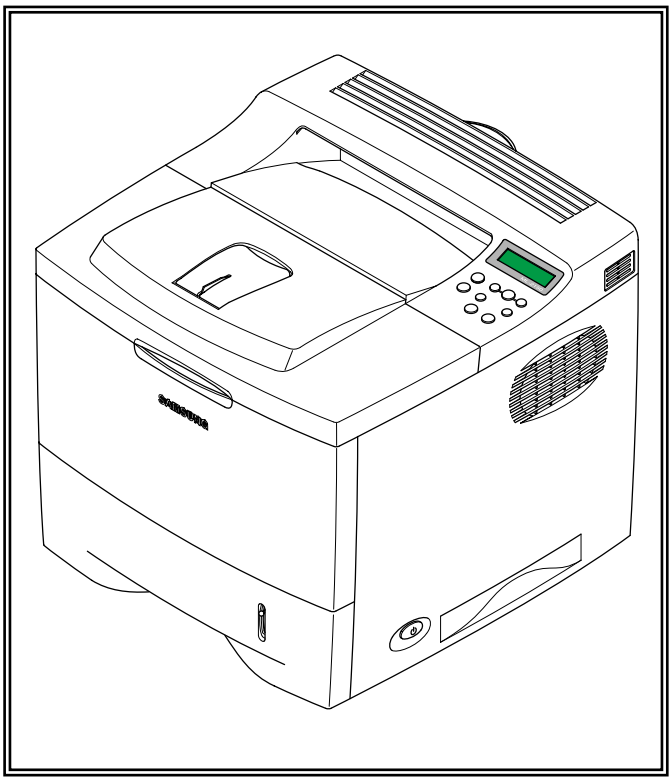
SAMSUNG

LASER PRINTER

ML-2550
ML-2551N
ML-2552W

SERVICE *Manual*

LASER PRINTER



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This manual is stated and provided for service description.

Specifications are subject to change without prior notice.

Samsung Electronics
Digital Printing CS Group

VERSION NO. : 1.00 CODE : JC-0106A

1. Precautions

The cautions in the below are items needed to keep in mind when maintaining and servicing.
Please read carefully and keep the contents in mind to prevent accidents while servicing and prevent any damages to the damage.

1.1 Warning for safety.

(1) Request the service by qualified service person.
The service for this machine must be performed by a service person who took the additional education of this field. It is dangerous if unqualified service person or user tries to fix the machine.

(2) Do not rebuild it discretionary.
Do not attach or change parts discretionary. Do not disassemble, fix, and rebuilt it. If you do, printer will not work and electric shock or a fire can be occurred.

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

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

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

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

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

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

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

ADVARSEL. - USYNLIG LASERSTR LNING VED BNING, N R
SIKKERHEDSBRYDERE ER UDE AF FUNKTION.
UNDG UDSAETTELSE FOR STR LNING.

ADVARSEL. - USYNLIG LASERSTR LNING N R DEKSEL
PNES. STIRR IKKE INN I STR LEN.
UNNG EKSPONERING FOR STR LEN.

VARNING - OSYNLIG LASERSTR LNING N R DENNA DEL
R PPNAD OCH SP RREN R URKOPPLAD.
BETRAKTA EJ STR LEN. STR LEN R FARLIG.

VARO! - AVATTAESSA JA SUOJALUKITUS OHITETTAESSA
OLET ALTTIINA N KYM TT M LLE LASER-
S TEILYLLE L KATSO S TEESEEN.

注 意 - 严禁渴开此盖, 以免激光泄露灼伤

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

1.2 Caution for safety

1.2.1 Precaution related noxious material

There is a possibility to get harm from noxious material if you ignore the below information.

(1) Do not touch the damaged LCD. This PRINTER has LCD in control panel. Noxious liquid to human body exists in the LCD. If it gets into your mouth, immediately see a doctor. If it gets into eyes or on skin, immediately wash it off for more than 15 minutes with flowing water and see a doctor.

(2) The toner in a printer cartridge contains a chemical material, which might harm human body if it is swallowed. Please keep children out of the toner cartridge.

1.2.2 Precaution related electric shock or fire

It is possible to get electric shock or burn by fire if you don't fallow the instructions of the manual.

(1) Use exact voltage. Please do use an exact voltage and wall socket. If not, a fire or an electric leakage can be caused.

(2) Use authorized power cord. Do use the power cord supplied with PRINTER. A fire can occur when over current flows in the power cord.

(3) Do not insert many cords in an outlet. If you do, a fire can be occurr due to flow over current over flow in an outlet.

(4) Do not put water or extraneous matter in the PRINTER. Please do not put water, other liquid, pin, clip, etc. It can cause a fire, electric shock, or malfunction. If it happens, turn off the power and remove the power plug from the outlet immediately.

(5) Do not touch the power plug with wet hands. When servicing, do remove the power plug from outlet. And do not insert or take off it with wet hands. Electric shock can be occur.

(6) Caution when inserting or taking off the power plug. The power plug has to be inserted completely. If not, a fire can be caused due to poor contact. When taking off the power plug, do grip the plug and take it off. If grip the line and pull over, it could be damaged. This could cuase a fire or electric shock.

(7) Management of power cord. Do not bend, twist, or bind it and place other materials on it. Also, do not fix it with staples. If the power cord gets damage, a fire or electric shock can be caused. A damaged power cord must be replaced immediately. Do not repair the damaged part and reuse it. A repaired part with plastic tape can be occurred a fire or electric shock. Do not spread chemicals on the power cord. Do not spread insecticide on the power cord. A fire or electric shock can be occurred due to thinner(weak) cover of the power cord.

(8) Check whether the power outlet and the power plug are damaged, pressed, chopped, or on fire. When such poor conditions are found, repair it immediately. Avoid pressure or cut when moving the machine.

(9) Caution when thundering, and being flash of lightening. It causes a fire or electric shock. Take the power plug off when thundering. Do not touch cable and device when thundering and being flash of lightening.

(10) Avoid places where there is moisture or dust. Do not install the printer in a place where lots of dusts or humidifier are around. A fire can occur. A plug part needs to be cleaned well with dried fabric to remove dust. If water drops are dripped on the place cover with dust, a fire can occur.

(11) Avoid direct sunlight. Do not install the printer near to window where directly contacts to the sunlight. If the machine contacts sunlight long time, the machine cannot work properly because inner temperature of the machine is getting higher. A fire can be caused.

(12) Turn off the power and take off the plug when a smoke, strange smell, or sound from the machine. If you keep using it, a fire can occur.

(13) Do not insert steel or metal piece inside/outside of the machine. Do not put steel or metal piece into a ventilator. An electric shock can happen.

1.2.3 Precaution related handling the machine.

If you ignore this information, you get hurt and machine could be damaged.

(1) Do not install unit on uneven surfaces or slanted floors.
Please confirm that unit is correctly balanced after installation. Machine may fall over when itis not balanced correctly.
(2) Be careful not to insert a finger or hair in the rotating unit.
Be careful not to insert a finger of hair in the rotating unit (motor, fan, paper feeding part, etc) while the machine is operating. Once it happens, you could harm.
(3) Do not place any containers of water/chemical or small metals. If those are got into the inner side of machine, a fire or electric shock can occur.
(4) Do not install machine in areas where moisture or dust exists. For example, do not install machine near open windows, damage maybe caused by these conditions.
(5) Do not place a candle, burning cigarettes, and etc. on the machine. Do not install it near to a heater. A fire can occur.

1.2.4 Precaution when assembly/disassembly

When replace parts, do it very carefully. Do memorize the location of each cable before replace parts for reconnecting it afterwards. Do memorize. Please perform the below before replace or disassemblying any parts.

(1) Check the contents stored in the memory. All the information will be erased after replace main board. The information needed to keep has to be written down.
(2) Remove printer cables and power cord.
(3) Take off printer cables and power code connected to printer.
(4) Do use formal parts and same standardized goods when replacing parts.Must check the product name, part cord, rated voltage, rated current, operating temperature, etc.
(5) Do not give an over-force when release or tighten up the plastic parts.
(6) Be careful not to drop the small parts such as screws in the printer.
(7) Be careful not to change the location of small parts such as screws when assembling and disassembling.
(8) Do remove dust or foreign matters completely to prevent fire of tracking, short, or etc.
(9) After finished repair, check the assembled state whether it is the same as before the repair or not.

1.3 ESD Precautions

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

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

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

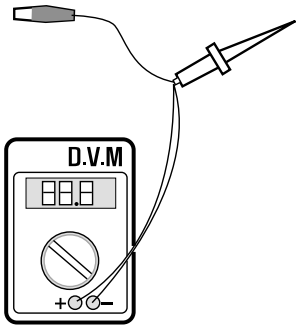
2. Reference Information

This chapter describes the reference information for applying this training manual, and it is consisted of the tool list, the abbreviation table, the outline of model, and so on.

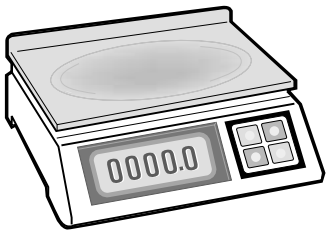
2.1 Tool for Troubleshooting

The following tools are recommended for safe and smooth troubleshooting described in this service manual.

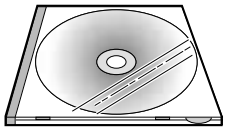
1 DVM(Digital Volt Meter)
Standard : Indicates more than 3 digits.



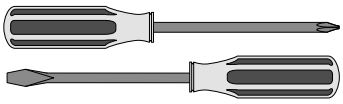
2 Electronic Scale
Standard : Equipment to check the weight of consumables(toner cartridge) supplied by Samsung Electronics. (The gram unit can be measured.)



3 Software(Driver) installation CD ROM



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



5 Tweezers
Standard : For general home use, small type.

6 Cotton Swab
Standard : For general home use, for medical ser-vice

7 Spring Hook
Standard : For general use

8 Cleaning Equipments a IPA(Isopropyl Alcohol)dry cloth or a soft stuff neutral detergent

Keep your hands not to be touched when you disassemble and reassemble PBA ASS'Y, such as the main board, SMPS, HVPS.

2.2 Acronyms and Abbreviations

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

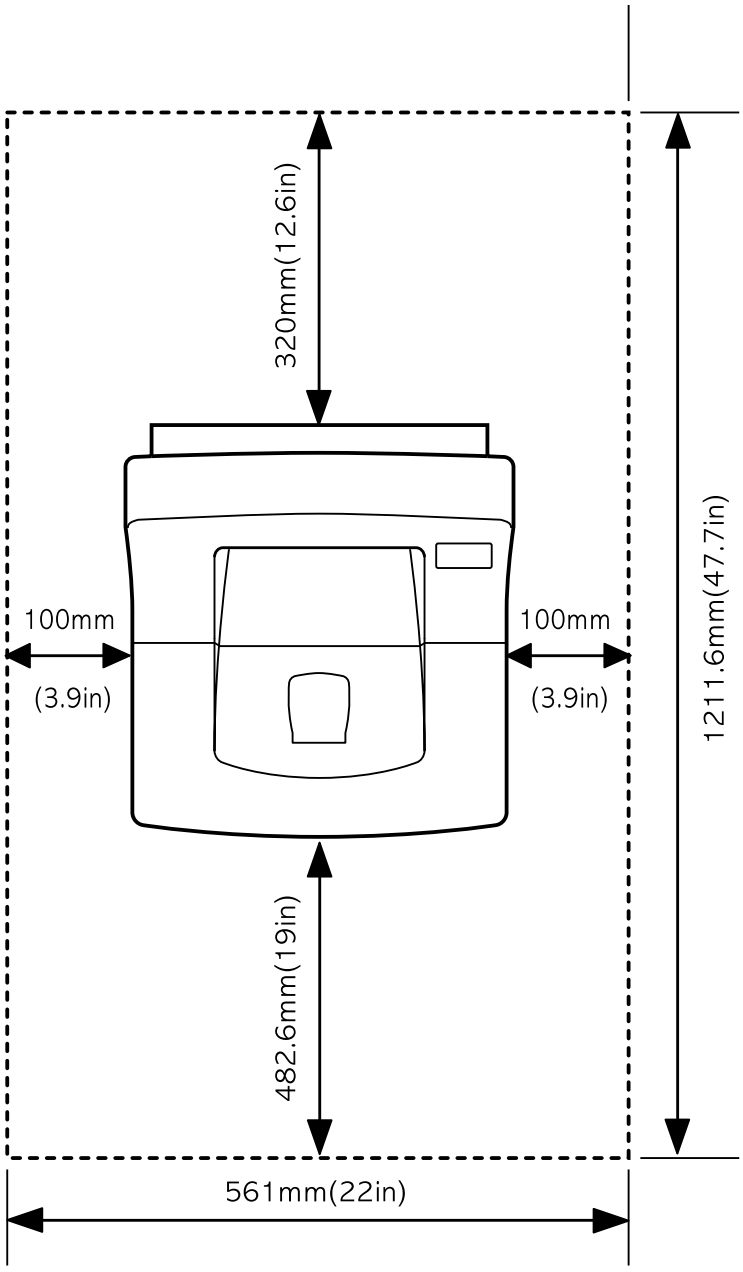
AC	Alternating Current
AP	Access Point
ASIC	Application Specific Integrated Circuit
ASSY	assembly
BIOS	Basic Input Output System
CMOS	Complementary Metal Oxide Semiconductor
CN	connector
CON	connector
CPU	Central Processing Unit
dB	decibel
dbA	decibelampere
dBM	decibel milliwatt
DC	direct current
DCU	Diagnostic Control Unit
DPI	Dot Per Inch
DRAM	Dynamic Random Access Memory
DVM	Digital Voltmeter
ECP	Enhanced Capability Port
EEPROM	Electronically Erasable Programmable Read Only Memory
EMI	Electro Magnetic Interference
EP	electrophotographic
EPP	Enhanced Parallel Port
F/W	firmware
GDI	graphics device interface
GND	ground
HBP	Host Based Printing
HDD	Hard Disk Drive
HV	high voltage
HVPS	High Voltage Power Supply
I/F	interface
I/O	Input and Output
IC	integrated circuit
IDE	Intelligent Drive electronics or Imbedded Drive Electronics
IEEE	Institute of Electrical and Electronics Engineers. Inc
IPA	Isopropy Alcohol
IPM	Images Per Minute
LAN	local area network
lb	pound(s)
LBP	Laser Beam Printer
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSU	Laser Scanning Unit
MB	megabyte
MHz	megahertz
MPF	Multi Purpose Feeder
NIC	Network Interface Card
NVRAM	nonvolatile random access memory
OPC	Organic Photo Conductor
PBA	Printed Board Assembly
PCL	Printer Command Language , Printer Control Language
PDL	Page Discription Language
PPM	Page Per Minute
PS	Post Script
PTL	Pre-Transfer Lamp
Q-PID	Quick Printer Initiating Device
Q ty	quantity
RAM	Random Access Memory
ROM	Read Only Memory
SCF	Second Cassette Feeder
SMPS	Switching Mode Power Supply
SPGP	Samsung Printer Graphic Processor
SPL	Samsung Printer Language
Spool	Simultaneous Peripheral Operation Online
SW	switch
sync	synchronous or synchronization
USB	Universal Serial Bus
WECA	Wireless Ethernet Compatibility Alliance

2.3 Selecting a Location

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

CLEARANCE SPACE

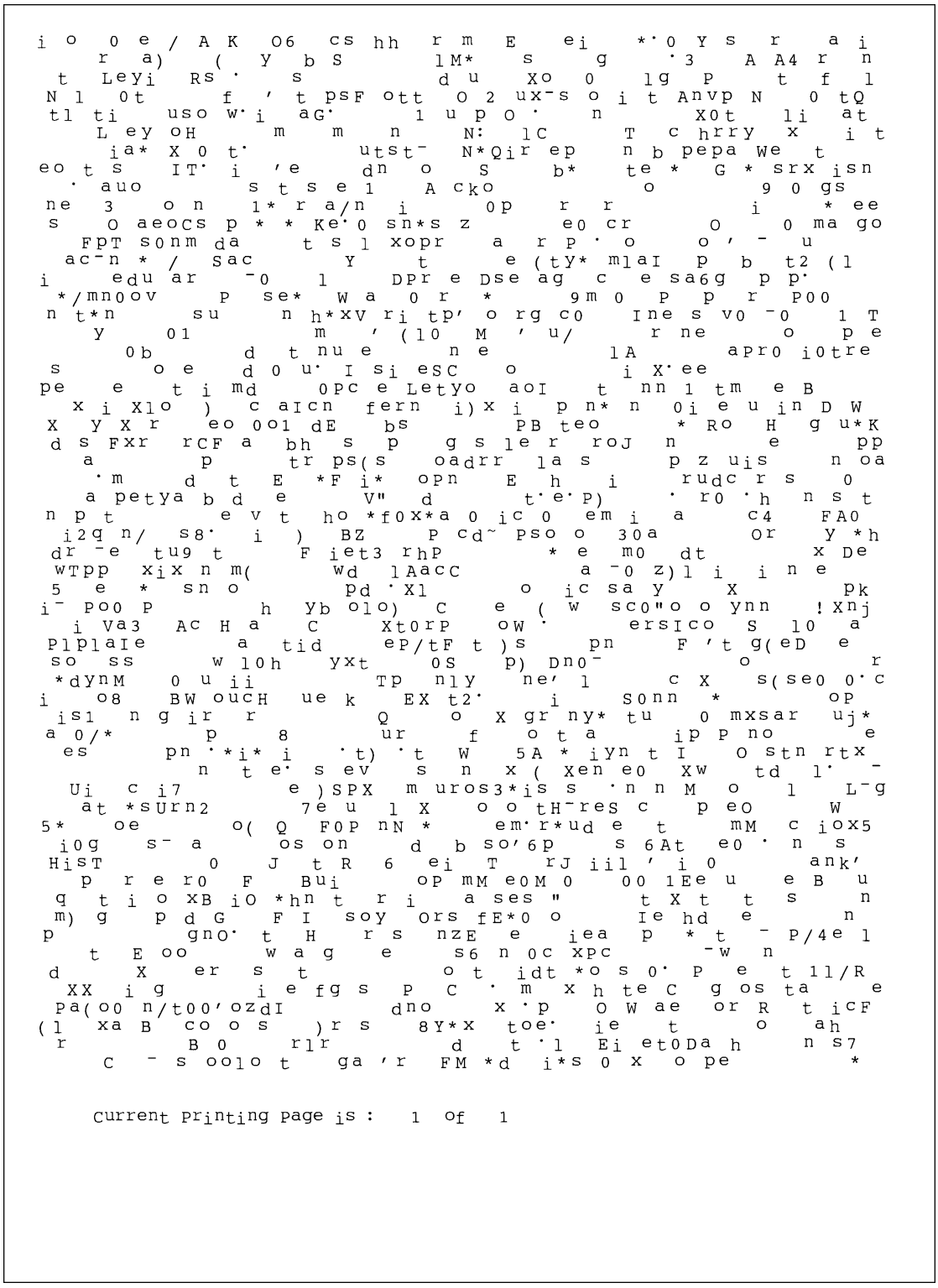
- **Front :** 482.6 mm (enough space so that trays can be removed)
- **Back :** 320 mm (enough space to allow opening of the rear cover)
- **Right :**100 mm
- **Left :**100 mm (enough space for ventilation)



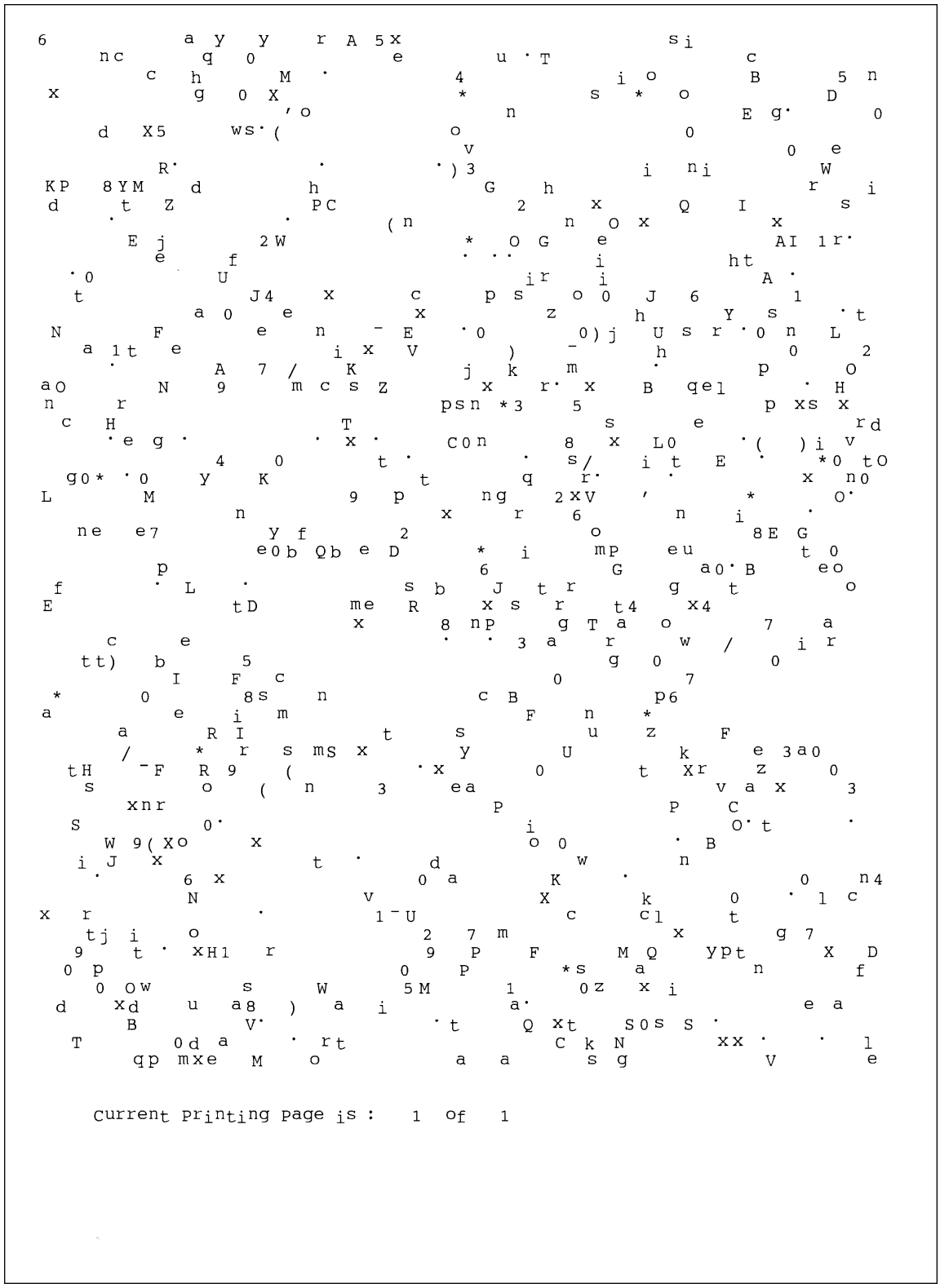
2.4 The Sample Pattern for the Test

The sample pattern shown in below is the standard pattern used in a factory.
The contents of the life span and the printing speed are measured with the pattern shown in below.
(The picture in the manual is 70% size of the actual A4 size.)

2.4.1 A4 5% Patten



2.4.2 A4 2% Patten



current printing page is : 1 of 1

2.4.3 A4 LSA 5% Patten

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890ABCDEFG

HIJKLMNOPQRSTUVWXYZ1234567890ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890

Stephen J. Singel
Labanda Sinpat Abarress
Tendar, BSF
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LSA
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27 March 2003

Jonathan Q. Maderia

Inpert Mampem Abaress
2343 Stantin Dawer Lank
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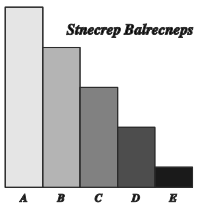

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2.6 Wireless LAN

• This product uses a printing function with a wireless LAN, which is an option.
  - The wireless LAN function uses a frequency instead of connecting LAN cable to connect data to an access point for print.
  - For a wireless LAN connection, an AP is needed, It is possible to use wireless LAN onnection with wired LAN. Also, if AP is installed in an office or at home, the wireless LAN function can be simply used.

• Types of desk top PC (or Lap top) that uses the wireless LAN.

Division	Basic type	Recommend type
CPU	Over PENTIUM 233M	PENTIUM 300MHz
MEMORY	Over 64MB	Over 128MB
VIDEO CARD	Over 800X600	Over 1024X768
OS	Over WINDOWS 98	Over WINDOWS ME
INTERFACE CARD	A product has a certificated mark of Wi-Fi™	

• About the certificated mark of Wi-Fi™

- The Wi-Fi™ is a registered trademark of WECA (Wireless Ethernet Compatibility Alliance). Over 50 of a wireless LAN companies are member of it. The most of main wireless networking companies are attending and the main companies are Lucent technologies, Cisco, Intel/Symbol, 3Com, Enterasys (Cabletron), Compaq, IBM, Nokia, Dell, Philips, Samsung electronic, Sony, Intersil, and so on. This mark certifies mutual compatibility among product has Wi-Fi™ (IEEE 802.1) and it is certified as a standard of a wireless LAN market.

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3. Specifications

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

3.1 General Specifications

ITEM	DESCRIPTION	
Print Method	Non-impact Electro-photography	
Development system	Non-Magnetic, Mono-Component Toner	
Transfer system	Conductive roller transfer	
Fuser Unit(Toner fix)	Pressure and Heating with Lamp	
Print Speed	24 PPM : A4 size	
	25 PPM : Letter size	
Resolution	True 600 X 600 DPI	
	Addressable 1200 X 1200 DPI	
Source of Light	Laser diode (LSU : Laser Scanner Unit)	
Warm-Up Time	Power-on boot : 50 seconds or less	
First Print Time	12 seconds or less	
Feed Method	Cassette & Manual , Option Feeder(SCF)	
Media Size	76mm * 128mm(3 * 5") to 216mm * 356mm(8.5 *14")	
Media Thickness	Cassette : 16 ~ 28 lb, Manual : 16 ~43lb	
Dimension(W X D X H)	386 X 436 X 326 mm / 15.2 X 17.2 X 12.8 inch (without options)	
Weight	Net : 13.7 Kg	
	Gross : 17.1 Kg	
Acoustic Noise	Stand by : Less than 35 dB	
	Printing: Less than 53 dB	
	Sleep mode : Background Noise	
Power save mode	Enable	
Toner save mode	Enable	
Consumption Parts	Retard Roller	100,000 Pasges
	Transfer Roller	100,000 Pasges
	Fuser Assembly	125,000 Pasges
Optional Parts	SCF	Paper Capacity : 500 Sheets
	Network Printing	Ethernet 10/100 base TX
	(ML-2550:Optional ML-2551N : Basic)	Protocols : TCP/IP, SPX/IPX, Ethertalk, SNMP, HTTP1.1, DLC/LLC 32MB RAM Buffer for faster graphics performance 2MB Flash Memory for upgrade Throughput : 200 ~ 300K TCP/IP
	SDRAM DIMM	16, 32, 64, 128MB 100PIN SDRAM DIMM
	802.11b Wireless LAN (ML-2552W Basic)	IEEE802.3b supportT Speed : 11, 5.5, 2, 1 Mbps Protocol : CSMA/CD Operation range : 30m(Indoors), 150m(Outdoors)

3.2 Controller Specification

ITEM	DESCRIPTION
Processor(CPU)	SPGPi + Power PC 266 MHz
Memory	FLASH ROM(PROGRAM +Postscript) : 2MB flash * 2
	RAM : 32MB (Expandable to 160MB)
	Option DIMM module : 16,32,64,128MB (SDRAM)
	100Pin SDRAM DIMM (Samsung Printer Only)
	EEPROM(NVRAM) : 512byte
Emulation	PCL6 : win 3.1/95/98/ME/NT/2000/XP
	Postscript Level3 : win 95/98 PPD , win NT4.0 PPD , Mac PPD
	PCL5e : Linux
Interface	Parallel : IEEE 1284 Bidirectional Parallel - Modes supported : Compatible,Nibble,Byte,ECP
	USB(without HUB mode) -USB 2.0 compliant -12 Mbps 1 port
	Serial : RS-232C
	Network Interface : option for ML-2550 -10/100 Base TX -10/100 Base TX & 802.11b Wireless LAN (option for ML-2551N)
Interface switching	Automatic
Interface time-out	5min(Max.)
Font	45 Scalable Font , 1 Bitmap Font ,Postscript 3 internal font 136

3.3 Electrical Specification

ITEM	DESCRIPTION		REMARK
Input Voltage	Nominal input voltage	220-240 VAC / 100~127VAC	
	Input voltage range	198-255 VAC/ 90~135VAC	
	Nominal frequency	50/60 MHz	
	Frequency tolerance	+3Hz	
Power Consumption	450W Avg or less (with SCF)		
	Idling : 100W Avg or less		
	Power Save : 20W Avg or less		

3.4 TONER Cartridge (Developer)

ITEM	DESCRIPTION	REMARK
Life span	Starter: 5,000 pages	A4 Size, LSA 5% pattern, SIMPLEX
	Running : 10,000 pages	
Developing	Non-magnetic Contact Developing	
Charging	Conductive Roller Charging	
Toner supply Method	Exchange the Developer	
Toner checking sensor	Enable	
Ozone	0.1PPM or less	
Style	Single cartridge	

3.5 Environmental Condition

ITEM	OPERATING	STORAGE
Temperature	10~30 oC(50-90 oF)	-20~40 oC (-4~104 oF)
Humidity	20~80%RH	10~80%RH

3.6 Paper Handling Specifications

>> Input Paper Size

PAPER	PAPER SIZE	1ST CASSETTE	2ND CASSETTE	MP TRAY	DUPLEX
A4	210 X 297 mm	O	O	O	O
Letter	216 X 279(8.5 X 11")	O	O	O	O
Folio(Legal13")	216 X 330(8.5 X 13")	O	O	O	O
Legal(Legal14")	216 X 356(8.5 X14")	O	O	O	O
Executive	184 X 267((7.25 X10.5")	O		O	
Statement	140 X 216(5.5 x8.5")			O	
ISO B5	176 X 250	O		O	
JIS B5	182 X257	O		O	
A5	148 X 210	O		O	
A6	105 X148			O	
No.10 Env	105 X 241(4.15 X 9.5")			O	
Monarch Envelope	98 X191(3.87 X 7.5")			O	
DL Envelope	110 X 220(4.33 X 8.66")			O	
C5 Envelope	162 X 229(6.38 X 9.01")			O	
C6 Envelope	114 X 162(4.49 X 6.38")			O	
Transparency(OHP)	A4 or Letter			O	
Label paper	A4 or Letter			O	

O : Enable

>> Input capacity

ITEM	DESCRIPTION	
Cassette	500sheets	
MP tray	Paper	100 sheets
	Transparencies	50 sheets
	Envelopes	10 sheets
	Labels	25 sheets
Option Cassette	500sheets	

>> Output capacity

ITEM	DESCRIPTION
Face Down	250 sheets
Face UP	100 sheets

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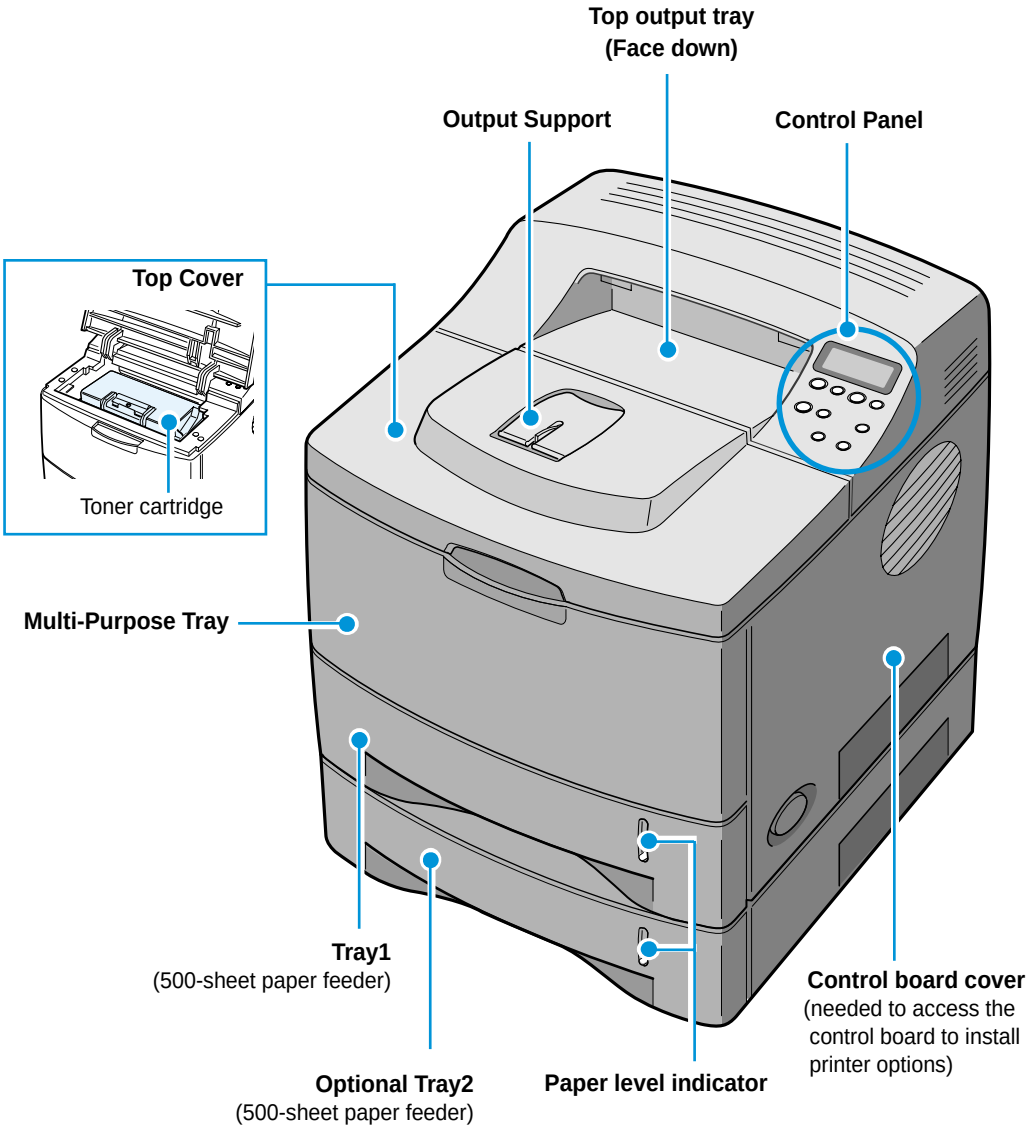
4. Summary of Product

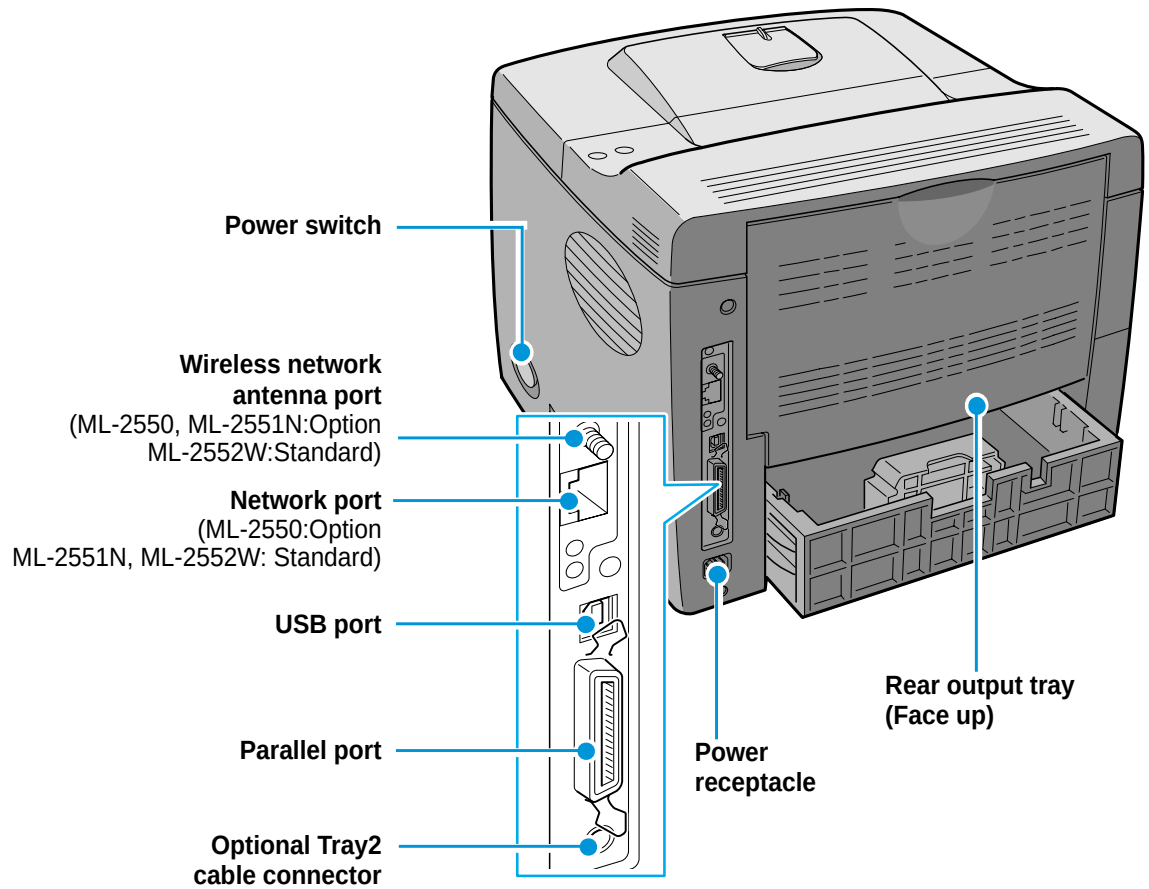
This chapter describes the functions and operating principal of the main component.

4.1 Printer Components

4.1.1 Front View

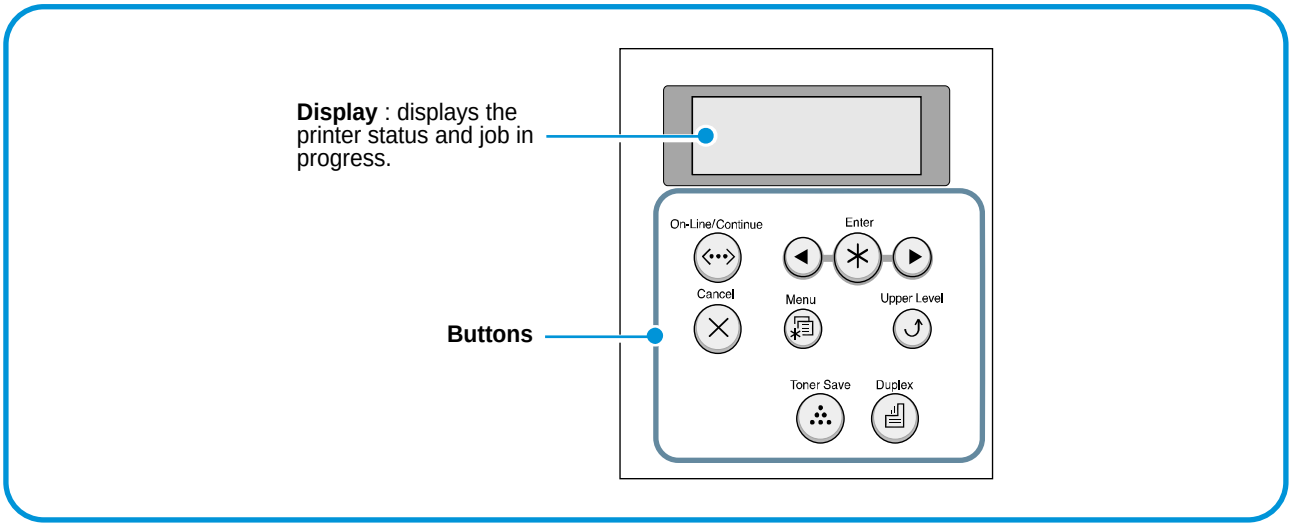


4.1.2 Rear View



4.1.3 Control Panel

The control panel on the top right side of your printer has the display and the nine buttons.



4.1.3.1 Display

Message	Description
Ready	• The printer is on-line and ready to print. • If you press **On-Line/Continue** ,the printer switches to off-line.
Offline	• The printer is off-line and cannot print. • If you press **On-Line/Continue** ,the printer switches to on-line.
Printing XXX * *xxx is the current emulation.*	• The printer is printing. • If you want to cancel printing,press **Cancel** .
Sleeping...	• The printer is in Power Save mode, consuming less power. When a print job is received from the computer or if any button is pressed,the printer switches to on-line.

4.1.3.2 Buttons

<table>
<tr><th>Button</th><th colspan="3">Description</th></tr>
<tr><td rowspan="5">On-Line/Continue
  </td><td colspan="3">• Press to switch between on-line and off-line.
• In menu mode,press to return to ready mode.
You can check the printer status according to the button backlight.</td></tr>
<tr><td rowspan="2">Green</td><td>On</td><td>The printer is on-line and can receive data from the computer.</td></tr>
<tr><td>Blinking</td><td>• When the backlight slowly blinks,the printer is receiving data from the computer.
• When the backlight fast blinks,the printer is receiving and printing data.
If you want to pause printing, switch the printer to off-line.</td></tr>
<tr><td rowspan="2">Orange</td><td>On</td><td>The printer stops printing due to a major error.Check the display message.</td></tr>
<tr><td>Blinking</td><td>A minor error occurs and the printer is waiting an error to be cleared.Check the display message.When the problem is cleared,the printer resumes printing.If you want to ignore this warning,press this button.</td></tr>
<tr><td>Off</td><td colspan="2">• The printer is off-line and cannot print.
• The printer is in Power Save mode.
When data is received,it switches to on-line.</td></tr>
<tr><td>Menu
  </td><td colspan="3">• Press to enter menu mode.
• In menu mode,press to scroll through the menus.</td></tr>
<tr><td>Enter
  </td><td colspan="3">In menu mode,press to select the displayed submenu item or confirm the changed setting. You can see the selected value marked with *.</td></tr>
<tr><td>  </td><td colspan="3">In menu mode,press to scroll through submenu items or setting options. Pressing ▶ moves you to the next option and pressing ◀ sends you back to the previous option.</td></tr>
<tr><td>Cancel
  </td><td colspan="3">• Press to cancel the current print job.
• In menu mode,press to return to ready mode.</td></tr>
<tr><td>Upper Level
  </td><td colspan="3">In menu mode,press to go back to the upper menu level.</td></tr>
<tr><td>Toner Save
  </td><td colspan="3">Press to enable or disable Toner Save mode.
• If the button backlight is on,the mode is enabled and the printer uses less toner to print a document.
• If the button backlight is off,the mode is disabled and the printer will print in the normal quality.
For more information on the Toner Save mode.</td></tr>
<tr><td>Duplex
  </td><td colspan="3">Press to enable or disable the double-sided printing.
• If the button backlight is on,the printer print on both sides of paper with long edge binding.
• If the button backlight is off,the double-side printing is disabled and the printer prints on one side of paper.

Note : The double-sided printing setting in the printer driver overrides that of the control panel.</td></tr>
</table>

4.1.3.2 Using Control Panel Menus

A number of menus are available to make it easy for you to change printer settings.

Accessing Control Panel Menus

You can control your printer from the printer 's control panel. You can also set the control panel menus while the printer is in use.

1. Press the **Menu** button ( ) until you see the desired menu on the bottom line of the display or Press the scroll button (or) until the desired menu item displays on the bottom line.
2. Press the **Enter** button ( ) to access the menu.
3. Press the scroll button (or) until the desired menu item displays on the bottom line.
4. Press the **Enter** button ( ) to confirm the selected item.
5. If the selected menu item has submenus,repeat steps 3 and 4.
6. Press the scroll button (or) until the desired setting option displays on the bottom line or enter the required value.
7. Press the **Enter** button ( ) to save your input or selection.

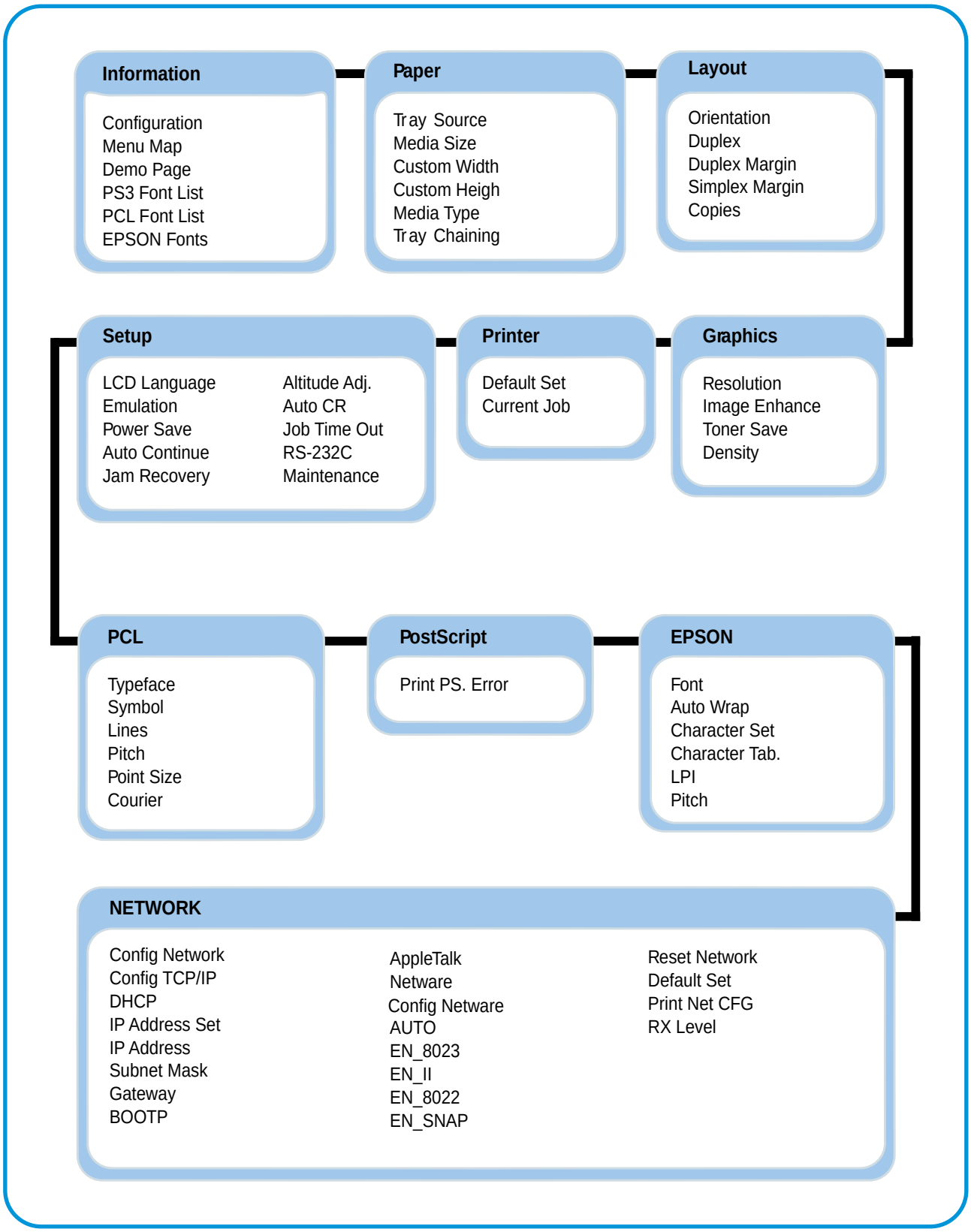
   An asterisk **(*)** appears next to the selection on the display, indicating that it is now the default.
8. To exit the menu,press the **Upper Level** button ( ) repeatedly,or the **Cancel** button ( ) .

   After 60 seconds of inactivity (no key has been pressed), the printer automatically returns to ready mode.

NOTE : Duplicate print settings that are selected in the printer driver override the settings on the control panel.

4.1.3.3 Overview of Control Panel Menus

The control panel menus are used to configure the printer for your environment.
The control panel provides access to the following menus.



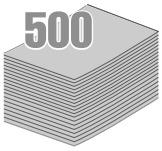
4.1.3.4 Special Features

Your new printer is equipped with special features that improve the print quality,giving you a competitive edge.
You can:

Print with excellent quality and high speed

- You can print at 1200 dots per inch (dpi).See page 5.25.
- Your printer prints 21 pages-per-minute (Letter size), 20 pages-per-minute (A4 size).

Handle paper flexibly



- A 100-sheet Multi-Purpose Tray supports letterheads, envelopes,labels,transparencies,custom-sized materials,postcards,and heavy paper.
- Standard 500-sheet input tray (Tray1)and optional 500-sheet input tray (Tray2)supports all standard sizes of paper.
- Two output tray;select either the top output (face-down)or the rear output tray (face-up)for the most convenient access.
- Straight-through paper path capability from the Multi-Purpose Tray to the rear output tray.

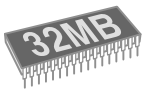
Create professional documents

- You can customize your documents using **Watermarks,** such as “Confidential.”
- Print **Booklets** .This feature enables you to easily print the pages required to create books.Once printed,all you have to do is to fold and staple the pages.
- Print **Posters** .The text and pictures of each page of your document are magnified and printed across the selected sheet of paper.After the document has printed,trim off the white edges of each sheet.Tape the sheets together to form a poster.

Save your time and money

- This printer allows you to use **Toner Save mode** to save toner.
- You can print on both sides of the paper to save paper (double-sided printing).
- You can print multiple pages on one single sheet of paper to save paper (N-Up printing).
- Preprinted forms and letterheads can be printed on plain paper.
- This printer automatically conserves electricity by substantially reducing power consumption when not printing.
- This printer meets Energy Star guidelines for energy efficiency.

Expand the printer capacity



• This printer has 32 MB of memory which can be expanded to **160 MB**.

• **Network interface** enables network printing.You can add the optional network interface card to ML-2550.

ML-2551N and ML-2552W comes with a built-in network interface,10/100 Base TX.ML-2552W also has a wireless network interface.

* PostScript 3 Emulation
IPS-PRINT_Printer language Emulation © Copyright 1995-2003,Oak Technology,Inc.,All rights reserved

* 136 PS3 fonts
Contains UFST and MicroType from Agfa Monotype Corporation.

Print in various environments

• You can print in Windows 95/98/Me/NT 4.0/2000/XP .

• Your printer is compatible with Linux and Macintosh .

• Your printer comes with both the Parallel and USB interfaces.

You can also use a network interface .ML-2551N and

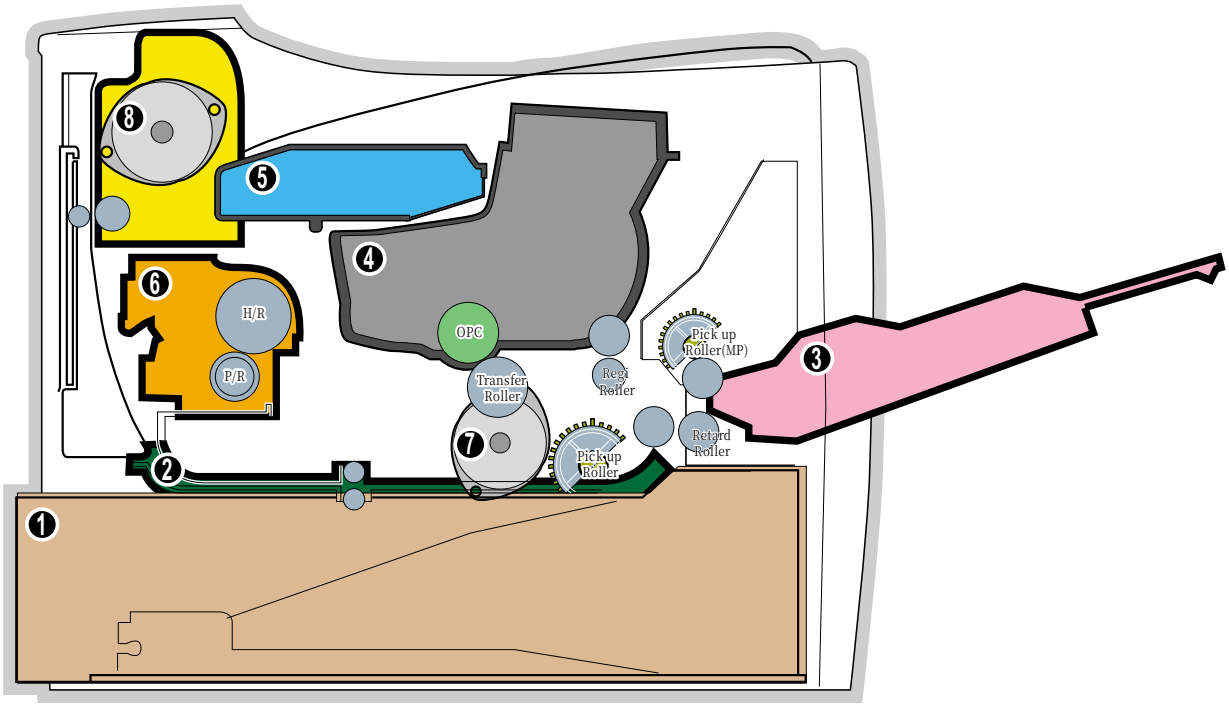
ML-2552W comes with a built-in **network interface**,10/100 Base TX.ML-2552W also has a wireless network interface. But, you need to add the optional network interface card to ML-2550.

Printer Features

The table below lists a general overview of features supported by your printer.

Features	ML-2550	ML-2551N	ML-2552W
IEEE 1284	STANDARD	STANDARD	STANDARD
USB 2.0	STANDARD	STANDARD	STANDARD
Network Interface	OPTION	STANDARD	STANDARD
Wireless LAN	OPTION	OPTION	STANDARD
PostScript Emulation	STANDARD	STANDARD	STANDARD

4.2 System Layout



1. Cassette
2. Duplex Unit
3. MPF
4. Toner Cartridge
5. LSU
6. Fuser
7. Main Motor
8. Exit Motor

4.2.1 Feeding

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

1) Separation method

Separate it from the finger mounted to the cassette side guide and apply retard roller that uses a spring clutch. A feed roller uses an electronic clutch to control driving power.

2) Basic cassette

It takes a center loading method and applies 'both side finger separating method.' It means that there is a paper sensor, but a paper size is detected after detecting the first paper by software.
Both the side guide and the rear guide can be adjusted for for various types of papers from A5 to legal size paper.
It has a paper existence sensing function (Capacity: 500 sheets of general paper), paper arranging function, various size papers accepting function, SCF paper path function, and displaying function of paper remaining amount.
In the front side, there is a paper level indicator.

3) Pick-up roller

It has functions such as a paper pickup function, driving control function, paper feeding function, and removing electronic static function.

4) Retard roller

It takes an arrangement method which uses a stopper roller and a weight without electric actuator.It has paper separating function, driving control function, and multi feeding prevention function.

6) Registration roller

It has a paper arranging function, paper transferring function, paper detecting function, jam removing function, and so on.

7) MP tray

It has a paper arranging function, paper transferring function, jam removing function, and so on.
It uses rubbing pad method to feed 100 sheets of general papers and 100 envelops.
It is possible to extend to 300mm for accepting a legal size paper.

8) Duplex unit

It has paper transferring function, paper guide function, jam removing function, paper sensing function, and main board supporting function.
It is designed for basic attachment, and the duplex feeding takes a side feeding method. Usable papers are A4, letter, and legal size paper.
For removing a jam occurred in a front part, it is designed to open a cassette and a guide. It is designed to open a rear cover to remove a jam in a rear part.
If a face up tray is open, the duplex option cannot be used.

9) SCF (Second Cassette Feeder)

It is the same method with the main cassette, and the capacity is 500 sheets.
It has a separate driving mechanism and feeds only A4, letter, and legal size paper.
It is designed for a common use with a main cassette, but it cannot be attached with the main cassette.

4.2.2 Transfer

It consists of a PTL (Pre-transfer Lamp) and a transfer roller. A PTL sheds light on an OPC drum, lowers an electric potential of an OPC drum's surface, and improves the efficiency of the transfer.
A transfer roller transfers toner on an OPC drum to the paper.
Life span: Print over 100,000 sheets (In 15~30(C)

4.2.3 Driver Ass'y

By driving the motor, the system takes power. It is consisted of a main motor for feeding and a toner cartridge, and sub-motors for fuser and duplex reverse turn.

