

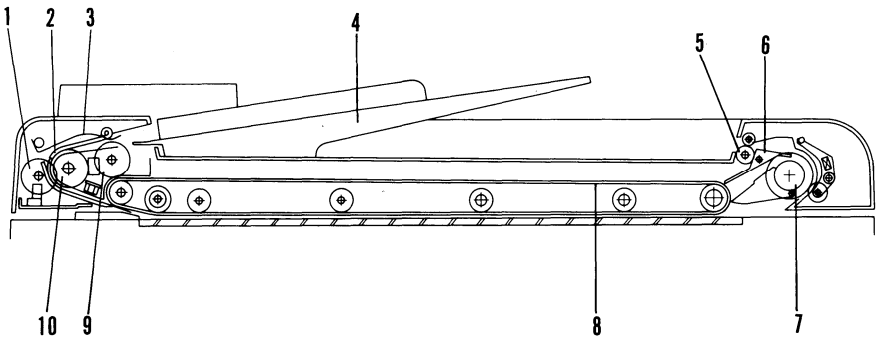
# 1. SPECIFICATIONS

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Original Size and Weight:	<ul style="list-style-type: none"> <li>- Thin original mode -               <ul style="list-style-type: none"> <li>Maximum A3 / 11" x 17"</li> <li>Minimum B6 / 5½" x 8½"</li> <li>Weight 41 to 128 g/m<sup>2</sup> (11 to 34 lb)</li> </ul> </li> <li>- Thick original mode -               <ul style="list-style-type: none"> <li>Maximum A3 / 11" x 17"</li> <li>Minimum B6 / 5½" x 8½"</li> <li>Weight 52 to 128 g/m<sup>2</sup> (14 to 34 lb)</li> </ul> </li> <li>- Auto reverse mode -               <ul style="list-style-type: none"> <li>Maximum A3 / 11" x 17"</li> <li>Minimum B6 lengthwise / 5½" x 8½" lengthwise</li> <li>Weight 64 to 105 g/m<sup>2</sup> (17 to 28 lb)</li> </ul> </li> </ul>
Original Feed:	Automatic feed – ADF mode Manual feed one by one – SADF mode
Original Table Capacity:	30 sheets / 80 g/m <sup>2</sup> (20 lb)
Original Set:	Face up. First sheet on top
Original Transport:	One flat belt
Copy Speed: (1 to 1 Copy)	ADF Free Size Mode OFF: 18 copies/minute for A4 / 8½" x 11" sideways ADF Free Size Mode ON: 12 copies/minute for A4 / 8½" x 11" sideways
Power Consumption:	20 W
Dimensions (W x D x H):	670 x 467 x 103 mm (26.4" x 18.4" x 4.1")
Weight:	Approximately 8.6 kg (19.0 lb)

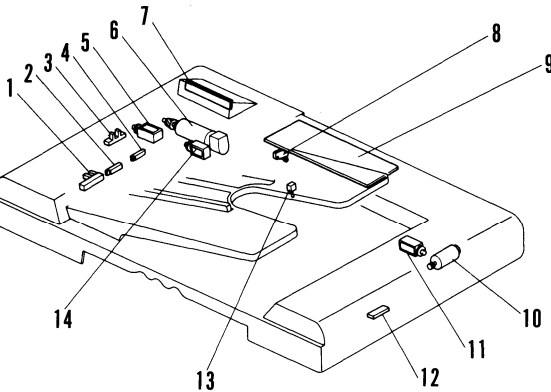
## 2. COMPONENT LAYOUT

### - Mechanical Components -



- |                         |                    |
|-------------------------|--------------------|
| 1. Pulse Generator Disk | 6. Inverter Pawl   |
| 2. Friction Belt        | 7. Inverter Roller |
| 3. Pick-up Lever        | 8. Transport Belt  |
| 4. Original Table       | 9. Pick-up Roller  |
| 5. Exit Roller          | 10. Feed Roller    |

### - Electrical Components -



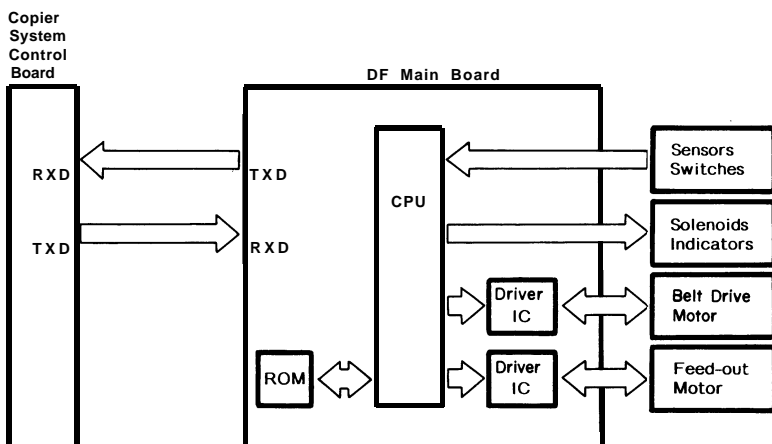
- |                                 |                                  |
|---------------------------------|----------------------------------|
| 1. Original Set Sensor (S26)    | 8. Lift Switch (SW7)             |
| 2. Registration Sensor (S27)    | 9. DF Main Board (PCB6)          |
| 3. Pulse Generator Sensor (S29) | 10. Feed-out Motor (M12)         |
| 4. Original Width Sensor (S28)  | 11. Inverter Solenoid (SOL12)    |
| 5. Pick-up Solenoid (SOL10)     | 12. Feed-out Sensor (S30)        |
| 6. Belt Drive Motor (M11)       | 13. Original Select Switch (SW8) |
| 7. Indicator Panel (PCB11)      | 14. Feed-in Solenoid (SOL11)     |

### 3. ELECTRICAL COMPONENT DESCRIPTIONS

Index No.	Name	Function	Symbol	P to P Location
<b>Motors</b>				
6	Belt Drive Motor	DC servomotor that drives the transport belt and feed-in system (pick-up roller, feed roller, pull-out roller and relay roller).	M11	B-1
10	Feed-out Motor	DC servomotor that drives the feed-out unit of the DF.	M12	B-2
<b>Solenoids</b>				
5	Pick-up Solenoid	Energizes to press the pick-up lever against the stack of originals in preparation for original feed-in.	SOL10	B-2
14	Feed-in Solenoid	Turns on to engage the feed-in clutch so rotation is transmitted to the feed roller, pull-out rollers, and relay rollers.	SOL11	B-2
11	Inverter Solenoid	Energizes to invert the original when copying two sided originals.	SOL12	B-2
<b>Switches</b>				
8	Lift Switch	Informs the CPU when the DF is lifted and also serves as the jam reset switch for the DF.	SW7	B-4
13	Original Select Switch	Selects thick original mode or thin original mode.	SW8	B-3
<b>Sensors</b>				
1	Original Set Sensor	Informs copier System Control PCB that originals have been placed and causes the Insert Original indicator to turn off.	S26	B-3
2	Registration Sensor	Sets original stop timing and measures original length.	S27	B-4
4	Original Width Sensor	Determines the width of the originals.	S28	B-4
3	Pulse Generator Sensor	Generates pulses used to measure the original length.	S29	B-3
12	Feed-out Sensor	Checks for original misfeeds and sets original stop timing when in auto reverse mode.	S30	B-4

<b>Index No.</b>	<b>Name</b>	<b>Function</b>	<b>Symbol</b>	<b>P to P Location</b>
<b>Printed Circuit Boards</b>				
9	DF Main Board	Controls all DF functions.	PCB6	A-1
7	Indicator Panel Board	Contains operator indicators.	PCB11	B-3

## 4. OVERALL MACHINE CONTROL



The DF CPU monitors the input signals from the sensors and switches, and directly controls the solenoids and the indicator LEDs. The belt drive motor and the inverter motor are controlled by the DF CPU through their respective driver ICs.

Also, the DF CPU communicates with the copier using fiber optics. The exchanged signals are shown in the tables on the next page.

**1. DF -> Copier**

<b>No.</b>	<b>Signal Name</b>	<b>Definition</b>
1	Original Set	Originals are set on the original table.
2	Copy Start	Allows the copier to start copy sequence.
3	Lift Up	The DF is lifted.
4	DF Misfeed	Misfeed occurs in the DF.

**2. Copier -> DF**

<b>No.</b>	<b>Signal Name</b>	<b>Definition</b>
1	Feed-in	Requests the DF to feed-in the original.
2	Feed-out	Requests the DF to feed-out the original.
3	Invert Original	Requests the DF to invert the original.
4	Auto Feed	Shifts the DF to the auto feed mode.
5	Remove Original	Attempting to use DF but the original from the previous copy run remains on the exposure glass.

## 5. BASIC OPERATION

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### 1. One-sided Original Feed

When an original is inserted face up into the DF, the Insert Original indicator light turns off and the DF informs the copier CPU that originals have been set.

When the Start key is pressed, the copier CPU sends the feed-in signal to the DF. On receipt of this signal, the DF energizes the pick-up solenoid, the feed-in solenoid, and the belt drive motor in order to feed the bottom sheet of the original stack onto the exposure glass. The pick-up solenoid and the feed-in solenoid remain energized until the original leading edge reaches the DF registration sensor. The belt drive motor turns off shortly after the original's trailing edge leaves the DF registration sensor.

While feeding the original, the DF registration sensor and the paper width sensor check the original size.

Just as the original trailing edge passes the DF registration sensor, the DF CPU sends the copy start signal to the copier. On receipt of this signal, the copier CPU starts the copy cycle.

When the scanner reaches to the return position, the copier CPU sends the feed-out and the feed-in signals to the DF CPU in order to exchange the original with the next original. At this time, the scanner begins returning to the home position.

When the scanner reaches the return position after scanning the last original, the copier CPU only sends the feed-out signal in order to feed-out the last original.

### 2. Two-sided Original Feed

Unlike one-sided original feed, the back side of the original must be copied first to keep the originals and copies in the correct order.

During original feed-in, the sequence is the same as for one-sided feed; however, a short time after the original trailing edge has passed the DF registration sensor, the DF CPU also energizes the inverter motor and the inverter solenoid. The belt drive motor continues to feed the original until the original leading edge passes the feed-out sensor. At this point the inverter mechanism inverts the original, in preparation for copying the back side. Then the belt drive motor reverses and the original is aligned against the left scale. The DF CPU sends the copy start signal a short time after the original trailing edge has passed the feed-out sensor.

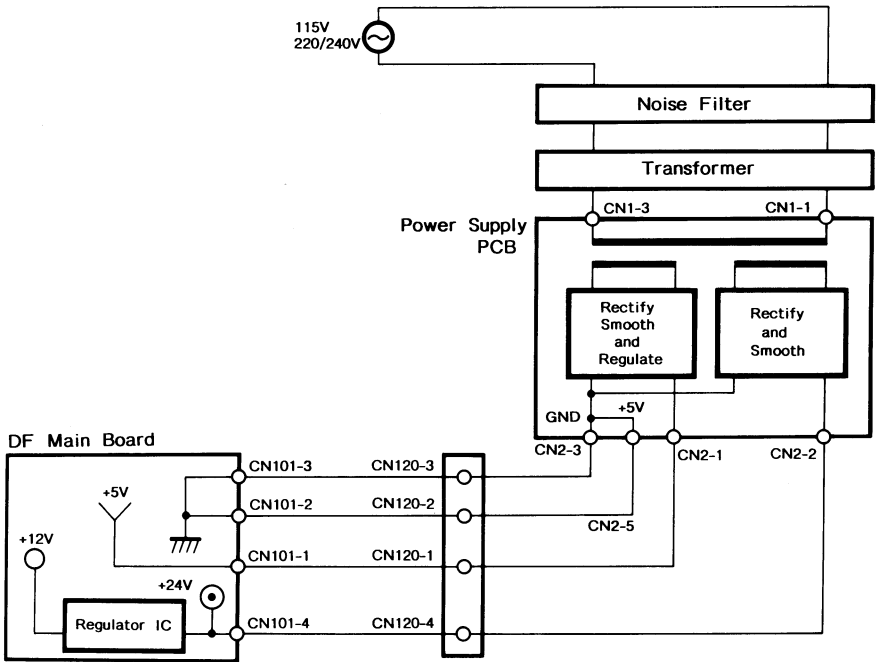
When the scanner reaches to the return position, the copier CPU sends the invert original signal to the DF CPU in order to make a copy of the front side. The original is inverted in the same way as for back side copying.

### 3. Semi-automatic Document Feed

If a single original is inserted into the original table and copied, the DF shifts to the semi-automatic feed mode and lights the Auto Feed indicator. The Auto Feed indicator remains on for five seconds after the copier main motor stops. If another original is inserted within that five-second period, it is automatically fed and copied.



## 6. POWER DISTRIBUTION

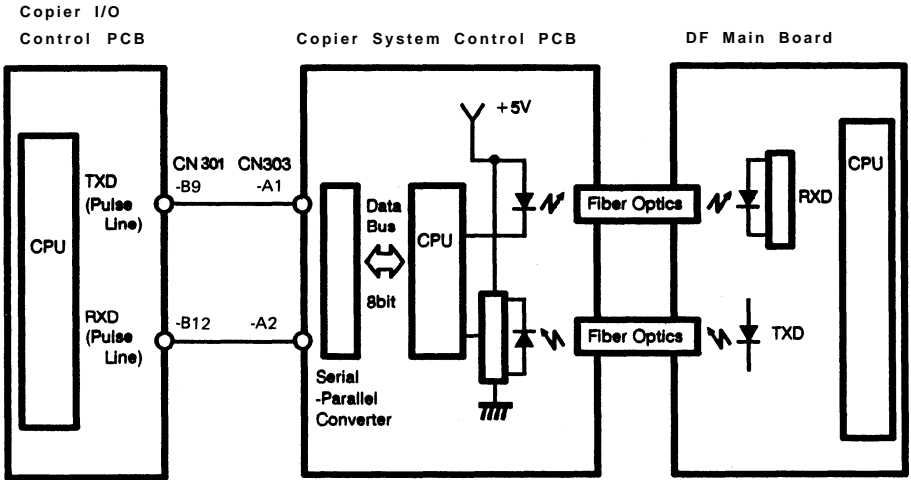


The DF uses three dc power levels : +24 volts, +12 volts, and +5 volts.

