ADF DF7010

Field Service Manual

November, 2017

Introduction

⚠ The cause of most accidents is failure to adhere to basic safety rules and observe safety instructions. It is important to prevent potential causes of accidents from occurring. In order to do so, read this manual carefully, and be sure to understand all the safety instructions and correct inspection and servicing procedures that it provides before beginning repair or servicing work.
Repairing or servicing the machine with insufficient knowledge about it could lead to unforeseen accidents.

⚠ It is not possible to anticipate and describe in a manual such as this every possible hazard that could arise in the course of repair and servicing. Therefore, besides observing the safety instructions marked in this manual and on the machine's labels, service personnel should be safety-conscious and take other safety precautions as necessary. When performing repair or service work not covered by this manual, you should obtain safety guidance from an appropriately knowledgeable person.

■ Using the Service Manual

●This manual contains the following information: structure and function of major parts, disassembly and reassembly procedures, specifications, and procedures for adjustment, maintenance, inspection and corrective action. This information is current as of September 2015, and applies basically to the model ADF DF7010. From time to time, parts are changed to improve quality, performance or safety.
Note therefore that in some cases, certain parts or machine structure aspects described in the text or illustrations of this manual may not be precisely the same as the product being serviced.

●Safety instructions marked with a "⚠" (WARNINGS and CAUTIONS) are very important for safety and must be observed.

● Safety-related instructions

⚠ **WARNING:** If the instructions accompanying this symbol are ignored and the machine is operated incorrectly, death or serious injury is likely to result.

⚠ **CAUTION:** If the instructions accompanying this symbol are ignored and the machine is operated incorrectly, death or serious injury, or else material damage, is likely to result.

Examples of pictorial symbols

A "⃠" symbol tells you that a certain action is forbidden. Precisely what is forbidden is indicated by a picture inside the symbol (in the example here, the picture means that disassembly is forbidden), or in writing at the side of the symbol.

A "●" symbol means that a certain action is forbidden and/or that a specific instruction must be followed. The specific instruction is indicated by a picture inside the symbol (in the example here, the instruction is "Remove the power plug from the socket").

● Service work-related instructions

IMPORTANT Draws attention to important information. If this information is ignored and the machine is operated or serviced incorrectly, the machine's performance could drop, or it could break down.

REFERENCE Draws attention to information that is useful for operation or maintenance of the machine, and to information about its performance, etc.

⚠ Safety Instructions

1. Cautions regarding the installation location

⚠ CAUTION

Installation environment

► Avoid installing the machine in places exposed to direct sunlight.
- ● Sunlight will cause the temperature in the machine's interior to rise, possibly leading to malfunction of the control system.
- ● Sunlight could cause misoperation of the sensors.
- ● The heat of direct sunlight could cause deformation of the machine's plastic parts.

*Also avoid installation near to a ground glass window; light and heat penetrate such windows although they are opaque.

► Avoid installing the machine in places subject to high or low temperature or humidity.
- ● High or low temperature or humidity could cause the machine to operate abnormally.

Suitable temperature and humidity ranges are:

Ambient temperature: 10°C-35°C

Ambient humidity: 40%-70%

Optimum temperature and humidity: 20°C, 65%

- ● If the machine is installed near to faucets, water heaters or humidifiers, or in cool (sunless) parts of a building or in the vicinity of water sources, the paper could absorb moisture and curl, leading to misfeeds or poor image quality.

► Avoid installing the machine in places with open flames, or where reflected heat or other hot air currents (from stoves, etc), or cold air currents from air conditioners, etc will strike it directly.

► Avoid installing the machine in poorly ventilated places.

► Avoid installing the machine in dusty places.

► The machine should not be tilting when it is used.
- ● Install the machine so that it is level.

(The machine should be level to within 5mm in the front-rear direction, and 5mm in the lateral direction.)

► Do not install the machine on shaky, sloping or otherwise unstable surfaces.
- ● The machine could fall over on such surfaces, or fall off them, causing injury.

2. Cautions for maintenance, inspection and servicing

⚠ WARNING

- **Precautions for safe servicing**
- Always remove the power cord plug from the outlet before starting work.
  → Otherwise, you could get a shock or your hands/fingers could be injured.
- However, the plug must be left connected to the outlet when performing function checks (of individual motors, a given series of operations, or electrical circuits).
  When motors are operated alone in function checks, interlocks are deactivated, so be aware of the conditions and positions of related equipment, and take great care not to put your hands or fingers into moving parts.

- Do not touch the rotating parts when operating the drum removal button and the paper eject switch or while the machine is running.
  → Otherwise, your hands/fingers could get caught and crushed between the drum and rollers.

- Working clothes
  • Wear clothing that enables you to work safely.
  Work clothing should be close-fitting.

⚠ CAUTION

- Tools
  • Use tools that are appropriate for the work.

Table of Contents

Chapter 1 Introduction

1 Specifications

Model name	ADF DF7010
Document feed	Automatic feed
Document type	Sheets*1
Document weight	64–128 gsm
Document size	MAX. : 297×432 mm MIN. : 100×148 mm
ADF Capacity	100 sheets (64 gsm), 85 sheets (80 gsm/20 lb Bond)
Document set	Document face up (printing side up)
Document set orientation	Document size (A4, B5, A5): portrait placement, landscape placement Document size (A3, B4): portrait placement only
Document processing mode	One-sided document → one-sided master making 2IN1 layout
Power supply	Supplied from printer 5 VDC, 24 VDC
Weight	8Kg
Dimension	563(W) x 459(D) x 203(H)mm
Operating temperature	10–35 degrees (C) (50–95 degrees (F))

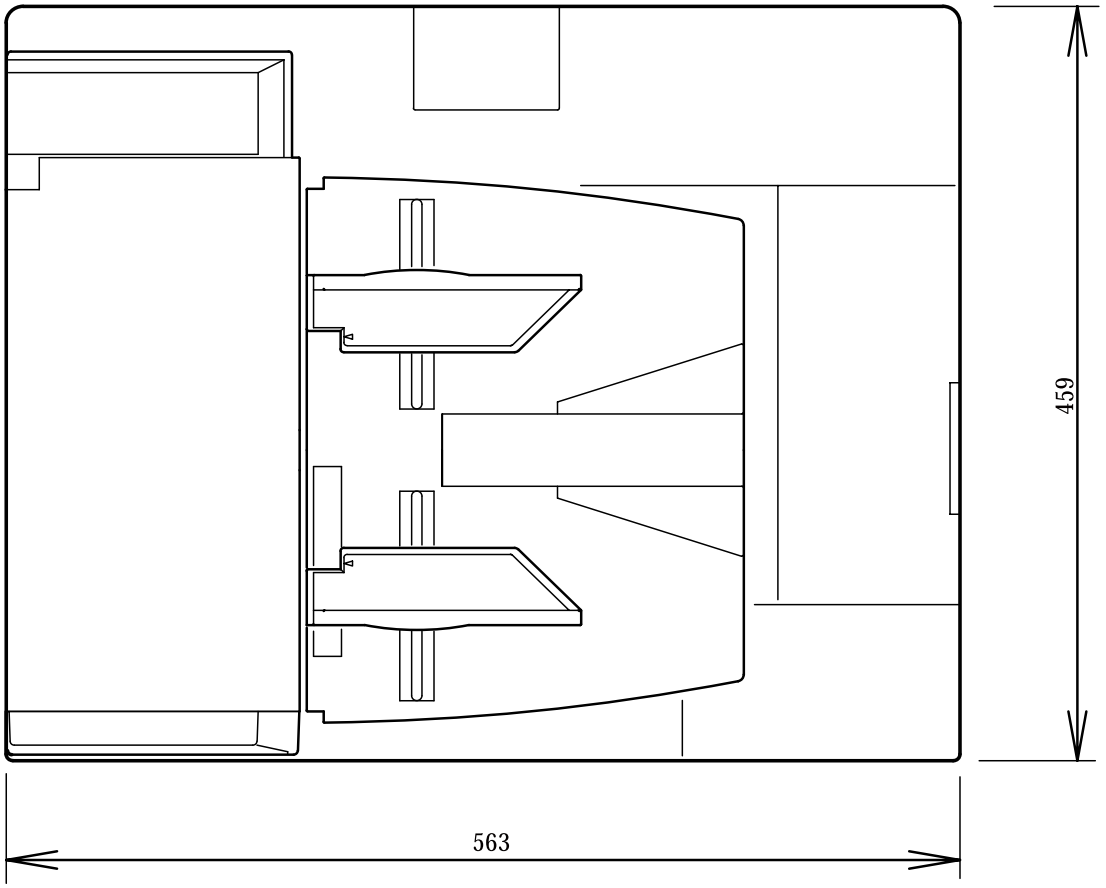
*1 The following types of document cannot be used :
- Documents with large file-binding holes
- Documents with staples or paper clips attached
- Documents with markedly curling ends/sides, or marked folds
- Documents with tears or rough edge
- Chemically treated documents with such as thermal paper and carbon paper, etc.
- Highly transparent documents such as OHP film and tracing paper, etc.
- Documents which surface is slippery such as art paper and coated paper, etc.
- Documents with correction fluid and glue, etc.
- Documents with smaller pieces of glued paper

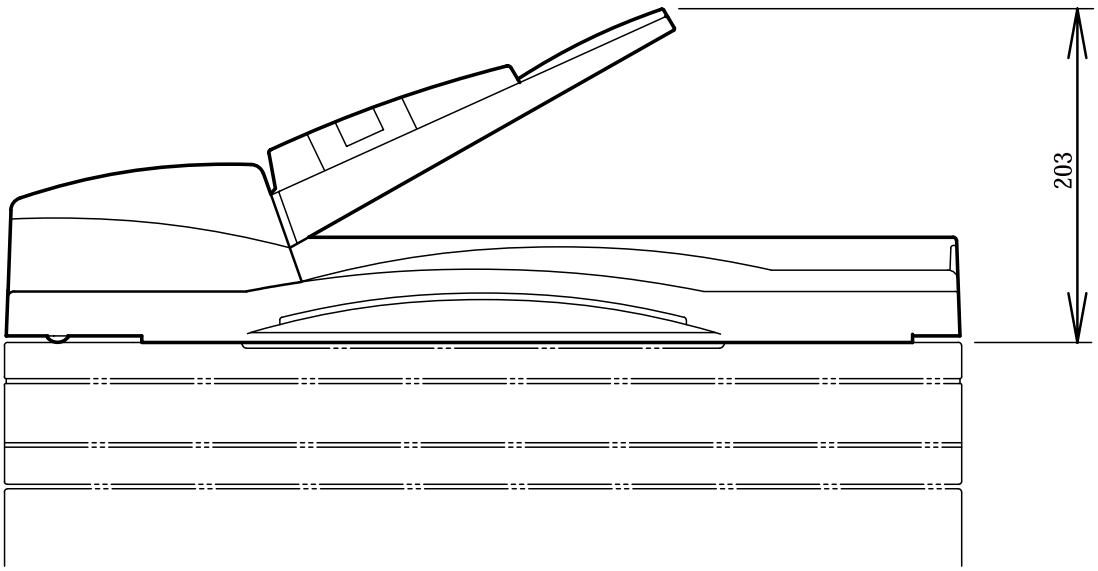
Always use documents of the same size. If you load documents in different length, the printer may not operate correctly.

Specifications are subject to change without prior notice due to continual improvements.