4.2.4 Fuser

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

1) Thermostat

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

3) Heat roller

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

4) Pressure roller

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

5) Items for safety

Protecting device for overheating

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

Safety device

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

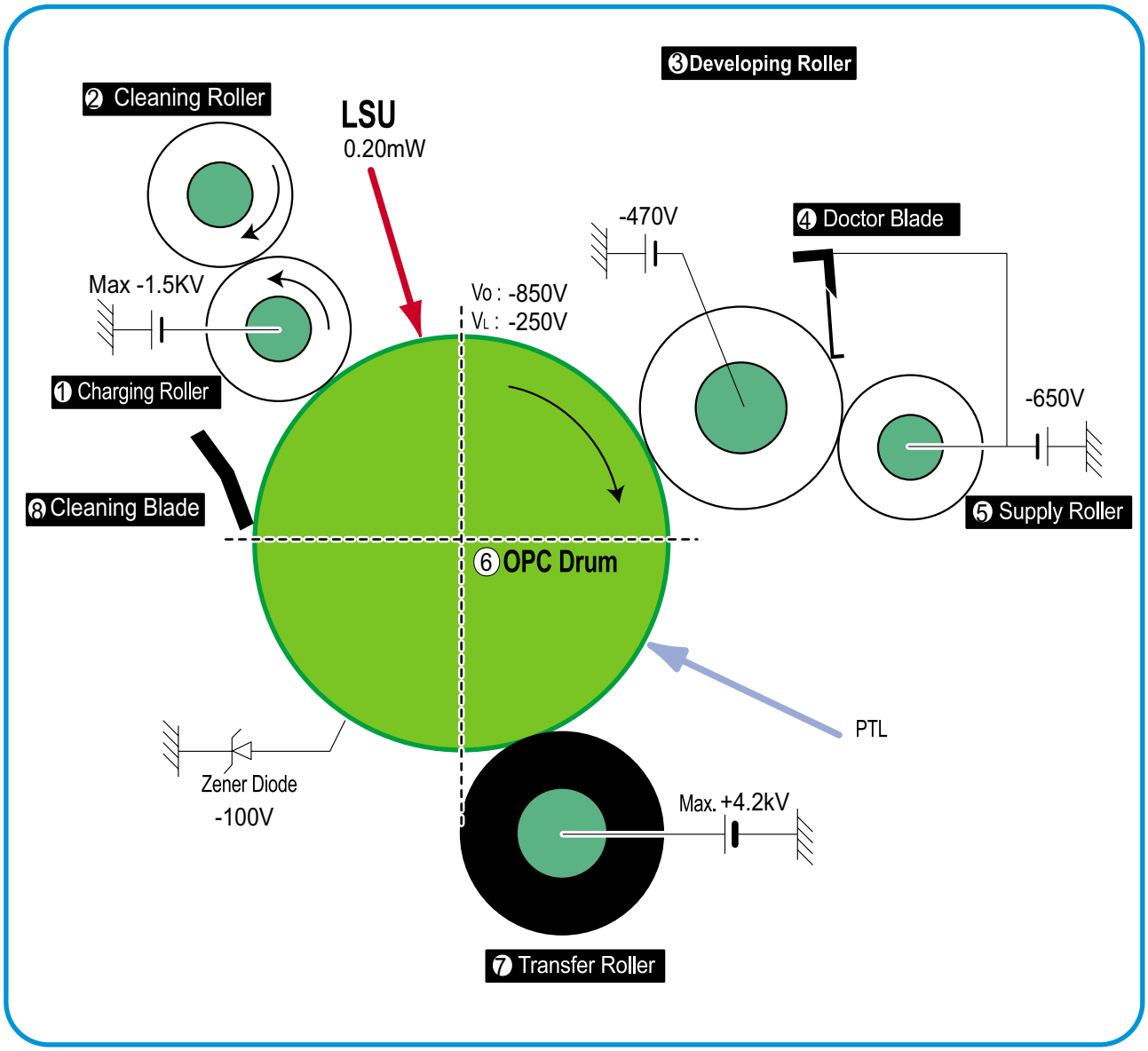
4.2.5 LSU (Laser Scanner Unit)

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

4.2.6 Toner Cartridge

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

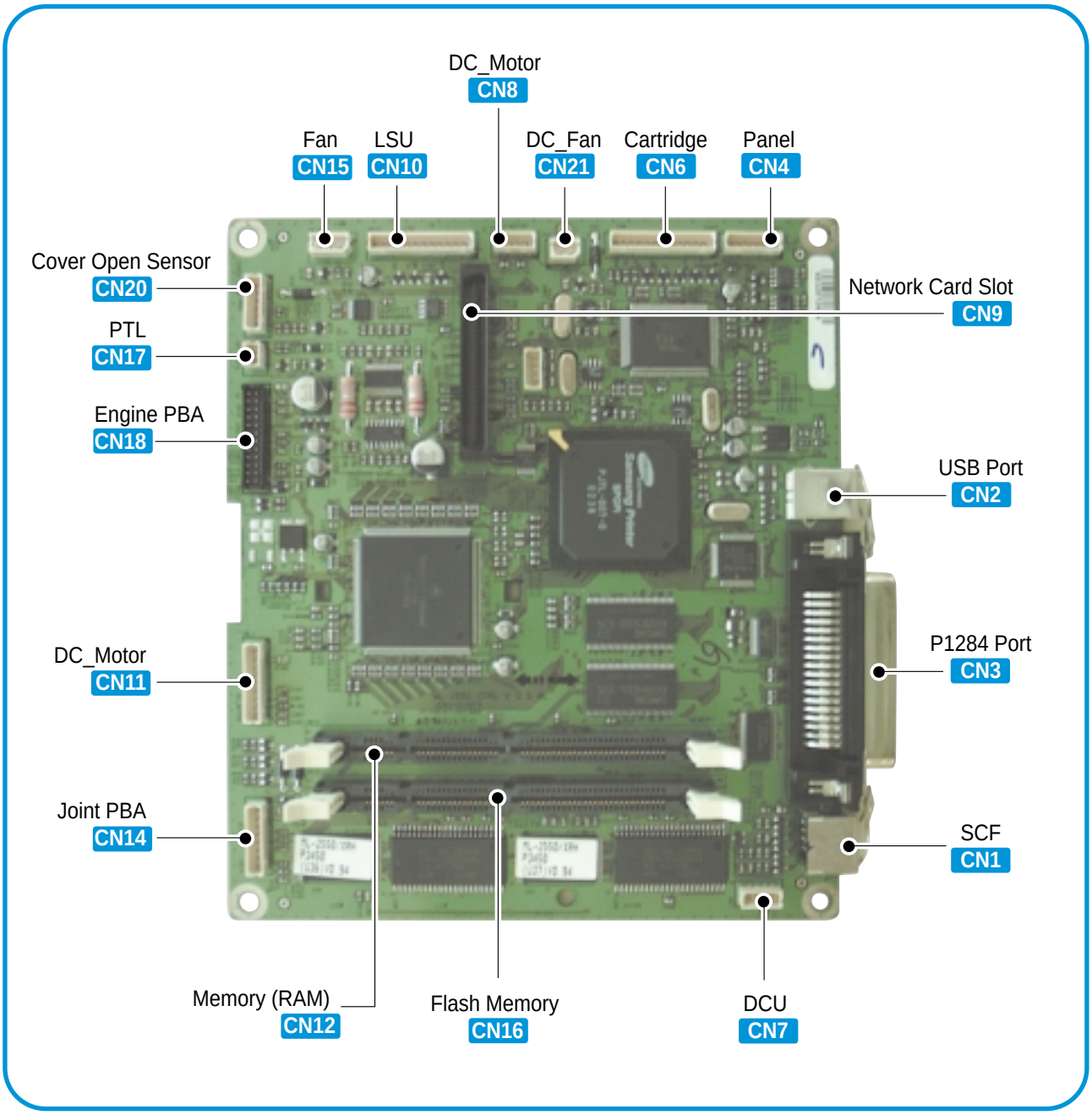
- Developing Method: Non magnetic 1 element contacting method
- Toner: Non magnetic 1 element shatter type toner
- The life span of toner: 10,000 sheets (LSA Pattern/A4 standard)
- Toner remaining amount detecting sensor: Yes
- OPC Cleaning: Cleaning blade type
- Management of disusable toner: Collect the toner by using Cleaning Blade
- OPC Drum protecting Shutter: Yes
- Classifying device for toner cartridge: ID is classified by interruption of the frame channel.



<Toner Cartridge Layout>

4.3 Main Board

Main controller part is organized with Asic (SPGPi) part, Memory part, and Engine interface part, and it is functions as a Bus control, I/O handling, Drivers, and PC interface by CPU.
Memory access has program memory (supports 32bit operation) and working memory (supports 32bit operation).



4.3.1 ASIC (SPGPi)

>> Power PC Comapatible Interface

>> 3 Memory Bus Architectur

ROM Bus, Primary DRAM Bus, Seconday SDRAM Bus for Band Buffer

>> Direct connected to 4 ROM Banks

32 MByte Address Space per Bank
Burst Capability
Programmable Timing per Bank

>> Direct connected to max 6 I/O Banks of ROM Bus

64 MByte Address Space per Bank
Programmable Timing per Bank

>> Direct connected to max 3 I/O Banks of DRAM Bus for DMA

8 KByte Address Space per Bank
Programmable Timing per Bank

>> Direct connected to max 9 DRAM / SDRAM Banks

Support EDO or FPM Type DRAM and SDRAM
Max 128 MByte Address Space per Bank
Programmable Timing to Control DRAM / SDRAM A.C Characteristics
Support Self Refresh for Data Retention

>> Direct connected to 1 SDRAM Banks using Secondary Bus for Band Buffer

Support SDRAM only
Max 512 KByte Address Space
Programmable Timing to Control SDRAM A.C Characteristics
Support Self Refresh for Data Retention
Bus Traffic Sharing using Secondary Bus

>> Graphic Coprocessor Core for Banding support of Printer Languages

Support up to 256 Bit Block Transfer
Scan Line Transfer
Polygon Filling
Enhanced Graphic Order compared to SPGP, SPGPe+
Access to Secondary Bus

>> Parallel Port Interface Controller

DMA based or Interrupt based Operation
Support IEEE Standard 1284 Communication

>> UART

4 Independent Full Duplex UART (Interrupt Based Operation Only)
max 16 Byte FIFO to Handle SIR Bit Rate Speed

>> DMA

3 Channel General Purpose DMA Controller for High Speed I/O
8 bit, 16 bit, 32 bit Data Transfer Mode Support

>> Timer

3 Independent Programmable Timer
Watch Dog Timer for S/W Trap and Tone Generator for MFP Application

>> RSH

Fully H/W Rotator, Scaler and Halftoner
Variable Image Scaler and Image Halftoning Unit for PCL6

>> Compression / Decompression

3 Different Kinds of Codec Algorithm
jCodec : Powerful T.85 JBIG Algorithm for Bi Level Image Compression
gCodec
- Simplified JBIG Algorithm for Band Compression, coupled with GEU
- Access to Secondary Bus

HCT : Halftone Compression Technology (Byte Run-Length Type)
Independent Compression & Decompression Data Path of Each Codec

>> Printer Video Controller

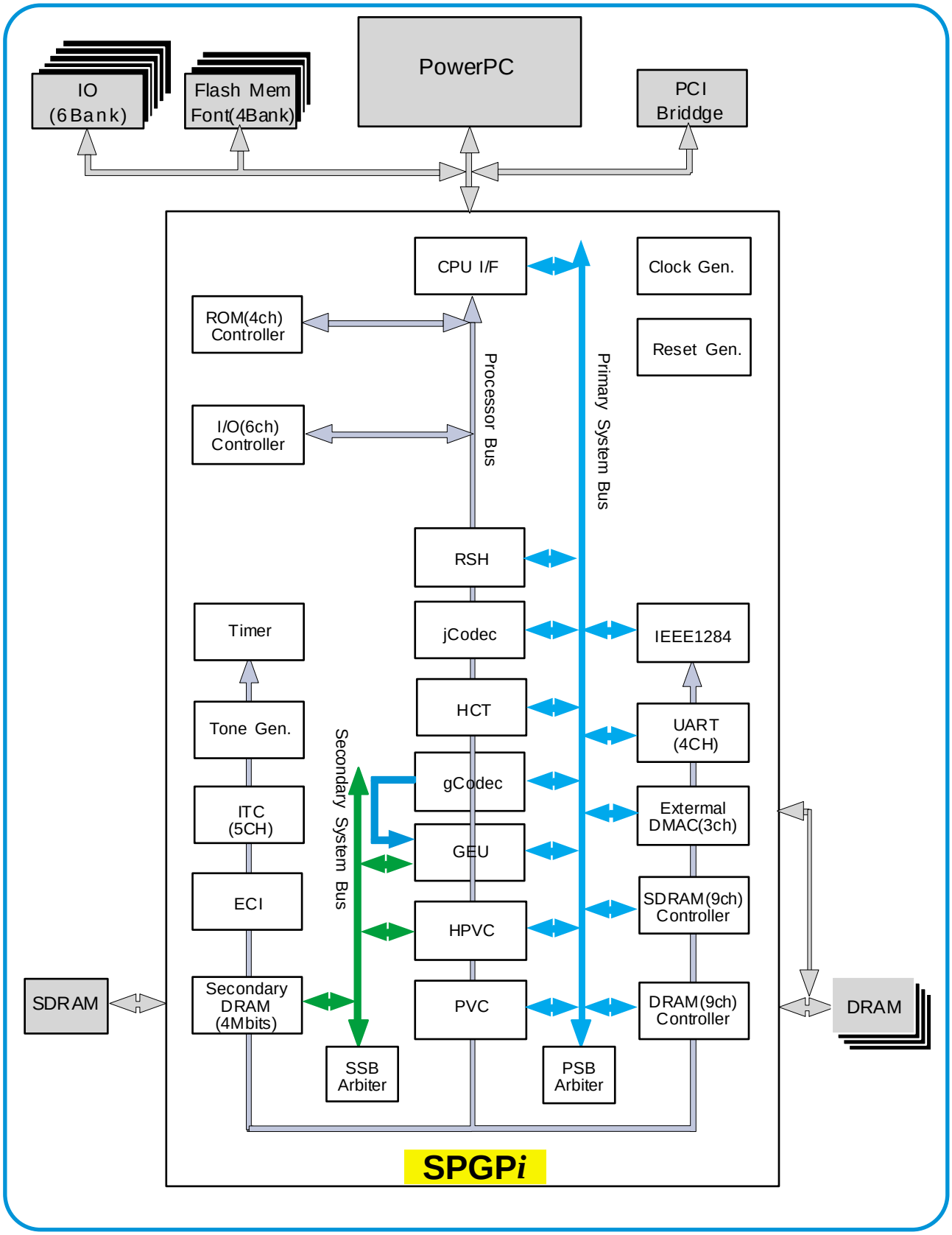
2 Different Kind of Printer Video Controller (Selected by S/W)
High Performance DMA based Interface to Printer Engine
PVC : Printer Video Controller without RET Algorithm
HPVC
- Printer Video Controller with RET Algorithm
- Access to Secondary Bus

>> Package : 352 pin BGA

>> Power

Core : 2.5 V
IO : 3.3 V

4.3.1.1 SPGPi Internal Block Diagram



4.3.2. Memory part

>> Flash Memory

It stores the System Program.

- Capacity: 2M Byte * 2
- Access Time : 70 nsec

>>SDRAM

It is used as Swath buffer, System working memory area, etc. when printing.

- Capacity: 32M Byte (Basic), upto 160M Byte (Option)
- DIMM : 16MB / 32MB / 64MB /128MB
- Type : SDRAM 100MHz/133MHz , 16bit

>>ROM DIMM

It supports the option ROM DIMM 1 Slot for supporting the expanding Memory.

- Capacity : 8MByte (Max)
- Access Time : 70nsec

4.3.3. RESET Circuit

After printer power is ON and 50~200 ms are passed, the reset signal from RESET IC (XC61FN3112MR) resets various IC such as the CPU, Memory, etc. to prevent malfunction of the set by setting the initial value of port.

4.3.4. ClOCK Circuit

Basically, it consists of the Crystal (12.5MHz) and Capacitor (27pF) which is connected to the crystal in parallel, and it is inputted to the MCLLK_Signal via the CY25814. The purpose of the adding SY25814 is substitution of EMI.

4.3.5. INTERFACE Part

>>IEEE1284

It supports the IEEE 1284 B Type Connection, and the protocol supports the IPP, ECP, Compatibility, Byte, and Nibble mode.

>>USB2.0

USB2.0 Compliant, 480Mbps 1 port

>>Network

- Option : Ethernet 10/100 Base TX
- Protocol : SPX/IPX, TCP/IP,Appletalk, SNMP, HTTP 1.1, DLC/LLC

>>Panel

- LCD : 16Char. * 2 Line / Back-light(Yellow)
- Key : 9 Key
- LED : 3 LED

The UART method is used for the controller and panel interface, and the HR 48C50 Holtak Micom is used

4.3.6. Sensor input circuit

4.3.6.1. Paper Empty Sensing

The Paper empty sensor (Photo Interrupter) on the engine board informs the state of paper to LPEC1 whether it is empty or not by operation of the actuator.
When cassette is empty, it detects the fact by reading the GPIO3_1 of LPEC1, and then displays the fact on the LCD panel.

4.3.6.2. MP Sensing

By operation of the MP Sensor (Photo Interrupter) on frame and Actuator, it informs the state of paper to CPU whether it is empty or not. It reads the IP5 sec_DRAM(K26) of CPU for recognizing paper in MP, and paper is fed from MP if there is.

4.3.6.3. Paper Feeding

When paper passes the actuator on the feed sensor part, it detects the signal of Photo interrupter, informs the paper feeding state to CPU, and then sprays the image data after certain time.
If it doesn't detect the feed sensor within 1 sec. after paper is fed, paper jam0 (LPEC1 GPIO3_2) is occurred. (Displays on the LCD panel)

4.3.6.4. Toner Remain Sensing

The Toner cartridge terminal is mounted to the joint board located on frame. When the toner cartridge is inserted, it is adhered to the contacting point of the joint board to sense whether the toner cartridge exists or not, ID, amount of toner, and so on.

4.3.6.5. Paper Exit Sensing

It detects paper state whether paper gets out from the set with operation of exit sensor on the engine board and actuator on the frame. Paper detects the on/off time of exit sensor by reading LPEC1 GPIO3_6, and the normal operation or jam information is informed to the CPU.
The paper JAM2 is informed. (Displays the state on LCD panel)

4.3.6.6. Cover Open Sensing

The Cover open sensor is located on the front cover. After the front cover is opened, +24V and +5V (DC fan, solenoid, main motor, polygon motor part of LSU, HVPS, LSU Laser diode), which is supplied to each unit, is cut off.

4.3.6.7. DC FAN/Solenoid Driving Circuit

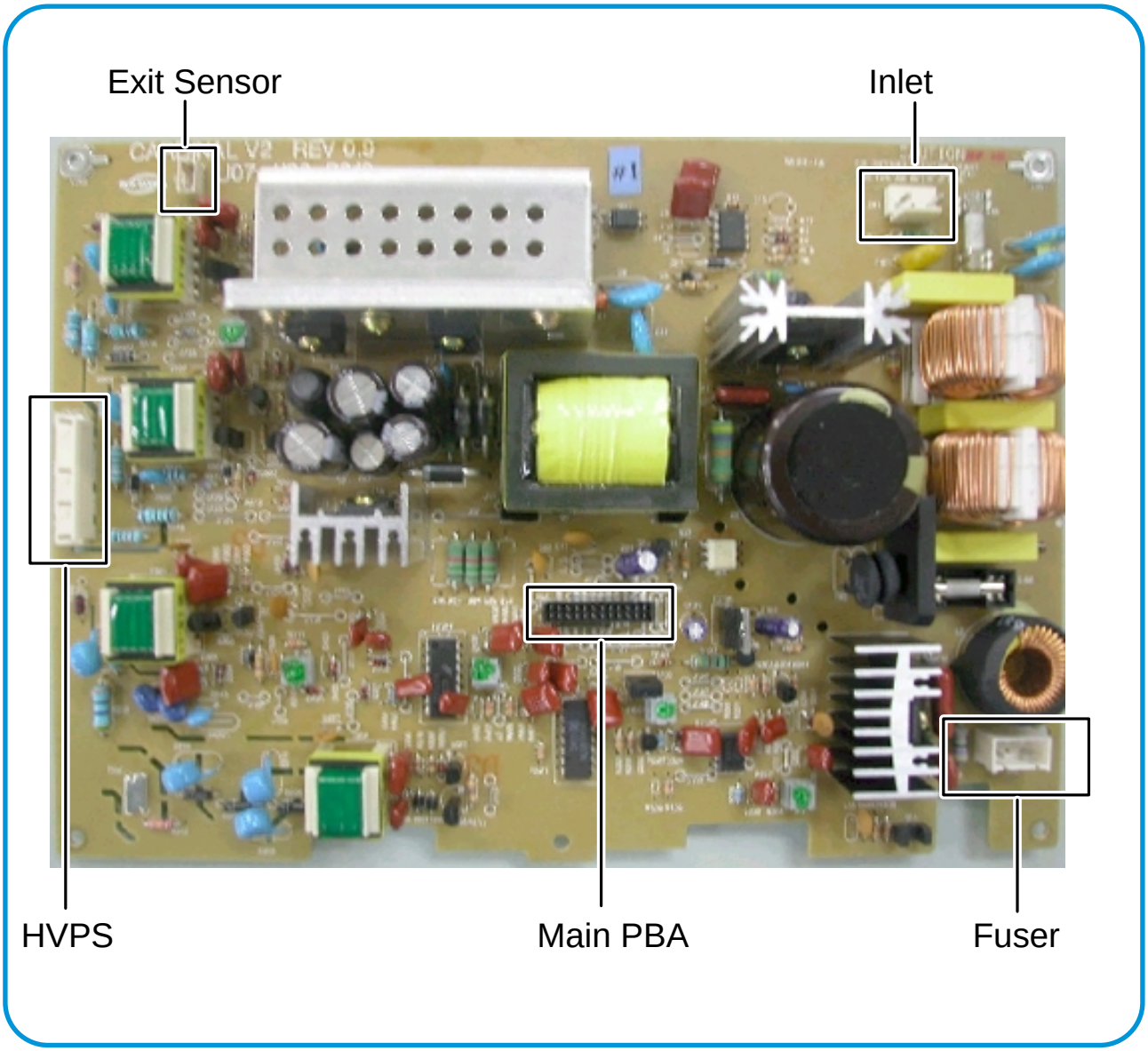
A fan driving circuit is driven by a transistor and a controller which is in the LPEC.
It is automatically turned off when a machine turns to sleep mode.
There are two solenoids, and it is driven by an MP signal and a paper pick-up signal.

4.3.6.8. Motor Driving Circuit

A main motor (BLDC) drives a feeding and developing unit and an exit motor (Step) drives a Fuser and an Exit ass'y.
When printing with a duplex function, it rotates the Exit Motor to a normal/reverse direction. It controls by dividing the acceleration section, standard speed section, and reducing speed section. A BLDC Motor is operated by a clock and enable signal, and a Step Motor is managed with an A3977 driver IC.

4.4 SMPS & HVPS board

The SMPS and HVPS are in one united board. The SMPS part supplies the DC power to the system.
It takes either 110V or 220V and outputs the +3.3V and +24V to supply the power to the main board.
The HVPS part creates the high voltage of THV/MHV/Supply/Dev and supplies it to the toner cartridge part for making the best condition to display the image.
The HVPS part takes the 24V and outputs the high voltage for THV/MHV/BIAS, and the outputted high voltage is supplied to the toner, OPC cartridge, and transfer roller.



4.4.1. HVPS(High Voltage Power Supply)

1) Transfer high voltage (THV (+))

- Function: It is a voltage that transfers toner on an OPC Drum to paper.
- Output voltage: MAX +4.2 KV +/- 5% (Duty is changeable, Not loading)
- 1.7KV +/- 15% (When cleaning, 200MOhm - It transfers toners with (+) polarity of transfer roller to an OPC Drum.
- Error type: IF THV (+) is not outputted, it causes a low density due to toner on an OPC Drum if it is not transferred to paper. It is possible that over-flow occurs if toner is piled up in a toner vessel continuously.

2) Charge voltage (MHV)

- Function: It is a voltage that charges a surface of OPC to -750V~-900V.
- Output voltage: -1.35KV~1.5KV DC +/- 50V
- Error type: IF MHV is not outputted, toner overflows and reaches to an OPC drum if surface of an OPC is not charged. A black paper is printed out when it happens.

3) Cleaning voltage: THV (-)

- Function: It removes contamination at a rear by sending (-) polarity in a transfer roller to OPC drum to take toner.
- Output voltage: A change range is large according to a load because there is no feedback control =(-600V~-1200V)
- Error type: An error due to contamination of toner on a backside of printing paper.

4) Developing voltage (DEV)

- Function: It is a voltage that develops toner with electronic potential difference of the section exposed by LSU (Laser Scanning Unit).
  * When printing, exposing voltage of OPC is -250V and exposing voltage of DEV is -470V. Therefore, toner with (-) polarity is developed on an exposed section.
- Output voltage: -380V~500DC +/- 20V
- Error type:
  a) If DEV is GND, a density gets extremely low.
  b) When DEV is floating due to instable of terminal's contacting point, and etc., density gets extremely high.

5) Supplying voltage (SUP)

- Function: It is a voltage that supplies toner to a developing roller.
- Output voltage: -560V~680V DC +/- 50V (Use AENER, Gearing of DEV - (-)180V more than DEV)
- Error type:
  a) When SUP is GND, density gets extremely low.
  b) If SUP is floating due to instable of terminal's contacting point, and etc., density gets extremely low that it is hard to catch up with eyes.

6) OPC Ground ZENER voltage

- Function: It is a voltage to prevent an image contamination under the condition of low temperature and low humidity environment.
- When a set prints without an output voltage, -100V is maintained on OPC ground. (-100V ZENER diode is connected to OPC ground)
- Error type:
  a) When ZENER diode is - 0V, there is no serious image problem in general environment, but in low temperature and low humidity environment, it is possible that a contamination occur on entire image
  b) When ZENER diode is disconnected, a blank page is printed out. (It is the same case as when a ZENER diode is disconnected to OPC ground.)

4.4.2. SMPS(Switching Mode Power Supply)

It is the power source for the whole system. It is an independent module so it is possible to use for common use. It is mounted at the bottom of the set.
It consists of the SMPS part, which supplies the DC power for driving the system, and the AC heater control part, which supplies the power for fuser. SMPS has three outputting channels (3.3V, 5V and +24V).
There are three kinds of power, 120V exclusive (America), 220V exclusive (Europe), and 220V for china (nations with instable power supply).

>>AC Input

- Inputting rated voltage : AC 220V ~ 240V AC 100V ~ AC 127V
- Inputting voltage fluctuating range: AC 198V ~ 255V AC 90V ~ 135V
- Rated frequency : 50/60 Hz
- Frequency fluctuating range : 47 ~ 63 Hz
- Inputting voltage: Under 5.5Arms/2.5Arms

>>Rated Power Output

NO	Item	CH1	CH2	CH3	Remark
1	Channel name	+3.3V	+5V	+24.0V	
2	CONNECTOR PIN	CON 3 3.3V PIN: 12, 14 GND PIN: 16, 18	CON 3 5V PIN : 8 GND PIN: 7	CON 3 24V PIN: 2, 4, 6 GND : 7, 8, 10	
3	Rated outputting voltage	3.3V ± 5% (3.2 ~ 3.4V)	+5V ± 5% (4.75 ~ 5.25V)	+24V ± 5%, -5% (21.6 ~ 26.4V)	
4	Maximum outputting voltage	1.5 A	0.5 A	0.5 A	
5	Peak loading voltage	1.5 A	0.5 A	0.5 A	1ms
6	Ripple noise voltage	200mVp-p	100mVp-p	500mVp-p	
7	Maximum output	5 W	2.5 W	84 W	
8	Peak output	5 W	2.5 W	84 W	1ms

>>Consumption Power

NO	Item	CH1 (+3.3V)	CH2 (+5V)	CH3 (+24V)	System
1	Stand-By	0.6 A	0.25A	0.4 A	AVG : 100 Wh
2	PRINTING	1.0 A	0.25 A	2.0 A	AVG : 450 Wh
3	Sleep-Mode	0.4 A	0.01 A	0.4 A	AVG : 20 Wh

>>Length of Power Cord: 1830 ± 50mm

>>Power Switch : Use

>>Feature

- Insulating resistance : over 50MΩ(at DC 500V)
- Insulating revisiting pressure Must be no problem within 1min. (at 1500Vzc, 10mA)
- Leaking voltage : under 3.5mA
- Running voltage : under 50A peak (at 25°C, Cold start)
  Under 60A peak (in other conditions)
- Rising Time : Within 2sec
- Falling Time : over 20ms
- Surge: Ring Wave 6KV-500A (Normal, Common)

>>Environment Condition

- Operating temperature range : 0°C~50°C
- Maintaining temperature range : -25°C~85°C
- Maintaining humid range : 10% ~90% RH
- Operating atmospheric pressure range: 1

>>EMI Requirement

CISPR ,FCC, CE, MIC, C-Tick,

>>Safety Requirement

IEC950 UL1950, CSA950, C-UL, TUV, Semko, iK, CB, CCC(CCIB),GOST, EPA

4.4.3. Fuser AC Power Control

Fuser (HEAT LAMP) gets heat by using AC power. The AC power controls the switch with the Triac, a semiconductor switch. The 'On/Off control' is operated when the gate of the Triac is turned on/off by Photo triac, which is insulting part. In the other words, the AC control part is passive circuit, so it turns the heater on/off with taking signal from engine control part. When the 'HEATER ON' signal is turned on at engine, the LED of PC1 (Photo Triac) takes the voltage and flashes. From the flashing light, the Triac part (light receiving part) takes the voltage, and the voltage is supplied to the gate of Triac and flows into the Triac. As a result, the AC current flows in the heat lamp, and heat is occurred.
On the other hand, when the signal is off, the PC1 is off, the voltage is cut off at the gate of Triac, the Triac becomes off, and then the heat lamp is turned off.

>>Triac (THY1) feature:12A,600V SWITCHING

>>Phototriac Coupler (PC3)

- Turn On If Current : 16mA
- High Repetive Peak Off State Voltage : Min 600V

4.5 Engine F/W

4.5.1 Feeding

If feeding from a cassette, the drive of the pickup roller is controlled by controlling the solenoid. The on/off of the solenoid is controlled by controlling the general output port or the external output port. If feeding from a manual feeder, decide to insert the paper according to the operation of the manual sensor, and by driving the main motor, insert the paper in front of the feed sensor. While paper moves, occurrence of jam is judged as below. (Refer to the [6.2 Paper Transfer rout])

4.5.1.1 Jam 0

- After picking up, paper cannot entered due to paper mis-feed.
- After picking up, paper entered but it cannot reach to the feed sensor in certain time due to slip, etc.
- After picking up, if the feed sensor is not on, repack up. After repacking up, if the feed sensor is not on after certain time, it is Jam 0.
  - It is a status that the leading edge of the paper doesn't pass the feed sensor.
- Even though the paper reaches to the feed sensor, the feed sensor doesn't turn on.
  - It is a status that the leading edge of the paper already passed the feed sensor.

4.5.1.2 Jam 1

- After the leading edge of the paper passes the feed sensor, the tailing edge of the paper cannot pass the feed sensor after certain time. (The feed sensor cannot be Off)
- After the leading edge of the paper passes the feed sensor, the paper cannot reach the exit sensor after certain time. (The exit sensor cannot be On)
  - The paper exists between the feed sensor and the exit sensor.

4.5.1.3 Jam 2

- After the tailing edge of the paper passes the feed sensor, the paper cannot pass the exit sensor after certain time.

4.5.1.4 Duplex Jam 1

A leading edge of a paper didn't reach a Duplex Sensor after certain time passes.

4.5.1.5 Duplex Jam 2

After a leading edge of the paper passes the Duplex Sensor, the rear edge of the paper does not pass a Duplex Sensor within a certain time.

4.5.2 Drive

A main motor (BLDC) drives a feeding and developing unit and an exit motor (Step) drives a Fuser and an Exit ass'y.
When printing with a duplex function, it rotates the Exit Motor to a normal/reverse direction. It controls by dividing the acceleration section, standard speed section, and reducing speed section. A BLDC Motor is operated by a clock and enable signal, and a Step Motor is managed with an A3977 driver IC.

4.5.3 Transfer

The charging voltage, developing voltage and the transfer voltage are controller by PWM (Pulse Width Modulation). The each output voltage is changeable due to the PWM duty. The transfer voltage admitted when the paper passes the transfer roller is decided by environment recognition. The resistance value of the transfer roller is changed due to the surrounding environment or the environment of the set, and the voltage value, which changes due to the environments, is changed through AD converter. The voltage value for impressing to the transfer roller is decided by the changed value.

4.5.4 Fusing

The temperature change of the heat roller's surface is changed to the resistance value through the thermistor. By converting the voltage value, which impressed to the resistance, to the digital value through the AD converter, the temperature is decided. The AC power is controlled by comparing the target temperature to the value from the thermistor. If the value from the thermistor is out of the controlling range while controlling the fusing, the error stated in the table occurs. (For the domestic model, the Q-PID method has been applied.)

Error	Description	LCD Display
Open Heat Error	When warming up, it has been lower than 68°C over 28 seconds	Engine Fuser Error
Lower Heat Error	• Standby: It has been lower than 130°C over 10 seconds • Printing: - 3 consecutive page; it has been 20°C lower than the fixed fusing temperature over 7 seconds.	Engine Fuser Low Heat Error
Over Heat Error	It have been higher than 230°C over 10 seconds	Engine Fuser Over Heat Error

4.5.5 LSU

The LSU is consisted of the LD (Laser Diode) and the polygon motor control. When the printing signal occurs, it turns the LD and drives the polygon motor. When the receiving light part detects the beam, Hsync occurs. When the polygon motor speed becomes a normal, LReady occurs. If two conditions are satisfied, the status bit of the LSU controller register becomes 1 to be judged that the LSU is ready. If two conditions are not satisfied, the error shown in below occurs.

Error	Description	LCD
Polygon motor error	When the polygon motor's speed doesn't become a normal	Engine LSUError
Hsync error	The polygon motor's speed is normal, but the Hsync signal is not created.	HSYNC Error

Memo

5. Disassembly and Reassembly

5.1 General Precautions on Disassembly

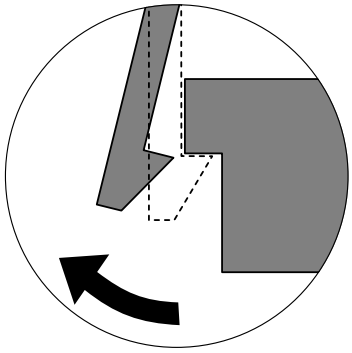
When you disassemble and reassemble components, you must use extreme caution. The close proximity of cables to moving parts makes proper routing a must.
If components are removed, any cables disturbed by the procedure must be restored as close as possible to their original positions. Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

1. Check to verify that documents are not stored in memory.
2. Be sure to remove the toner cartridge before you disassemble parts.
3. Unplug the power cord.
4. Use a flat and clean surface.
5. Replace only with authorized components.
6. Do not force plastic-material components.
7. Make sure all components are in their proper position.

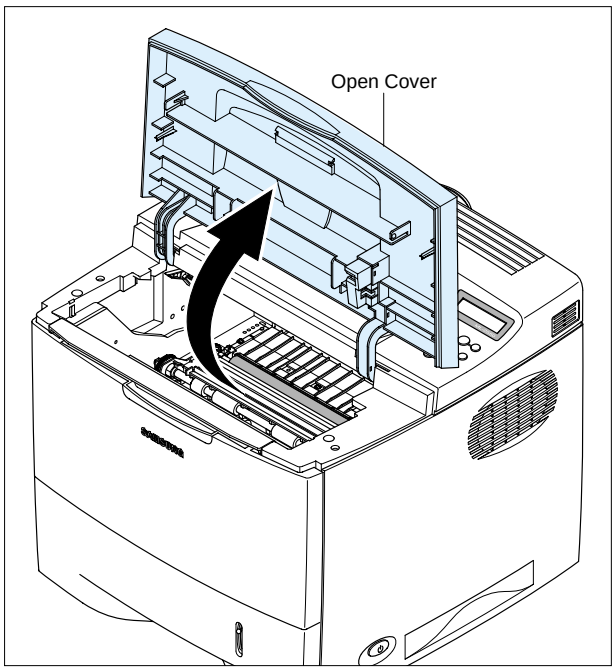
Releasing Plastic Latches

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.

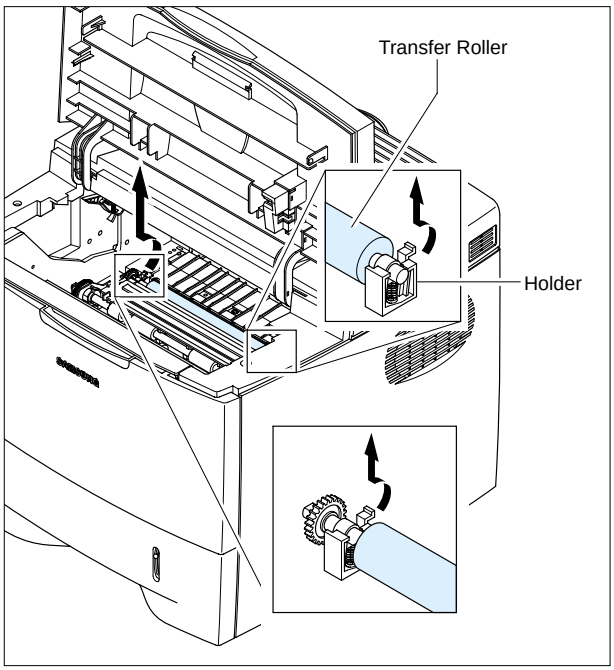


5.2 Transfer Roller

1. Open the Open Cover.

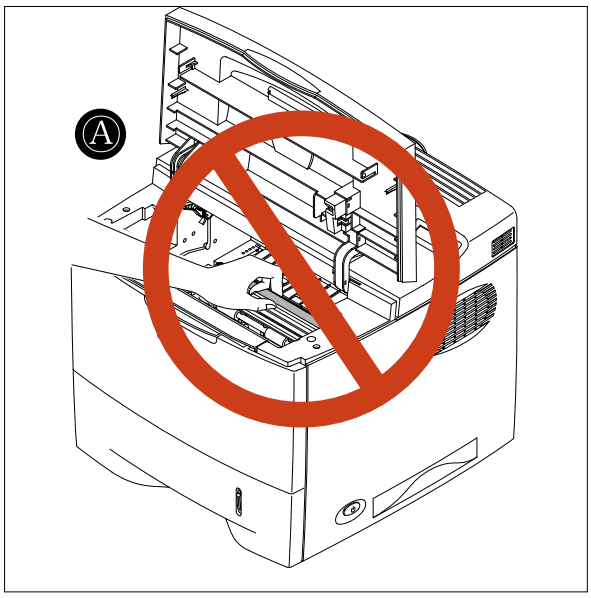


2. Hold the lever at both ends of the roller, then remove the roller.

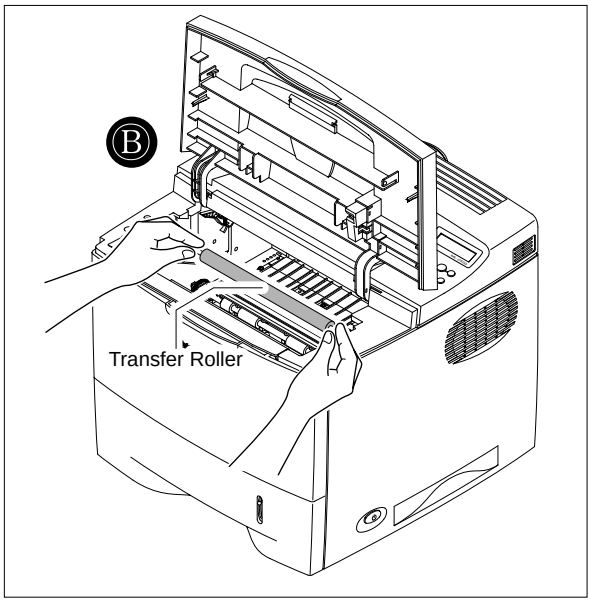


<Cautions When Replacing a Transfer Roller>

* Do not grab the transfer roller shown in picture (A). It may cause a malfunction due to a foreign object.
* Hold the both sides of the transfer roller shown in picture (B) when replacing it.



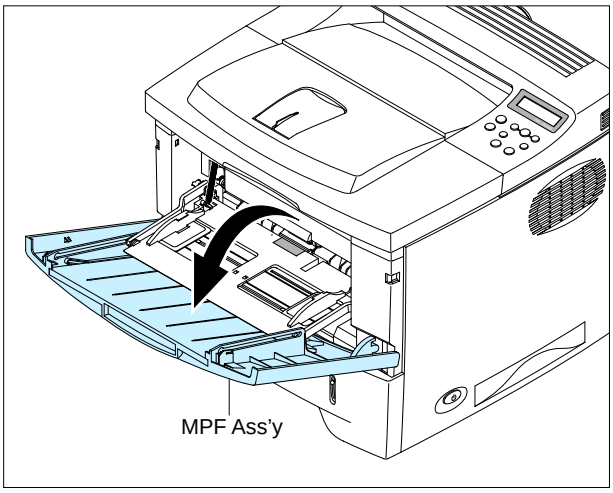
(A)



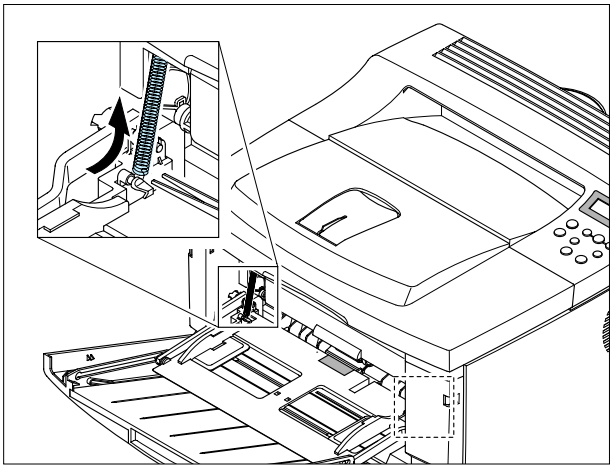
(B)

5.3 MPF Ass'y

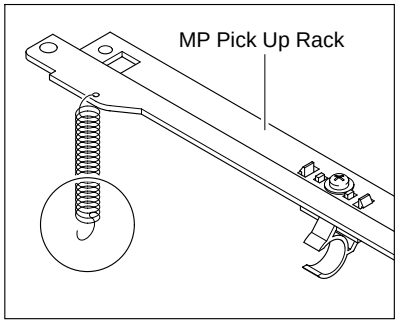
1. Open the MPF Ass'y.



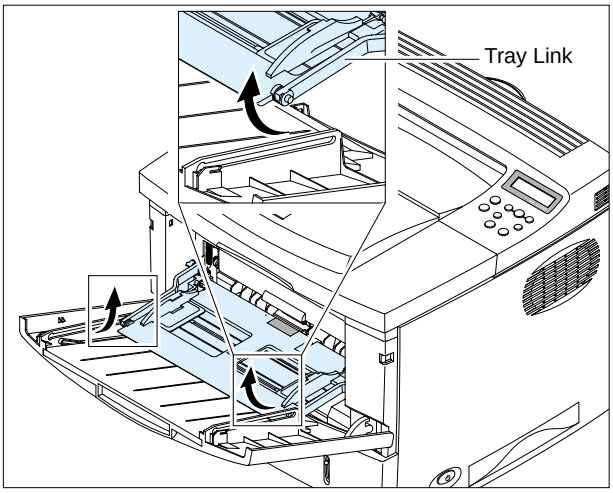
2. Remove two springs from the Knock Up Plate Ass'y.



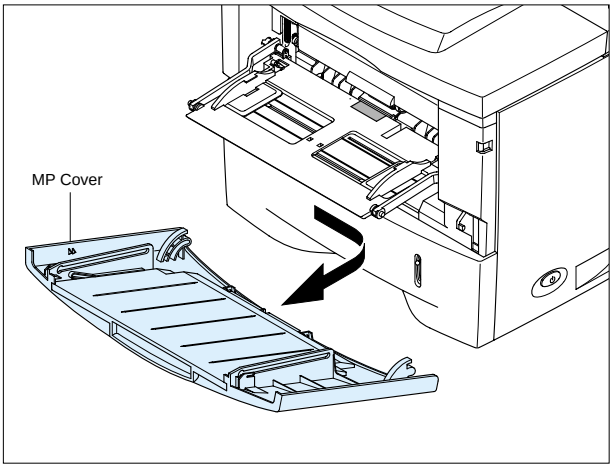
▲ *NOTICE : Do not separate the spring from the MP Pick-up rack for convenience of assembling. Locate the hook section of the spring that is connected to the Knock Up Plate ass'y as shown in the picture below toward the outside for convenience of assembling.*



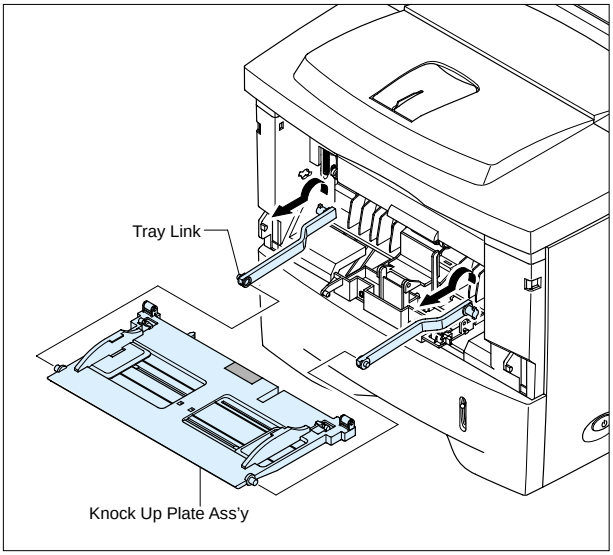
3. Remove the Tray Links from the MP Cover



4. Push the MP Cover and remove it as shown below.

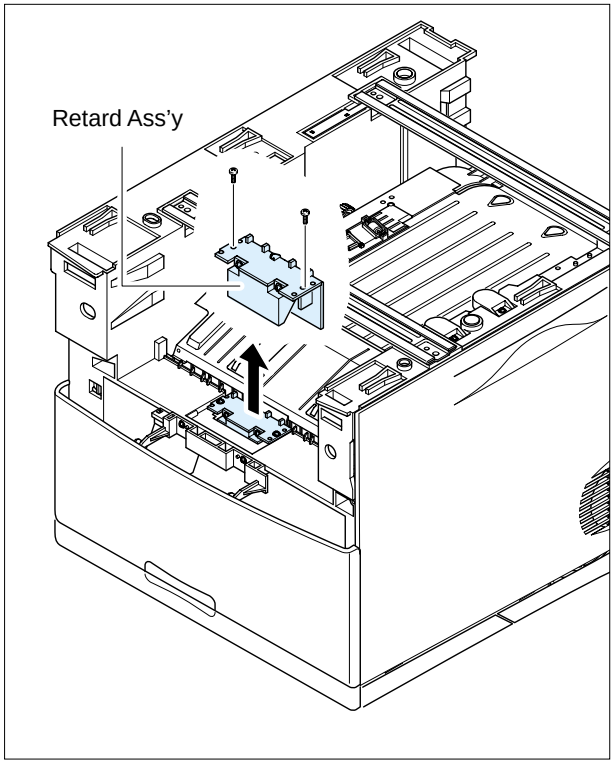


5. Remove MP Cover in the direction of arrow

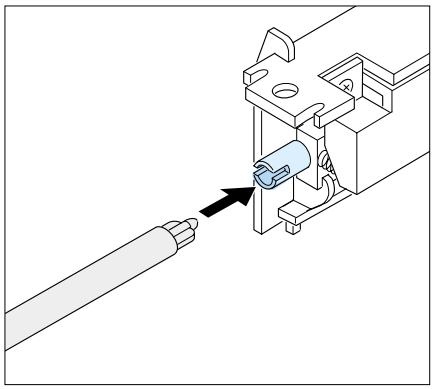


5.4 Retard Ass'y

1. Remove two screws. Then lift the Roller Ass'y, as shown below.

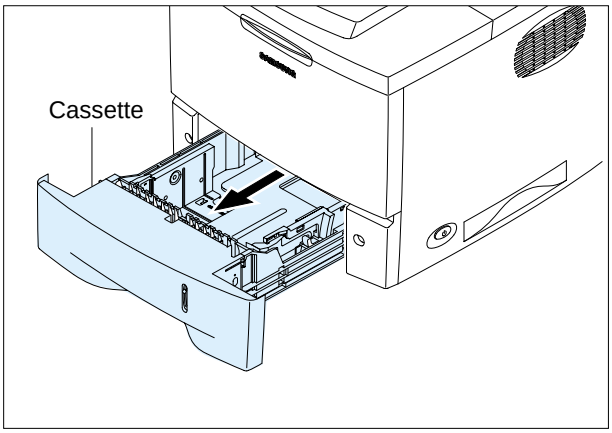


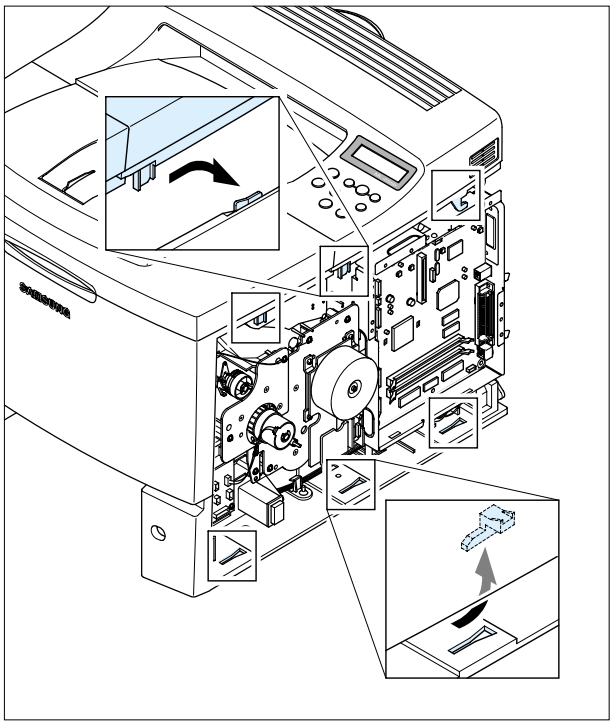
⚠ *Notice: When you reassemble the Retard Roller ass'y make sure that the let and of the Retard roller fits into the Retard shaft.*



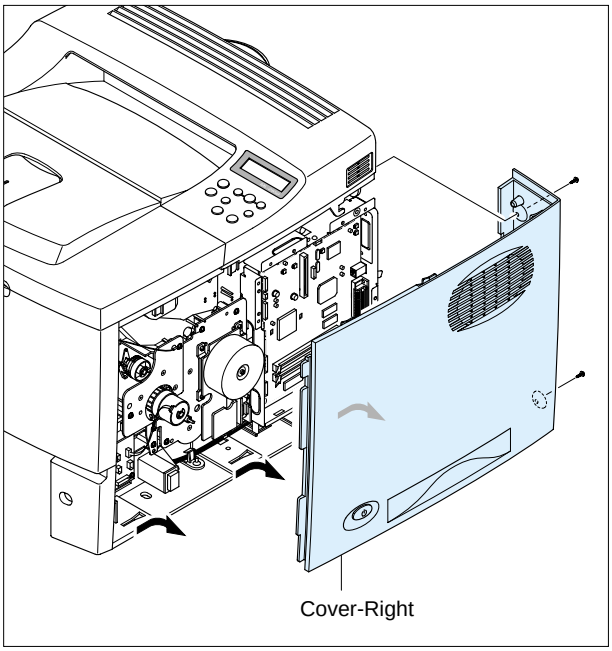
5.5 Cover-Right

1. Pull the Cassette out of the printer.





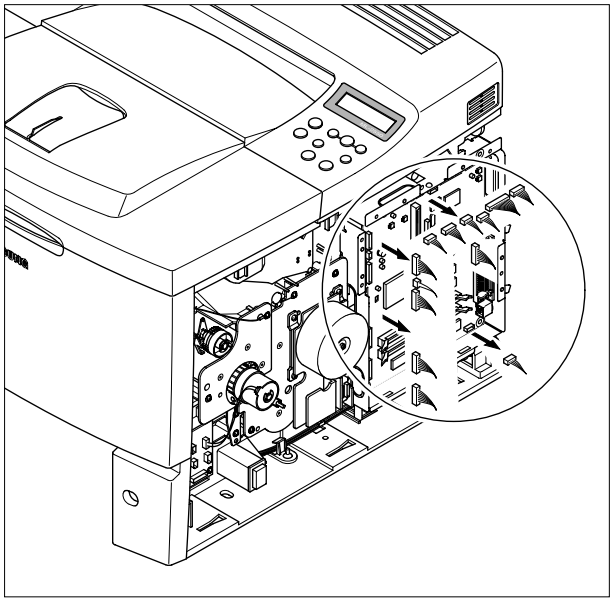
2. Remove two screws and take out the Right Side.



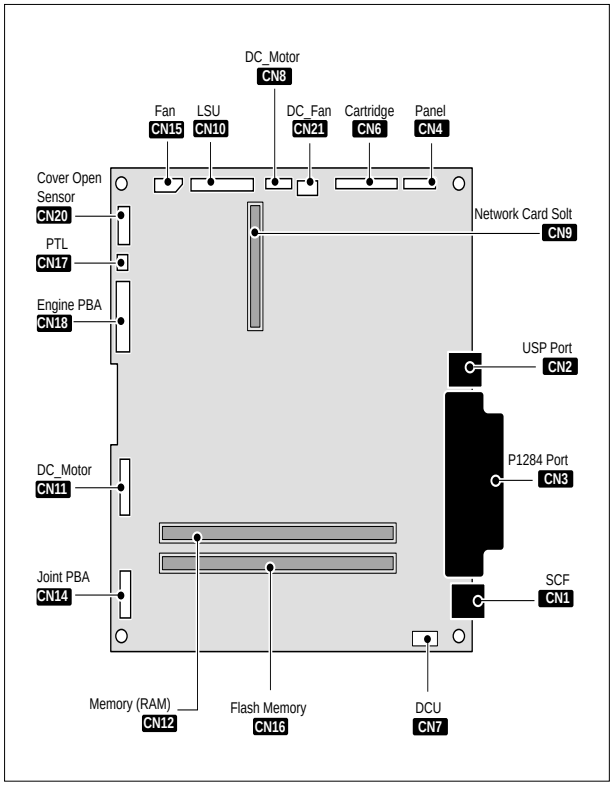
5.6 Main PBA

1. Before you remove the Main PBA you should remove:
   - Cover-Right (Refer to the 5.5)

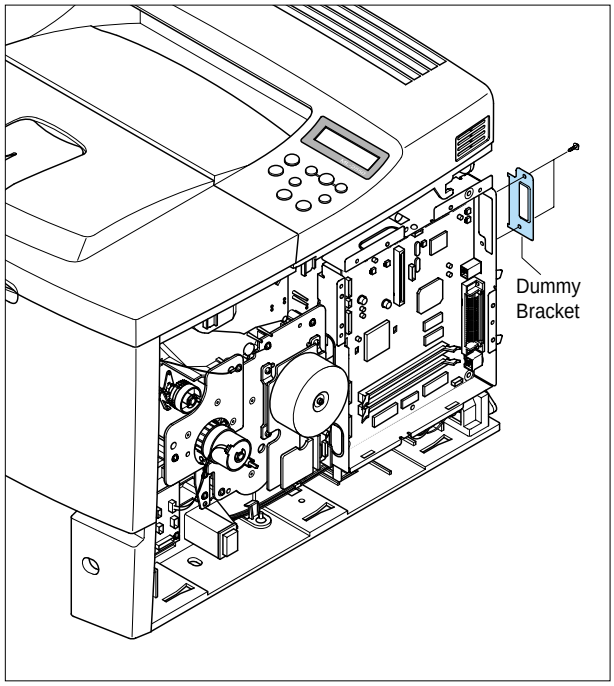
2. Unplug all the connectors, as shown below.



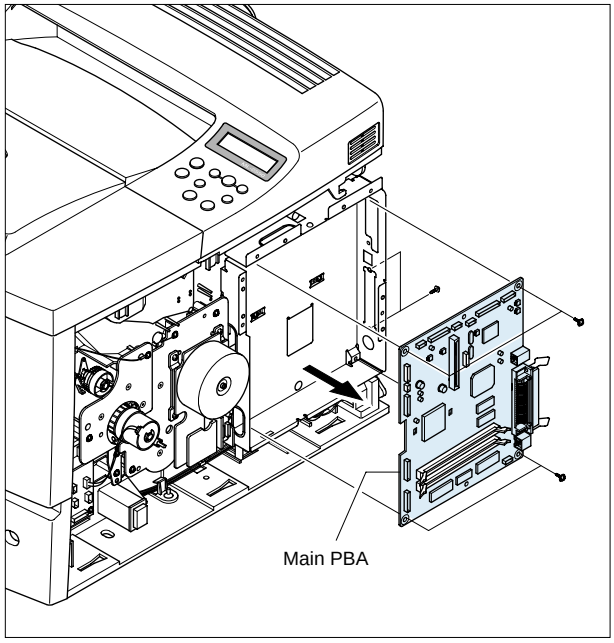
3. The connectors are located as shown below.



4. Remove two screws and take out the Dummy Bracket.



5. Remove six screws and take out the Main PBA.

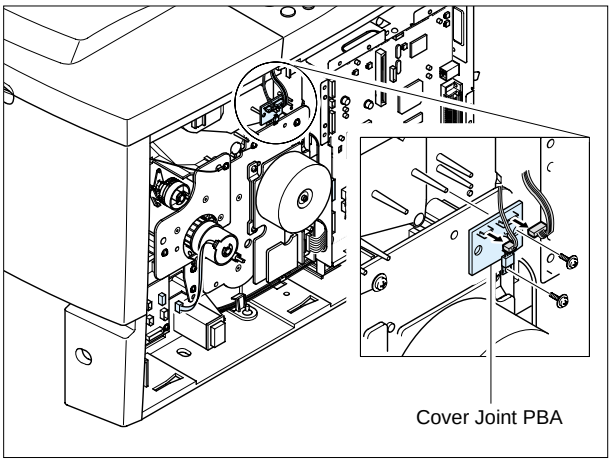


⚠ *NOTICE : One screw among the screws is locked on the Engine Shield.(Refer to 5.25.3)*

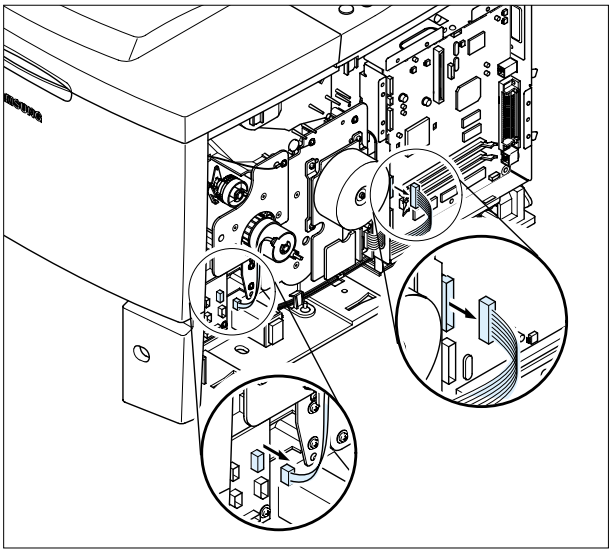
5.7 Main Drive Ass'y

1. Before you remove the Right Side Ass'y, you should remove:
   - Cover-Right (Refer to the 5.5)

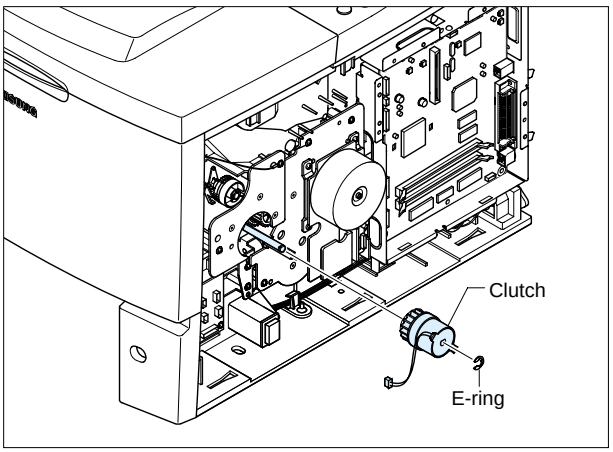
2. Unplug the two Connectors after you remove the two screws and take out the Cover Joint PBA.



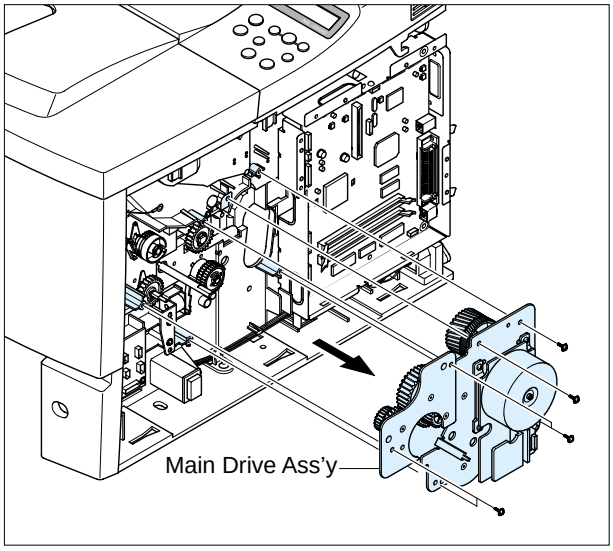
3. Unplug the two connectors from the Main PBA and the Connector PBA.



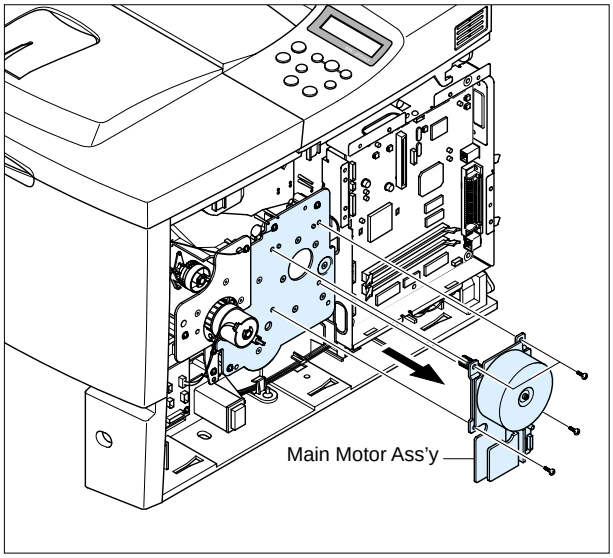
4. Remove the E-ring and take out the Clutch.



