Model C-C1
(Machine Code: B173)

SERVICE MANUAL

27 February 2004
Subject to Change

PRECAUTIONS

The cautions in the below are items needed to keep in mind when maintaining and servicing.

Please read carefully and keep the contents in mind to prevent accidents while servicing and to prevent that the machine gets damage.

WARNING FOR SAFETY

1. **Request the service by qualified service person.**
   The service for this machine must be performed by a service person who took the additional education of this field. It is dangerous if unqualified service person or user tries to fix the machine.
2. **Do not rebuild it discretionary.**
   Do not attach or change parts discretionary. Do not disassemble, fix, and rebuilt it. If you do, the printer will not work and 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 nor-mal 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.WMF

CAUTION FOR SAFETY

PRECAUTION RELATED NOXIOUS MATERIAL

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

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

Please keep children out of the toner cartridge.

PRECAUTION RELATED ELECTRIC SHOCK OR FIRE

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

1. Use exact voltage. Please do use an exact voltage and wall socket. If not, a fire or an electric leakage can be caused.
2. Use authorized power code. Do use the power code supplied with PRINTER. A fire can be occurred when over current flows in the power code.
3. Do not insert many cords into a outlet. If do, a fire can occur due to a over flow of current in an outlet.
4. Do not put water or extraneous matter in the PRINTER. Please do not put water, other liquid, pin, clip, etc. It can cause a fire, electric shock, or malfunction. If it happens, turn off the power and remove the power plug from outlet immediately.
5. Do not touch the power plug with a wet hand. When servicing, remove the power plug from the outlet and do not insert or remove it with a wet hand. Electric shock can occur.
6. Use caution when inserting or taking off the power plug. The power plug has to be inserted completely.
   If not, a fire will be caused due to poor contact. When taking off the power plug, grip the plug and remove it.
7. Management of power cord. Do not bend, twist, bind or place other materials on it. Do not use stales around printer. If the power code gets damage, a fire or electric shock can occur. A damaged power code must be replaced immediately. Do not repair the damaged part or reuse it. Repairing cord with plastic tape can cause a fire or electric shock. Do not spread chemicals on the power code. Do not spread insecticide on the power code. A fire or electric shock can occurred due to a thin(weak) cover on the power code.

8. Check whether the power outlet and the power plug are damaged, pressed or chopped. When such inferiorities are found, repair it immediately. Do not press or chop the cord when moving the machine.
9. Use caution during thunder or lightning storms. It may cause fire or electric shock. Take the power plug off under these conditions. Do not touch cable and device duing thender or lightening storms.
10. Avoid damp or dusty areas. Do not install the printer in dusty areas or around humidifiers. A fire can occurs. Clean plug well with dried fabric to remove dust. Fire can occur if water is dropped into the unit or if covered with dust.
11. Avoid direct sunlight. Do not install the printer near to a window where it directly contacts to the sun-light.
    If the machine contacts sunlight for a long time, the machine will not work properly, because the inner temperature of machine will get higher. A fire can be occur.
12. Turn off the power and take off the plug when smoke, a strange smell, or sound from the machine is detected. A fire can occur if unit is used under these conditions.
13. Do not insert steel or metal pieces inside/outside of the machine. Do not put steel or metal piece into the ventilator. 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 unit on uneven surfaces or slanted floors.
   Please confirm unit is correctly balanced after installation. Machine may fall ove when not balanced correctly.
2. Be careful not to insert a finger or catch your hair in the rotating unit.
   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 near the machine. If these objects get into the inner side a fire or electric shock can be occurred.
4. Do not install machine in areas where moisture or dust exists. For example, do not install machine near open windows, damage may be caused by these conditions.
5. Do not place candles, burning cigarettes, etc. on the machine. Do not install it near to a heater. A fire may occur.

PRECAUTIONS FOR WHEN ASSEMBLY/DISASSEMBLY

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

1. Check the contents stored in the memory. All the information will be erased after the main board is replaced. Write down and needed information.
2. Disconnect power before servicing or replacing electrical parts.
3. Remove printer cables and power cord.
4. Do use formal parts and same standardized goods when replacing parts. Must check the product name, part code, rated voltage, rated current, operating temperature, etc.
5. Do not use excessive force when loosening or tightening of plastic parts.
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 ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components.

The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

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

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
3. Use only a grounded tip soldering iron to solder or desolder ESDs.
4. Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.

5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one's foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

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PARTS CATALOG

1. INSTALLAITON

Refer to the operating instructions for details.

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

3. REPLACEMENT AND ADJUSTMENT

3.1 GENERAL PRECAUTIONS ON DISASSEMBLY

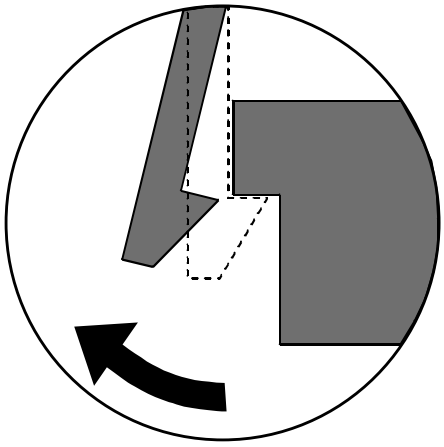
Use caution when you disassemble and reassemble components. Make sure that you put all cables in the correct position, after you replace a part.

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 are 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.



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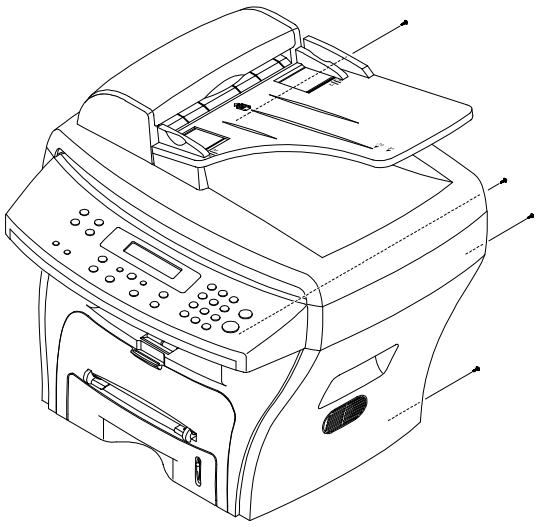
3.2 REAR COVER

1. Remove the four screws from the rear cover.



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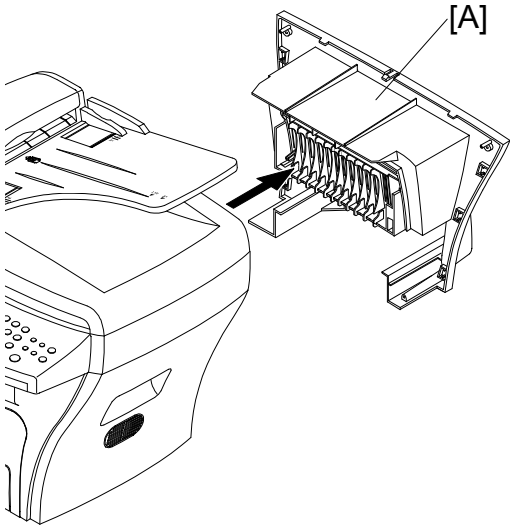
2. Remove the rear cover [A] from the frame assembly and scanner assembly.



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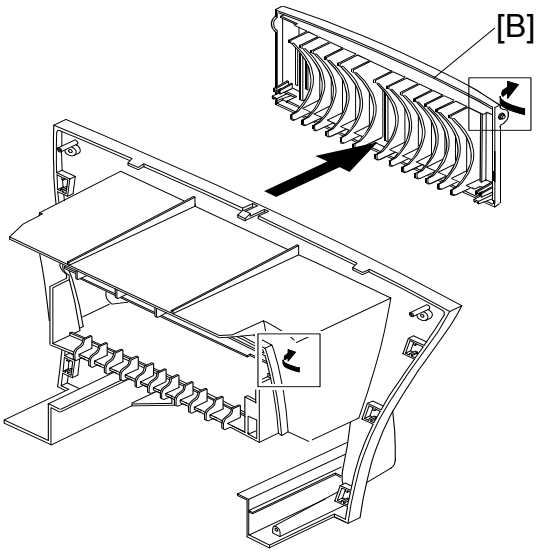
3. Release the cover - face up [B] that attaches the rear cover. Then lift the cover - face up out.



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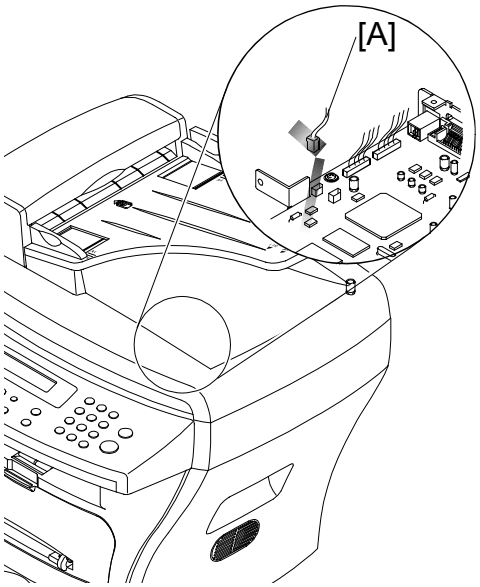
3.3 SIDE COVERS

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



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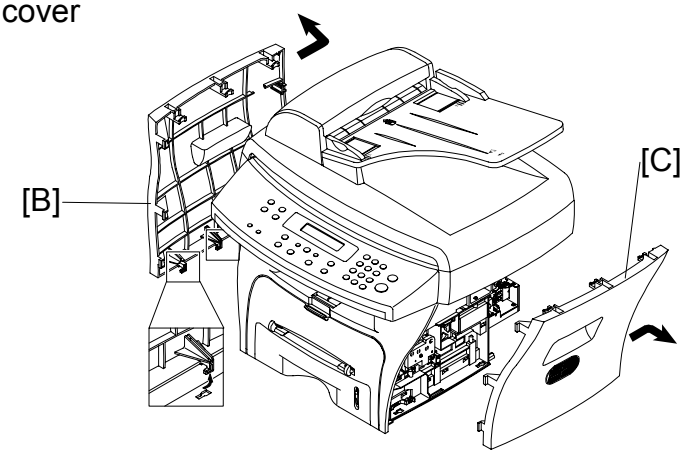
3. Lift the Left cover [B] and Right cover [C] in the direction of arrow.



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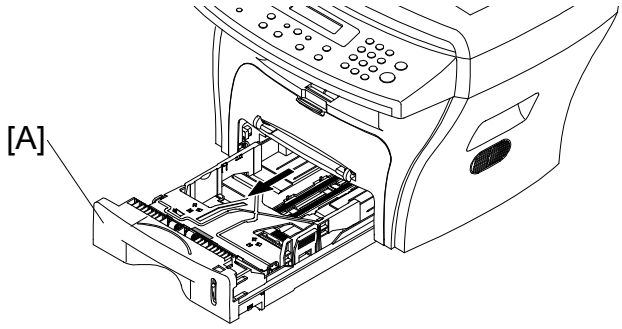
3.4 FRONT COVER

1. Remove the cassette [A].



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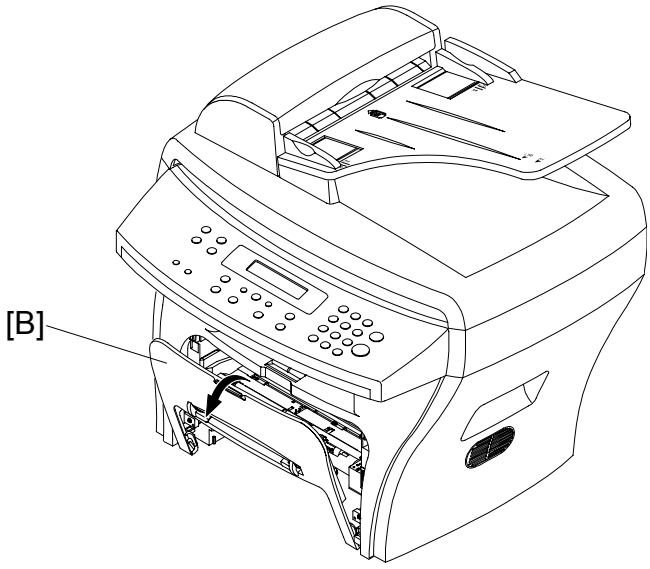
2. Open the front cover[B].



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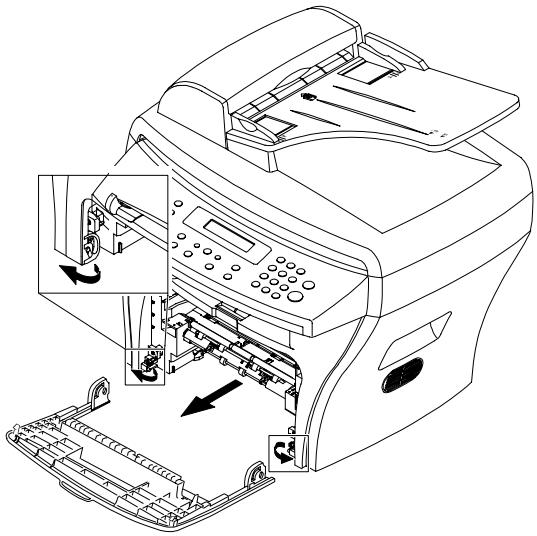
3. Remove the front cover that attaches the frame assembly. Then remove the front cover.



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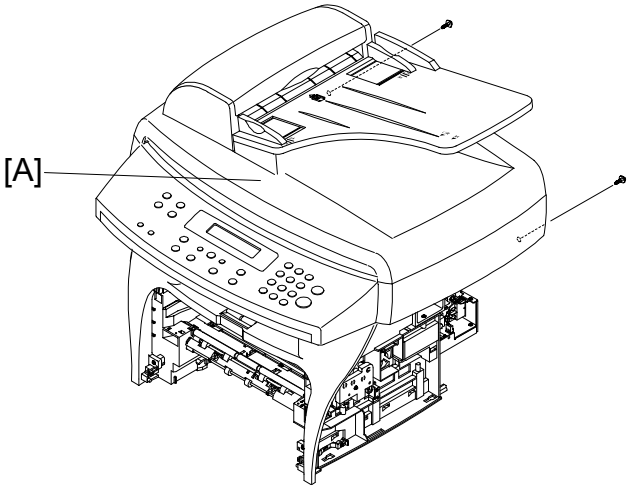
3.5 SCANNER ASS'Y

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].



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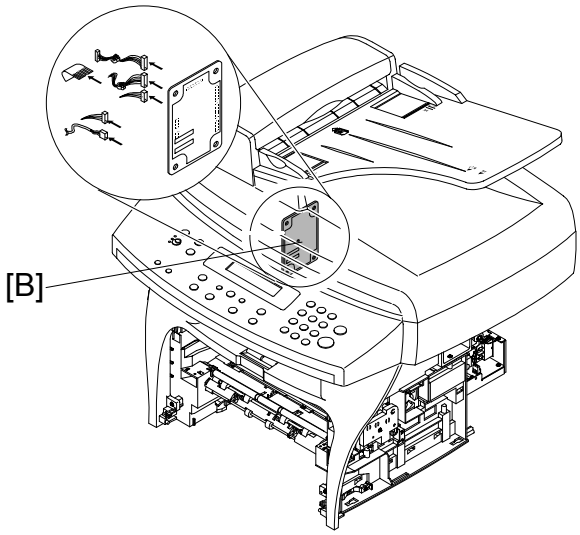
3. Disconnect the 6 connectors from the connector PBA [B].



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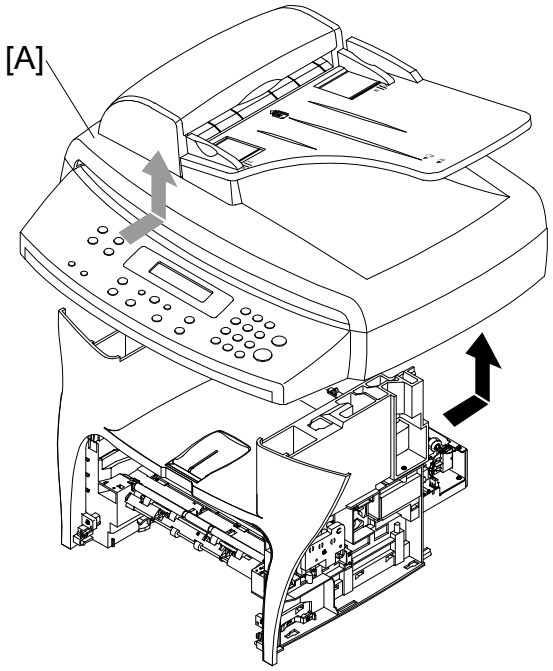
4. Pull up the scanner ass'y [A].



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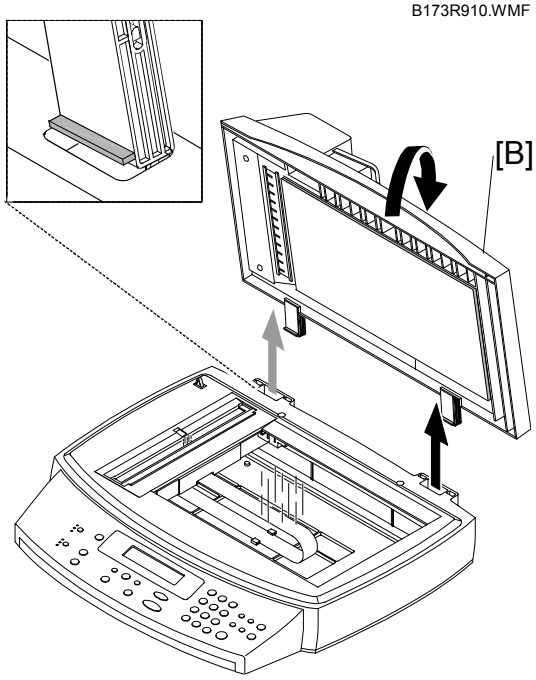
5. Pull the platen cover [B] up. Then remove it.



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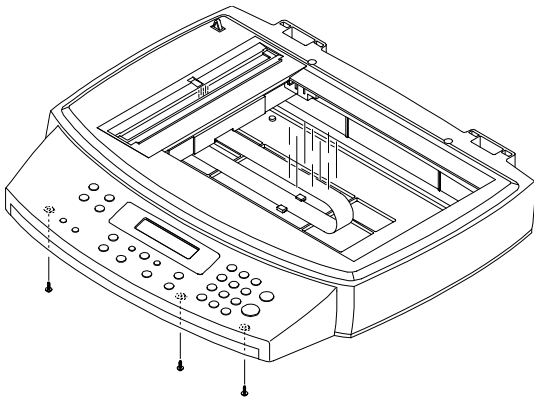
6. Remove three screws from the scan lower assembly.



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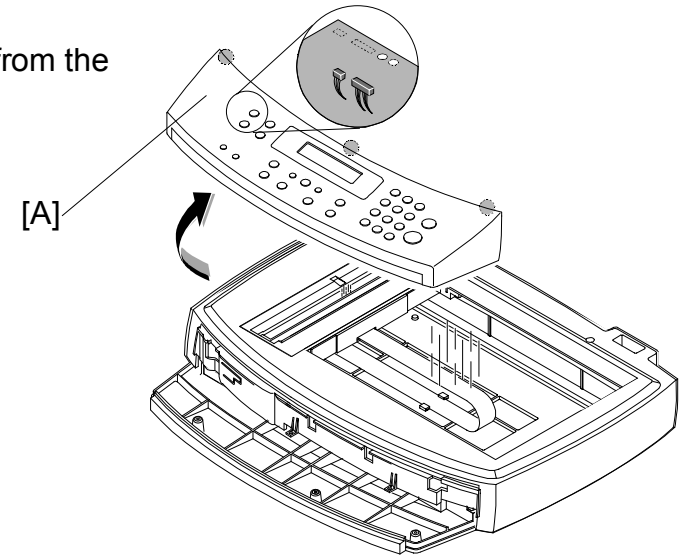
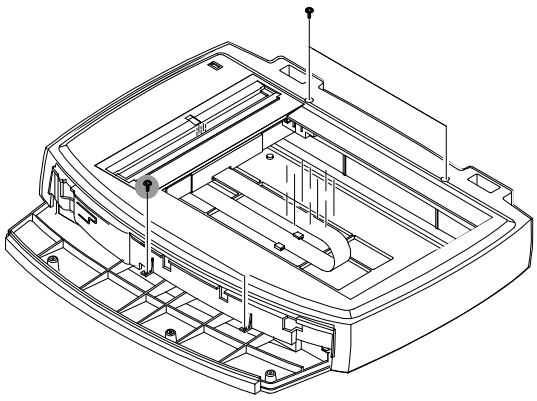
7. Remove the OPE unit [A]. Then disconnect the two connectors from the OPE unit. Then remove it.