2 Dimensions

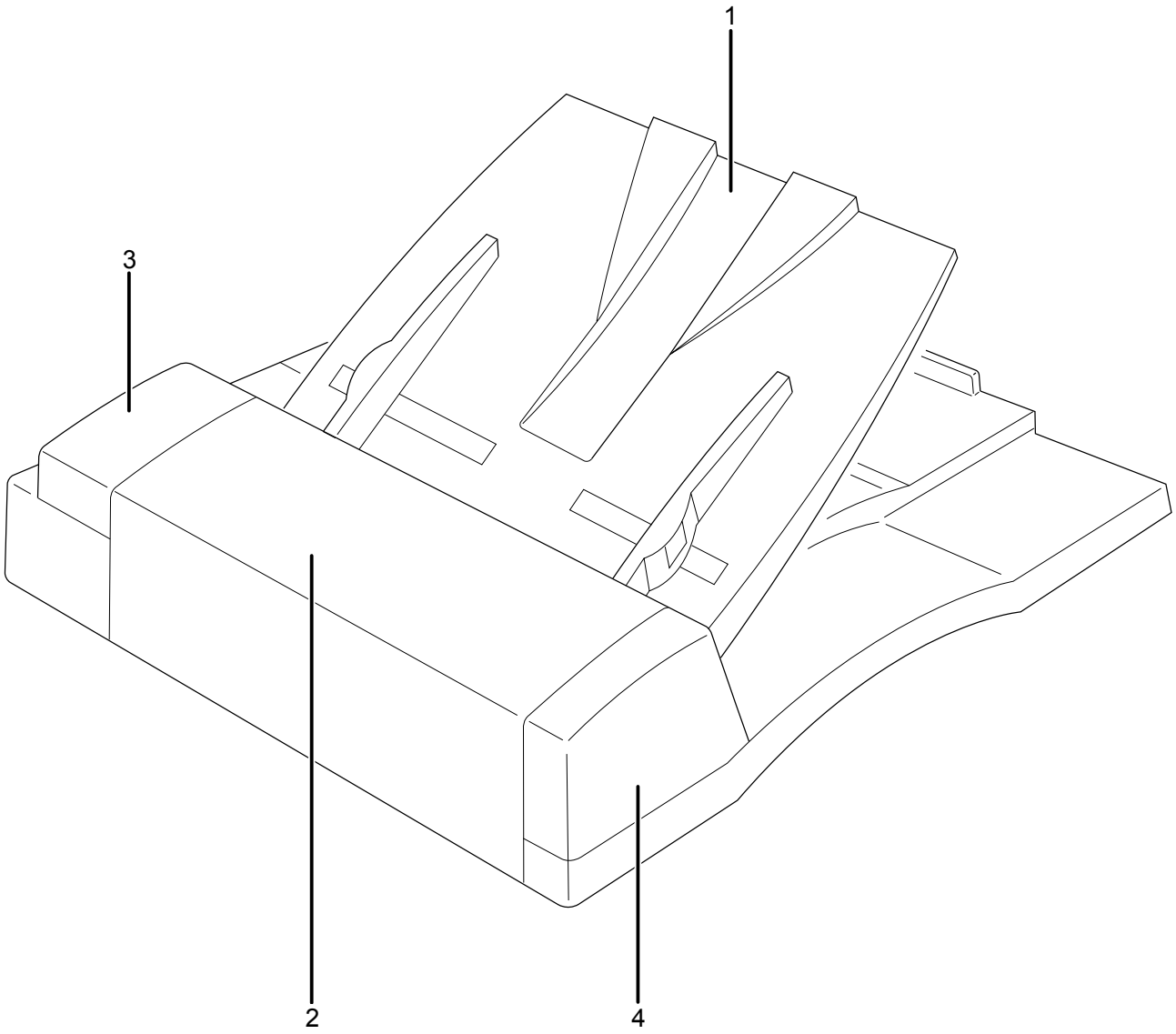
Unit : mm





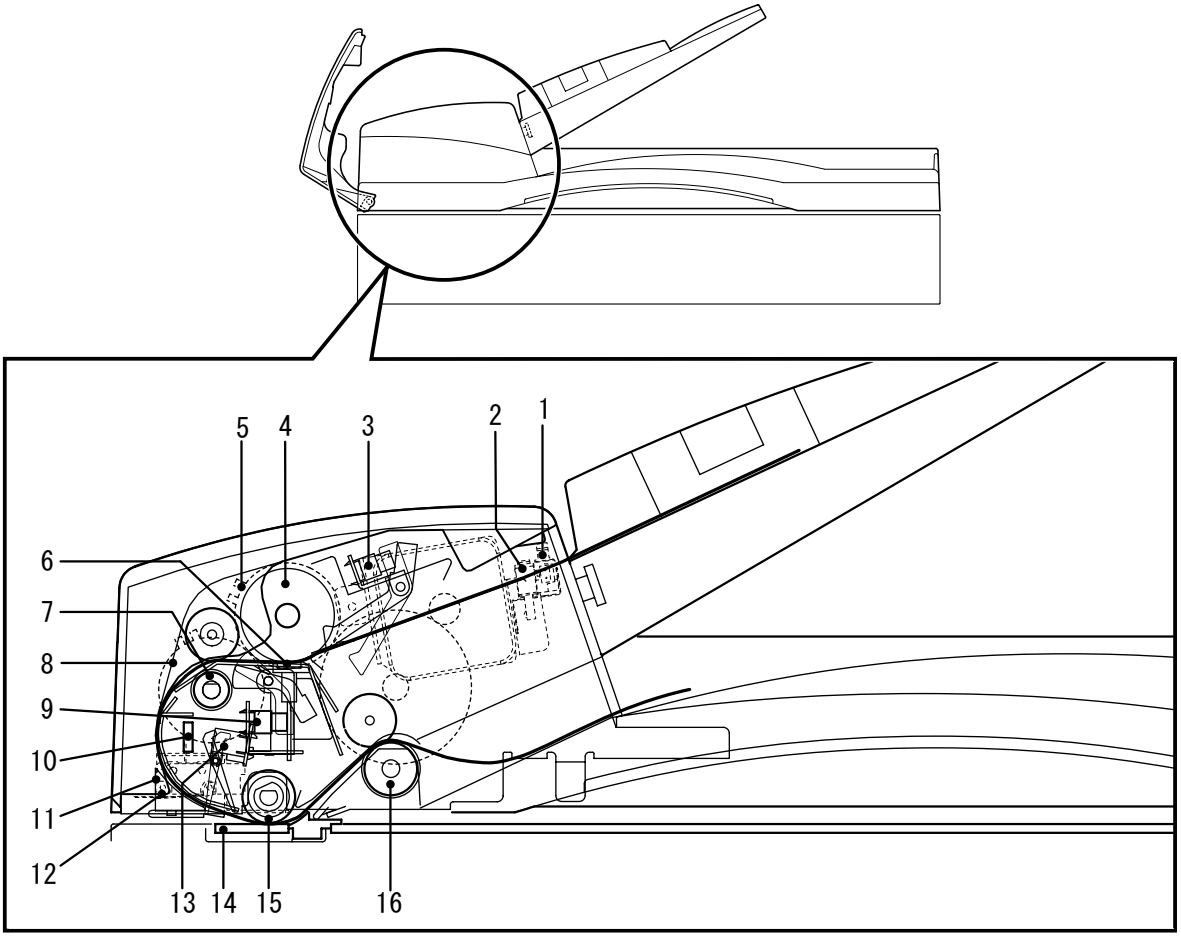
3 Part Names

1. Machine Exteriors(Paper infeed side)



No.	Name
1	Document tray
2	ADF cover
3	ADF Rear cover
4	ADF Front cover

2. Cross Section (Structure) Surface



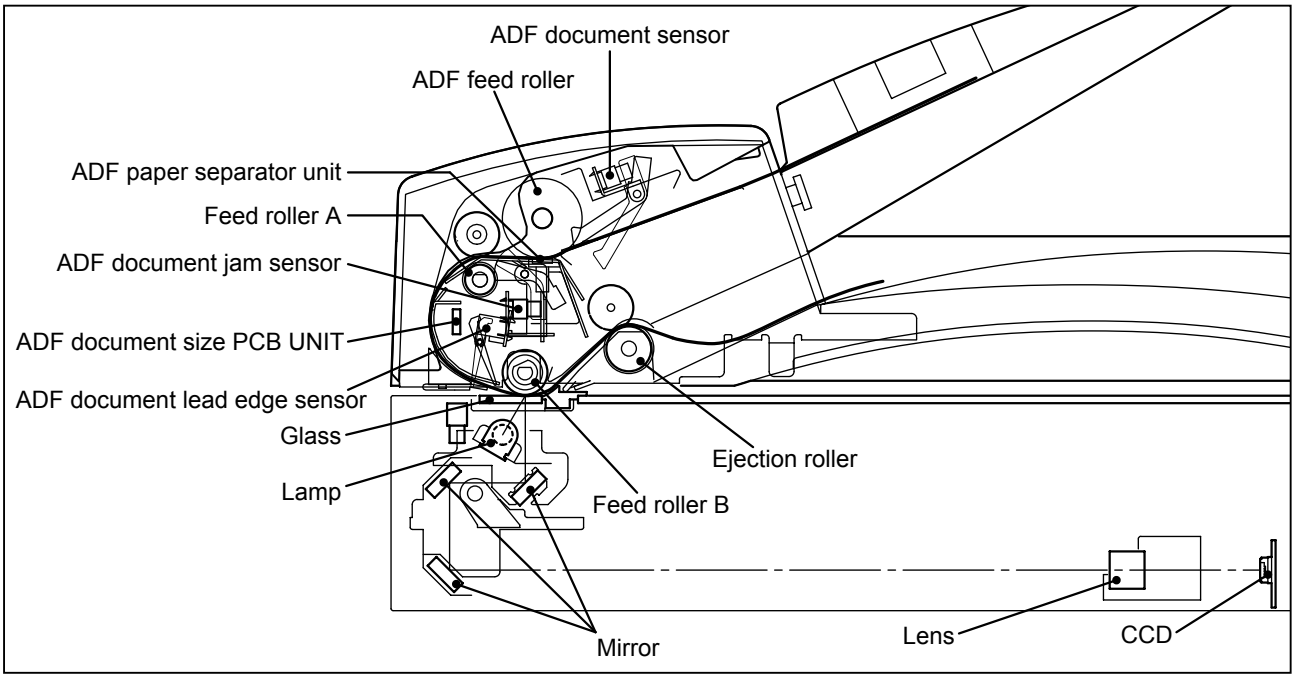
No.	Name
1	ADF cover switch
2	ADF cover switch 2 (for interlock)
3	ADF document sensor
4	ADF feed roller
5	ADF clutch A
6	ADF paper separator unit
7	Feed roller A
8	ADF clutch B
9	ADF document jam sensor
10	ADF document size PCB UNIT
11	ADF document cover open/close switch
12	ADF document cover open/close switch 2 (for interlock)
13	ADF document lead edge sensor
14	Glass
15	Feed roller B
16	Ejection roller

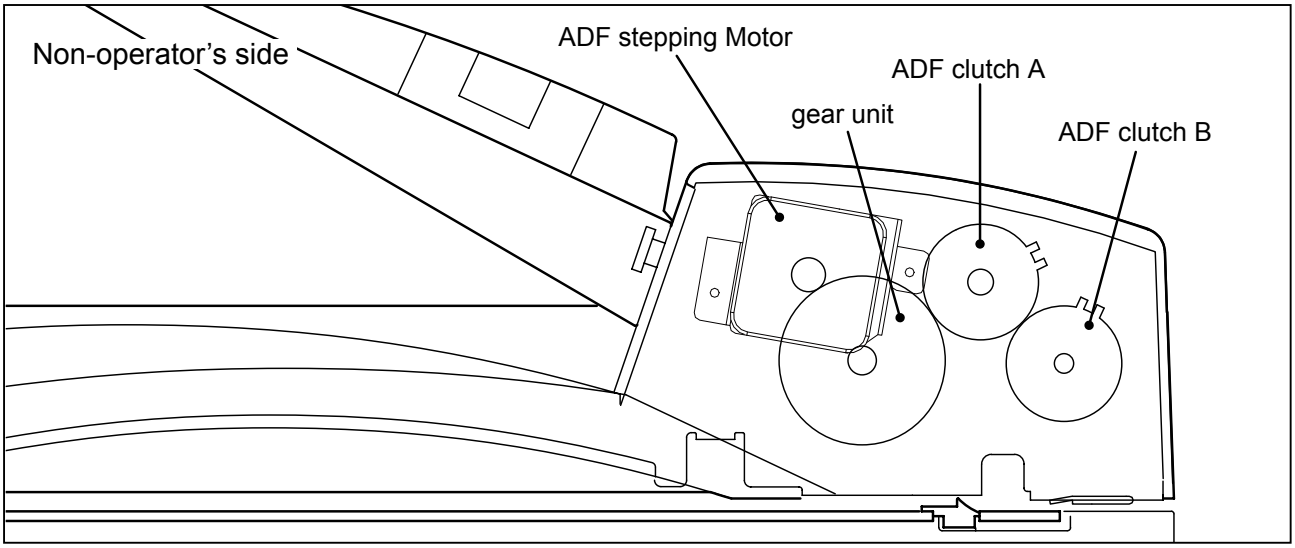
MEMO

Chapter 2 Description of the Operation

1 Description

The machine contains a scanner of the document moving type which scans images while the document is fed. The document is illuminated with the lamps while being transferred, and the reflection in proportion to the document image darkness is imaged on the CCDs through the mirror lens. Then the image is resoluted into picture elements and converted photoelectrically into the level of electricity simultaneously.
The document is fed and carried by a single stepping motor. Two clutches (A and B) are used to engage or disengage the ADF feed roller and the feed roller. The clutch is turned on only for feeding paper to engage the scanner stepping motor with the driving system for the ADF feed roller. After the document reaches the feed roller, clutch A is turned off and clutch B is turned on. The roller follows the movement of the document (fed by the ejection roller).





2 Sequence of Operation

(1) Document Detection

1. Detection of the the document
2. Detection of the front end of the document
3. Detection of the rear end of the document
4. Detection of the finish of the document
5. Detection of document jam

(1) Detection of the document

The ADF document sensor detects the document on the document receiving tray. When the document is placed on the document receiving tray, the ADF document sensor is photointerrupted and detects the presence of the document, which turns on the ADF stepping motor and the ADF clutch A to feed paper.

(2) Detection of the front end of the document

The ADF document lead edge sensor detects the front end of the document before the reading section. When the ADF document lead edge sensor is photointerrupted by the document fed with the ADF feed roller, it detects the front end of the document.

(3) Detection of the rear end of the document

The ADF document lead edge sensor also detects the rear end of the document during master making. When the document is fed 20 mm after the rear end is detected, the reading of the document is finished and the ADF stepping motor runs at a slower speed than the document reading speed to eject the document. When the document is fed approx. 20 mm after the reading is finished, the ADF stepping motor stops.

IMPORTANT

The reading of document is terminated at the earlier time when the longitudinal length is fed of the document size selected on the control panel or the document is fed approx.20 mm after the rear end is detected. If master making for the document with an unspecified size is required, select a document size on the control panel with a longer longitudinal length than the longitudinal length of the document.

(4) Detection of the finish of the document

The document sensor also detects the finish of the document on the document receiving tray. When the rear end of the last document on the document receiving tray have passed by the document sensor, the sensor is photoexposed and detects the finish of the document, which prohibits feeding the next document.

(5) Detection of document jam

When the document front end detected by the ADF document sensor cannot be detected by the ADF document jam sensor, jam error is displayed. When the document front end that has passed by the ADF document jam sensor cannot be detected by the ADF document lead edge sensor, jam error is displayed.

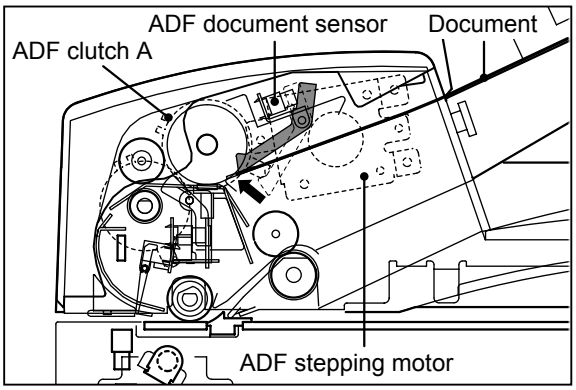
Also when the document rear end detected by the ADF document jam sensor cannot be detected by the ADF document lead edge sensor, jam error is displayed.

(2) Basic Operation for Feeding Paper to Scanner

Operation

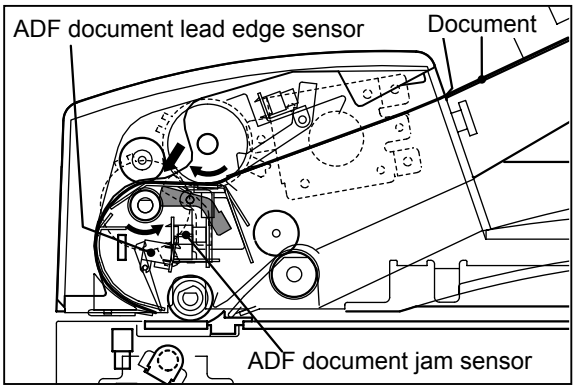
(1) Paper feed 1

When the document is placed on the document receiving tray, the ADF document sensor is photointerrupted and detects the presence of the document. Pressing the MASTER MAKING key turns on the ADF stepping motor and ADF clutch A, feeding the document.



(2) Positioning

ADF Clutch A and the ADF stepping motor are turned off when the document is fed 16 mm after the ADF document jam sensor is photointerrupted. This prevents the position of the documents from deviating, which is caused by meandering during paper feeding. If the front end of the document does not reach the ADF document lead edge sensor within 5 seconds after the ADF document jam sensor is photointerrupted, DOCUMENT JAM will be displayed.

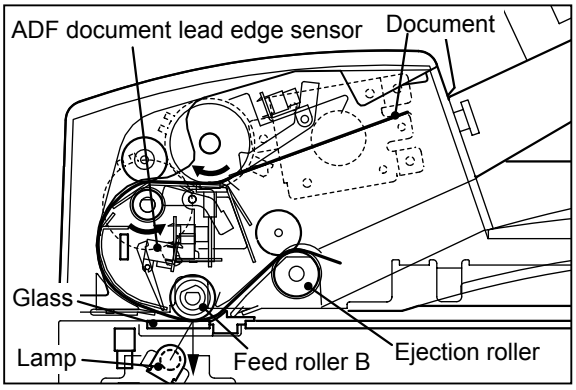


(3) Paper feed 2

The ADF stepping motor and ADF clutch B are turned on again and the document is fed.

(4) Reading the document

After the front end of the document is detected at the ADF document lead edge sensor, the document is fed several steps, and shading is performed on approximately 2mm of the front end of the document.

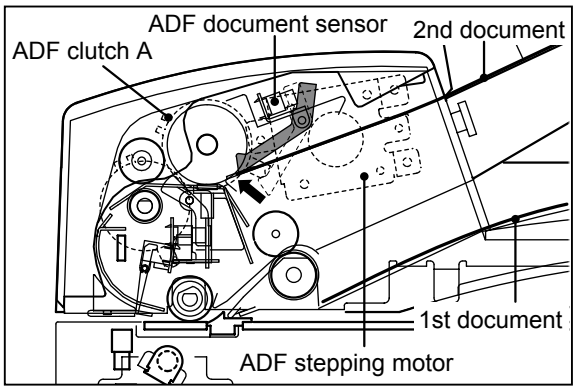


(3) Operation on Continuous Master Making

Operation

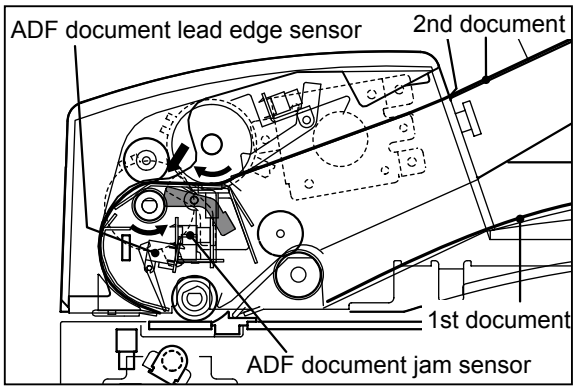
(1) Paper feed 1 for the second document

If the ADF document sensor is photointerrupted when the document has been ejected and master making process is finished at the master feeding section, it is determined that the next document exists and the ADF stepping motor, and the ADF clutch A is turned on to feed the document.



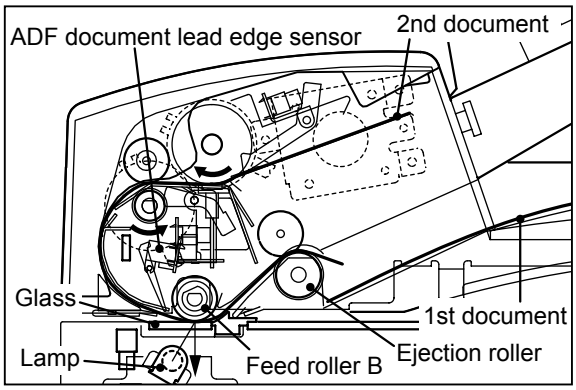
(2) Positioning

When the front end of the document reaches the ADF document lead edge sensor, the ADF document lead edge sensor is photointerrupted and detects the front end of the document, which turns off the ADF stepping motor and the ADF clutch A to hold. This method assures stable positioning of the document.



(3) Reading the document

After the front end of the document is detected at the ADF document lead edge sensor, the document is fed several steps, and shading is performed on approximately 2 mm of the front end of the document.



IMPORTANT

- When the previous document has been printed, the printer detaches the master and then the drum moves to the master attachment position to open the master clamp. During these operations, the ADF is in the standby status.