5. Remove six screws and take out the Main Drive Ass'y.



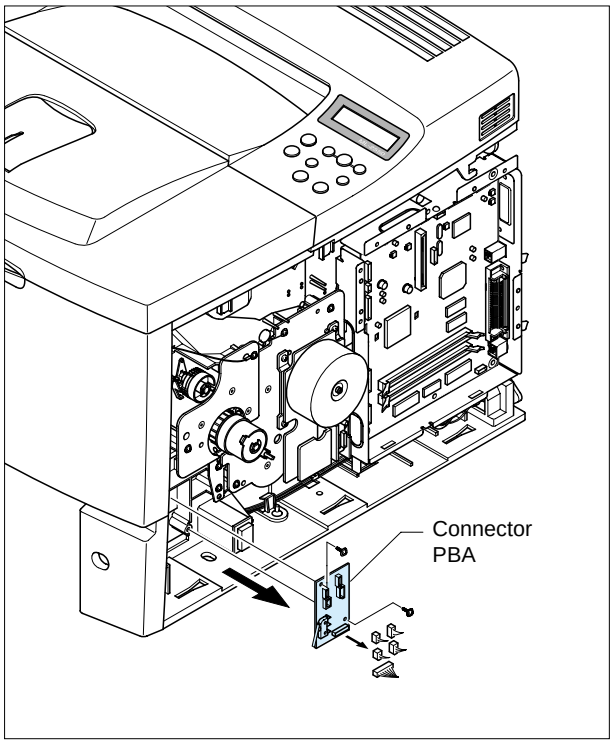
6. When separating the Main Motor ass'y, disconnect the connector form the Main PBA, remove 4 screws, and then remove the Main Motor ass'y.



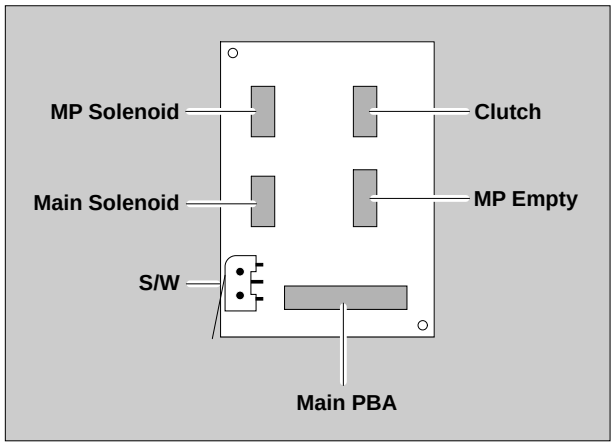
5.8 Connector PBA

1. Before you remove the Connector PBA, you should remove:
   - Cover-Right (Refer to the 5.5)

2. Unplug all of the connectors from the Connector PBA and take it out.



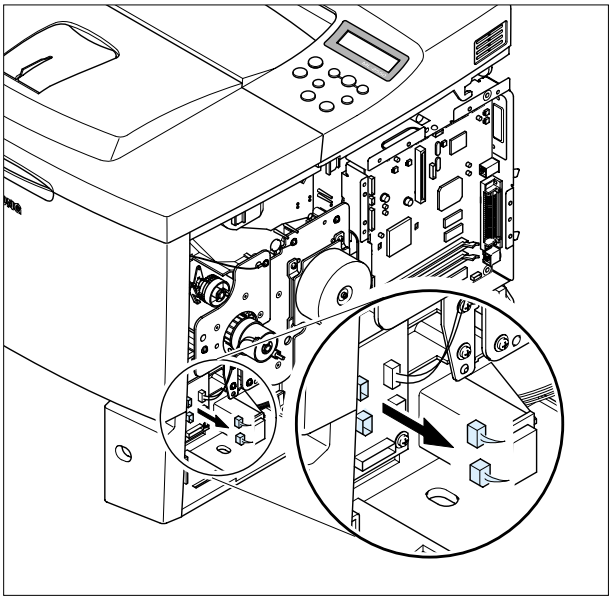
3. The connectors are located as shown below.



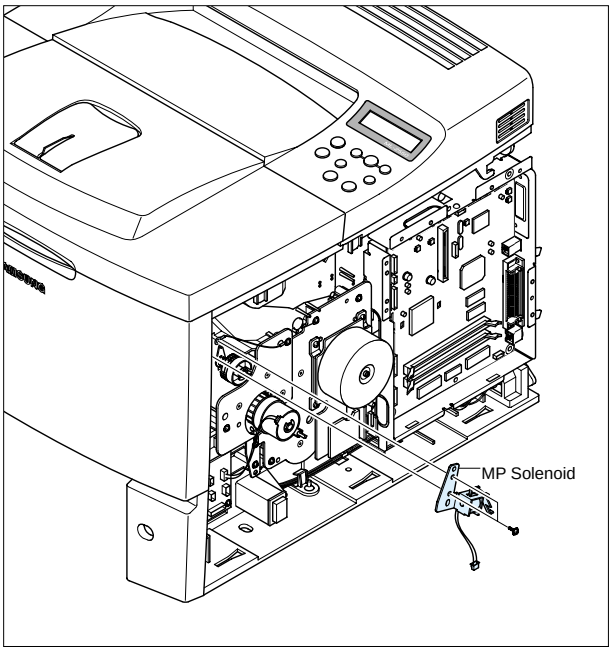
5.9 Solenoid

1. Before you remove the Connector PBA, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Main Drive Ass'y (Refer to the 5.7)

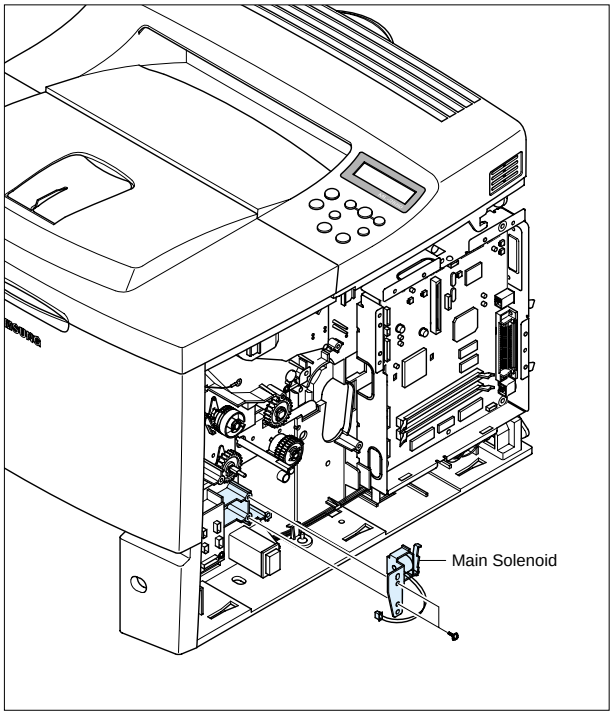
2. Unplug the MP Solenoid Harness and the Main Solenoid Harness from the Connector PBA.



3. Remove two screws and take out the MP Solenoid.



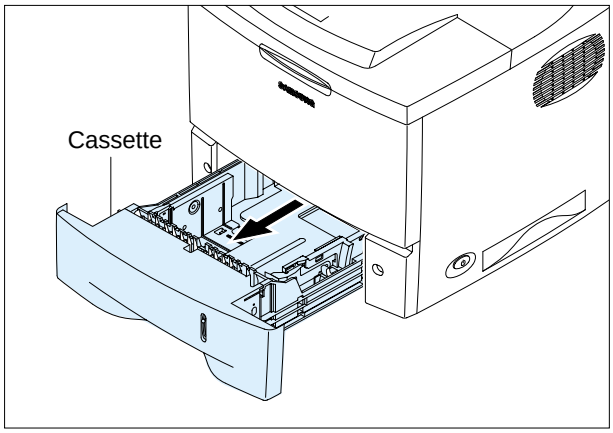
4. Remove two screws and take out the Main Solenoid.



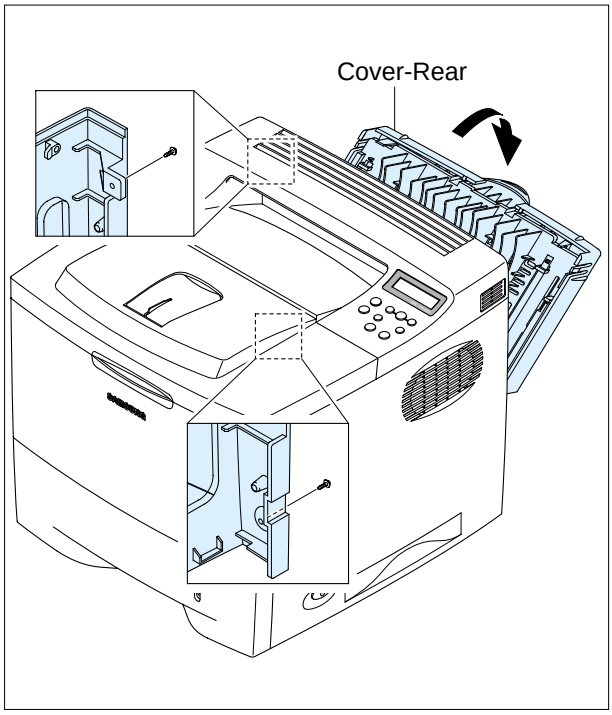
⚠ *NOTICE : It is not necessary to disassemble the Main Drive Ass'y to remove the MP Solenoid*

5.10 Cover-Left

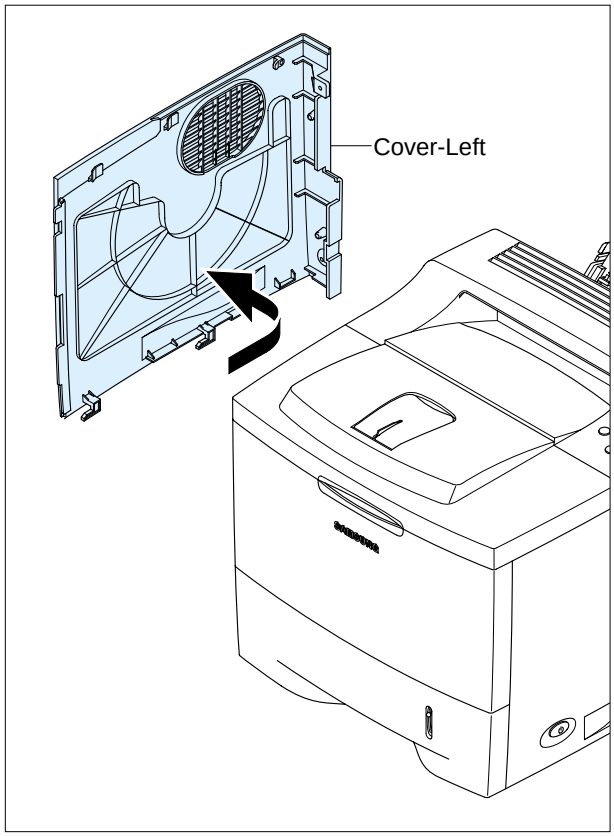
1. Pull the Cassette out of the printer.



2. Remove two screws and take out the Right Side.



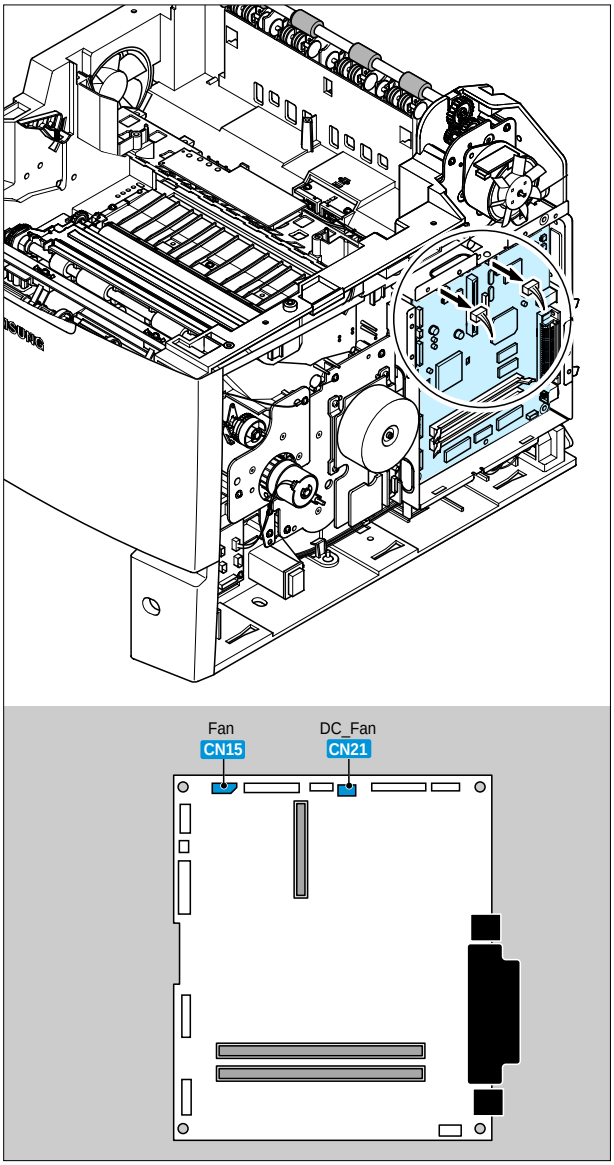
3. Remove two screws and take out the Cover-Left



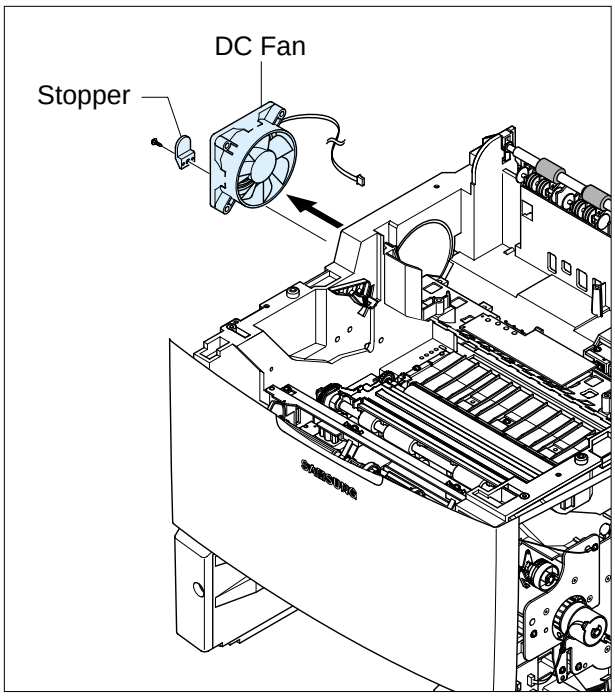
5.11 DC Fan

1. Before you remove the DC Fan, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)

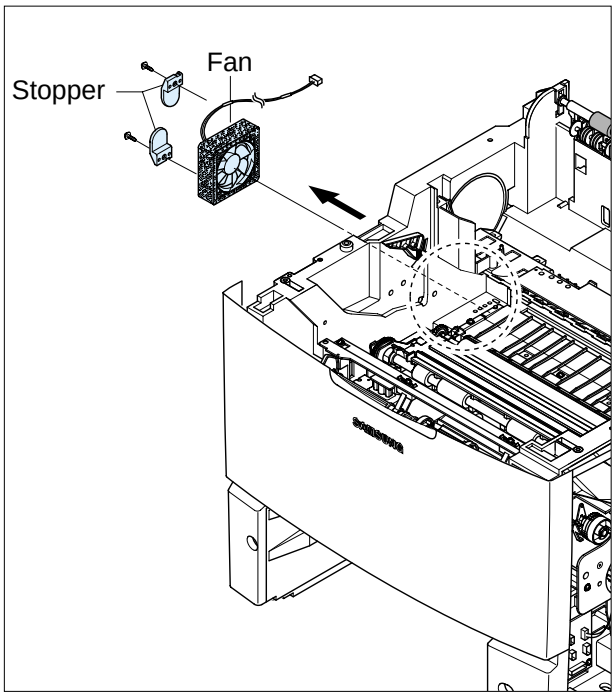
2. Unplug the two Connectors from the Connector PBA.



3. Remove one screw for taking out the Stopper, and then take out the DC Fan.

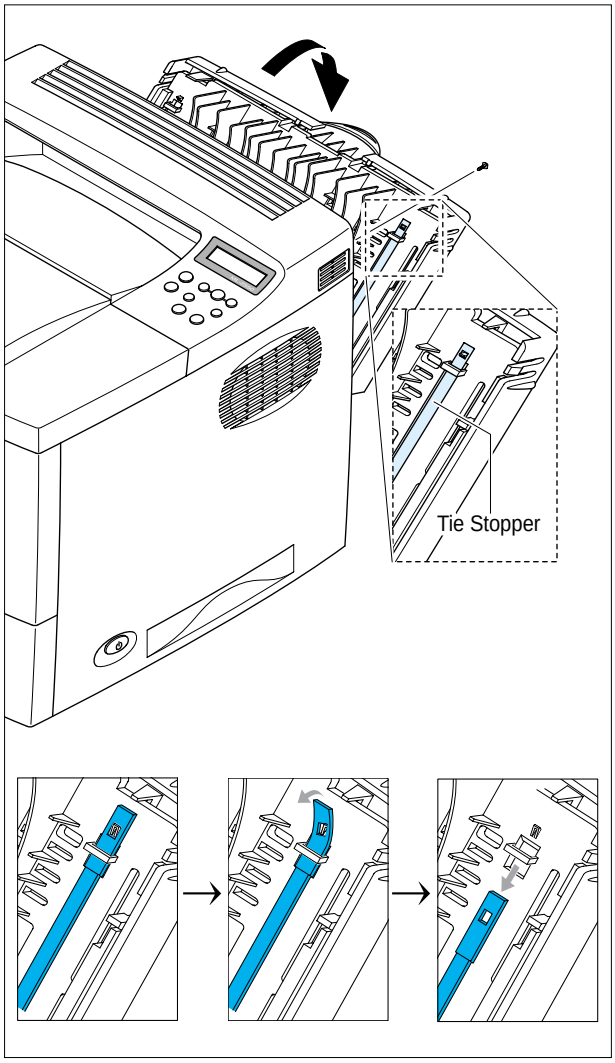


4. Remove two screw for taking out the Stoppers, and then take out the Fan.

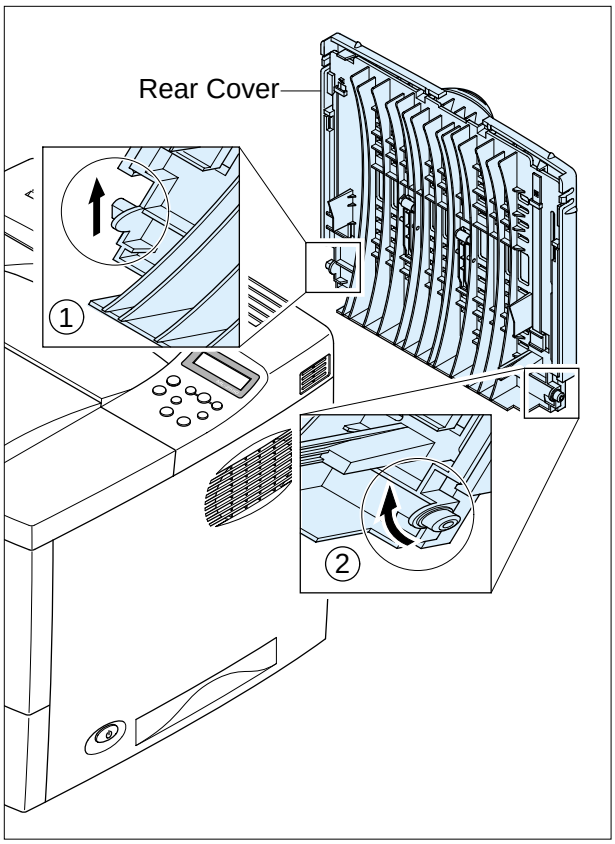


5.12 Rear Cover

1. Open the Rear Cover, and then take out the Stopper.



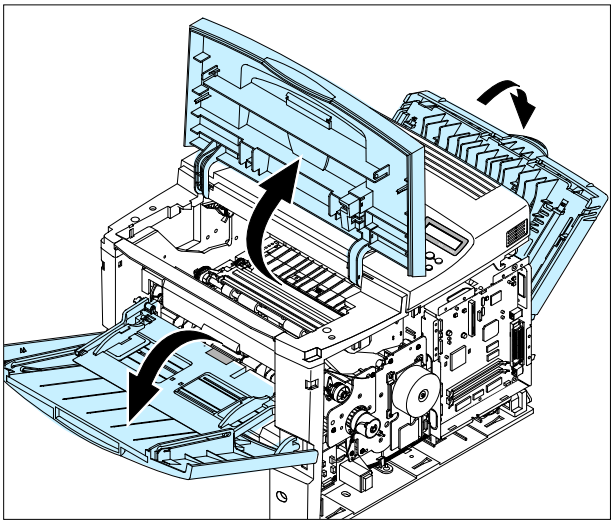
2. Remove the Rear Cover in the direction of arrow.



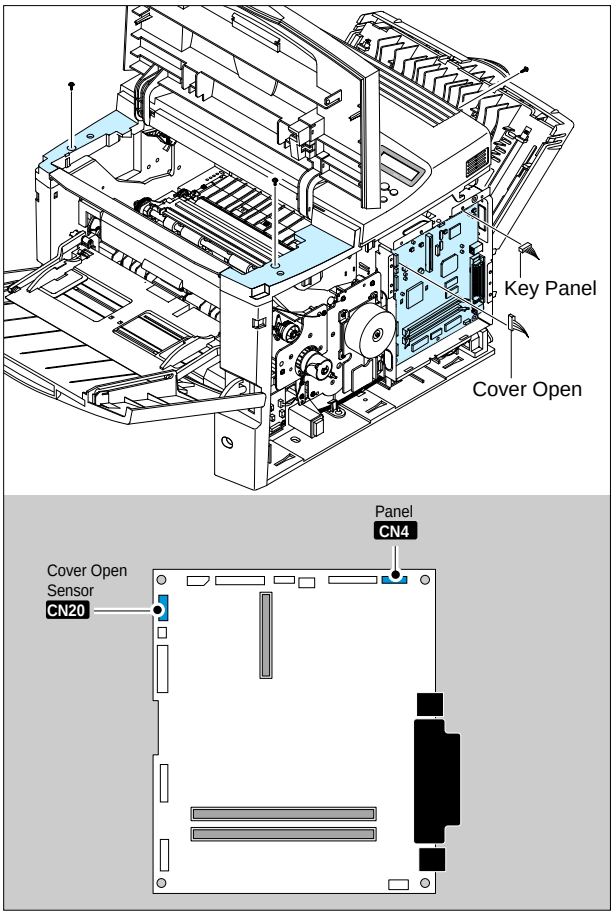
5.13 Top Cover

1. Before you remove the Top Cover, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)

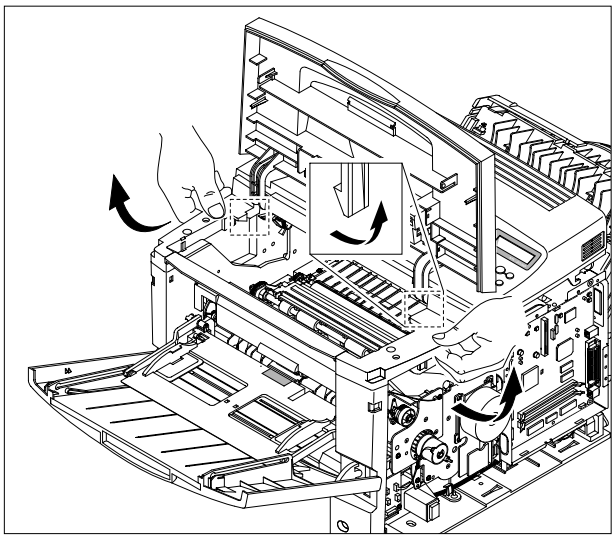
2. Open the MPF Ass'y, the Rear Cover, the Open Cover.



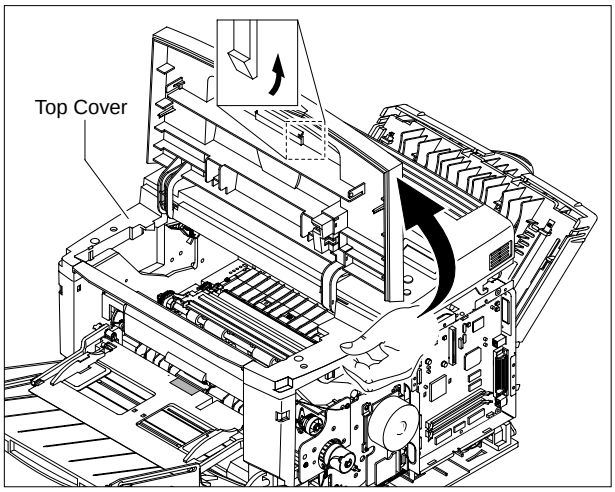
3. Unplug the two Connectors after you remove the three screws from the Main PBA.



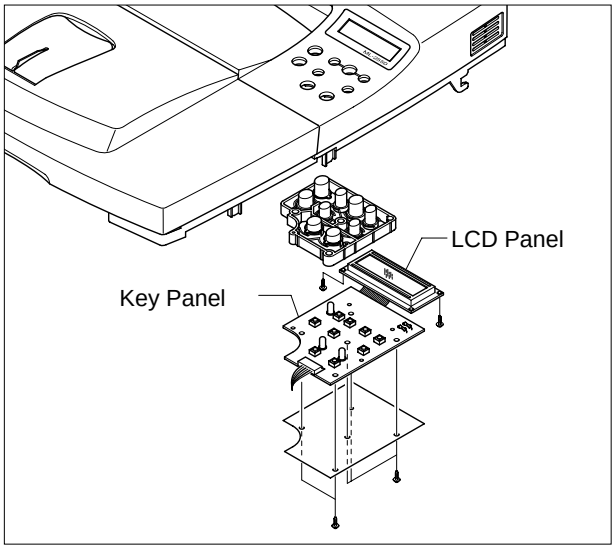
4. Unlatch both ends of the Top Cover.



5.Unlatch the hook and take out the Top Cover.



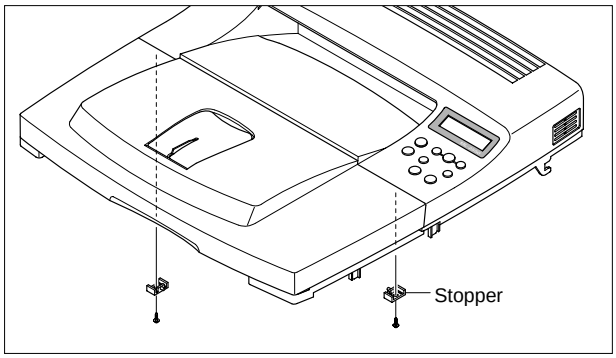
6. Remove 7 screws, and then take out the LCD Panel and the Key Panel.



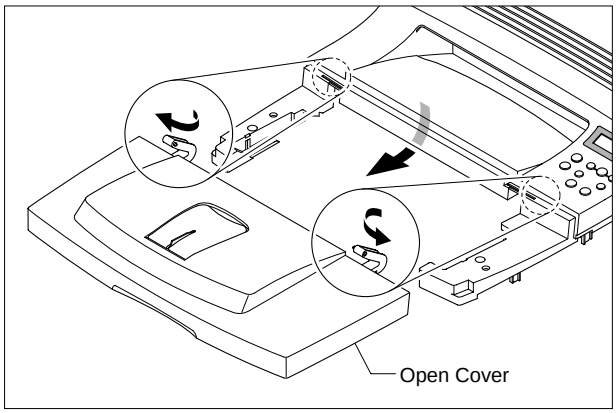
5.14 Open Cover

1. Before you remove the Open Cover, you should remove:
   - Top Cover (Refer to the 5.13)

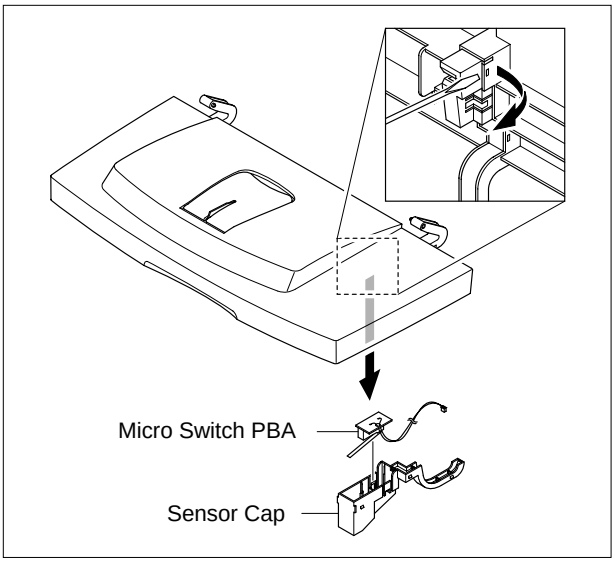
2. Remove two screws and take out the Stopper.



3. Take out the Open Cover as shown below.



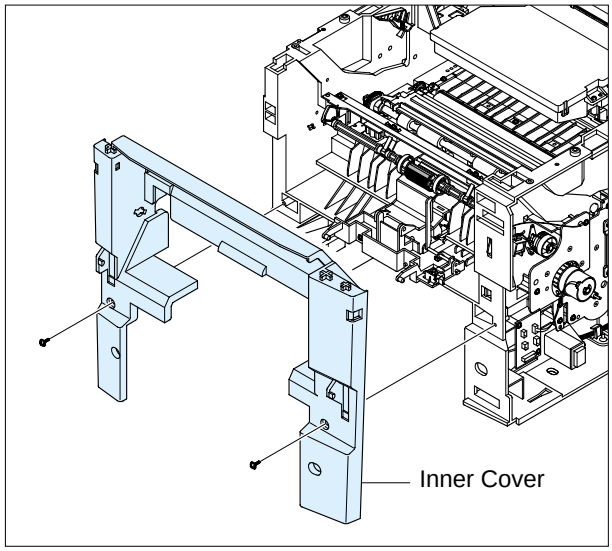
4. Release the lock as shown below and lift up the Sensor Cap.



5.15 Inner Cover

1. Before you remove the Inner Cover, you should remove:
   - MPF Ass'y (Refer to the 5.3)
   - Top Cover (Refer to the 5.13)

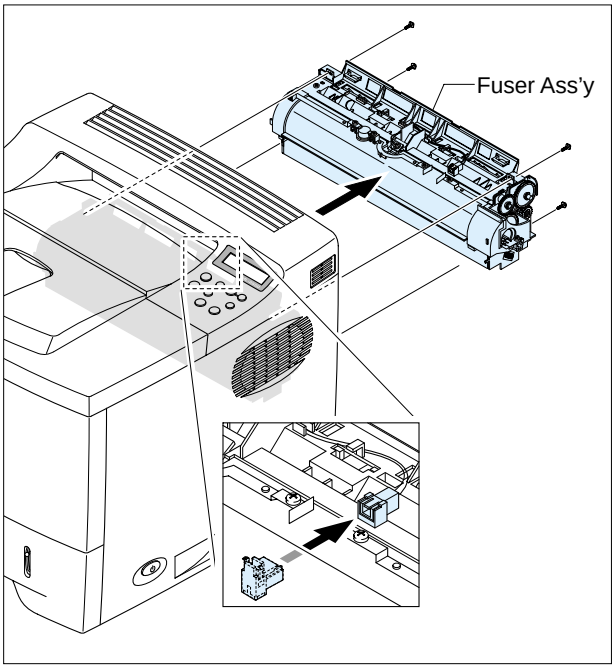
2. Remove two screws and take out the Inner Cover.



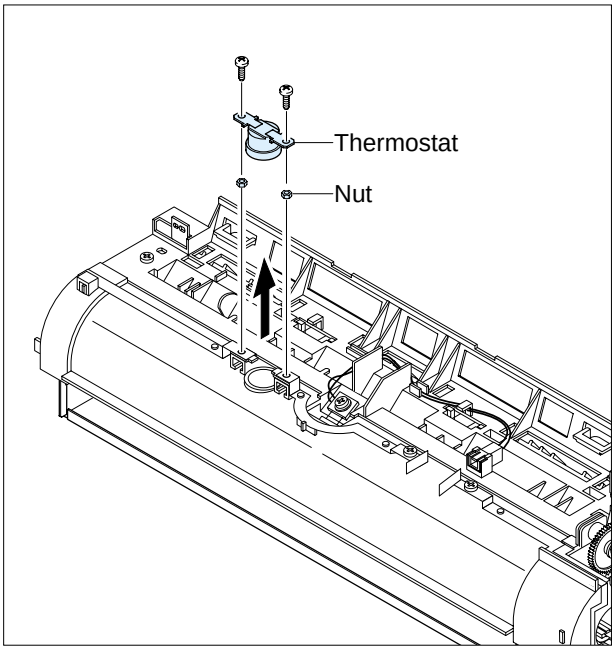
5.16 Fuser Ass'y

1. Before you remove the Fuser Ass'y, you should remove:
   - Rear Cover (Refer to the 5.12)

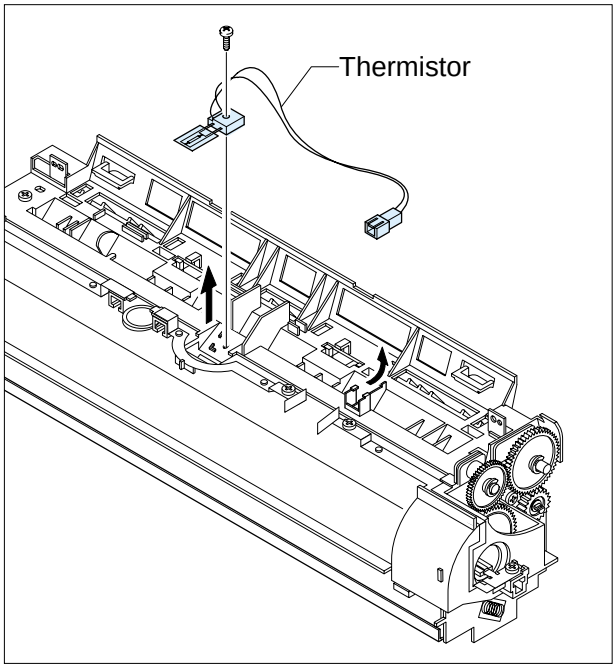
2. Remove four screws and take out the Fuser Ass'y.



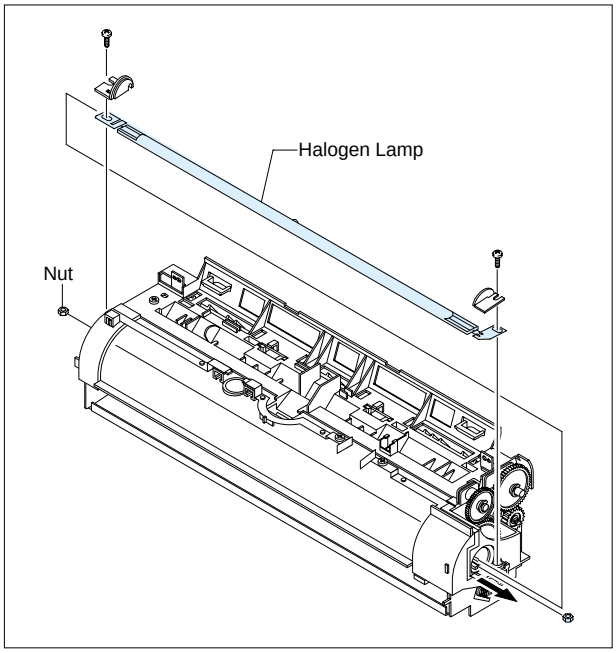
3. Remove two screws and take the Thermostat out of the Fuser Ass'y.



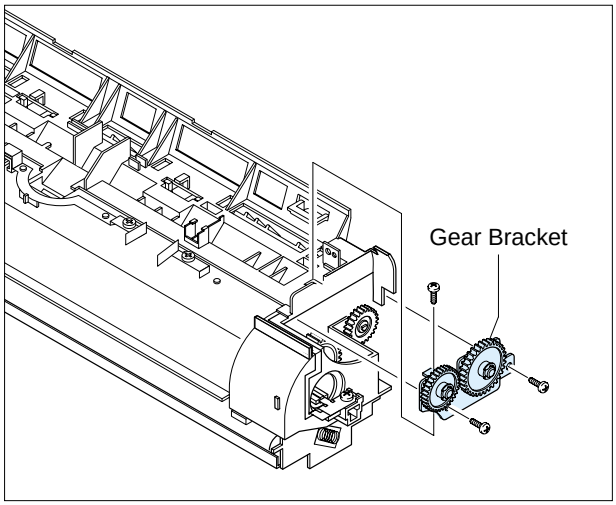
4. Remove one screw, and then take out the Thermistor from the Fuser Ass'y.



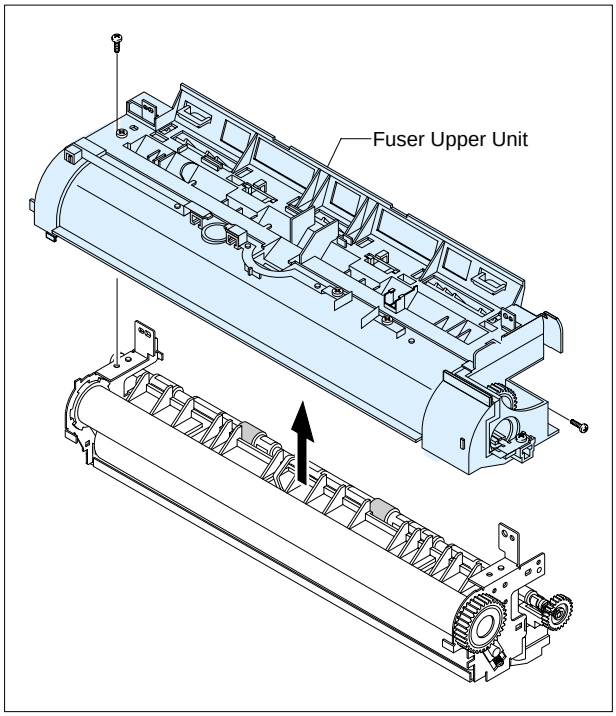
5. Remove two screws and take the Halogen Lamp out of the Heat Roller.



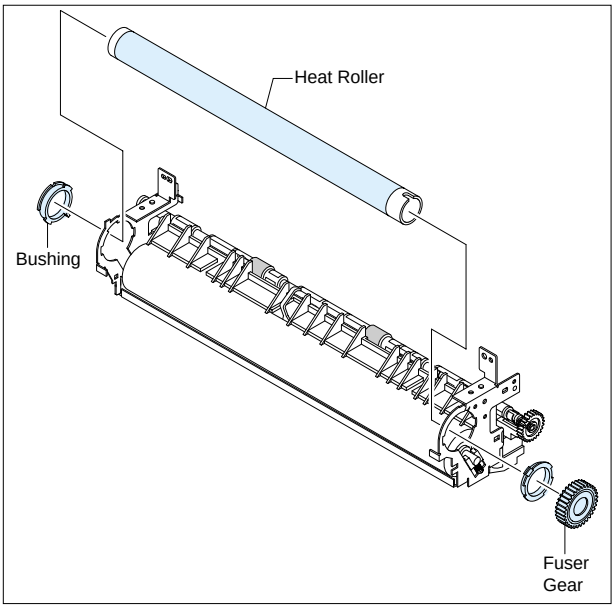
6. Remove three screws and take out the Gear bracket.



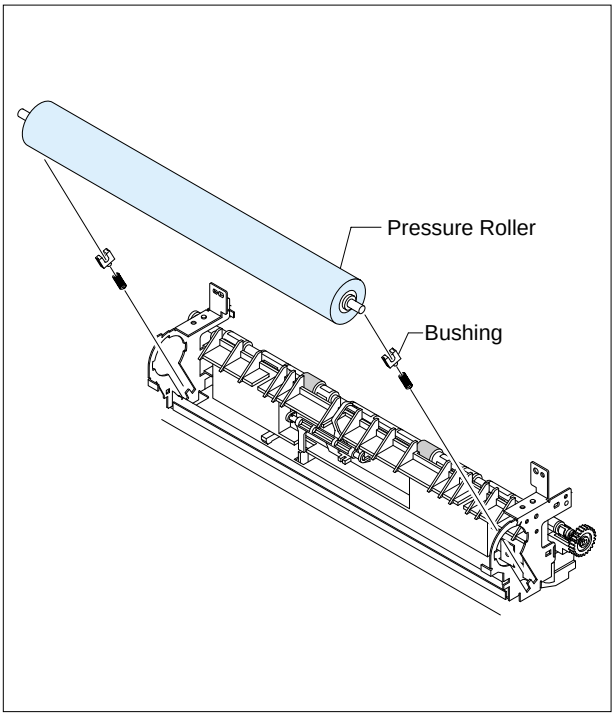
7. Remove two screws and divide the Fuser into two parts.



8. Take out the Heat Roller as shown below.



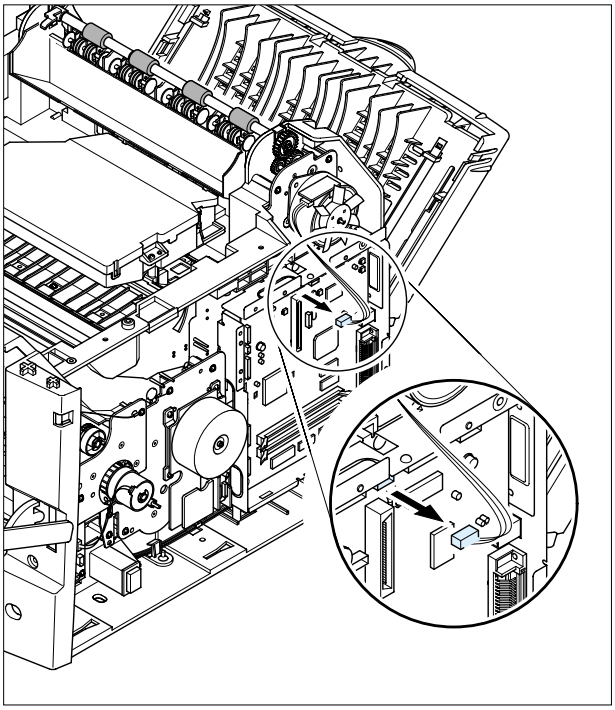
9. Take out the Pressure Roller as shown below.



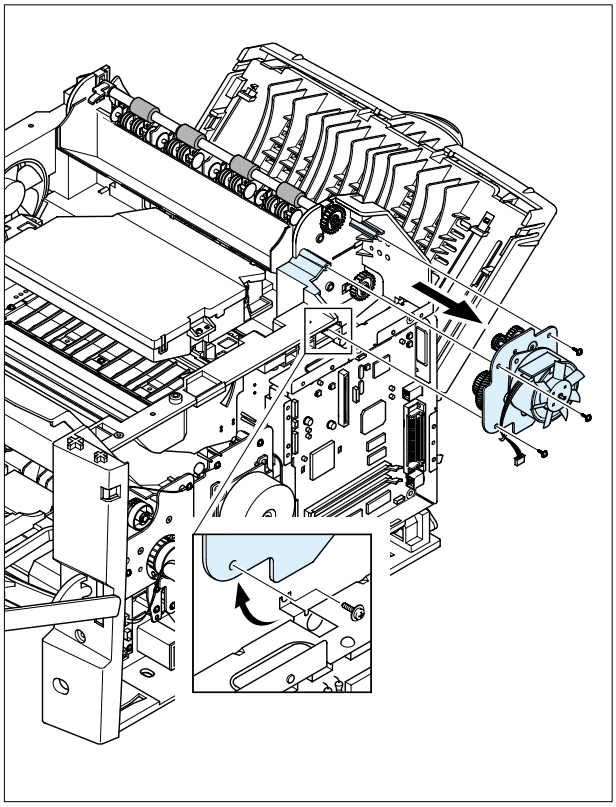
5.17 Exit Drive

1. Before you remove the Exit Driver, you should remove:
   - Top Cover (Refer to the 5.13)

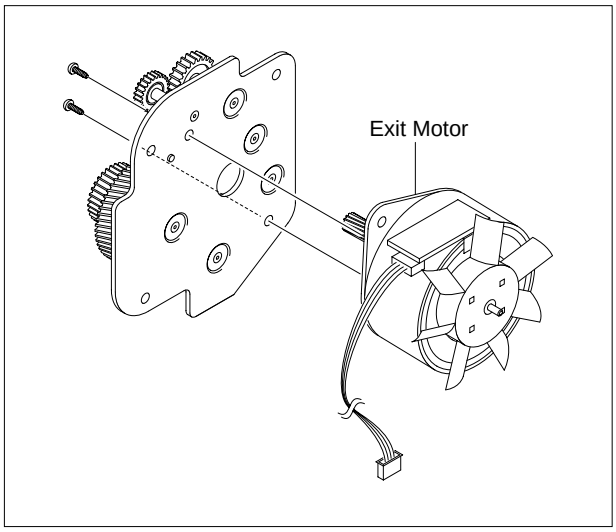
2. Unplug the Exit Driver Harness from the Main PBA.



3. Remove three screws and take out the Exit Driver Ass'y.



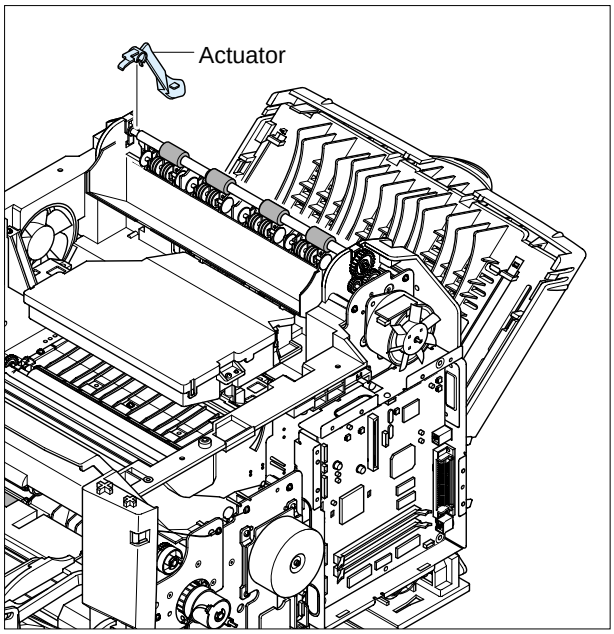
4.Remove two screws and take out the Exit Motor.



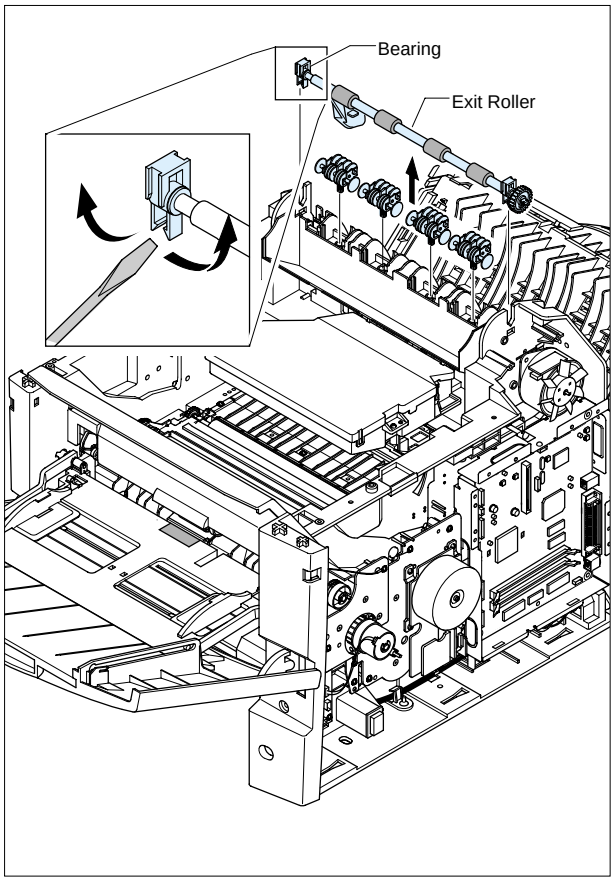
5.18 Exit Roller

1. Before you remove the Exit Roller, you should remove:
   - Top Cover (Refer to the 5.13)

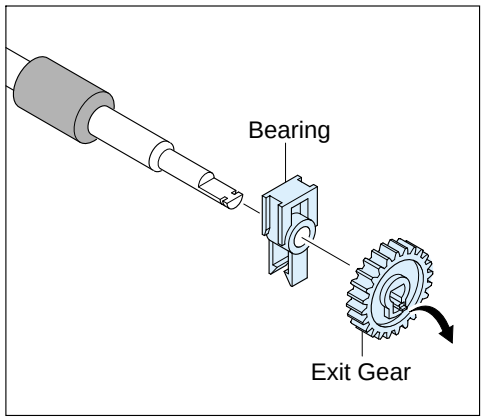
2. Take the Actuator out.



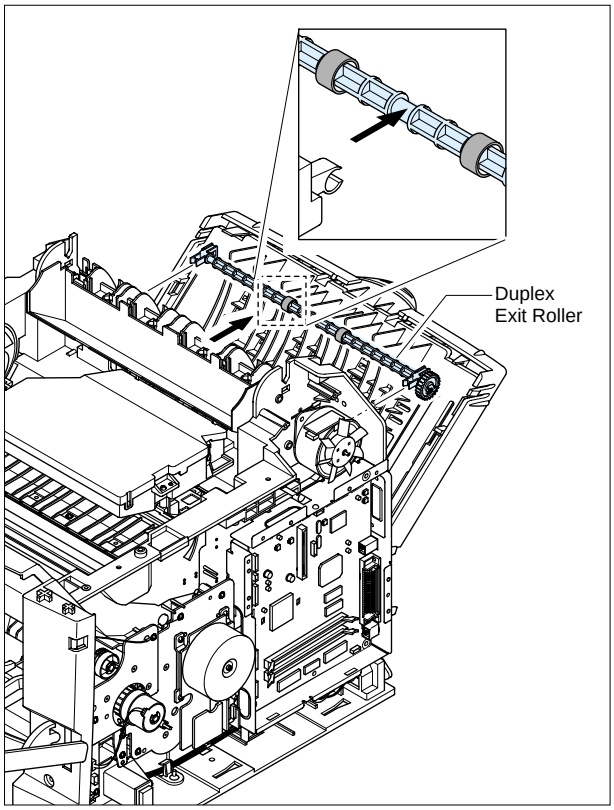
3. Remove the Exit Roller and Bearing as shown below.



4 Take out the Exit Gear as shown below.



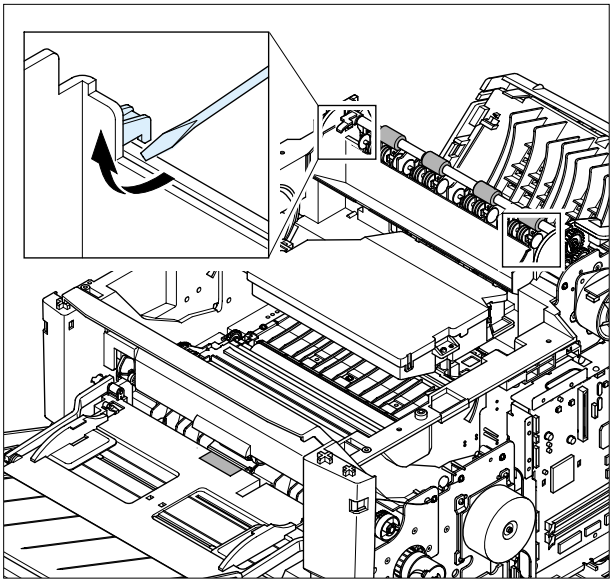
5. Take out the Duplex Exit Roller as same method.



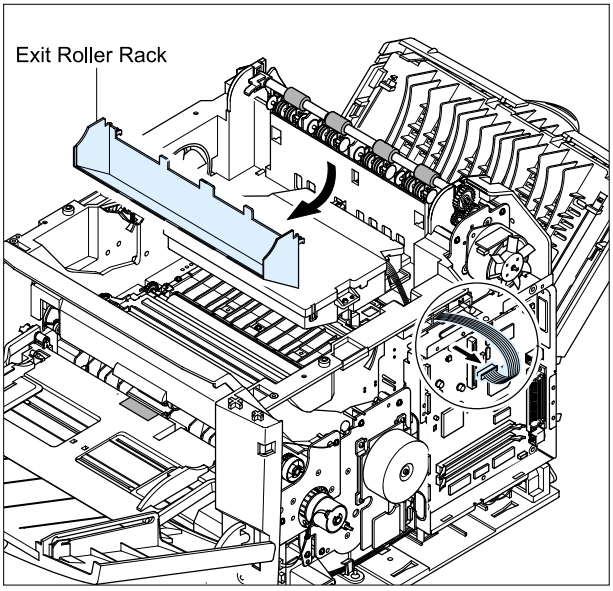
5.19 LSU

1. Before you remove the LSU, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)
   - Top Cover (Refer to the 5.5)

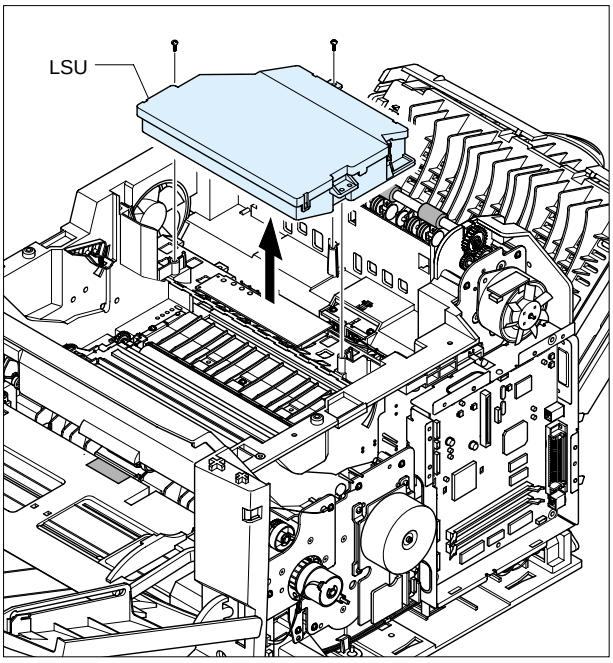
2. Release the lock as shown below.



3. Remove the Exit Roller Rack in the direction of arrow.



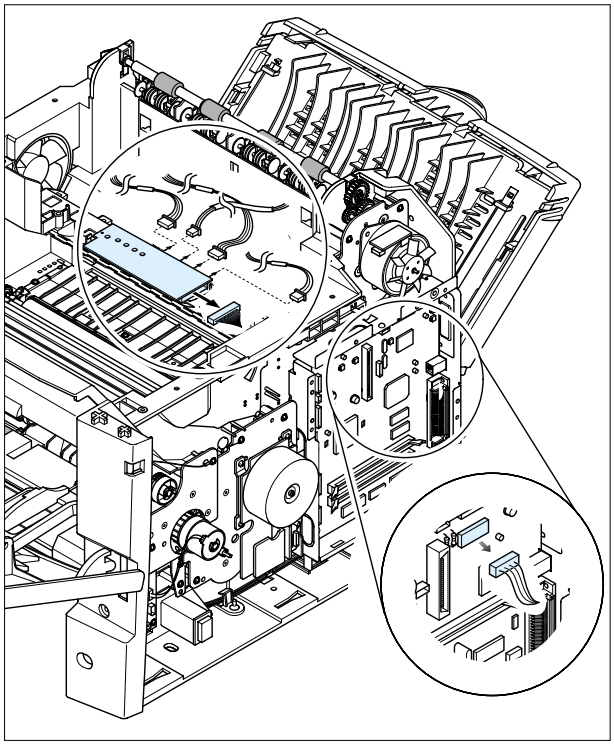
4. Remove three screws and take out the LSU.



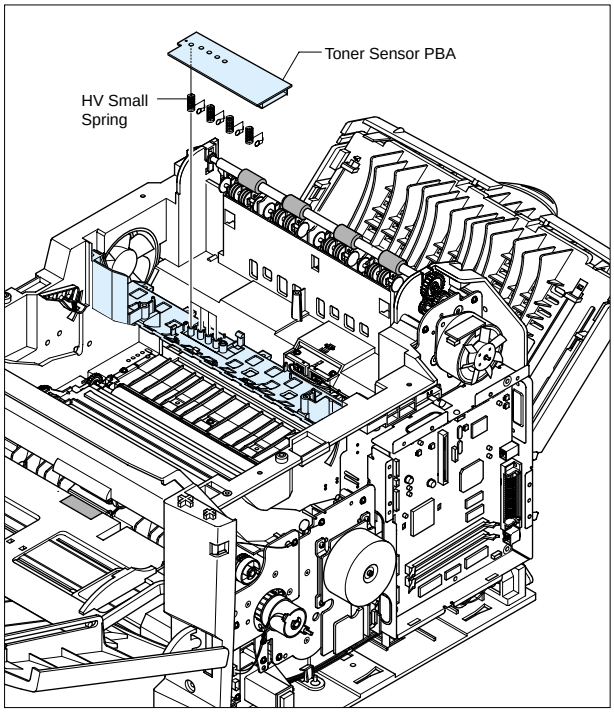
5.20 Toner Sensor Board

1. Before you remove the Toner Sensor Board, you should remove:
   - Top Cover (Refer to the 5.13)
   - LSU (Refer to the 5.19)

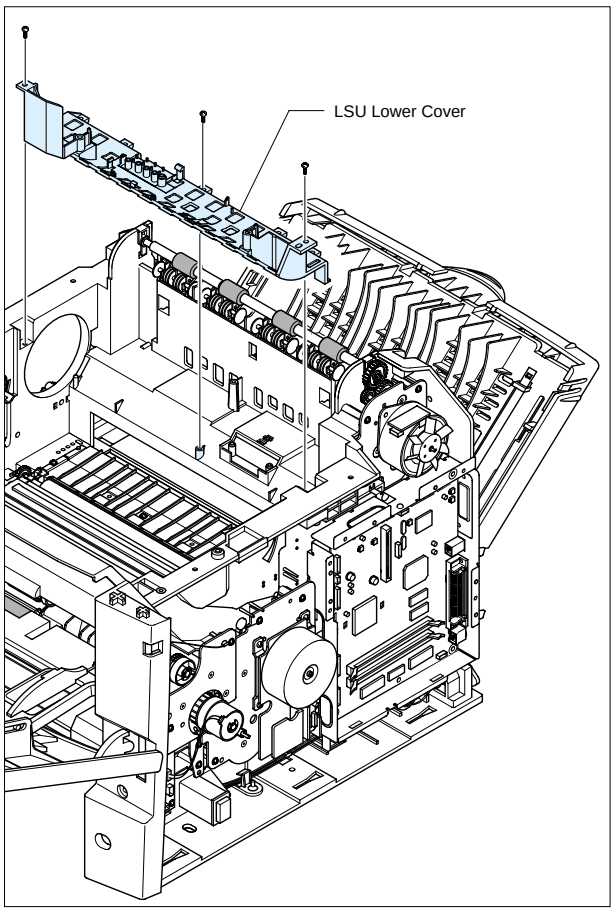
2. Unplug 5 Harness from the Toner Sensor PBA.



3. Take out the Toner Sensor PBA.



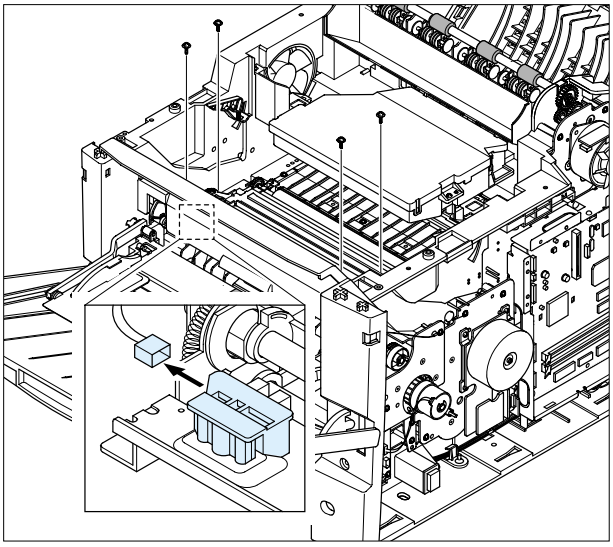
4. Remove 3 screws and take out the LSU Lower Cover.



