

# **DOCUMATE 510**

## **Service Manual**

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Version 1.0

**Visioneer Inc.**

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# 1. INTRODUCTION

## 1.1 General Notes for Servicing

## 1.2 General Description

## 1.3 Features

This manual is intended to be used by the maintenance engineers. It describes areas to be maintained, the detailed installation, the disassembly of optional ADF, and the component replacement procedures as well as the main trouble shooting guides.

Please take your time to read this manual thoroughly to obtain comprehensive knowledge about the DOCUMATE 510 before serving the unit.

## 1.1 GENERAL NOTES FOR SERVICING

- (1) Before trying to disassemble the DOCUMATE 510, make sure the power supply cord of the DOCUMATE 510 is disconnected from the power outlet. Under any circumstance, do not remove or install the connectors on the DOCUMATE 510 with the power supply turned ON.
- (2) Use caution not to drop small parts or screws inside the unit when disassembling and reassembling. If left inside, they might cause the malfunction of the unit.
- (3) Do not pull the connector cable when disconnecting it. Hold the connector.
- (4) When carrying the scanning head unit, put it in an anti-static bag.
- (5) Keep the document table glass surface always clean. If contaminated, use a dry clean cloth for cleaning.
- (6) Use caution not to injure your fingers or hands when disassembling or reassembling the unit.

### 1.2 GENERAL DESCRIPTION

DOCUMATE 510 is a fantastic color USB scanner with an Automatic Document Feeder. The digital solution makes your reproduction exceedingly clear and sharp.

Without further leaning, you can get a scan image and link the image to a variety of applications, for example, the image-editing software, the OCR(Optical character recognition) software, to make your jobs done .

## 2. SPECIFICATION

### 2.1 Basic Specification

Product Name:	DOCUMATE 510
Type:	ADF/Flatbed Desktop scanner
Resolution:	up to 600 x 1200 dpi (1% increments)
Color Depth:	42-bit single pass color (R, G, B)
Image Type:	256 shades of gray scale 64 shades of gray for halftones Line art (binary) Error diffusion
ADF Scan Speed: (at 200dpi B&W A4 size)	10 pages per minute
Scan Area:	Flat-bed: up to European A4 (8.5" x 11.69") ADF: minimum: 4.5" x 5.5" ADF: maximum: up to legal size (8.5" x 14")
Paper Size:	A4,A5,LetterLegal,B5, Business card 3.5" x 2.0" (Flatbed Mode)
Paper Thickness:	16 – 28 lbs/0.002" ~ 0.006"
Paper Input (ADF):	up to 25 sheets
Physical Dimension:	Width: 447 mm Depth: 316 mm Height: 275 mm
Weight:	4.7g (10.35 lbs.)
Interface:	USB 1.1
Voltage:	100 to 240 V (International)
Frequency:	47 to 63 Hz
Power Consumption:	≤ 20 Watts



### 3. UNPACKING, INSTALLATION, AND TRANSPORTATION

- 3.1 Precautions of Installation**
- 3.2 Unpacking Procedure**
- 3.3 Installation**
- 3.4 Placing the Original**
- 3.5 Transportation**

#### 3.1 PRECAUTIONS OF INSTALLATION

Pay attention to the following matters before unpacking and installation.

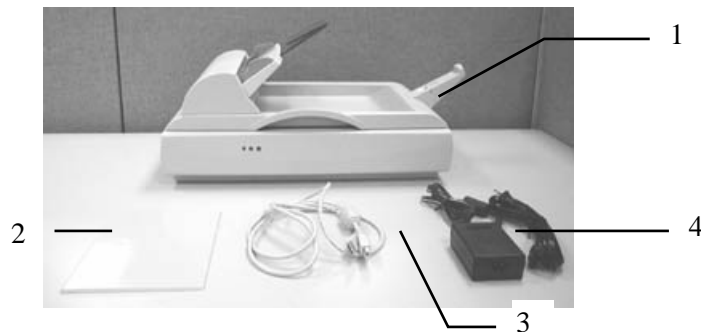
- Do not install in a place where vibration may occur.
- Keep the DOCUMATE 510 out of direct sunlight. Do not install near a heat source.
- Do not place the DOCUMATE 510 around materials which shut off the circulation of air.
- Do not install in a humid or dusty place.
- Use care not to scratch the glass surface of the DOCUMATE 510 or the document holding pad with a clip or staple.
- Do not use the wall socket with connecting devices which may generate noise, for example, air-conditioner, etc.
- Use a suitable AC power source.
- Place the DOCUMATE 510 on a level surface.

#### 3.2 UNPACKING PROCEDURE

Unpack the DOCUMATE 510 according to the following procedure.

- Remove the packing material.
- Remove the DOCUMATE 510 from the shipping container.
- Remove the DOCUMATE 510 from the PVC bag.
- Check the items by referring to Figure 3.1.
- For any missing items, please contact your nearest dealer or distributor.

Note: Keep all the packing material in case you may need to return the DOCUMATE 510.



1. Scanner main unit
2. Users manual with CD
3. USB cable
4. Power cord & adapter

Figure 3.1 Package Contents

### 3.3 INSTALLATION

#### (1). Unlocking theDOCUMATE 510

Before you use DOCUMATE 510, be sure to unlock it by moving the lock switch under the DOCUMATE 510 to the “Unlock” position (See the following figure). The lock switch is designed to protect the scanning head in case of any damage during shipment.

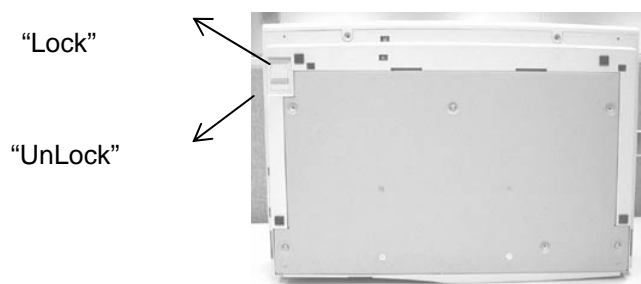


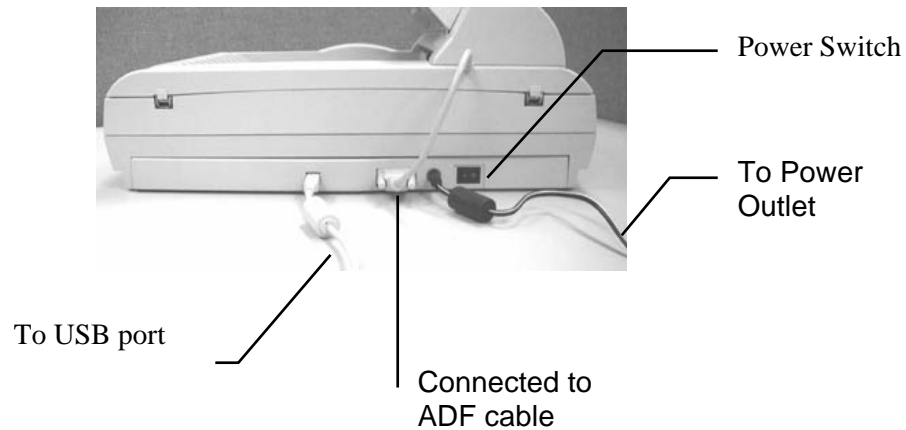
Figure 3.2 Unlock the DOCUMATE 510

**Note:** If you need to transport the DOCUMATE 510, be sure to first move the lock switch to the “Lock” position to prevent any damage during transportation.\_

## (2). Connecting the Cables

**Be sure the scanner power is switched off.**

Connect the power cable, ADF cable, and USB cable as Figure 3.3.



## **Turning on the Power**

The power is controlled by a toggle switch on the side of the scanner. To turn on the scanner, press the switch toward "1".

### **3.4 PLACING THE ORIGINAL**

- (1) Place your original face down on the document glass.
- (2) Observe that the upper-left corner (front page) of your original is placed beneath the home position mark.

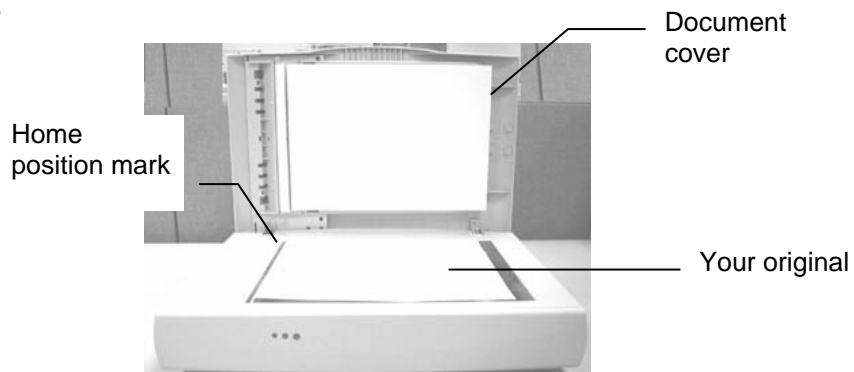


Figure 3.4 Placing the original

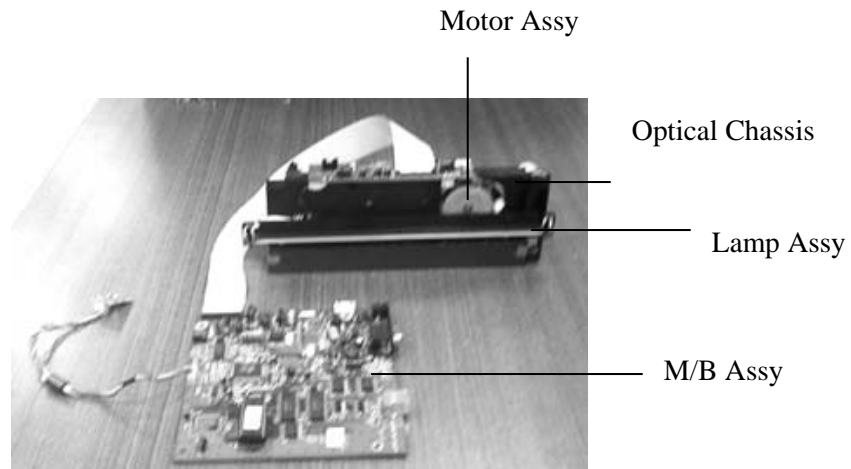
### 3.5 TRANSPORTATION

To move the DOCUMATE 510 from where it is installed, for repair or any other reason, make sure to observe the following conditions:

- (1) Turn off the power of the DOCUMATE 510.  
If the scanning head is located at a place other than the home position, turn the DOCUMATE 510 on to return the scanning head to the home position. Before making sure the scanning head is returned to the home position, turn the power supply off.
- (2) Move the lock switch to the "lock" position.
- (3) Remove the power and printer cables.
- (4) Put the DOCUMATE 510 in the packing case with the packing material.



