AUTO REVERSE DOCUMENT FEEDER (Machine Code: A497)

1. SPECIFICATIONS

Original Size:	Max A3, 11" x 17" Min B6, 5 1/2" x 8 1/2"
Original Weight:	42~128 g/m^2 (11~34lb) -SADF. ADF 52~104 g/m^2 (14~28lb) -SADF. ADF. ARDF
Original Feed Mode:	Automatic feed ADF Set: Face-up, 1st sheet on top Manual feed one by one SADF Auto Reverse Feed ARDF
Original Table Capacity:	Max 50 sheets (A4/8 1/2" x 11") 52 g/m^2 (14lb)
Original Separation:	Feed and Friction Belts
Original Transport:	One flat belt
Original Stop System:	Dc servo motor control system
Copying Speed (FT5233):	Continuous copy 33 copies/minute (A4/8 1/2" x 11" sideways) Single copy 31 copies/minute (A4/8 1/2" x 11" sideways)
Power Source:	24V from copier, 1.8A
Power Consumption:	45W
Dimensions (W x D x H):	670 x 468 x 120 mm (26.4" x 18.5" x 4.8")
Weight:	Approximately 9.5 kg (21lb)

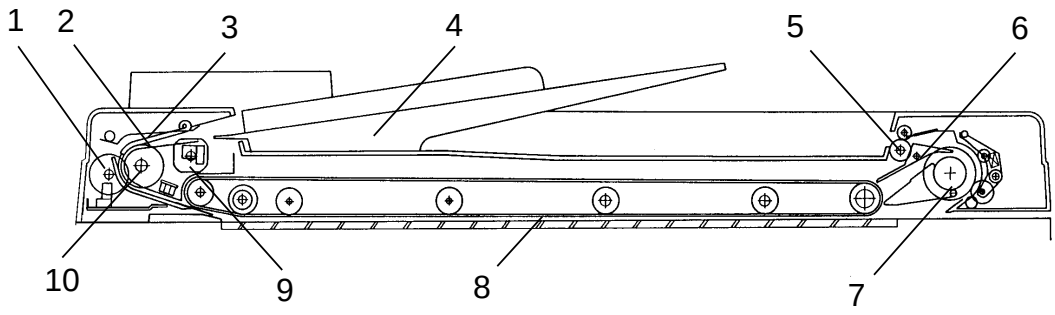
ARDF

TABLE:

<table>
<tr><td rowspan="2">WEIGHT
SIZE</td><td>41 - 51 (g/m^2)</td><td>52 - 81</td><td>82 - 104</td><td>105 - 128</td></tr>
<tr><td>11 - 13 (lb)</td><td>14 - 22</td><td>23 - 28</td><td>29 - 34</td></tr>
<tr><td>A3L</td><td rowspan="15">50 sheets (ADF, SADF only)</td><td rowspan="9">50 sheets (ARDF, ADF, SADF)</td><td rowspan="9">30 sheets (ARDF, ADF, SADF)</td><td rowspan="15">25 sheets (ADF, SADF only)</td></tr>
<tr><td>A4S</td></tr>
<tr><td>A4L</td></tr>
<tr><td>A5S</td></tr>
<tr><td>A5L</td></tr>
<tr><td>B4L</td></tr>
<tr><td>B5S</td></tr>
<tr><td>B5L</td></tr>
<tr><td>B6L</td></tr>
<tr><td>B6S</td><td rowspan="2">50 sheets (ADF, SADF only)</td><td rowspan="2">30 sheets (ADF, SADF only)</td></tr>
<tr><td>5 1/2" x 8 1/2"S</td></tr>
<tr><td>11" x 17"L</td><td rowspan="5">50 sheets (ARDF, ADF, SADF)</td><td rowspan="5">30 sheets (ARDF, ADF, SADF)</td></tr>
<tr><td>8 1/2" x 14"L</td></tr>
<tr><td>8 1/2" x 11"S</td></tr>
<tr><td>8 1/2" x 11"L</td></tr>
<tr><td>5 1/2" x 81/2"L</td></tr>
</table>

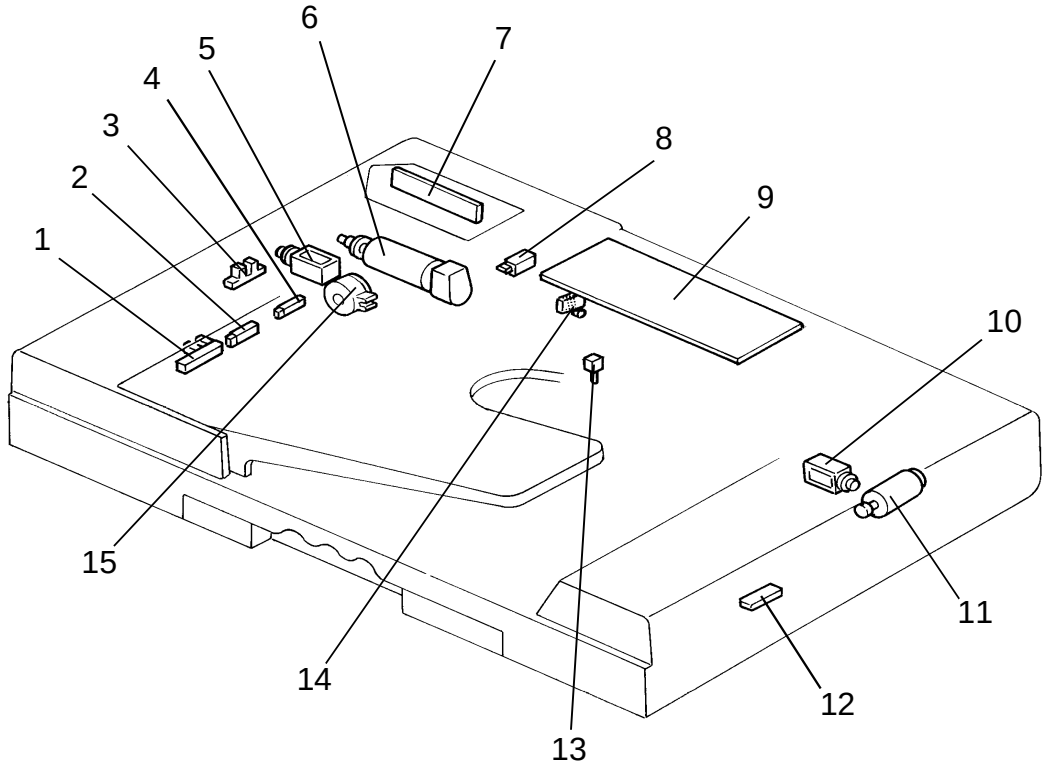
"L" means lengthwise.
"S" means sideways.

2. MECHANICAL COMPONENT LAYOUT



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

3. ELECTRICAL COMPONENT LAY OUT



1. Original Set Sensor
2. Registration Sensor
3. Pulse Generator Sensor
4. Original Width Sensor
5. Pick-up Solenoid
6. Belt Drive Motor
7. Indicator Panel
8. DF Position Sensor
9. DF Main Board
10. Inverter Solenoid
11. Feed-out Motor
12. Feed-out Sensor
13. Original Select Switch
14. Lift Switch
15. Feed-in Clutch

4. ELECTRICAL COMPONENT DESCRIPTIONS

MOTORS

NAME	FUNCTION	LOCATION
Belt Drive Motor	DC servomotor that drives to the transport belt and feed-in system (pick-up roller, feed roller, pull-out roller and relay roller).	6
Feed-out Motor	DC servomotor that drives the feed-out unit of the DF.	11

SOLENOIDS

NAME	FUNCTION	LOCATION
Pick-up Solenoid	Energizes to press the pick-up lever against the stack of originals in preparation for original feed-in.	5
Inverter Solenoid	Energizes to invert the original when copying two sided originals.	10

SWITCHES

NAME	FUNCTION	LOCATION
Lift Switch	Informs the CPU when the DF is lifted and also serves as the jam reset switch for the DF.	14
Original Select Switch	Selects thick original mode or thin original mode.	13

SENSORS

NAME	FUNCTION	LOCATION
Original Set Sensor	Informs the main system's CPU that originals have been placed and causes the Insert Original indicator to go out.	1
Registration Sensor	Sets original stop timing and measures original length.	2
Original Width Sensor	Determines the width of the originals.	4
DF Position Sensor	Informs the CPU when DF is being closed so that APS sensor can begin checking the original size.	8
Pulse Generator Sensor	Generates pulses used to measure the original length.	3
Feed-out Sensor	Checks for original misfeeds and sets original stop timing when in auto reverse mode.	12

MAGNETIC CLUTCH

NAME	FUNCTION	LOCATION
Feed-in Clutch	Energizes to rotate the feed roller, pull-out rollers, and relay roller	15

PRINTED CIRCUIT BOARDS

NAME	FUNCTION	LOCATION
DF Main Board	Controls all DF functions.	9
Indicator Panel Board	Contains operator indicators.	7

5. BASIC OPERATION

1. One-sided Original Feed

When an original is inserted into the DF, the Insert Original indicator light goes out and the DF informs the main system's CPU that originals have been set.

When the Start key is pressed, the main system's CPU sends the feed-in signal to the DF. On receipt of this signal, the DF energizes the pick-up solenoid, the feed-in clutch, and the belt drive motor in order to feed-in the bottom sheet of the original stack onto the exposure glass. The pick-up solenoid and the feed-in clutch remain energized until the original's leading edge reaches the DF registration sensor. The belt drive motor turns off 2,088 encoder pulses after the original's leading edge passes the DF registration sensor.

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

Shortly before the belt drive motor turns off, the DF CPU sends the copy start signal to the main system. On receipt of the signal, the main system's CPU starts the copy cycle.

When the scanner reaches to the return position, the main system's CPU sends the feed-out and the feed-in signals to the DF CPU in order to exchange the original with the next original.

When the scanner comes to the return position after scanning the last original, the main system's 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, the DF CPU also energizes the feed-out motor and the inverter solenoid a short time after the original's leading edge has passed the DF registration sensor. The belt drive motor continues to feed the original until 85 milliseconds after the original leading's 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 fed towards the original stopper and is stopped at the correct position on the exposure glass. The DF CPU sends the copy start signal a short time after the original's trailing edge has passed the feed-out sensor.

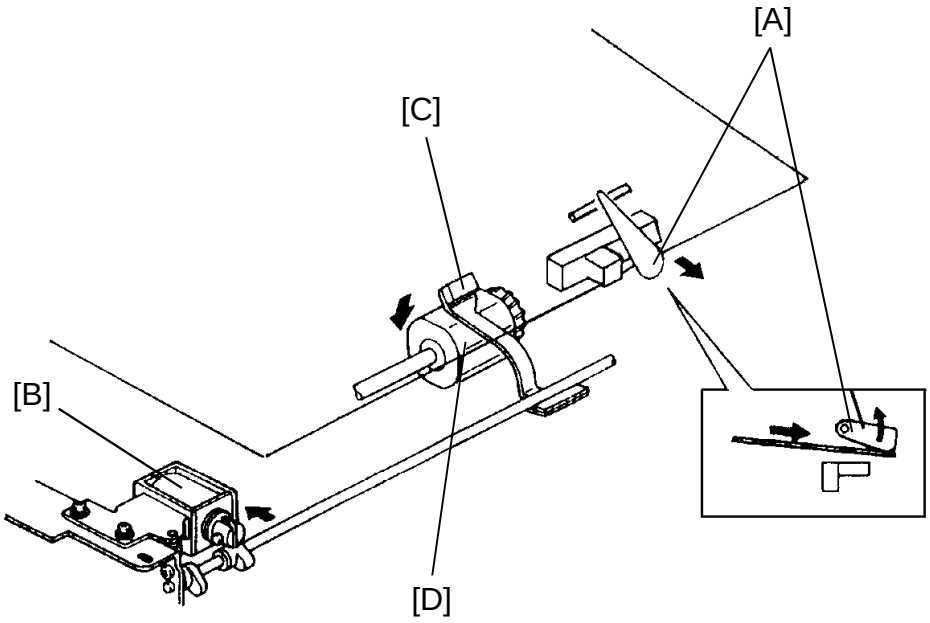
When the scanner reaches to the return position, the main system's CPU sends the invert original signal to the DF CPU in order to make a copy of the front side. The original is inverted in the same way as for back side copying.

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 four seconds after the main system's main motor stops. If another original is inserted within that four-second period, it is automatically fed and copied.

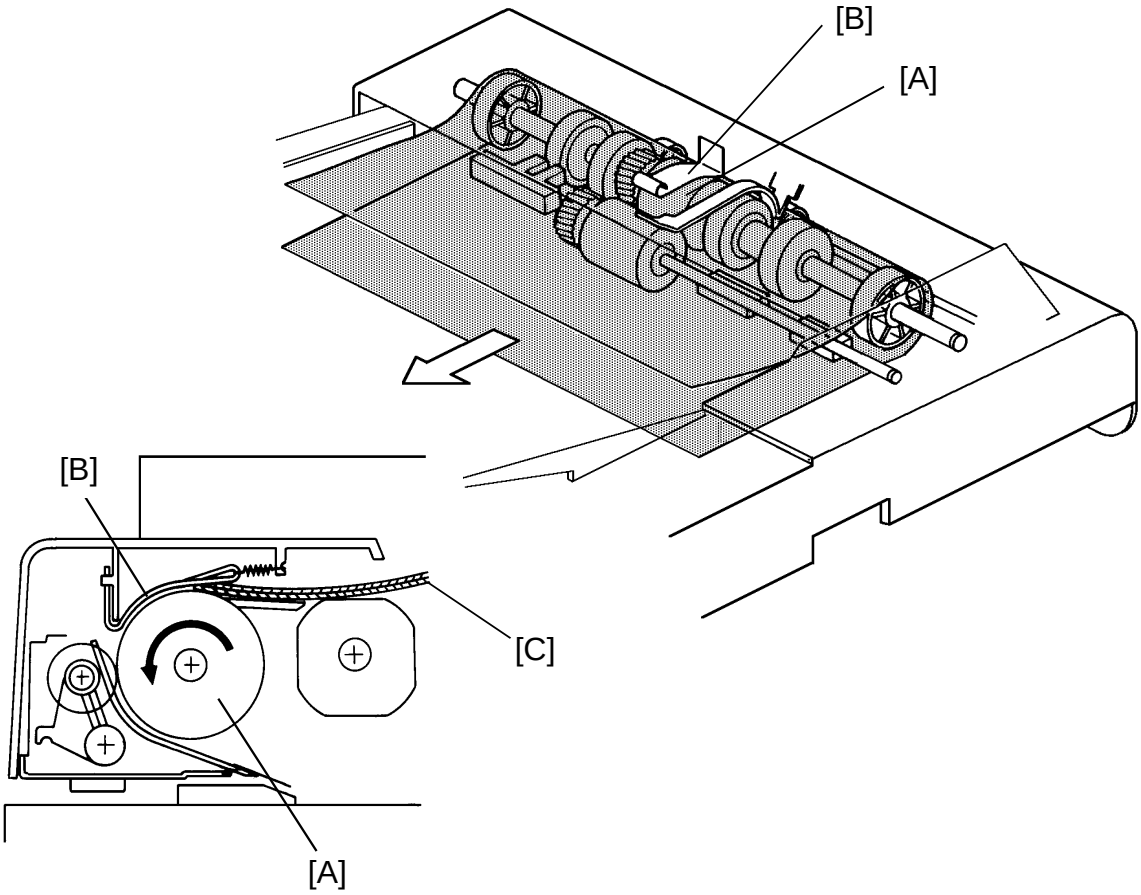
6. ORIGINAL FEED

6.1 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 main system's 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.

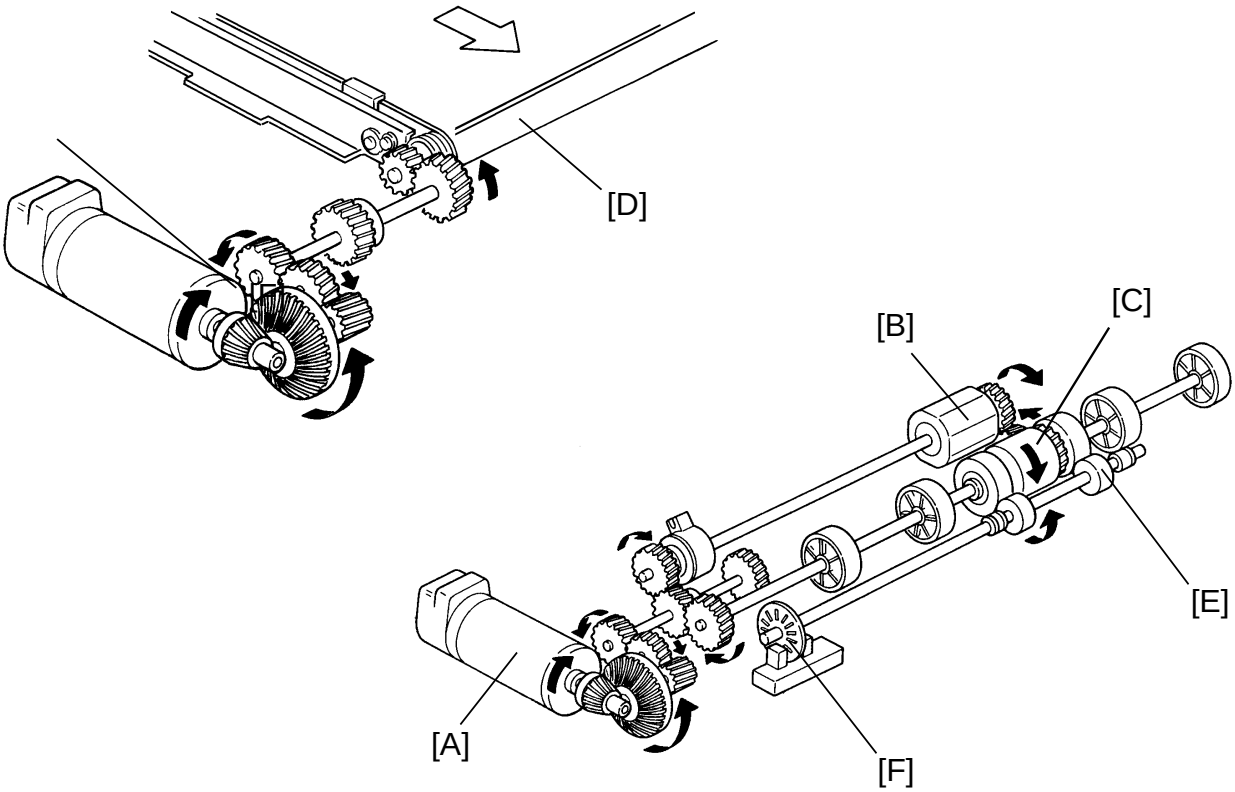
6.2 ORIGINAL SEPARATION



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.

6.3 ORIGINAL FEED-IN MECHANISM

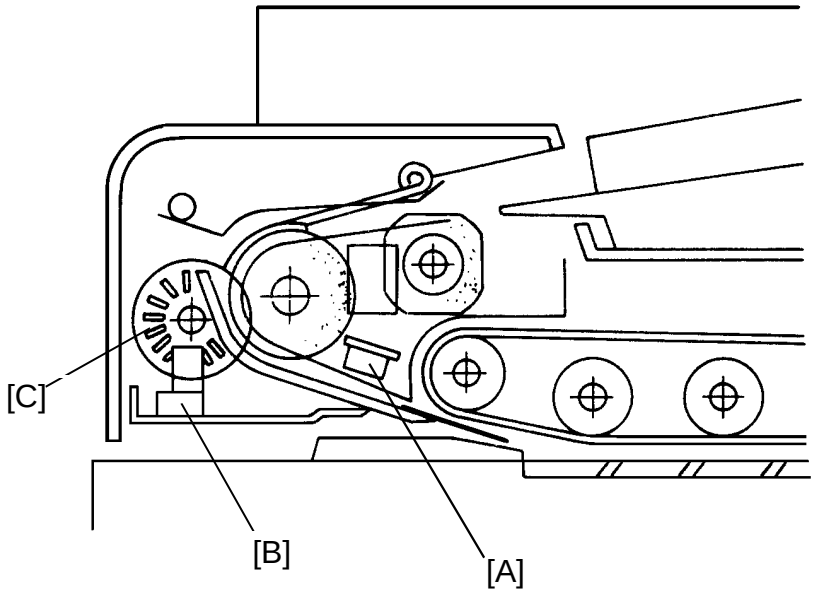


The belt drive motor [A] drives the pick-up roller [B], the feed roller [C], and transport belt [D] via a feed clutch and a gear train. And, the pull out roller [E] is driven by friction with the feed roller.

The pick-up solenoid is energized 100 milliseconds after the Start key is pressed. Then 100 milliseconds after the solenoid is energized, the belt drive motor starts turning. The pulse generator disc [F] on the pull-out roller shaft always turns when the belt drive motor is on in the forward direction.

238 encoder pulses of the belt drive motor after the original's trailing edge passes the registration sensor, the relay rollers and the transport belt stop turning.

6.4 ORIGINAL SIZE DETECTION

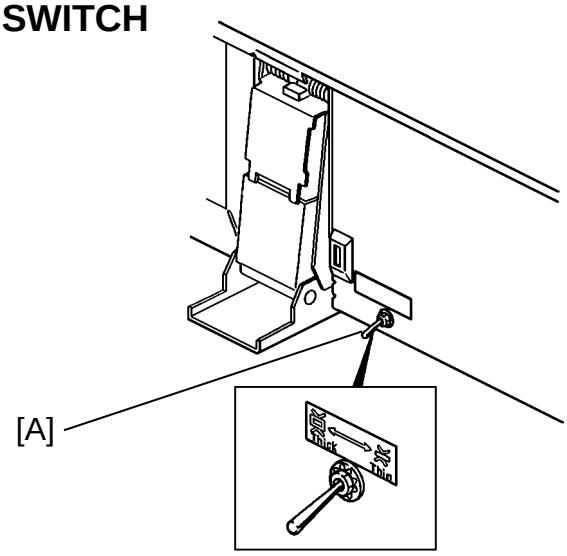


The DF determines original size (both width and length) through the use of the original width sensor [A, rear of DF], registration sensor [A, center of DF], and pulse generator sensor [B]. The original's length is calculated by counting the number of pulses from the pulse generator [C] while the registration 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 APS, AMS and the feed-in/feed-out timing of the DF.

