

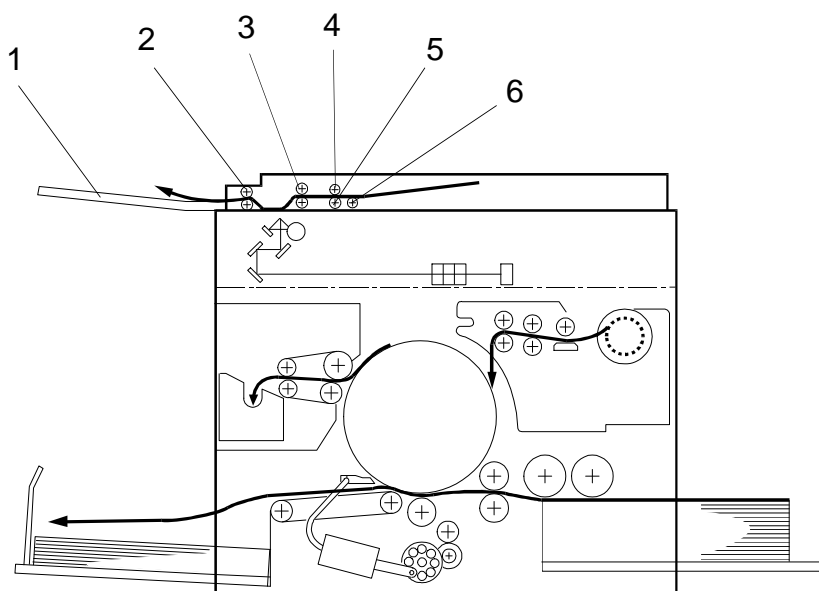
**DOCUMENT FEEDER  
DF UNIT (20-SHEET)  
(C550)**

## 1. OVERALL MACHINE INFORMATION

### 1.1 SPECIFICATIONS

Original Type:	Sheet-feed
Original Paper Size:	Maximum 307 mm x 432 mm (12.0" x 17.0") Minimum 90 mm x 140 mm (3.6" x 5.5")
Original Weight:	40.7 g/m <sup>2</sup> to 127.9 g/m <sup>2</sup> , 10.8 lb to 34 lb
ADF Original Capacity:	20 sheets (66 g/m <sup>2</sup> , 17.6 lb) or 1.8 mm height

### 1.2 MECHANICAL COMPONENT LAYOUT

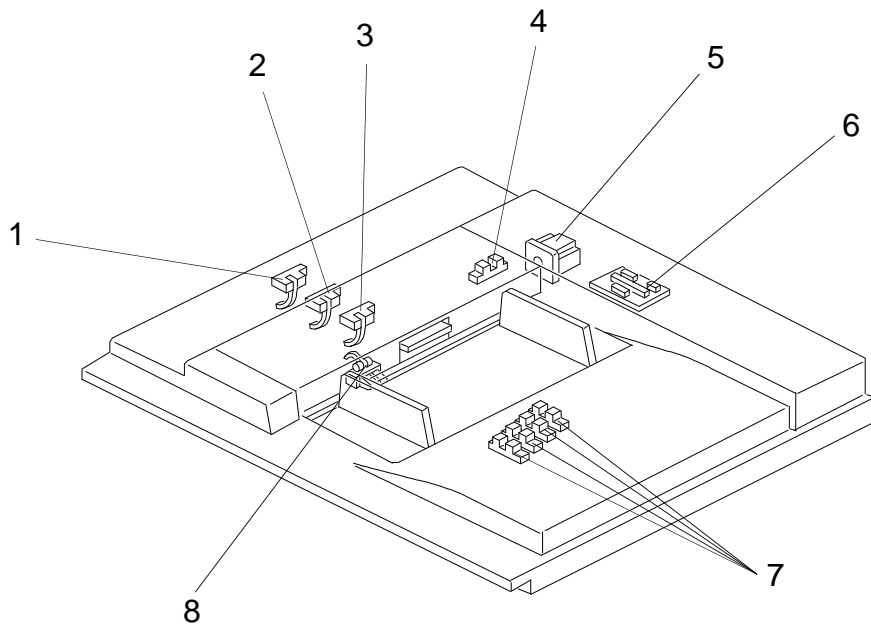


C550V500.wmf

1. Original Exit Tray
2. 2nd Original Transport Roller
3. 1st Original Transport Roller
4. Separation Roller
5. Feed Roller
6. Pick-up Roller

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### 1.3 ELECTRICAL COMPONENT LAYOUT



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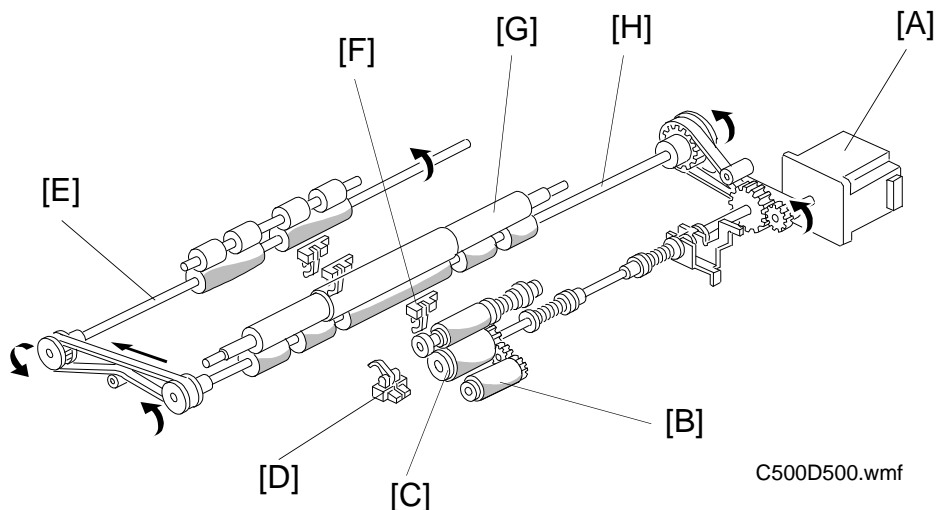
- |                                 |                          |
|---------------------------------|--------------------------|
| 1. Original Exit Sensor         | 5. ADF Motor             |
| 2. Scan Line Sensor             | 6. ADF Interface Board   |
| 3. Original Registration Sensor | 7. Original Width Sensor |
| 4. ADF Cover Sensor             | 8. Original Set Sensor   |

### COMPONENT DESCRIPTION

Index No.	Name	Function
1	Original Exit Sensor	Informs the CPU when the original activates the sensor. Also detects original misfeeds.
2	Scan Line Sensor	Determines the timing for scanning. Also detects original misfeeds.
3	Original Registration Sensor	Determines the timing for the ADF motor to start. Also detects original misfeeds.
4	ADF Cover Sensor	Informs the CPU when the ADF cover is opened.
5	ADF Motor	Drives the ADF mechanisms.
6	ADF Interface Board	Controls the ADF in response to signals from the main body.
7	Original Width Sensor	Informs the CPU of the original width.
8	Original Set Sensor	Informs the CPU when an original is placed in the ADF.

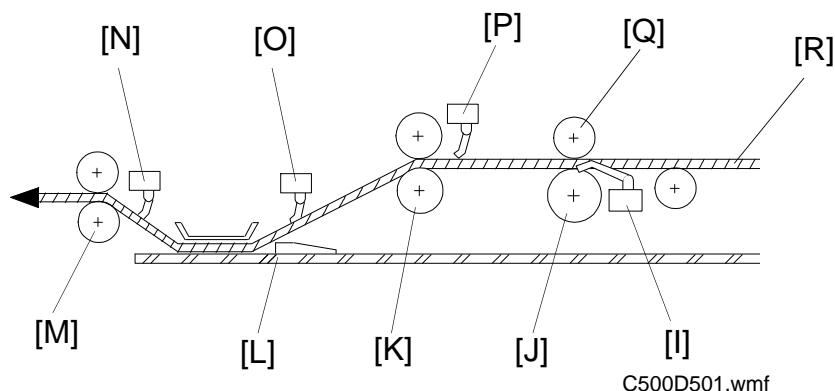
## 2. SECTIONAL DESCRIPTIONS

### 2.1 DRIVE MECHANISM



- [D]: Original Set Sensor
- [G]: 1st Original Transport Roller

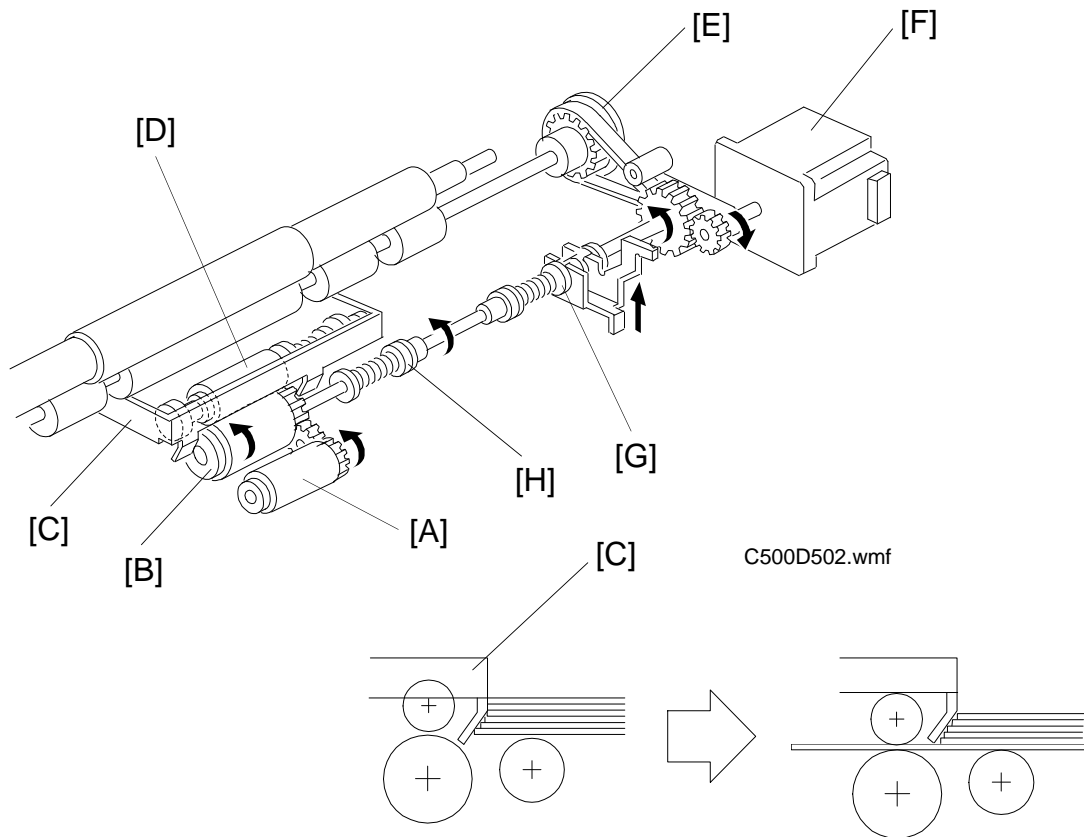
The ADF motor [A] is a stepper motor. The ADF motor rotates clockwise and then counterclockwise to feed the original. When the Master Making key is pressed, the ADF motor rotates clockwise to drive the pick-up roller [B] and the feed roller [C] turns counterclockwise to feed the bottom page of the original. When the original has been fed 14.5 mm after the original registration sensor [F] was activated, the ADF motor starts to rotate counterclockwise. This drives the lower 1st original transport roller [H] and the lower original exit roller [E] counterclockwise, feeding the original.