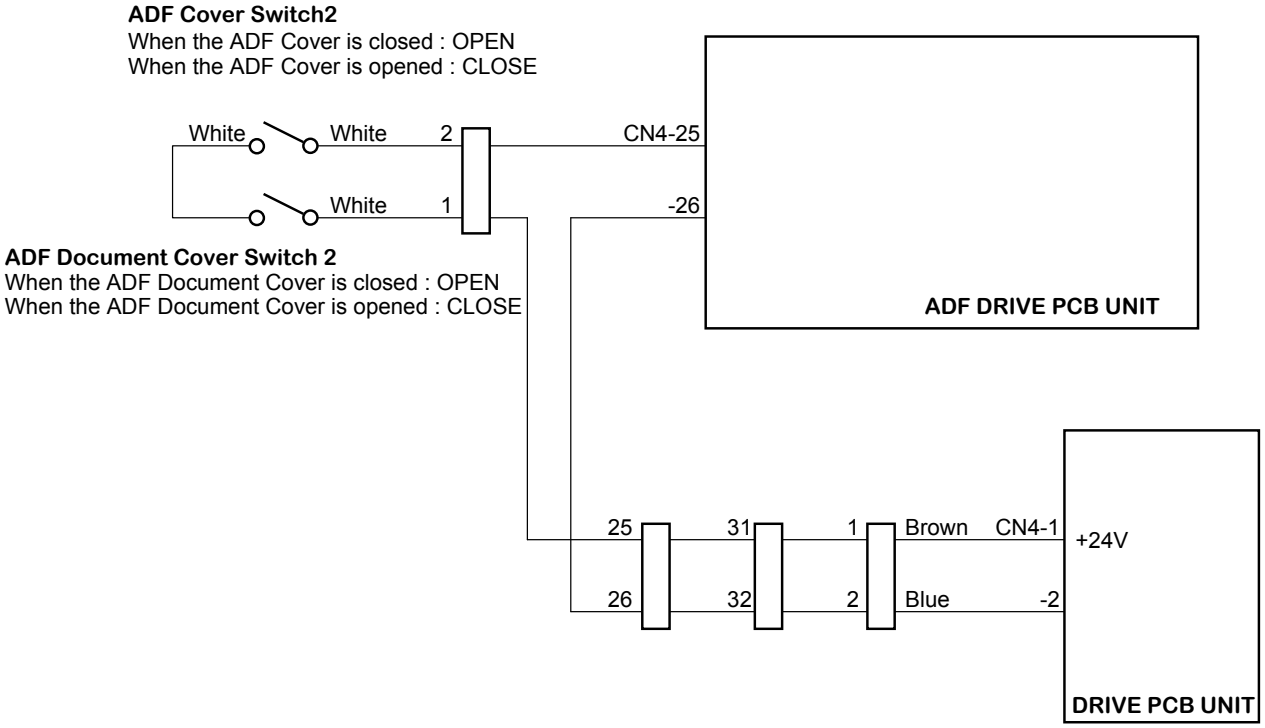
3 Function of Parts and Circuit

(1) Interlock Circuit

Description

Opening and closing of the ADF cover and ADF document cover is detected by the micro switch. This unit does not work for safety unless the ADF cover and ADF document cover are closed. The unit stops immediately when the ADF cover or ADF document cover are opened during operation.

Circuit

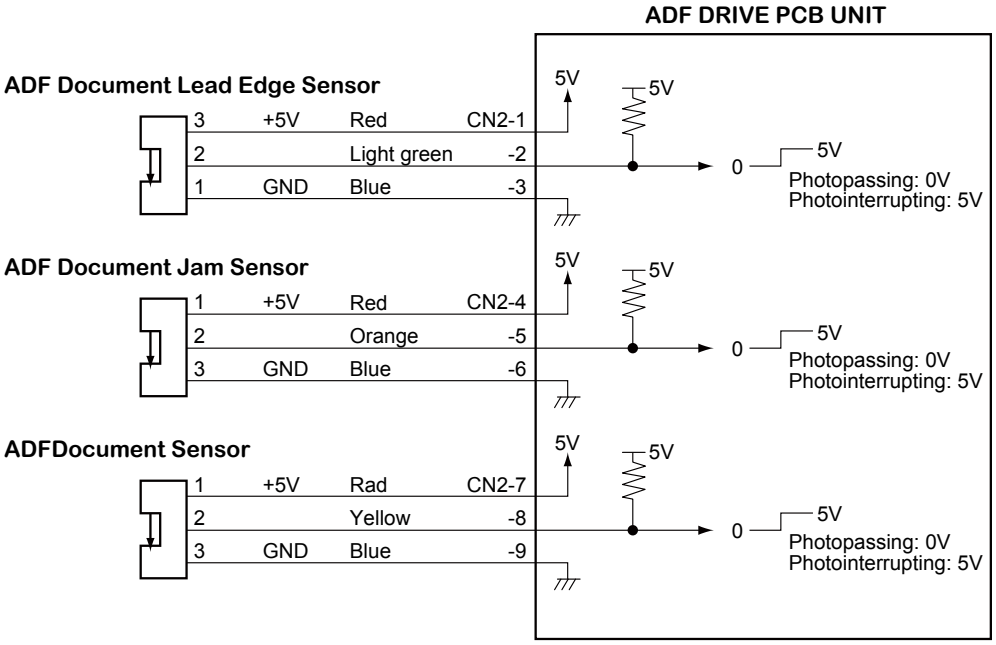


(2) Document Sensors

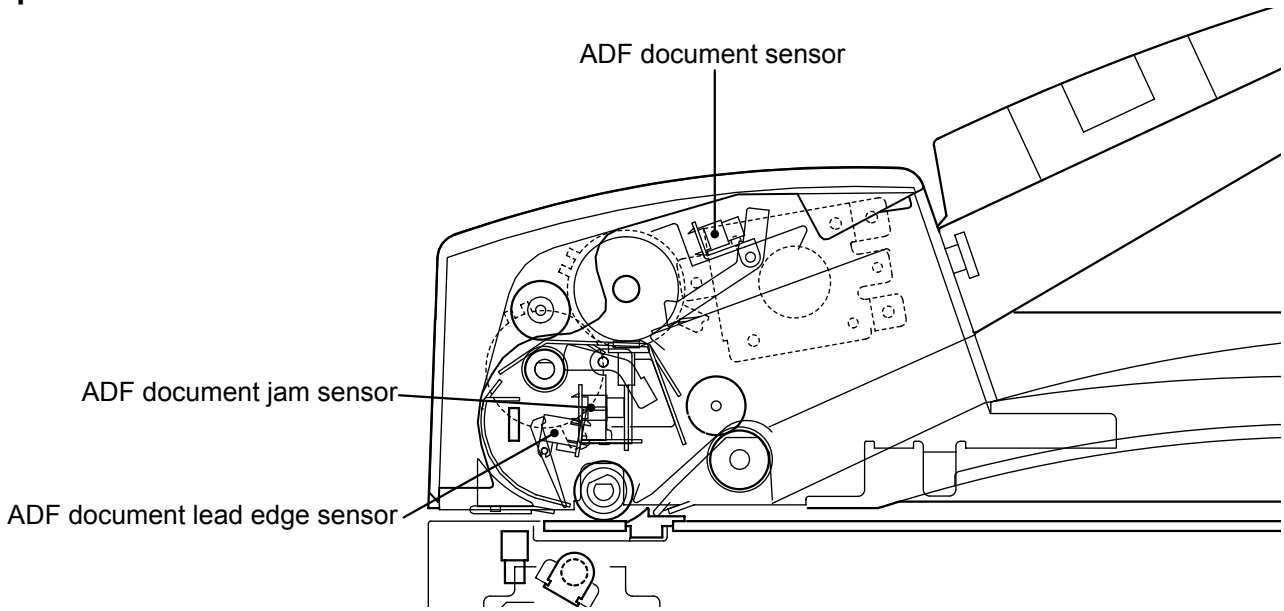
Description

The ADF document sensor detects the presence of the document on the document tray. The ADF document jam sensor and ADF document lead edge sensor detects the front and rear end of the document. Five types of document detection are performed: detection of the document presence, detection of the front end of the document, detection of the rear end of the document, detection of the finish of the document, detection of document jam.

Circuit



Operation

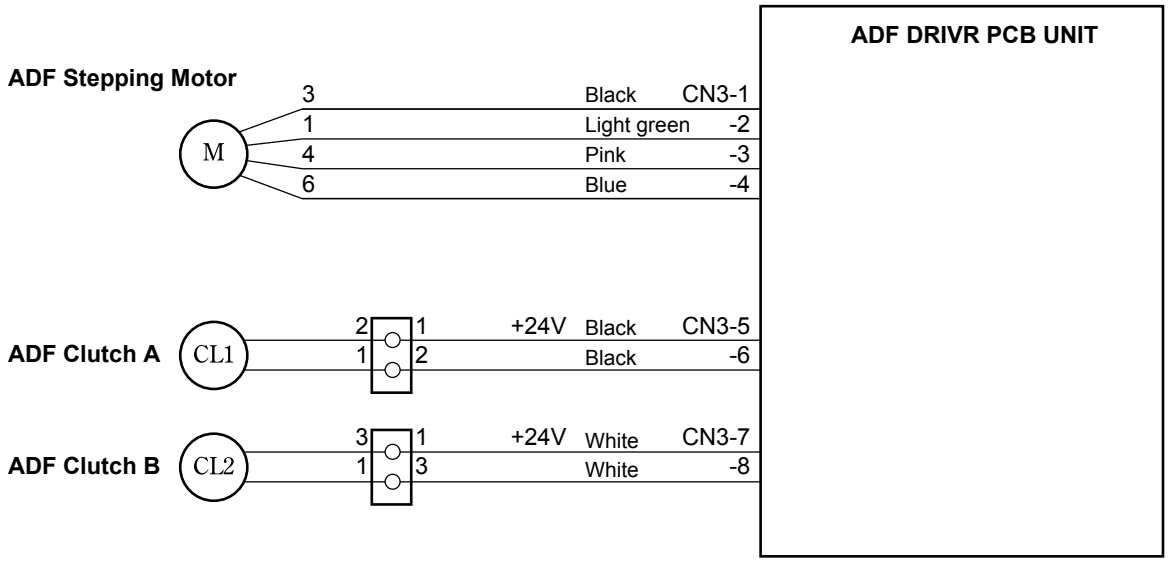


(3) ADF Stepping Motor / ADF Clutch A, B

Description

The rollers for ADF are driven by the ADF stepping motor. The paper feed roller is engaged with the drive system when the ADF clutch A is turned on. Also, the feed roller A is engaged with the drive system when the ADF clutch B is turned on.

Circuit



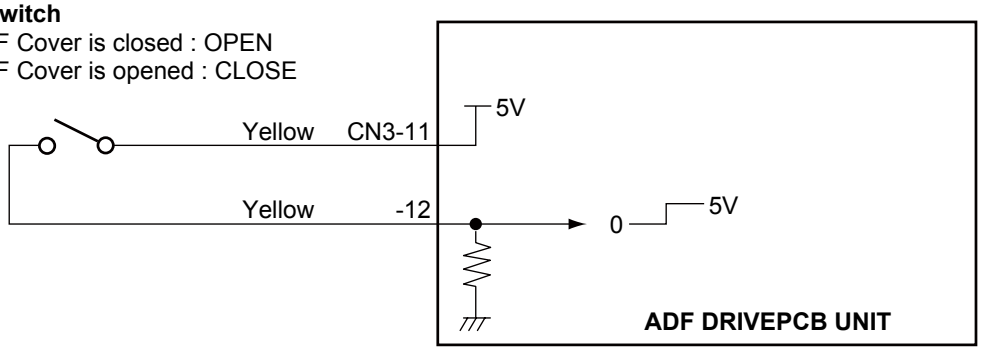
(4) ADF Cover Switch

Description

Opening and closing of the ADF cover is detected by the micro switch. If the ADF cover is not closed firmly, **CLOSE ADF COVER** will be displayed.

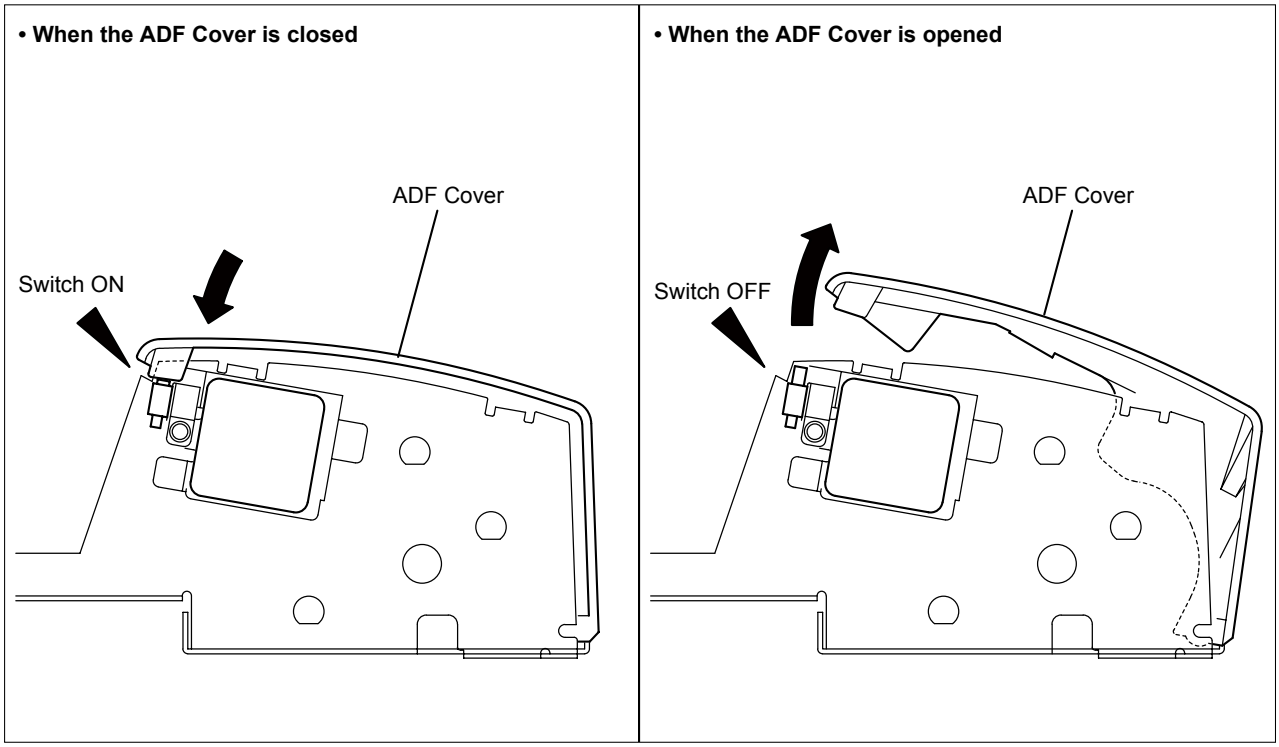
Circuit

ADF Cover Switch
When the ADF Cover is closed : OPEN
When the ADF Cover is opened : CLOSE



Operation

When the ADF cover is closed, the switch is pressed; OPEN.
When the ADF cover is open, the actuator is released; the micro switch is turned to CLOSE.



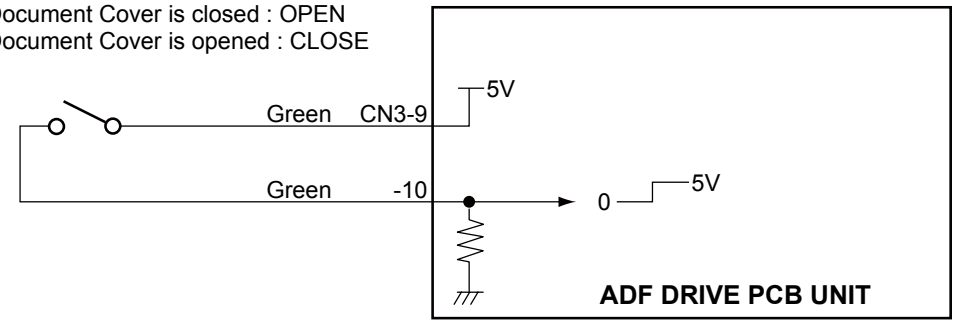
(5) ADF Document Cover Open/Close Switch

Description

Opening and closing of the ADF document cover is detected by the micro switch. If the ADF document cover is not closed firmly, **CLOSE SCANNER COVER** will be displayed.

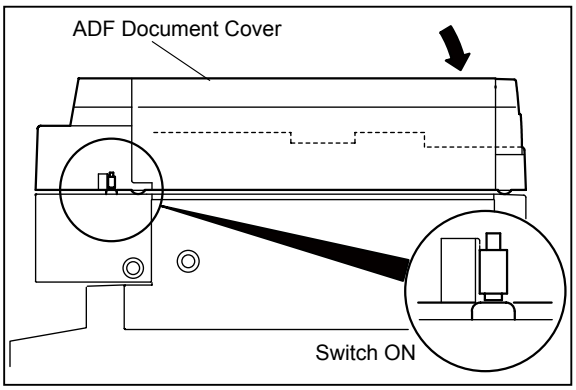
Circuit

ADF Document Cover Open/Close Switch
When the ADF Document Cover is closed : OPEN
When the ADF Document Cover is opened : CLOSE

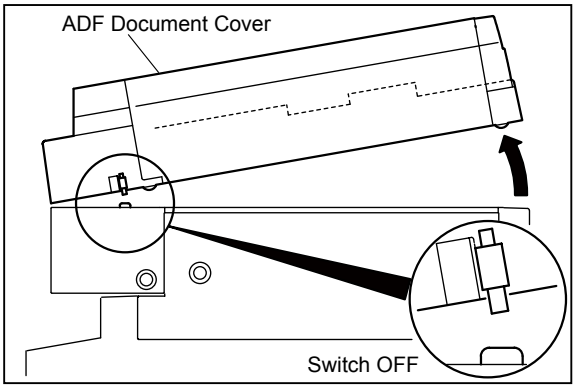


Operation

When the ADF document cover is closed, the switch is pressed; OPEN.



When the ADF document cover is open, the actuator is released; the micro switch is turned to CLOSE.



Chapter 3 Mechanism

⚠ CAUTION

• Always remove the power cord plug from the outlet before starting work.

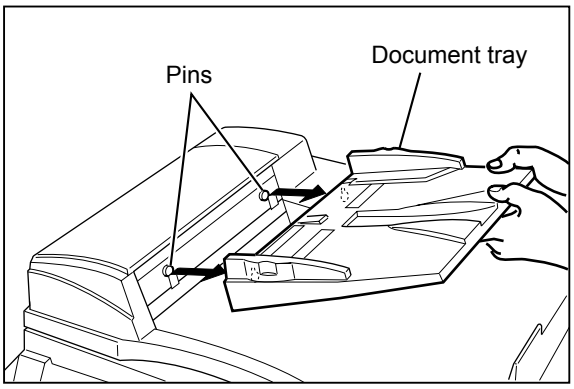
• Cautions Regarding Disassembly and Assembly

- In principle, do not operate this machine with parts removed.
- When assembling:
  - Unless specified otherwise, perform the disassembly procedure in reverse.
  - Make sure that screw types (radius, length) and locations are correct.
  - Be sure to use rosette washers when they are specified.
    (Rosette washers are used with installation screws to prevent static electricity.)
  - To ensure electrical current, a rosette washer is used with the installation screw on the ground wire. Be sure to use the rosette washer during assembly.