6.5 ORIGINAL SELECT SWITCH



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].

1. Thin Original Mode

The original is stopped at the correct position on the exposure glass based on encoder pulse count. For the first side of the original, the belt drive motor stops 238 encoder pulses after the original's trailing edge passes the registration sensor in the one-sided original mode. For the reverse side of the original, the belt drive motor reverses its rotation 85 m sec after the leading edge passes the feed-out sensor. It stops after 2805 pulses. (Exact timing depends on registration adjustment.) Thin original mode is selected at the factory.

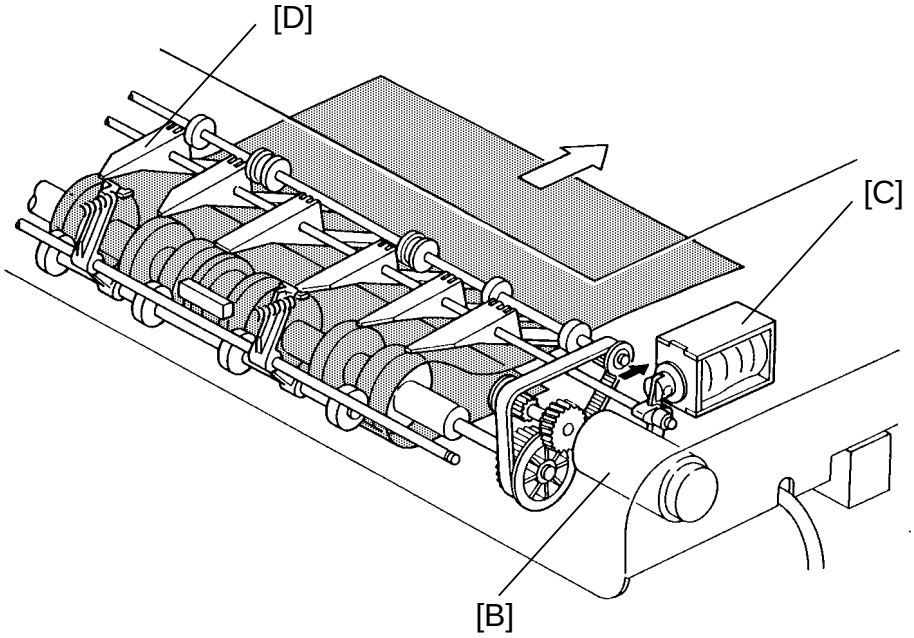
2. Thick Original Mode

When the thick original mode is selected, the original is aligned against the original scale. For the first side, the belt drive motor stays on 36 encoder pulses longer than when in the thin original mode, and then reverses for 62 encoder pulses. This forces the original against the original scale and thus aligns the edge of the original with the original scale.

For the reverse side, the belt drive motor continues to reverse for 62 encoder pulses longer than when in the thin original mode.

NOTE: The thick original mode should be used when the customer requires more correct leading edge registration adjustment or when these are complaints of skewed copies. The thin original mode is to prevent the thin original's from being bent since they do not have great stiffness.

6.6 ORIGINAL INVERSION MECHANISM

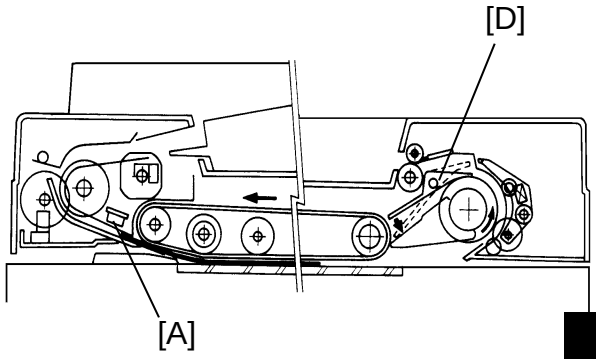


The two sided originals are inverted in the feed-out unit.

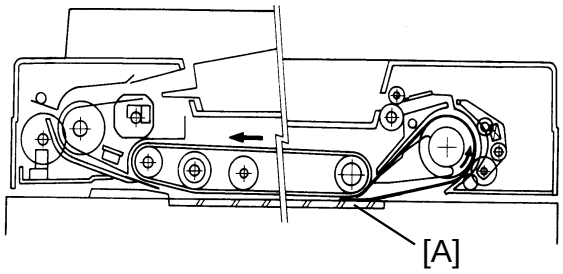
1) When the Start key is pressed, the two sided original is fed into the feed-in unit, passing over the DF registration sensor [A]. At the same time, the feed-out motor [B] starts turning

   The inverter solenoid [C] turns on 100 milliseconds after the original's trailing edge passes the registration sensor

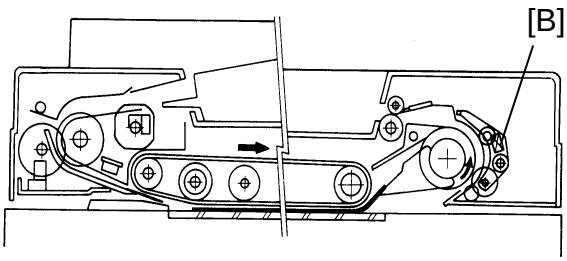
   When the inverter solenoid turns on, the inverter pawls [D] rotate counterclockwise.



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

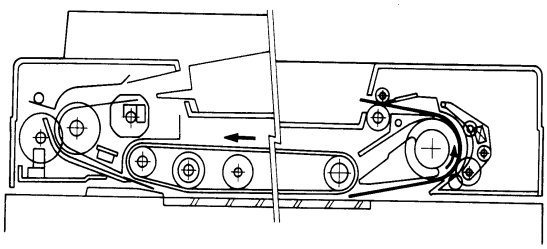


3) The original is directed onto the exposure glass again by the inverter pawls. The belt drive motor now reverses 85 milliseconds after the feed out sensor [B] turns on. The transport belt then moves the original toward the original scale.
When the original leading edge reaches the original scale, the belt drive motor stops. At the same time, the feed-out motor and the inverter solenoid turn off.



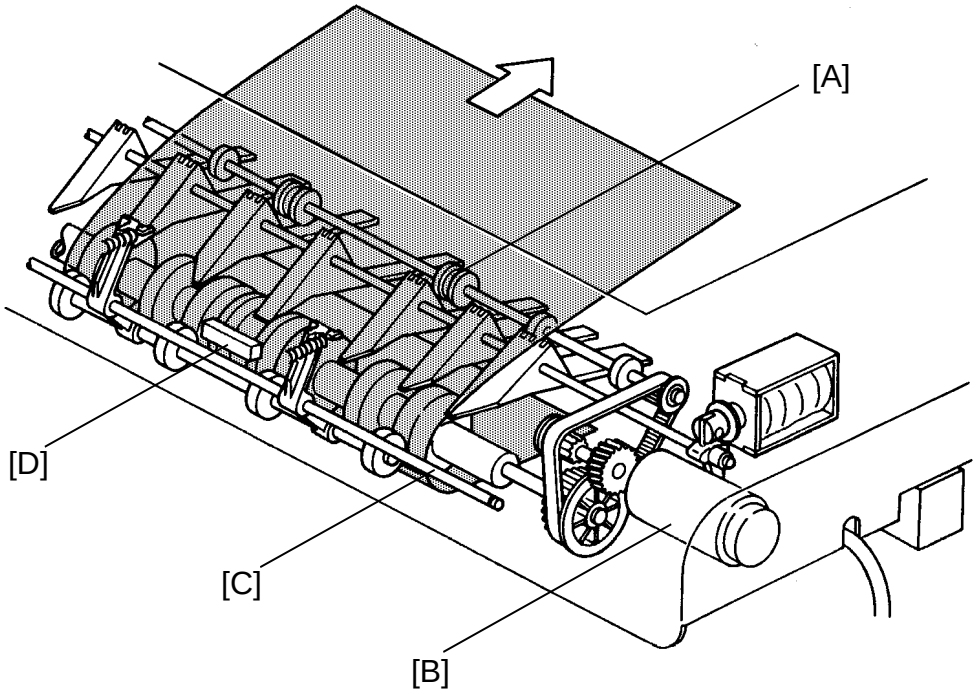
4) After the reverse side of the original is exposed, the belt drive motor, the feed-out motor, and the inverter solenoid turn on, and the original is fed into the inverter section. (This is the same as step 2 above.)

5) The original is fed onto the exposure glass again as in step 3 above. The front side of the original is then copied.



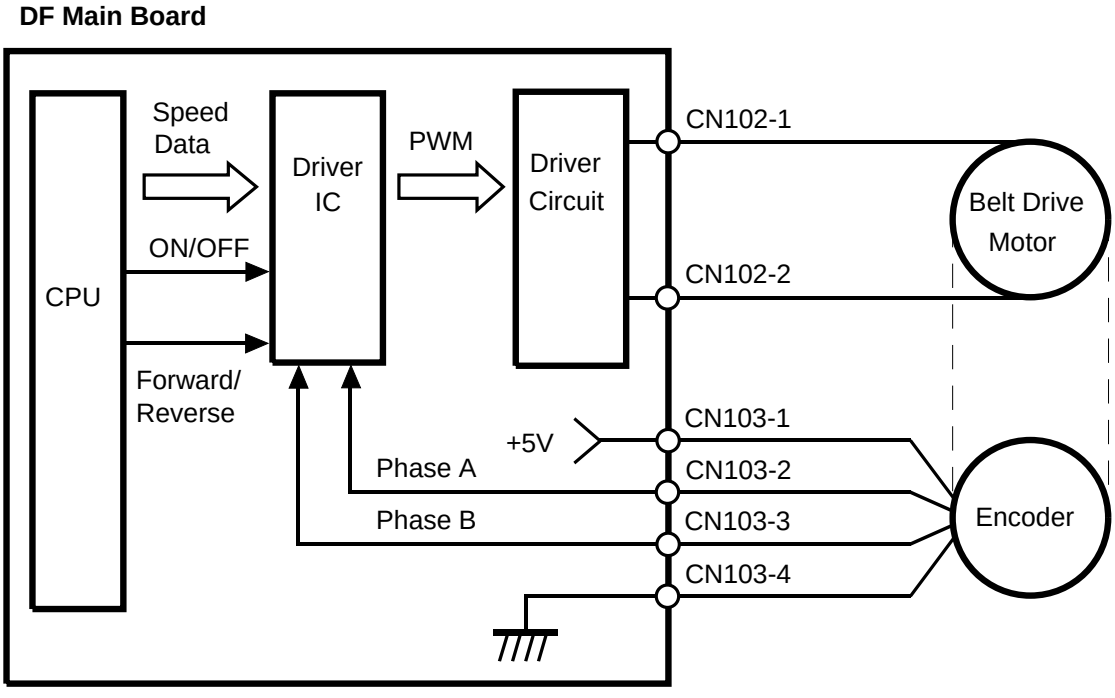
6) After the front side of the original has been exposed, the original is fed out from the DF.

6.7 ORIGINAL FEED-OUT MECHANISM



The exit rollers [A] are driven by inverter motor [B]. When the document feeder receives the feed out signal from the main system, 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 take over the original feed-out. When the original's trailing edge passes the feed-out sensor [D], the feed-out motor drops to half of its normal speed for 350 milliseconds and then stops. The lower speed prevents uneven stacking of originals. For A3 or double letter size originals, the feed-out motor speed does not change due to the length of the originals.

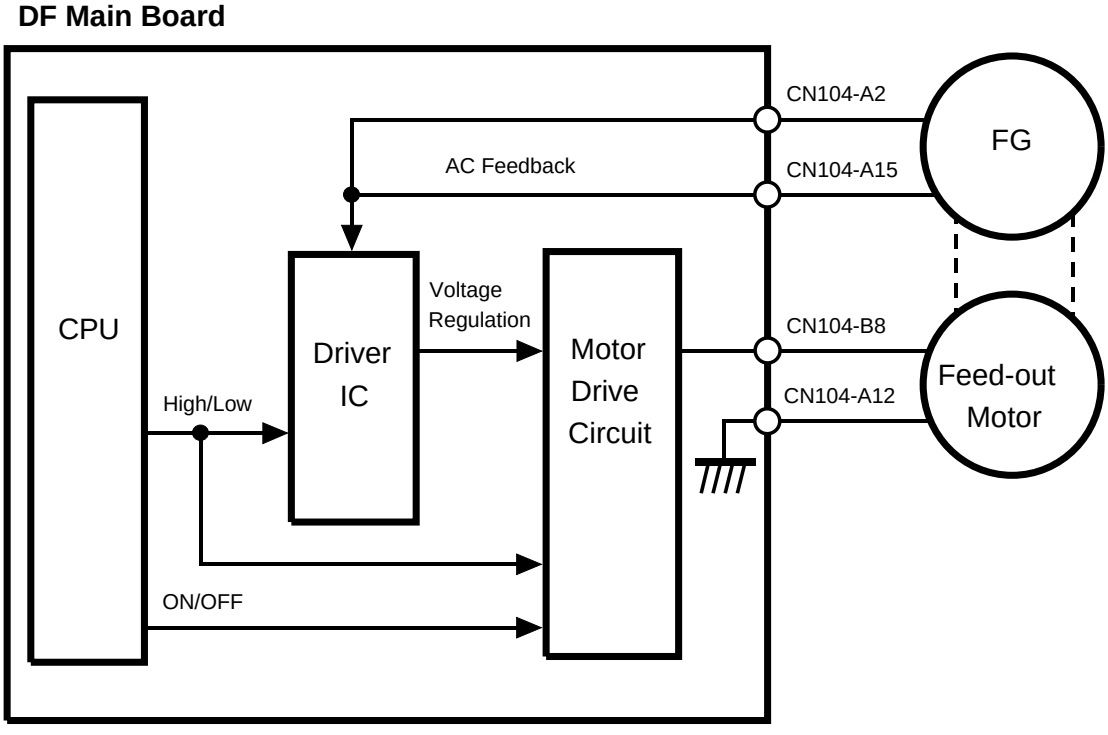
6.8 BELT DRIVE MOTOR CIRCUIT



A dc servomotor is used as 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.

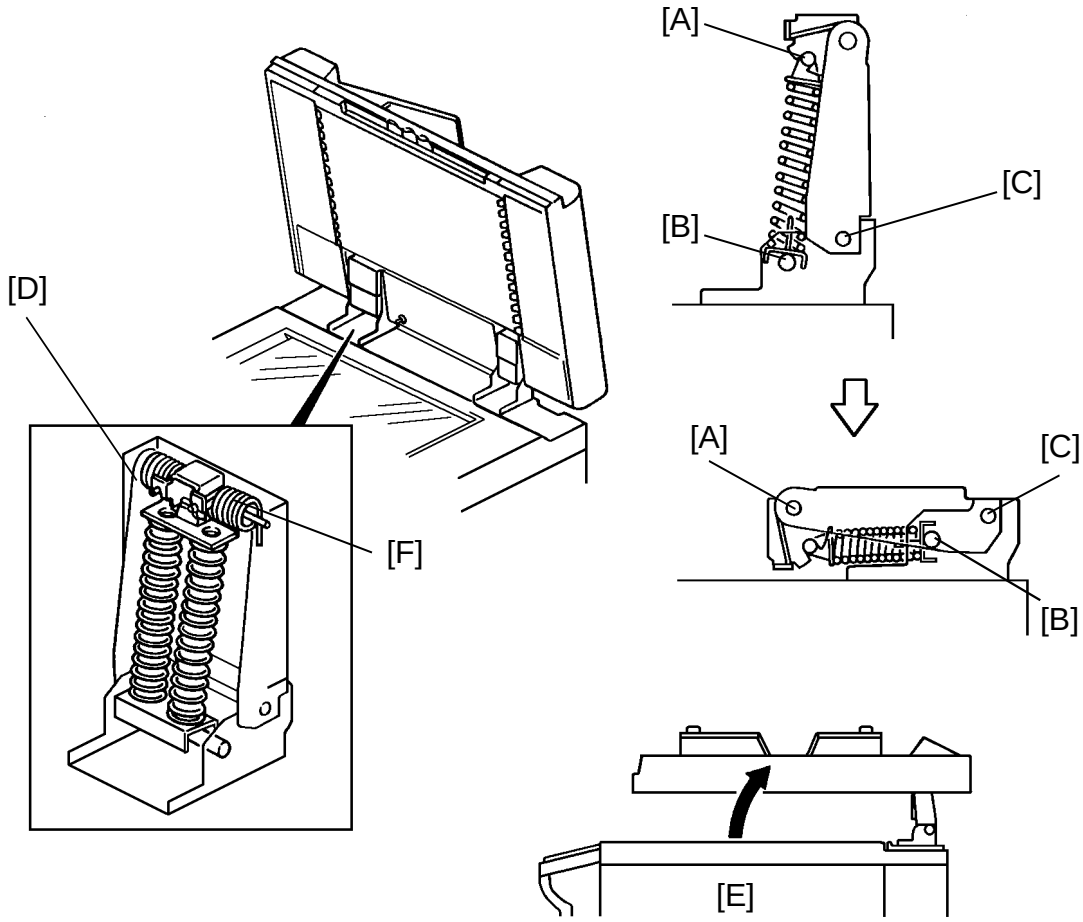
6.9 FEED-OUT MOTOR CIRCUIT



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 feed-out 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 it regulates the motor speed.

7. 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 is actuated when the document feeder is closed. The main system then shifts to the document feeder mode. The lift switch also serves as the reset switch for document feeder misfeeds.

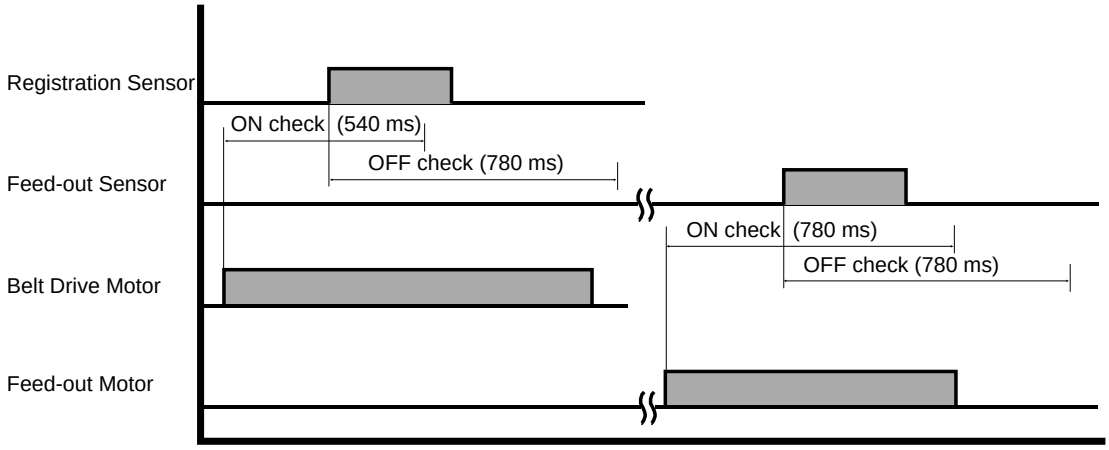
When a book or thick original (maximum thickness 60 mm) is copied, the DF acts as a cover for the original as shown in the figure [E]. The lift switch is turned off during this condition, so the DF does not function. The tension of spring [F] returns the DF to the normal condition after copying a thick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

8. ORIGINAL MISFEED DETECTION

The main system's CPU lights the original misfeed indicator if the previous original remains on the exposure glass after manual copying and DF feed is attempted. When the DF is lifted and the previous original is removed, DF copying is permitted.
The registration sensor and the feed-out sensor are used for misfeed checks.

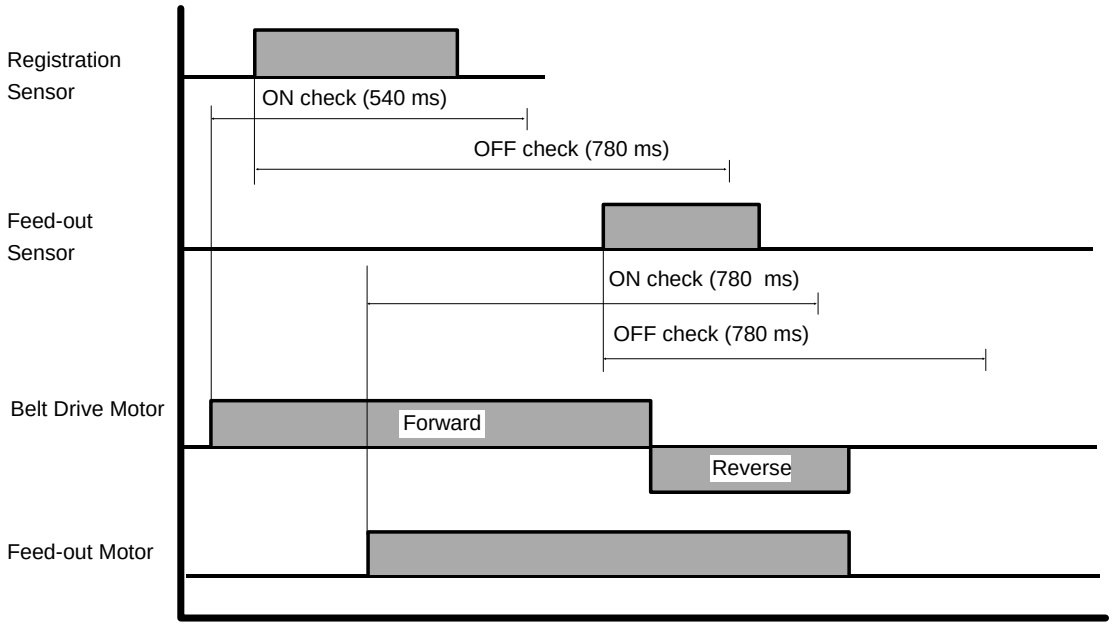
The functions of the two sensors are as follows:

8.1 ONE-SIDED ORIGINAL



If the registration sensor is not actuated within 540 milliseconds after the belt drive motor starts turning, the Original Misfeed indicator lights (ON check).
If the registration sensor does not turn off within 780 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 780 milliseconds after the belt drive motor starts turning forward (ON check), or if the feed-out sensor does not turn off within 780 milliseconds after the feed-out sensor turns on (OFF check).