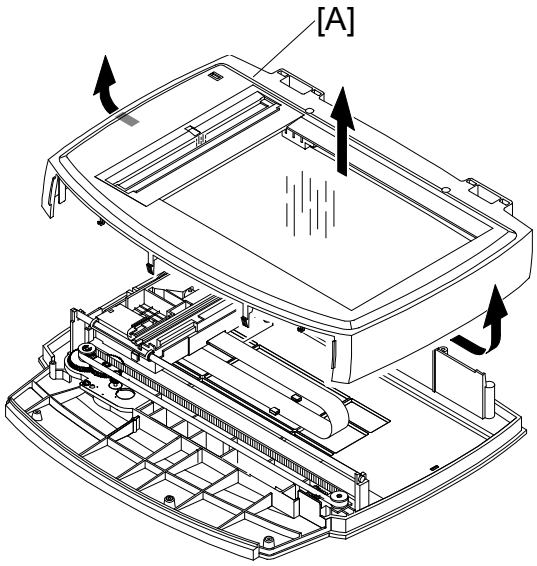
B173R913.WMF

8. Remove the four screws from the window cover.



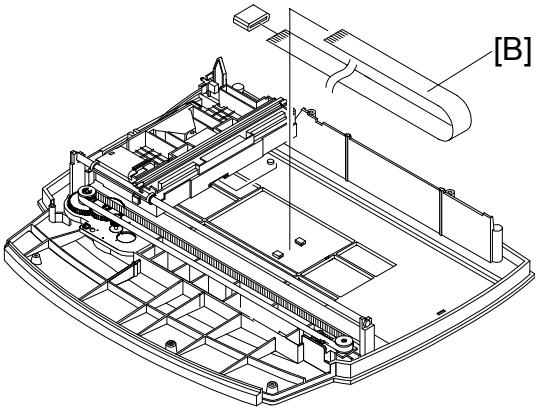
B173R914.WMF

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



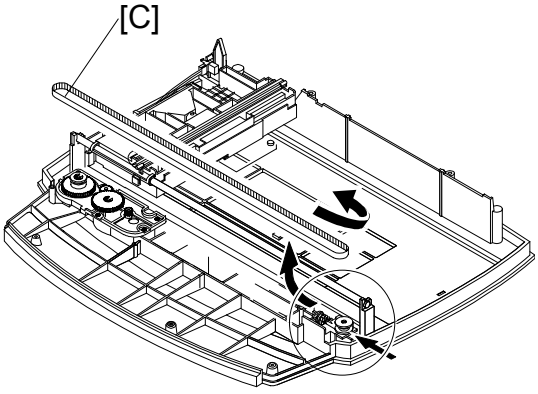
B173R915.WMF

10. Remove the CCD Cable [B].



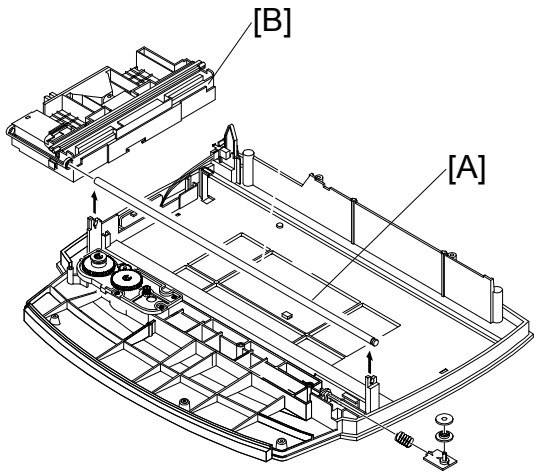
B173R916.WMF

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



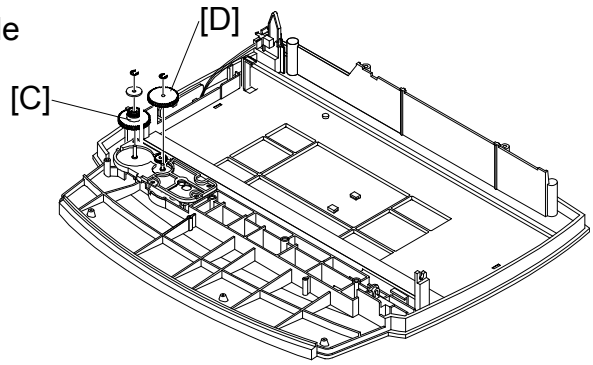
B173R917.WMF

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



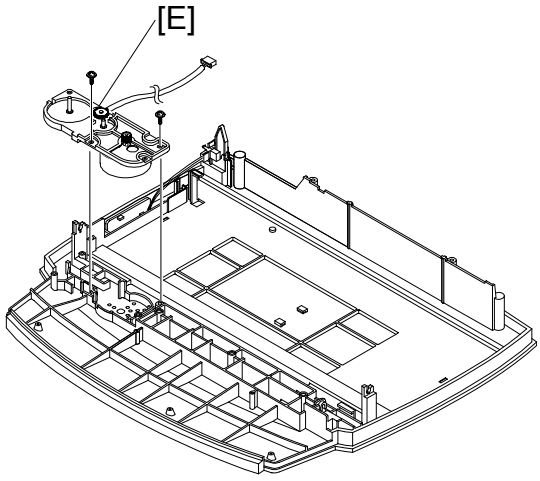
B173R918.WMF

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



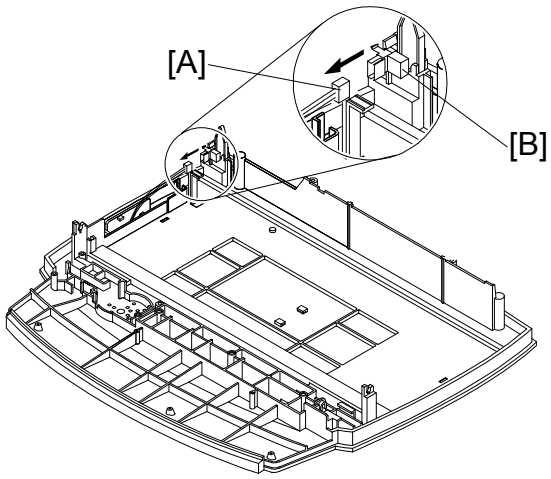
B173R919.WMF

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



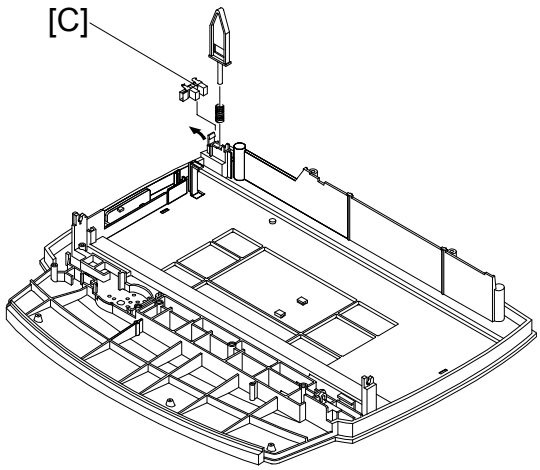
B173R920.WMF

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



B173R921.WMF

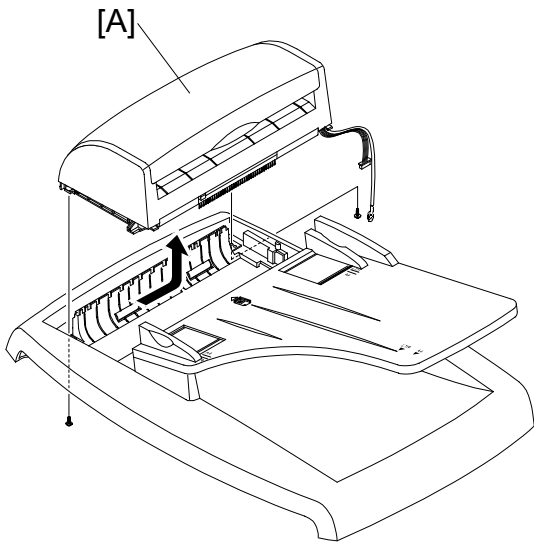
16. Release the open sensor [C]. Then remove it.



B173R922.WMF

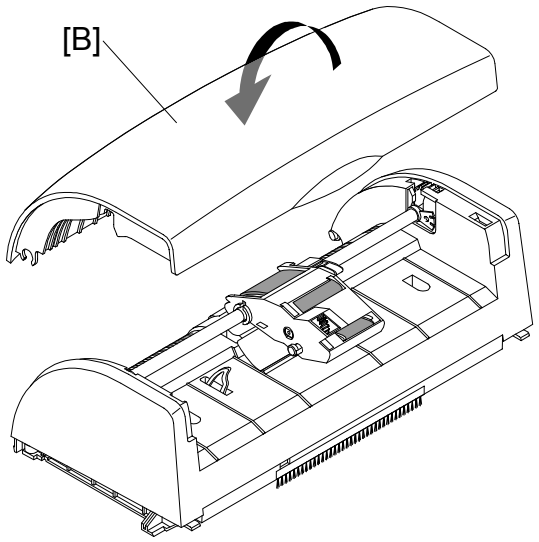
3.6 ADF MOTOR ASS'Y

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.



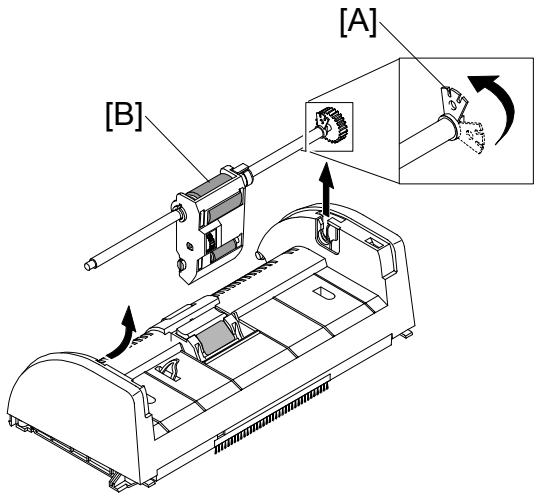
B173R923.WMF

3. Remove the open cover [B].



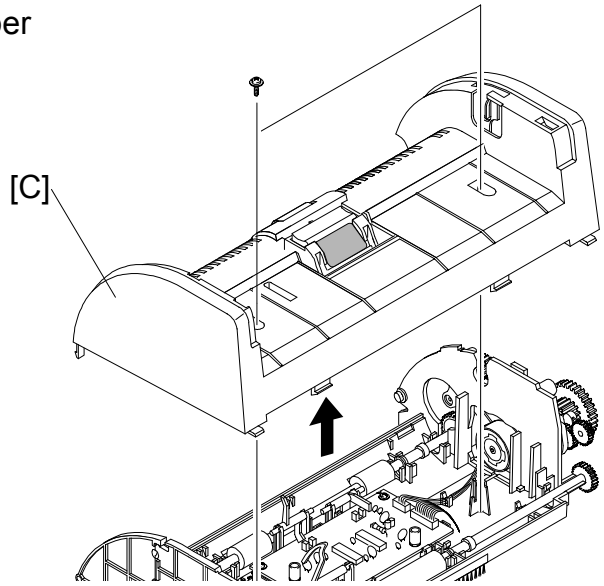
B173R924.WMF

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



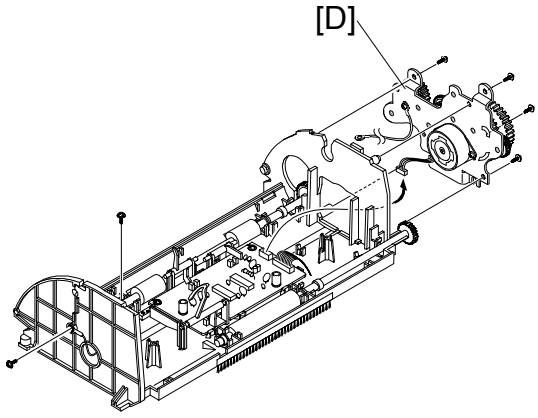
B173R925.WMF

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



B173R926.WMF

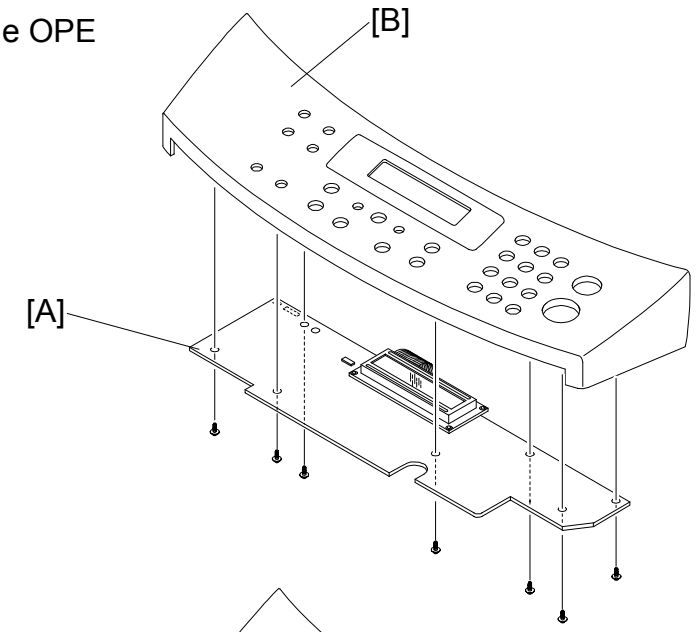
6. Disconnect the connector. Then remove four screws from the ADF motor ass'y [D]. Then remove it.



B173R927.WMF

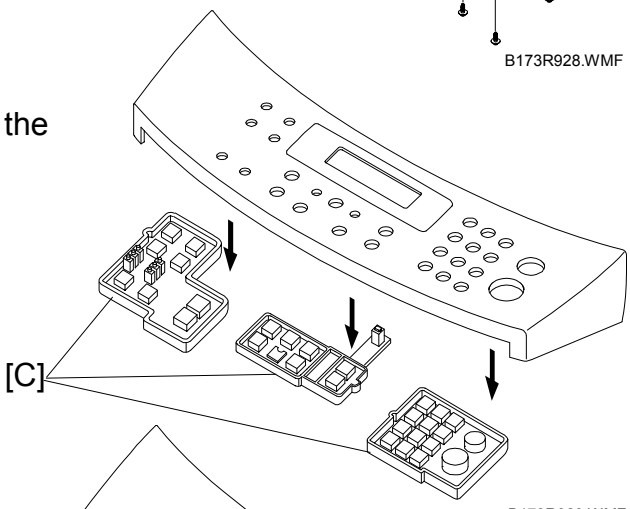
3.7 OPE UNIT (ALSO KNOWN AS OP-PORT)

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].

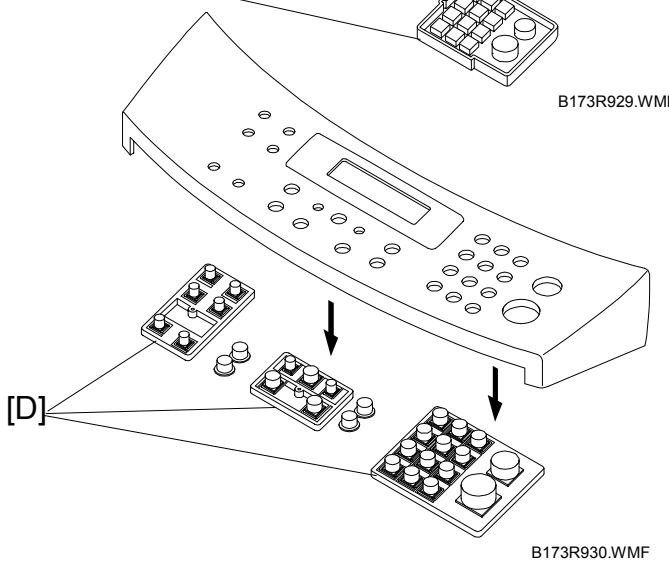


B173R928.WMF

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



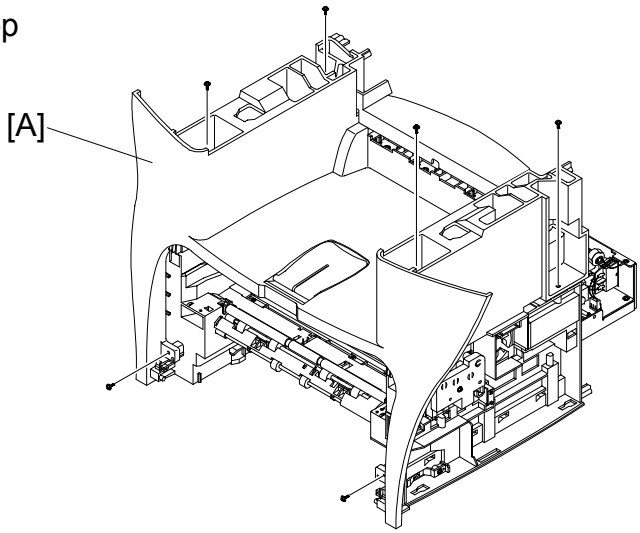
B173R929.WMF



B173R930.WMF

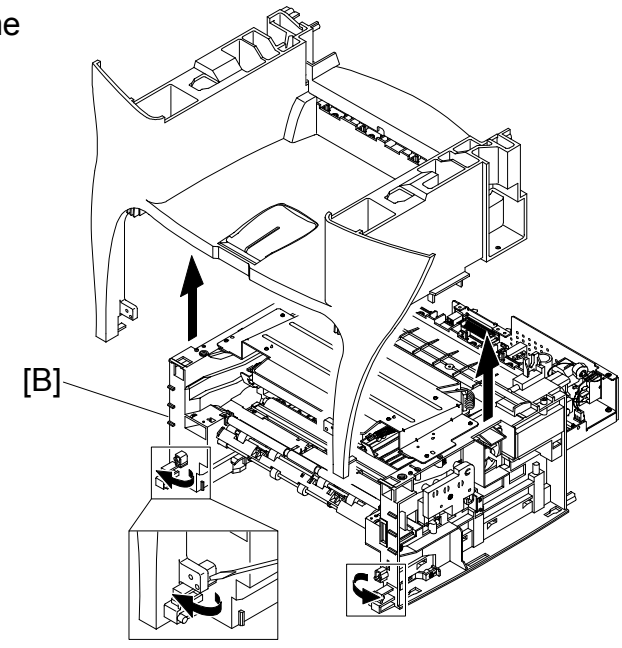
3.8 MIDDLE COVER AND EXIT ROLLER

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].



