

6. Troubleshooting

6.1 The cause and solution of Bad image

6.1.1 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.	

6.1.2 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 occurred as NO.6

6.1.3 Horizontal Black Band

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

Digital Printer
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Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
<ol style="list-style-type: none"> 1. Bad contacts of the voltage terminals to toner cartridge. 2. The rollers of toner cartridge may be stained. <div> Charge roller = 37.7mm Supply roller = 44.9mm Develop roller = 35.2mm Transfer roller = 47.1mm </div> 	<ol style="list-style-type: none"> 1. Clean each voltage terminal of the Charge, Supply, Develop and Transfer roller. (remove the toner particles and paper particles) 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.

6.1.4 Black/White Spot

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

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Digital Printer

Check and Cause	Solution
<ol style="list-style-type: none"> 1. If dark or blurry black spots occur periodically, the rollers in the Toner cartridge may be contaminated with foreign matter or paper particles. (Charge roller : 37.7 mm interval OPC drum : 75.5 mm interval) 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. 3. If a black image is partially broken, the transfer voltage is abnormal or the transfer roller's life has expired. 	<ol style="list-style-type: none"> 1. Run OPC cleaning Mode Print and run the Self-test 2 or 3 times. 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. The transfer roller guarantees 100,000 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.

6.1.5 Light Image

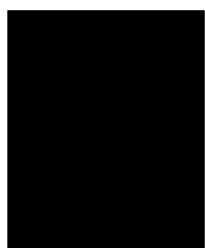
- **Description** The printed image is light, with no ghost.

Digital Printer
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Digital Printer
Digital Printer
Digital Printer

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.

6.1.6 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. Check the state of the connector which connects the engine board and HVPS.
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. Clean the high voltage charge terminal. 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.

6.1.7 Uneven Density

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

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Digital Printer
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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.

6.1.8 Background

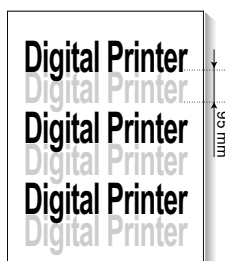
- **Description** Light dark background appears in whole area of the printing.

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 7K sheets with 5% image. If it prints more than 8K sheets with 2% coverage, a background can occur.
2. Is a recycled toner cartridge be used?	2. The A/S is not guaranteed if using a recycled the toner cartridge.
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.

6.1.9 Ghost (1)

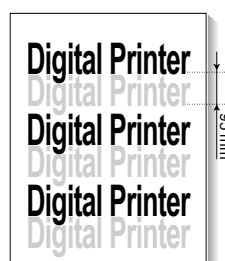
- **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.



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(70K 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.

6.1.10 Ghost (2)

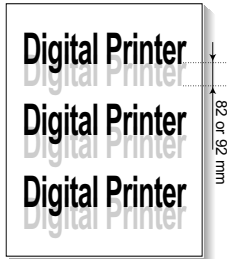
- **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.
(When printing on card stock or transparencies using manual feeder)



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.

6.1.11 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)

6.1.12 Stains 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. 2. If the transfer roller is contaminated, stains on the face of page will occur.	1. Replace the toner cartridge. 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.

6.1.13 Stains on Back of Page

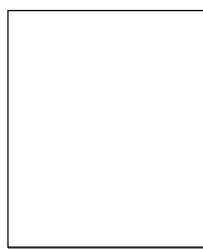
- **Description** The back of the page is stained at 57 or 92 mm intervals.



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.

6.1.14 Blank Page Print out (1)

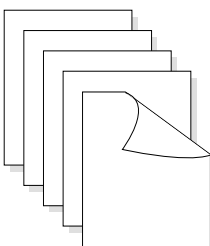
- **Description** Blank page is printed.



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.

6.1.15 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.

6.2 The cause and solution of the bad discharge

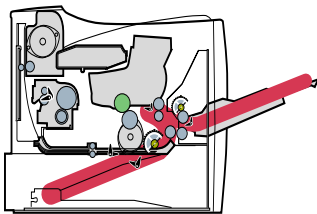
6.2.1 Wrong Print Position

- **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

6.2.2 JAM 0

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

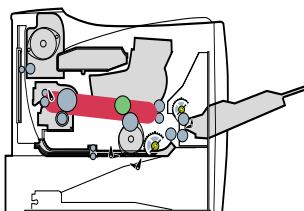


Check and Cause	Solution
<ol style="list-style-type: none"> 1. Check the Solenoid by using EDC Mode. 2. Check if the pad is loose due to bad sealing of the side-pad. 3. Check the surface of the roller-pick-up for foreign matter. 4. If continuous clusters occur, check whether the assembly slot between shaft-pickup and housing-pickup opens or is broken away. 5. If the paper feeds into the printer and Jam 0 occurs, perform EDC Mode to check feed-sensor of the engine board. 	<ol style="list-style-type: none"> 1. Replace the solenoid. 2. Replace the side-pad Assembly L or R, if necessary. 3. Clean with soft cloth dampened with IPA(Isopropyl Alcohol) or water. 4. Replace the Main PBA and/or Sensor.

6.2.3 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.

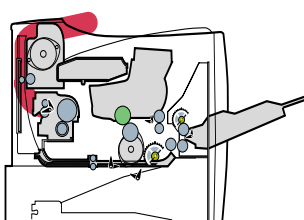


Check and Cause	Solution
1. If the recording paper is jammed in front of or inside the fuser.	1. Replace the SMPS or Exit-Sensor.
	2. Replace the Main PBA.
2. If the recording paper is stuck in the discharge roller and the fuser just after passing through the Actuator-Feed, Feed Actuator may be defective.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

6.2.4 JAM 2

• **Description**

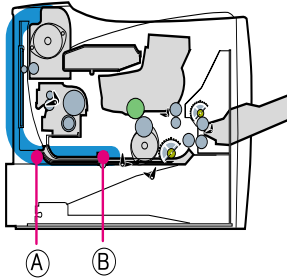
1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



Check and Cause	Solution
1. If the paper is completely fed out of the printer, but Jam 2 occurs : Exit sensor is defective. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Remove the toner particles stained on the rib. • Check the assemblage and performance of the exit.