8.2 TWO-SIDED ORIGINAL



The Original Misfeed indicator lights if the registration sensor is not actuated within 540 milliseconds after the belt drive motor starts turning (ON check), or if the registration sensor does not turn off within 780 milliseconds after the registration sensor turns on (OFF check). If the feed-out sensor is not actuated within 780 milliseconds after the registration sensor turns off, the Original Misfeed indicator lights (ON check). The Original Misfeed indicator also lights if the feed-out sensor does not turn off within 780 milliseconds after the feed-out sensor turns on (OFF check).

The feed-out ON/OFF check is same as for one-sided originals.

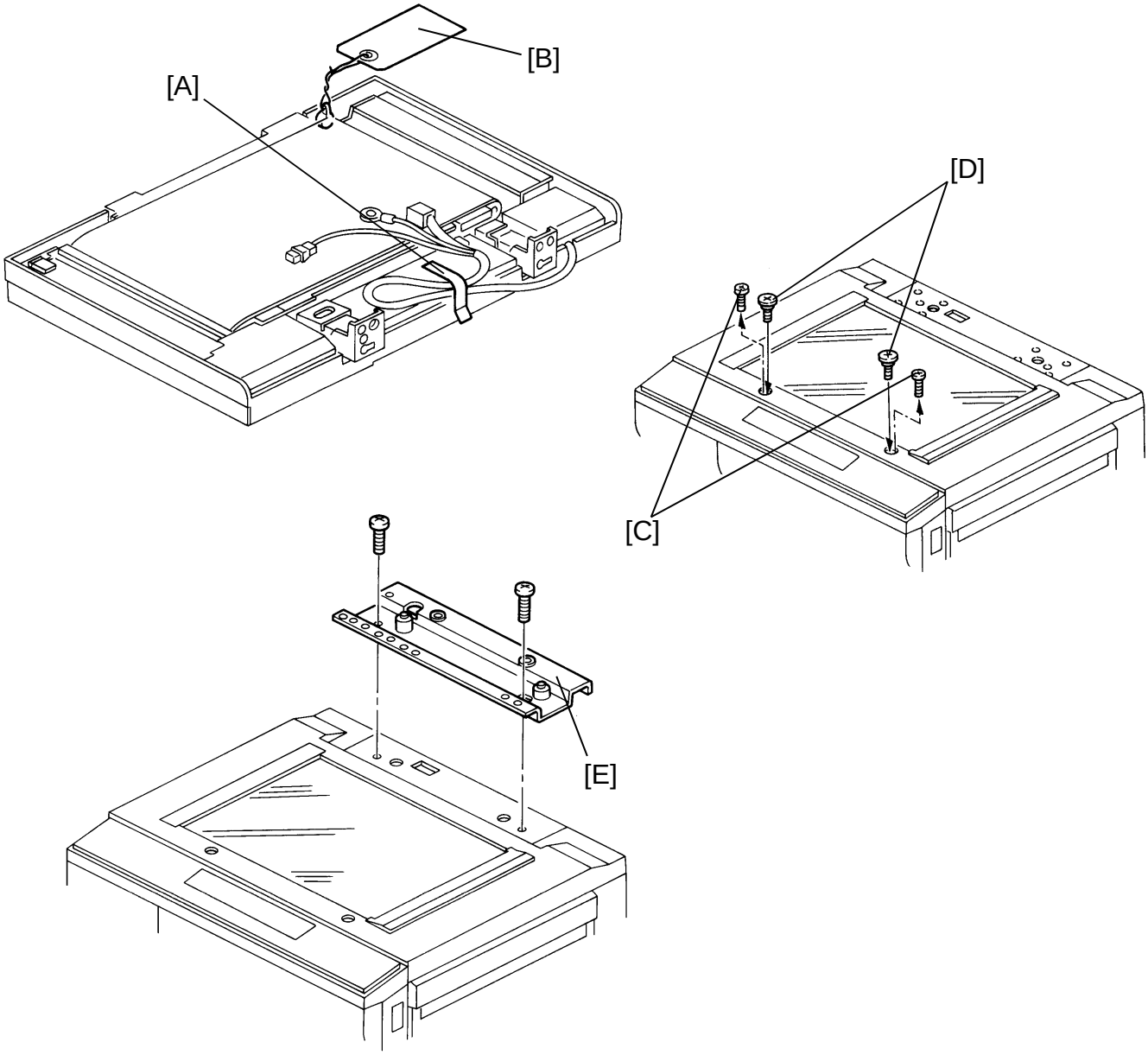
9. INSTALLATION

9.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box according to the following list:

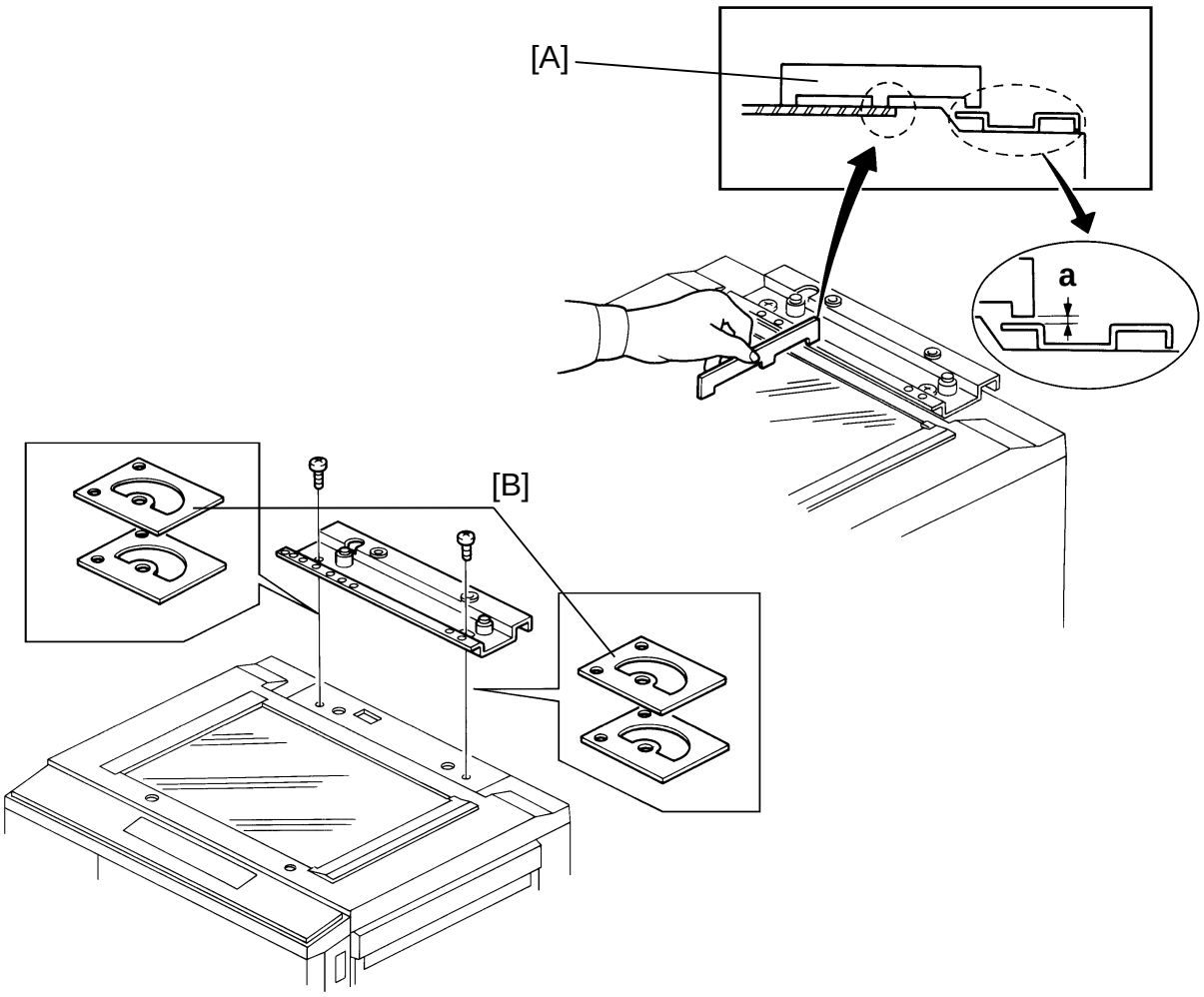
1. Installation Procedure 1
2. DF Test chart 1
3. DF Mounting Bracket 2
4. Panhead Screw 4 x 14 1
5. Original Table 1
6. Angle Stopper 1
7. Spacer 0.5 mm 1
8. Spacer 0.2 mm 1
9. E-plate 1
10. Lift Switch Actuator 1
11. Cover Size Actuator 1
12. Bushing 1
13. Toothed Washer 1
14. Ground Screw 1
15. Stud Screw 2
16. Plastic Clamp 1
17. Panhead Screw 4 x 6 5
18. Shoulder Screw 4 x 5 4
19. NECR 1
20. NECR-Envelope (U.S.A. only) 1

9.2 INSTALLATION PROCEDURE (FT5233 series)

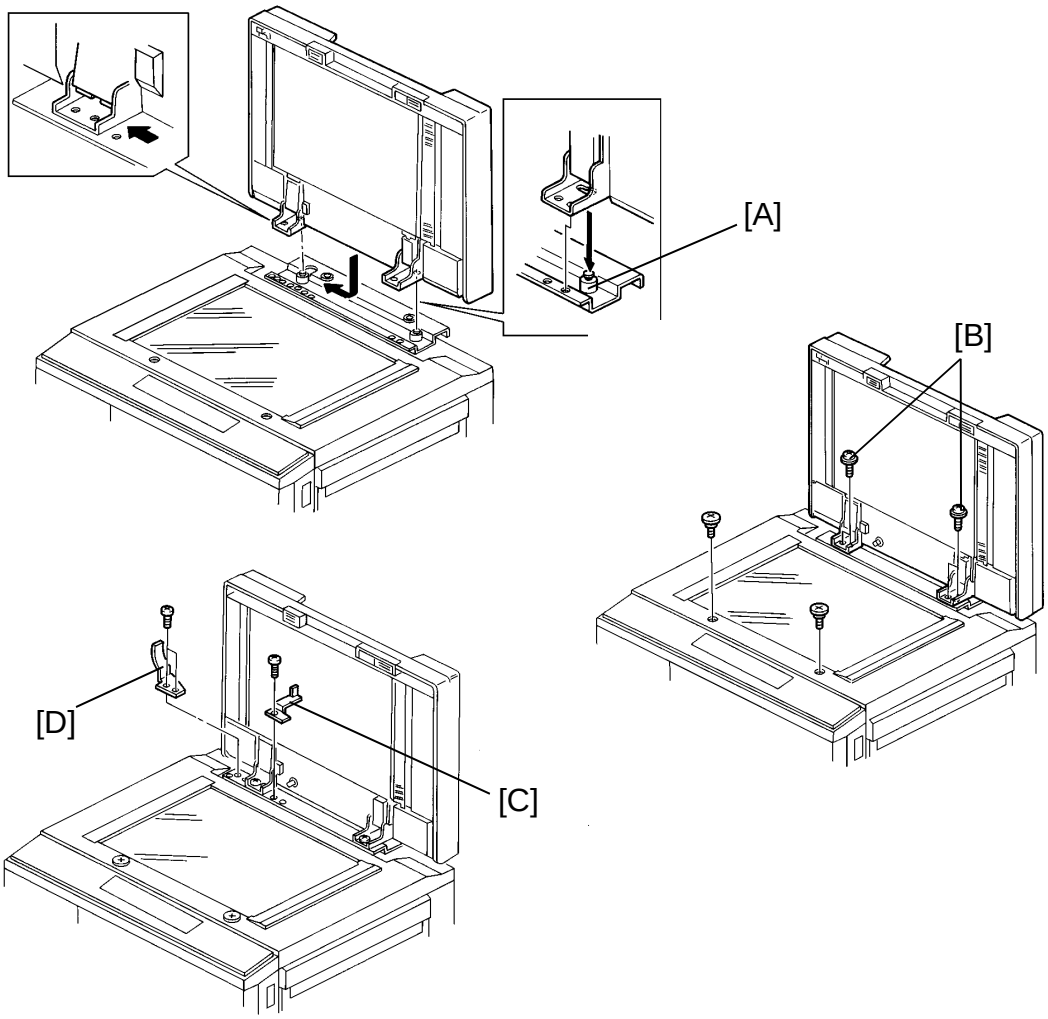


CAUTION: Before installing the document feeder (DF), make sure that the copier is unplugged.

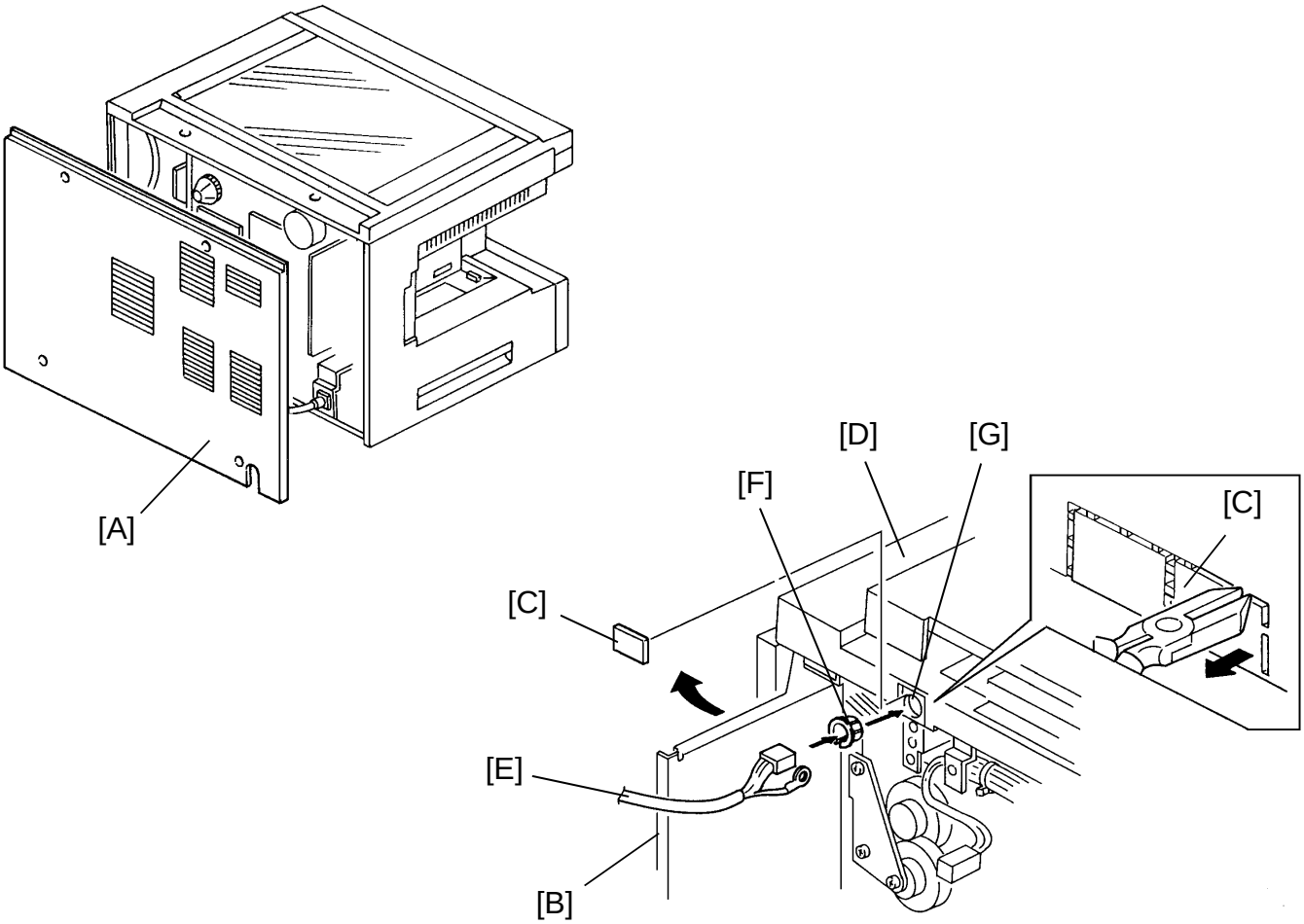
1. Remove the strip of tape [A] and the shipping retainer [B] (1 screw).
2. Remove the two pan head screws [C] and replace them with flat shoulder screws [D].
3. Install the DF mounting bracket [E] (2 screws).



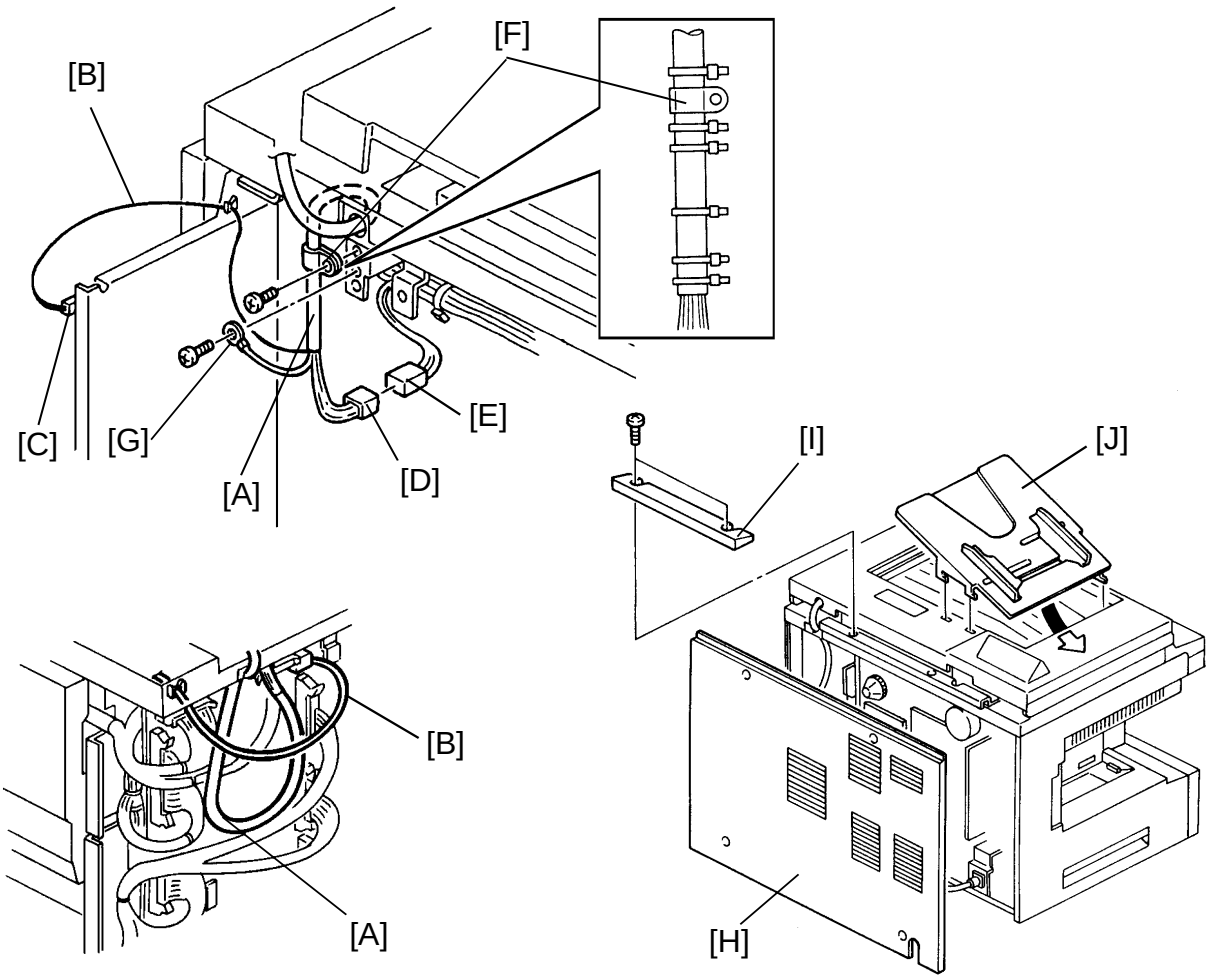
4. Adjust the height of the DF mounting bracket.
   1) Set the E-plate [A] on the exposure glass as shown and measure the clearance **"a"** between the DF mounting bracket and the E-plate.
   2) Remove the DF mounting bracket and insert the spacers [B] (0.2 mm and. 0.5 mm) to adjust the clearance **"a"** to between 4.0 mm and 4.5 mm.
   3) After securing the mounting bracket, reconfirm the clearance **"a"**.



5. Mount the DF on the DF mounting bracket by aligning the holes in the DF and the pins [A] on the mounting bracket, then slide the DF to the left as shown.
6. Secure the DF to the DF mounting bracket [B] (4 screws with flat washer).
7. Install the lift switch actuator [C] (1 screw – M3 x 4).
8. Install the sensor actuator [D] (2 screws).

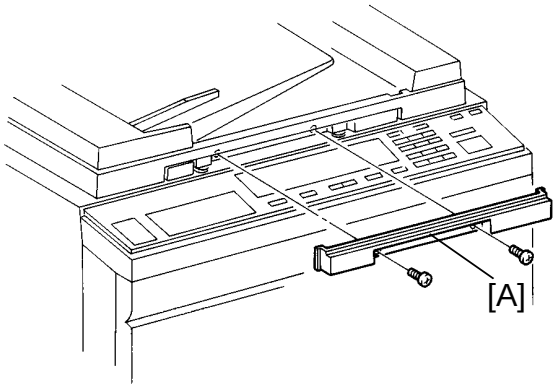


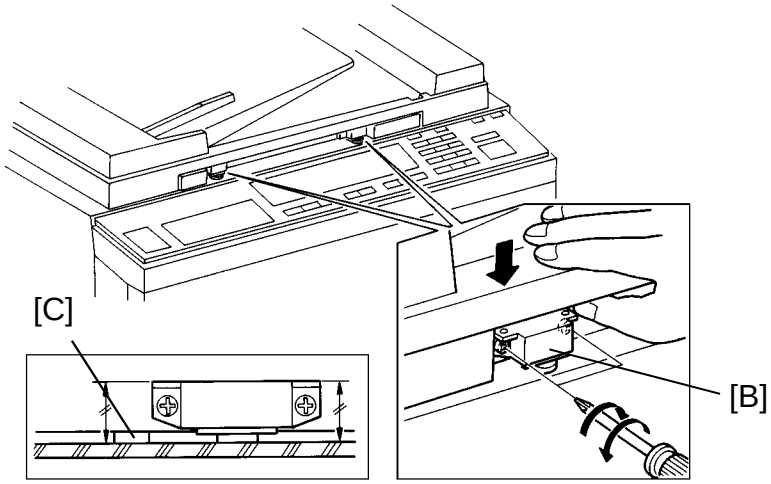
9. Remove the rear cover [A] (remove 2 screws and loosen 2 screws).
10. Swing out the main control board assembly [B] (1 screw).
11. Remove the cover plate [C] from the top cover [D] with cutting pliers.
12. Run the DF harness [E] through the bushing [F] and bracket hole [G], then secure the bushing.