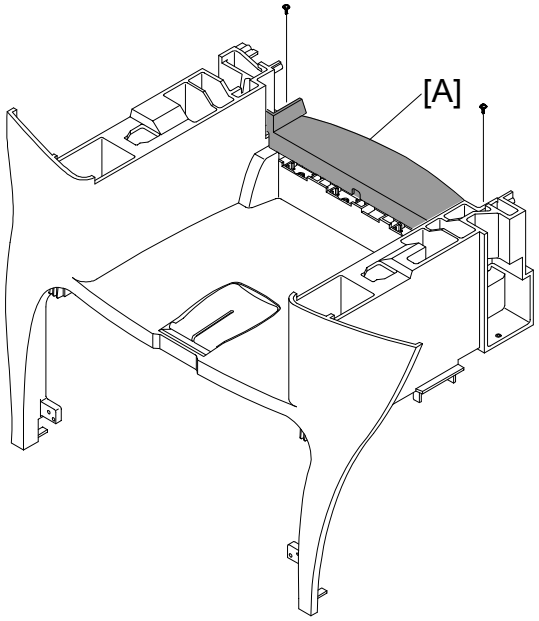
B173R931.WMF

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



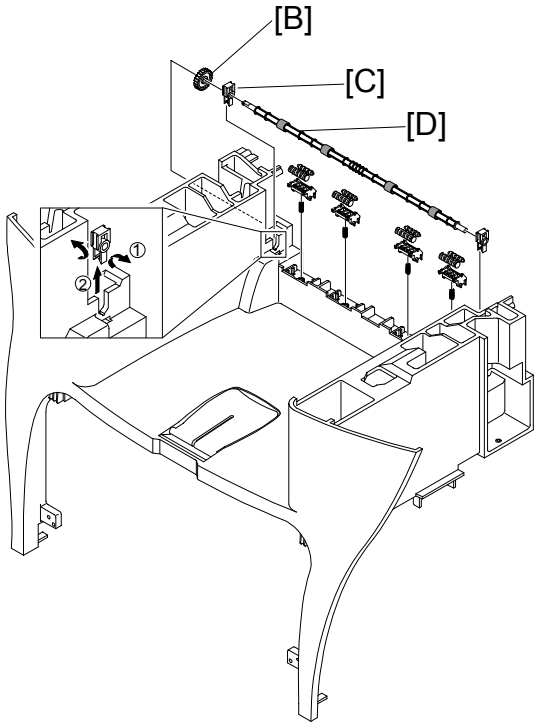
B173R932.WMF

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



B173R933.WMF

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

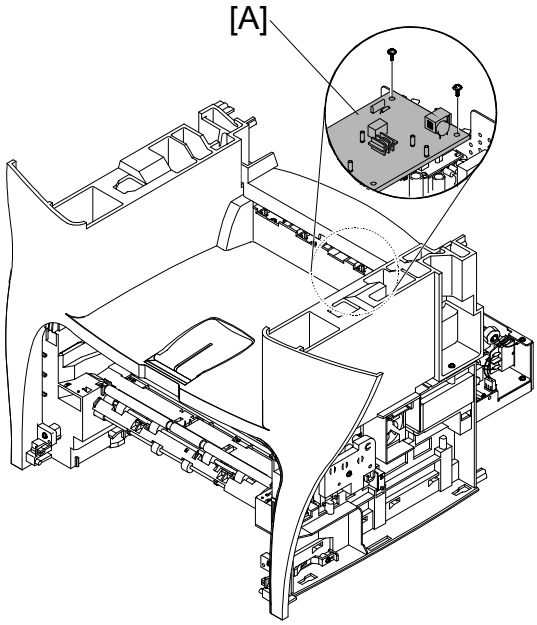


B173R934.WMF

3.9 ENGINE SHIELD ASS'Y

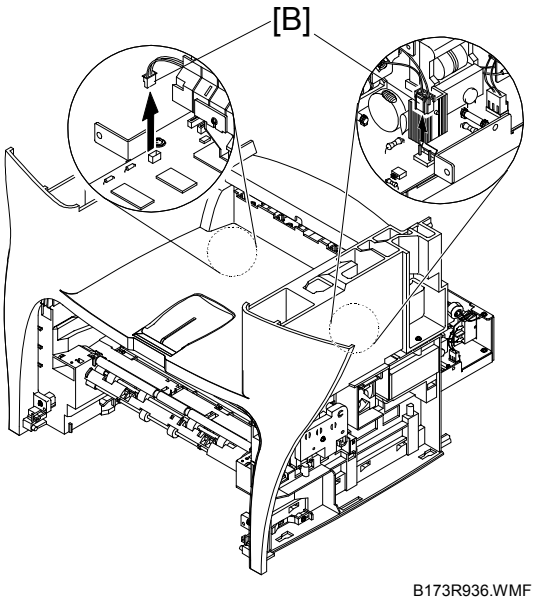
1. Before you remove the engine shield ass'y, you must remove these:
   - Rear Cover (☛ 3.2)
   - Side Covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)

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



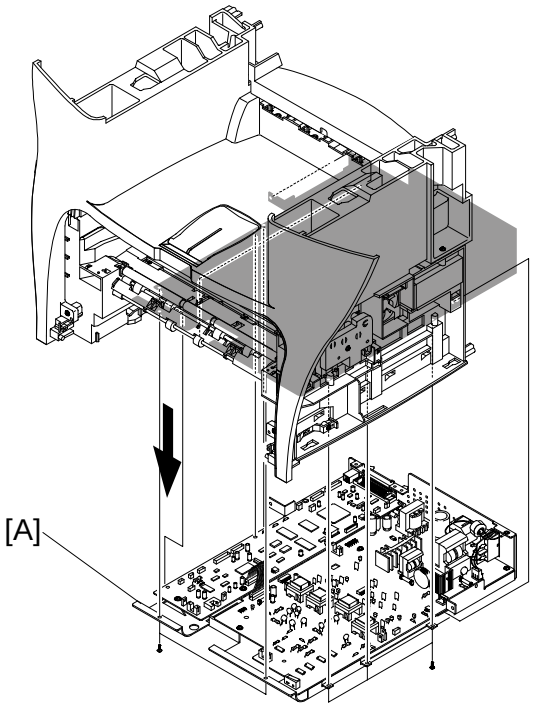
B173R935.WMF

3. Disconnect two connectors [B].



B173R936.WMF

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.

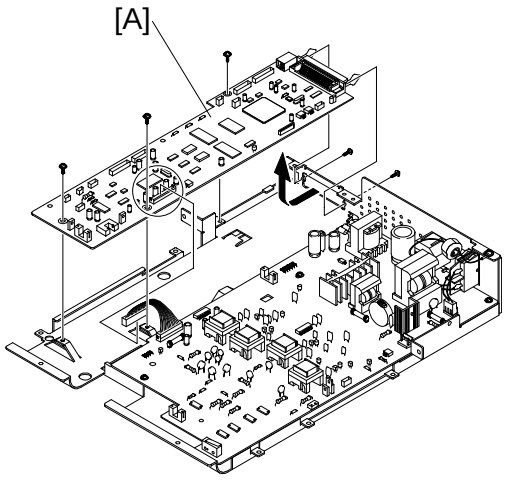


B173R937.WMF

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 (☛ 5.2.3) after you finish the replacement procedure.

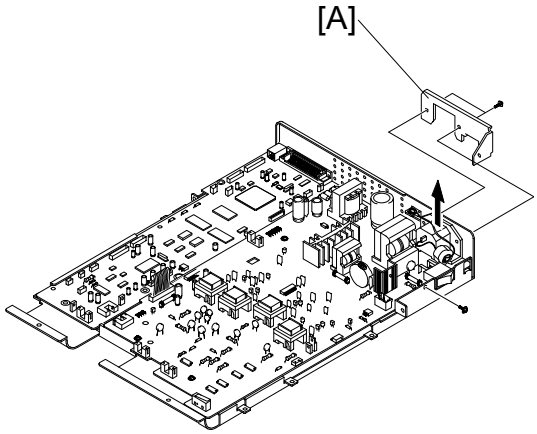
1. Before you remove the main PBA, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Engine shield ass'y (☛ 3.9)
2. Disconnect one connector. Then remove the five screws from the main PBA. Then remove the main PBA [A].



B173R938.WMF

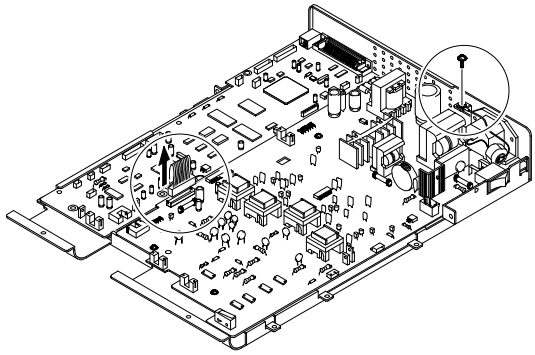
3.11 SMPS (ALSO KNOWN AS POWER SUPPLY UNIT)

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



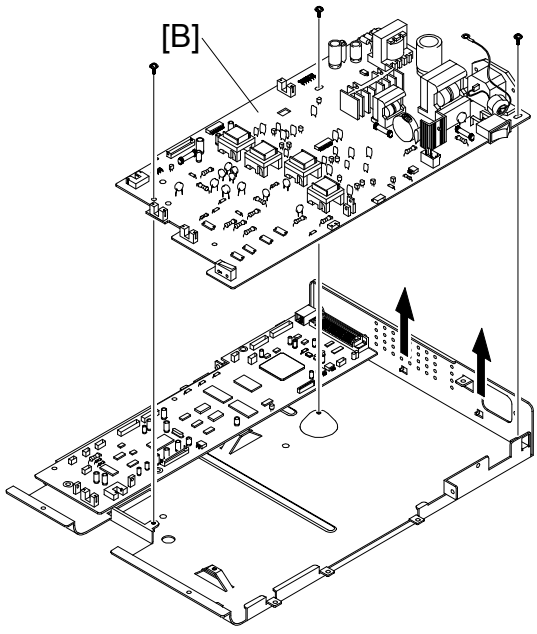
B173R939.WMF

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



B173R940.WMF

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



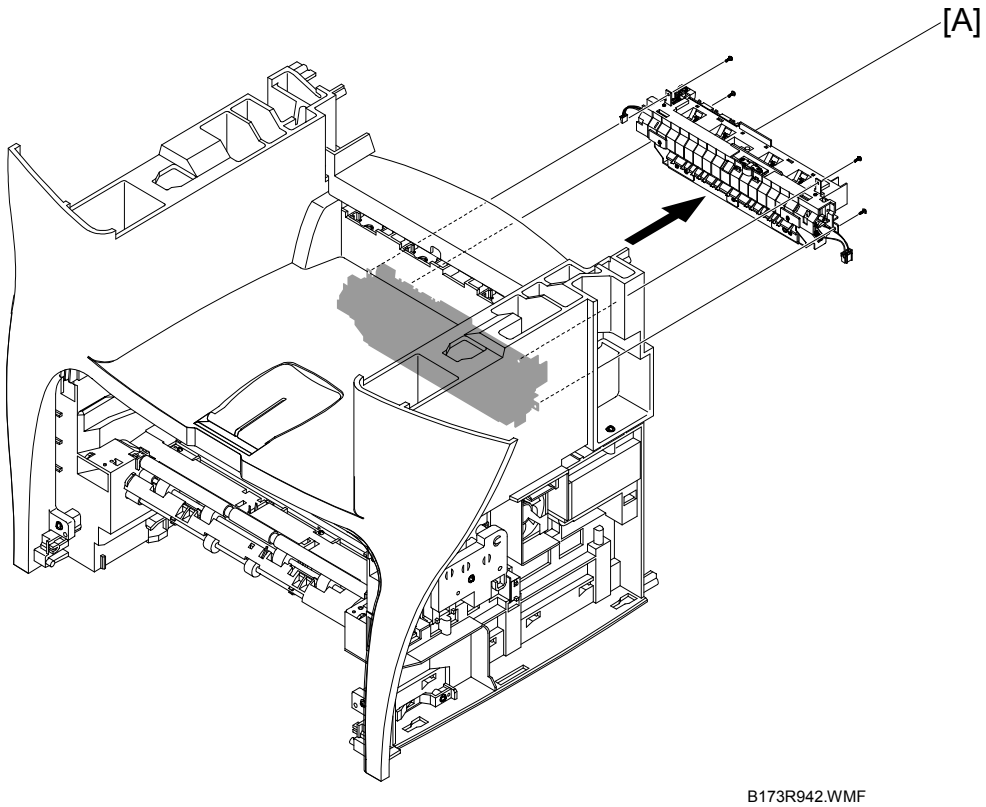
B173R941.WMF

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

⚠CAUTION

The fusing unit is assembled with tapping screws. Assembly/disassembly should be kept to a minimum. Repeated adjustments may 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..

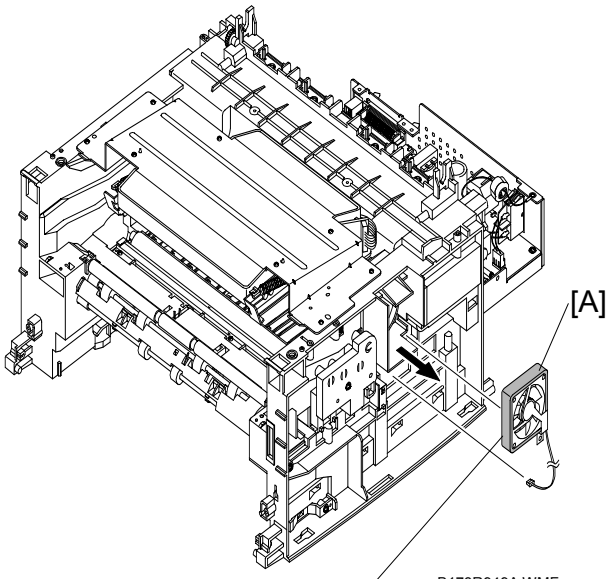
1. Before you remove the fuser ass'y, you must remove these:
   - Rear cover (☛ 3.2)
   - Side covers (☛ 3.3)
   - Scanner Ass'y (☛ 3.5)
   - Engine shield ass'y (☛ 3.9)
2. Disconnect the two connectors from the main PBA and SMPS. Then remove the four screws from the fusing unit [A]. Then remove it.



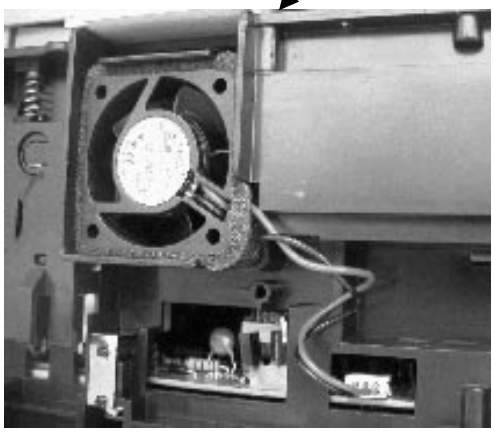
B173R942.WMF

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 fan [A].



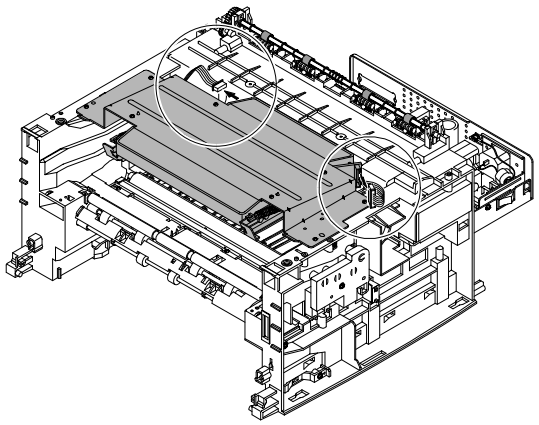
B173R949A.WMF



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

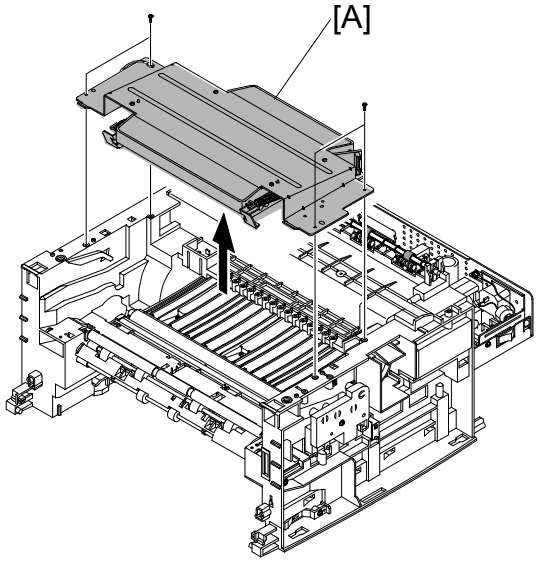
3.14 LSU (LASER SCANNING UNIT)

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.



B173R950.WMF

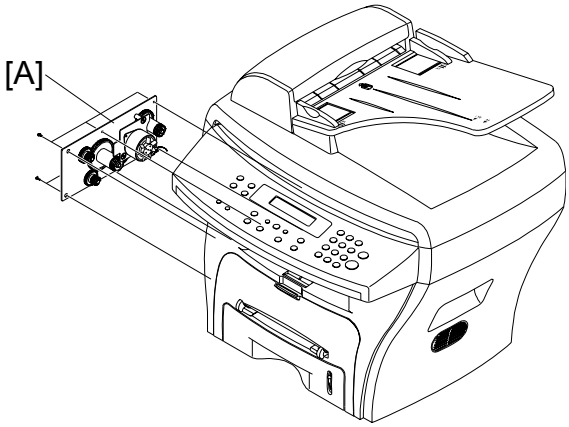
3. Remove the four screws from the LSU [A]. Then remove it.



B173R951.WMF

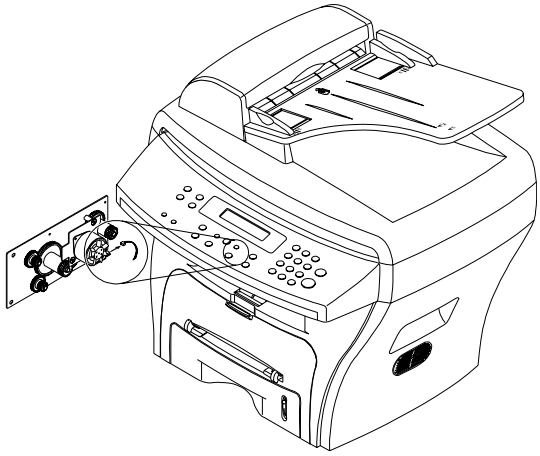
3.15 DRIVE ASS'Y

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].



B173R952.WMF

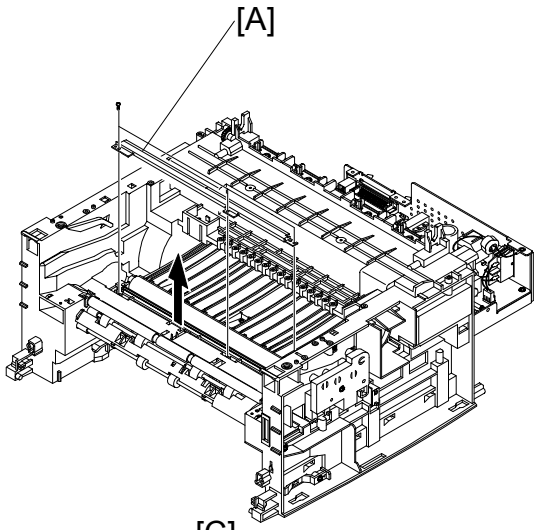
3. Remove the drive ass'y. Then disconnect the connector from the main PBA.



B173R953.WMF

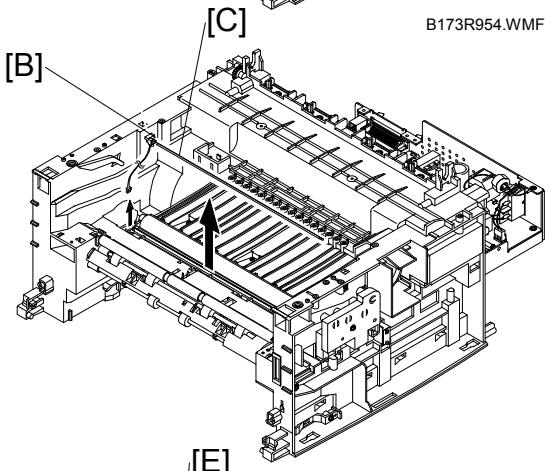
3.16 TRANSFER ASS'Y

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.



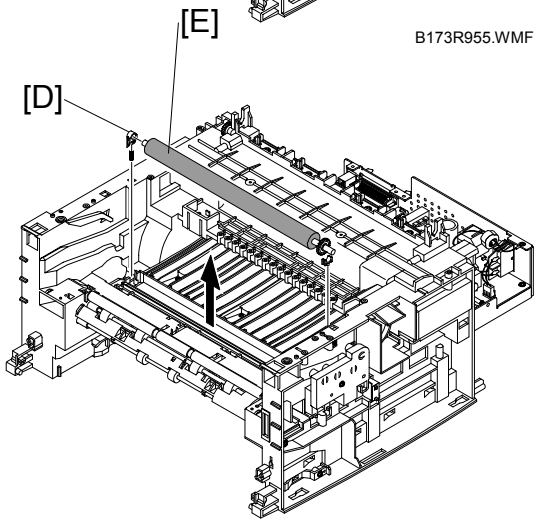
B173R954.WMF

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



B173R955.WMF

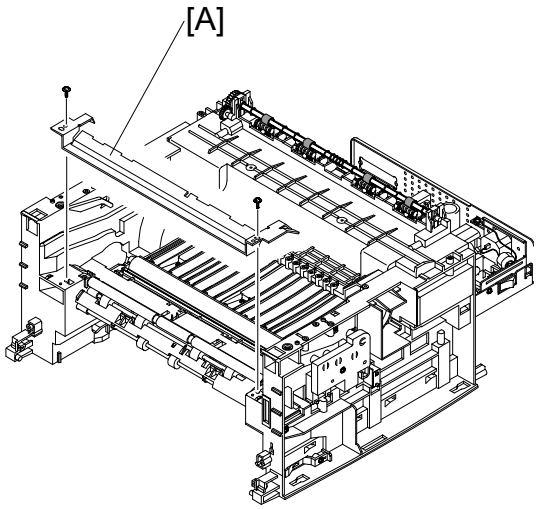
4. Release the bushing [D]. Then remove it. Then remove transfer roller [E].



B173R956.WMF

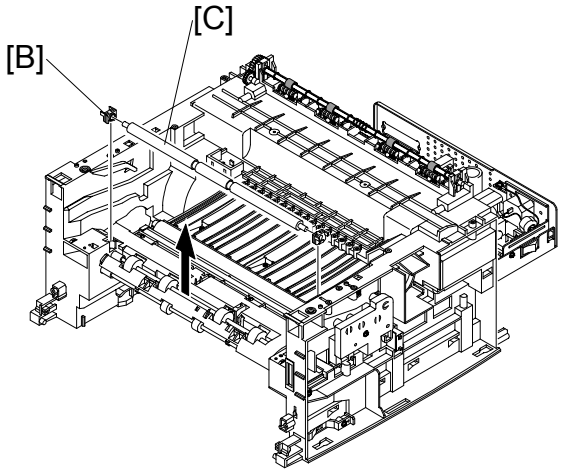
3.17 FEED ASS'Y

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.



