in the hard disk. If a bad sector is found, the system will display an error message and send an email notification to the system administrator.

4.5.6.3. Network Port

- **Service Functions > Network Port**

This function enables/disables remote connections to the system via telnet, OSGI command shell, and SMB(samba) protocol.

This function can be used when there is a problem that requires developers to access the system or when there is a need for developers to upload applications for a test.

Since enabling those ports can creates a risk of damaging data stored in the device, agreement of the administrator of the customer site is necessary. The user must log in as the administrator to enable/disable the services.

4.5.6.4. Debug Log

- **Service Functions > Debug Log**

  This function sets the system log message level. Users can select three options.

  - Off : This option disables the logging option.
  - Job Status: This option only enables the logging option of user created jobs.
  - Details : This option enables all the logging options of the running tasks of the system. Note that this option might create a trade-off of performance in certain system operation. Use this option when the system behaves abnormally, and engineers need to investigate problems.

4.5.6.5. Capture Log

- **Service Functions > Capture Log**

This function copies all the saved log in the system to a UBS memory as a zip file. Note that the size of system log could reach up to 1GB. If the system log size become considerably huge, it will take longer time to copy to the plugged memory.

1) Connect USB memory to device.
2) When the pop-up appears, press the area below until the passcode window appears. Eenter “**1934**” and press the “OK” button.
3) Go to "**Service Functions > Debug Log**" and change debug log level to “DETAILS”.
4) Go to "**Service Functions > Capture Log**"
5) Select All or Period. When you select Period, input the start and end date.
6) Press Capture Log button.
7) Once it is completed, the message will be displayed. Then restore the debug log level to ”JOB STATUS”.

   NOTE

   If the system log size become considerably huge, it will take longer time to copy to the plugged memory.

8) Check is the Log file is created in the USB memory.

4.5.6.6. Network Packet Capture

- **Service Functions > Network Packet Capture**

1) Capture Packets
   - Start button
     a) Start to capture network packet between device and external peer mode
     b) Start button shall be changed to Stop button

     NOTE

     The packet capture is implemented by using “tcpdump-leth0–s1200–w[filename]”
   - Packet Size
     - Show the file size captured
2) Export Capture File
   - Export button
     - Export network packet capture file to USB memory stick
3) Delete Capture File
   - Delete button
     - Clear network packet capture file in a device

4.5.6.7. System Recovery

- **Service Functions > System Recovery**

NOTE

There are 3 methods for entering System Recovery mode.

- In case of normal booting,
  - Enter SVC mode and select **System Recovery** menu.
- In case of abnormal booting,
  - If the HDD is broken, the machine will enter System Recovery at booting.
  - When turning the machine on while pushing the power button on OP panel, you can enter System Recovery forcibly.

This function repairs or formats the HDD of the system. To use this function, a HDD image need to be saved in a USB memory, and that USB memory needs to be plugged in the system before the execution.

NOTE

- Memory stick file system type : FAT16 or FAT32 not NTFS
- Memory stick must contain the following 3 files only.
  - **unix script files x 2**
  - **HDD image file x1**

1) From the system recovery UI, Choose “SYS” to recover only the system partition of the HDD or “ALL” to recover all the partition of the HDD.
2) When the system recovery UI is appeared after reboot, choose “HDD Repair” to repair any corrupted data in the selected partition or choose “HDD Format” to format the data in the selected partition.
   a) HDD Format
      - Hidden Partition : This can format and reinstall the only System Binary in HDD. User data is not deleted.
      - USB : This can format the HDD using USB stick. All data except the stored in MSOK will be deleted.
      - Network : This can format the HDD using network. All data except the stored in MSOK will be deleted.
   b) HDD Repair : This can restore the internal system by checking the HDD error. This is for HDD recovery itself and irrelevant to the user data in device.
3) When pushing “Next” button, the login page for authentication will be displayed. The password will be **1934** as the factory setting password.
4) When pushing “Next” button, the following page will be displayed.
   - In case of selecting USB option :

     The Next button is pressed after inserting the USB stick.

     The system will check for the required packages in the USB stick. If all the packages are present in the USB stick then the system will be directed to the confirmation page otherwise an Error page will be displayed with an appropriate error message.
   - In case of selecting Network option :

     This page contains two sections :
     - **Configure device IP address**
       a) Device IP: IP address for the device
       b) Gateway IP: Gateway IP address for the device

c) Subnet Mask: Network Subnet Mask for the device

- **Configure samba settings**
  a) Server IP : IP address of the server.
  b) User ID : user ID of the server to login into the server system
  c) Password : password of the server system
  d) Shared folder : name of the shared folder on the server, where the packages for the system recovery are present.

The Next button is pressed after providing the above information.

The system will establish the provided IP to the device and try to connect to the server and check for the available packages on the server.

If Network is establish and all the packages are present in the shared folder of the server then the system will be directed to the Confirmation page otherwise an Error page will be displayed with an appropriate error message.

5) When pushing “Next” button on option selection page, the confirmation page will be displayed.

6) When pushing “Next” button, progress page will be displayed.

7) When completing HDD Recovery or HDD Repair successfully, reboot the machine.

8) After rebooting, the machine will start the system initialization.

NOTE

If the system initialization is not executed, enter the svc mode and execute “Full memory clear”.
If not, the machine may not work normally.

9) Execute the firmware update using the one ROM FW file after system initialization. This work is a must for all FW module level.

4.5.6.8. Clear System Cache

- **Service Functions > Clear System Cache**

This function is to clear machine’s cache data for it after installing the XOA app.

4.5.6.9. Hibernation

- **Service Functions > Hibernation**

Hibernation mode makes the operating system image and it reduces operating time when you turn on the machine.

- ON : Hibernation mode ON
- OFF : Hibernation mode OFF
- Create New Image : Make the new Hibernation system image. When you enable the hibernation mode, you can use this menu.

4.5.6.10. Paper Low Warning Message

- **Service Functions > Paper Low Warning Message**

This function enables / disables the warning message of the paper low status.

4.5.6.11. Part Replacement Alert

- **Service Functions > Part Replacement Alert**

This function enables / disables the alert message of the consumable's life time.

- ON : Alert message on (Level : Low, Empty, Exhaust, Worn)
- OFF : Alert message off

4.5.6.12. FDI

- **Service Functions > FDI**

In this function, user and administrator can choose the type of FDI.

4.5.6.13. EIUL (End of Image Unit Life)

- **Service Functions > EIUL**

The function is to set the machine hard stop when the drum life is expired.

- Off : No machine stop @ end of drum life
- On : Machine stop @ end of drum life

4.5.6.14. SFE (Special Feature Enablement)

- **Service Functions > SFE**

Special Feature Enablement (SFE) means to provide the configurable options (On/Off) in service mode for technicians or dealers to satisfy the requirements from B2B sites easily without changing the firmware installed in a device.

NOTE

The description for some codes like a 003, 020 can not be provided by HQ R&D policy.

SFE menu description

SFE Code	Description
001	In case of printing in directional media (Letterhead/Preprinted/Punched), the device prints as the same output direction regardless of simplex or duplex.

SFE Code	Description
003	confidential
006	The device supports only user's own email address for scan to email.
007	[PCL6] The device prints as original 1 dot line without 2 dot line compensation.
008	[PCL5] The device ignores paper size command in PRN and prints as paper size in tray.
009	PJL readback response is changed with HPOS. 1) Add <CR><LF> to EOJ response. 2) No EOJ job but EOJ response occurs. 3) Device uses Job name instead of EOJ name.
010	Maximum value of 'Power save time' is increased as 240 min.
012	If the device is in jam status, all print jobs except secure or stored jobs are deleted automatically.
013	The device ignores the USB memory stick and detects only card reader.
014	When the authenticated user uses scan to email, user's email address is added automatically.
015	The device supports to connect to LDAPs server without any certificate.
016	The device fits image appearance in report page
018	The device blocks apk installation.
019	User ID is not case-sensitive for login
020	confidential
023	The device rotates copy output 180 degrees when executed on flatbed.
025	confidential
026	The device maintains HDD encryption as a default.
029	The device support 3 digit password for SMB
031	The device shall store confidential/store print without image processing. (If this SFE option is enabled, the device shall not execute emul image processing and just store prn data. At release time the device shall execute image process. So the some detail information of job shall not be shown in job status such as total pages and printing options.)
032	The device shall print line even though that has less than 1 dot. (If this SFE option is enabled, the image processor shall not omitt line that is less than 1 dot. By PCL 6 command rule, the device shall not print less than 1 dot line. But this SFE is enabled, the device shall print it.)
033	The device shall draw Letter Gothic font as previous thickness. (If this SFE option is enabled, the image processor shall draw Letter Gothic font as previous thickness(Bitstream) thicker than URW++.)
035	The device shall provide auto scale for A3/Leger to A4/Letter in case of A4 Models that doesn't support A3/Ledger size.
054	Keep Jam animation pop-up (If this SFE is enabled, UI shall keep jam animation pop-up until error is cleared.)
055	Keep paper setting as No. 10 envelope (If this SFE is enabled, the system shall maintain the paper settings as No.10 envelope even though detected size is statement.)
056	Support duplex borderless printing (If this SFE is enabled, the system shall print with 0 margin for left and right. In top and bottom, the system shall apply 2mm margin.)

SFE Code	Description
058	Print from high priority tray regardless paper type (If this SFE is enabled and the user doesn't specify paper type, the system shall print out high priority tray among trays that matching paper size. The system shall choose high priority tray even though the tray doesn't have plain paper type.)
059	LDAP Authentication after Kerberos Authentication (If this SFE is enabled, the system should log in LDAP server using GSSAPI interface. (Not LDAP ID/Password login))

4.6. Error Code and Troubleshooting

Messages appear on the control panel display to indicate the machine's status or errors.

NOTE

Some messages may not appear on the display depending on the options or models.

Error Code	Error Message	Troubleshooting Page
11-2T01	Tray paper mismatch	P.4–53
11-2T11	Tray 1 paper mismatch	P.4–53
11-2T21	Tray 2 paper mismatch	P.4–53
11-2T31	Tray 3 paper mismatch	P.4–53
11-2T41	Tray 4 paper mismatch	P.4–53
11-2T61	MP tray paper mismatch	P.4–53
61-1111	Booting Failure: #61-1111. Turn off then on. Call for service if the problem persists	P.4–53
61-1500	Unverified application(s) installed. Please contact administrator	P.4–54
61-1H01	Firmware Update Failure: #61-1H01. Firmware update has failed due to invalid FW file. Please try again after power off and on. If this problem persists, contact service engineer.	P.4–54
61-1H04	Firmware Update Failure: #61-1H04. Firmware update has failed due to invalid FW file. Please try again after power off and on. If this problem persists, contact service engineer.	P.4–54
61-1H50	3rd party application update has failed due to insufficiant storage space in hard disk. Please remove unused 3rd party applications	P.4–55
61-1H51	3rd party application update has failed due to unsigned certificate. Please make sure installation file is valid	P.4–55
61-1H52	3rd party application update has failed due to expired certificate. Please make sure installation file is valid	P.4–55
61-1H53	3rd party application update has failed due to unverified certificate. Please make sure installation file is valid	P.4–55
61-1H54	3rd party application update has failed due to invalid certificate. Please make sure installation file is valid	P.4–55
61-1H60	Android app installation has failed. The app is already installed	P.4–55
61-1H61	Android app installation has failed due to invalid installation file. Install valid file	P.4–56
61-1H62	Android app installation has failed due to insufficiant storage space. Remove unused apps and try again	P.4–56
A1-1112	Main Motor Failure: #A1-1112. Turn off then on. Call for service if the problem persists	P.4–57
A1-1113	Main Motor Failure: #A1-1113. Turn off then on. Call for service if the problem persists	P.4–57
A1-2112	OPC Motor Failure: #A1-2112. Turn off then on. Call for service if the problem persists	P.4–58
A1-2113	OPC Motor Failure: #A1-2113. Turn off then on. Call for service if the problem persists	P.4–58

Error Code	Error Message	Troubleshooting Page
A1-5110	Supply Motor Failure: #A1-5110. Turn off then on. Call for service if the problem persists	P.4–59
A3-3212	Temperature Sensor Failure: #A3-3212. Turn off then on. Call for service if the problem persists	P.4–60
A3-3312	Temperature Sensor Failure: #A3-3312. Turn off then on. Call for service if the problem persists	P.4–61
A3-3320	The room temperature is not suitable for this set use. Please adjust room temperature	P.4–61
A4-1110	Lamp Failure: #A4-1110. Open the door, then close it. Call for service if the problem persists	P.4–62
C1-1110	Toner is low	P.4–63
C1-111A	Shake toner cartridge and then install. Replace toner cartridge if the problem persists	P.4–63
C1-1140	End of life, Replace with new toner cartridge	P.4–63
C1-1150	Toner is very low	P.4–63
C1-1160	Toner is very low	P.4–63
C1-1170	End of life, Replace with new toner cartridge	P.4–63
C1-1313	Shake toner cartridge and then install. Call for service if the problem persists	P.4–64
C1-1314	Did not supply enough toner. Remove seal tape of toner cartridge or shake it. Call for service if the problem persists	P.4–64
C1-1411	Toner cartridge is not installed. Install the cartridge	P.4–65
C1-1512	Toner cartridge is not compatible. Check the user guide	P.4–66
C1-1712	Toner Cartridge Failure: #C1-1712. Call for service	P.4–67
C3-1110	Prepare new imaging unit	P.4–68
C3-1150	Replace with new imaging unit	P.4–68
C3-1312	Imaging Unit Failure: #C3-1312. Install imaging unit again	P.4–69
C3-1411	Imaging unit is not installed. Install the unit	P.4–69
C3-1414	Imaging Unit Failure: #C3-1414. Install imaging unit again	P.4–69
C3-1512	Imaging unit is not compatible. Check the user guide	P.4–70
C3-1712	Imaging Unit Failure: #C3-1712. Call for service	P.4–70
C6-1120	Replace with new fuser unit	P.4–70
H1-1210	Paper jam in tray 2. Please open the door and remove paper, then close the door.	P.4–71
H1-1211	Paper jam in tray 2. Please open the door and remove paper, then close the door.	P.4–71
H1-1222	Tray 2 cassette is pulled out. Insert it properly	P.4–73
H1-1252	Paper is empty in tray 2. Load paper	P.4–74
H1-1253	Tray Failure: #H1-1253. Pull tray 2 out and insert it. Call for service if the problem persists	P.4–75
H1-1310	Paper jam in tray 3. Please open the door and remove paper, then close the door.	P.4–76
H1-1311	Paper jam in tray 3. Please open the door and remove paper, then close the door.	P.4–76
H1-1322	Tray 3 cassette is pulled out. Insert it properly	P.4–78

Error Code	Error Message	Troubleshooting Page
H1-1352	Paper is empty in tray 3. Load paper	P.4–79
H1-1353	Tray Failure: #H1-1353. Pull tray 3 out and insert it. Call for service if the problem persists	P.4–80
H1-1410	Paper jam in tray 4. Please open the door and remove paper, then close the door.	P.4–81
H1-1411	Paper jam in tray 4. Please open the door and remove paper, then close the door.	P.4–81
H1-1422	Tray 4 cassette is pulled out. Insert it properly	P.4–83
H1-1452	Paper is empty in tray 4. Load paper	P.4–84
H1-1453	Tray Failure: #H1-1453. Pull tray 4 out and insert it. Call for service if the problem persists	P.4–85
H1-1454	Paper is empty in tray 4. Load paper	P.4–84
M1-1110	Paper jam in tray 1. Please remove the paper	P.4–86
M1-1610	Paper jam in MP tray. Please remove the paper	P.4–88
M1-3122	Tray 1 cassette is pulled out. Insert it properly	P.4–90
M1-4111	Tray Failure: #M1-4111. Pull tray 1 out and insert it. Call for service if the problem persists	P.4–90
M1-5112	Paper is empty in tray 1. Load paper	P.4–91
M1-5113	Paper is empty in tray 1. Load paper	P.4–91
M1-5120	Paper is empty in all tray. Load paper	P.4–91
M1-5612	Paper is empty in MP tray. Load paper	P.4–92
M2-1111	Paper jam inside of machine. Please remove the paper	P.4–93
M2-1114	Paper jam inside of machine. Please remove the paper	P.4–93
M2-1214	Paper jam inside of machine. Please remove the paper	P.4–93
M2-2212	Paper jam at the top of duplex path. Please remove the paper	P.4–95
M2-2214	Paper jam inside of duplex path. Please remove the paper	P.4–95
M2-2310	Paper jam at the bottom of duplex path. Please remove the paper	P.4–95
M3-1110	Paper jam in exit area. Please remove the paper	P.4–96
M3-1112	Paper jam inside of machine. Please remove the paper	P.4–96
M3-2130	Paper in output bin is full. Remove printed paper	P.4–97
S1-2433	System Failure: #S1-2433 . Call for service	P.4–98
S1-2434	There is not enough space on the hard disk. Please delete the information stored in the address book	P.4–98
S1-2435	There is not enough space on the hard disk. Please delete the stored file	P.4–98
S1-2436	There is not enough space on the hard disk. Please delete the stored file	P.4–98
S1-2437	There is not enough space on the hard disk. Please wait a moment	P.4–98
S1-2438	There is not enough space on the hard disk. Please check your printer	P.4–98
S1-2439	There is not enough space on the hard disk. Please check your printer	P.4–98
S1-2443	HDD System Failure: #S1-2443. Call for service	P.4–98
S1-2444	HDD System Failure: #S1-2444. Call for service	P.4–98
S1-2445	HDD System Failure: #S1-2445. Call for service	P.4–98
S1-2446	HDD System Failure: #S1-2446. Call for service	P.4–98