## 4. WIRING COMPONENTS EXTERNAL VIEW





## 5. THEORY OF OPERATION

### 5.1 INTRODUCTION

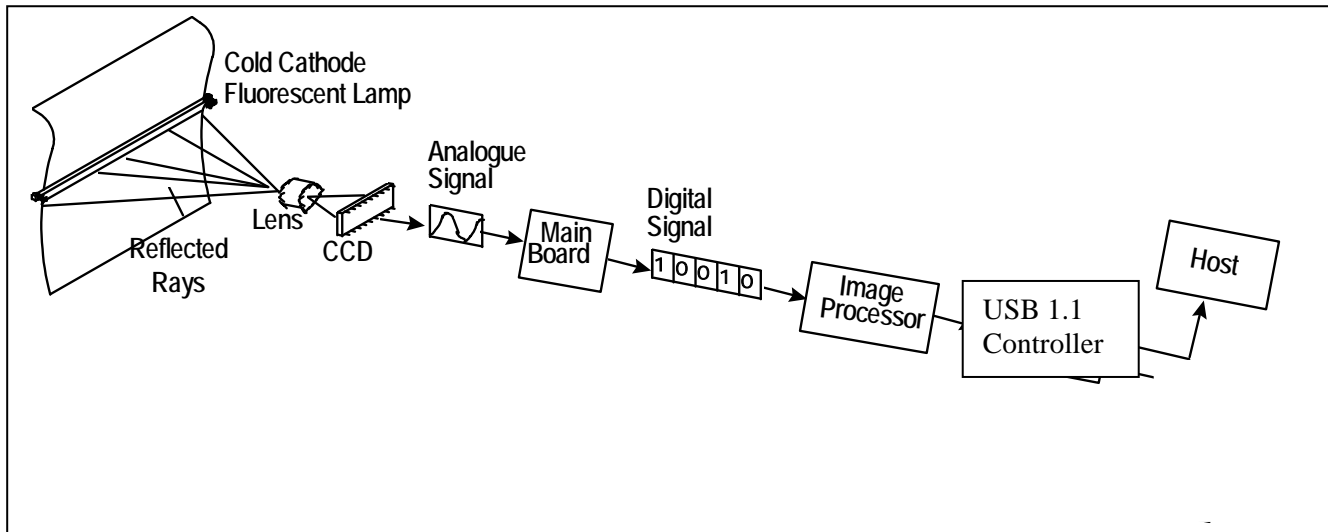


Figure 5.1 Theory of Operation

The reflected rays of the original, as shown in the above Figure 5.1, pass through the lens and creates an image on the CCD (Charged Coupled Device). Then, according to the different light intensity perceived by the CCD, the CCD will transfer these data into a series of analog signals to the main board, where the signals are turned into digital signals. These digital signals flows to the image processor to store into a printer acceptable format then goes to USB1.1 Controller to transfer to printer or to a host computer.

## 5.2 MAIN CONTROL UNIT

### 5.2.1 SYSTEM DIAGRAM

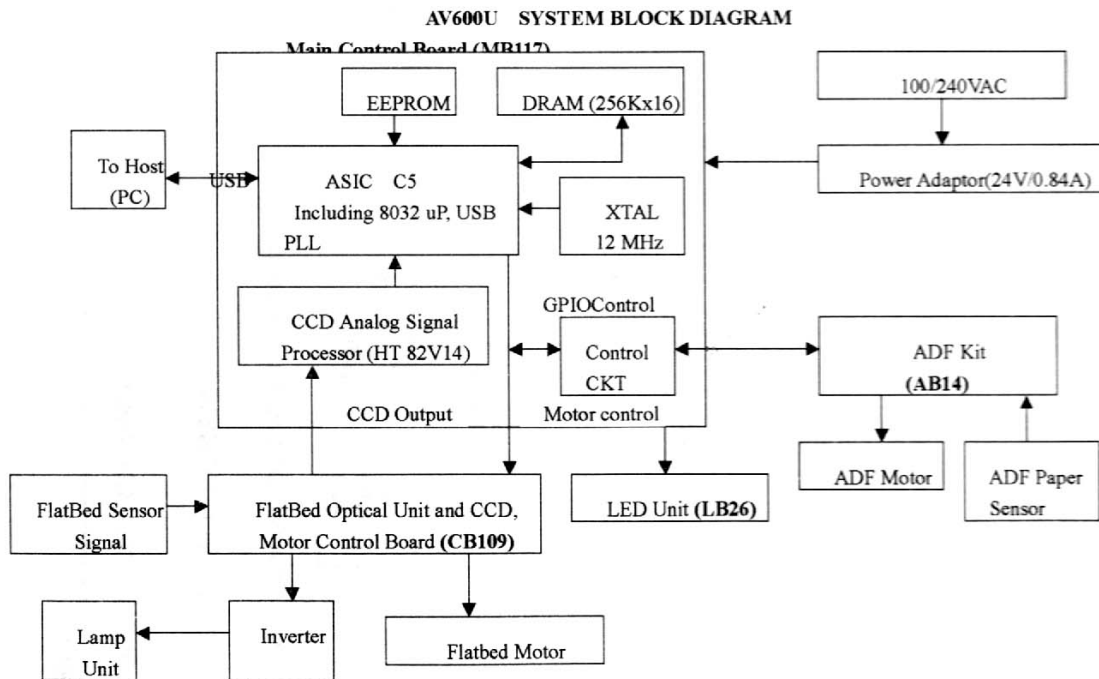


Figure 5.2 System block diagram

## 5.2.2 MAIN CONTROL CIRCUIT

This DOCUMATE 510 is controlled by the 80C32. The 80C32 is configured with a 64-KB external ROM program area, a 256-BYTE internal RAM work area, a 64-KB external RAM work area, 2 timer / counters, 4 I/O ports, 2 external interrupts, and 2 internal interrupts for 2 internal timer / counters.

Address Maps:

- ROM program area:

0000	64KB Program
FFFF	

- Internal RAM working area:

00	256-byte
FF	Internal Registers

-

### 5.2.3 VIDEO CIRCUIT:

The video circuit of this DOCUMATE 510 includes: 1. CCD driving circuit, 2. CCD signal processing circuit.

#### 1. CCD Driving Circuit

The CCD driving circuit is used to generate correct signals to the CCD, so that the CCD may generate the correct image data.

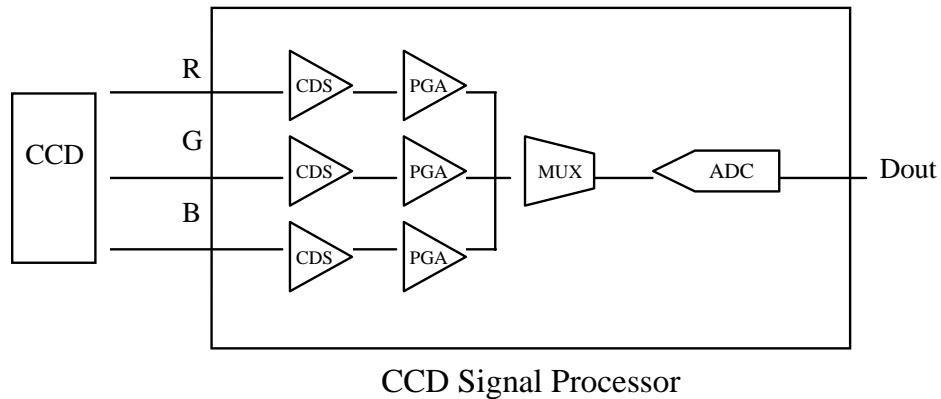
Signals for CCD:

Pin Assignment for CCD cable

Pin No.	Name	Function
1	MI01	Motor coil 1 current control 1
2	MI02	Motor coil 2 current control 1
3	MI11	Motor coil 1 current control 2
4	MI12	Motor coil 2 current control 2
5	VMOT	Motor Driver Power Supply
6	VMOT	Motor Driver Power Supply
7	MGND	Motor Driver Ground
8	MGND	Motor Driver Ground
9	MPH1	Motor phase Control 1
10	MPH2	Motor phase Control 2
11	SH-	CCD RGB channel shift Gate
12	DG	Digital Ground
13	RS	CCD Reset Gate
14	CD	Clamp Gate
15	PH1	CCD clock phase
16	PH2	CCD clock phase
17	DG	Digital Ground
18	12VC	CCD Power Supply
19	VOR	CCD Red Channel Output Signal
20	AG	Analog
21	VOG	CCD Green Channel Output Signal
22	AG	Analog

Pin No.	Name	Function
23	VOB	CCD Blue Channel Output Signal
24	AG	Analog
25	HMSEN	Home Sensor Signal
26	VCC	Digital 5V Power Supply
27	IG	Inverter Ground
28	IG	Inverter Ground
29	24VI	Inverter Power Supply
30	24VI	Inverter Power Supply

## 2. CCD signal processing circuit



The CCD signal processor includes all the necessary circuitry to perform three-channel conditioning and sampling. The signal chain consists of three-channel correlated double sampling (CDS) and programmable gain adjustment of the CCD output (PGA) is a 14 bit analog to digital converter (ADC) quantizes the analog signal.

## 5.2.4 LED MODULE CIRCUIT

The circuit for LED module shows the function of the entire scanner including the Power LED, the Check LED, and the Ready LED.

Pin assignment of LED module

Pin No.	Name	Function
1	Vcc	+5V power
2	Power	Power status indicator
3	Ready	Ready status indicator
4	Check	Check condition status indicator

### 5.2.5 SENSOR INPUT

The sensor input includes home position sensor.

Home position sensor

The home position of the carrier motor is detected by photo sensor. The photo transistor transmission to the photo sensor receiver circuit is shown below .

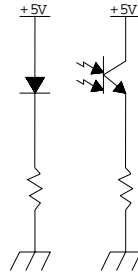
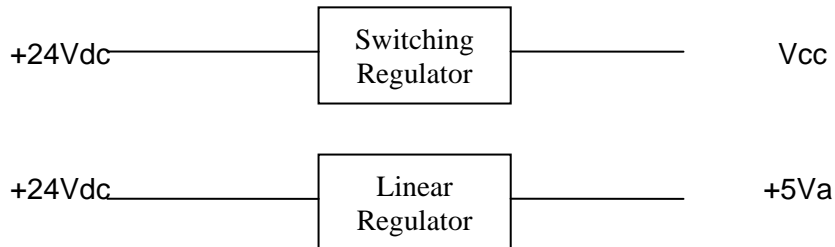


Figure 5.3 Home position sensor

The home position is detected when the carrier passes between the LED and the photo transistor.

### 5.2.6 SUB POWER SUPPLY CIRCUIT

The sub power supply circuit is provided for the internal analog circuit. Input is 24V and output is Vcc and +5Va. The circuit configuration is shown below:



The sub power supply is used for: A/D, and logic circuits.

## 5.2.7 POWER SUPPLY

In this system, there is only one type of power supply. Please see Table 5.1 for details.