- [I]: Original Set Sensor
- [J]: Feed Roller
- [K]: 1st Original Transport Roller
- [L]: Exposure Glass
- [M]: 2nd Original Transport Roller
- [N]: Original Exit Sensor
- [O]: Scan Line Sensor
- [P]: Original Registration Sensor
- [Q]: Separation Roller
- [R]: Original Paper Path

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## 2.2 PAPER FEED AND SEPARATION



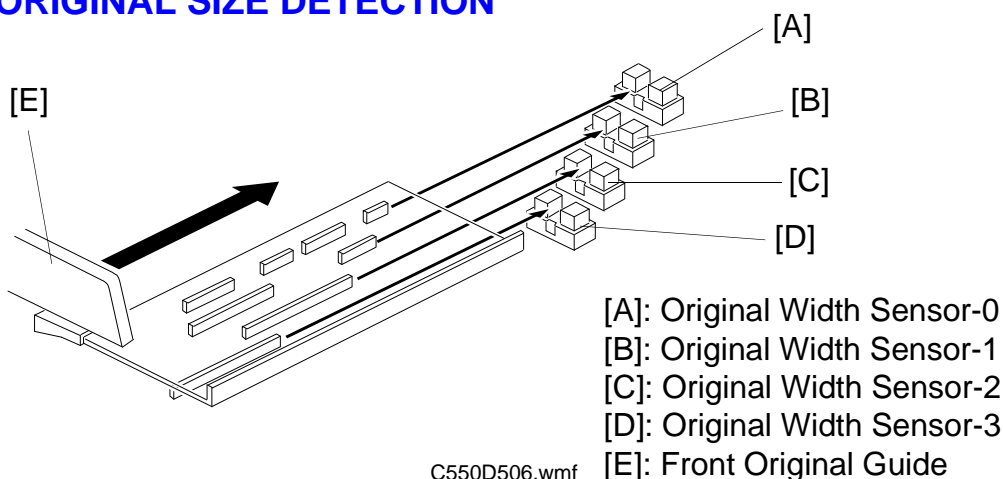
C500D502.wmf

C550D503.wmf

When the originals are placed on the ADF and the Master Making key is pressed, the pick-up roller [A] starts to rotate as it is lifted by the spring clutch [H] to touch the bottom page of the document. The original shutter [C] is lifted by the spring clutch and the lever [G] when the ADF motor is turned on. The separation roller [D] and the feed roller [B] allow only one page into the scanner. The one-way clutch on the feed roller [E] prevents its backward rotation when the ADF motor [F] rotates counterclockwise.

The pick-up and the shutter torque are adjustable by the length of the spring. See Pick-up Torque and Shutter Torque Adjustment for details.

## 2.3 ORIGINAL SIZE DETECTION



There are 4 sensors (photointerrupters) for detecting the original width. When the front original guide [E] is shifted to match the original width, the plate [F] moves with the guide. Eight actuators are installed on the plate, and depending on the side guide position, the sensor status will be changed.

The following table shows the relationship between the paper size and the sensor status.

Original Size	A3	DLT	B4	LT/LG	A4	B5	A5
Original Size Sensor-0	O		O			O	
Original Size Sensor-1		O	O			O	O
Original Size Sensor-2			O	O	O	O	
Original Size Sensor-3					O	O	O

X= Non-blocked, O= Blocked

\* : All of the above original sizes are for lengthwise feed.

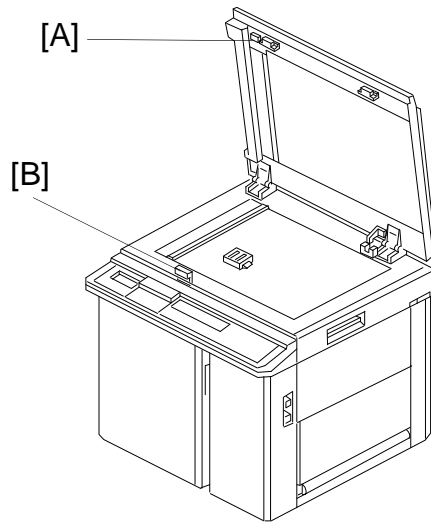
## 2.4 ORIGINAL MISFEED DETECTION

The machine indicates an original misfeed in the following conditions.

- When the original registration sensor does not go ON within 3 seconds after the ADF motor starts rotating (clockwise).
- When the scan line sensor does not go ON within 2.5 seconds after the original registration sensor is turned on.
- When the original exit sensor does not go ON after the scan line sensor is turned on and the original has been fed 60 millimeters.



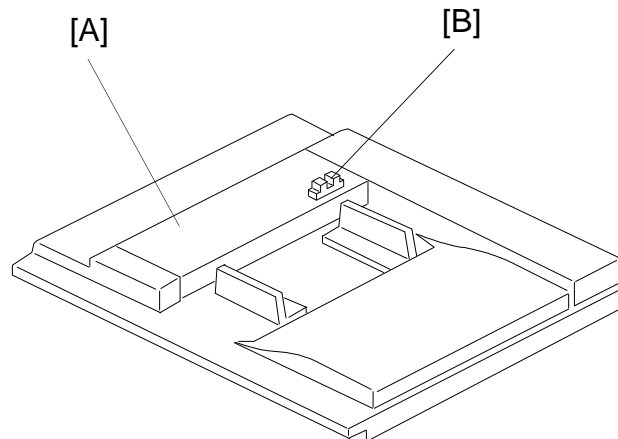
## 2.5 ADF OPEN/CLOSE DETECTION



C550D504.wmf

The ADF set sensor detects whether the ADF unit is opened or closed. This sensor is a reed switch. A magnet mounted on the ADF [A] activates the reed switch [B]. When an original is placed in the ADF and the Master Making key is pressed while this sensor detects that the ADF is not closed, the machine indicates "CLOSE PLATEN COVER" on the operation display. The machine indicates this only when the optional ADF unit is installed.

## 2.6 ADF POSITION DETECTION



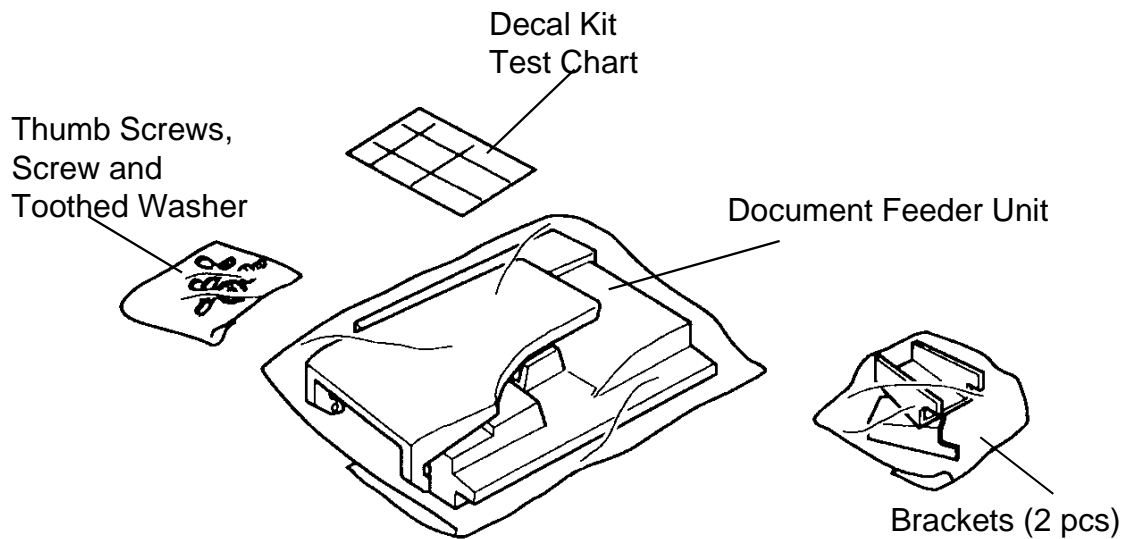
C550D505.wmf

When the ADF cover [A] is opened, the platen cover position sensor [B] is deactivated. When this sensor is deactivated, the machine indicates "CLOSE ADF COVER" on the operation display.