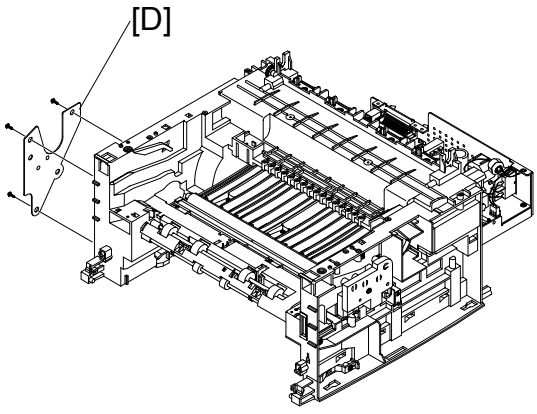
B173R957.WMF

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



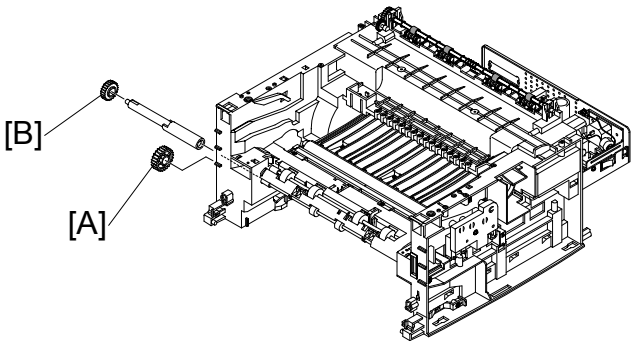
B173R958.WMF

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



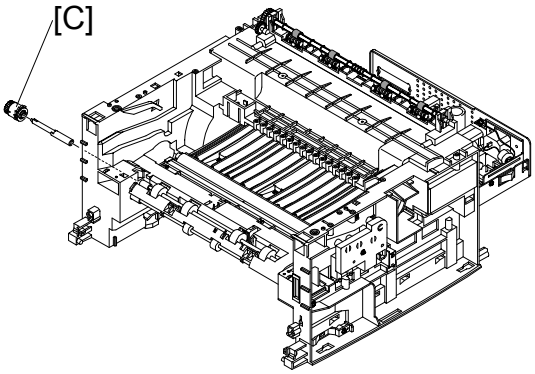
B173R959.WMF

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



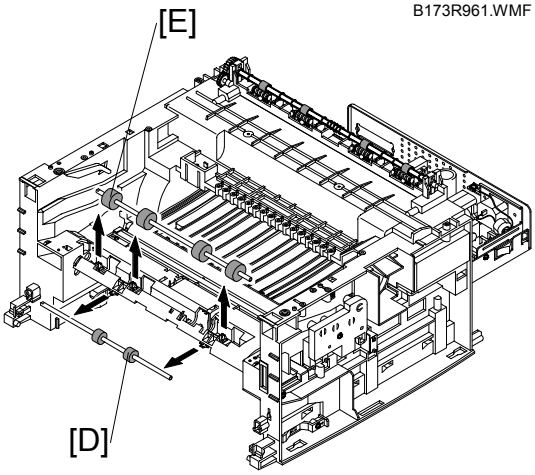
B173R960.WMF

6. Remove feed gear 1 assembly [C] .



B173R961.WMF

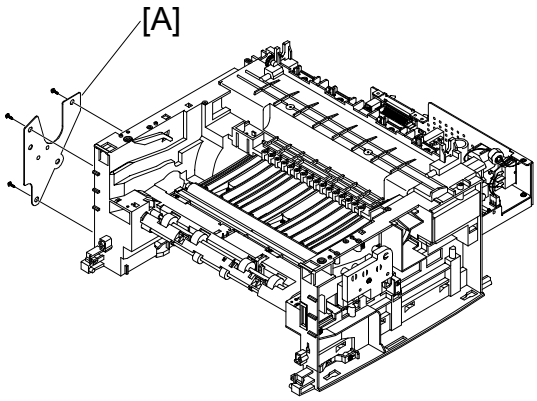
7. Pull up the feed roller [D] and feed roller 1 [E].



B173R962.WMF

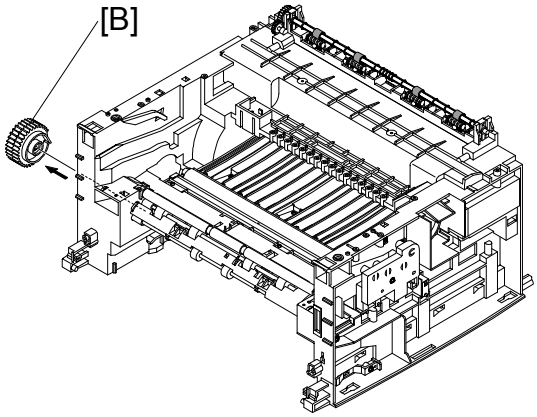
3.18 PICK UP ASS'Y AND SOLENOID

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.



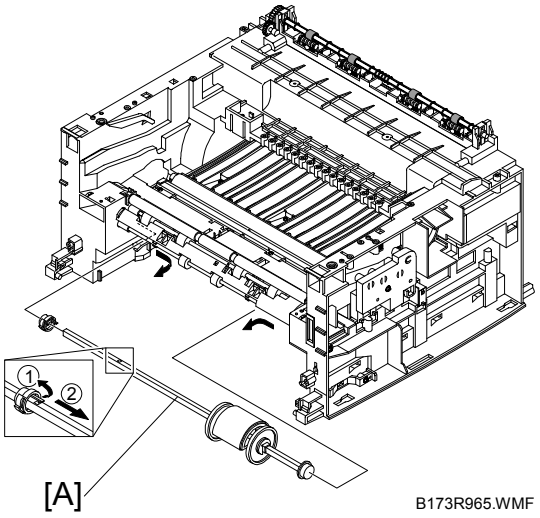
B173R959.WMF

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



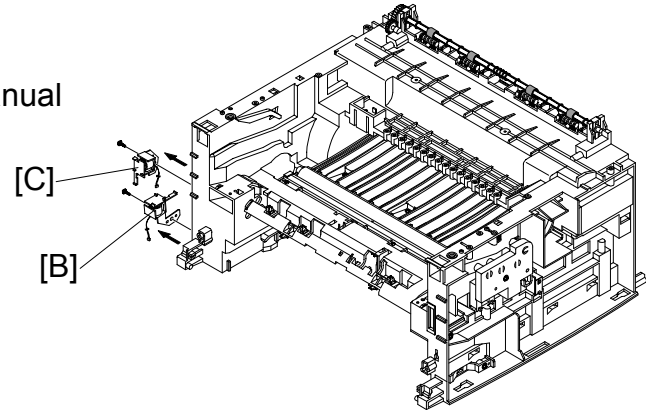
B173R964.WMF

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



B173R965.WMF

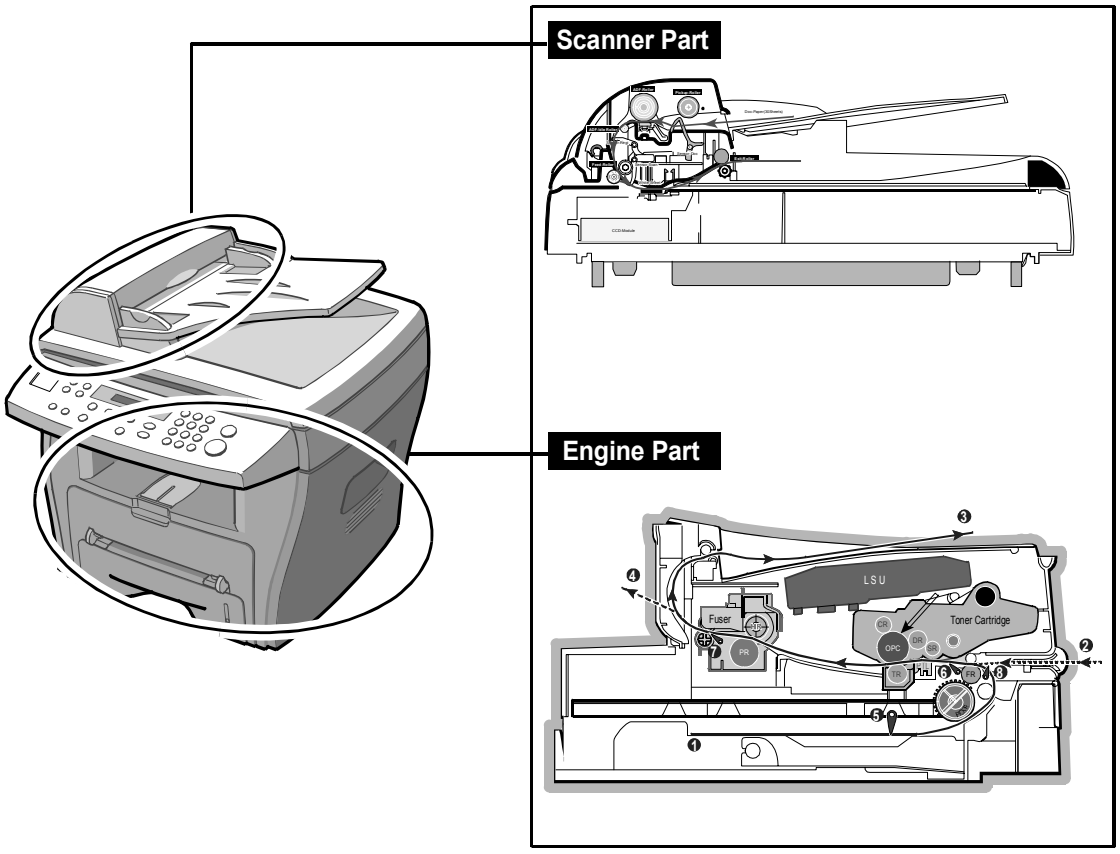
5. Remove the two screws from the manual solenoid [B] and pick-up solenoid [C]. Then remove the manual solenoid and pick-up solenoid.



B173R966.WMF

4. TROUBLESHOOTING

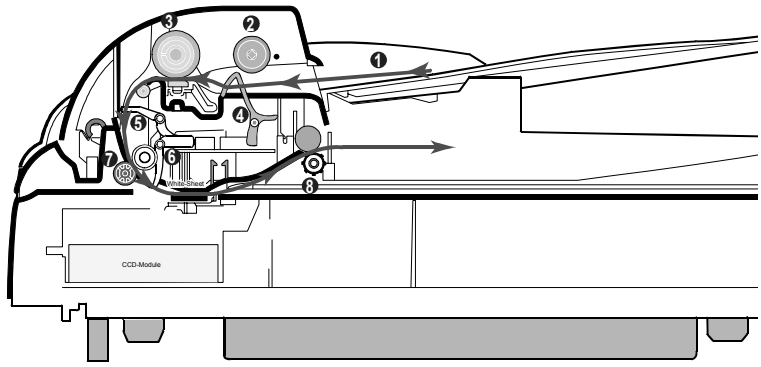
4.1 PAPER PATH



B173T936.WMF

4.1.1 COPY & SCAN DOCUMENT PATH

Scanner Part

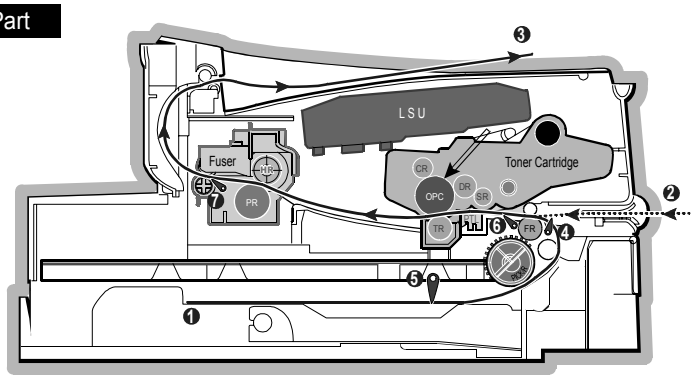


B173T937.WMF

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



B173T938.WMF

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.

The covering of a metal part can be removed which can cause an electric leakage.

4.2.1 CLEARING PAPER JAMS

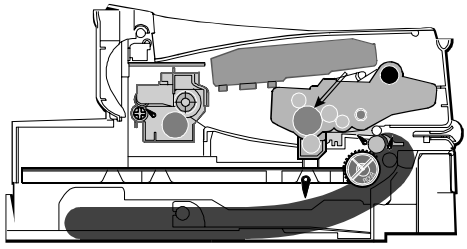
If paper jams occur, " PAPER JAM " appears on the display. Refer to the table below to locate and clear the paper jam.

PAPER JAM 0: In the paper feed area

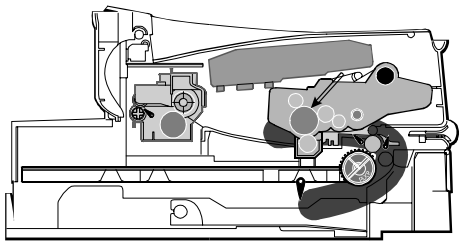
PAPER JAM 1: In the paper exit area

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

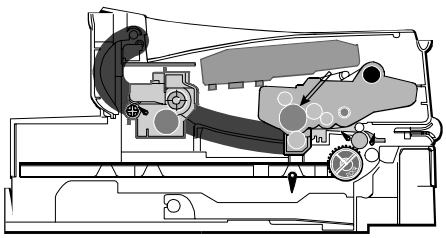
BYPASS JAM: In the Bypass tray



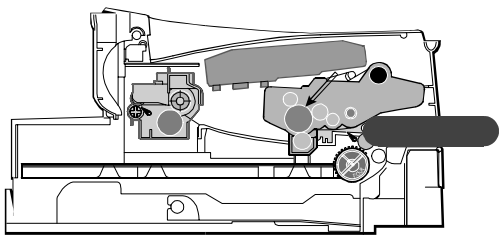
Paper Jam0 B173T939A.WMF



Paper Jam1 B173T939B.WMF



Paper Jam2 B173T939C.WMF



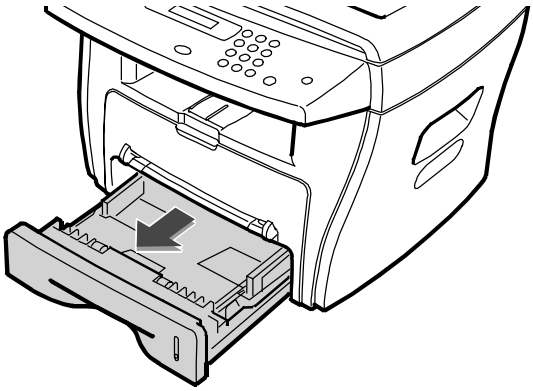
Bypass Jam B173T939D.WMF

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

JAM0 (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.

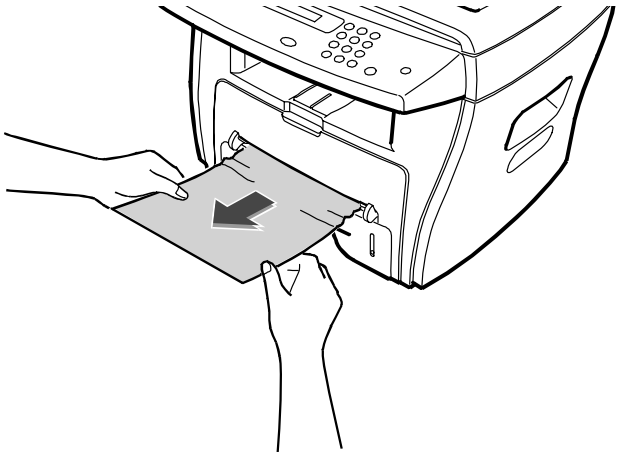
2. Pull the paper cassette open.



B173T944.WMF

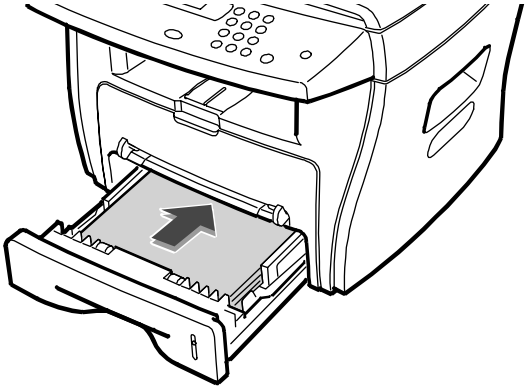
3. Remove the jammed paper by gently pulling it straight out.

   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



B173T945.WMF

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



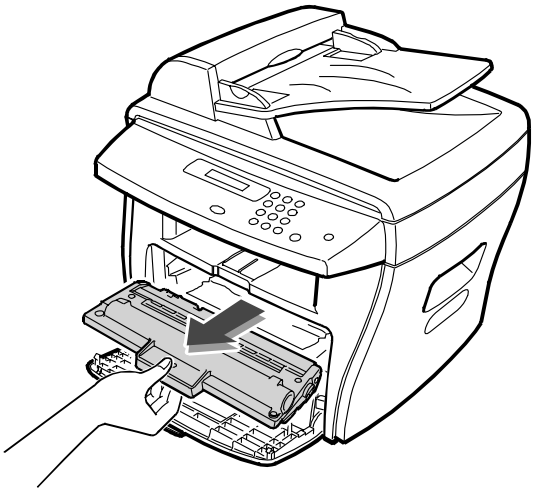
B173T946.WMF

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

JAM1 (In the Fuser Area of Around the Toner Cartridge Area)

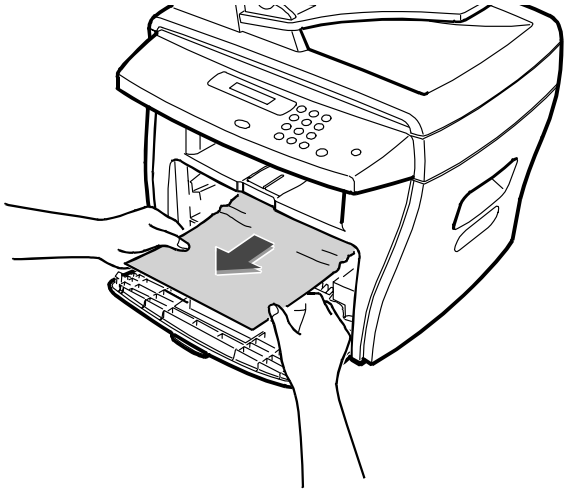
NOTE: The fuser area is hot. Be careful when removing paper from the machine.

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



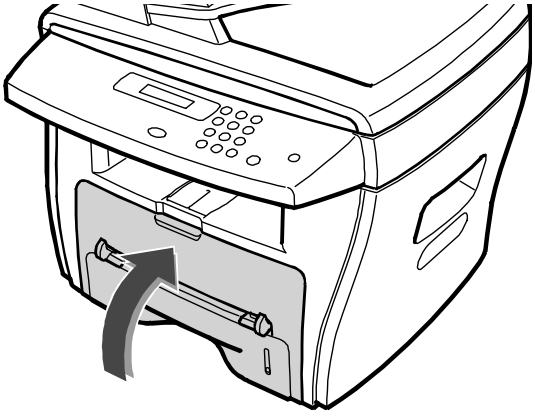
B173T950.WMF

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



B173T951.WMF

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

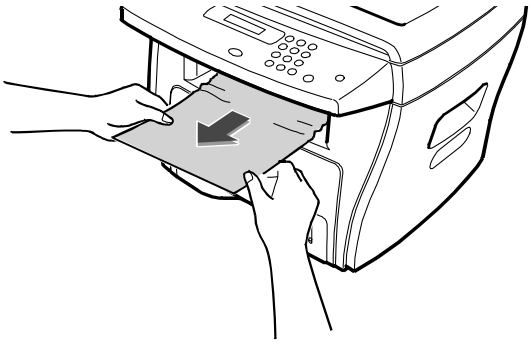


B173T952.WMF

JAM2 (In the Paper Exit Area)

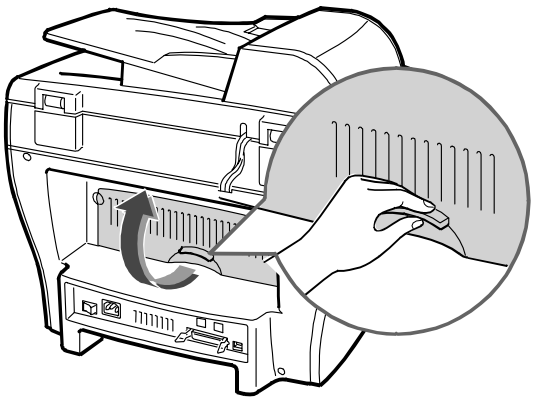
1. Open and close the front cover. The jammed paper automatically exits the machine. If the paper does not exit, continue to Step 2.

