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AFICIO FX16-AC104(B173)
SERVICE DOCUMENTATION

001954MIU

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WARNING

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Untrained and uncertified users utilizing information contained in this service manual to repair or modify Ricoh equipment risk personal injury, damage to property or loss of warranty protection.

Ricoh Corporation

LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	LANIER	RICOH	SAVIN
B173	DSm516	AC017	AC104	AC104

DOCUMENTATION HISTORY

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SEE PARTS CATALOG FOR DETAILED TABLE OF CONTENTS

PRECAUTIONS

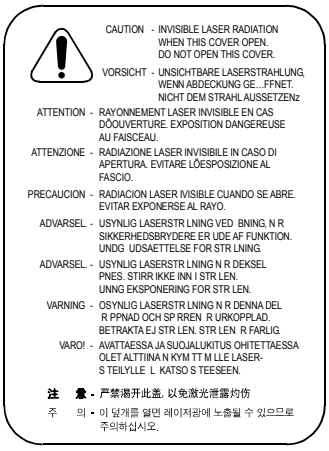
Please carefully read the cautions below to prevent accidents while servicing the machine.

WARNING FOR SAFETY

1. **Request the service by qualified service person.**
   The service for this machine must be performed by a qualified service person. It is dangerous if an unqualified service person or user tries to repair the machine.
2. **Do not rebuild it discretionary.**
   Do not disassemble, fix, and rebuilt the machine. If you do, the machine may not work and an electric shock or a fire can occur.
3. **Laser Safety Statement**
   The Printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class 1(1) laser products, and elsewhere, it is certified as a Class I laser product 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 FOR SAFETY

PRECAUTION RELATED NOXIOUS MATERIAL

It is possible to be harmed from noxious material if you ignore the below information.

1. Do not touch the damaged LCD. Noxious liquid to a human body exists in the LCD. If it is got into the mouth, immediately see a doctor. If it gets into the eyes or on the skin, immediately wash off with flowing water for 15 minutes and then see a doctor.
2. The toner in a printer cartridge contains a chemical material, if swallowed, might harm a human body.

Please keep the toner cartridge away from children.

PRECAUTION RELATED ELECTRIC SHOCK OR FIRE

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

1. Use the exact voltage and wall socket. If not, a fire or an electric leakage can occur.
2. Use an authorized power cord. Use the power code supplied with machine. A fire can occur when an over current condition flows in the power cord.
3. Do not insert many cords into an outlet. A fire can occur due to an over current condition in the outlet.
4. Do not put water or other liquid, pin, clip, etc in the machine. It can cause a fire, electric shock, or malfunction. If this occurs, immediately turn off the power off and remove the power plug from outlet.
5. Do not touch the power plug with a wet hand. When servicing, remove the power plug from the outlet.
6. Use caution when inserting or unplugging the power plug. The power plug has to be inserted completely. If not, a fire can occur due to a poor contact. When unplugging the power cord, grip the plug, not the wire.
7. Do not bend, twist, bind or place other materials on the power cord. Do not use staples around machine. If the power cord becomes damaged, a fire or electric shock can occur. A damaged power code must be replaced immediately. Do not attempt to repair the damaged cord or reuse it. Repairing the cord with plastic tape can cause a fire or electric shock. Do not spread chemicals or insecticide on the power cord
8. Check whether the power outlet and the power plug are damaged, compressed or cracked. When such inferiorities are found, replace it immediately. Do not roll over the cord when moving the machine.

9. Use caution during lightning storms. It may cause a fire or electric shock. Unplug the power plug off under these conditions. Do not touch cable and device during a lightning storm.
10. Avoid damp or dusty areas. Do not install the machine in dusty areas or around humidifiers. A fire can occur. Clean the plug with dried fabric cloth to remove dust.
11. Avoid direct sunlight. Do not install the machine near to a window where it is in direct sunlight. If the machine operates in direct sunlight for a long periods, the machine may not work correctly, because the increased inner temperature of machine.
12. Turn off the machine and unplug the power cord when smoke, a strange smell, or sound is detected from the machine. A fire can occur if the machine is used under these conditions.
13. Do not insert steel or metal pieces inside/outside of the machine. Do not insert metal pieces into the ventilator slots. An electric shock can occur.

PRECAUTION RELATED TO HANDLING THE MACHINE

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

1. Do not install the machine on an uneven surface or slanted floor. Confirm that the machine is correctly balanced after installation. The machine may fall over if not balanced correctly.
2. Be careful not to insert a finger or hair in the rotating unit (motor, fan, paper feeding part, etc) while the machine is operation.
3. Do not place any containers of water or chemical or small metals on top of the machine. If these objects spill into the machine, a fire or electric shock can occur.
4. Do not install the machine in areas where moisture or dust exists. For example, do not install machine near open windows.
5. Do not place candles, burning cigarettes, etc. on the machine. Do not install it near to a heater.

PRECAUTIONS FOR WHEN ASSEMBLY/DISASSEMBLY

Replace parts very carefully. Remember the location of each cable before removing parts, in order to reconnect it afterwards. Please perform the steps below before replacing or disassembling any parts.

1. Check the contents stored in the memory. Either print a copy of stored data or write down all of the needed information. All the stored information will be erased when the main board is replaced.
2. Disconnect the power cord before servicing or replacing electrical parts.
3. Remove the printer cable.
4. Use formal parts and same standardized goods when replacing parts. Check the product name, part code, rated voltage, rated current, operating temperature, etc.
5. Do not use excessive force when loosening or tightening plastic components.
6. Be careful not to drop small parts or objects in the machine.

ESD PRECAUTIONS

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electro statically Sensitive (ES) Devices”, or ESD’s. Examples of typical ESD’s 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, use 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 ESD’s, 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 an ESD’s.

4. Only use an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” and can generate an electrical charge sufficient to damage ESD’s.
5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESD’s.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESD’s 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 ESD’s. Normal motions, actions such as brushing together of clothing fabric or lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

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INSTALLATION

1. INSTALLAITON

Refer to the operating instructions for details.

PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE

The cycle period shown below is for maintenance.

Environmental conditions and use will change.

The cycle period shown is for reference only.

	Component	Replacement Cycle	Done by
Scanner	ADF Rubber	20,000 Pages	Service
	ADF Pick-up Ass'y	60,000 Pages	Service
Printer	Friction Pad	60,000 pages	Service
	Paper Feed Roller	60,000 Pages	Service
	Transfer Roller	60,000 Pages	Service
	Fuser	60,000 Pages	Service

REPLACEMENT AND ADJUSTMENT

3. REPLACEMENT AND ADJUSTMENT

3.1 GENERAL PRECAUTIONS ON DISASSEMBLY

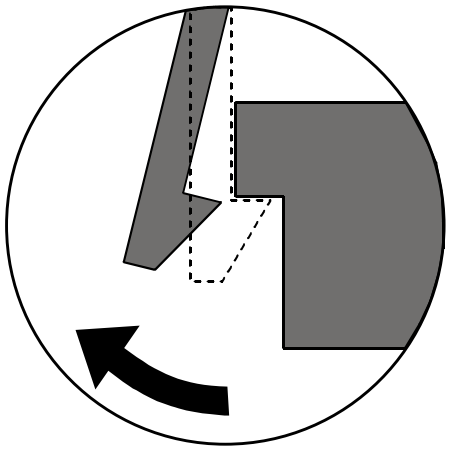
Use caution when you disassemble and reassemble components. Make sure that you put all cables in the correct position, after you replace a part.

You must do these before you service the machine:

1. Make sure that no documents are in the memory.
2. Disconnect the power cord.
3. Remove the toner and drum cartridges before you disassemble parts.
4. Use a flat and clean surface.
5. Replace only with necessary components.
6. Do not use high force when you push plastic-material components.
7. Make sure that all components are in their correct position.

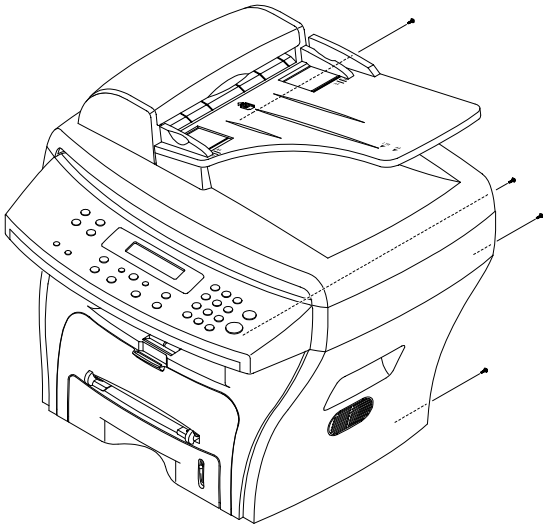
Releasing Plastic Latches

Many parts set in their positions with plastic latches. The latches break easily. Release them carefully. Push the hook end of the latch away from the part to which it is latched to remove these parts.

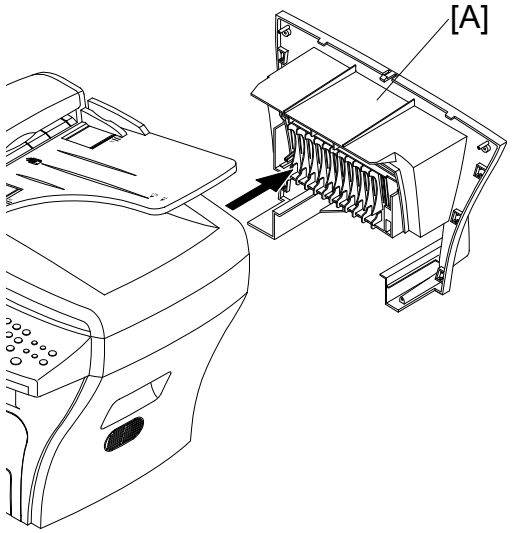


3.2 REAR COVER

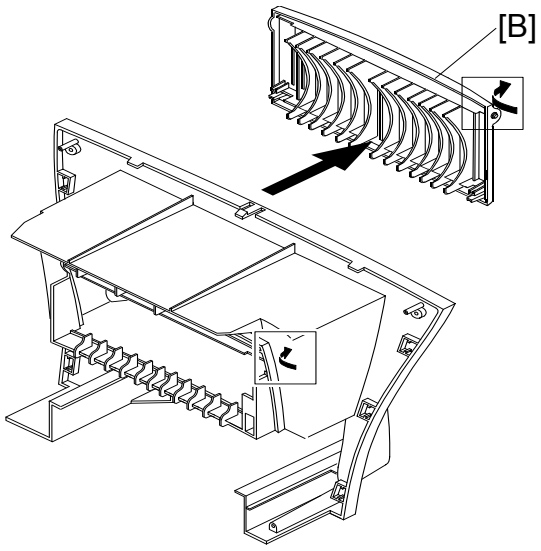
1. Remove the four screws from the rear cover.



2. Remove the rear cover [A] from the frame assembly and scanner assembly.

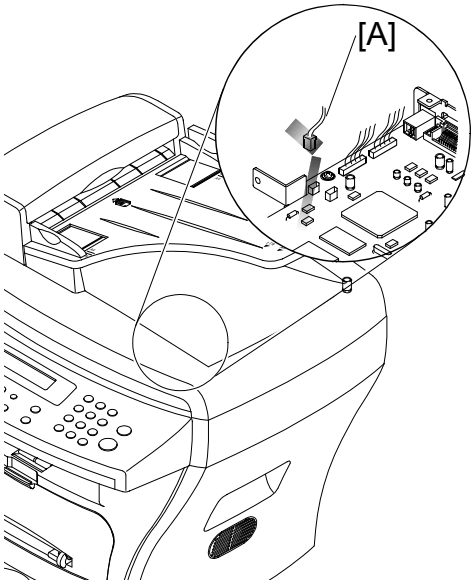


3. Release the cover - face up [B] that attaches the rear cover. Then lift the cover - face up out.

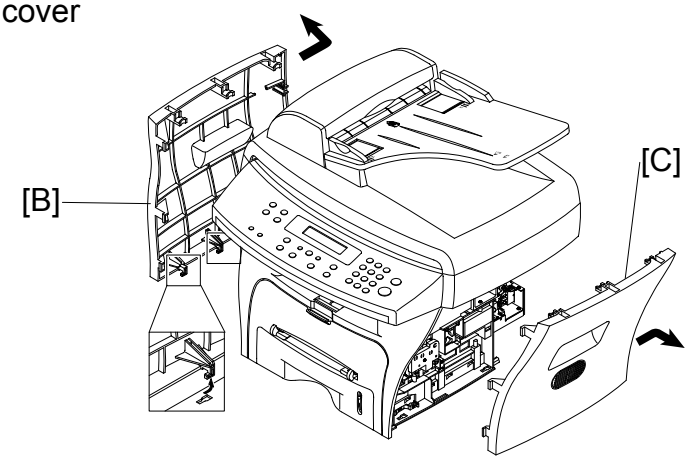


3.3 SIDE COVERS

1. You must remove the rear cover (☛ 3.2) before you remove the side covers.
2. Disconnect the speaker [A].

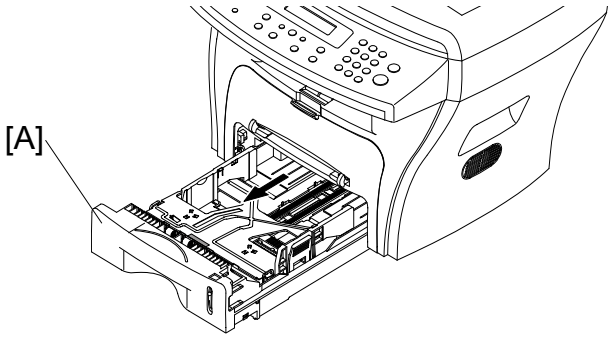


3. Lift the Left cover [B] and Right cover [C] in the direction of arrow.

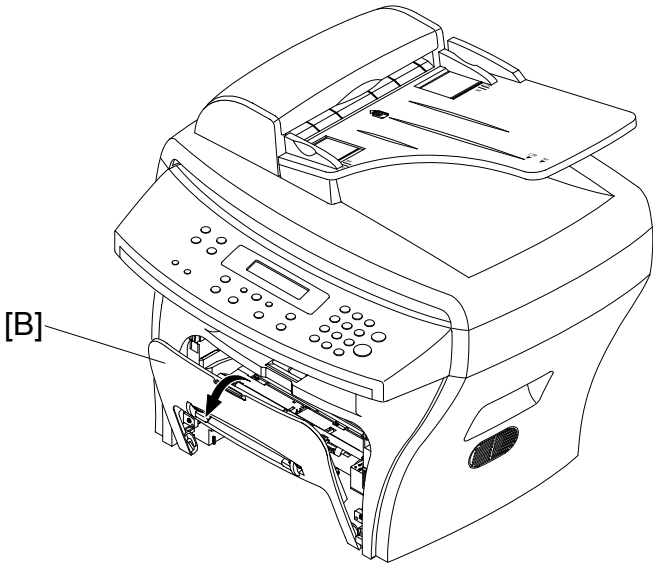


3.4 FRONT COVER

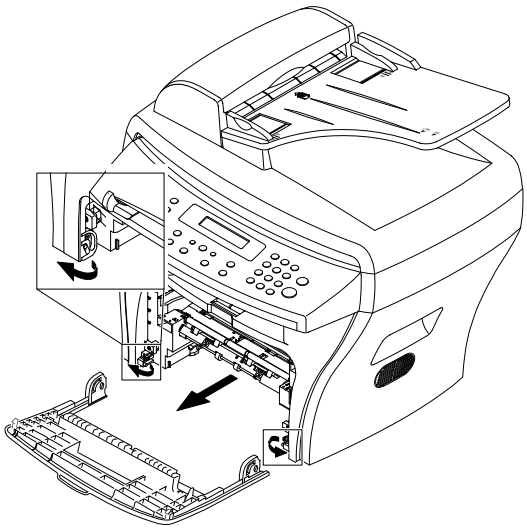
1. Remove the cassette [A].



2. Open the front cover[B].

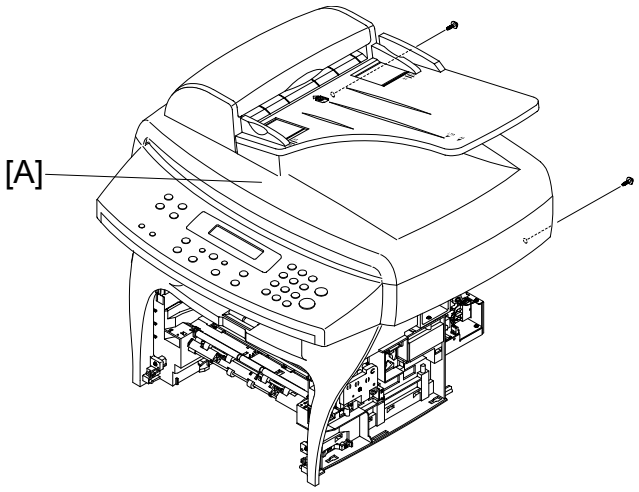


3. Remove the front cover that attaches the frame assembly. Then remove the front cover.

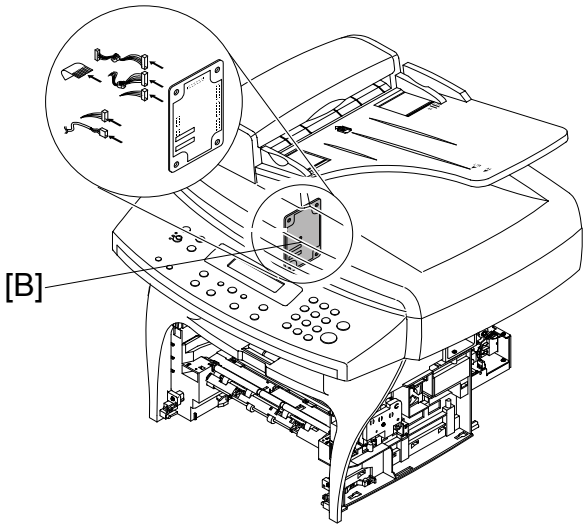


3.5 SCANNER ASS'Y

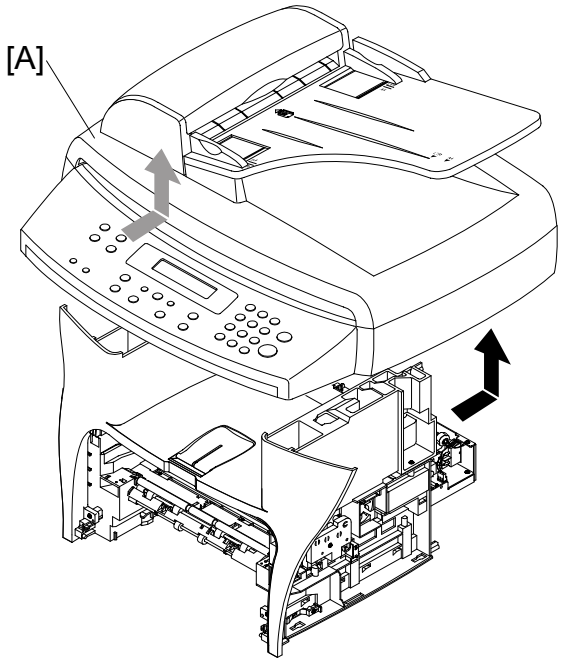
1. You must remove these before you remove the scanner ass'y:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
2. Remove the two screws from the scanner ass'y [A].



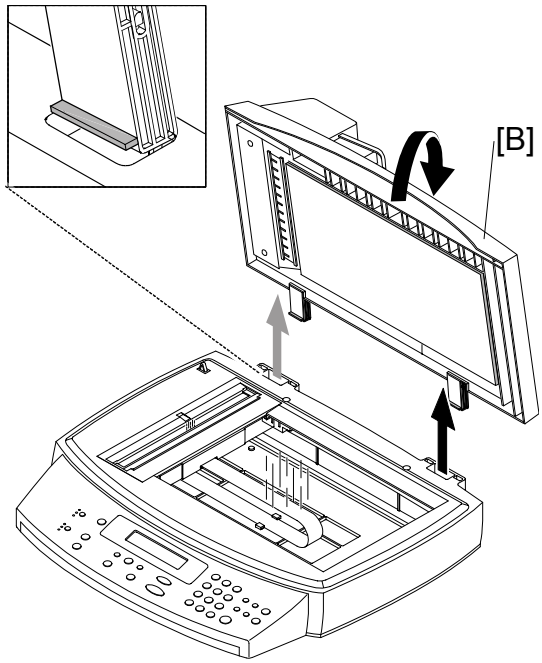
3. Disconnect the 6 connectors from the connector PBA [B].



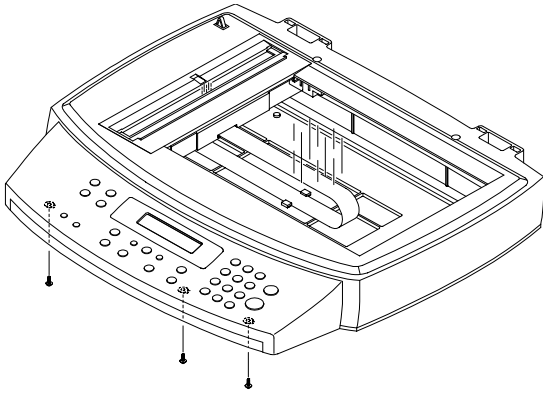
4. Pull up the scanner ass'y [A].



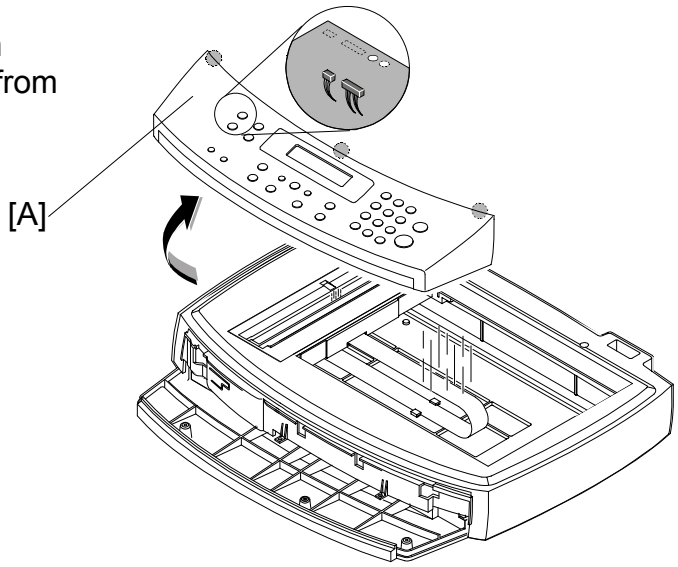
5. Pull the platen cover [B] up. Then remove it.



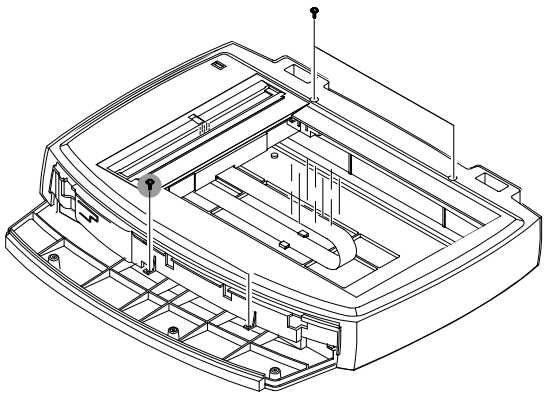
6. Remove three screws from the scan lower assembly.



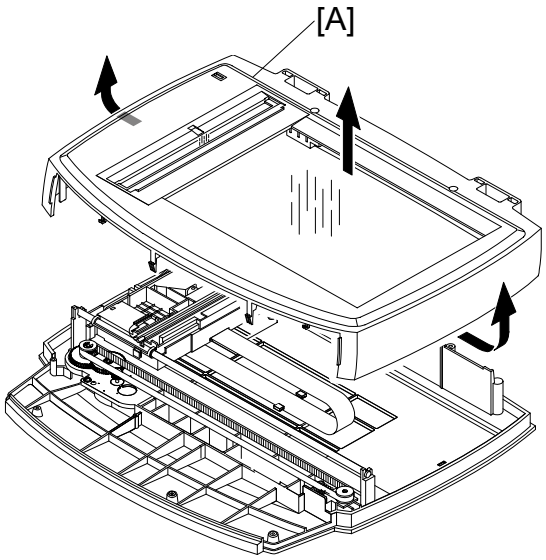
7. Remove the OPE unit [A]. Then disconnect the two connectors from the OPE unit. Then remove it.



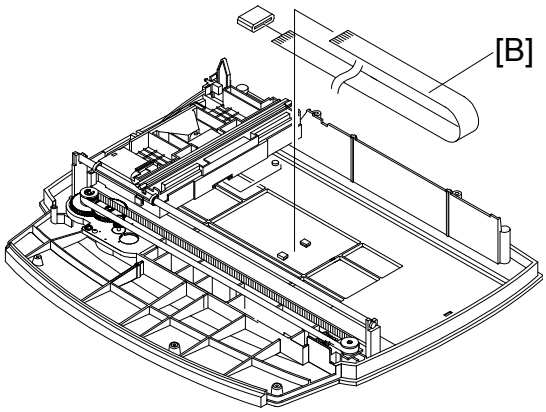
8. Remove the four screws from the window cover.



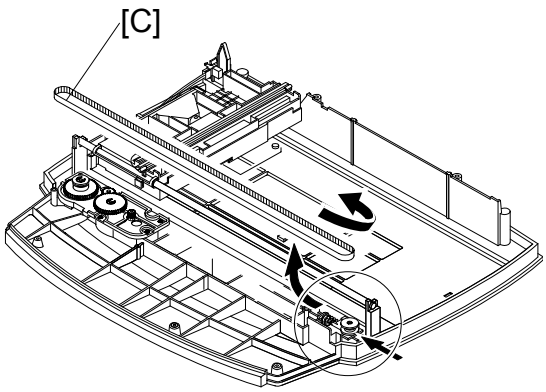
9. Release the window cover [A] from the scan lower assembly. Then pull the window cover up. Then remove it.



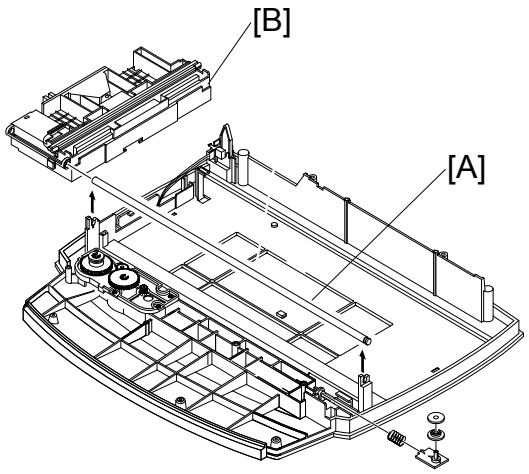
10. Remove the CCD Cable [B].



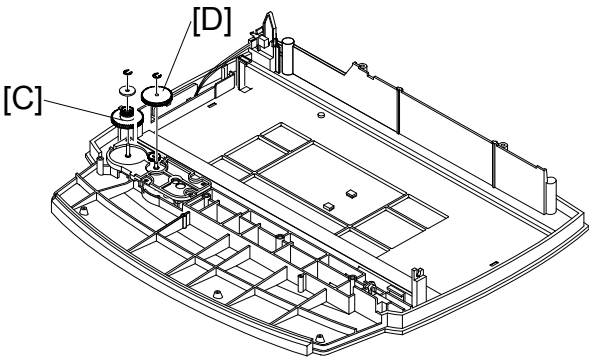
11. Push the belt holder. Then remove the Belt [C].



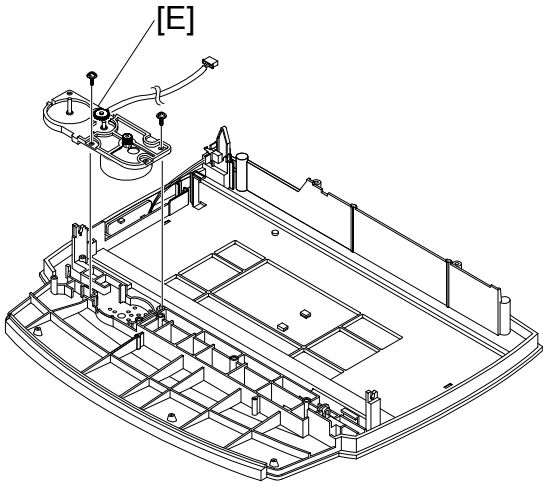
12. Pull up the CCD shaft [A]. Then remove the scanner module [B].