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## 3. INSTALLATION PROCEDURE

### 3.1 ACCESSORY CHECK

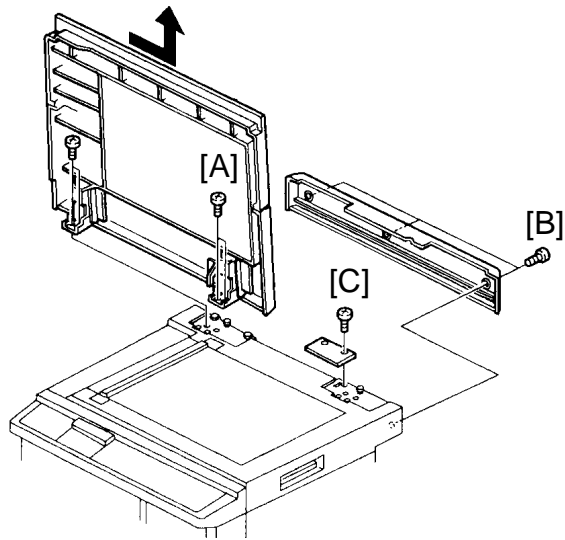


C550I500.img

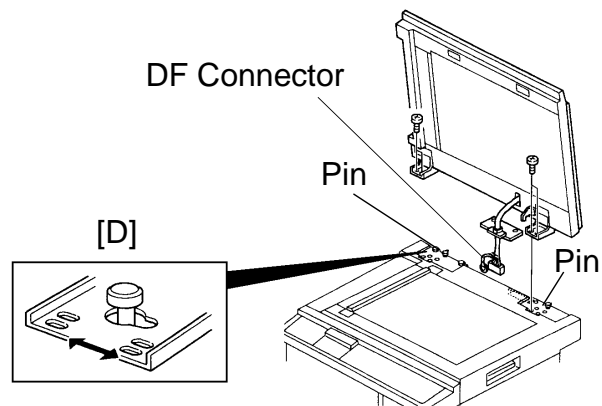
Make sure that you have all the accessories listed below.

- (1) Document Feeder Unit
- (2) Bracket (2 pcs.)
- (3) Screw and a Toothed Washer
- (4) Thumb Screws (4 pcs.)
- (5) Test Chart
- (6) Installation Procedure
- (7) Decal Kit



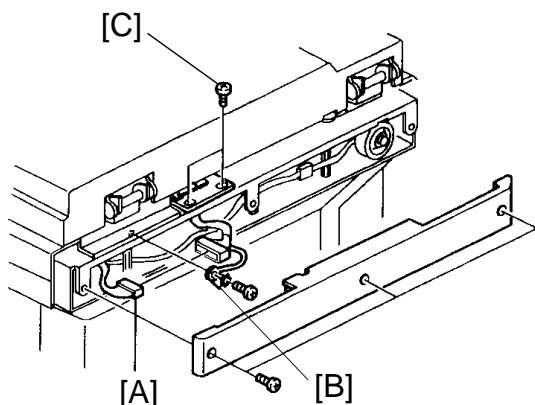


C550i501.img

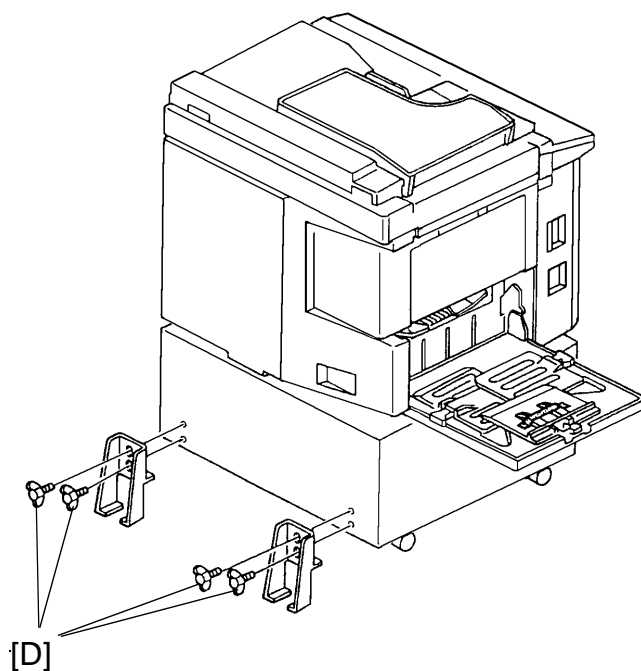


C550i502.img

1. Turn off the main switch and unplug the power cord.
2. Open the Platen Cover, remove 4 screws [A] and remove the Platen Cover.
3. Remove 3 screws [B] and remove the Upper Rear Cover.
4. Remove 2 screws [C] and remove the cover plate.
5. Let the DF connector through the opening and mount the DF Unit as shown in the diagram [D].
6. Secure the DF Unit by 4 screws that were removed in step 2.



C550I503.img



C550I504.img

7. Close the DF and connect the connector to the scanner connector [A].
8. Secure the wire [B] by the screw and the washer in the accessory.
9. Secure the DF Harness Bracket by 2 screws [C].
10. Replace the Upper Rear Cover by 3 screws.
11. Secure the machine by placing 2 brackets [D] on the back of the table using 4 thumb screws in the accessory.

**⚠ CAUTION**

**The brackets must be attached to the back of the table. This is to prevent the machine from falling over when the ADF is opened. Also, make sure that the machine is secured to the table.**

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When you install the optional ADF, do the following adjustments.

- ADF height adjustment.
- Image center adjustment.
- Image scan magnification adjustment.

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## 4. SERVICE TABLES

### 4.1 USER'S MAINTENANCE

Advise the customer to clean each item regularly. Clean the following items at every EM call if necessary.

<b>Cleaning Point</b>	<b>Cleaner</b>
Original Feed Rollers	Cloth, soap, and water

### 4.2 PERIODIC INSPECTION

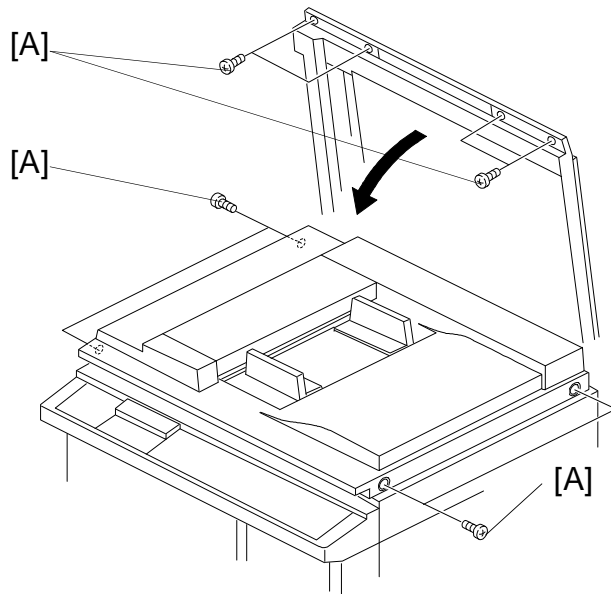
Inspect the following every 6 months.

<b>Item</b>	<b>Standard Procedure</b>
Pick-up Roller Feed Roller Separation Roller	Wipe off paper powder using a cloth moistened with water.

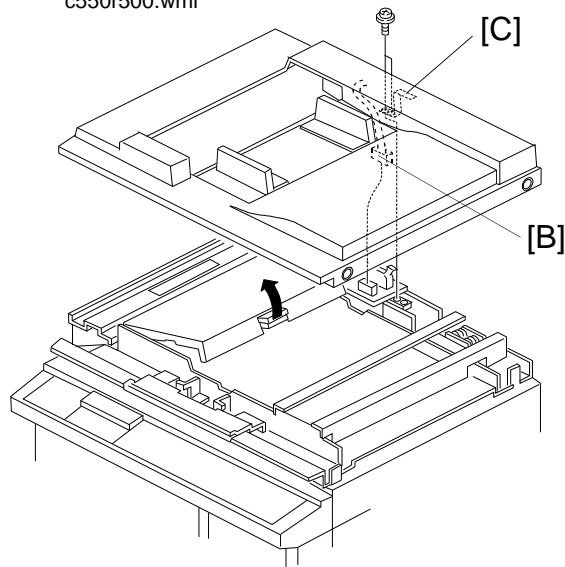
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## 5. REPLACEMENT AND ADJUSTMENT

### 5.1 ADF COVER REMOVAL



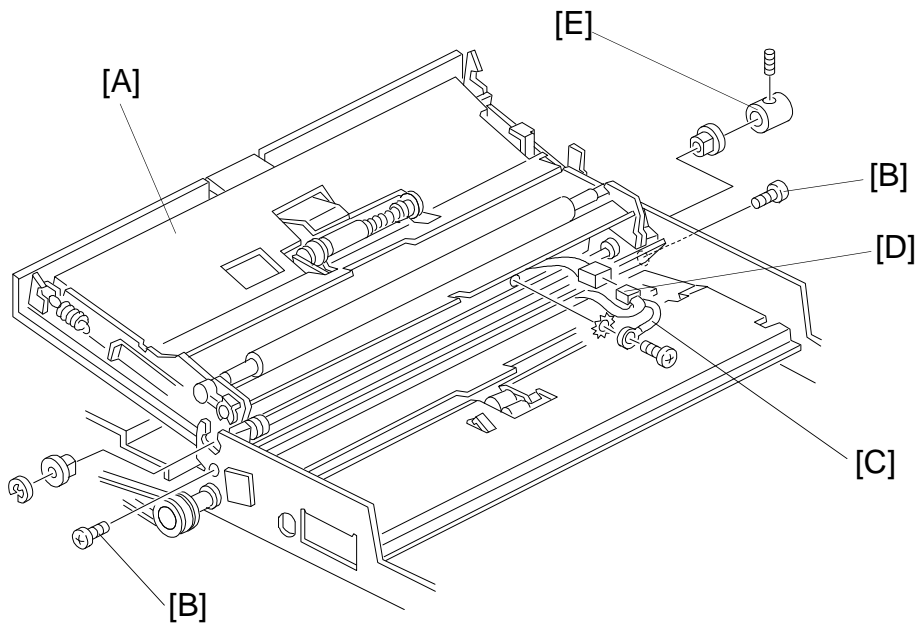
c550r500.wmf



C550R501.wmf

1. Remove the screws [A] securing the ADF cover (8 screws).
2. Disconnect the original size detector harness [B].
3. Remove the harness protector [C] (2 screws).