Table 5.1 Power Adapter

Type Characteristic	Wall-mount
Input voltage range	100-240V
Input current(max.)	0.6A (rms)
Input frequency	50-60Hz
Max. in-rush current(@115VAC, cold start)	27A
Output voltage	+24Vdc
Min. load current	0.0A
Max. load current	0.84A
Total Power	20W



## 6. PROBLEM SOLVING

- 3.1     Diagnostics**
  - 3.2     Troubleshooting**

This chapter supplies two paths for dealing with operational problems. The first relies on the DOCUMATE 510's internal diagnostics. The second uses troubleshooting flowcharts and tables to isolate the problem. In many cases, the internal diagnostics will help you to locate the source of the problem quickly. Use these diagnostics first. If the diagnostics do not locate the source of the problem, refer to Section 3.2 **Troubleshooting**.

### 6.1 DIAGNOSTICS

The DOCUMATE 510 has internal diagnostics to help you determine the cause of operational problems. Some of the diagnostics function with the scanner online, while others are part of a separate offline diagnostics feature.

#### 6.1.1 ONLINE DIAGNOSTICS

Determine operational problems by observing the display panel Power , Ready, and Check LED's. With the scanner online and operating normally, the Ready LED is on and the Paper Jam LED is off. Any other LED combination indicates a problem, as shown in the following table.

Ready LED	Check LED	Error indication
Off	Blinking	Group Error
Blinking	Off	Power on diagnostics

**Table 3.1   Online diagnostics**

If the ADF cover is open, close it. For the group errors, see the flowcharts later in this section.

### 6.1.2 OFFLINE DIAGNOSTICS

To run the offline diagnostics, and turn the power back on. When you first turn the scanner back on, the READY light will blink, indicating that the diagnostics are in progress. Observe the front panel LED's closely. In a short time, the LED's indicate the results of the offline diagnostics as explained in the table below.

Ready LED	Check LED	Error indication
OFF	2 blinks	DRAM FAILURE
OFF	3 blinks	DC offset adjust failure
OFF	5 blinks	Motor or Home sensor error
OFF	6 blinks	Motor or Home sensor error
OFF	7 blinks	Chassis locked
OFF	8 blinks	USB RD/WR failure

**Table 3.2 Offline diagnostics results**

For DRAM error, refer to Main Control PCBA Replacement in Chapter 4. For the Group 2 error, see the flowchart in the following section.

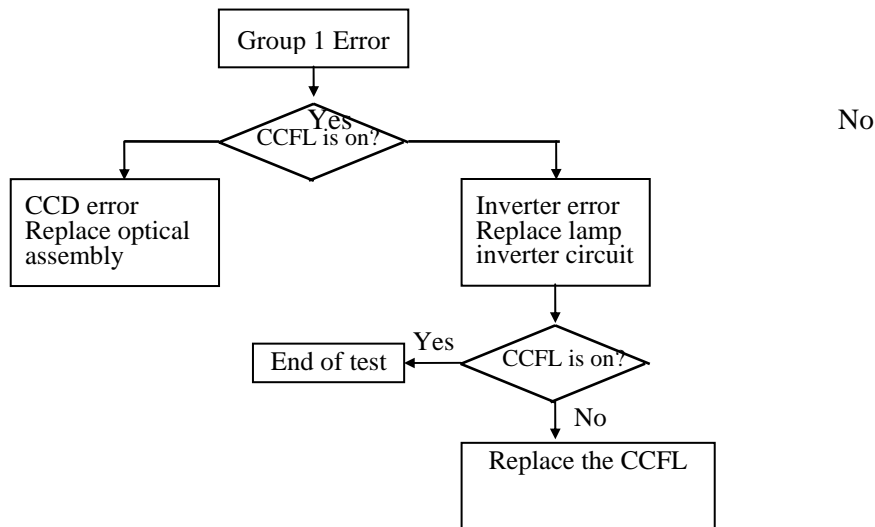
To return the scanner to online operation, turn off the scanner, turn the scanner back on.

### 6.1.3 DIAGNOSTIC FLOWCHARTS

Use the flowcharts that follow to determine the exact problem when either the online or offline diagnostics indicate a group error. Refer to Chapter 4 for parts replacement.

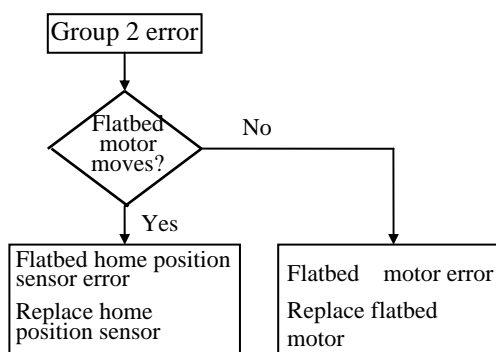
#### 6.1.3.1 Group 1 error flowchart (CCFL assembly)

This flowchart applies when the Check LED blinks 6 times the same while, with the scanner offline.



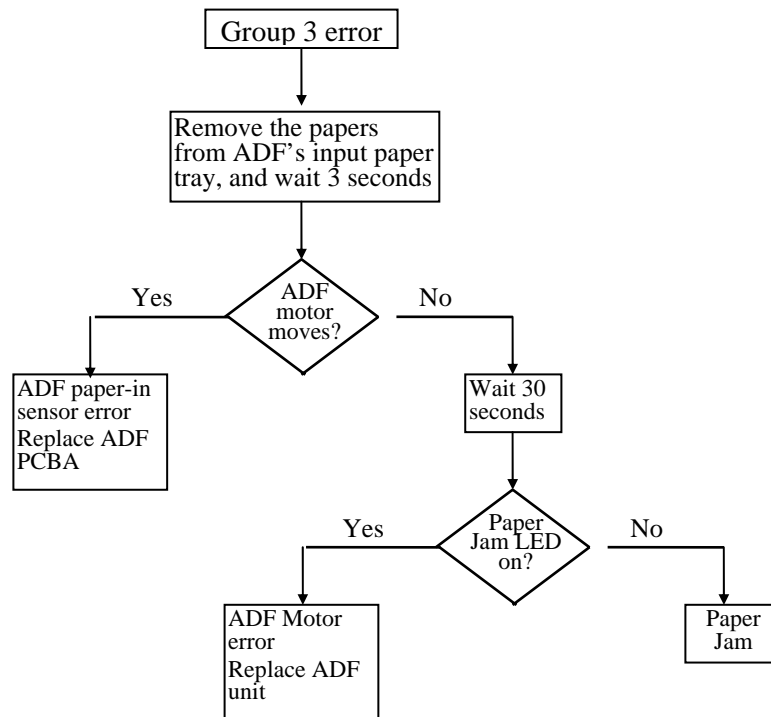
#### 6.1.3.2 Group 2 error flowchart (Flatbedmotor)

This flowchart applies when the offline diagnostics error indication is the simultaneous blinking 5 times of the Check LED.



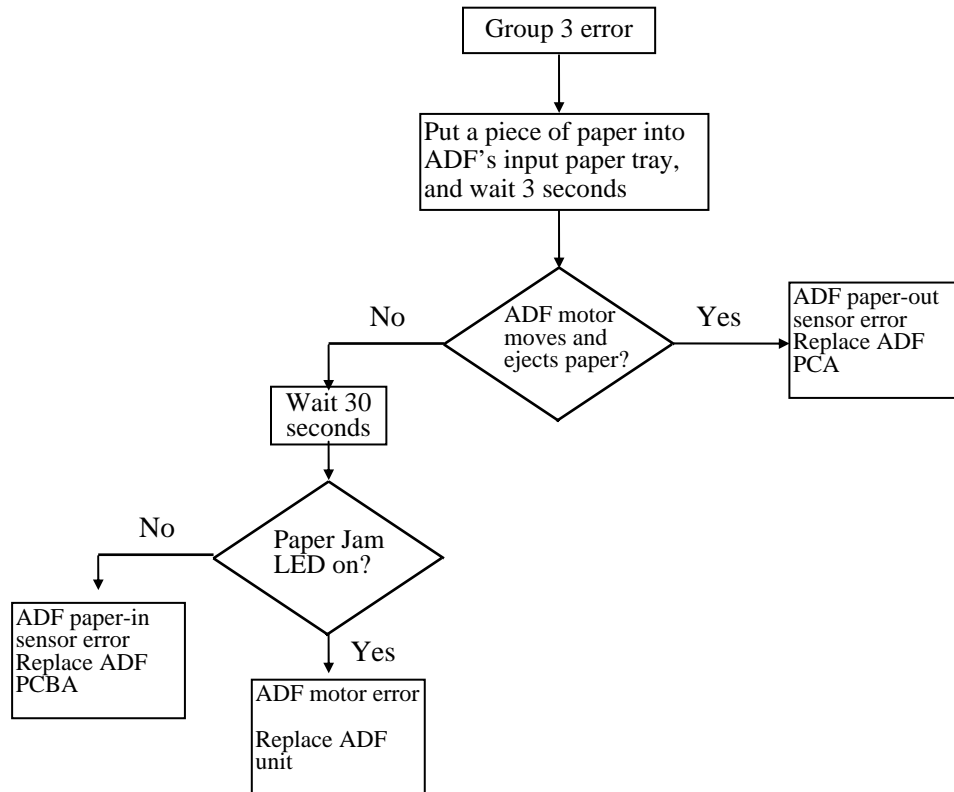
### 6.1.3.3 Group 3 error flowchart (paper in ADF paper tray)

This flowchart applies when the Ready LED is off and Paper Jam LED steadily on with the scanner online, and there is paper in the ADF paper tray.



#### 6.1.3.4 Group 3 error flowchart (no paper in ADF paper tray)

This flowchart applies when the Ready LED is off and Paper Jam LED steadily on with the scanner online, and there is no paper in the ADF paper tray.



## **6.2 TROUBLESHOOTING**

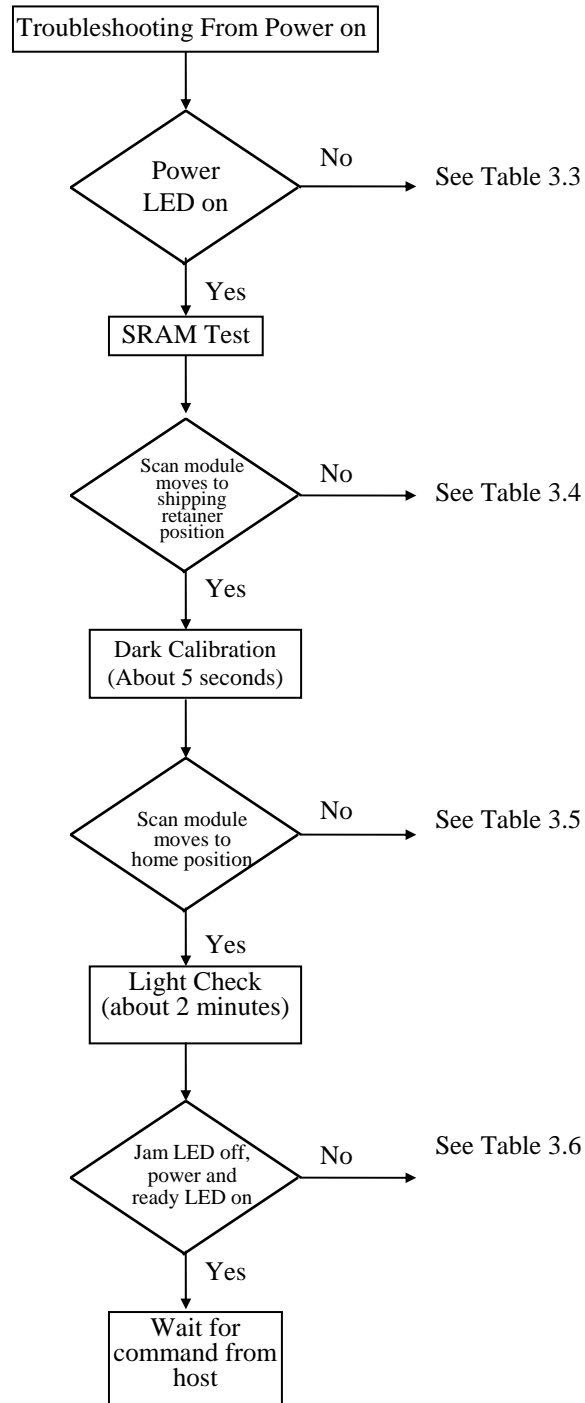
Refer first to the applicable troubleshooting flowchart in the following three sections. The flowcharts refer you to the appropriate table for detailed troubleshooting.