The line voltage is applied to the copier power supply board where it is stepped down and rectified to +24 volts and +5 volts. Then, those two dc voltages are supplied to the DF main board.

The regulator IC on the DF main board further steps down the +24 volts to +12 volts.

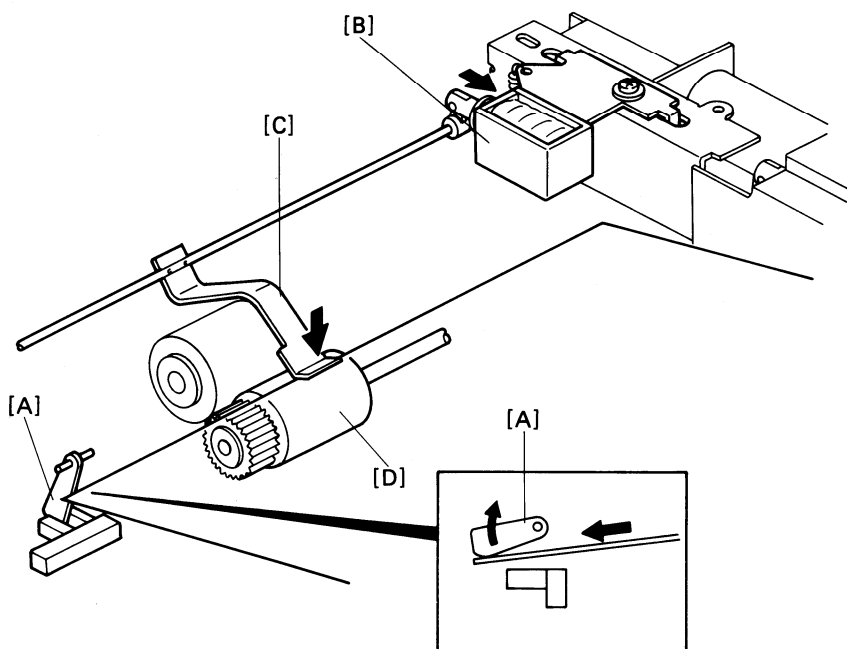
# 7. INTERFACE CIRCUIT



The Copier System Control CPU and the DF CPU communicate via the fiber optics. The system control board changes the optical signals to electrical signals (and vice versa) for communication with the I/O control PCB.

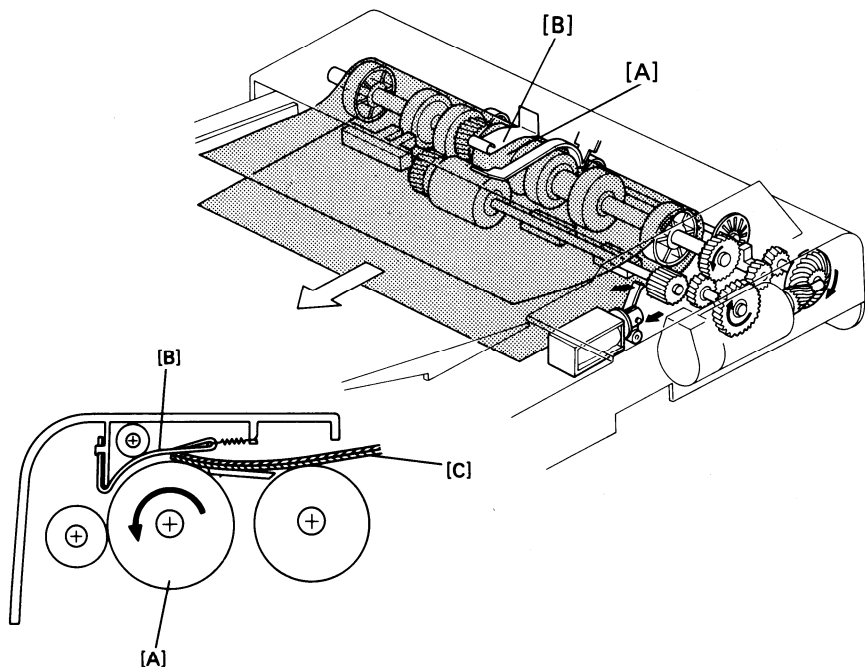
## 8. ORIGINAL FEED

### 8.1 ORIGINAL PICK-UP



After setting the originals on the original table, the originals contact the feeler [A] of the original set sensor and cause the feeler to move out of the sensor. The DF then sends the original set signal to the copier CPU to inform it that the DF will be used. When the Start key is pressed, the pick-up solenoid [B] is energized. The original stack is then pressed between the pick-up lever [C] and pick-up roller [D]. The rotation of the pick-up roller advances the bottom original.

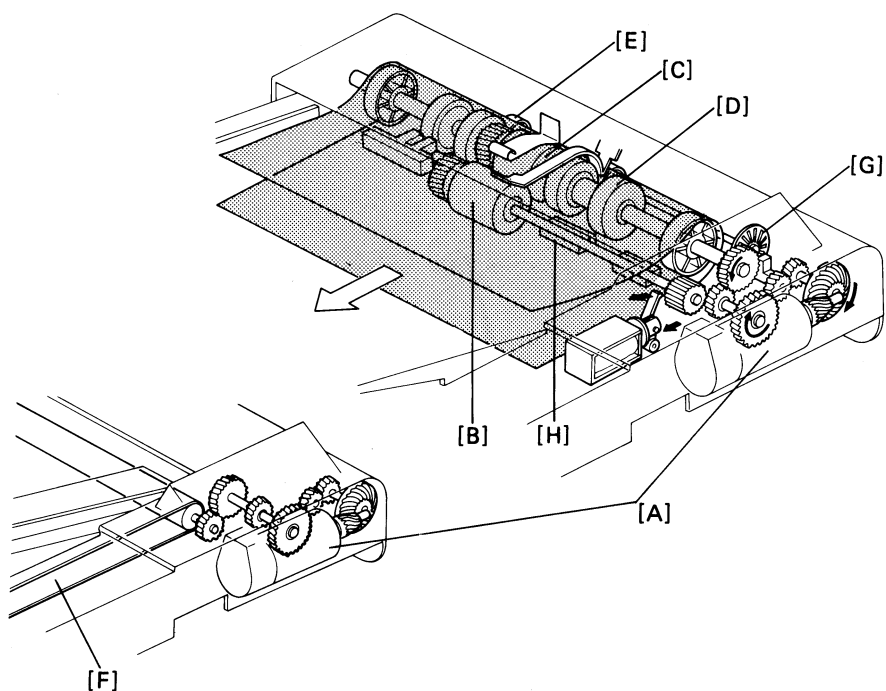
## 8.2 ORIGINAL SEPARATION



The feed roller [A] and the friction belt [B] are used to feed-in and separate the originals [C]. Only the bottom original is fed because the friction belt prevents any other originals from feeding.

Original feed starts when the feed roller starts turning and advances the bottom original of the stack. The feed roller moves the original past the friction belt because the driving force of the feed roller is greater than the resistance of the friction belt. The friction belt prevents multiple feeds because the resistance of the friction belt is greater than the friction between original sheets.

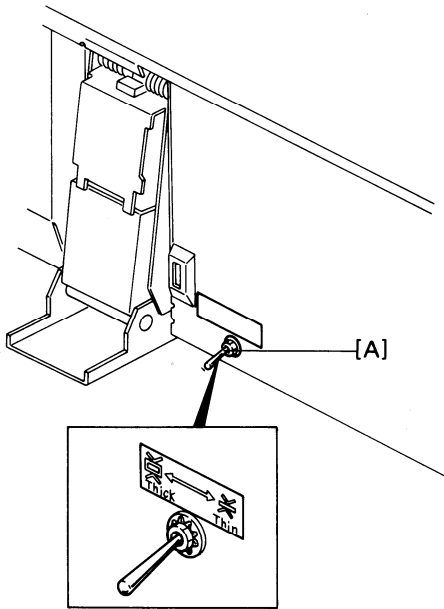
### 8.3 ORIGINAL FEED-IN MECHANISM



The belt drive motor [A] drives the pick-up roller [B], the feed roller [C], the pull out roller [D], the relay roller [E], and transport belt [F] via a feed clutch and a gear train.

The pick-up and feed-in solenoids are energized 100 milliseconds after the Start key of the copier is pressed. Then 100 milliseconds after the solenoids are energized, the belt drive motor starts turning. The pulse generator disc [G] turns whenever the belt drive motor is on.

Slightly after the original trailing edge leaves the registration sensor [H], the relay rollers and the transport belt stop turning.



This document feeder has two different ways of stopping original at the correct position on the exposure glass. They are called the “thin original mode” and the “thick original mode”. The mode used is determined by the original select switch [A].

### - Original Select Switch -

#### 1. Thin Original Mode

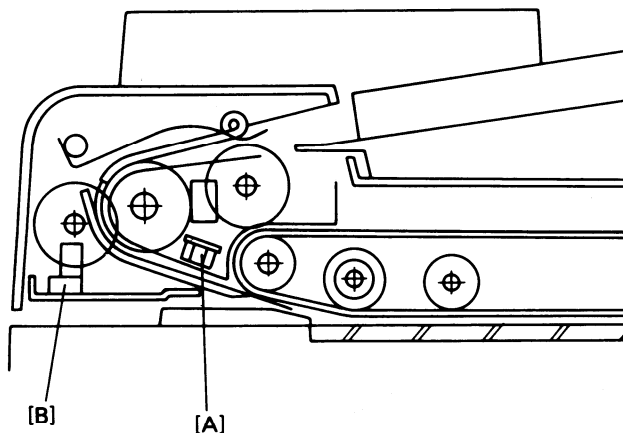
The original is stopped at the correct position on the exposure glass based on encoder pulse count. The belt drive motor stops shortly after the original trailing edge passes the DF registration sensor. (Exact timing depends on registration adjustment.) Thin original mode is selected at the factory.

#### 2. Thick Original Mode

When thick original mode is selected, the belt drive motor remains energized for an additional 30 encoder pulses as compared to thin original mode. Then, the belt drive motor pauses and reverses for 21 pulses. This forces the original against the left scale and thus aligns the edge of the original with the scale.

After the exposure cycle is completed, the copier sends the feed-out signal to the DF CPU and the belt drive and feed out motors start turning. At this time, the copied original feeds out and the next original feeds in.

## 8.4 ORIGINAL SIZE DETECTION

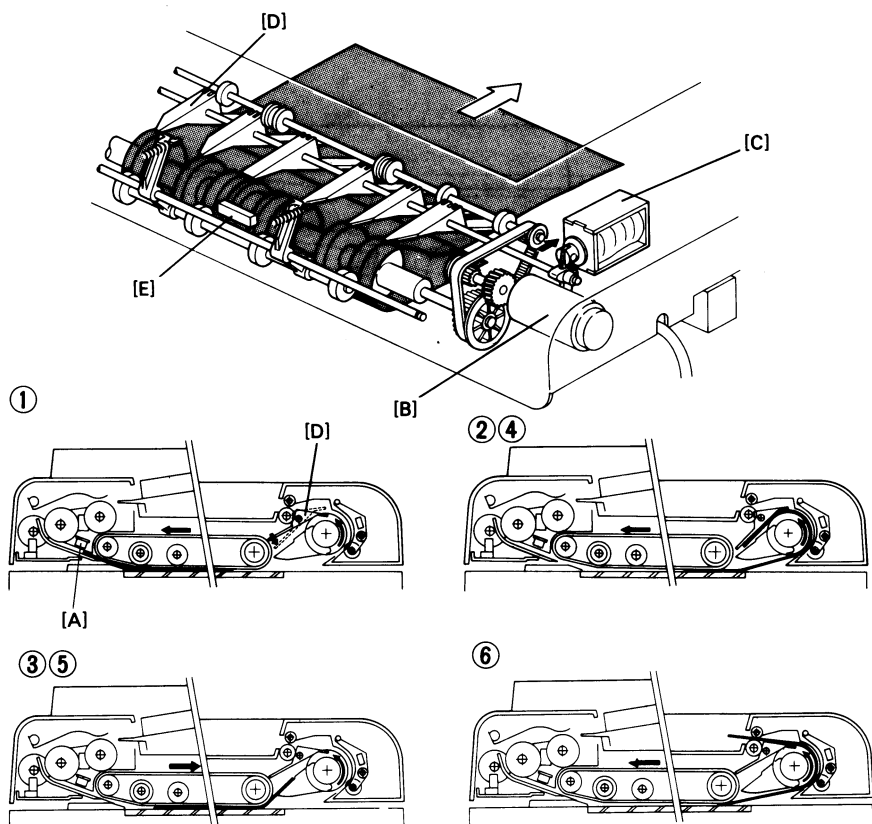


The DF determines original size (both width and length) through the use of the original width sensor [A], registration sensor, and pulse generator sensor [B]. The original's length is calculated by counting the number of pulses from the pulse generator while the registration sensor is on.

The original width sensor is turned on when the original width is 204 mm (8") or more. It is in the same position (front to back) as the original width sensor in the copier.

Original size detection is necessary for the feed-in/feed-out timing of the DF.

## 8.5 ORIGINAL INVERSION MECHANISM



The two sided originals are inverted in the feed-out unit.