1 Exterior

(1) Removing the Document Tray

1. Lift the document tray directly upward, and remove the document tray by pulling it off the pins of the ADF unit.



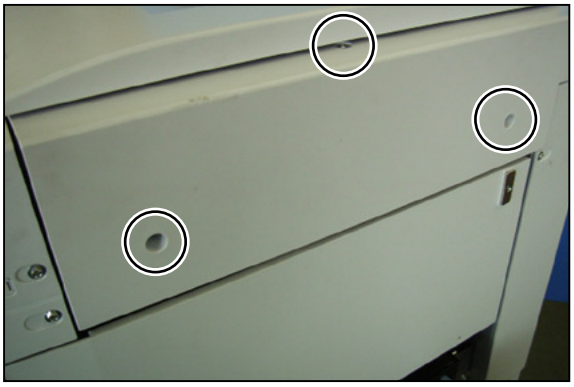
(2) Removing the ADF

1. Remove the document tray.

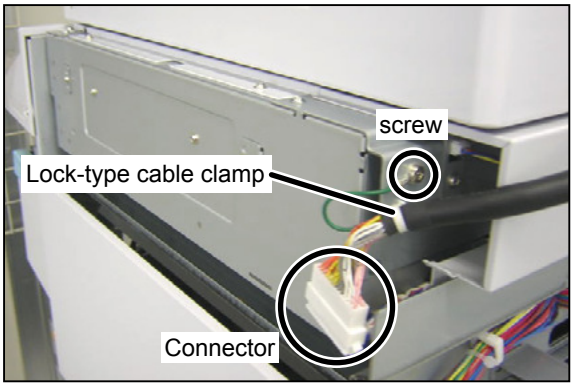
→See (1) above

2. Open the ADF.

3. Remove the three screws to remove the side cover R, and cut the precut part.



4. Remove the lock-type cable clamp and screw, and disconnect the connector.

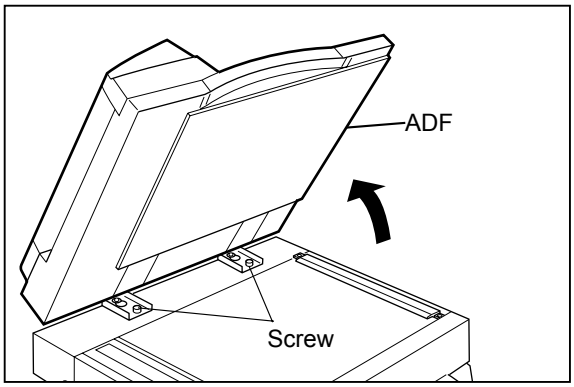


Reinstallation

IMPORTANT

The cables should be secured with the lock-type cable clamp above the line shown in the above picture. If they are positioned below the line, they may contact the frame while sliding the scanner.

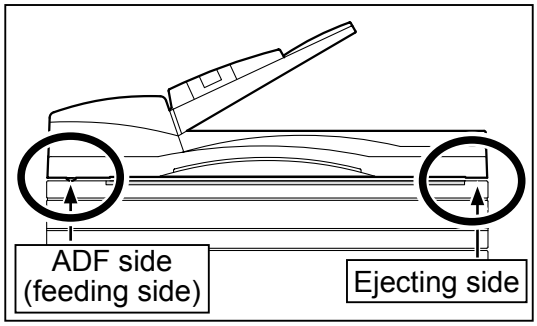
5. Remove the two screws, and slide the ADF document cover 1 cm and pull it out upward.



Reinstallation

- When attaching the ADF document cover, adjust the height.

a. Front side



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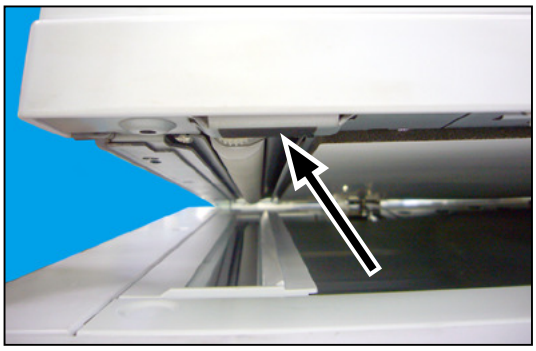
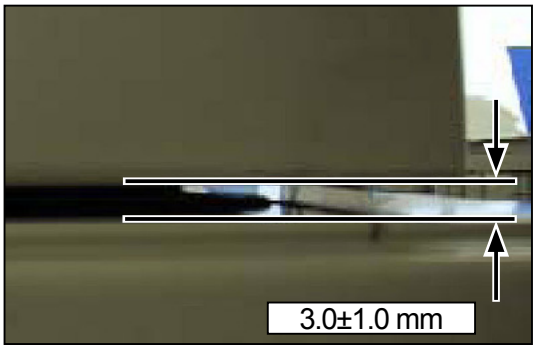
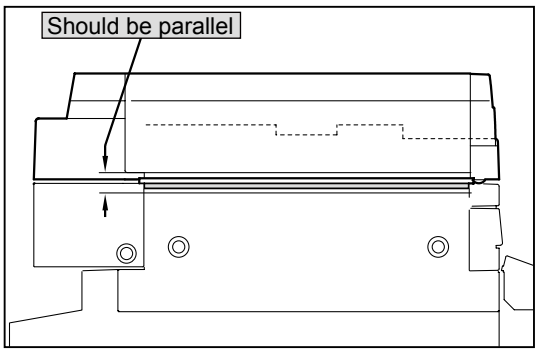
● ADF side (feeding side)
The arrowed part should contact the scanner cover.



● Ejecting side
The distance between the scanner cover and ADF should be 3.0±1.0 mm.



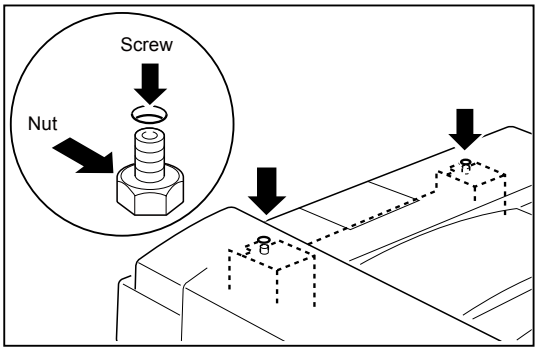
b. Feeding side
The ADF and scanner should be parallel each other.



● Adjusting the height of the ADF

IMPORTANT
As the height of the ADF is adjusted before shipping, do not adjust it except when required.

Loosen the nuts on the left and right hinges, and then use a hexagonal wrench to adjust the height by turning the screws.

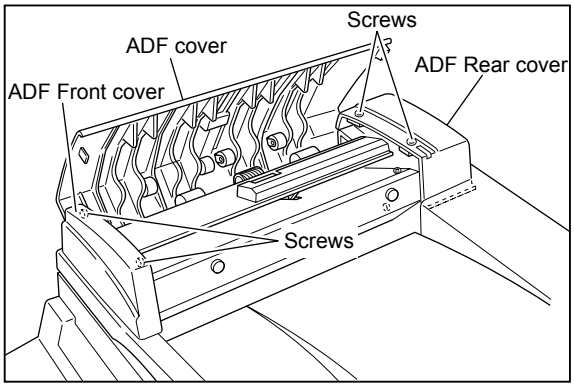


(3) Removing the ADF Front / Rear Cover

1. Remove the document tray.
→See (1) above

2. Open the ADF cover.

3. Remove the two screws each to remove the ADF front cover and ADF rear cover.

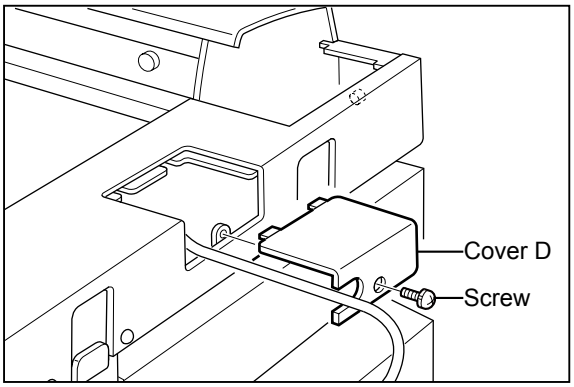


(4) Removing the ADF Document Cover

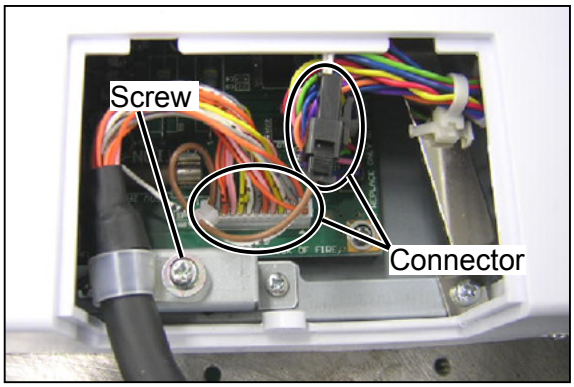
1. Remove the document tray.
→See (1) above

2. Remove the ADF Front/Rear cover.
→See (3) above

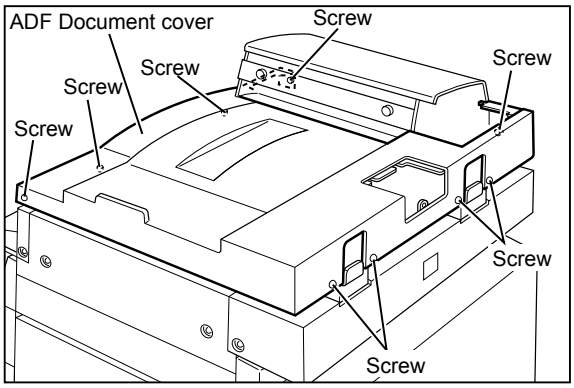
3. Remove the screw to remove the cover D of ADF document cover.



4. Disconnect the two connectors and remove one screw.



5. Remove the nine screws to remove the ADF document cover.



IMPORTANT

- After removing the screws, care should be taken when lifting the ADF base cover.

(5) Removing the ADF Unit

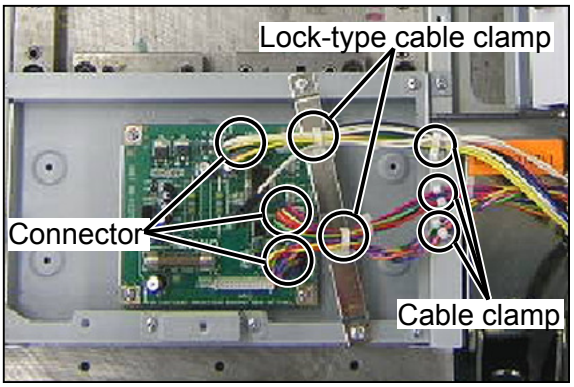
1. Remove the ADF.
→See (2) above

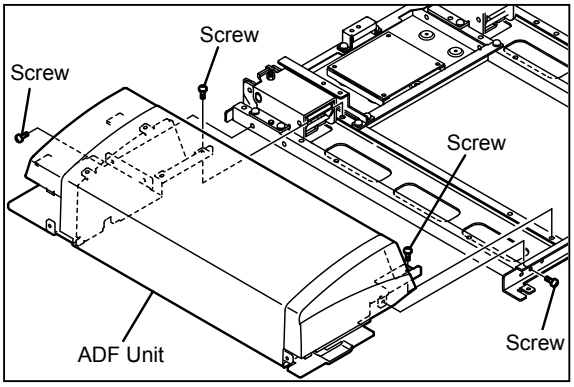
2. Remove the ADF document cover.
→See (4) above

3. Disconnect the three connectors.

4. Remove the two lock-type cable clamps and take out the cable units from the three cable clamps.

5. Remove the six screws to remove the ADF unit.

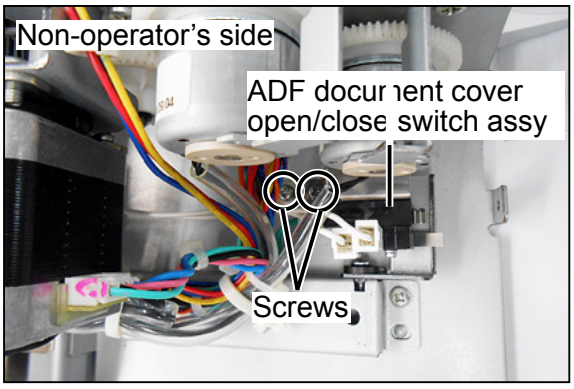




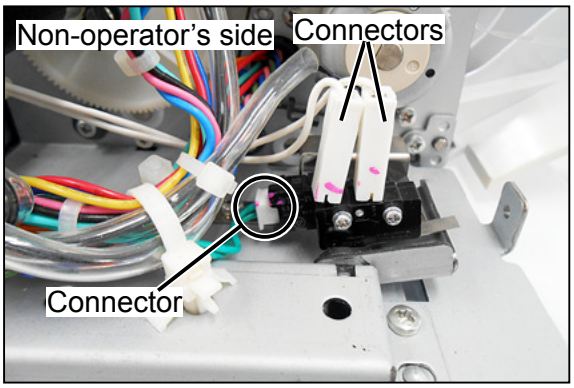
(6) Removing the ADF Document Cover Open/Close Switch

1. Remove the ADF document cover.
→See (4) above

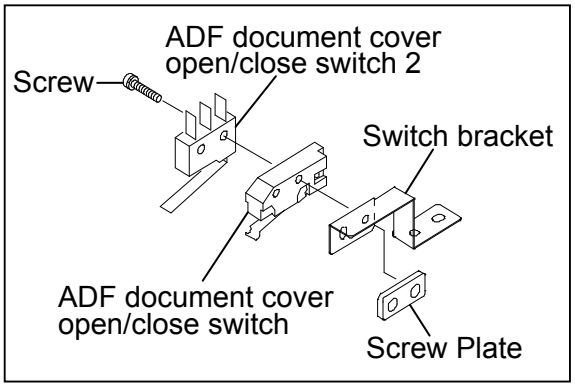
2. Remove the two screws to remove the ADF document cover open/close switch assy.



3. Remove the two connectors of the ADF document cover close switch and one connector of the ADF document cover close switch 2.



4. Remove the two screws to remove the ADF document cover open/close switch and ADF document cover open/close switch 2.



2 ADF Section

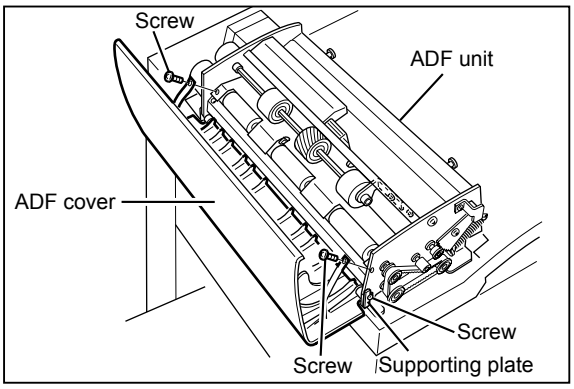
(1) Removing the ADF Cover

1. Remove the ADF document cover.
→See Page 27

2. Remove the two screws.

3. Remove the screw to remove to the supporting plate.

4. Remove the ADF cover.

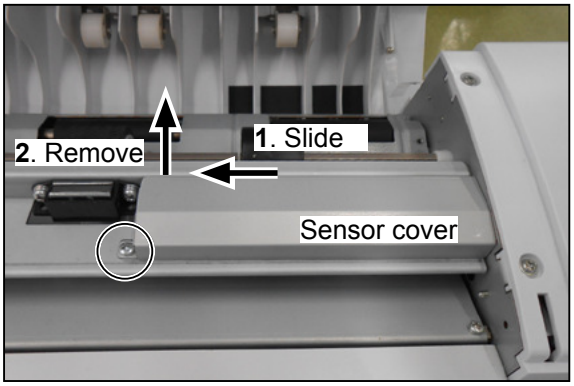


(2) Removing the ADF Document Sensor

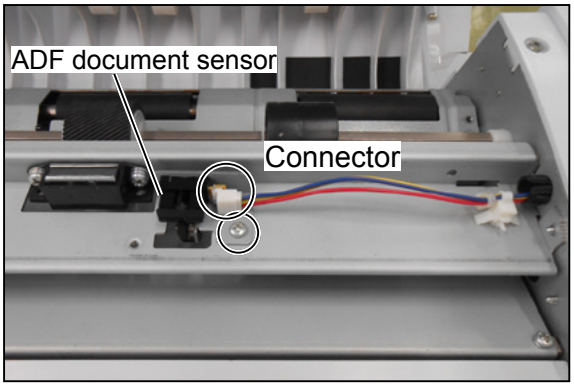
1. Open the ADF cover.