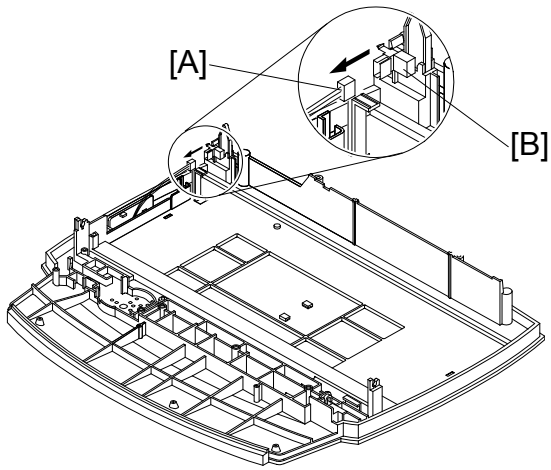
13. Remove the reduction gear [C] and idle gear [D].



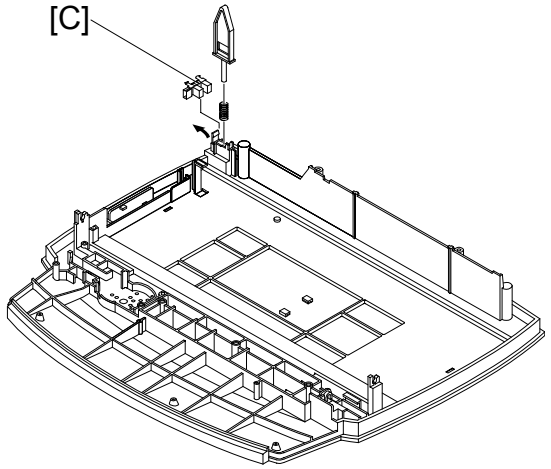
14. Remove the two screws. Then remove the motor bracket [E].



15. Disconnect the connector [A] from the open sensor assembly [B].

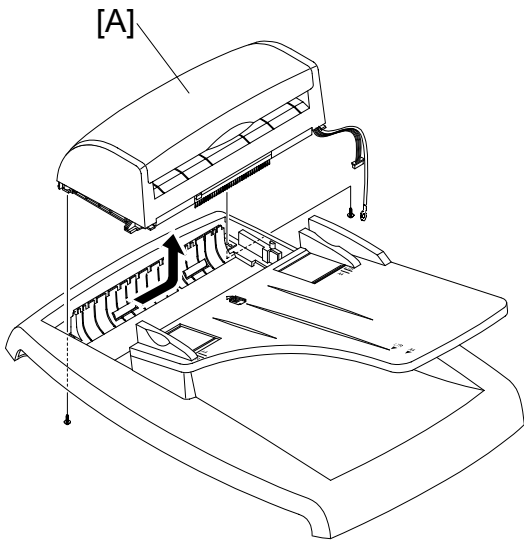


16. Release the open sensor [C]. Then remove it.

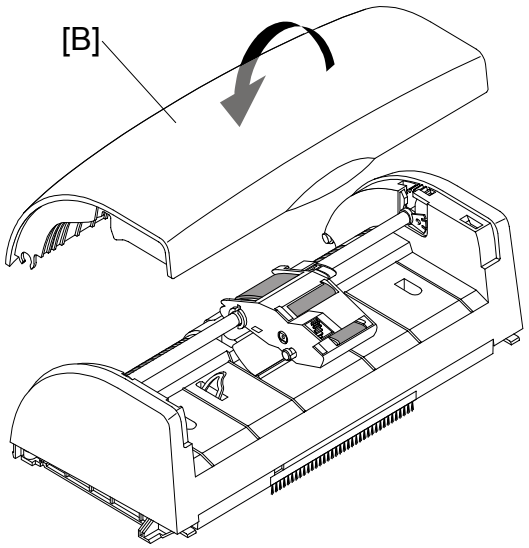


3.6 ADF MOTOR ASS'Y

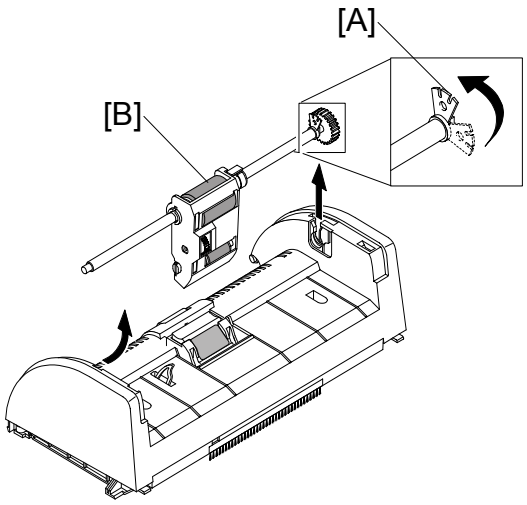
1. Before you remove the ADF Motor Ass'y, you must remove these:
   - Rear Cover (☛ 3.2)
   - Side Covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
2. Remove the two screws from the ADF ass'y [A]. Then remove it.



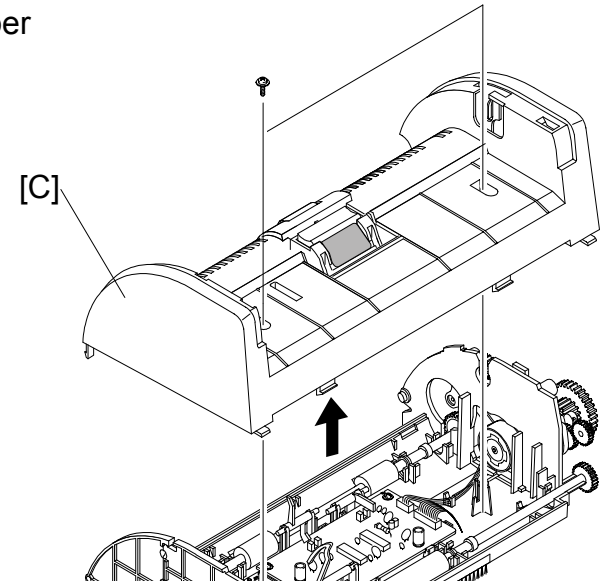
3. Remove the open cover [B].



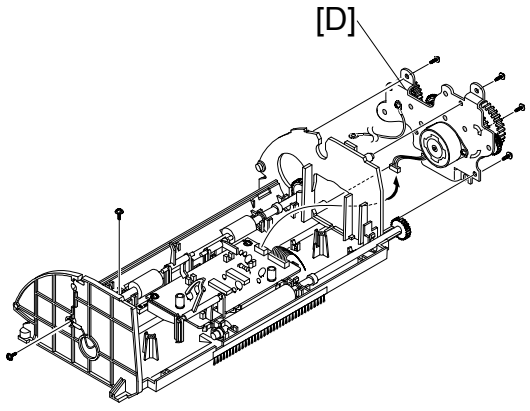
4. Pull the white bush [A]. Then turn it until it gets to the slot. Then remove the pick-up ass'y [B].



5. Remove the two screws from the upper cover [C]. Then remove it.

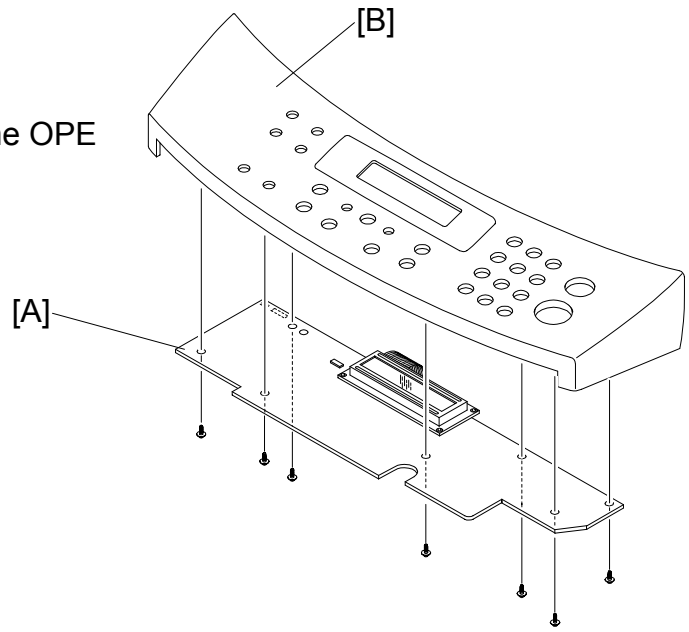


6. Disconnect the connector. Then remove four screws from the ADF motor ass'y [D]. Then remove it.

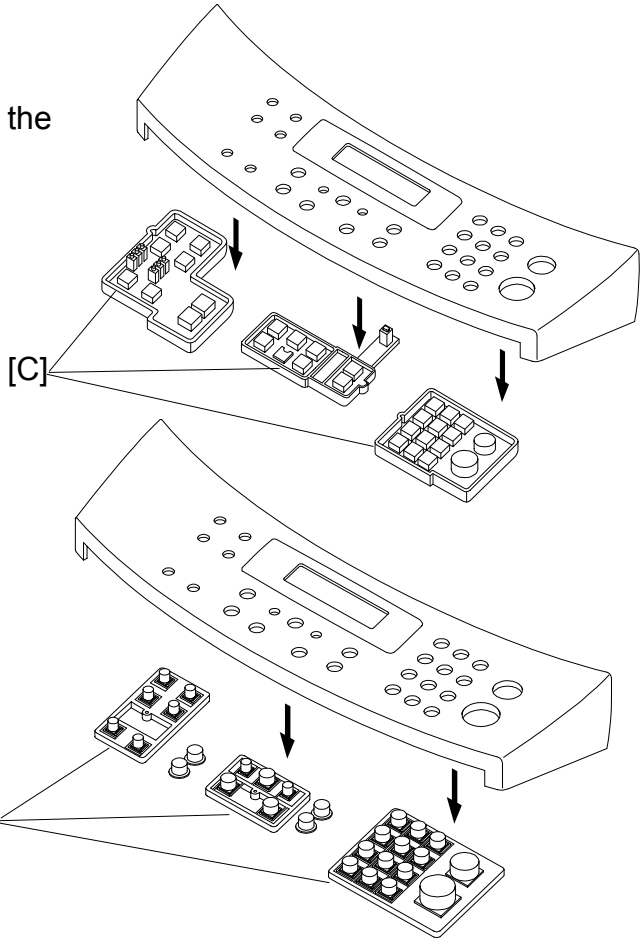


3.7 OPE UNIT (ALSO KNOWN AS OP-PORT)

1. Before you remove the OPE Unit, you must remove these:
   - Rear Cover (☛ 3.2)
   - Side Covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
2. Remove the six screws from the OPE PBA [A] and OPE cover [B].

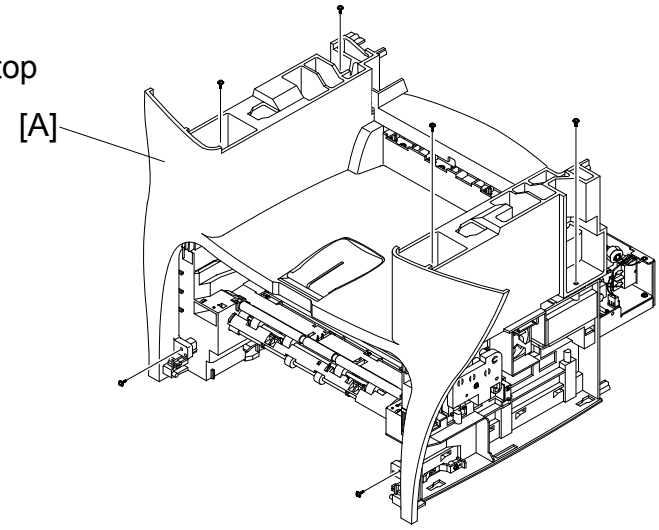


3. Remove the contact rubber [C] and the key pad [D] from the OPE cover.

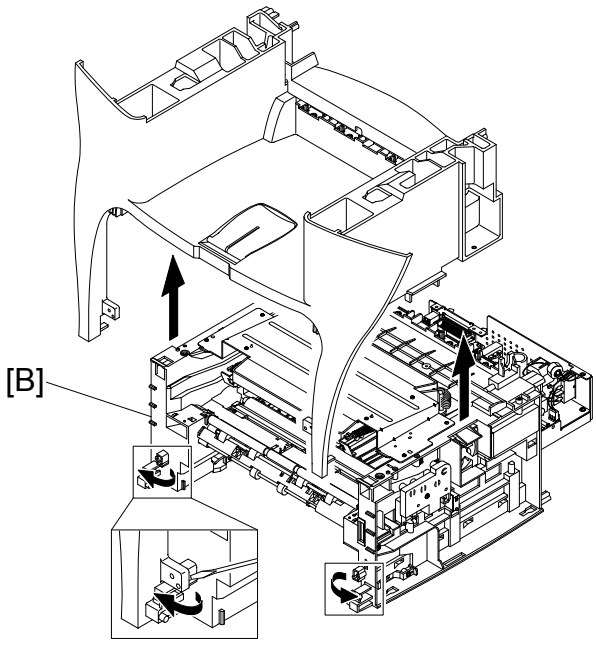


3.8 MIDDLE COVER AND EXIT ROLLER

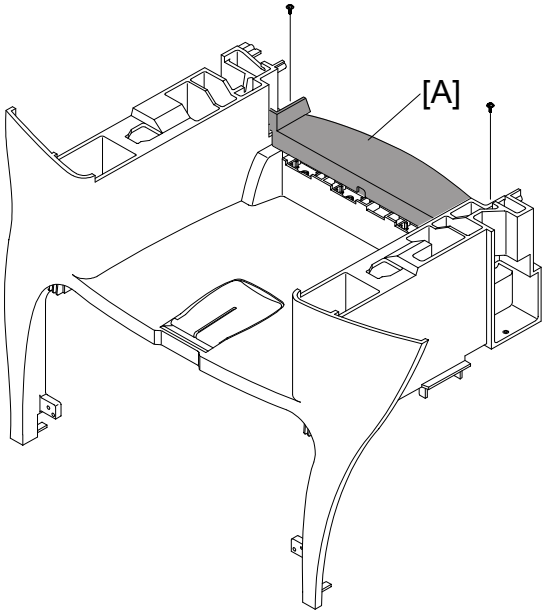
1. Before you remove the Exit Roller, you must remove these:
   - Rear Cover (☛ 3.2)
   - Front Cover Ass'y (☛ 3.4)
   - Side Covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
2. Remove the six screws from the top cover [A].



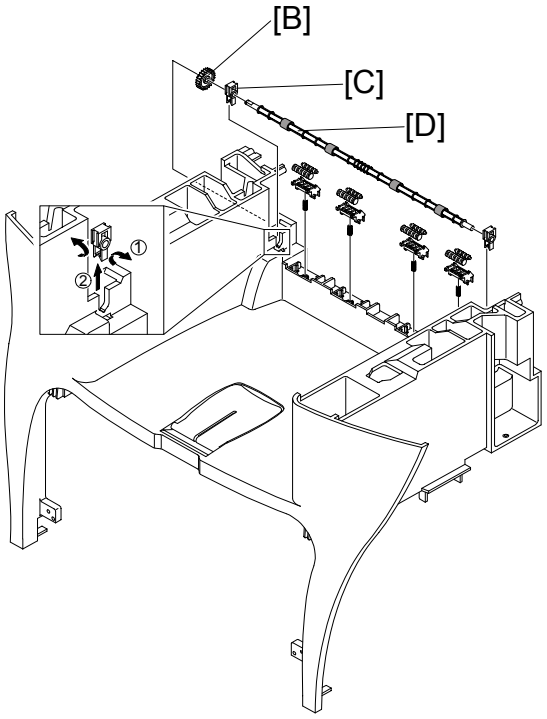
3. Release the top cover from the frame assembly [B]. Then remove the top cover.



4. Remove the two screws from the rear upper cover [A].



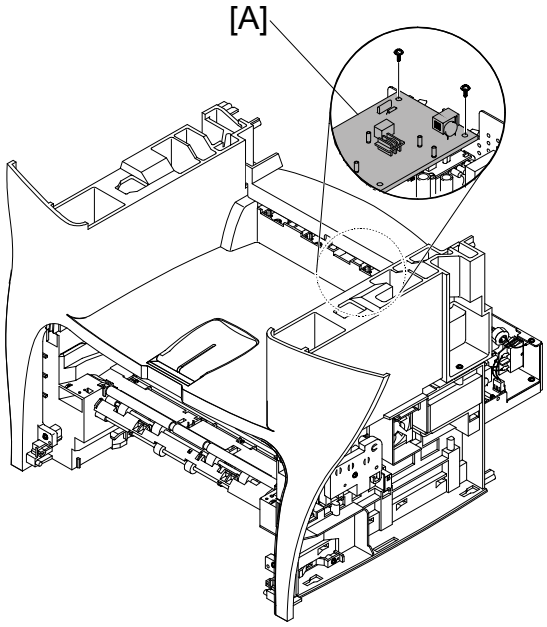
5. Remove the exit gear [B] and bearing [C] from exit roller [D].



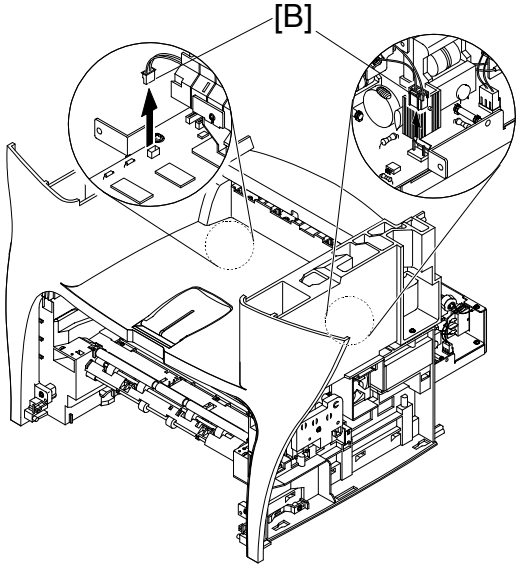
3.9 ENGINE SHIELD ASS'Y

1. Before you remove the engine shield ass'y, you must remove these:
   - Rear Cover (☛ 3.2)
   - Side Covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)

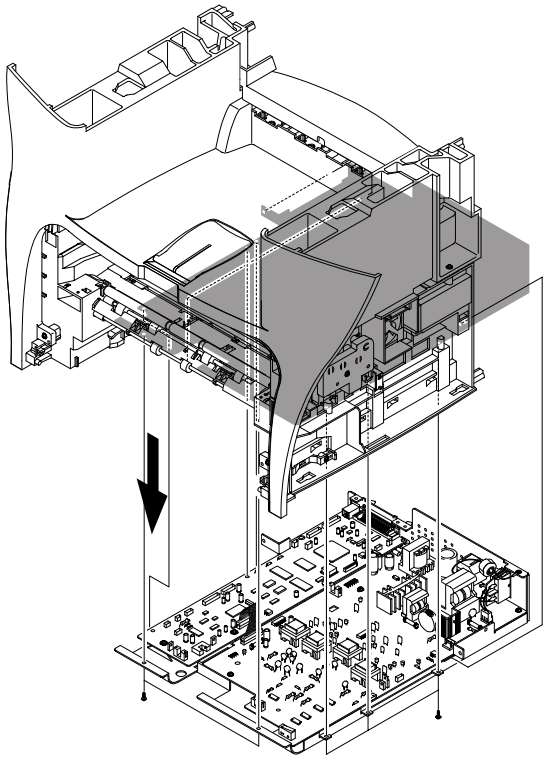
2. Remove the two screws. Then disconnect the FPC cable from the main PBA. Then remove the LIU PBA [A].



3. Disconnect two connectors [B].



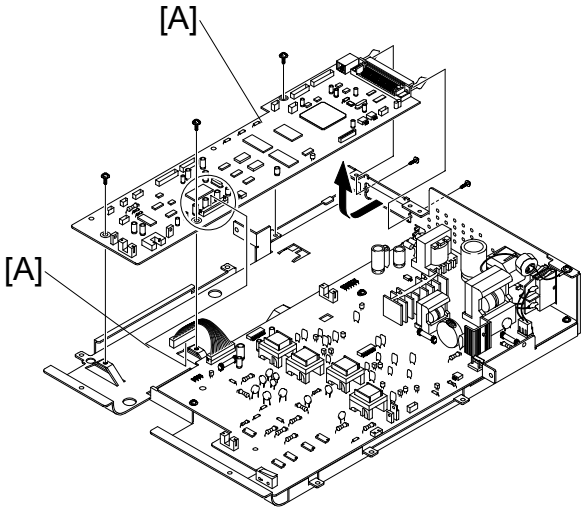
4. Remove the ten screws from the engine shield ass'y [A]. Then remove it. Then disconnect all connectors from the main PBA and SMPS.



3.10 MAIN PBA (MAIN BOARD)

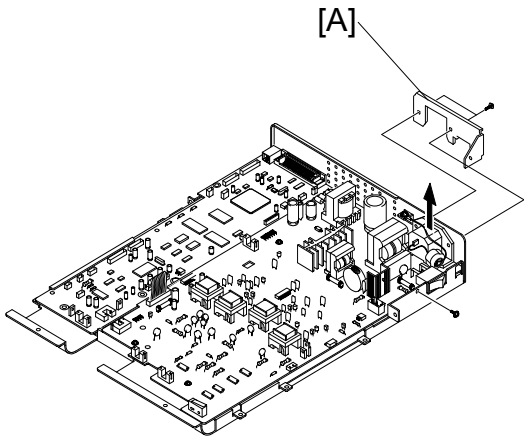
NOTE: 1) Print out the system data list in Tech mode to keep programmed data before you do the replacement procedure.
2) Do the "Clear All Memory" in Tech mode (☛ 5.1.3) after you finish the replacement procedure.

1. Before you remove the main PBA, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Engine shield ass'y (☛ 3.9)
2. Disconnect one connector. Then remove the five screws from the main PBA. Then remove the main PBA [A].

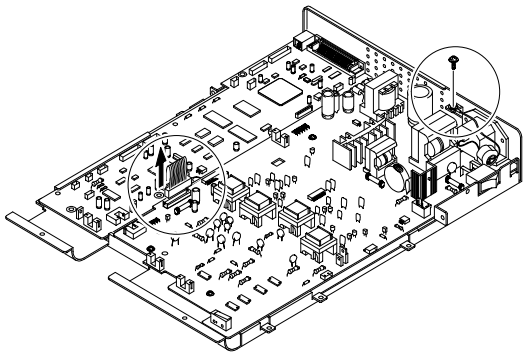


3.11 SMPS (ALSO KNOWN AS POWER SUPPLY UNIT)

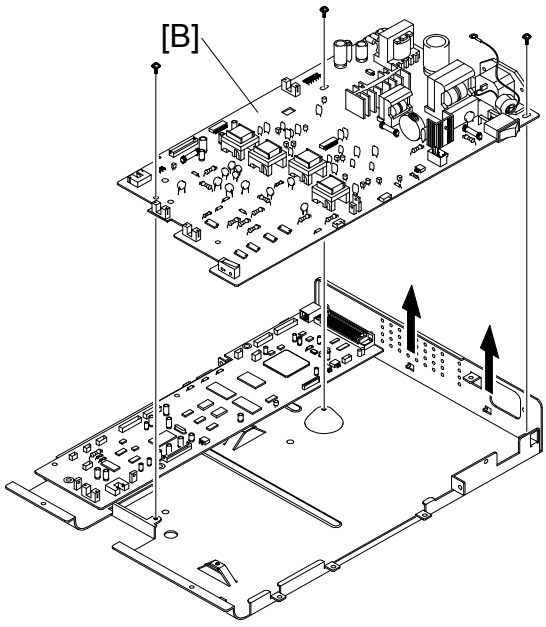
1. Before you remove the SMPS, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Engine shield ass'y (☛ 3.9)
2. Remove the three screws from the inlet bracket [A]. Then remove it



3. Disconnect one connector. Then remove the one screw from the engine shield.



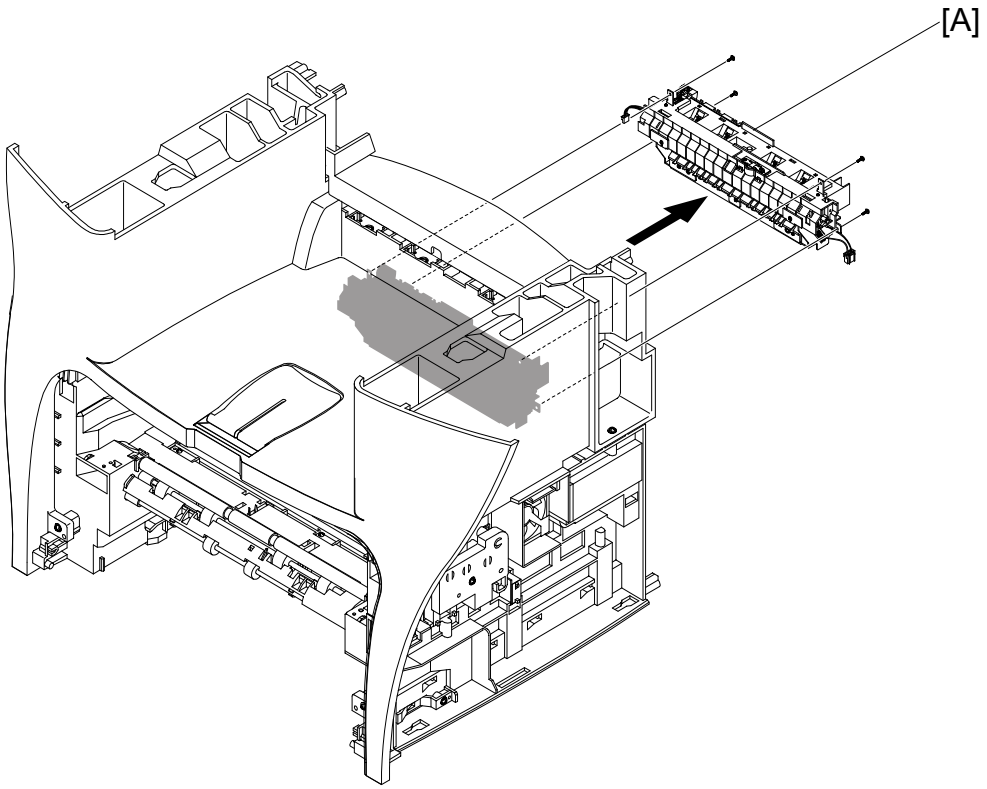
4. Remove the three screws from the SMPS [B]. Then remove the SMPS.



3.12 FUSER ASS'Y (ALSO KNOWN AS FUSING UNIT)

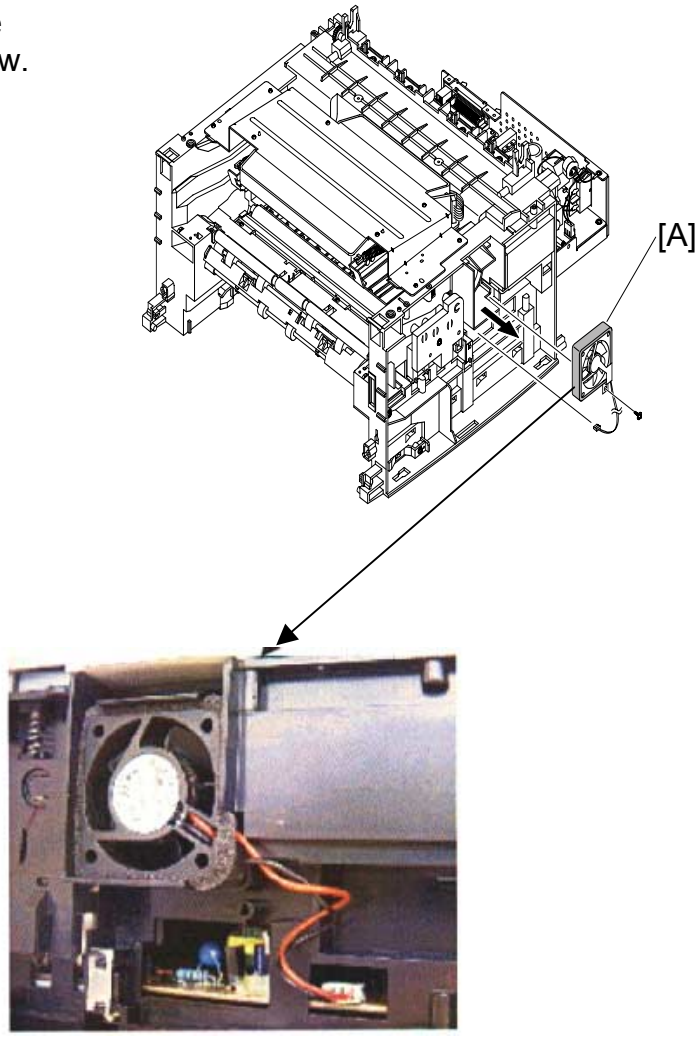
CAUTION
The fusing unit has tapping screws. Assembly/disassembly should be kept to a minimum. Adjustments again and again can cause failure. To avoid hazardous situations, do not replace any components inside the fusing unit such as thermistor, hot roller, stripper pawls, fusing lamp, etc..