### **6.2.1 FLOWCHARTS**

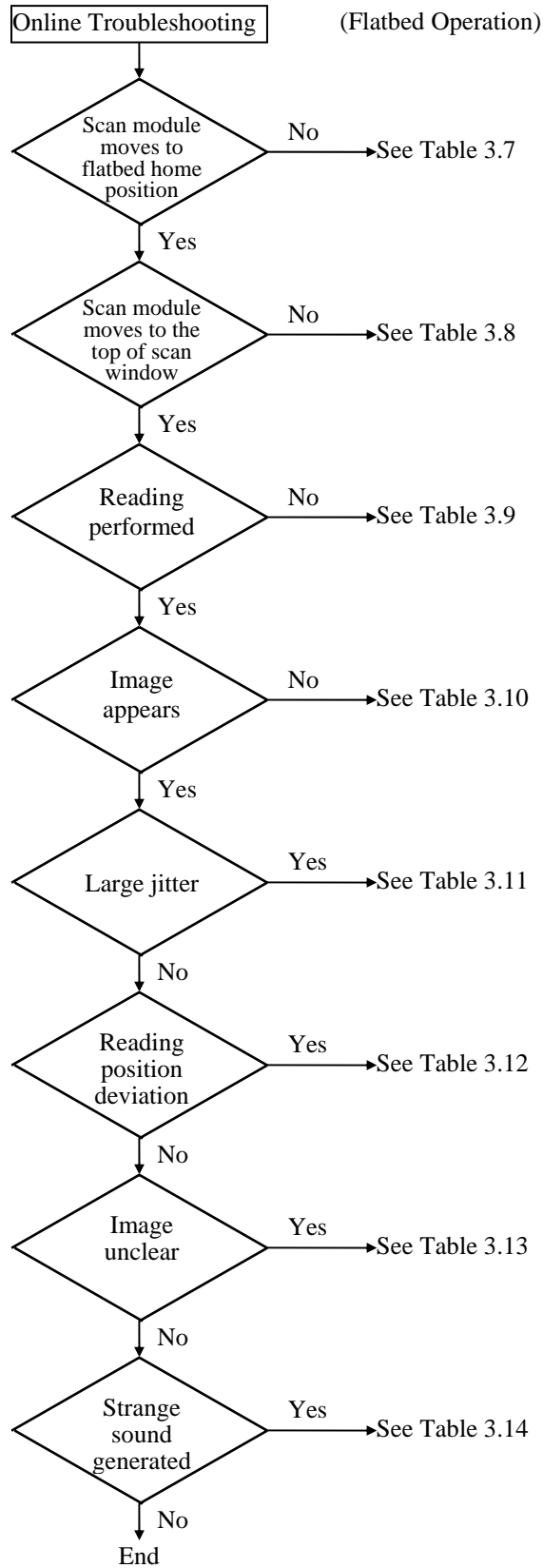
This section provides the following troubleshooting flowcharts:

- Troubleshooting from power on to scanner ready
- Online troubleshooting (flatbed operation)
- Online troubleshooting (ADF operation)
- Offline troubleshooting (flatbed operation)

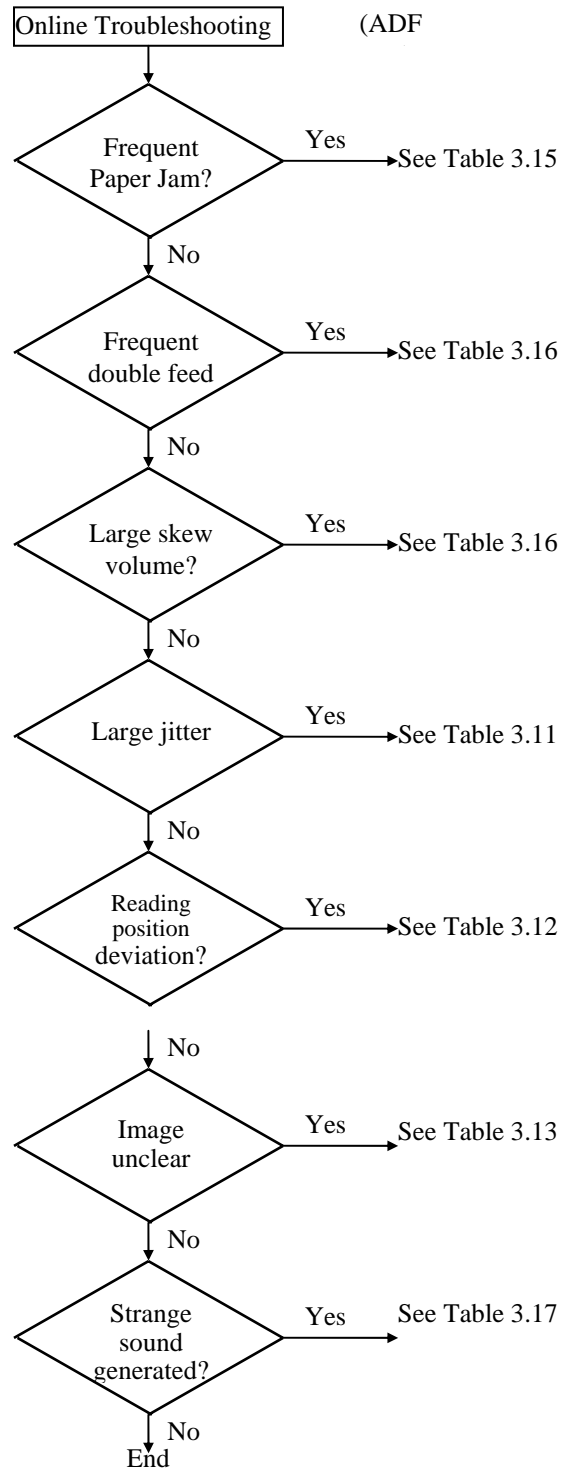
6.2.1.1 Troubleshooting flowchart: power on to scanner ready.



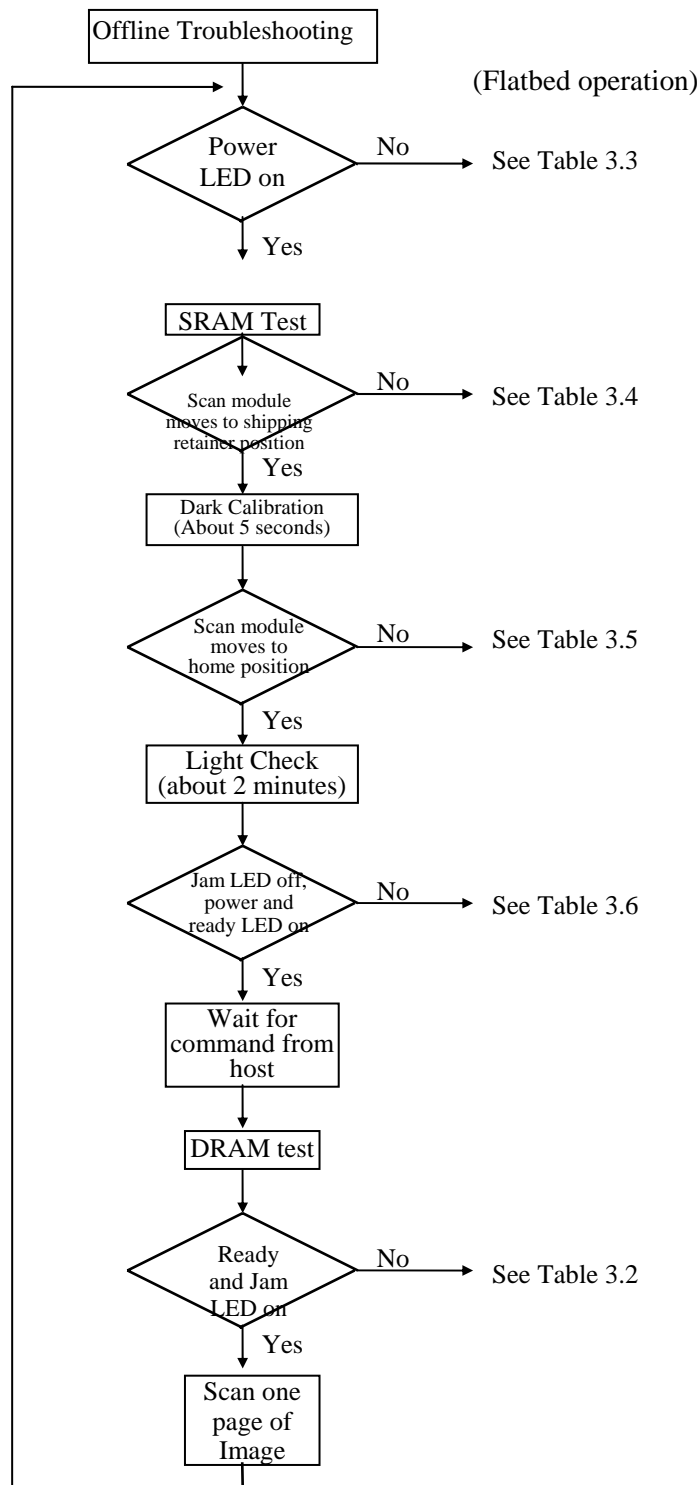
6.2.1.2 Troubleshooting flowchart: online flatbed operation



### 6.2.1.3 Troubleshooting flowchart: online ADF operation



#### 6.2.1.4 Troubleshooting flowchart: Offline flatbed operation



## 6.2.2 TABLES

The tables in this section provide detailed troubleshooting information.