Error Code	Error Message	Troubleshooting Page
S1-2447	HDD System Failure: #S1-2447. Call for service	P.4–98
S1-2448	HDD System Failure: #S1-2448. Call for service	P.4–98
S1-2449	HDD System Failure: #S1-2449. Call for service	P.4–98
S1-2450	HDD Failure: #S1-2450. Call for service.	P.4–98
S1-2451	HDD Failure: #S1-2451. Call for service.	P.4–99
S1-2452	HDD Failure: #S1-2452. Call for service.	P.4–99
S1-2453	HDD Failure: #S1-2453. Call for service.	P.4–99
S1-2454	HDD Failure: #S1-2454. Call for service.	P.4–99
S1-2510	MSOK Failure: #S1-2510. Call for service and change MSOK	P.4–99
S1-2550	MSOK Failure: #S1-2550. Call for service and change MSOK	P.4–99
S2-1110	Engine Failure: #S2-1110. Call for service if the problem persists	P.4–100
S2-331D	Wait delay time for lower fixing temperature...	P.4–100
S2-4210	Front door is open. Close it	P.4–101
S2-4310	Rear door is open. Close the door	P.4–102
S3-3121	Scanner is locked. Please try to release scanner lock	P.4–103
S3-3130	Scan System Failure: #S3-3130. Call for service	P.4–104
S3-3230	Scan System Failure: #S3-3230. Call for service	P.4–104
S6-3122	Network cable is disconnected. Check it	P.4–105
S6-3123	This IP address conflicts with that of other system. Check it	P.4–105
S6-3128	802.1x authentication failed. Please contact the system administrator	P.4–106
S7-2110	Fuser Unit Failure: #S7-2110. Turn off then on. Call for service if the problem persists	P.4–106
U1-2115	Fuser Unit Failure: #U1-2115. Turn off then on. Call for service if the problem persists	P.4–107
U1-2116	Fuser Unit Failure: #U1-2116. Turn off then on. Call for service if the problem persists	P.4–107
U1-2117	Fuser Unit Failure: #U1-2117. Turn off then on. Call for service if the problem persists	P.4–109
U1-2132	Fuser Unit Failure: #U1-2132. Turn off then on. Call for service if the problem persists	P.4–111
U1-2316	Fuser Unit Failure: #U1-2316. Turn off then on. Call for service if the problem persists	P.4–111
U1-2317	Fuser Unit Failure: #U1-2317. Turn off then on. Call for service if the problem persists	P.4–111
U1-2321	Fuser Unit Failure: #U1-2321. Please turn off then on. Call for service if the problem persists	P.4–111
U1-2323	Fuser Unit Failure: #U1-2323. Turn off then on. Call for service if the problem persists	P.4–111
U1-2339	Fuser Unit Failure: #U1-2339. Turn off then on. Call for service if the problem persists	P.4–111
U1-2341	Fuser Unit Failure : #U1-2341. Turn off then on. Call for service if the problem persists	P.4–111
U1-2342	Fuser Unit Failure: #U1-2342. Turn off then on. Call for service if the problem persists	P.4–111

Error Code	Error Message	Troubleshooting Page
U1-2343	Fuser Unit Failure: #U1-2343. Turn off then on. Call for service if the problem persists	P.4–111
U1-234H	Fuser Unit Failure: #U1-234H. Turn off then on. Call for service if the problem persists	P.4–111
U2-1111	LSU Failure: #U2-1111.Turn off then on. Call for service if the problem persists	P.4–114
U2-1112	LSU Failure: #U2-1112. Turn off then on. Call for service if the problem persists	P.4–114
U2-1113	LSU Failure: #U2-1113.Turn off then on. Call for service if the problem persists	P.4–114
U3-3313	Original paper jam inside the scanner	P.4–115
U3-3314	Original paper jam inside the scanner	P.4–115
U3-4210	Top door of scanner is open	P.4–116

4.6.1. 11-xxxx_61–xxxx type error code

► **Error Code**

11-2T01 / 11-2T11 / 11-2T21 / 11-2T31 / 11-2T41 / 11-2T61

► **Error message**

Tray paper mismatch

Tray 1 paper mismatch

Tray 2 paper mismatch

Tray 3 paper mismatch

Tray 4 paper mismatch

MP tray paper mismatch

► **Symptom**

Paper in tray is not matched to the machine paper setting.

► **Troubleshooting method**

1) Check and change the paper setting of the corresponding tray properly.

► **Error Code**

61–1111

► **Error message**

Booting Failure: #61-1111. Turn off then on. Call for service if the problem persists

► **Symptom**

Hibernation image creation is failed.

► **Troubleshooting method**

1) Turn the machine on with a normal booting.

2) Enter the SVC mode. Select “Hibernation On” again.

► **Error Code**

61-1500

► **Error message**

Unverified application(s) installed. Please contact administrator

► **Symptom**

When unverified 3rd party solution is installed, user or administrator is not easily noticed for the unverified solution, which might cause market issue sooner or later.

► **Troubleshooting method**

1) Access SyncThru Web Service. You can check up Samsung Verified information in SyncThru Web Service Maintenance Application Management Application.

2) If necessary, only administrator can delete the unverified application(s) or make them disabled.

► **Error Code**

61-1H01 / 61-1H04

► **Error message**

Firmware Update Failure: #61-1H0x. Firmware update has failed due to invalid FW file. Please try again after power off and on. If this problem persists, contact service engineer.

► **Symptom**

Firmware update has completed with error.

► **Troubleshooting method**

1) Turn off and on.

2) Download valid file again. If you use USB memory stick, It must be removed via a USB safe removal.

3) Try firmware update again.

4) Replace main board if problem persists.

► **Error Code**

61-1H50

► **Error message**

3rd party application update has failed due to insufficient storage space in hard disk. Please remove unused 3rd party applications

► **Symptom**

PAR update has completed with error. (PAR updating has failed due to insufficient storage space in hard disk.)

► **Troubleshooting method**

1) Remove another 3rd party applications.

2) Try PAR update again.

► **Error Code**

61-1H51 / 61-1H52 / 61-1H53 / 61-1H54

► **Error message**

3rd party application update has failed due to unsigned certificate. Please make sure installation file is valid

► **Symptom**

PAR update has completed with error.
- PAR uses unsigned certificate.
- PAR uses expired certificate.
- PAR uses unverified certificate.
- PAR uses invalid certificate.

► **Troubleshooting method**

1) Get PAR file with signed certificate again.

2) Try PAR update again.

► **Error Code**

61-1H60

► **Error message**

Android app installation has failed. The app is already installed

► **Symptom**

APK update has completed with error.
- The app is already installed.

► **Troubleshooting method**

1) There is no need for user intervention.

► **Error Code**

61-1H61

► **Error message**

Android app installation has failed due to invalid installation file. Install valid file

► **Symptom**

APK update has completed with error.
- APK file is invalid.

► **Troubleshooting method**

1) Get valid APK file again.
2) Try APK update again.

► **Error Code**

61-1H62

► **Error message**

Android app installation has failed due to invalid installation file. Install valid file

► **Symptom**

APK update has completed with error.
- APK updating has failed due to insufficient storage

► **Troubleshooting method**

1) Make room for APK installation.
2) Remove unused apps.
3) Try APK update again.

4.6.2. Ax-xxxx type error code

► **Error Code**

A1–1112

A1–1113

► **Error message**

Motor Failure: #A1-1112. Turn off then on. Call for service if the problem persists

Motor Failure: #A1-1113. Turn off then on. Call for service if the problem persists

► **Symptom**

Main(Feed/Fuser) motor operation is abnormal.

► **Troubleshooting method**

- A1–1112 : Main motor is not operated for print-job.
- A1–1113 : Main motor is operating but machine recognizes status as "Stopped".

1) Turn the machine off. Check if there are any foreign substances or paper around the paper path.

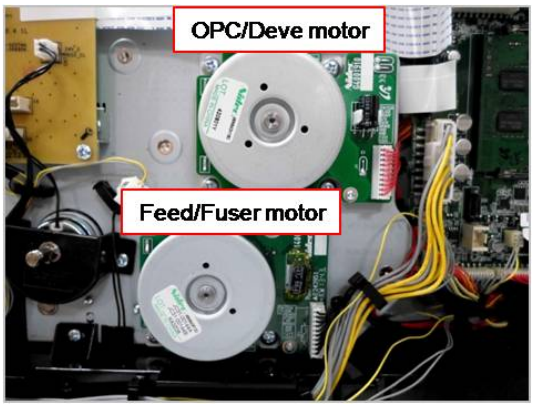
2) Remove the right cover.

3) Check if the main motor connector is connected correctly.

4) If the connection is OK, turn the machine on. Enter SVC mode. Select the main motor test.
(**Diagnostics > Engine Diagnostics > Engine Test Routines**)
Check the motor operation.

a) If the motor is not operational,

- Check the signal and power with the DVM.
- If the checked result is normal, replace the main(feed/fuser) motor.



- If the checked result is abnormal, check the following.
  - If 24V power is not generated, replace the SMPS board.
  - If the control signal is abnormal, replace the main board.

b) If the motor is operational,

- Check the Pin No 8. If the value is abnormal, replace the main board. If the value is normal, replace the harness.

5) If the main motor operation is normal, remove the fuser unit. Check if the fuser unit has any problem. Replace the fuser unit.

► **Error Code**

A1–2112

A1–2113

► **Error message**

Motor Failure: #A1-1112. Turn off then on. Call for service if the problem persists

Motor Failure: #A1-1113. Turn off then on. Call for service if the problem persists

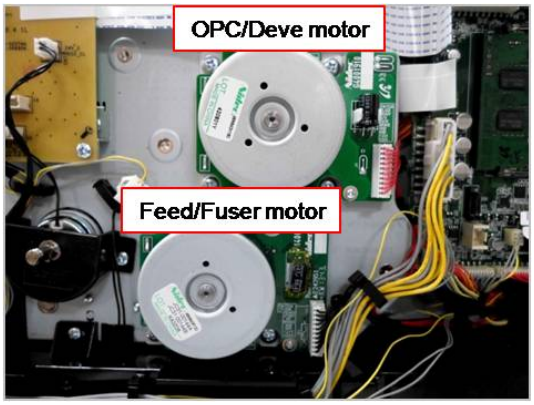
► **Symptom**

OPC/Deve motor operation is abnormal.

► **Troubleshooting method**

- A1–2112 : OPC/Deve motor is not operated for print-job.
- A1–2113 : OPC/Deve motor is operating but machine recognizes status as "Stopped".

1) Turn the machine off. Check if there are any foreign substances or paper around the paper path.
2) Remove the right cover.
3) Check if the OPC/Deve motor connector is connected correctly.
4) If the connection is OK, turn the machine on. Enter SVC mode. Select the OPC/Deve motor test.
   (**Diagnostics > Engine Diagnostics > Engine Test Routines**)
   Check the motor operation.
   a) If the OPC/Deve motor is not operational,
      - Check the signal and power with the DVM.
      - If the checked result is normal, replace the OPC/Deve motor.



      - If the checked result is abnormal, check the following.
        - If 24V power is not generated, replace the SMPS board.
        - If the control signal is abnormal, replace the main board.

   b) If the OPC/Deve motor is operational,
      - Check the Pin No 8. If the value is abnormal, replace the main board. If the value is normal, replace the harness.
5) If the OPC/Deve motor operation is normal, remove the imaging unit. Check if the imaging unit has any problem. Replace the imaging unit.

► **Error Code**

A1-5110

► **Error message**

Motor Failure: #A1-5110. Turn off then on. Call for service if the problem persists

► **Symptom**

Supply motor operation is abnormal.

► **Troubleshooting method**

1) Turn the machine off.

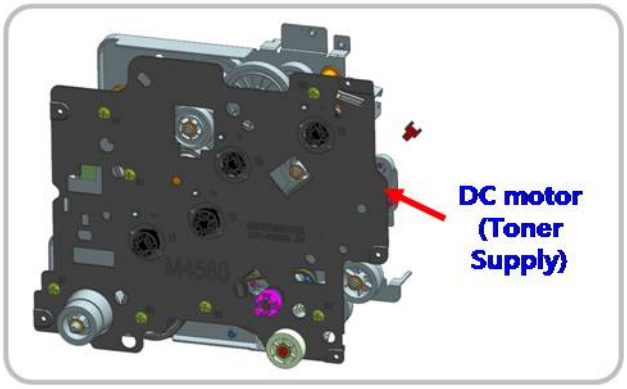
2) Remove the right cover.

3) Check if the DC motor (toner supply motor) connector in the main drive unit is connected correctly.

4) If the connection is OK, turn the machine on. Enter SVC mode. Select the DC motor test.
(**Diagnostics > Engine Diagnostics > Engine Test Routines**)
Check the motor operation.

a) If the DC motor is not operational,

- Check the signal and power with the DVM.
- If the checked result is normal, replace the DC motor or the main drive unit.



- If the checked result is abnormal, check the following.
  - If 24V power is not generated, replace the SMPS board.
  - If the control signal is abnormal, replace the main board.

b) If the DC motor is operational,

- If the value on the main board is abnormal, replace the main board. If the value is normal, replace the harness.

► **Error Code**

A3–3212

► **Error message**

Sensor Failure: #A3-3212. Turn off then on. Call for service if the problem persists

► **Symptom**

Inner temperature sensor is defective.

► **Troubleshooting method**

1) Enter SVC mode. Execute sensor test to check its operation.
   (**Diagnostics > Engine Diagnostics > Engine Test Routines**)
2) Measure the resistance value of the connector at both ends.
   If the value is not in 47.5KΩ ~ 52.5KΩ (@ 25 ℃), replace the inner temp sensor.
3) If the sensor is normal, replace the main board.

► **Error Code**

A3–3312

A3–3320

► **Error message**

Sensor Failure: #A3-3312. Turn off then on. Call for service if the problem persists

The room temperature is not suitable for this set use. Please adjust room temperature

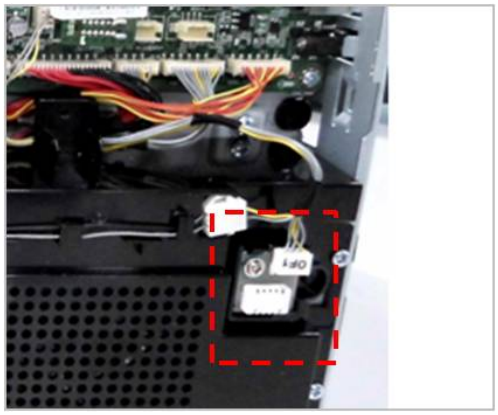
► **Symptom**

Outer temperature/humidity sensor is defective.

► **Troubleshooting method**

1) Enter SVC mode. Execute sensor test to check its operation.
(**Diagnostics > Engine Diagnostics > Engine Test Routines > Outer Temperature**)

2) Measure the resistance value of the connector at both ends.
If the value is not in 47.5KΩ ~ 52.5KΩ (@ 25 ℃), replace the outer temperature/humidity sensor.



3) If the harness and sensor are normal, replace the main board.

► **Error Code**

A4-1110

► **Error message**

Lamp Failure: #A4-1110. Open the door, then close it. Call for service if the problem persists

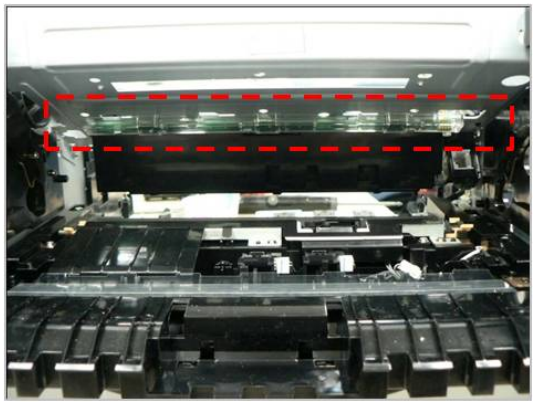
► **Symptom**

Erase Lamp does not turn on.

► **Troubleshooting method**

1) Enter SVC mode. Execute the erase lamp test.
   (**Diagnostics > Engine Diagnostics > Engine Test Routines > Erase Lamp**)

2) If the erase lamp does not turn on, replace it.



4.6.3. Cx-xxxx type error code

► **Error Code**

C1–1110

C1–111A

► **Error message**

Prepare new toner cartridge

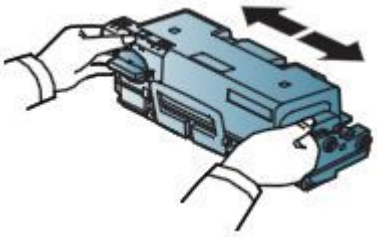
Shake toner cartridge and then install. Replace toner cartridge if the problem persists

► **Symptom**

Toner cartridge is almost empty.

► **Troubleshooting method**

1) Open the front cover.
2) Remove the toner cartridge.
3) Shake the toner cartridge horizontally to distribute the toner evenly inside the cartridge.



4) Reinstall the toner cartridge.
5) Close the front cover.
6) Prepare new toner cartridge because it will be exhausted soon.

► **Error Code**

C1–1140/ C1–1170

C1–1150 / C1–1160

► **Error message**

End of life, Replace with new toner cartridge.

Toner is very Low.

► **Symptom**

Toner cartridge is at the end of its life.

► **Troubleshooting method**

1) Open the front cover.
2) Remove the toner cartridge.
3) Install the new toner cartridge.
4) Close the front cover.

► **Error Code**

C1–1313

C1–1314

► **Error message**

Shake toner cartridge and then install. Call for service if the problem persists

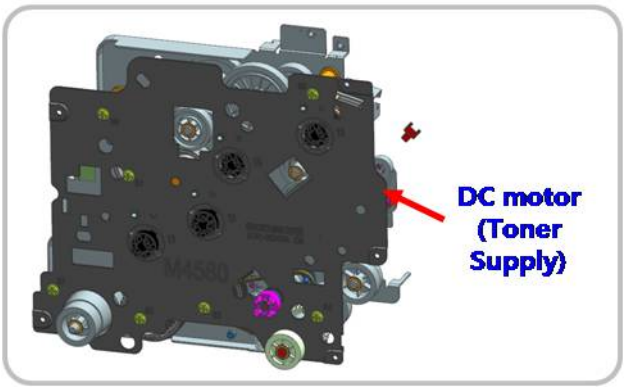
Did not supply enough toner. Remove seal tape of toner cartridge or shake it. Call for service if the problem persists

► **Symptom**

The toner supply is abnormal.

► **Troubleshooting method**

1) Turn the machine off then on.
2) Open the front cover.
3) Remove the toner cartridge.
   Thoroughly roll the cartridge three or four times to distribute the toner evenly inside the cartridge. And reinstall the toner cartridge.
4) Try to print out the sample page more than 20 pages.
5) Check the toner cartridge.
   - Check if the toner cartridge is installed correctly.
   - Check if the toner seal is removed perfectly.
   - Check if the toner supply shutter between the toner cartridge and the imaging unit works normally.
6) Replace the toner cartridge. Print out the sample page.
7) Check the toner supply motor operation.
   - Check the signal and power with the DVM.
   - If the checked result is normal, replace the DC motor or the main drive unit.



► **Error Code**

C1–1411

► **Error message**

Toner cartridge is not installed. Install the cartridge.

► **Symptom**

The toner cartridge is not installed properly.

► **Troubleshooting method**

1) Open the front cover.
2) If the toner cartridge is not installed, install it. Try to test the machine again.
3) If the toner cartridge is installed, remove it. Check if the modular jack is contaminated or broken.
4) Clean the modular jack or replace the toner cartridge.
5) If it is OK, check the CN22 harness connection on the main board.
6) If the harness is defective, replace it.
7) Turn the machine off then on. Try to test the machine.

► **Error Code**

C1–1512

► **Error message**

Toner cartridge is not compatible. Check users guide.

► **Symptom**

Toner cartridge is not compatible.

► **Troubleshooting method**

1) Open the front cover. Remove the toner cartridge.
2) Check if the label information of the toner cartridge is same with the machine's one. (ex. /SEE)
3) If label information is different from the machine or the toner cartridge is not a samsung genuine, replace it with a new one.

► **Error Code**

C1–1712

► **Error message**

Toner Cartridge Failure: #C1-1712. Call for service

► **Symptom**

The data of CRUM is not detected. / CRUM is defective.