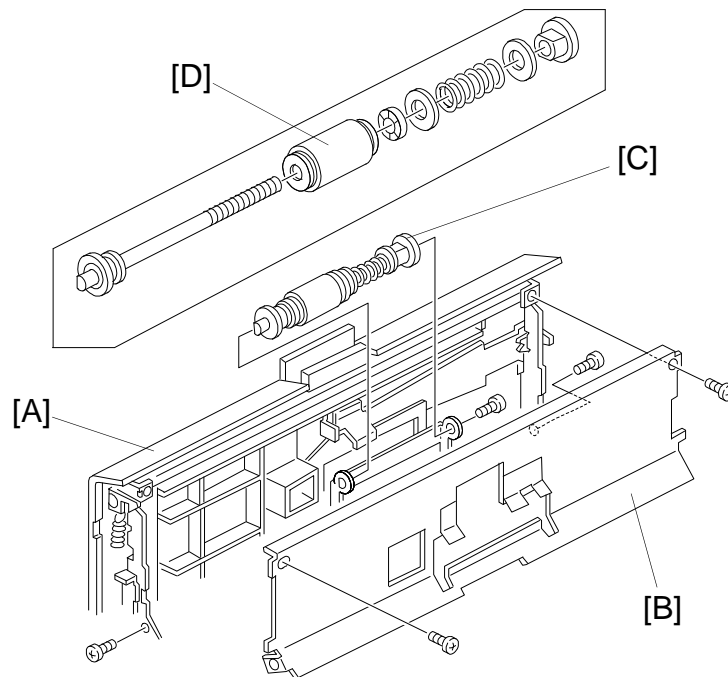
## 5.2 ADF UNIT REMOVAL



C550r502.wmf

1. Remove the ADF cover (see section 4-1).
2. Open the ADF unit [A] and remove two stopper screws [B].
3. Remove the grounding wire [C] (1 screw, 1 toothed washer).
4. Disconnect the connector [D].
5. Remove the collar [E].
6. Remove the ADF unit [A] (2 bushings, 1 E-ring).

### 5.3 SEPARATION ROLLER REMOVAL

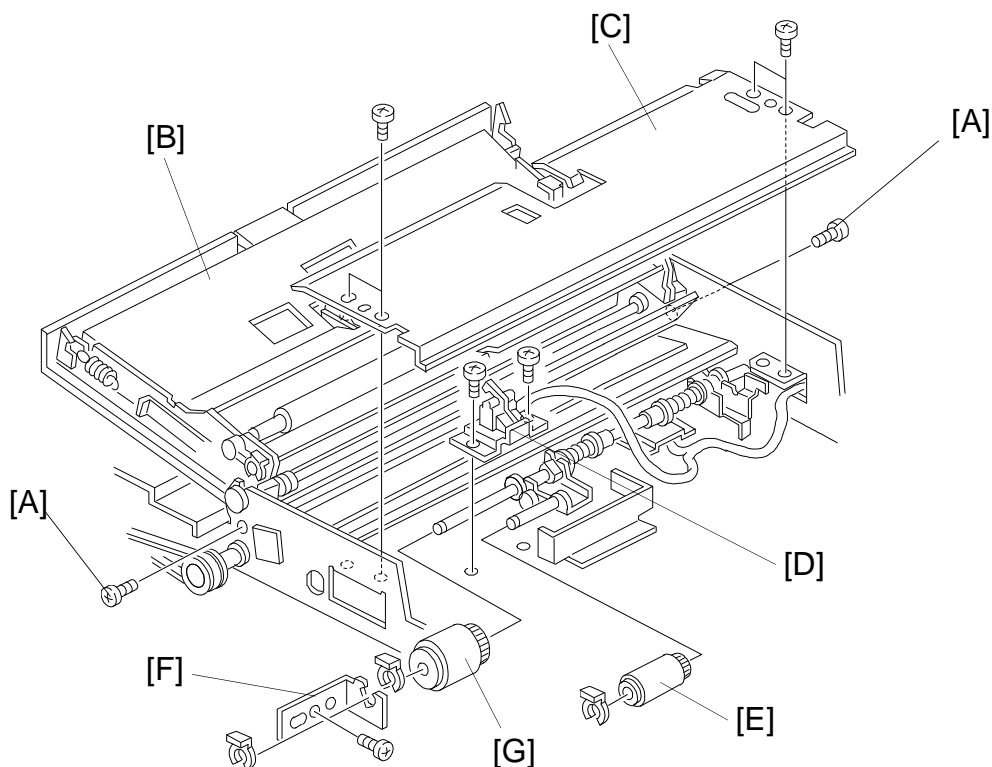


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1. Open the ADF unit [A].
2. Remove the separation guide plate [B] (4 screws).
3. Remove the separation roller assembly [C] (1 screw).
4. Remove the separation roller [D].

**NOTE:** After replacing the separation roller, perform the separation torque adjustment (see section 5-14).

## 5.4 PICK-UP ROLLER AND FEED ROLLER REMOVAL

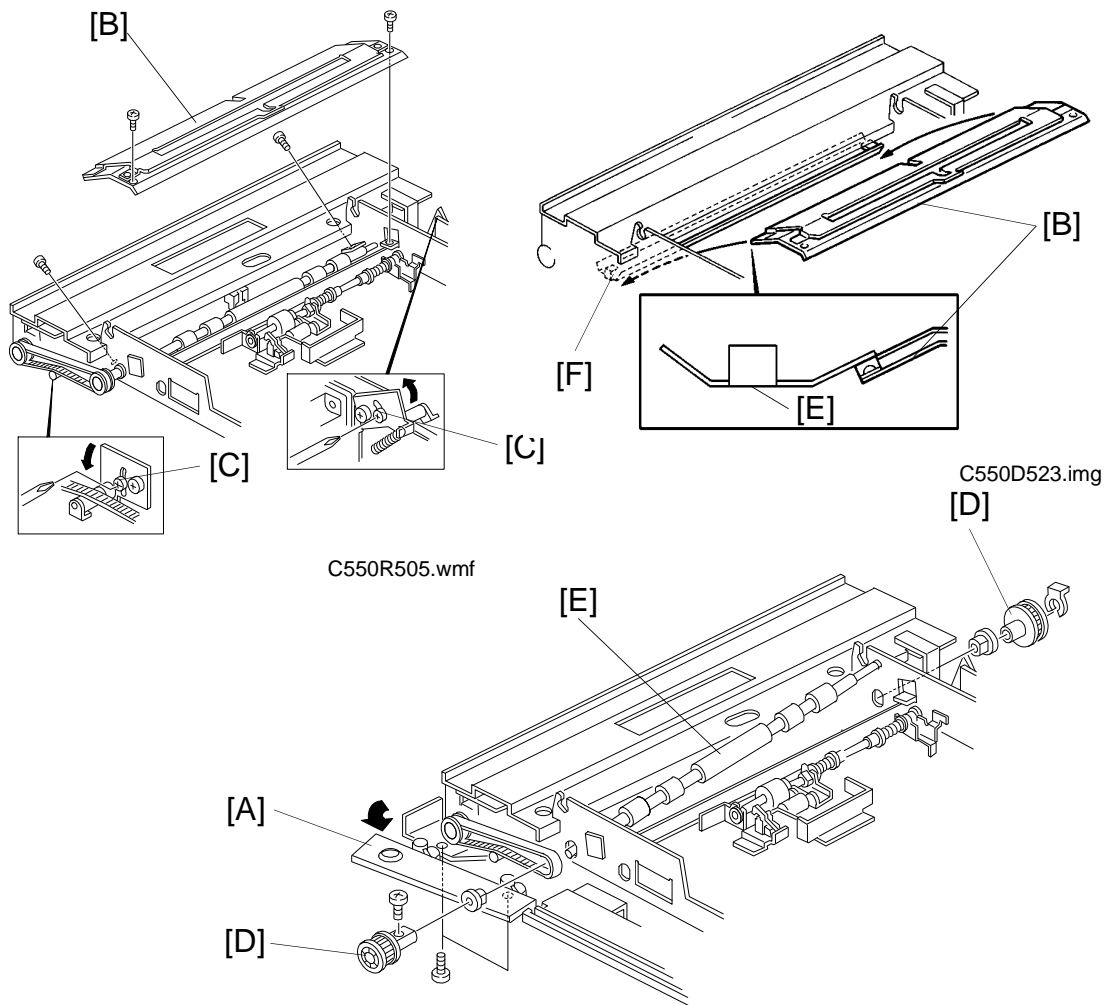


C550R504.wmf

1. Remove the ADF cover (see section 4-1).
2. Remove two stopper set screws [A] and open the ADF unit [B].
3. Remove the guide plate [C] (4 screws).
4. Remove the sensor bracket [D] (2 screws).
5. Remove the pick-up roller [E] (1 clip).
6. Remove the bracket [F] (1 screw, 1 clip).
7. Remove the feed roller [G] (1 clip).