### 6.2.2.1 The Power LED does not go on

Cause	Relevant Unit	Check Method v	Maintenance Method	Remark
Unplugged from outlet	None	Visual check	Insert the AC plug into the outlet.	None
AC power unplugged at unit	None	Visual check	Insert the AC cable into unit.	None
Power switch is OFF	None	Visual check	Turn the power switch on.	None
AC voltage failure	None	AC outlet voltage check	None	None
Power unit AC input connector disconnected	None	Visual check	Connect the connector.	None
Power switch connector disconnected	None	Visual check	Connect the connector.	None
Power unit-main PCBA connection failure	None	Visual check	Connect the connector.	None
Power unit output voltage failure	Power unit	Output voltage (+15V) check Ξ	Replace the power unit	None
PCBA Failure	*main control PCBA *LED board	Tester check (+24V, GND) Ξ	Remove the cause or replace the PCBA.	None
LED board-main PCBA connection failure	None	Visual check	Connect the connector	None

**Table 3.3**

v = Check method explains how to check the failed item.

The visual check can be made by physically observing the part or observing the offline test display on the front panel. The tester check is made by checking the voltage levels of the relevant units. (See section 4.6)

Ξ = Refer to section 4.6.

**6.2.2.2 Scan module does not move to shipping retainer position**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Sensor board-main control PCBA connection failure	None	Visual check	Connect the connector.	None
Home position sensor board-main control PCBA cable failure.	Sensor board-main control PCBA cable	Tester or visual check H	Replace the home position cable.	υ
Home position sensor board failure	Home position sensor PCBA	Tester check H	Replace the PCBA	None
Motor-main control PCBA connection failure	None	Visual check	Connect the connector.	None
Motor failure	Motor	Visual check	Replace the motor.	None
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails.	Power supply	Tester check (+24V, GND) H	Replace the power supply.	None

**Table 3.4**

υ = See section 1.4.3 Wiring configuration

H = Refer to section 4.6

### 6.2.2.3 Scan module does not move to the home position

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Home position sensor board-main control PCBA connection failure	None	Visual check H	Connect the connector.	None
Home position sensor board-main control PCBA cable failure	Sensor board-main control PCBA cable	Tester or visual check H	Replace the home position sensor cable.	υ
Home position sensor board failure	Sensor board	Tester check H	Replace the PCBA.	None
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails	Power supply	Tester check (+24V, GND) H	Replace the power supply.	None
Lamp failure	Lamp	Visual check	Replace the lamp.	None
Inverter failure	Inverter	Visual check	Replace the inverter.	None
CCD board-main control board connection failure	None	Visual check	Connect the connector	None
CCD board fails	CCD board	Tester check	Replace the optical unit	None

**Table 3.5**

υ = See section 1.4.3 Wiring configuration

H = Refer to section 4.6

**6.2.2.4 Ready and Power LED does not light on**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Home position sensor board-main control PCBA connection failure	None	Visual check	Connect the connector.	None
Home position sensor board-main control PCBA cable failure	Sensor board-main control PCBA cable	Tester or visual check H	Replace the home position sensor cable.	υ
Home position sensor board failure	Sensor board	Tester check H	Replace the PCBA.	None
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails	Power supply	Tester check (+24V, GND) H	Replace the power supply.	None

**Table 3.6**

υ = See section 1.4.3 Wiring configuration

H = Refer to section 4.6

**6.2.2.5 Scan module does not move to the flatbed position**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Power supply-main control board connection failure	None	Visual check	Replace the power supply.	None
Power supply fails	Power supply	Tester check (+24V, GND) H	Replace the power supply.	None
Motor-main control PCBA connection failure	None	Visual check	Connect the connector.	None
Motor failure	Motor	Visual check  H	Replace the motor module.	None

**Table 3.7**

H Refer to section 4.6.

**6.2.2.6 Scan module does not move to the top of the scan window**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails	Power supply	Tester check (+15V, GND) H	Replace the power supply.	None
Lamp Failure	Lamp	Visual check	Replace the lamp.	None
Inverter Failure	Inverter	Visual check	Replace the inverter	None
CCD board-main control board connection failure	None	Visual check	Connect the connector.	None
CCD board fails	CCD Board	Visual check	Replace the optical unit.	None

**Table 3.8**

H Refer to section 4.6

### 6.2.2.7 *Reading is not performed*

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
ADF cover open	ADF cover	Visual check	Close the ADF cover.	None

**Table 3.9**

### 6.2.2.8 *Image does not appear*

#### 6.2.2.9

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
ADF cover open	ADF cover	Visual check	Close the ADF cover	None
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails.	Power supply	Tester check (+15V, GND) H	Replace the power supply.	None
Lamp failure	Lamp	Visual check	Replace the lamp.	None
Inverter failure	Inverter	Visual check	Replace the inverter.	None
CCD board-main control board connection failure	None	Visual check	Connect the connector.	None
CCD board fails.	CCD Board	Visual check	Replace the optical unit.	None

**Table 3.10**

6.2.2.10 *Large jitter*

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails	Power supply	Tester check (+15V, GND) H	Replace the power supply.	None
Motor-main control PCBA connection failure	None	Visual check	Connect the connector.	None
Motor failure	Motor	Visual check	Replace the motor.	None

**Table 3.11**

H = Refer to section 4.6.

### 6.2.2.11 Reading position deviation

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Power supply-main control board connection failure	None	Visual check	Connect the connector.	None
Power supply fails	Power supply	Tester check (+15V, GND) H	Replace the power supply.	None
Motor- main control PCBA connection failure	None	Visual check	Connect the connector.	None
Motor failure	Motor	Visual check	Replace the motor	None
Home position sensor board- main control PCBA cable failure	None	Visual check	Connect the connector	None
Home position sensor board- main control PCBA cable failure	Sensor board- main control PCBA cable	Tester or visual check	Replace the home position sensor cable	None
Home position sensor board failure	Sensor board	Tester check	Replace the PCBA.	None

Table 3.12

H Refer to section 4.6.

### 6.2.2.12 Image unclear

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Lamp too dark	Lamp	Visual check	Replace with a new lamp.	None
Dirt on calibration reference plate	Calibration reference plate	Visual check	Clean the flatbed glass with isopropyl alcohol.	None
Dirt on calibration reference plate	Calibration reference plate	Visual check	Clean the calibration reference plate with isopropyl alcohol.	None
Dirt on the mirrors	Mirrors	Visual check	Clean the mirrors with isopropyl alcohol.	None
Dirt on the lens	Lens	Visual check	Clean the lens with isopropyl alcohol.	None

Table 3.13

**6.2.2.13 Strange sound generated (flatbed)**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Motor unit failure	Motor unit	Replace the motor unit.	Replace the motor unit.	None
Main control PCBA failure	Main control PCBA	Replace the main control PCBA.	Replace the main control PCBA.	None
Scanning module failure	Scanning module	Check if scanning module is loose.	Replace the optical unit.	None
Dirt on rail	None	Visual check	Clean the rail with isopropyl alcohol	None

**Table 3.14**

**6.2.2.14 Frequent paper jam**

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Paper setting failure	Operation error	Is the paper correctly set in the paper chute?	Teach users to properly position the paper.	None
Paper failure	operation error	Is the specified paper used?	None	None
ADF connector slip-off	ADF unit	Visual check of motor rotation	Connect the connector.	None
Pad assembly failure	Pad assembly	Check the pad assembly for wear and tear	Replace the pad assembly/ touch spring unit.	None
ADF unit failure	ADF unit	Replace the ADF unit.	Replace the ADF unit.	None

**Table 3.15**

### 6.2.2.15 Frequent double feed and skew

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Paper setting failure	Operation error	Is the paper correctly set in the paper chute?	Teach users to properly position the paper	None
Paper failure	Operation error	Is the specified paper used	None	None
ADF connector slip-off	ADF unit	Visual check of motor rotation	Connect the connector.	None
Pad assembly failure	Pad assembly	Check the pad assembly for wear and tear.	Replace the pad assembly/ touch spring unit.	None
ADF unit failure	ADF unit	Replace the ADF unit.	Replace the ADF unit.	None

Table 3.16

### 6.2.2.16 Strange sound generated (ADF)

Cause	Relevant Unit	Check Method	Maintenance Method	Remark
Paper setting failure	Operation error	Is the paper correctly set in the paper chute?	Teach users to properly position the paper	None
paper failure	Operation error	Is the specified paper used?	None	None
ADF connector slip-off	ADF unit	Visual check of motor rotation	Connect the connector.	None
ADF unit failure	ADF unit	Replace the ADF unit	Replace the ADF unit.	None

Table 3.17



## 7. DISASSEMBLY

- 8.1 Service Tools**
- 8.2 Lubricants**
- 8.3 Procedure for Disassembly and Reassembly**

### 7.1 SERVICE TOOLS

Table 7.1 describes the maintenance tools necessary for the maintenance of this equipment.

No.	Name	Description
1	Minus screwdriver	Idler pulley module screw
2	Philips screwdriver (magnetic)	Nominal No.2 M3, M4
3	Oil	Shell "Terrace Oil 46"
4	Grease	Shell "Alvania Grease No.2"
5	Alcohol (Isopropyl 91% >)	Cleaning
6	Digital voltmeter	With 0.01 V range
7	Oscilloscope	100 MHz or more with external sweep
8	Blower	Cleaning

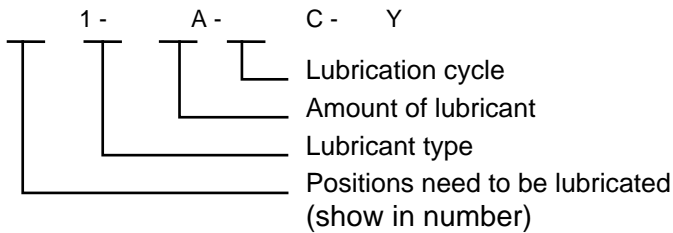
Table 8.1 Maintenance tools

## 7.2 LUBRICANTS

This section describes the items to check and the places to lubricate when maintenance parts are replaced.

### 7.2.1 MECHANICAL UNIT LUBRICATION

This lubrication method:



1. Positions need to be lubricated:  
The positions need to be lubricated is indicated in numbers.
2. Lubricant type:  
A: Shell Alvania Grease No. 2  
B: Shell Terrace Oil 46
3. Amount of lubricant:  
C: Coat thinly uniformly
4. Lubrication cycle:  
Y: Every year

Table 8.2 below shows the position to be lubricated.