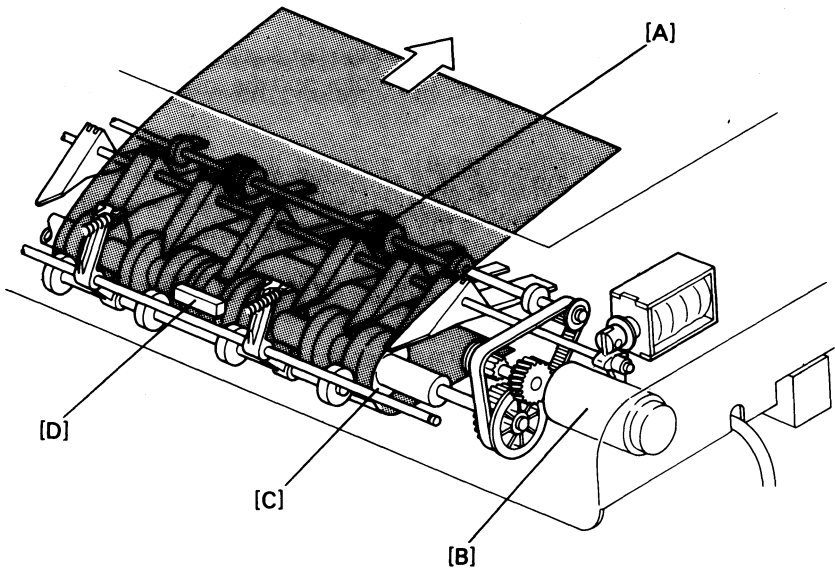
1) When the copier Start key is pressed, the two sided original is fed into the feed-in unit, passing over the DF registration sensor [A]. The feed-out motor [B] and the inverter solenoid [C] turn on 100 milliseconds after the original trailing edge passes the registration sensor. When the inverter solenoid turns on, the inverter pawls [D] rotate counterclockwise.

2) The original is passes over the exposure glass and feeds into the feed-out unit.



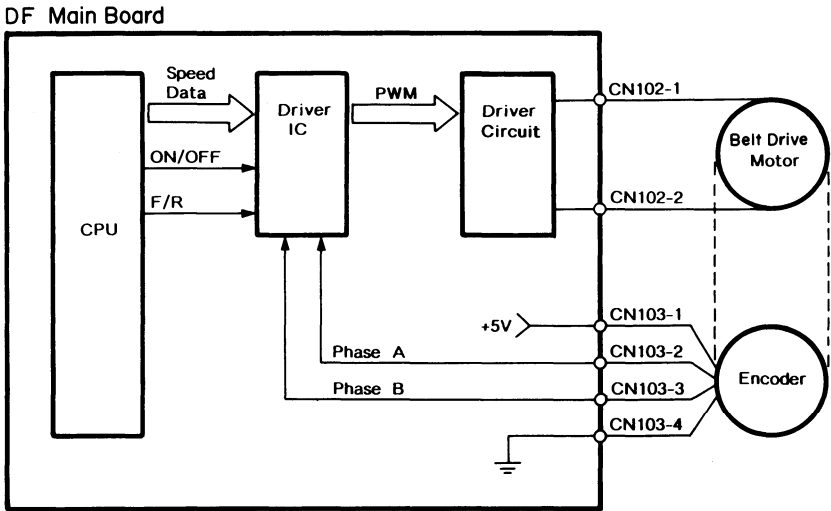
- 3) The original is directed onto the exposure glass again by the inverter pawls. The belt drive motor now reverses 140 milliseconds after the feed out sensor [E] turns on. The transport belt then moves the original toward the left scale. Slightly before the original reaches the left scale, the belt drive motor drops to half speed. This is to prevent damaging the edge of the original against the left scale.  
When the original leading edge reaches the left scale, the belt drive motor stops. At the same time, the feed-out motor and the inverter solenoid turn off.
- 4) After the reverse side of the original is exposed, the belt drive motor, the feed-out motor, and the inverter solenoid turn on, and the original is fed into the inverter section. (This is the same as step "2".)
- 5) The original is fed onto the exposure glass again as in step 3 above. The front side of the original is then copied.
- 6) After the front side of the original has been exposed, the original is fed out from the DF.

## 8.6 ORIGINAL FEED-OUT MECHANISM



The exit rollers [A] are driven by the inverter motor [B]. When the document feeder receives the feed-out signal from the copier, the transport belt and the exit rollers start turning simultaneously. The transport belt carries the original to the inverter rollers [C] and the exit rollers finish feeding the original out. When the original trailing edge passes the feed-out sensor [D], the feed-out motor drops to half of its normal speed for 220 milliseconds and then stops. The lower speed prevents uneven stacking of originals. For A3 or ledger size originals, the feed-out motor speed does not change due to the length of the originals.

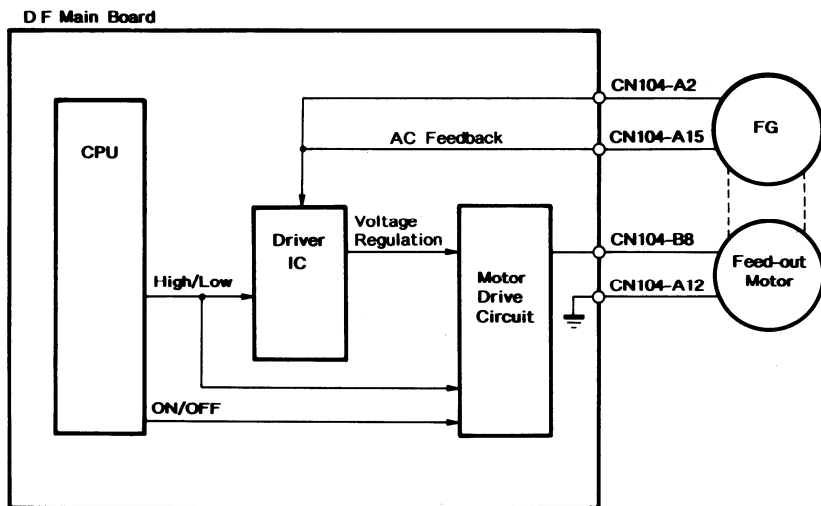
## 8.7 BELT DRIVE MOTOR CIRCUIT



A dc servomotor is used for the belt drive motor. The driver IC controls the speed of the belt drive motor. The CPU sends the speed data (programmed) to the driver IC. The driver IC sends the pulse-width-modulation (PWM) signal to the driver circuit, which sends the motor drive pulses.

An encoder in the servomotor has two magnetic sensors that generate two pulse signals (phase A and B). The driver IC monitors the belt speed and direction by these pulse signals and uses this data to regulate the motor's speed.

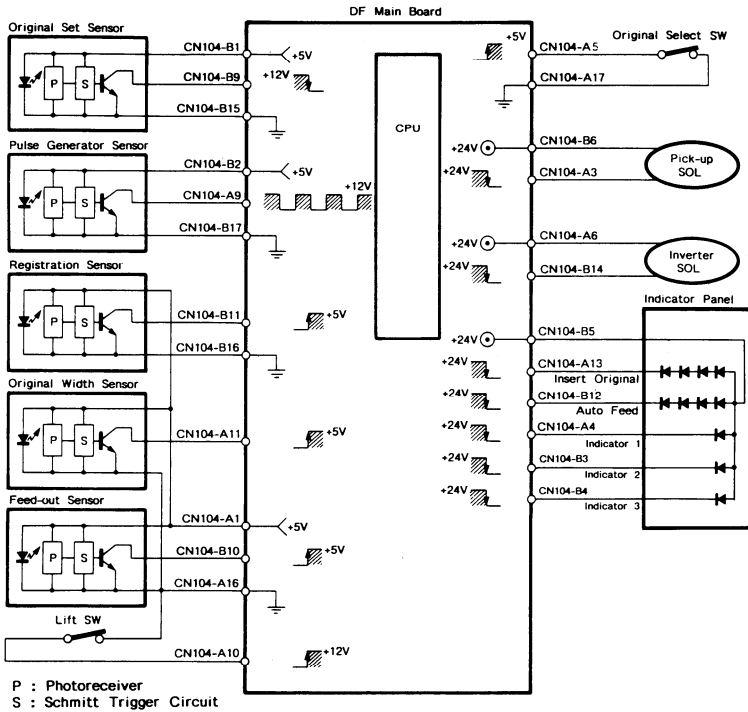
## 8.8 FEED-OUT MOTOR CIRCUIT



The DF CPU sends the speed data (high or low) to the driver IC and the motor drive circuit. The motor drive circuit creates the PWM signal and sends the motor drive pulses to the inverter motor.

The frequency generator of the feed-out motor makes a very low voltage ac current which is fed back to the driver IC. The driver IC monitors the frequency of this ac current and based on the frequency, regulates the motor speed.

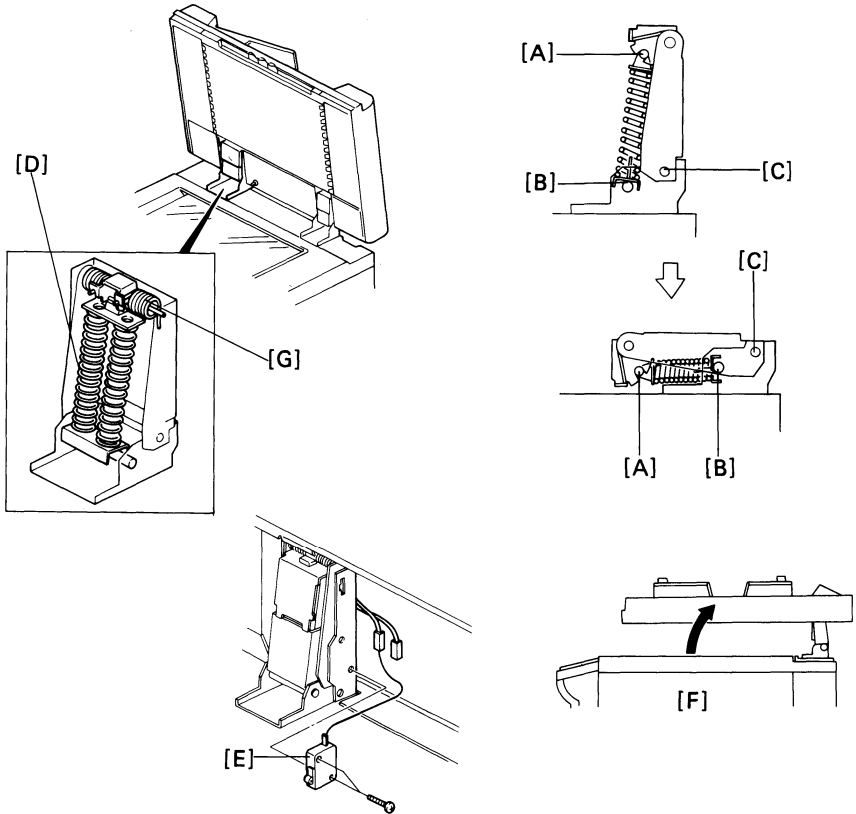
## 8.9 INPUT AND OUTPUT CIRCUITS



The above devices are directly controlled and monitored by the DF CPU. The solenoids and indicator panel are energized with +24 volts. The sensors and switches are energized with +12 volts or +5 volts.

To energize a solenoid or indicator, the CPU drops the connected trigger line from +24 volts to LOW. The CPU monitors the input lines of the sensors and switch to determine when they are activated.

## 9. LIFT MECHANISM



When the document feeder is opened, the lift springs [D] provide enough force to ensure that the document feeder does not fall onto the exposure glass. When the document feeder is closed, points "A", "B", and "C" are aligned and no such force is provided to the document feeder.

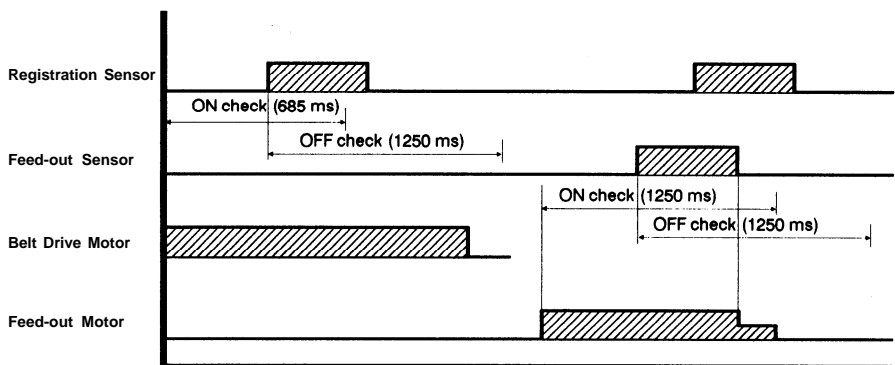
The lift switch [E] is actuated when the document feeder is closed. The copier then shifts to the document feeder mode. The lift switch also serves as the reset switch for document feeder misfeeds.

When a book or thick (maximum thickness 60 mm) original is copied, the DF acts as a cover for the original as shown in the figure [F]. The lift switch is turned off during this condition, so the DF does not function. The tension of spring [G] returns the DF to the normal condition after copying a thick original.

## 10. ORIGINAL MISFEED SENSING

The registration sensor and the feed-out sensor are used for misfeed detection.

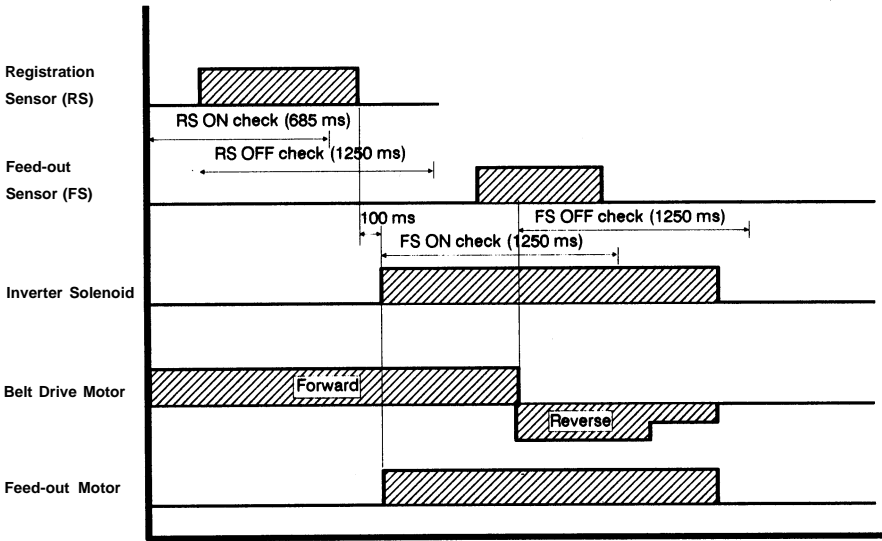
### 1. One sided original



If the registration sensor is not actuated within 685 milliseconds after the belt drive motor starts turning, the Original Misfeed indicator lights (ON check).