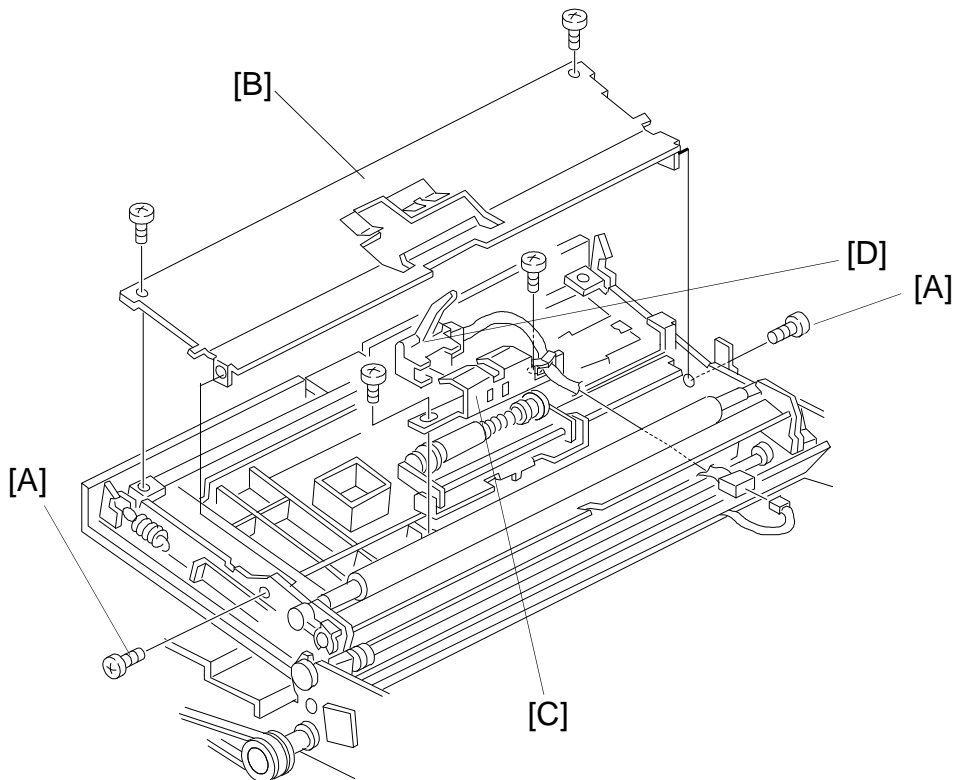
### 5.5 TRANSPORT ROLLER REMOVAL



1. Remove the ADF cover (see section 4-1).
2. Remove the grip cover [A] (2 screws).
3. Remove two stopper set screws and open the ADF unit (see section 4-4).
4. Remove the guide plate (see section 4-4).
5. Remove the transport guide plate [B] (4 screws).
6. Loosen the screws [C] securing the belt tension bracket.
7. Remove the pulleys [D] (1 screw at the front, 1 clip at the rear).
8. Remove the transport roller [E] (2 bushings).

**NOTE:** When you reinstall the transport guide plate [B], make sure the guide plate is under the white plate [F].

### 5.6 ORIGINAL REGISTRATION SENSOR REMOVAL

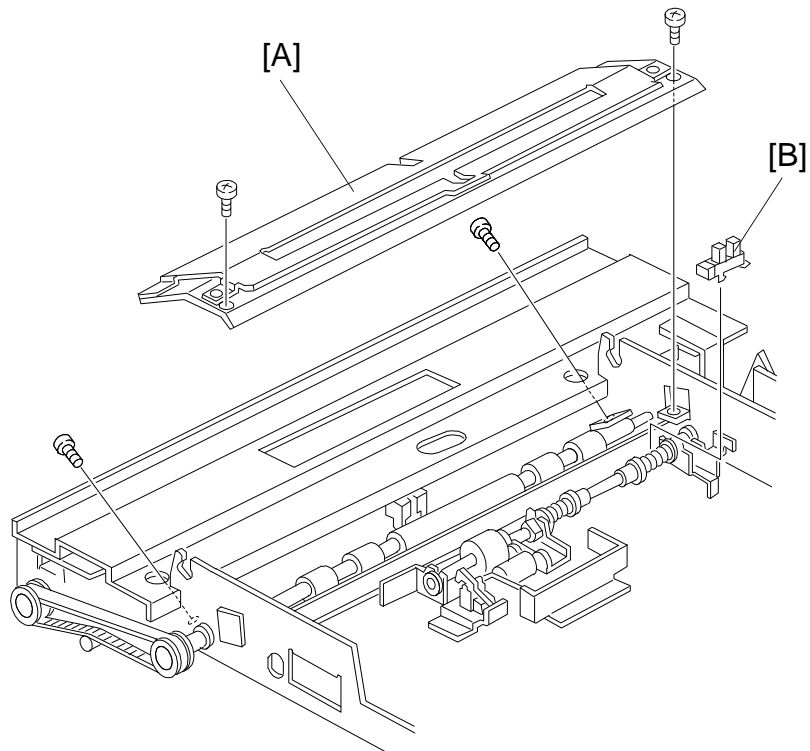


C550R508.wmf

1. Remove the ADF cover (see section 5-1).
2. Remove two stopper set screws [A] and open the ADF unit.
3. Remove the separation guide plate [B] (4 screws).
4. Remove the sensor bracket [C] (2 screws).
5. Remove the original registration sensor [D] (1 connector).



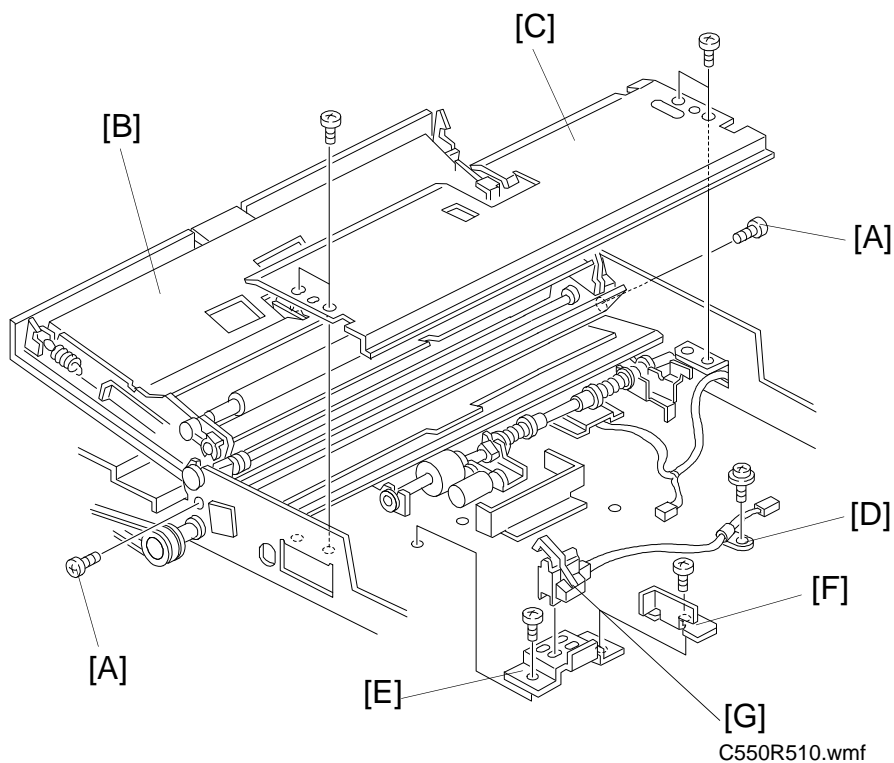
## 5.7 ADF POSITION SENSOR REMOVAL



C550R509.wmf

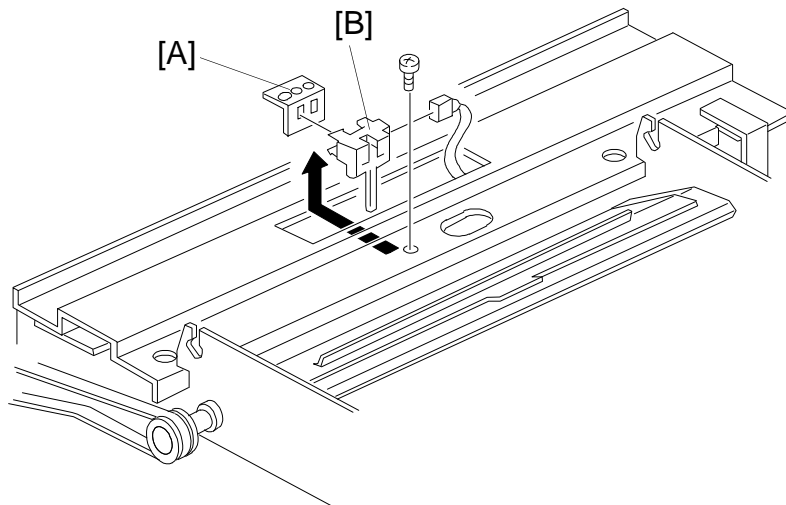
1. Remove the ADF cover (see section 5-1).
2. Remove two stopper set screws and open the ADF unit (see section 5-4).
3. Remove the guide plate (see section 5-4).
4. Remove the transport guide plate [A] (4 screws).
5. Remove the ADF position sensor [B] (1 connector).

## 5.8 ORIGINAL SET SENSOR REMOVAL



1. Remove the ADF cover (see section 5-1).
2. Remove two stopper set screws [A] then open the ADF unit [B].
3. Remove the guide plate [C] (4 screws).
4. Remove the harness clamp [D] (1 screw).
5. Remove the sensor bracket [E] and the bracket [F] (2 screws).
6. Remove the original set sensor [G] (1 connector).

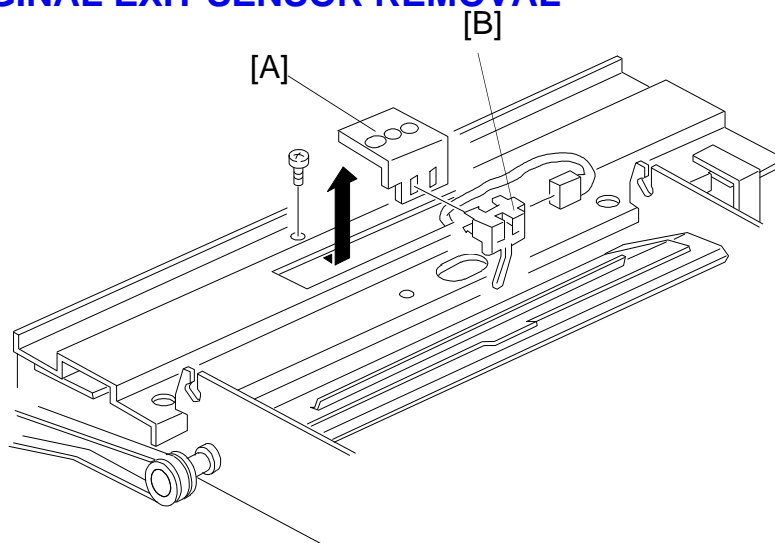
## 5.9 SCAN LINE SENSOR REMOVAL



C550R511.wmf

1. Remove the ADF unit (see section 5-2).
2. Remove the sensor bracket [A] (1 screw).
3. Remove the scan line sensor [B] (1 connector).