Lubrication Position	Lubricant Type	Lubricant Amount	Lubrication Cycle	Lubrication Position
1	B	C	Y	Sliding rod
2	A	C	Y	Sliding frame

Table 8.2

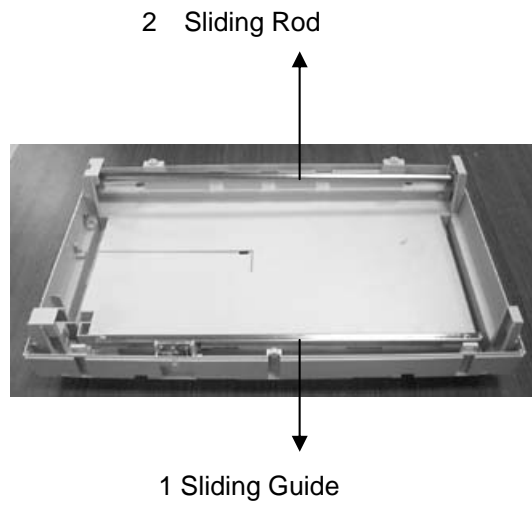


Figure 8.1 Lubricated Position

## 7.3 PROCEDURE FOR DISASSEMBLY AND REASSEMBLY

### 7.3.1 NOTES ON DISASSEMBLY

- (1) Clean the disassembly and assembly location.
- (2) Disconnect the power cable and remove the AC plug from the outlet before disassembly and assembly.
- (3) Follow the disassembly and assembly procedures. Never loosen the screws of parts that must not be disassembled.
- (4) Store the disassembled parts in a clean place to avoid loss.
- (5) After replacement, check the contacts and spare part mounting.
- (6) Assemble the parts in reverse order of disassembly procedure.

### 7.3.2 DOCUMENT COVER

- (1) As shown in the figure below, unplug the ADF cable, and then lift the document cover to remove the studs from the hinge holes. The studs are loosely attached to the hinge holes in the purpose to cover your original when it is a few inches high.



Figure 8.2 Document cover removal

### 7.3.3 UPPER HOUSING

- (1) Remove the document cover as described in the previous section.
- (2) As shown in the figure below, loosen the fixing screws with a Philips screwdriver.
- (3) Remove the upper housing by lifting it gently.

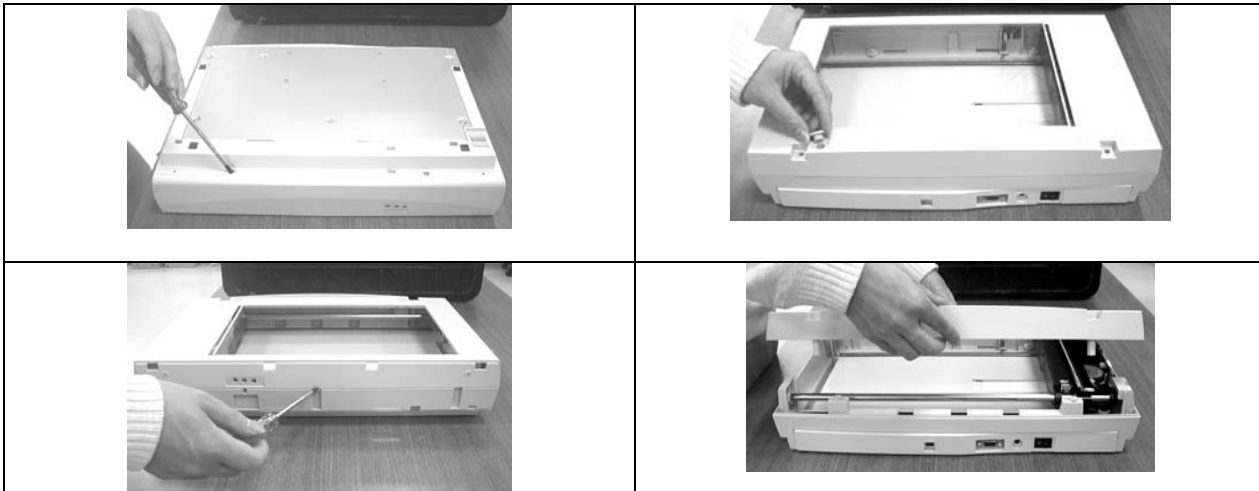
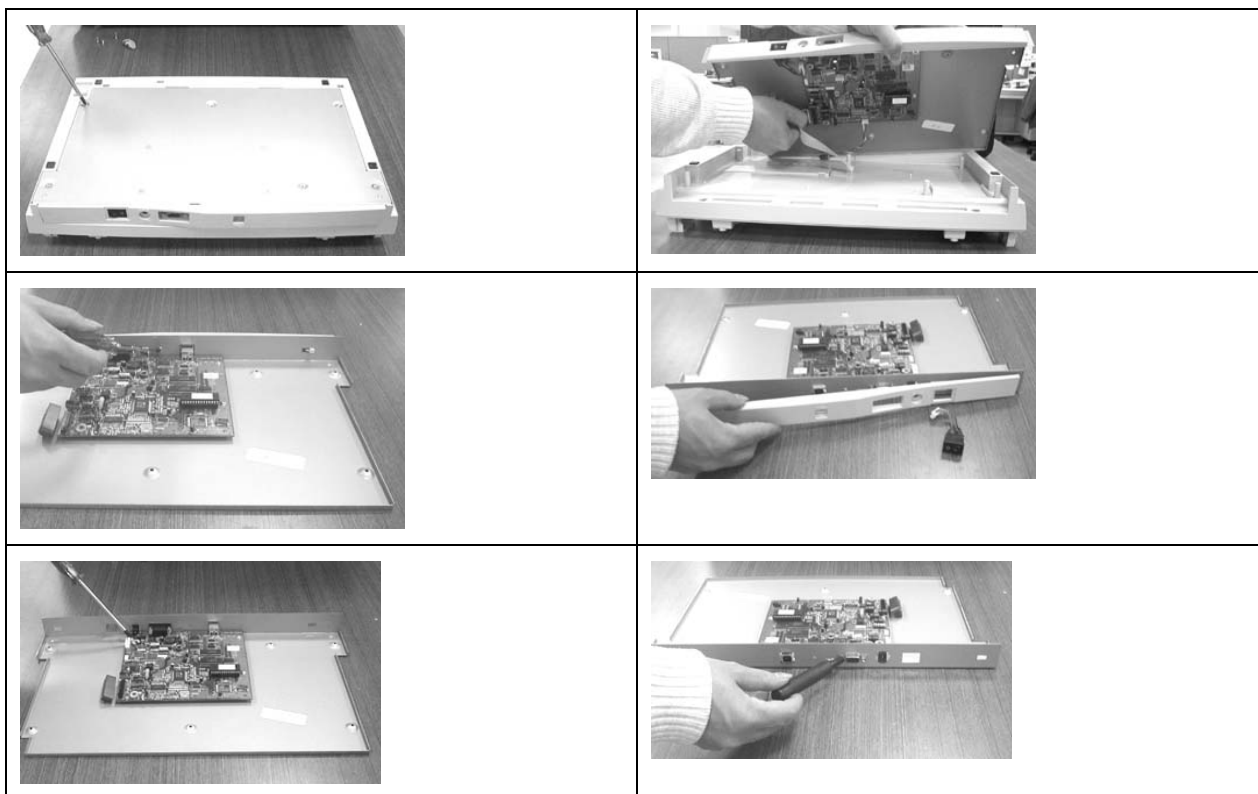


Figure 8.3 Upper housing removal

### 7.3.4 MAIN CONTROL BOARD ASSEMBLY

- (1) Loosen the fixing screws of the metal cover from the bottom housing as shown in the figure below.
- (2) Lift the metal cover and disconnect the FFC.
- (3) Loosen the screws fixed on the front panel, and remove the front panel.
- (4) Loosen the screws fixed on the main board.



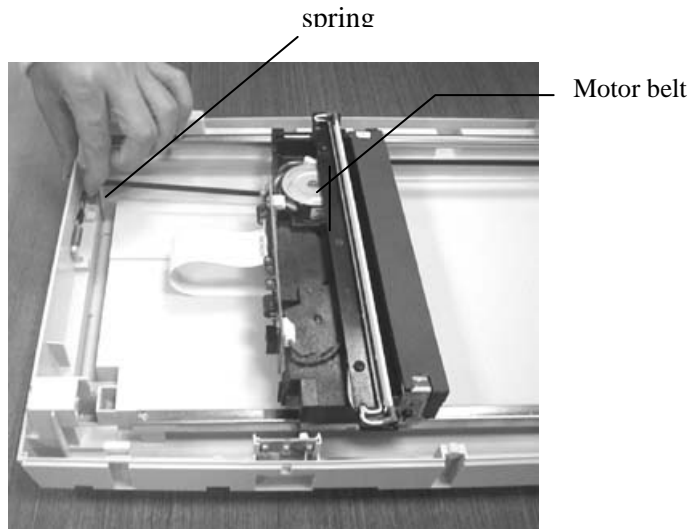
Main control PCBA removal

### 7.3.5 MOTOR BELT

- (1) Remove upper housing and main control PCBA.
- (2) Disconnect the motor belt by releasing the belt spring as shown in the figure below.

**Note:**

During the assembling process, keep the belt straight in center line.

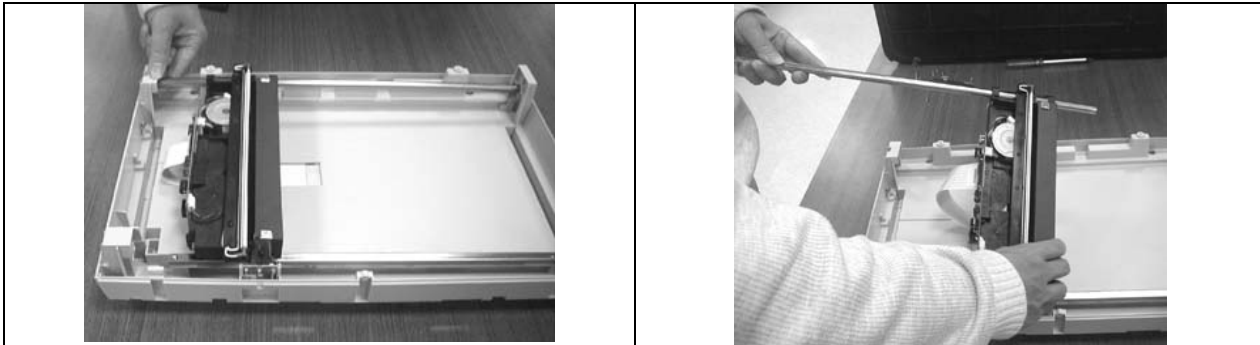


Belt removal

### 7.3.6 OPTICAL CHASSIS

#### DISASSEMBLING PROCEDURE

- (1) Lift the sliding rod and pull it out.
- (2) Disconnect the flat cable fixed on the bottom housing.