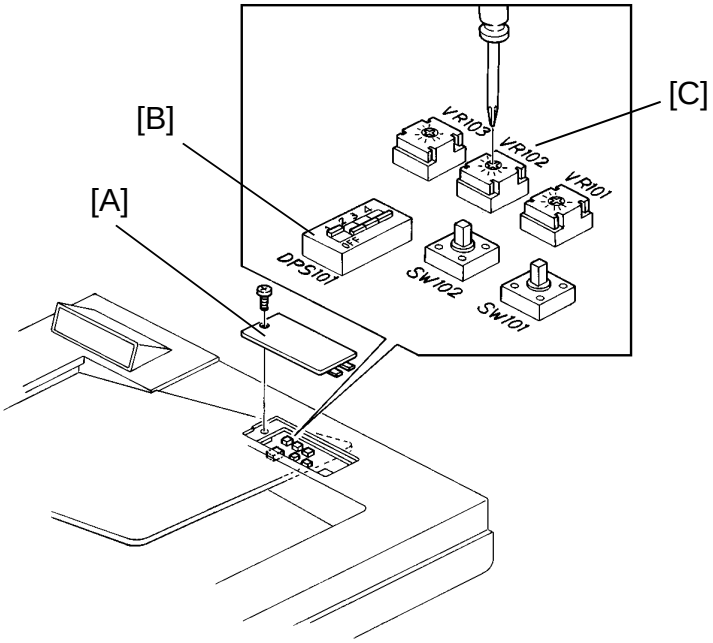
13. Set the DF harness [A] as follows:
    (1) Fiber optics cable [B] — CN106 (Main control board) [C]
    (2) 4P connector (White) [D] — 4P connector (White/copier) [E]
14. Secure the DF harness with a plastic clamp [F] (1 screw) as shown.
15. Secure the protective earth wire [G] (1 grounding screw and 1 toothed washer).
16. Close and secure the main control board assembly.

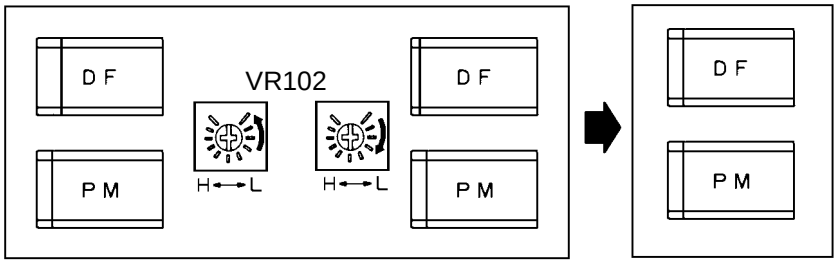
    NOTE: Place the DF harness in front of the main control board as shown.
17. Reinstall the rear cover [H].
18. Install the angle stopper [I] (2 screws), and the original table [J].





19. Remove the grip cover [A] (2 screws).
20. Adjust the height of the magnet catch on each side. Repeat the following procedure for each magnet catch:
    1) Loosen the screws securing the magnet catch [B] (2 screws).
    2) Close the document feeder and tighten the magnet catch screws when the rubber stopper [C] touches the exposure glass.
21. Reinstall the grip cover.



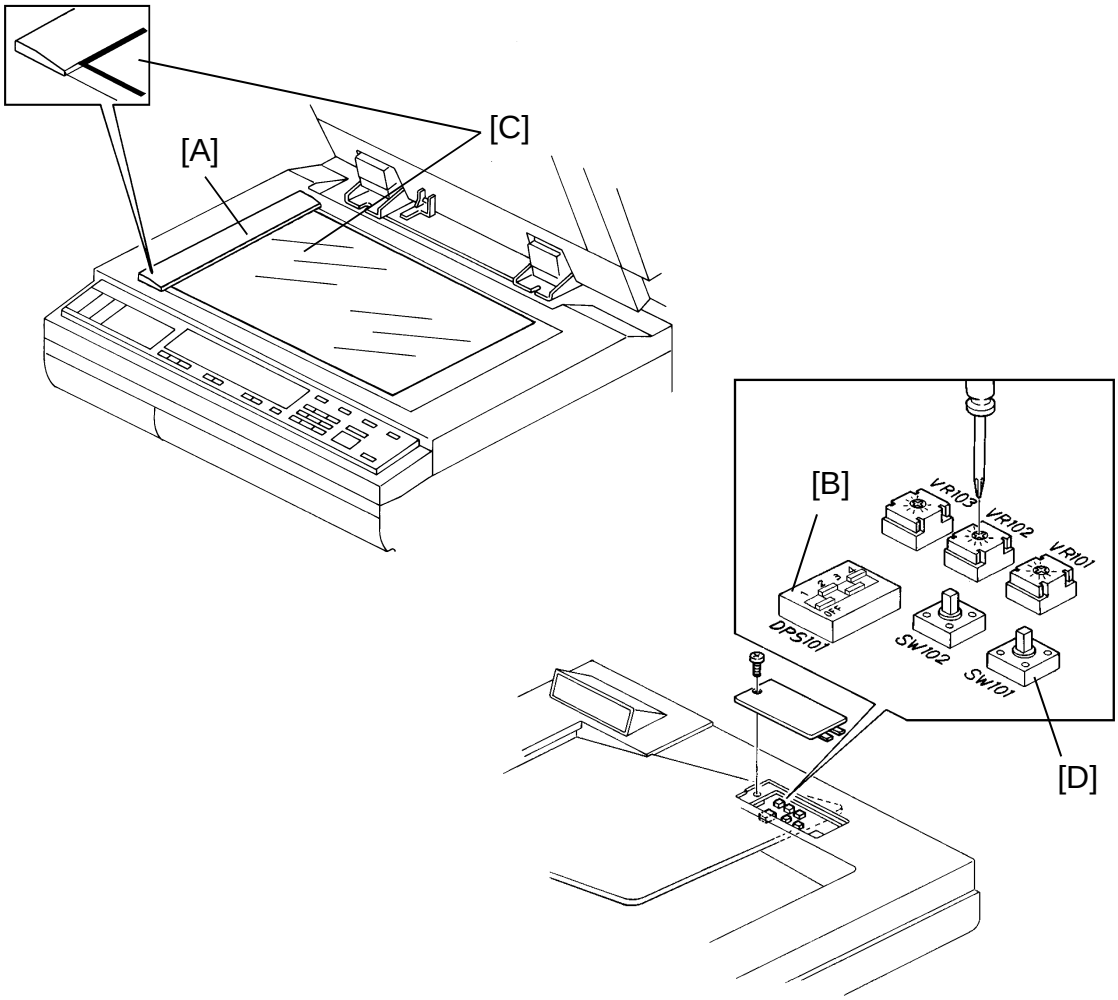


22. Remove the DF main control board cover [A] (1 screw), and confirm that the setting of DIP SW 101 [B] on the main control board is as follows:

    ON: 101-1
    OFF: 101-2,3,4

23. Plug in the copier and turn on the main switch.

24. Confirm the original registration in one-sided original mode as follows:
    1) Make a copy of the test sheet in platen mode (A4 / 8 1/2" x 11" sideways).
    2) Confirm that the original select switch is set to the thin original mode and make a copy in DF mode (A4 / 8 1/2" x 11" sideways).
    3) Compare the registration of the copy in platen mode with that in the DF mode, and confirm that the difference is within 2.5 mm.
    4) If the difference is more than 2.5 mm, adjust VR102 [C] to change the original-stop timing according to the above illustration.



25. Confirm the original registration in two-sided original mode as follows:

NOTE: a) An original should stop pressed against the left scale [A] in DF two-sided original mode.

b) The position of the original select switch does not matter.

1) Set DIP SW101 [B] on the main control board as follows:

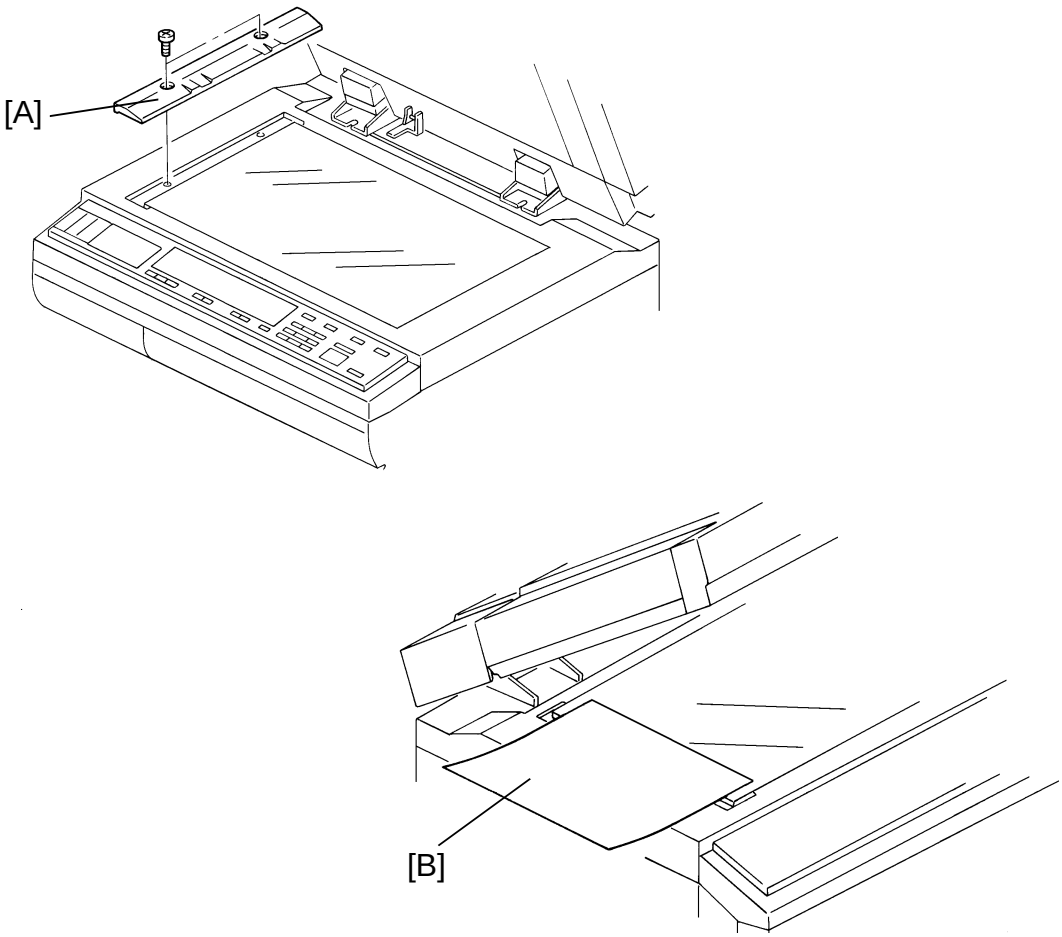
ON: 101–2, 4

OFF: 101–1, 3

2) Set a sheet of A3/11" x 17" paper [C] on the DF then press SW 101 [D] to feed the paper into the DF belt section.

3) When the paper stops on the exposure glass after the inversion, open the DF slowly so that the paper does not move from the stop position.

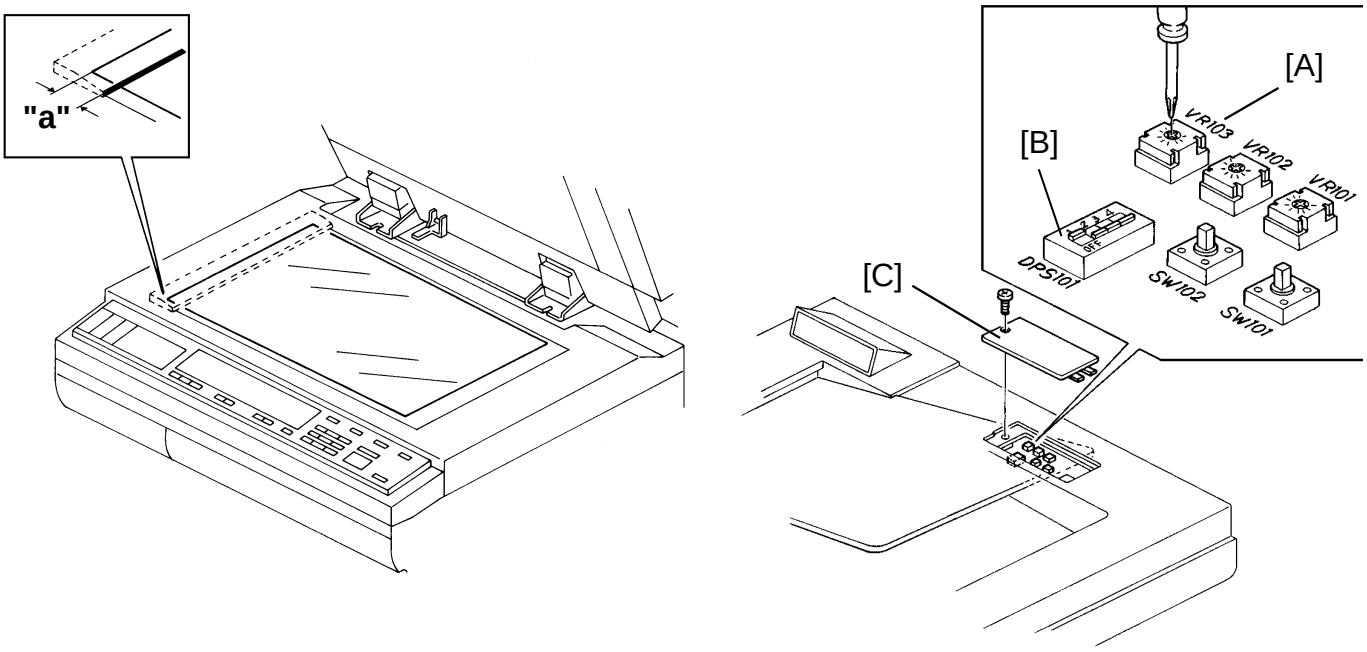
4) Confirm that the paper has stopped against the left scale.



5) If the paper has not stopped against the left scale [A], remove the left scale (2 shoulder screws).
6) Set a sheet of A4 / 8 1/2" x 11" paper [B] sideways on the exposure glass edge as shown.

NOTE: This sheet of paper prevents the original from jamming at the edge of the exposure glass when it is fed in without the left scale.

7) Set a sheet of A3 / 11" x 17" paper on the DF then press SW101.
8) Just after the paper is fed in, gently pull off the sheet set in step 6).
9) When the paper (set in step 7) stops on the exposure glass after the inversion, open the DF slowly so that the paper does not move from the stop position.



VR 103

"a" ≤ 10~15 mm 

"a" ≥ 10~15 mm

10) If the paper did not stop at the correct position (**"a"**=10~15 mm), turn VR 103 [A] to correct the original stop timing.

NOTE: Turning VR103 clockwise results in the original stopping later.

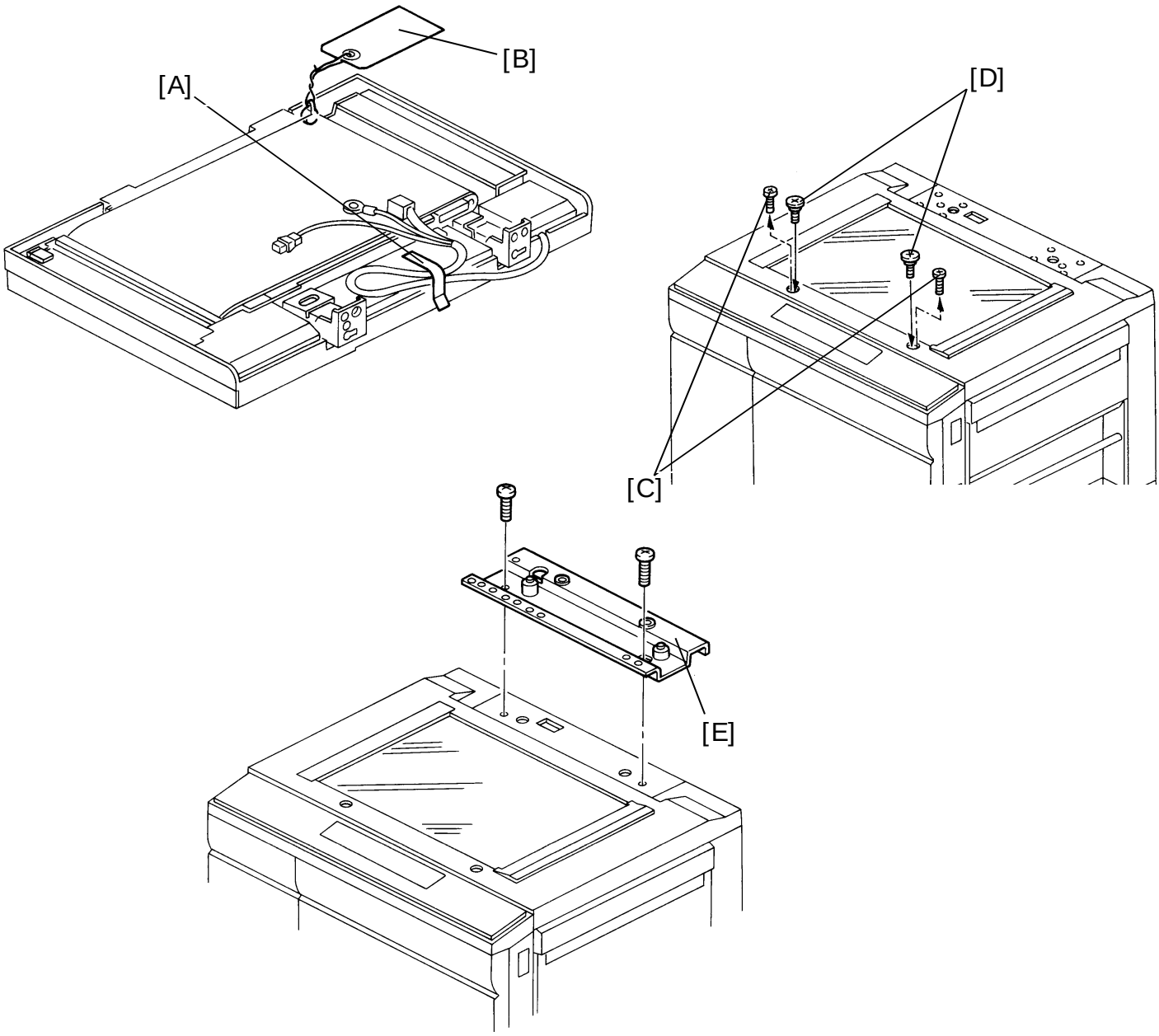
11) Set back DIP SW101 [B] on the main control board as follows:
ON: 101-1
OFF: 101-2,3,4

12) Reinstall the DF main control board cover [C] and the left scale.

26. Check the operation of the DF.

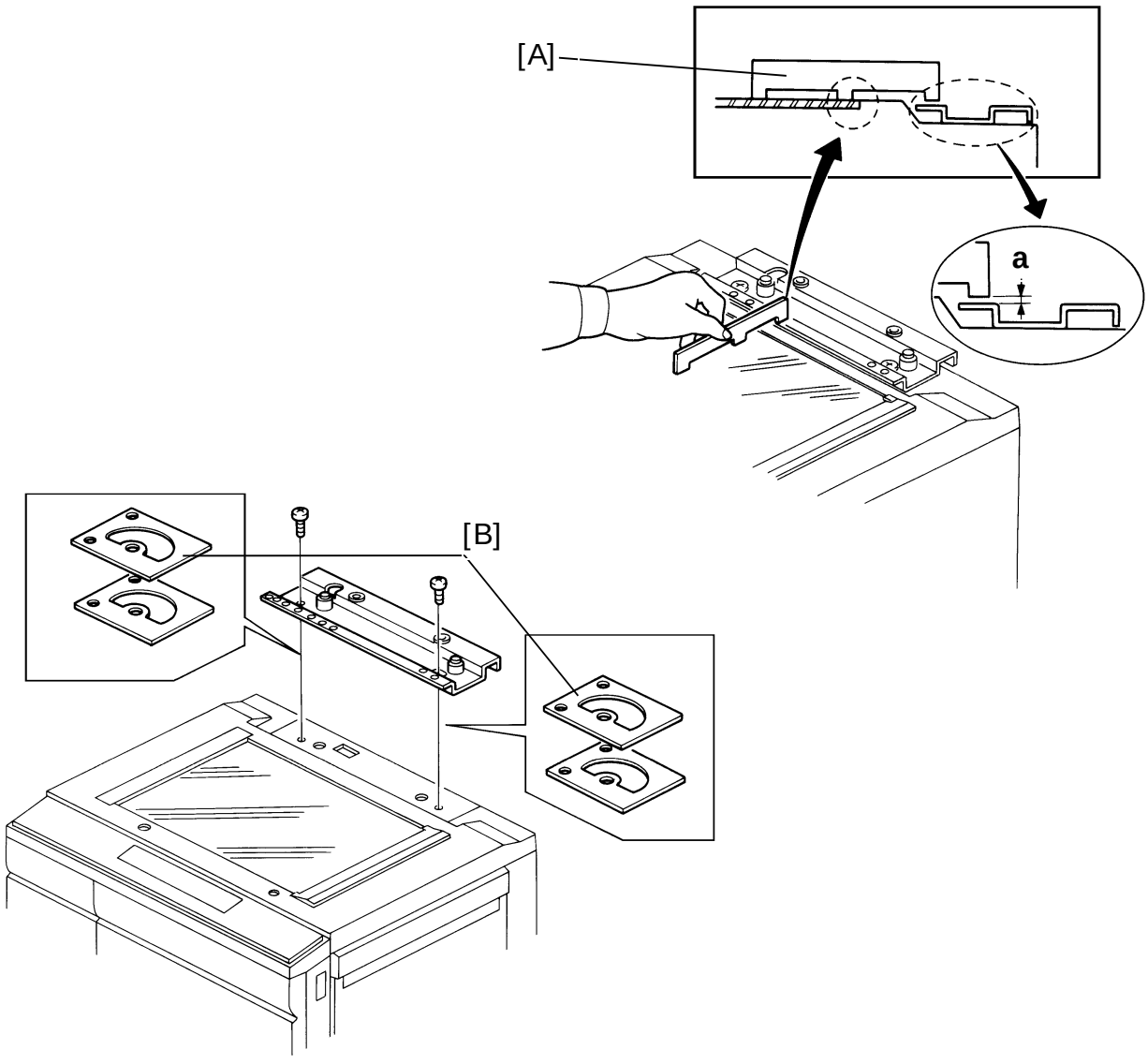
27. Set the original select switch to the thin paper mode (normal position), and explain the function of this switch to the customer.