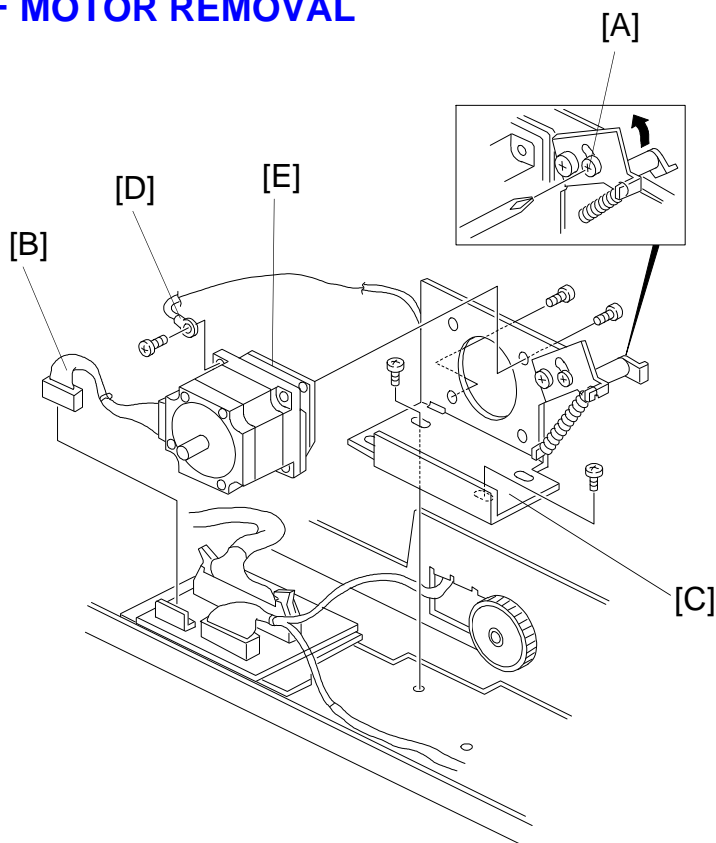
## 5.10 ORIGINAL EXIT SENSOR REMOVAL



C550R512.wmf

1. Remove the ADF unit (see section 5-2).
2. Remove the sensor bracket [A] (1 screw).
3. Remove the original exit sensor (1 connector).

## 5.11 ADF MOTOR REMOVAL



C550R513.wmf

1. Remove the ADF cover (see section 5-1).
2. Loosen the screw [A] securing the belt tension bracket.
3. Disconnect the motor harness [B].
4. Remove the motor bracket [C] (2 screws, 1 timing belt).
5. Remove the ground wire [D] (1 screw).
6. Remove the ADF motor [E] (2 screws).

**NOTE:**

- When reinstalling the motor bracket, slide the bracket slightly to the right as viewed when standing at the back of the machine.
- After reinstalling the timing belt, make sure that you tighten the screw [A].

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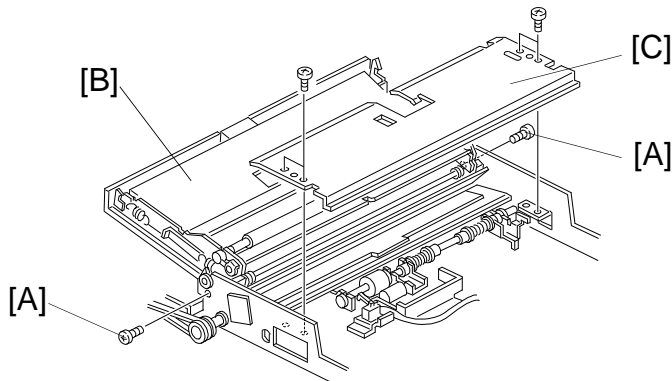
## 5.12 PICK-UP TORQUE AND SHUTTER TORQUE ADJUSTMENT

**Purpose:** To ensure that the originals are picked-up properly.

**Adjustment Standard:** The length of the spring for:

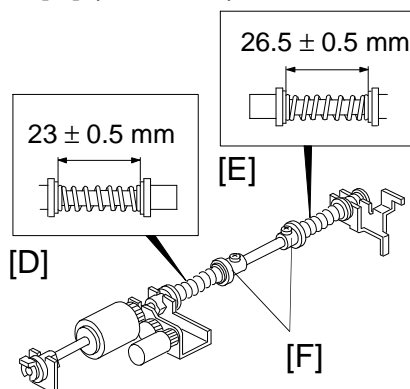
Pick-up:  $23 \pm 0.5$  mm

Shutter:  $26.5 \pm 0.5$  mm



C550R514.wmf

1. Remove the ADF cover (see section 5-1).
2. Remove two stopper screws [A] and open the ADF unit [B].
3. Remove the guide plate [C] (4 screws).

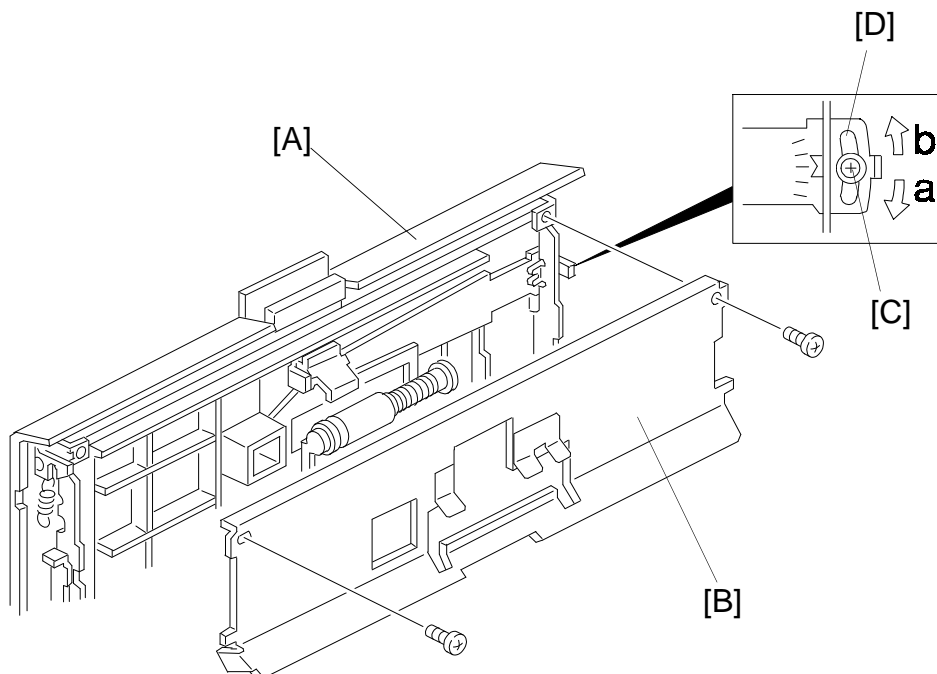


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4. Check that the length of the pick-up and shutter torque springs are within the following specifications.
  - Length of the pick-up spring [D]:  $23 \pm 0.5$  mm
  - Length of the shutter spring [E]:  $26.5 \pm 0.5$  mm
5. If they are out of the specified range, adjust the spring lengths by sliding the collar [F].
  - Original double feed: These springs should be shorter than the specification.
  - Original non-feed: These springs should be longer than the specification.

### 5.13 SEPARATION ROLLER PRESSURE ADJUSTMENT

**Purpose:** To ensure that the originals are fed properly.



C550R516.wmf

1. Open the ADF unit [A].
2. Remove the separation guide plate [B] (4 screws).
3. Loosen the screw [C] securing the pressure adjustment lever [D] then move the lever to change the pressure.  
Original non-feed: Move the lever towards [a] (decrease the pressure).  
Original double feed: Move the lever towards [b] (increase the pressure).
4. After adjusting the pressure, tighten the screw [C].

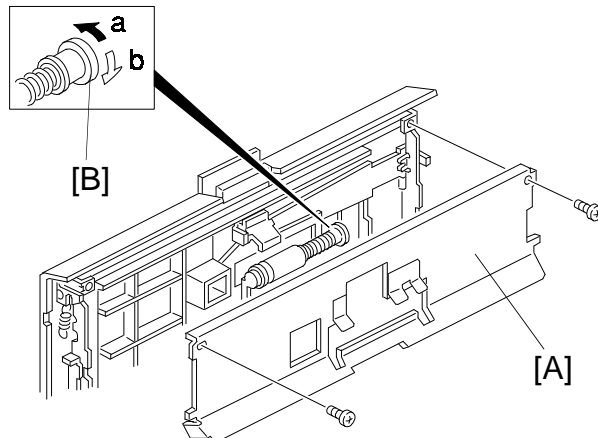
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## 5.14 SEPARATION TORQUE ADJUSTMENT

**Purpose:** To ensure that the originals are fed properly.

**Adjustment Standard:** 450 gf (use a torque gauge)

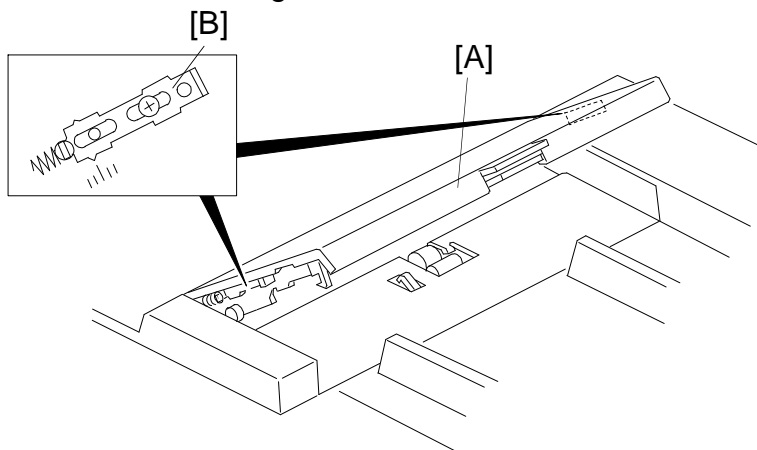


C550R517.wmf

1. Open the ADF unit and remove the separation guide plate [A].
2. Adjust the separation torque by turning the bushing [B].  
 Original double feed: Turn the bushing in the [a] direction (increase the torque).  
 Original non-feed: Turn the bushing in the [b] direction (decrease the torque).