Optical chassis removal

**Attention:** Do not remove the flat cable fixed on the optical chassis.

#### ASSEMBLING PROCEDURE

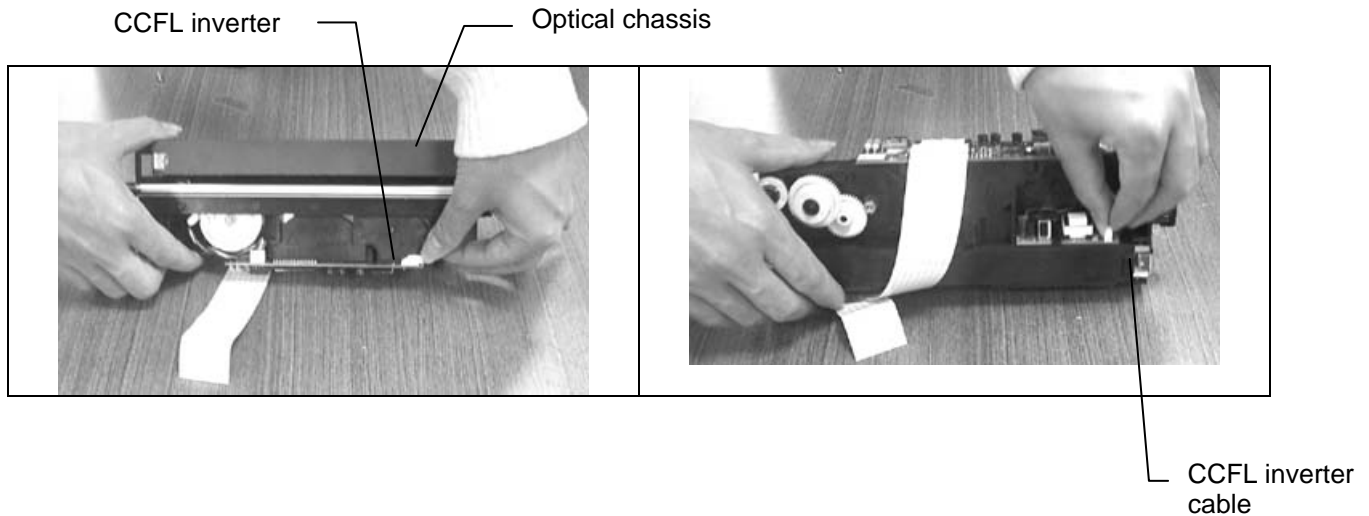
Assemble the part in reverse order of the disassembling procedure.

**Note:**

- Do not remove the flat cable from the optical chassis as the flat cable need special tool to reinstall it.
- Any unauthorized action may cause unexpected result and will therefore not be responsible by the manufacturer.

### 7.3.7 CCFL INVERTER PCBA

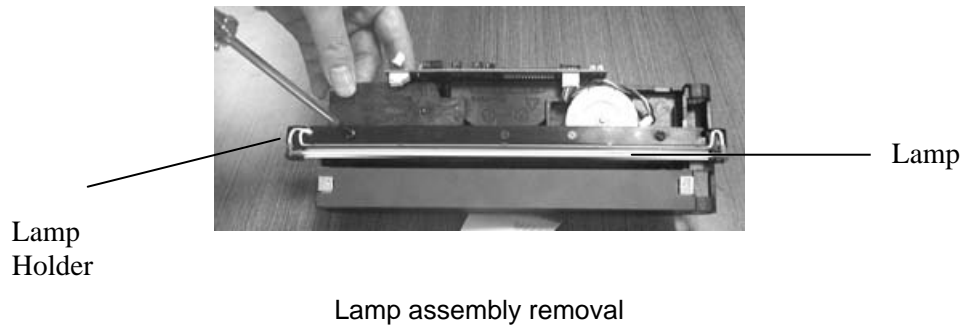
- (1) Remove optical chassis.
- (2) Remove the CCFL inverter PCBA from the optical chassis.
- (3) Disconnect the CCFL inverter cable and CCFL inverter PCBA cable.



Inverter PCBA removal

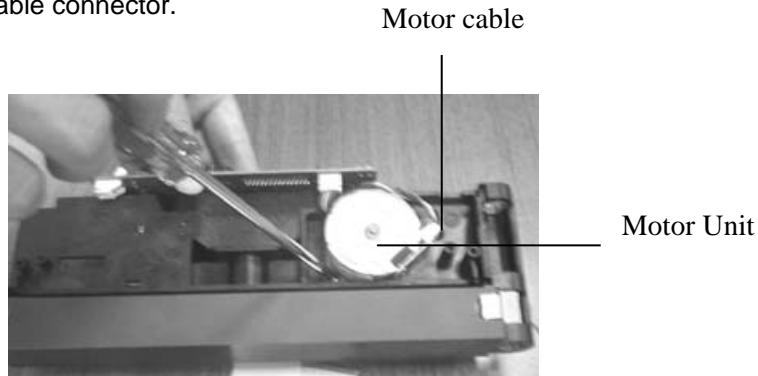
### **7.3.8 LAMP ASSEMBLY**

- (1) Remove the CCFC inverter
- (2) Loosen the fixing screws of the lamp holder.
- (3) Disconnect and replace the old lamp assembly with a new one.
- (4) Fix the lamp assembly in place with the fixing screw.



### 7.3.9 MOTOR UNIT

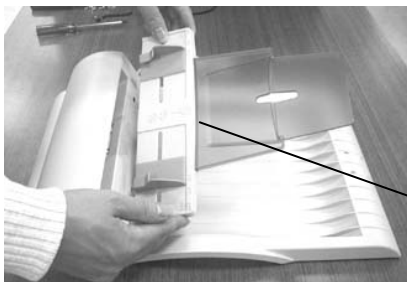
- (1) Remove upper housing.
- (2) Remove the optical chassis and the CCFL inverter PCBA.
- (3) Remove the lamp assembly by loosening the fixing screws.
- (4) Loosen the fixing screws as shown in the figure below.
- (5) Remove the motor cable connector.



Motor unit removal

### 7.3.10 ADF PAPER-TRAY REMOVAL

Move the adjusting guides to the medium place , and then remove the paper-tray supports

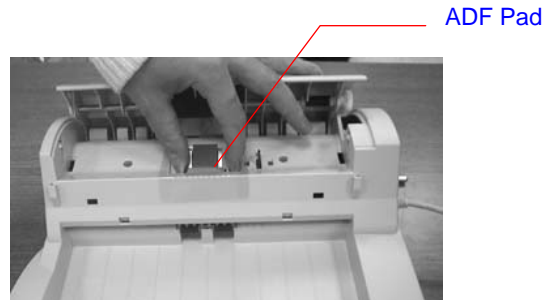


Paper -tray  
Support

### 7.3.11 REPLACING THE ADF SNAP-IN PAD MODULE

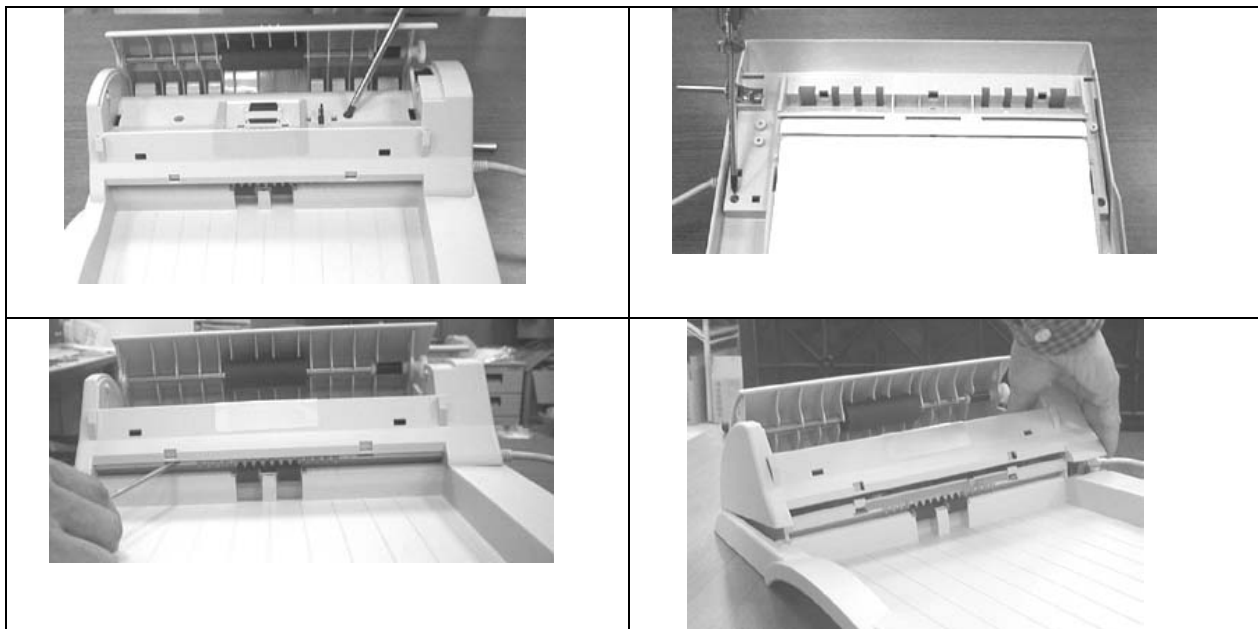
After scanning approximately 20,000 pages through the ADF, the pad may be worn out and you may experience problems with document feeding. In this case, it is highly recommended that you replace the pad module with a new one. To order a pad module, please consult your nearest dealer and follow the procedure below to replace it.

1. Gently open the ADF front cover to the left.
2. Press both arms of the ADF snap-in pad module inwardly with your two fingers to pull out the ADF snap-in pad module.



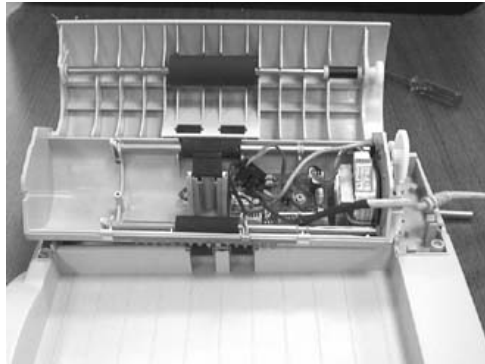
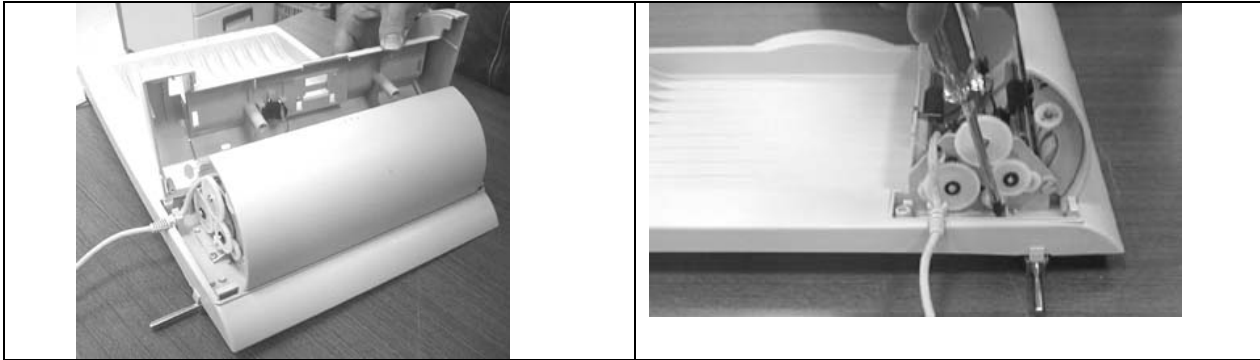
### 7.3.12 FRONT COVER REMOVAL

1. Move the front cover to the indicated left.
2. Loosen the screws.
3. Turn the ADF cover up side down, and loosen the screws.
4. Insert a flat screwdriver into the two indicated holes to release the ADF cover.
5. Hold one side to lift the ADF front cover.