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



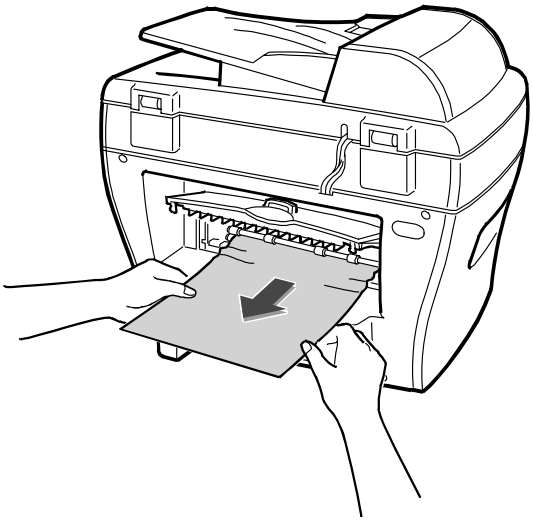
B173T947.WMF

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.



B173T948.WMF

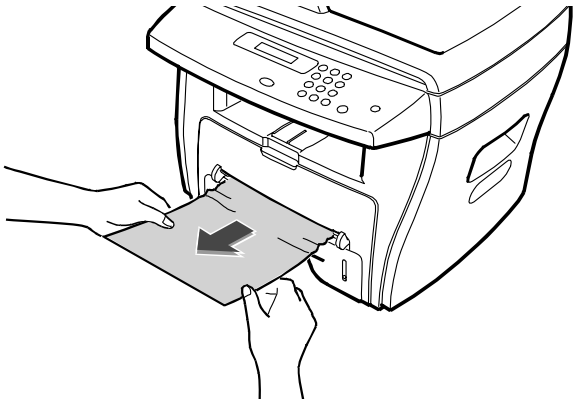
4. Remove the jammed paper by gently pulling it straight out.



B173T949.WMF

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

BYPASS JAM (In the Bypass Tray)



B173T953.WMF

"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

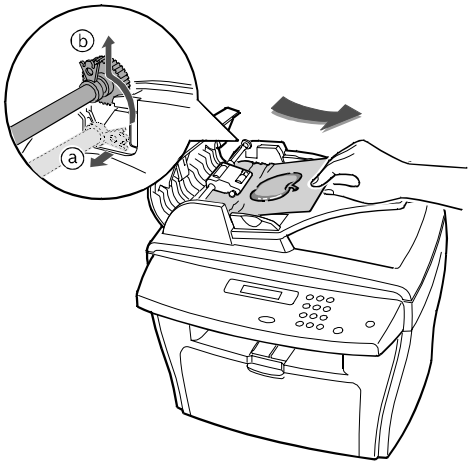
If a document jams while it is feeding through the ADF (Automatic Document Feeder),“DOCUMENT JAM ” appears on the display.

Input Misfeed

1. Open the ADF top cover.

B173T940.WMF

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



B173T941.WMF

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

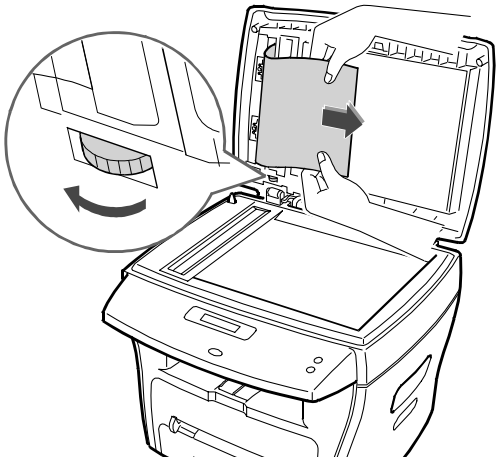
NOTE: To prevent document jams, use the document glass for the thick, thin or mixed documents.

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.

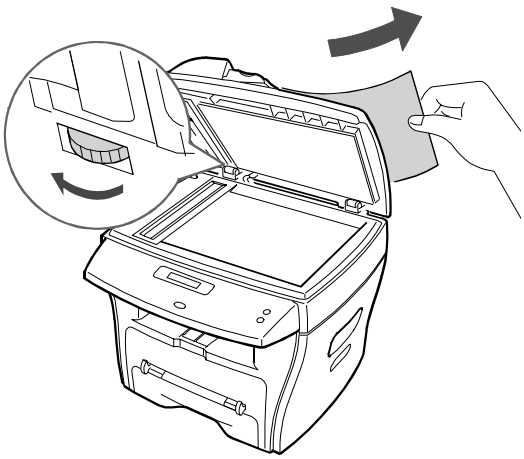
Roller Misfeed

1. Open the document cover.



B173T942.WMF

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.

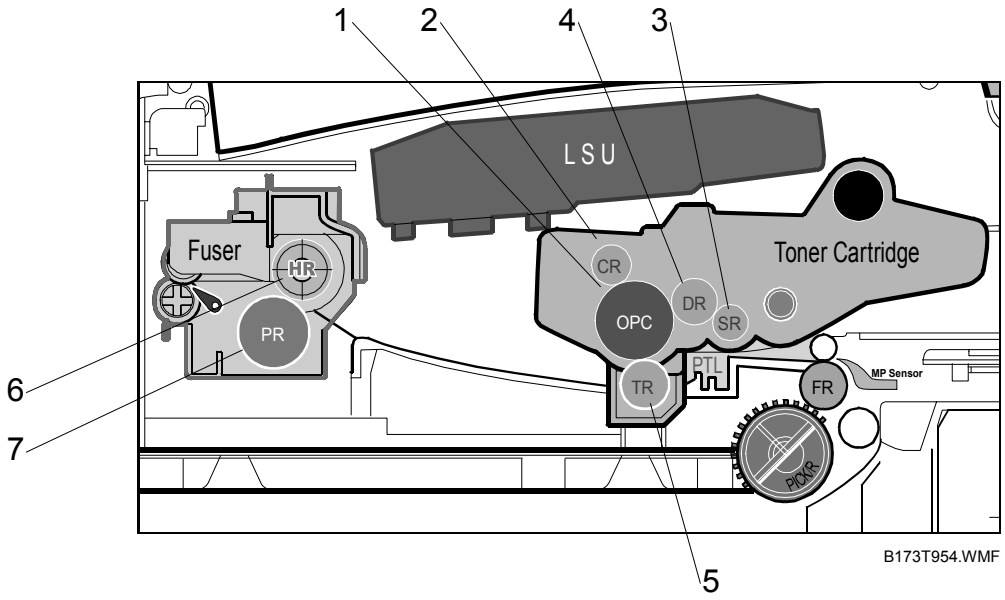


B173T943.WMF

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

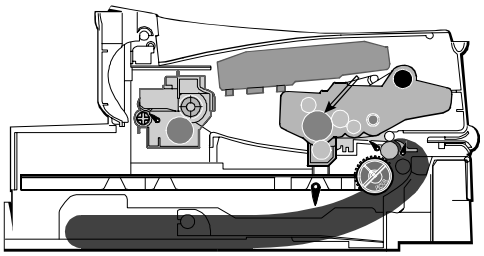
Printing begins when the paper is in the wrong position.

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.



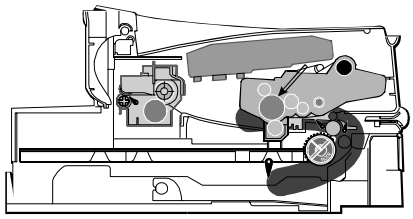
B173T910.WMF

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 fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



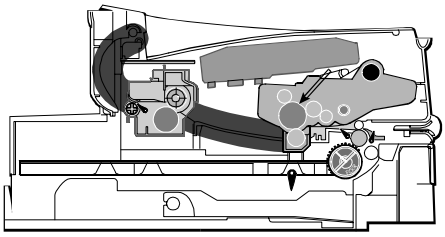
B173T911.WMF

Check and Cause	Solution
If the recording paper is jammed in front of or inside the fuser.	Replace the SMPS.
The actuator may be defective if the recording paper stays in the discharge 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 discharge roller and in the fuser just after passing through the Actuator-Feed.



B173T912.WMF

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 exit or not. Check if the actuator is smoothly operated. • Check if unwanted matters and wires are 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 assemblage and 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 does not work 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 in the printout, fix it by referring 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) or 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 confirm the damaged part with the naked eye, 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.	Check that 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 wrongly 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 is still not working, try to replace the OPE Ass'y and the Main Board in sequence.

4.5.3 FUSER GEAR MALFUNCTION DUE TO MELTING

Description

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

Check and Cause	Solution
Check the Fusing Lamp.	Replace the Fuser.
	Replace the Main Board.
	Replace the SMPS.

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, replace it, if defective.
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 ARE CURVED

Description

When printing, vertical lines are curved.

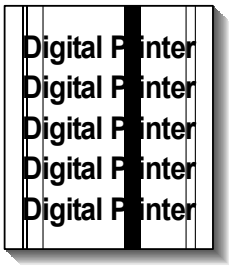
Check and Cause	Solution
If the supply of +24v is unstable in the Main Board linking with LSU, check drive by Engine Test Mode: Diagnostic Code Check -1- LSU Motor on.	Replace LSU.
	Replace the Main Board.

4.6 PRINTING QUALITY PROBLEMS

4.6.1 VERTICAL BLACK LINE AND BAND

Description

1. Straight thin black vertical lines occur in the printing
2. Dark black vertical bands occur in the printing.



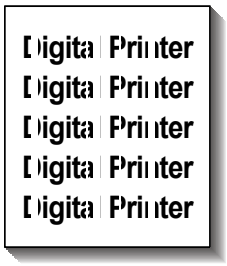
B173T913.WMF

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.
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 LINES

Description

White vertical voids in the image.



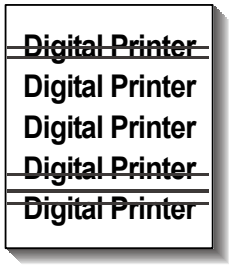
B173T914.WMF

Check and Cause	Solution
Foreign matter stuck onto the window of internal lenses of LSU mirror.	Foreign matter stuck onto the window: Clean the LSU window with recommended cleaner (IPA). Clean the window with 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.)	Foreign matter in the LSU: Open the cover of LSU and clean the surface of the reflex mirror with a 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 BANDS

Description

Dark or blurry horizontal stripes.



B173T915.WMF

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)
If the bands are at regular intervals: The rollers may be dirty. 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 SPOTS

Description

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

B173T916.WMF

Check and Cause	Solution
If dark or blurry black spots occur periodically, the rollers in the Developer may be contaminated with foreign matte 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, remove foreign substances stuck on the OPC location equivalent to 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 guarantees 60,000 sheets printing. 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 out.
	Remove paper particles and foreign matter from the inside of the machine.

4.6.5 LIGHT IMAGE

Description

The printed image is light, with no ghost.

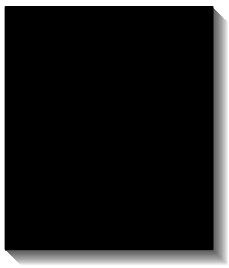
B173T917.WMF

Check and Cause	Solution
Develop roller is stained when the toner of developer cartridge is almost consumed.	Check if the Toner Save mode is off.
	Replace the AIO and try to print out.
Ambient temperature is below than 10°C.	Wait 30 minutes after printer is powered on before you start printing.
Bad contact caused by the toner stains between the high voltage terminal in the HVPS and the one in the set.	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 four directions.

4.6.6 DARK IMAGE OR A BLACK

Description

The printed image is dark.



B173T919.WMF

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.

B173T920.WMF

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 out.
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.

B173T921.WMF

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.

B173T922.WMF

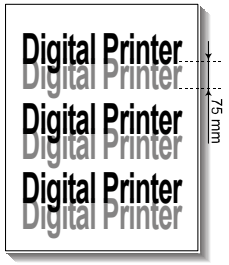
Check and Cause	Solution
Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the electrode of the Developer.	Clean the contaminated terminals.
Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the one in the HVPS board.	Problem in the toner cartridge, replace the AIO and try to print.
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 the printer.
Damaged cleaning blade in the developer.	Problem in the toner cartridge, replace the AIO and try to print.

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)



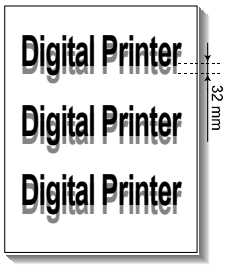
B173T923.WMF

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.



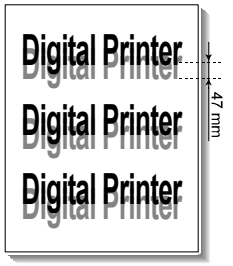
B173T924.WMF

Check and Cause	Solution
The life of the developer may be expired.	Problem in the toner cartridge, replace the AIO and try to print.
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.



B173T925.WMF

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.

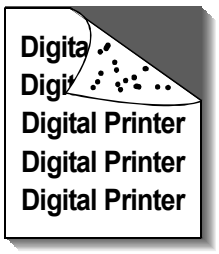
B173T926.WMF

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.



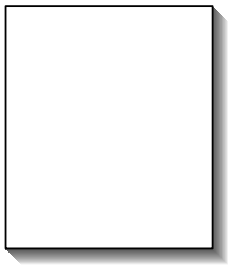
B173T927.WMF

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.



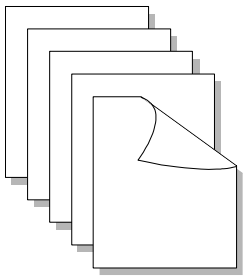
B173T928.WMF

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.



B173T929.WMF

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.
While the ten key pad is pressed, check to heara CLICK sound.	If you can heara 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 about the image quality of fax messages sent to it by other machines.	Check if the fax condition 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 machine at 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.	After confirming that it is proper by performing a PC printing test related to driver setup, if it is not so, reinstall it. (Refer to Operating Instructions.)
Check if copy function operates normally.	If copy function works, replace the Main Board. If 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 PC Scan options. (Refer to Operating Instructions.)	If the resolution is set to low, tell the user how to adjust it correctly.

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 with numbered messages.

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, Heating Camp & Thermostat.

OVERHEAT

Description: The printer part has overheated.

Solution: Your unit will automatically return to the standby mode when it cools down to normal operating temperature. If failure persists, service the machine.

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

Machine operation is not guaranteed if customers use a toner cartridge other than the cartridge supplied for this product or if there is non-licensed refilling.

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 cartridge.

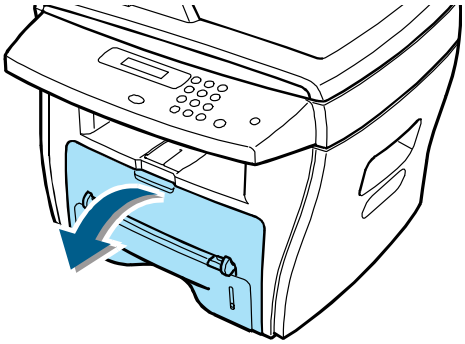
4.11.2 SERVICE FOR THE LIFE OF TONER CARTRIDGE

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.



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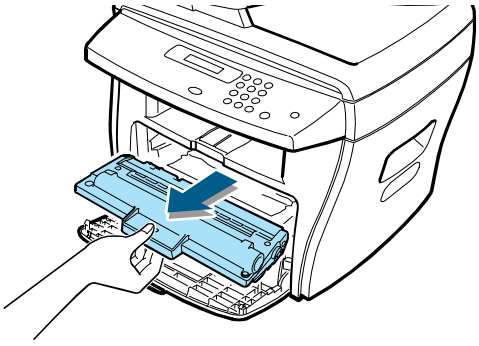
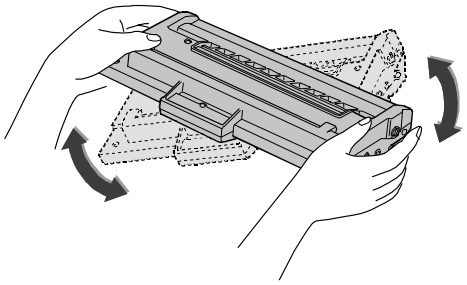
2. Lightly pushing the used cartridge down, pull it out.
   NOTE: Help the environment by recycling your used toner cartridge. Refer to the recycling brochure packed with the toner cartridge for details.



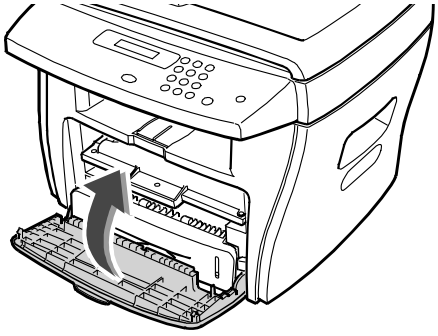
B173T931.WMF

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



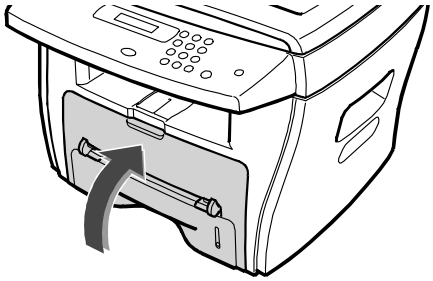
B173T932.WMF

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



B173T934.WMF

5. Close the front cover.



B173T935.WMF

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 SERVICE FOR JUDGMENT OF INFERIOR EXPENDABLES AND THE STANDARD OF GUARANTEE

Please refer to Operating Instructions or Instructions on Fax/Printer Expendables Service for the judgment of inferior expendables and the standard of guarantee besides this service manual.

4.11.4 SIGNS AND MEASURES AT POOR TONER CARTRIDGE

Fault	Signs	Cause & Check	Solution
Light image and partially blank image (The life is ended.)	• 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 developer and then recheck. **NG:** Check the weight of the developer **OK:** Lack of toner, so the life is nearly closed.	1. All of 1, 2, 3 - • The weight of the developer ended: 800g ± 20g • If it becomes better by shaking, replace with a new developer after 50-100 sheets in the closing state of the life span.
	• Periodically a noise as “tick tick” occurs.	2. Some part of image is not printed - Shake the developer and then recheck. **NG:** Check the weight of the developer and clean the LSU window with a cotton swab, then recheck. **OK:** Lack of toner, so the life is nearly closed.	2. In case of 2- if it becomes better after cleaning the LSU window, then the developer 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 developer.	3. In case of 3- If the cycle of noise is about 2 seconds, the toner inside the developer has been nearly exhausted. (Purchase and replace with a new developer 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 developer.	4. In case of 3- This is a phenomenon caused by lack of toner, so replace with a new developer.

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 developer OPC drum.	1. If both ends of the OPC drum are contaminated with toner: Check the life of the developer. (In case of less than 820g, the life may be expired.)
		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 developer. • 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 developer.

Fault	Signs	Cause & Check	Solution
White Black Spot	• Light or dark black dots on the image occur periodically. • White spots occur in the image periodically.	1. If light or dark periodical black dots occur, this is because the 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 disappear after running 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
Recycled product	• Poor appearance of the developer. • Unclean and rough printouts. • Bad background in the image.	1. Poor appearance of the developer. • Check the damage to label and whether different materials are used. • Check the appearance of parts of the developer, such as frame, hopper.	1. In case of 1 – • If there is an evidence of disassembling the developer. • If materials other than normal parts of the developer are added or substituted.
		2. Unclean and rough printouts. • Check whether foreign sub-stance or toner is stuck to the terminal (contact point) of the developer. • Check whether the state of the terminal assembly is normal.	2. In case of 2 - If there are any abnormal in connection with the situation of 1. • It occurs when the developer is recycled over 2 times. • If toner nearly being expired are collected to use, it is judged as the recycled developer.

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 developer. • 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 developer. (2) The contact point of the unit facing that of the developer 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 developer 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 developer 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 developer. Clean the terminals of the developing roller, then recheck it.

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 can show 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 GO INTO TECH MODE

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

The machine operates correctly in Tech mode.

Do this procedure to go into the Tech mode:

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

Do this procedure to go 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 name will show. You can see all available countries when you scroll by pressing "◄" or "►"
   - EU default (UK)
   - North America default (USA/Canada)
   - Asia default (Singapore)
   - 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 do 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 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 does 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 make sure if the printer mechanism operates correctly.

The patterns are

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

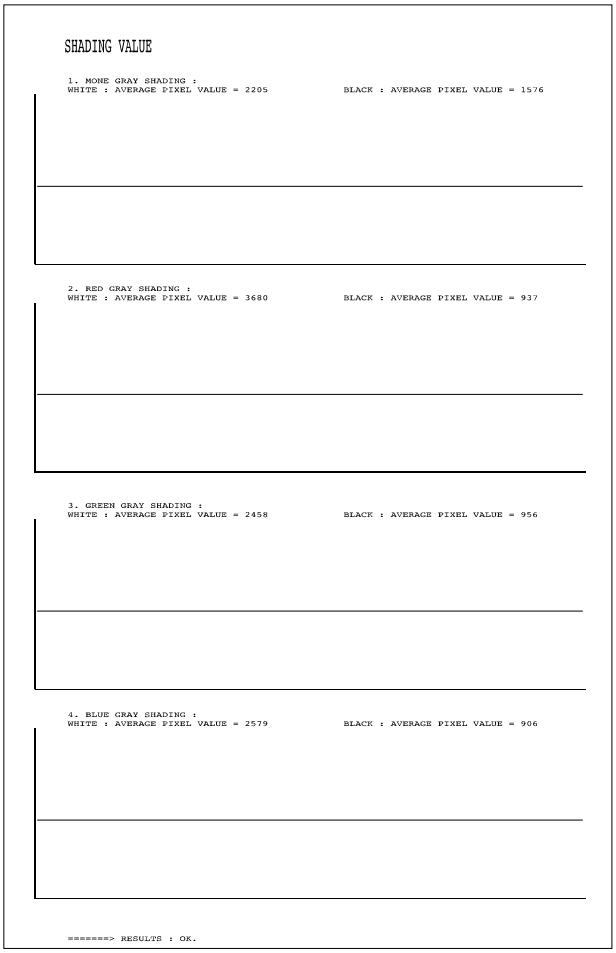
SHADING TEST

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 does not operate correctly.