If the registration sensor does not turn off within 1,250 milliseconds, the CPU determines that there has been an original misfeed (OFF check). The Original Misfeed indicator also lights if the feed-out sensor is not actuated within 1,250 milliseconds after the feed-out motor starts turning (ON check) or if the feed-out sensor does not turn off within 1,250 milliseconds after the feed-out sensor is actuated (OFF check).

## 2. Two sided original



The registration ON/OFF check is same as for one-sided originals. The inverter motor and the inverter solenoid turn on 100 milliseconds after the registration sensor turns off. If the feed-out sensor is not actuated within 1,250 milliseconds after the feed-out motor starts turning, the Original Misfeed indicator lights (ON check). The Original Misfeed indicator also lights if the feed-out sensor does not turn off within 1,250 milliseconds after the belt drive motor reverses (OFF check).

If a previous original remains on the exposure glass after manual copying and DF feed is attempted, the original misfeed indicator lights. When the DF is lifted and the previous original is removed, DF copying is permitted.



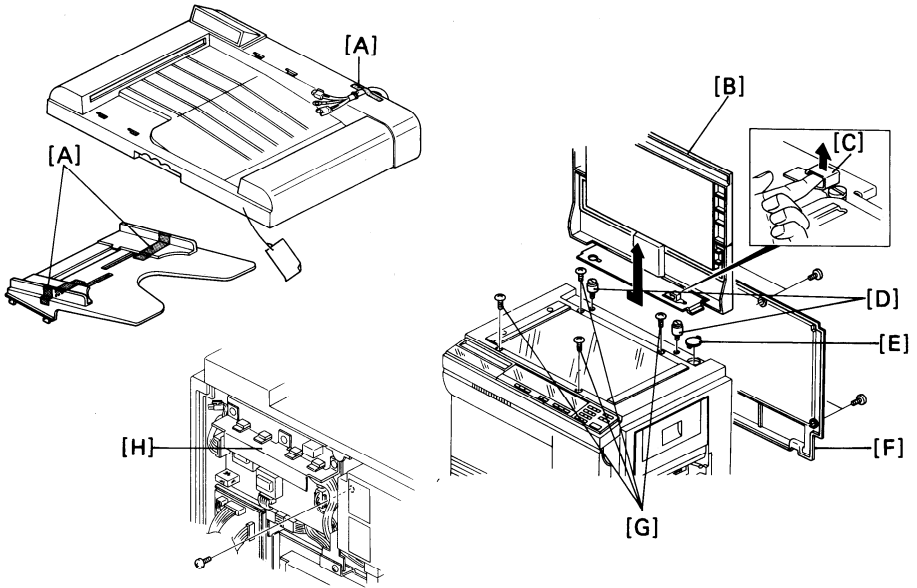
## 11. ACCESSORY CHECK

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Check the accessories and their quantities according to the following list:

1. Installation Procedure ..... 1 pc  
(115V - English only / 220V Five Languages)
2. New Equipment Condition Report ..... 1 pc
3. Envelope for NECR (115V only) ..... 1 pc
4. Original Feed Table ..... 1 pc
5. Pan Head Screw - M4 x 6 ..... 3 pcs
6. Pan Head Screw with Washer - M4 x 3 ..... 2 pcs
7. Bushing ..... 1 pc
8. Pan Head Screw - M5 x 10 ..... 2 pcs
9. Grounding Screw - M4 x 6 ..... 1 pc
10. Star Washer ..... 1 pc
11. Angle Stopper ..... 1 pc
12. DF Mounting Bracket ..... 1 pc
13. Lift Switch Actuator ..... 1 pc
14. Shoulder Screw ..... 2 pcs
15. Test Sheet (A4) ..... 1 pc
16. Spacer - 0.5 mm ..... 8 pcs
17. Spacer - 0.2 mm ..... 4 pcs
18. E Plate ..... 1 pc
19. Multilingual Decal for Jam Removal ..... 1 pc  
(220/240V only)
20. English Decal for Original Set (115V only) ..... 1 pc
21. Multilingual Decal for Original Set ..... 1 pc  
(220/240V only)

## 12. INSTALLATION PROCEDURE



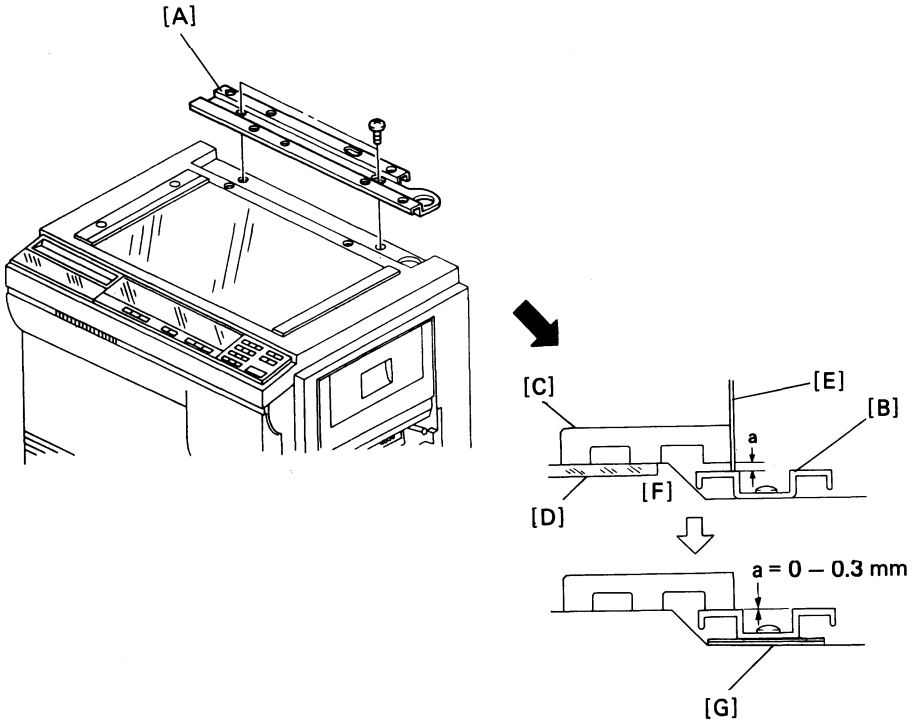
Install the document feeder before installing the optional sorter. This is to prevent damage to the sorter cover when installing the document feeder on the copier.

1. Unplug the power cord of the copier and turn off the main switch.
2. Remove the strips of shipping tape [A] and the red tag. (Pull the plastic spacer off the belt roller shaft.)
3. Remove the following parts:
  - 1) Platen cover [B] (Push up the leaf spring [C] and slide the platen cover to the right).
  - 2) Mounting stud [D] (2 pcs)
  - 3) DF docking hole cap [E] (1 pc)
  - 4) Rear cover [F] (4 screws)
  - 5) Pan head screw [G] (4 screws)

**NOTE:** Save the above parts for future use. (The platen cover is used as a mounting table for the optional editor board.)

4. Remove the ac drive board [I] (1 screw).

**NOTE:** Do not disconnect the harnesses of the ac drive board.



5. Secure the DF mounting bracket [A] (2 screws : M5 x 10)

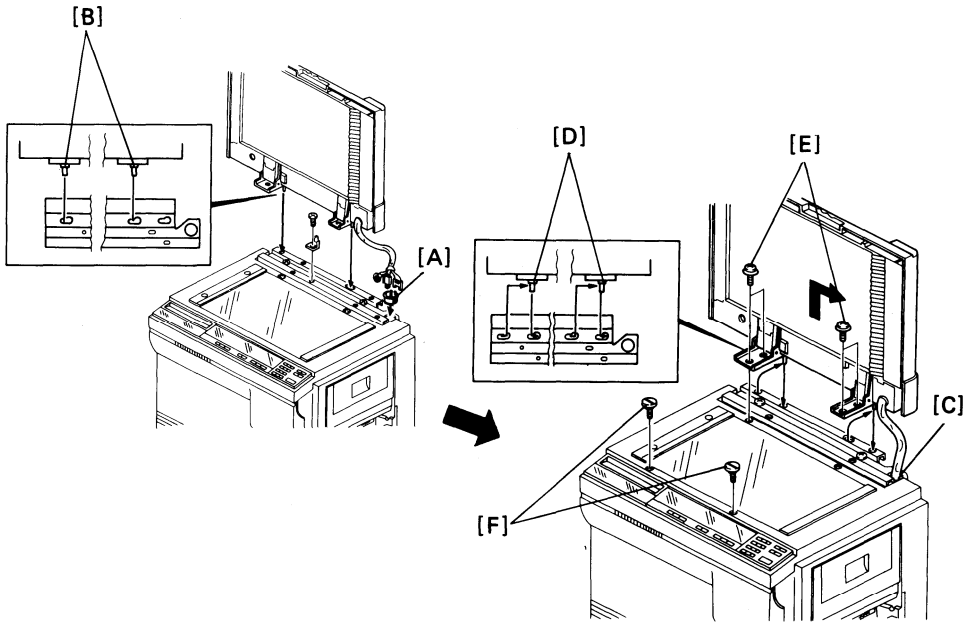
6. Adjust the height of the DF mounting bracket [B] in the following order:

- 1) Set the E plate [C] (accessory) on the exposure glass [D] as illustrated and measure the clearance "a" between the DF mounting bracket [B] and the E plate tool [C] using a metal scale [E]

**NOTE:** Make sure that the tool is placed on the exposure glass [D] and is not placed on the plastic cover in area [F].

- 2) Adjust the height of the DF mounting bracket using the spacers [G] (0.2 mm and 0.5 mm) so that the clearance "a" is between 0 and 0.3 mm.

**NOTE:** If the clearance "a" is incorrect, remove the DF mounting bracket and insert the proper spacer under the bracket.



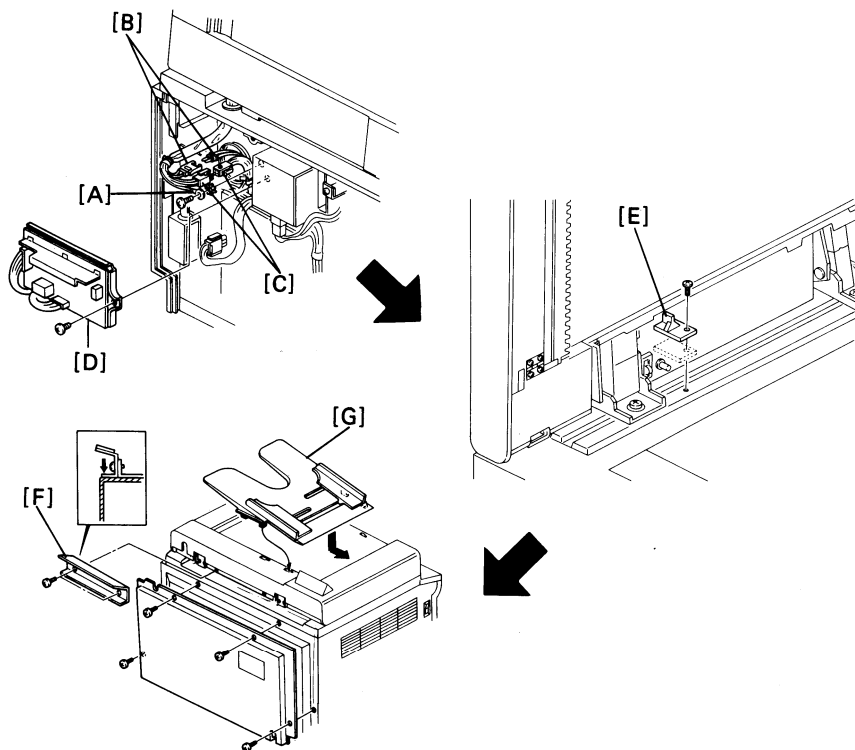
7. Install the bushing [A] into the harness hole of the DF mounting bracket.
8. Temporarily set the pins [B] of the document feeder into the left side holes of the DF mounting bracket and slide the document feeder to the left as viewed from the front of the machine.

**NOTE:** When the optional sorter has already been installed on the copier, remove the rear sorter cover and disconnect the door safety switch connectors of the sorter. This is because the left side of the document feeder contacts the rear side sorter cover and the switch connectors when temporarily setting the document feeder on the DF mounting bracket.

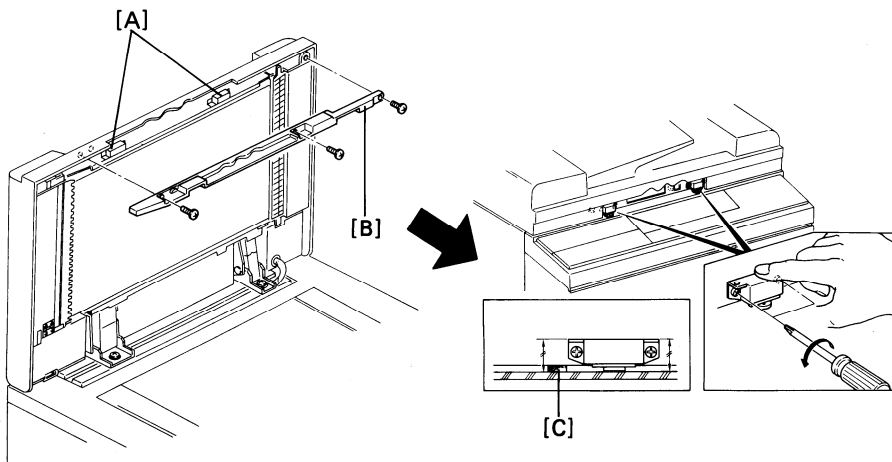
9. Feed the DF harness [C] through the docking hole of the copier.