### 7.3.13 LOWER COVER REMOVAL

1. Remove the lower cover.
2. Loosen the screws as indicated.

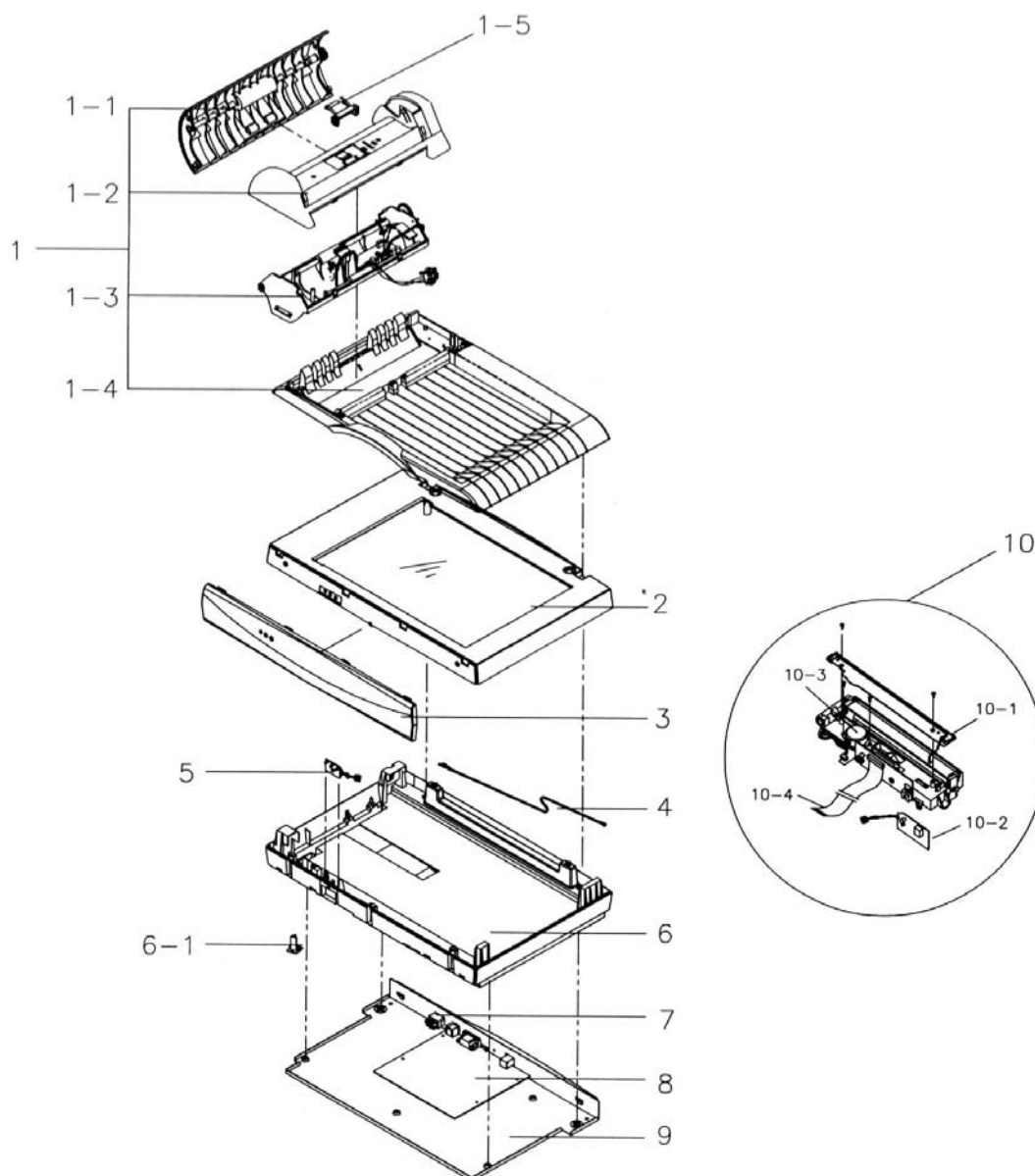


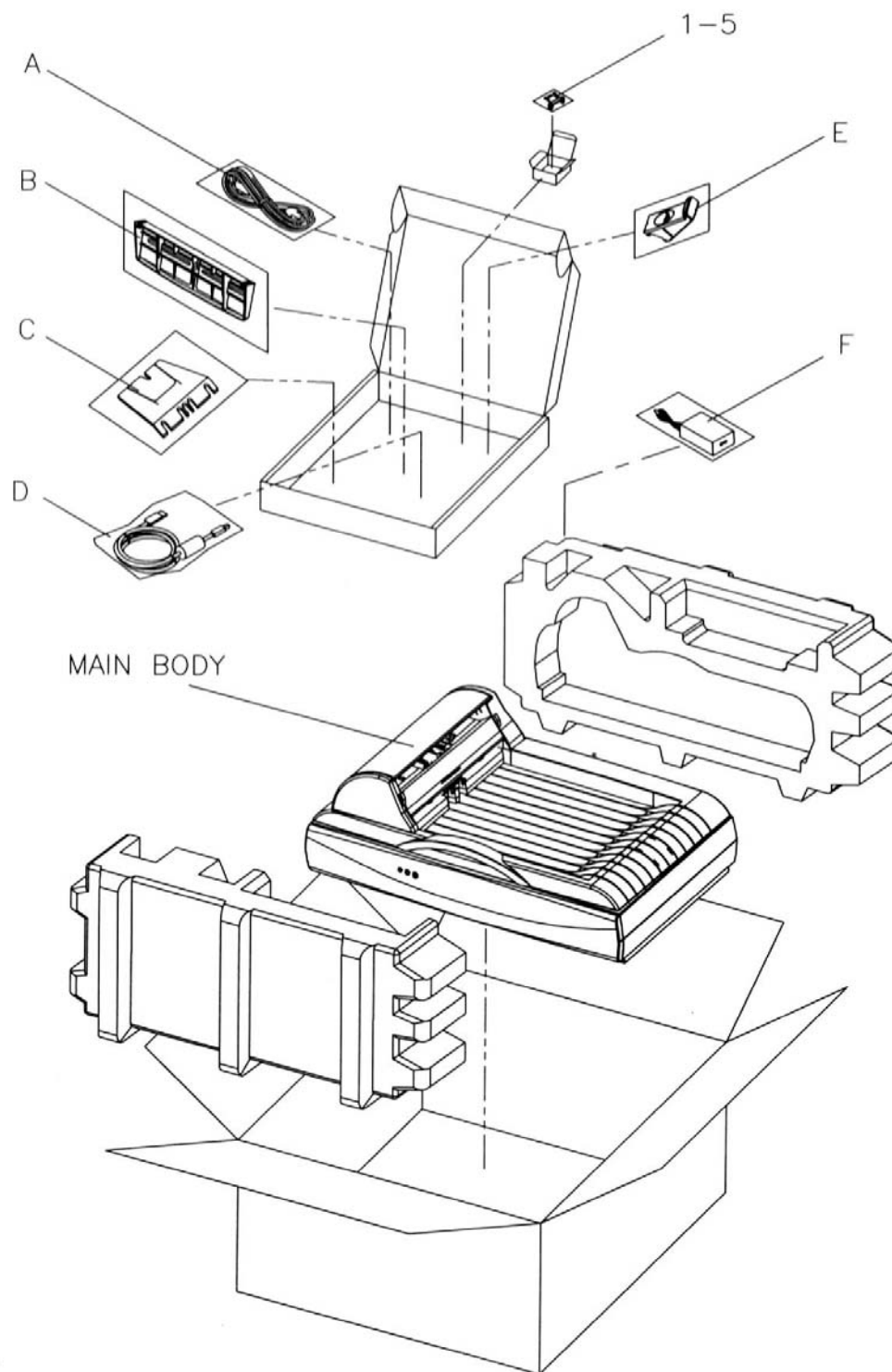


## 8. PARTS

### 8.1 Spare Part Diagram/Table

#### 8.1 SPARE PART DIAGRAM





<p><b>DOCUMATE 510</b> <b>SERVICE PARTS TABLE</b></p>			
ITEM	DESCRIPTION	AV P/N	REV.
<b>ADF PARTS</b>			
1	ADF UNIT	002-1141-0-SP	1.0
1-1	UPPER COVER, ASSEMBLY	051-0822-0-SP	1.0
1-2	FRONT CASE, ASSEMBLY	002-1285-0-SP	1.0
1-3	MAIN CASE, ASSEMBLY	002-1182-0-SP	1.0
1-4	BOTTOM CASE, ASSEMBLY	002-1181-0-SP	1.0
1-5	PAD, ASSEMBLY	002-1193-0-SP	1.0
<b>FLATBED SCANNER PARTS</b>			
2	UPPER HOUSING, ASSEMBLY	002-1165-0-SP	1.0
3	FRONT CASE, ASSEMBLY	002-1299-0-SP	1.0
4	BELT, ASSEMBLY	003-2178-0-SP	1.0
5	LED BOARD (LB26), ASSEMBLY	004-0438-0-SP	1.0
6	BOTTOM, ASSEMBLY	002-0956-0-SP	1.0
6-1	LOCK, ASSEMBLY	051-1035-0-SP	1.0
7	SWITCH, ASSEMBLY	003-0212-0-SP	1.0
8	PCBA MOUNT, ASSEMBLY	054-0241-0-SP	1.0
9	MB117 + F/W, ASSEMBLY	003-5342-0-SP	1.0
10	OPTICAL, ASSEMBLY	002-1395-0-SP	1.0
10-1	LAMP, ASSEMBLY	002-1160-0-SP	1.0
10-2	INVERTER, ASSEMBLY	003-0187-0-SP	1.0
10-3	MOTOR MODULE, ASSEMBLY	065-0053-0-SP	1.0
10-4	FLEXIBLE FLAT CABLE, ASSEMBLY	104-0148-0-SP	1.0
<b>OTHERS</b>			
A	AC POWER CORD---US/JPN	104-0080-0-SP	1.0
A-1	AC POWER CORD---UK	104-0077-0-SP	1.0
A-2	AC POWER CORD---EUR	104-0079-0-SP	1.0

**DOCUMATE 510**

B	PAPER TRAY, ASSEMBLY	002-1177-0-SP	1.0
C	PAPER SUPPORT, ASSEMBLY	002-0777-0-SP	1.0
D	USB CABLE	104-0119-0-SP	1.0
E	PAPER STOPPER, ASSEMBLY	002-1178-0-SP	1.0
F	ADAPTOR : IEC-2PIN, 24V/0.83A(20W),100-240V	003-0306-0-SP	1.0

**Table 10.1 Spare Parts for DOCUMATE 510**