1. Before you remove the fuser ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Engine shield ass'y (☛ 3.9)
2. Disconnect the two connectors from the main PBA and SMPS. Then remove the four screws from the fusing unit [A]. Then remove it.



3.13 FAN

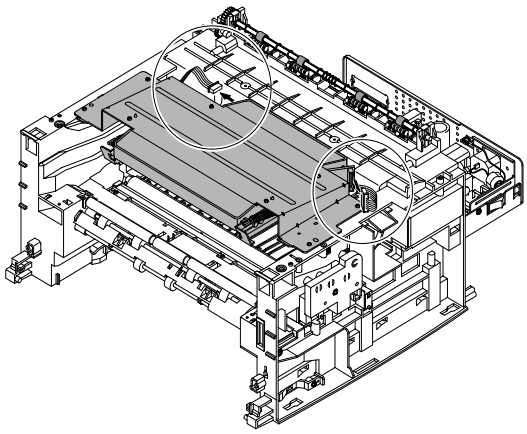
1. Before you remove the fan, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
2. Disconnect the connector from the SMPS. Then remove the one screw. Then remove the fan [A].



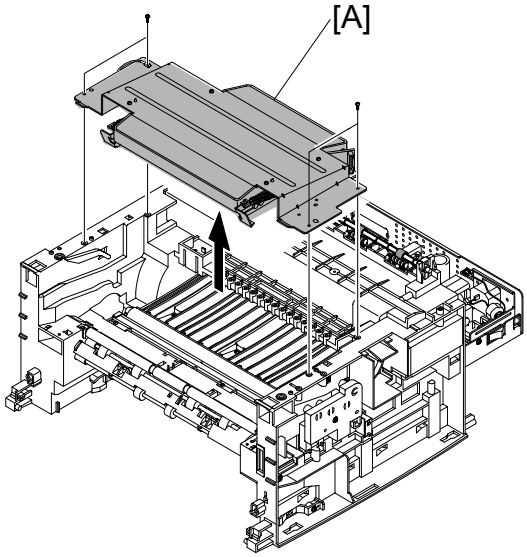
CAUTION: Make sure to set the fan in the correct position. The label on the fan must face outward.

3.14 LSU (LASER SCANNING UNIT)

1. Before you remove the LSU, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Front cover (☛ 3.4)
   - Middle cover (☛ 3.8)
2. Disconnect the two connectors.

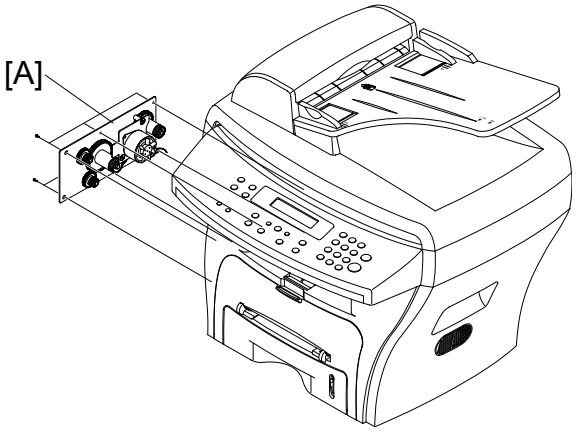


3. Remove the four screws from the LSU [A]. Then remove it.

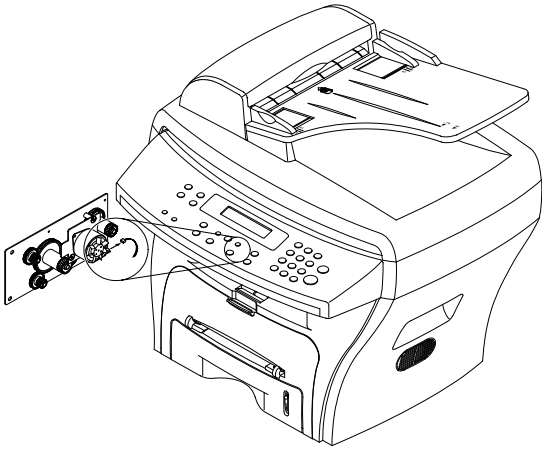


3.15 DRIVE ASS'Y

1. Before you remove the drive ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
2. Remove the six screws from the drive ass'y [A].

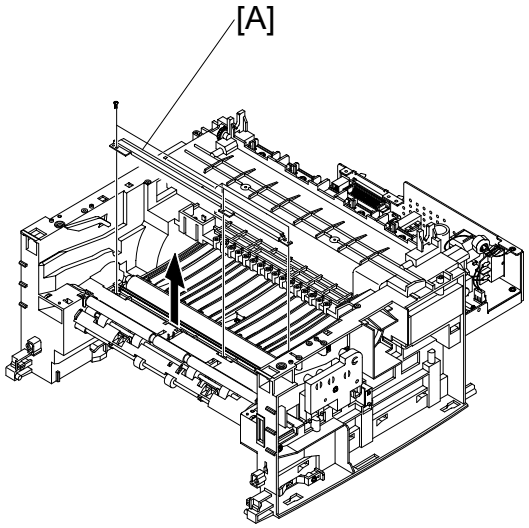


3. Remove the drive ass'y. Then disconnect the connector from the main PBA.

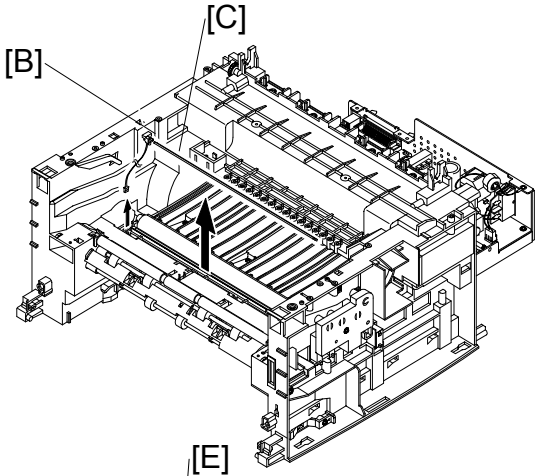


3.16 TRANSFER ASS'Y

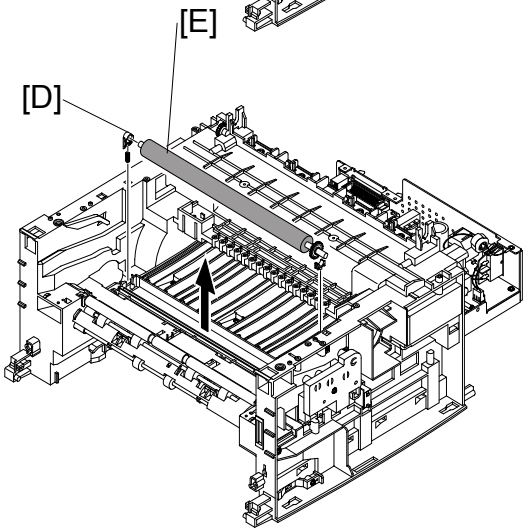
1. Before you remove the transfer ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Front cover (☛ 3.4)
   - Middle cover (☛3.8)
   - LSU (☛3.14)
2. Remove the three screws from the transfer ass'y [A]. Then remove it.



3. Disconnect the PTL holder connector. Then remove the PTL holder [B] and PTL Lens [C].

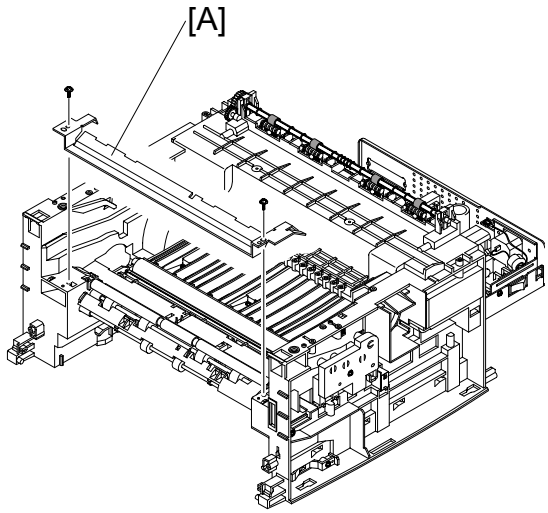


4. Release the bushing [D]. Then remove it. Then remove transfer roller [E].

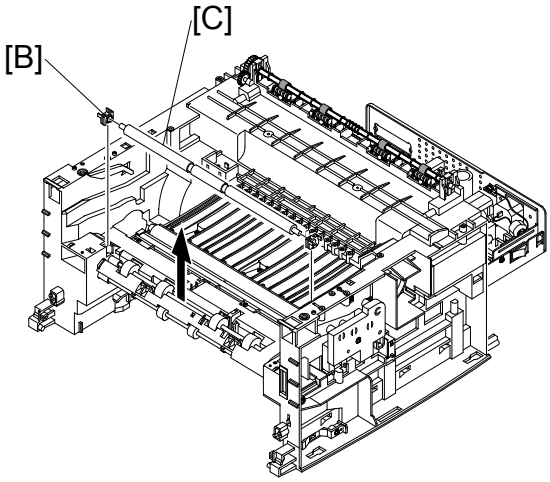


3.17 FEED ASS'Y

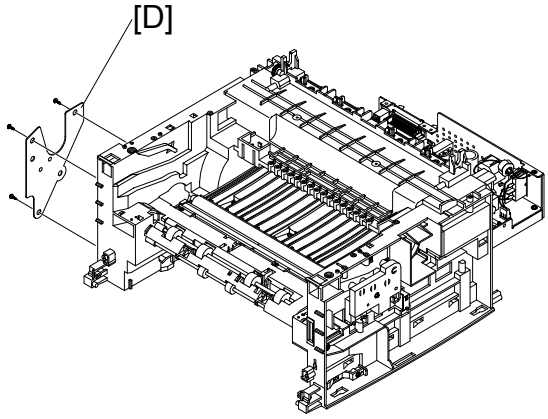
1. Before you remove the feed ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Front cover (☛ 3.4)
   - Middle cover (☛3.8)
   - Drive ass'y (☛ 3.15)
2. Remove the two screws from the paper guide [A]. Then remove it.



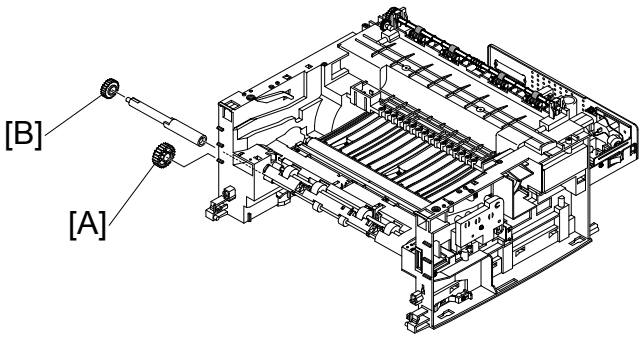
3. Pull up the feed idle bushing [B]. Then pull up the feed idle shaft [C].



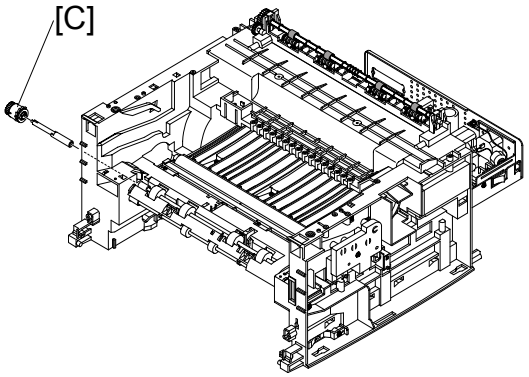
4. Remove the three screws from the feed bracket [D]. Then remove it.



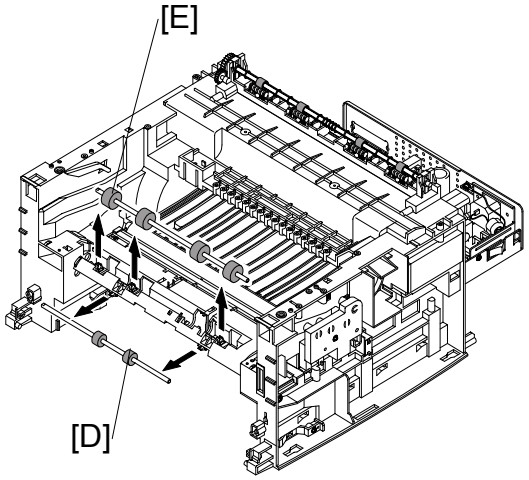
5. Remove the idle gear [A] and feed gear 2 [B].



6. Remove feed gear 1 assembly [C] .

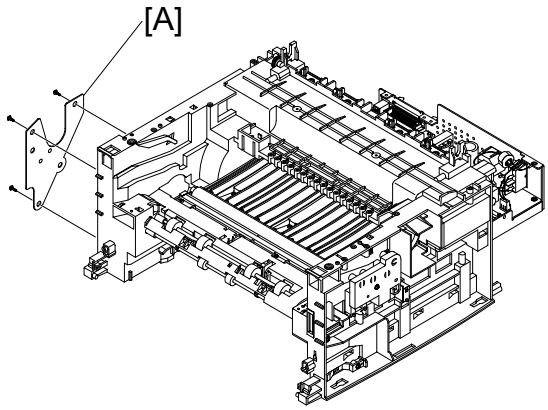


7. Pull up the feed roller [D] and feed roller 1 [E].

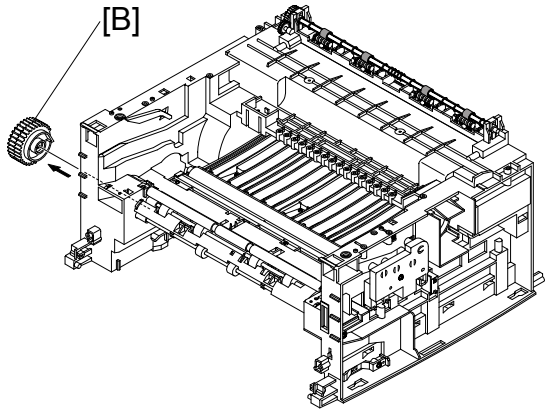


3.18 PICK UP ASS'Y AND SOLENOID

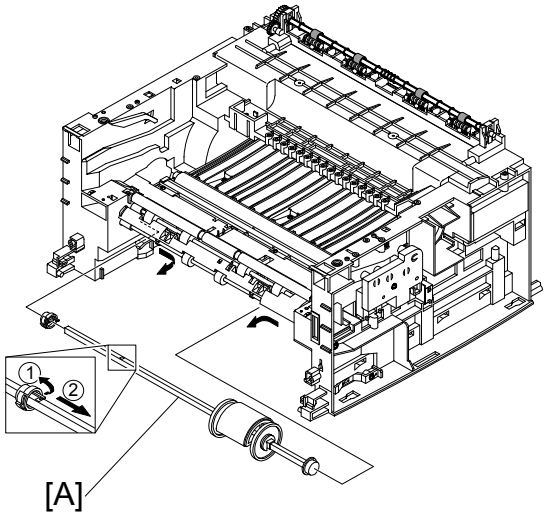
1. Before you remove the pick up ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Front cover (☛ 3.4)
   - Scanner Ass'y (☛ 3.5)
   - Middle cover (☛3.8)
   - Engine shield Ass'y (☛ 3.9)
   - Drive Ass'y (☛ 3.15)
2. Remove the three screws from the feed bracket [A]. Then remove it.



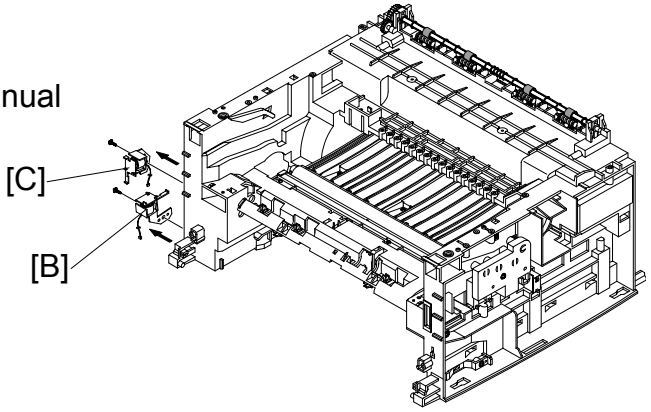
3. Remove the pick up gear assembly [B].



4. Remove the pick-up ass'y [A].



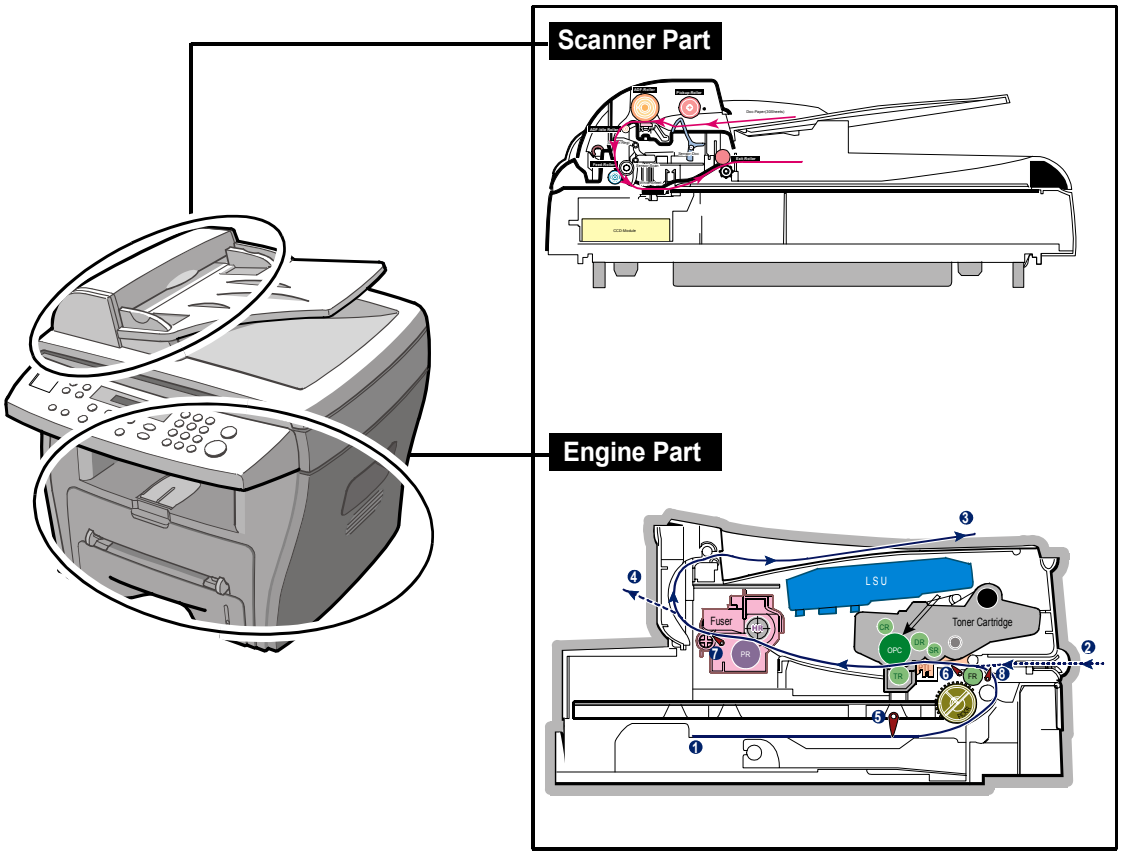
5. Remove the two screws from the manual solenoid [B] and pick-up solenoid [C]. Then remove the manual solenoid and pick-up solenoid.



TROUBLESHOOTING

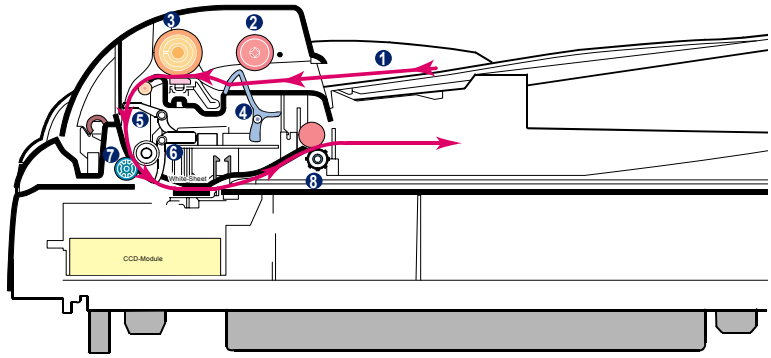
4. TROUBLESHOOTING

4.1 PAPER PATH



4.1.1 COPY & SCAN DOCUMENT PATH

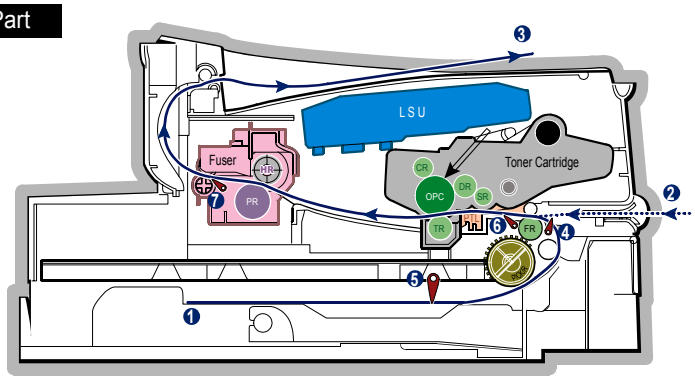
Scanner Part



❶ Doc. Paper (30 Sheets)
❷ Pickup Roller
❸ ADF Roller
❹ Sensor - Doc.
❺ Sensor - Regi
❻ Sensor - Scan
❼ Feed Roller
❽ Exit Roller

4.1.2 PRINTER PAPER PATH

Engine Part



❶ Paper Input (Cassette)
❷ Paper Input (Manual Feeder)
❸ Paper Out (Face Down)
❹ Paper Empty Sensor (Manual)
❺ Paper Empty Sensor (Cassette)
❻ Paper Feeding Sensor
❼ Paper Exit Sensor

1. After receiving print job, the printer feeds the printing paper from the cassette or manual feeder.
2. The fed paper passes the paper feeding sensor. (Jam 0 occurs if the sensor is not operated after certain time passes)
3. The paper passed the paper feeding sensor moves to the paper exit sensor via printing process. (Jam 1 occurs if the sensor is not operated after certain time passes)
4. The paper passed the paper exit sensor moves out from the set. (Jam 2 occurs sometime after if the tailing edge of the paper has not exited out from the set after the leading edge of paper passes the paper exit sensor.)

4.2 CLEARING JAMS

Occasionally, paper can be jammed during a print job. Some of the causes include:

- The tray is loaded improperly or overfilled.
- The tray has been pulled out during a print job.
- The front cover has been opened during a print job.
- Paper was used that does not meet paper specifications.
- Paper that is outside of the supported size range was used.

If a paper jam occurs, the On Line/Error LED on the control panel lights red. Find and remove the jammed paper. If you don't see the paper, open the covers.

Do not use a pinset or a sharp metal tool when removing a jam.

4.2.1 CLEARING PAPER JAMS

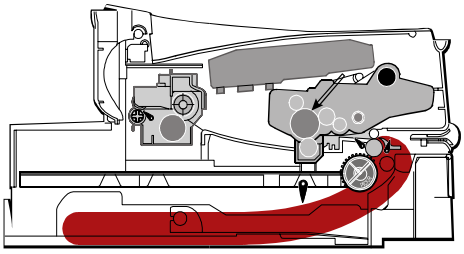
If paper jams occur, " PAPER JAM " appears on the display. Refer to the table below to locate and clear the paper jam.

PAPER JAM 0: In the paper feed area

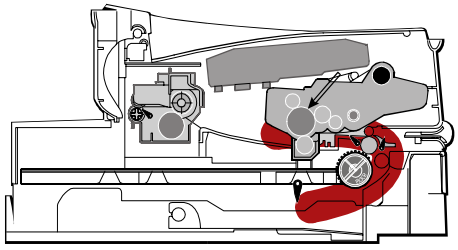
PAPER JAM 1: In the paper exit area

PAPER JAM 2: In the fuser area or around the toner cartridge

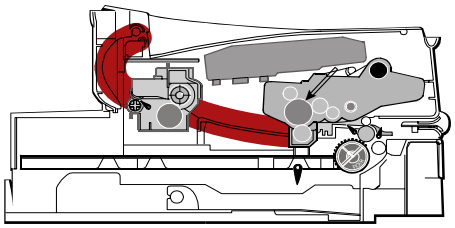
BYPASS JAM: In the Bypass tray



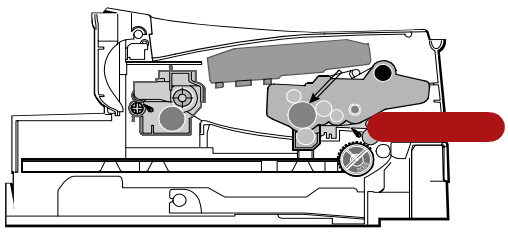
Paper Jam 0



Paper Jam 1



Paper Jam 2



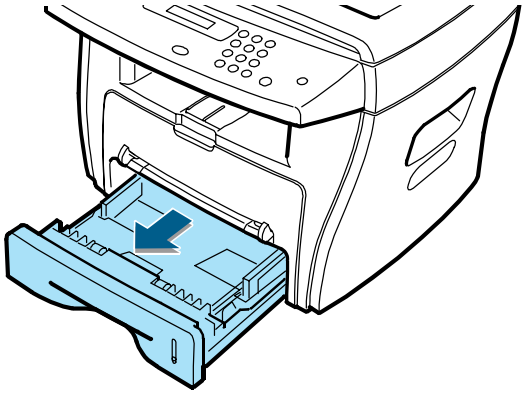
Bypass Jam

Follow the steps below to clear a jam. To avoid tearing the paper, pull the jammed paper out gently and slowly.

JAM 0 (In the Paper Feed Area)

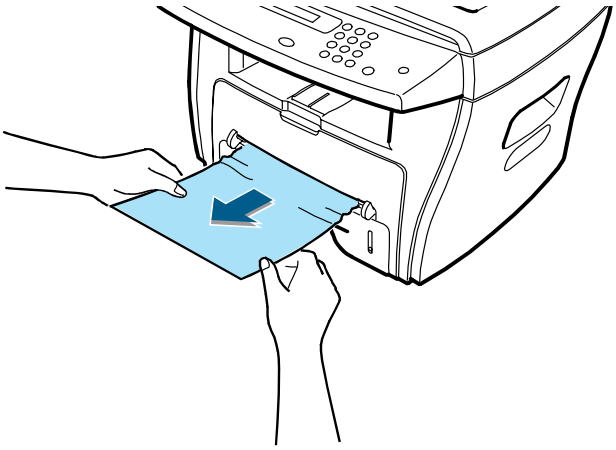
1. Open and close the front cover. The jammed paper automatically exits the machine. If the paper does not exit, continue to Step 2.