2. Remove one screw, and slide the bracket in the direction of the arrow to remove it.

3. Remove one screw to detach the sensor bracket.



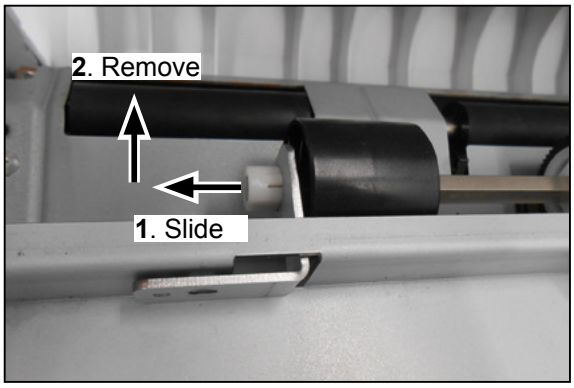
4. Disconnect the connector to remove ADF the document sensor.



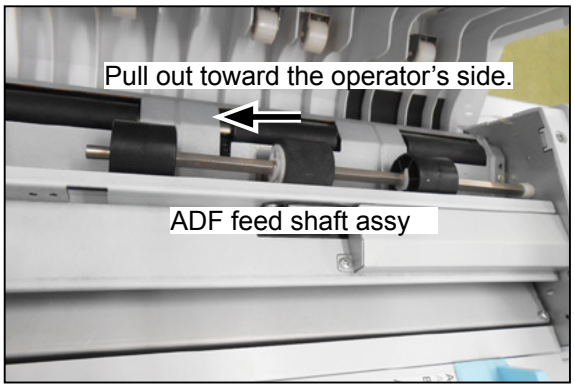
(3) Removing the ADF Feed Shaft ASSY

1. Open the ADF cover.

2. Remove one screw to detach the angle.



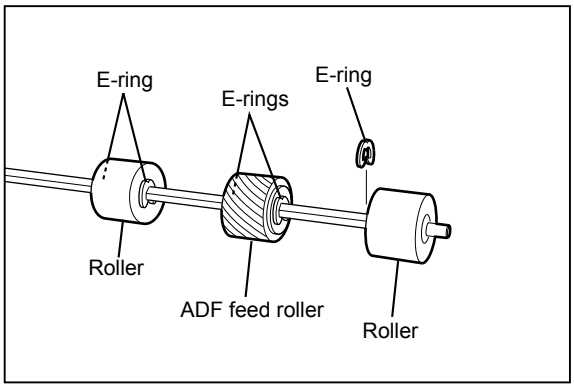
3. Pull out the ADF feed shaft toward the operator's side.



(4) Removing the ADF Feed Roller

1. Remove the ADF feed shaft assy.
→See (3) above

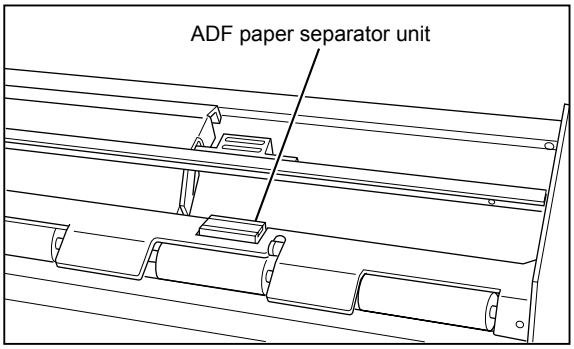
2. Remove the E-rings, and remove the ADF feed roller.



(5) Removing the ADF Feed Roller

1. Remove the ADF feed shaft assy.
→See (3) above

2. Remove the ADF paper separator unit.



Reinstallation

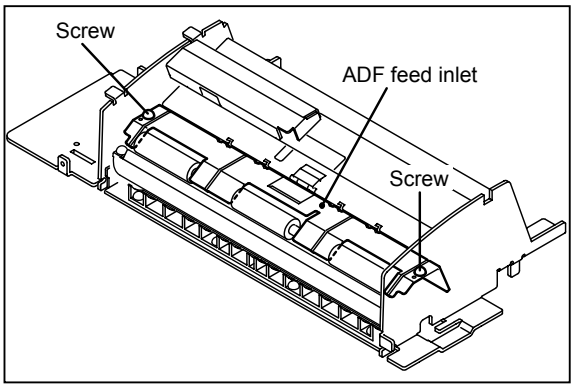
IMPORTANT

- After reinstalling the ADF paper separator unit, adjust its clearance.
→See Page 41

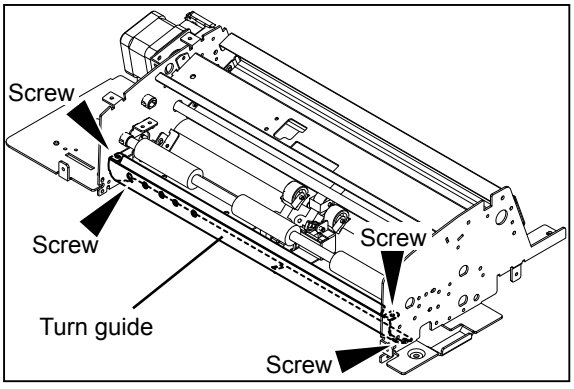
(6) Removing the ADF Document Jam Sensor

1. Remove the ADF feed shaft assy.
→See (3) above

2. Remove the two screws to remove the ADF feed inlet.

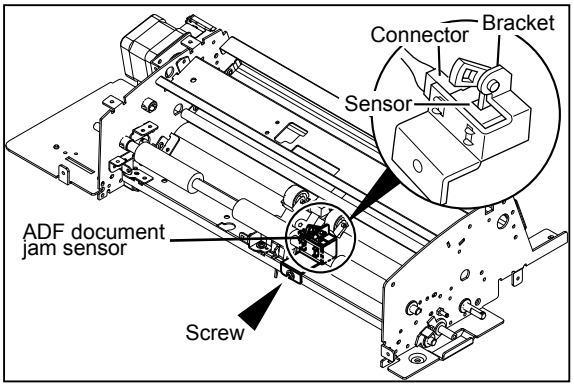


3. Remove the four screws to remove the turn guide.



4. Remove the screw, together with the bracket.

5. Disconnect the connector.
Remove the ADF document jam sensor.

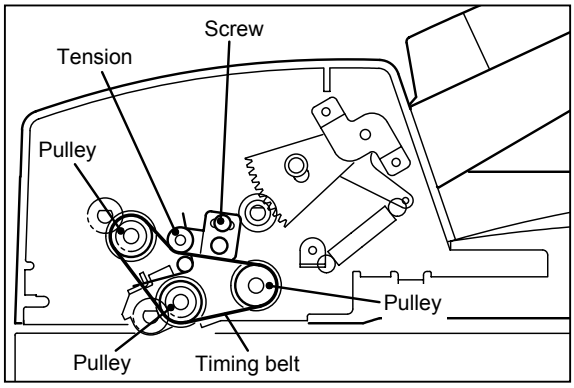


(7) Removing the Timing Belt

1. Remove the ADF front cover.
→See Page 27

2. Loosen the tension's fixing screw.

3. Pull the timing belt off the pulley, and remove the timing belt.



Reinstallation

IMPORTANT

- Be sure to adjust the tension after installing the Timing belt.

→See Page 40

(8) Removing the ADF Clutch A/B

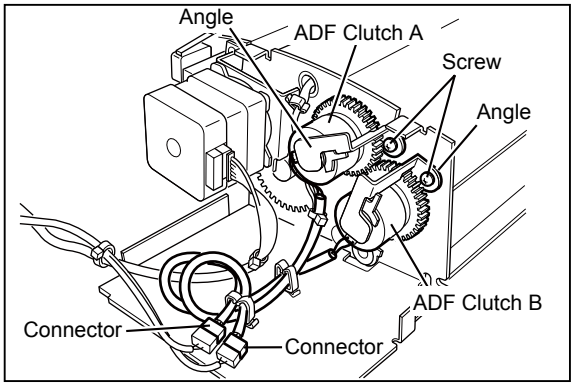
1. Remove the ADF document cover.
→See Page 24

2. Remove the ADF rear cover.
→See Page 27

3. Disconnect the two connectors.

4. Remove the screw to remove the angle.

5. Remove the ADF clutch A/B.



Reinstallation

IMPORTANT

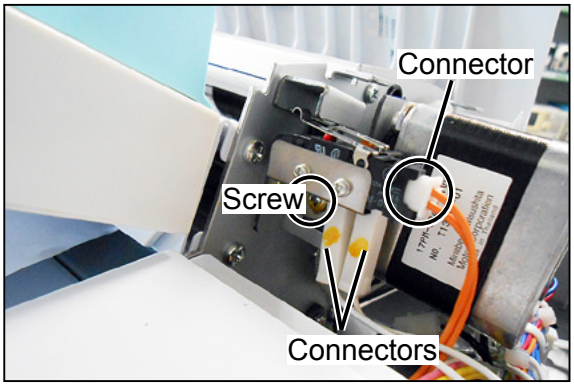
- The ADF clutch A and ADF clutch B are not the same type. Attach the correct one to the correct position.
  - ADF clutch A: 2-pin connector
  - ADF clutch B: 3-pin connector

(9) Removing the ADF Cover Switch

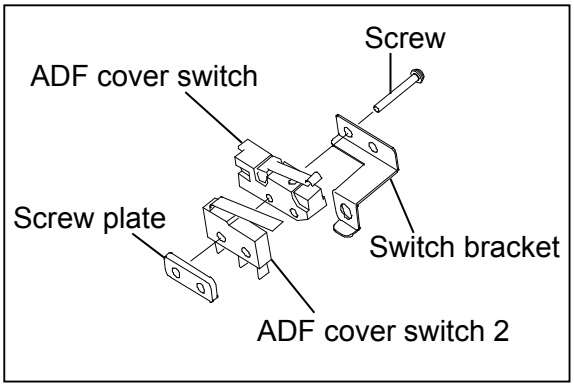
1. Remove the ADF rear cover.
→See Page 27

2. Disconnect the two connectors of the ADF cover switch and one connector of the ADF cover switch 2.

3. Remove the screw to remove the ADF cover switch assy.



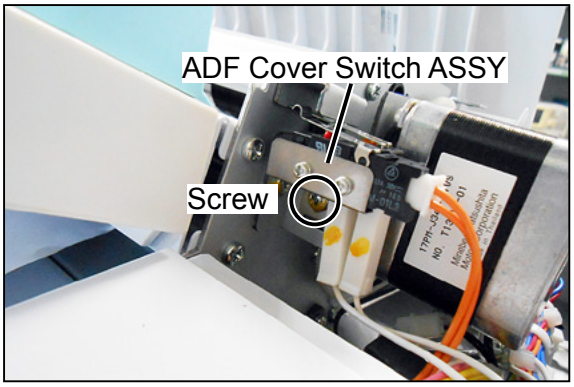
4. Remove the two screws to remove the ADF cover switch and ADF cover switch 2.



(10) Removing the ADF Stepping Motor

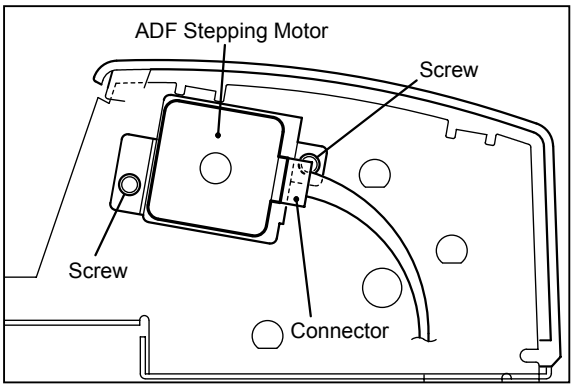
1. Remove the ADF rear cover.
→See Page 27

2. Remove the screw to remove the ADF cover switch ASSY.



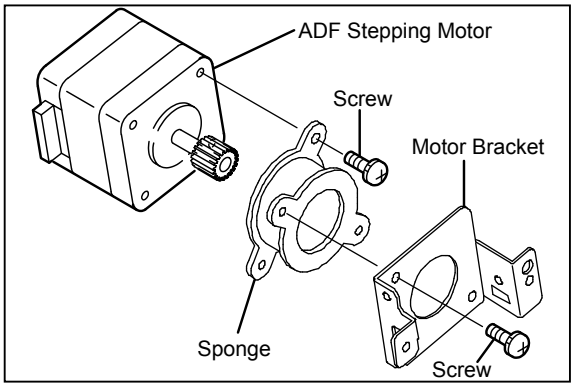
3. Disconnect the connector.

4. Remove the two screws to detach the motor together with the bracket.



5. Remove the two screws to remove the motor bracket.

6. Remove the two screws to remove the ADF stepping motor.

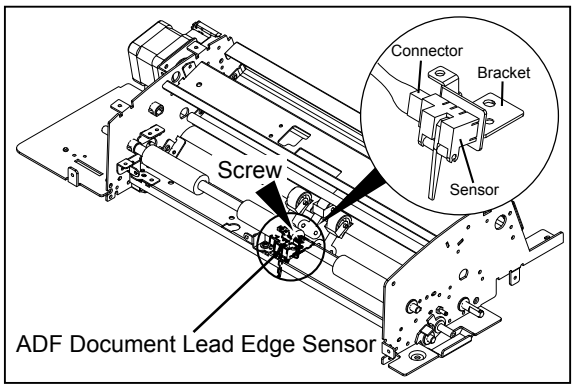


(11) Removing the ADF Document Lead Edge Sensor

1. Follow steps 1 to 4 in Removing the ADF Document Jam Sensor.
→See (6) above

2. Remove one screw to detach the ADF document lead edge sensor together with the bracket.

3. Disconnect the connector to remove the ADF document lead edge sensor.



3 Electrical System

(1) Removing the ADF Cover

⚠ WARNING

- Always remove the power cord plug from the outlet before replacing a PCB unit.

1. Remove the ADF .

→See Page 24

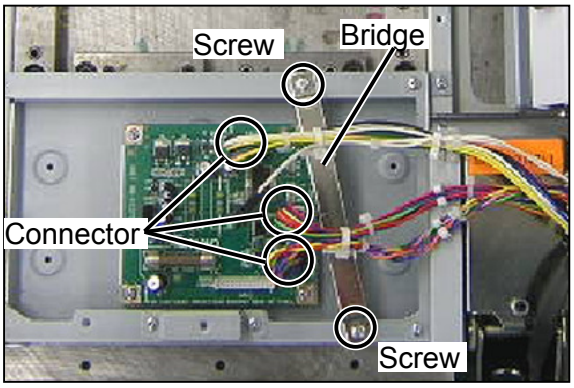
2. Remove the ADF document cover.

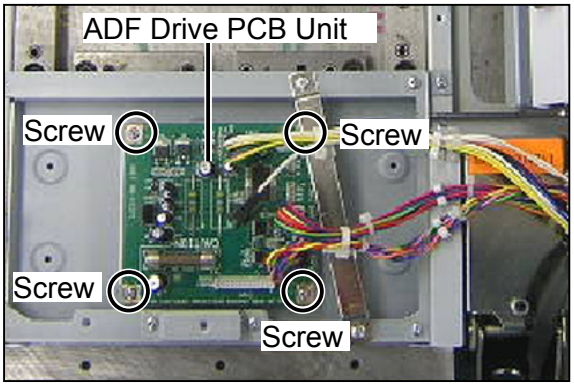
→See Page 27

3. Disconnect the three connectors.

4. Remove the two screws to remove the bridge.

5. Remove the four screws to remove the ADF drive PCB unit.



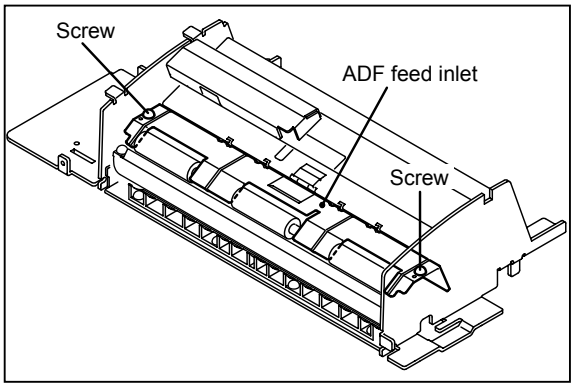


(2) Removing the ADF Document Size PCB UNIT

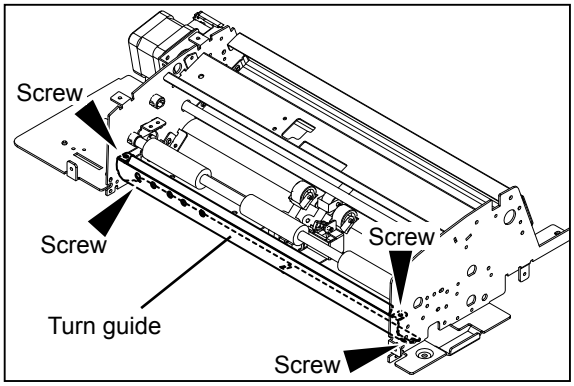
> **⚠ WARNING**
> ● Always remove the power cord plug from the outlet before replacing a PCB unit.