## 5.15 ORIGINAL SKEW ADJUSTMENT

**Purpose:** To correct original skew.



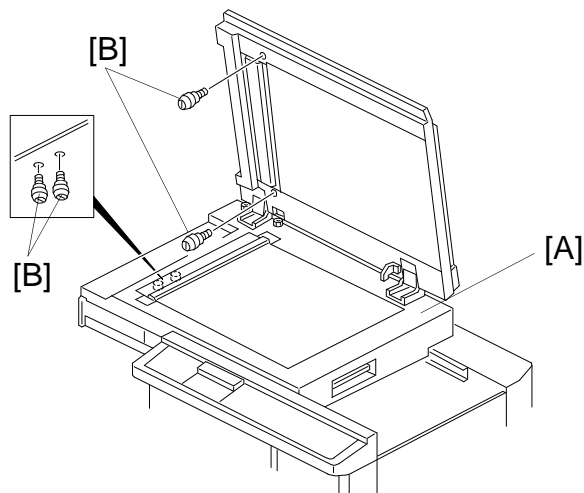
C550R518.wmf

1. Open the ADF unit [A].
2. Move the adjustment plates [B] to correct the skew.
3. After adjusting the skew, tighten the plate properly.

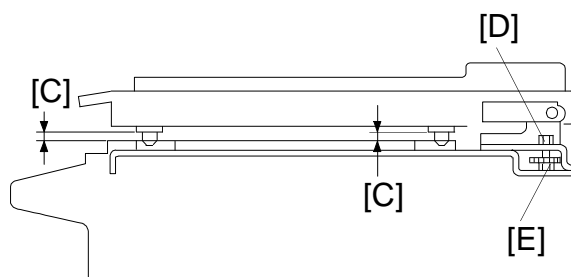
## 5.16 ADF HEIGHT ADJUSTMENT

**Purpose:** To ensure that the image can be scanned properly.

**Adjustment Standard:** Less than 0.5 mm



C550R519.wmf



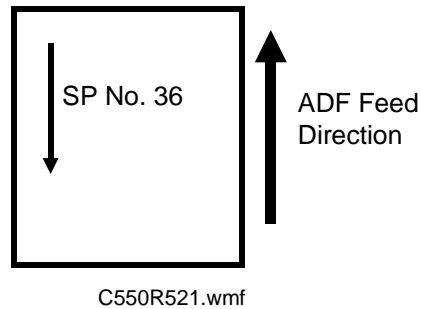
1. Slide the scanner unit to the left [A]. C550R520.wmf
2. Remove two positioning pins (white) [B] under the scanner unit. Then, attach them to the ADF as shown in the diagram.
3. Close the ADF and check that the gap [C] between the positioning pins and the scanner upper cover is less than 0.5 mm, using a thickness gauge.
4. If not, adjust the ADF height as follows.
  - 4-1. Remove the upper rear cover (see section 5-1 of the main frame's manual.).
  - 4-2. Loosen the nut [D] and adjust the height by turning the knob screw [E]. Then, tighten the nut.
5. After adjusting the ADF height, put the positioning pins back in their previous position (under the scanner unit).

## 5.17 IMAGE SCAN MAGNIFICATION ADJUSTMENT

**Purpose:** To correct the sub scan magnification.

**Adjustment Standard:**  $100 \pm 0.5\%$  in full size mode.

1. Using a test chart, make a print in ADF mode.
2. Check that the sub scan magnification is within the specification.
3. If it is out of specification, adjust the sub scan magnification using SP No. 36.



## 5.18 IMAGE CENTER ADJUSTMENT (SIDE-TO-SIDE)

**Purpose:** To correct the center position of the printed image.

**Adjustment Standard:** Less than 1 mm

**NOTE:** Before adjusting the image center position in ADF mode, adjust it in platen mode.

1. Using a test chart, make a print using both ADF mode and platen mode.
2. Compare both copies and check that the difference between the two copies is within 1 mm.
3. If the difference is too great, adjust the image center using SP No. 39-1.

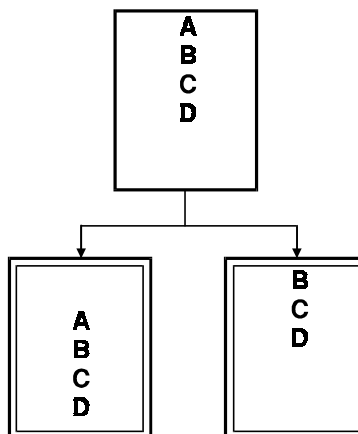
## 5.19 SCANNER LEADING EDGE REGISTRATION ADJUSTMENT

**Purpose:** To adjust the scanner start position in accordance with the customer's request, or to adjust the vertical image position of the prints to match the original.

**Standard Position:** The scanning starts at 5 mm after the leading edge.

**NOTE:** When performing this adjustment, set the print speed and the image position to the standard positions.

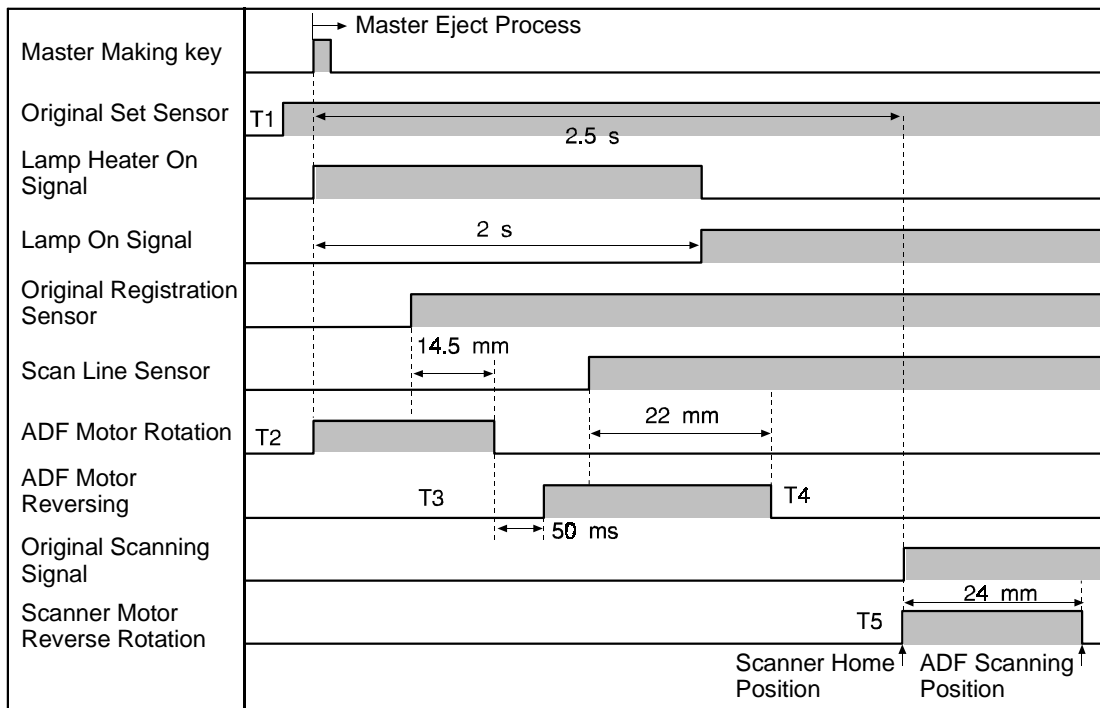
1. Using a test chart, make a print using ADF mode.
2. Check the scanner start position and adjust the scanner leading edge registration using SP No. 38.



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## 2.6 ELECTRICAL TIMING

### 2.6.1 ADF (Before Scanning)

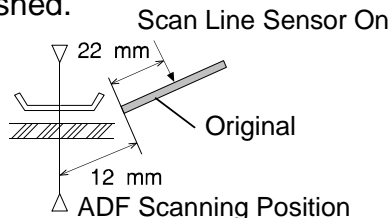


T1: When originals are inserted in the ADF unit, the original set sensor is activated.

T2: When the Master Making key is pressed, the ADF motor rotates the pickup roller and the feed roller to feed the bottom original into the ADF.

T3: The ADF motor stops rotating clockwise when the original has been fed 14.5 millimeters after the original registration sensor was activated. After 50 milliseconds, the ADF motor starts rotating counterclockwise to rotate the 1st original transport roller.

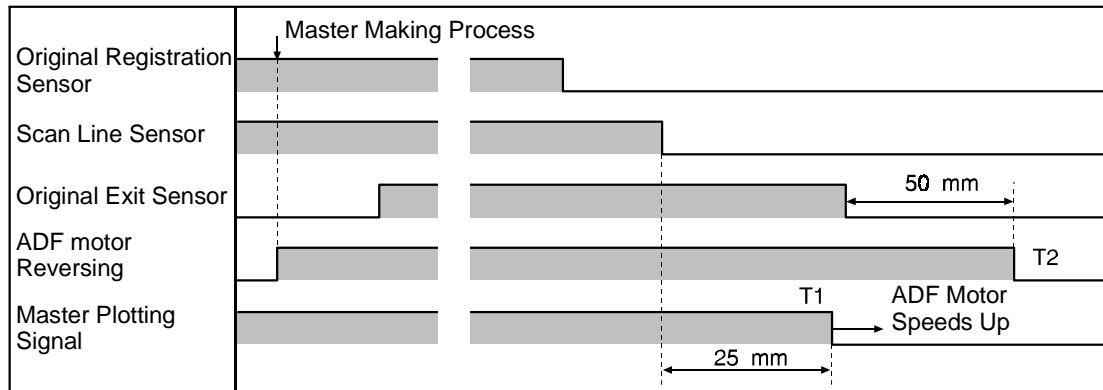
T4: The ADF motor stops again when the original has been fed 22 millimeters after the scan line sensor was activated. The ADF motor waits until the master eject process is finished.



T5: The scanner motor rotates counterclockwise for 2.5 seconds after the Master Making key is pressed, to bring the scanner to the ADF scanning position.