**CAUTION:** During this step, avoid bending the fiber optics sharply as this will damage the fiber optics.

10. Lift the document feeder, then insert the document feeder pins [D] into the DF mounting holes on the right side (see illustration).
11. Secure the document feeder (2 screws [E]: M4 x 5).
12. Install the 2 shoulder screws [F] of the operation panel.



13. Secure the DF ground wire [A] (1 ground screw and star washer).
14. Connect the fiber optics connector [B] (black connector) and dc harness 4P connector (white connector) [C].
15. Reinstall the ac drive board [D] (1 screw).
16. Install the lift switch actuator [E] on the DF mounting bracket (1 screw : M4 x 6).
17. Install the angle stopper [F] (2 screws : M4 x 6).
18. Set the original table [G] as shown.
19. Reinstall the rear cover of the copier (4 screws).



20. Adjust the height of the magnet catches [A] in the following order:

- 1) Remove the grip cover [B] (3 screws) of the document feeder.
- 2) Loosen the screws of the magnet catches (2 screws each).
- 3) Close the document feeder and tighten the screws of the magnet catches when the rubber stopper [C] contacts the exposure glass.

21. Reinstall the grip cover of the document feeder (3 screws).

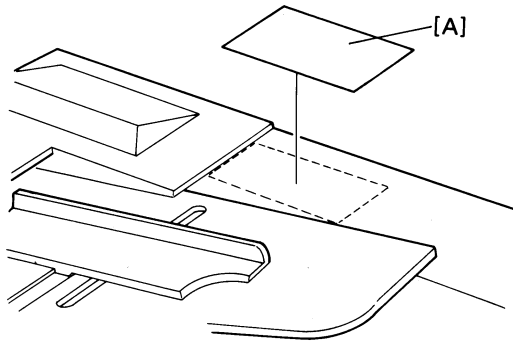
**NOTE:** Open and close the document feeder confirming secure connection of the magnet catches.

22. Confirm the original registration as follows:

- 1) Make a copy of the test sheet (accessory) in platen mode.
- 2) Set the original select switch of the document feeder to the thin mode and make a copy of the test sheet in ADF mode.
- 3) Compare the registration of the copy made in platen mode with that of ADF mode, and make sure that the difference is  $0 \pm 2.5$  mm.

If the difference is more than 2.5 mm, remove the ADF main PCB cover and adjust VR102 to change the original stopping timing.

**NOTE:** Turning VR102 clockwise results in the original stopping later.



- 4) Make a copy of the test sheet using the ADF two-sided original mode.

**NOTE:** The position of the original select switch does not matter.

- 5) Compare the registration of the copy in the platen mode with that of the ADF two-sided original mode, and confirm that the difference is within 2.0 mm. If it is more than 2.0 mm, remove the ADF main PCB cover and adjust VR103 to change the original-stop timing.

**NOTE:** a) The test sheet should stop against the left scale in the ADF two-sided original mode.

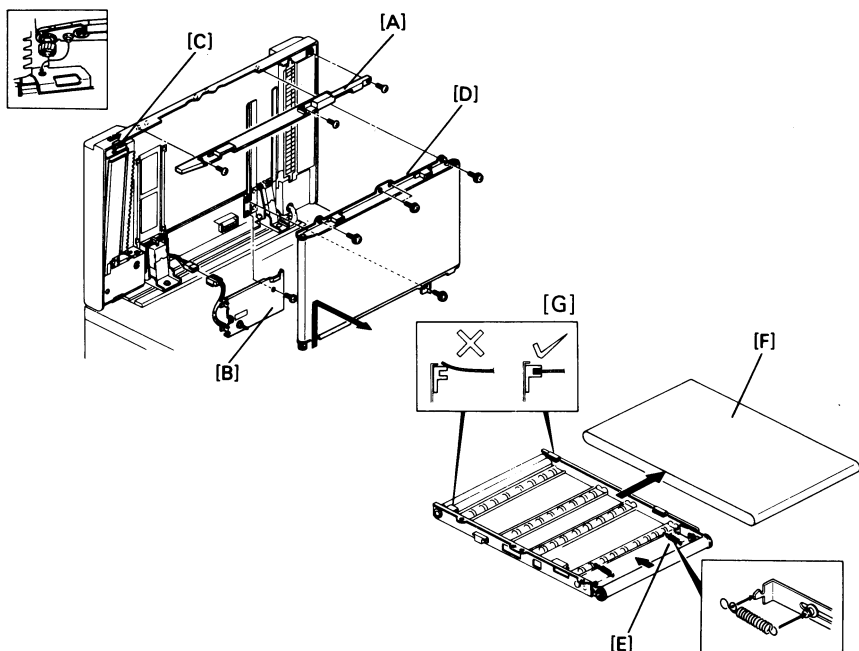
b) Turning VR103 clockwise results in the original stopping later.

23. Explain the function of the Free Size mode to the customer. When the Free Size mode (enables originals of various sizes to be fed from the same stack) is selected (by SP mode #23 [Data 1]) and the ADF mode is used, the APS mode is automatically selected. However, this can only be used if the originals have the same width.
24. Position the select switch to the thin mode (thick mode: heavier than 52 g/m<sup>2</sup> (14 lb)) and explain the function of this switch to the customer.
25. Place the Original Set decal [A] on the document feeder as shown.
26. Check the operation of the DF and copier system and fill out the New Equipment Condition Report.

## 13. REPLACEMENT AND ADJUSTMENT

### 13.1 FEED-IN UNIT

#### 13.1.1 Transport Belt Replacement



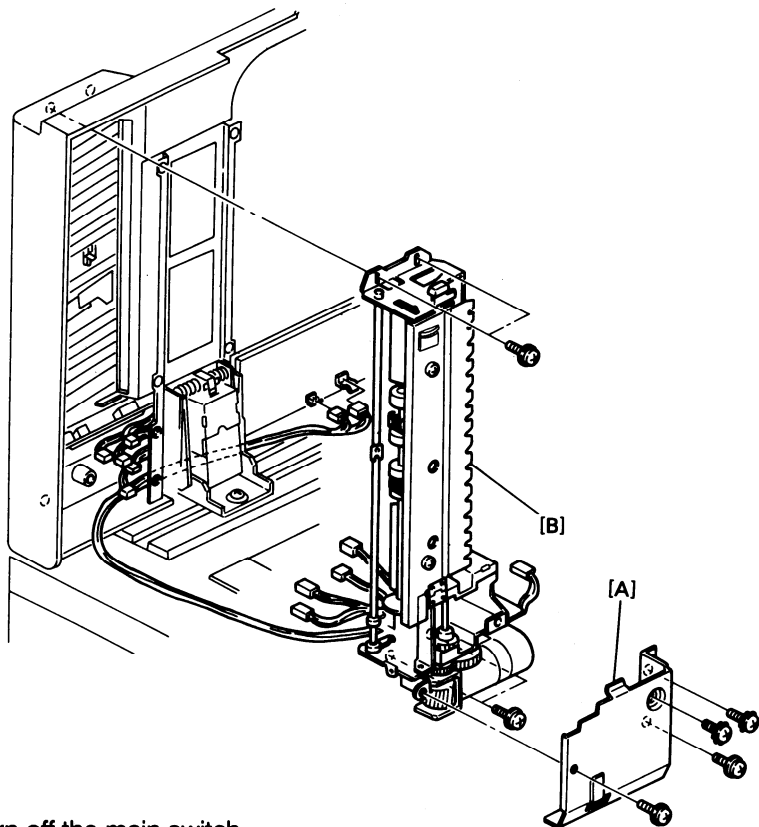
1. Turn off the main switch and remove the grip [A] (3 screws).
2. Remove the DF main PCB cover [B] (1 screw, 1 connector).
3. Open the entrance guide [C] and remove the transport belt assembly [D] (5 screws).
4. Remove the 2 tension springs [E] and pull off the transport belt [F].

**NOTE:** a) When installing the transport belt, make sure the belt lies between the belt guide spacers [G].

- b) When installing the transport belt assembly, make sure the positioning pin correctly fits in the DF frame, and hold open the exit guide to prevent the mylar strip from becoming damaged.

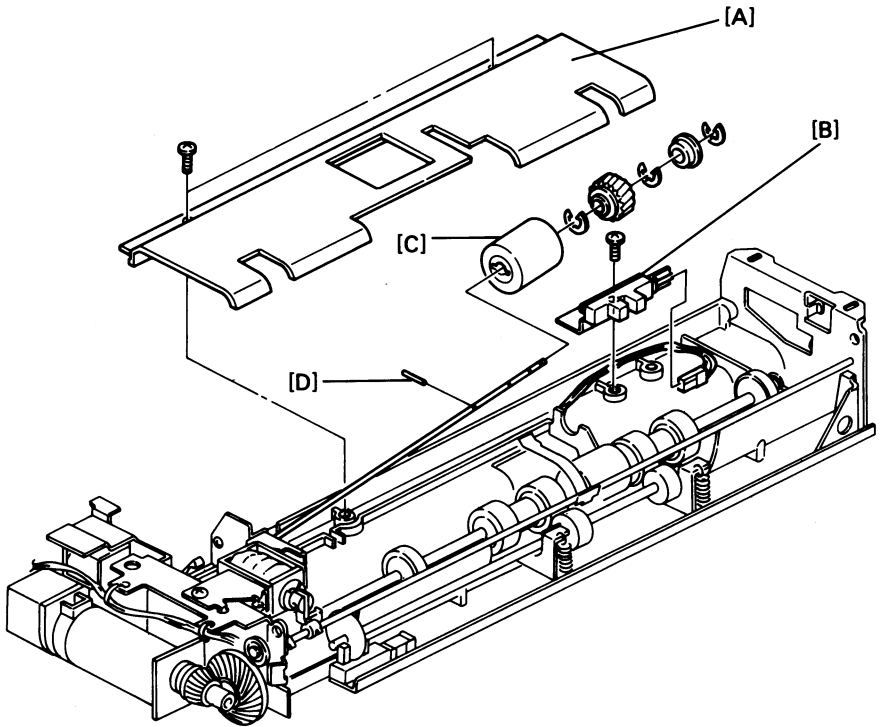


### 13.1.2 Feed-in Unit Removal



1. Turn off the main switch.
2. Remove the transport belt assembly. (See the Transport Belt Replacement section.)
3. Remove the belt drive motor cover [A] (4 screws).
4. Remove the feed-in unit [B] (4 screws, 8 connectors).

### 13.1.3 Pick-up Roller Replacement



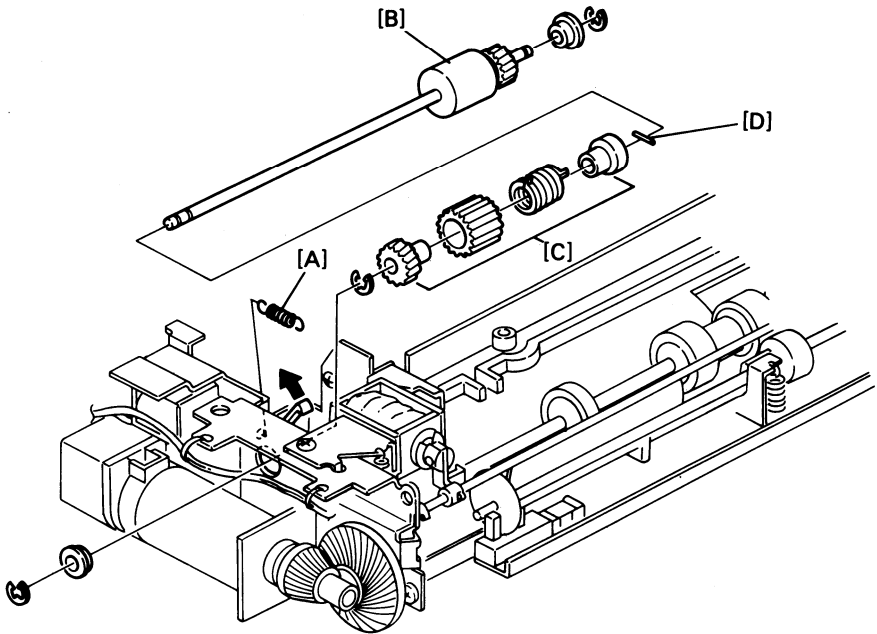
1. Turn off the main switch.
2. Remove the feed-in unit. (See the Feed-in Unit Removal section.)
3. Remove the lower entrance guide [A] (2 screws).
4. Remove the original set sensor assembly [B] (1 screw, 1 connector).
5. Remove the pick-up roller [C] (3 E-rings, 1 bushing, 1 gear).

**NOTE:** a) Be careful not to loose the pin [D].

b) When installing the roller, make sure the positioning pin is correctly inserted in the cut-out of the roller.

c) When installing the gear, make sure the flat side of the gear is facing away from the roller.