1. Remove the ADF feed shaft assy.
→See Page 31

2. Remove the two screws to remove the ADF feed inlet.

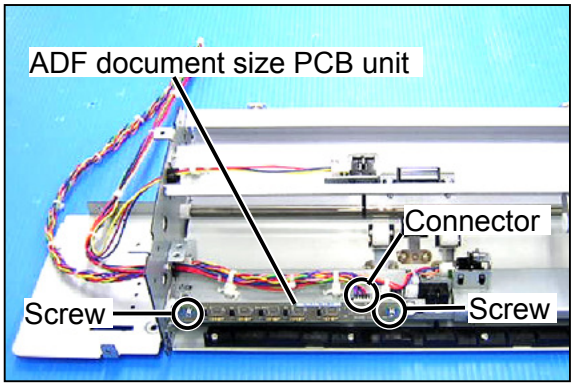


3. Remove the four screws to remove the Turn guide.



4. Disconnect the connector.

5. Remove the two screws to remove the ADF document size PCB unit.



MEMO

Chapter 4 Standards/Adjustment

1 Mechanical System

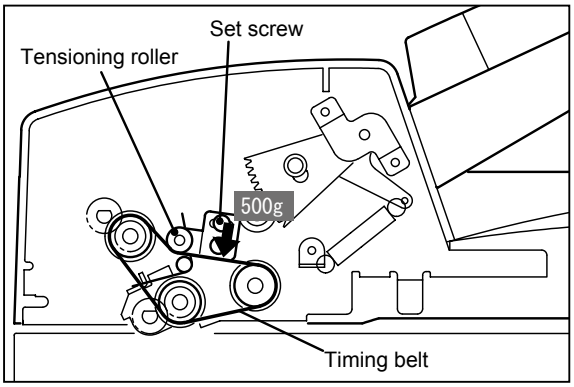
(1) Adjusting the Timing Belt Tension

1. Remove the ADF Front cover.

→See Page 27

Adjustment procedure

1. Loosen the set screw.
2. Use the set screw to adjust the belt's tension, applying a force of approx. 500 g to the timing belt in the direction of the arrow with a tension gauge so that the deflection is 2±0.5 mm.



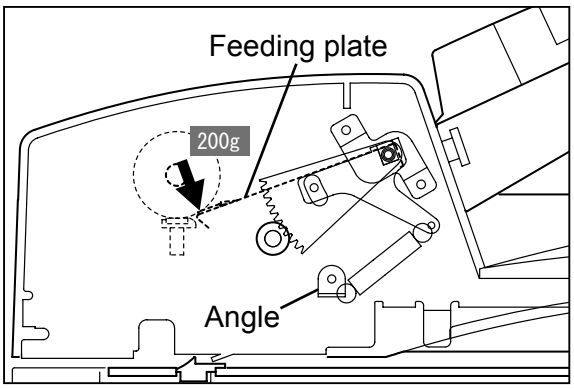
(2) Adjusting the Feeding Plate Pressure

1. Remove the ADF Front cover.

→See Page 27

Adjustment procedure

1. Open the ADF cover.
2. Adjust the angle of the angle so that the feeding plate starts to move when the feeding plate comes into contact with the feed roller, applying a force of 200 g with a tension gauge.



(3) Adjusting the Paper Separator Unit Clearance

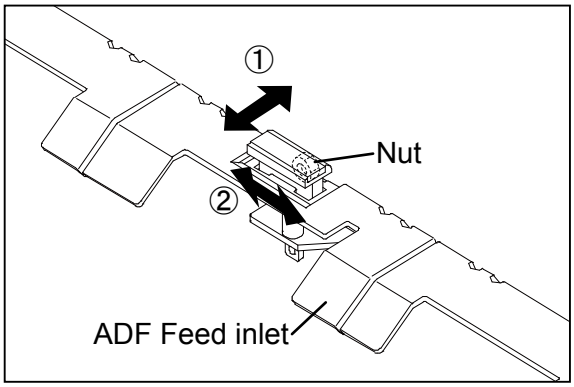
REFERENCE

● For removal of the ADF feed inlet
Follow steps 1 and 2 in Removing the ADF Document Jam Sensor.

→See Page 32

Adjustment procedure

1. When the paper separator unit is installed, use the adjustment bolt to adjust the unit so that it moves in direction 1 without sticking, and moves smoothly in direction 2. Tighten the bolt's nut to secure the unit in the adjusted position.



2 Electrical System

(1) Adjusting the Reduction/Enlargement of ADF

1. Adjusting ADF Vertical Magnification

Adjustment procedure

1. Prepare a basic document as shown in the figure.
   Draw a line (vertical direction) at the position 30 mm from the top end of the paper* and at the position 200 mm from the above line.
   * A3 model: A3 paper
   * B4 model: B4 paper
2. Place the document on the ADF to perform master making and printing.

Standard value

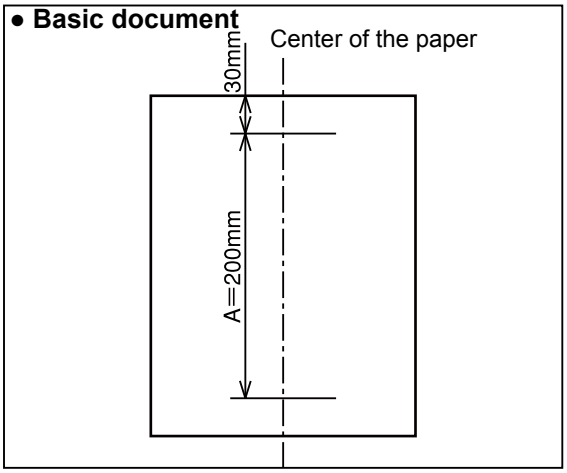
Item	Standard value
Compare the size of A section of the printed image with that of the basic document	±0.5 mm

If the clearance is not the standard value:

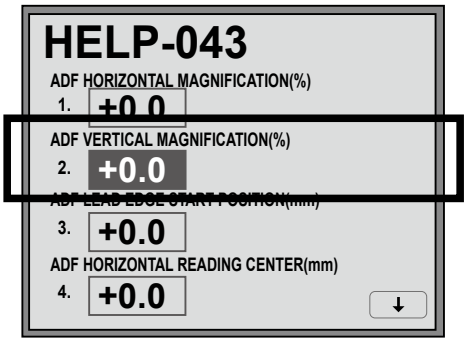
● Touch "2" of the HELP-043 screen for adjustment.

HELP-043 → See page 63

● **Basic document**



● **HELP-043 (page 1) display**



2. Adjusting ADF Horizontal Magnification

Adjustment procedure

1. Prepare a basic document as shown in the figure.
   Draw a 200 mm-line(horizontal direction) at the position 30 mm from the top end of the paper*.
   * A3 model: A3 paper
   * B4 model: B4 paper
2. Place the document on the document table to perform master making and printing.

Standard value

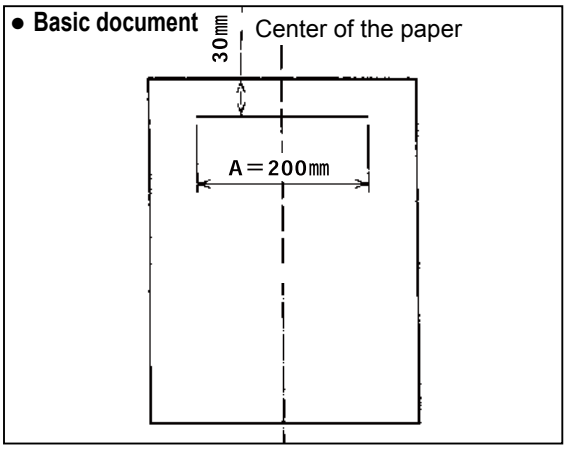
Item	Standard value
Compare the size of A section of the printed image with that of the basic document	±0.5 mm

If the clearance is not the standard value:

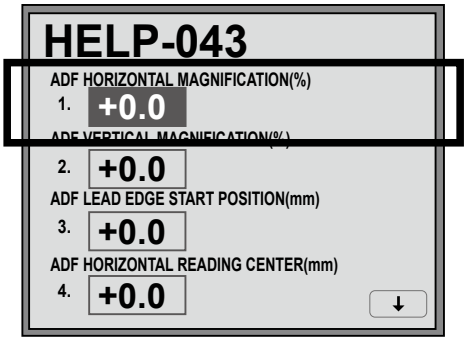
● Touch "1" of the HELP-042 screen for adjustment.

HELP-043 → See page 63

● **Basic document**



● **HELP-043 (page 1) display**



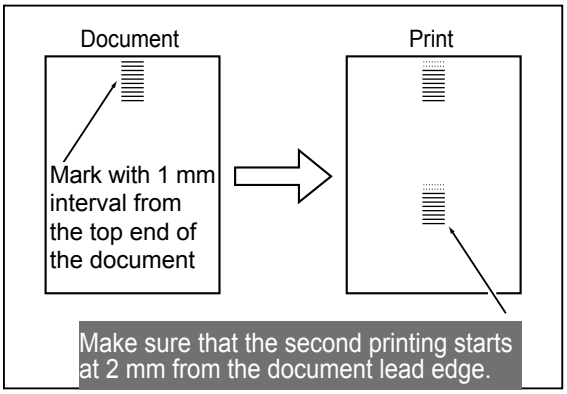
(2) Reading Start Position of ADF

1. Adjusting the Top End Reading Start Position Adjustment procedure

Adjustment procedure

1. Mark with 1 mm interval up to 5 mm from the top end of the paper to prepare a test document.
2. Perform master making and printing to the same size and to two printouts.
3. Make adjustment by "3. SCAN LEAD EDGE START POSITION" of HELP-042 so that printing starts at 2 mm from the document lead edge on the second print paper.

HELP-043 → See page 63



2. Adjusting the Lateral (Operation Side) Reading Start Position

Adjustment procedure

1. Make a basic document (as shown in the figure) from a sheet of paper*.
   Draw a 100 mm line at the position 30 mm from the right end and from the top end of the paper*.
   * A3 model: A3 paper
   * B4 model: B4 paper

REFERENCE

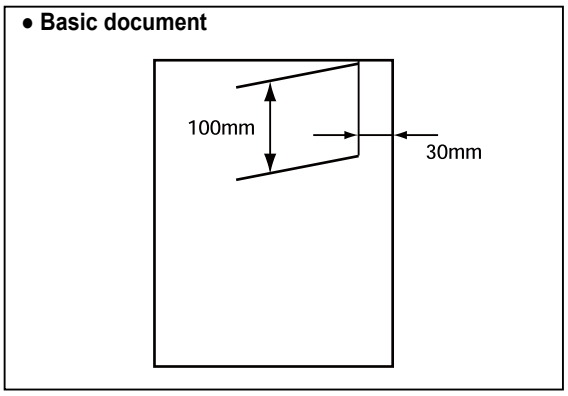
For the model with the feed tray horizontal registration adjuster dial equipped, preset the dial to “0”.

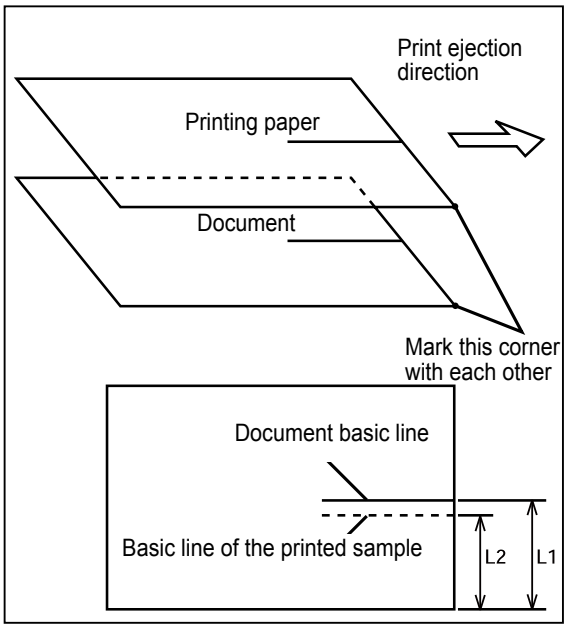
2. Compare the printed image with the basic document.
   Check the difference between the straight lines in the vertical direction.
3. Make adjustment by "4. SCANNER HORIZONTAL READING CENTER(mm)" of HELP-042 so that the following equation holds.
   L1−L2 ≤ ±1 mm

HELP-043 → See page 63

Adjusting direction

- L1<L2: The value is decreased.
- L1>L2: The value is increased.





(3) Adjusting the Document Reading Darkness of ADF

IMPORTANT

Be sure to adjust scanning level on the scanner side before adjusting ADF scanning level. If adjusting of scanning level on the scanner side is performed after adjusting ADF scanning level, the values for the ADF side will be changed to those for the scanner side.

1. Adjusting the ADF Scan Level: Text mode

(Make adjustment by the black level and the white level.)

Adjustment procedure

1. Access HELP-045.

HELP-045 → See page 65

2. Select and touch the item to be adjusted and change the value.

Adjust density of the dark part.

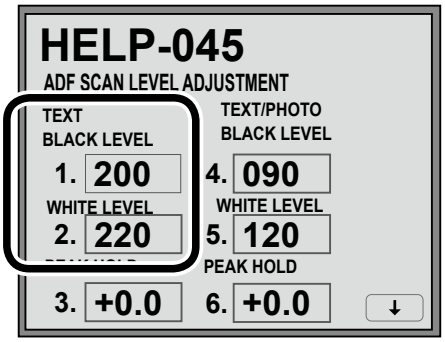
- **To heighten density of the dark part.**
  → Increase the black level.
- **To lower density of the dark part.**
  → Decrease the black level.

Adjust density of the light part.

- **Scumming occurs.**
  → Increase the white level.
- **Master making of the light part is impossible.**
  → Decrease the white level.

3. Press the ↧ key to store the set value.
4. After master making and printing, check density.

● **HELP-044 display**



2. Adjusting the ADF Scan Level: Text/ Photo,Photo/Text, Photo mode

(Make adjustment by the black level and the peak hold.)

Adjustment procedure

1. Access HELP-045.

HELP-045 → See page 65

2. Select and touch the item to be adjusted and change the value.

Adjust density of the dark part.

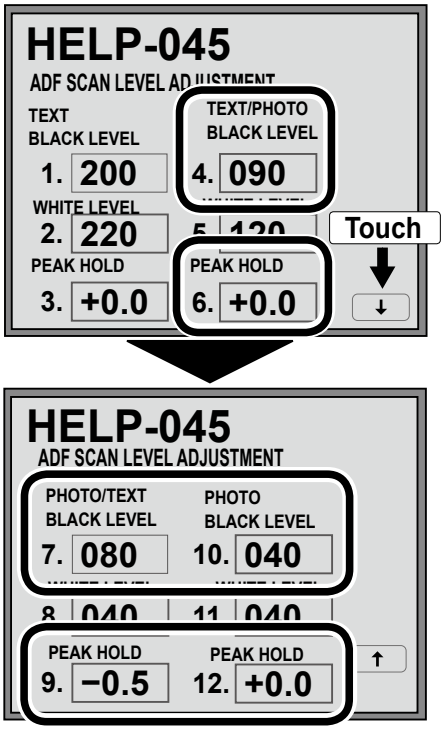
- **To heighten density of the dark part.**
  → Increase the black level.
- **To lower density of the dark part.**
  → Decrease the black level.

Adjust the total lightness.

- **Scumming occurs.**
  → Decrease the peak hold. (Minus side)
- **Master making of the light part is impossible.**
  → Increase the peak hold. (Plus side)

3. Press the ≦ key to store the set value.
4. After master making and printing, check density.

- **HELP-045 display**



MEMO

Chapter 5 Maintenance/Check

1 Guaranteed Periodical Maintenance Cycle

●The service person will visit the user periodically after delivery. The maintenance operation described in the periodical maintenance list is performed and instructs how to follow the operation. When the service person is called by telephone, the following maintenance must be performed after clearing the trouble.

1. Cleaning the glass of jump base

2. Cleaning the scanner cover

3. Cleaning the document glass

4. Cleaning the ADF feed rollers and ejection rollers

2 Cleaning and Oiling

(1) Cleaning

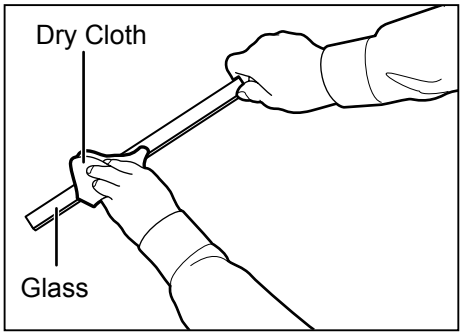
1. Paper shreds: Clean with a brush or dry cloth.
Clean the mirror and reflection plate in the scanner section with a blower brush.

2. Glass: If there is foreign matters on the glass, it will cause black lines. Clean the glass with a blower brush or dry cloth.

● How to clean the glass:

1. Remove the jump plate and take out the glass.

2. Hold the edge of the glass and clean both sides of the glass with dry cloth.



(2) Oiling

1. Bearing section: Oil the edge surface and bearing sections with oiler, rotating the lever and roller.

2. Gear section: Grease the gear section after removing paper shreds on the bottom of gear.

3 Periodical Maintenance Check List

(1) Periodical Checking

Section to be checked	Description	Remarks
Sensor	Cleaning	Remove dust with a blower brush.
Paper feeding section	Checking	Paper is fed smoothly. Remove paper shreds.
Rollers	Cleaning	Remove adhered matters such as paper shreds.
Driving section, bearing	Cleaning, oiling	Checking, smooth rotation

Chapter 6 Troubleshooting

1 Troubleshooting Guide

Countermeasures for the Defective Operation

When the messages listed below are displayed on the LCD or when trouble such as malfunctioning or a paper jam occurs, proceed with an inspection following the procedure for the item and take measures accordingly.