Document Feeder

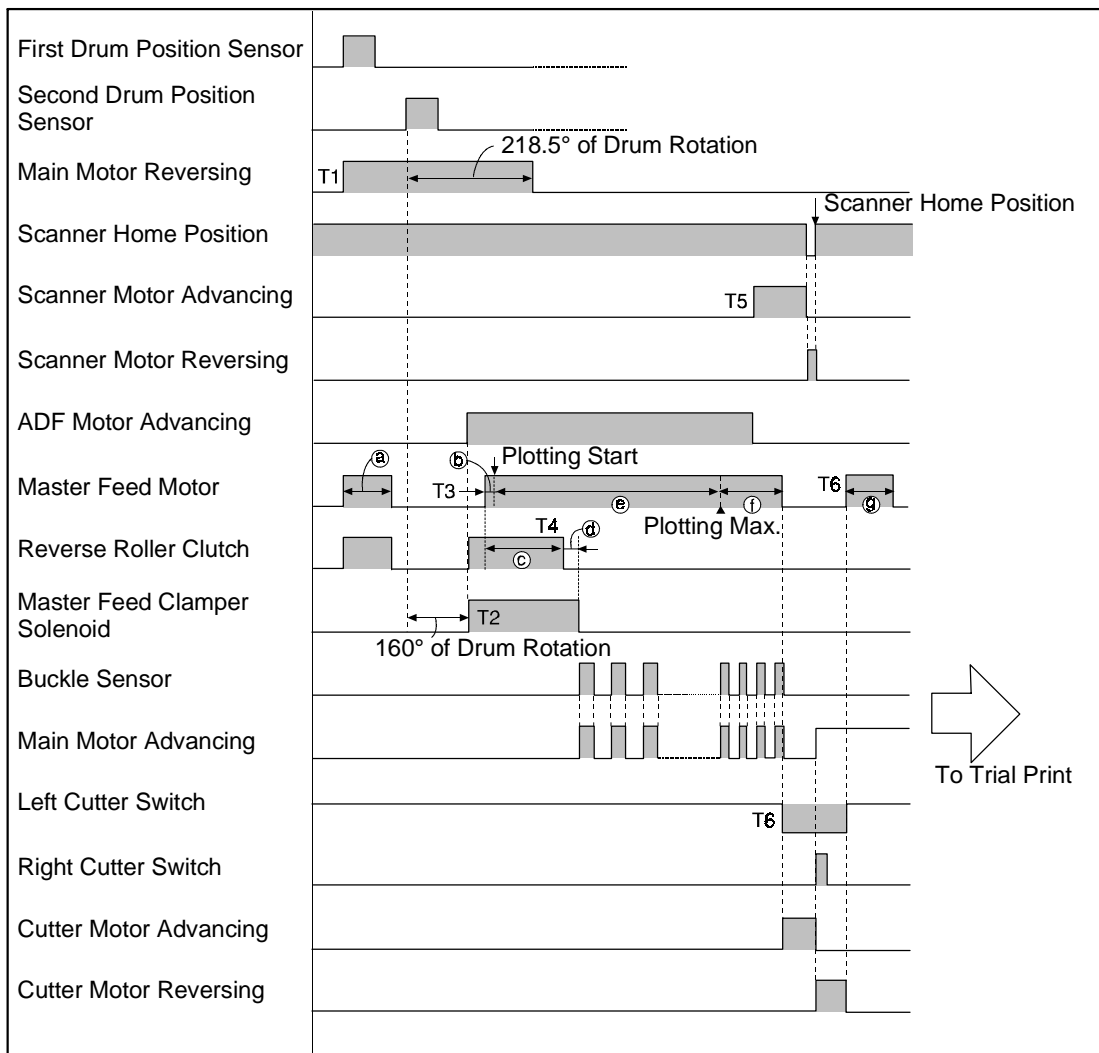
## 2.6.2 ADF Scanning Process



T1: The master plotting signal is de-energized when the original has been fed 25 millimeters after the scan line sensor was deactivated. At the same time, the ADF motor speeds up to feed out the original.

T2: The ADF motor stops when the original has been fed out 50 millimeters after the original exit sensor was deactivated.

### 2.6.3 Plotting



For C218	a: 21.5 mm	b: 0.9 mm	For C219	a: 18.5 mm	b: 1.0 mm
	e: 412 mm	f: 60 mm		e: 359 mm	f: 61 mm
	g: 40 mm	c: 38 mm		g: 40 mm	c: 41 mm
	d: 5 mm			d: 5 mm	

T1: After the master eject process is completed, the main motor starts reverse rotation at 30 rpm. At the same time, the master feed motor and the reverse roller magnetic clutch turn on to feed the master for 21.5 millimeters (18.5 mm for C219 model).

T2: The master feed clamper solenoid is energized when the drum has rotated 160 degrees past the second drum position sensor (162 degrees for the C219 model). At the same time the reverse roller magnetic clutch is turned on and the scanner motor starts to rotate.



T3: When the scanner has moved 20 millimeters from its home position (17 mm for C219 model), the master starts to be fed. When the master has been fed 0.9 millimeters (1.0 mm for C219 model), the thermal head starts plotting on the master.

The leading edge is zero when the scanner is 12 millimeters from its home position. The leading edge margin can be changed to a value between 4 and 10 millimeters by SP mode No.33.

T4: When the master has been fed 38 millimeters (41 mm for the C219 model), the reverse roller magnetic clutch turns off. Then the master is fed 5 millimeters more and the master feed clamper solenoid is de-energized to close the master clamper. The master is fed in the same way as the #C210 models. The ADF motor and the master feed motor speed up once the master plotting is done. The master feeding length for plotting is:

For #C218 models

412 millimeters: A3/DLT drum.

204 millimeters: A4/LT drum.

For #C219 models

355 millimeters: for both B4 and LG drums

T5: When the ADF motor stops, the scanner motor starts to rotate clockwise to bring back the scanner to the home position.

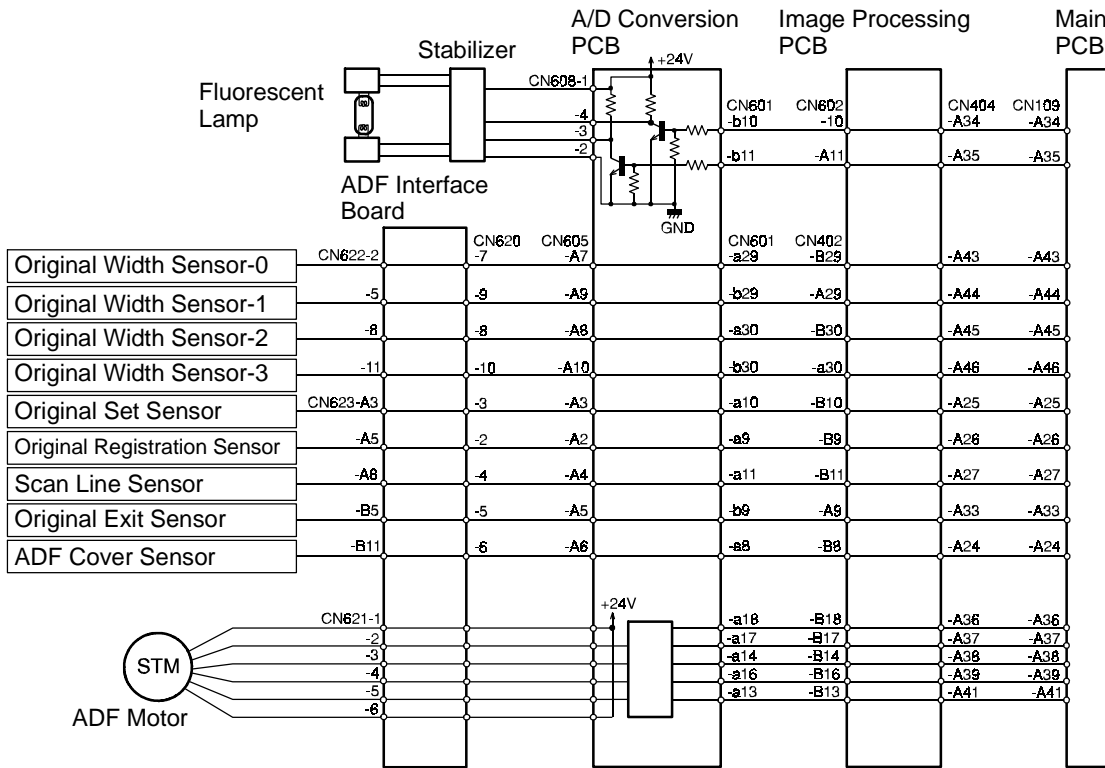
T6: The master feed motor stops when the master has been fed 534.4 millimeters (479.5 mm for the C219 model). At the same time the cutter motor starts rotating to cut the master. The cutter motor changes the rotation direction when the cutter holder pushes the right cutter switch. The cutter motor stops when the cutter holder goes back to the home position to activate the left cutter switch (in the same way as the #C210 models).

When the right cutter switch is activated, the drum starts rotating to go back to its home position.

When the left cutter switch is activated (when the cutter comes back to its home position), the master feed motor turns on again to feed the master 40 millimeters.



## 2.7 CIRCUIT



Component Name	I/O	A/D Conversion PCB		Description
		CN No.	Signal Level	
Original Width Sensor 0-3	In			Signal goes high when the sensors are interrupted by the detection plate.
Original Set Sensor	In	623-A3		Signal goes low when the sensors are interrupted by the detection plate.
Original Registration Sensor	In	623-A5		Signal goes low when the sensors are interrupted by the detection plate.
Scan Line Sensor	In	623-A8		Signal goes low when the sensors are interrupted by the detection plate.
Original Exit Sensor	In	623-B5		Signal goes low when the sensors are interrupted by the detection plate.
ADF Cover Sensor	In	623-B11		Signal goes low when the ADF Cover is opened.

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## **2.8 ORIGINAL MISFEED DETECTION**

The machine indicates an original misfeed in the following conditions.

- When the original registration sensor does not go ON within 3 seconds after the ADF motor starts rotating (clockwise).
- When the scan line sensor does not go ON within 2.5 seconds after the original registration sensor is turned on.
- When the original exit sensor does not go ON after the scan line sensor is turned on and the original has been fed 60 millimeters.