► **Troubleshooting method**

1) Open the front cover. Check if the toner cartridge is installed.
2) Remove and reinstall the toner cartridge.
3) If the problem persists, check if the toner cartridge modular jack is contaminated or deformed.
4) Replace the toner cartridge with new one.

► **Error Code**

C3–1110

► **Error message**

Prepare new imaging unit.

► **Symptom**

Imaging unit has almost reached the end of its life.

► **Troubleshooting method**

1) Prepare the new imaging unit because it will be exhausted soon.

► **Error Code**

C3–1150

► **Error message**

Replace with new imaging unit

► **Symptom**

Imaging unit is at the end of its life.

► **Troubleshooting method**

1) Open the front cover.
2) Remove the imaging unit and replace it with new one.
3) Close the front cover.

► **Error Code**

C3–1312

► **Error message**

Imaging Unit Failure: #C3-1312. Install imaging unit again.

► **Symptom**

Toner sensor is defective. The machine can't detect the sensor signal in the imaging unit normally.

► **Troubleshooting method**

1) Install the genuine samsung imaging unit.
2) If the imaging unit is already installed, check the following.
   - Reinstall the toner cartridge and imaging unit.
   - Check if the CRUM connector is normal.
   - Turn the machine off then on.

► **Error Code**

C3–1411

C3–1414

► **Error message**

Imaging unit is not installed. Install the unit

Imaging Unit Failure: #C3-1414. Install imaging unit again.

► **Symptom**

The imaging unit is not installed properly.

► **Troubleshooting method**

1) Open the front cover.
2) If the imaging unit is not installed, install it. Try to test the machine again.
3) If the imaging unit is installed, remove it. Check if the modular jack is contaminated or broken.
4) Clean the modular jack or replace the imaging unit.
5) If it is OK, check the CN22 harness connection on the main board.
6) If the harness is defective, replace it.
7) Turn the machine off then on. Try to test the machine.

► **Error Code**

C3–1512

► **Error message**

Imaging unit is not compatible. Check users guide.

► **Symptom**

Imaging unit is not compatible.

► **Troubleshooting method**

1) Open the front cover.
2) Remove and reinstall the imaging unit.
3) Close the front cover.
4) If the problem persists, replace the imaging unit with new one.

► **Error Code**

C3–1712

► **Error message**

Imaging unit Failure: #C3-1712. Call for service.

► **Symptom**

The data of CRUM is not detected.

► **Troubleshooting method**

1) Open the front cover.
2) Remove the imaging unit check that its modular jack is contaminated or deformed.
3) If it is defective, replace it with new one.
4) Close the front cover.

► **Error Code**

C6–1120

► **Error message**

Replace with new fuser unit

► **Symptom**

Fuser unit is at the end of its life.

► **Troubleshooting method**

1) Turn the machine off.
2) Open and remove the rear cover.
3) Remove the fuser unit and replace it with new one.
4) Close the rear cover.

4.6.4. H1-xxxx type (Optional Cassette) error code

► **Error Code**

H1-1210 / H1-1211

► **Error message**

Paper jam in tray 2. Please open the door and remove paper, then close the door.

► **Symptom**

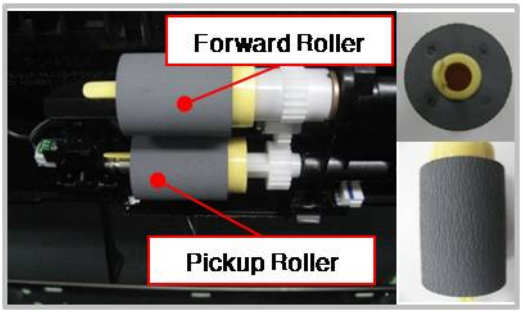
Paper jam has occurred in tray2.

► **Troubleshooting method**

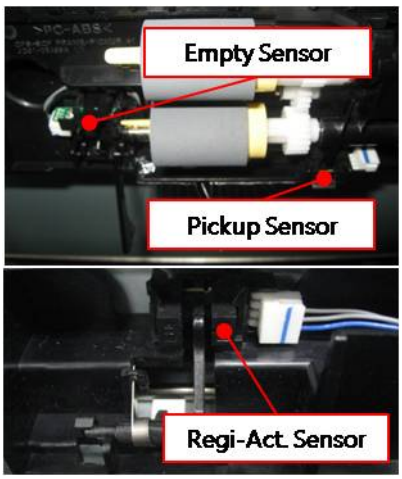
1) Remove the jammed paper. If the problem persists, check the followings.

2) Check if the paper is loaded in the tray2 properly.

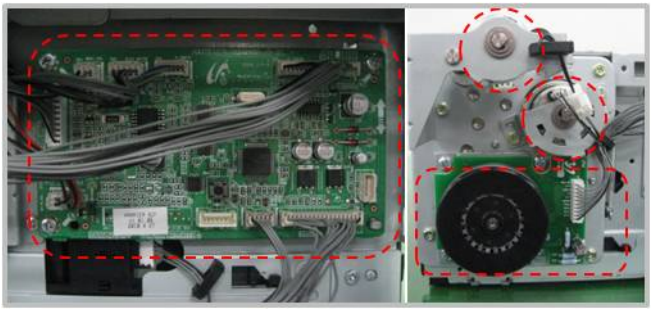
3) Check if the pick up/forward/reverse rollers of the tray2 are defective or worn out.



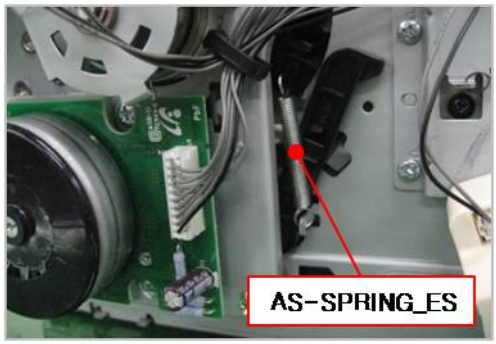
4) Check if the Empty/ Pick up/ Regi-Act sensor of the tray2 is working properly.



5) Check the connection between the motor/clutch and the SCF board. Reconnect the harness.



6) Check if the AS-SPRING_ES is deformed or assembled properly.



7) If the problem persists after checking No. 1~7, replace the SCF board.

8) If the problem persists, replace the Drop connector harness.

► **Error Code**

H1-1222

► **Error message**

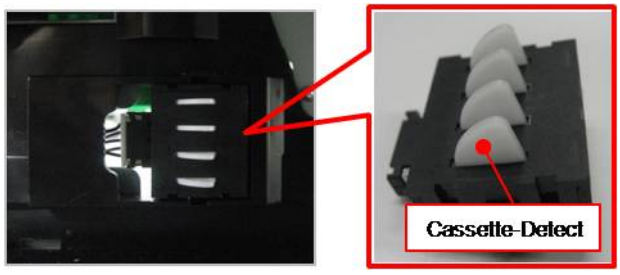
Tray 2 cassette is pulled out. Insert it properly.

► **Symptom**

Tray 2 is pulled out or the cassette detection sensor connector is not connected or broken.

► **Troubleshooting method**

1) Remove and insert tray2 correctly.
2) If the problem persists, remove tray2 again.
3) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.
4) If the connection is OK, replace the cassette detection sensor.



5) If the problem persists, replace the SCF board.

► **Error Code**

H1-1252

► **Error message**

Paper is empty in tray 2. Load paper.

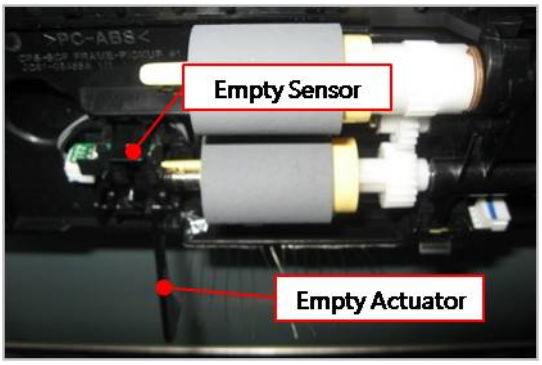
► **Symptom**

Tray 2 (optional cassette) is empty. / The photo sensor is defective.

► **Troubleshooting method**

1) Remove tray2. Load the paper in tray2.

2) If paper is loaded but error message has not disappeared, check the following.
   a) Check if the paper empty sensor is contaminated. If so, clean it.
   b) If the paper empty sensor is defective, replace it.



   c) If the empty actuator(*JC66–02613A*) is defective, replace it.

► **Error Code**

H1-1253

► **Error message**

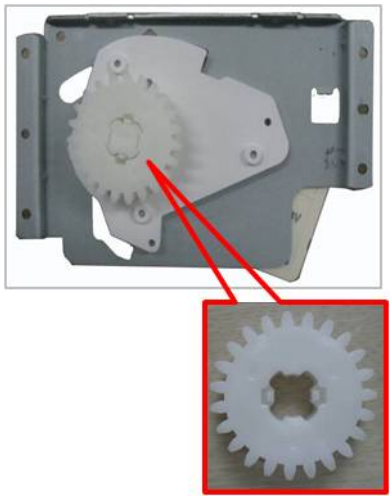
Tray Failure: #H1-1253. Pull tray 2 out and insert it. Call for service if the problem persists

► **Symptom**

The paper is not fed from tray2.

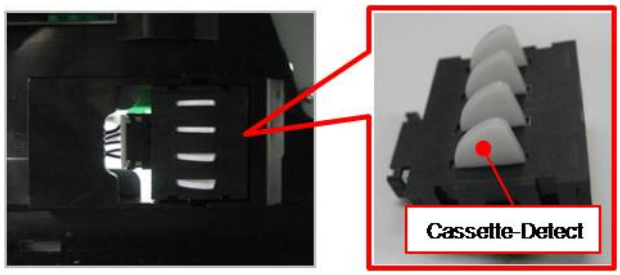
► **Troubleshooting method**

1) Check if the Gear-Idle Lift is broken.



2) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.

3) If the connection is OK, replace the cassette detection sensor.



4) Check if the Lift-Motor connector is connected properly.

5) If the problem persists, replace the Lift-Motor.

► **Error Code**

H1-1310 / H1-1311

► **Error message**

Paper jam in tray 3. Please open the door and remove paper, then close the door.

► **Symptom**

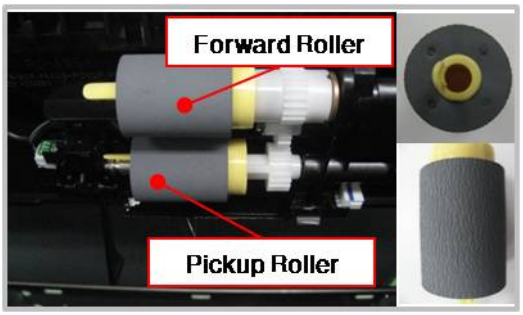
Paper jam has occurred in tray3.

► **Troubleshooting method**

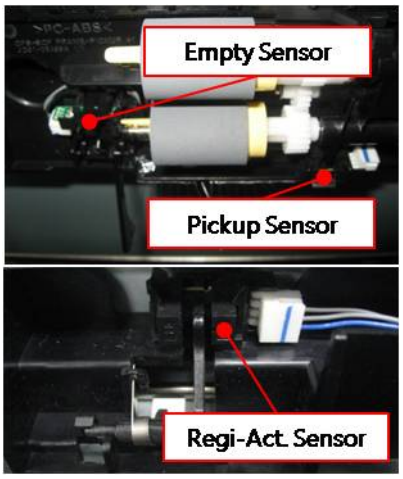
1) Remove the jammed paper. If the problem persists, check the followings.

2) Check if the paper is loaded in the tray3 properly.

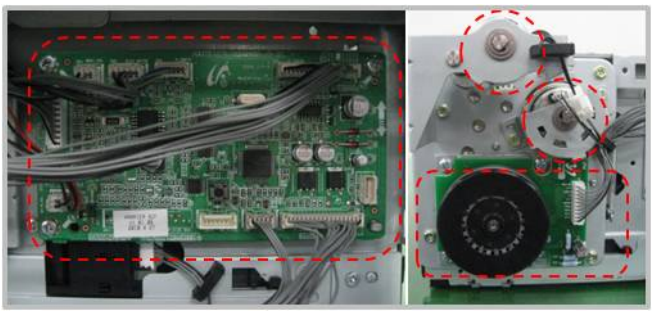
3) Check if the pick up/forward/reverse rollers of the tray2 are defective or worn out.



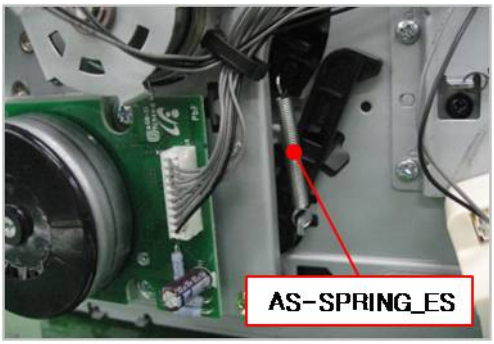
4) Check if the Empty/ Pick up/ Regi-Act sensor of the tray3 is working properly.



5) Check the connection between the motor/clutch and the SCF board. Reconnect the harness.



6) Check if the AS-SPRING_ES is deformed or assembled properly.



7) If the problem persists after checking No. 1~7, replace the SCF board.

8) If the problem persists, replace the Drop connector harness.

► **Error Code**

H1-1322

► **Error message**

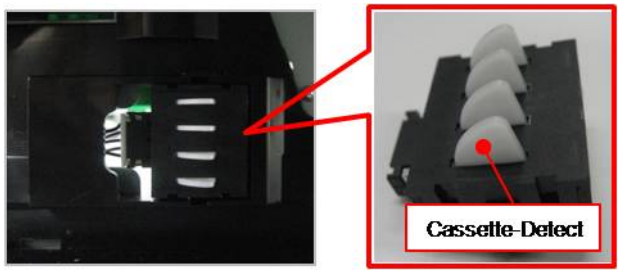
Tray 3 cassette is pulled out. Insert it properly.

► **Symptom**

Tray 3 is pulled out or the cassette detection sensor connector is not connected or broken.

► **Troubleshooting method**

1) Remove and insert tray3 correctly.
2) If the problem persists, remove tray3 again.
3) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.
4) If the connection is OK, replace the cassette detection sensor.



5) If the problem persists, replace the SCF board.

► **Error Code**

H1-1352

► **Error message**

Paper is empty in tray 3. Load paper.

► **Symptom**

The media level in tray 3 (optional cassette) is empty. / The photo sensor is defective.

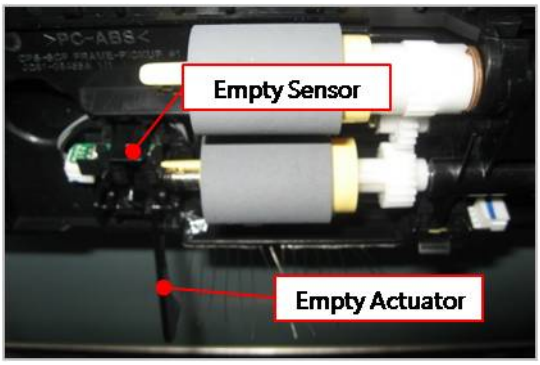
► **Troubleshooting method**

1) Remove tray2. Load the paper in tray3.

2) If paper is loaded but error message has not disappeared, check the following.

a) Check if the paper empty sensor is contaminated. If so, clean it.

b) If the paper empty sensor is defective, replace it.



c) If the empty actuator is defective, replace it.

► **Error Code**

H1-1353

► **Error message**

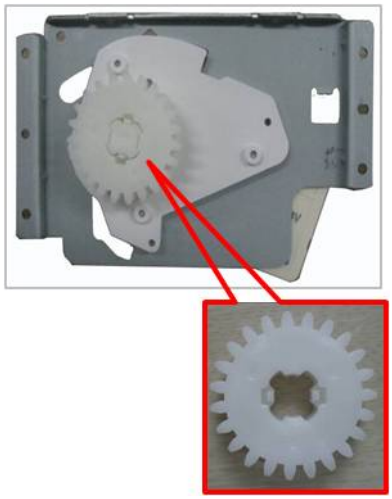
Tray Failure: #H1-1353. Pull tray 3 out and insert it. Call for service if the problem persists

► **Symptom**

The paper is not fed from tray3.

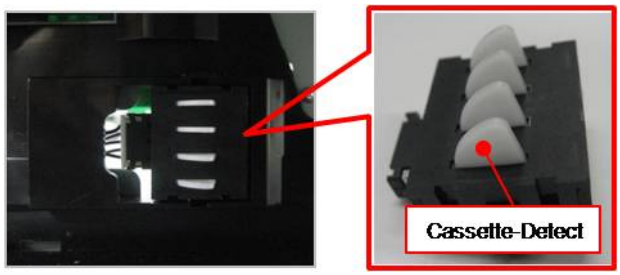
► **Troubleshooting method**

1) Check if the Gear-Idle Lift is broken.



2) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.

3) If the connection is OK, replace the cassette detection sensor.



4) Check if the Lift-Motor connector is connected properly.

5) If the problem persists, replace the Lift-Motor.

► **Error Code**

H1-1410 / H1-1411

► **Error message**

Paper jam in tray 4. Please open the door and remove paper, then close the door.

► **Symptom**

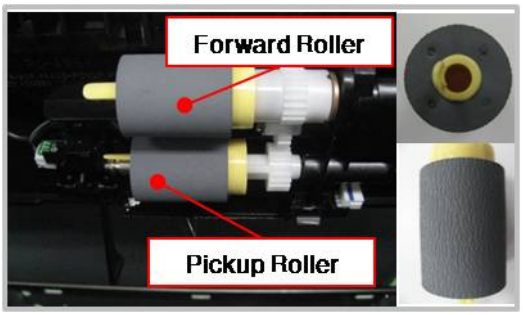
Paper jam has occurred in tray4.

► **Troubleshooting method**

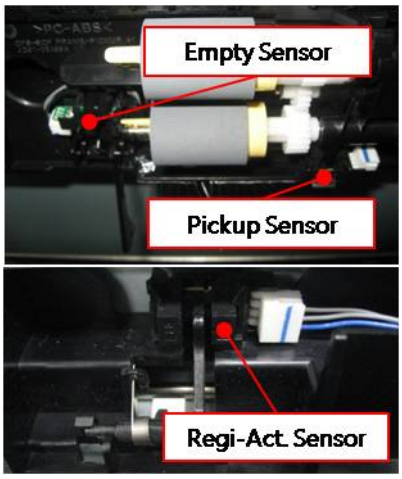
1) Remove the jammed paper. If the problem persists, check the followings.

2) Check if the paper is loaded in the tray4 properly.