2. Pull the paper cassette open.

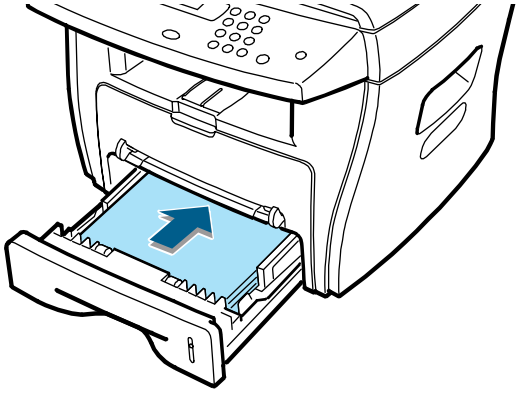


3. Remove the jammed paper by gently pulling it straight out.

   NOTE: If there is any resistance when you pull the paper or the paper is not seen in this area, skip to the fuser area around the toner cartridge



4. Insert the paper tray into the machine until it snaps into place.

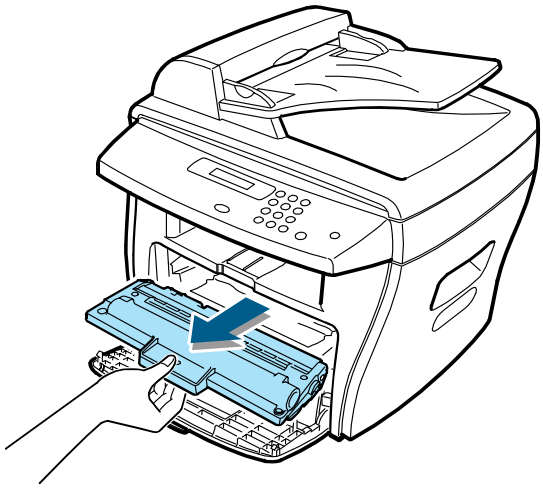


5. Open and close the front cover to resume printing.

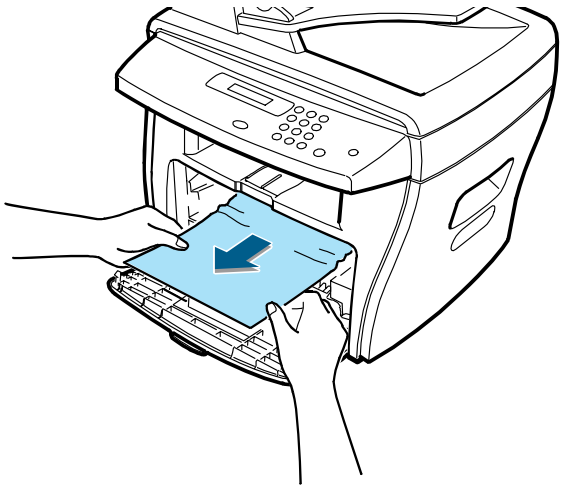
JAM 1 (In the Fuser Area of Around the Toner Cartridge Area)

NOTE: The fuser area is hot. Be careful when removing paper from the machine.

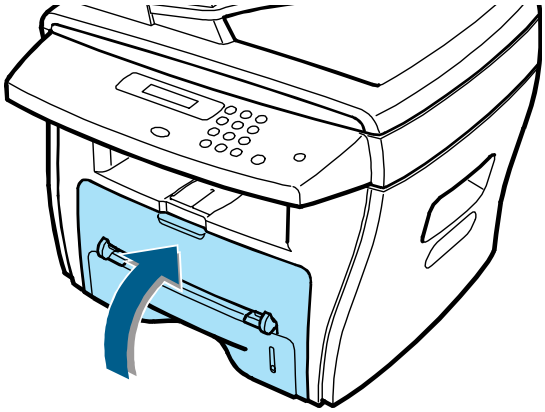
1. Open the front cover and remove the toner cartridge.



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



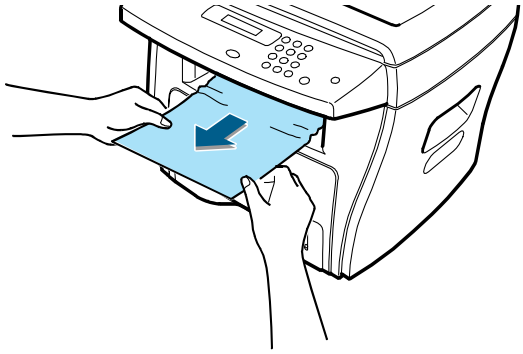
3. Replace the toner cartridge and close the front cover. Printing automatically resumes.



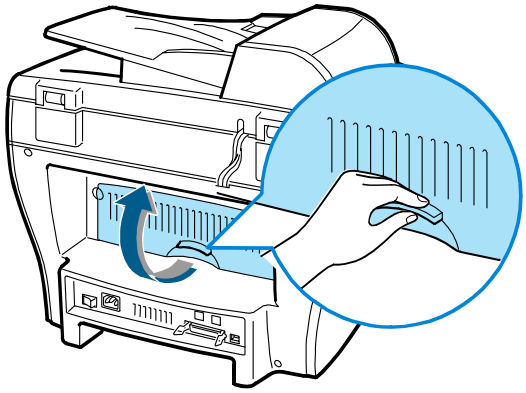
JAM 2 (In the Paper Exit Area)

1. Open and close the front cover. The jammed paper automatically exits the machine. If the paper does not exit, continue to Step 2.

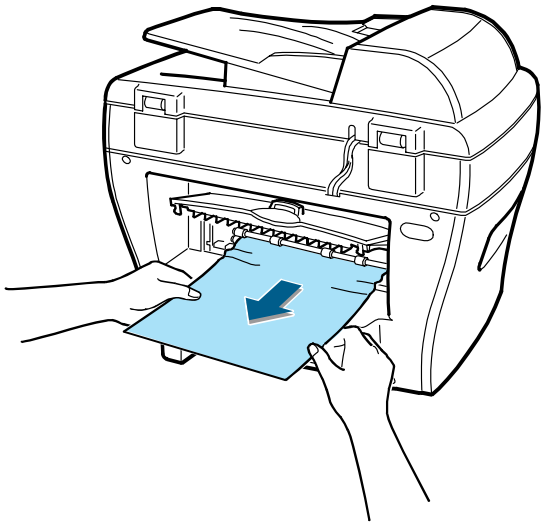
2. Gently pull the paper out of the front output tray.



3. If there is any resistance when you pull the paper or the paper is not seen in the front output tray, open the rear cover.

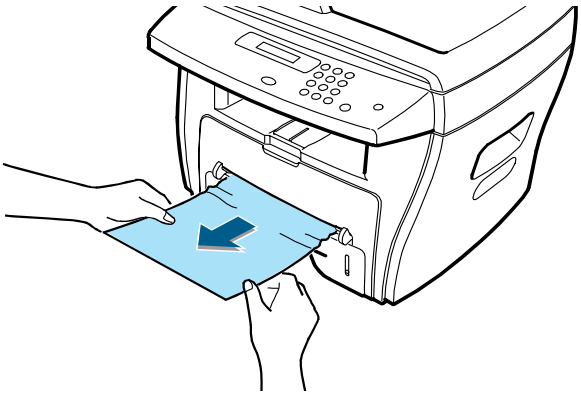


4. Remove the jammed paper by gently pulling it straight out.



5. Close the rear cover.
6. Open and close the front cover to resume printing.

BYPASS JAM (In the Bypass Tray)



“BYPASS JAM ” appears on the display when the machine does not detect paper in the Bypass tray due to no paper or improper paper loading when you try to print using the Bypass tray.

“BYPASS JAM ” also may occur when the paper is not properly fed into the machine through the Bypass tray. In that case, pull the paper out of the machine.

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 “Clearing Paper Jams ”

- Follow the procedures in “Loading Paper”. Ensure that the adjustable guides are positioned correctly.
- Do not overload the paper tray. Ensure that the paper is below the paper capacity mark on the inside wall of the paper 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 paper tray.
- Use only recommended print materials. See “Paper Specifications ”
- Ensure that the recommended print side is facing down when loading paper in the paper tray and facing up in the Bypass tray.

4.2.2 CLEARING DOCUMENT JAMS

If a document jams while it is feeding through the ADF (Automatic Document Feeder),“DOCUMENT JAM ” appears on the display.

Input Misfeed

1. Open the ADF top cover.

2. Pull the document gently to the right and out of the ADF.

3. Close the ADF top cover. Then load the documents back into the ADF.

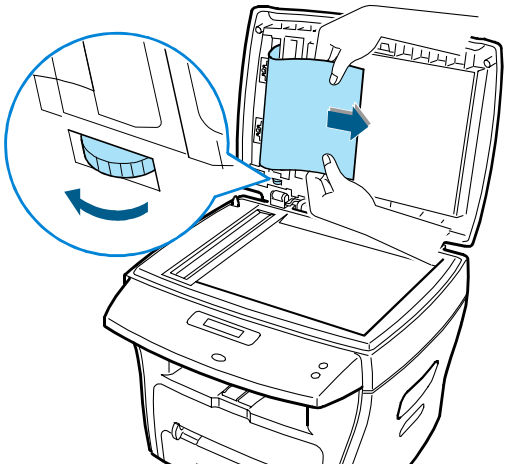
NOTE: To prevent document jams, use the document glass for the thick, thin or mixed documents.

Exit Misfeed

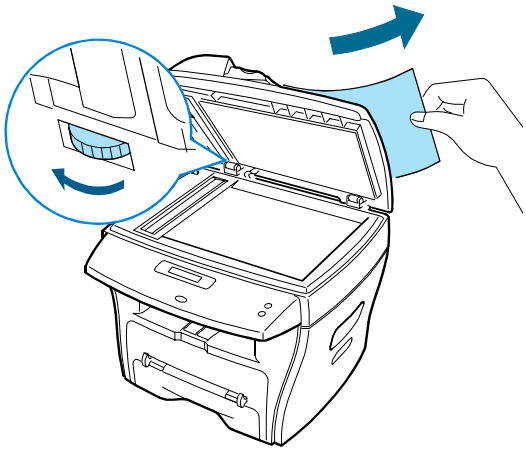
1. Open the document cover and turn the release knob to remove the misfed documents from the exit area.
2. Close the document cover. Then load the documents back into the ADF.

Roller Misfeed

1. Open the document cover.



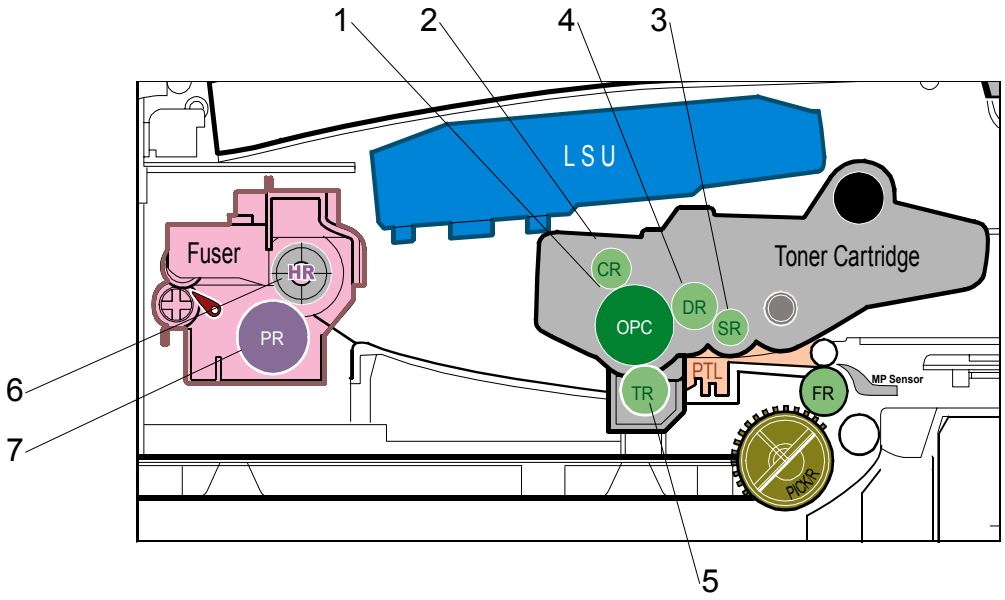
2. Turn the release knob so that you can easily remove the misfed document, and remove the document from the ADF or the feed area by carefully pulling it towards the right by using both hands.



3. Close the document cover. Then load the documents back into the ADF.

4.3 ABNORMAL IMAGE PRINTING AND DEFECTIVE ROLLER

If abnormal image prints periodically, check the parts shown below.



No	Roller	Abnormal Image Period	Kind of Abnormal Image
1	OPC Drum	75.5 mm	White spot, Block spot
2	Charge Roller	37.7 mm	Black spot
3	Supply Roller	37.0 mm	Horizontal density band
4	Develop Roller	35.2 mm	Horizontal density band
5	Transfer Roller	45.3 mm	Black side contamination/transfer fault
6	Hot Roller	66.3 mm	Black spot and fuser ghost
7	Pressure Roller	75.5 mm	Black side contamination

4.4 PAPER FEEDING PROBLEMS

4.4.1 WRONG PRINT POSITION

Description

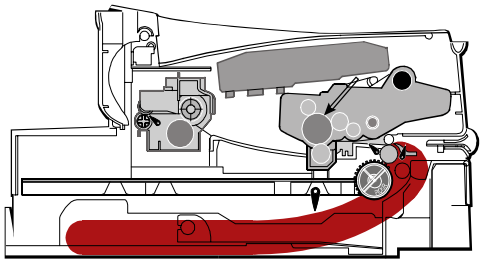
Printing begins when the paper is in the wrong position.

Check and Cause	Solution
A defective feed sensor actuator can cause incorrect timing.	Replace the defective actuator.

4.4.2 JAM 0

Description

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

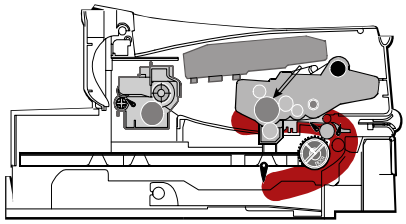


Check and Cause	Solution
Check the solenoid by using Engine Test Mode: Diagnostic Mode 0.	Replace the solenoid.
Check if the pad is loose due to bad sealing of the side-pad.	Replace the side-pad or assembly L or R if necessary.
Check the surface of the roller-pick-up for foreign matter.	Clean with a soft cloth dampened with IPA (Isopropyl Alcohol) or water.
If continuous clusters occur, check whether the assembly slot between shaft-pickup and housing-pickup become open or is broken away.	Replace the house pick-up unit and/or shaft pick-up.
If the paper feeds into the printer and Jam 0 occurs, perform Engine Test Mode to check feed-sensor of the engine board.	

4.4.3 JAM 1

Description

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

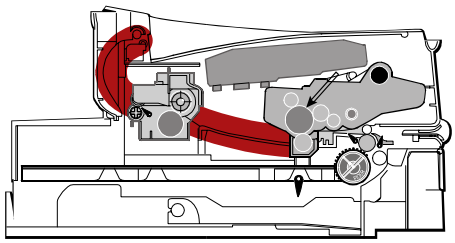


Check and Cause	Solution
If the recording paper is jammed in front of or inside the toner cartridge.	Replace the SMPS. (Power supply)
The actuator may be defective if the recording paper stays in the transfer roller and the fuser after it passes through the actuator-feed.	Reassemble the Actuator-Feed and Spring-Actuator if the return is bad.

4.4.4 JAM 2

Description

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



Check and Cause	Solution
Exit sensor is defective if the paper is completely fed out of the printer, but Jam 2 occurs. • After the paper is completely discharged, actuator exit should return to the original position to shut off the photo-sensor. Sometimes it takes longer than it should and does not return.	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 if burrs occur in the assembly part of the actuator. Check if the actuator is smoothly operated. • Check if unwanted matters and wire got caught in the actuator exit's operation.
If the paper is rolled in the fuser roller: • This occurs when a guide claw breaks away or becomes deformed. • It occurs when the guide spring breaks away or becomes deformed. • It occurs when the heat-roller or pressure-roller gets too much toner powder.	If the paper is stuck in the fuser, disassemble the fuser and remove the jammed paper. Then clean the surface of the pressure roller with dry gauze.
Paper is accordion and jams in fuser.	Remove the jammed paper after you disassemble the fuser: Clean the surface of the pressure roller with dry gauze. • Remove the toner particles stained on the rib. • Check the assembly and the performance of the exit.

4.4.5 MULTI-FEEDING

Description

Multiple sheets of paper are fed at once.

Check and Cause	Solution
Solenoid malfunction (the solenoid is not working properly): Perform Engine Test Mode: Diagnostic Mode code 0.	Replace the solenoid if necessary.
Friction-Pad is contaminated with foreign matter (oil).	Clean the friction-pad with soft cloth dampened with IPA (Isopropyl Alcohol).
The front and back side of the paper is mixed.	Use smooth paper.

4.4.6 PAPER STAYS ROLLED IN THE FUSER

Description

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

Check and Cause	Solution
Contamination of the pressure roller. (Background, Hot off set)	Disassemble the fuser, clean the area between the Heat-roller and Thermistor and remove the foreign matter off of the pressure roller. **NOTE:** As explained in page 3-19, assembly/disassembly of the fuser unit should be kept to a minimum, in order to avoid hazardous situations.
	If background appears refer to the Solutions for background. (☛ 4.6.8)

4.4.7 PAPER ROLLED IN THE OPC

Description

Paper stays in the OPC.

Check and Cause	Solution
Paper is too thin.	Recommend to use normal paper thickness.
The face of paper is curled.	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 IPA (Isopropyl Alcohol) and a tissue.

4.4.8 DEFECTIVE ADF

Description

ADF does not operate correctly.

Check and Cause	Solution
Check if ADF rubber and holder rubber are damaged.	Check if the document sensors of OPE assembly (2 paper sensors) are normal.
Check if the document sensors of ADF Ass'y (3 sensors) are normal.	If you cannot visually confirm the damaged part, try to replace the ADF Ass'y.

4.5 PRINTING PROBLEMS

4.5.1 DEFECTIVE OPERATION (LCD WINDOW) DISPLAY

Description

Strange characters are displayed on the OPE Panel or buttons do not operated.

Check and Cause	Solution
Clear the memory. (☛ 5.2.3)	Then try again after clearing the memory.
Check if OPE harness is connected to the Connection Board correctly.	Confirm that the OPE HARNESS is connected to the Main Board correctly though the connector board. If it is so, then replace the OPE assembly, Connector Board and Main Board in sequence.

4.5.2 DEFECTIVE LCD OPERATION

Description

Defective LCD Operation

Check and Cause	Solution
Clear the memory. (☛ 5.2.3)	The key is defective or incorrectly assembled
Confirm to catch a click sound, while a key on the OPE panel is pressed on.	Even after the key has been replaced, if it still fails, try to replace the OPE Ass'y and the Main Board in sequence.

4.5.3 FUSER FAILURE DUE TO MELTED GEAR

Description

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

Check and Cause	Solution
Check the Fusing Lamp.	Replace the Fuser.
	Replace the Main Board.
	Replace the SMPS. (Power supply)

4.5.4 PAPER EMPTY

Description

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

Check and Cause	Solution
Bending or deformation of the actuator of the paper sensor.	Replace the defective actuator.
The function of the Main Control board is defective Perform Engine Test Mode: diagnostic code 2.	Replace the Main Board.

4.5.5 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
Bending or deformation of the actuator of the paper sensor.	Replace the defective actuator.
The function of the Main Control board is defective Perform Engine Test Mode: diagnostic code 2.	Replace the Main Board.

4.5.6 COVER OPEN

Description

The ERROR lamp is on even when the front door is closed.

Check and Cause	Solution
The hook lever in the Front Cover may be defective.	Replace the hook lever, if defective.
Check the connector (CN1) and circuit of the cover switch department in the Main Board.	Check the insertion of the Cover Open S/W Connecter.
	Replace the Main Board or Cover Open S/W.

4.5.7 NO LAMP ON WHEN THE COVER IS OPEN

Description

The ERROR lamp does not come on even when the front door is open

Check and Cause	Solution
Check the connector (CN1) and circuit of the cover switch department in the Main Board.	Check the insertion of the Cover Open S/W Connecter.
	Replace the Main Board or Cover Open S/W.

4.5.8 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
Motor harness or Main Board may be defective.	Check the motor harness, if defective, replace.
Perform Engine Test Mode diagnostic code 0 and Check the Motor operation.	Replace the SMPS, if necessary.

4.5.9 NO POWER

Description

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

Check and Cause	Solution
Check if the power input and SMPS output are normal.	Replace the power supply cord or SMPS.
Check for defective of LED-Panel on the OPE if the LED of panel does not appear after normal warming-up.	Replace the OPE ass’y.

4.5.10 VERTICAL LINES CURVED

Description

When printing, vertical lines curve.

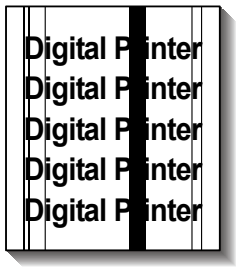
Check and Cause	Solution
If the supply of +24v is unstable in the Main Board linking with LSU, check drive by Engine Test Mode: Diagnostic Code Check -1- LSU Motor on.	Replace LSU.
	Replace the Main Board.

4.6 PRINTING QUALITY PROBLEMS

4.6.1 VERTICAL BLACK LINE AND BAND

Description

1. Straight thin black vertical line(s) occurs in the printing
2. Dark black vertical band(s) occur in the printing.

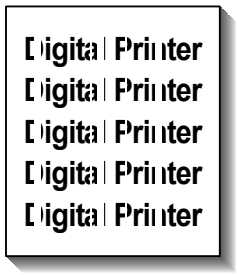


Check and Cause	Solution
1. Damaged develop roller in the Developer. Deformed Doctor-blade or cleaning-blade.	If causes 1 and 2 occur in the developer cartridge, replace the AIO and try to print again.
2. Scratched surface of the discharge roller in the developer.	Replace the transfer roller if occurred as No. 3.
3. Partial depression or deformation on the surface of the transfer roller.	

4.6.2 VERTICAL WHITE LINE

Description

White vertical voids in the image.

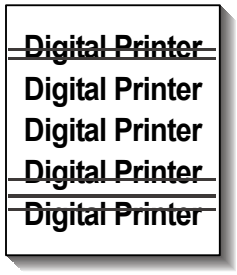


Check and Cause	Solution
Foreign matter stuck onto the window of internal lenses of LSU mirror.	Clean the LSU window with recommended cleaner(IPA) and a clean cotton swab.
Foreign matter or toner particles between the developer roller and blade. (In case the life of the developer has been expired, white lines or light image occur in front of the image.)	Open the cover of LSU and clean with a cotton swab on the surface of the reflex mirror with a clean cotton swab.
It may occur when a Burr and foreign substances are on the window of the developer frame.	Remove the foreign matter and burr of the exposure window. (Developer cartridge)
If the fuser is defective, voids occur periodically at the top of a black image.	Open the front cover and check if the ribs correspond to the position of the voids. Remove if found.
	If the problems are not solved, replace the AIO.

4.6.3 HORIZONTAL BLACK BAND

Description

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

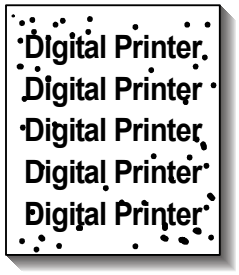


Check and Cause	Solution
Bad contacts of the voltage terminals to developer.	Clean each voltage terminal of the Charge, Supply, Develop and Transfer roller. (remove the toner particles and paper particles)
The rollers of developer may be stained. Charge roller = 37.7 mm Supply roller = 37 mm Develop roller = 35.3 mm Transfer roller = 45.3 mm	Clean the right Gear that has a relatively small gap of the teeth in the OPC.
	If the malfunction persists, replace the AIO.

4.6.4 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
If dark or blurry black spots occur periodically, the rollers in the Developer may be contaminated with foreign matter or paper particles. (Charge roller : 37.7 mm interval OPC drum : 75.5 mm interval)	Run OPC cleaning Mode Print and run the Self-test 2 or 3 times.
If faded areas or voids occur in a black image at intervals of 75.5 mm, or black spots occur elsewhere, the OPC drum surface is damaged.	In case of 75.5 mm interval, clean foreign substances stuck on the OPC location equivalent to the black spots and white spots with a dry duster.
If a black image is partially broken, the transfer voltage is abnormal or the transfer roller's life has expired.	The transfer roller is guaranteed for 60,000 sheets. If the roller's life is expired, replace it.
	In case of 37.7 mm interval, take measures as to replace the AIO and try to print again.

4.6.5 LIGHT IMAGE

Description

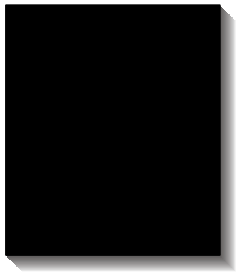
The printed image is light, with no ghost.

Check and Cause	Solution
Develop roller is stained when the toner of developer cartridge is almost consumed.	Check if the Toner Save mode is selected.
	Replace the AIO and try to print again.
Ambient temperature is below than 10°C.	Wait 30 minutes after the machine is powered on before you start printing.
Bad contact caused by the toner stains between the high voltage terminal in the HVPS and the terminal in the AIO.	Clean up the contaminated area by the toner.
Abnormal output from the HVPS. (Run self-test and check the solution)	
	Replace the HVPS (SMPS) if the problems are not solved by the above solutions.

4.6.6 DARK IMAGE OR A BLACK

Description

The printed image is dark.



Check and Cause	
No charge voltage in the Main Board. (Perform Engine Test Mode diagnostic code 4 HVPS check.)	Clean the high voltage charge terminal.
Charge voltage is not turned on due to the bad contacts between power supply in the side of the Developer and charge terminal of HVPS.	Check the state of the connector, which connects the Main Board and HVPS.
	If steps 1 and 2 above did not correct the problem, replace the HVPS (SMPS).

4.6.7 UNEVEN DENSITY

Description

Print density is uneven between left and right.

Check and Cause	Solution
The pressure force on the left and right springs of the transfer roller is not even, the springs are damaged, the transfer roller is improperly installed, or the transfer roller bushing or holder is damaged.	Replace both the left and right Spring Holder.
The life of the Developer has expired.	Problem with the toner cartridge, replace the AIO and try to print again.
The toner level is not even on the developer roller due to the bad blade.	

4.6.8 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
Recycled recording paper has been used.	Quality is not guaranteed when using recycled paper.
The life of the Developer has expired.	Replace the AIO.
The up-to-down movement of the transfer roller is swift?	Clean the bushings on the transfer roller.
The HVPS is normal? (Perform Engine Test Mode diagnostic code 4)	Replace the HVPS (SMPS).

4.6.9 GHOST (1)

Description

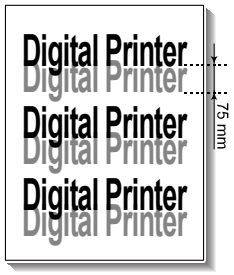
Ghost occurs at 75.5 mm intervals of the OPC drum in the whole printing.

Check and Cause	Solution
Bad contacts caused by contamination from toner particles between the high voltage terminal in the main body and the electrode of the developer.	Clean the contaminated terminals.
Bad contacts caused by contamination from toner particles between the high voltage terminal in the main body and the electrode in the HVPS board.	Problem in the toner cartridge, replace the AIO and try to print again.
The life of developer is expired.	Replace the Main Board if not solved by the above two directions.
Transfer roller lifetime (60,000 sheets) has expired.	If not solved by the above direction, check the transfer roller lifetime and replace it.
Abnormal low temperature (below 10°C).	Wait about 1 hour after power on before using machine.
Damaged cleaning blade in the developer.	Problem in the toner cartridge, replace the AIO and try to print again.

4.6.10 GHOST (2)

Description

Ghost occurs at 75 mm intervals of the OPC drum in the whole printing. (When printing on card stock or transparencies using manual feeder)

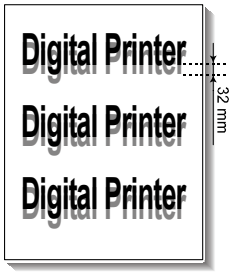


Check and Cause	Solution
When printing on card stock thicker than normal paper or transparencies such as OHP, higher transfer voltage is required.	Select “Thick Mode” on paper type menu from the software application and after use, we recommend returning to the original Mode.

4.6.11 GHOST (3)

Description

White ghost occurs in the black image printing at 32 mm intervals.

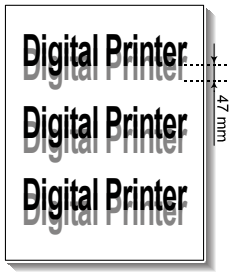


Check and Cause	Solution
The life of the developer may be expired.	Problem in the toner cartridge, replace the AIO and try to print again.
The abnormal voltage and bad contact of the terminal of the supply roller	Check the approved voltage of the supply roller and contact of the terminal and adjust if necessary.

4.6.12 GHOST (4)

Description

Ghost occurs at 47 mm intervals.