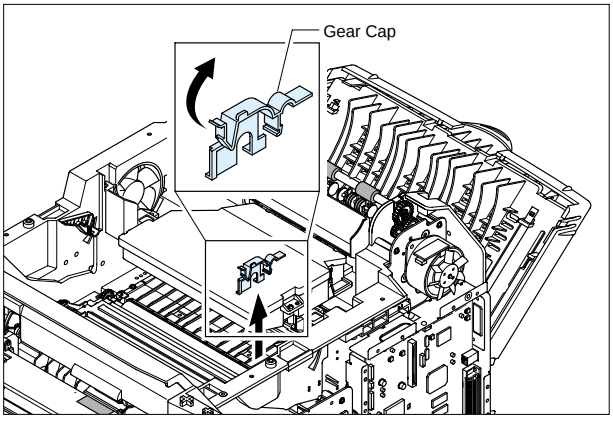
5.21 REGI Ass'y

1. Before you remove the REGI Ass'y, you should remove:
   - Top Cover (Refer to the 5.13)

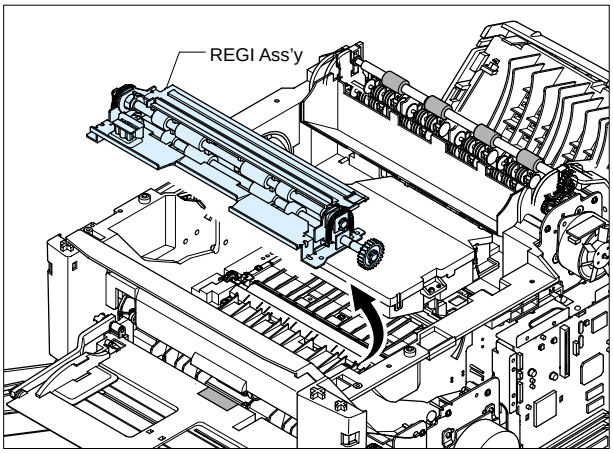
2. Unplug the Harness, Remove 4 screws.



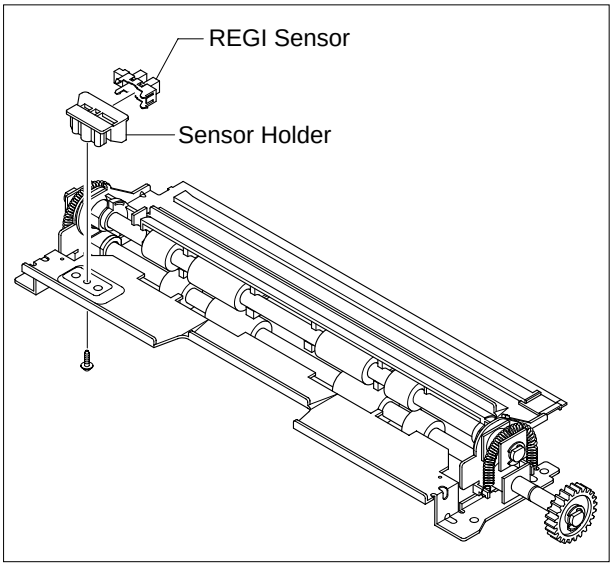
3. Release the lock as shown below and lift up the Gear Cap.



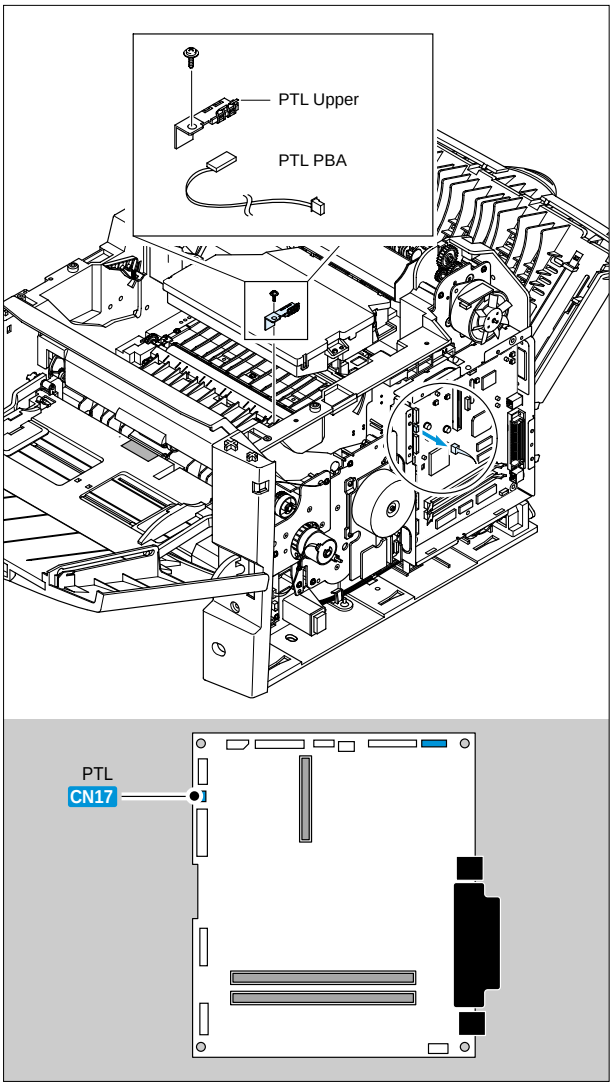
4. Take out the Regi. Ass'y as shown below.



5. Remove one screw and take out the Regi. Sensor.



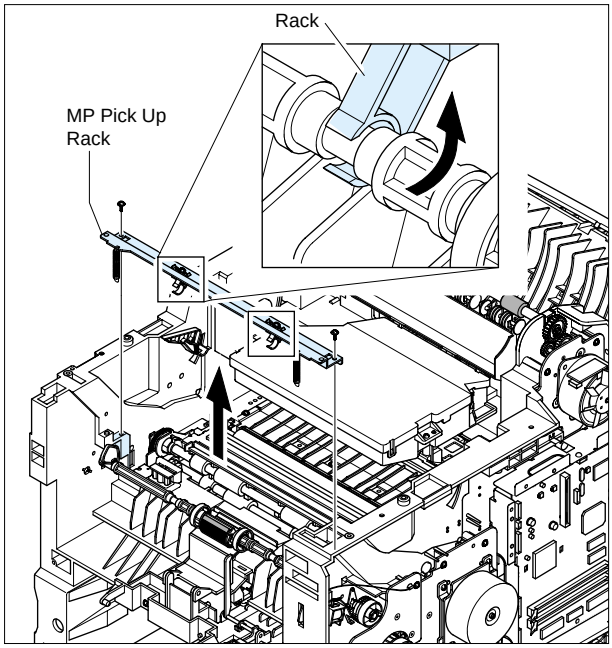
6. Unplug the Harness, remove one screw and take out the PTL PBA.



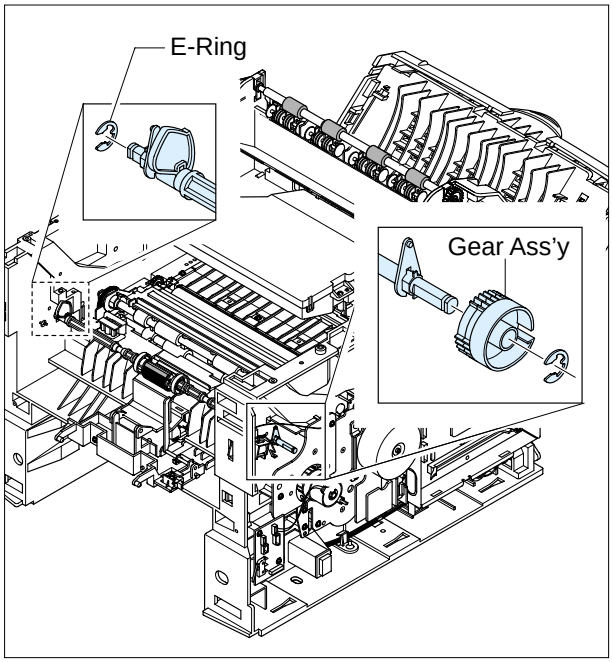
5.22 MP Pick-up Ass'y

1. Before you remove the MP Pick-up Ass'y, you should remove:
   - MPF Ass'y (Refer to the 5.3)
   - Main Drive Ass'y (Refer to the 5.7)
   - Top Cover (Refer to the 5.13)
   - Inner Cover (Refer to the 5.15)

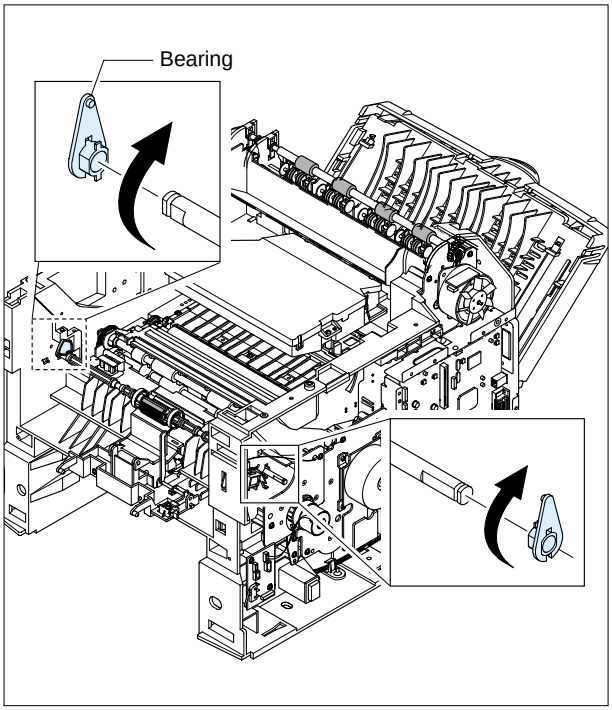
2. First of all remove two screws. Lift up the MP Pick-up Shaft for taking out the MP Pick-up Rack.



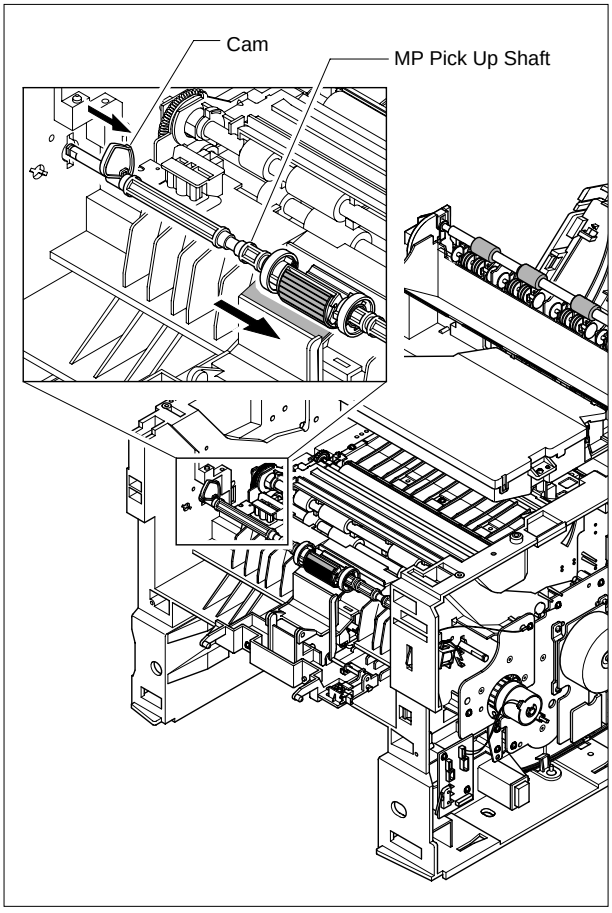
3. Remove the E-Rings on both ends of Gear Ass'y and remove Ass'y as shown below.



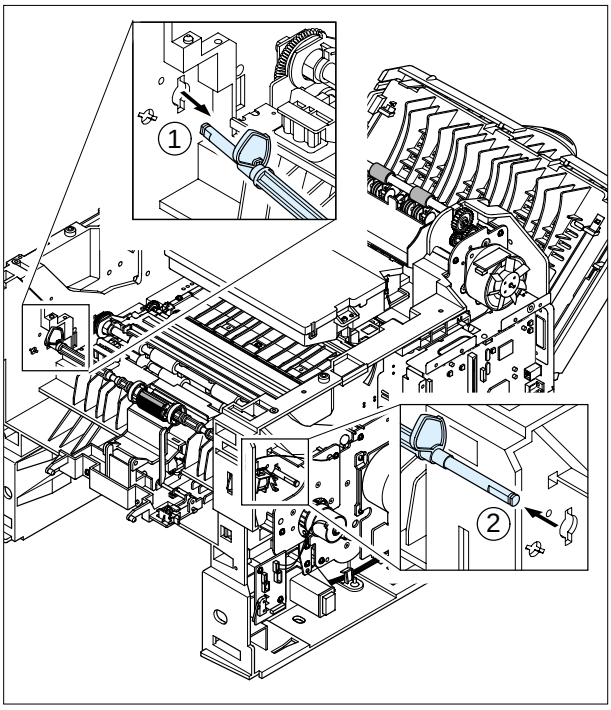
4. Pull and remove the lock equipment, then rotate the Bearing as shown below.



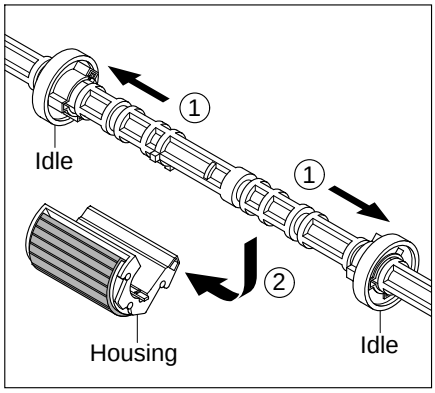
5. Slide the cam to the left by pulling on the MP Pick-up shaft



6. First lift the left side of the Shaft and then remove the Shaft.



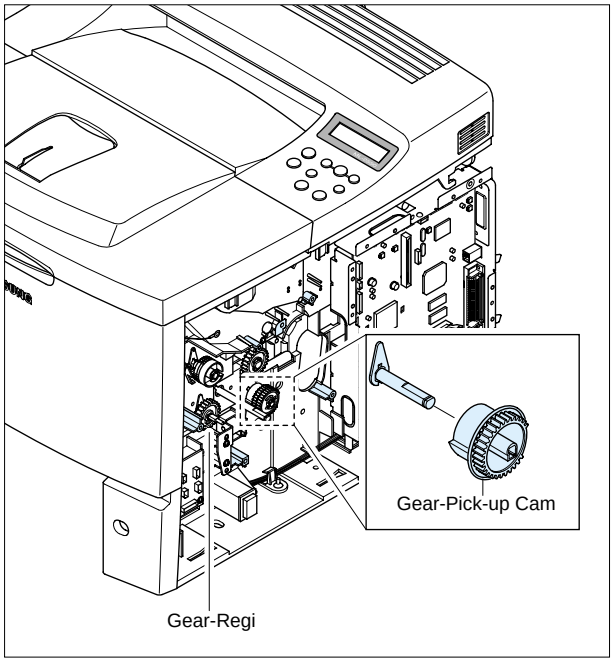
7. Push the idles toward the ends of shaft then take out the Housing as shown below.



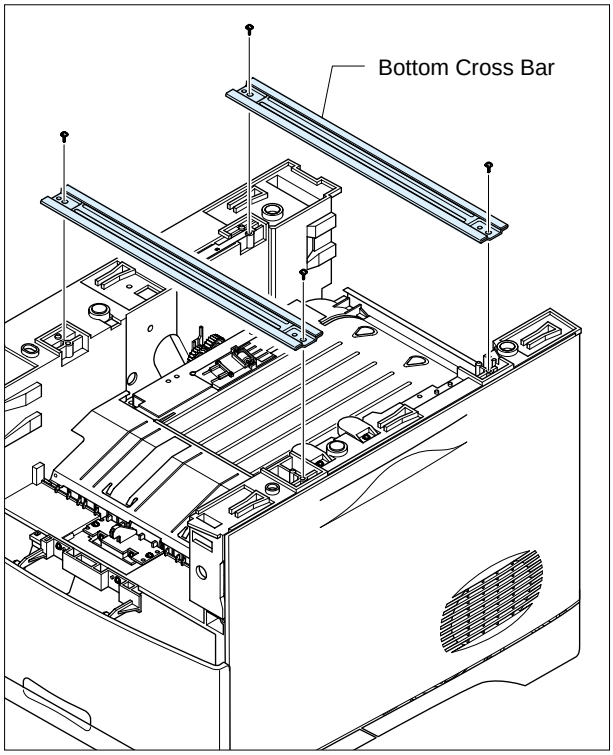
5.23 Pick-up Ass'y

1. Before you remove the Pick-up Unit, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Main Drive Ass'y (Refer to the 5.7)

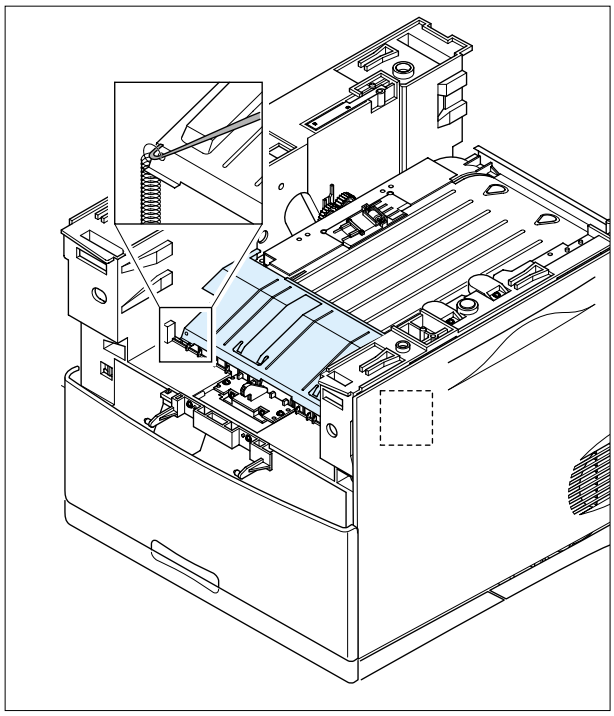
2. Remove E-Ring and take The Gear-Pick-up Cam out. Take the Gear-Regi out.



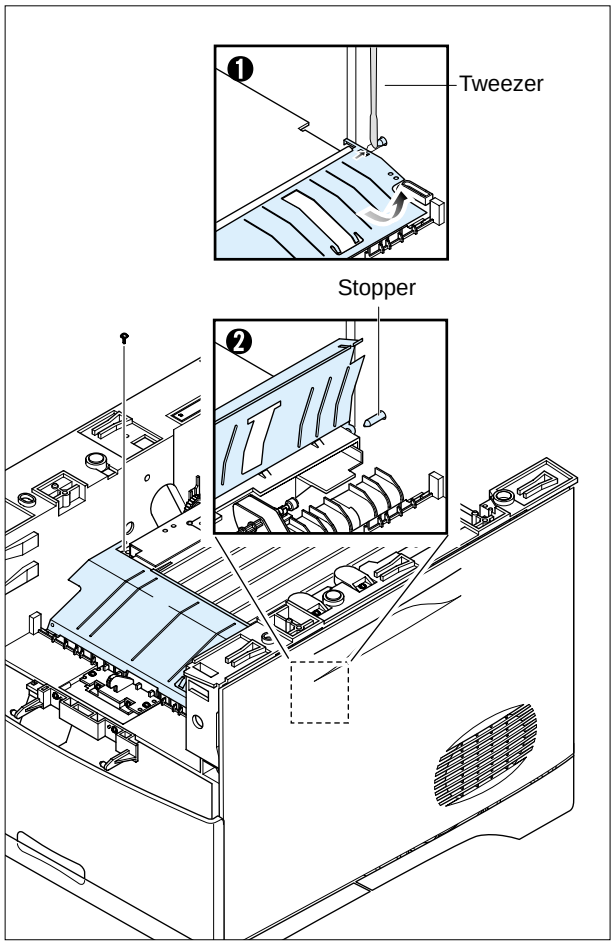
3. Remove four screws. Then lift the Bottom Cross Bar, as shown below.



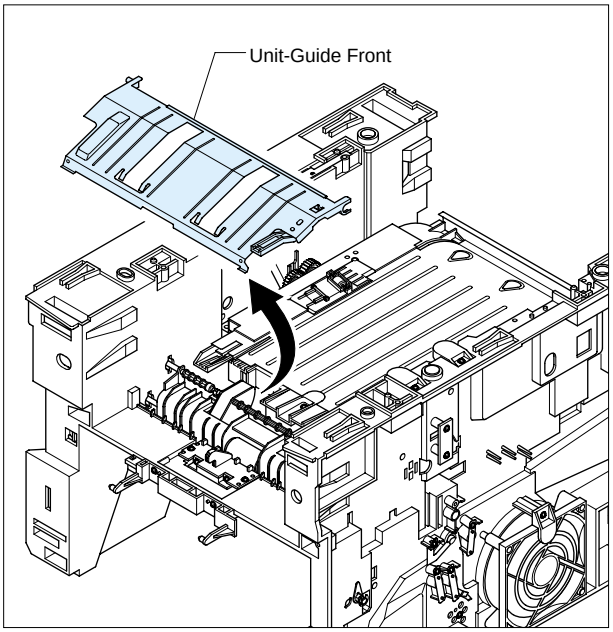
4. Remove two springs from the Pick-up Ass'y.



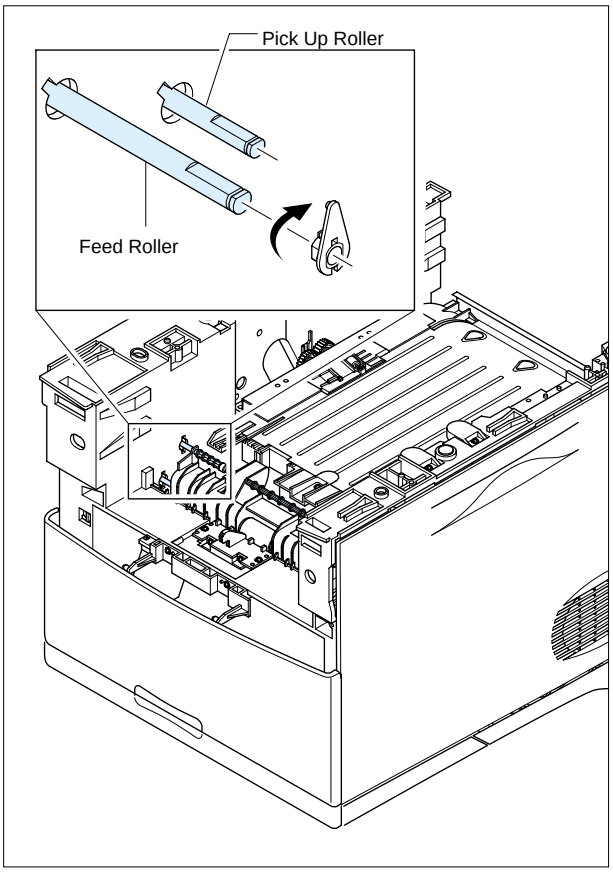
5. Lift Guide-Front-Dup out in the direction of arrow as shown below.



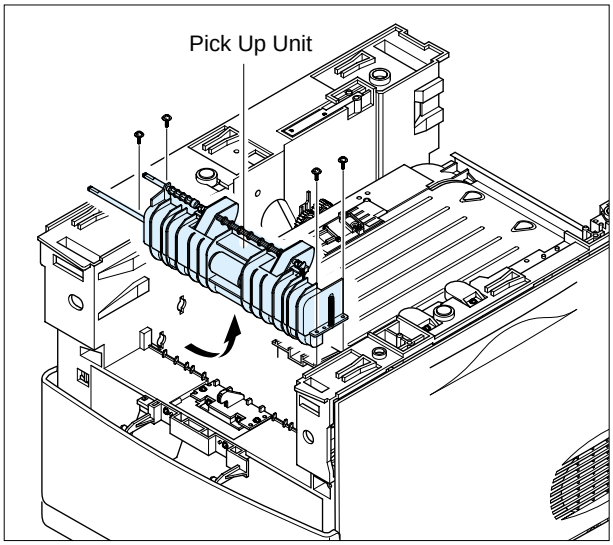
6. Lift Unit-Guide Front out in the direction of arrow as shown below.



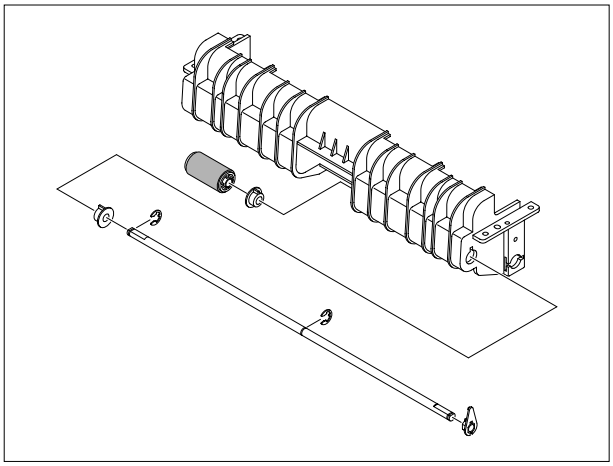
7. Remove the locking equipment rotate the Feed Roller Shaft's in the direction of the arrow and slide the bearing off as shown below.



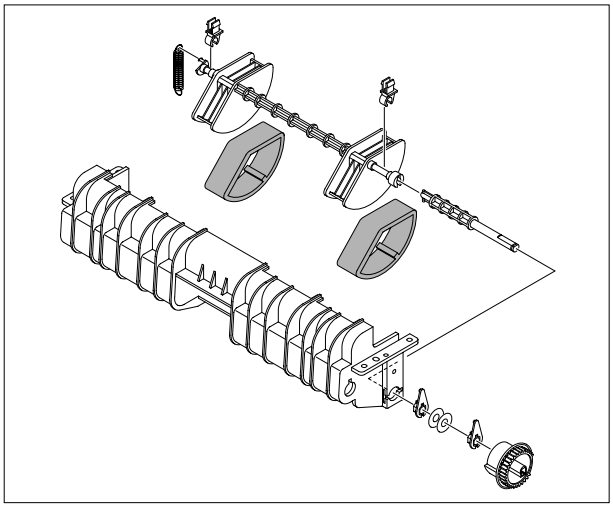
8. Remove four screws and lift the Pick-up Unit out in the direction of the arrow as shown below.



9. Remove the Feed Ass'y as shown below.



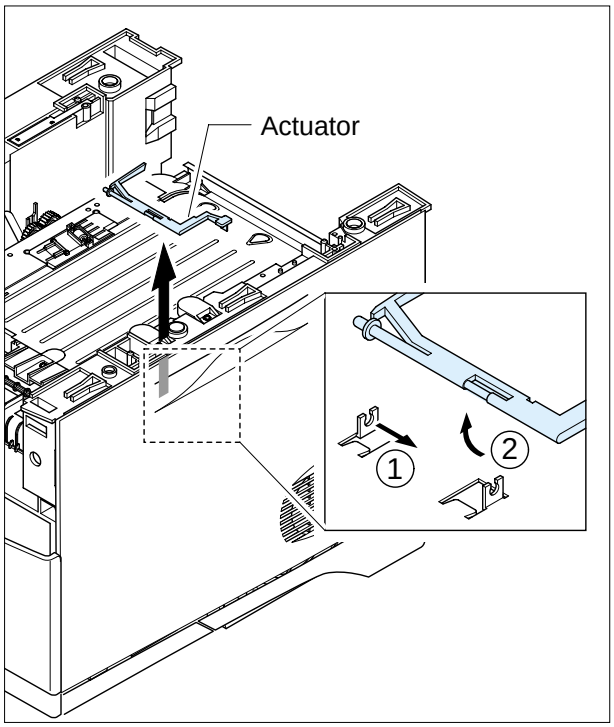
10. Remove the Pick-up Ass'y as shown below.



5.24 Engine Shield

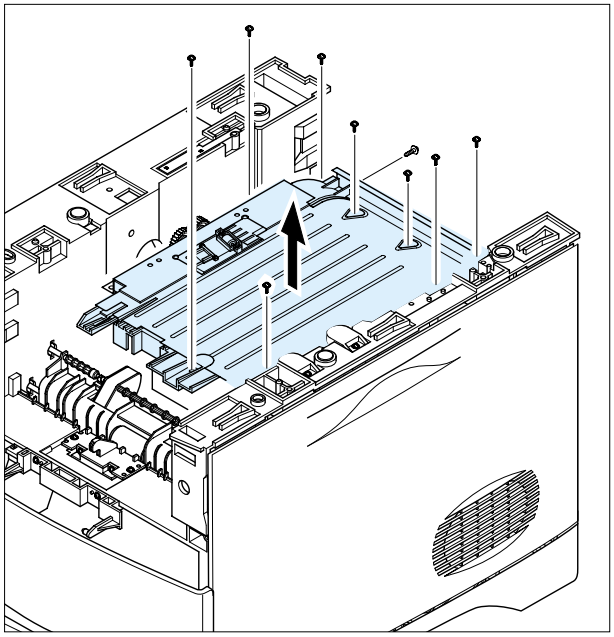
1. Remove the Guide-Front-Dup.(Refer to the 5.23.5)

2. Remove the Actuator as shown below.

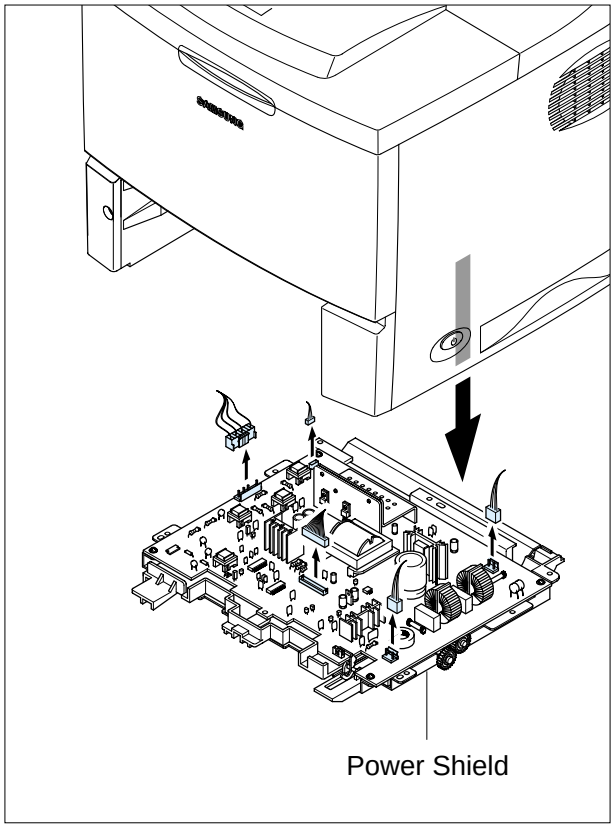


⚠ *Notice: Be careful not to get burnt when separating an Engine PBA.*

3. Remove nine screws and slightly lift the Engine Shield, as shown below.



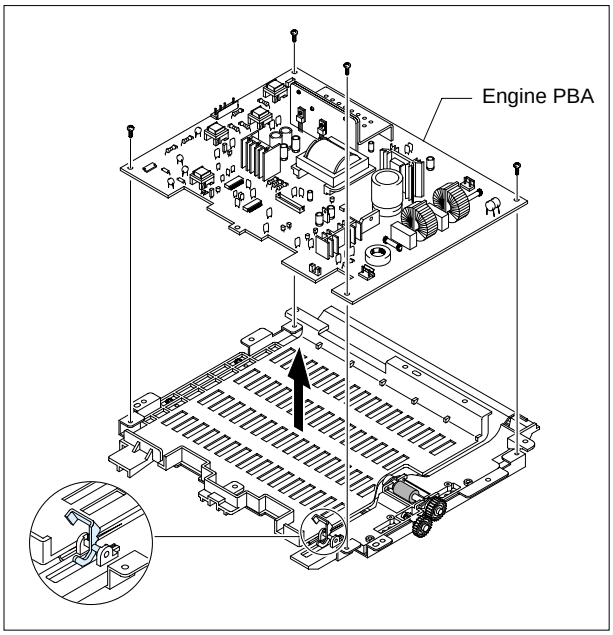
4. Unplug all of the connectors from the Engine PBA. Then take out the Engine Shield Ass'y.



5.25 Engine PBA

1. Before you remove the Engine Shield, you should remove:
   - Engine Shield (Refer to the 5.25)

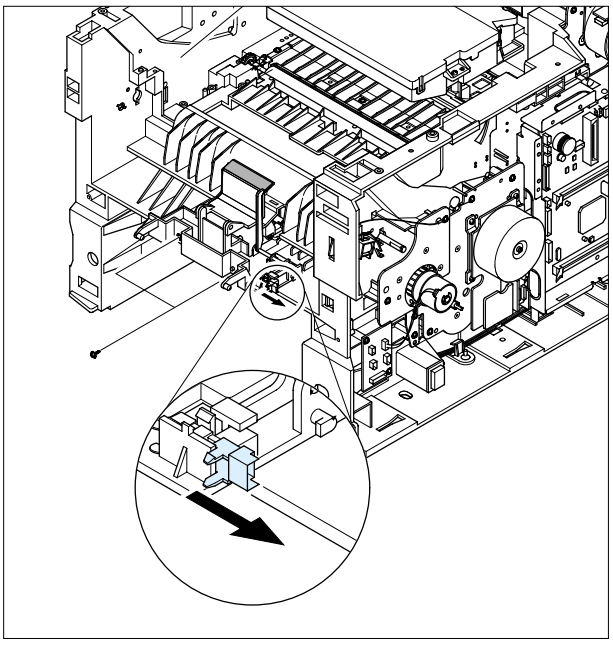
2. Remove four screws and take the Engine Board out of the Duplex Unit.



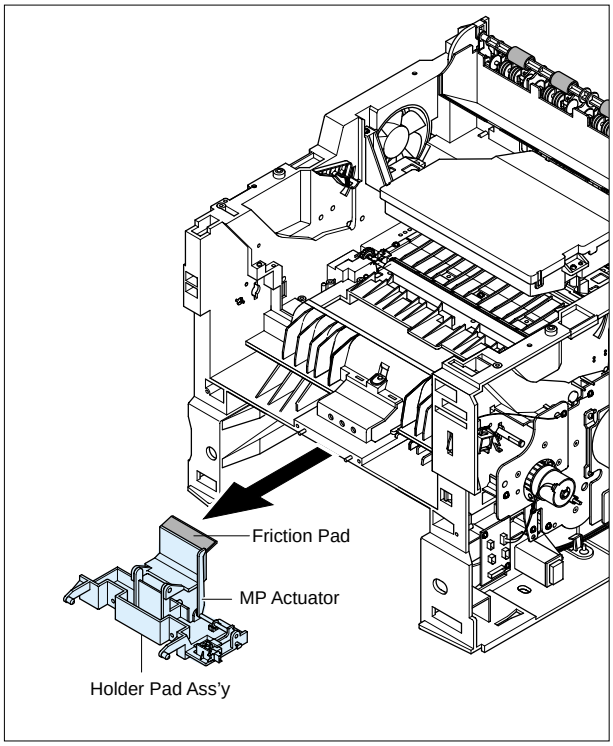
5.26 Holder Pad Ass'y

1. Before you remove the Holder Pad Ass'y, you should remove:
   - Unit-Guide Front(Refer to the 5.23.6)

2. Unplug the connector and remove the two screws, as shown below.



3. Remove the photo interrupter and the MP Actuator as shown below.



6. Alignment and Adjustments

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

6.1 How to use EDC (Engine Diagnostic Control) Mode

6.1.1 EDC Setup

- EDC(Engine Diagnostic Control, EDC will be used below) is considered to test and check whether each functions of machinery and h/w module are normal or not. All of the test function are able to be controlled by the keys and LCD window on the panel without any other kits.
- It's developed for related engineers, not for users.

6.1.2 Entering/Exiting Method For EDC

<1> Outline

- The method for entering "EDC" mode is especial because it is intended for technicians and not users
- After Entering the mode, the message, "**Engine EDC Mode**" is displayed.
- On the mode, an engineer should press the "Menu Key" to search each function he would like to test.
- Turn the power off, after the test is entirely end.

<2> Usage

1. Power off the printer.
2. Pressing the **"Select key"**, power the printer on.
3. Keep pressing it until the message, "**Engine EDC Mode**" is shown on the panel.
4. Follow the usage for a function you would like to use.
5. Turn the power off, after the test is complete.

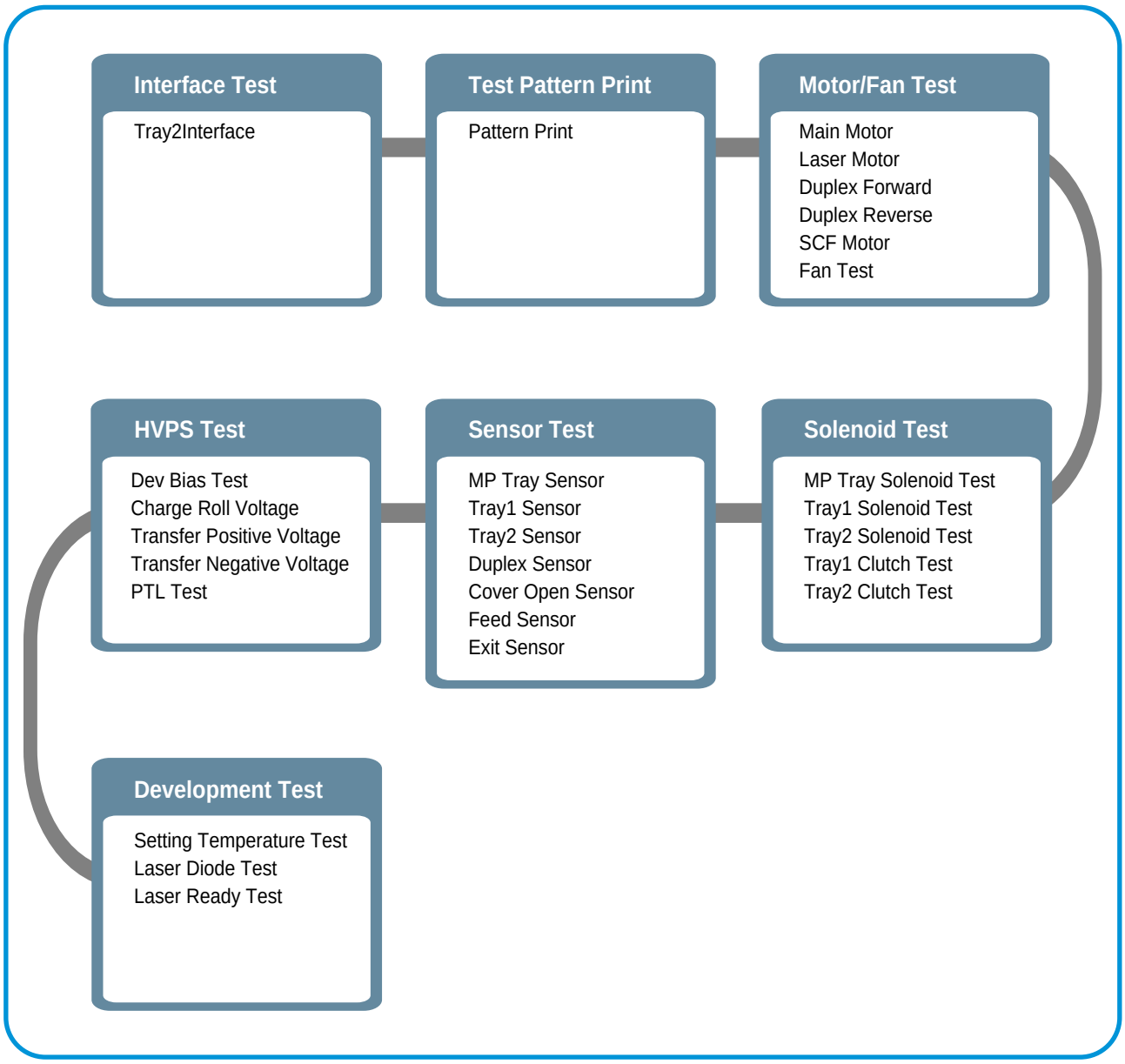
6.1.3 Usage & Function of Key on OPE

Key	Function	Description	Remarks
Menu	Menu	To enter the main Menu	
Arrow (right)	Search a Menu/ Input Data	To search a Menu and input a data	
Arrow (left)	Search a Menu/ Input Data	To search a Menu and input a data	
Select	Execute / Select	To execute a function	
Cancel	Stop / Cancel	To stop a function	
Upper Level	Move	To move to the upper level	

6.1.4 Usage & Function of LCD

Line	Characters	Description	Remarks
Top	16	Make engineers recognizing a test location. [Main Menu] or [Function] is displayed.	
Bottom	16	Make engineers recognizing a menu or function to be tested A menu or function name displayed	

6.1.2 How to use EDC (Engine Diagnostic Control) Mode



6.1.2.1 Interface Test (Main controller and Tray3 controller)

- This Function is used to check the communication state between the main controller and the tray 3 controller.

1. Press the "Menu Key", until finding "Interface Test" message on the panel.
2. Press the "Select Key", when it's found.

Sub Menu	Description	Display (LCD)
Tray2 Interface	After it is on the test, confirm a message on the panel. The I/F is normal for the message, "PASS" and abnormal for the message, "FAIL" on the bottom line.	Tray 2 I/F : PASS(FAIL)

6.1.2.2 Test Pattern and Paper path

- These Functions are considered to check the total print process state.
- On the EDC mode, a Test pattern is able to be printed. While the printing job is processing, the location of the paper is continuously displayed.

1. Press the “Menu Key” until finding “Test Pattern Print” message on the panel.
2. Press the “Select Key”, when it’s found.
3. Confirm the message “Choose a tray: 1”(default: 1).
4. Press the “Arrow keys” (< / >) to select a tray you would like to choose.
5. Fill a Tray(1, 2, 3) with papers.
5. Press the “Select Key”, if you would like to print it.

Sub Menu	Description	Display (LCD)	Remark
Test Pattern Print	The test pattern is printed after the execution key is chosen and “More?” is displayed. Press the “Select Key” for printing more, the “Cancel Key” for stopping.	Pattern Print (Location)	Example -> Pattern Print : Exit On

Location order: Pick up a Feed On → Exit On → Feed Off → Exit Off → End
(It is possible that Feed Off → Exit On, when a paper size is small)

6.1.2.3 Motor & Fan Test

- These Functions are used to check the present state (normal or not) of the motors and fan.

1. Press the "Menu Key", until finding "Motor/Fan Test" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding the desired function
   (Refer to the table below).
4. Press the "Select Key", when it's found.
5. Press the "Select Key" for execution or the "Cancel key" to stop.

Sub Menu		Description	Remarks
Main Motor		The main motor keeps running after the execution key is chosen and stops when the stop key is chosen.	Main Motor On(Off)
Laser Motor		The laser motor keeps running after the execution key is chosen and stops when the stop key is chosen.	Laser Motor On(Off)
Duplex Motor	Duplex Forward	The duplex motor keeps running on the forward direction after the execution key is chosen and stops when the stop key is chosen.	Duplex Forward On(Off)
	Duplex Reverse	The duplex motor keeps running on the backward direction after the execution key is chosen and stops when stop key is chosen.	Duplex Backward On(Off)
SCF Motor		The Tray3 motor keeps running after the execution key is chosen and stops when the stop key is chosen. --> When a tray 3 is not installed, this function is not processed and "Tray 3 Not Installed" is shown.	SCF Motor On(Off)
FAN		The fan keeps running after the execution key is chosen and stops when the stop key is chosen.	Fan On(Off)

6.1.2.4 Solenoid & Clutch Test

- These Functions are used to check the present state (normal or not) of the solenoids and clutches.

1. Press the "Menu Key", until finding "Solenoid Test" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding the desired function.
   (Refer to the table below)
4. Press the "Cancel Key", when it's found.
5. Press the "Select Key" for execution

Sub Menu	Description	Remarks
MP Tray Solenoid Test	The tray1 solenoid is on for 150ms and then it automatically stops, when the execution is chosen.	MP Tray Solenoid On/Off
Tray1 Solenoid Test	The tray2 solenoid is on for 150ms and then it automatically stops, when the execution is chosen.	Tray 1 Solenoid On/Off
Tray2 Solenoid Test	The tray3 solenoid is on for 150ms and then it automatically stops, when the execution is chosen.	Tray 2 Solenoid On/Off
Tray1 Clutch Test	The tray2 clutch is on for 1sec and then it automatically stops, when the execution is chosen. On this function, the main motor runs before 2sec from the point of the clutch on in order to check the clutch state.	Tray 1 Clutch On/Off
Tray2 Clutch Test	The tray3 clutch is on for 1sec and then it automatically stops, when the execution is chosen. On this mode, the tray 3 motor runs before 2sec from the point of the clutch on in order to check the clutch state. --> When a tray 3 is not installed, this function is not processed and "Tray 3 Not Installed" is shown.	Tray 2 Clutch On/Of

6.1.2.5 Sensor Test

- These Functions are considered to check the present state (normal or not) of the Sensors.

1. Press the "Menu Key", until finding "Sensors Test" message on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding a suitable function.
4. Press the "Select Key", when it's found.
3. Touch a sensor you would like to test.
4. Confirm a message on the LCD window for the state of it.

Sub Menu	Description	Display(LCD)	
		Befor touching	After touching
MP Tray Sensor	After the tray 1 is gotten down, touch the sensor and confirm the message changed "Tray 1 Sensor Off" to "Tray 1 Sensor On"	MP Tray Sensor Off	MP Tray Sensor Oo
Tray1 Sensor	After the tray 2 is pulled out, touch the sensor and confirm the message changed "Tray 2 Sensor Off" to "Tray 2 Sensor On".	Tray 1 Sensor Off	Tray 1 Sensor On
Tray2 Sensor	After the tray 3 is pulled out, touch the sensor and confirm the message changed "Tray 3 Sensor Off" to "Tray 3 Sensor On".	Tray 2 Sensor Off	Tray 2 Sensor On
Duplex Sensor	After the back cover is open, push a paper into the duplex path and confirm the message changed "Duplex Sensor Off" to "Duplex Sensor On".	Duplex Sensor Off	Duplex Sensor On
Cover Open Sensor	After the cover is open, touch the sensor and confirm the message changed "Cover Open" to " Cover Close"	Cover Open	Cover Close
Feed Sensor	Touch the Feed sensor.	Feed Off	Feed On
Exit Sensor	Touch the Feed sensor.	Exit Off	Exit On

6.1.2.6 HVPS Test Item : High Voltage Power Supply

- These Functions are used to check whether the control for HVPS is normal or not.

1. Press the "Menu Key", until finding "Developing Test" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding a suitable function (Refer to the table below).
4. Press the "Select Key", when it's found.
5. Press the "Select Key" for execution or the "Cancel key" for stop.

Sub Menu	Description	Display (LCD)	Remarks
Dev Bias Test	Dev bias(- 470V) and Supply bias(- 650V) are supplied and after the execution key is chosen and it stops when the stop key is chosen.	Dev Bias On (Off)	
Charge Roll Voltage Test	Charge roll voltage (- 1500V) is supplied after the execution key is chosen and it stops when the stop key is chosen.	Charge: -1500V [Value]	ADC value displayed
Transfer (+) Test	Transfer positive voltage (+1000V) is supplied after the execution key is chosen and it stops when the stop key is chosen.	Transfer: +1000V [Value	ADC value displayed
Transfer (-) Test	Transfer negative voltage(- 600 ~ -1000 V) is supplied after the execution key is chosen and it stops when the stop key is chosen.	Transfer(-) On(Off)	Voltage in the range
PTL Test	PTL(Pre-Transfer Lamp) is on after the execution key is chosen and it stops when the stop key is chosen.	PTL On(Off)	

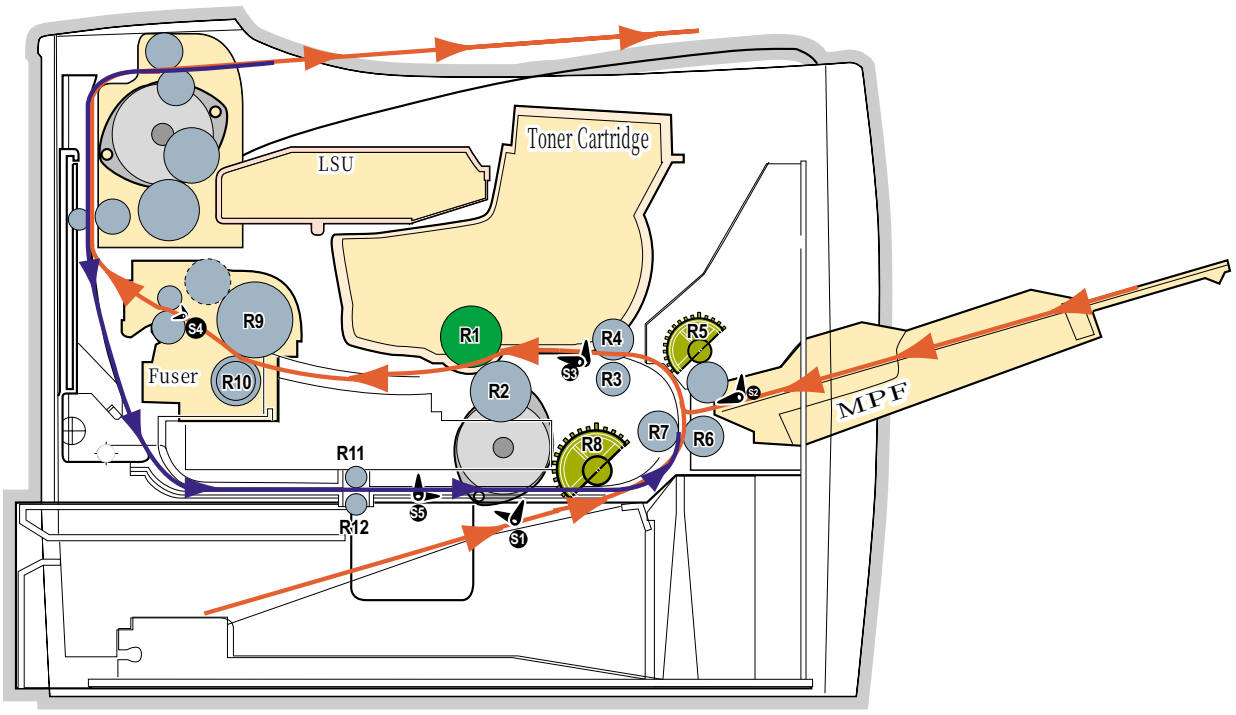
6.1.2.7 Developing Test Item : Fuser,Laser Scanning Unit

- These Functions are used to check whether functions related to the development are normal or not. (Fuser, OPC, LSU)

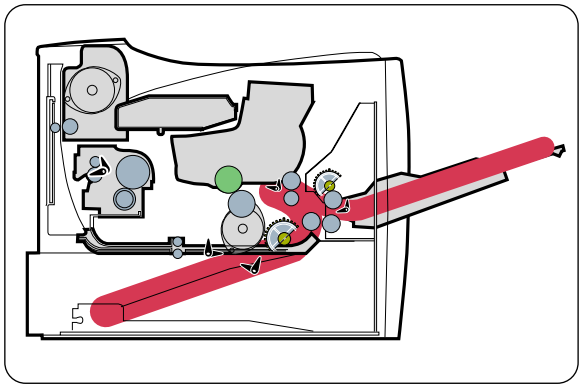
1. Press the "Menu Key", until finding "Developing Test" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "arrow keys" (< / >), until finding a suitable function (Refer to the table below).
4. Press the "Select Key", when it's found.
5. Press the "Select Key" for execution or the "Cancel key" for stop.

Sub Menu	Description	Display (LCD)	Remarks
Setting Temperature	When “Temp” is displayed, Input a temperature you would like to set with the “arrow keys(◀ / ▶)”. It will be displayed on the bottom line.	[Temperature]: Test	T:[target value] C:[current value] on/off
Laser Diode Test	“Diode On” is displayed, when the laser diode is on. On the other case “Diode Off” is displayed.	Ld On(Off)	
Laser Ready Test	“Laser Leady” is displayed, When the Laser Scanning Unit is ready to print. On the other case “Laser Error”	Laser Leady (Error)	

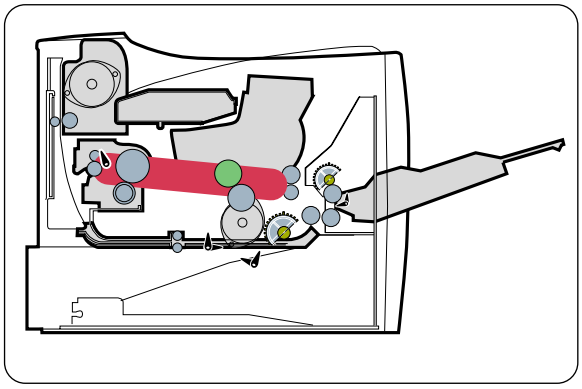
6.2 Paper Path



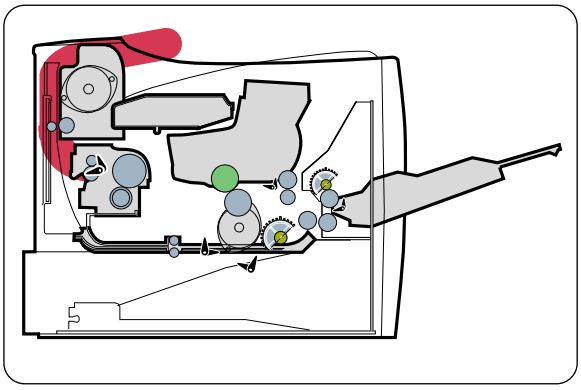
R1 : OPC Drum	R7 : Feed Roller	S1: Paper Empty(Cassette) Sensor
R2 : Transfer Roller	R8 : Pick-UP Roller	S2: Paper Empty(MPF) Sensor
R3 : Regi Roller	R9 : Heat Roller	S3: Regi Sensor
R4 : Idle Roller	R10 : Pressure Roller	S4: Exit Sensor
R5 : MP Pick-UP Roller	R11 : Duplex Roller	S5: Duplex Sensor
R6 : Retard Roller	R12 : Duplex Idle Roller	



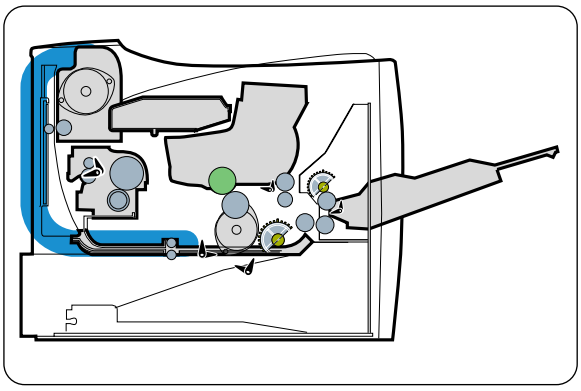
<Jam 0>



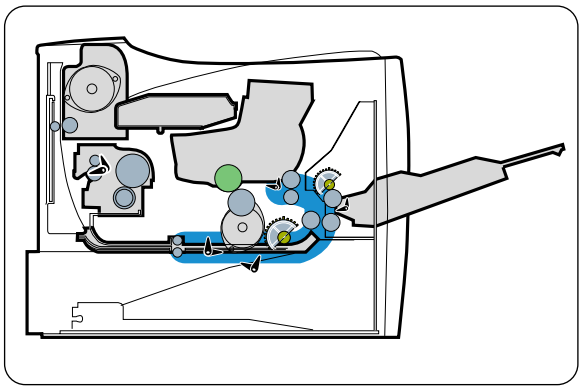
<Jam 1>



<Jam 2>



<Jam Duplex 1>



<Jam Duplex 2>

• Simplex

1) A paper is fed from a cassette or MPF by a printing order.
2) The fed paper passes a paper feeding sensor.
   - If the sensor does not operate after feeding the paper, the Jam0 occurs.
3) The paper passes a paper exit sensor, and it comes out from a machine.
   - If the tailing edge of the paper does not come out from a machine after the leading edge of the paper passes the sensor, then certain time later, a Jam2 occurs.

• Duplex

1) A paper is fad from a cassette or MPF by a printing order.
2) The fed paper passes a paper feeding sensor.
   - If the sensor does not operate after feeding the paper, a Jam0 occurs.
3) The paper that passes a paper exit sensor takes several printing processes, and moves to a paper exit sensor.
   - If the sensor does not operate after certain time, a Jam 1 occurs.
4) If the paper does not discharge until the paper passes an exit roller and a Roller-Exit-F/Down, a Jam 2 occurs.
5) The printing paper starts to be printed for duplex only by reversing rotation by an exit motor. The printing paper enters to a machine through an exit roller, and reaches to duplex sensor.
   - If the printing paper cannot reach to the duplex sensor after certain time, a duplex Jam 1 occurs.
6) The printing paper that passes the duplex sensor reaches to a feed sensor again and a printing operation is tried over again.
   - If the printing paper cannot reach to a feed sensor after certain time later, a duplex Jam 2 occurs.

6.2.1 Clearing Paper Jams

When a paper jam occurs,the display on the control panel shows the message indicating the corresponding location of the paper jam.

6.2.1.1 Tips for Avoiding Paper Jams

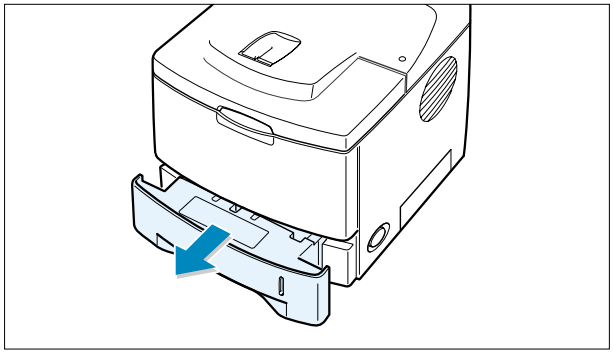
By selecting the correct paper types, most paper jams can be avoided. If a paper jam occurs, follow the steps outlined in

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

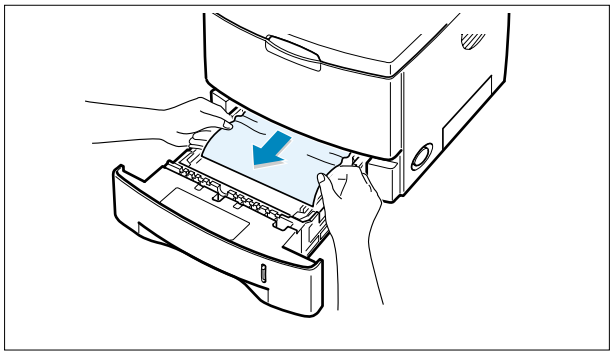
6.2.1.2 In the Paper Feed Area(Jam 0)

• In the Tray1

1. Slide out the Tray1 to expose the jammed paper.

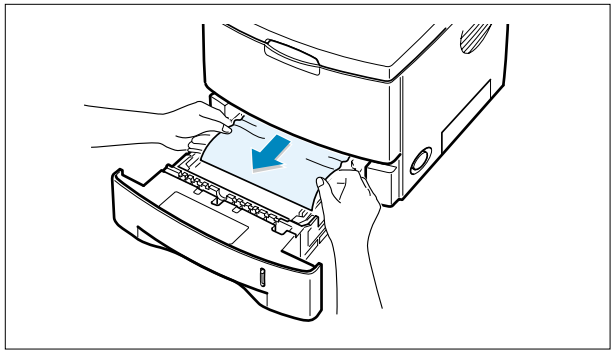


2. Remove any misfed paper by pulling it out by the visible edge from the tray.Make sure that all of the paper is properly aligned in the tray.



NOTE : If the jammed paper is not invisible or if there is resistance when you pull the paper,remove the tray from the printer and carefully pull the jammed paper free from the printer.