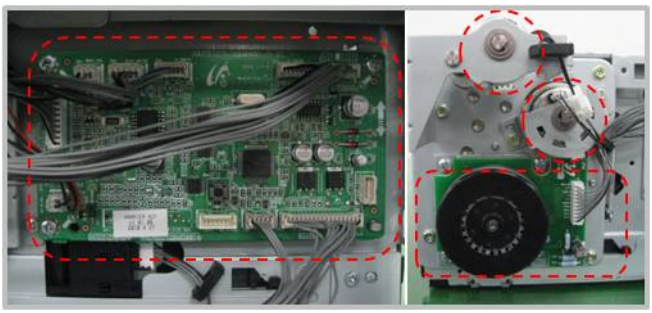
3) Check if the pick up/forward/reverse rollers of the tray2 are defective or worn out.



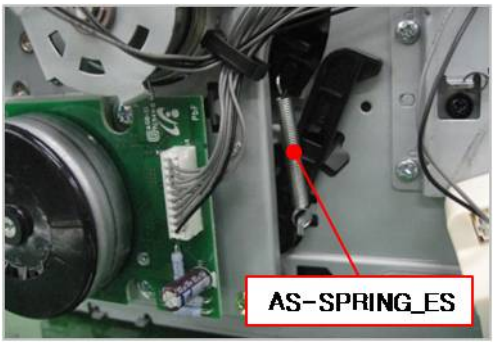
4) Check if the Empty/ Pick up/ Regi-Act sensor of the tray4 is working properly.



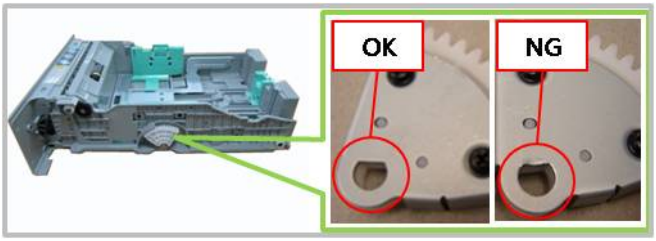
5) Check the connection between the motor/clutch and the SCF board. Reconnect the harness.



6) Check if the AS-SPRING_ES is deformed or assembled properly.



7) Check if the Press D-cut of the Gear-Lifting is broken.



8) If the problem persists after checking No. 1~7, replace the SCF board.

9) If the problem persists, replace the Drop connector harness.

► **Error Code**

H1-1422

► **Error message**

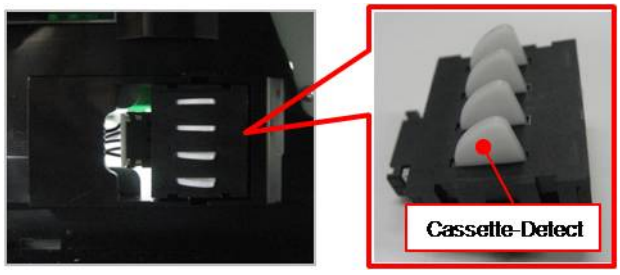
Tray 4 cassette is pulled out. Insert it properly.

► **Symptom**

Tray 4 is pulled out or the cassette detection sensor connector is not connected or broken.

► **Troubleshooting method**

1) Remove and insert tray4 correctly.
2) If the problem persists, remove tray4 again.
3) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.
4) If the connection is OK, replace the cassette detection sensor.



5) If the problem persists, replace the SCF board.

► **Error Code**

H1-1452 / H1-1454

► **Error message**

Paper is empty in tray 4. Load paper

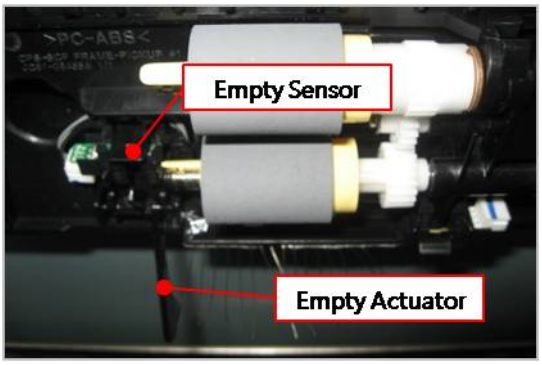
► **Symptom**

The media level in tray 4 (optional cassette) is empty. The tray is empty. / The photo sensor is defective.

► **Troubleshooting method**

1) Remove tray2. Load the paper in tray4.

2) If paper is loaded but error message has not disappeared, check the following.
   a) Check if the paper empty sensor is contaminated. If so, clean it.
   b) If the paper empty sensor is defective, replace it.



   c) If the empty actuator is defective, replace it.

► **Error Code**

H1-1453

► **Error message**

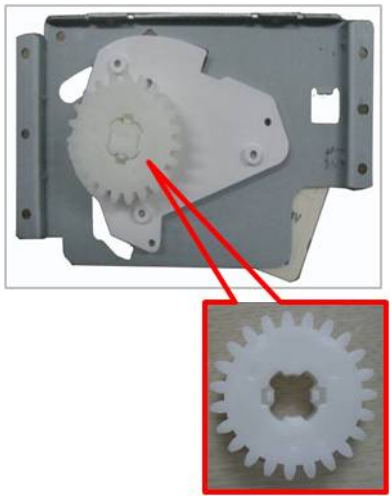
Tray Failure: #H1-1453. Pull tray 4 out and insert it. Call for service if the problem persists

► **Symptom**

The paper is not fed from tray4.

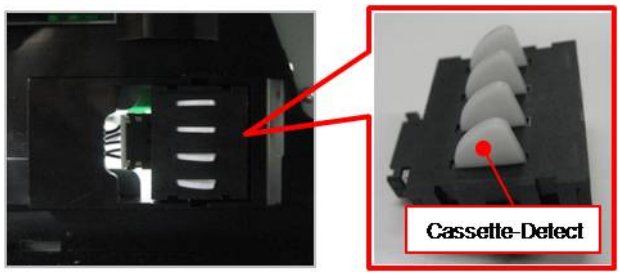
► **Troubleshooting method**

1) Check if the Gear-Idle Lift is broken.



2) Check if the cassette detection sensor cable is connected correctly. Unplug and reconnect it.

3) If the connection is OK, replace the cassette detection sensor.



4) Check if the Lift-Motor connector is connected properly.

5) If the problem persists, replace the Lift-Motor.

4.6.5. Mx-xxxx type error code

► **Error Code**

M1–1110

► **Error message**

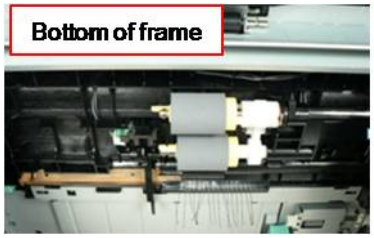
Paper jam in tray 1. Please remove the paper

► **Symptom**

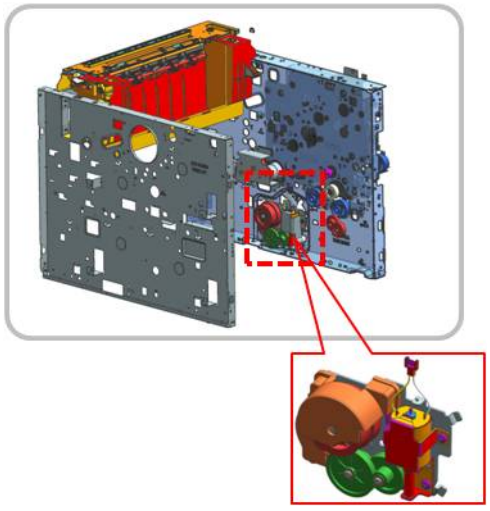
Paper jam has occurred in tray1.

► **Troubleshooting method**

1) Remove the tray1. Remove the jammed paper. And install the tray.
2) If the problem persists, check the followings.
3) Check if the proper paper is loaded in the tray. If not, replace the paper.
4) Check if the pick up/forward/reverse roller are contaminated or worn out. Replace these rollers.

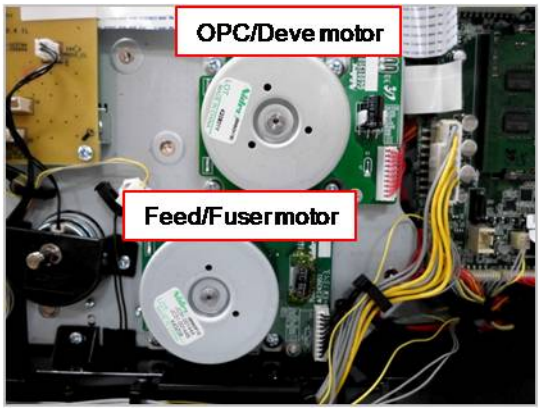


5) Check if the cassette lifting is working normally. If not, check the feed drive unit.



6) Check if the main(feed/fuser) motor connector is connected correctly.
7) If the connection is OK, enter SVC mode. Select the main(feed/fuser) motor test.
   (**Diagnostics > Engine Diagnostics > Engine Test Routines**)
   Check the motor operation.
   a) If the main(feed/fuser) motor is not operational,

- Check the signal and power with the DVM.
- If the checked result is normal, replace the main(feed/fuser) motor.

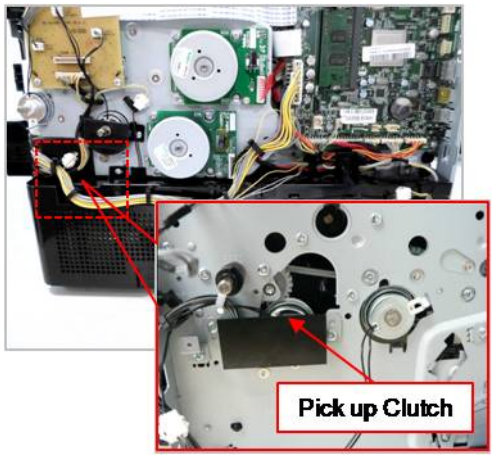


- If the checked result is abnormal, check the following.
  - If 24V power is not generated, replace the SMPS board.
  - If the control signal is abnormal, replace the main board.

b) If the main(feed/fuser) motor is operational,

- Check the Pin No 8. If the value is abnormal, replace the main board. If the value is normal, replace the harness.

8) Check the pick up clutch connection. If the pick up clutch is defective, replace it.



► **Error Code**

M1–1610

► **Error message**

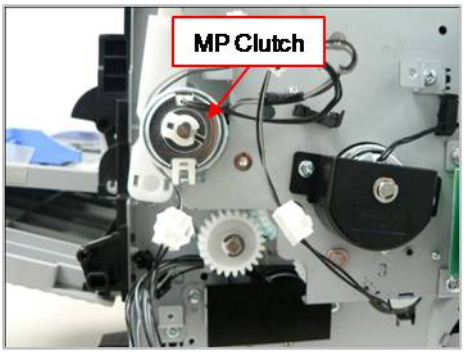
Paper jam in MP tray. Please remove the paper

► **Symptom**

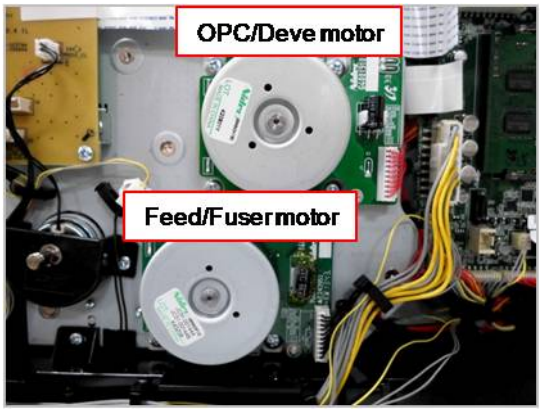
Paper jam has occurred in MP tray.

► **Troubleshooting method**

1) Remove the jammed paper from the MP tray.
2) If the problem persists, check the followings.
3) Check if the proper paper is loaded in the tray. If not, replace the paper.
4) Check if the MP pick up roller is contaminated or worn out. Replace the MP pick up roller Assy.
5) Check the MP pick up clutch connection. If the MP pick up clutch is defective, replace it.



6) Check if the main(feed/fuser) motor connector is connected correctly.
7) If the connection is OK, enter SVC mode. Select the main(feed/fuser) motor test.
(**Diagnostics > Engine Diagnostics > Engine Test Routines**)
Check the motor operation.
   a) If the main(feed/fuser) motor is not operational,
      - Check the signal and power with the DVM.
      - If the checked result is normal, replace the main(feed/fuser) motor.



      - If the checked result is abnormal, check the following.
        - If 24V power is not generated, replace the SMPS board.
        - If the control signal is abnormal, replace the main board.

b) If the main(feed/fuser) motor is operational,

- Check the Pin No 8. If the value is abnormal, replace the main board. If the value is normal, replace the harness.

► **Error Code**

M1–3122

► **Error message**

Tray 1 cassette is pulled out. Insert it properly.

► **Symptom**

Tray1 is not installed properly.

► **Troubleshooting method**

1) Install the tray1. If the tray1 is already installed, remove and reinstall it.
2) Check if the harness connection for cassette detection is normal. Reconnect it. If the harness is defective, replace it.
3) Check if the cassette detection sensor is defective, replace it.

► **Error Code**

M1–4111

► **Error message**

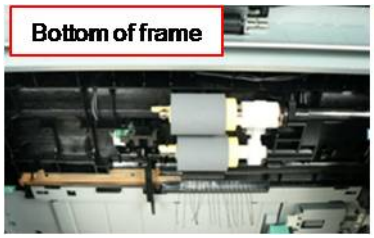
Tray Failure: #M1-4111. Pull tray 1 out and insert it. Call for service if the problem persists.

► **Symptom**

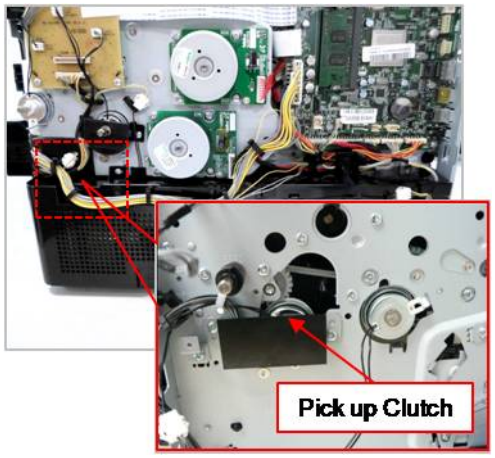
The paper has jammed in the path or can't be fed.

► **Troubleshooting method**

1) Check if the pick up/ forward/ retard roller are contaminated or worn out. Replace the defective roller.



2) Check the feed drive unit for cassette lifting.
   - Check if the gear is worn out or broken.
   - Check if the DC motor is working normally.
   - If any part is defective, replace it or the feed drive unit.
3) Check the pick up clutch connection. If the pick up clutch is defective, replace it.



► **Error Code**

M1–5112

M1–5113

► **Error message**

Paper is low in tray 1. Load paper

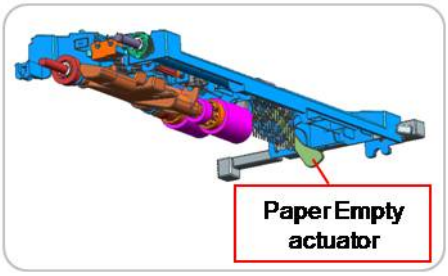
Paper is empty in tray 1. Load paper.

► **Symptom**

Paper is empty in Tray1.

► **Troubleshooting method**

1) Check if the paper is loaded in tray1. Load the paper.
2) Check if the empty actuator of the pick up Assy is assembled correctly. If it is broken or deformed, replace it.



3) If the empty sensor harness is connected correctly. If the harness is defective, replace it.
4) If the empty sensor is defective, replace it.

► **Error Code**

M1–5120

► **Error message**

Paper is empty in all tray. Load paper

► **Symptom**

Paper is empty in all tray.

► **Troubleshooting method**

1) Check if the paper is loaded in tray1 and MP tray. Load the paper.
2) Check if the empty actuator is assembled correctly. If it is broken or deformed, replace it.
3) If the empty sensor harness is connected correctly. If the harness is defective, replace it.
4) If the empty sensor is defective, replace it.

► **Error Code**

M1–5612

► **Error message**

Paper is empty in all tray. Load paper

► **Symptom**

Paper is empty in MP tray.

► **Troubleshooting method**

1) Check if the paper is loaded in MP tray. Load the paper.
2) Check if the MP empty actuator is assembled correctly. If it is broken or deformed, replace it.
3) If the MP empty sensor harness is connected correctly. If the harness is defective, replace it.
4) If the MP empty sensor is defective, replace it.

► **Error Code**

M2–1111 / M2–1114 / M2–1214

► **Error message**

Paper jam inside of machine. Please remove the paper

► **Symptom**

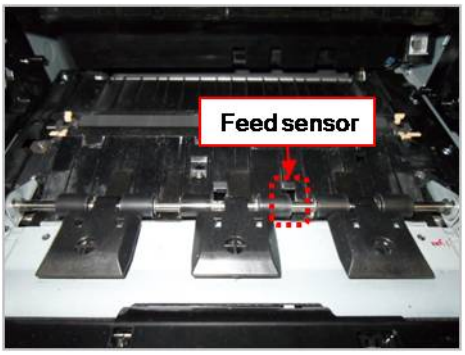
The paper has jammed at the feed sensor.

► **Troubleshooting method**

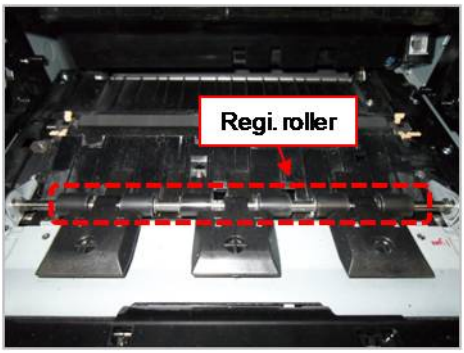
1) Remove the tray1. Remove the jammed paper. And install the tray.

2) If the problem persists, check the followings.

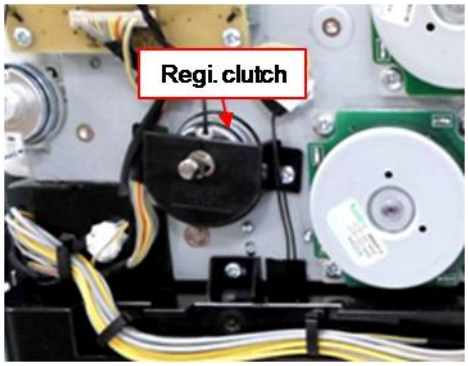
3) Check if the feed sensor connector is connected correctly.



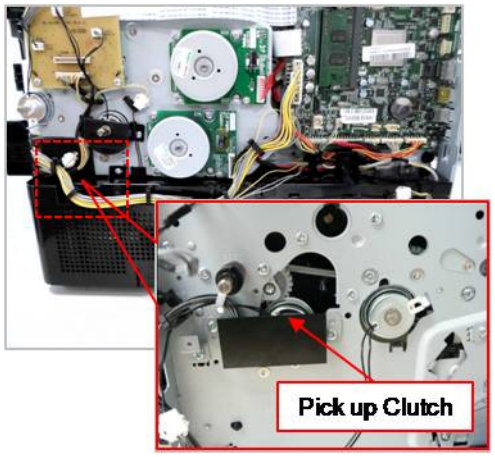
4) Check if the regi. roller is contaminated or worn out.