### 13.1.4 Feed-in Clutch Lubrication

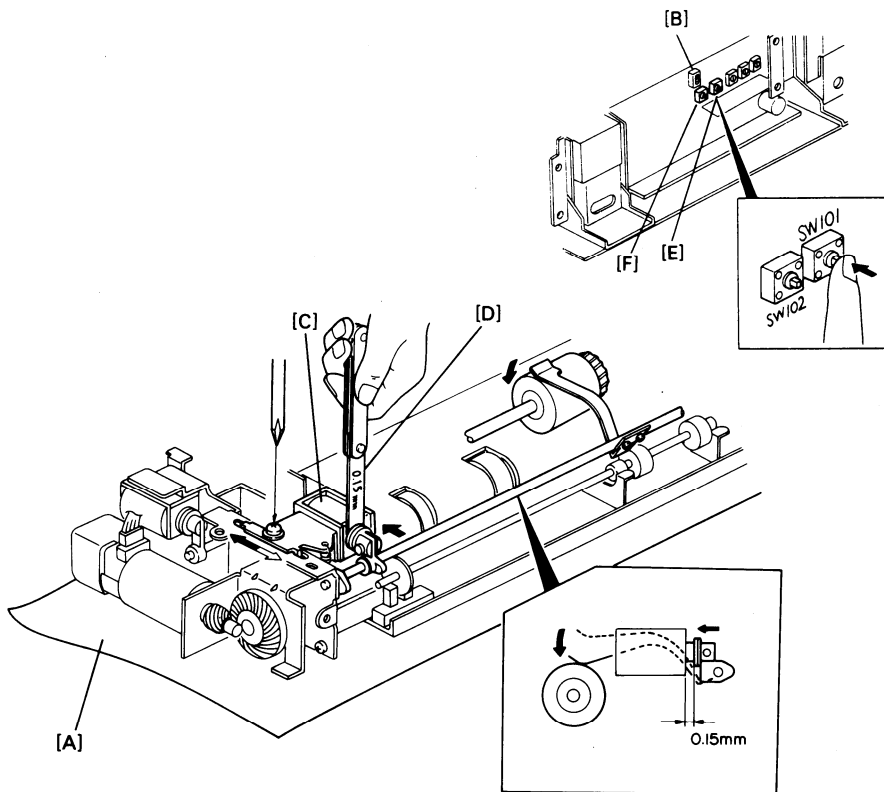


1. Turn off the main switch.
2. Remove the original set sensor assembly. (See the Pick-up Roller Replacement section.)
3. Remove the feed-in solenoid lever spring [A].
4. Remove the pick-up roller assembly [B] (2 E-rings, 2 bushings).
5. Disassemble and lubricate the feed clutch [C] (1 E-ring) with Mobil Temp. 78.

**NOTE:** a) Be careful not to loose the pin [D].

b) When installing the feed clutch, make sure the positioning pin is correctly inserted in the cut-out of the clutch.

### 13.1.5 Pick-up Solenoid Adjustment



1. Turn off the main switch.
2. Place several sheets of paper [A] over the exposure glass area.
3. Lower the feed-in unit (see Feed-in Unit Removal section) without disconnecting the eight connectors.
4. Turn on the main switch.

**NOTE:** When the main switch is turned on, the DPS101 setting on the DF main PCB must be as follows:

1 = ON 3 = OFF  
 2 = ON 4 = OFF

This is so that the initial check sequence can take place.

5. Turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
6. Loosen the screw fixing the pick-up solenoid [C].
7. Place the 0.15 mm thickness gauge [D] between the plunger and the solenoid.

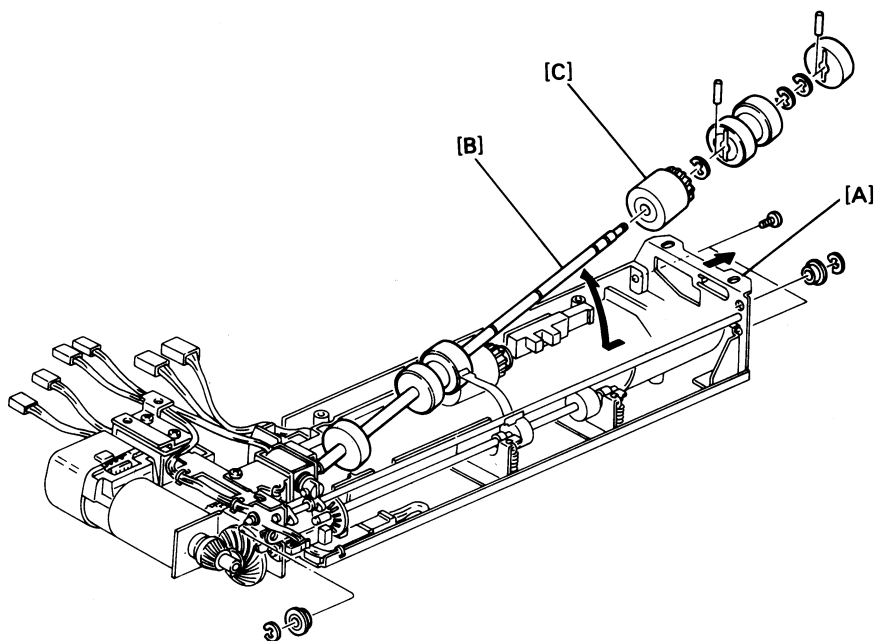
**NOTE:** Two sheets of paper (20 lb) can be used instead of a thickness gauge.

8. While holding the solenoid, press SW101 [E] on the DF main PCB to engage all DF solenoids.
9. Holding the solenoid securely, move it slowly towards the left, until the plunger is touching the thickness gauge (0.15 mm short of bottoming out). Just at this point, tighten the screw.

**NOTE:** Make sure the pick-up lever is touching the pick-up roller during this adjustment.

10. Press SW102 [F] to turn off the solenoids.
11. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.
12. Turn off the main switch and reassemble the DF.
13. Check the original feed-in operation.

### 13.1.6 Feed Roller Replacement



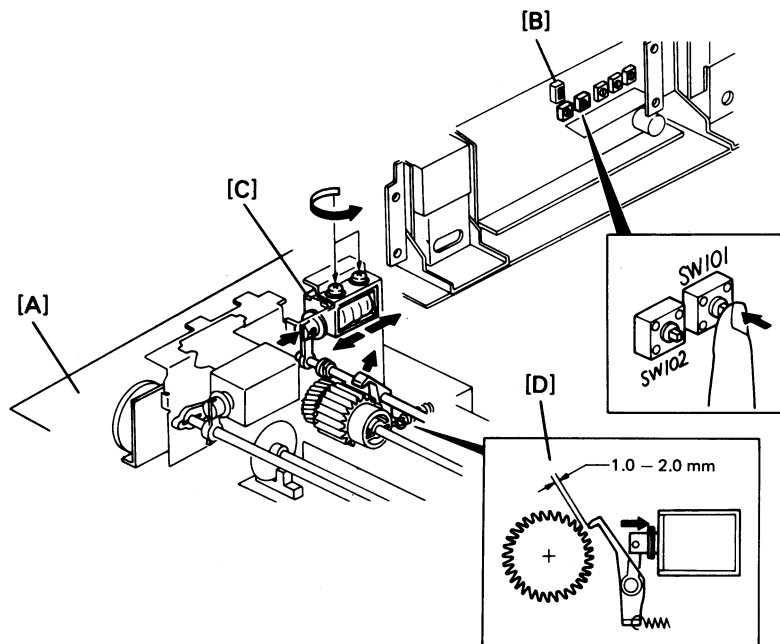
1. Turn off the main switch.
2. Remove the lower entrance guide. (See the Pick-up Roller Replacement section.)
3. Loosen the front bracket [A] (2 screws).
4. Release the feed roller shaft [B] from the front bracket (1 E-ring, 1 bearing).
5. Remove the feed roller [C] (3 E-rings, 1 side roller, 1 pull-out roller).

**NOTE:** a) Take care not to lose the pins.

b) When installing the feed roller, make sure the gear side of the roller faces the front (see illustration).

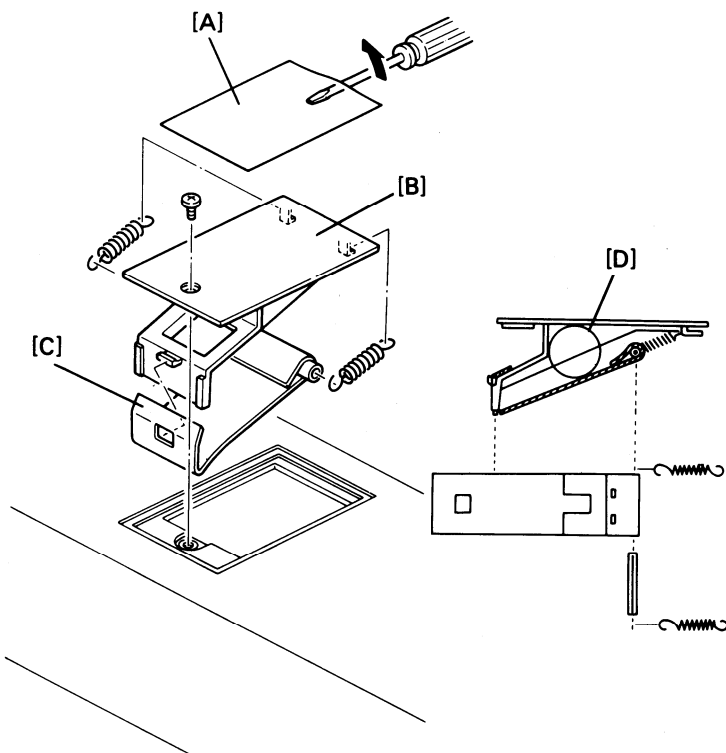
c) When installing the side and pull-out rollers, make sure the pins are correctly inserted in the cut-outs of the rollers.

### 13.1.7 Feed-in Solenoid Adjustment



1. Turn off the main switch.
2. Place several sheets of paper [A] over the exposure glass area.
3. Lower the feed-in unit (see Feed-in Unit Removal section) without disconnecting the eight connectors.
4. Check that DPS101 is set for the normal mode (1 = ON, 2 = ON, 3 = OFF, 4 = OFF).
5. Turn on the main switch.
6. Turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
7. Loosen the 2 screws securing the feed-in solenoid [C].
8. Press SW101 on the DF main PCB (to engage all DF solenoids) and adjust the position of the solenoid until the gap [D] (see illustration) is within 1.0 - 2.0 mm.
9. Press SW102 on the DF main PCB to turn off all DF solenoids.
10. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.

### 13.1.8 Friction Belt Replacement



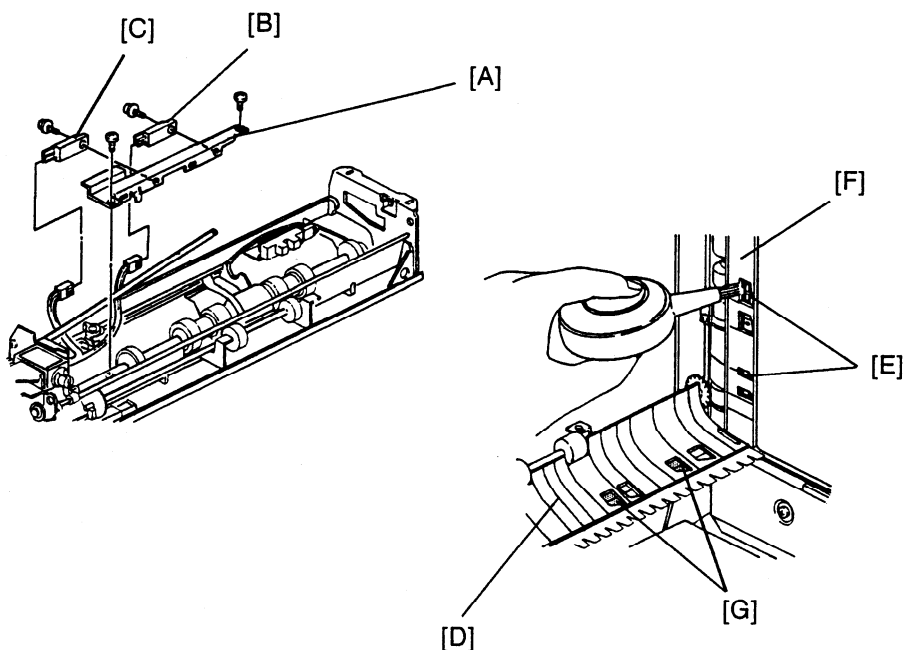
1. Turn off the main switch.
2. Remove the seal cover [A] on top of the DF cover.
3. Remove the friction belt assembly [B] (1 screw).
4. Remove the friction belt [C] (2 springs, 1 pin).

**NOTE:** a) When installing the friction belt assembly, make sure the friction roller [D] is set in the correct position (see illustration).

b) If the seal cover becomes dirty or deformed, replace it with a new one.



### 13.1.9 Registration Sensor and Original Width Sensor Replacement

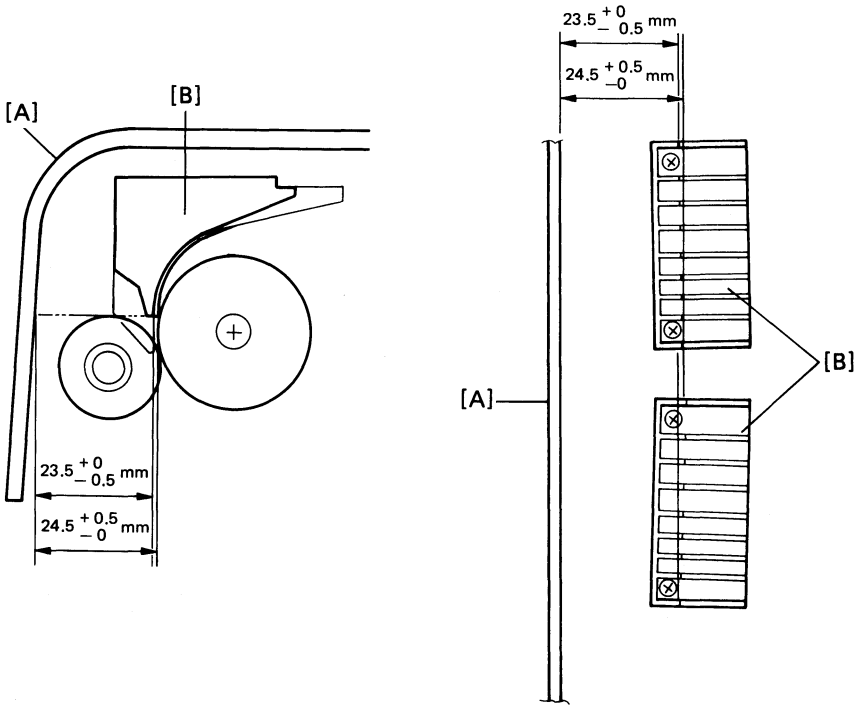


1. Turn off the main switch and unplug the machine.
2. Remove the pick-up roller. (See the Pick-up Roller Replacement section.)
3. Remove the sensor holder plate [A] with the 2 sensors (2 screws).
4. Remove the registration sensor [B] and the original width sensor [C] (1 screw, 1 connector).