(1) "E017" Is Displayed

Step	Cause/Detective section	Items to be checked	Result	Countermeasure
1		Are all the wiring harnesses of the main PCB unit securely connected?	NO	Securely connect all the connectors of the main PCB unit.
	Main PCB unit		YES	Replace the main PCB unit.

(2) ADF PAPER JAM Is Displayed When the Power Is Turned On

Step	Cause/Detective section	Items to be checked	Result	Countermeasure
1		Does the ADF feed roller rotate?	NO	Go to step 7.
			YES	Go to step 2.
2	Paper separator unit, ADF feed roller	Do the paper separator unit and ADF feed roller feed the document?	NO	Clean the paper separator unit and ADF feed roller. If the trouble still exits, replace them.
			YES	Go to step 3.
3	Main PCB unit	When the ADF document jam sensor is checked with HELP-011-2, does **ADF DOCUMENT JAM SENSOR** display **0** in the photopassing status and **1** in the photointerrupting status?	NO	Go to step 4.
			YES	Check the bundled wire and connectors and then replace the main PCB unit.
4	ADF drive PCB unit	Measure the voltage between CN2-5 and GND of the ADF drive PCB unit with a tester. Is it HIGH (approx. 4.5 V) in the photointerrupting status and LOW in the photopassing status?	NO	Go to step 5.
			YES	Replace the main PCB unit.
5	ADF document jam sensor	When the ADF document jam sensor is checked with HELP-011-2, does **ADF DOCUMENT JAM SENSOR** display **0** in the photopassing status and **1** in the photointerrupting status?	NO	Replace the ADF document jam sensor.
			YES	Go to step 6.

Step	Cause/Detective section	Items to be checked	Result	Countermeasure
6	ADF document lead edge sensor	When the ADF document lead edge sensor is checked with HELP-011-2, does **ADF DOCUMENT LEAD EDGE SENSOR** display **0** in the photopassing status and **1** in the photointerrupting status?	NO	Replace the ADF document lead edge sensor.
			YES	Go to step 7.
7	Gear	Is the gear damaged?	NO	Go to step 8.
			YES	Replace the Gear.
8	24 V power supply (UA071)	Measure the voltage between CN601-1 (+24) and CN602-1 (GND) of the 24 V power supply with a tester. Is it +24 V?	NO	Replace the 24 V power supply.
			YES	Go to step 9.
9	Main PCB unit	Does replacing the main PCB unit solve the problem?	NO	Go to step 10.
			YES	Finish
10	ADF stepping motor	Does replacing the ADF drive PCB unit solve the problem?	NO	Replace the ADF stepping motor.
	ADF drive PCB unit		YES	Finish

2 Error Display

This machine has a self-diagnosis function. The state of the machine is always checked with this function and is displayed with code on the control panel. The following are the code display, cause and detection timing.

Code display	Detection timing	Cause
E017	Error : ADF stepping motor locked	The main PCB unit is defective.
	Write/readout to FPGA stepping controller of the main PCB is defective.	

Chapter 7 HELP Mode

1HELP Mode List

HELP mode No.	Item	Function	Page
HELP-011	Adjusting/Checking the ADF Section	[Page 1] Setting(ADF,ADF2in1)	60
		[Page 2]Check operation (ADF STEPPING MOTOR, ADF CLUTCH (A), ADF CLUTCH B) Checking sensors/switches.	
		[Page 3]Check operation (Feesd the document through the machine.) Checking sensors/switches. (ADF DOCUMENT SIZE SENSOR 1,2,3,4,5) Information displayed (ADF DOCUMENT SIZE)	
HELP-043	ADF Read Adjustment	[Page 1] Adjustment : ADF horizontal (main scan) magnification, ADF vertical (sub scan) magnification, ADF lead edge start position, ADF horizontal reading center	63
		[Page 2] Adjustment : ADF read width, ADF read length, ADF feed range, ADF trail edge end position	
HELP-045	ADF Level Adjustment	[Page 1] Adjustment (TEXT mode, TEXT/PHOTO mode)	65
		[Page 2] Adjustment (PHOTO/TEXT mode, PHOTO mode)	

2 Overview

The PRINTER's HELP modes can be broadly classified into the following types:

♦ Modes for ROM version display / version upgrade
To display the version of the main PCB ROM, the panel PCB ROM, relay PCB ROM, Tape Dispenser ROM (option).

♦ Modes for adjustment / specification setting
These modes set the functioning of variable resistors and switches by using the battery PCB unit's EEPROM to memorize settings made on the operation panel.
The ADF is an option. All of these adjustments and settings are required at the time of installation.

IMPORTANT

- New adjustments and appropriate settings must be made after the battery PCB unit is replaced and after initialization setting has been implemented (using HELP-027).

♦ **Modes for function checks**
These modes permit the running of function checks on:
individual motors, given series of operations, and electrical circuits.
When these modes are used to check motor functioning, the motor being checked is run by itself, but interlocks are suspended. When such checks are run, take care not to put hands or fingers **in motor-related moving parts that could start up unexpectedly.**

⚠ WARNING

Failure to heed the above could result in crushed or otherwise injured hands or fingers.

♦ **Modes for sensor and switch displays**
These modes provide displays of the conditions of sensors and switches.

3 HELP Mode Functions and Operation Procedures

● Accessing HELP Modes

1. Using the numeric keys, enter the number of the HELP mode you want to access.
   Example: To access HELP mode H-011, enter **[0], [1], [1].**

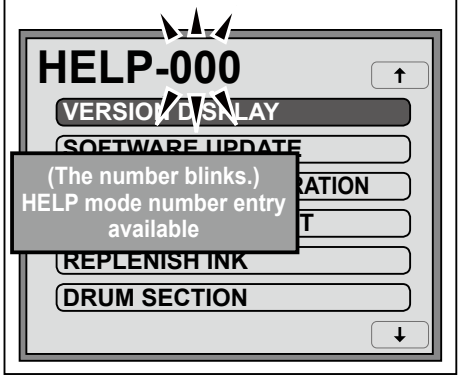
IMPORTANT

- The HELP mode number cannot be selected by the PRINT SPEED keys ◁ and ▷.

REFERENCE

- The HELP mode number can be selected by the PRINT DARKNESS keys ◁ and ▷, and the PRINT POSITION keys △ and ▽.

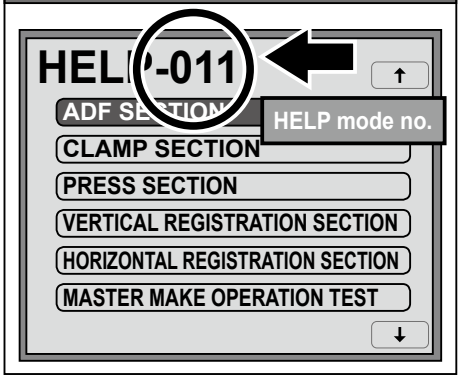
● HELP mode number selection screen



Ex : enter 0, 1, 1, PRINT key

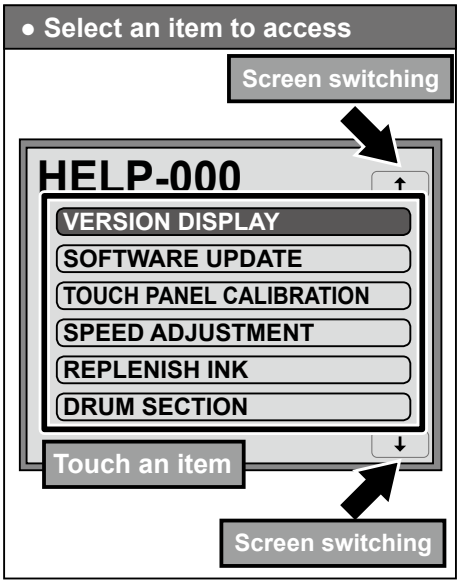
2. Press the (PRINT) key. The HELP mode specified in 3 will be accessed.
   From this point on, follow the procedure given below for the particular mode accessed.

● HELP mode screen (HELP-011)



REFERENCE

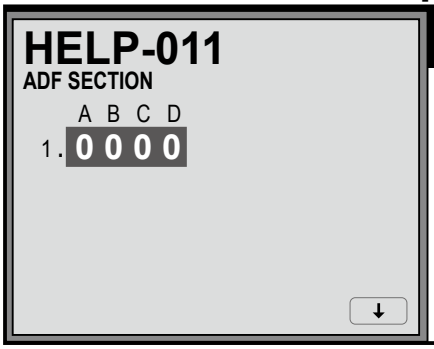
- You can access a HELP mode by touching an item.
- You can switch the screen by touching the arrow on the screen upper right or screen lower right.
- The "HELP-000" screen reappears by pressing the C (clear) key.



IMPORTANT

- Description of HELP modes is in RICOH DD5450/ DD5440 Service Manual.

● HELP Mode Descriptions



(1) Adjusting/Checking the ADF Section (3 pages in total)

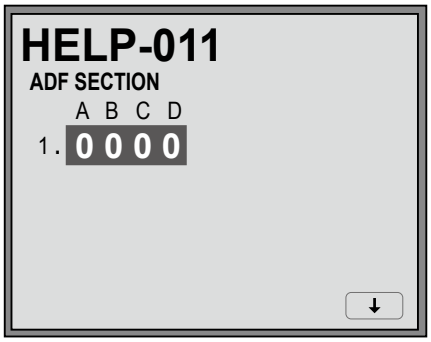
Page 1:

● Function enabled/disable setting
ADF, ADF2in1

● Operation procedure

1. Call the HELP mode "H-011".

Enter "**011**" by the NUMERIC keys and then press the **PRINT** key.

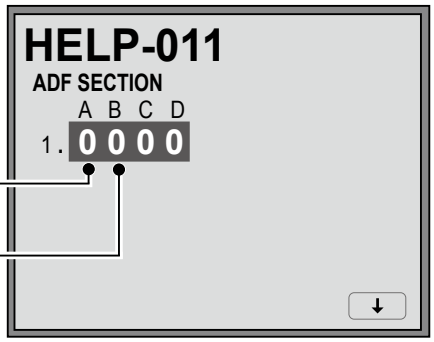


2. Function enabled/disable setting

1. Enter four digits (0,1) by the NUMERIC keys to specify enabled/disable of the function.

► Function enabled/disable setting

Item		Value	Description
1	A	0	ADF section disabled (Default)
		1	ADF section enabled
	B	0	ADF2in1 disabled (Default)
		1	ADF2in1enabled
	C-D	-	-



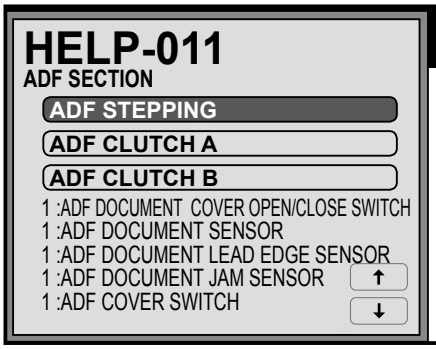
- Example: For ADF section enabled and ADF2 in 1 disabled, enter "1100" by the NUMERIC keys.

2. Press the ≝ key to store all set values.

3. Return to the HELP mode.

Press the STOP key.
The HELP mode selection display will reappear.

→ To exit the HELP mode : Turn the power switch OFF.
→ To access another HELP mode : Enter the desired mode number using the numeric keys.



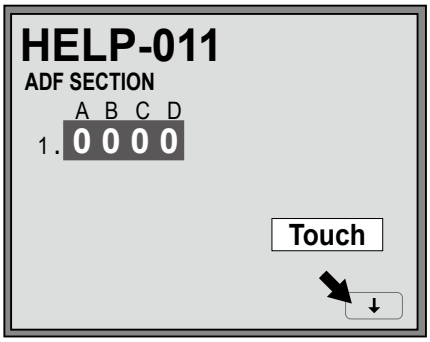
(2) Adjusting/Checking the ADF Section (3 pages in total)

Page 2:
- **Check operation.**
  ADF STEPPING, ADF CLUTCH A, ADF CLUTCH B
- **Checking sensors.**
  ADF DOCUMENT COVER OPEN/CLOSE SWITCH,ADF DOCUMENT SENSOR
  ADF DOCUMENT LEAD EDGE SENSOR ADF JAM SENSOR
  ADF COVER SWITCH

● Operation procedure

1. **Call the HELP mode "H-011".**

Enter "**011**" by the NUMERIC keys and then press the PRINT key.

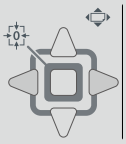


2. **Change the screen.**

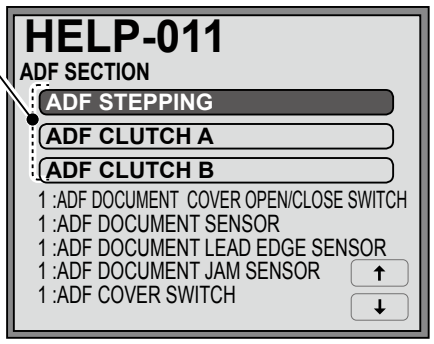
Touch the **arrow** on the screen lower right once to switch to Page 2.

3. **Check operation.**

To check the operation:
1. Select and touch the motor or clutch to be checked.
2. When selecting motor/clutch:
   Press the PRINT POSITION ◁▷ key;
   while this key is held down,the motor/clutch rotates.



3. While the MASTER MAKING key is held down, the ADF clutch A/B is **ON** to rotate the ADF stepping motor.
4. While the TEST PRINT key is held down, the ADF clutch A/B is ON to rotate the ADF stepping motor at high speed.
5. Press the HOME key or PROPERTY key, the ADF stepping motor operates to lower the glass where the document is placed for document standby.

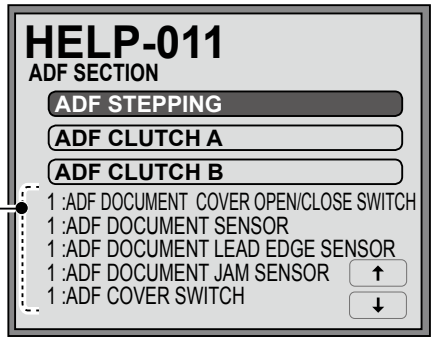


4. **Checking sensors/switches.**

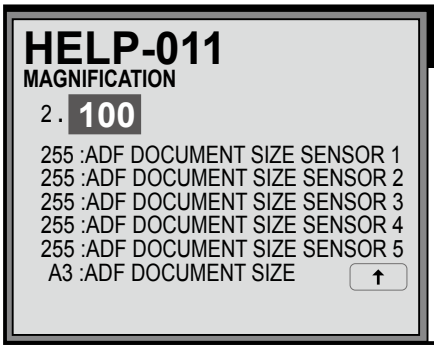
Check the following sensors and switches.

► **Status of sensors and Switches**

Sensors/Switches	0	1
ADF DOCUMENT COVER OPEN/CLOSE SWITCH	ON: Close	OFF: Open
ADF DOCUMENT SENSOR	Photopassing	Photointerrupting
ADF DOCUMENT LEAD EDGE SENSOR	Photopassing	Photointerrupting
ADF DOCUMENT JAM SENSOR	Photopassing	Photointerrupting
ADF COVER SWITCH	ON: Close	OFF: Open



Step5. → Press the STOP key. The HELP mode selection display will reappear.



(3) Adjusting/Checking the ADF Section (3 pages in total)

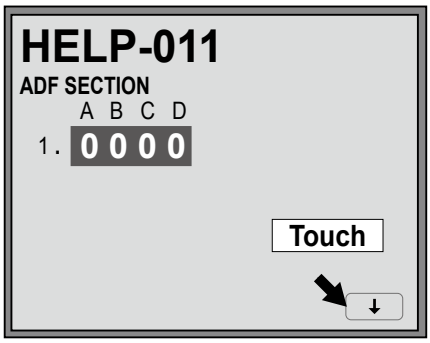
Page 3:

- **Check operation.**
  Feed the document through the machine.
- **Checking sensors.**
  ADF DOCUMENT SIZE SENSOR 1 - 5
- **Checking ADF Document size.**

● Operation procedure

1. **Call the HELP mode "H-011".**

Enter "**011**" by the NUMERIC keys and then press the PRINT key.



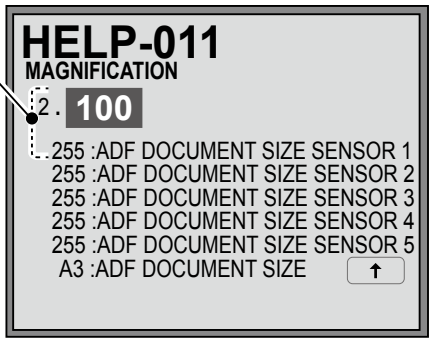
2. **Change the screen.**

Touch the **arrow** on the screen lower right twice to switch to Page 3.

3. **Check operation.**

Feed the document through the machine.

1. Feed the document by the TEST PRINT key.
   The document size detected by ADF document size sensor is displayed.
   - Two or more documents are present in ADF, continuously feed all documents though the machine. If the STOP key is pressed in the middle of operation, continuous feeding is cancelled.
     After the document being fed is ejected,operation stops.
2. While the MASTER MAKING key is held down, the ADF clutch A/B is **ON** to rotate the ADF stepping motor.
3. Press the HOME key or PROPERTY key. The ADF stepping motor operates to lower the glass for document standby.