5) Check the regi. clutch connection. If the regi. clutch is defective, replace it.



6) Check the pick up clutch connection. If the pick up clutch is defective, replace it.



► **Error Code**

M2–2212

M2–2214

M2–2310

► **Error message**

Paper jam at the top of duplex path. Please remove the paper

Paper jam inside of duplex path. Please remove the paper

Paper jam at the bottom of duplex path. Please remove the paper

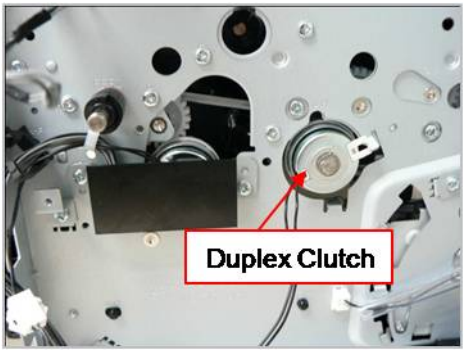
► **Symptom**

The paper did not enter the duplex path and has jammed.

► **Troubleshooting method**

1) Remove the jammed paper. If the same error occurs continually, check the following.
2) Check if there are any obstacles or contamination in the duplex path.
3) Check if the exit actuator of the fuser unit works normally.

4) Check if the exit motor works normally and its connector is connected properly.
5) If the exit motor is defective, replace it or exit drive unit.
6) Check if the duplex clutch works normally and its connector is connected properly.
7) If the duplex clutch is defective, replace it.



► **Error Code**

M3–1110 / M3–1112

► **Error message**

Paper jam in exit area. Please remove the paper

Paper jam inside of machine. Please remove the paper

► **Symptom**

Paper jam has occurred around the exit area.

► **Troubleshooting method**

1) Remove the jammed paper. If the same error occurs continually, check the following.
2) Check if there are any obstacles or contamination in the duplex path.
3) Check if the exit actuator of the fuser unit works normally.

4) Check if the exit motor works normally and its connector is connected properly.
5) If the exit motor is defective, replace it or exit drive unit.
6) Remove the exit drive unit. Check if the gear is worn out or broken. If necessary, replace the exit drive unit.
7) Remove the fuser unit. If there is any broken or defective part of the fuser unit. Replace it or fuser unit.

► **Error Code**

M3–2130

► **Error message**

Too much paper in output bin tray. Remove printed paper

► **Symptom**

There are too much paper in output bin tray.

► **Troubleshooting method**

1) Remove the paper on exit tray.

2) If this error occurs continually, check the following.
   a) Check if the bin-full sensor and actuator is assembled correctly.
   b) Check if the bin-full sensor is defective.

4.6.6. Sx-xxxx type error code

► **Error Code**

S1–2433

S1–244x

► **Error message**

System Failure: #S1-2433 . Call for service

HDD System Failure #S1-244x : Call for service

► **Symptom**

System memory is corrupted. / Unexpected S/W error has occurred.

► **Troubleshooting method**

1) Enter the SVC(tech) mode. Select “System Recovery” in Service Function menu.
2) Execute the hard disk format and firmware re-installation.
3) If the problem persists, replace the HDD.

► **Error Code**

S1–2434

S1–2435

S1–2436

S1–2437

S1–2438

S1–2439

► **Error message**

There is not enough space on the hard disk. Please delete the information stored in the address book

There is not enough space on the hard disk. Please delete the stored file

► **Symptom**

HDD partition or memory is full.

► **Troubleshooting method**

- S1-2434 : Addresses in Address book / User data in User profile
- S1–2435 : Documents in Document box / Jobs in Secure job list / Fonts / Forms
- S1-2436 : System Logs
- S1-2437 : Pending print jobs and received fax jobs.
- S1-2438/2439 : Printing Error / No Paper in Tray

1) Enter SVC mode. Select “Hard Disk Maintenance” in Service Function menu.
2) Execute hard disk format.
3) If the problem persists, replace the HDD.

► **Error Code**

S1–2450 / S1–2451 / S1–2452 / S1–2453 / S1–2454

► **Error message**

HDD Failure: #S1-245x. Call for service.

► **Symptom**

The printer cannot access the data stored in the HDD database. The file in the database is corrupted.

► **Troubleshooting method**

- S1–2451 : Audit Log data
- S1–2452 : XOA data
- S1–2453 : License data
- S1–2454 : Job log data

1) When this error occurs, you can reboot the system in forced system recovery mode and execute HDD recovery
2) You can use the TS update manager to execute the patch file and delete the database.
3) If neither of these methods fix the error, then you can attempt a low format (all data will be lost) or replace the HDD.

► **Error Code**

S1–2510 / S1–2550

► **Error message**

MSOK Failure: #S1-2510. Call for service and change MSOK

MSOK Failure: #S1-2550. Call for service and change MSOK

► **Symptom**

MSOK module was broken.
TPM in MSOK doesnt work.
* TPM: Trusted Platform Module, Security password processing unit for storing the encryption key

► **Troubleshooting method**

1) MSOK needs to be replaced. Please contact HQ tech support.

► **Error Code**

S2–1110

► **Error message**

Engine Failure: #S2-1110. Call for service if the problem persists

► **Symptom**

The CPU in main board has some problem. (Booting error, Communication error etc.)

► **Troubleshooting method**

1) Turn the machine off then on.

2) If the problem persists, replace the main board.

► **Error Code**

S2–331D

► **Error message**

Wait delay time for lower fixing temperature…

► **Symptom**

These errors show the engine status.

► **Troubleshooting method**

1) Please wait until this error will disappear.

► **Error Code**

S2–4210

► **Error message**

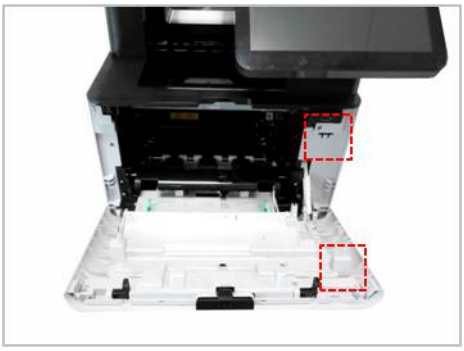
Front door is open. Close it

► **Symptom**

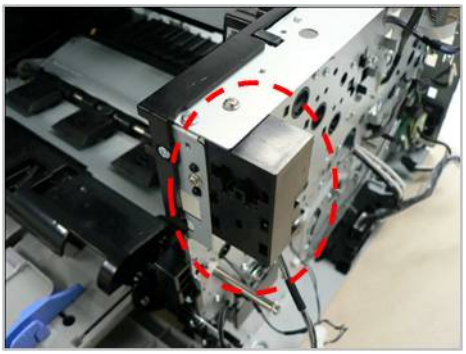
Front cover is opened.

► **Troubleshooting method**

1) Open the front cover and close it correctly.
2) Open the front cover.
3) Check if the switch contact of the front cover is deformed.



4) Remove the right cover.
5) Check the connection between the cover open sensor and the joint board. Reconnect the harness. If the harness is defective, replace it.
6) Open the front cover. Check if the message is changed when pushing the micro switch(cover open sensor).
7) If the cover open sensor is defective, replace it.



► **Error Code**

S2–4310

► **Error message**

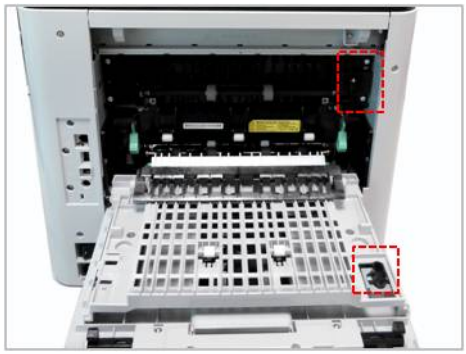
Rear door is open. Close the door

► **Symptom**

Rear cover is opened.

► **Troubleshooting method**

1) Open the rear cover and close it correctly.
2) Open the rear cover.
3) Check if the switch contact of the rear cover is deformed.



4) Remove the left cover.
5) Check the connection between the cover open sensor and HVPS board. Reconnect the harness. If the harness is defective, replace it.
6) Open the rear cover. Check if the message is changed when pushing the micro switch(cover open sensor).
7) If the cover open sensor is defective, replace it.

► **Error Code**

S3–3121

► **Error message**

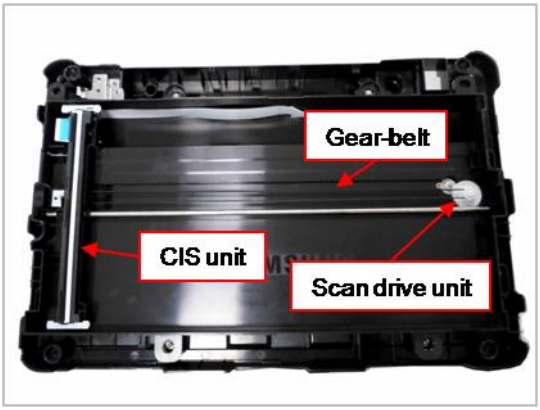
Scanner is locked

► **Symptom**

Scanner module does not move. / Scanner lock error has occurred.

► **Troubleshooting method**

1) Check if the CIS unit is moving when power on.
2) Check if the flat cable is connected to the CIS unit properly. Reconnect or replace the cable.
3) If the CIS is defective, replace it.
4) Check if there is any defective part in the scanner unit. (Gear, Belt, Motor etc.)



- Gear-Belt
- Scan drive unit

► **Error Code**

S3–3130

► **Error message**

Scan System Failure: #S3-3130. Call for service

► **Symptom**

CIS cable in the platen unit is not connected correctly.

► **Troubleshooting method**

1) Power off the machine.
2) If CIS connection cable is not connected, connect CIS connection cable.
3) If CIS connection cable is connected but this error code has occurred, then disconnect CIS cable. And then, connect CIS cable again.
4) Power On.
5) If the problem persists, check the cable. If it is defective, replace it.
6) If the problem persists, check the CIS. If it is defective, replace it.

► **Error Code**

S3–3230

► **Error message**

Scan System Failure: #S3-3130. Call for service

► **Symptom**

CIS cable in the ADF unit is not connected correctly.

► **Troubleshooting method**

1) Power off the machine.
2) If CIS connection cable is not connected, connect CIS connection cable.
3) If CIS connection cable is connected but this error code has occurred, then disconnect CIS cable. And then, connect CIS cable again.
4) Power On.
5) If the problem persists, check the cable. If it is defective, replace it.
6) If the problem persists, check the CIS. If it is defective, replace it.

► **Error Code**

S6–3122

► **Error message**

This IP address conflicts with that of other system. Check it.

► **Symptom**

The network cable is not connected.

► **Troubleshooting method**

1) Check if the network cable is connected to the machine correctly.

2) If the connection is OK, check the network status.

► **Error Code**

S6–3123

► **Error message**

This IP address conflicts with that of other system. Check it.

► **Symptom**

Network has some problem. (IP address conflicts with that of other system.

► **Troubleshooting method**

- Change the machine's IP address.

  1) Select "Machine Setup" on the touch screen.

  2) Select "Networking Setting".

  3) "Log-In".

  4) Select "TCP/IP".

  5) Select the proper item for your machine.

  6) Select "IP Setting".

  7) Select the proper item for your machine.

  8) Change the IP address.

► **Error Code**

S6–3128

► **Error message**

802.1x authentication failed. Please Contact the System Administrator.

► **Symptom**

Network error. (A authenticator(eg switch) rejected authentication. / There is no response when checking the ping test.)

► **Troubleshooting method**

1) Change the machine's 802.1x credentials.
   a) Select "Machine Setup" on the touch screen.
   b) Select "Security"
   c) Select "802.1x"
   d) Select the proper authentication mode for your network environment.
   e) Input valid credentials.
2) The System Administrator should check if Ethernet port and authentication server were configured correctly.

► **Error Code**

S7–2110

► **Error message**

Fuser Failure: #S7-2110. Turn off then on

► **Symptom**

Heater control relay is abnormal.

► **Troubleshooting method**

1) Turn the machine off. Re-install the fuser unit, then turn the machine on.
2) If the problem persists, replace the fuser drive board(FDB).
3) If the problem persists, replace the fuser unit.

4.6.7. U1-xxxx type (Fuser) error code

► **Error Code**

U1–2115

U1–2116

► **Error message**

Fuser unit Failure: #U1-2115. Turn off then on. Call for service if the problem persists

Fuser unit Failure: #U1-2116. Turn off then on. Call for service if the problem persists

► **Symptom**

The pressure control unit(Cam unit)of the fuser is abnormal.

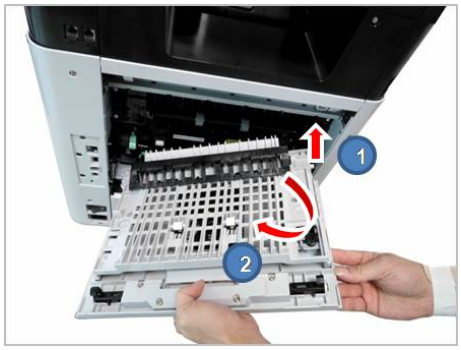
► **Troubleshooting method**

CAUTION

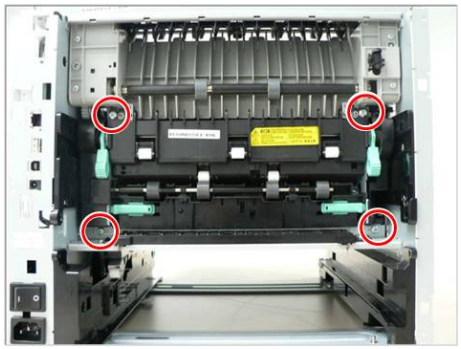
The temperature gets hot around the fuser unit. To prevent burns, make sure the fuser unit area is cool before performing this procedure.

1) After checking the fuser installation, turn the machine off then on.

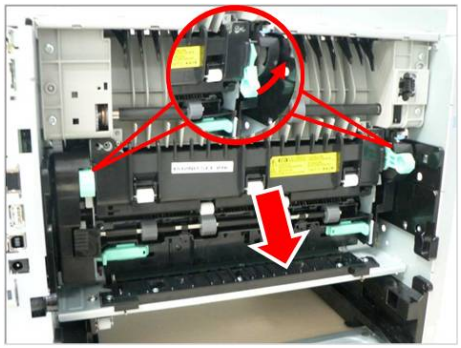
2) Open the rear cover. Lift up the right side and release the rear cover.



3) If there is no problem, remove 4 screws.



4) Lift up the both levers. Then take off the fuser unit.



5) Remove the fuser side cover L/R. Check if the Actuator cam, Gear cam are assembled correctly.

6) If there is no problem for above steps, assemble and reinstall fuser unit. Then turn the machine on.

7) If the same error persists, perform a Memory Clear (backup data in SWS first); if that does not work try reinstalling the firmware.

8) If the same error persists, replace the fuser unit with new one.

9) If the same error persists, replace the main board.

► **Error Code**

U1–2117

► **Error message**

Fuser unit Failure: #U1-2117. Turn off then on.

► **Symptom**

The machine can't detect that the fuser unit is installed.

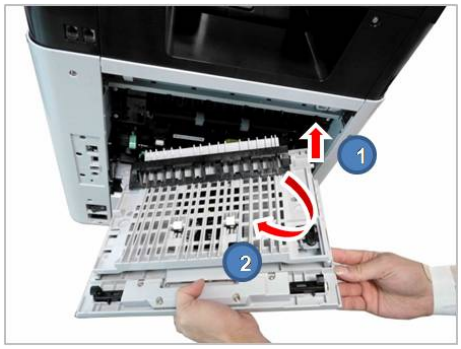
► **Troubleshooting method**

CAUTION

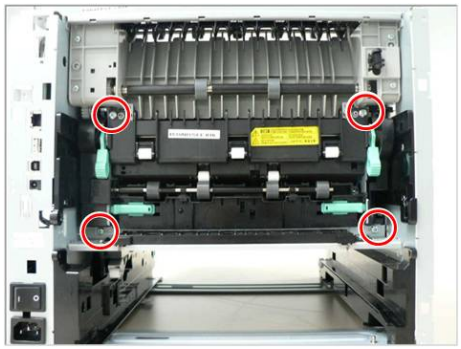
The temperature gets hot around the fuser unit. To prevent burns, make sure the fuser unit area is cool before performing this procedure.

1) After checking the fuser installation, turn the machine off then on.

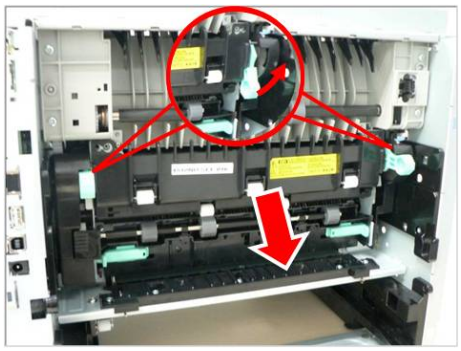
2) Open the rear cover. Lift up the right side and release the rear cover.



3) If there is no problem, remove 4 screws.



4) Lift up the both levers. Then take off the fuser unit.



5) If there is no problem for above steps, assemble and reinstall fuser unit. Then turn the machine on.

6) If the same error persists, execute the memory clear.

7) If the same error persists, replace the fuser unit with new one.

8) If the same error persists, replace the main board.

► **Error Code**

U1–213x / U1–23xx

► **Error message**

Fuser unit Failure: #U1-2xxx. Turn off then on. Call for service if the problem persists

► **Symptom**

The temperature control of fuser unit is abnormal. (Open Heat Error or Low Heat Error or Over Heat Error) / Thermistor is defective. / Fuser unit connection is bad.

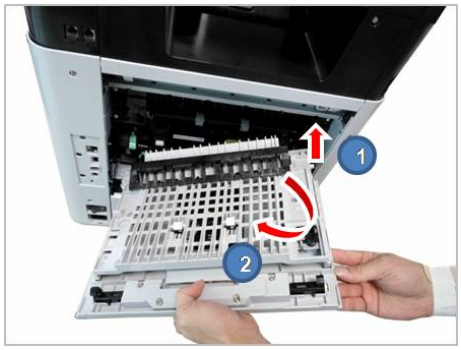
► **Troubleshooting method**

CAUTION

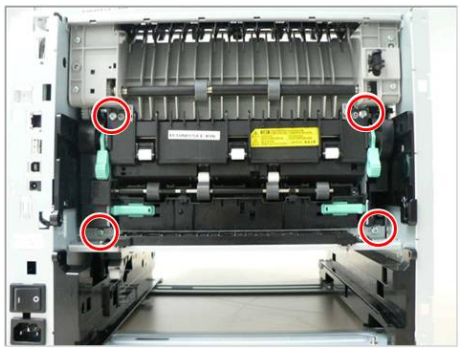
The temperature gets hot around the fuser unit. To prevent burns, make sure the fuser unit area is cool before performing this procedure.