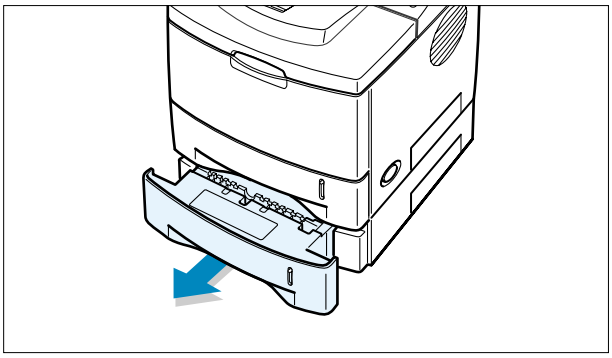
3. Slide the tray back into the printer.



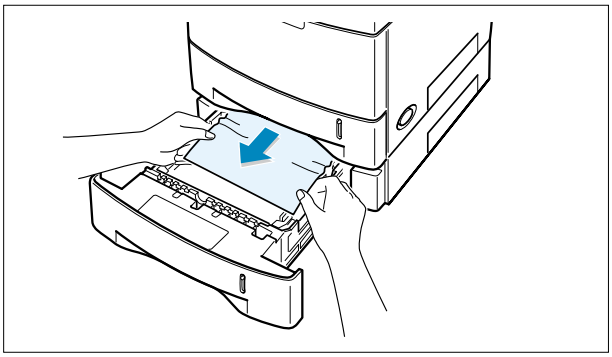
4. Open and close the top cover to resume printing.

• In the Optional Tray2

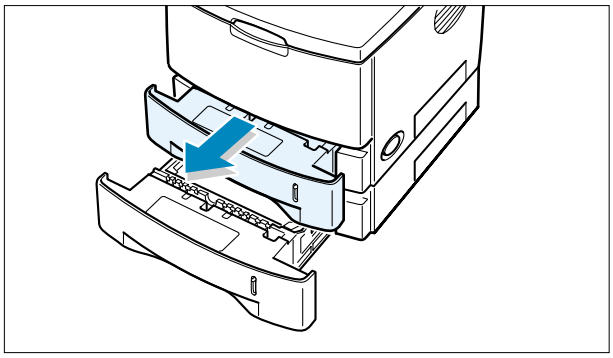
1. Pull the optional Tray2 out of the printer.



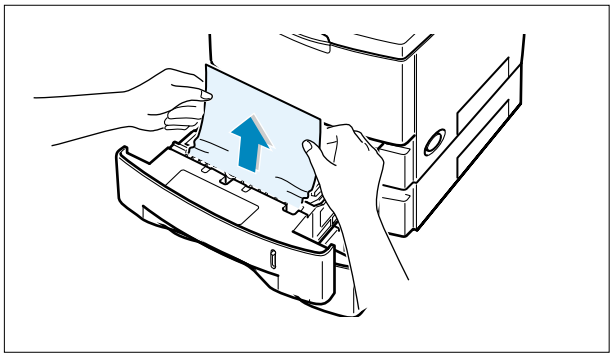
2. If you see the jammed paper,remove the paper from the tray.



3. If you cannot find the jammed paper in the Tray2,pull the Tray1 half way out of the printer,and remove the paper.



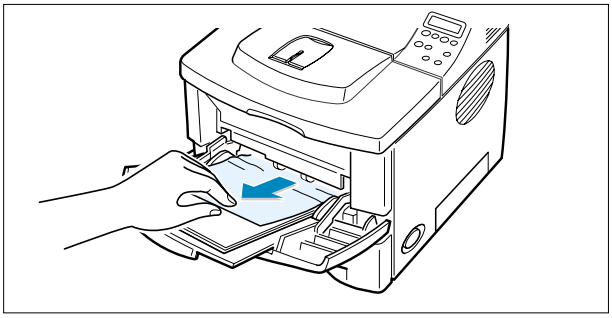
4. Slide the trays back into the printer. Open and close the top cover.Printing can be resumed.



• In the Multi-Purpose Tray

1. Open the Multi-Purpose Tray.

2. Carefully remove the jammed paper from the tray.



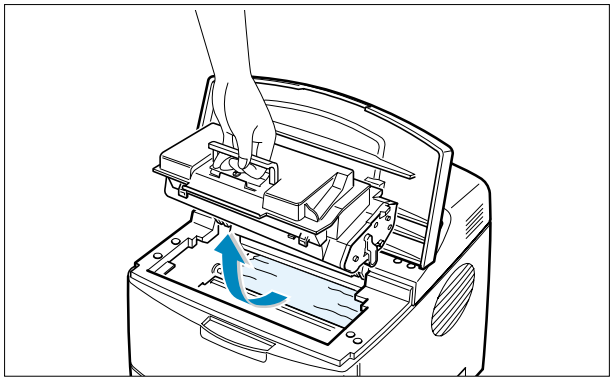
3. Open and close the top cover.Printing can be resumed.

6.2.1.3 Around the Toner Cartridge (Jam1)

1. Open and close the top cover,and the jammed paper should exit the printer.

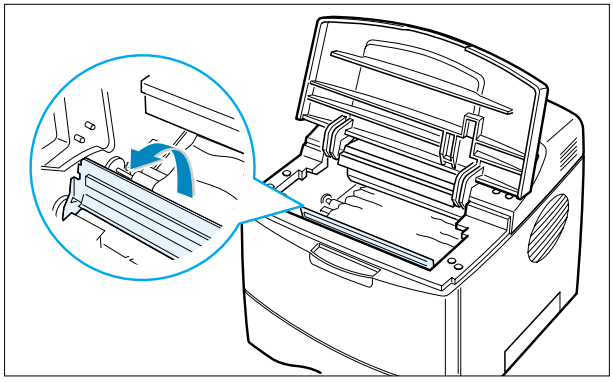
   If not,continue to Step 2.

2. Open the top cover and remove the toner cartridge.

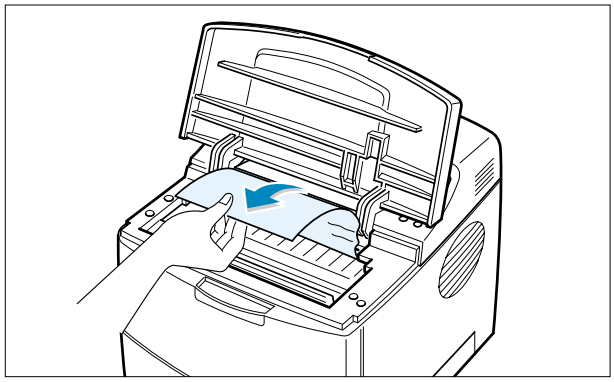


CAUTION : To prevent damage to the toner cartridge,do not expose it to light for more than a few minutes.Place a piece of paper over the top of the toner cartridge to shield it while it is out of the printer.

3. Carefully lift up the guide feed.

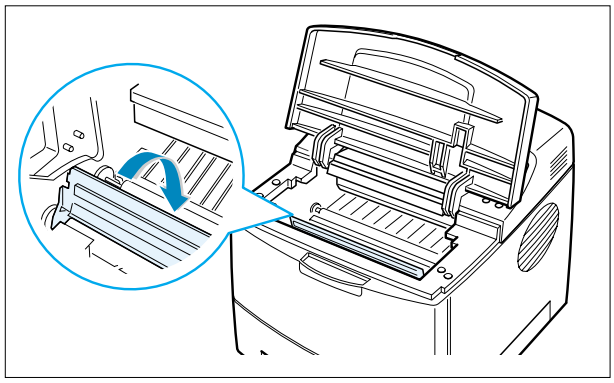


4. Gently pull the jammed paper towards you to remove it from the printer.



   If the jammed paper is not visible or there is resistance when you pull the paper,go to “In the Paper Exit Area ”.

5. Flip down the guide feed and reinstall the toner cartridge.

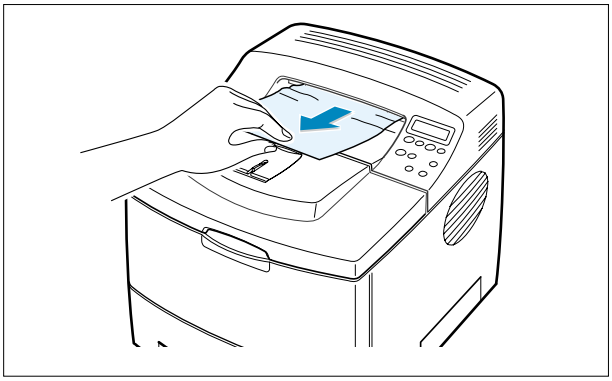


NOTE : If the toner cartridge is difficult to reinstall,make sure that the guide feed has been flipped back down into position.

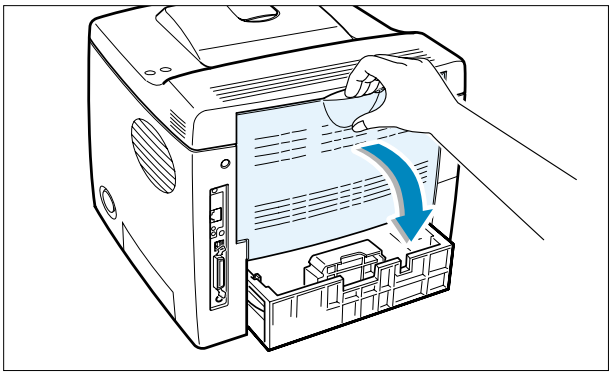
6. Close the top cover.Printing can be resumed.

6.2.1.4 In the Paper Exit Area (Jam 2)

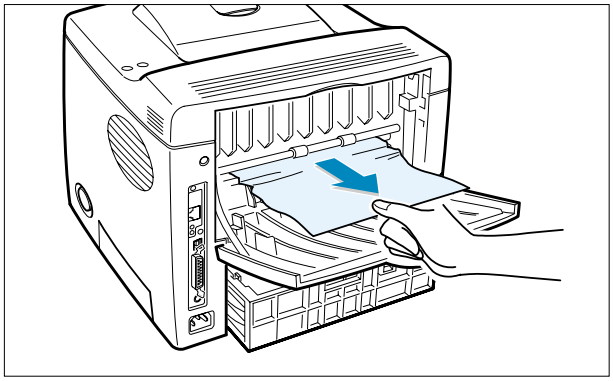
1. If a long portion of the paper is visible,pull it straight out. If not,continue to Step 2.



2. Open the rear output tray.



3. Loosen the paper if it is caught in the feed rollers. Then gently pull the paper out.



4. Close the rear output tray.

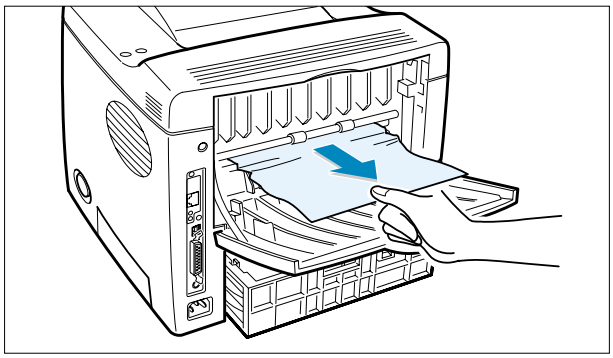
5 Open and close the top cover.Printing can be resumed.

6.2.1.5 In the Duplex Area

• Duplex Jam 1

1. Open the rear output tray.

2. Remove the jammed paper.



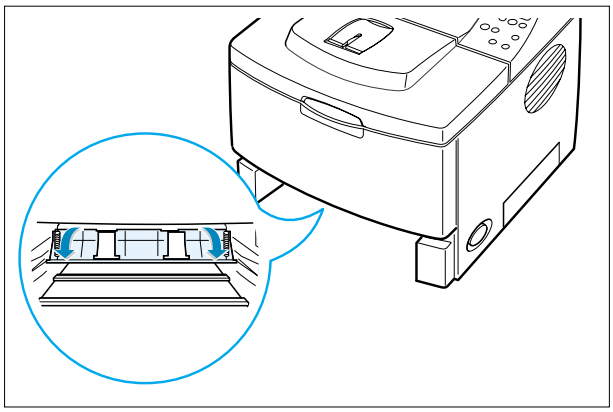
3. Close the rear output cover.

4. Open and close the top cover.Printing can be resumed.

• Duplex Jam 2

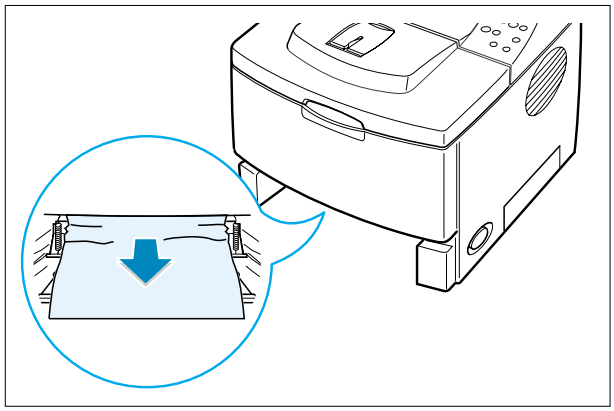
1. Pull the paper tray out of the printer.

2. Pull down the metal plate inside of the printer.



CAUTION : Pulling the plate could cause an injury.Use the lever on the left.

3. Remove the jammed paper.



4. Slide the tray back into the printer.

5. Open and close the top cover.Printing can be resumed.

6.3 Sample Pattern

This product has the several sample patterns for maintenance. With the sample patterns, check the existence of the abnormality. The patterns help to regularly maintain the product.

6.3.1 Printing a Demo Page

Print a demo page to make sure that the printer is operating correctly.

1. Press the **Menu** button ( ) on the control panel until you see “Information ” on the bottom line of the display..
2. Press the **Enter** button ( ) to access the Menu.
3. Press the scroll button (or) until you see “Demo Page ” on the bottom line.
4. Press the **Enter** button ( ) .

A demo page showing the printer ’s features and capabilities prints out.

6.3.2 Printing a cleaning sheet

If you are experiencing blurred,faded or smeared printouts,you can clear the problem by printing a cleaning sheet,provided by your printer.You can print:

• OPC Cleaning sheet:cleans the OPC drum of the toner cartridge.
• Fuser Cleaning sheet:cleans the fuser unit inside the printer.

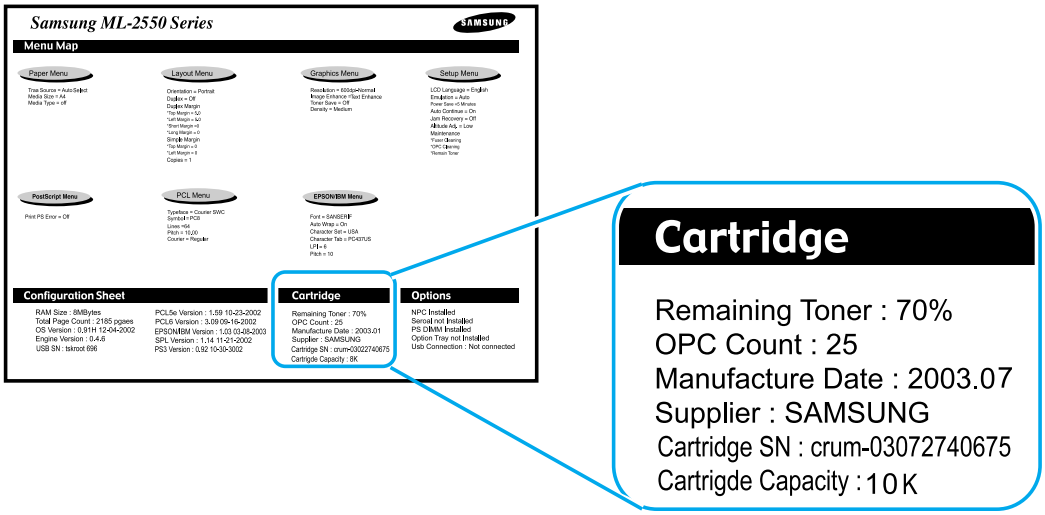
This process will produce a page with toner debris,which should be discarded.

1. Ensure that the printer is turned on and in ready mode with paper loaded in the tray.
2. Press the **Menu** button ( ) on the control panel until you see “Setup ” on the bottom line of the display..
3. Press the **Enter** button ( ) to access the Menu.
4. Press the scroll button (or) until “Maintenance ” displays on the bottom line and press the **Enter** button ( ) .
5. Press the scroll button (or) to select the required option,“OPC Cleaning ” or “Fuser Cleaning.”
6. Press the Enter button ( ) .

Your printer automatically picks up a sheet of paper from the tray and prints out a cleaning sheet with dust or toner particles on it.

6.3.3 Checking the toner cartridge count

Information about the 'toner cartridge count' can be checked by printing the Configuration Sheet.



6.3.3.1 Remaining Toner: xx%

- Contents: Shows the remaining amount of toner.
- Description: It starts with 100%, and it reduces every 5% unit until it becomes 0%. (A message "Low Toner" is displayed in a LCD when it reaches 10%.)

  * In a low toner status, additional 1,000 sheets can be printed (5% coverage pattern standard-10K cartridge)

6.3.3.2 OPC Count: XXXXXX

- Contents: It starts with 0 and increases to display count.
- Description: It is an imaginary page count that accumulates a rotating time of a Main Motor. When the count reaches 20,000(pages), a message "Replace cart" is displayed in LCD. It means the life span of the toner cartridge (except a toner part) has ended. Even though it is a case that a toner is refilled, the rest of major parts should end, so entire toner cartridge should be replaced. In the worst case, when an OPC rotates over 20,000 pages, it is possible that a toner may overflow. When the count reaches to 20,000 pages, the printed image becomes misty, and an On-Line key that is flashing on a set must be pressed for a single print. If an OPC count is under 8,000 when displaying a message "Remaining Toner:0%", it means that a high-coverage has been used. If an OPC count is over 8,000 and if it has not been reached to 0% yet, a low-coverage should was used.

6.3.3.3 Manufacture Date: 2003.07

- Contents: Shows the product year and the month of the toner cartridge.

6.3.3.4 Supplier: SAMSUNG

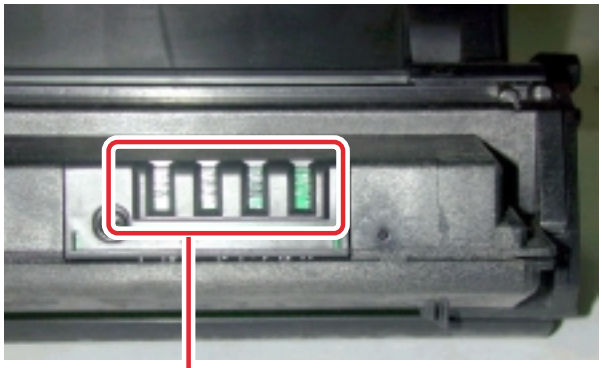
- Contents: shows the brand name of the toner cartridge. (Supplier is Samsung)
- Description: If a supplier is other OEM, the other OEM's name is displayed. If a supplier is different between a set and toner cartridge, a message "invalid toner" will be displayed in a LCD of a set, and a machine turns to an impossible status to print.

6.3.3.5 A checking method of a toner remaining amount

(1) Check a configuration sheet.
(2) Check by using a key of a set. (Setup-maintenance-remain toner)
(3) Check with a network: Check on a Webthru (Setup Menu-remaining toner)

Caution

(1) Please be careful not to damage a toner sensor part when assembling and disassembling a toner cartridge.
(2) Please be careful not to stain anything to jumper (4), which is shown in the picture.



6.4 Consumables and Replacement Parts

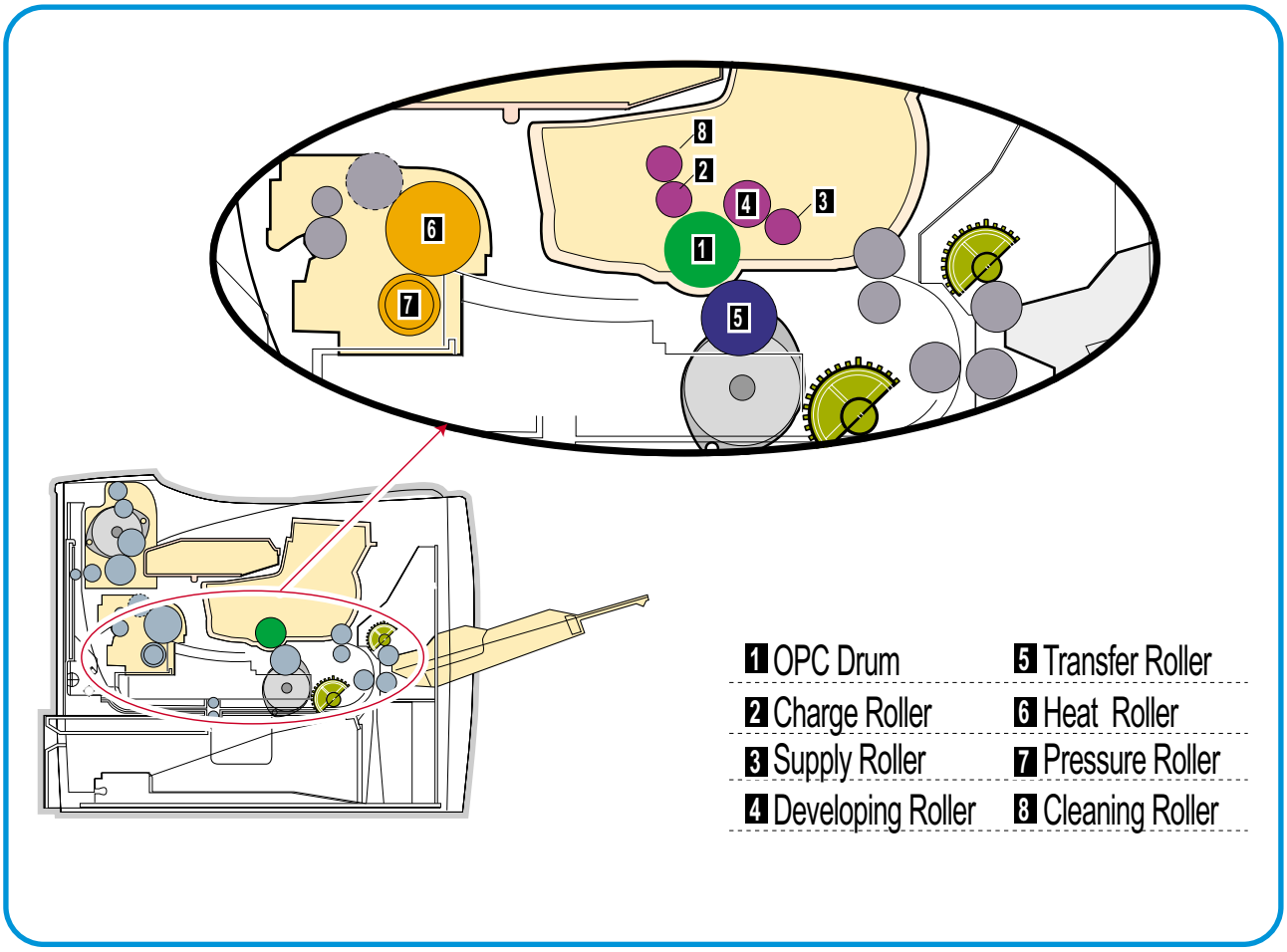
The cycle period outlined below is a general guideline for maintenance.
The example list is for an average usage of 50 transmitted and received documents per day.
Environmental conditions and actual use will vary these factors.
The cycle period given below is for reference only.

COMPONENT	REPLACEMENT CYCLE
Pick-up Roller	100,000 Pages
Paper Feeding Roller(Friction Pad)	100,000 Pages
Transfer Roller	100,000 Pages
Fuser	125,000 Pages
Toner Cartridge	Normal cartridge : 10,000 Pages (A4 5% LSA Pattern) Starter cartridge : 5,000 Pages (A4 5% LSA Pattern)

6.5 Periodic Defective Image

If the delinquent image regularly occurs in the printed-paper, it is due to delinquent or damaged roller. Refer to the table in below and check the condition of the roller.

No	Roller	Defective image	Typical defect
1	OPC Drum	95 mm	white spot on black image or black spot
2	Charge Roller	38 mm	black spot
3	Supply Roller	45 mm	light or dark horizontal image band
4	Developing Roller	49 mm	horizontal image band
5	Transfer Roller	57 mm	image ghost
6	Heat Roller	82 mm	Black spot and image ghost
7	Pressure Roller	92 mm	black spot on the backside



<Rollers Layout>

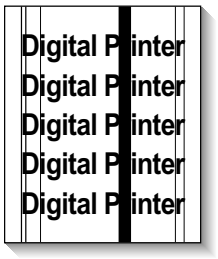
Memo

7. Troubleshooting

7.1 The cause and solution of Bad image

7.1.1 Vertical Black Line and Band

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



Check and Cause	Solution
1. Damaged develop roller in the Toner cartridge. Deformed Doctor-blade or cleaning-blade.	1. If causes 1 and 2 occur in the toner cartridge, replace the toner cartridge and try to print out.
2. Scratched surface of the charge roller in the toner cartridge.	2. Replace the transfer roller if occurred as No. 3.
3. Partly depression or deformation on the surface of the transfer roller.	

7.1.2 Vertical White Line

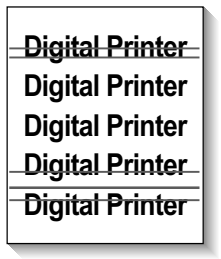
• **Description** White vertical voids in the image.

Check and Cause	Solution
1. Foreign matter stuck onto the window of internal lenses of LSU mirror.	1. Foreign matter stuck onto the window : Clean the LSU window with recommended cleaner(IPA) Clean the window with a clean cotton swab.
2. Foreign matter or toner particles between the toner cartridge roller and blade. (In case the life of the toner cartridge has been expired, white lines or light image occur in front of the image.)	2.. Replace the toner cartridge.
3. It may occur when Burr and foreign substances are on the window of the toner cartridge frame.	3. No 3. : Remove the foreign matter and burr of the exposure window. (toner cartridge)
4. If the fuser is defective, voids occur periodically at the top of a black image.	4. No. 4. : Open the front cover and check ribs that corresponds to the position of the voids. Remove if found.
5. It may occur when foreign substances are on the OPC Drum.	5. If the problems are not solved, replace the toner cartridge.
6. Partly depression or deformation on the surface of the transfer roller	6. Replace the transfer roller if occured as NO.6

7.1.3 Horizontal Black Band

• Description

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



Check and Cause	Solution
1. Bad contacts of the voltage terminals to toner cartridge.	1. Clean each voltage terminal of the Charge, Supply, Develop and Transfer roller. (remove the toner particles and paper particles)
2. The rollers of toner cartridge may be stained. Charge roller = 38mm Supply roller = 45mm Develop roller = 49mm Transfer roller = 57mm	2. Clean the right Gear that has relatively small gap of the teeth in the OPC. 3. If the malfunction persists, replace the toner cartridge.

7.1.4 Black/White Spot

• Description

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

Check and Cause	Solution
1. If dark or blurry black spots occur periodically, the rollers in the Toner cartridge may be contaminated with foreign matte or paper particles. (Charge roller : 38 mm interval OPC drum : 95 mm interval)	1. Run OPC cleaning Mode Print and run the Self-test 2 or 3 times.
2. If faded areas or voids occur in a black image at intervals of 95 mm, or black spots occur elsewhere, the OPC drum surface is damaged.	2. In case of 95 mm interval unremovable in 1, cleanly remove foreign substances stuck on the OPC location equivalent to black spots and white spots with a dry duster.
3. If a black image is partially broken, the transfer voltage is abnormal or the transfer roller's life has expired.	3. The transfer roller guarantees 125,000 sheets printing. If the roller's life is expired, replace it. 4. In case of 95 mm interval unremovable in 1, take measures as to replace the toner cartridge and try to print out. 5. Clean the inside of the set against the paper particles and foreign matter in order not to cause the trouble.

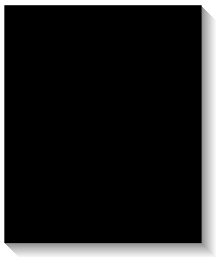
7.1.5 Light Image

• **Description** The printed image is light, with no ghost.

Check and Cause	Solution
1. Develop roller is stained when the toner of toner cartridge is almost consumed.	1. Check if the Toner Save mode is off. Check if the density is light.
2. Ambient temperature is below than 10°C.	2. No 1 : Replace the toner cartridge and try to print out.
3. Bad contact caused by the toner stains between the high voltage terminal in the HVPS and the one in the set.	3. No 2 : Wait 30 minutes after printer is powered on before you start printing.
4. Abnormal output from the HVPS. (Run self-test and check 1~4)	4. No3 : Clean up the contaminated area by the toner.
	5. Replace the HVPS if the problems are not solved by the above four instructions.

7.1.6 Dark Image or a Black Page

• **Description** The printed image is dark.



Check and Cause	Solution
1. No charge voltage in the engine board.	1. Clean the high voltage charge terminal.
2. Charge voltage is not turned on due to the bad contacts between power supply in the side of the Toner cartridge and charge terminal of HVPS.	2. Check the state of the connector which connects the engine board and HVPS.
	3. Replace the HVPS if not solved by the above direction 1 and 2.
3. VD0 signal of the Main PBA is Low state.	4. Replace the LSU Unit or Main PBA.

7.1.7 Uneven Density

• **Description** Print density is uneven between left and right.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. 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, or the transfer roller bushing or holder is damaged.	1. Replace both the left and right Spring Holder.
2. The life of the Toner cartridge has expired.	2. Occur in the toner cartridge gently shake the toner cartridge.
3. The toner level is not even on the toner cartridge roller due to the bad blade.	3.Replace the toner cartridge and try to print out.

7.1.8 Background

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

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. Does character exist less than 2% per a page, and hasn't it been used long time?	1. The toner cartridge is basically designed to print 10,000 sheets with 5% image. If it prints more than 12,000 sheets with 2% coverage, a background can occur.
2. Is a recycled toner cartridge be used?	2. The B/S is not guaranteed if using a recyled the toner cartridger.
3. Has the life span of the toner cartridge ended?	3. Replace the toner cartridge when the life span of it has been ended.
4. Is the movement(Up and Down) of the transfer roller smooth?	4. Clean the bushing part of the transfer roller.
5. Is the HVPS normal?	5. If the problem is still not solved, replace the toner cartridge.
	6. Gently shake the toner cartridge.

7.1.9 Ghost (1)

• **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.

Check and Cause	Solution
1. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the electrode of the Toner cartridge.	1. Clean the terminals when contaminated by toner particles.
2. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the one in the HVPS board.	2. Occur in the toner cartridge, replace the toner cartridge and try to print out.
3. The life of toner cartridge is expired.	3. Replace the engine board if not solved by the above directions 1-2.
4. Transfer roller lifetime(100,000 sheets) has expired.	4. If not solved by the direction 3, check the transfer roller lifetime and replace it.
5. Abnormal low temperature(below 10°C).	5. Wait about 1 hour after power on before using printer.
6. Damaged cleaning blade in the toner cartridge.	6. Occur in the toner cartridge, replace the toner cartridge and try to print out.

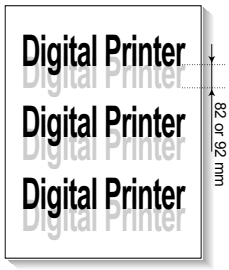
7.1.10 Ghost (2)

• **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.
(When printing on card stock or transparencies using manual feeder)

Check and Cause	Solution
When printing on card stock thicker than normal paper or transparencies such as OHP, higher transfer voltage is required.	Select 'Thick Mode' on paper type menu from the software application and after using returning to the original mode is recommended.

7.1.11 Ghost (3) : Fuser

• **Description** Ghost occurs at 82 or 92 mm intervals.



Check and Cause	Solution
The temperature of the fuser is maintained high.	1. Disassemble the fuser and remove the contaminated toner particles on the roller and clean the foreign matter between Thermistor and Heat roller. (Caution: can be deformed)

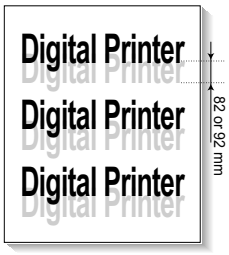
7.1.12 Satins on the Face of Page

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

Check and Cause	Solution
1. Toner leakage due to improperly sealed toner cartridge.	1. Replace the toner cartridge.
2. If the transfer roller is contaminated, stains on the face of page will occur.	2. If the transfer roller is contaminated, run PC Cleaning Mode Print 2 or 3 times. And perform Self-Test 2 or 3 times to remove contamination.

7.1.13 Satins on Back of Page

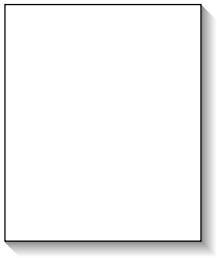
• **Description** The back of the page is stained at 57 or 92 mm intervals.



Check and Cause	Solution
1. 57mm : Transfer roller is contaminated.	1. Perform the OPC Cleaning Mode Print 2 or 3 times. Run Self-Test to remove the contamination of the transfer roller.
2. 92mm : Pressure roller is contaminated.	2. Replace the transfer roller if contaminated severely.
	3. Disassemble the fuser and clean the H/R(Heat Roller) and P/R(Pressure roller). And check the area between H/R and Thermistor. If contaminated, clean the area not to be deformed.

7.1.14 Blank Page Print out (1)

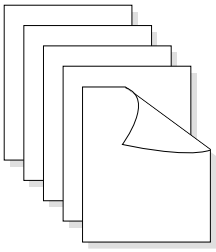
• **Description** Blank page is printed.



Check and Cause	Solution
Bad ground contacts in OPC and/or toner cartridge.	1. Check if the Ground-OPC is defective(set inside left side).
	2. Remove contamination of the terminals of the toner cartridge and the unit.

7.1.15 Blank Page Print out (2)

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



Check and Cause	Solution
1. Bad ground contacts in OPC and/or toner cartridge.	1. Remove contamination of the terminals of the toner cartridge.
2. Abnormal solenoid.	2. Perform the engine self test using EDC Mode to check if the Solenoid is normal.
	3. If not solved by the above directions 1-2, Replace the engine board.
	4. Turn the power off, delete the data of PC and try printing again.

7.2 The cause and solution of the bad discharge

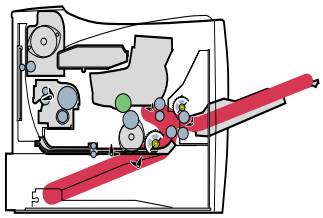
7.2.1 Wrong Print Position

• **Description** Printing begins at wrong position on the paper.

Check and Cause	Solution
Wrong sense time caused by defective feed sensor actuator.	Replace the defective actuator

7.2.2 JAM 0

• **Description**
1. Paper is not exited from the cassette.
2. Jam-0 occurs if the paper feeds into the printer.

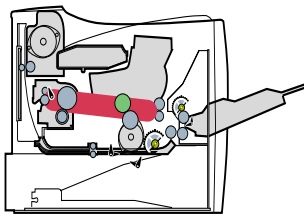


Check and Cause	Solution
1. Check the Solenoid by using EDC Mode.	1. Replace the solenoid.
2. Check if the pad is loose due to bad sealing of the side-pad.	2. Replace the side-pad Assembly L or R, if necessary.
3. Check the surface of the roller-pick-up for foreign matter.	3. Clean with soft cloth dampened with IPA(Isopropyl Alcohol) or water.
4. If continuous clusters occur, check whether the assembly slot between shaft-pickup and housing-pickup opens or is broken away.	4. Replace the Main PBA and/or Sensor.
5. If the paper feeds into the printer and Jam 0 occurs, perform EDC Mode to check feed-sensor of the engine board.	

7.2.3 JAM 1

• Description

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

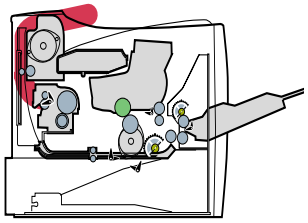


Check and Cause	Solution
1. If the recording paper is jammed in front of or inside the fuser.	1. Replace the SMPS or Exit-Sensor. 2. Replace the Main PBA.
2. If the recording paper is stuck in the discharge roller and the fuser just after passing through the Actuator-Feed, Feed Actuator may be defective.	3. Reassemble the Actuator-Feed and Spring-Actuator if the movement is bad.

7.2.4 JAM 2

• Description

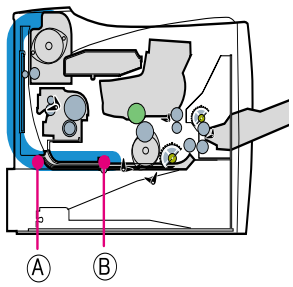
1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



Check and Cause	Solution
1. If the paper is completely fed out of the printer, but Jam 2 occurs : Exit sensor is defective. • After the paper is completely discharged, actuator Exit should return to the original position to shut the photo-sensor. Sometimes it takes longer hour than it should and does not return.	1. Check if the exit sensor actuator is defective. • Check if the actuator exit is deformed (Check if the lever part is deformed in shape). • Check whether burrs occur in the assembly part of the actuator exit or not and if the actuator is smoothly operated. • Check if foreign matter and wire get caught in the actuator exit's operation.
2. If the paper is rolled in the Fuser Roller: • This occurs when a Guide claw is broken away or transformed. • It occurs when the Spring of a Guide claw is broken away or transformed. • It occurs when the Heat-Roller or Pressure-Roller is seriously contaminated with the toner.	2. If the paper is stuck in the fuser : disassemble the fuser and remove the jammed paper, and clean the surface of the pressure roller with dry gauze.
3. Paper is accordion in the fuser.	3. Remove the jammed paper after disassembling the fuser : Clean the surface of the pressure roller with dry gauze. • Remove the toner particles stained on the rib. • Check the assemblage and performance of the exit.

7.2.5 JAM Duplex 1

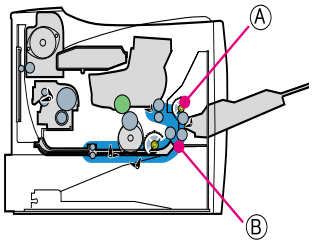
• **Description** A message 'Jam duplex 1' is displayed in a LCD window.



Check and Cause	Solution
1. It is a case when a paper cannot operate a duplex sensor.	1. Replace a SMPS or main PBA
2. It is a case when a paper cannot reach to a duplex sensor due to a paper jam on a duplex path.	2. A case that a paper jam occurs on (A) after it is reversed: replace a 2nd exit roller after checking its operation.
	3. A case that a paper jam occurs on (B) after it is reversed: replace a duplex roller after checking its operation

7.2.6 JAM Duplex 2

• **Description** A message 'Jam duplex 2' is displayed in a LCD window.



Check and Cause	Solution
1. It is a case that a paper cannot pass a duplex sensor.	1. Replace a SMPS or main PBA.
2. It is a case that a paper cannot reach to a registration sensor after it is passed a duplex sensor.	2. A case that a leading edge of a paper is jammed on (A) check an operation of a guide front. If it is worn or defective, replace it.
	3. Check an operation of a feed roller and a registration roller. If they are worn or defective replace them.

7.2.7 Multi-Feeding

• **Description** Multiple sheets of paper are fed at once.

Check and Cause	Solution
1. Check the Guide side L/R or Guide Rear in the Cassette, if the position is correct.	1. Replace the solenoid if necessary.
2. Solenoid malfunction(the solenoid does not work properly): Perform EDC Mode.	2. Replace the Main PBA.
3. Pad-Friction is contaminated with foreign matter.(oil...)	3. Clean the pad friction with soft cloth dampened with IPA(Isopropyl Alcohol).
4. The face of paper is blended.	4. Use the smooth paper.

7.2.8 Paper rolled in the fuser

• **Description** If contaminated at intervals of 57mm on the back of a paper.

Check and Cause	Solution
1. Contamination of the pressure roller or heat roller (Background, Hot off set).	1. After disassembling the fuser, clean contamination between the heat roller and the thermostor and remove the contamination of the pressure roller.
2. Check the claw of the fuser whether it is deformed.	2. If there is heavy background, repair it by the background troubleshooting method.
	3. Clean the surface of the heat roller with IPA or water
	4. Check the warp or separation of the print claw and the holder plate claw, and then manage it.

7.2.9 Paper rolled on the OPC Drum

• **Description** Paper is rolled up in the OPC.

Check and Cause	Solution
1. Paper is too much thin.	1. Recommend to use normal paper.
2. The face of paper is curled.	2. How to remove the rolled paper in the OPC. • Remove the paper while turning the OPC against the ongoing direction. • Clean fingerprints on the OPC softly with soft cloth dampened with tissue.

7.3 The cause and solution of the malfunction

7.3.1 Fuser Error

• **Description** A message "Open fuser/Over heat/Low heat' is displayed in a LCD panel.

Check and Cause	Solution
1. Check whether a thermostat, AC wire, and heat lamp are open or not.	1. Replace the fuser if a thermostat is open.
2. Check whether a thermistor is open or not.	2. Replace the fuser if a thermistor sensor is located deep inside of a sponge.
3. Heat lamp ON/OFF test	3. Check whether the overheat mode circuit operates normally or not.
4. It could not operate due to a gear of a fuser is melted.	4. Replace the fuser.

7.3.2 LSU Error

• **Description** A message "PMOTOR ERROR/HSYNC ERROR' is displayed in a LCD panel.

Check and Cause	Solution
1. Check whether the LSU connector is disconnected or not.	- Replace a LSU
2. Check whether the LSU motor is rotating or not.	- Replace a main board if the same error occurs again after replacing a LSU.
3. Check the HSYNC signal.	

7.3.3 Not function of the gear of the fuser due to melting away

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

Check and Cause	Solution
1. Check the Heat Lamp.	1. Replace the Fuser. 2. Replace the Main PBA. 2. Replace the SMPS.

7.3.4 Paper Empty

• **Description** The paper lamp on the operator panel is on even when paper is loaded in the cassette.

Check and Cause	Solution
1. Bending or deformation of the actuator of the paper sensor. 2. The function of the engine board is defective 3. Check the Connector.	1. Replace the defective actuator. 2. Replace the Sensor PBA.

7.3.5 Paper Empty without indication

• **Description** The paper lamp on the operator panel does not come on when the paper cassette is empty.

Check and Cause	Solution
1. Bending or deformation of the actuator of the paper sensor.	1. Replace the defective actuator.
2. The function of the engine board is defective	2. Replace the engine board.

7.3.6 Cover Open

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

Check and Cause	Solution
1. The hook lever in the top cover may be defective.	1. Replace the hook lever, if defective.
2. Check the connector and circuit of the cover switch department in the Main Control board.	2. Check the insertion of the Cover Open S/W Connect.
	3. Replace the Main Control board or Cover Open S/W.

7.3.7 No error message when the cover is open

• **Description** The ERROR message does not come on even when the printer cover is open

Check and Cause	Solution
1. Check the connector and circuit of the cover switch department in the Main Control board. Perform EDC mode	1. Check the insertion of the Cover Open S/W Connect. 2. Replace the Main Control board or Cover Open S/W.

7.3.8 Defective motor operation

• **Description** Main motor is not driving when printing, and paper does not feed into the printer, resulting 'Jam 0'.

Check and Cause	Solution
1. The Motor harness or Motor PCB may be defective.	1. Check the motor harness, replace it, if defective.
2. Check the motor operation in the EDC Mode.	2. Replace the Main PBA.

7.3.9 No Power

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

Check and Cause	Solution
1. Check if the power input and SMPS output are normal.	1. Replace the power supply cord or SMPS.
2. Check the inferiority of LED-Panel or LDC window on the front-cover if the OP panel does not appear after normal warming-up.	2. Replace the control board. 3. Replace the OP panel.

7.3.10 Vertical Line Getting Curved

• **Description** When printing, vertical line gets curved.

Check and Cause	Solution
1. If the supply of +24v is unstable in the Main Control board linking with LSU, check drive by EDC Mode: LSU Check.	1. Replace LSU.
2. Chect the Deve PBA in the Toner Cartridge.	2. Replace theToner Joint PBA. 2. Replace the MainPBA.

7.4 Toner Cartridge Service

It is not guaranteed for the default caused by using other toner cartridge other than the cartridge supplied by the Samsung Electronic or caused by non-licensed refill production.

7.4.1 Precautions on Safe-keeping of Toner Cartridge

Excessive exposure to direct light more than a few minutes may cause damage to the cartridge.

7.4.2 Service for the Life of Toner Cartridge

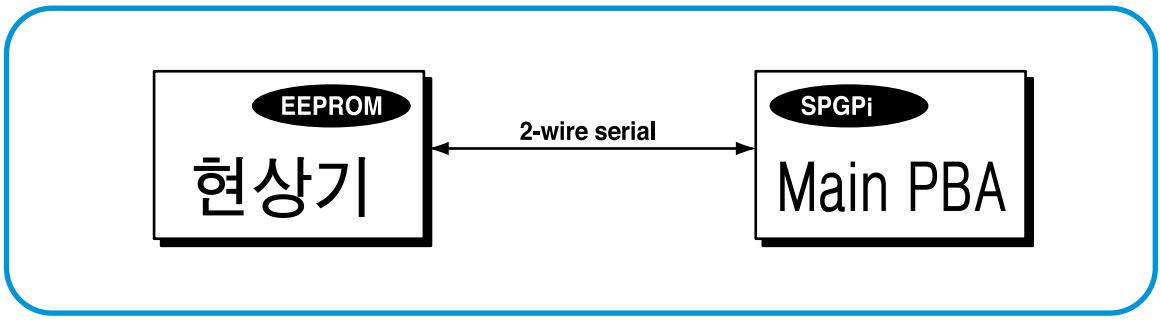
If the printed image is light due to the life of the toner, you can temporarily improve the print quality by redistributing the toner(Shake the toner cartridge), however, you should replace the toner cartridge to solve the problem thoroughly.

7.4.3 Distinguish function for choice cartridge

• Distinguish function for choice cartridge

An EEP ROM is mounted to a cartridge for distinguishing a choice toner cartridge. Items written in below are detected by checking up memory information.
If the data of the EEP ROM is broken, it cannot be detected.

1) Detecting existence of a toner cartridge: It detects whether a toner cartridge is mounted or not.
2) Detecting a serial number of a toner cartridge.
3) Detecting a toner cartridge supplying company: If it is not Samsung's, it is not operated.
4) Detecting an OPC rotating counter: It detects the life span of an OPC drum.



• Distinguish a refilled cartridge. (with eyes)

1) Check whether One-way screw is damaged or not
2) Check the cartridge on configuration sheet(Print out the self-test configuration)
: Manufacture date and serial number of toner cartridge are different(permissible range : +/- 1).

7.4.4 Error message (LCD window) related in a toner sensor

It explains a message related in toner sensor in a LCD.

7.4.4.1 Invalid Toner

- Contents: It is displayed when a supplier is different between a toner cartridge and a set. If this message is shown up, a printing process cannot operate.
- Solution: Attach a suitable toner cartridge (the same supplier's) to a set. (A unique key has been applied.)

7.4.4.2 Low Toner

- Contents: This message shows up when a message "remaining toner: 10%" is displayed in a cartridge count information. And the same message shows up when an OPC count becomes 18,000 (page).
- Solution: It means that a toner in the toner cartridge has been almost ended. Repare the new toner cartridge.

7.4.4.3 Replace Cartridge

- Contents: This message shows up when an OPC count becomes 20,000 (pages). It means the life span of a toner cartridge (except a toner part) has been ended. Even though a case that a toner is refilled, the rest of major parts have been ended, so entire toner cartridge might be replaced.
- Solution: If an OPC rotates about 20,000 (page), in a worst case, a toner overflows and it may cause a system fail. Therefore, recommend a user to replace a toner cartridge. When continuously using, even though a count reaches to 20,000 pages, a printed image becomes misty, and an on-line key that is flashing on a set must be pressed for a single print.

7.4.5 Signs and Measures at Poor toner cartridge

Fault	Signs	Cause & Check	Solution
Light image and partially blank image (The life is ended.) Digital Printer Digital Printer Digital Printer Digital Printer Digital Printer	• The printed image is light or unclean and untidy. • Some part of the image is not printed. • Periodically a noise as "tick tick" occurs.	1. If the image is light or unclean and untidy printed image - Shake the toner cartridge and then recheck. (1)NG: Check the weight of the toner cartridge (2)OK: Lack of toner, so the life is nearly closed. 2. Some part of image is not printed - Shake the toner cartridge and then recheck. (1)NG: Check the weight of the toner cartridge and clean the LSU window with a cotton swab, then recheck. (2)OK: Lack of toner, so the life is nearly closed. 3. Periodically a noise as "tick tick" occurs - Measure the cycle and the weight of the toner cartridge. 4. White vertical stripes on the whole screen or partly : Check the weight of the toner cartridge.	1. All of 1, 2, 3 above- If it become better by shaking, replace with a new toner cartridge after 50-100 sheets in the closing state of the life span. 2. In case of 2- If it becomes better after cleaning the LSU window, then the toner cartridge is normal. (Because of foreign substance on the LSU window, the image has not been printed partly.) 3. In case of 3- If the cycle of noise is about 2 seconds, the toner inside the toner cartridge has been nearly exhausted.(Purchase and replace with a new toner cartridge after using about 200 sheets at the point of occurrence) 4. In case of 3- This is a phenomenon caused by lack of toner, so replace with a new toner cartridge.
Toner Contamination	• Toner is fallen on the papers periodically. • Contaminated with toner on prints partly or over the whole surface.	1. Toner is fallen on the paper periodically. (1)Check the cycle of the falling of the toner. (2)Check the appearance of both ends of the toner cartridge OPC drum. 2.The center of the printed matter is contaminated with toner. (1)Check whether foreign substances or toner are stuck to the terminal (contact point) of the toner cartridge. (2)Check whether the state of the terminal assembly is normal.	1. If both ends of the OPC drum are contaminated with toner: Check the life of the toner cartridge. 2. Check whether it could be recycled. 3. If it cannot be recycled: Replace the toner cartridge.

Fault	Signs	Cause & Check	Solution
White Black spot  	• Light or dark black dots on the image occur periodically. • White spots occur in the image periodically.	1. If light or dark periodical black dots occur, this is because the toner cartridge rollers are contaminated with foreign substance or paper particles. (1)38mm interval : Charged roller (2)95mm interval : OPC cycle 2. If white spots occur in a black image at intervals of 95mm, or black spots occur elsewhere, the OPC drum is damaged or foreign substance is stuck to the surface. 3. If a black and white or graphic image is partially broken at irregular intervals, the transfer roller's life has been expired or the transfer voltage is abnormal.	1. In case of 1 above - Run OPC Cleaning Mode Print 4-5 times repeatedly to remove. Especially check foreign substance on the OPC surface, then remove them with a clean gauze moistened with IPA(Isopropyl Alcohol) not to damage OPC if necessary. ⚠ **Never use usual alcohol.** 2. In case of 2 If they are not disappeared by running OPC Cleaning Mode Print 4-5 times. : at intervals of 38mm - Replace the toner cartridge. : at intervals of 95mm - Remove foreign substance. : Broken image - Replace the toner cartridge according to carelessness. 3. In case of 3 - Exchange the transfer roller because the life of the transfer roller in use has been expired. (Check the transfer voltage and readjust if different.)
Recycled product	• Poor appearance of the toner cartridge. • Unclean and rough printouts. • Bad background in the image.	1. Poor appearance of the toner cartridge. (1)Check the damage to label and whether different materials are used. (2)Check the appearance of parts of the toner cartridge, such as frame, hopper. 2. Unclean and rough printouts. (1)Check whether foreign substance or toner are stuck to the terminal (contact point) of the toner cartridge. (2)Check whether the state of the terminal assembly is normal.	1. In case of 1 - (1)If there is an evidence of disassembling the toner cartridge. (2)If materials other than normal parts of the toner cartridge are added or substituted. 2. In case of 2 - If there are any abnormals in connection with the situation of 1. (1)It occurs when the toner cartridge is recycled over 2 times. (2)If toner nearly being expired are collected to use, it is judged as the recycled toner cartridge.

Fault	Signs	Cause & Check	Solution
Ghost & Image Contamination	• The printed image is too light or dark, or partially contaminated black. • Totally contaminatedblack. (Black image printed out) • The density of printouts is too dark and ghost occurs.	1. The printed image is too light or dark, or partially contaminated black. (1)Check whether foreign substance or toner are stuck to the terminal(point of contact) of the toner cartridge. (2)Check whether the terminal assembly is normal.	1. All of 1, 2, 3 above (1)Remove toner and foreign substances adhered to the contact point of the toner cartridge. (2)The contact point of the unit facing that of the toner cartridge also must be cleaned. (3)If the terminal assembly is unsafe: • Fully stick the terminal to or reassemble it after disassembling. • Disassemble the side plate and push the terminal to be stuck, then reassemble it.
		2. Totally contaminated black. (Black image printed out) (1)Check whether foreign substances are stuck to the terminal(point of contact) of the toner cartridge and the state of assembly. (Especially check the charged roller terminal.)	2. In case of 2 It is a phenomenon when the OPC drum of the toner cartridge is not electrically charged. Clean the terminals of the charged roller, then recheck it.
		3. The printed image is dark and ghost occurs. (1)Check foreign substance attached to the terminal (point of contact) of the toner cartridge and the state of assembly. (Especially check the developing roller terminal.)	3. In case of 3 It is a phenomenon as the developing bias voltage of the toner cartridge. Clean the terminals of the developing roller, then recheck it.

7.5 The cause and solutions of bad environment of the software

7.5.1 The printer is not working (1)

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

Check and Cause	Solution
1. Run Self-Test Mode: Turn the power on while pressing the test printing button for 2 or 3 seconds before printing works.	1.Check the power of the printer and perform the Self-Test. If the test printing works, that means no problems in the printer itself. If the test printing does not work, that means bad functioning of the printer(not because of software).
2. Check if the PC and the printer is properly connected and the toner cartridge installed.	2. Replace the printer cable. If the problems not solved even after the cable replaced, check the amount of the remaining tone. (refer to Toner Cartridge Service 4-5)
3. Printing is nor working in the Windows.	3. Check if the connection between PC and printer port is proper. If you use windows, check if the printer driver in the controller is set up. If the printer driver is properly set up, check in which program the printing is not working. The best way to find out is to open the memo pad to check the function of printing. If it is not working in a certain program, adjust the setup the program requires. Sometimes, the printout is normal within the Windows basic programs, but it's not working in a particular program. In such case, install the new driver again. If not working in the Windows basic program, Check the setup of the port of CMOS is on ECP. And check the address of IRQ 7 and 378
4. Check if the printer cable is directly connected to peripheral devices	4. If the scanner needs to be connected to the printer, first the remove the scanner from the PC to see if the printer is properly working alone.

7.5.2 The printer is not working (2)

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

Check and Cause	Solution
1. Secure more space of the hard disk.	1. Not working with the message 'insufficient printer memory' means hard disk space problem rather than the RAM problem. In this case, provide more space for the hard disk. Secure more space using the disk utilities program.
2. Printing error occurs even if there is enough space in the hard disk.	2. The connection of the cable and printer port is not proper. Check if the connection is properly done and if the parallel port in CMOS is rightly set up.
3. Check the parallel-port-related items in the CMOS Setup.	3. As a printer port, Select ECP or SPP among SPP(Normal), ECP, and EPP modes(increase printing speed) SPP normal mode support 8-bit data transfer, while ECP Mode transfer the 12-bit data.
4. Reboot the system to print.	4. If the regular font is not printing, the cable or the printer driver may be defective. Turn the PC and printer off, and reboot the system to print again. If not solved, double-click the printer in my computer If the regular fonts are not printed this time again. the cable must be defective so replace the cable with new one.

7.5.3 Abnormal Printing

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

Check and Cause	Solution
1. Set up the parallel port in the CMOS SETUP.	1. Select SPP(Normal) or ECP LPT Port the among ECP, EPP or SPP in the CMOS Setup.
2. Printer Driver Error.	2. Check the printer in My Computer.(to see if the printer driver is compatible to the present driver or delete the old driver, if defective and reinstall the new driver)
3. Error message from insufficient memory. (The printing job sometimes stops or due to insufficient virtual memory, but it actually comes from the insufficient space of the hard disk.)	3. Delete the unnecessary files to secure enough space of the hard disk and start printing job again.

7.5.4 SPOOL Error

• **Description**	To spool which stands for "simultaneous peripheral operations online" a computer document or task list (or "job") is to read it in and store it, usually on a hard disk or larger storage medium so that it can be printed or otherwise processed at a more convenient time (for example, when a printer is finished printing its current document).

Check and Cause	Solution
1. Insufficient space of the hard disk in the directory assigned for the basic spool.	1. Delete the unnecessary files to provide more space to start printing job.
2. If the previous printing error not solved.	2. If there are some files with the extension name of ****.jnl, Delete them and Reboot the Windows to restart printing job.
3. When expected to collide with other program.	3. Shut down all other programs except the current one, if possible.
4. When an application program or the printer driver is damaged.	4. Delete the printer driver completely and reinstall it.
5. When some files related to OS are damaged or virus infected.	5 After rebooting the computer, check for viruses, restore the damaged files and reinstall the program to do the printing job.
6. Memory is less than suggested one.	6. Add up enough memory to the PC.

How to delete the data in the spool manager.

In the spool manager, the installed drivers and the list of the documents waiting to be printed are shown. Select the document to be deleted and check the delete menu.

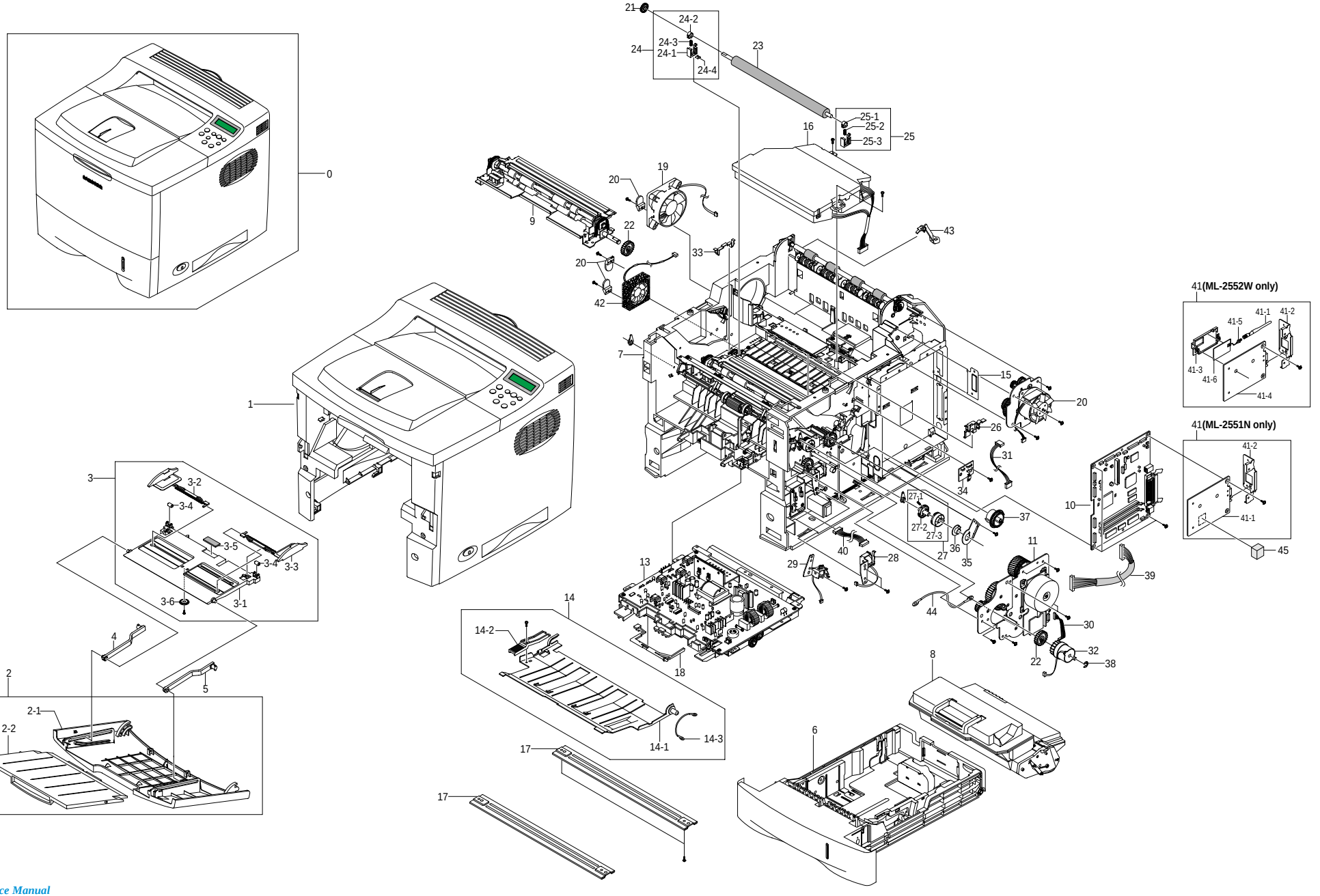
If you intend to delete the current document being printed, the data being transferred to the printer will be put out and then the document is removed. Before choosing the document, the menu is still inactive.