Check and Cause	Solution
The temperature of the fuser is maintained high.	Toner particles may be contaminated on the hot roller and/or Thermistor. Replace the fuser.

4.6.13 STAINS ON THE FRONT OF THE PAGE

Description

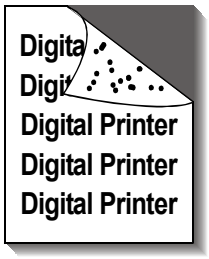
The background on the face of the printed page is stained.

Check and Cause	Solution
Toner leakage due to improperly sealed developer.	Replace the AIO.
If the transfer roller is contaminated, stains on the face of page will occur.	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.

4.6.14 STAINS ON BACK OF THE PAGE

Description

The back of the page is stained at 56.1 mm intervals.

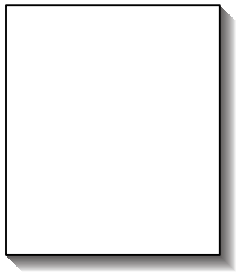


Check and Cause	Solution
Transfer roller is contaminated.	Perform the OPC Cleaning Mode Print 2 or 3 times. Run Self-Test to remove the contamination of the transfer roller.
Pressure roller is contaminated.	Replace the transfer roller if contaminated severely.
	Replace the fuser.

4.6.15 BLANK PAGE PRINT OUT (1)

Description

Blank page is printed.

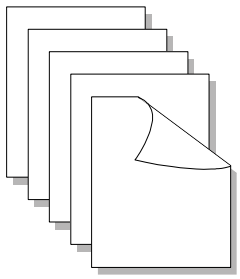


Check and Cause	Solution
Bad ground contacts in OPC and/or developer.	Remove contamination of the terminals of the AIO and the printer.

4.6.16 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	
Bad ground contacts in OPC and/or developer.	Remove contamination of the terminals of the AIO.
Abnormal solenoid.	Perform the engine self test using Engine Test Mode diagnostic code 0 to check if the Solenoid is normal.
	If not solved by the above two directions, replace the Main Board.
	Turn the power off, clear the print job on the computer, and try printing again.

4.7 FAX & PHONE PROBLEMS

4.7.1 NO DIAL TONE

Description

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

Check and Cause	Solution
Check if the telephone line cord is connected to “LINE” correctly.	If the telephone cord is normal but there is no dial tone, then try to replace the LIU Board.
Check if it makes CLICK sound while on hook dial key is pressed.	If you cannot hear the CLICK sound of the on hook dial key, the OPE Ass’y may be defective. Replace the OPE assembly.
Check the connection of HARNESS between the LIU and the Main Board.	Check the Speaker connection, and try to replace it.
Check if the SPEAKER is connected correctly.	Lastly, try to replace the Main Board.

4.7.2 DEFECTIVE TONE DIAL

Description

The Tone Dial is not functioning.

Check and Cause	Solution
Check if the telephone line is connected correctly.	If you cannot hear the CLICK sound of the on hook dial key, the OPE Ass’y may be defective. Replace the OPE assembly.
When the ten key pad is pressed, check to hear a CLICK sound.	If you can hear a CLICK sound, after checking the connection of HARNESS between the LIU and the Main Board, try to replace the HARNESS.
Check the connection of HARNESS between the LIU and the Main Board.	The problem still persists, then replace the LIU and the Main Board in sequence. **Notes:** Product supports the Tone Dial type only.

4.7.3 DEFECTIVE FAX FORWARD/RECEIVE

Description

The FAX FORWARD/RECEIVE is not functioning.

Check and Cause	Solution
Check if you can hear a dial tone by pressing on hook dial key.	☛ 4.7.1
Check if you can hear a RECEIVE tone while MODEM testing in the TECH mode.	If the MODEM testing is normal and there is no dial tone, then try to replace the LIU Board.
	If the MODEM testing is abnormal, try to replace the Main Board.

4.7.4 DEFECTIVE FAX FORWARD

Description

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

Check and Cause	Solution
Check if there is NOISE when pressing on-hook dial.	If it makes NOISE while using on-hook dial, replace or repair the telephone line.
Check the RECEIVE condition by trying to forward a FAX to another fax machine from the forwarding side FAX.	
Check if the telephone line connected to the Product is contaminated or gets stripped off or down.	

4.7.5 DEFECTIVE FAX RECEIVE (1)

Description

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

Check and Cause	Solution
Check if there is NOISE when pressing on-hook dial.	If it makes NOISE while on-hooking, replace or repair the telephone line.
Check the RECEIVE condition by trying to receive a FAX at another fax machine.	

4.7.6 DEFECTIVE FAX RECEIVE (2)

Description

The received data are lengthened or cut in the printing.

Check and Cause	Solution
Check if there is NOISE when pressing on-hook dial.	If it makes NOISE, rearrange the telephone line. (☛ 4.7.5)
Ask the forwarding side to resend the FAX from another machine. Check the image quality received from the other machine.	Check if the FAX status of the forwarding side is also normal.

4.7.7 DEFECTIVE FAX RECEIVE (3)

Description

The phone is ringing continuously, but it cannot receive.

Check and Cause	Solution
Check if the RECEIVE mode is TEL MODE or FAX MODE.	Even when the RECEIVE mode is changed to FAX MODE, it cannot receive, then replace the LIU and the Main Board in sequence.

4.7.8 DEFECTIVE FAX RECEIVE (4)

Description

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

Check and Cause	Solution
Check the FAX status of the forwarding side.	After checking the data of the forwarding side, correct the FAX on the forwarding side.

4.7.9 DEFECTIVE AUTOMATIC RECEIVING

Description

The automatic receiving function is not working.

Check and Cause	Solution
Check if the RECEIVE mode is TEL MODE or FAX MODE.	If the RECEIVE mode is set to the TEL MODE, reset it to the FAX MODE.
	Even after the RECEIVE mode is changed to the FAX mode, it cannot receive, then try to replace the LIU and the Main Board in sequence.

4.8 COPY PROBLEMS

4.8.1 WHITE COPY

Description

Blank page is printed out when copy.

Check and Cause	Solution
Check the Scan-Cover open.	Room light can transit a thin original.
Check shading profile.	Remake a shading profile in the tech mode.
Check white/black reference voltage in the Main Board.	Replace the Main Board if it is defective.

4.8.2 BLACK COPY

Description

Black page is printed out when Copy.

Check and Cause	Solution
Check the CCD problem in Main Board.	Check the CCD harness contact.
Check shading profile.	Remake shading profile in the tech mode.

4.8.3 ABNORMAL NOISE

Description

There is noise when copy.

Check and Cause	Solution
Check the Scanner Motor and any mechanical disturbance.	Check the right position of the Scanner Motor, and check any mechanical disturbance in the CCD carriage part.
Check the Motor Driver in the Main Board.	If any driver is defective, replace the Main Board. • Connection PBA U4-1, 19 or U5-1, 19=0V to 24V swing signal when operating.

4.8.4 DEFECTIVE IMAGE QUALITY

Description

The copied image is light or bad.

Check and Cause	Solution
Check shading profile.	Remake shading profile in the tech mode.
Check the gap between original and scanner glass.	The gap above 0.5 mm can cause a blurred image.
Check printing quality.	☛ 4.6

4.9 SCANNING PROBLEMS

4.9.1 DEFECTIVE PC SCAN

Description

The PC Scan is not functioning at all.

Check and Cause	Solution
Check the Cable (USB or Parallel)	If the PC and the cable are not connected properly, reconnect it.
Check if the driver is installed properly.	Confirm that the printer driver is properly installed by performing a PC printing test related to driver setup. If it is not, reinstall the printer driver. (Refer to Operating Instructions.)
Check if copy function operates normally.	If the copy function works, replace the Main Board. If the copy function does not work, replace the CCD assembly and try again.

4.9.2 DEFECTIVE IMAGE QUALITY OF PC SCAN

Description

The image PC scanned is not clear or bad.

Check and Cause	Solution
Check the waveform by performing a CCD test in TECH mode.	If the CCD waveform is abnormal, try to replace the CCD assembly.
Check if the resolution is set too low in the PC Scan options. (Refer to Operating Instructions.)	Re-adjust if the resolution is set to low.

4.10 ERROR MESSAGES

The display on the front panel shows the messages to indicate the printer's status or errors. Refer to the tables below to understand the message's meaning and clear the problem if necessary. Message details are shown in alphabetical order.

BYPASS JAM

Description: The machine detects non-feed from bypass tray.

Solution: Open the side cover. Then clear the jam.

COMM. ERROR

Description: Facsimile communication problem.

Solution: Try again.

DOCUMENT JAM

Description: Document jams in the feeder when document jam occurs at ADF

Solution: Clear the document jam.

DOOR OPEN

Description: Side cover is not correctly closed.

Solution: Close the cover correctly.

GROUP NOT AVAILABLE

Description: You have tried to set a group location when you can only set a single location number. This can occur when you try to add locations for multi-dial operation.

Solution: Try again. Check group location.

HEATING ERROR

Description: Temperature does not go up at the time of operation.

Solution: Check thermistor contact point and heating lamp.

LINE BUSY

Description: Remote fax did not answer

Solution: Try again.

LINE ERROR

Description: The machine cannot connect with the remote machine, or has lost contact because of a problem on the phone line.

Solution: Try again. Wait an hour for the line to clear. Then try again if you still have problems.

LOAD DOCUMENT

Description: You have attempted to set up a sending operation with no document loaded. Load a document and try again.

Solution: Try again. Make sure the remote machine is OK.

MEMORY FULL

Description: The memory has become full.

Solution: Either delete unnecessary documents, or retransmit after more memory becomes available, or split the transmission into more than one operation.

NO ANSWER

Description: The remote machine did not answer after all the redial attempts.

Solution: Try again. Make sure the remote machine is OK.

NO CARTRIDGE

Description: When the machine detected the toner cartridge has not been installed.

Solution: Install the Cartridge.

NO. NOT ASSIGNED

Description: The speed dial location you tried to use has no number assigned to it.

Solution: Dial the number manually with the keypad, or assign the number.

NO PAPER [ADD PAPER]

Description: The recording paper has run out. The printer system stops.

Solution: Load the recording paper in the paper feeder.

OPEN HEAT ERROR

Description: Thermistor does not connected to main board or contact point is not coupled tightly in power on.

Solution: Check thermistor contact point.

OVERHEAT

Description: The printer part has overheated.

Solution: The unit will automatically return to the standby mode when it cools down to normal operating temperature.

PAPER JAM 0 OPEN/CLOSE DOOR

Description: Recording paper has jammed in paper feeding area. Recording paper is jammed in pick-up unit

Solution: Press STOP and clear the jam.

PAPER JAM 1/2 OPEN/CLOSE DOOR

Description: Recording paper has jammed inside the unit. Recording paper has jammed in paper exit unit.

Solution: Clear the jam.

RETRY REDIAL?

Description: The machine is waiting for the programmed interval to automatically redial.

Solution: You can press START to immediately redial, or STOP to cancel the redial operation.

TONER EMPTY

Description: When the machine has encountered the Toner Empty.

Solution: Replace the Toner Cartridge.

TONER LOW

Description: Toner may be low

Solution: Toner may be unevenly distributed. Remove the toner cartridge and shake it gently to evenly distribute the toner. Then replace the toner cartridge.

4.11 TONER CARTRIDGE (AIO) SERVICE

The use of a non-authorized toner cartridge may cause a machine malfunction and/or copy quality problems.

4.11.1 PRECAUTIONS ON SAFE-KEEPING OF TONER CARTRIDGE

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

4.11.2 SERVICE FOR THE LIFE OF TONER CARTRIDGE

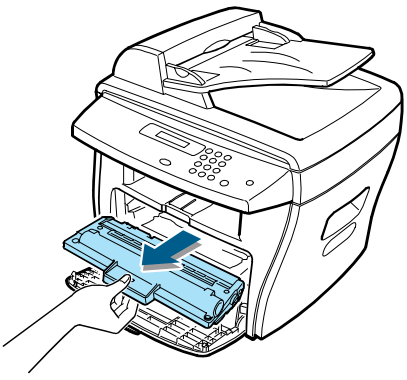
If the printed image is light due to the life of the toner, you can temporarily improve the print quality by redistributing the toner (Shake the toner cartridge), however, you should replace the toner cartridge to solve the problem thoroughly.

Redistributing Toner

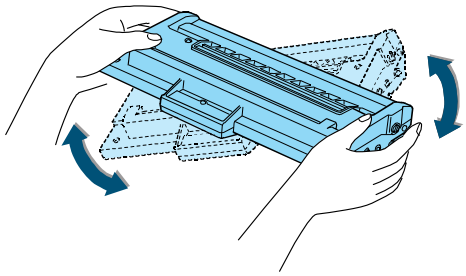
When the toner cartridge is near the end of its life, white streaks or light print occurs. The LCD displays the warning message, “Toner Low.” You can temporarily reestablish the print quality by redistributing the remaining toner in the cartridge.

1. Open the Front Cover.

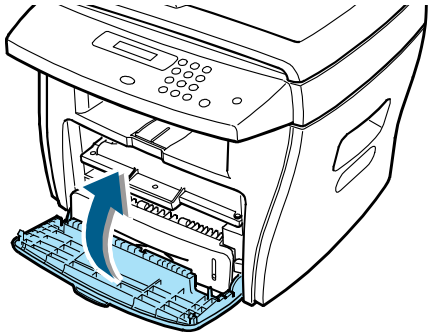
2. Lightly pushing the used cartridge down, pull it out.
   NOTE: Help the environment by recycling your used toner cartridge. Refer to the recycling brochure packed with the toner cartridge for details.



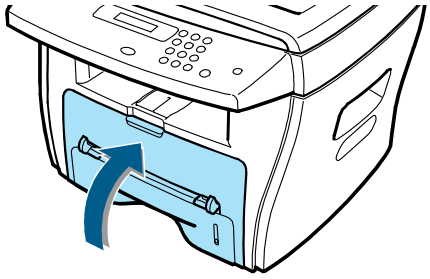
3. Unpack the new toner cartridge and gently shake it horizontally four or five times to distribute the toner evenly inside the cartridge.



4. Save the box and the cover for shipping. Slide the new toner cartridge in until it locks into place.



5. Close the front cover.



NOTE: Help the environment by recycling your used toner cartridge. Refer to the recycling brochure packed with the toner cartridge for details.

4.11.3 SIGNS AND MEASURES AT POOR TONER CARTRIDGE

Fault	Signs	Cause & Check	Solution
Light image and partially blank image	• The printed image is light or unclean and untidy. • Some part of the image is not printed. .	1. If the image is light or unclean and untidy printed image –Shake the cartridge and then recheck. **NG:** Check the weight of the cartridge **OK:** Lack of toner	1. All of 1, 2, 3 - • The weight of the cartridge ended: 800g ± 20g • If it becomes better by shaking, replace with a new cartridge.
	• Periodically a noise as “tick tick” occurs.	2. Some part of image is not printed - Shake the cartridge and then recheck. **NG:** Check the weight of the cartridge and clean the Laser Scanning Unit (LSU) window with a cotton swab, then recheck. **OK:** Lack of toner	2. In case of 2- if it becomes better after cleaning the LSU window, then the cartridge is normal. (Because of foreign substance on the LSU window, the image has not been printed partly.)
		3. Periodically a noise as “tick tick” occurs - Measure the cycle and the weight of the cartridge.	3. In case of 3- If the cycle of noise is about 2 seconds, the toner inside the cartridge has been nearly exhausted. (Purchase and replace with a new cartridge after using about 200 sheets at the point of occurrence.)
		4. White vertical stripes on the whole screen or partly: Check the weight of the cartridge.	4. In case of 3- This is a phenomenon caused by lack of toner, so replace with a new cartridge.

Fault	Signs	Cause & Check	Solution
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. • Check the cycle of the falling of the toner. • Check the appearance of both ends of the cartridge OPC drum.	1. If both ends of the OPC drum are contaminated with toner: Check the life of the cartridge
		2. The center of the printed matter is contaminated with toner. • Check whether foreign sub-stances or toner are stuck to the terminal (contact point) of the cartridge. • Check whether the state of the terminal assembly is normal.	2. Check whether it could be recycled.
			3. If it cannot be recycled: Replace the cartridge.

Fault	Signs	Cause & Check	Solution
White or Black Spots	• 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 developer rollers are contaminated with foreign substance or paper particles. • 37.7mm interval : Charged roller • 75.5mm interval : OPC cycle	1. In case of 1 – 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. If white spots occur in a black image at intervals of 75 mm, or black spots occur elsewhere, the OPC drum is damaged or foreign substance is stuck to the surface.	2. In case of 2 - If they do not disappeared by running the OPC Cleaning Mode Print 4-5 times. • at intervals of 37.7 mm – Replace the AIO. • at intervals of 75 mm – Remove foreign substance. • Broken image - Replace the AIO.
		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.	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.)

Fault	Signs	Cause & Check	Solution
Ghost & Image Contamination	• The printed image is too light or dark, or partially contaminated black. • Totally contaminated-black. (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. • Check whether foreign sub-stance or toner is stuck to the terminal (point of contact) of the cartridge. • Check whether the terminal assembly is normal.	1. All of 1, 2, 3 - (1) Remove toner and foreign sub-stances adhered to the contact point of the cartridge. (2) The contact point of the unit facing that of the 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) • Check whether foreign sub-stances are stuck to the terminal (point of contact) of the 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 cartridge is not electrically charged. Clean the terminals of the charged roller, then recheck it.
		3. The printed image is dark and ghost occurs. • Check foreign substance attached to the terminal (point of contact) of the developer 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 cartridge. Clean the terminals of the developing roller, then recheck it.

SERVICE TABLES

5. SERVICE TABLES

5.1 USER MODE

Function	Item		Contents
1. Paper Setting	Paper Type		Plain Paper / Bond
	Paper Size	Tray Paper	A4 / A5 / B5 / A6 / LTR / LGL / Executive / Folio
		Bypass Paper	A4 / A5 / B5 / A6 / LTR / LGL / Executive / Folio
2. Copy Setup	Change Default	Contrast	Lighten / Normal / Darken
		Image	Text / Mixed / Photo
		Reduce / Enlarge	Original / LGL->LTR
		Number Of Copy	1-99
	Timeout		15 / 30 / 60 / 180 / off
3. Fax Setup	Receive Mode		Fax / Tel / Tel/Fax
	Ring to Answer		1-7
	Contrast		Lighten / Normal / Darken
	Redial Term		1-15
	Redials		0-13
	MSG Confirm.		On / Off / On-Err
	Auto Report		On / Off
	Auto Reduction		On / Off
	Discard Size		0-30 MM
	Receive Code		0-9
	DRPD Mode		Set (On / Off)
4. Fax Feature	Delay Fax		Enter number
	Priority Fax		Enter number
	Add / Cancel		Add Page / Cancel Job
5. Advanced Fax	Send Forward		On / Off
	RCV Forward		On / Off
	Junk Fax Setup		On / Off
	Secure Receive		On / Off
	Prefix Dial		Enter number
	Stamp RCV Name		On / Off
	ECM Mode		On / Off
6. Reports	Phone Book		Phone Book List
	Sent Report		Transmission Journal
	RCV Report		Reception Journal
	System Data		System Data List
	Scheduled Jobs		Schedule Information List
	MSG Confirm		Message Confirmation Report
	Junk Fax List		Junk Fax List
7. Sound / Volume	Speaker		On / Off / Comm.
	Ringer		Off / Low / Med / High
	Key Sound		On / Off
	Alarm sound		On / Off

Function	Item	Contents
8. Machine Setup	Machine ID	Enter number
	Date & Time	Set date and time
	Clock Mode	12 Hour / 24 Hour
	Dial Mode*	Tone/Pulse
	Language	English / French / Spanish / Portuguese / German / Italian / Dutch / Danish / Swedish / Finnish / Norwegian / Russian / Polish / Hungarian / Czech
	Power Save	5 / 10 / 15 / 30 / 45 / Off
	CCD Power Save	1 / 4 / 8 / 12 Hours
	USB Mode	Fast / Slow
9. Maintenance	Clean Drum	
	Notify toner	On / Off
	Remote Test	On / Off
	Clear Memory	On / Off

*This item shows only in some country code settings.

The table shows functions the user can set. Examine the user manual for instructions.

The service manual shows things that the user can set.

5.2 TECH MODE

5.2.1 HOW TO ACCESS THE TECH MODE

The technician can examine the machine and perform different tests in the service (tech) mode. This will help show the cause of a malfunction.

The machine operates correctly in Tech mode.

Do this procedure to access the Tech mode:

Press Menu → # → 1 →9 → 3 → 4 in sequence. The LCD shows 'TECH'. Then the machine will enter the service (tech) mode.

Do this procedure return back to user mode:

Menu → # → 1 → 9 → 3 → 4

5.2.2 SETTING-UP SYSTEM IN TECH MODE

Function	Item	Contents	
Data Setup	Send Level	9-15	
	Dial Mode	Tone / Pulse	
	Modem Speed	33.6 / 28.8 / 14.4 / 12.0 / 9.6 / 4.8 (K bps)	
	Error Rate	5% / 10%	
	Notify Toner	Customer No.	
		Customer Name	
		Service No.	
		Serial No.	
	Clear All Memory	Select Country Code	
	Clear Count	Enter Password (1934 enter)	Total Page CNT
			CRU Print CNT
			FLT Scan CNT
			ADF Scan CNT
			Used Toner CNT
			Edit Toner Dot
	Flash Upgrade	Local / Remote	
	Silence Time	12 Sec / Unlimit / Off	
Machine Test	Switch Test		
	Modem Test		
	Dram Test	OK / NG	
	Rom Test	Flash / Engine versions	
	Pattern Test	☛ 5.2.4	
	Shading Test		
Report	Protocol	Protocol List	
	System Data	System Data List	
New Cartridge		Yes / No	

5.2.3 DATA SET-UP

SEND LEVEL

You can set the level of the transmission signal. The Tx level must be less than -12 dBm.

CAUTION: The send fax level is set at the factory. Do not change this in the field.

DIALING MODE

Select the dialing mode according to the user's line status.

- TONE: Electrical type of dial
- PULSE: Mechanical type of dial

MODEM SPEED

You can set the maximum modem speed.

Communication is automatic when modem speed sets at lower speed. Keep the default at 33.6 Kbps.

ERROR RATE

The baud rate automatically goes to 2400 bps when the error rate is not the same as the set value. This keeps the error rate below the set value.

You can set the rate between 5% and 10%.

NOTIFY TONER

With this feature enabled, when the toner becomes low, the toner low information will be sent to a specified contact point, for example, the service company. After you access this menu, select ON, and when the LCD-prompts, enter the name and the number of the contact point, the customer's fax number, the model name, and the serial number.

CLEAR ALL MEMORY

Use this function to reset the system to the default set at the factory.

This function resets the system to the initial value when the machine does not work correctly. Values are set to the default values. The machine will not keep data set by the user. This procedure does not clear the counter data values.

<Procedure>

1. Set the [MEMORY CLEAR] in tech mode.
2. Push the ENTER button.
3. The country names will show. You can see all available countries when you scroll by pressing " ◀ " or " ▶"
   - EU default (UK)
   - North America default (USA/Canada)
   - Asia default (Sinapore)
   - China default (China)

   Note: You cannot change the default country values.
4. Push the ENTER button. This clears the memory. Then it changes it to the country code that you set.

Note: Do this procedure after you replace the main board. If you do not perform this procedure, the system will not operate correctly.

CLEAR COUNT

This function erases the counters stored in system memory. Type password "1934" to enter the menu.

FLASH UPGRADE

The firmware upgrade has these functions:

- Local and remote.

Examine the firmware upgrade section (☛ 5.4.4).

SILENCE TIME

In ANS/FAX mode, after a call is picked up by the answering machine, the machine monitors the line. If a period of silence is detected on the line at any time, the call will be treated as a fax message and the machine begins receiving. Silence detection time is selectable between limited (about 12 seconds) and unlimited time.

When "12 sec" is selected, the machine switches to receiving mode as soon as it detects a period of silence. When "unlimited" is selected, the machine waits until the answering operation is concluded even though a period of silence is detected. After the answering operation is concluded, the machine switches to receiving mode.

5.2.4 MACHINE TEST

SWITCH TEST

Use this to test all keys on the operation control panel. The LCD window shows the result when you push a key.

MODEM TEST

Use this to hear the different transmission signals to the telephone line from the modem and to check the modem. If no transmission signal sound is heard, the modem part of the main board is not operate correctly.

DRAM TEST

Use this to examine the machine's DRAM. The LCD shows the result.

The LCD shows << O K >> if the memory works correctly.

ROM TEST

Use this to examine the machine's ROM. The LCD shows the result and the software version.

Example:

- FLASH VER: 6.04 V
- ENGINE VER:1.08 V

PATTERN TEST

Use this to verify that the printer mechanism is operating correctly.

The patterns are:

- Pattern-1 ~ Pattern-7
- QA Pattern-1 ~ QA Pattern-4

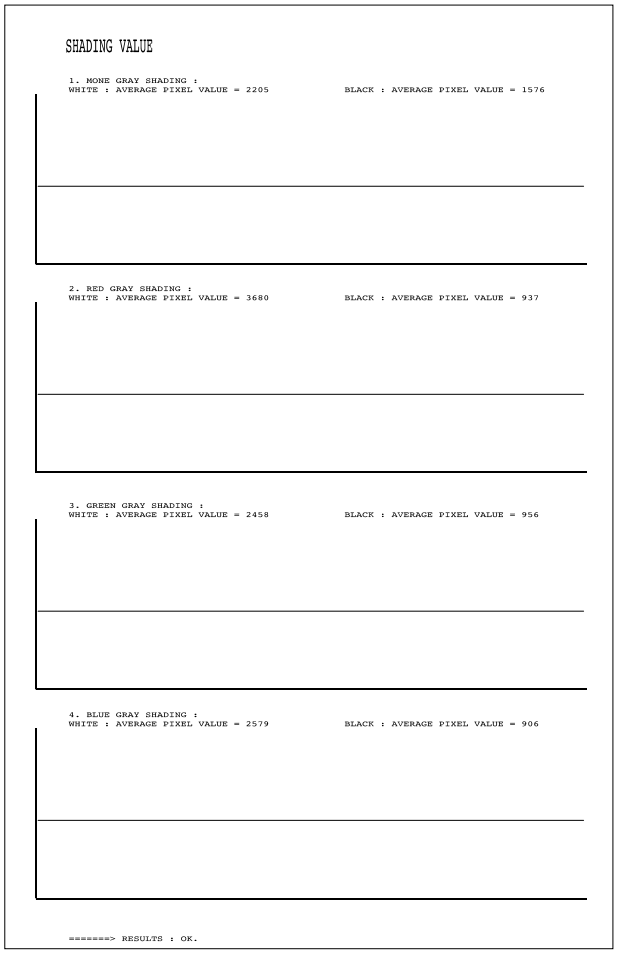
SHADING TEST

This function gives the best scan quality by the specified character of the CCD (Charge Coupled Device). Do this to examine the condition of the print out. Then examine if there is CCD problems.

< Procedure >

1. Set the [ADJUST SHADING] in tech mode.
2. Press the Enter key. An image will be scanned.
3. After the scan, CCD SHADING PROFILE will be output.
4. If the printed image is not the same as the image, the CCD did not operate correctly.

Make sure that the cover is closed when you examine the CCD.


SHADING VALUE

1. MONE GRAY SHADING :
WHITE : AVERAGE PIXEL VALUE = 2205 BLACK : AVERAGE PIXEL VALUE = 1576

2. RED GRAY SHADING :
WHITE : AVERAGE PIXEL VALUE = 3680 BLACK : AVERAGE PIXEL VALUE = 937

3. GREEN GRAY SHADING :
WHITE : AVERAGE PIXEL VALUE = 2458 BLACK : AVERAGE PIXEL VALUE = 956

4. BLUE GRAY SHADING :
WHITE : AVERAGE PIXEL VALUE = 2579 BLACK : AVERAGE PIXEL VALUE = 906

=======> RESULTS : OK.

5.2.5 REPORT

PROTOCOL LIST

Use this list to examine the send and receive errors. The protocol list is automatically printed if a communication error occurs when the machine is in tech mode.

SYSTEM DATA

This gives the listing of the system data set by the user and the technician in the tech mode.

5.3 DATE OF SALE

This function shows the date that the customer used the machine for the first time.

When the customer first operates the machine, the machine starts a scan and page count.

The machine will keep the time of first operation.

The machine will keep this data even if you erase the memory (Clear All Memory).