1) After checking the fuser installation, turn the machine off then on.

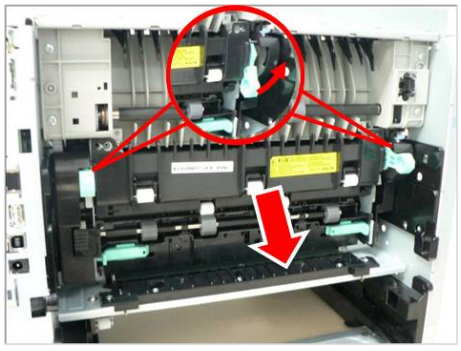
2) Open the rear cover. Lift up the right side and release the rear cover.



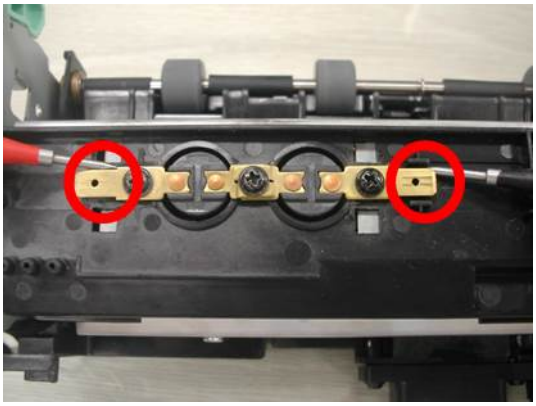
3) If there is no problem, remove 4 screws.



4) Lift up the both levers. Then take off the fuser unit.



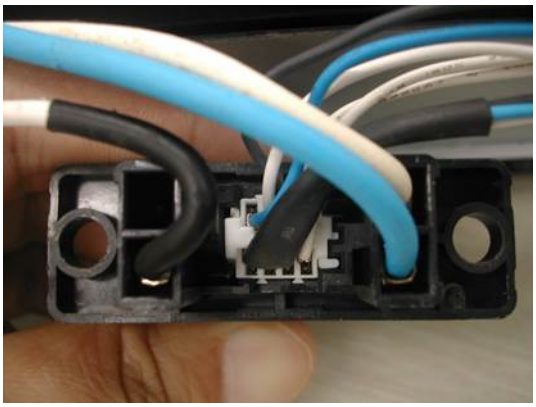
5) Remove the Frame-cover-upper after removing 2 screws. And measure the thermostat continuity. Check if the thermostat is opened.



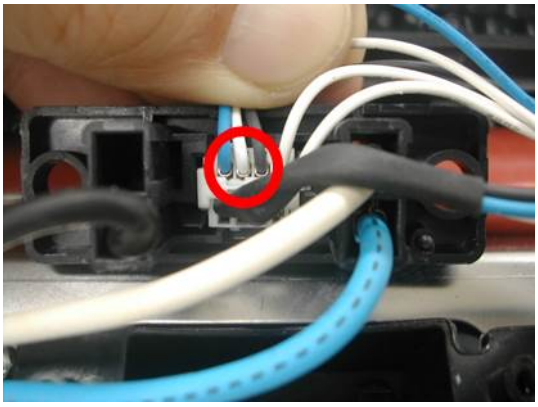
6) Measure the LAMP-HALOGEN resistance value from the center and both sides. Check if it has the continuity.

[Center Lamp] [Side Lamp]

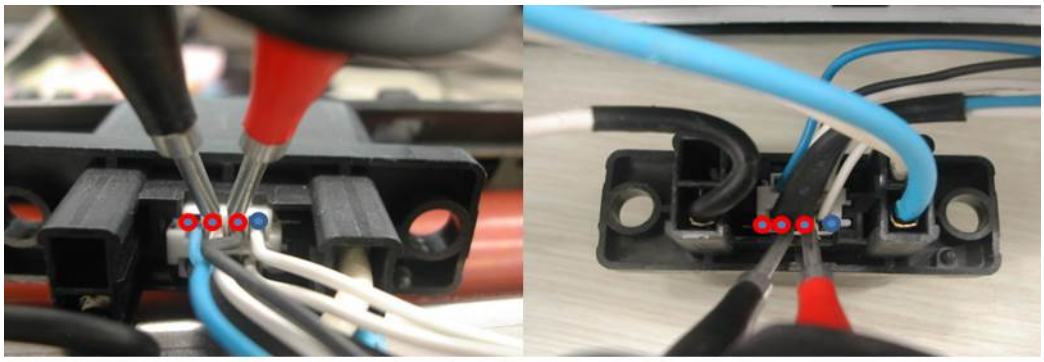
7) Check if the Draw-connector harness is correct. Check its color.



8) Check if 2 thermistor connectors are connected properly.



9) Measure the Thermistor resistance value from the center and both sides.
Check if it has the continuity. (3 Red Circles)



Center Thermistor Side Thermistor

10) Check if the thermistor connector on the main board is connected properly.

11) Check if the FDB connector is connected properly.

12) Check if the voltage in user environment is in this range (80V ~ 140V, 160V ~ 260V).

13) If there is no problems for above steps, update the firmware.

14) Replace the FDB.

15) If the problem persists, replace the SMPS.

16) If the problem persists, replace the main board.

4.6.8. U2-xxxx type (LSU) error code

► **Error Code**

U2–1111

U2–1112

U2–1113

► **Error message**

LSU Failure: #U2-1111. Please turn off then on.

LSU Failure: #U2-1112. Please turn off then on.

LSU Failure: #U2-1113. Please turn off then on.

► **Symptom**

LSU motor does not operate or it operates abnormally. / LSU Motor ready signal is abnormal.

► **Troubleshooting method**

1) Turn the machine off then on. Check for the LSU motor operation sound during warm-up.
2) Print a demo page to check that the machine operates normally.
3) If the problem persists, check the following :

- If the LSU motor makes a sound,
  a) Enter SVC mode to check the LSU motor ready signal.
  (**Diagnostics > Engine Diagnostics > Engine Test Routines**)
  b) Select “LSU Motor1 Run Ready”. (**Diagnostics > Engine Diagnostics > Engine Test Routines > 110-0000**)
  c) Press ‘Start’ button. Check that the status has changed to ‘Executing -> Low -> High’.
  d) If the status has not changed, the motor ready signal is abnormal. Replace the LSU.
- If the LSU motor does not makes a sound,
  a) Turn the machine off and open the side cover. Unplug and reconnect the LSU cable. Check that the LSU motor make a sound after turning the machine on.
  b) If the LSU cable is defective, replace it. Check that the LSU motor make a sound after turning the machine on.
  c) If the problem persists, replace the LSU.

4.6.9. U3-xxxx type(DSDF) error code

► **Error Code**

U3–3313

U3–3314

► **Error message**

Original paper jam inside the scanner

► **Symptom**

Original jam has occurred on the paper path.

► **Troubleshooting method**

1) Check if the pick up motor operates normally.
2) Open the DSDF cover. Check if the paper jam is occurred.
3) Remove the jammed paper.
4) Check if there are any obstacles or contamination on the paper path. Remove it.
5) If the problem persists, check the followings.
   a) Separate the DSDF Unit.
   b) Remove the screw. Check the sensor connection. If the connection is OK, replace the sensor.
6) Push the white bar. Check if it returns in original condition.
7) Close the DSDF unit.

► **Error Code**

U3-4210

► **Error message**

Top door of scanner is open

► **Symptom**

DSDF cover is open.

► **Troubleshooting method**

1) Close the DSDF cover properly.

2) If this error occurs continually, check the following:
   a) Check the DSDF cover open sensor and its harness. If there is a defective part, replace it.
   b) If both of them are normal, check the Cover-Open Rib. If it is broken, replace the Cover-Open.

4.7. Image quality problem

Print-quality defects can be attributed to printer components, supplies, media, internal software, external software applications and environmental conditions.

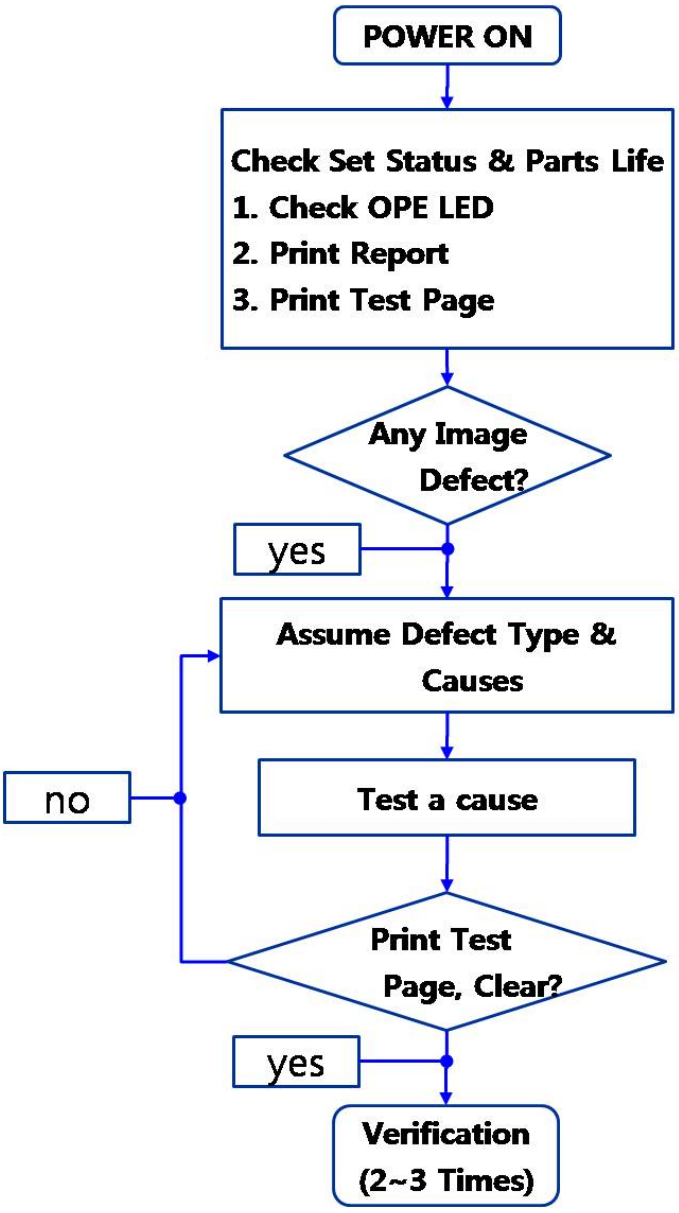
To successfully troubleshoot print-quality problems, as many variables as possible must be eliminated.

The first step is to generate prints using printable pages embedded in the printer on laser paper. The paper should be from an unopened ream that has been acclimated to room temperature and you should ensure that genuine Samsung Toner is installed in the printer.

How to analysis the defect image

TIP

- According to the part remain life, cause can vary. Check the part remain life.
- Check the defect whether periodic or not.



1) Vertical Black Line and Band

Description : Straight thin black vertical line occurs in the printed image.

Probable Cause	Solution
The paper is not the proper type.	Replace the paper.
The paper path is contaminated by toner residue, debris etc.	Clean the paper path.
The imaging unit is defective.	Replace the imaging unit.
The transfer roller is contaminated or worn out.	Replace the transfer roller.
The pressure roller or heat roller in fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**

2) Vertical White Line, Band

Description : White vertical voids occurs in the printed image.

Probable Cause	Solution
The paper is not the proper type.	Replace the paper.
The paper path is contaminated by toner residue, debris etc.	Clean the paper path.
The imaging unit is defective.	Replace the imaging unit.
The transfer roller is contaminated or worn out.	Replace the transfer roller.
The LSU window is contaminated.	1) Clean the LSU window. 2) Replace the LSU
The connection between the LSU and main board is defective.	1) Disconnect and reconnect the harness. 2) Replace the harness.

3) Horizontal Black Band

Description : Dark of blurry horizontal stripes occur in the printing periodically.

Probable Cause	Solution
The paper is dirty or not the proper type.	Replace the paper.
The paper path is contaminated by toner residue, debris etc.	Clean the paper path.
The contact terminal of the imaging unit is bad.	1) Clean the contact terminal of the imaging unit. 2) Replace the imaging unit.
The surface of transfer roller is contaminated or worn out.	Replace the transfer roller.
The LSU window is contaminated.	1) Clean the LSU window.
The pressure roller or heat roller in fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**
HVPS terminal is contaminated.	Clean the contaminated terminal.
The output from the HVPS is abnormal.	Replace the HVPS board.

NOTE

Roller Period for Horizontal Problem

Roller	Period	Replacement Unit
Charge roller	38.3 mm	Imaging unit
OPC drum	94.3 mm	
Developing roller	51.7 mm	
Supply roller	75.6 mm	
Pressure roller	112.2 mm	Fuser unit
Heat roller	94.2 mm	
Transfer roller	56.5 mm	Transfer roller

4) Black and White spot

Description : Dark or blurry black spots occur periodically in the printing.

Probable Cause	Solution
The paper path is contaminated by toner residue, debris etc.	Clean the paper path.
The rollers in the imaging unit may be contaminated with foreign matter or paper particles.	Replace the imaging unit.
The transfer roller is contaminated or worn out.	Replace the transfer roller.
The pressure roller or heat roller in fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**

5) Light image

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

Probable Cause	Solution
The toner cartridge life is expired.	Replace the toner cartridge.
The imaging unit life is expired.	Replace the imaging unit.
The surface of transfer roller is contaminated or worn out.	Replace the transfer roller.
HVPS terminal is contaminated.	Clean the contaminated terminal.
The output from the HVPS is abnormal.	Replace the HVPS board.

6) Dark or Black page

Description : The printed image is dark or black.

Probable Cause	Solution
The charging roller in the imaging unit is defective.	Replace the imaging unit.
The HVPS contact terminal is contaminated.	Clean the HVPS contact terminal.
The output from the HVPS is abnormal.	Replace the HVPS board.
The LSU is defective.	Replace the LSU.

7) Uneven Density

Description : Print density is uneven between left and right.

Probable Cause	Solution
• The pressure force on the left and right springs of the transfer roller is not even. • The springs are damaged. • The transfer roller is improperly installed.	1) Remove the transfer roller Assy. 2) Check if the transfer roller Assy has any wrong part. 3) Replace the transfer roller Assy.
The toner level is not even on the imaging unit roller due to the bad blade.	Replace the imaging unit.

8) Background

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

Probable Cause	Solution
Does recycle paper be used?	Use the proper papers.
The life of the imaging unit has been expired	Replace the imaging unit.
The output from the HVPS is abnormal.	Replace the HVPS board.

9) Ghost

Description : Ghost occurs.

Probable Cause	Solution
The residual toner on the rollers exists.	Print 10 test prints.
The contact terminal of the imaging unit is bad.	1) Clean the contact terminal of the imaging unit. 2) Replace the imaging unit.
The transfer roller is contaminated or worn out.	Replace the transfer roller.
The pressure roller or heat roller in fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**
The HVPS contact terminal is contaminated.	Clean the HVPS contact terminal.
The output from the HVPS is abnormal.	Replace the HVPS board.

10) Stains on back of page

Description : The back of the page is stained.

Probable Cause	Solution
The transfer roller is contaminated or worn out.	Replace the transfer roller.
The pressure roller or heat roller in fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**

11) Blank page

Description : No visible image anywhere on the output.

Probable Cause	Solution
The contact terminal of the imaging unit is bad.	1) Clean the contact terminal of the imaging unit. 2) Replace the imaging unit.
The surface of transfer roller is contaminated or worn out.	Replace the transfer roller.
The LSU window is contaminated.	1) Clean the LSU window. 2) Replace the LSU
The connection between the LSU and main board is defective.	1) Disconnect and reconnect the harness. 2) Replace the harness.
The connection between the main board and HVPS board is bad.	Reconnect the harness. If the main board or HVPS board is defective, replace it.

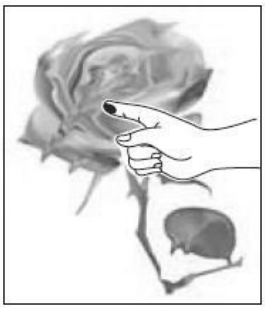
12) Partial image void

Description : The partial void occurs in the printed page.

Probable Cause	Solution
The printer is not installed on flat ground.	Install the printer on flat ground. Print 10 sample pages for test.
The developer circulation in the imaging unit is bad.	1) Shake the imaging unit 2~3 times from right to left. Reinstall the imaging unit. Print 10 sample pages for test. 2) If the problem persists, replace the imaging unit.
The contact between imaging unit and transfer roller is bad.	Check if the imaging unit and transfer roller are installed properly.

13) Unfused image

Description : The printed image is not fully fused to the paper. The image rubs off easily

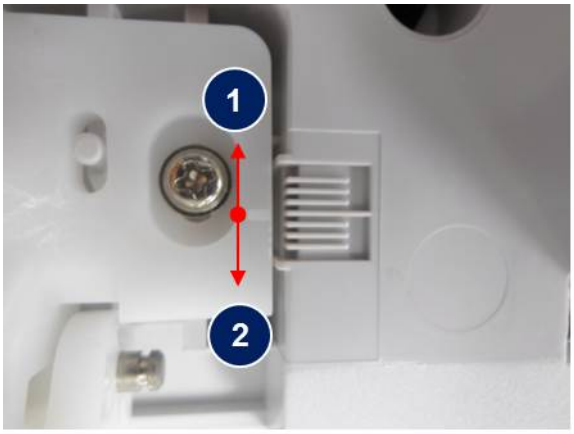


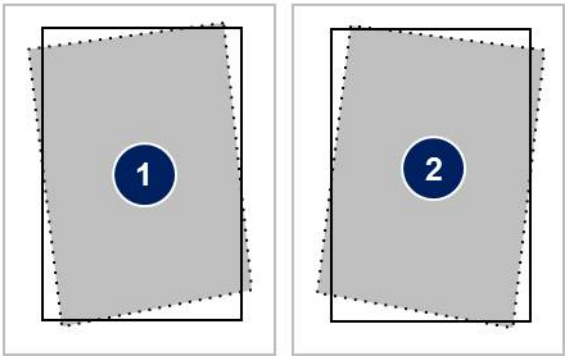
Probable Cause	Solution
The papers are wet with moisture.	Replace the paper.
The fuser unit is not tight.	1) Turn the machine off. 2) Remove and reinstall the fuser unit. 3) Turn the machine on.
The fuser connection is bad.	Check the connection between the fuser unit and main board.
The fuser unit defective.	1) Turn the machine off. 2) Remove and replace the fuser unit. 3) Turn the machine on. **WARNING** **Do not touch the fuser unit while it is hot.**

4.8. DSDF skew adjustment for M4560FX

1) Open the DSDF unit. Loosen 3 screws securing the right hinge.