Or put the document out of the list and repeat the routine as in the above or finish the spool manager.

Memo

8. Exploded Views and Parts List

8.1 Main Assembly



Main Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

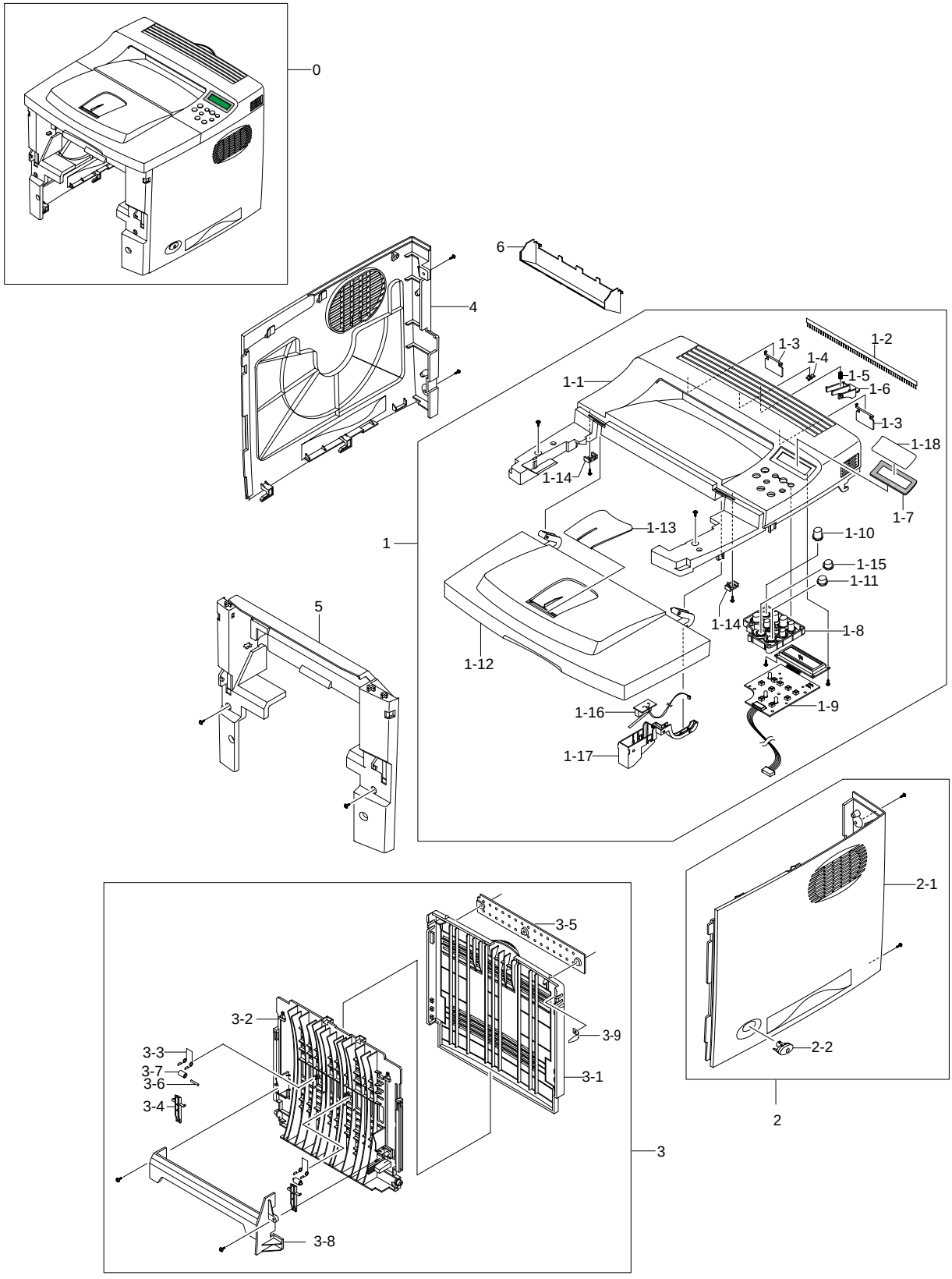
No.	Description	SEC.Code	Q'ty	SA	Remark
1	ELA HOU BASE-HOUSHING	JC96-02695?	1	X	ML-2550
	ELA HOU BASE-HOUSHING	JC96-02695?	1	X	ML-2551N
	ELA HOU BASE-HOUSHING	JC96-02695?	1	X	ML-2552W
2	ELA UNIT-COVER MP	JC96-02679A	1	O	
2-1	COVER-M-MP	JC63-00127A	1	X	
2-2	TRAY-M-EXTEND MP	JC63-00128A	1	X	
3	ELA UNIT-KNOCK UP MP	JC96-02680A	1	O	
3-1	PLATE-M-KNOCK UP MP	JC61-00686A	1	X	
3-2	PMO-SIDE GUIDE MP(L)	JC72-01005A	1	X	
3-3	PMO-SIDE GUIDE MP(R)	JC72-01006A	1	X	
3-4	PMO-IDLE KNOCK UP MP	JC72-01004A	2	X	
3-5	MPR-PAD KNOCK UP MP	JC74-00011A	1	X	
3-6	GEAR-PINION	JG66-40003A	1	X	
3-7	SCREW-TAPTITE	6003-000264	1	X	
4	TRAY-M-LINK MP(L)	JC63-00129A	1	X	
5	TRAY-M-LINK MP(R)	JC63-00130A	1	X	
6	ELA UNIT-CASSETTE(550)	JC96-02845A	1	O	
7	ELA UNIT-FRAME BASE	JC96-02627G	1	X	⚠ 220V
	ELA UNIT-FRAME BASE	JC96-02627F	1	X	⚠ 110V
8	ELA UNIT-DEVE	JC96-02851A	1	O	5K
	ELA UNIT-DEVE	JC9602640H	1	O	10K
9	ELA UNIT-REGI	JC96-02626A	1	O	
10	PBA MAIN-CONTROLLER	JC92-01487A	1	O	
11	ELA UNIT-MOTOR MAIN CARDINAL	JC96-02725B	1	O	
12	ELA UNIT-MOTOR EXIT CARDINAL	JC96-02857A	1	O	
13	ELA HOU-SMPS_HVPS_V1(110V)	JC96-02779A	1	X	⚠ 110V
	ELA HOU-SMPS_HVPS_V2(220V)	JC96-02777A	1	X	⚠ 220V
14	MEA UNIT-GUIDE FRONT, DUP	JC97-01715A	1	X	
14-1	GUIDE-P-FRONT, DUP	JC61-00660A	1	X	
14-2	LEVER-M-OPEN, DUP	JC66-00443A	1	X	
14-3	CBF HARNESS-EARTH (TX MOTOR)	JB39-00017A	1	X	None N/W Card
15	BRACKET-P_DUMMY CTRL	JC61-00679A	1	X	ML-2550 Only
16	UNIT-LSU_CARDINAL	JC59-00019B	1	O	
17	BAR-P_CROSS BOTTOM	JC71-00042A	2	X	
18	PMO-ACTUATOR EMPTY	JC72-00991A	1	O	
19	FAN-DC	JC31-00029A	1	O	
20	STOPPER-M-FAN80	JC61-00667A	3	X	
21	GEAR-TR29	JC66-00039A	1	O	
22	GEAR-REGI Z25	JC66-00420A	2	X	
23	ROLLER-TRANSFER	JC66-00540A	1	O	

Main Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
24	ELA UNIT-HOLDER TR R	JC96-01729A	1	O	
24-1	PMO-TRANSFER HOLDER R	JC72-41145C	1	X	
24-2	PMO-BUSHING TR	JC72-41142A	1	X	
24-3	SPRING ETC-TR R HAWK	JC61-00046A	1	X	
24-4	IPR-PLATE TR	JC70-11053A	1	X	
25	ELA UNIT-HOLDER TR L	JC96-01730A	1	O	
25-1	PMO-BUSHING TR	JC72-41142A	1	X	
25-2	SPRING ETC-TR L HAWK	JC61-00047A	1	X	
25-3	PMO-TRANSFER HOLDER L	JC72-41145D	1	X	
26	CAP-M-GEAR	JC67-00039A	1	O	
27	MEA UNIT-GEAR P/UP MP CARDINAL	JC97-01738A	1	O	
27-1	SPRING ETC-CAM MP	JC61-00003A	1	X	
27-2	GEAR-MP PICK_UP	JC66-00423A	1	X	
27-3	GEAR-MP HOLDER_CAM	JC66-00424A	1	X	
28	SOLENOID-MAIN	JC33-00012A	1	O	
29	SOLENOID-MP	JC33-00013A	1	O	
30	CBF HARNESS-MAIN MOTOR	JC39-00257A	1	X	
31	CBF HARNESS-MOTOR	JC39-00157A	1	X	
32	MEP-CLUTCH FEED CARDINAL	JC47-00009A	1	O	
33	PMO-CAP TR	JC72-41292A	1	X	
34	PBA SUB-COVER JOINT	JC92-01510A	1	X	
35	BRACKET-P-SHAFT MP	JC61-00755A	1	X	
36	BEARING-PICK UP	JC66-10202A	1	X	
37	GEAR-PICK_UP CAM	JC66-00533A	1	X	
38	RING-E	6044-000125	1	X	
39	CBF HARNESS-SMPS	JC39-00253A	1	X	
40	CBF HARNESS-MPF JOINT	JC39-00205A	1	X	
41	ELA HOU-NPC3_PRT	JC96-02699A	1	X	ML-2551N Only
41-1	BRACKET-P_NETWORK	JC61-00680A	1	X	
41-2	PBA SUB-NPC3_PRT	JC92-01466A	1	X	
41	ELA HOU-WLAN NPC FOR_EU	JC96-02803B	1	X	ML-2552W Only
41-1	ANTENNA-WLAN	JC42-00001A	1	X	
41-2	BRACKET-P_NETWORK WIRELESS	JC61-00680B	1	X	
41-3	COVER-M-NON WIRE NET	JC63-00126A	1	X	
41-4	PBA SUB-NPC3_PRT WLAN	JC92-01498A	1	X	
41-5	CBF COAXIAL CABLE-WLAN	JC39-00231A	1	X	
41-6	ELA MODUL-WLAN FOR_EU	JC96-02701B	1	X	
42	FAN-DC, CARDINAL	JC31-00027B	1	O	
43	ACTUATOR-OUTFULL	JC72-01310A	1	X	
44	CBF-HARNESS-OPE	JB39-40532A	1	X	
45	STOPPER-NETWORK	JC61-00837A	1	X	
S	SCREW-TAPTITE	6003-000008	1	X	
S	SCREW-TAPTITE	6003-000267	1	X	

8.2 Base-Houshing Assembly

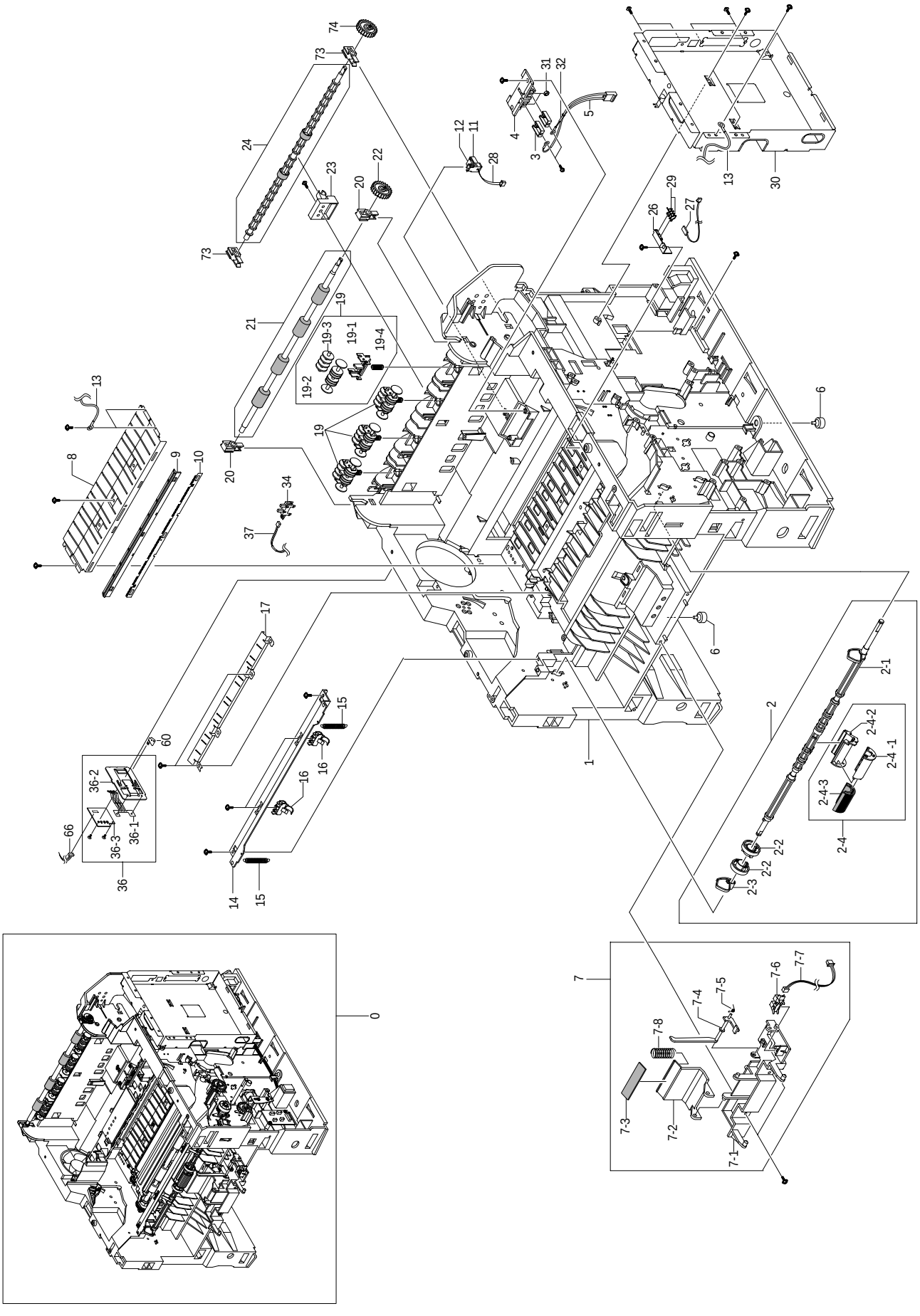


Base-Houshing Assembly Parts List

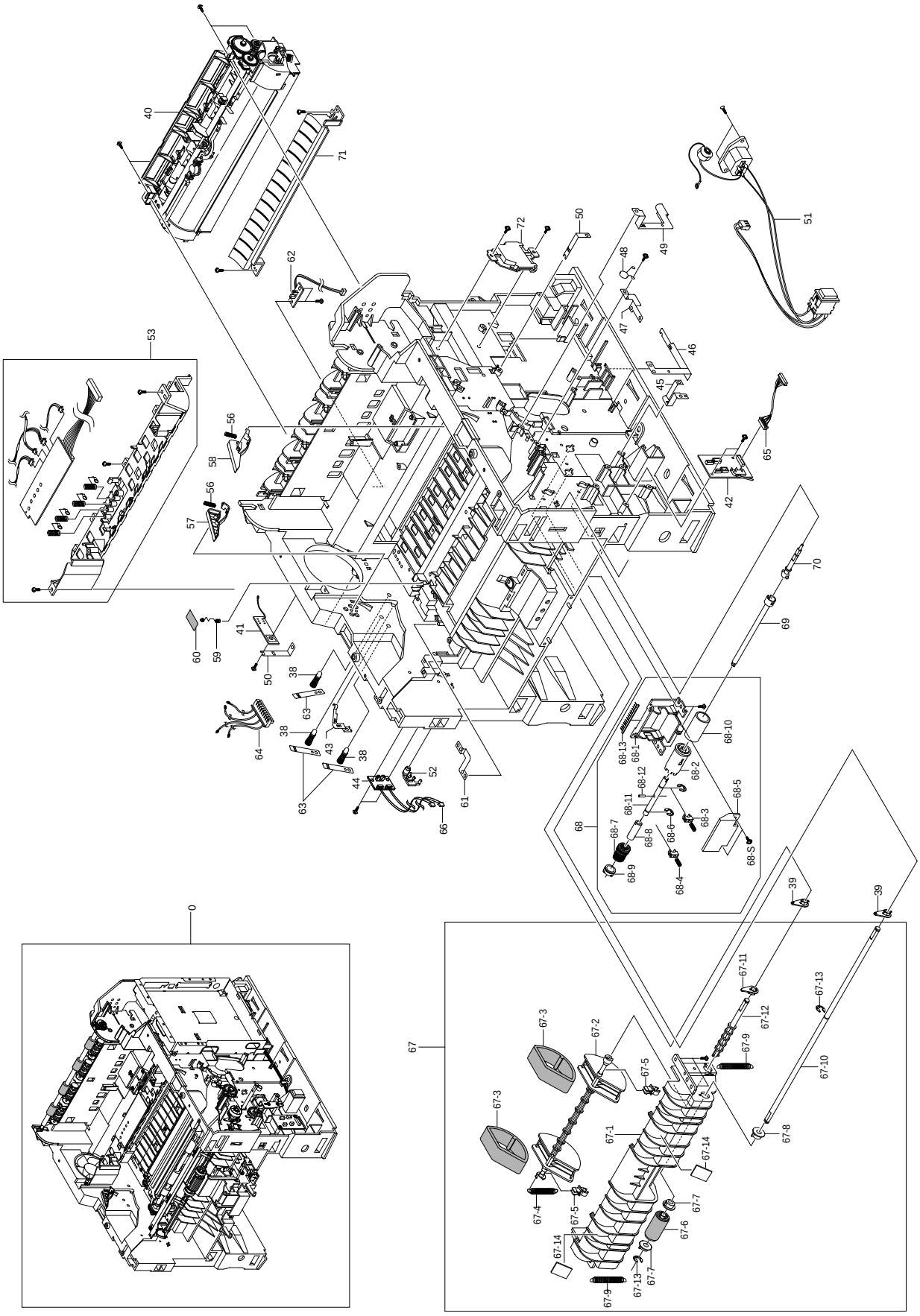
SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA HOU BASE-HOUSHING	JC96-02695T	1	X	ML-2550
	ELA HOU BASE-HOUSHING	JC96-02695E	1	X	ML-2551N
	ELA HOU BASE-HOUSHING	JC96-02695Z	1	X	ML-2552W
1	ELA UNIT-COVER TOP	JC96-02696T	1	O	ML-2550
	ELA UNIT-COVER TOP	JC96-02696W	1	O	ML-2551N
	ELA UNIT-COVER TOP	JC96-02696Z	1	O	ML-2552W
1-1	COVER-M-TOP	JC63-00119S	1	X	ML-2550
	COVER-M-TOP	JC63-00119V	1	X	ML-2551N
	COVER-M-TOP	JC63-00119Y	1	X	ML-2552W
1-2	MEC-BRUSH ANTISTATIC	JC75-00095A	1	O	
1-3	PMO-LEVER STACKING	JC66-00646B	2	O	
1-4	BUSH-M-RETAINER	JC61-00657A	1	O	
1-5	SPRING ETC-DUPLEX COVER	JC61-00391A	1	O	
1-6	PMO-STACKER LOCKER	JC72-00995A	1	O	
1-7	WINDOW-M-LCD	JC64-00048A	1	X	
1-8	KEY-M-BUTTON	JC64-00045A	1	X	
1-9	PBA MAIN-LCD PANEL	JC92-01473A	1	X	
1-10	KEY-M-DUPLEX	JC64-00044A	1	X	
1-11	KEY-M-ON LINE	JC64-00046A	1	X	
1-12	COVER-M-OPEN	JC63-00116A	1	O	
1-13	PMO-STACKER_RX	JC72-00973B	1	O	
1-14	STOPPER-M-HINGE OPEN	JC61-00656A	2	O	
1-15	KEY-M-SAVE MODE	JC64-00047A	1	X	
1-16	PBA SUB-COVER OPEN	JC92-01514A	1	O	
1-17	CAP-M-SENSOR	JC67-00034A	1	X	
1-18	COVER WINDOW	JC63-00256A	1	X	
2	ELA UNIT-COVER RIGHT	JC96-02697A	1	O	
2-1	COVER-M-RIGHT	JC63-00115A	1	X	
2-2	BUTTON-M-POWER	JC64-00043A	1	O	
3	MEA UNIT-COVER REAR	JC97-01743A	1	O	
3-1	COVER-M-REAR	JC63-00120A	1	X	
3-2	PMO-STACKER REAR	JC72-00996A	1	O	
3-3	SPRING-TS	6107-001160	2	X	
3-4	GUIDE-M-DUPLEX	JC61-00658A	2	X	
3-5	ICT-BRKT REAR COVER	JC70-00007A	1	X	
3-6	IEX-SHAFT IDLE,F/UP	JC70-20901A	2	X	
3-7	PEX-ROLLER F/UP(2)	JC72-20902A	2	X	
3-8	PMO-DUMMY FRAME FUSER	JC72-00999A	1	O	
3-9	TENSION-PLATE	JC70-00465A	1	X	
4	COVER-M-LEFT	JC63-00117A	1	O	
5	COVER-M-FRONT INNER	JC63-00118A	1	O	
6	COVER-M-FRAME EXIT	JC63-00122A	1	O	
S	SCREW-TAPTITE	6003-000196	9	X	
S	SCREW-TAPTITE	6003-000119	5	X	

8.3 Frame Assembly (1)



Frame Assembly (2)



Frame Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-FRAME BASE	JC96-02627G	1	X	⚠ 110V
	ELA UNIT-FRAME BASE	JC96-02627F	1	X	⚠ 220V
1	FRAME-M-BASE	JC61-00677A	1	X	
2	ELA UNIT-PICKUP MP	JC96-02681A	1	O	
2-1	SHAFT-M-PICK UP MP	JC66-00453A	1	X	
2-2	PMO-IDLE PICK UP MP	JC72-01003A	2	X	
2-3	CAM-M-PICK UP MP	JC66-00452A	1	X	
2-4	ELA UNIT-ROLLER P/UP MP	JC96-02686A	1	O	
2-4-1	HOLDER-M-PICKUP MP	JC61-00705A	1	X	
2-4-2	HOUSING-M-PICK UP MP	JC61-00685A	1	X	
2-4-3	RUBBER-PICK UP MP	JC73-00131A	1	X	
3	IPR-TERMINAL FU	JC70-10961A	2	X	
4	PMO-HOUSING TERMINAL	JC72-41010A	1	X	
5	CBF HARNESS-FUSER 220V	JC39-00279A	1	X	
6	FOOT-ML80	JC61-40001A	2	X	
7	AS-HOLDER PAD	JC81-01715A	1	O	
7-1	FRAME-M-HOLDER PAD	JC61-00683A	1	X	
7-2	HOLDER-M-PAD	JC61-00684A	1	X	
7-3	RPR-FRICTION PAD MP	JC73-00132A	1	X	
7-4	PMO-ACTUATOR MP	JC72-01002A	1	X	
7-5	SPRING ETC-EMPTY	JC61-70965A	1	X	
7-6	PHOTO-INTERRUPTER	0604-001095	1	X	
7-7	CBF HARNESS-MP EMPTY	JC39-00256A	1	X	
7-8	SPRING ETC-PAD	JC61-00387A	1	X	
8	GUIDE-P_TRANSFER	JC61-00678A	1	X	
9	PMO-HOLDER PLATE SAW	JC72-40247B	1	X	
10	IPR-PLATE SAW	JC70-10232C	1	X	
11	PMO-CAP CONNECTOR L	JC72-00463A	1	X	
12	PMO-CAP CONNECTOR U	JC72-00465A	1	X	
13	CBF HARNESS OPE	JB39-40532A	1	X	
14	GUIDE-P_REGI UPPER	JC61-00675A	1	X	
15	SPRING ETC-LEVER	JC61-70918A	2	X	
16	HOLDER-M-BUSHING TX	JC61-00671A	2	X	
17	GUIDE-PLATE PAPER	JC61-00691A	1	X	
19	MEA RACK-EXIT ROLLER	JC97-01034A	4	O	
19-1	PMO-HOLDER EXIT ROLL	JC72-41006A	1	X	
19-2	PMO-ROLLER FD F	JC72-41007A	1	X	
19-3	PMO-ROLLER FD R	JC72-41008A	1	X	
19-4	SPRING ETC-EXIT ROLL FD	JC61-70911A	1	X	
20	MEC-BEARING,EXIT	JC75-10529A	2	O	
21	ROLLER-EXIT_F/DOWN	JC66-00668A	1	O	
22	GEAR-EXIT	JC66-40209A	1	O	
23	HOLDER-M-BUSHING EXIT	JC61-00673A	1	X	

Frame Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

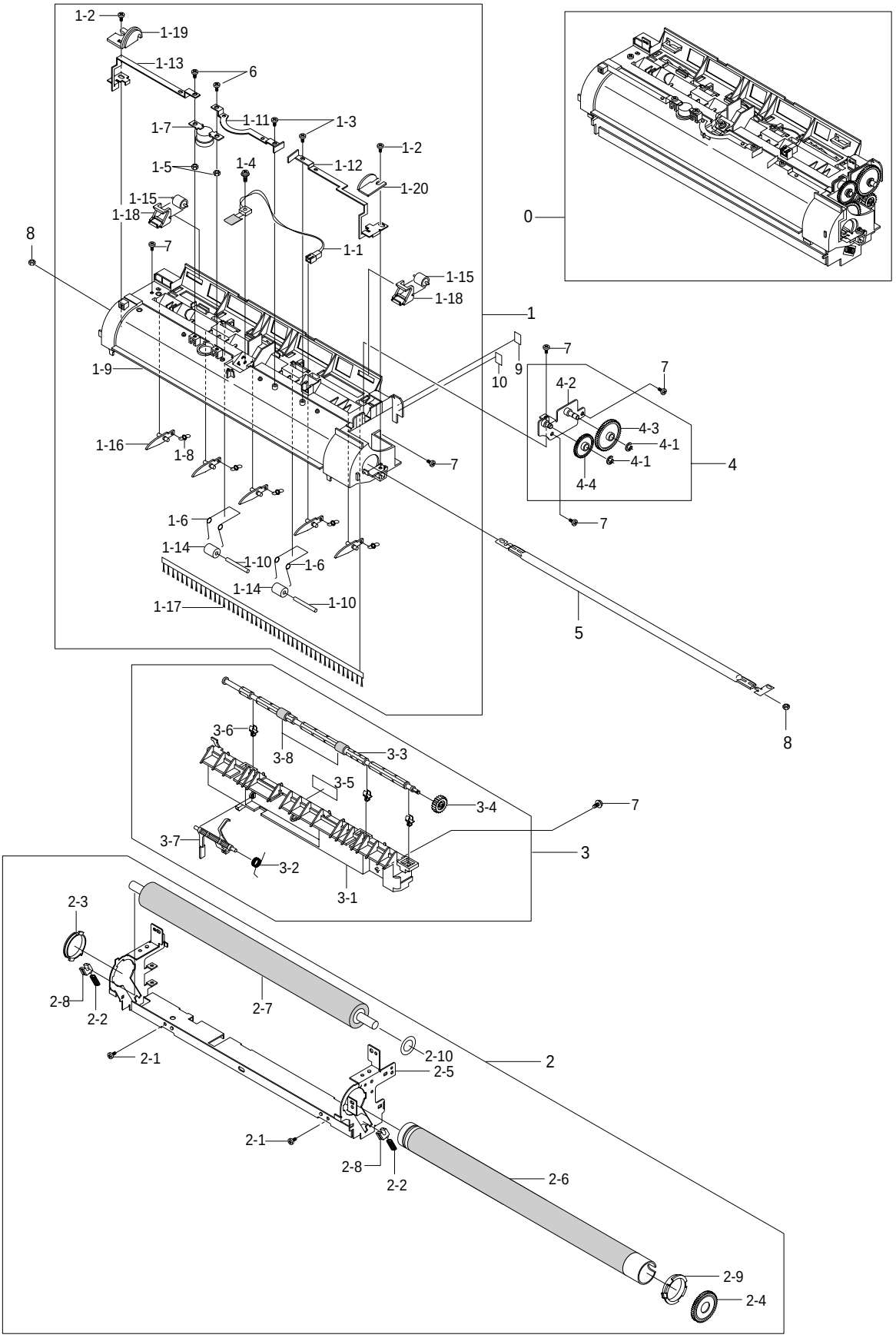
No.	Description	SEC.Code	Q'ty	SA	Remark
24	AS-ROLLER EXIT_DUPLEX	JC81-01732A	1	O	
25	IPR-TERMINAL TR HAWK	JC70-00132A	1	X	
26	CAP-M-WIRE PTL LOWER	JC67-00036A	1	X	
27	PBA SUB-PTL2	JC92-01516A	1	X	
28	CBF HARNESS-THERMISTOR	JC39-00255A	1	X	
29	TERMINAL-P_PTL	JC65-00001A	2	X	
30	SHIELD-P_CONTROLLER	JC63-00124A	1	X	
31	NUT-HEXAGON	6021-000222	2	X	
32	CABLE TIE	6501-000004	1	X	
34	PHOTO-INTERRUPTER	0604-001095	1	X	
36	ELA HOU-CST SENSOR	JC96-02127A	1	O	
36-1	IPR-PLATE-SENSOR	JC70-00192A	1	X	
36-2	IPR-BRKT-SENSOR	JC70-00195A	1	X	
36-3	PBA-SUB CASSETTE	JC92-01336A	1	X	
37	HARNESS-OUT FULL	JC39-00250A	1	X	
38	MEA UNIT-TERMINAL:L	JC97-01401A	3	X	
39	PMO-BEARING SHAFT	JC72-41191B	5	X	
40	ELA UNIT-FUSER	JC81-01728A	1	O	⚠ 110V
	ELA UNIT-FUSER	JC81-01729A	1	O	⚠ 220V
41	PBA MAIN-ZENER	JC92-01488A	1	X	
42	PBA SUB-PANEL	JC92-01519A	1	O	
43	IPR-P_GROUND OPC	JC70-00332A	1	X	
44	PBA SUB-EMPTY SENSOR	JC92-01511A	1	O	
45	IPR-P_GND SOLENOID FEED	JC70-00336A	1	X	
46	IPR-P_GROUND SCF MAIN	JC70-00334A	1	X	
47	IPR-P_GROUND REGI ROLLER	JC70-00333A	1	X	
48	ELA HOU-VARISTOR	JC96-01772A	1	X	
49	IPR-P_GROUND MOTOR MAIN2	JC70-00330A	1	X	
50	IPR-P_GROUND GUIDE TR	JC70-00328A	2	X	
51	CBF HARNESS-INLET	JC39-00246A	1	O	
52	HINGE-M-FRONT GUIDE, DUP	JC61-00666A	1	X	
53	AS-FRAME LSU LOWER	JC81-01727A	1	O	
56	SPRING ETC-GUIDE DEVE	JC61-70932A	2	X	
57	PMO-GUIDE DEVE L	JC72-00317A	1	X	
58	PMO-GUIDE DEVE R	JC72-00318A	1	X	
59	TERMINAL-P_TR CARDINAL	JC65-00005A	1	X	
60	GND-PAPER-SIZE	JC70-00467A	1	X	
61	IPR-P_GROUND PLATE PAPER	JC70-00339A	1	X	
62	PBA SUB-EXIT SENSOR	JC92-01512A	1	O	
63	TERMINAL-P_HV CARDINAL	JC65-00006A	3	X	

Frame Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
64	CBF HARNESS-HVPS	JC39-00247A	1	X	
65	CBF HARNESS-CONNECTOR	JC39-00259A	1	X	
66	CBF HARNESS-SENSOR	JC39-00261A	1	X	
67	ELA UNIT-PICK UP	JC96-02683A	1	O	
67-1	FRAME-M-PICKUP	JC61-00641A	1	X	
67-2	HOUSING-M-PICKUP	JC61-00636A	1	X	
67-3	RUBBER-PICK UP	JC73-00127A	2	O	
67-4	SPRING ETC-EXTENSION	JC61-70950A	1	X	
67-5	PMO-BUSHING FEED	JC72-00382B	2	X	
67-6	HOUSING-M-FEED	JC61-00637A	1	X	
67-7	RUBBER-FEED	JC73-00128A	1	X	
67-8	BEARING-PICK UP	JC66-10202A	3	X	
67-9	SPRING ETC-KNOCK UP MP	JC61-70913A	2	X	
67-10	SHAFT-FEED	JC66-00592A	1	X	
67-11	PMO-BEARING SHAFT	JC72-41191B	1	X	
67-12	SHAFT-M-PICK UP	JC66-00440A	1	X	
67-13	RING-E	6044-000125	2	X	
67-14	SHEET-COVOR-PICK UP	JC63-00293A	2	X	
68	ELA UNIT-RETARD	JC96-02682A	1	O	
68-1	FRAME-M-RETARD	JC61-00640A	1	X	
68-2	HOUSING-M-RETARD	JC61-00635A	1	X	
68-3	BUSH-M-RETARD	JC61-00652A	2	X	
68-4	SPRING ETC-PAD	JC61-00013A	2	X	
68-5	HOLDER-M-RETARD	JC61-00638A	1	X	
68-6	RING-E	6044-000231	2	X	
68-7	SPRING-TS	6107-001157	1	X	
68-8	PMO-HUB IN RETARD	JC72-00994A	1	X	
68-9	PMO-HUB OUT RETARD	JC72-00993A	1	X	
68-10	RUBBER-RETARD	JC73-00129A	1	X	
68-11	SHAFT-RETARD	JC66-00590A	1	X	
68-12	SHAFT-HUB IN	JC66-00591A	1	X	
68-13	MEC-BRUSH ANTISTATIC	JC75-00095A	0.25	X	
68-S	SCREW-TAPTITE	6003-000196	2	X	
69	SHAFT-M-COUPLING RETARD	JC66-00439A	1	X	
70	SHAFT-M-GEAR RETARD	JC66-00438A	1	X	
71	GUIDE-M-FRONT	JC61-00801A	1	X	
72	CAP-FUSER-FRAME	JC67-00060A	1	X	
73	BUSH-M-EXIT	JC61-00845A	2	O	
74	GEAR-M-EXIT Z17	JC66-00674A	1	O	

8.4 Fuser Assembly



Fuser Unit Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

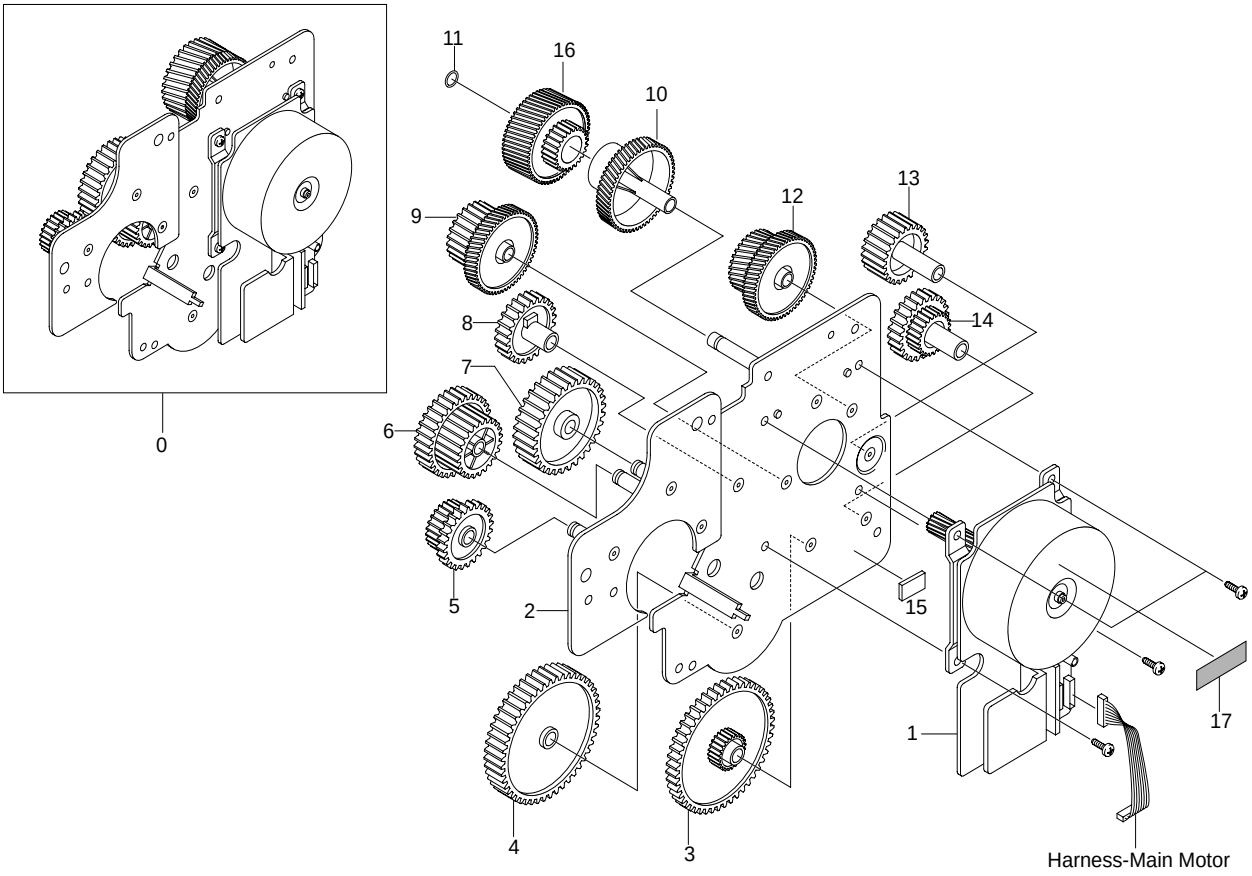
No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-FUSER	JC81-01728A	1	O	⚠ 110V
	ELA UNIT-FUSER	JC81-01729A	1	O	⚠ 220V
1	ELA UNIT-UPPER FUSER	JC96-02694A	1	X	
1-1	THERMISTOR-NTC	1404-001305	1	X	
1-2	SCREW-ASSY MACH	6006-001193	2	X	
1-3	SCREW-TAPTITE	6003-000119	2	X	
1-4	SCREW-TAPTITE	6003-000196	1	X	
1-5	NUT-HEXAGON	6021-000222	2	X	
1-6	SPRING-TS	6107-001159	2	X	
1-7	THERMOSTAT-150	JC47-00005A	1	X	
1-8	SPRING ETC-SAPERATION	JC61-70909A	5	X	
1-9	COVER-M-FUSER	JC63-00110A	1	X	
1-10	IEX-SHAFT IDLE,F/UP	JC70-20901A	2	X	
1-11	ELECTRODE-P-FU_M	JC71-00039A	1	X	
1-12	ELECTRODE-P-FU_R	JC71-00040A	1	X	
1-13	ELECTRODE-P_FU_L	JC71-00041A	1	X	
1-14	PEX-ROLLER F/UP(2)	JC72-20902A	2	X	
1-15	PMO-ROLLER UPPER DP	JC72-40981A	2	X	
1-16	PMO-GUIDE CLAW	JC72-41012B	5	X	
1-17	MEC-BRUSH ANTISTATIC	JC75-00095A	1	X	
1-18	HOLDER-IDLE ROLLER	JC61-00785A	2	X	
1-19	CAP-FUSER L	JC67-00056A	1	X	
1-20	CAP-FUSER R	JC67-00057A	1	X	
2	MEA UNIT-LOWER FUSER	JC97-01718A	1	X	
2-1	SCREW-TAPTITE	6003-000179	2	X	
2-2	SPRING ETC-PR(7300)	JC61-00056A	2	X	
2-3	BUSH-M-HR_R	JC61-00615A	1	X	
2-4	GEAR-FUSER 7300	JC66-40913B	1	X	
2-5	FRAME-P-FUSER	JC61-00621A	1	X	
2-6	ROLLER-HEAT	JC66-00597A	1	X	
2-7	ROLLER-PRESSURE	JC66-00599A	1	X	
2-8	BEARING-PRESSURE/R	JC66-10901A	2	X	
2-9	BEARING-H/R L	JC66-10902A	1	X	
2-10	SPACER-DR.R	JC72-00288B	2	X	
3	MEA UNIT-GUIDE REAR	JC97-01719A	1	X	
3-1	GUIDE-M-REAR	JC61-00620A	1	X	
3-2	SPRING ETC-ACTUATOR	JC61-70903A	1	X	
3-3	SHAFT-EXIT-F/UP	JC66-00402A	1	X	
3-4	GEAR-EXIT	JC66-40209A	1	X	
3-5	LABEL(R)-CAU_HOT_FU	JC68-30928B	1	X	
3-6	PMO-BUSHING TX	JC72-00382A	3	X	
3-7	PMO-ACTUATOR EXIT	JC72-00988A	1	X	
3-8	RMO-RUBBER EXIT_F/UP	JC73-40909B	2	X	

Fuser Unit Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
4	MEA UNIT-BRK GEAR FU	JC97-01720A	1	X	
4-1	RING-E	6044-000231	2	X	
4-2	BRACKET-P-FUSER	JC61-00617A	1	X	
4-3	GEAR-IDLE 33	JC66-00425A	1	X	
4-4	GEAR-IDLE 23	JC66-00426A	1	X	
5	LAMP-HALOGEN	4713-001186	1	X	⚠ 110V
	LAMP-HALOGEN	4713-001187	1	X	⚠ 220V
6	SCREW-ASSY MACH	6006-001193	2	X	
7	SCREW-TAPTITE	6003-000179	6	X	
8	NUT-HEXAGON	6021-000222	2	X	
9	LABEL(R)-LV FUSER	JC68-00408A	1	X	⚠ 110V
	LABEL(R)-HV FUSER	JC68-00407A	1	X	⚠ 220V
10	LABEL(R)-FUSER TOUCH	JC68-01139A	2	X	

8.5 Main Driver Assembly

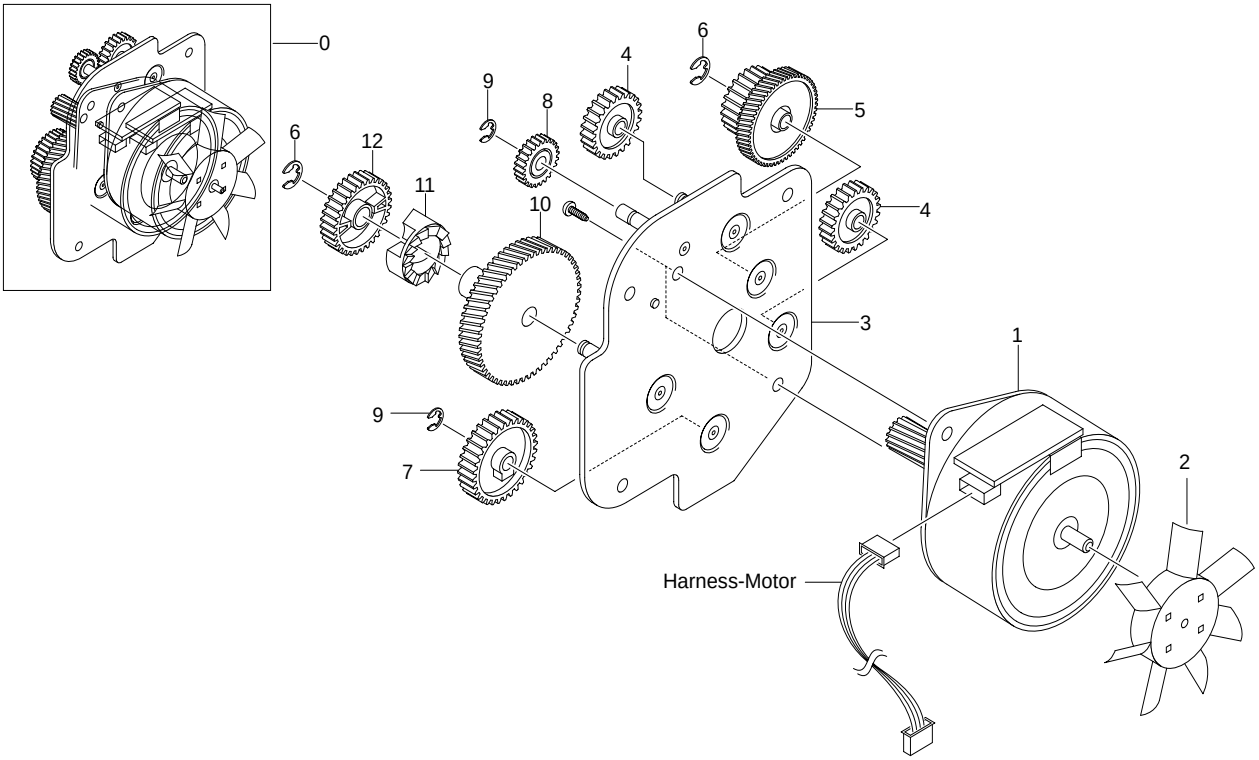


Main Driver Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-MOTOR MAIN CARDINAL	JC96-02725B	1	O	
1	MOTOR DC-BLDC CARDINAL	JC31-00024A	1	X	
2	BRACKET-P-MAIN	JC61-00622A	1	X	
3	GEAR-RDCN PICK_UP	JC66-00411A	1	X	
4	GEAR-PICK_UP DRV	JC66-00412A	1	X	
5	GEAR-RDCN RETARD	JC66-00410A	1	X	
6	GEAR-RDCN FEED	JC66-00409A	1	X	
7	GEAR-MP DRV	JC66-00413A	1	X	
8	GEAR-REGI IDLE	JC66-00408A	1	X	
9	GEAR-RDCN REGI	JC66-00407A	1	X	
10	GEAR-OPC DRV INNER	JC66-00644A	1	X	
11	WASHER-PLAIN	6031-001255	2	X	
12	GEAR-RDCN OPC	JC66-00405A	1	X	
13	GEAR-DUPLEX IDLE	JC66-00415A	1	X	
14	GEAR-RDCN DUPLEX	JC66-00414A	1	X	
15	FOOT-SF4000	JG61-40001A	1	X	
16	GEAR-OPC DRV OUTER	JC66-00645A	1	X	
17	LABEL(P)-CAUTION MOTOR	JC68-00261A	1	X	
S	SCREW-TAPTITE	6003-000301	4	X	

8.6 Exit Driver Assembly

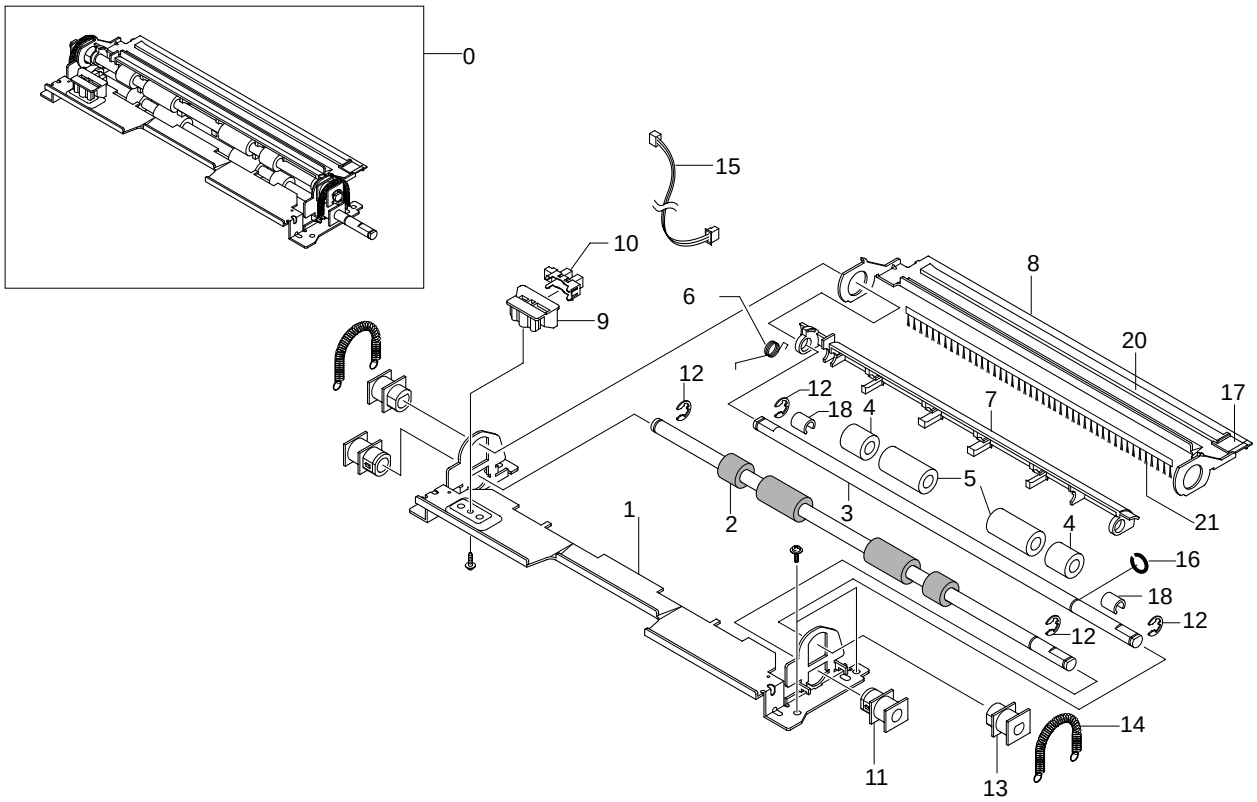


Exit Drive Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-MOTOR EXIT CARDINAL	JC96-02857A	1	O	
1	MOTOR-STEP-CARDINAL 2	JC31-00028C	1	X	
2	PMO-IMPELLER_DRV	JC72-00825A	1	X	
3	BRACKET-P-EXIT	JC61-00623A	1	X	
4	GEAR-DP,IDLE	JC66-40911A	2	X	
5	GEAR-RDCN EXIT	JC66-00419A	1	X	
6	RING-E	6044-000231	2	X	
7	GEAR-FUSER IDLE	JC66-00418A	1	X	
8	GEAR-EXIT/U,ID	JC66-40211B	1	X	
9	RING-E	6044-000125	2	X	
10	GEAR-RDCN FUSER IN	JC66-00416A	1	X	
11	GEAR-HUB CLUTCH	JC66-00340A	1	X	
12	GEAR-RDCN FUSER OUT	JC66-00417A	1	X	
S	SCREW-MACHINE	6001-000131	2	X	

8.7 Regi Assembly

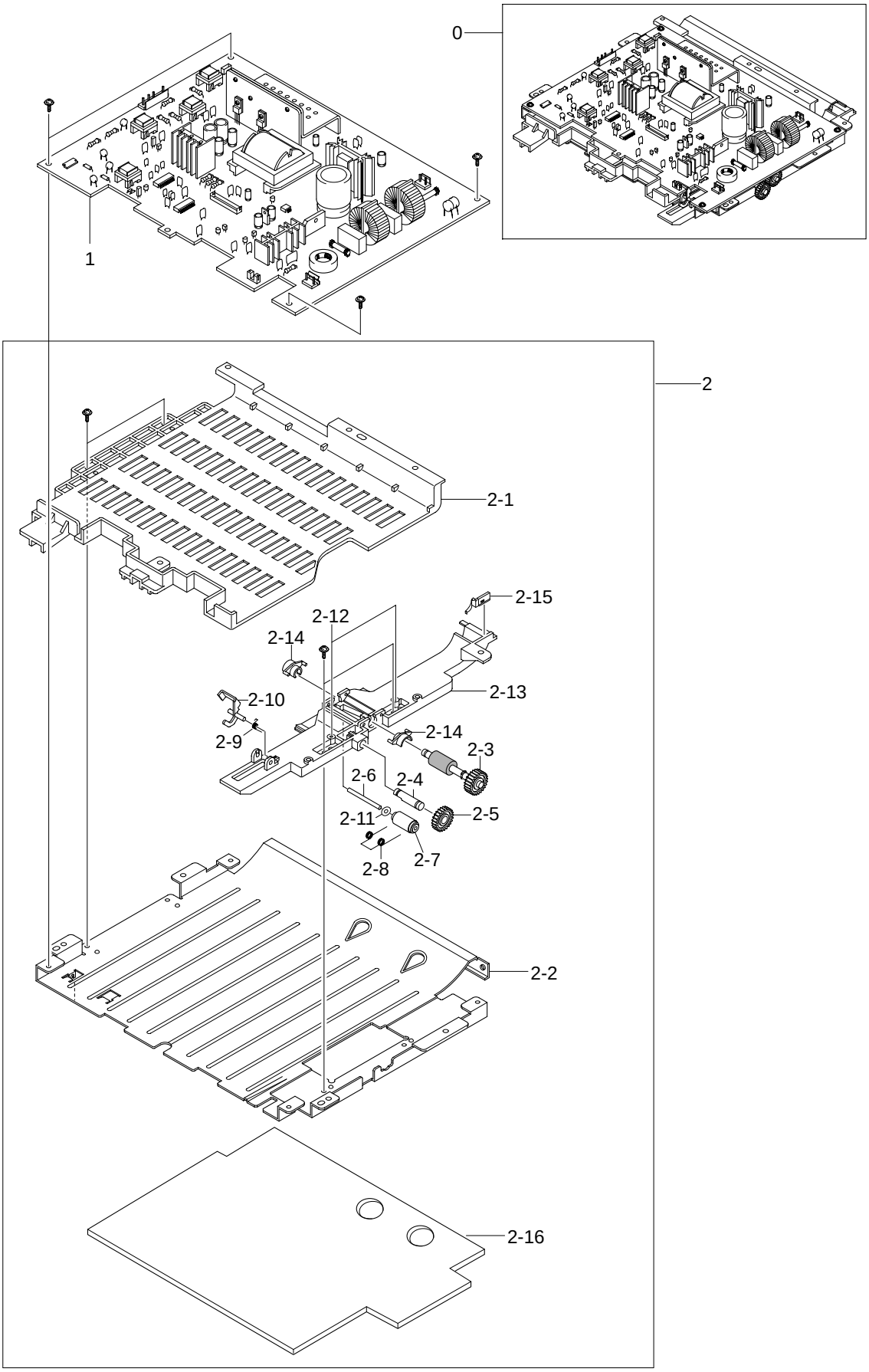


Regi Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-REGI	JC96-02626A	1	O	
1	GUIDE-P_REGI LOWER	JC61-00674A	1	X	
2	ROLLER-REGI LOWER L	JC66-00450A	1	X	
3	SHAFT-REGI UPPER	JC66-00446A	1	X	
4	ROLLER-M-REGI IDLE S	JC66-00648A	2	X	
5	ROLLER-M-REGI IDLE L	JC66-00647A	2	X	
6	SPRING-TS	6107-001158	1	X	
7	PMO-ACTUATOR REGISHUTTER	JC72-00998A	1	X	
8	GUIDE-P_REGI PLATE	JC61-00670A	1	X	
9	HOLDER-M-SENSOR	JC61-00672A	1	X	
10	PHOTO-INTERRUPTER	0604-001095	1	O	
11	BUSH-M-ROLLER REGI L	JC61-00668A	2	X	
12	RING-E	6044-000231	4	X	
13	BUSH-M-ROLLER REGI U	JC61-00669A	2	X	
14	SPRING-ES	6107-001155	2	X	
15	CBF HARNESS-MP EMPTY	JC39-00256A	1	X	
16	WASHER-PLAIN	6031-001255	1	X	
17	CAP-M-WIRE PTL UPPER	JC67-00035A	1	X	
18	CAP-M_BUSHING ACTUATOR	JC67-00047A	2	X	
19	CAP-P_BUSHING REGI LOWER	JC67-00038A	2	X	
20	PBA MAIN-PTL1	JC92-01475A	1	X	
21	BRUSH-ANTISTATIC	JC75-00095A	1	X	
S	SCREW-TAPTITE	6003-000196	1	X	

8.8 SMPS Assembly

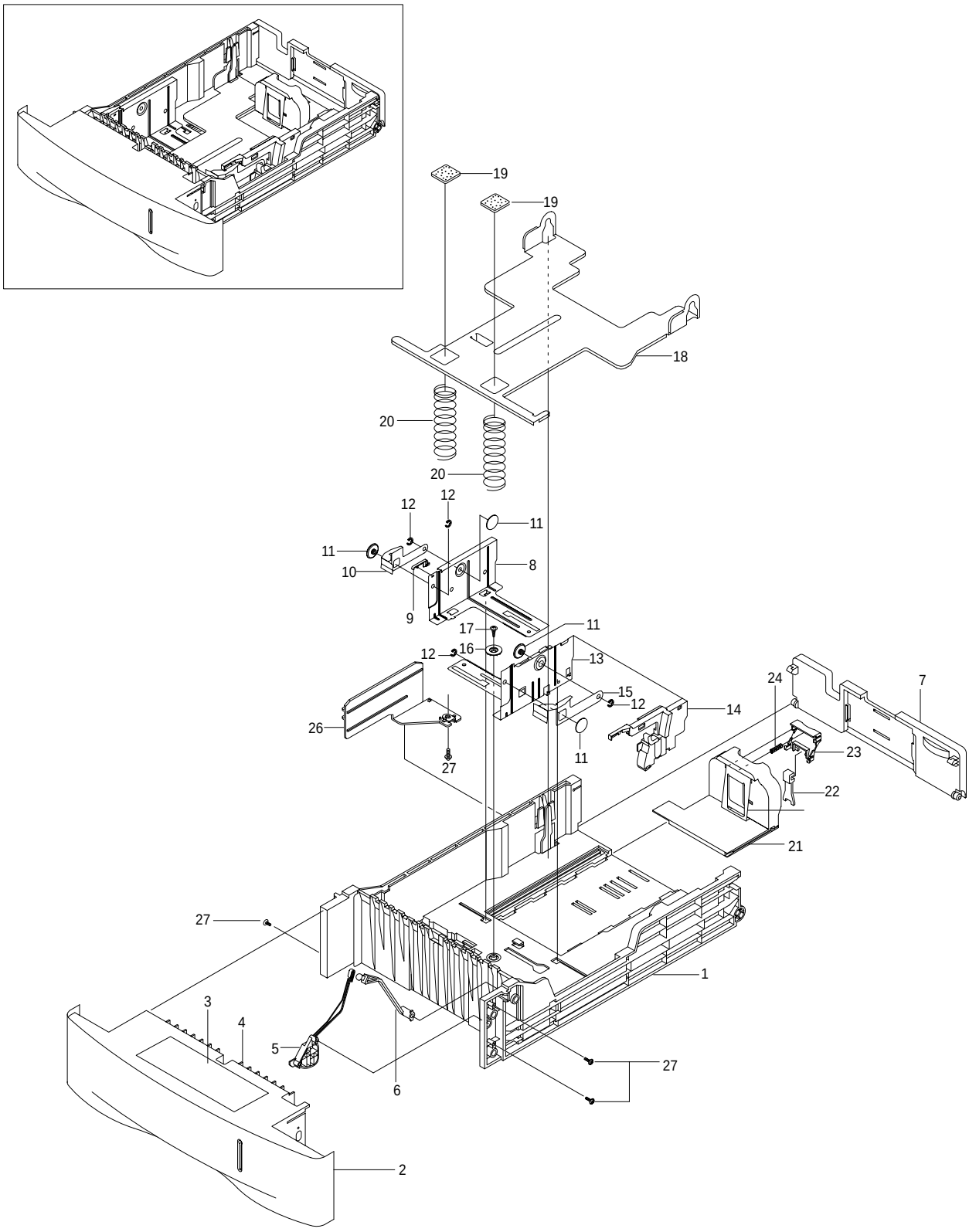


SMPS Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA HOU-SMPS_HVPS_V1(110V)	JC96-02779A	1	O	⚠ 110V
	ELA HOU-SMPS_HVPS_V2(220V)	JC96-02777A	1	O	⚠ 220V
1	SMPS-V1_HVPS	JC44-00052A	1	X	⚠ 110V
	SMPS-V2_HVPS	JC44-00053A	1	X	⚠ 220V
2	MEA UNIT-DUPLEX	JC97-01714A	1	O	
2-1	GUIDE-M-LEFT, DUP	JC61-00664A	1	X	
2-2	GUIDE-P-BOTTOM, DUP	JC61-00661A	1	X	
2-3	MEA UNIT-ROLLER FEED, DUP	JC97-01713A	1	X	
2-4	ICT-STUD DRV GEAR, DUP	JC70-00327A	1	X	
2-5	GEAR-DP,IDLE	JC66-40911A	1	X	
2-6	SHAFT-IDLE ROLL, DUP	JC66-00444A	1	X	
2-7	ROLLER-M-IDLE, DUP	JC66-00442A	1	X	
2-8	SPRING-TS	6107-001156	1	X	
2-9	SPRING ETC-EMPTY	JC61-70965A	1	X	
2-10	PMO-ACTUATOR FEED, DUP	JC72-00997A	1	X	
2-11	PCT-SILP WASHER	JK72-00058A	1	X	
2-12	ICT-STUD PAPER GUIDE, DP	JC70-00457A	2	X	
2-13	GUIDE-M-RIGHT, DUP	JC61-00662A	1	X	
2-14	BUSH-M-FEED, DUP	JC61-00665A	2	X	
2-15	GUIDE-SKEW DUP	JC61-00787A	1	X	
2-16	SHEET GUIDE BOTOM	JC63-00297A	1	X	
S	SCREW-TAPTITE	6003-000266	4	X	
S	SCREW-TAPTITE	6003-000266	2	X	
S	SCREW-TAPTITE	6003-000266	2	X	