Procedure

Press MENU, #, 1, 9, 3, # in sequence. Firmware version is shown on LCD.

Press 1 (in the number keypad): The LCD display shows "Firmware Updated date"

Press 2 (in the number keypad): The LCD display shows "product first use date"

5.4 FIRMWARE DOWNLOAD

You can use the remote control panel to upgrade the machine firmware. Connect the machine to a PC through parallel or USB cable before you do the firmware upgrade procedure.

It is very rare to lose the data and settings after the program has downloaded. However, you should print out the system data list in tech mode before you start the download procedure. This will let you re-program settings that may be lost.

5.4.1 DOWNLOAD PROCEDURE

RCP (Remote Control Panel) mode

This procedure is used when the machine is connected with a parallel port or USB port to a PC. The machine uses the RCP (Remote Control Panel) software to upgrade the firmware.

1. Connect PC and printer with parallel cable or USB cable.
2. Do RCP and set the Firmware update tab. Current firmware version and emulation version are shown.
3. Keep the firmware file on the PC, in a path near to the root of C:, ie C:\TEMP. Use the “Browse” button to get the firmware file to update the machine.
4. Push the update button. The firmware file automatically goes to the printer. The printer is initialized when the update is finished. Ensure that the following message is shown in the LCD display when you download the new firmware:
   1) DATA RECEIVING (USB) / COPY/B FILE LPT1 (PARALELL)
   2) PC TO DRAM IS OK
   3) FLASH IS ERASING
   4) FLASH PROGRAMMING
   5) CHECKSUMMING
   6) DOWNLOAD OK
   7) Warming up Please wait…
5. Push the refresh icon. Then make sure that the version number shown agrees with the new firmware.

Note: Country code

The country code will not change after you download the new firmware.

To get the system data list

Use this procedure to make sure that the firmware was correctly upgraded.

1. Go into TECH mode. Then get the system data list.
2. Make sure that the correct firmware version is shown on the system data list.
   - Example: Firmware/Engine/Emulation Version: 6.04 V1.0.8

5.4.2 RECOVERY PROCEDURE

The machine will not operate if the update procedure did not work correctly. At this time, do these steps:

1. Set the power off and then on.
2. Do the steps in the download procedure from step 4 again.

The machine will start the upgrade procedure again.

5.4.3 REMOTE MACHINE UPDATE

This function uses one fax machine installed with the most recent firmware. It can upgrade one or more other remote machines of the same type from the telephone network.

How to update firmware by remote fax

1. Operate a fax with the most recent firmware to prepare it to send the upgrade.
2. Select “Remote” in the Flash Upgrade of Data Setup menu in Tech mode.
   Tech Mode → Data Setup → Flash Upgrade (☛ 5.2.3)
3. Enter in the telephone number of the fax machine to upgrade. (You can upgrade several faxes at the same time). At this time, enter in the telephone number for each machine.)
4. Then push the enter button. This will send the firmware file to each of the selected fax machines. (It will be 10 or 15 minutes to send the file to each machine.)

CAUTION: 1) The sending and receiving fax machines must be the same model.
2) A sending fax must be set up as ECM mode. The receiving machine memory must be set to 100%. If not the upgrade will fail.

5.5 ENGINE TEST MODE

The engine test mode provides functions to examine the engine condition. It examines the condition of each device and shows the result of the test on the LCD. It is in 6. items (0~5). The functions of items are shown below.

5.5.1 TO ENTER THE ENGINE TEST MODE

Press MENU, #, 1, 9, 3, 1 in sequence, and the LCD briefly displays 'Engine Test Mode', the machine has entered service (tech) mode.

NOTE: It may cause any damage on the machine if a test is done for long time.

5.5.2 DIAGNOSTIC

No.	Test Name	Engine Test	Remarks
0	MTR FAN SOL ETC	Motor Test	1 : On, 2 : Off
		PickUp Test	1 : On, 2 : Off
		Fan Test	1 : On, 2 : Off
		Manual Clt Test	1 : On, 2 : Off
		PTL Test	1 : On, 2 : Off
1	LSU TEST	LSU Motor Test	1 : On, 2 : Off
		LSU Hsync Test	1 : On, 2 : Off
		LD Test	1 : On, 2 : Off
2	SENSOR TEST	Feed Sensor Test	Check : Check Sensor status
			Next : Next Sensor Check
		Exit Sensor Test	Check : Check Sensor status
			Next : Next Sensor Check
		Cover Sensor Test	Check : Check Sensor status
			Next : Next Sensor Check
		Empty Sen Test (Paper End Sensor)	Check : Check Sensor status
			Next : Next Sensor Check
		MP Empty Sen Test (Bypass paper sensor)	Check : Check Sensor status
			Next : Next Sensor Check
3	HEAT TEST	THERM ADC 220~85	1 : On, 2 : Off (maintain the fusing temp.)
4	HVPS TEST	MHV Test	1 : On, 2 : Off (-1550V ± 50V)
		Dev Bias Test	1 : On, 2 : Off (-430V ± 20V)
		THV EN/NEG Test	1 : On, 2 : Off (-1000V +300V/-150V)
		THV On (1300V)	1 : On, 2 : Off (+1300V ± 20V)
		THV ADC 1300V	1 : On, 2 : Off (ADC Value : 101 ± 5)
		THV ADC 600V~3550V	1 : On, 2 : Off (Compare each ADC Value)
5	Heat Error Num		
	Low Heat Num		
	Heat Buffer 1~10		

5.5.3 STATUS PRINT

When the function is enabled a group of parameters are printed at the bottom of each page. This shows the print engine condition. This is not necessary for service use.

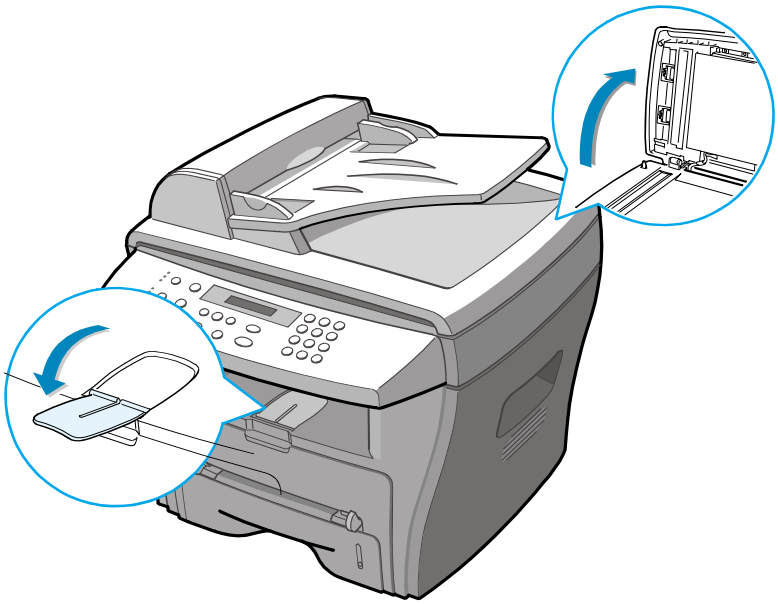
This setting will remain on when you get out of Engine Mode. Make sure to set it off.

DETAILED DESCRIPTIONS

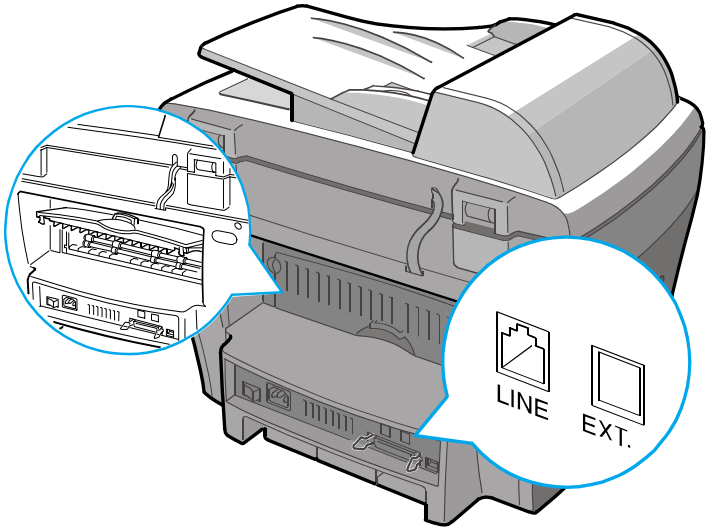
6. DETAILED DESCRIPTIONS

6.1 PRINTER COMPONENTS

6.1.1 FRONT VIEW



6.1.2 REAR VIEW



6.2 SYSTEM LAYOUT

6.2.1 FEEDING SECTION

The universal cassette automatically moves paper to the manual feeder. The machine will then feed the paper, one sheet at a time. The cassette has these:

- Friction pad to separate paper.
- Sensor to check for loaded paper in the cassette.
- Feed Method: Universal cassette type
- Feed Standard: Center load
- Feed capacity: Cassette -250 sheets (75g/m2, 20 lb paper standard)
  Manual - 1 sheet (Paper, OHP, Envelope, etc.)
- Paper detect sensor: Photo sensor
- Paper size sensor: None

6.2.2 TRANSFER ASSEMBLY

This unit has a PTL (pre-transfer lamp: also known as the quenching lamp) and the transfer roller. The PTL sends light to the OPC drum. The light lowers the current on the drum surface and improves the transfer efficiency.

The transfer roller moves the toner from the OPC drum surface to the paper.

6.2.3 DRIVER ASSEMBLY

The main motor driver controls the main motor. The main motor provides drive to the feeding unit, the fusing unit, and the distributing unit.

6.2.4 FUSING

The fusing unit contains a heat lamp, heat roller, pressure roller, thermistor, and thermostat. With pressure and heat, the fusing unit fuses (melts) the toner onto the paper. This completes the printing job.

Thermostat

The thermostat cuts power if the heat lamp or the heat coil of the heat roller gets too hot.

Thermistor

The thermistor checks the surface temperature of the heat roller, and regulates the temperature of the heat roller.

Heat Roller

The heat roller gets heat from the heat lamp. Then it heats the surface of the paper. The heat roller is coated with Teflon to prevent the melted toner from sticking to the heat roller.

Pressure roller

The pressure roller, located below the heat roller, is made of silicon resin, and the surface of the roller is coated with Teflon. The toner is fused onto the paper when the sheet of paper passes between the heat roller and the pressure roller.

Safety Features

There are 3 procedures to prevent the machine from overheating.

- 1st: Hardware cuts power when the machine gets to an overheat condition.
- 2nd: Software cuts power when the machine gets to an overheat condition.
- 3rd: Thermostat power.

Safety device

- Power is removed from the fusing unit when the front cover is open.
- Overheat safety device for customer.
- Keeps the surface temperature of the fuser cover less than 80°C. A customer caution label is adhered inside of the rear cover.

6.2.5 SCANNER

The scanner reads an image with a photosensitive sensor.

Hardware:

- CCD module, connection board, ADF board, AFE (Analog Front End), and image processor (Located in CPU).

Mechanical:

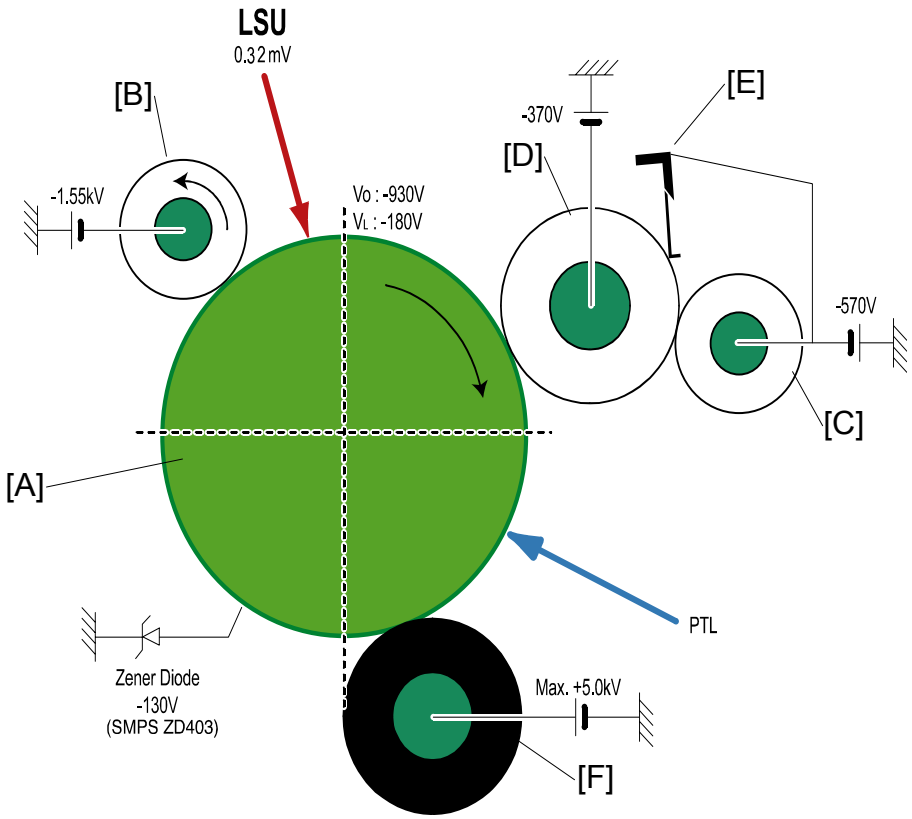
- ADF (Automatic Document Feeder)

6.2.6 LSU (LASER SCANNER UNIT)

The video controller controls the LSU unit. It scans the video data from the video controller with laser beam. It uses the rotation principal of the polygon mirror to put the latent image on the OPC drum.

One face of the polygon mirror is for one line scanning.

6.3 CRU (ALSO KNOWN AS AIO)



[A]: OPC Drum

[B]: Charge Roller

[C]: Supply Roller

[D]: Developing Roller

[E]: Doctor Blade

[F]: Transfer Roller

A visual image is made with the electronic photo procedure.

The OPC unit and developer unit are in the same cartridge.

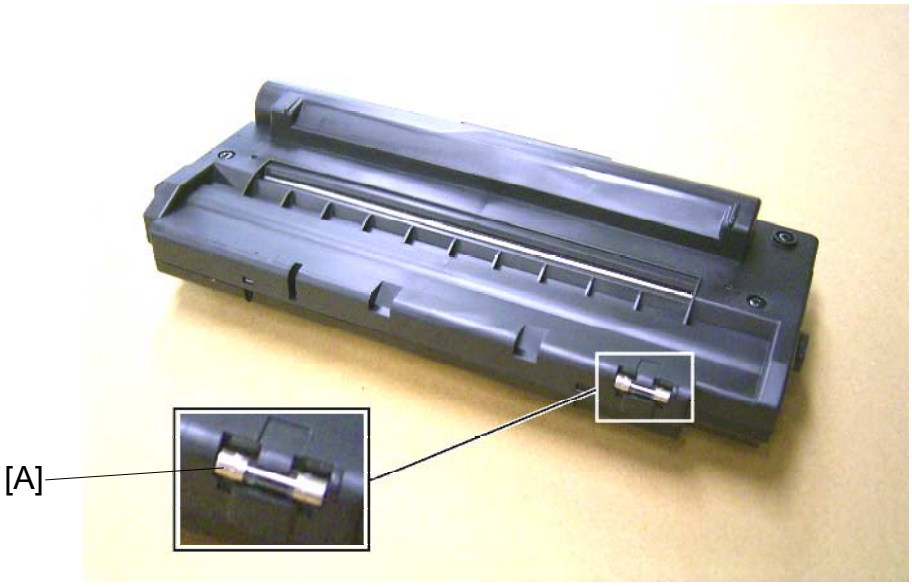
The OPC unit has the OPC drum [A] and charging roller [B].
The developer unit has toner, toner cartridge, supply roller, developing roller, and doctor blade.

- Developing procedure: Non magnetic 1 element contact procedure
- Toner: Non magnetic 1 element shatter type toner
- Toner near end sensor: None
- OPC cleaning: Electric static + FILM OPC gets the toner.
- Toner waste: Electrical static gets the toner.
- OPC drum protect shutter: None

6.3.1 NEW CRU (AIO) DETECTION

A new supply CRU cartridge has a fuse [A]. The machine knows that a new cartridge has been installed when the fuse is detected. The starter CRU does not have fuse. When the new cartridge is installed, the machine will automatically detect the fuse. The fuse will blow. This opens the circuit when you install the CRU.

The machine will then reset the total dot counter (TOTAL TONER COUNT), CRU print counter (Cru Prints), and increments the counter for counting the number of CRU replaced (Replaced Toner Counts).



6.3.2 TONER END DETECTION

The machine does not have a toner end sensor. The machine determines the amount of toner with software. The machine counts and adds the number of black dots used as the toner consumption. For example, when the machine prints 5% of black rate chart, approx. 1,165,000 dots will be used (added to the total count).

When the total number of dots reaches a pre-programmed count (toner near-end), the machine will display “TONER LOW”. After another period of dots being counted, the machine will display “TONER EMPTY” (toner end), and the machine will stop printing.

You can check the total dot count from the current AIO in the System Data List in TECH mode.

6.4 MAIN BOARD

The engine board and the controller board are on the same board. The CPU functions as the bus controller, I/O, drivers, and PC interface. The main board sends the current image video data to the LSU. Then the machine manages the electro photography to let the machine print. It has circuits on the drive motor (paper feed, pass), clutch drive, pre-transfer lamp drive, current drive, and fan drive.

The signals from the paper feed jam sensor and paper empty sensor are directly put to the main board.

Scan image processing: CCD drive signal and scan motor drive signal.

6.4.1 ASIC (CHORUS2)

The 16/32-bit RISC micro controller gives a cost-effective, low power, high performance micro-controller solution for MFP.

Main function block

- 1.8V internal, 3.3V external (I/O boundary) microprocessor with 4 K Cache
- Image processor
- On-chip clock generator with PLL
- Memory & external bank control
- DMA control (5-channel)
- Interrupt control
- 2-port USB Host /1- port USB device (ver 1.1) interface control
- Parallel port interface control
- UART (2 Channel)
- Synchronous serial interface control
- Timer (4 Channel)
- Watch dog timer
- Power control: Normal, slow, idle, stop and SL_IDLE mode
- A/D converter (10-bit, 2 Channel)
- General I/O port control
- Print head control
- Carrier motor control
- Paper motor control
- Toner generator
- RTC with calendar function
- S/W assistant function (Rotator)

6.4.2 FLASH MEMORY

It keeps the system program and downloads the system program through the PC interface.

- Capacity: 0.5 M Byte
- Access Time: 70 nsec

6.4.3 SDRAM

Used as a buffer, system memory area at the time the machine prints.

6.4.4 SENSOR INPUT CIRCUIT

Paper Empty Sensor:

The paper empty sensor (Photo Interrupter) on the engine board lets the CPU know if the tray has paper. If the paper tray is empty when it reads the D0 Bit of CPU, it sets the second LED (yellow) on the panel.

MP Sensing:

The MP Sensor (Photo Interrupter) uses an actuator to let the CPU know if paper is in the manual paper (MP) tray.

Paper Feed and Toner Cartridge Sensor:

When paper passes the actuator (feed sensor part), it detects the photo interrupter signal. Then lets the CPU know the paper feed condition. Then it sends image data. If it doesn't detect the feed sensor in 1 sec. after paper is fed, Jam 0 is shown (Red and yellow LED’s will be set on). The machine checks if the cartridge is installed. The actuator operates after the cartridge is attached. The signal from the photo interrupter is detected when it passes the actuator of the sensor part. This is the developer ID sensing procedure.

Paper Exit Sensor:

Checks if paper had exited from the machine. The exit sensor on the engine board and actuator on the frame are used for this process. Paper detects the on/off time of exit sensor. Then either a correct operation or a jam information is sent to the CPU.

Cover Open Sensor:

The cover open sensor is located on the front cover. The +24V (DC fan, solenoid, main motor, polygon motor part of LSU, HVPS), to each unit is cut off when the front cover is opened. The CPU operates the cover-open sensor and the developer ID sensor.

DC FAN / SOLENOID Drive:

Driven by transistor and controlled by the CPU.
When it is set high, the transistor turns on and drives the fan. It goes off when the sleep mode is set. There are two solenoids, driven by the paper pick-up and MP signal. The drive time is 300 ms. A diode prevents the transistor from the noise pulse generated when the solenoid is de-energizing.

Motor Drive:

The motor drive circuit starts when the driver IC is set. You can set the R sensor value and the voltage value of the V reference with the motor drive voltage value.

6.5 SMPS & HVPS (ALSO KNOWN AS PSU AND POWER PACK)

The SMPS and HVPS are on the same board.
The SMPS gives DC power to the system.
It gets 110V (NA model) / 220V (EU, AS and China models) and outputs the 5 V, 12 V and 24 V. Then it gives power to the main board and ADF board.

The HVPS generates the high voltage of THV/MHV/Supply/Dev for the developer part. The HVPS gets 24V and outputs the high voltage for THV/MHV/BIAS. The output high voltage goes to the toner, OPC cartridge, and transfer roller.

6.5.1 HVPS (HIGH VOLTAGE POWER SUPPLY)

Transfer High Voltage (THV+)

- Function: Moves developed toner on OPC drum to the paper.
- Output voltage: Maximum +5.0 KV ± 5% (Duty changeable, unload)
- 1.0 KV ±15% (When you clean, 200 MOhm)
- Error: If THV (+) does not output, a ghost image with low density shows. Toner on OPC drum cannot correctly transfer to the paper.

Charge voltage (MHV)

- Function: Charges the OPC surface of with –900 V ~ –1000 V.
- Output voltage: -1.3 KV ~ 1.8 KV DC ± 50 V
- Error: If MHV does not output, a black paper is printed. This is because the developing roller moves to a part of the OPC drum that does not get charge.

Cleaning voltage (THV-)

- Function: Cleans the surface. It sends minus toner from the transfer roller to the OPC drum to get toner.
- Output voltage: There is no feedback control.
- Error: Toner contamination shows at the backside of a printed-paper.

Developing voltage (DEV)

- Function: Develops toner with different electronic potential on an exposed part by LSU (Laser Scanning Unit).
  * The electronic potential of exposed OPC is –180V and exposed developer is –350 V when the machine prints. Toner with minus (-) develops on an exposed part.
- Output voltage: –200 V ~ 600 V DC ±20 V
- Error:
  1) If DEV is GND, density goes down.
  2) If DEV floats due to an unstable contact point of terminal, etc., density goes up.

Supply voltage (SUP)

- Function: Gives toner to the developing roller.
- Output voltage: –400V ~ 800 V DC °50 V (Use ZENER, DEV gear)
- Error:
  1) If SUP is GND, density goes down.
  2) If DEV floats due to an unstable contact point of terminal, etc., density goes down.

6.5.2 SMPS (SWITCHING MODE POWER SUPPLY)

This is the power source for the full system and is located at the bottom of the set.

It has the SMPS part, which gives DC power to drive the system. The AC heater control part gives power to fuser. SMPS has four outputting channels (+5 V, +12 V, +12 V and +24 Vs).

These types of power are available:

- 120 V (North America)
- 220 V (Europe, Asia, China)

AC input

- Input voltage: AC 220 V ~ 240 V, AC 120 V ~ 127 V
- Input voltage fluctuation range: AC 198 V ~ 264 V AC, 90 V ~ 135 V AC
- Frequency: 50/60 Hz
- Frequency fluctuation range: 47 ~ 63 Hz

Inputting voltage: Under 4.0 Arms/2.0 Arms

- (The condition when lamp is off or rated voltage is inputted/outputted)

Length of Power Cord: 1830 ± 50 mm

Power Switch: Use

6.6 ENGINE F/W

6.6.1 FEEDING

The pick-up solenoid controls the pick-up roller drive to feed paper from the cassette. The bypass solenoid controls the paper feed from the manual tray. You must put the paper in front of the feed sensor when you feed from the manual feeder.

Jam conditions are below:

Jam 0

- Paper does not move after pick-up.
- Paper does not get to the feed sensor in time after pick-up.
- The machine will get the paper again if the feed sensor is not set on. When the machines tries to get the paper a second time and the feed sensor is not set on for some time, Jam 0 shows.
- Leading edge of the paper does not get to the feed sensor.
- Feed sensor does not go on when the paper gets to the feed sensor. This will show after the paper goes past the feed sensor.

Jam 1

- The trailing edge of the paper does not go past the feed sensor after some time (The feed sensor cannot be set off)
- The paper cannot get to the exit sensor after the leading edge of the paper goes past the feed sensor. (The exit sensor cannot be set on) The paper is between the feed sensor and the exit sensor.

Jam 2

- The paper does not pass the exit sensor after the trailing edge of the paper goes past the feed sensor.

6.6.2 DRIVE

The main motor drives these rollers:

- Feeding roller
- Developing roller
- Hot roller
- Distributing roller.

6.6.3 TRANSFER

PWM (Pulse Width Modulation) controls these:

- Charge voltage
- Development voltage
- Transfer voltage

6.6.4 FUSING

The resistance of the thermistor varies inversely with the temperature of the hot roller. The control circuit monitors the temperature through the thermistor and turns the fusing lamp on and off. This keeps the hot roller at the operating temperature.

Error Type

Error	Description
Open heat error	Goes lower than 68°C for 28 seconds at the time of warm up
Lower heat error	• Standby: Goes lower than 80°C over 10 seconds • Print mode: 1. Goes lower than 145°C for 4 seconds for consecutive pages. 2. Sets at 25°C or lower than the fixed fusing temperature over 4 seconds for consecutive pages.
Over heat error	Goes higher than 220°C for 3 seconds

6.6.5 LSU

The LSU consists of the LD (Laser Diode) and the polygon motor. The LD turns and drives the polygon motor when it gets a print signal. Hsync occurs when the light part gets the beam. LReady occurs when the polygon motor speed gets to a correct condition. The LSU controller gets to 1 when the LSU is ready. If not, an error is shown.

Error Type

Error	Description
Polygon motor error	When the polygon motor's speed is not correct
Hsync error	The polygon motor's speed is correct, but the Hsync signal is not shown.

6.7 LIU BOARD

LIU board is a line interface unit, and circuit to interface with a telephone line.

There is a ring-detect circuit to detect a ring signal from a switchboard. In addition there is a surge absorber to protect the machine during lightning storms.

6.8 OPE BOARD

OPE board has different function keys and LCD to show key operations.