INSTALLATION PROCEDURE (FT6750)

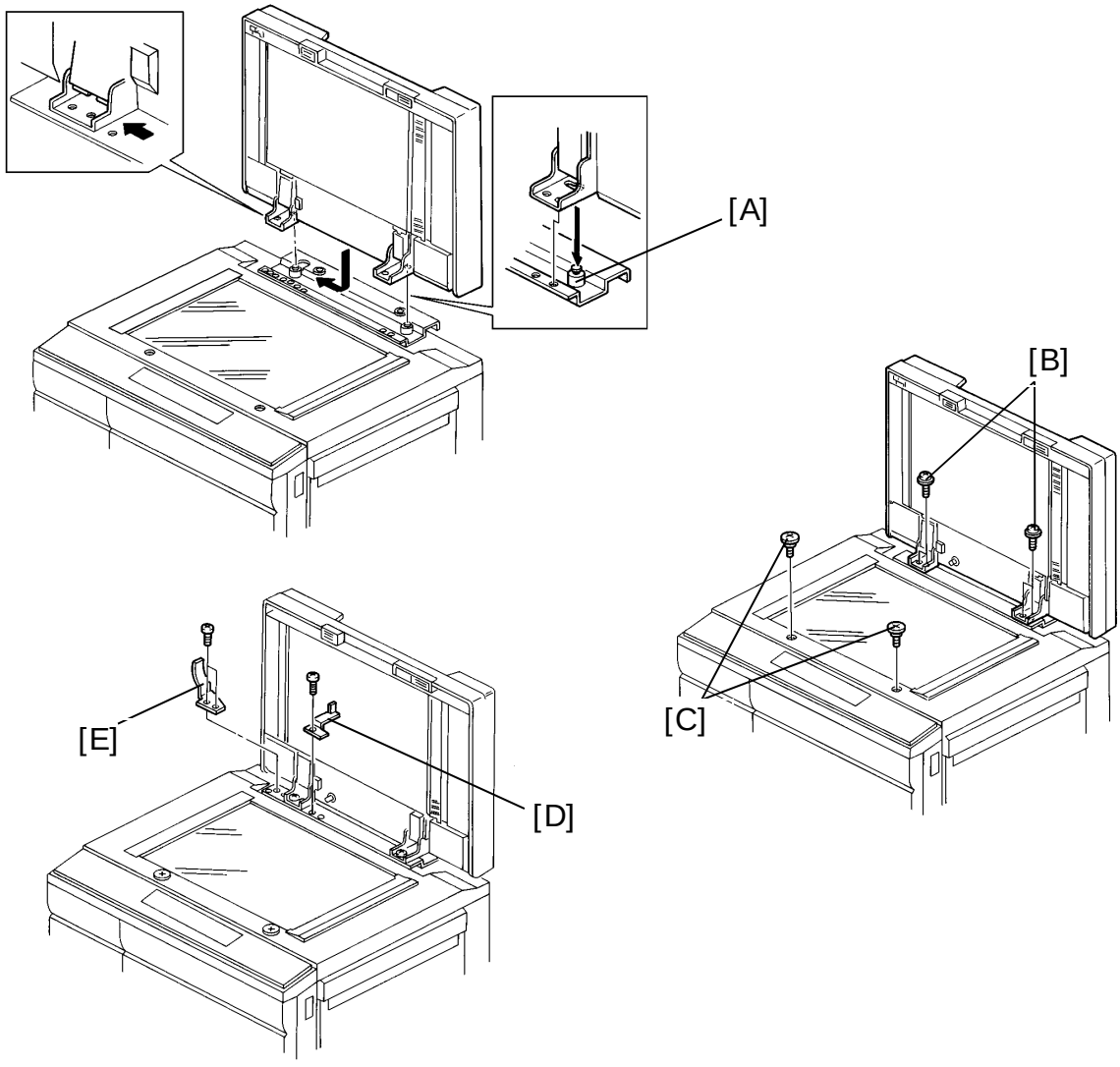


Warning : Before installing the DF, make sure that the copier is unplugged.

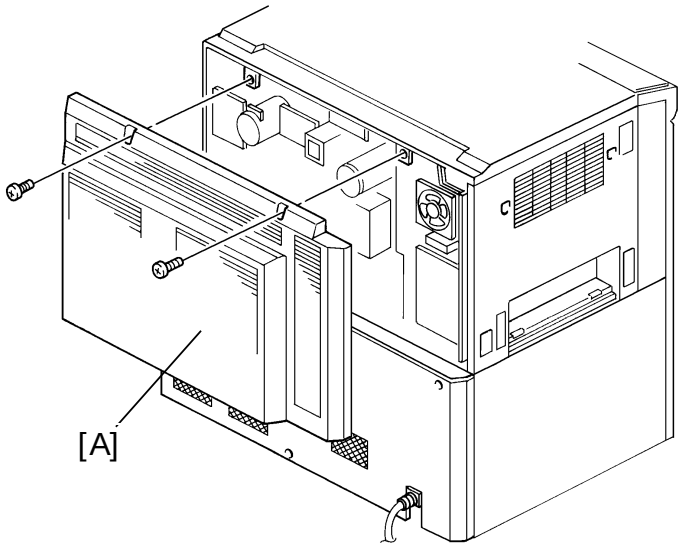
1. Remove the strip of tape [A] and the shipping retainer [B] (1 screw).
2. Remove the two pan head screws [C] and replace then with flat shoulder screws [D].
3. Install the DF mounting bracket [E] (2 screws).

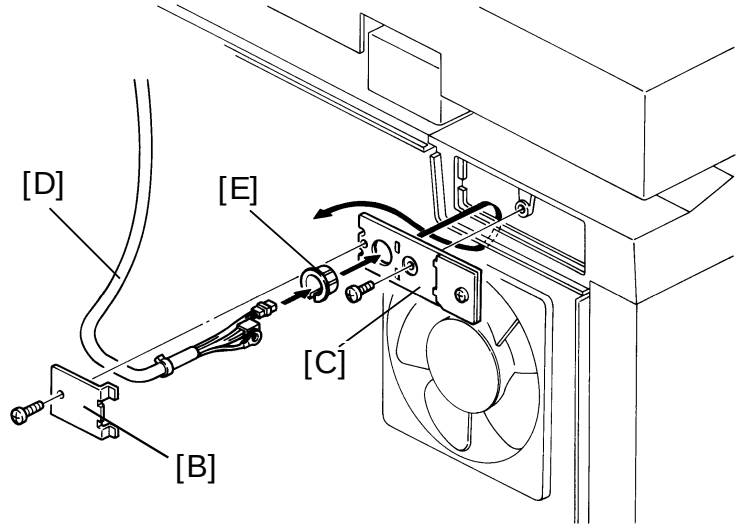


4. Adjust the height of the DF mounting bracket.
   1) Set the E-plate [A] on the exposure glass as shown and measure the clearance **"a"** between the DF mounting bracket and the E-plate.
   2) Remove the DF mounting bracket and insert the spacers [B]. (0.2 mm and. 0.5 mm) to adjust the clearance **"a"** to between 4.0 mm and 4.5mm .

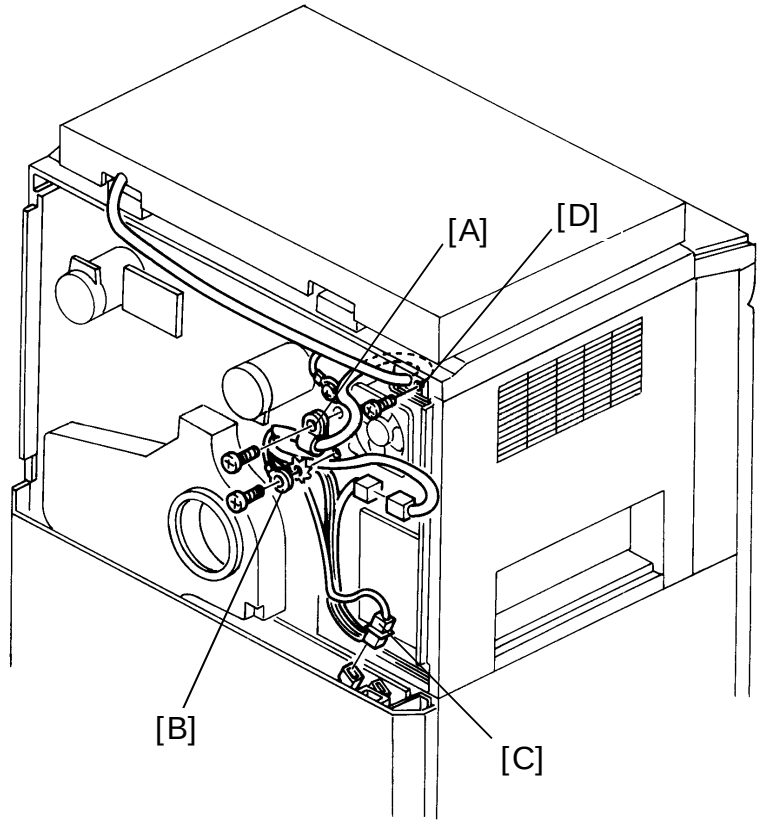


5. Mount the DF on the DF mounting bracket by aligning the holes in the DF and the pins [A] on the mounting bracket, then slide the DF to the left as shown.
6. Secure the DF to the DF mounting bracket [B] (4 shoulder screws).
7. Remove the 2 pan head screws then install the 2 stud screws [C] as shown in the figure.
8. Install the lift switch actuator [D] (1 screw).
9. Install the sensor actuator [E] (2 screws).

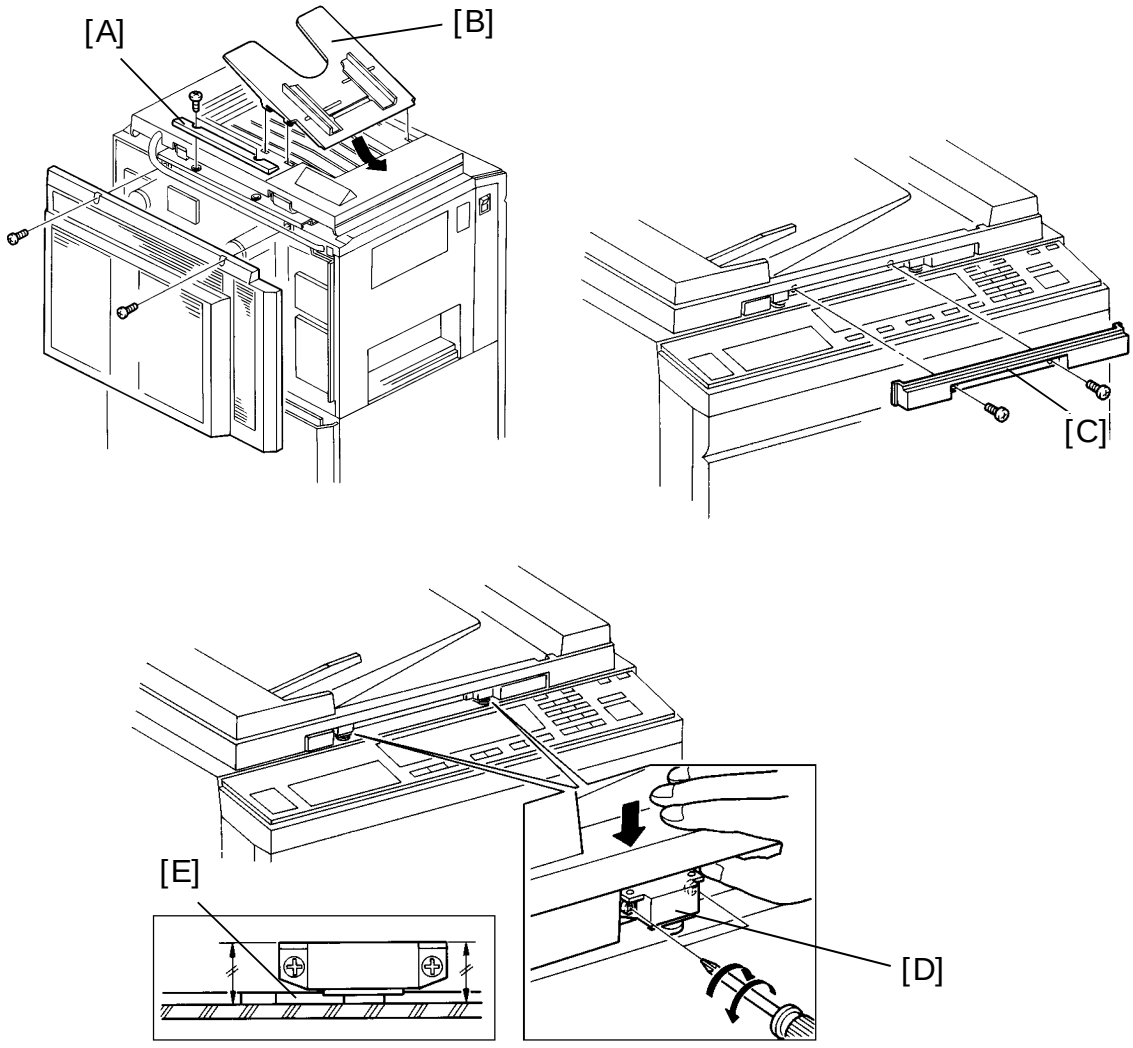




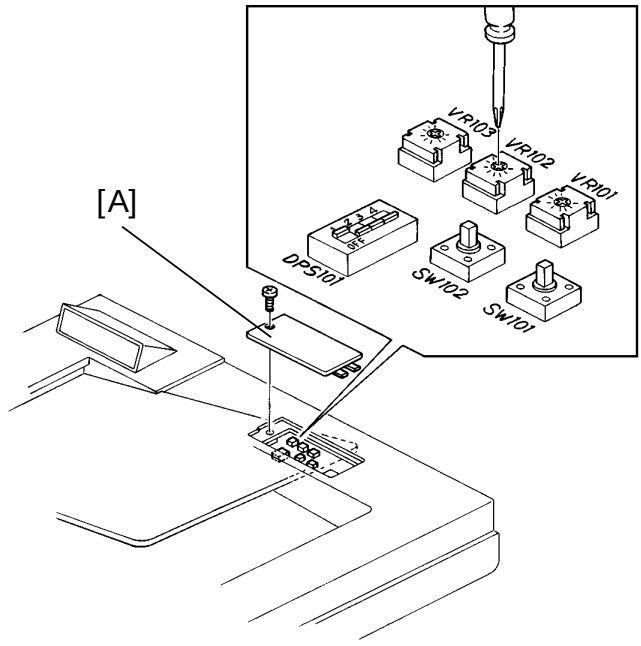
10. Remove the copier rear top cover [A] (2 screws).
11. Remove the harness bracket cover plate [B] (1 screw).
    Then remove harness bracket [C] (1 screw).
12. Feed the harness [D] through the bushing [E] and the bracket hole, then secure the bushing.



13. Secure the harness as shown with a plastic clamp [A] (1 screw). Reinstall the harness bracket.
14. Secure the grounding wire [B] (1 grounding screw, 1 toothed washer).
15. Set the DF harness as follows:
    1) Fiber optic cable - CN113 (main PCB) [C]
    2) 4P connector - 4P connector (copier).
16. Reinstall the harness bracket [D] (1 screw).



17. Reinstall the rear cover (2 screws).
18. Install the angle stopper [A] (2 screws), and the original table [B].
19. Adjust the height of the magnet catch on each side. Repeat the following procedure for each magnet catch:
    1) Remove the grip cover [C] (2 screws).
    2) Loosen the screws securing the magnet catch [D] (2 screws).
    3) Close the document feeder and tighten the magnet catch screws when the rubber stopper [E] contacts the exposure glass.
20. Reinstall the grip cover (2 screws).

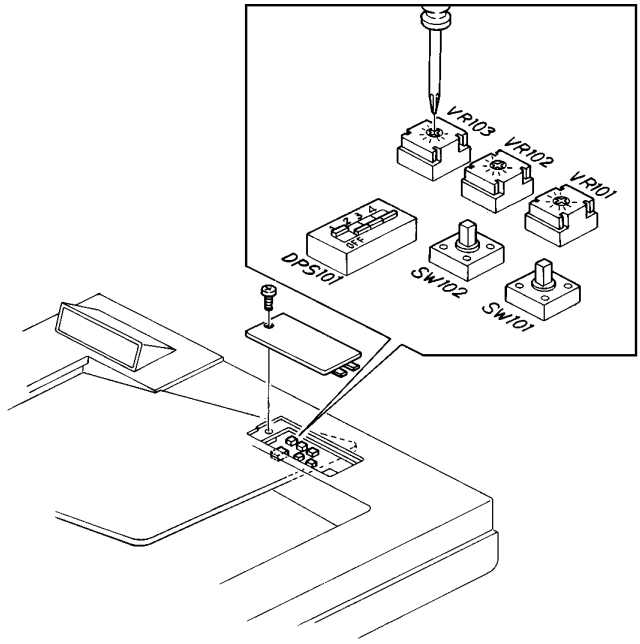


21. Remove the main PCB cover [A] (1 screw), and set DIP SW 101 on the main PCB as follows:

    ON: 101-1

    OFF: 101-2,3,4
22. Plug in the copier and turn on the main switch.
23. Confirm the original registration as follows:
    1) Make a copy of the test sheet in platen mode (A4/8 1/2" x 11" sideways).
    2) Confirm that the original select switch is set to thin original mode and make a copy in DF mode (A4/8 1/2" x 11" sideways).
    3) Compare the registration of the copy in platen mode with that of the DF mode, and confirm that the difference is within 2.5 mm.
    4) If the difference is more than 2.5 mm, adjust VR102 to change the original-stop timing.

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



5) Make a copy of the test sheet in DF two-sided original mode.

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

b) The position of the original select switch does not matter.

6) Compare the registration of the copy in platen mode with that of DF two-sided original mode, and confirm that the difference is within 2.0 mm.

7) If the difference is more than 2.0 mm, adjust VR103 to change the original-stop timing.

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

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

24. Check the operation of the DF.

25. Set the original select switch to thin paper mode (normal position), and explain the function of this switch to the customer.

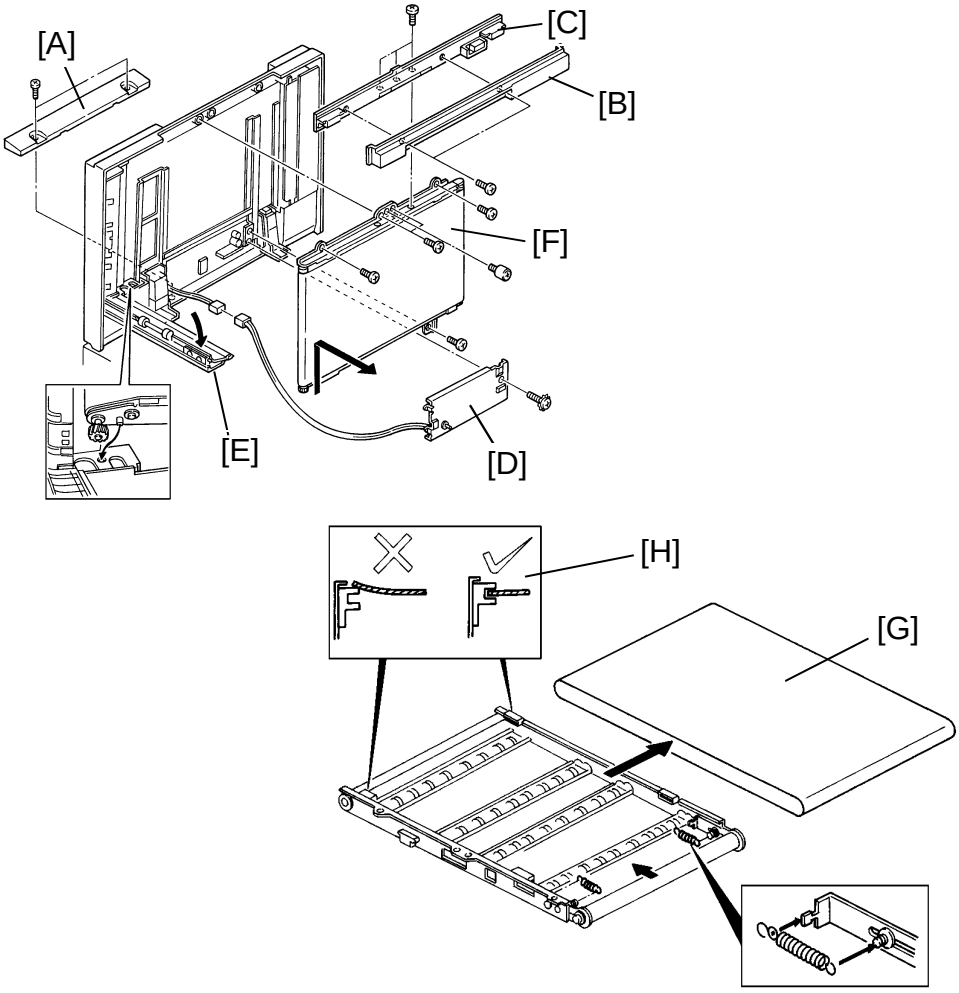
26. Reset DIP SW 101, to the normal position.