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



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Service Tables

5.2.5 REPORT

PROTOCOL LIST

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

SYSTEM DATA

This gives a list of the system data set by the user and those in tech mode.

5.2.6 NEW CARTRIDGE

The machine usually detects when a new AIO (CRU) cartridge has been put in. However there may be the case when the machine does not detect the new AIO automatically. In cases like this you can manually let the machine detect a new AIO. The manual procedure and the automatic detect procedure have the same effect on the machine when the AIO is replaced. (New AIO Detection: ☛ 6.3.1).

If this is set to “Yes”, the machine will clear “TOTAL TONER COUNT” and “Cru Prints”. Then the machine increments the counter “Replaced Toner Counts”.

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 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 get 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. Make sure that these show on 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 uses the telephone network to update one or more other remote machines of the same type.

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. Put in the telephone number of the fax machine to upgrade. (You can upgrade several faxes at the same time). At this time, put 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 gives 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

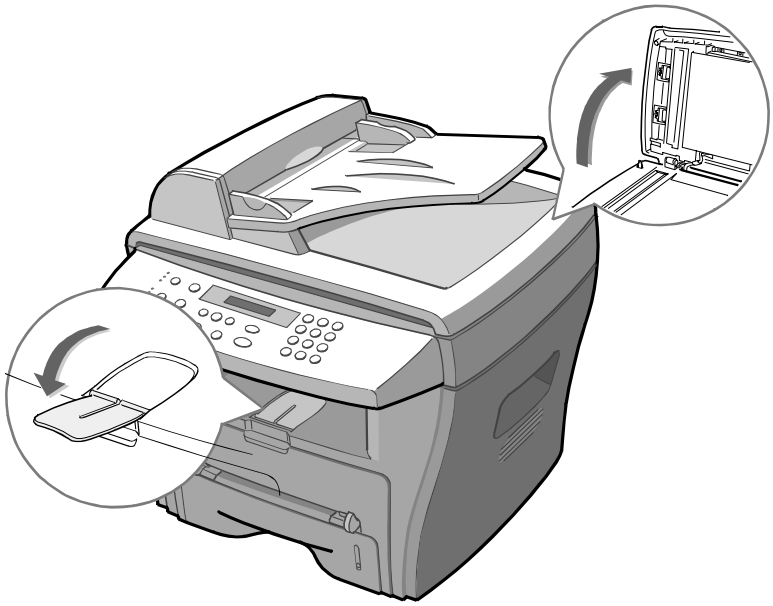
When the function is enabled a group of parameters are printed at the bottom of each page. This shows the print engine condition. This is not necessary for service use.

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

6. DETAILED DESCRIPTIONS

6.1 PRINTER COMPONENTS

6.1.1 FRONT VIEW



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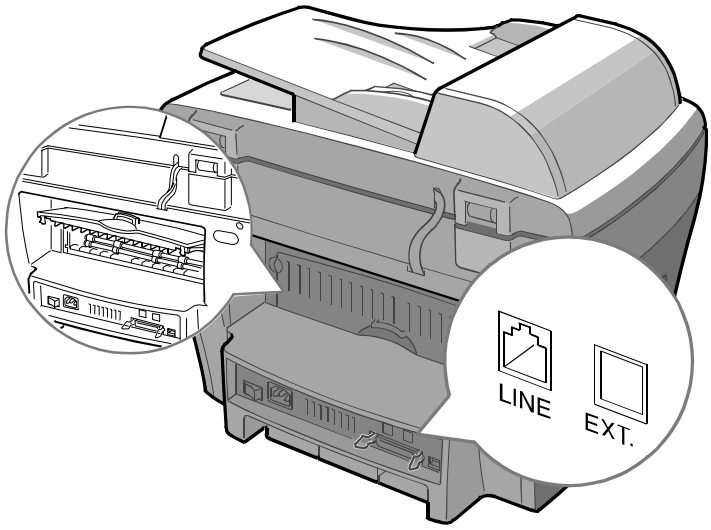
6.1.2 REAR VIEW



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6.2 SYSTEM LAYOUT

6.2.1 FEEDING SECTION

The universal cassette automatically moves paper to the manual feeder. Then it gives paper one by one. The cassette has these:

- Friction pad to separate paper one by one.
- Sensor to check for 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 quenching lamp) and transfer roller. The PTL sends light to the OPC drum. Then it lowers the current on the drum surface and improves the transfer efficiency.

The transfer roller moves 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 gives power to the feeding unit, the fusing unit, and the distributing unit.

6.2.4 FUSING

The fusing unit has a heat lamp, heat roller, pressure roller, thermistor, and thermostat. It fuses toner to the paper with pressure and heat. 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 keeps the temperature of the heat roller constant.

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 melted toner spots on the heat roller.

Pressure roller

The pressure roller is below the heat roller. It is made of silicon resin, and the surface of the roller is coated with Teflon. This lets toner fuse to the paper when paper passes between the heat roller and the pressure roller.

Safety Features

There are 3 procedures for overheat prevention.

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

Safety device

- Power is cut to 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 caution label is put 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:

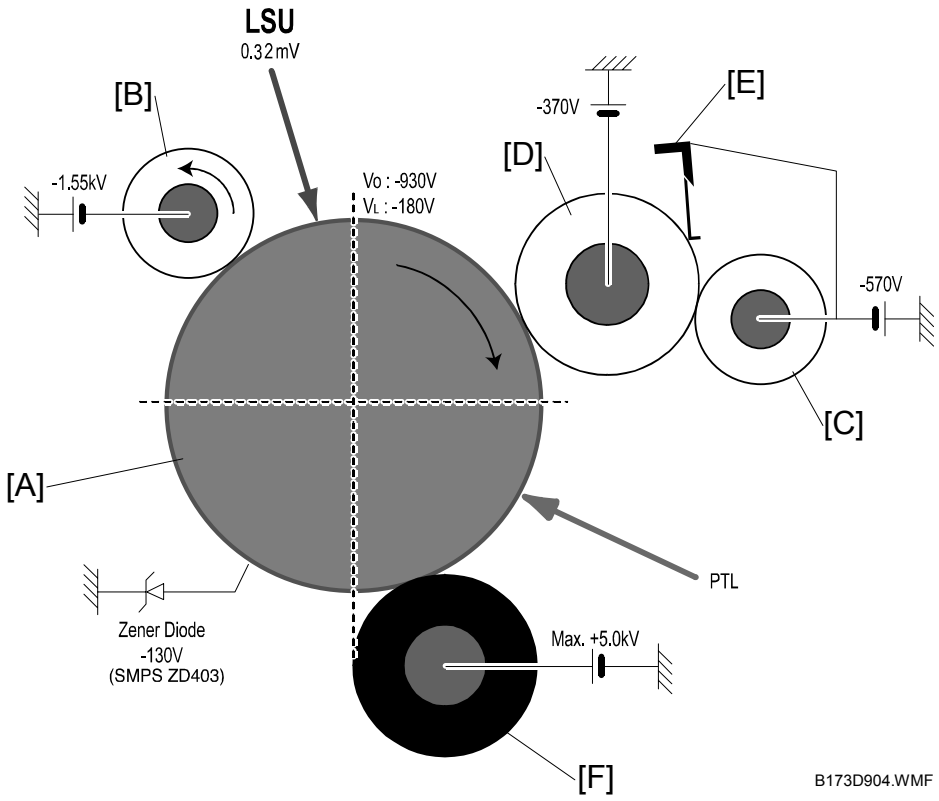
- ADF (Automatic Document Feeder)

6.2.6 LSU (LASER SCANNER UNIT)

The video controller controls the LSU unit. It scans the video data it gets 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

Detailed Descriptions

A visual image is made with the electronic photo procedure.

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

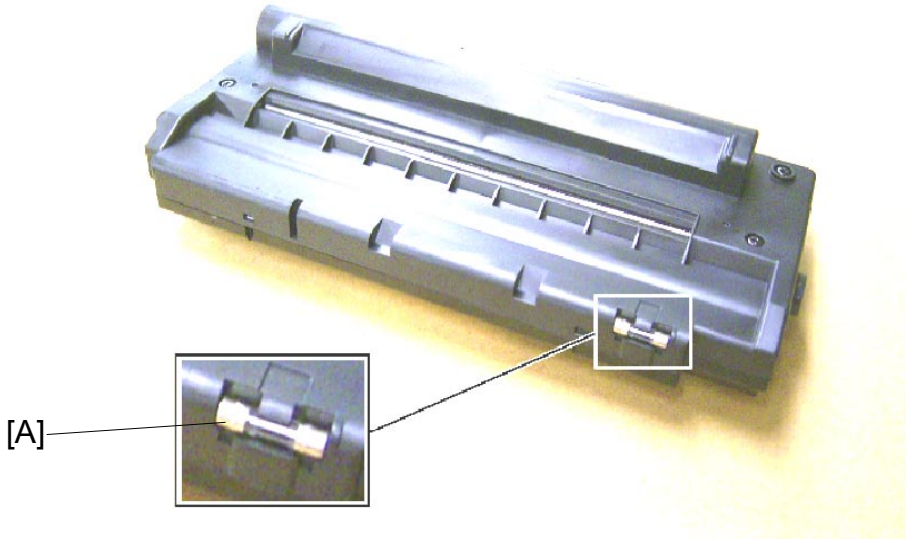
The OPC unit has the OPC drum [A] and charging roller [B].
The developer unit has toner, toner cartridge, supply roller, developing roller, and doctor blade.

- 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 a new cartridge has been installed when the fuse gets detected. The starter CRU does not have fuse.

When the new cartridge is installed in the machine, the machine automatically detects by the fuse that the cartridge is brand-new. Then the machine resets the total dot counter (TOTAL TONER COUNT) and CRU print counter (Cru Prints). and increments the counter for counting the number of CRU replaced (Replaced Toner Counts). Only if the “Replaced Toner Counts” was 0, the CRU currently installed is regarded as a starter CRU. In this condition, threshold to detect toner end is shorter than that for supply CRU.



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The fuse will blow. This opens the circuit when you install the CRU.

6.3.2 TONER END DETECTION

The machine does not have a toner end sensor. The machine checks the amount of toner with software. The machine counts and adds up black dots as the toner consumption. For example, when the machine prints 5% of black rate chart, approx. 1,165,000 dots will be added.

When the total number of dots gets to a pre-programmed figure (for toner near-end), the machine shows “TONER LOW”. After another period of dots has been counted up, the machine finally shows “TONER EMPTY” (for toner end), and the machine stops printing.

You can check the total dot counts 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 dlml 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 CPU know if the tray has paper. It uses the actuator to do this.
It shows a paper empty condition when it reads the D0 Bit of CPU. Then it sets the second LED (yellow) on the panel LEDs.

MP Sensing:

The MP Sensor (Photo Interrupter) uses an actuator to let the CPU know the paper condition. It lets the CPU know if the paper is empty or not. It reads the D0 Bit of CPU to check if paper is in the MP. Then it moves paper from the MP if there is paper in the MP.

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. Jam 0 is shown (Red and yellow will be set on), if it doesn't detect the feed sensor in 1 sec. after paper is fed. The machine checks if the developer is put in or not. The actuator operates after the developer 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 gets out 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 correct operation or jam information is sent to the CPU.

Cover Open Sensor:

The cover open sensor is located on the front cover. +24V (DC fan, solenoid, main motor, polygon motor part of LSU, HVPS), given to each unit, cuts off when the front cover is opened. The D0 bit of CPU operates the cover-open sensor and the developer ID sensor.

DC FAN / SOLENOID Drive:

Driven by transistor and controlled by D6 bit of CPU.
When it is set high, the TR goes on and drives the fan. It goes off when 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 TR from the noise pulse given when the solenoid is de-energizing.

Motor Drive:

The motor drive circuit starts when the driver IC is set. A3977 (Motor driver IC) is used. 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 makes high voltage of THV/MHV/Supply/Dev and gives it to 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 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

A solenoid controls the pick-up roller drive to feed paper from the cassette. The general output port or the external output port set the solenoid on/ off. 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. There is also a surge absorber to prevent it from a thunderbolt located on a line input unit.

6.8 OPE BOARD

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

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration	Desktop	
Major Features:	Copier, Print, Scan, Fax (with ADF)	
Operating System:	Win95/98/Win-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 (18.7” x 17.2” x 16.4”)	
Weight:	13 Kg (28.8 lbs.); With toner Cartridge	
Absolute Storage Condition:	Temperature:	-20°C ~ 40°C
	Humidity:	10% RH ~ 95% RH
Operating Condition:	Temperature:	10°C ~ 32°C
	Humidity:	20% RH ~ 80% RH
Recommended Operating Condition:	Temperature:	16°C ~ 30°C
	Humidity	30% RH ~ 70% RH

2. PRINT SPECIFICATION

Configuration		Desktop
Print Speed:		A4 - 16 ppm, Letter - 17 ppm (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 HANDLING

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	60 ~ 90g/m^2 (16 ~ 24 lb)
	Bypass	60 ~ 163g/m^2 (16 ~ 43 lb)
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	47 ~ 105g/m^2 (12.5~28lb)
	Capacity	30 sheets (75g/m^2 /20 lb)
	Document size width	148mm – 216 mm (5.8" - 8.5")
	Document size length	127 mm – 356 mm (5" - 14.0")

8. SOFTWARE

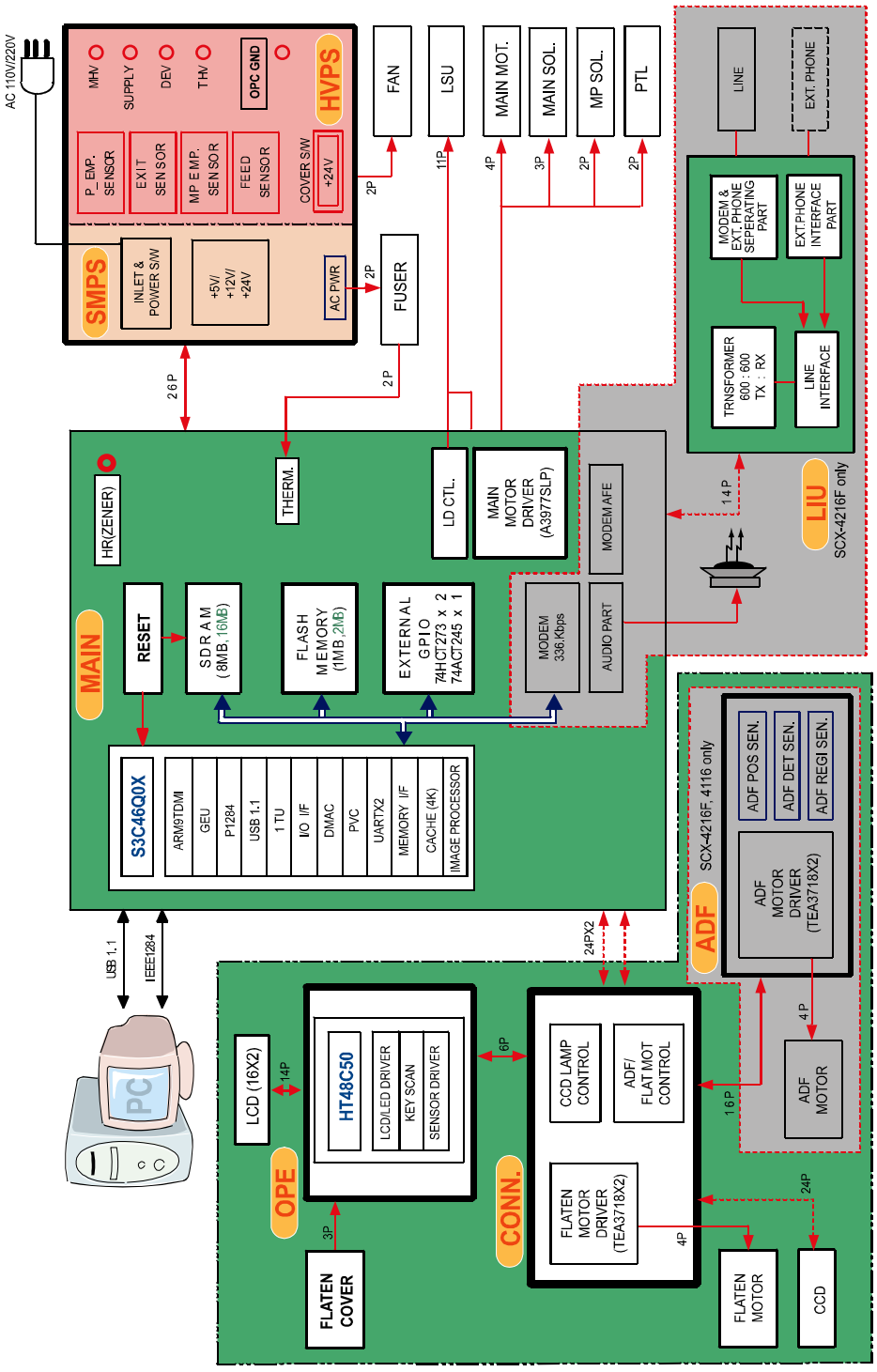
Configuration		Desktop	
Compatibility:	DOS	No	
	Win 3.x	No	
	Win 95	Yes	
	Win 98&WinME	Yes	
	Win NT4.0	Yes	
	Win 2000	Yes	
	Win XP	Yes	WHQL for Printer Only
	Mac	Yes	Mac printer only
	Linux	No	
Driver:	Printer	GDI	
	TWAIN	Yes	
	PC-FAX	No	PC fax is only available through PC Modem

9. CONSUMABLES

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

APPENDIX

BLOCK DIAGRAM



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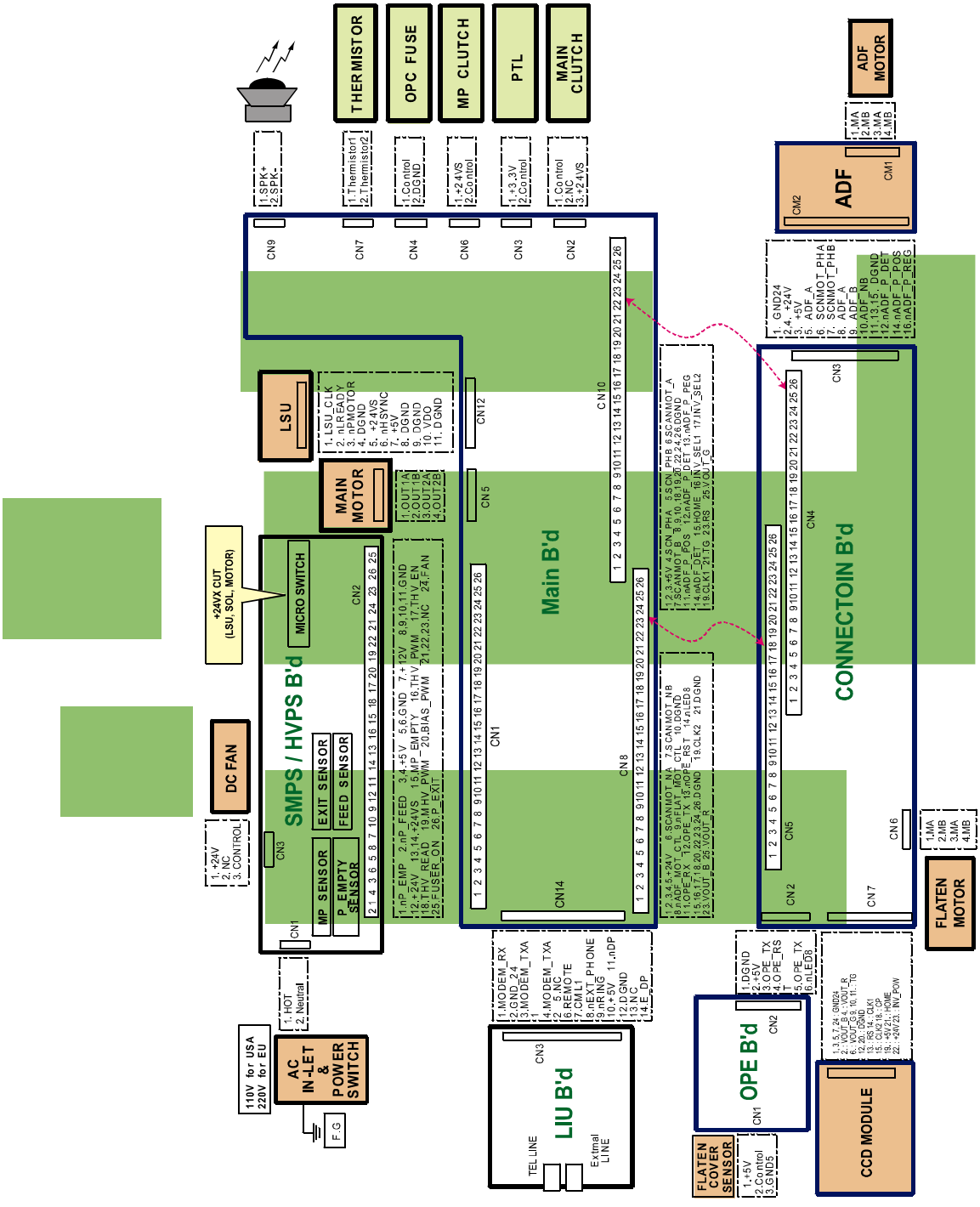
CONNECTION DIAGRAM