8.9 Cassette Assembly

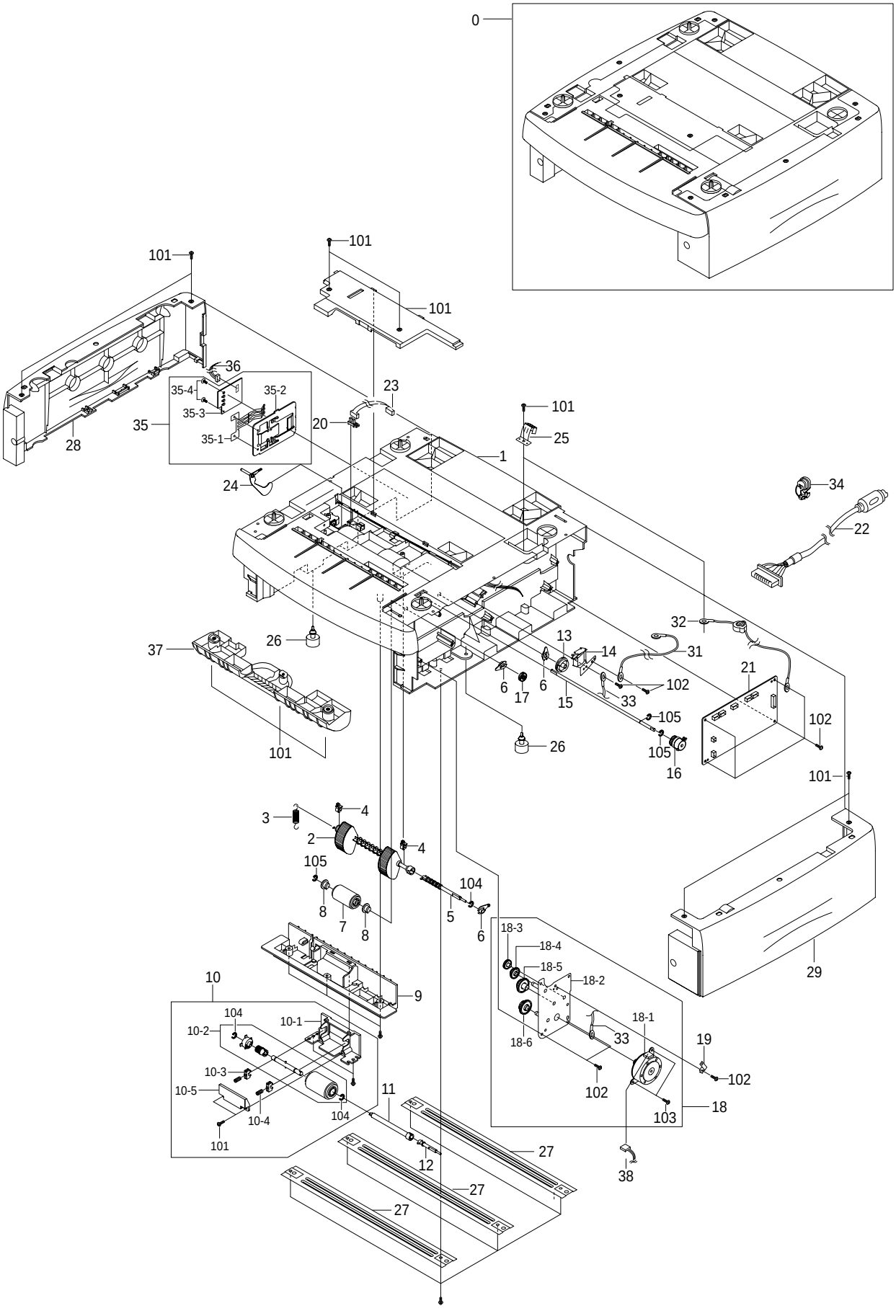


Cassette Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Description	SEC.Code	Q'ty	SA	Remark
0	ELA UNIT-CASSETTE(550)	JC96-02845A	1	O	
1	FRAME-M-CASSETTE	JC61-00642A	1	X	
2	GUIDE-M-HANDLE	JC61-00655A	1	X	
3	LABEL(R)-CASSETTE	JC68-01031A	1	X	
4	GUIDE-M-INNER CST	JC61-00704A	1	X	
5	HOLDER-M-INDICATOR	JC61-00639A	1	X	
6	INDICATOR-M-EMPTY	JC64-00041A	1	X	
7	GUIDE-M-EXTENSION CST	JC61-00644A	1	X	
8	GUIDE-P-SIDE,L	JC61-00647A	1	X	
9	CAP-M-GUIDE SIDE,L	JC67-00037A	1	X	
10	IPR-P-FINGER LEFT	JC70-00325A	1	X	
11	BUSH-M-FINGER,F	JC61-00653A	4	X	
12	WASHER-PLAIN	6031-001255	4	X	
13	GUIDE-P-SIDE,R	JC61-00649A	1	X	
14	GUIDE-M-SIDE LOCK	JC61-00645A	1	X	
15	IPR-P-FINGER RIGHT	JC70-00326A	1	X	
16	GEAR-PINION	JG66-40003A	1	X	
17	SCREW-TAPTITE	6003-000196	6	X	
18	PLATE-P-KNOCK_UP	JC61-00651A	1	X	
19	RPR-PAD CST	JC73-10910A	2	X	
20	SPRING-CS	6107-001174	2	X	
21	GUIDE-M-REAR	JC61-00646A	1	X	
22	GUIDE-M-LOCK A	JC61-00267B	1	X	
23	KNOB-M-REAR	JC64-00042A	1	X	
24	SPRING ETC-REMAIN	JC61-00414A	1	X	
25	GUIDE-P-REAR PAPER CST	JC61-00751A	1	X	
26	GUIDE PAPER SIZE	JC61-00648A	1	X	
27	SCREW-TAPPING	6002-000175	4	X	

8.10 SCF Assembly



SCF Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

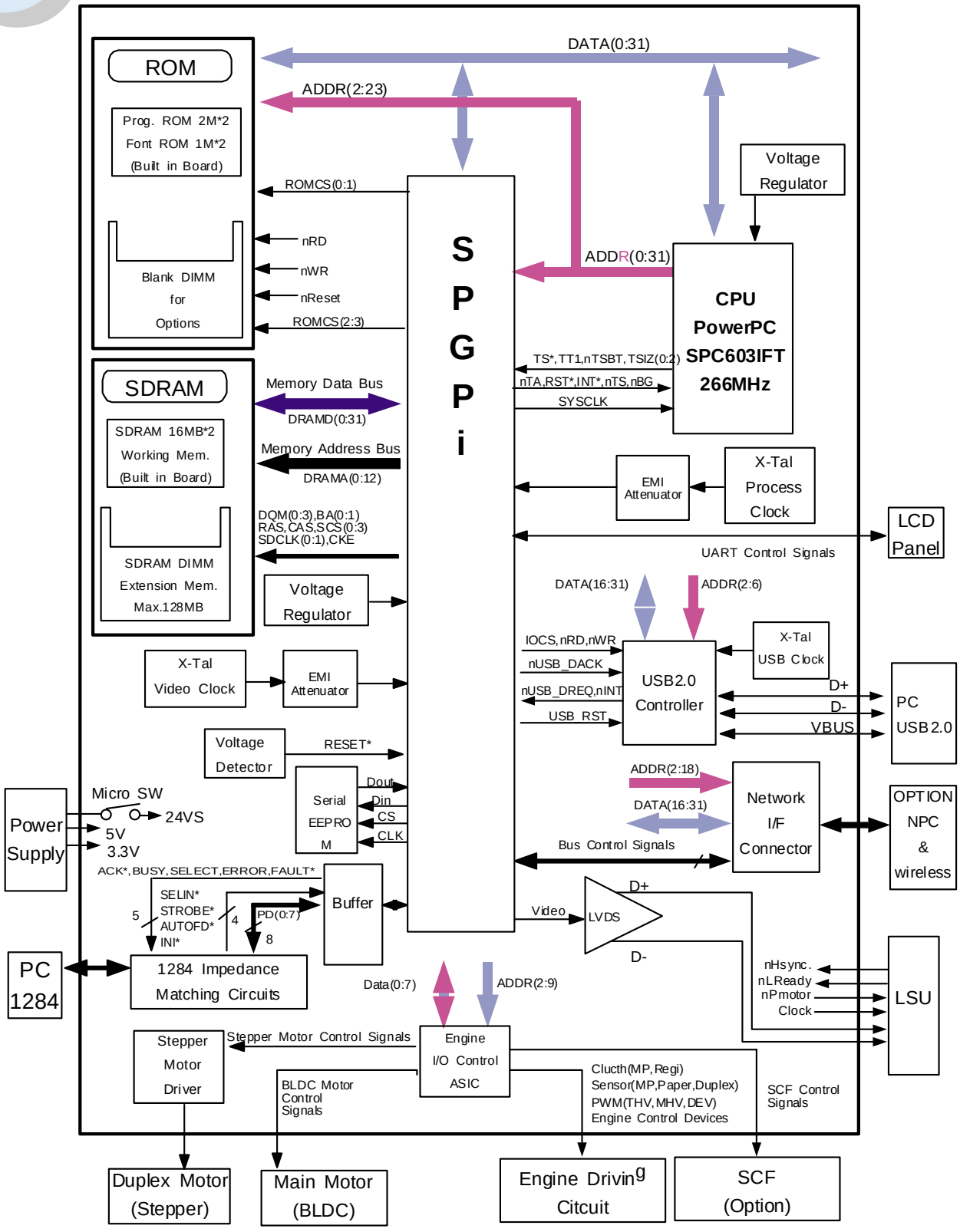
No.	Description	SEC.Code	Q'ty	SA	Remark
0	MEA UNIT-SECOND FEEDER	JC96-02842A	1	X	
1	PMO-FRAME SCF	JC61-00643A	1	X	
2	MEA UNIT-PICK UP	JC96-02683A	1	O	
2-1	HOUSING-PICK UP	JC61-00636A	1	X	
2-2	RUBBER-PICK UP	JC73-00127A	2	X	
3	SPRING ETC-EXTENSION	JC61-70950A	1	X	
4	PMO-BUSHING FEED	JC72-00382B	2	X	
5	SHAFT-PICK UP	JC66-00440A	1	X	
6	PMO-BEARING SHAFT	JC72-41191B	4	X	
7	MEA UNIT ROLLER FEED	JC96-02685A	1	X	
8	BEARING-PICK UP	JC66-10202A	2	X	
9	PMO-GUIDE INNER-SCF	JC61-00650A	1	X	
10	ELA UNIT-RETARD	JC96-02682A	1	O	
11	SHAFT-COUPLING RETARD SCF	JC66-00441A	1	X	
12	SHAFT-GEAR RETARD	JC66-00438A	1	X	
13	GEAR-PICK UP CAM SCF	JC66-00534A	1	X	
14	SOLENOID-MP	JC33-00013A	1	O	
15	SHAFT FEED SCF	JC66-00593A	1	X	
16	CLUTCH-FEED SCF	JC47-00009B	1	O	
17	GEAR-REGI Z25	JC66-00420A	1	X	
18	ELA UNIT-MOTOR SCF	JC96-02858A	1	X	
18-1	MOTOR-SCF	JC31-00005E	1	O	
18-2	IPR-BRK MOTOR SCF	JC61-00624A	1	X	
18-3	GEAR REGI IDLE	JC66-00408A	1	X	
18-4	GEAR SCF RDCN RETARD	JC66-00410A	1	X	
18-5	GEAR SCF RDCN PICKUP	JC66-00428A	1	X	
18-6	GEAR SCF RDCN FEED	JC66-00427A	1	X	
19	IPR-GND SPRING,FEED	JC70-00464A	1	X	
20	PHOTO-INTERRUPTER	0604-001095	1	X	
21	PBA SUB-SCF	JC92-01436A	1	O	
22	CBF HARNESS-SCF	JC39-00248A	1	O	
23	CBF HARNESS-SCF EMPTY	JC39-00250A	1	X	
24	PMO-ACTUATOR EMPTY SCF	JC72-00992A	1	O	
25	IPR-GND TOP	JC70-11028A	1	X	
26	FOOT-ML80	JC61-40001A	2	X	
27	IPR-BAR CROSS BOTTOM	JC71-00042A	3	X	
28	PMO-COVER L-SCF	JC63-00112A	1	X	
29	PMO-COVER R-SCF	JC63-00113A	1	X	
30	PMO-COVER DUMMY-SCF	JC63-00114A	1	X	
31	CBF HARNESS-SCF GND	JC39-40608A	1	X	
32	CBF HARNESS-LIU GND	JB39-00103A	1	X	
33	CBF HARNESS-OPE	JC39-40532A	1	X	
34	BUSH-CABLE	JC61-00804A	1	X	

SCF Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

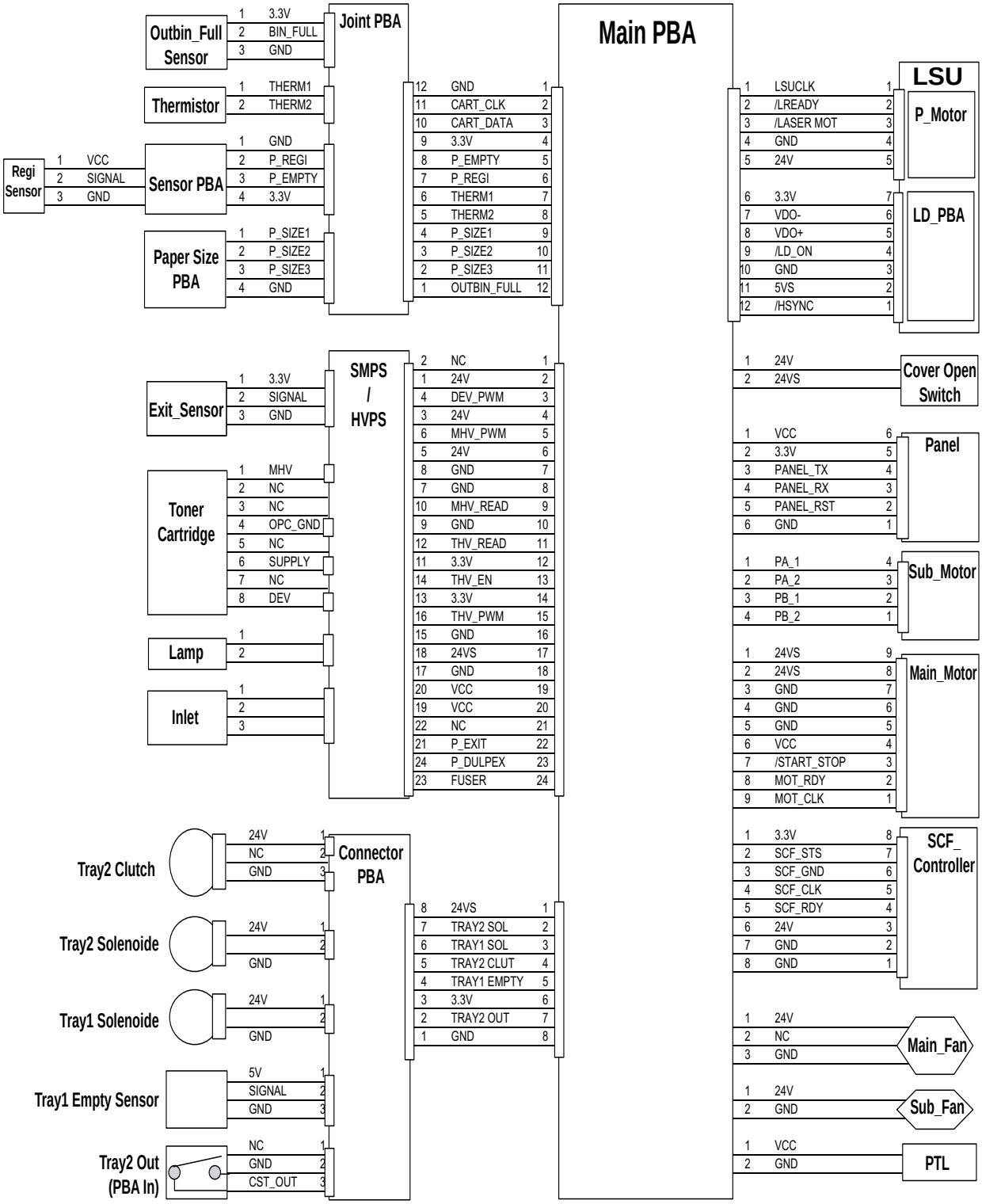
No.	Description	SEC.Code	Q'ty	SA	Remark
35	ELA HOU-CST SENSOR HAWK16	JC96-02127A	1	X	
35-1	IPR-PLATE SENSOR	JC70-00192A	1	X	
35-2	IPR-BRACKET SENSOR	JC70-00195A	1	X	
35-3	PBA SUB-CASSETTE	JC92-01336A	1	X	
35-4	SCREW-TAPTITE	6003-000266	2	X	
36	CBF HARNESS-SCF PAPER SIZE	JC39-00297A	1	X	
37	CBF HARNESS-MOTOR	JC39-00157A	1	X	
38	GUIDE-M-PAPER PATH	JC61-00803A	1	X	
101	SCREW-TAPTITE	6003-000196	25	X	
102	SCREW-TAPTITE	6003-000259	9	X	
103	SCREW-MACHINE	6001-000131	2	X	
104	RING-E	6044-000231	3	X	
105	RING-E	6044-000125	3	X	

9. Block Diagram



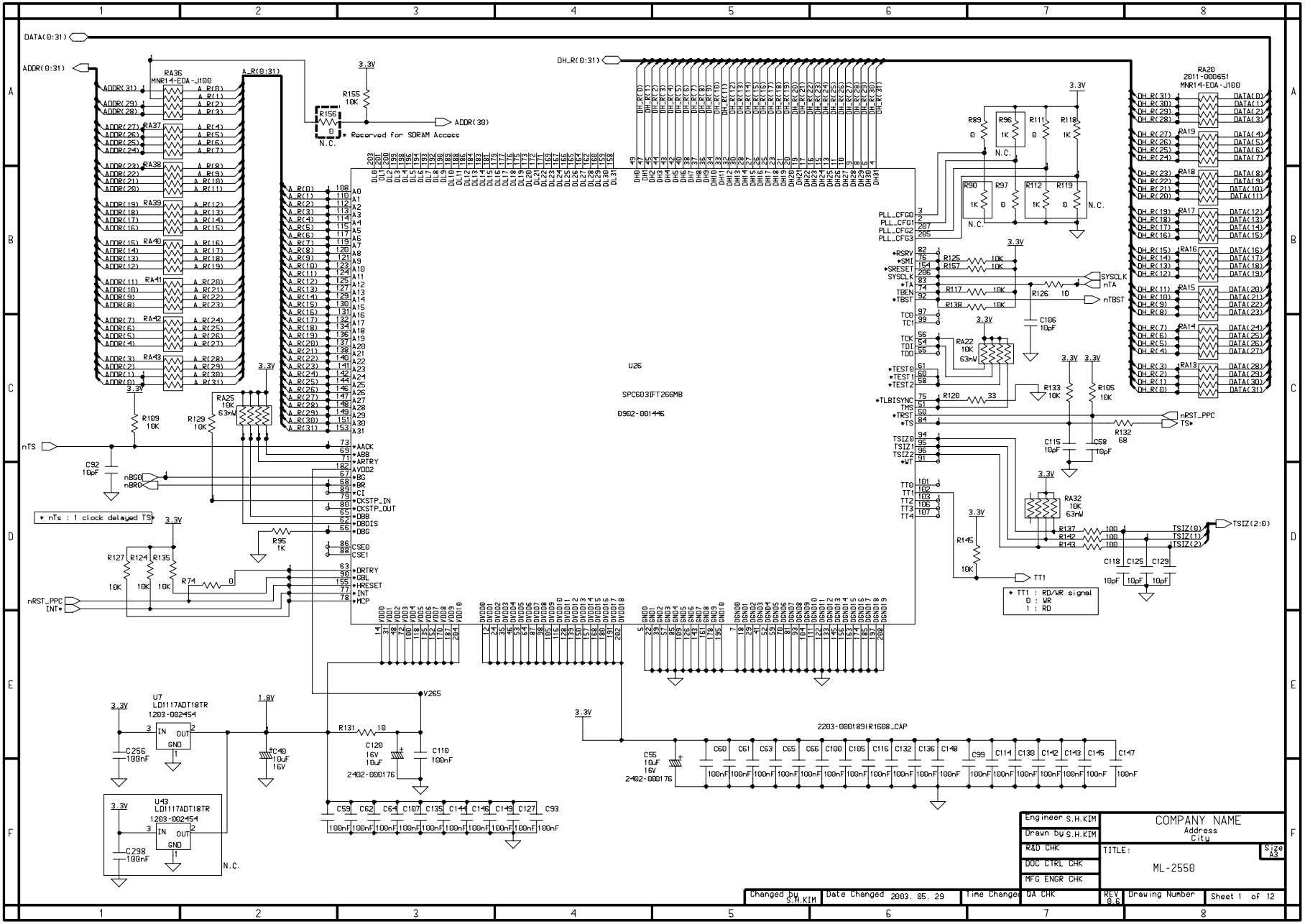
Memo

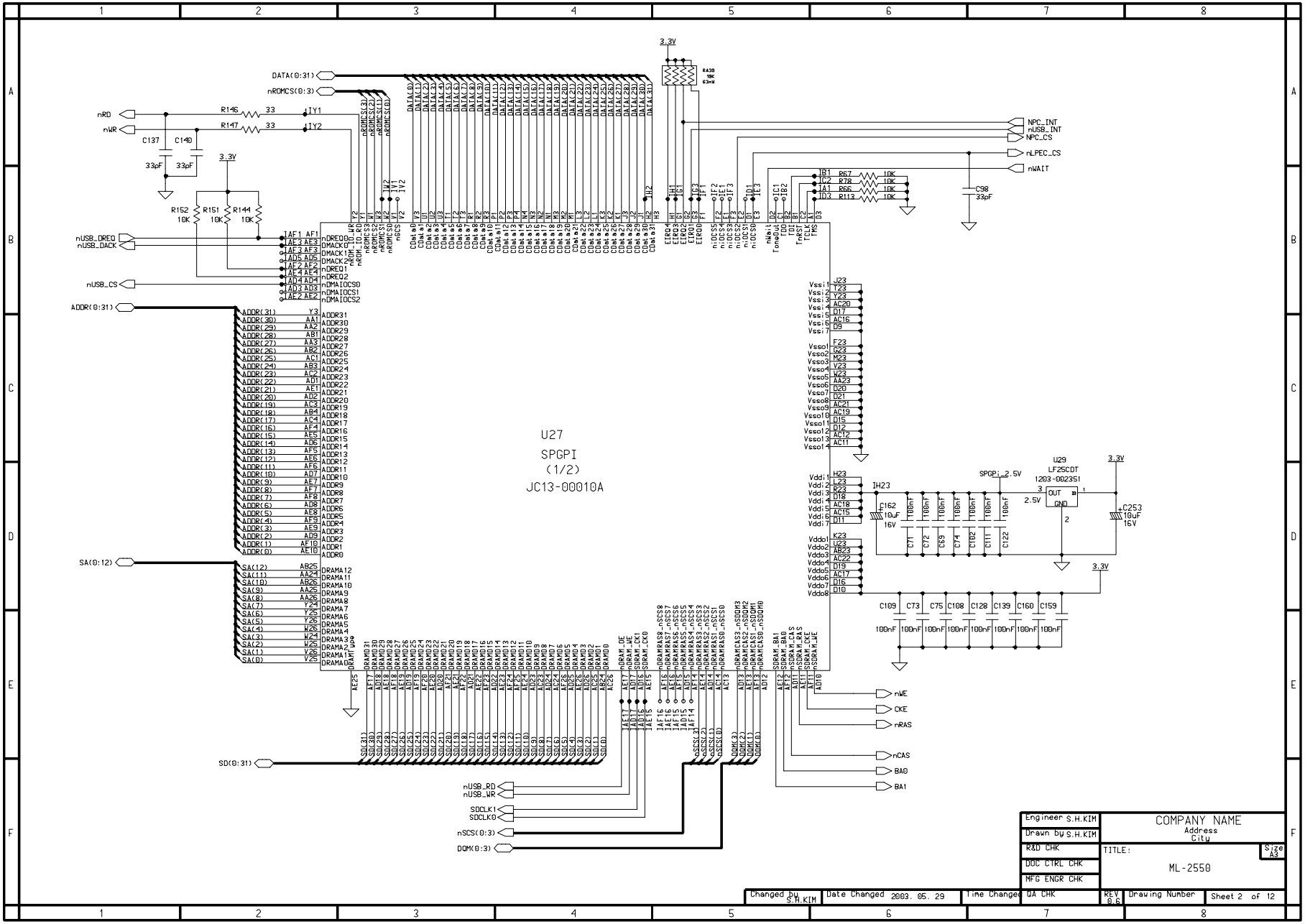
10. Connection Diagram

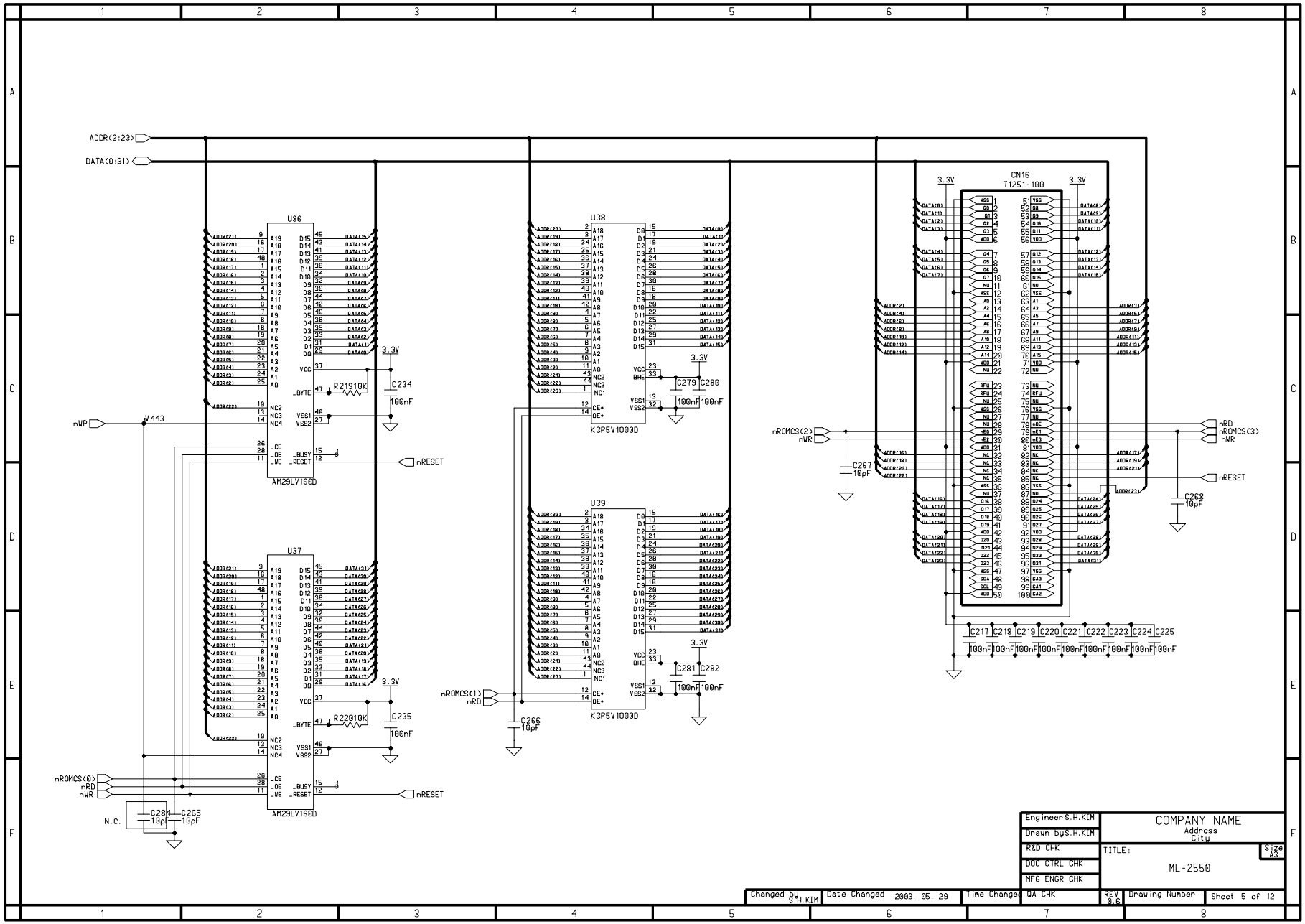


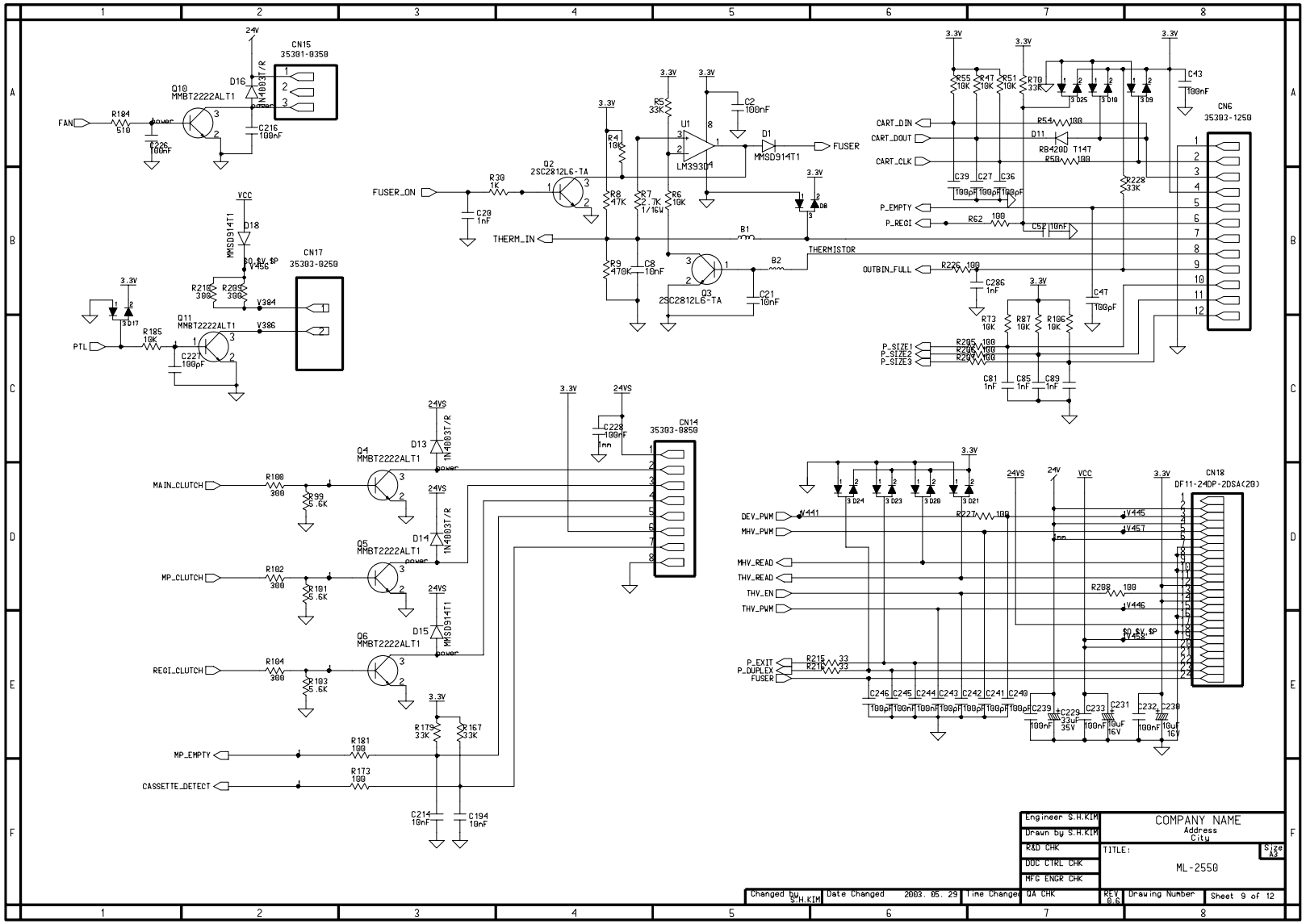
Memo

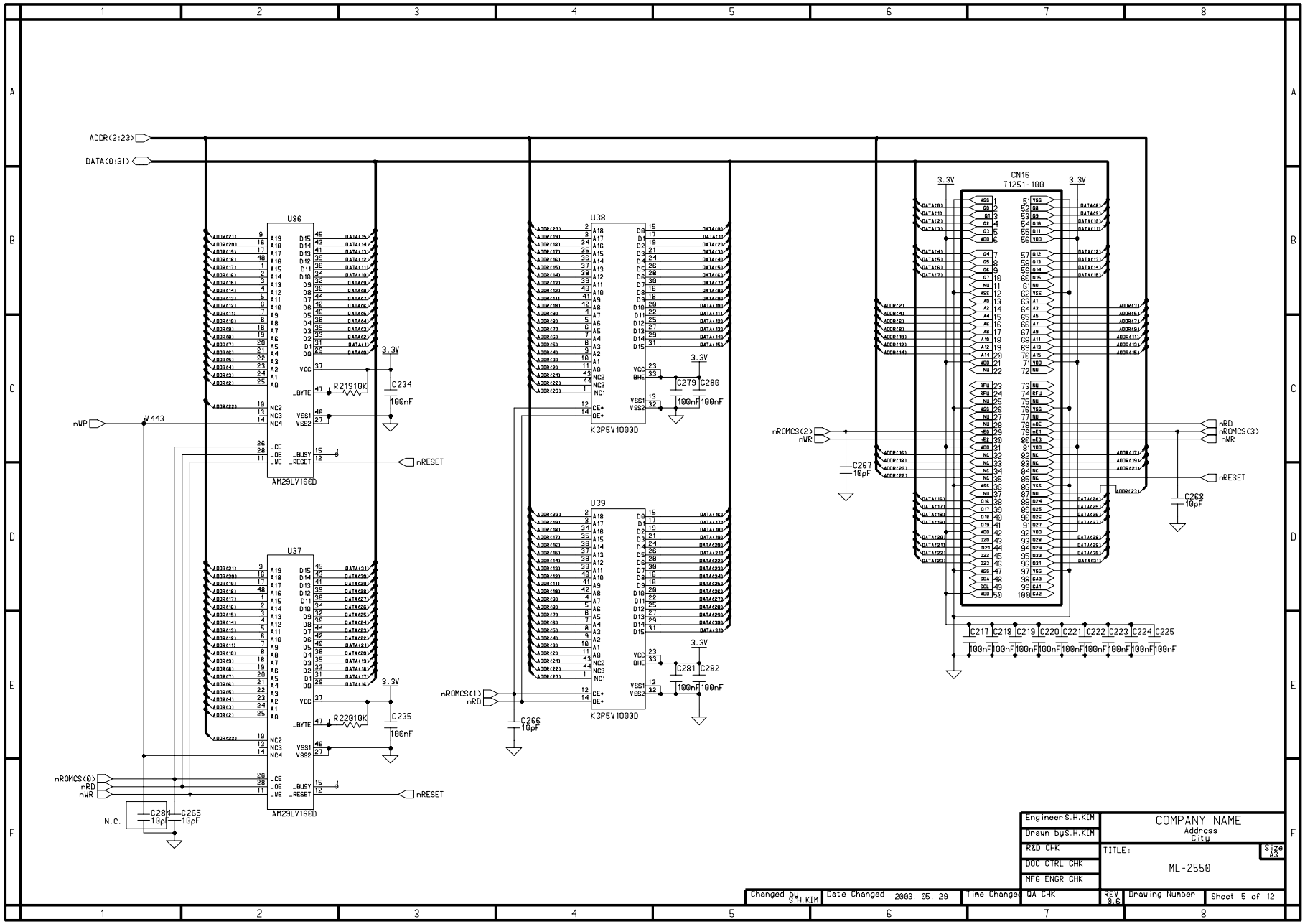
Main Circuit Diagram(1/9)