**NOTE:** The registration sensor and the original sensor can be cleaned as follows:

Open the DF and release the lower guide plate [D] of the feed-in unit by pushing the lever for misfeed removal. Then, clean the 2 sensors [E] from the cutout portion of the plastic guide plate [F]. Also, clean the black rubber seals [G] installed on the lower guide plate using a blower brush.

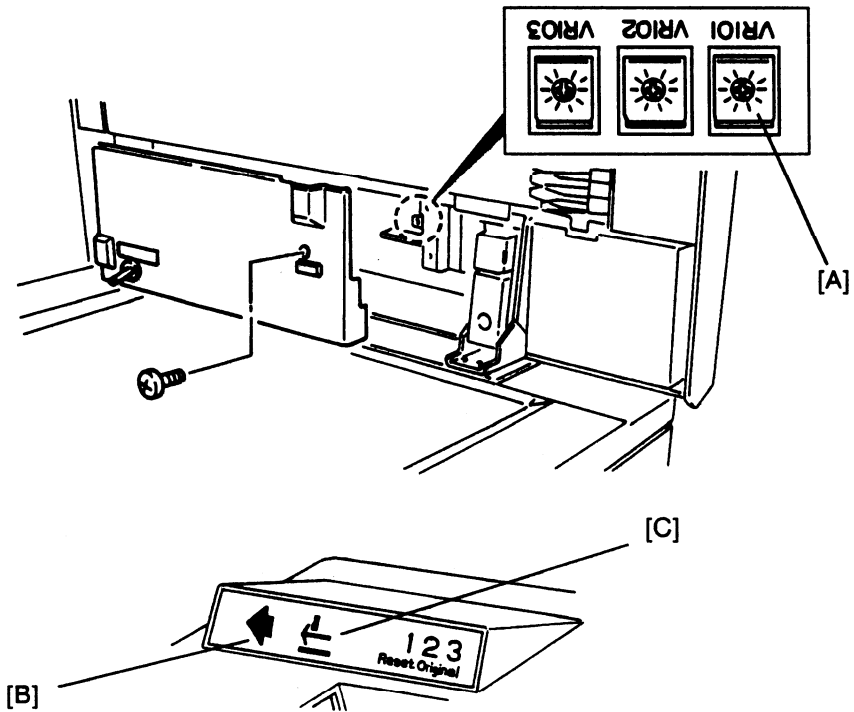
### 13.1.10 Entrance Guide Plate Adjustment



When the DF cover [A] or the entrance guide plate [B] is replaced, adjust the position of both the front and rear entrance guide plates as follows:

1. Adjust the clearance between the inner edge of the guide plates (see illustration) and the DF cover to  $24.5 + 0.5 \text{ mm}$ .
2. Adjust the clearance between the outer edge of the guide plates (see illustration) and the DF cover to  $23.5 - 0.5 \text{ mm}$ .

### 13.1.11 Belt Drive Motor Speed Adjustment



1. With the main switch on, turn on DPS 101-4.
2. While holding the lift switch on manually, adjust the belt drive motor speed to within 2,570 to 2,630 rpm using VR101 [A], so that both the Insert Original indicator [B] and the Auto Feed indicator [C] go out.

**NOTE:** a) When the Insert Original indicator lights, turn VR101 clockwise to reduce the motor speed.

b) When the Auto Feed indicator lights, turn VR101 counter-clockwise to raise the motor speed.

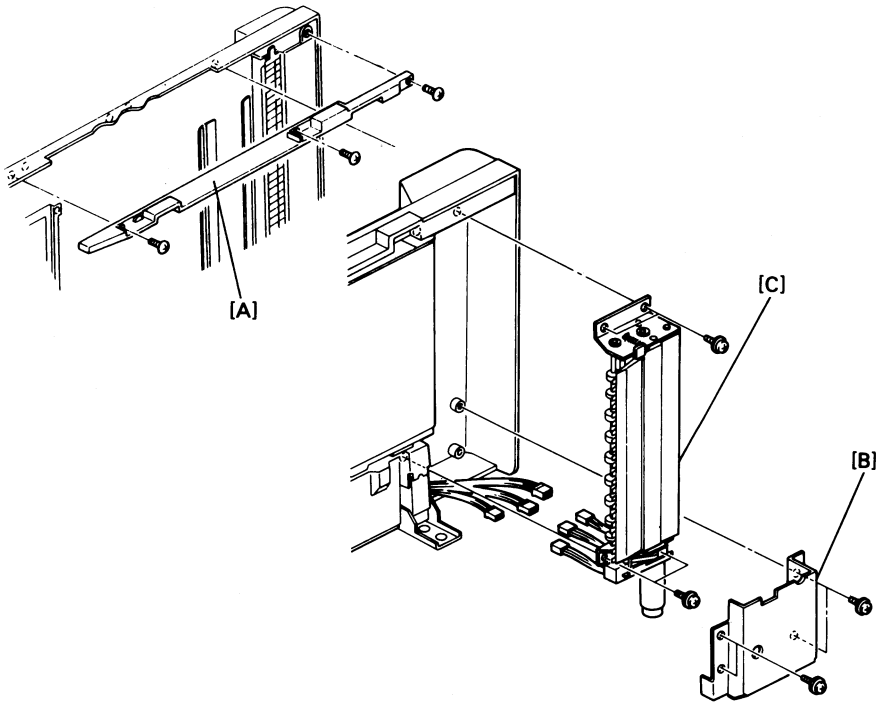
c) Confirm that both indicators remain off for approximately 5 seconds in order to steady the motor speed.

d) This procedure must be performed when replacing the DF main PCB.

3. Turn off DPS 101-4.

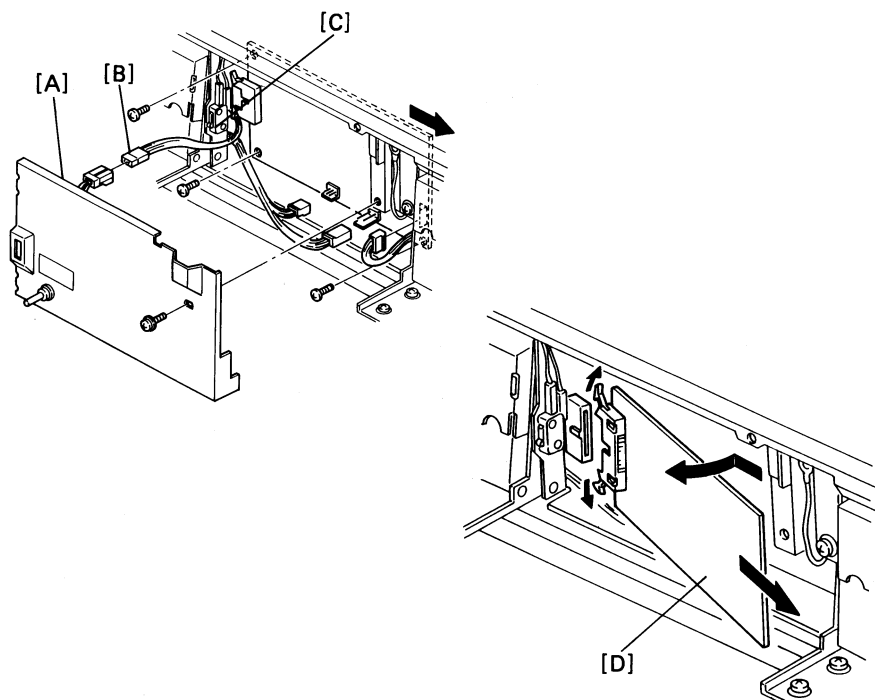
## 13.2 FEED-OUT UNIT

### 13.2.1 Feed-out Unit Removal



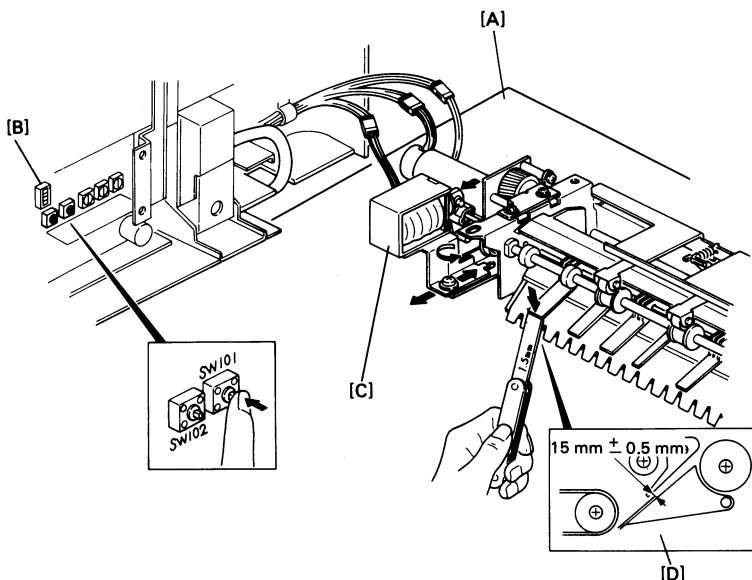
1. Turn off the main switch.
2. Remove the DF grip [A] (3 screws).
3. Remove the feed-out motor cover [B] (4 screws).
4. Remove the feed-out unit [C] (4 screws, 3 connectors).

### 13.2.2 DF Main PCB Removal



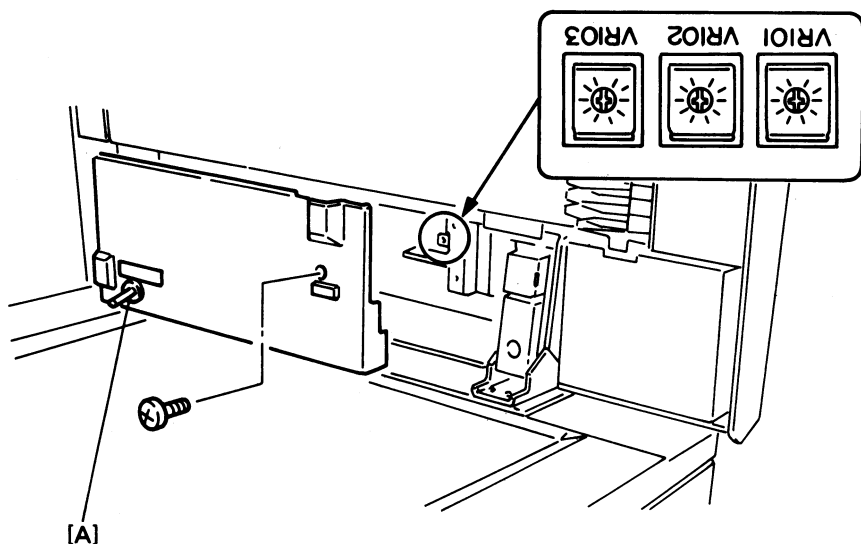
1. Remove the DF angle stopper (2 screws) and stand the DF up vertically.
2. Remove the Df main PCB cover [A] (1 screw).
3. Disconnect the connector [B] of the original select switch.
4. Remove the lift and safety switch [C] (2 screws).
5. Remove the 3 screws securing the DF main PCB [D].
6. Disconnect the optical fiber and connectors and remove the DF main PCB [D].

### 13.2.3 Inverter Solenoid Adjustment



1. Place several sheets of paper [A] over the exposure glass area.
2. Lower the feed-out unit (see Feed-out Unit Removal section) without disconnecting the three connectors.
3. With the main switch on, turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
4. Loosen the screw securing the inverter solenoid [C].
5. Press SW101 on the DF main PCB (to engage all DF solenoids), and adjust the position of the solenoid until the gap [D] (see illustration) is within  $1.5 \pm 0.5$  mm.
6. Press SW102 on the DF main PCB to turn off all DF solenoids.
7. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.

### 13.2.4 DF Leading Edge Registration Adjustment



1. Using the DF test sheet (accessory), make a copy in the platen cover mode (A4/8½" x 11" width).
2. Confirm that the original select switch [A] is in the thin mode and again using the test sheet, make a copy in the DF mode (A4/8½" x 11" width).
3. Compare the leading edge registration of both copies, and check that the difference between the two copies is within 2.5 mm.

4. If the difference is more than 2.5 mm, remove the DF main PCB cover (1 screw) and adjust VR102 on the DF main PCB [B] until the leading edge registration is within specification.

**NOTE:** Turning VR102 clockwise results in stopping the original later (moving to the right).

5. Using the DF test sheet, make a copy in the DF two sided-original mode. (Insert the original face down.)
6. Compare the leading edge registration with that of the platen cover mode copy, and check that the difference between the two copies is within 2.0 mm.
7. If out of specification, adjust VR103 on the DF main PCB [B] until the leading edge registration is correct.