SPECIFICATIONS

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration	Desktop	
Major Features:	Copier, Print, Scan, Fax (with ADF)	
Operation System	Win95/98-Me/NT4.0/2000/XP	
LCD:	16 Characters x 2 lines	
I/O Interface:	USB1.1 & IEEE1284	
Power Consumption:	Print Mode	350 W
	Sleep Mode	20 W
Power Switch:	Yes	
Noise:	Operating	55 dBA
	Standby	39 dBA
Warm Up:	Less than 42 seconds	
Approval:	Class B	
Device Memory:	16 MB	
Size (W*D*H) w/o Hand Set:	474 x 436 x 417 mm	
Weight:	13 Kg (28.8 lbs.) With toner Cartridge	
Absolute Storage Condition	Temperature:	-20^0C ~ 40^0C
	Humidity:	10% RH ~ 95% RH
Operating Condition	Temperature:	10^0C ~ 32^0C
	Humidity:	20% RH ~ 80% RH
Recommended Operating Condition	Temperature:	16^0C ~ 30^0C
	Humidity:	30% RH ~ 70% RH

2. PRINT SPECIFICATION

Configuration		Desktop
Print Speed:		A4 - 16ppm, Letter size - 17ppm (5%, Character Pattern)
Print Method:		Laser Scanning Unit + Electro Photography
Print Language:		GDI
Power Save:		Yes (5/10/15/30/45 min.)
Resolution:	Normal	600 *600 dpi
	RET	No
Toner Save:		Yes
Memory:		8MB
FPOT:	Stand by	Approx. 12 seconds
	Power Save	Less than 54 seconds
Duplex Print:		Manual (driver support provided)
Printable Area:		207.6 x 270.6 mm (Letter)

3. SCAN SPECIFICATION

Configuration	Desktop	
Halftone (Gray Scale):	256 level	
Scan Method:	Color CCD (ITU-T#1 Chart)	
Scan Speed	ADF	25 seconds: Text/Mixed Mode, B/W Letter and 300dpi. (USB)
		72 sec Photo Mode: Gray Letter & 300dpi. (USB)
	Platen	23 sec
Resolution:	Optical	600 x 600 dpi
Scan Width:	Width	Max.216mm (8.5")
	Length (ADF)	Max. 356mm (14.0")
	Length (Platen)	Max. 297mm (11.7")
Scan-to:	E-mail, Image, OCR, FAX, WEB	

4. COPY SPECIFICATION

Configuration		Desktop	
Original mode	Text	600 x 300 dpi	
	Auto	600 x 300 dpi	
	Photo	600x600dpi for platen / 600 x 300 dpi for ADF	
	Other	-	
FCOT:	Platen	Power Save	Approx. 54 seconds
		Stand by	Approx. 12 seconds
	ADF	Power Save	Approx. 54 seconds
		Stand by	Approx. 17 seconds
Copy Speed / Letter:	Platen	SDMC	16cpm/A4, 17 cpm/LTR
		MDMC	7cpm/A4, 17 cpm/LTR
	ADF	SDMC	16 cpm/LTR
		MDMC	4 cpm/LTR
Resolution:		Scan: 600*600dpi	
		Print: 600*600dpi	
Zoom Range:		25% to 400 %	
Multi Copy:		1~99	
Preset:		Yes	
Contrast Control:		3 level (by LED)	
Copy Mode:		TEXT/MIXED/PHOTO	
Collation		Yes (300dpi only)	
Auto return to default mode:		Yes (after 1 minute)	
N-up copy:		2-up, 4-up	
AutoFit Copy:		Yes	
Clone:		Yes	
Poster:		Yes	

5. TELEPHONE SPECIFICAITON

Configuration		Desktop
Handset:		No
On hook Dial:		Yes
Search:		Yes (Phone Book)
1-Touch Dial:		10EA
Auto dial:		100 locations
TAD I/F:		No
Tone/Pulse:		Set in Tech mode
Pause:		Yes (Using Redial Key)
Auto Redial:		Yes
Last Number Redial:		Yes
Distinctive Ring:		No
Caller ID:		No
External Phone Interface:		No
Report & List Print out:	Tx/Rx Journal	Yes
	Confirmation	2 types available (With Image TCR, w/o image TCR)
	Help List	No
	Auto Dial List	Yes
	System Data List	List all user settings
Sound Control:	Ring Volume	Yes (Off, Low, MED, HIGH)
	Key Volume	Yes (On, Off)
	Speaker	Yes (On, Off)
Junk Fax barrier:		Yes
Security Mode:		Yes
Battery Backup:		Less than 15 minutes

6. FAX SPECIFICATION

Configuration			Desktop
Compatibility:			ITU-T G3
Communication System:			PSTN/PABX
Modem Speed:			33.6Kbps
TX Speed:			Approx. 3sec
Compression:			MH/MR/MMR/JPEG
ECM:			Yes
Resolution:		Std	203 x 98dpi
		Fine	203 x 196dpi
		Super Fine	300 x 300dpi
Scan Speed		Std	Approx. 5sec/LTR
		Fine	Approx. 7.5sec/LTR
		Super Fine	Approx. 7.5sec/LTR
Rx fax duplex print out:			No
Multiple page scan speed:			Approx. 7 ppm/LTR
Receive Mode:			Fax, TEL
Memory:	Capacity		4MB (320 pages)
	Optional Memory		No
	Max locations to		99 locations
	Fax Forward		Yes (On/Off)
	Broadcasting		Up to 59 locations
	Forced Memory TX		No
	Cover page		No
	Delayed fax		Yes
	Memory RX		Yes
Functions:	Voice Request		No
	TTI		Yes
	RTI		Yes
	Polling		No
	Earth/Recall		No
	Auto Reduction		Yes
	RDC		No

7. PAPER HANDING

Configuration		Desktop
Capacity (20lbs):	Main Tray	250 sheets
	Bypass	Single sheet
Optional Cassette:		No
Output Capacity:		150Sheets/20 lb
Output Control:		Face down
Paper Size:	Main tray	CST: A4, Letter, Legal
		Folio, Executive, B5
	Bypass	Bypass: Envelope 6 3/4,
		7 3/4, #9, #10, DL, C5, B5
Paper Weight:	Main tray	16~24 lb. (60 ~ 90 G/m^2)
	Bypass	16~32 lb. (60 ~ 163 G/m^2)
Paper Path:	Standard output	Bottom to Middle Front
	Straight through	Face up, Single Sheet
Paper Size:	Max	216 x 356mm (8.5" x 14")
	Min	76 x 127mm (3"x 5 ")
Output Stacker:	Paper	Extension
	Document	Fixed
Input Guide:	Bypass tray	Adjustable
	Main tray	Universal
	Document	Adjustable
ADF:	Paper Weight	12.5~28lb
	Capacity	30 sheets (20 lb)
	Document size width	148mm – 216 mm (5.8" - 8.5")
	Document size length	127 mm – 356 mm (5" - 14.0")

8. SOFTWARE

Configuration		Desktop	
Compatibility:	DOS	No	
	Win 3.x	No	
	Win 95	Yes	
	Win 98&WinME	Yes	
	Win NT4.0	Yes	
	Win 2000	Yes	
	Win XP	Yes	WHQL for Printer Only
	Mac	Yes	Mac printer only
	Linux	No	
Driver:	Printer	GDI	
	TWAIN	Yes	
	PC-FAX	No	PC fax is only available through PC Modem

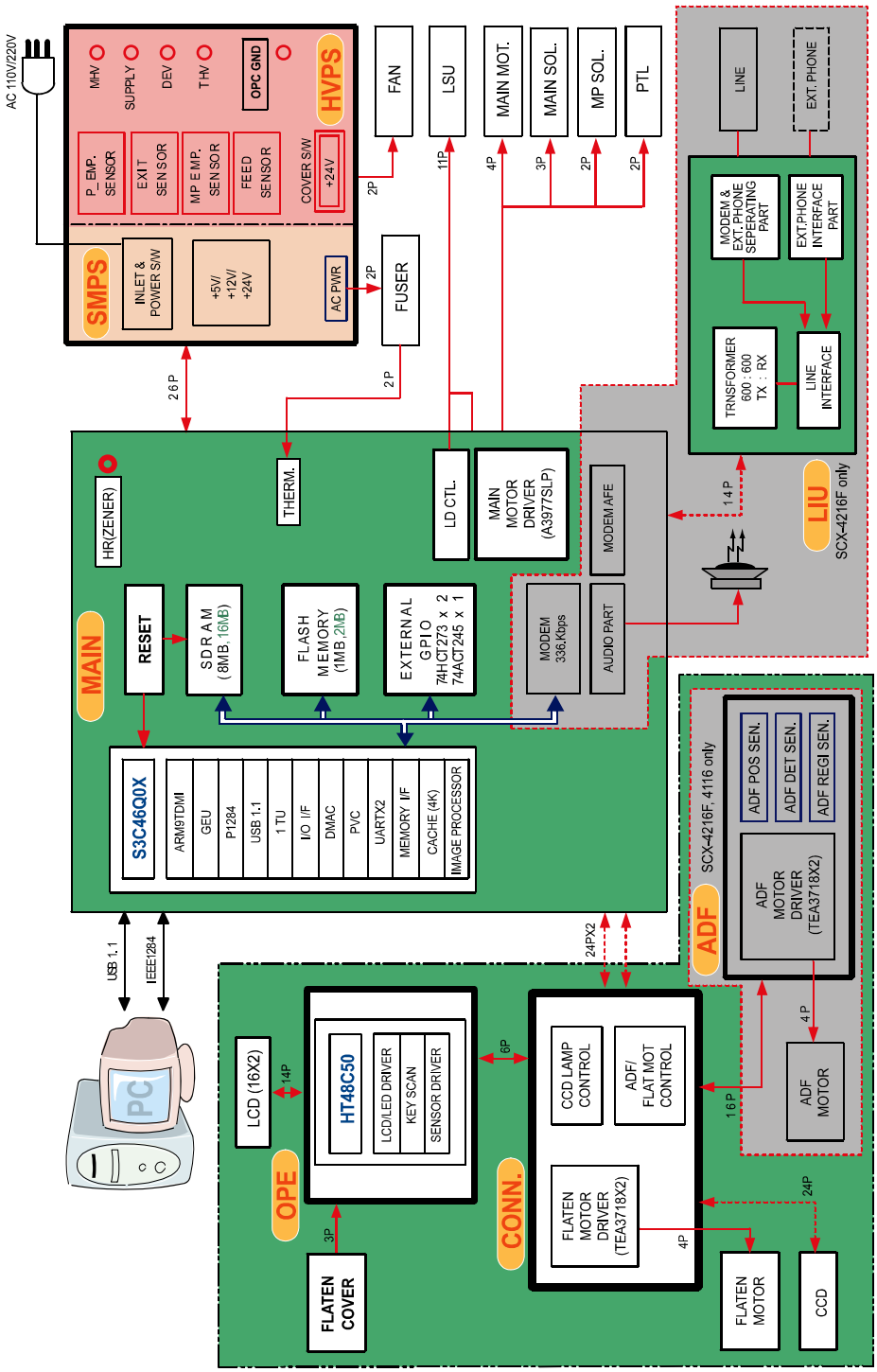
9. CONSUMABLES

Configuration		Desktop
Type:		Single cartridge
How to install		Front door open and front loading
Toner	Level sensor	No
Toner Count	Yes	

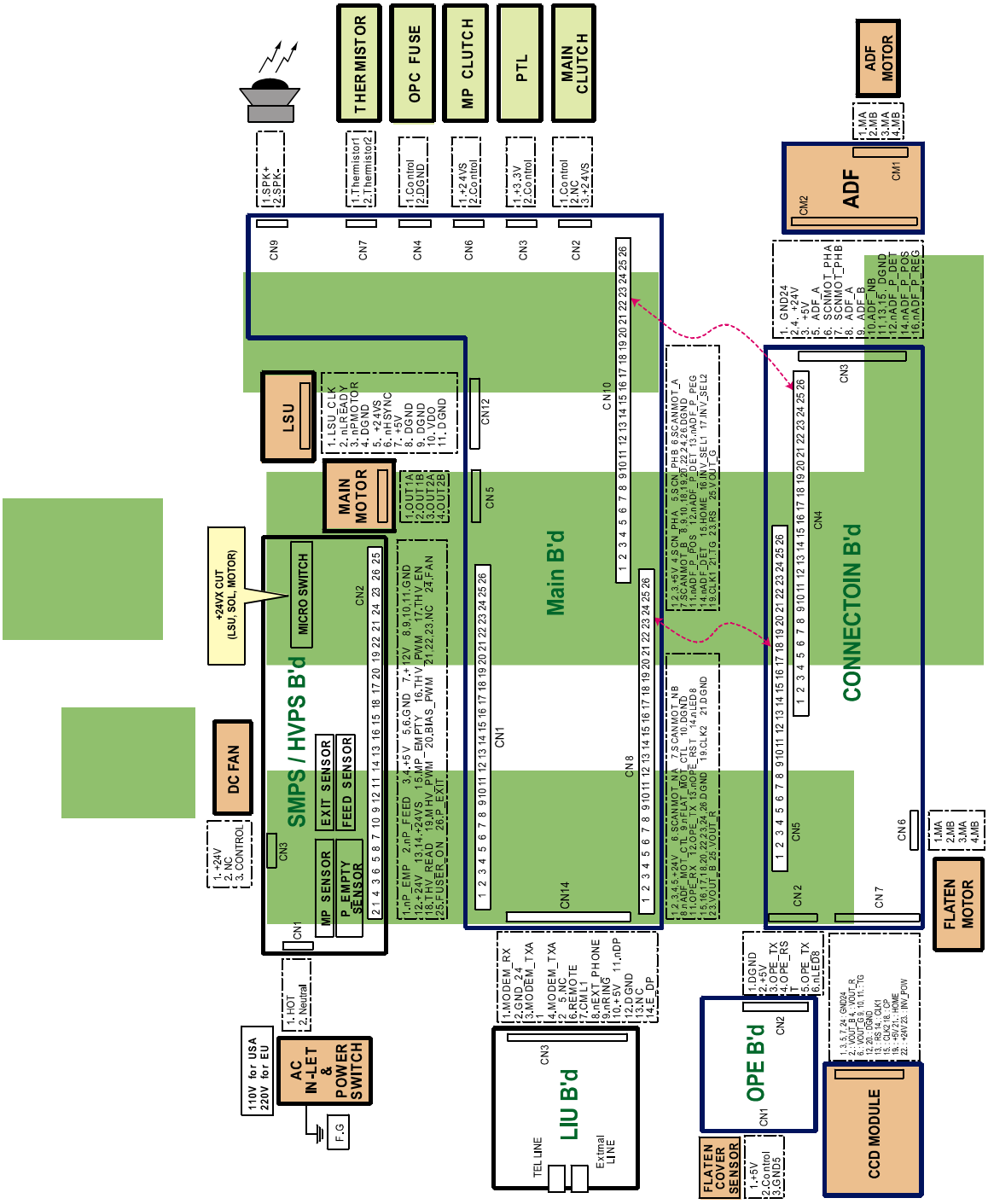
APPENDIX

APPENDIX

BLOCK DIAGRAM



CONNECTION DIAGRAM



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

AFICIO FX 16-AC104(B173)
PARTS CATALOG

PARTS CATALOG

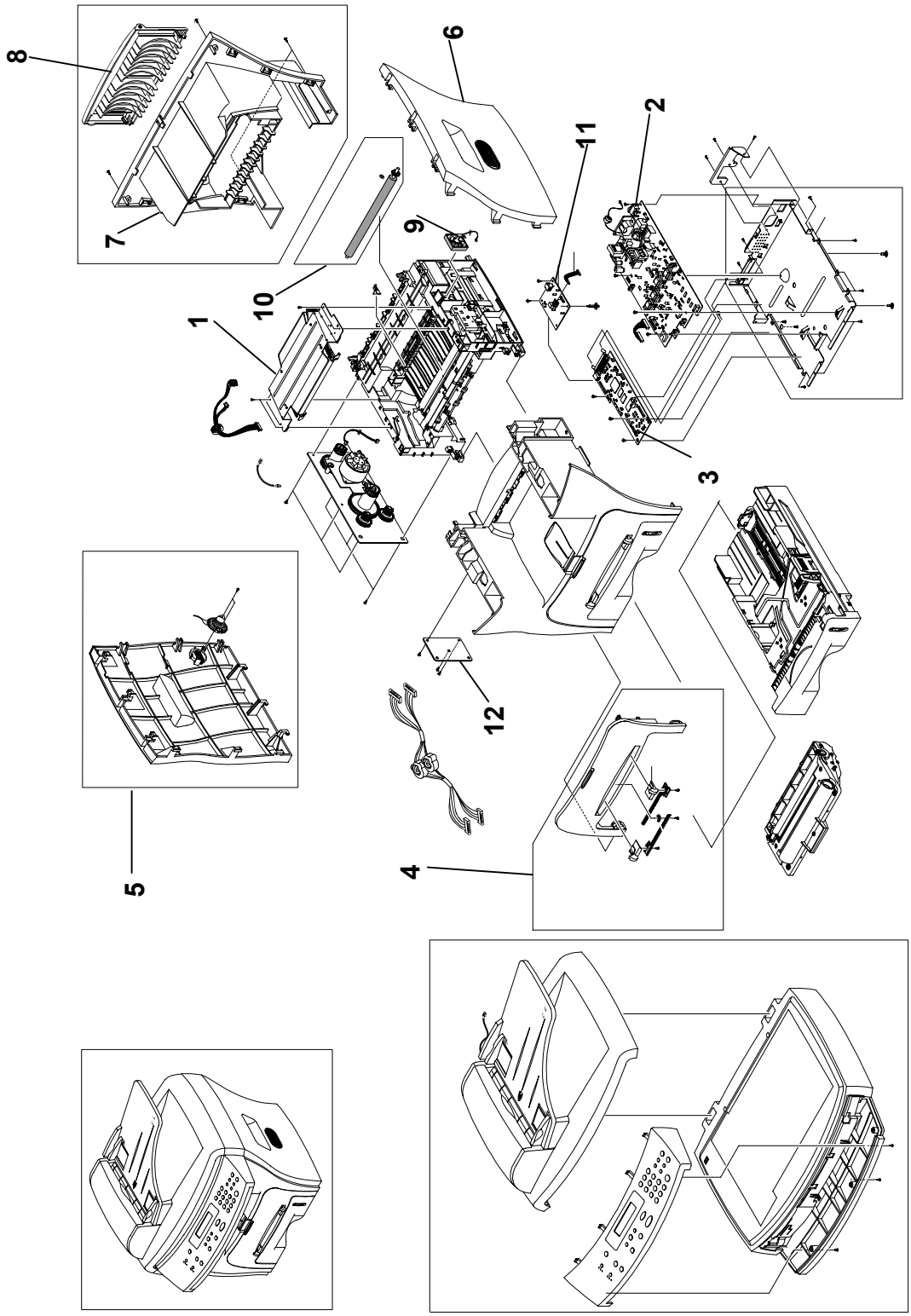
AFICIO FX 16-AC 104(B173)

TABLE OF CONTENTS

AFICIO FX 16-AC104(B173)
PARTS LOCATION AND LIST

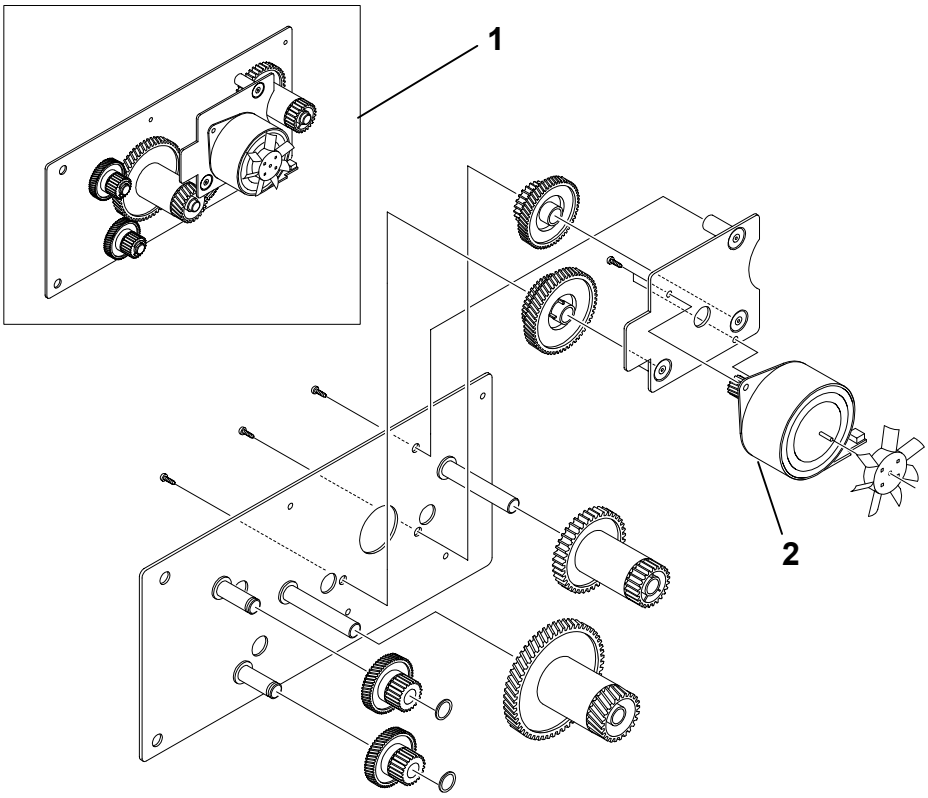
This section instructs you as to the numbers and names of parts on this machine.

1. MAIN ASSEMBLY



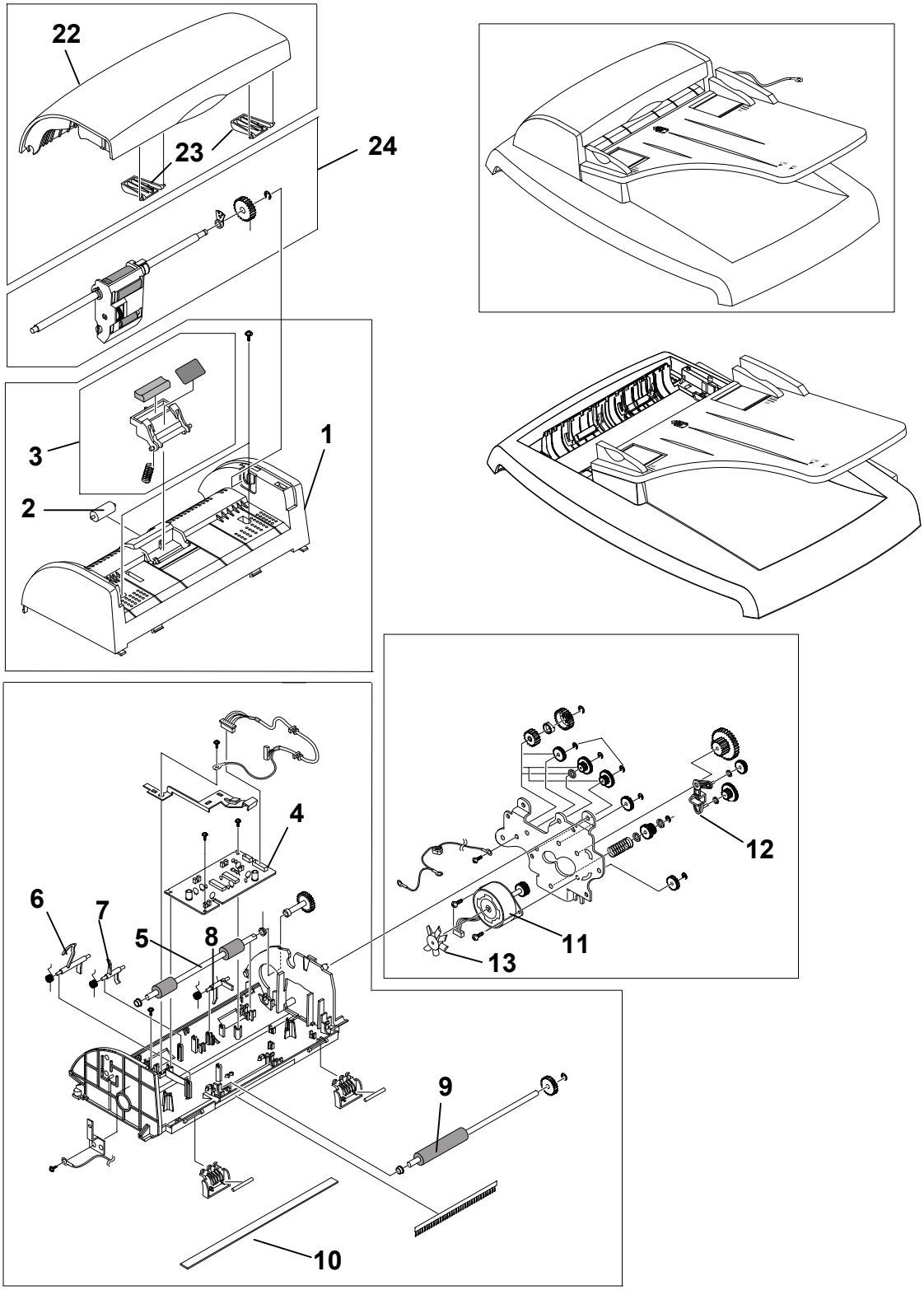
Index No.	Part No.	Description	Q'ty
1	B173 9501	Laser Unit	1
2	B173 9503	PSU - 220V	1
2	B173 9665	PSU - 110V	1
3	B173 9504	PCB - Main Board	1
4	B173 9505	Front Cover	1
5	B173 9672	Left Cover	1
6	B173 9673	Right Cover	1
7	B173 9508	Rear Cover	1
8	B173 9509	Face Up Door - Rear	1
9	B173 9511	Cooling Fan	1
10	B173 9513	Transfer Roller Ass'y	1
11	B173 9515	PCB - NCU: EU	1
11	B173 9516	PCB - NCU: NA	1
12	B173 9518	PCB - Connector Board	1

2. RX DRIVE ASSEMBLY

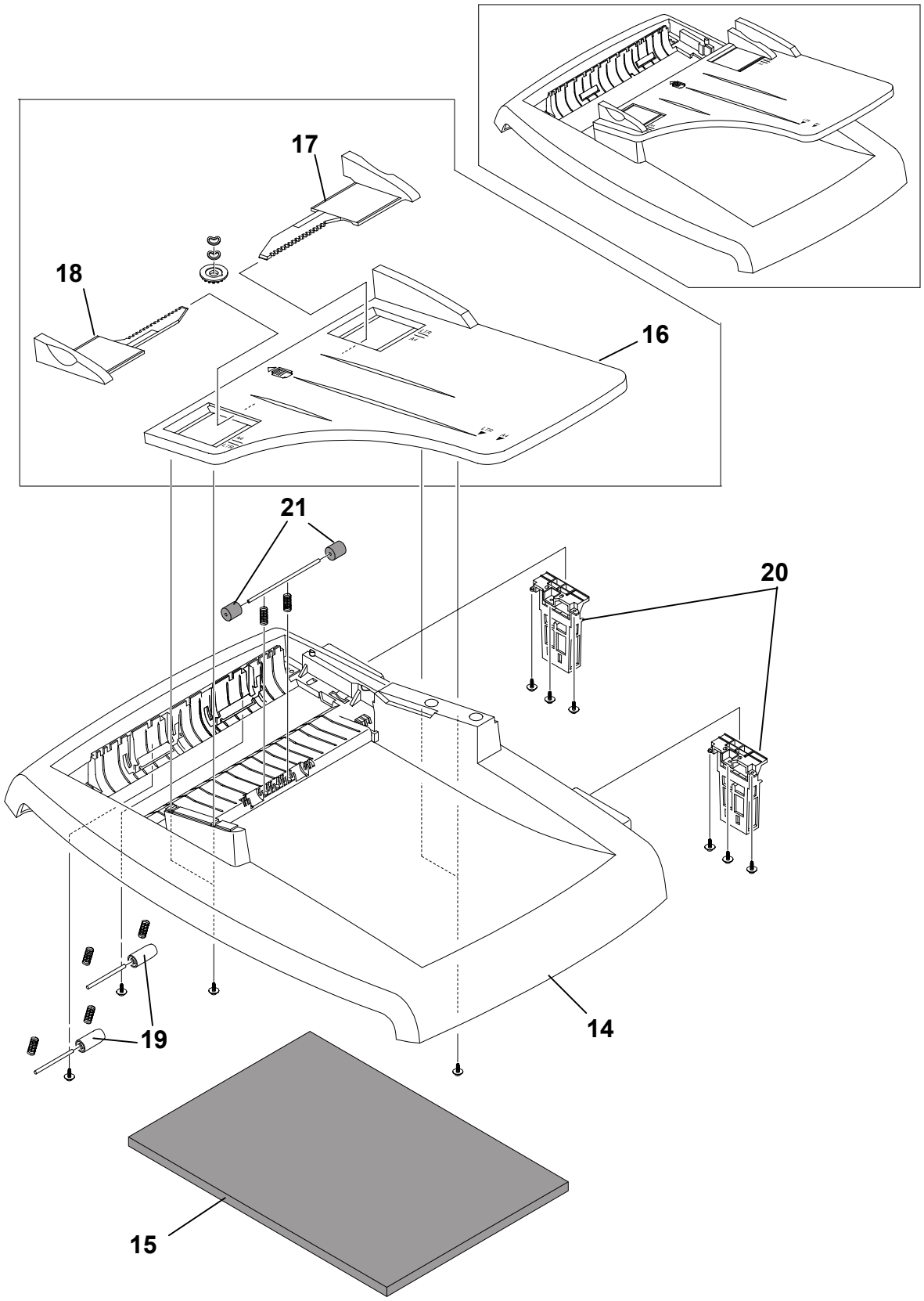


Index No.	Part No.	Description	Q'ty
1	B173 9526	RX Drive Ass'y	1
2	B173 9531	Stepping Motor	1