2) Check the copy skew status. And then, adjust the position of the ADF hinge as shown below and tighten 3 screws.

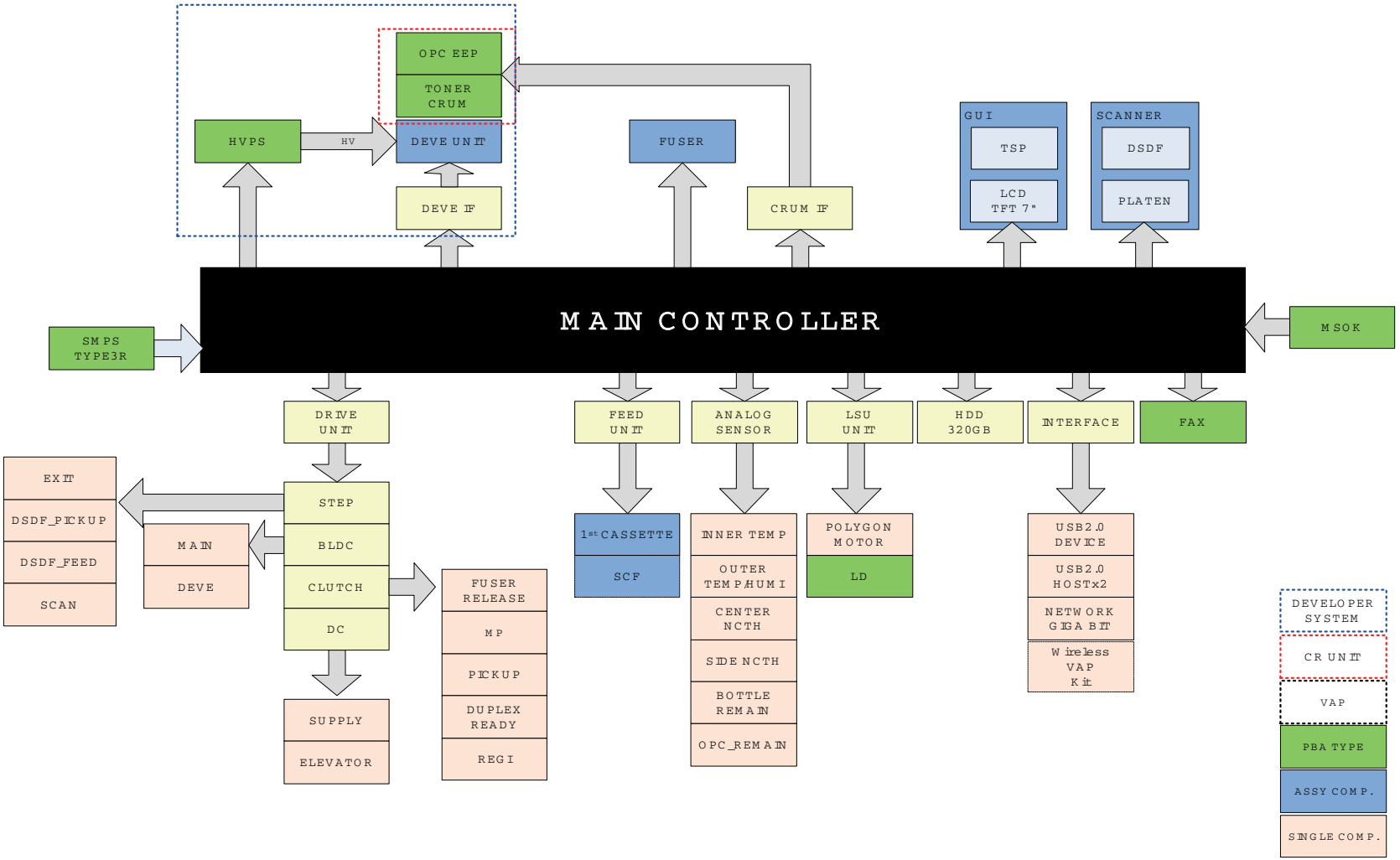




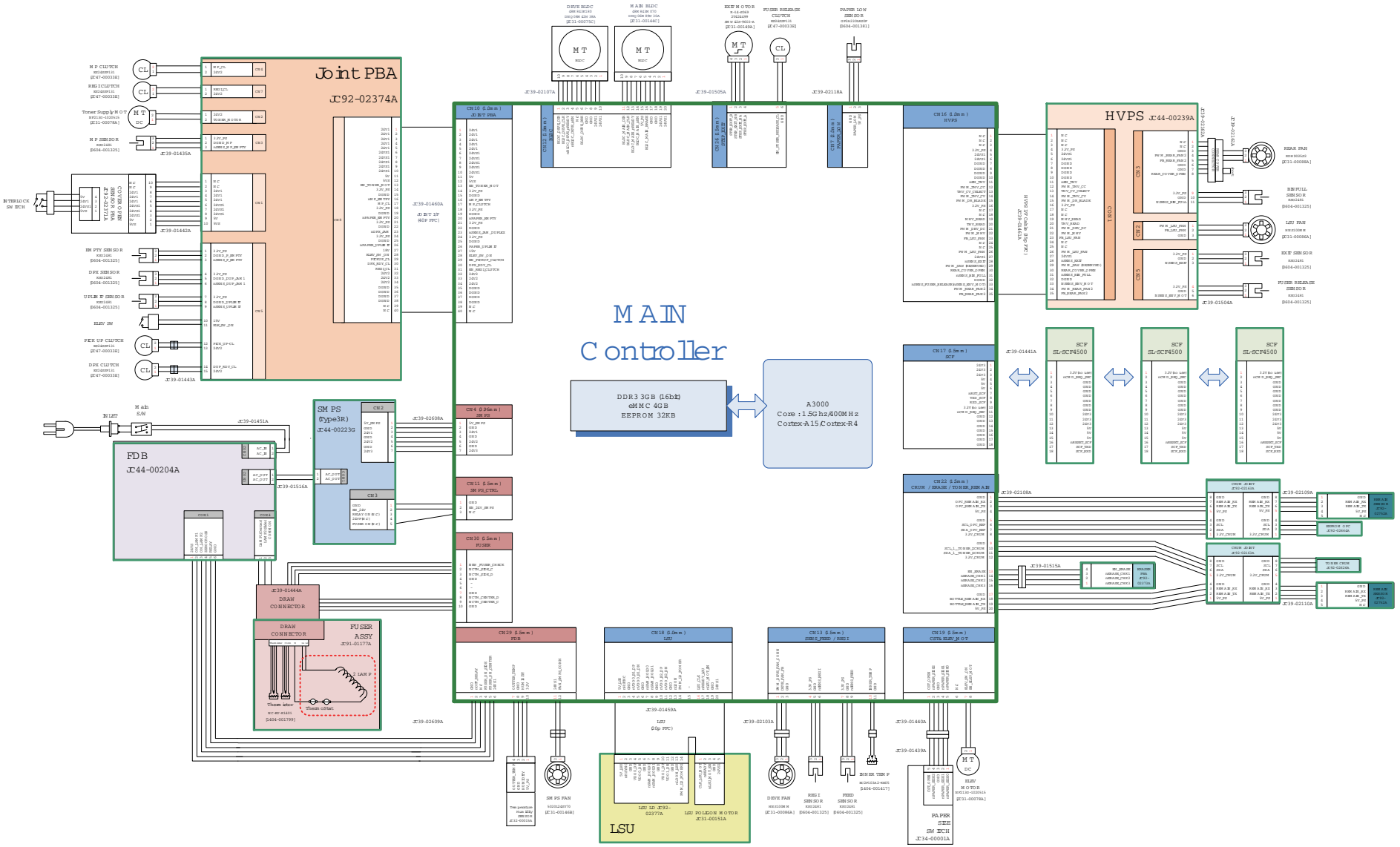
3) Detach the white-sponge(white-sheet) after adjusting the skew. Place the sponge on platen glass. And then, close the DSDF unit to stick the sponge.

5. System Diagram

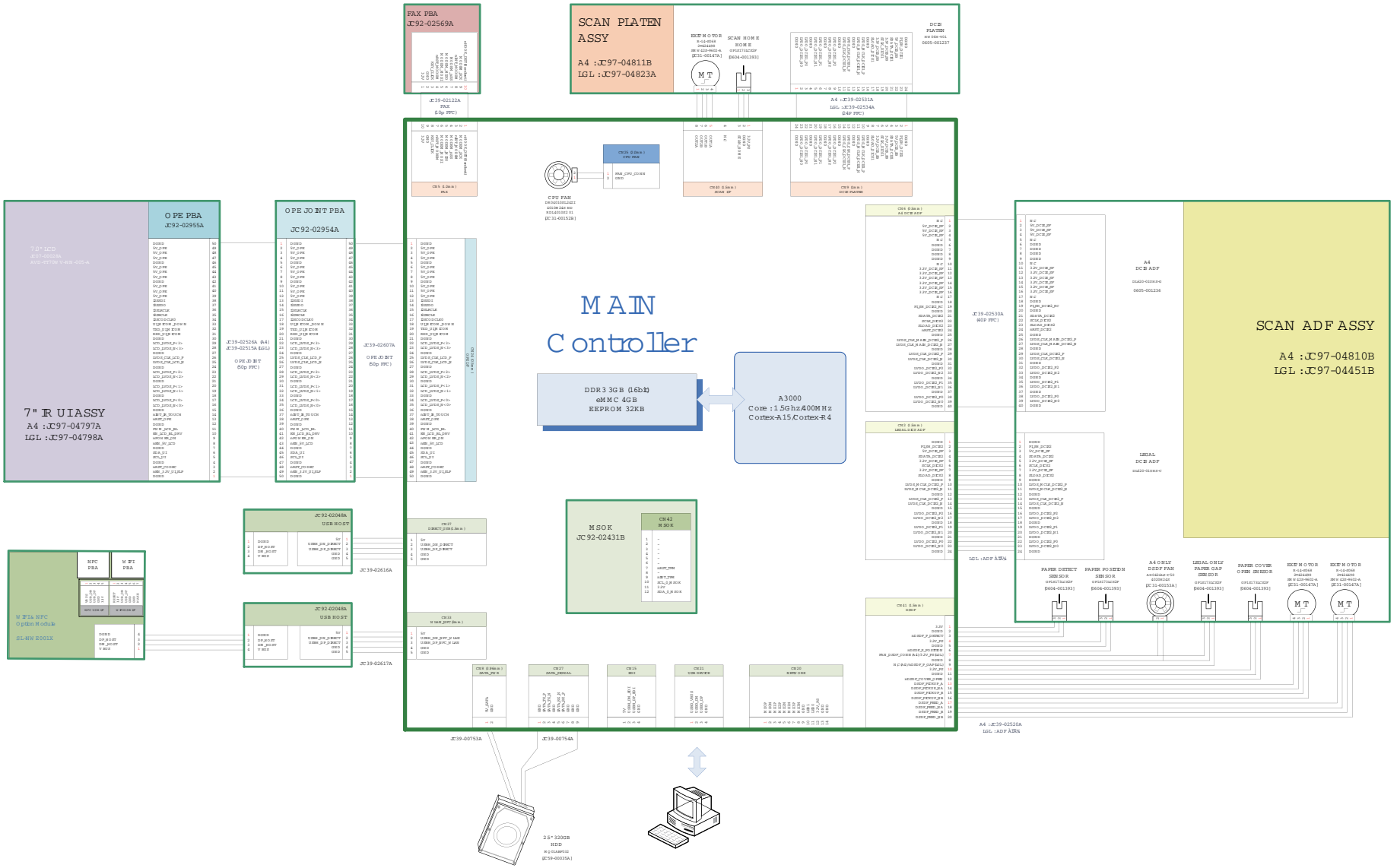
5.1. Block Diagram



5.2. Connection Diagram1



5.3. Connection Diagram2

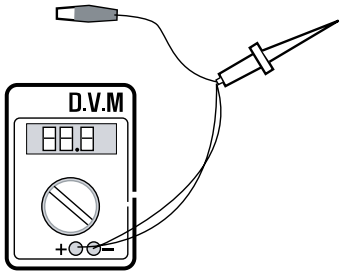
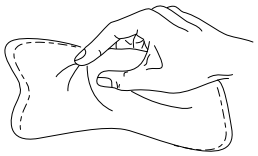
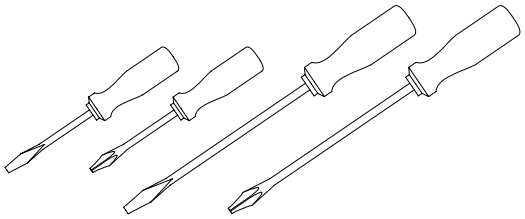
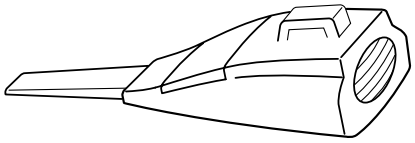
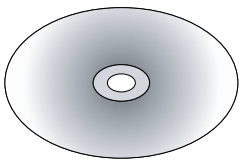


6. Reference Information

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. 	**Cleaning Equipments** Standard : An IPA (Isopropyl Alcohol) dry wipe tissue or a gentle neutral detergent and lint-free cloth. 
Driver Standard : "-" type, "+" type (M3 long, M3 short, M2 long, M2 short). 	**Vacuum Cleaner** 
Tweezers Standard : For general home use, small type. 	**Spring Hook** Standard : For general use 
Cotton Swab Standard : For general home use, for medical service. 	**Software (Driver) installation CD ROM** 

6.2. Glossary

The following glossary helps you get familiar with the product by understanding the terminologies commonly used with printing as well as mentioned in this user's guide and service manual.

802.11	802.11 is a set of standards for wireless local area network (WLAN) communication, developed by the IEEE LAN/MAN Standards Committee (IEEE 802).
802.11b/g/n	802.11b/g/n can share same hardware and use the 2.4 GHz band. 802.11b supports bandwidth up to 11 Mbps, 802.11n supports bandwidth up to 150 Mbps. 802.11b/g/n devices may occasionally suffer interference from microwave ovens, cordless telephones, and Bluetooth devices.
Access point	Access Point or Wireless Access Point (AP or WAP) is a device that connects wireless communication devices together on wireless local area networks (WLAN), and acts as a central transmitter and receiver of WLAN radio signals.
ADF	An Automatic Document Feeder (ADF) is a scanning unit that will automatically feed an original sheet of paper so that the machine can scan some amount of the paper at once.
AppleTalk	AppleTalk is a proprietary suite of protocols developed by Apple, Inc for computer networking. It was included in the original Macintosh (1984) and is now deprecated by Apple in favor of TCP/IP networking.
BIT Depth	A computer graphics term describing the number of bits used to represent the color of a single pixel in a bitmapped image. Higher color depth gives a broader range of distinct colors. As the number of bits increases, the number of possible colors becomes impractically large for a color map. 1-bit color is commonly called as monochrome or black and white.
BMP	A bitmapped graphics format used internally by the Microsoft Windows graphics subsystem (GDI), and used commonly as a simple graphics file format on that platform.
BOOTP	Bootstrap Protocol. A network protocol used by a network client to obtain its IP address automatically. This is usually done in the bootstrap process of computers or operating systems running on them. The BOOTP servers assign the IP address from a pool of addresses to each client. BOOTP enables 'diskless workstation' computers to obtain an IP address prior to loading any advanced operating system.
CCD	Charge Coupled Device (CCD) is a hardware which enables the scan job. CCD Locking mechanism is also used to hold the CCD module to prevent any damage when you move the machine.
Collation	Collation is a process of printing a multiple-copy job in sets. When collation is selected, the device prints an entire set before printing additional copies.
Control Panel	A control panel is a flat, typically vertical, area where control or monitoring instruments are displayed. They are typically found in front of the machine.
Coverage	It is the printing term used for a toner usage measurement on printing. For example, 5% coverage means that an A4 sided paper has about 5% image or text on it. So, if the paper or original has complicated images or lots of text on it, the coverage will be higher and at the same time, a toner usage will be as much as the coverage.
CSV	Comma Separated Values (CSV). A type of file format, CSV is used to exchange data between disparate applications. The file format, as it is used in Microsoft Excel, has become a de facto standard throughout the industry, even among non-Microsoft platforms.
DADF	A Duplex Automatic Document Feeder (DADF) is a scanning unit that will automatically feed and turn over an original sheet of paper so that the machine can scan on both sides of the paper.
Default	The value or setting that is in effect when taking a printer out of its box state, reset, or initialized.
DHCP	A Dynamic Host Configuration Protocol (DHCP) is a client-server networking protocol. A DHCP server provides configuration parameters specific to the DHCP client host requesting, generally, information required by the client host to participate on an IP network. DHCP also provides a mechanism for allocation of IP addresses to client hosts.
DIMM	Dual Inline Memory Module (DIMM), a small circuit board that holds memory. DIMM stores all the data within the machine like printing data, received fax data.

DLNA	The Digital Living Network Alliance (DLNA) is a standard that allows devices on a home network to share information with each other across the network.
DNS	The Domain Name Server (DNS) is a system that stores information associated with domain names in a distributed database on networks, such as the Internet.
Dot Matrix Printer	A dot matrix printer refers to a type of computer printer with a print head that runs back and forth on the page and prints by impact, striking an ink-soaked cloth ribbon against the paper, much like a typewriter.
DPI	Dots Per Inch (DPI) is a measurement of resolution that is used for scanning and printing. Generally, higher DPI results in a higher resolution, more visible detail in the image, and a larger file size.
DRPD	Distinctive Ring Pattern Detection. Distinctive Ring is a telephone company service which enables a user to use a single telephone line to answer several different telephone numbers.
DSDF	Dual Scan Document Feeder (DSDF) is a scanning unit that will automatically feed an original sheet of paper so that the machine can scan on both sides of the paper at once.
Duplex	A mechanism that will automatically turn over a sheet of paper so that the machine can print (or scan) on both sides of the paper. A printer equipped with a Duplex Unit can print on both sides of paper during one print cycle.
Duty Cycle	Duty cycle is the page quantity which does not affect printer performance for a month. Generally the printer has the lifespan limitation such as pages per year. The lifespan means the average capacity of print-outs, usually within the warranty period. For example, if the duty cycle is 48,000 pages per month assuming 20 working days, a printer limits 2,400 pages a day.
ECM	Error Correction Mode (ECM) is an optional transmission mode built into Class 1 fax machines or fax modems. It automatically detects and corrects errors in the fax transmission process that are sometimes caused by telephone line noise.
Emulation	Emulation is a technique of one machine obtaining the same results as another. An emulator duplicates the functions of one system with a different system, so that the second system behaves like the first system. Emulation focuses on exact reproduction of external behavior, which is in contrast to simulation, which concerns an abstract model of the system being simulated, often considering its internal state.
Ethernet	Ethernet is a frame-based computer networking technology for local area networks (LANs). It defines wiring and signaling for the physical layer, and frame formats and protocols for the media access control (MAC)/data link layer of the OSI model. Ethernet is mostly standardized as IEEE 802.3. It has become the most widespread LAN technology in use during the 1990s to the present.
EtherTalk	A suite of protocols developed by Apple Computer for computer networking. It was included in the original Macintosh (1984) and is now deprecated by Apple in favor of TCP/IP networking.
FDI	Foreign Device Interface (FDI) is a card installed inside the machine to allow a third party device such as a coin operated device or a card reader. Those devices allow the pay-for-print service on your machine.
FTP	A File Transfer Protocol (FTP) is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an intranet).
Fuser Unit	The part of a laser printer that fuses the toner onto the print media. It consists of a heat roller and a pressure roller. After toner is transferred onto the paper, the fuser unit applies heat and pressure to ensure that the toner stays on the paper permanently, which is why paper is warm when it comes out of a laser printer.
Gateway	A connection between computer networks, or between a computer network and a telephone line. It is very popular, as it is a computer or a network that allows access to another computer or network.
Grayscale	A shades of gray that represent light and dark portions of an image when color images are converted to grayscale; colors are represented by various shades of gray.
Halftone	An image type that simulates grayscale by varying the number of dots. Highly colored areas consist of a large number of dots, while lighter areas consist of a smaller number of dots.