**NOTE:** a) The test sheet stops pressed against the left scale in DF two-sided original mode.

- b) Turning VR103 clockwise results in the original stopping later (moving to the left)



## 14. SERVICE TABLES FOR DF MAIN PCB

### 14.1 TEST POINTS

NUMBER	FUNCTION
TP101	Factory use
TP102	+5V
TP103	GND
TP104	Factory use
TP105	+12V
TP106	+24V
TP107	Factory use

### 14.2 VARIABLE RESISTORS

NUMBER	FUNCTION
VR101	Belt drive motor speed adjustment
VR102	Original leading edge registration adjustment (one-sided original mode)
VR103	Original leading edge registration adjustment (two-sided original mode)
VR106	Factory use

### 14.3 LEDs

NUMBER	FUNCTION
LED101	Lights when the registration sensor is activated
LED102	Goes out when the original width sensor is activated
LED103	Goes out when the feed-out sensor is activated
LED104	Lights when the pulse generator sensor is activated
LED105	Lights when the original set sensor is activated
LED106	Lights when the lift sensor is turned on
LED107	Goes out when the original select switch is turned on (when the thin original mode is selected)

## 14.4 DIP SWITCHES

DPS 101				FUNCTION
-1	-2	-3	-4	
1	0	0	0	Normal mode 12 cpm (Not used)
1	1	0	0	Normal mode 18 cpm (Factory Setting)
1	0	0	1	One-sided free run : SW101 - ON
0	1	0	1	Two-sided free run : SW101 - ON
0	0	1	1	Solenoid test : SW101 - solenoids ON SW102 - solenoids OFF
1	1	0	1	Motor test
1	1	1	1	All indicators ON

0: OFF 1: ON

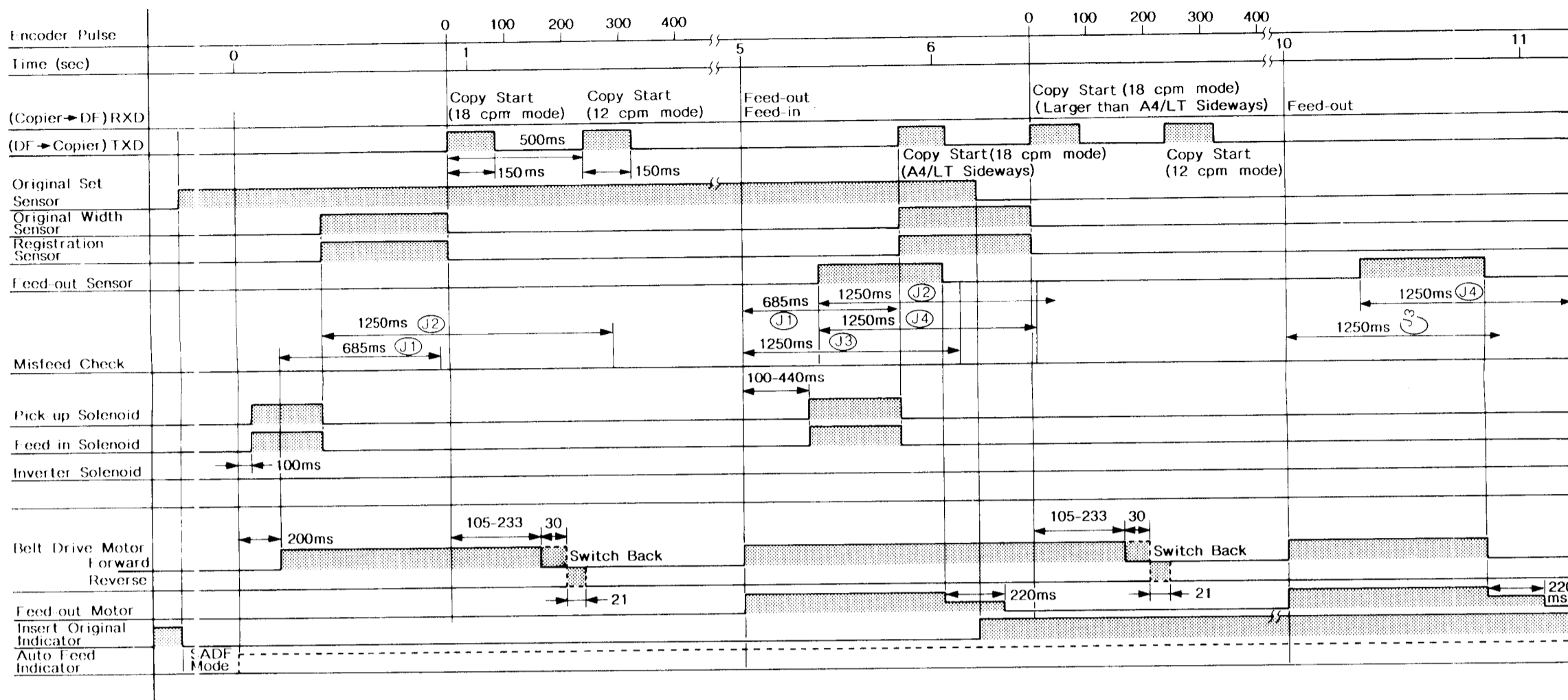
- NOTE:** a) When the main switch is turned on, the DPS101 setting must be normal, so that the initial sequence between the copier and the DF can take place.
- b) The lift switch must be turned on to use all functions except for the solenoid test mode.
- c) When utilizing the free run mode, the lift switch must be ON (close the DF unit), and the original(s) must be inserted since sensors detect the original as in normal mode. Then, actuate SW101 from the rear side of the DF (this is easier if the angle stopper is removed).

# Section 7

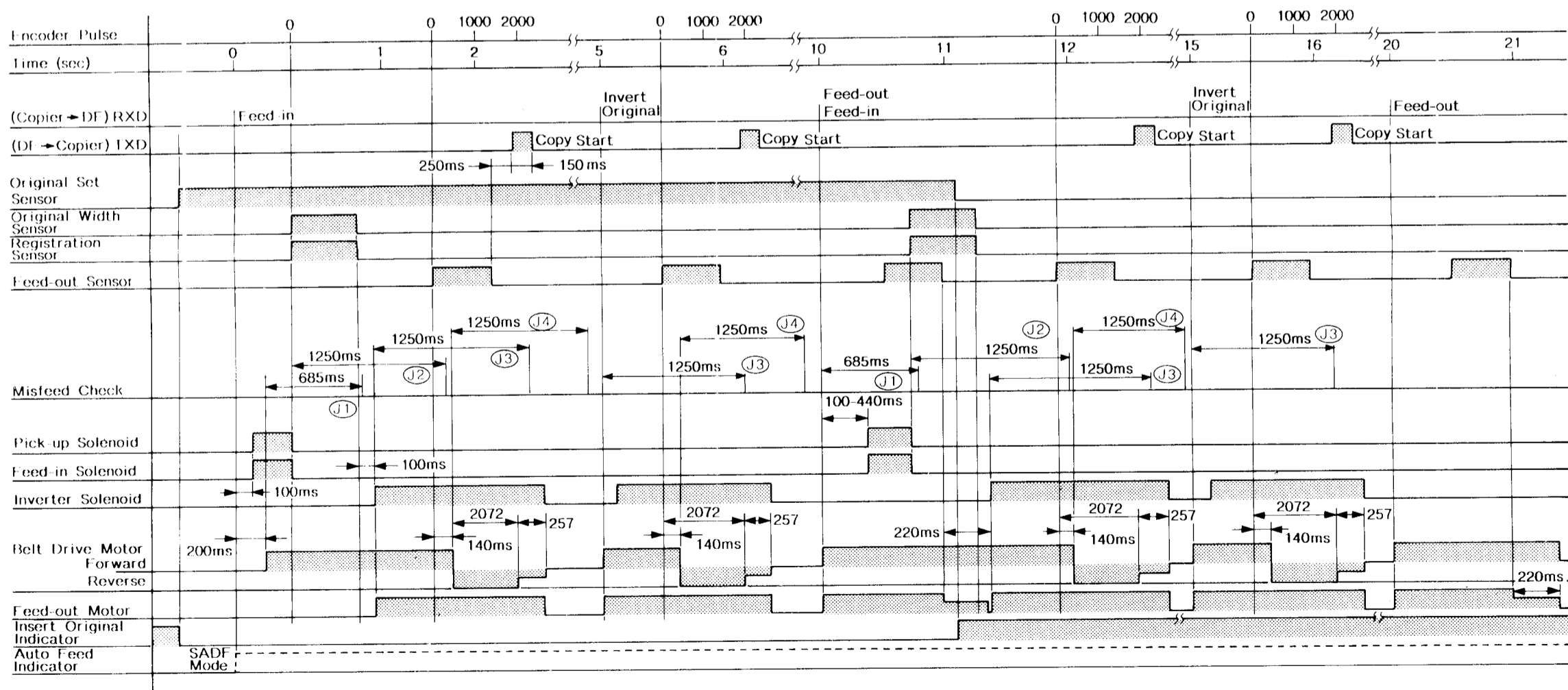
*DF Timing Chart (following page)*

# 15. DF TIMING CHART

## < One-sided Original Mode >



## < Two-sided Original Mode >

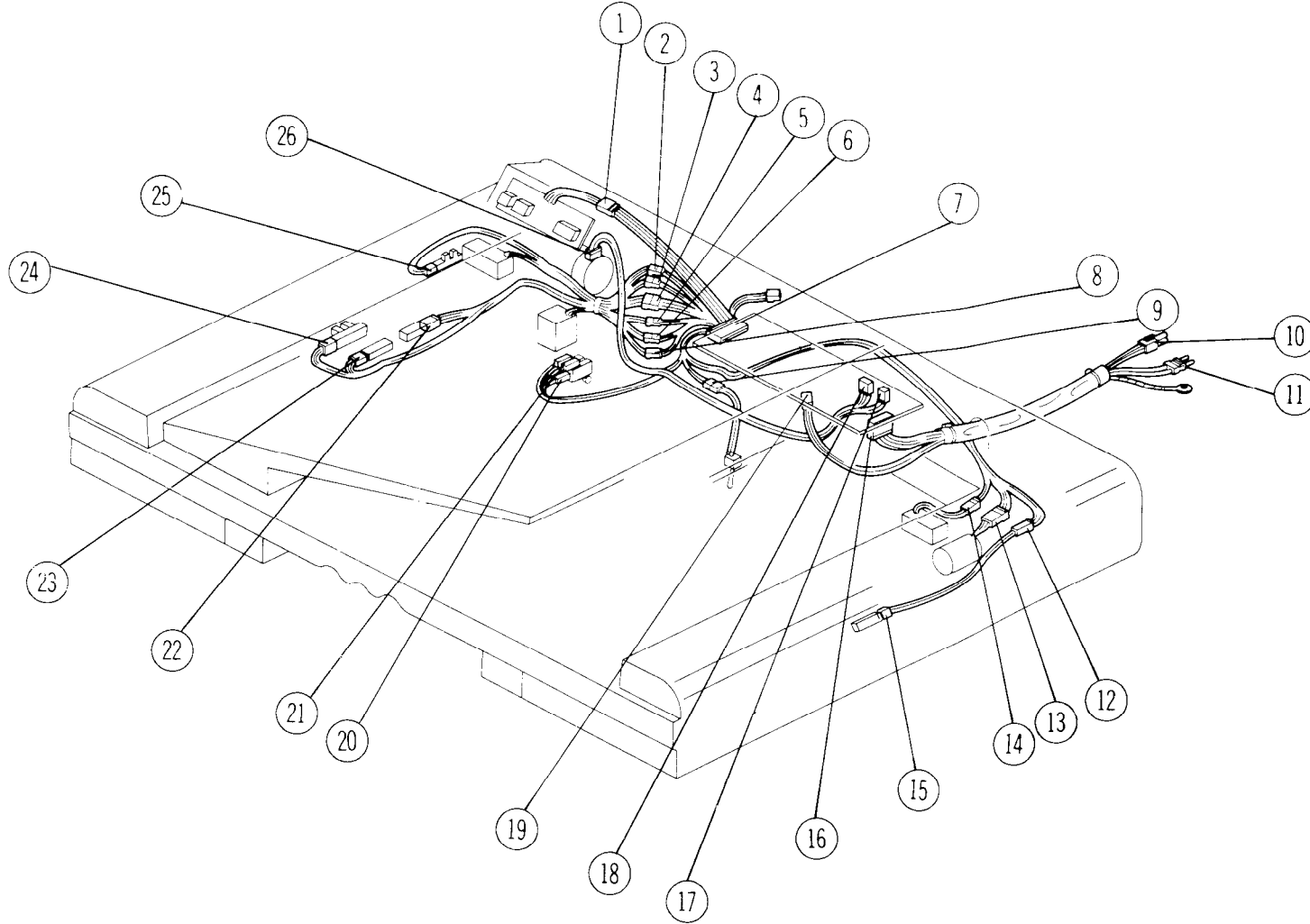


7-51

### JAM CHECK

- J1: Registration sensor ON check
- J2: Registration sensor OFF check
- J3: Feed-out sensor ON check
- J4: Feed-out sensor OFF check

## 2. ADF



## 2. ADF

Index No	CN. No.	Component	Type	P to P
1.	CN201	Indicator Panel Harness	6P/W	B-3
2.	CN114	Pick-up Solenoid Harness	2P/R	B-2
3.	CN115	Feed-in Solenoid Harness	2P/Y	B-2
4.	CN26	Original Set Sensor Harness	3P/W	B-3
5.	CN25	Pulse Generator Sensor Harness	3P/R	B-3
6.	CN24	Original Width Sensor Harness	4P/W	B-4
7.	CN104	DF Main Board	34P/B	B-2/3/4
8.	CN23	Registration Sensor Harness	3P/Y	B-4
9.	CN120	Original Select Switch	2P/W	B-3
10.	CN120	DF DC Harness	4P/W	B-1
11.	CN27	DF TXD/RXD Harness	2P/B	B-1
12.	CN22	Feed-out Sensor Harness	3P/W	B-4
13.	CN108	Feed-out Motor	4P/W	B-2
14.	CN110	Inverter Solenoid	2P/R	B-2
15.	CN109	Feed-out Sensor	3P/W	B-4
16.	CN101	DF Main Board	4P/W	B-1
17.	CN102	DF Main Board	2P/W	B-1
18.	CN103	DF Main Board	4P/W	B-1
19.	CN106	DF Main Board	2P/B	B-1
20.	T1	Lift Switch	1P/W	B-4
21.	T2	Lift Switch	1P/W	B-4
22.	CN121	Original Width Sensor	3P/B	B-4
23.	CN117	Registration Sensor	3P/B	B-4
24.	CN116	Original Set Sensor	3P/W	B-3
25.	CN118	Pulse Generator Sensor	3P/W	B-3
26.	CN111	Belt Drive Motor	6P/W	