3. ADF ASSEMBLY

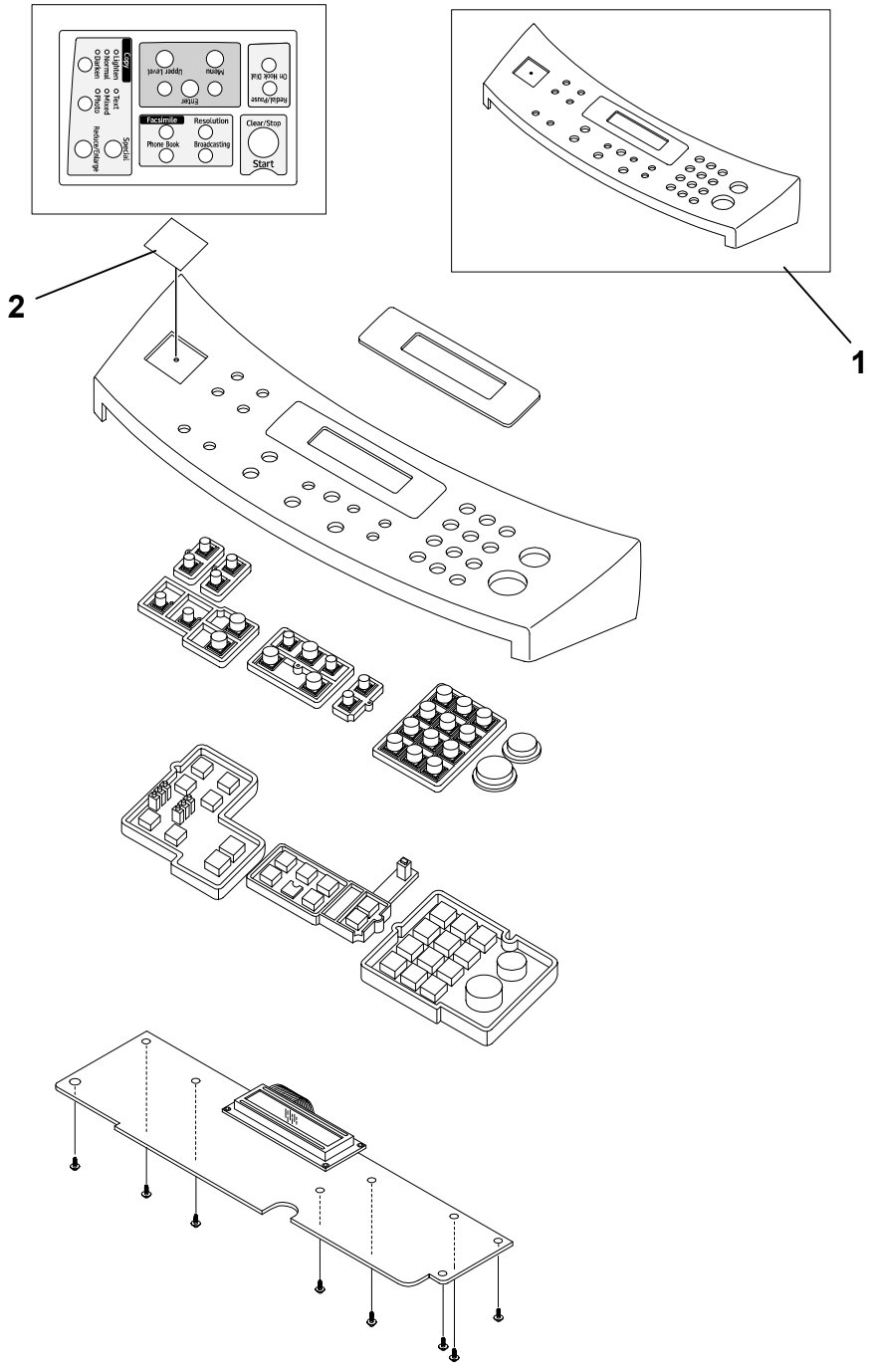


ADF ASSEMBLY



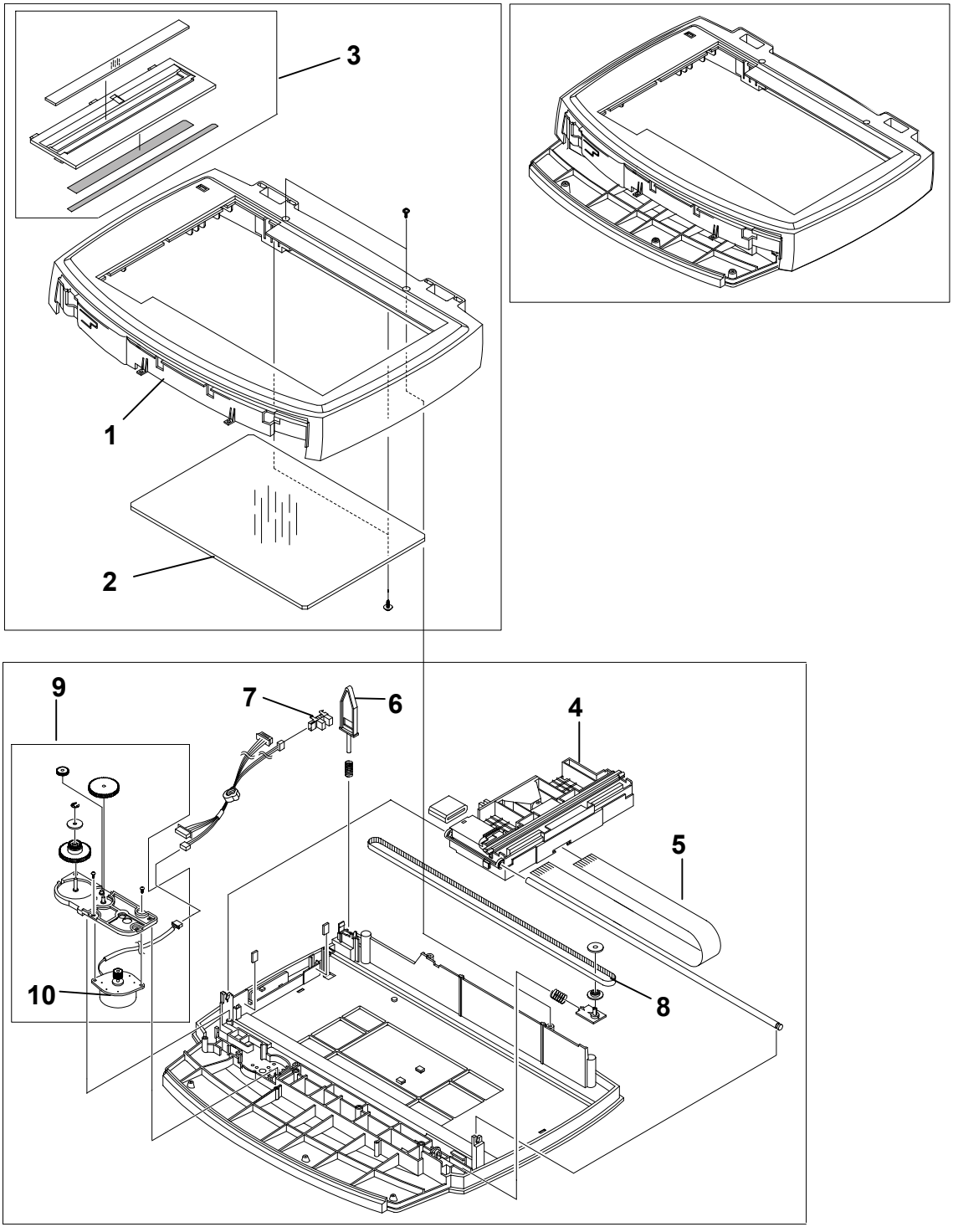
Index No.	Part No.	Description	Q'ty
1	B173 9532	ADF Upper Cover	1
2	B173 9533	Idle Roller - ADF	1
3	B173 9534	ADF Rubber Pad	1
4	B173 9536	PCB - ADF	1
5	B173 9539	ADF Drive Roller	1
6	B173 9540	Actuator - ADF Doc Sensor	1
7	B173 9541	Actuator - ADF Regist Sensor	1
8	B173 9542	Actuator - ADF Scan Sensor	1
9	B173 9546	Exit Roller - ADF	1
10	B173 9548	White Sheet	1
11	B173 9554	ADF Motor	1
12	B173 9562	Link - Swing: ADF	1
13	B173 9564	Impeller - ADF	1
14	B173 9573	Platen Cover	1
15	B173 9574	Sponge Sheet	1
16	B173 9575	Document Table	1
17	B173 9576	Document Guide - L	1
18	B173 9578	Document Guide - R	1
19	B173 9580	Pinch Roller	2
20	B173 9582	Hinge - Platen	2
21	B173 9583	Exit Roller - Platen	2
22	B173 9585	ADF Top Cover	1
23	B173 9586	Paper Guide - ADF Top Cover	2
24	B173 9587	ADF Pick-up Ass'y	1

4. OPE UNIT ASSEMBLY



Index No.	Part No.	Description	Q'ty
1	B173 9667	OP - Port Ass'y - NA/Asia	1
1	B173 9668	OP - Port Ass'y - EU	1
1	B173 9669	OP - Port Ass'y - China	1
2	B173 9671	Brand Plaque	1

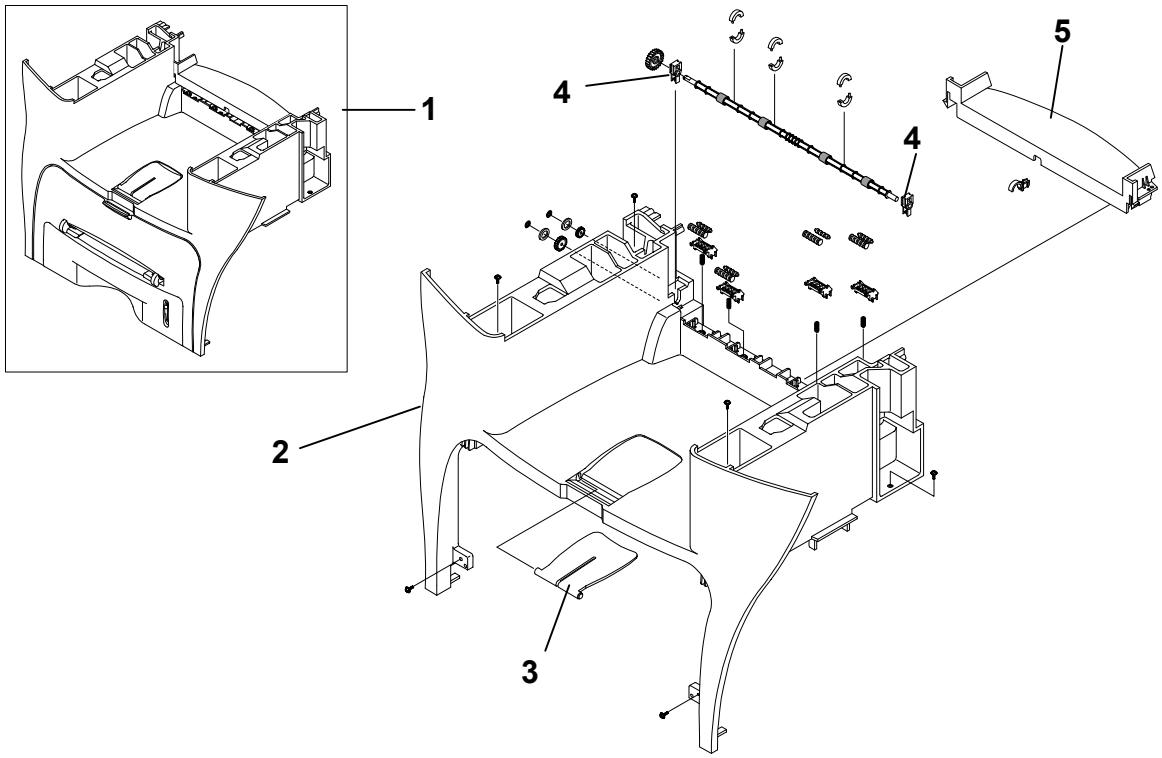
5. SCANNER ASSEMBLY



SCANNER ASSEMBLY

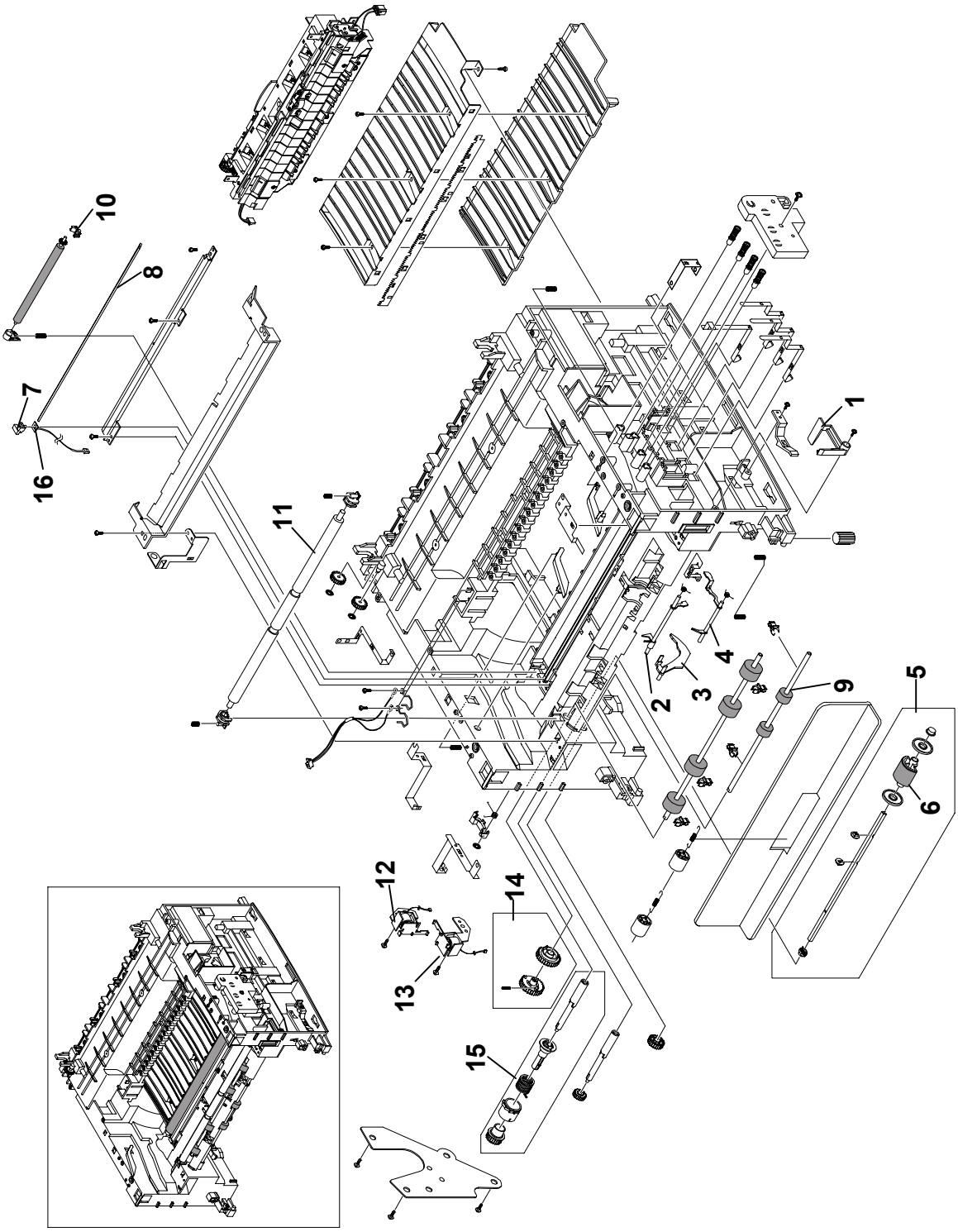
Index No.	Part No.	Description	Q'ty
1	B173 9588	Scanner Cover	1
2	B173 9589	Platen Glass	1
3	B173 9590	Platen Cover Ass'y - ADF	1
4	B173 9592	CCD Unit	1
5	B173 9593	Flat Cable - CCD	1
6	B173 9601	Sensor Lever	1
7	B173 9602	Platen Cover Sensor	1
8	B173 9604	Timing Belt - Scanner	1
9	B173 9605	Scanner Motor Ass'y	1
10	B173 9606	Scanner Motor	1

6. MIDDLE COVER ASSEMBLY



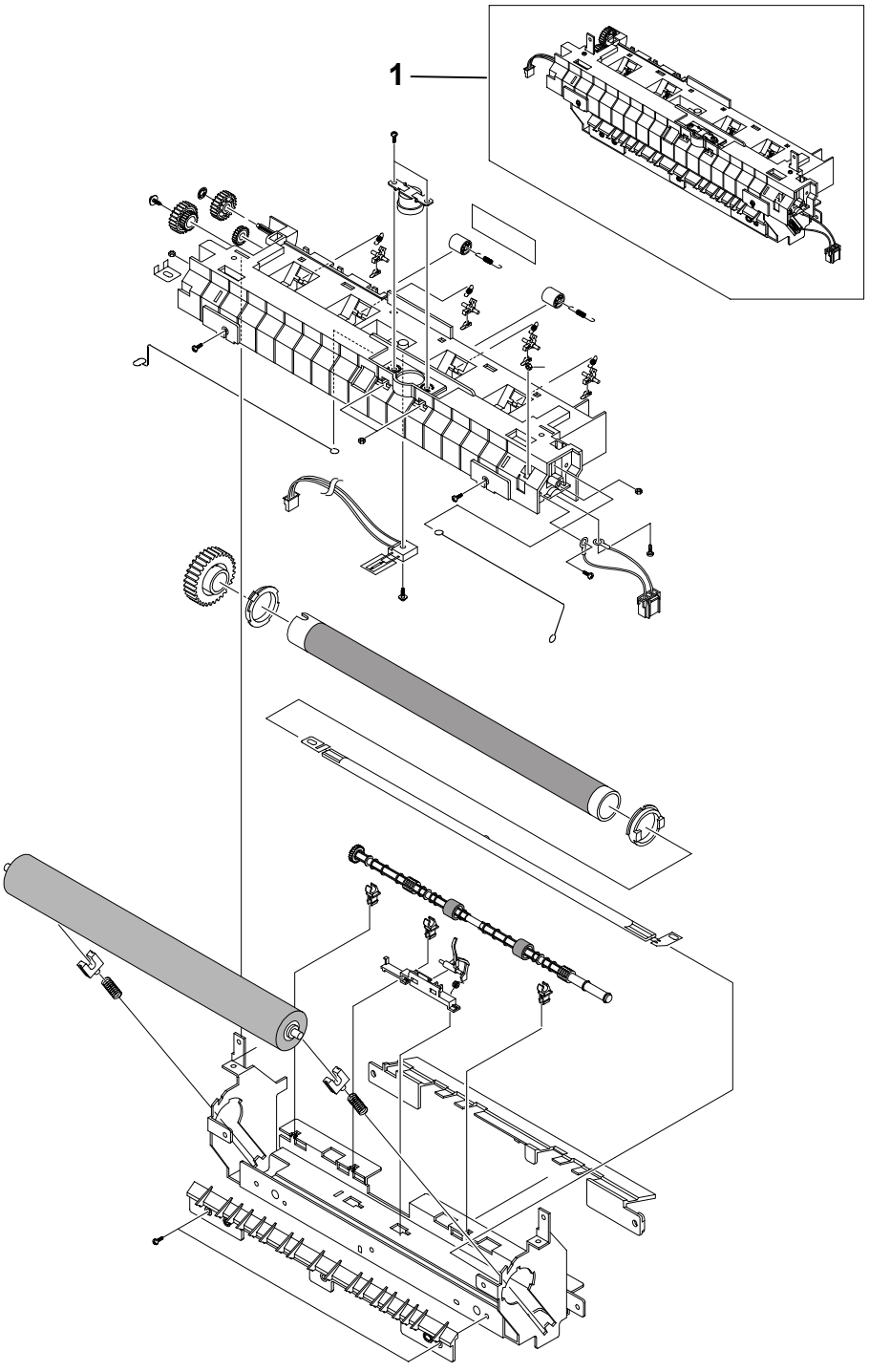
Index No.	Part No.	Description	Q'ty
1	B173 9608	Middle Cover Ass'y	1
2	B173 9609	Middle Cover	1
3	B173 9610	Paper Stack - Extension	1
4	B173 9611	Bearing - Exit	2
5	B173 9612	Upper Rear Cover	1

7. FRAME ASSEMBLY



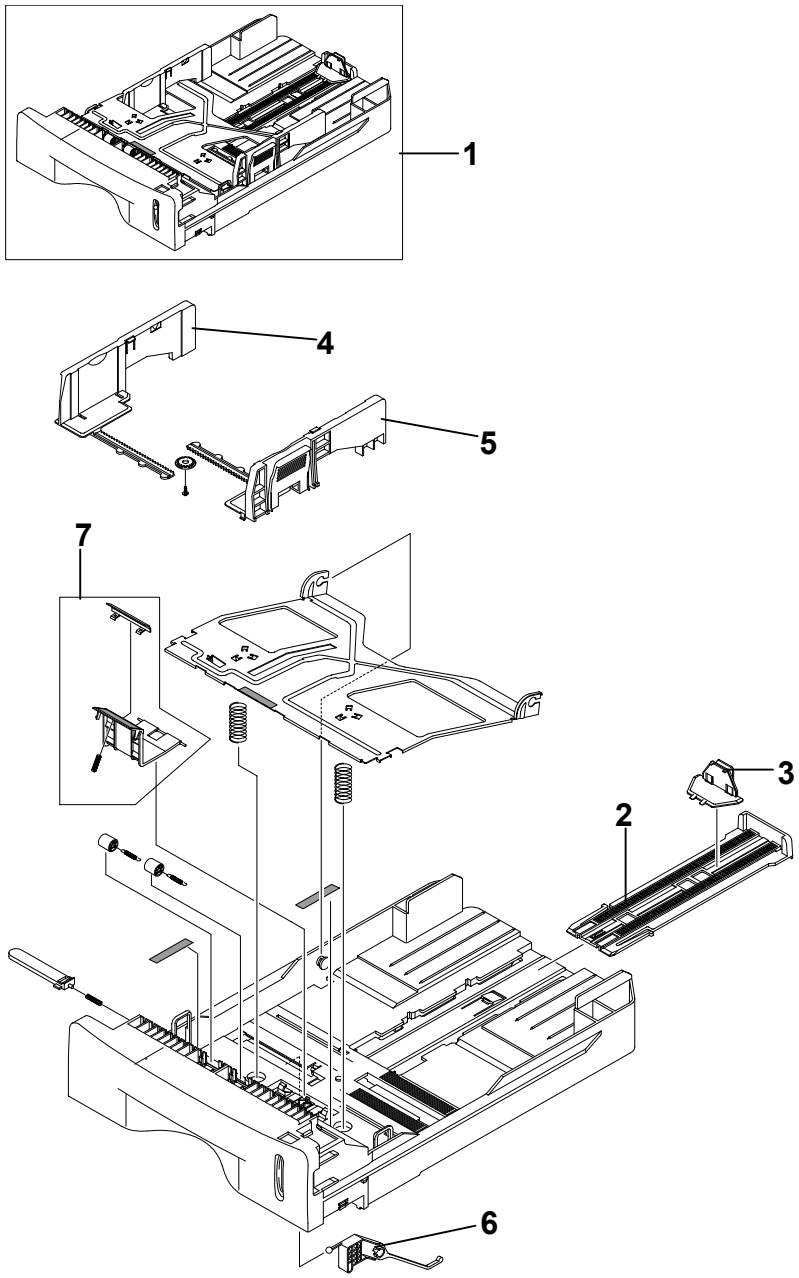
Index No.	Part No.	Description	Q'ty
1	B173 9621	Actuator - Cover Open	1
2	B173 9625	Actuator - Feed	1
3	B173 9626	Actuator - Paper End	1
4	B173 9627	Actuator - Bypass	1
5	B173 9629	Paper Pick-up Ass'y	1
6	B173 9631	Sponge Roller - Pick-up	1
7	B173 9635	Holder - Quenching	1
8	B173 9636	Lens - Quenching	1
9	B173 9638	Feed Roller	1
10	B173 9639	Bushing - Transfer : R	1
11	B173 9641	Idle Shaft - Feed	1
12	B173 9646	Solenoid - Pick-up	1
13	B173 9647	Solenoid - Bypass	1
14	B173 9648	Pick-up Gear Ass'y	1
15	B173 9651	Feed Clutch Ass'y	1
16	B173 9655	PCB - Quenching	1

8. FUSER ASSEMBLY



Index No.	Part No.	Description	Q'ty
1	B173 9656	Fusing Unit - 220V	1
1	B173 9666	Fusing Unit - 110V	1

9. CASSETTE ASSEMBLY



Index No.	Part No.	Description	Q'ty
1	B173 9657	Cassette Ass'y	1
2	B173 9658	Extension - End	1
3	B173 9659	End Fence	1
4	B173 9661	Side Fence - L	1
5	B173 9662	Side Fence - R	1
6	B173 9663	Lever - Paper Indicator	1
7	B173 9670	Friction Pad Ass'y	1

B173
PARTS INDEX

This section instructs you as to the numbers and names of parts on this machine.

PARTS CATALOG INDEX

PARTS CATALOG INDEX

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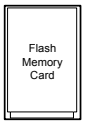
B173 9606	Scanner Motor	5-10
B173 9608	Middle Cover Ass'y	6-1
B173 9609	Middle Cover	6-2
B173 9610	Paper Stack - Extension	6-3
B173 9611	Bearing - Exit	6-4
B173 9612	Upper Rear Cover	6-5
B173 9621	Actuator - Cover Open	7-1
B173 9625	Actuator - Feed	7-2
B173 9626	Actuator - Paper End	7-3
B173 9627	Actuator - Bypass	7-4
B173 9629	Paper Pick-up Ass'y	7-5
B173 9631	Sponge Roller - Pick-up	7-6
B173 9635	Holder - Quenching	7-7
B173 9636	Lens - Quenching	7-8
B173 9638	Feed Roller	7-9
B173 9639	Bushing - Transfer : R	7-10
B173 9641	Idle Shaft - Feed	7-11
B173 9646	Solenoid - Pick-up	7-12
B173 9647	Solenoid - Bypass	7-13
B173 9648	Pick-up Gear Ass'y	7-14
B173 9651	Feed Clutch Ass'y	7-15
B173 9655	PCB - Quenching	7-16
B173 9656	Fusing Unit - 220V	8-1
B173 9657	Cassette Ass'y	9-1
B173 9658	Extension - End	9-2
B173 9659	End Fence	9-3
B173 9661	Side Fence - L	9-4
B173 9662	Side Fence - R	9-5
B173 9663	Lever - Paper Indicator	9-6
B173 9665	PSU - 110V	1-2
B173 9666	Fusing Unit - 110V	8-2
B173 9667	OP - Port Ass'y - NA/Asia	4-1
B173 9668	OP - Port Ass'y - EU	4-1
B173 9669	OP - Port Ass'y - China	4-1
B173 9670	Friction Pad Ass'y	9-7
B173 9671	Brand Plague	4-2
B173 9672	Left Cover	1-5
B173 9673	Right Cover	1-6

FIRMWARE HISTORY

FIRMWARE HISTORY

PUBLISHED DATE: 08/06/2004

PRODUCT CODE: B173
APPLICABLE MODEL:
- **GESTETNER - DSm516**
- **LANIER - AC017**
- **RICOH - AC104**
- **SAVIN - AC104**



GENERAL:

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: *Refer to Facts Line Bulletin # FL002 and Publication Bulletin #023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.*

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1. B173 FIRMWARE:

VERSION	PART NUMBER	PRODUCTION DATE
6.09	B173609	First mass production
6.12	B173612	May 2004 production

1.1 B173 FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release • Regular upgrade: Improved management of energy saver function.	6.09
Corrects the following: • Cannot use the Menu key once the number of pages is programmed for the job. • The operator was able to set the “End Time” for Forward Job to an earlier value than the “Start Time.” • “Warming up” remains displayed after the machine is woken up by a print job set for plain paper feed from the Bypass Tray. (Printing is normal). Other changes: • Optimized the Toner Low/Empty timing by adjusting the threshold for the toner dot counter based on the temperature/humidity data from the environmental sensor. • Modified software so that the display does not allow the operator to access the Copier function during fax communication. **NOTE:** *With previous versions, the machine prohibited Copier operations in accordance with specification, but the display allowed the operator to input the number of copies.* • Modified software so that the operator can print from the Bypass Tray after clearing a Jam 0 at this tray. (Previously, it was necessary to re-feed from a paper tray). • Modified software so that a Speed Dial cannot be deleted if it is currently programmed in Forward Job. (Deletion causes this feature to operate incorrectly). • Reduce/Enlarge default changed from Custom to Original. • The following setting has been applied for the China model. **NOTE:** *This is effective when the country code is set to China.* *Redial count:* *- Setting range: 0-2* *- Default: 2*	6.12