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		

PARTS CATALOG

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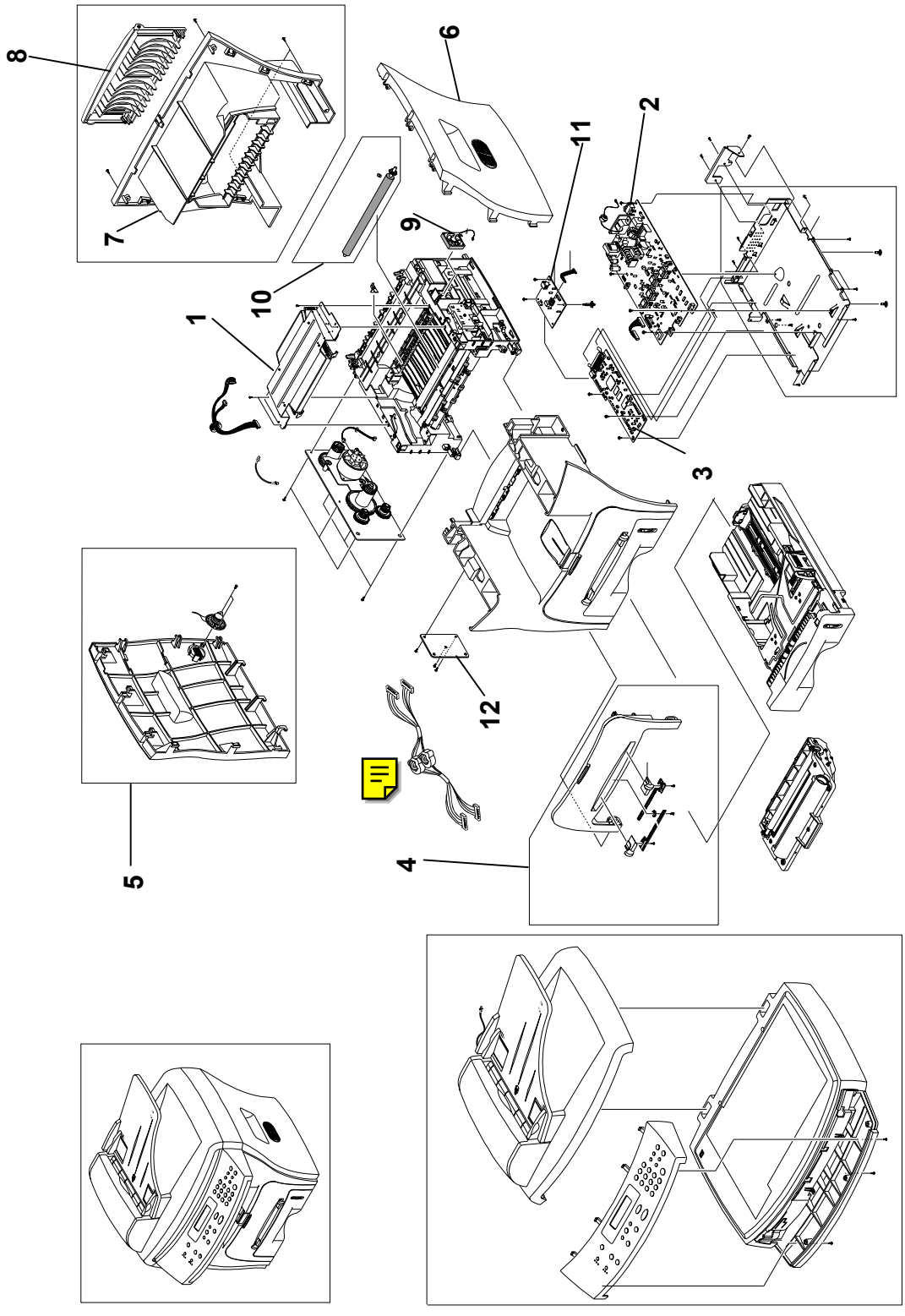
1. MAIN ASSEMBLY



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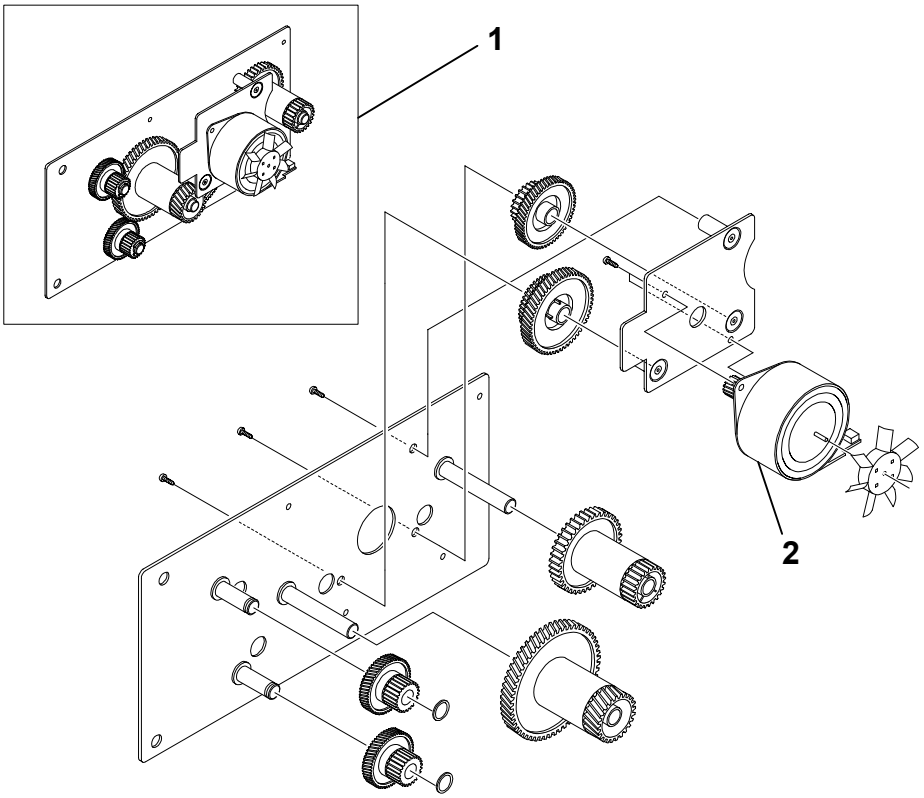
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9501	Laser Unit	1	O	O	O	O
2	B173 9503	PSU - 220V	1		O	O	O
2	B173 9665	PSU - 110V	1	O			
3	B173 9504	PCB - Main Board	1	O	O	O	O
4	B173 9505	Front Cover	1	O	O	O	O
5	B173 9672	Left Cover	1	O	O	O	O
6	B173 9673	Right Cover	1	O	O	O	O
7	B173 9508	Rear Cover	1	O	O	O	O
8	B173 9509	Face Up Door - Rear	1	O	O	O	O
9	B173 9511	Cooling Fan	1	O	O	O	O
10	B173 9513	Transfer Roller Ass'y	1	O	O	O	O
11	B173 9515	PCB - NCU: EU	1		O		
11	B173 9516	PCB - NCU: NA	1	O		O	O
12	B173 9518	PCB - Connector Board	1	O	O	O	O

2. RX DRIVE ASSEMBLY



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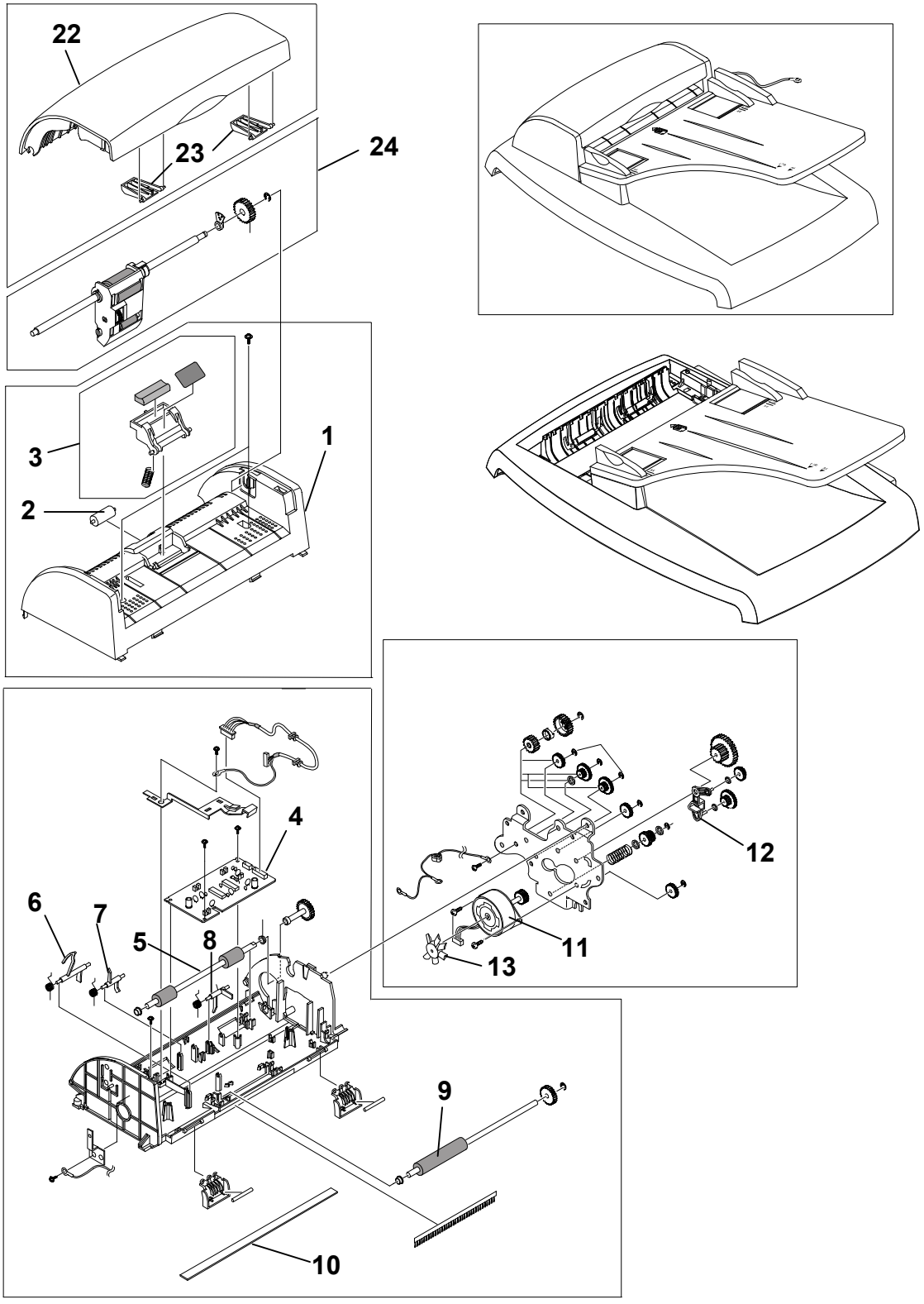
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9526	RX Drive Ass'y	1	O	O	O	O
2	B173 9531	Stepping Motor	1	O	O	O	O

3. ADF ASSEMBLY



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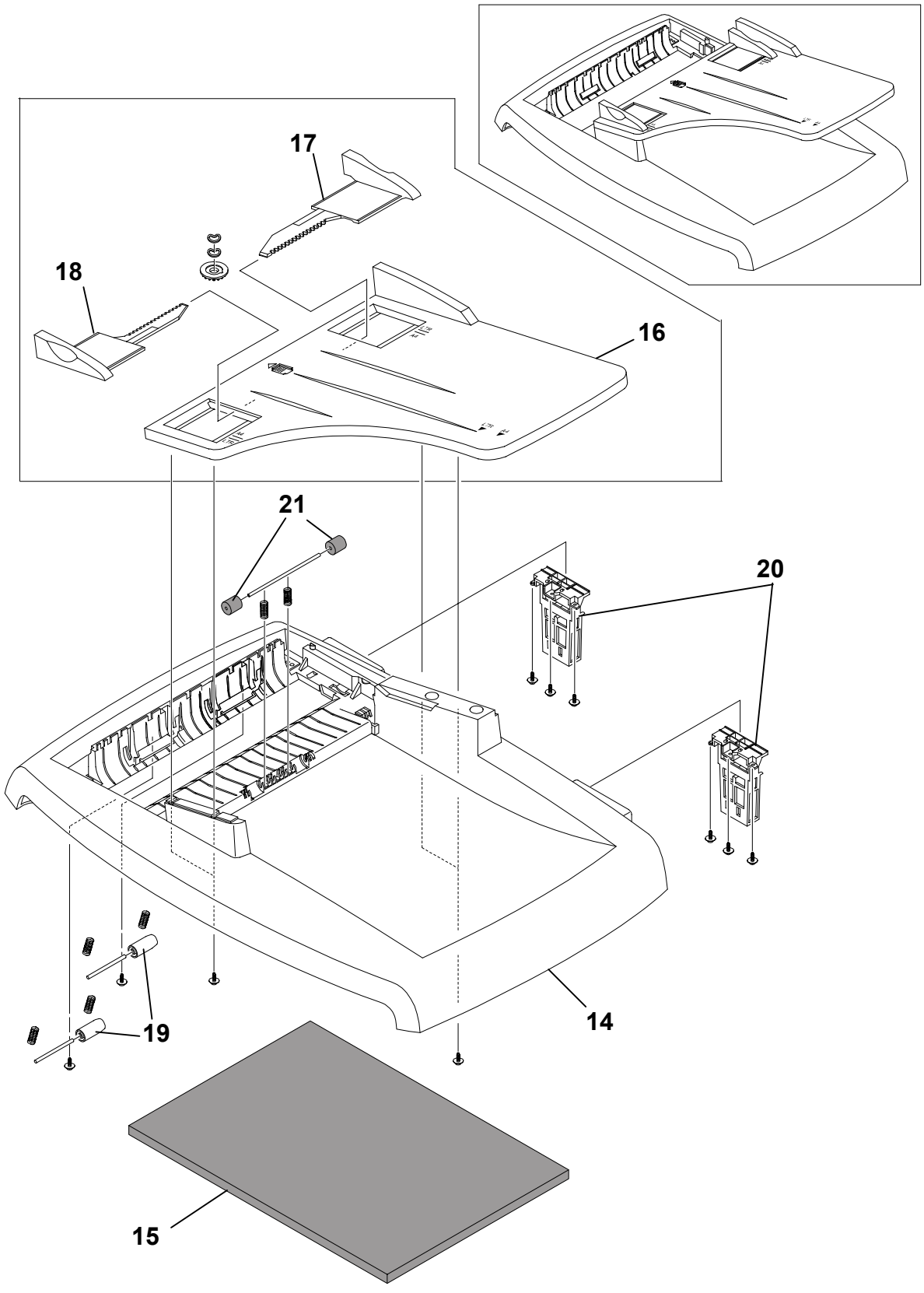

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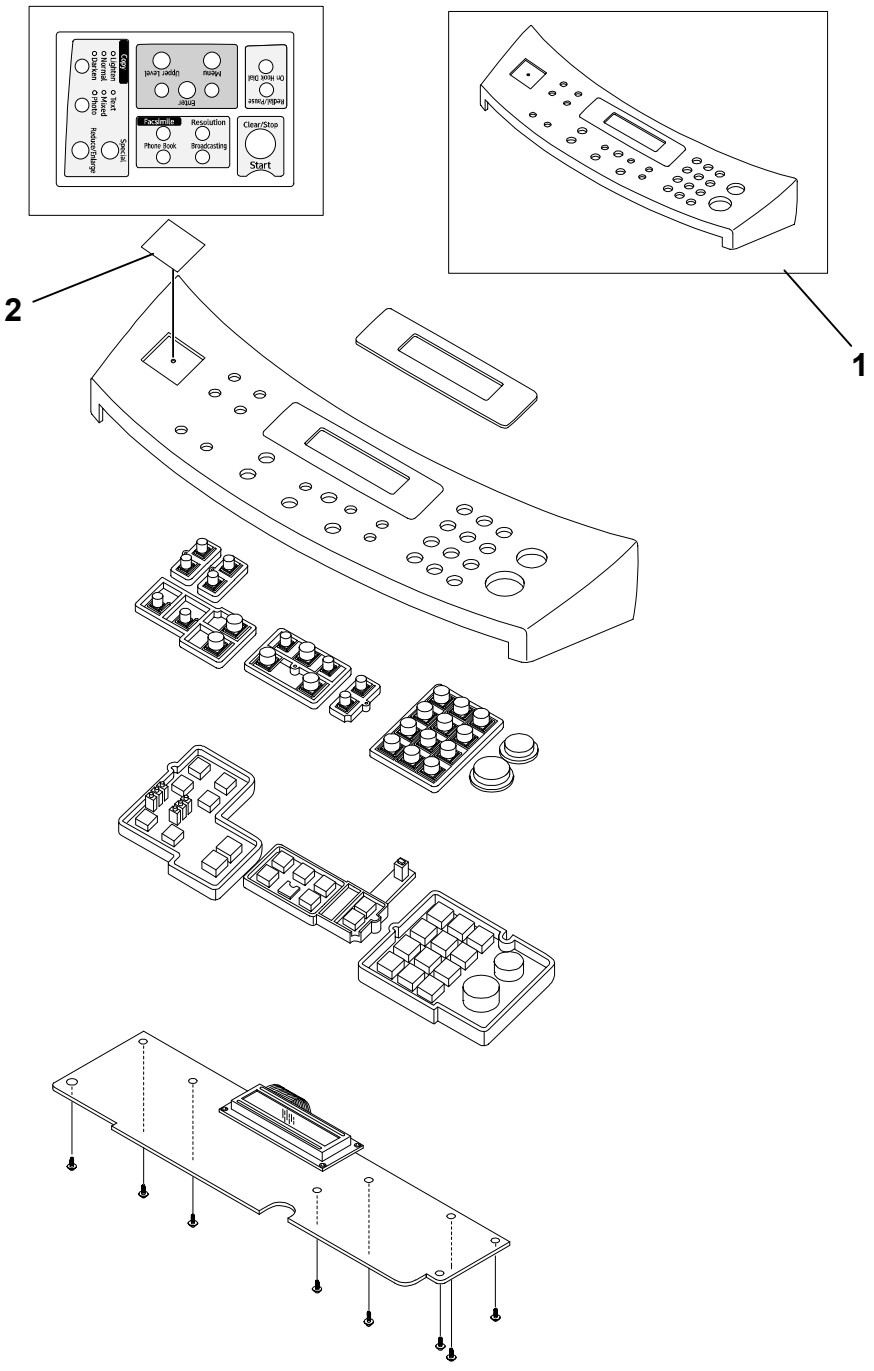
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9532	ADF Upper Cover	1	O	O	O	O
2	B173 9533	Idle Roller - ADF	1	O	O	O	O
3	B173 9534	ADF Rubber Pad	1	O	O	O	O
4	B173 9536	PCB - ADF	1	O	O	O	O
5	B173 9539	ADF Drive Roller	1	O	O	O	O
6	B173 9540	Actuator - ADF Doc Sensor	1	O	O	O	O
7	B173 9541	Actuator - ADF Regist Sensor	1	O	O	O	O
8	B173 9542	Actuator - ADF Scan Sensor	1	O	O	O	O
9	B173 9546	Exit Roller - ADF	1	O	O	O	O
10	B173 9548	White Sheet	1	O	O	O	O
11	B173 9554	ADF Motor	1	O	O	O	O
12	B173 9562	Link - Swing: ADF	1	O	O	O	O
13	B173 9564	Impeller - ADF	1	O	O	O	O
14	B173 9573	Platen Cover	1	O	O	O	O
15	B173 9574	Sponge Sheet	1	O	O	O	O
16	B173 9575	Document Table	1	O	O	O	O
17	B173 9576	Document Guide - L	1	O	O	O	O
18	B173 9578	Document Guide - R	1	O	O	O	O
19	B173 9580	Pinch Roller	2	O	O	O	O
20	B173 9582	Hinge - Platen	2	O	O	O	O
21	B173 9583	Exit Roller - Platen	2	O	O	O	O
22	B173 9585	ADF Top Cover	1	O	O	O	O
23	B173 9586	Paper Guide - ADF Top Cover	2	O	O	O	O
24	B173 9587	ADF Pick-up Ass'y	1	O	O	O	O