NOTE: Normal DIP SW 101 is set 101-1,2 ON 101-3,4 OFF

27. Reassemble.

10. REPLACEMENT AND ADJUSTMENT

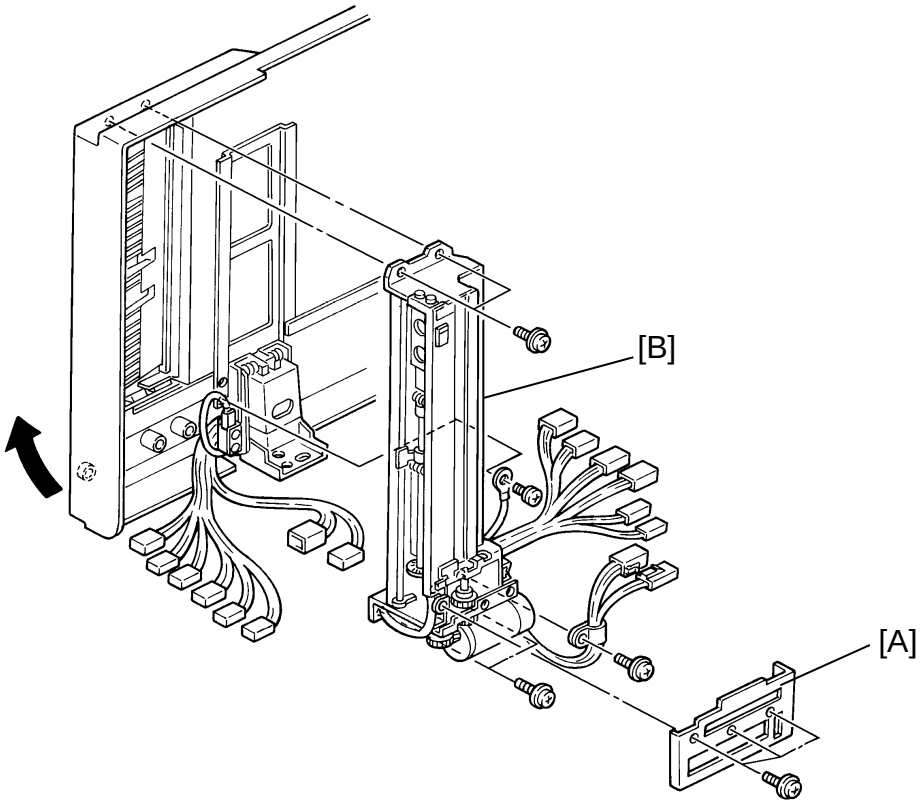
10.1 TRANSPORT BELT REMOVAL



1. Shut down the power, then remove the DF stopper [A] (2 screws) and stand the DF 90° on end.
2. Remove the inner cover [B] (2 screws), hinge [C] (1 stud screw and 3 screws), and switch cover [D] (1 screw and 1 connector)
3. Open the paper feed unit [E]. Then remove the transport belt unit [F] (5 screws).
4. Remove the 2 springs, then remove the transport belt. [G].

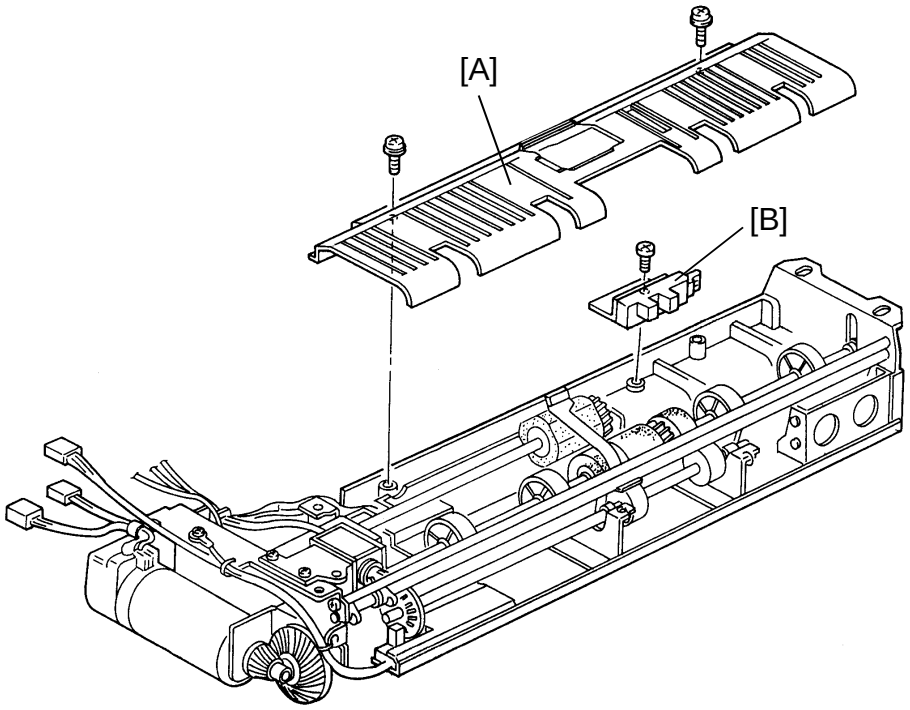
NOTE: The DF belt has to be installed in the notch [H] as shown.

10.2 FEED-IN UNIT REMOVAL



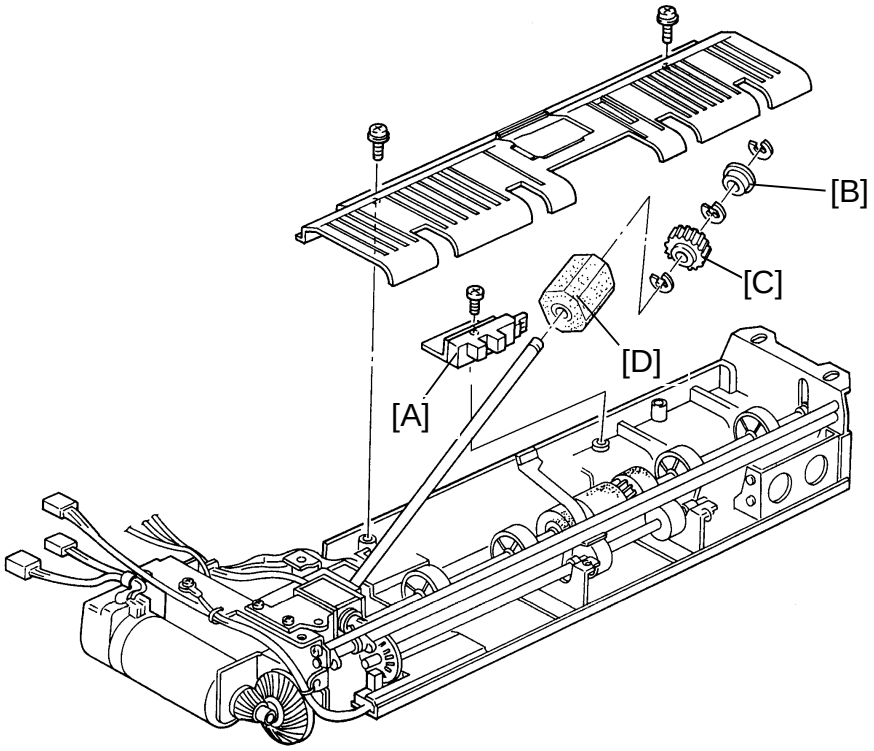
1. Remove the transfer belt unit. (See Transfer Belt Removal steps 1 - 3.)
2. Remove the motor cover [A] (3 screws).
3. Remove the paper feed unit [B] (6 screws and 8 connectors).

10.3 DOCUMENT SET SENSOR REPLACEMENT



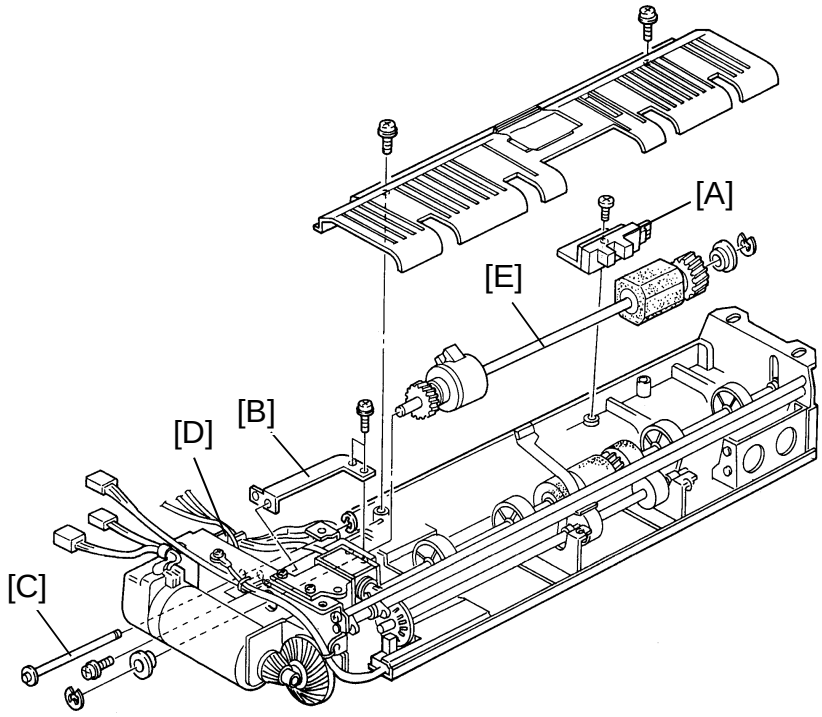
1. Remove the paper feed unit. (See Paper Feed unit Removal).
2. Remove the paper feed guide [A] (2 screws).
3. Remove the document set sensor assembly [B] (1 screw and 1 connector), then remove the sensor (1 screw).

10.4 PICK UP ROLLER REPLACEMENT



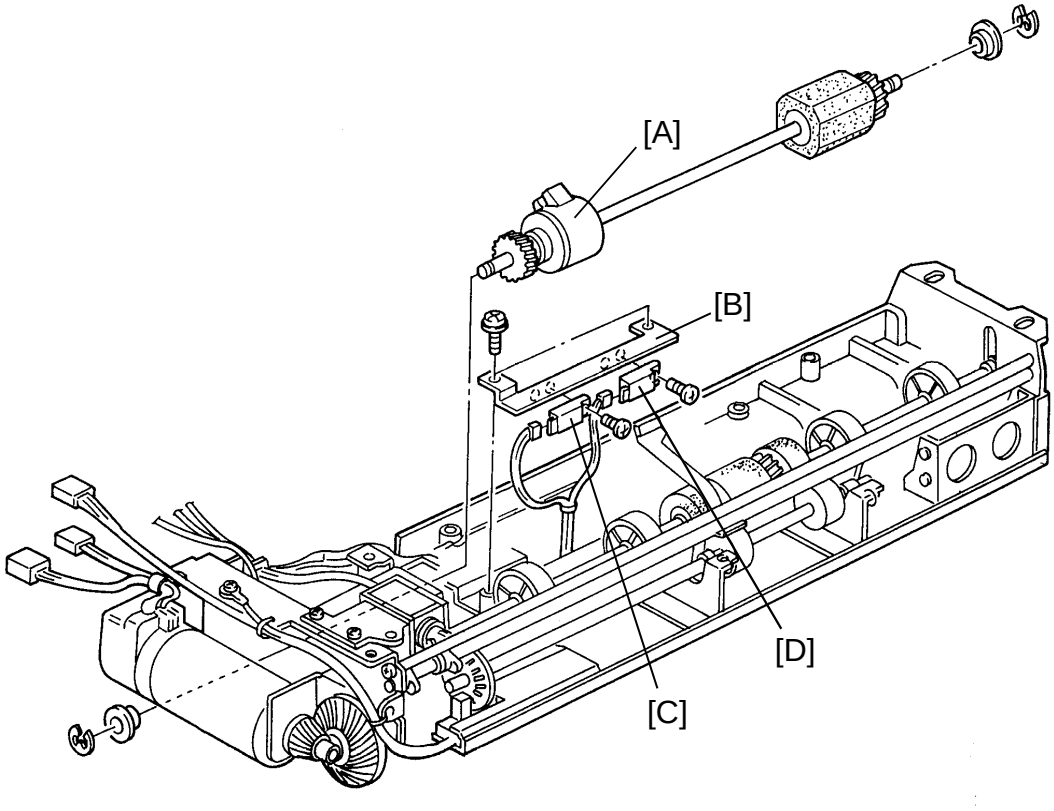
1. Remove the document set sensor assembly [A] (Refer to the Document Set Sensor Replacement).
2. Remove the bushing [B] (1 E-ring), and a gear [C] (1 E-ring), then remove the pick-up roller [D] (1 E-ring).

10.5 FEED-IN CLUTCH REPLACEMENT



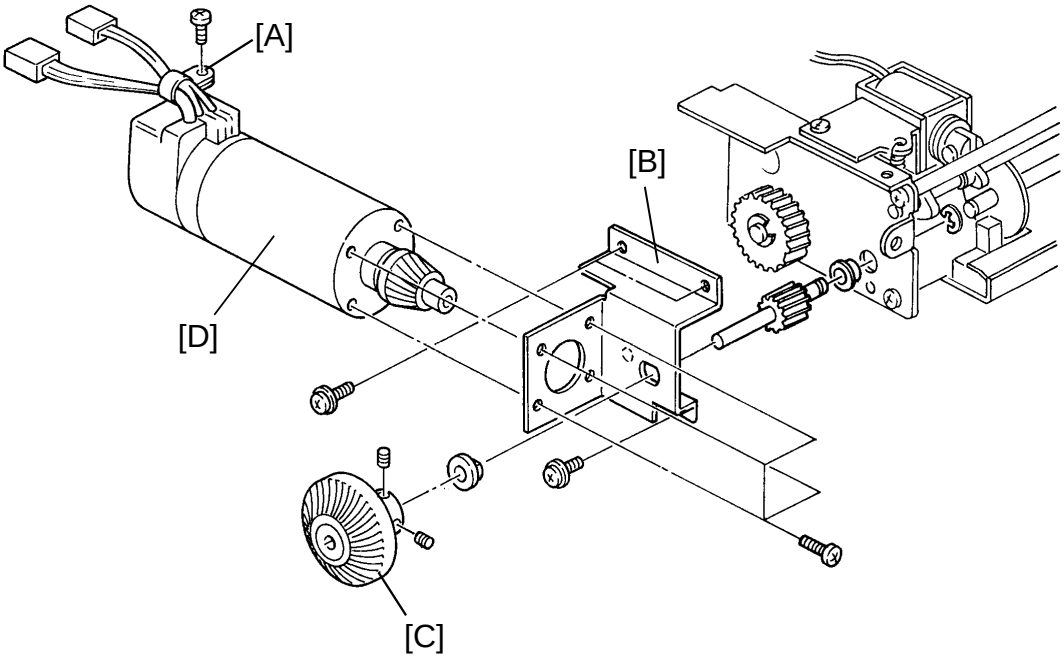
1. Remove the document set sensor assembly [A]. (Refer to the Document Set Sensor Replacement.)
2. Remove the reinforcement bracket [B] (4 screws).
3. Remove the paper feed clutch stopper [C] (1 E-ring).
4. Open the harness clamp [D], then remove the paper feed clutch axis [E] (2 E-rings and 2 bushings).

10.6 REGISTRATION SENSOR AND SIZE SENSOR REPLACEMENT



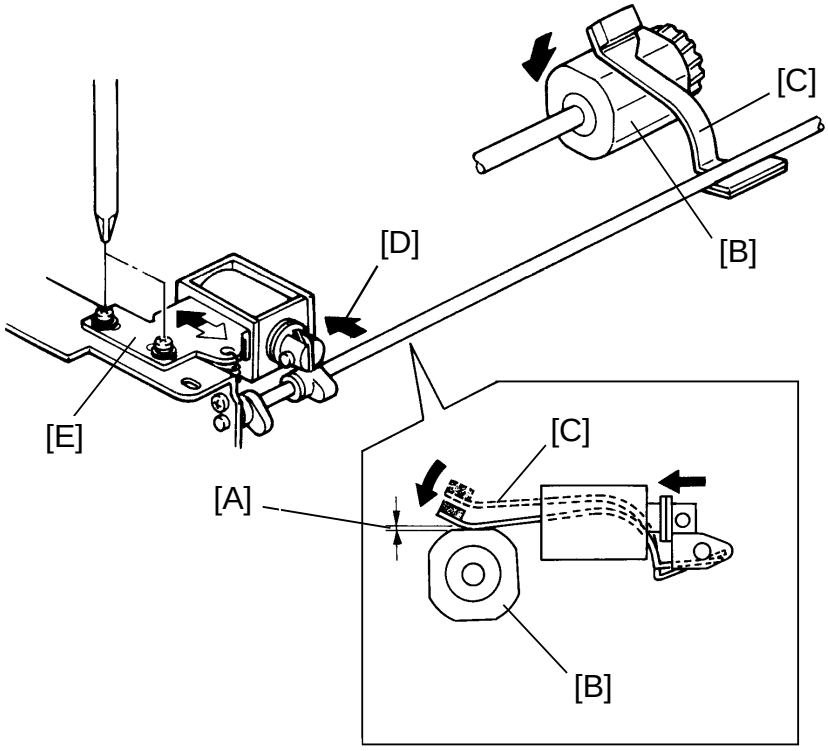
1. Remove the paper feed clutch [A]. (Refer to the Paper Feed Clutch Replacement).
2. Remove the registration sensor and size sensor assembly [B] (2 screws, 2 connectors).
3. Remove the registration sensor [C] (1 screw), and the size sensor [D] (1 screw).

10.7 BELT DRIVE MOTOR REPLACEMENT



1. Remove the paper feed unit. (See Paper Feed Unit Removal.)
2. Remove the plastic clamp [A] (1 screw) and disconnect the 2P and the 4P connector .
3. Remove the motor assembly [B] (3 screws and 1 E-ring).
4. Remove the gear [C] (2 Allen screws), then remove the motor [D] (4 screws).

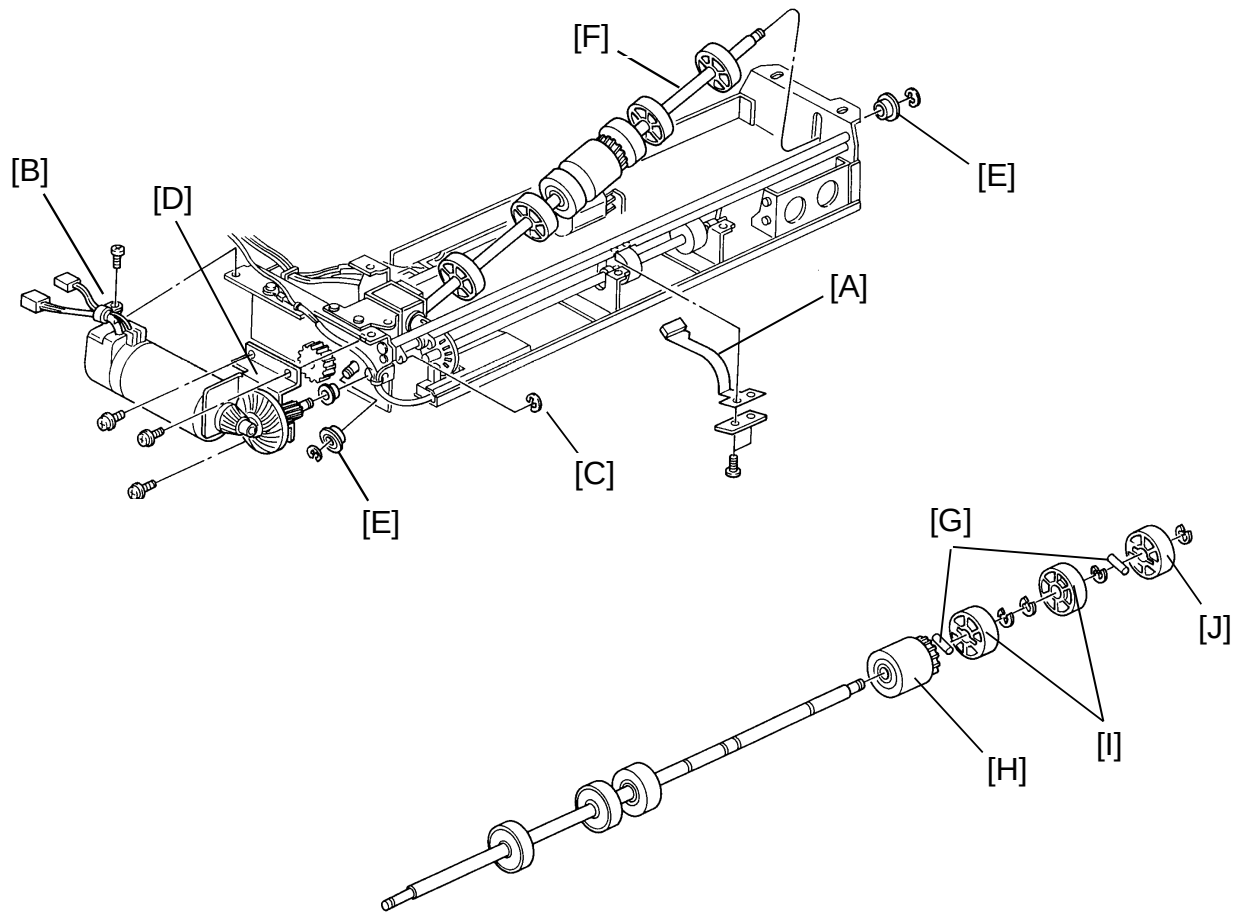
10.8 PICK-UP SOLENOID GAP ADJUSTMENT



Adjustment Standard: 0.1~0.6 mm

1. Measure the gap [A] between the pick-up roller [B] and pick-up lever [C] while pushing the solenoid bar [D].
2. If the gap is not within specifications (0.1 to 0.6 mm), perform the following step.
3. While pushing the solenoid bar [D], loosen the pick-up solenoid bracket (2 screws) [E] and secure them so that the gap [A] is within specifications.