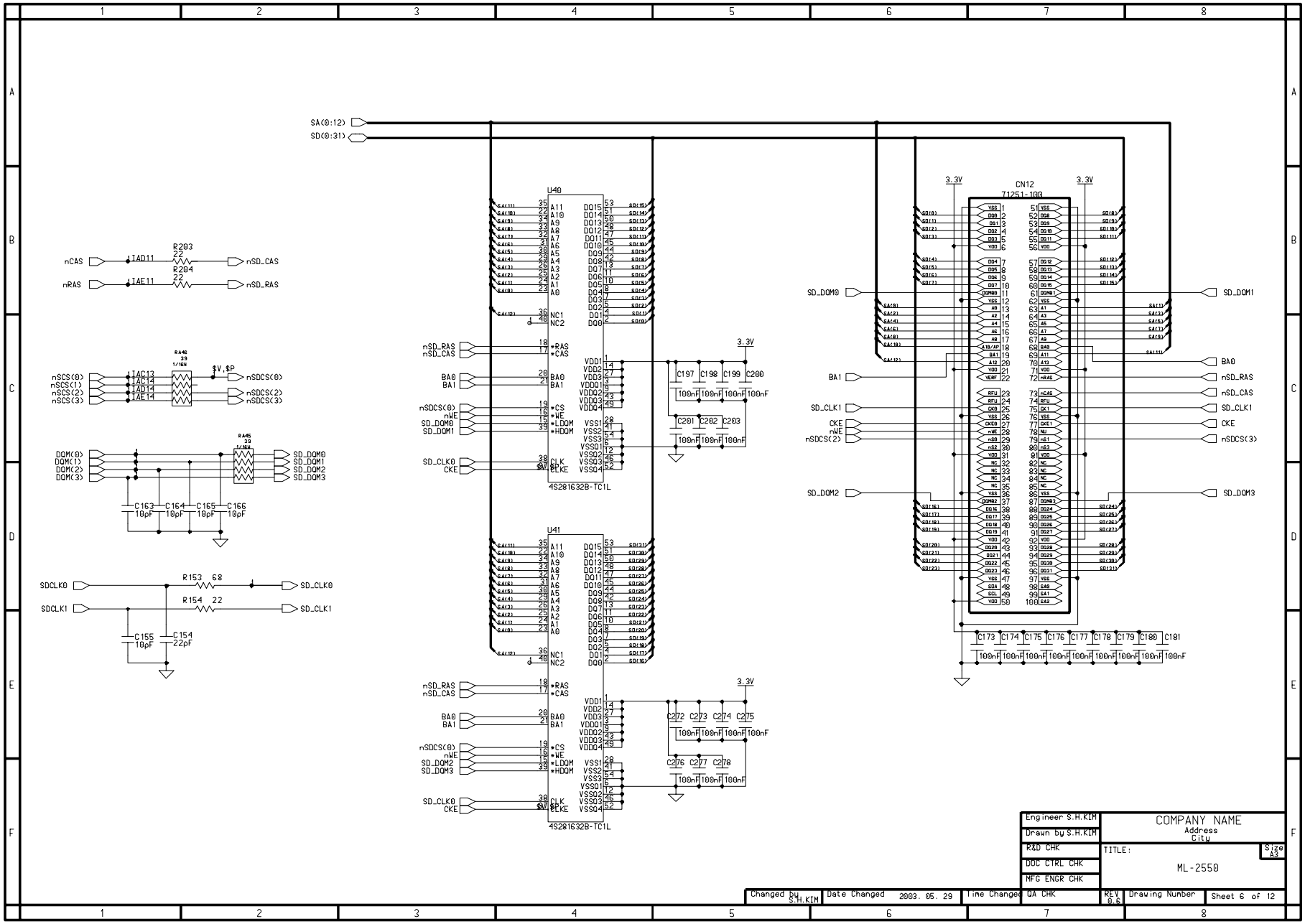


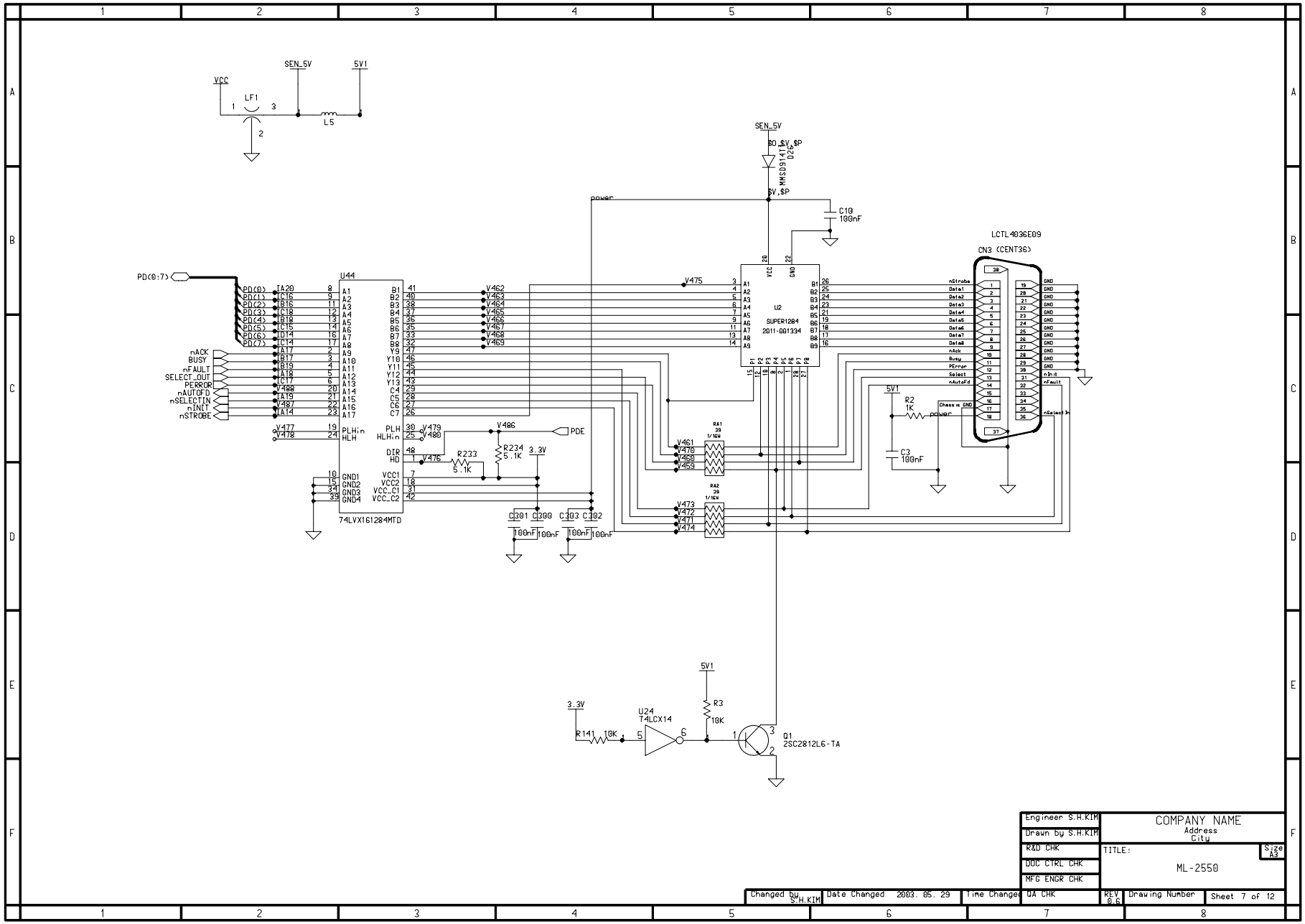


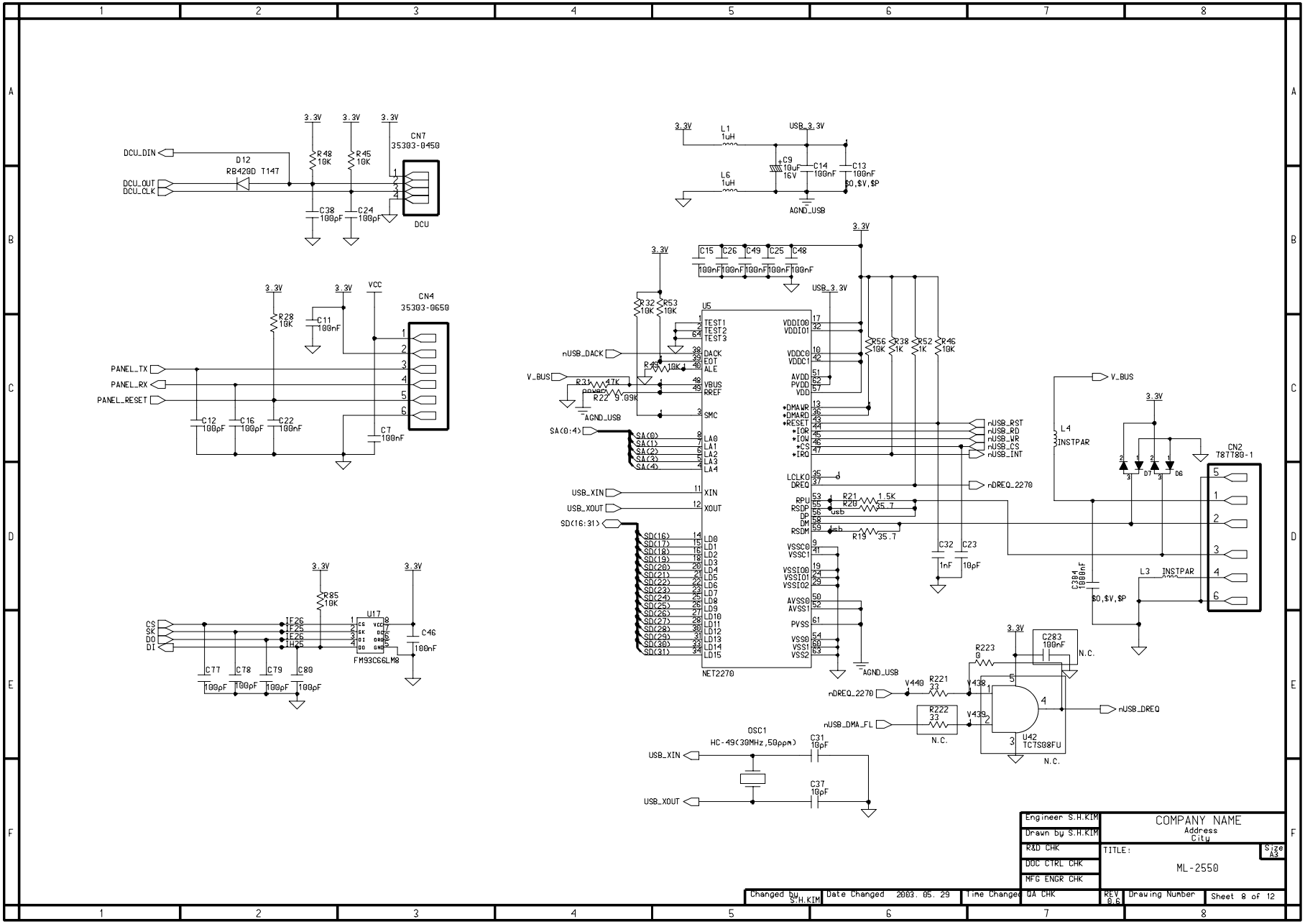


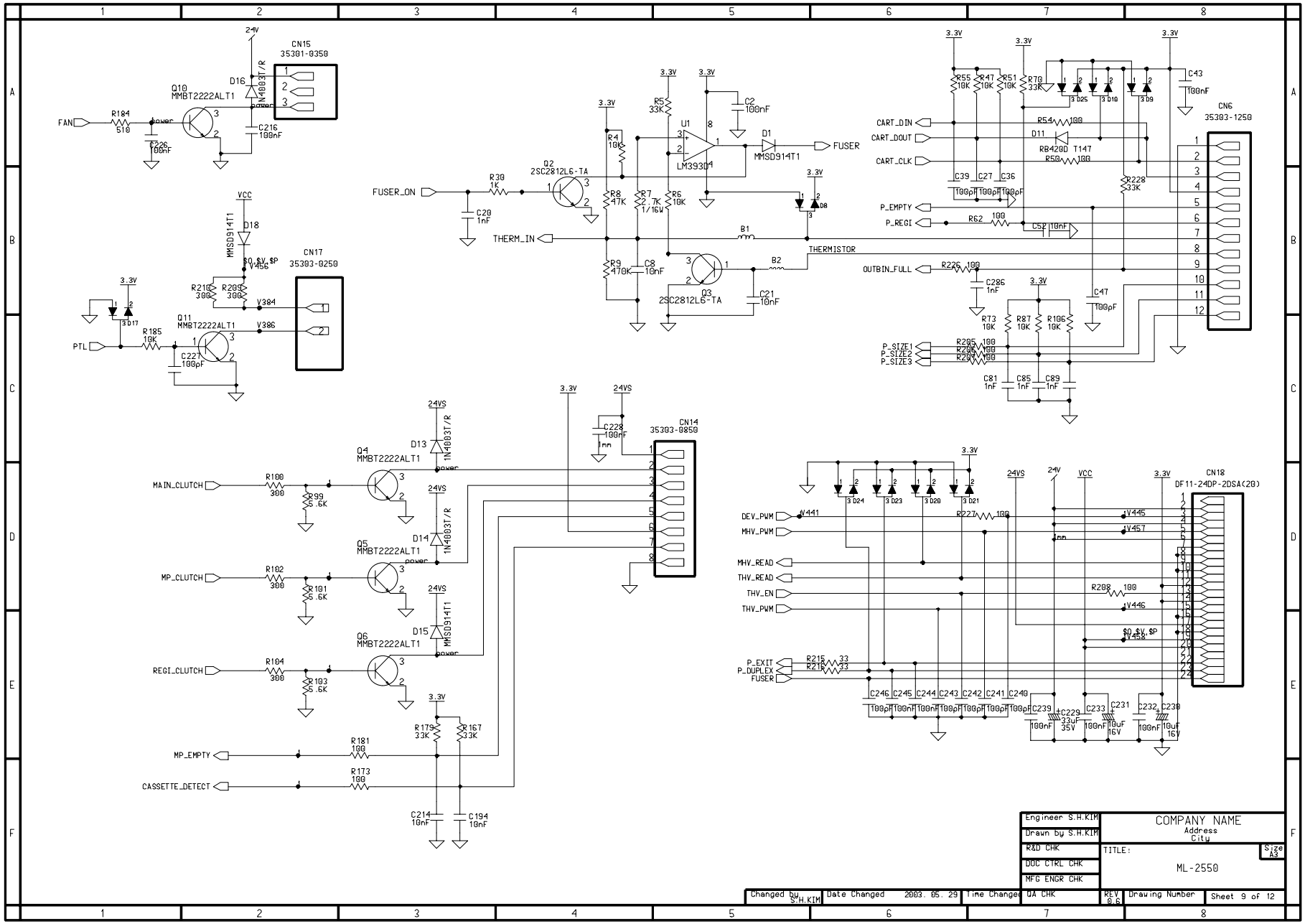


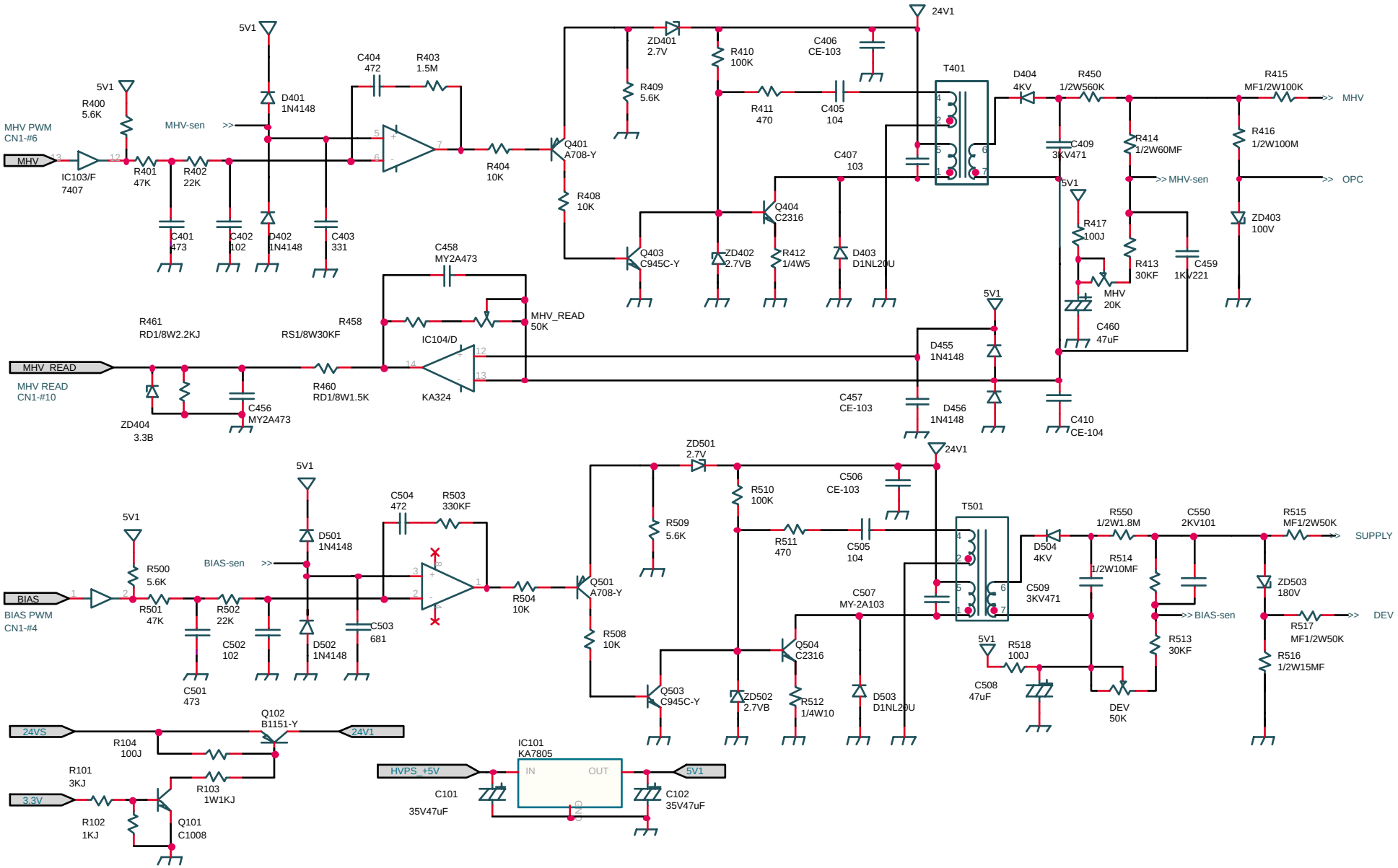


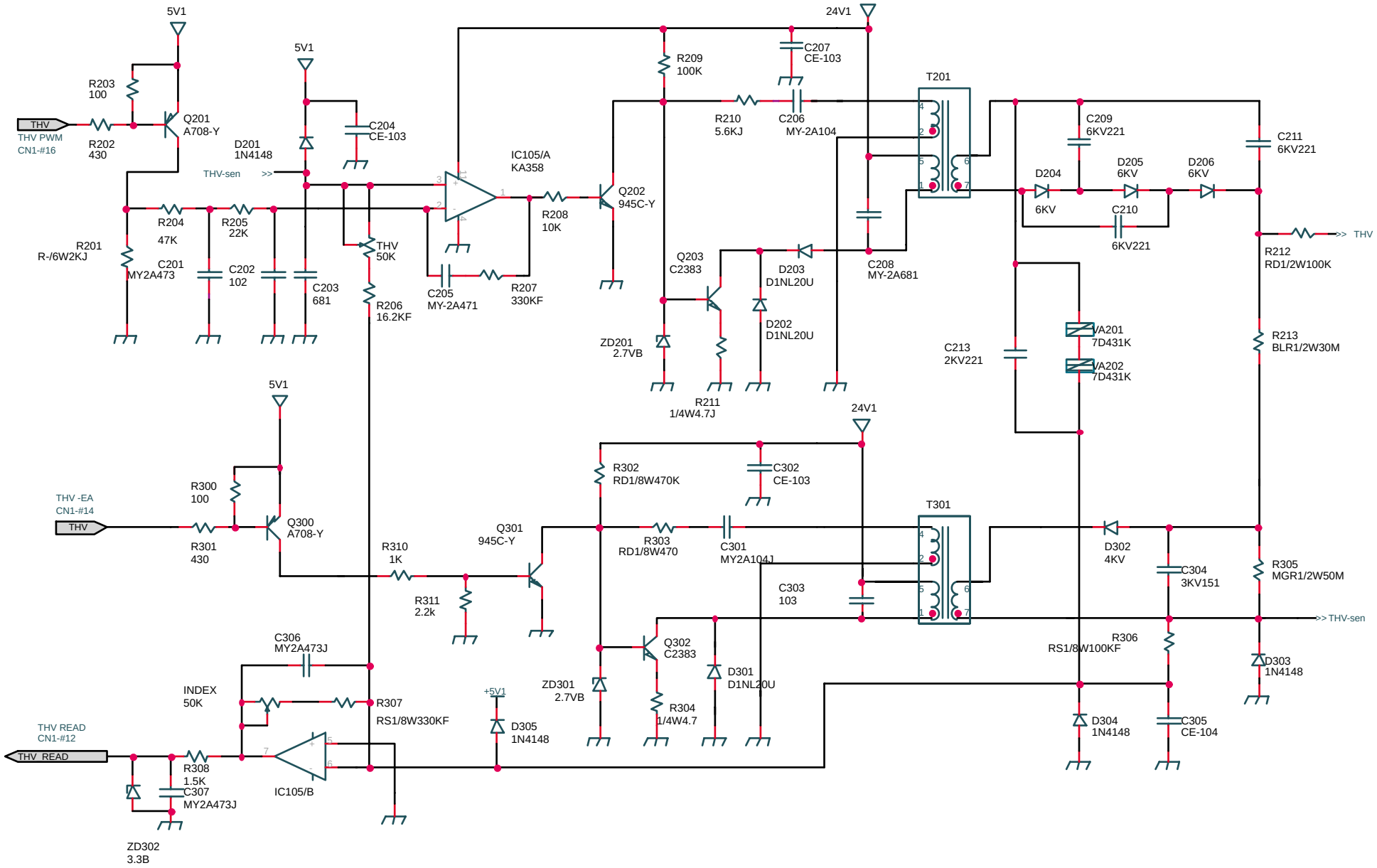


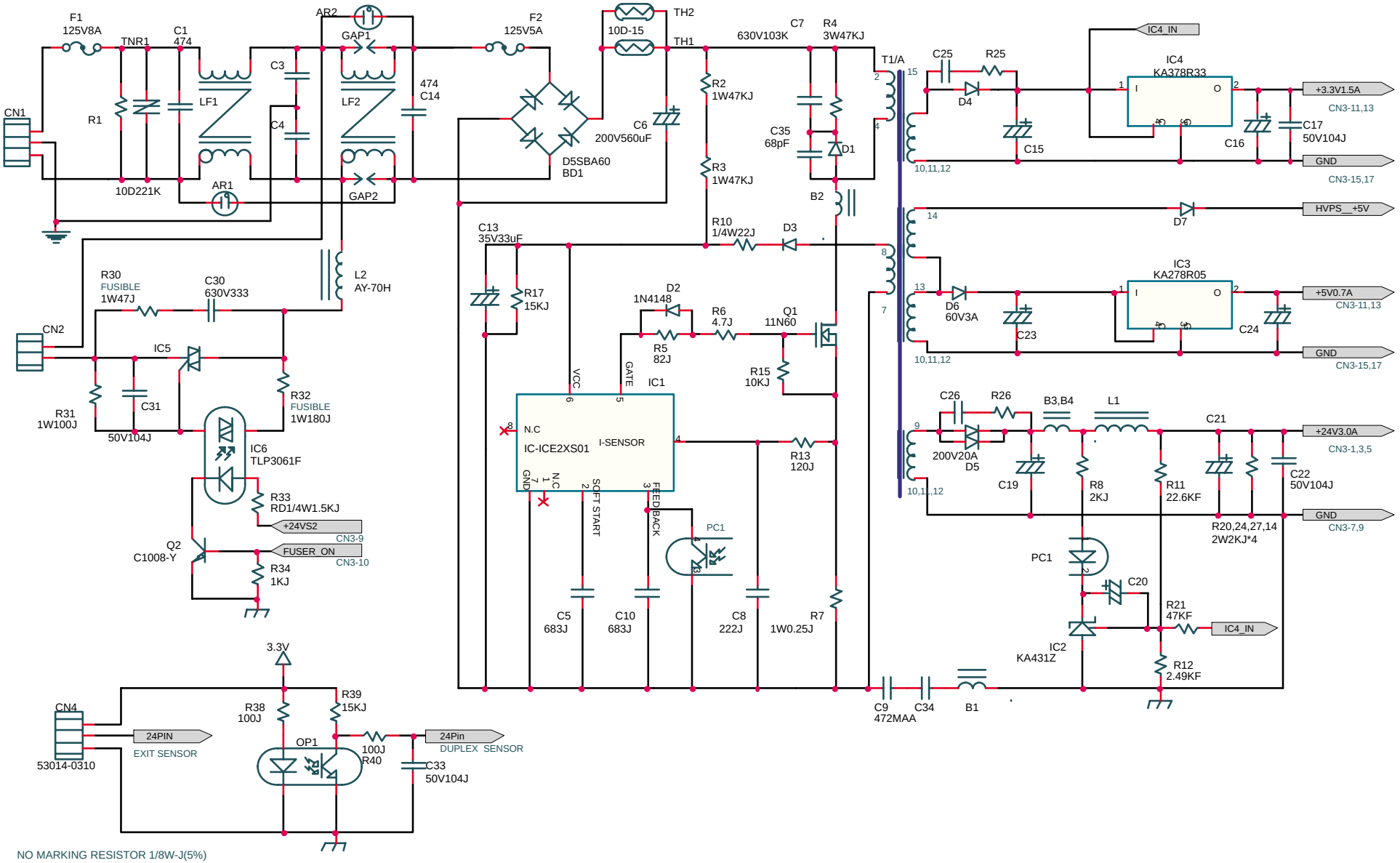




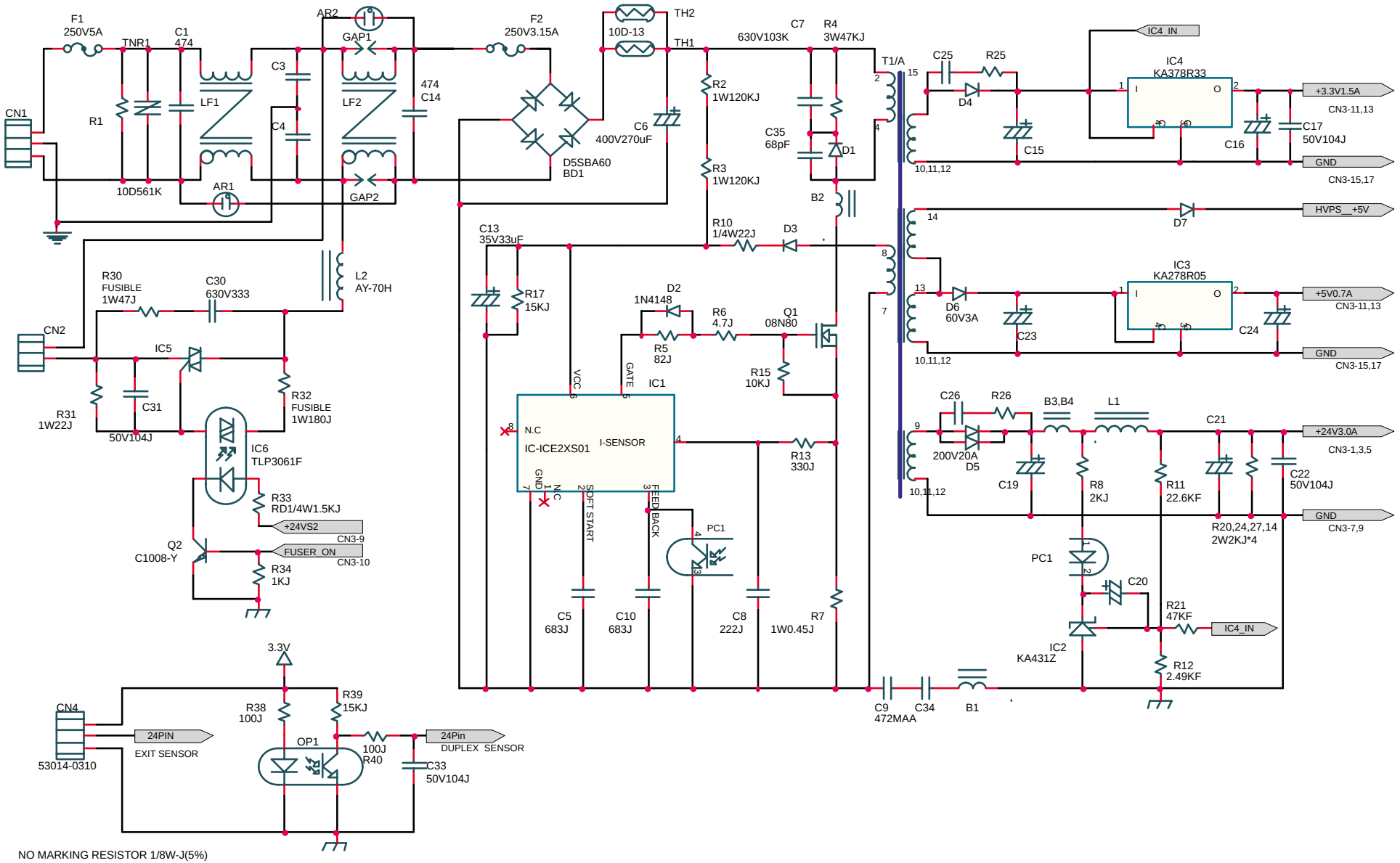




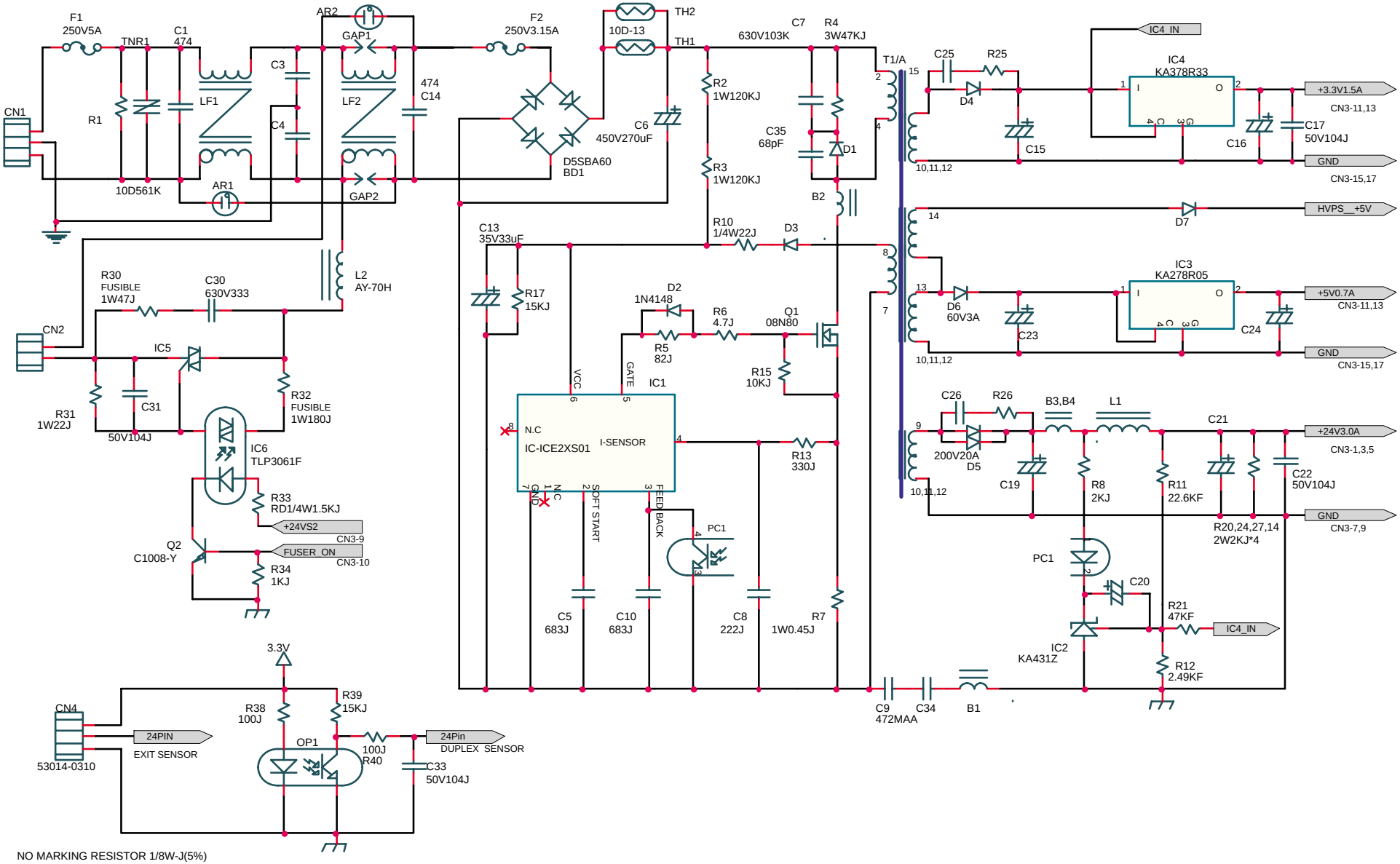


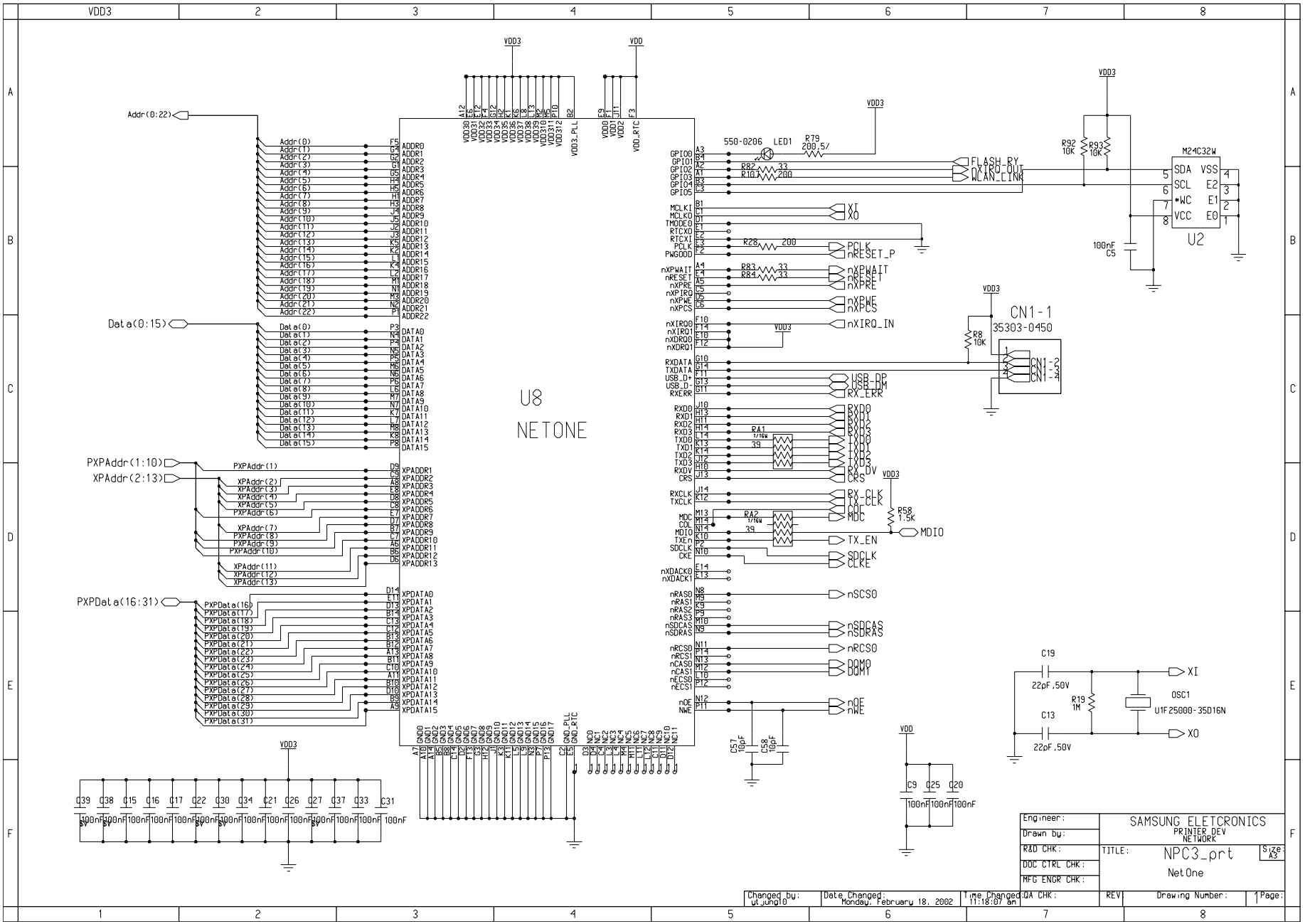


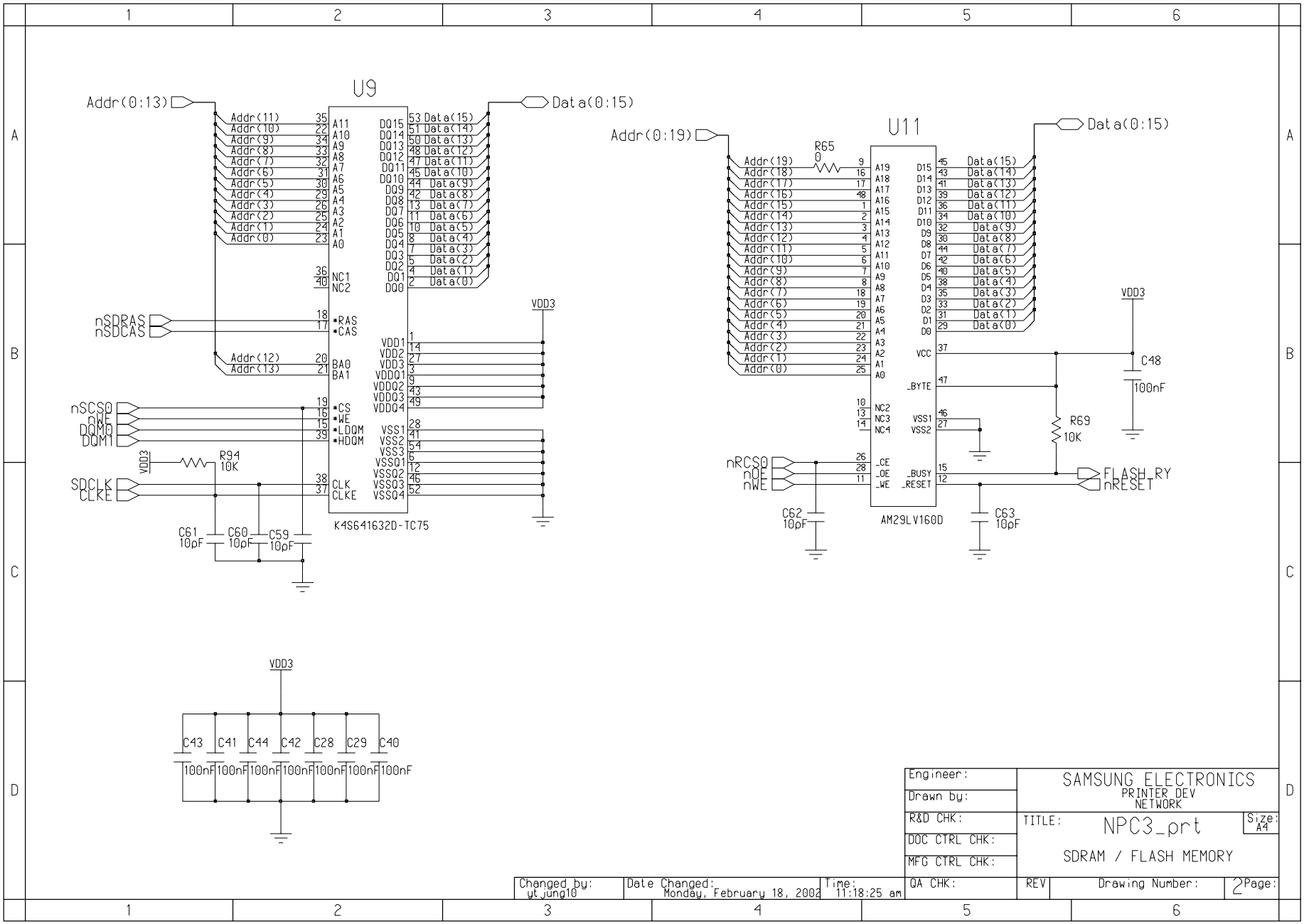
SMPS Circuit Diagram(220V)

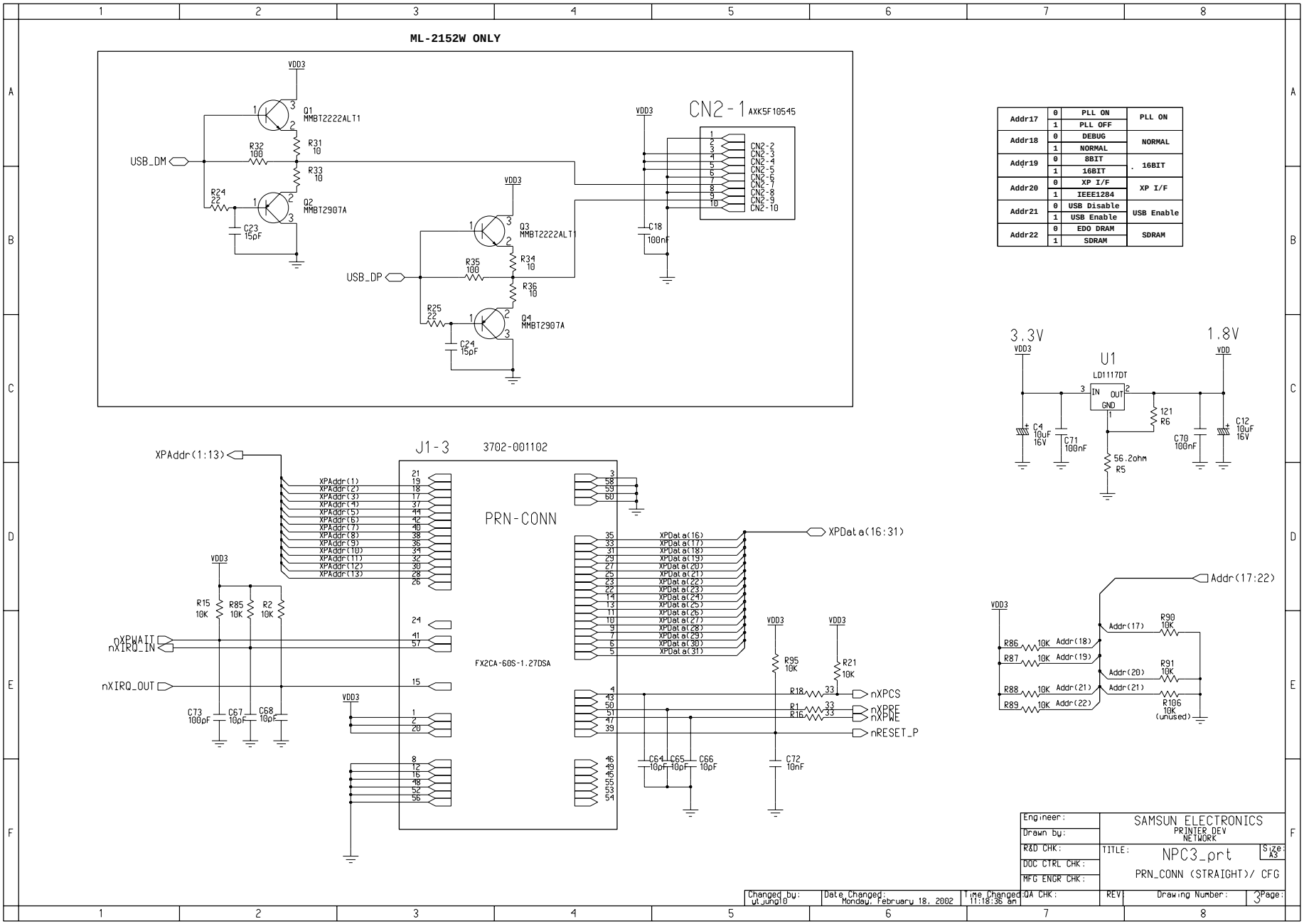


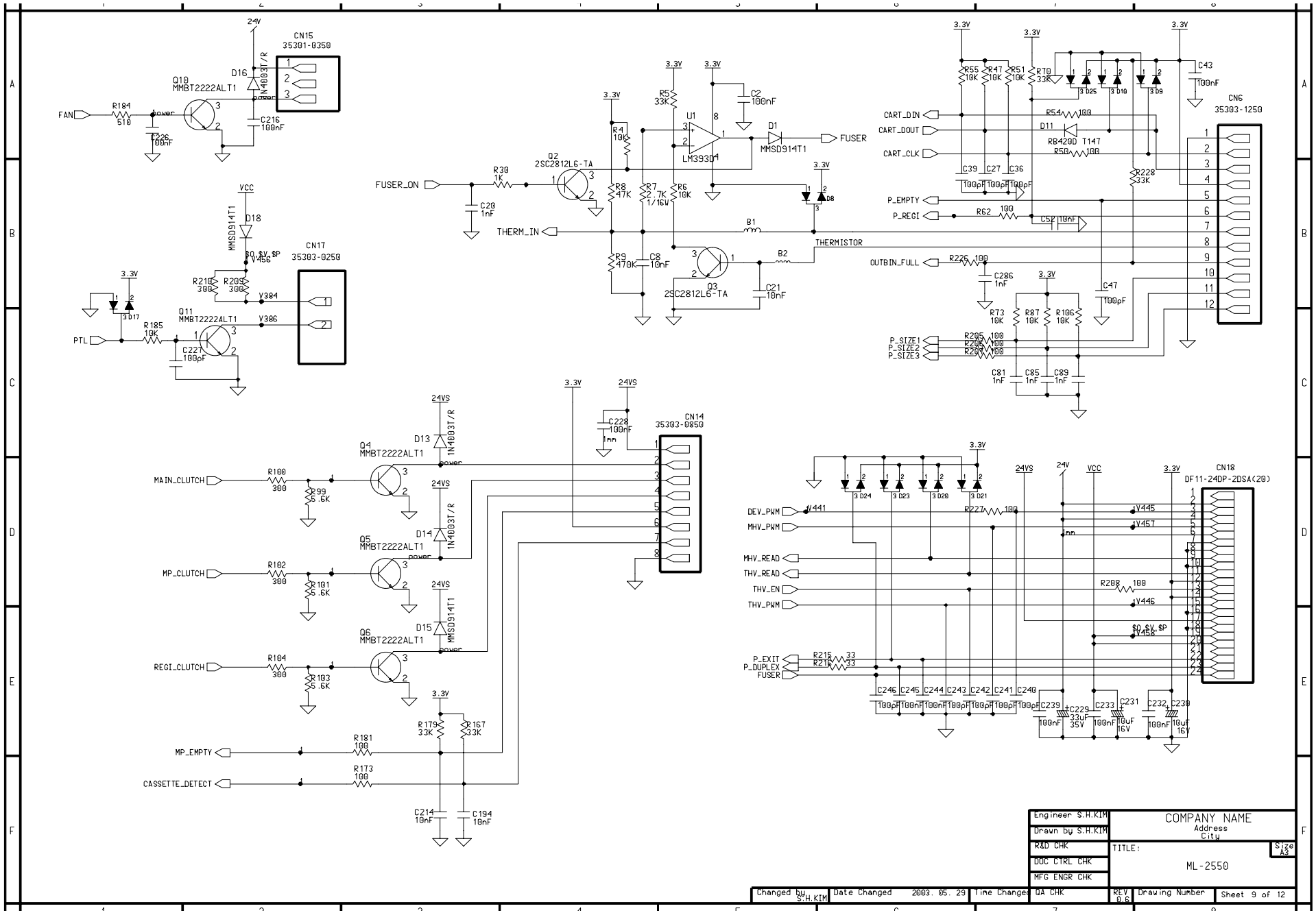
SMPS Circuit Diagram(220V for China)

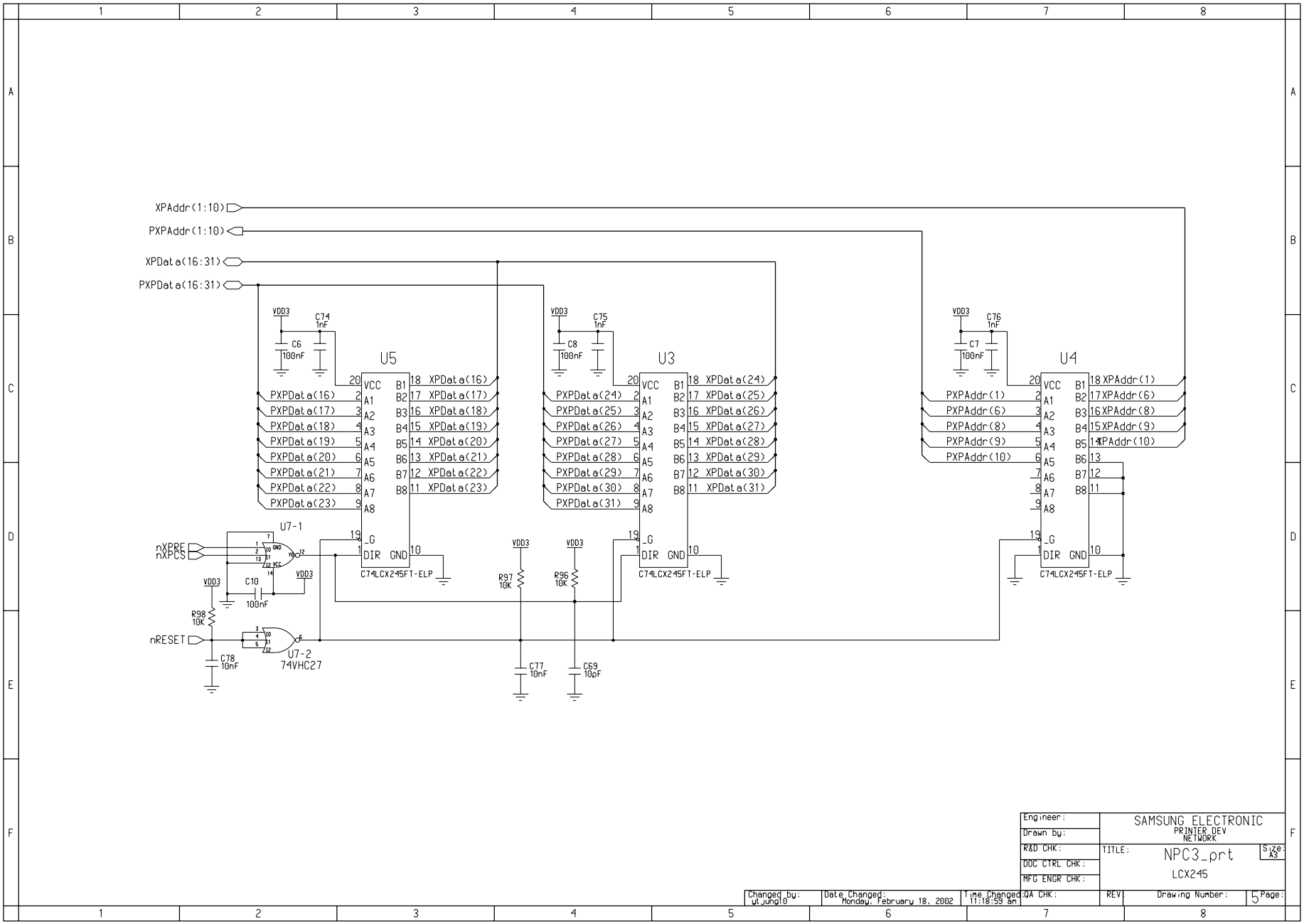


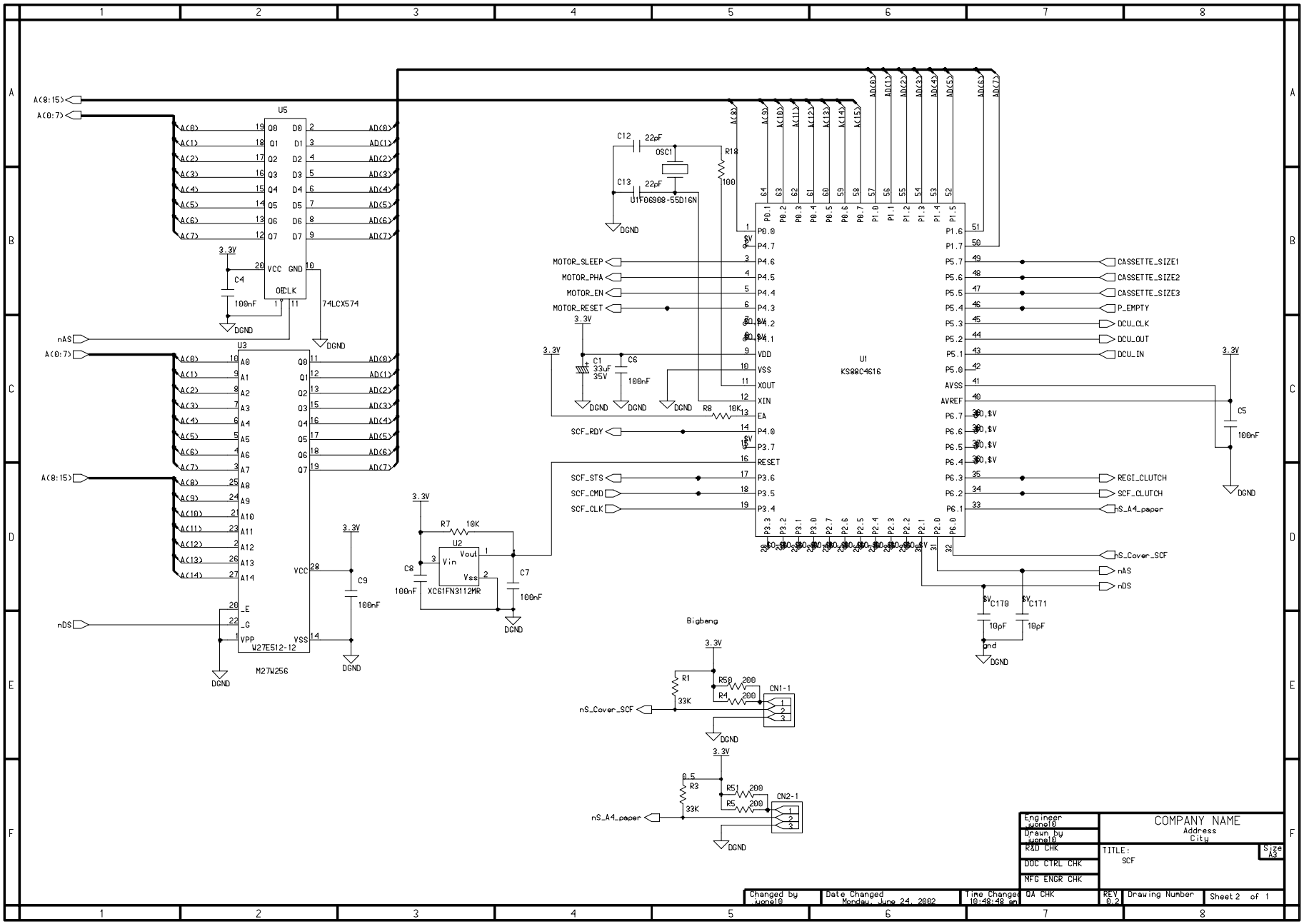


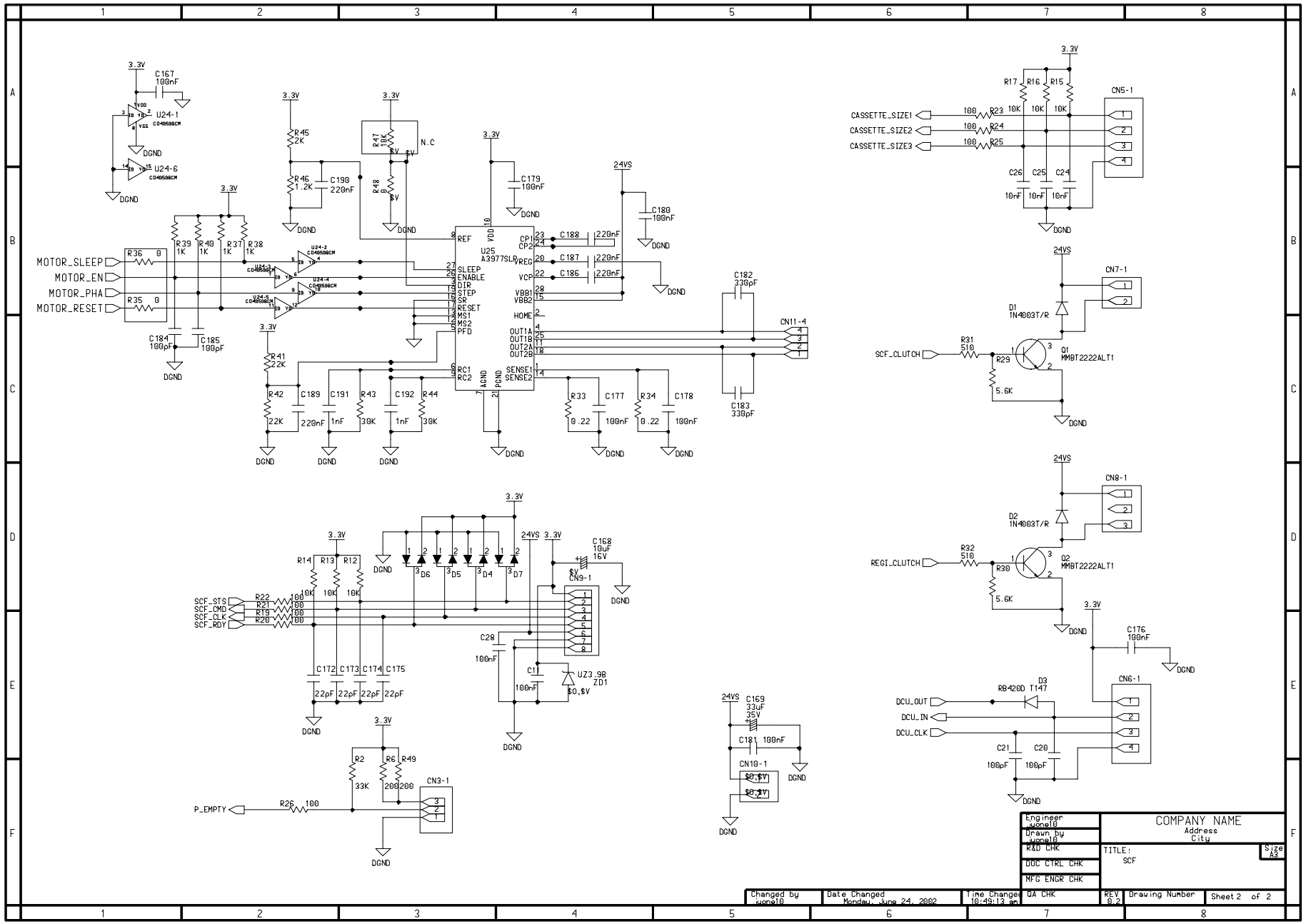


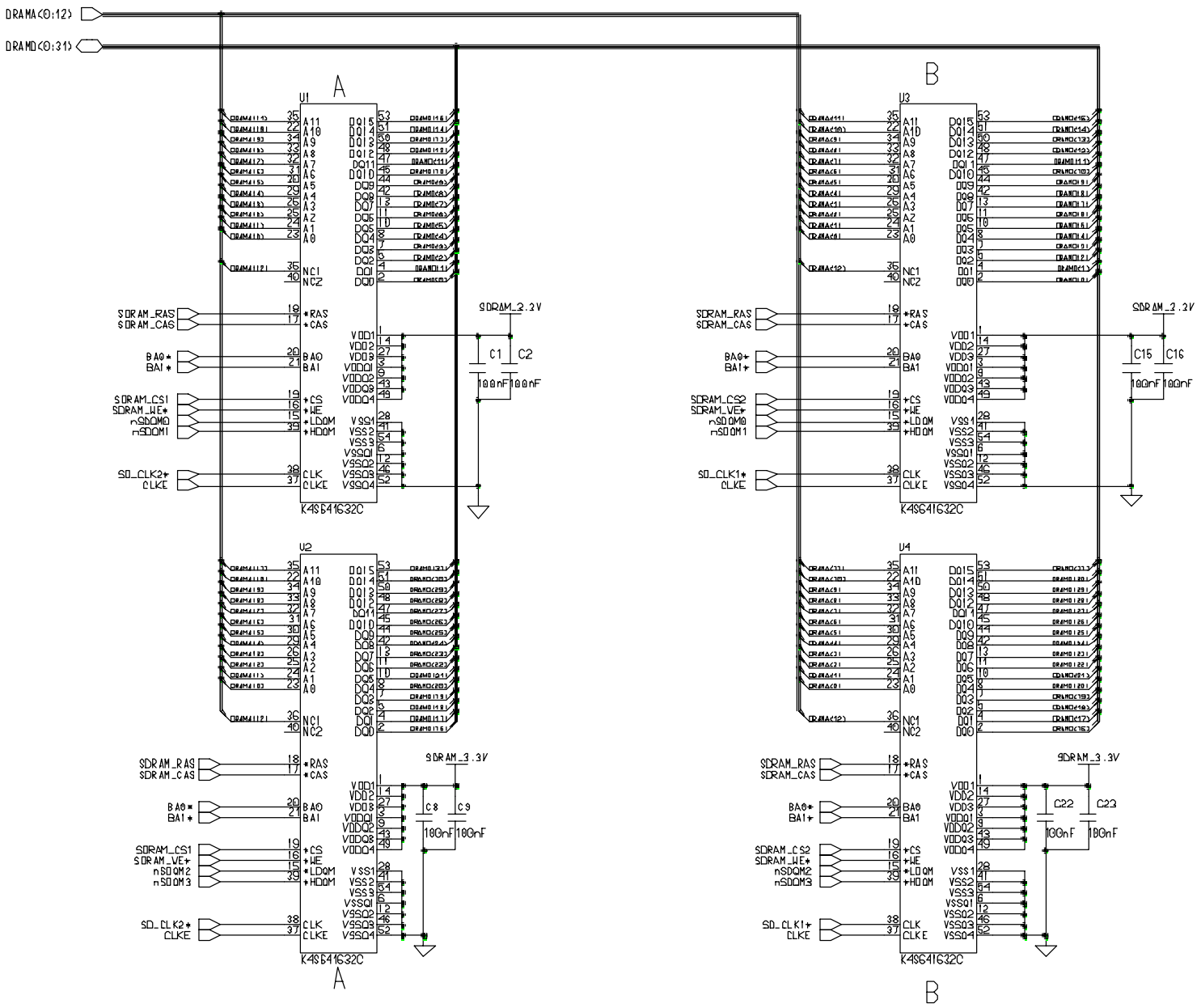




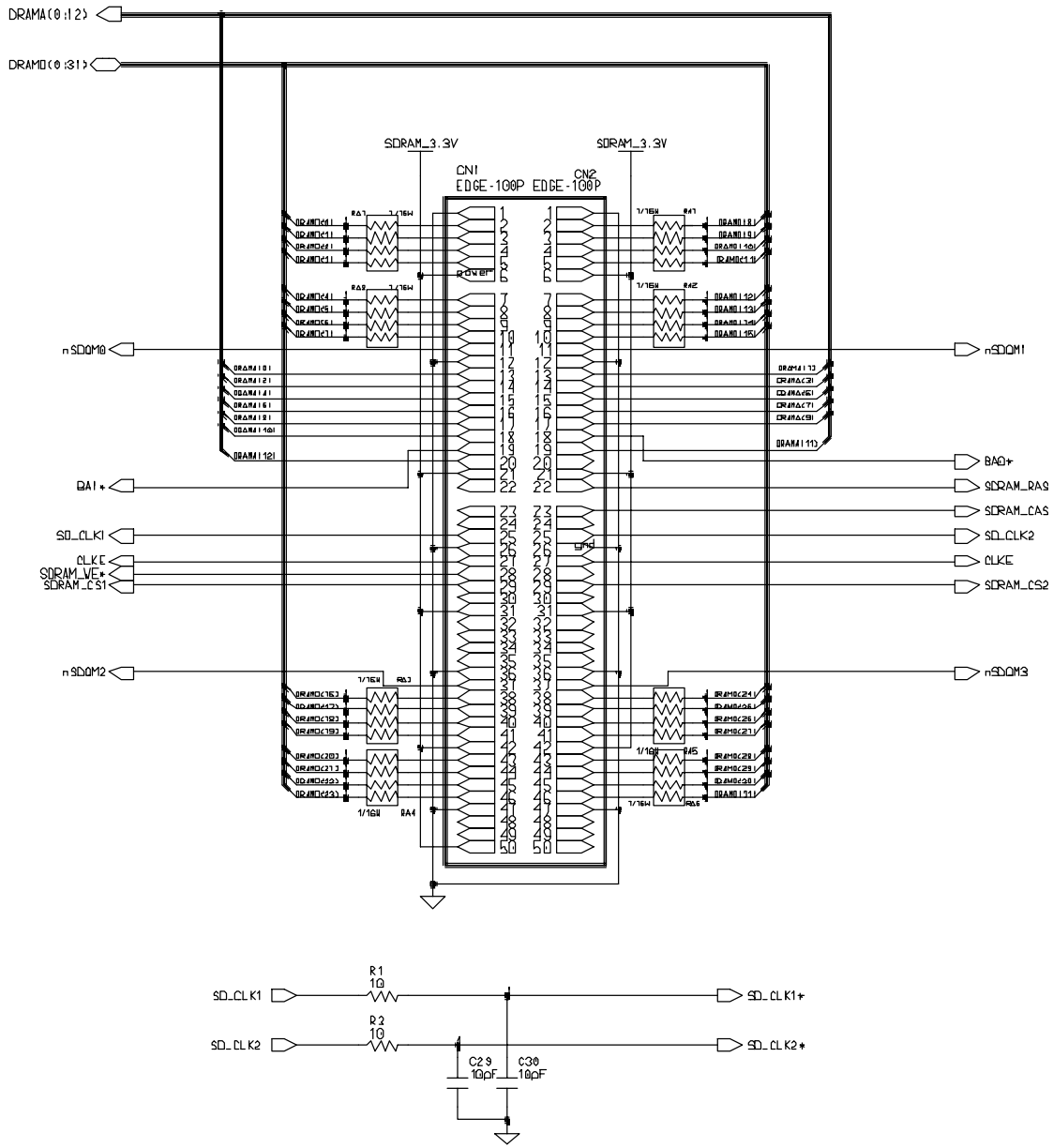


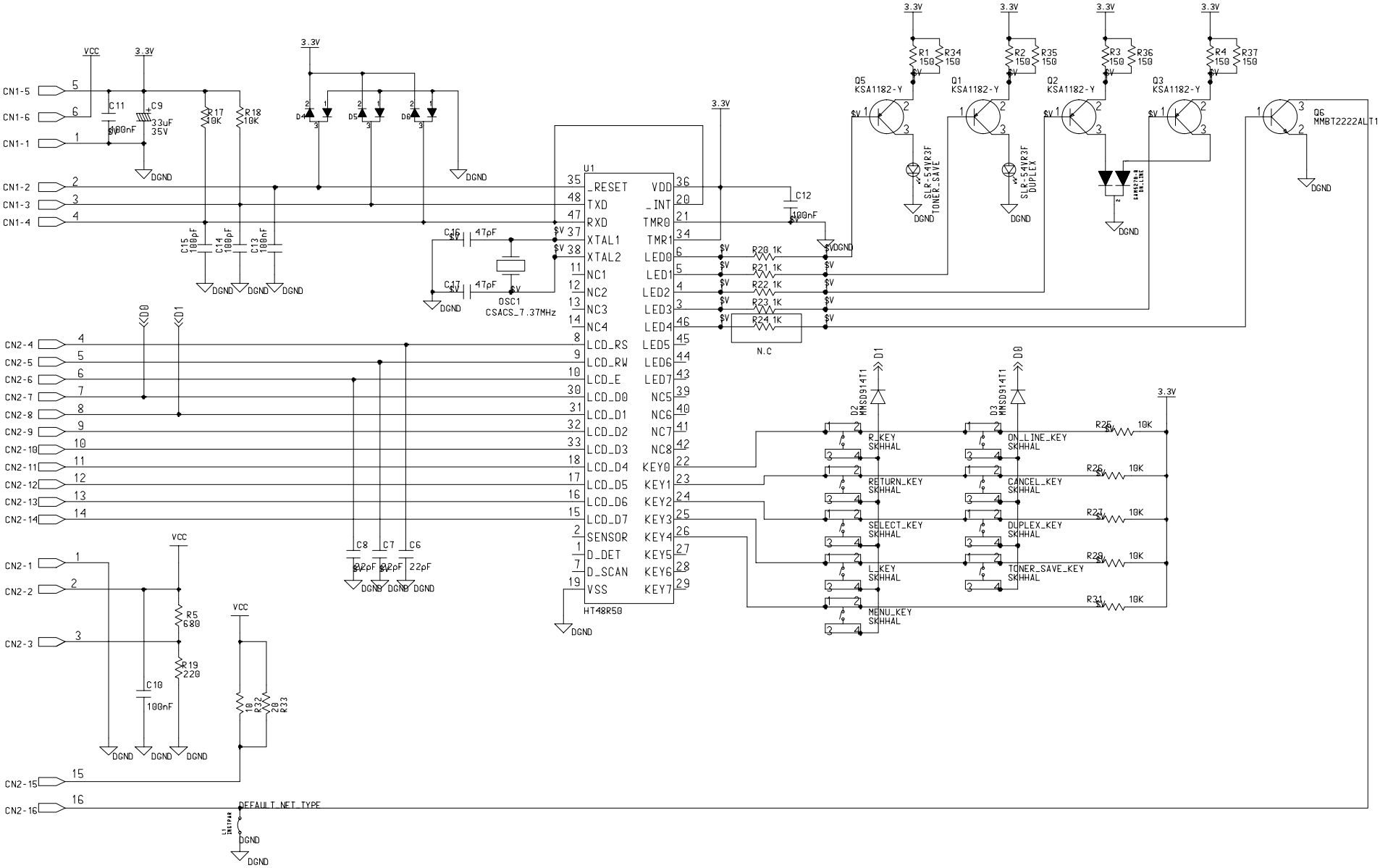


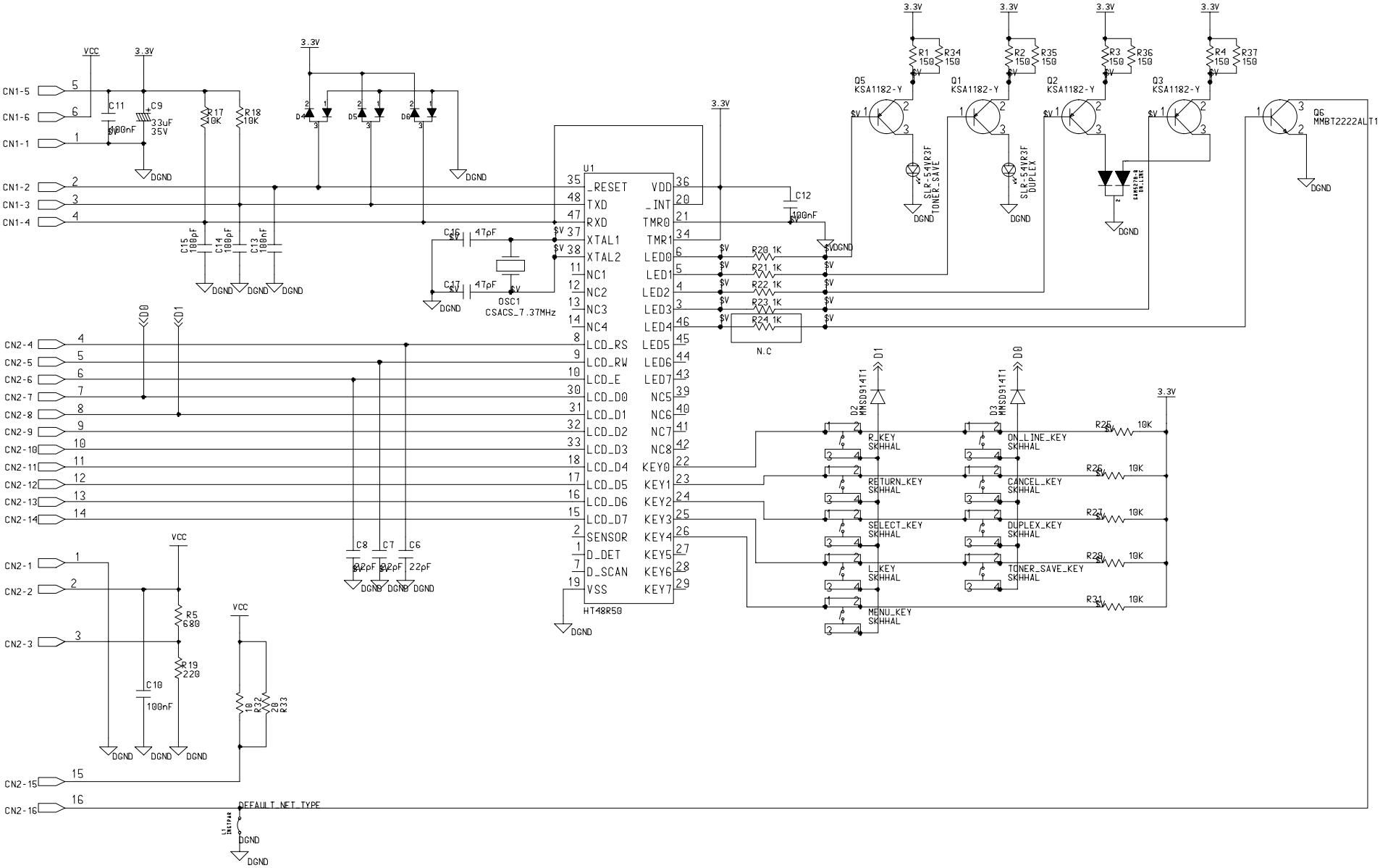




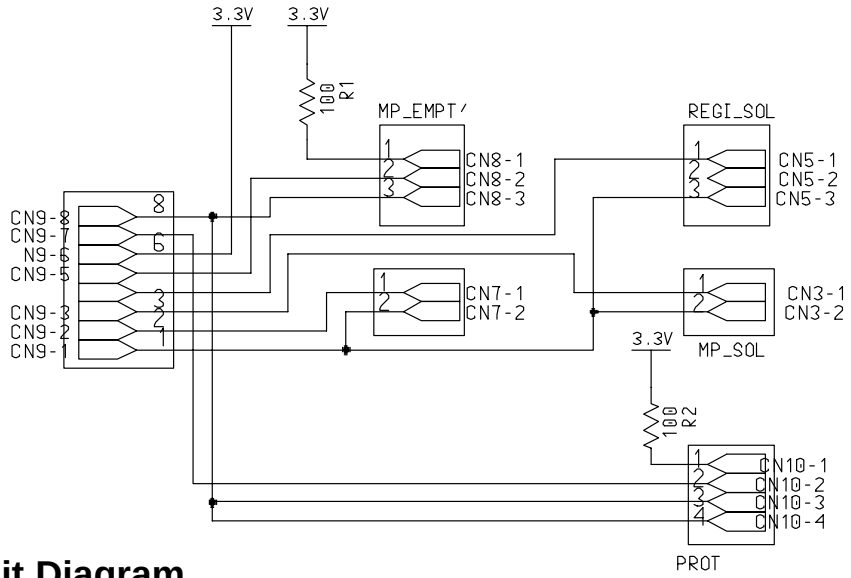
RAM DIMM Circuit Diagram(2/2)



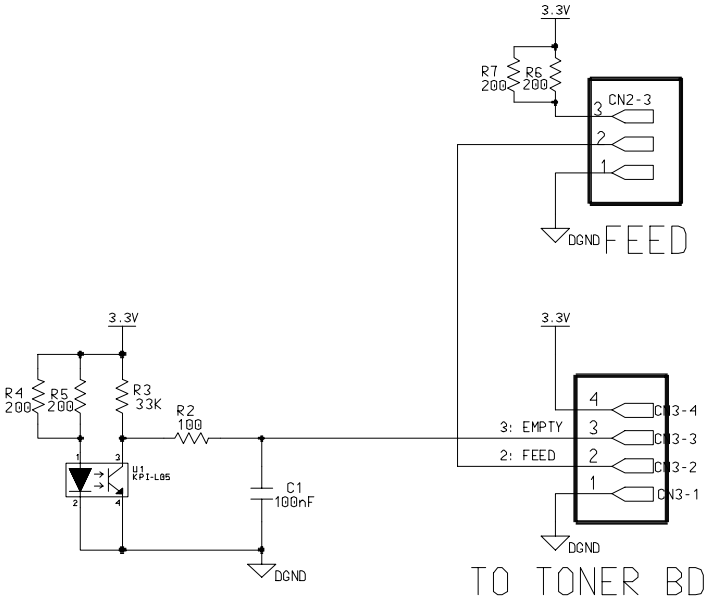



U1
HT48R50
_RESET
TXD
RXD
XTAL1
XTAL2
NC1
NC2
NC3
NC4
LCD_RS
LCD_RW
LCD_E
LCD_D0
LCD_D1
LCD_D2
LCD_D3
LCD_D4
LCD_D5
LCD_D6
LCD_D7
SENSOR
D_DET
D_SCAN
VSS
VDD
_INT
TMR0
TMR1
LED0
LED1
LED2
LED3
LED4
LED5
LED6
LED7
NC5
NC6
NC7
NC8
KEY0
KEY1
KEY2
KEY3
KEY4
KEY5
KEY6
KEY7
OSC1
CSACS_7.37MHz
R_KEY
RETURN_KEY
SELECT_KEY
L_KEY
MENU_KEY
ON_LINE_KEY
CANCEL_KEY
DUPLEX_KEY
TONER_SAVE_KEY
DEFAULT_NET_TYPE
N.C
3.3V
VCC
DGND

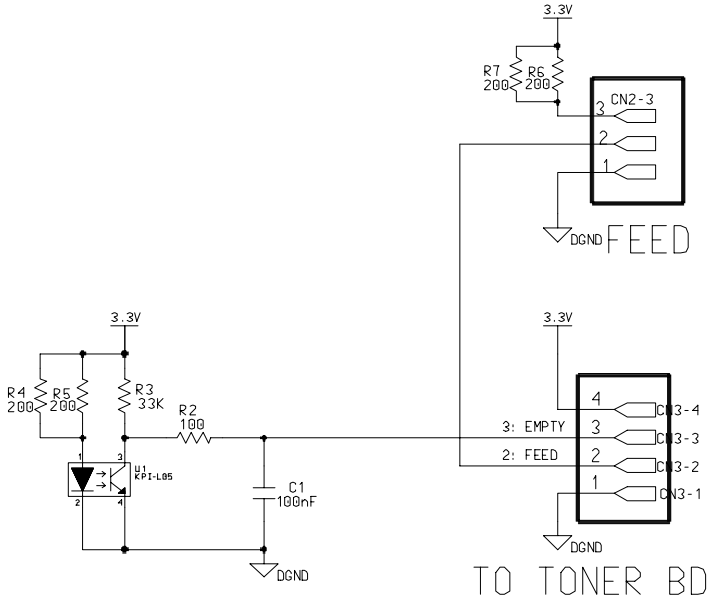
11-8 Connector PBA Circuit Diagram



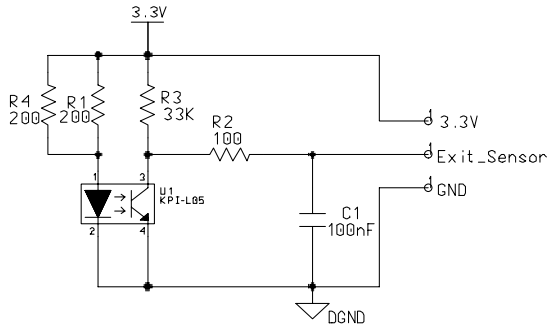
11-9 Cover Open Sensor Circuit Diagram

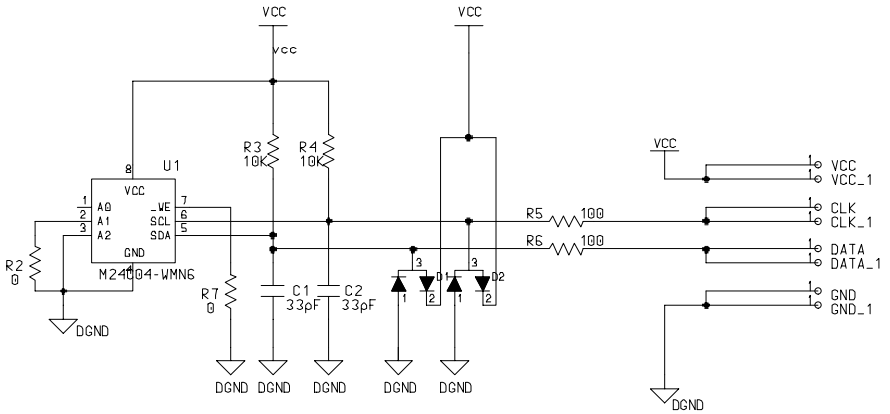


11-10 Enpty Sensor Circuit Diagram



11-11 Exit Sensor Circuit Diagram





11-13 Toner PBA Circuit Diagram