6.2.5 JAM Duplex 1

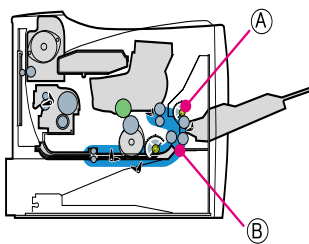
- **Description** A message 'Jam duplex 1' is displayed in a LCD window.



Check and Cause	Solution
<ol style="list-style-type: none"> 1. It is a case when a paper cannot operate a duplex sensor. 2. It is a case when a paper cannot reach to a duplex sensor due to a paper jam on a duplex path. 	<ol style="list-style-type: none"> 1. Replace a SMPS or main PBA 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

6.2.6 JAM Duplex 2

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



Check and Cause	Solution
<ol style="list-style-type: none"> 1. It is a case that a paper cannot pass a duplex sensor. 2. It is a case that a paper cannot reach to a registration sensor after it is passed a duplex sensor. 	<ol style="list-style-type: none"> 1. Replace a SMPS or main PBA. 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.

6.2.7 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.

6.2.8 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 thermostat 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.

6.2.9 Paper rolled on the OPC Drum

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

Check and Cause	Solution
<ol style="list-style-type: none">1. Paper is too much thin.2. The face of paper is curled.	<ol style="list-style-type: none">1. Recommend to use normal paper.2. How to remove the rolled paper in the OPC.<ul style="list-style-type: none">• Remove the paper while turning the OPC against the ongoing direction.• Clean fingerprints on the OPC softly with soft cloth dampened with tissue.

6.3 The cause and solution of the malfunction

6.3.1 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.

6.3.2 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.	

6.3.3 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.

6.3.4 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.	1. Replace the defective actuator.
2. The function of the engine board is defective	2. Replace the Sensor PBA.
3. Check the Connector.	

6.3.5 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.

6.3.6 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.

6.3.7 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.

6.3.8 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.

6.3.9 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.

6.3.10 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. Check the Deve PBA in the Toner Cartridge.	2. Replace the Toner Joint PBA. 2. Replace the Main PBA.

6.4 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.

6.4.1 Precautions on Safe-keeping of Toner Cartridge

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

6.4.2 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.

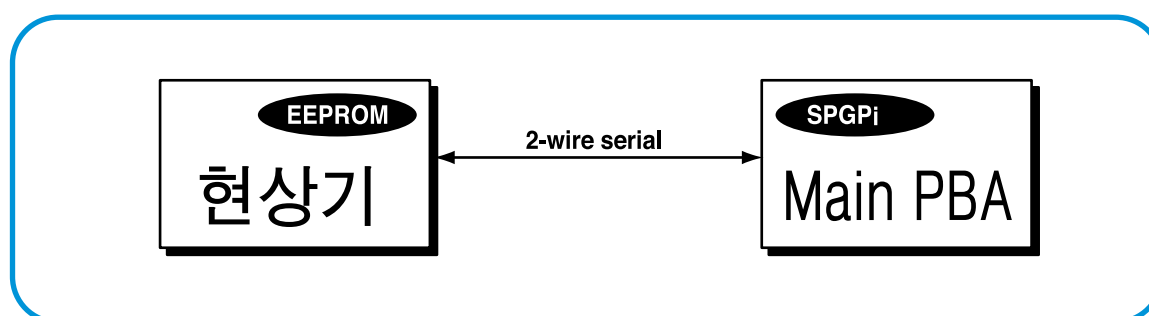
6.4.3 Distinguish function for choice cartridge

• 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).

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

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

6.4.4.1 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.)

6.4.4.2 Low Toner


- Contents: This message shows up when a message "remaining toner: 10%" is displayed in a cartridge count information.
- Solution: It means that a toner in the toner cartridge has been almost ended. Replace the new toner cartridge.

6.4.4.3 Replace Cartridge

- Contents: 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 Toner Cartridge Life cycle Problem, in a worst case, a toner overflows and it may cause a system fail. Therefore, recommend a user to replace a toner cartridge.

6.4.5 Signs and Measures at Poor toner cartridge

Fault	Signs	Cause & Check	Solution
Light image and partially blank image (The life is ended.) <div> </div>	<ul style="list-style-type: none"> • The printed image is light or unclear and untidy. • Some part of the image is not printed. • Periodically a noise as "tick tick" occurs. 	<ol style="list-style-type: none"> 1. If the image is light or unclear 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. 	<ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> • Toner is fallen on the papers periodically. • Contaminated with toner on prints partly or over the whole surface. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 	<ul style="list-style-type: none"> • Light or dark black dots on the image occur periodically. • White spots occur in the image periodically. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> • Poor appearance of the toner cartridge. • Unclean and rough printouts. • Bad background in the image. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 abnormalities 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	<ul style="list-style-type: none"> • The printed image is too light or dark, or partially contaminated black. • Totally contaminated black. (Black image printed out) • The density of print-outs is too dark and ghost occurs. 	<p>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.</p> <p>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.)</p> <p>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.)</p>	<p>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.</p> <p>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.</p> <p>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.</p>

6.5 The cause and solutions of bad environment of the software

6.5.1 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 not 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.

6.5.2 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.

6.5.3 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.

6.5.4 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.