10.9 ORIGINAL FEED ROLLER REPLACEMENT

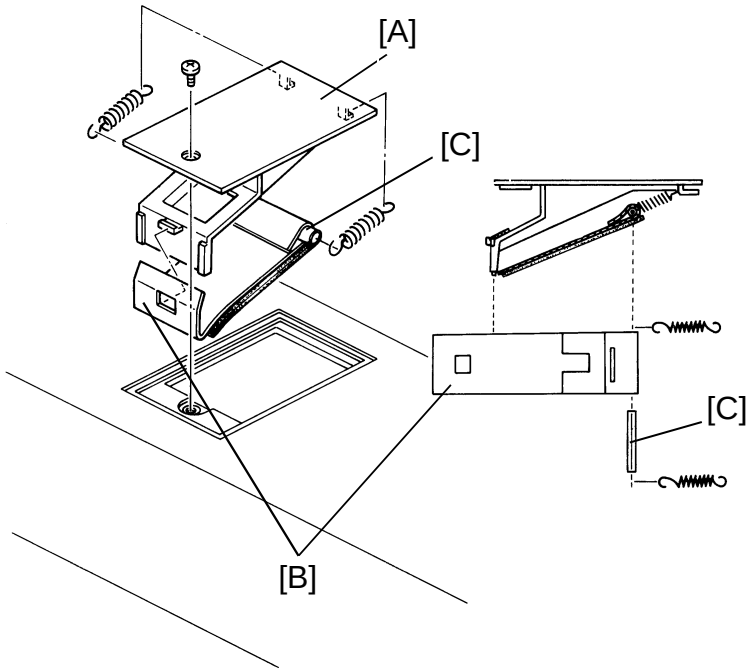


1. Remove the paper feed unit. (See Paper Feed Unit Removal.)
2. Remove the pick-up lever [A] (2 screws and 1 bracket), plastic clamp [B] (1 screw) and a E-ring [C]. Then remove the paper feed motor assembly [D] (3 screws).
3. Remove 2 sets of E-rings and bearings [E]. Then remove the roller shaft [F].

   NOTE: Be careful not to loose pins [G].

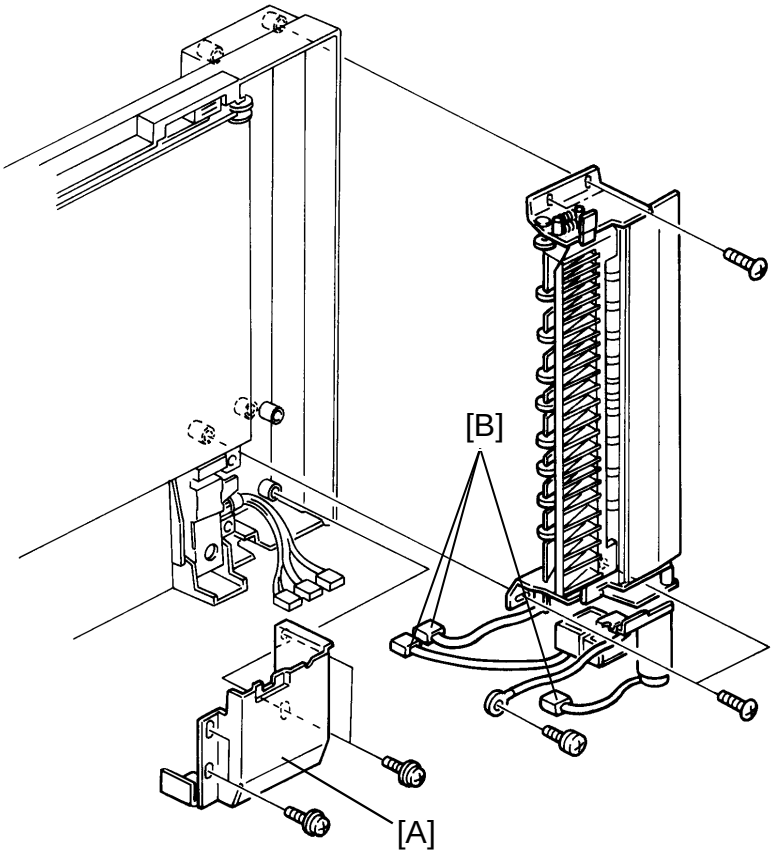
4. Remove the feed rollers [H] (2 pull-out rollers [I], 1 side-roller [J], and 4 E- rings).

10.10 FRICTION BELT REPLACEMENT



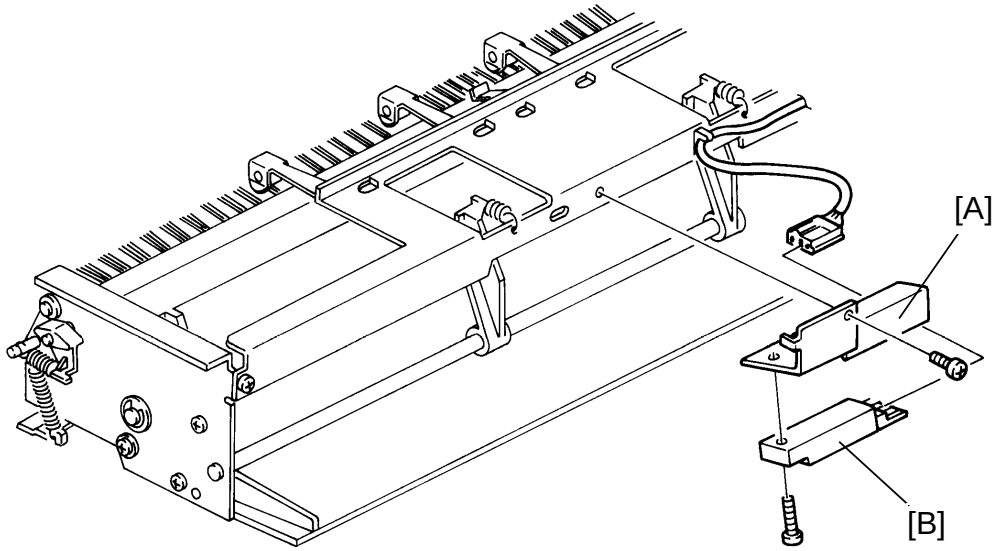
1. Remove the friction belt assembly [A] (1 screw).
2. Remove the friction belt [B] (2 springs and 1 pin [C]).
   NOTE: Do not touch the friction belt surface.

10.11 FEED-OUT UNIT REMOVAL



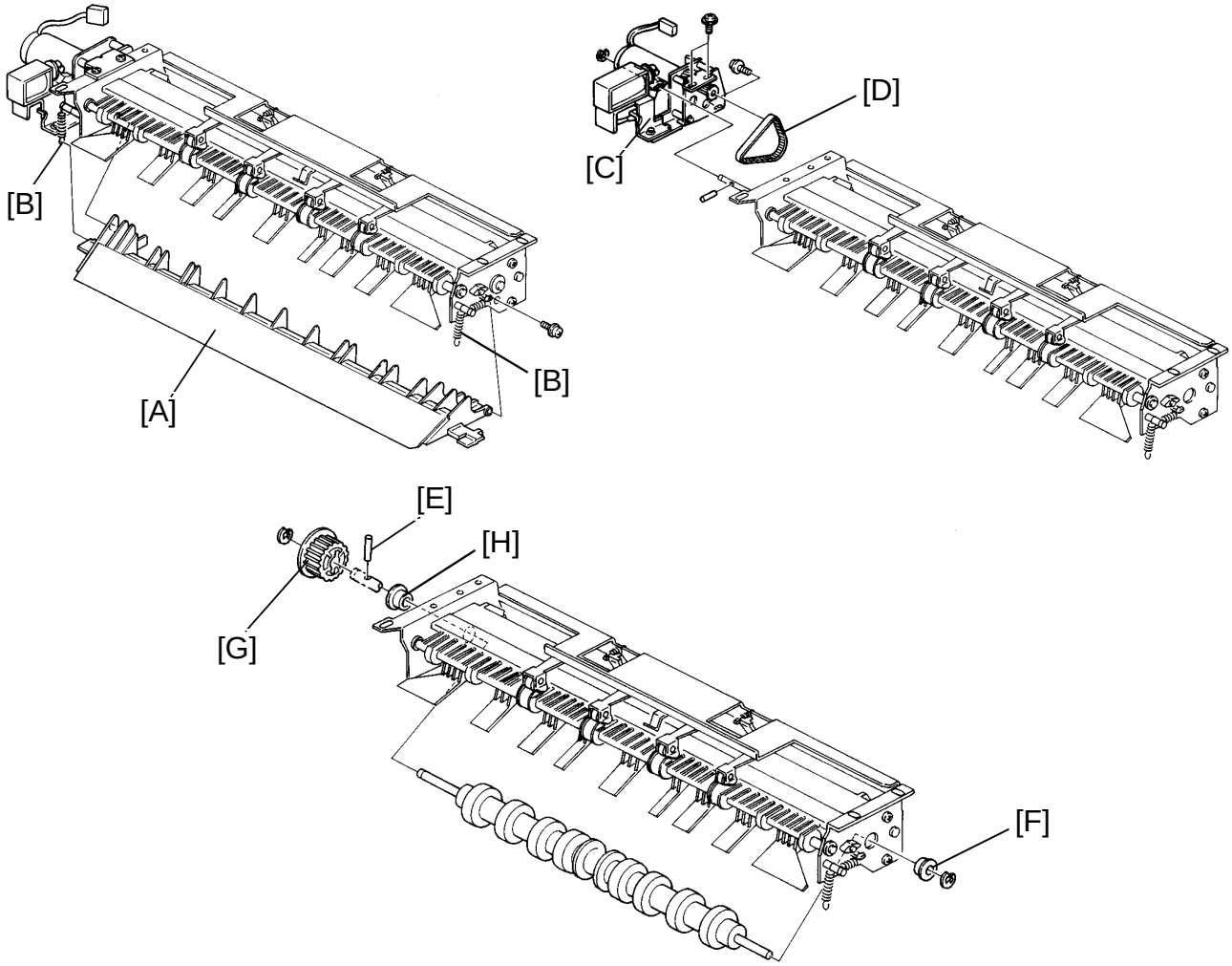
1. Remove the motor cover [A] (4 screws).
2. Disconnect the 3 connectors [B].
3. Remove the feed-out unit (5 screws).

10.12 FEED-OUT SENSOR REPLACEMENT



1. Remove the feed-out unit. (Refer to Feed-Out Unit Removal.)
2. Remove the feed-out sensor assembly [A] (1 screw and 1 connector).
3. Replace the feed-out sensor [B] (1 screw).

10.13 INVERTER ROLLER REPLACEMENT

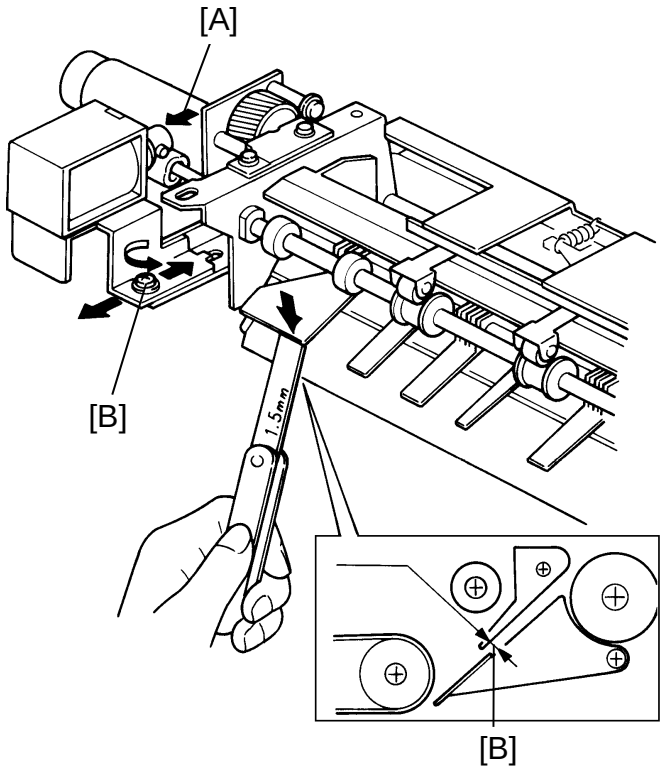


1. Remove the paper feed-out unit. (Refer to Feed-Out Unit removal.)
2. Remove the inverter guide plate [A] (1 screw and 2 springs [B]).
3. Remove the inverter motor assembly [C] (3 screws and 1 E-ring) and the timing belt [D].

   NOTE: Be careful not to lose pin [E].

4. Remove the bushing [F] (1 E-ring), inverter roller sprocket [G] (1 E-ring), and bushing [H].
5. Replace the inverter roller and the inverter roller shaft.

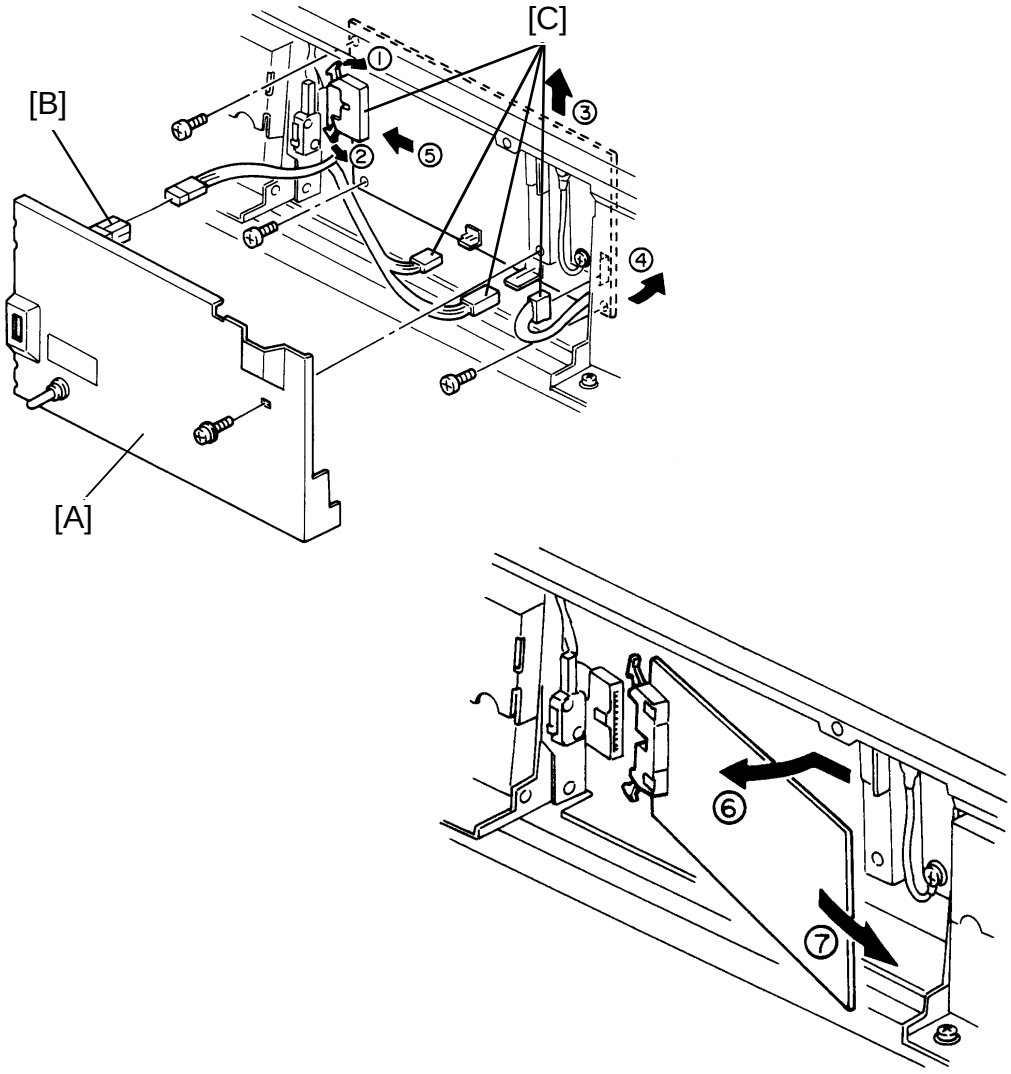
10.14 INVERTER SOLENOID ADJUSTMENT



Adjustment Standard:1.5±0.5 mm

1. Remove the feed-out unit. (Refer to Feed-Out Unit Removal.)
2. Hold down the inverter solenoid bar [A] to measure the gap [B].
3. If the gap is not within specifications, take the following steps.
4. Loosen the solenoid bracket screw [B].
5. Adjust the gap by sliding the inverter solenoid assembly

10.15 MAIN PCB REPLACEMENT

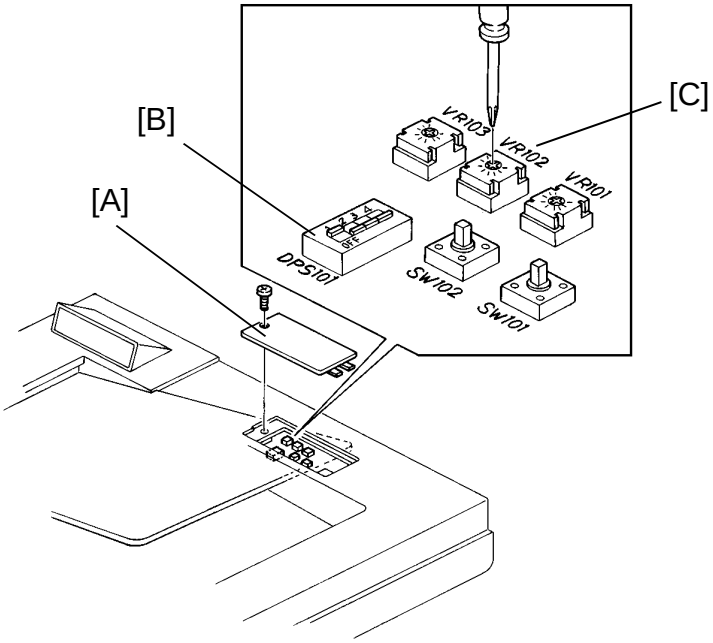


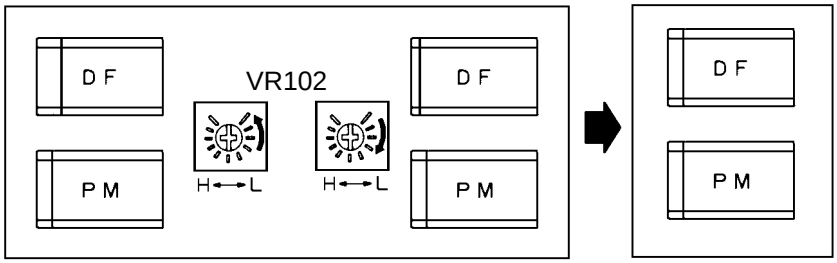
1. Remove the main PCB cover [A] (1 screw, 1 connector).
2. Remove 3 screws to disconnect the optic fiber cable connector [B].
3. Disconnect the connectors [C], then remove the PCB as shown.

NOTE: When removing the PCB, be careful not to damage any of the components that protrude from the board.

10.16 DF LEADING EDGE REGISTRATION ADJUSTMENT (FT5233)

10.16.1 One-sided Original Mode





1. Remove the DF main control board cover [A] (1 screw), and confirm that the setting of DIP SW 101 [B] on the main control board is as follows:

   ON: 101-1
   OFF: 101-2,3,4

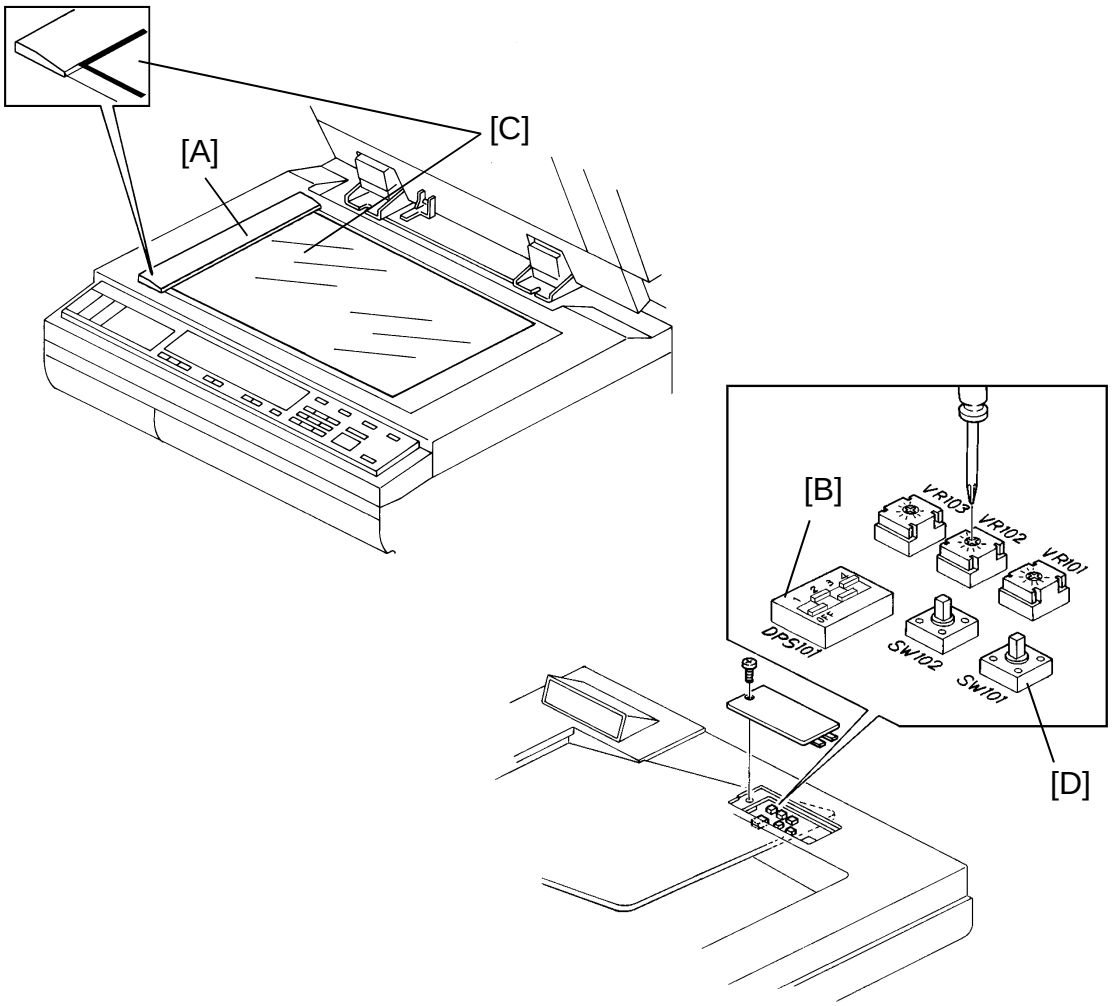
2. Make a copy of the test sheet in platen mode (A4 / 8 1/2" x 11" sideways).