HDD	Hard Disk Drive (HDD), commonly referred to as a hard drive or hard disk, is a non-volatile storage device which stores digitally-encoded data on rapidly rotating platters with magnetic surfaces.
IEEE	The Institute of Electrical and Electronics Engineers (IEEE) is an international non-profit, professional organization for the advancement of technology related to electricity.
IEEE 1284	The 1284 parallel port standard was developed by the Institute of Electrical and Electronics Engineers (IEEE). The term "1284-B" refers to a specific connector type on the end of the parallel cable that attaches to the peripheral (for example, a printer).
Intranet	A private network that uses Internet Protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with its employees. Sometimes the term refers only to the most visible service, the internal website.
IP address	An Internet Protocol (IP) address is a unique number that devices use in order to identify and communicate with each other on a network utilizing the Internet Protocol standard.
IPM	The Images Per Minute (IPM) is a way of measuring the speed of a printer. An IPM rate indicates the number of single-sided sheets a printer can complete within one minute.
IPP	The Internet Printing Protocol (IPP) defines a standard protocol for printing as well as managing print jobs, media size, resolution, and so forth. IPP can be used locally or over the Internet to hundreds of printers, and also supports access control, authentication, and encryption, making it a much more capable and secure printing solution than older ones.
IPX/SPX	IPX/SPX stands for Internet Packet Exchange/Sequenced Packet Exchange. It is a networking protocol used by the Novell NetWare operating systems. IPX and SPX both provide connection services similar to TCP/IP, with the IPX protocol having similarities to IP, and SPX having similarities to TCP. IPX/SPX was primarily designed for local area networks (LANs), and is a very efficient protocol for this purpose (typically its performance exceeds that of TCP/IP on a LAN).
ISO	The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from national standards bodies. It produces world-wide industrial and commercial standards.
ITU-T	The International Telecommunication Union is an international organization established to standardize and regulate international radio and telecommunications. Its main tasks include standardization, allocation of the radio spectrum, and organizing interconnection arrangements between different countries to allow international phone calls. A -T out of ITU-T indicates telecommunication.
ITU-T No. 1 chart	Standardized test chart published by ITU-T for document facsimile transmissions.
JBIG	Joint Bi-level Image Experts Group (JBIG) is an image compression standard with no loss of accuracy or quality, which was designed for compression of binary images, particularly for faxes, but can also be used on other images.
JPEG	Joint Photographic Experts Group (JPEG) is a most commonly used standard method of lossy compression for photographic images. It is the format used for storing and transmitting photographs on the World Wide Web.
LDAP	The Lightweight Directory Access Protocol (LDAP) is a networking protocol for querying and modifying directory services running over TCP/IP.
LED	A Light-Emitting Diode (LED) is a semiconductor device that indicates the status of a machine.
MAC address	Media Access Control (MAC) address is a unique identifier associated with a network adapter. MAC address is a unique 48-bit identifier usually written as 12 hexadecimal characters grouped in pairs (e. g., 00-00-0c-34-11-4e). This address is usually hard-coded into a Network Interface Card (NIC) by its manufacturer, and used as an aid for routers trying to locate machines on large networks.
MFP	Multi Function Peripheral (MFP) is an office machine that includes the following functionality in one physical body, so as to have a printer, a copier, a fax, a scanner and etc.
MH	Modified Huffman (MH) is a compression method for decreasing the amount of data that needs to be transmitted between the fax machines to transfer the image recommended by ITU-T T.4. MH is a codebook-based run-length encoding scheme optimized to efficiently compress white space. As most faxes consist mostly of white space, this minimizes the transmission time of most faxes.

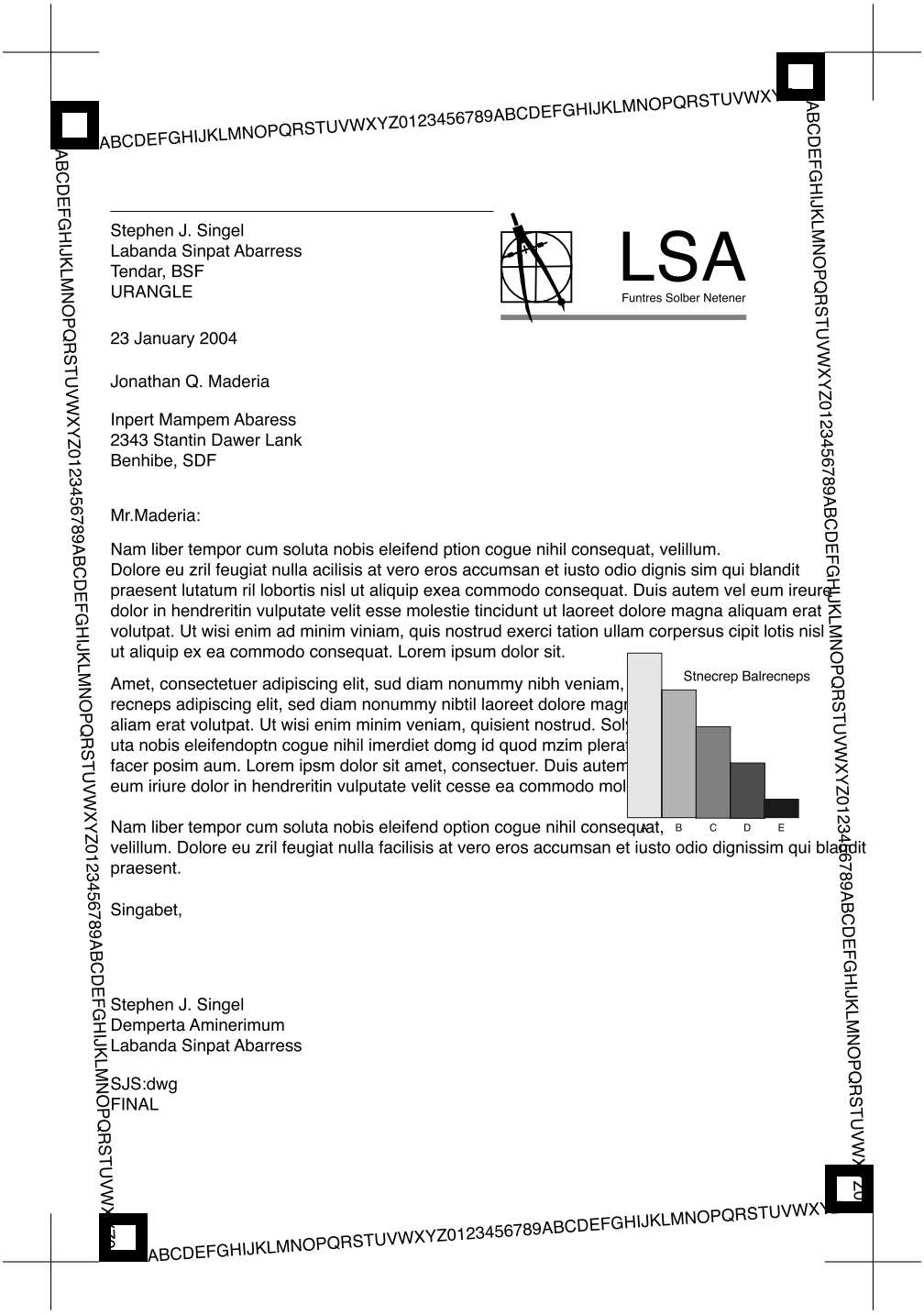
MMR	Modified Modified READ (MMR) is a compression method recommended by ITU-T T.6.
Modem	A device that modulates a carrier signal to encode digital information, and also demodulates such a carrier signal to decode transmitted information.
MR	Modified Read (MR) is a compression method recommended by ITUT T.4. MR encodes the first scanned line using MH. The next line is compared to the first, the differences determined, and then the differences are encoded and transmitted.
NetWare	A network operating system developed by Novell, Inc. It initially used cooperative multitasking to run various services on a PC, and the network protocols were based on the archetypal Xerox XNS stack. Today NetWare supports TCP/IP as well as IPX/SPX.
NFC Printing	The NFC(Near Field Communication) printer allows you to directly print/scan from your cell phone just by holding your cell phone over the NFC tag on your printer. It does not require installing print driver or connecting to an access point. You just need NFC supported cell phone. In order to use this feature, Samsung Mobile Print app needs to be installed on your cell phone.
OPC	Organic Photo Conductor (OPC) is a mechanism that makes a virtual image for print using a laser beam emitted from a laser printer, and it is usually green or rust colored and has a cylinder shape. An imaging unit containing a drum slowly wears the drum surface by its usage in the printer, and it should be replaced appropriately since it gets worn from contact with the cartridge development brush, cleaning mechanism, and paper.
Originals	The first example of something, such as a document, photograph or text, etc, which is copied, reproduced or translated to produce others, but which is not itself copied or derived from something else.
OSI	Open Systems Interconnection (OSI) is a model developed by the International Organization for Standardization (ISO) for communications. OSI offers a standard, modular approach to network design that divides the required set of complex functions into manageable, self-contained, functional layers. The layers are, from top to bottom, Application, Presentation, Session, Transport, Network, Data Link and Physical.
PABX	A private automatic branch exchange (PABX) is an automatic telephone switching system within a private enterprise.
PCL	Printer Command Language (PCL) is a Page Description Language (PDL) developed by HP as a printer protocol and has become an industry standard. Originally developed for early inkjet printers, PCL has been released in varying levels for thermal, dot matrix printer, and laser printers.
PDF	Portable Document Format (PDF) is a proprietary file format developed by Adobe Systems for representing two dimensional documents in a device independent and resolution independent format.
PostScript(PS)	PostScript (PS) is a page description language and programming language used primarily in the electronic and desktop publishing areas. - that is run in an interpreter to generate an image.
Printer Driver	A program used to send commands and transfer data from the computer to the printer.
Print Media	The media like paper, envelopes, labels, and transparencies which can be used in a printer, a scanner, a fax or, a copier.
PPM	Pages Per Minute (PPM) is a method of measurement for determining how fast a printer works, meaning the number of pages a printer can produce in one minute.
PRN file	An interface for a device driver, this allows software to interact with the device driver using standard input/output system calls, which simplifies many tasks.
Protocol	A convention or standard that controls or enables the connection, communication, and data transfer between two computing endpoints.
PSTN	The Public-Switched Telephone Network (PSTN) is the network of the world's public circuit-switched telephone networks which, on industrial premises, is usually routed through the switchboard.
RADIUS	Remote Authentication Dial In User Service (RADIUS) is a protocol for remote user authentication and accounting. RADIUS enables centralized management of authentication data such as usernames and passwords using an AAA (authentication, authorization, and accounting) concept to manage network access.

Resolution	The sharpness of an image, measured in Dots Per Inch (DPI). The higher the dpi, the greater the resolution.
SMB	Server Message Block (SMB) is a network protocol mainly applied to share files, printers, serial ports, and miscellaneous communications between nodes on a network. It also provides an authenticated Interprocess communication mechanism.
SMTP	Simple Mail Transfer Protocol (SMTP) is the standard for e-mail transmissions across the Internet. SMTP is a relatively simple, text based protocol, where one or more recipients of a message are specified, and then the message text is transferred. It is a client server protocol, where the client transmits an email message to the server.
SSID	Service Set Identifier (SSID) is a name of a wireless local area network (WLAN). All wireless devices in a WLAN use the same SSID in order to communicate with each other. The SSIDs are case-sensitive and have a maximum length of 32 characters.
Subnet Mask	The subnet mask is used in conjunction with the network address to determine which part of the address is the network address and which part is the host address.
TCP/IP	The Transmission Control Protocol (TCP) and the Internet Protocol (IP); the set of communications protocols that implement the protocol stack on which the Internet and most commercial networks run.
TCR	Transmission Confirmation Report (TCR) provides details of each transmission such as job status, transmission result and number of pages sent. This report can be set to print after each job or only after failed transmissions.
TIFF	Tagged Image File Format (TIFF) is a variable-resolution bitmapped image format. TIFF describes image data that typically come from scanners. TIFF images make use of tags, keywords defining the characteristics of the image that is included in the file. This flexible and platform-independent format can be used for pictures that have been made by various image processing applications.
Toner Cartridge	A kind of bottle or container used in a machine like a printer which contains toner. Toner is a powder used in laser printers and photocopiers, which forms the text and images on the printed paper. Toner can be fused by a combination of heat/pressure from the fuser, causing it to bind to the fibers in the paper.
TWAIN	An industry standard for scanners and software. By using a TWAINcompliant scanner with a TWAIN-compliant program, a scan can be initiated from within the program. It is an image capture API for Microsoft Windows and Apple Macintosh operating systems.
UNC Path	Uniform Naming Convention (UNC) is a standard way to access network shares in Window NT and other Microsoft products. The format of a UNC path is: \\<servername>\<sharename>\<Additional directory>
URL	Uniform Resource Locator (URL) is the global address of documents and resources on the Internet. The first part of the address indicates what protocol to use, the second part specifies the IP address or the domain name where the resource is located.
USB	Universal Serial Bus (USB) is a standard that was developed by the USB Implementers Forum, Inc., to connect computers and peripherals. Unlike the parallel port, USB is designed to concurrently connect a single computer USB port to multiple peripherals.
Watermark	A watermark is a recognizable image or pattern in paper that appears lighter when viewed by transmitted light. Watermarks were first introduced in Bologna, Italy in 1282; they have been used by papermakers to identify their product, and also on postage stamps, currency, and other government documents to discourage counterfeiting.
WEP	Wired Equivalent Privacy (WEP) is a security protocol specified in IEEE 802.11 to provide the same level of security as that of a wired LAN. WEP provides security by encrypting data over radio so that it is protected as it is transmitted from one end point to another.
WIA	Windows Imaging Architecture (WIA) is an imaging architecture that is originally introduced in Windows Me and Windows XP. A scan can be initiated from within these operating systems by using a WIAcompliant scanner.
Wi-Fi	Wi-Fi is a popular technology that allows an electronic device to exchange data wirelessly over a computer network, including high-speed Internet connections.

WPA	Wi-Fi Protected Access (WPA) is a class of systems to secure wireless (Wi-Fi) computer networks, which was created to improve upon the security features of WEP.
WPA-PSK	WPA-PSK (WPA Pre-Shared Key) is special mode of WPA for small business or home users. A shared key, or password, is configured in the wireless access point (WAP) and any wireless laptop or desktop devices. WPA-PSK generates a unique key for each session between a wireless client and the associated WAP for more advanced security.
WPS	The Wi-Fi Protected Setup (WPS) is a standard for establishing a wireless home network. If your wireless access point supports WPS, you can configure the wireless network connection easily without a computer.
XPS	XML Paper Specification (XPS) is a specification for a Page Description Language (PDL) and a new document format, which has benefits for portable document and electronic document, developed by Microsoft. It is an XML-based specification, based on a new print path and a vector-based device-independent document format.

6.3. The Sample Pattern for the Test

The life of the toner cartridge and the printing speed are measured using the pattern shown below.



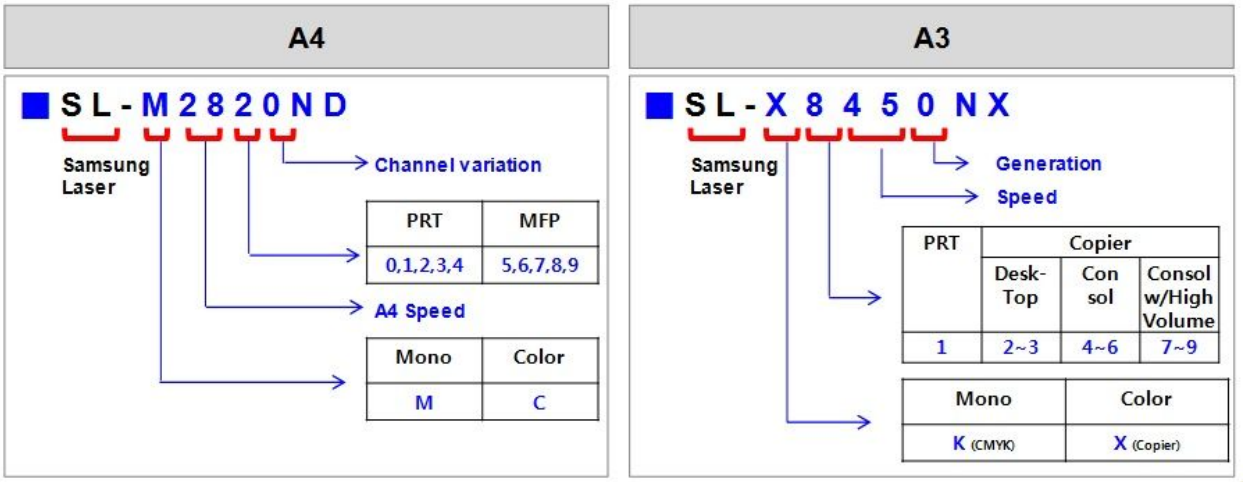
6.4. Model Name and Code

1) Sub brand name Information

- Applying Independent sub brand name by Segment : Xpress / ProXpress / MultiXpress

2) Model code Information

- Basic Structure : [SL-●○○■□◆◆]



- ◆◆ : Function Information

	Function
N	Network
W	Wireless Network
D	Duplex Printing
R	Reverse Type ADF
F	Fax
X	XOA (eXtensible Open Architecture)
H	Handset
A	Auto Document Feeder

6.5. Document Revision List

Version	Date	Page	Description
1.00	15/Sep/2017	-	Release

GSPN (GLOBAL SERVICE PARTNER NETWORK)

Area	Web Site
Europe, MENA, CIS, Africa	https://gspn1.samsungcsportal.com
E.Asia, W.Asia, China, Japan	https://gspn2.samsungcsportal.com
N.America, S.America	https://gspn3.samsungcsportal.com

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