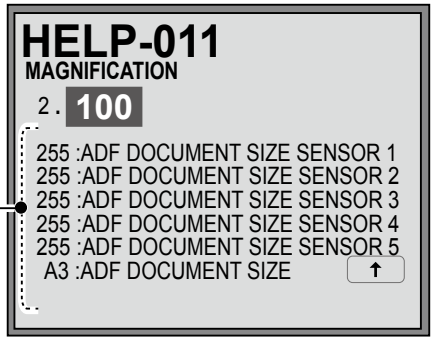


4. **Checking the sensor.**

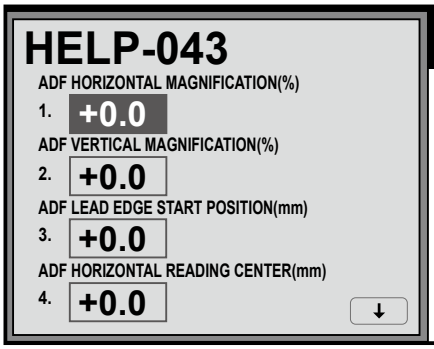
Check the following sensors.

► **Status of Sensors**

Sensors	under 80	80 or more
ADF DOCUMENT SIZE SENSOR 1	Present	Not present
ADF DOCUMENT SIZE SENSOR 2	Present	Not present
ADF DOCUMENT SIZE SENSOR 3	Present	Not present
ADF DOCUMENT SIZE SENSOR 4	Present	Not present
ADF DOCUMENT SIZE SENSOR 5	Present	Not present
ADF DOCUMENT SIZE	detected document size displayed	



Step5. → Press the STOP key. The HELP mode selection display will reappear.



(1) ADF Read Adjustment (2 pages in total)

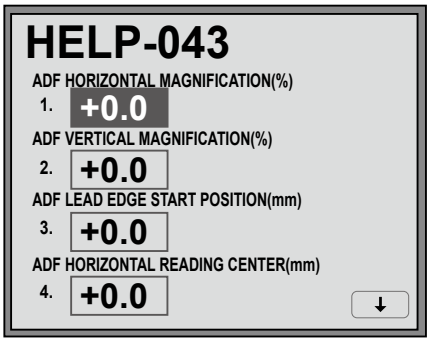
Page 1:

- **Adjustment.**
  ADF horizontal (main scan) magnification
  ADF vertical (sub scan) magnification
  ADF lead edge start position
  ADF horizontal reading center

• Operation procedure

1. Call the HELP mode "H-043".

Enter "**043**" by the NUMERIC keys and then press the **PRINT** key.



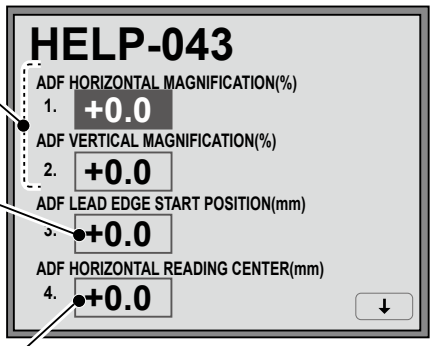
2. Adjust the ADF read.

Adjustment

1. Select and touch the item to be adjusted.
   ADF horizontal (main scan) magnification
   ADF vertical (sub scan) magnification
   - Make a master by the ADF and make the document the same length as the printed material.

   ADF lead edge start position
   - Make double master(2 in 1 mode).
     Make the second master at 2 mm from the lead edge.
     (* It is necessary to reset the value to default in HELP-068-5 : 'Multiple exposure: Margin of vertical reading center'.)
     Document reading starts earlier by "-".
     Document reading starts later by "+".

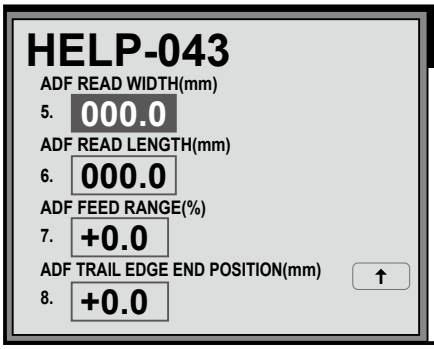
   ADF horizontal reading center
   - The print deviates rightward from the document by "-". (Main scan reading starts earlier.)
     The print deviates leftward from the document by "+". (Main scan reading starts later.)
2. Enter the value by the NUMERIC keys or change the value by the PRINT POSITION ◁ ▷ keys.
   - Press the HOME key or PROPERTY key to invert "+" and "-" of the selected set value.
   - Press the **C** (clear) key to return the selected set value to the value before change.
3. Press the ≚ key to store the set value.



3. Return to the HELP mode.

Press the STOP key.
The HELP mode selection display will reappear.

→ **To exit the HELP mode : Turn the power switch OFF.**
→ **To access another HELP mode : Enter the desired mode number using the numeric keys.**



(2) ADF Read Adjustment (2 pages in total)

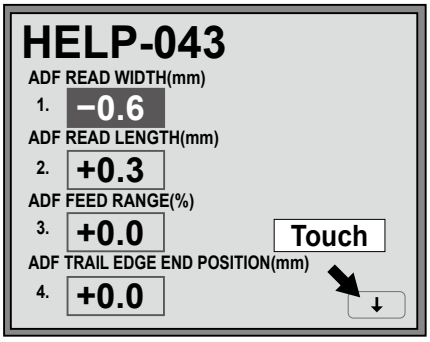
Page 2:

- **Adjustment.**
  ADF read width
  ADF read length
  ADF feed range
  ADF trail edge end position

● Operation procedure

1. **Call the HELP mode "H-043".**

Enter "**043**" by the NUMERIC keys and then press the PRINT key.



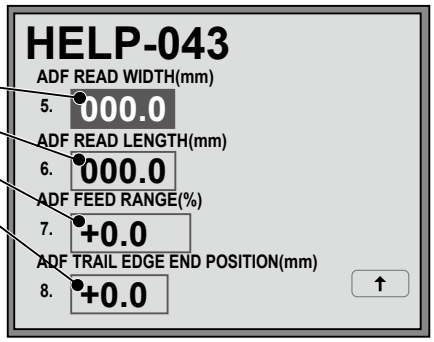
2. **Change the screen.**

Touch the **arrow** on the screen lower right once to switch to Page 2.

3. **Adjust the ADF read.**

Adjustment

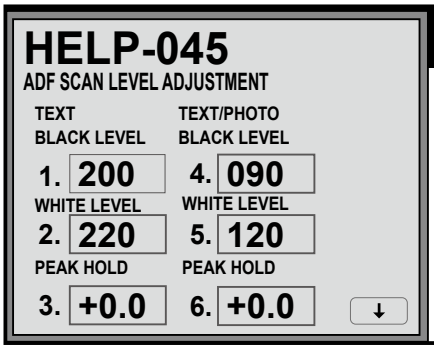
1. Select and touch the item to be adjusted.
   ADF read width
   ADF read length
   ADF feed range
   ADF trial edge end position
2. Enter the value by the NUMERIC keys or change the value by the PRINT POSITION ◁ ▷ keys.
   - Press the HOME key or PROPERTY key to invert "+" and "-" of the selected set value.
   - Press the **C** (clear) key to return the selected set value to the value before change.
3. Press the ⏎ key to store the set value.



4. **Return to the HELP mode.**

Press the STOP key.
The HELP mode selection display will reappear.

→ To exit the HELP mode : Turn the power switch OFF.
→ To access another HELP mode : Enter the desired mode number using the numeric keys.



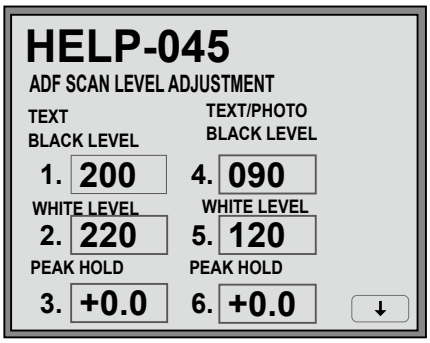
(1) ADF scan Level Adjustment (2 pages in total)

Page 1:
- **Adjustment.**
  TEXT mode
  Black level , White level , Peak hold
  TEXT/PHOTO mode
  Black level , White level , Peak hold

● Operation procedure

1. Call the HELP mode "H-045".

Enter "**045**" by the NUMERIC keys and then press the PRINT key.

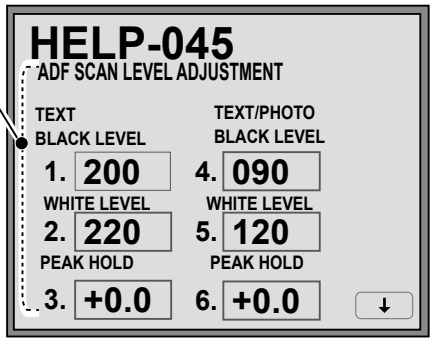


2. Adjust the ADF scan level.

Adjustment

1. Select and touch the item to be adjusted.
   ► Reference values

No.	Item		Adjustment width
1	Text mode	Black level	0 - 255
2		White level	0 - 255
3		Peak hold	−9.9 - +9.9
4	Text/Photo mode	Black level	0 - 255
5		White level	0 - 255
6		Peak hold	−9.9 - +9.9



2. Enter the value by the NUMERIC keys or change the value by the PRINT POSITION ◁ ▷ keys.
   - Press the HOME key or PROPERTY key to invert "+"and "-"of the selected set value.
   - Press the **C** (clear) key to return the selected set value to the value before change.

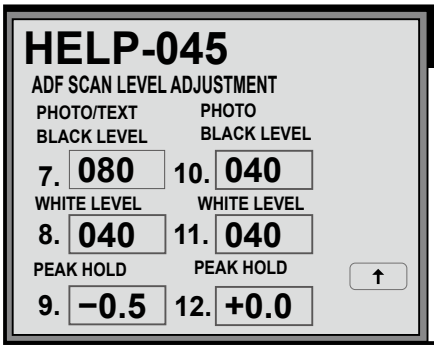
3. Press the X key to store the set value.

●Text mode
Adjust it by black and white levels.
Do not change the peak hold.
●Text /Photo mode
Adjust it by the black level and the peak hold.
Do not change the white level.

3. Return to the HELP mode.

Press the STOP key.
The HELP mode selection display will reappear.

→ To exit the HELP mode : Turn the power switch OFF.
→ To access another HELP mode : Enter the desired mode number using the numeric keys.



(2) ADF scan Level Adjustment (2 pages in total)

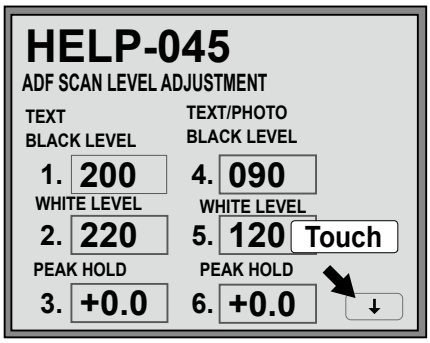
Page 2:

- **Adjustment**
  PHOTO/TEXT mode
  Black level , White level , Peak hold
  PHOTO mode
  Black level , White level , Peak hold

● Operation procedure

1. Call the HELP mode "H-045".

Enter "**045**" by the NUMERIC keys and then press the PRINT key.



2. Change the screen.

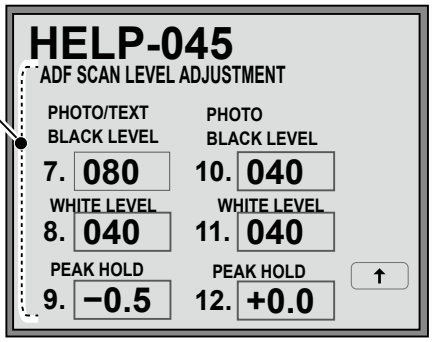
Touch the **arrow** on the screen lower right once to switch to Page 2.

3. Adjust the ADF scan level.

Adjustment

1. Select and touch the item to be adjusted.
   ► Reference values

No.	Item		Adjustment width
7	Text mode	Black level	0 - 255
8		White level	0 - 255
9		Peak hold	-9.9 - +9.9
10	Text/Photo mode	Black level	0 - 255
11		White level	0 - 255
12		Peak hold	-9.9 - +9.9



● Photo/Text mode, Photo mode
Adjust it by the black level and the peak hold.
Do not change the white level.

2. Enter the value by the NUMERIC keys or change the value by the PRINT POSITION ◁ ▷ keys.
   - Press the HOME key or PROPERTY key to invert "+"and "-"of the selected set value.
   - Press the **C** (clear) key to return the selected set value to the value before change.

3. Press the **X** key to store the set value.

4. Return to the HELP mode.

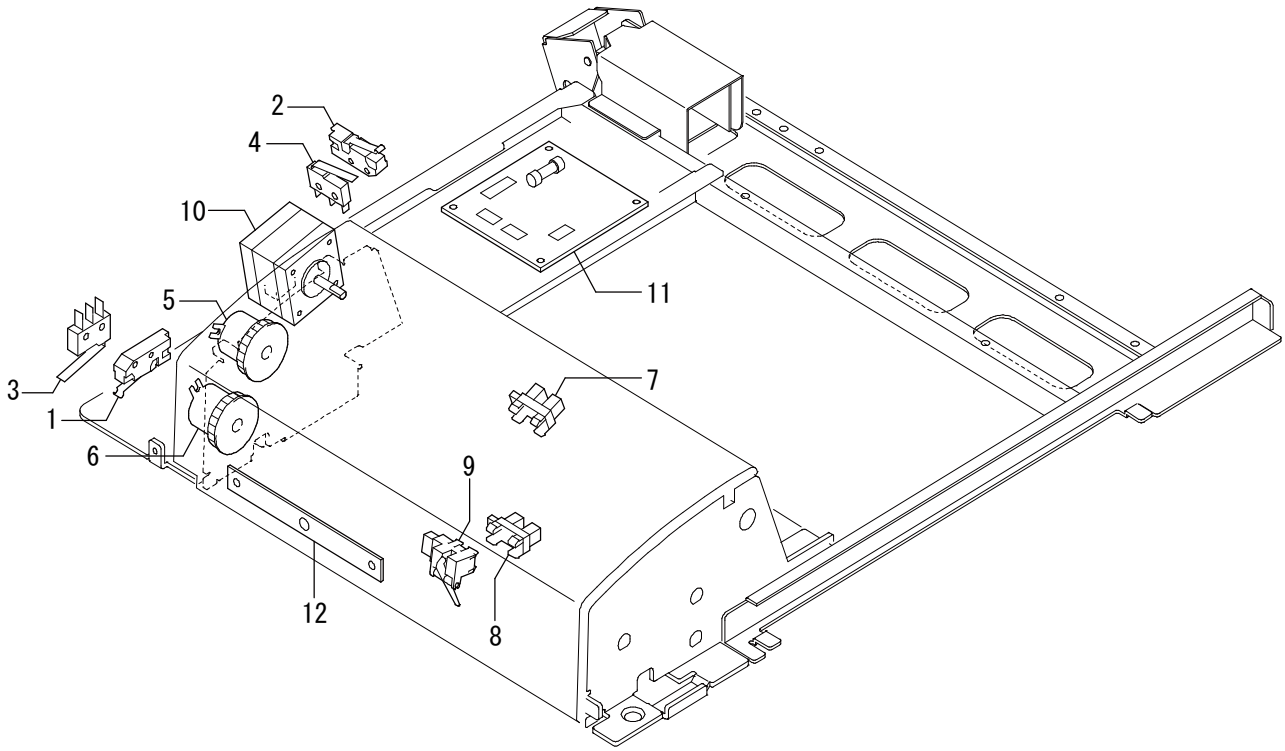
Press the STOP key.
The HELP mode selection display will reappear.

→ To exit the HELP mode : Turn the power switch OFF.
→ To access another HELP mode : Enter the desired mode number using the numeric keys.

Chapter 8 Others

1 Electrical Parts Layout and Their Functions

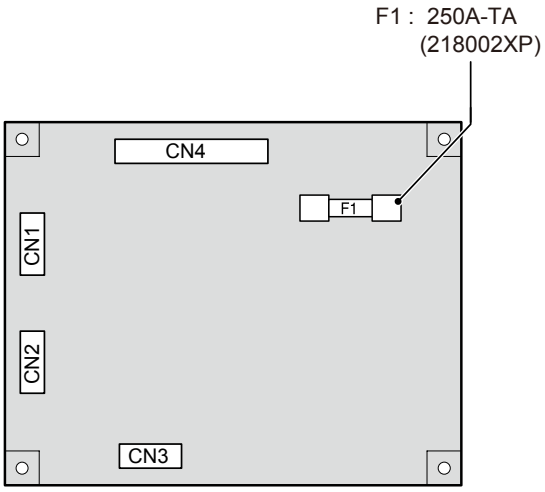
(1) Electrical Parts



Item	No.	Functions
Microswitch	1	ADF Document cover open/closed is detected.
	2	ADF cover open/closed is detected.
	3	ADF Document cover open/closed is detected. (for interlock)
	4	ADF cover open/closed is detected. (for interlock)
Clutch	5	ADF clutch A
	6	ADF clutch B
Sensor	7	Weather the document is placed or not is detected.
	8	Document JAM is detected.
	9	ADF document lead edge is detected.
Stepping motor	10	ADF stepping motor.
ADF drive PCB unit	11	Controlling the ADF on the whole.
ADF document size PCB UNIT	12	Document size is detected.

(2) Position of Connectors/Fuse

1. ADF Drive PCB Unit



2 Overall Wiring Layout