4. OPE UNIT ASSEMBLY



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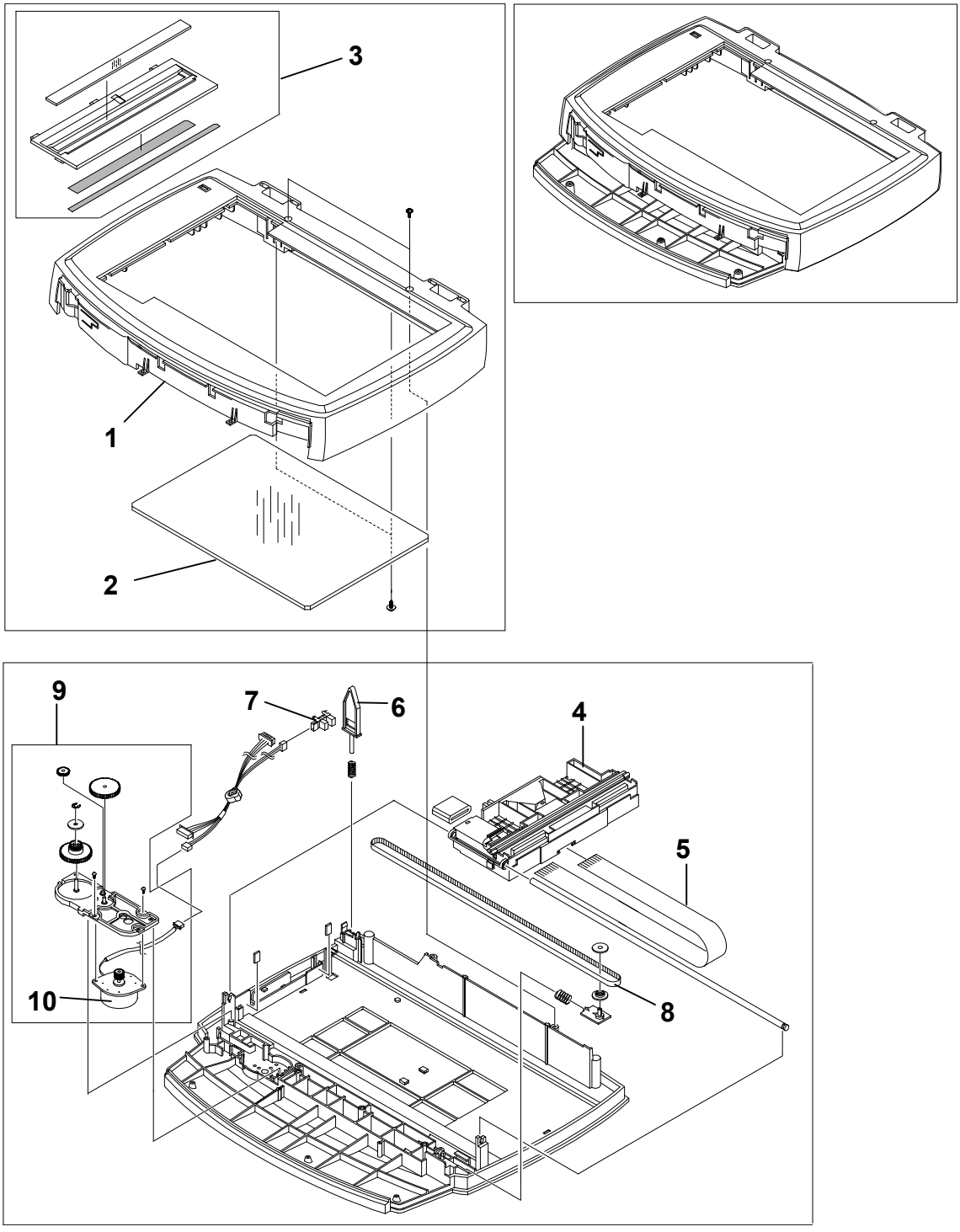
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9667	OP - Port Ass'y - NA/Asia	1	O		O	
1	B173 9668	OP - Port Ass'y - EU	1		O		
1	B173 9669	OP - Port Ass'y - China	1				O
2	B173 9671	Brand Plague	1			O	O

5. SCANNER ASSEMBLY



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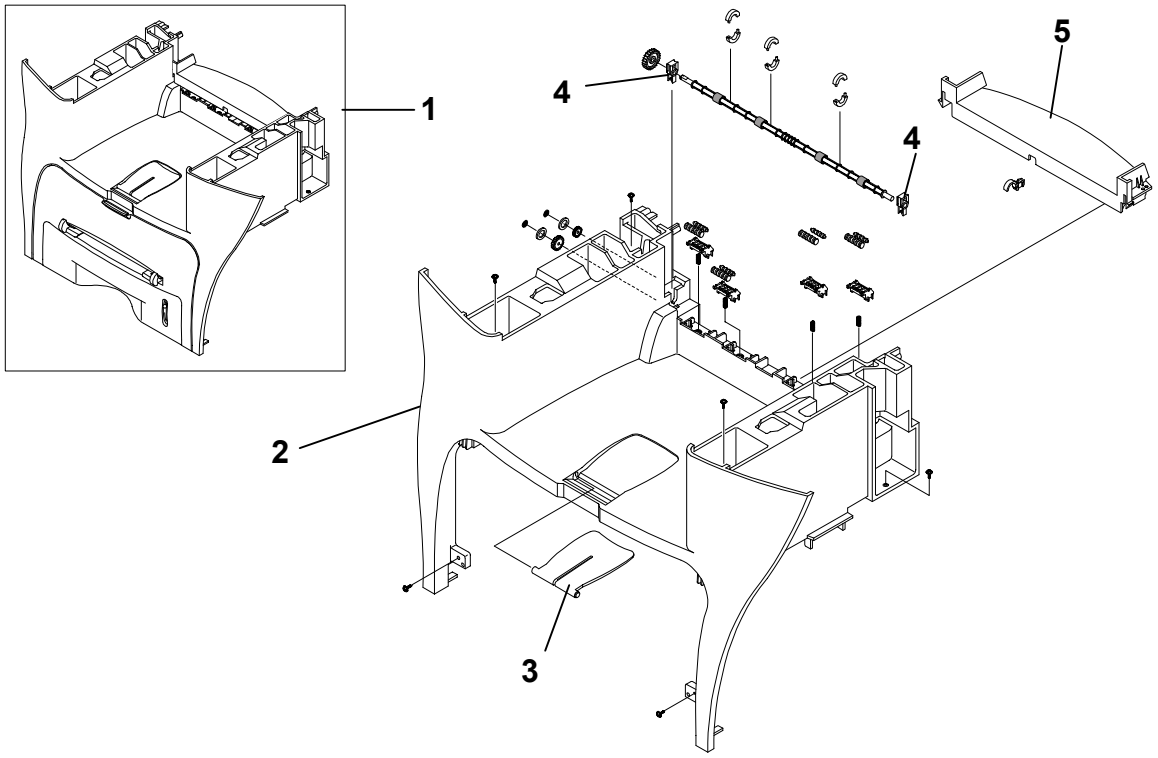
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9588	Scanner Cover	1	O	O	O	O
2	B173 9589	Platen Glass	1	O	O	O	O
3	B173 9590	Platen Cover Ass'y - ADF	1	O	O	O	O
4	B173 9592	CCD Unit	1	O	O	O	O
5	B173 9593	Flat Cable - CCD	1	O	O	O	O
6	B173 9601	Sensor Lever	1	O	O	O	O
7	B173 9602	Platen Cover Sensor	1	O	O	O	O
8	B173 9604	Timing Belt - Scanner	1	O	O	O	O
9	B173 9605	Scanner Motor Ass'y	1	O	O	O	O
10	B173 9606	Scanner Motor	1	O	O	O	O

6. MIDDLE COVER ASSEMBLY



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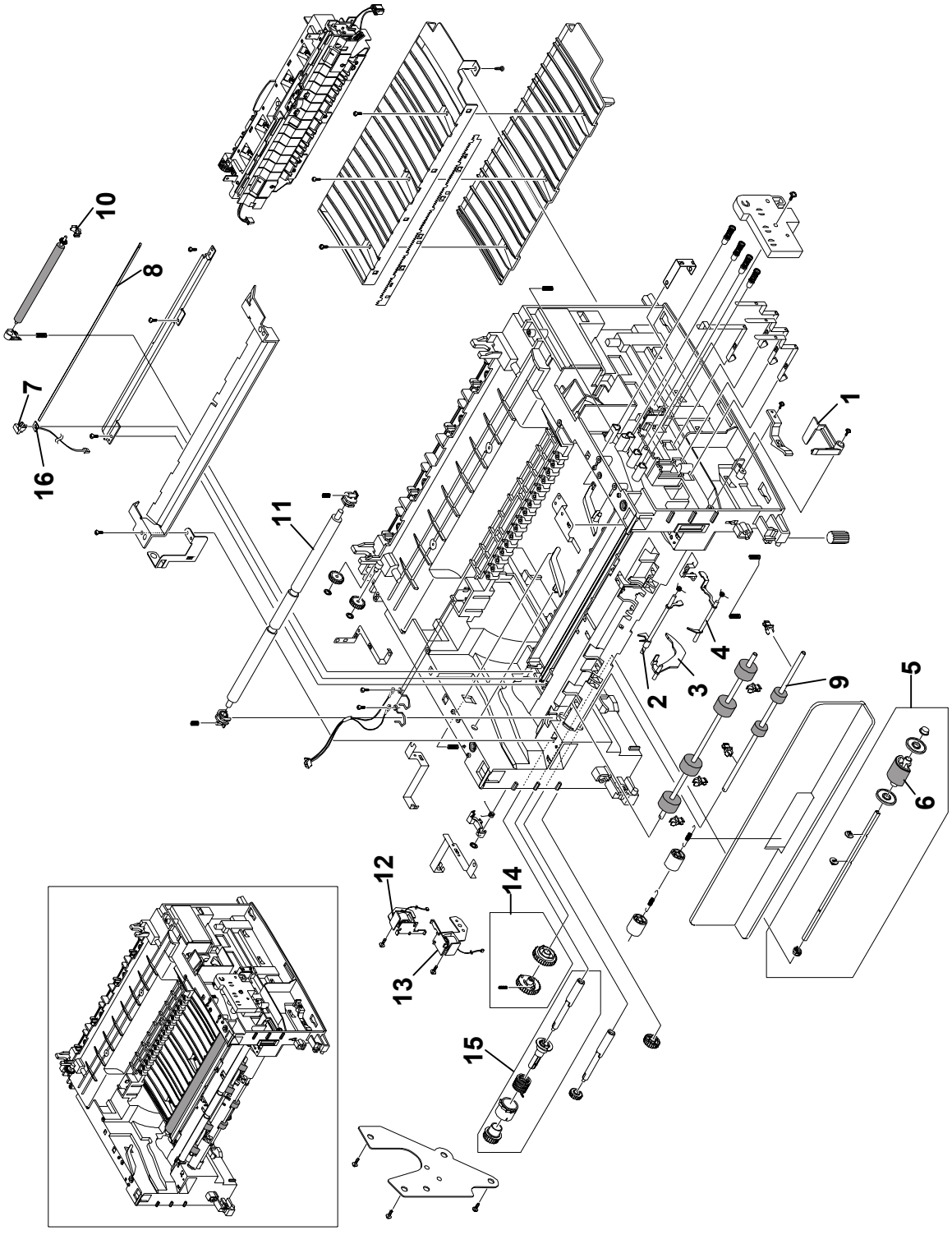
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9608	Middle Cover Ass'y	1	O	O	O	O
2	B173 9609	Middle Cover	1	O	O	O	O
3	B173 9610	Paper Stack - Extension	1	O	O	O	O
4	B173 9611	Bearing - Exit	2	O	O	O	O
5	B173 9612	Upper Rear Cover	1	O	O	O	O

7. FRAME ASSEMBLY



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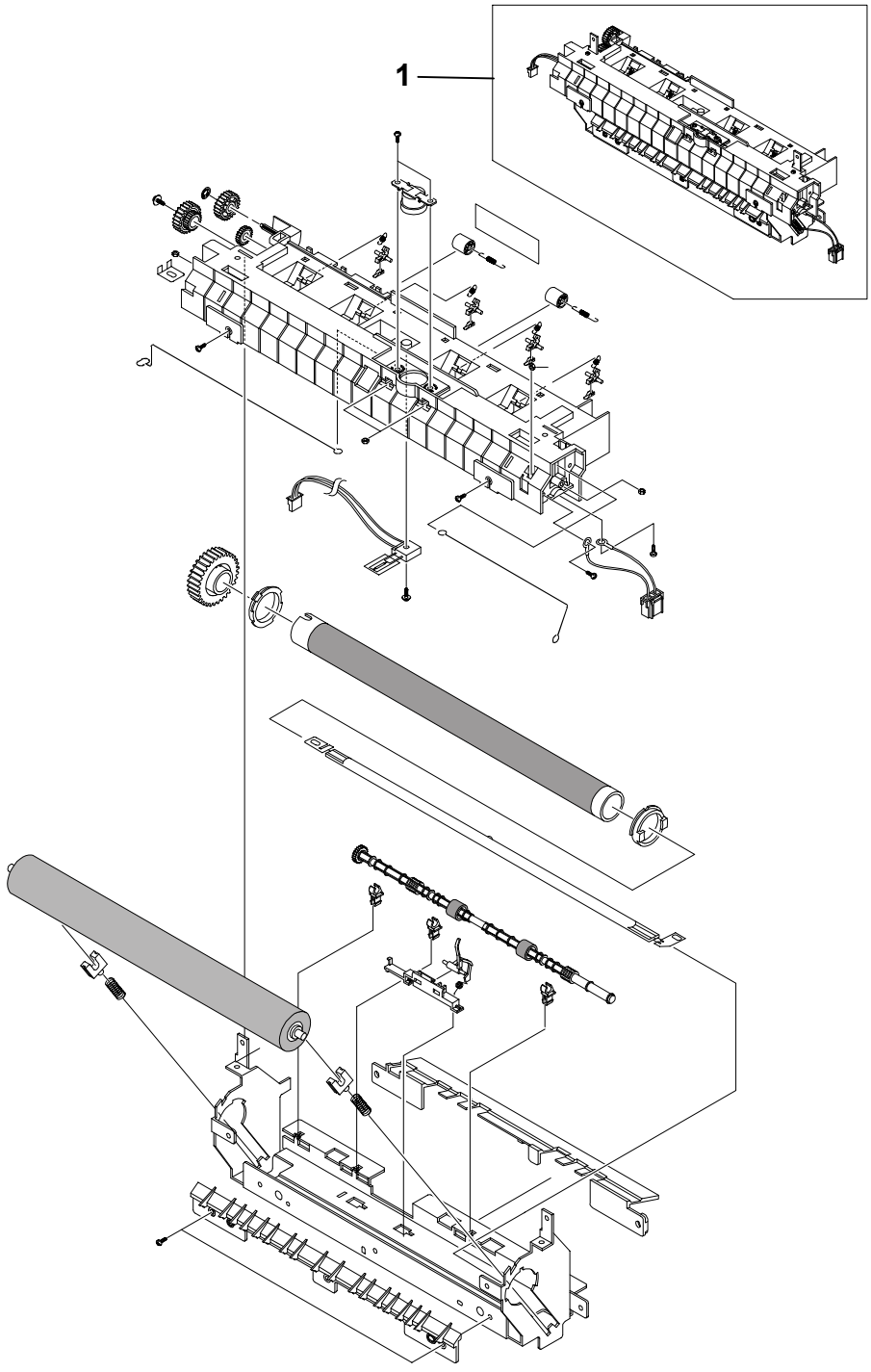
Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9621	Actuator - Cover Open	1	O	O	O	O
2	B173 9625	Actuator - Feed	1	O	O	O	O
3	B173 9626	Actuator - Paper End	1	O	O	O	O
4	B173 9627	Actuator - Bypass	1	O	O	O	O
5	B173 9629	Paper Pick-up Ass'y	1	O	O	O	O
6	B173 9631	Sponge Roller - Pick-up	1	O	O	O	O
7	B173 9635	Holder - Quenching	1	O	O	O	O
8	B173 9636	Lens - Quenching	1	O	O	O	O
9	B173 9638	Feed Roller	1	O	O	O	O
10	B173 9639	Bushing - Transfer : R	1	O	O	O	O
11	B173 9641	Idle Shaft - Feed	1	O	O	O	O
12	B173 9646	Solenoid - Pick-up	1	O	O	O	O
13	B173 9647	Solenoid - Bypass	1	O	O	O	O
14	B173 9648	Pick-up Gear Ass'y	1	O	O	O	O
15	B173 9651	Feed Clutch Ass'y	1	O	O	O	O
16	B173 9655	PCB - Quenching	1	O	O	O	O

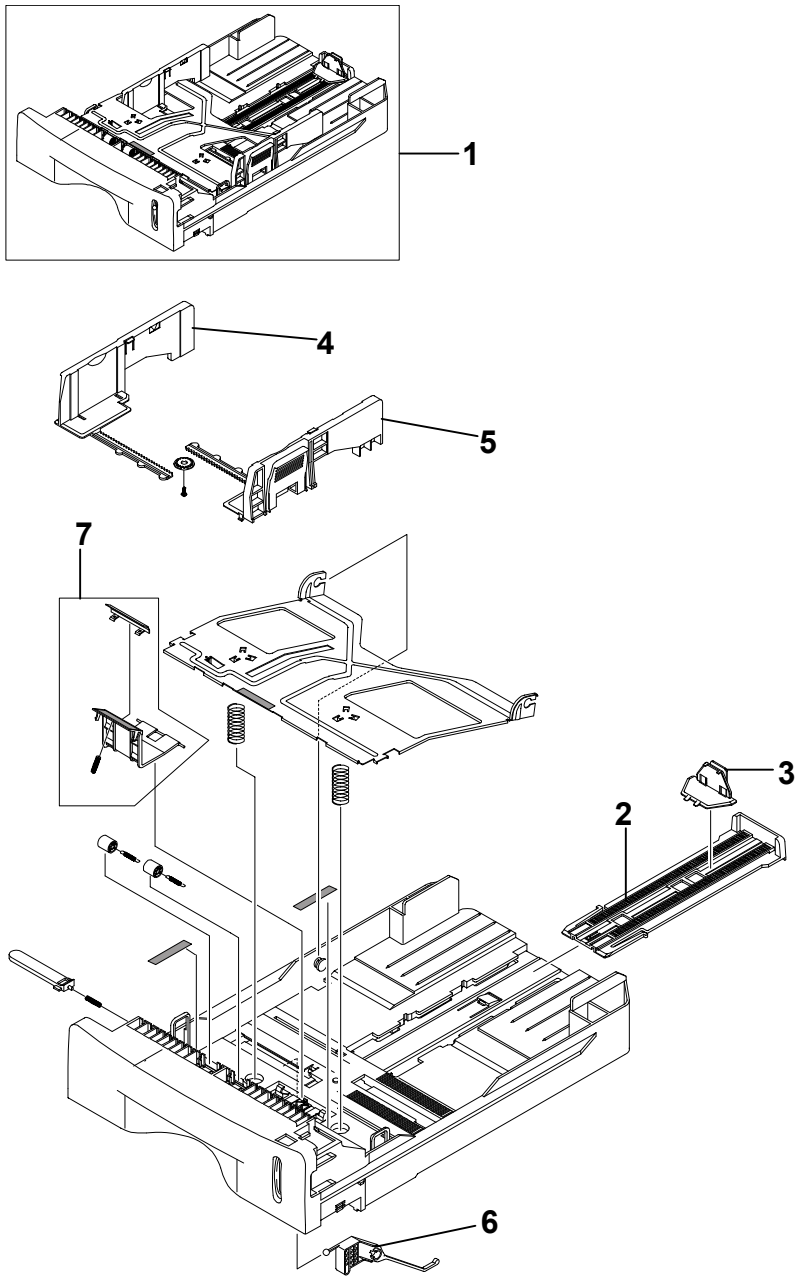
8. FUSER ASSEMBLY



B173C908.WMF

Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9656	Fusing Unit - 220V	1		O	O	O
1	B173 9666	Fusing Unit - 110V	1	O			

9. CASSETTE ASSEMBLY



B173C909.WMF

Index No.	Part No.	Description	Q'ty	B173			
				17	27	29	21
1	B173 9657	Cassette Ass'y	1	O	O	O	O
2	B173 9658	Extension - End	1	O	O	O	O
3	B173 9659	End Fence	1	O	O	O	O
4	B173 9661	Side Fence - L	1	O	O	O	O
5	B173 9662	Side Fence - R	1	O	O	O	O
6	B173 9663	Lever - Paper Indicator	1	O	O	O	O
7	B173 9670	Friction Pad Ass'y	1	O	O	O	O

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