3. Confirm that the original select switch is set to the thin original mode and make a copy in DF mode (A4 / 8 1/2" x 11" sideways).

4. Compare the registration of the copy in platen mode with that in the DF mode, and confirm that the difference is within 2.5 mm.

5. If the difference is more than 2.5 mm, adjust VR102 [C] to change the original-stop timing according to the above illustration.

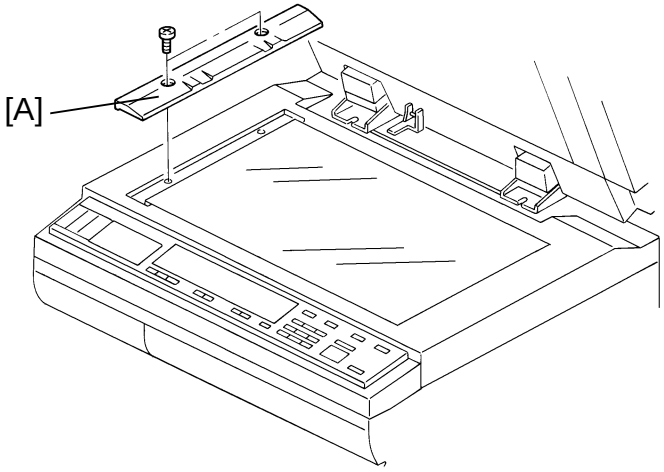
10.16.2 Two-sided Original Mode

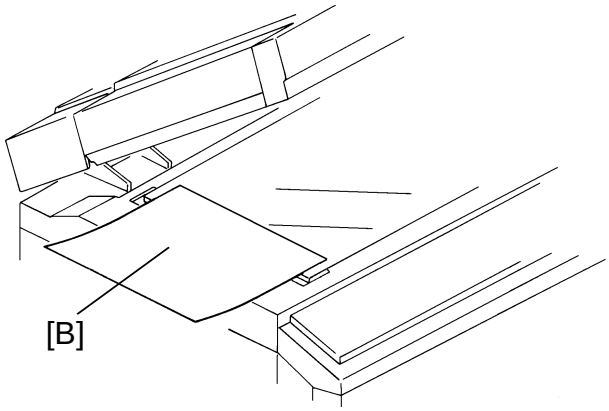


NOTE: a) An original should stop pressed against the left scale [A] in DF two-sided original mode.

b) The position of the original select switch does not matter.

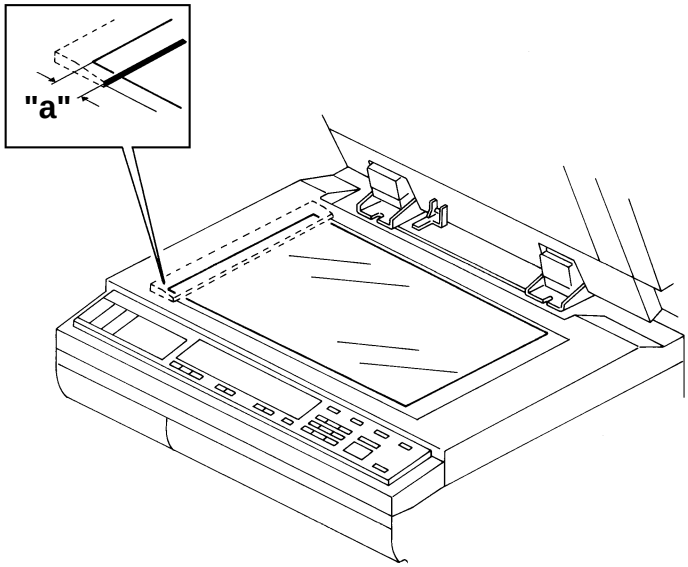
1. Set DIP SW101 [B] on the main control board as follows:
   ON: 101–2, 4
   OFF: 101–1, 3
2. Set a sheet of A3/11" x 17" paper [C] on the DF then press SW 101 [D] to feed the paper into the DF belt section.
3. When the paper stops on the exposure glass after the inversion, open the DF slowly so that the paper does not move from the stop position.
4. Confirm that the paper has stopped against the left scale.

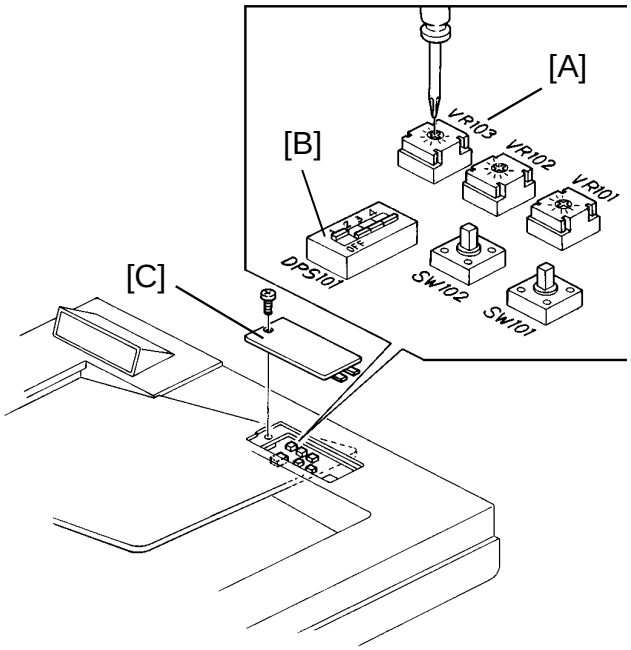




5. If the paper has not stopped against the left scale [A], remove the left scale (2 shoulder screws).
6. Set a sheet of A4 / 8 1/2" x 11" paper [B] sideways on the exposure glass edge as shown.

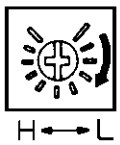
   NOTE: This sheet of paper prevents the original from jamming at the edge of the exposure glass when it is fed in without the left scale.
7. Set a sheet of A3 / 11" x 17" paper on the DF then press SW101.
8. Just after the paper is fed in, gently pull off the sheet set in step 6.
9. When the paper (set in step 7) stops on the exposure glass after the inversion, open the DF slowly so that the paper does not move from the stop position.





VR 103

"a" ≤ 10~15 mm 



"a" ≥ 10~15 mm

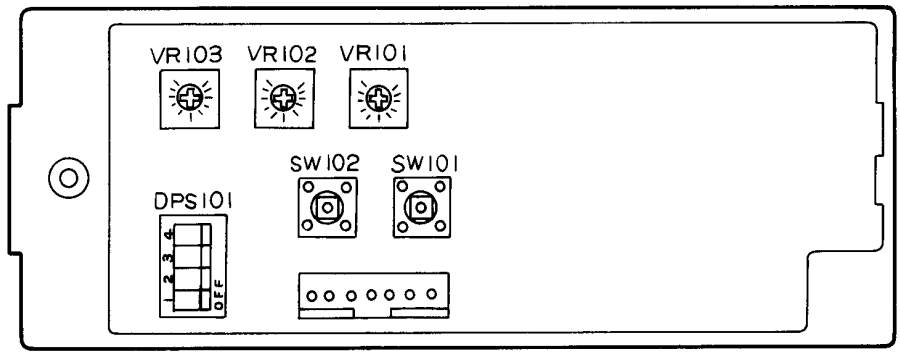
10. If the paper did not stop at the correct position (**"a"**=10~15 mm), turn VR 103 [A] to correct the original stop timing.

    NOTE: Turning VR103 clockwise results in the original stopping later.

11. Set back DIP SW101 [B] on the main control board as follows:
    ON: 101-1
    OFF: 101-2,3,4

12. Reinstall the DF main control board cover [C] and the left scale.

DF LEADING EDGE REGISTRATION ADJUSTMENT (FT6750)



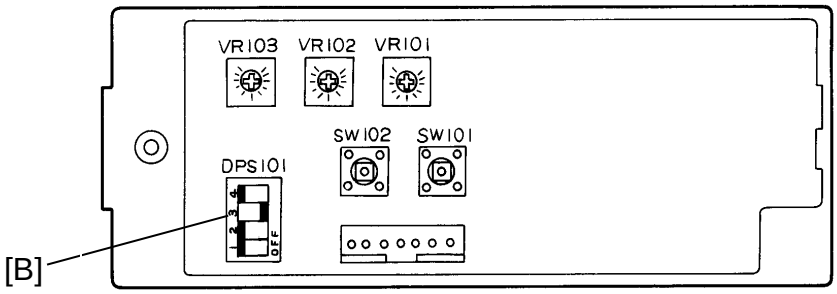
1. Using the DF test chart, make a copy in platen cover mode (A4/LT width).
2. Confirm that the original select switch [A] is in thin mode, then make another copy of the test chart in DF mode (A4/LT width).
3. Compare the leading edge registration of both copies. There should be no more than a 2.5 mm difference.
4. If the difference is more than 2.5mm, remove the DF main PCB cover [B] (1 screw) and turn VR102 on the DF main PCB unit until the leading edge registration is within the specification.

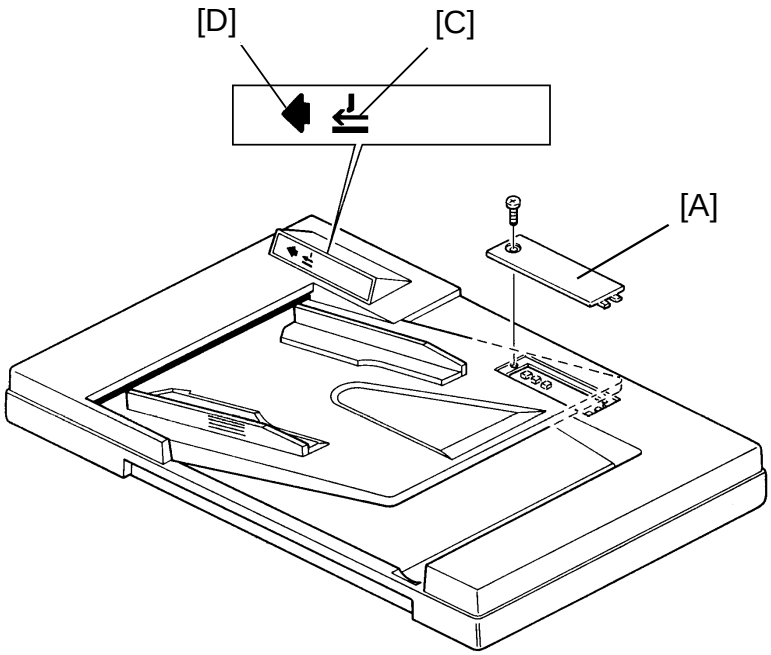
NOTE: Turning VR102 clockwise results in the original stopping later.

5. Make a copy of the DF test chart in DF two sided-original mode. (Insert the original face down.)
6. Compare the leading edge registration with that of the platen cover mode copy. There should be no more than a 2.00 mm difference.
7. If the leading edge registration is out of specification, turn VR103 on the DF main PCB until the leading edge registration is correct.

NOTE: a) The test sheet stops against the left scale in DF two-sided original mode.
b) Turning VR103 clockwise results in the original stopping later.

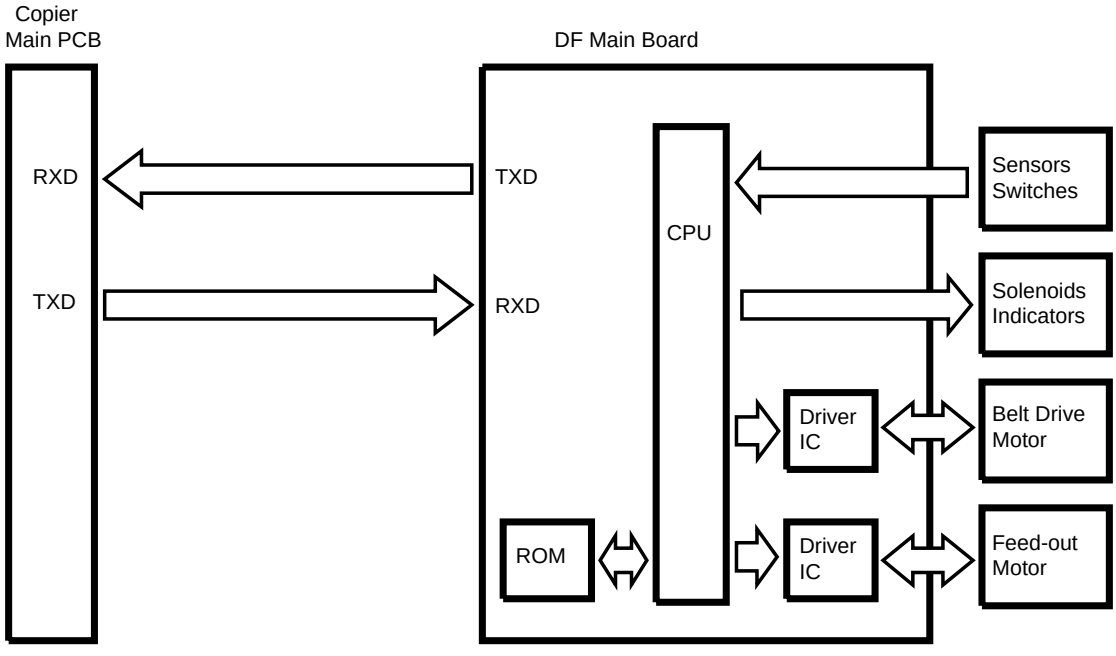
10.17 PAPER FEED MOTOR SPEED CHECK AND ADJUSTMENT





1. Remove the DF main PCB cover [A] (1 screw).
2. Set DIP SW101 [B] NO. 1, 2, and 4 to ON. Leave DIP SW 3 in the OFF position. Then turn the main switch on.
3. If either the original set indicator [C] or the original feeding indicator [D] is on, adjust the speed by turning VR-101. If the original set indicator is on, turn VR-101 in the L direction. If the original feeding indicator is on, turn VR-101 in the H direction. Adjust until both indicators stay off for at least 5 seconds.

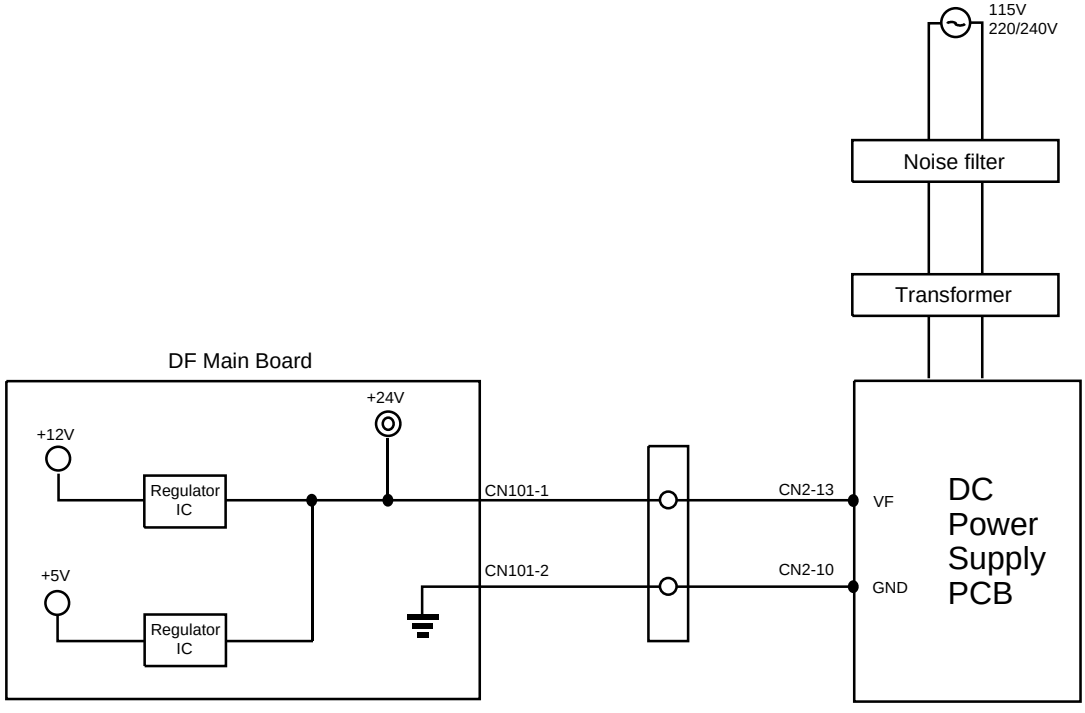
11. OVERALL MACHINE CONTROL



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

Also, the DF CPU communicates with the main system using a serial interface (fiber optics).

12. POWER DISTRIBUTION



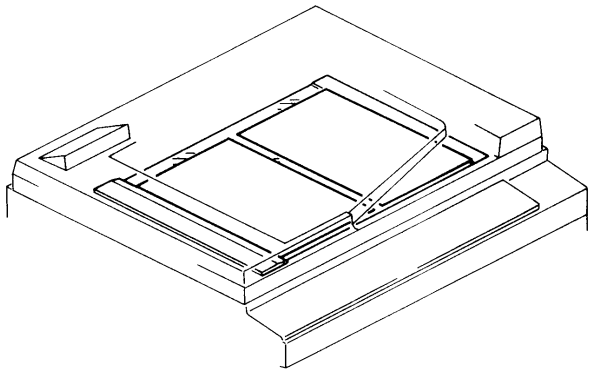
The DF uses three dc power levels : + 24 volts, + 12 volts, and + 5 volts.

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

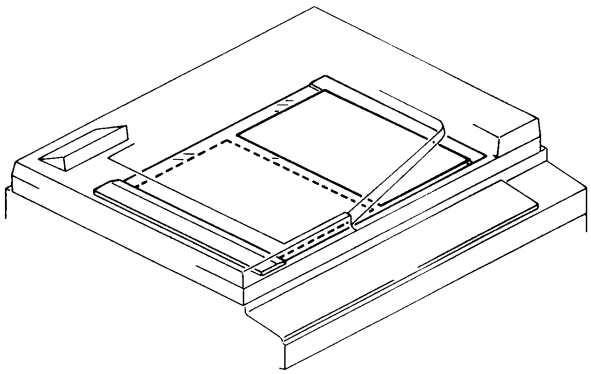
The regulator IC on the DF main board further steps down the + 24 volts to + 12 volts and + 5 volts.

13. COMBINE 2 ORIGINALS MODE

13.1 OVERVIEW



[Fig.1]



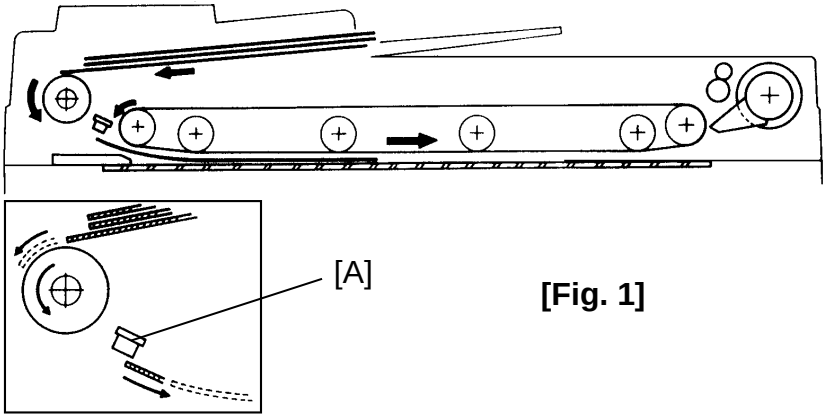
[Fig.2]

Two originals are fed onto the exposure glass at once in the combine 2 originals mode as shown in figure 1. This allows copying 2 originals onto one sheet of paper automatically either in the full size mode or in the reduction mode. If it is used together with the duplex mode, 4 originals can be copied on a single sheet of paper automatically.

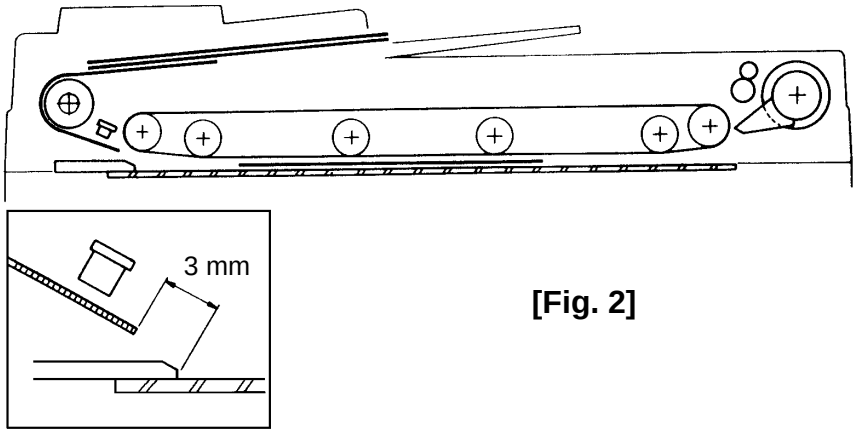
If odd numbered originals are placed on the original table, the last original is placed on the exposure glass as shown in figure 2.

Only 1-sided originals can be used, and Auto Paper Select (APS) and Auto Reduce/Enlarge modes cannot be used with this mode.

13.2 OPERATION



[Fig. 1]



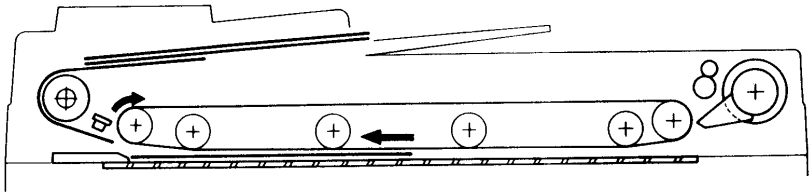
[Fig. 2]

The original transport speed in the combine 2 originals mode is 203 mm/second, while the speed in DF, SADF, and ARDF modes is 810 mm/second. This is to accurately control the 2 originals' stop position on the exposure glass. The originals exchange speed is about 4 seconds.

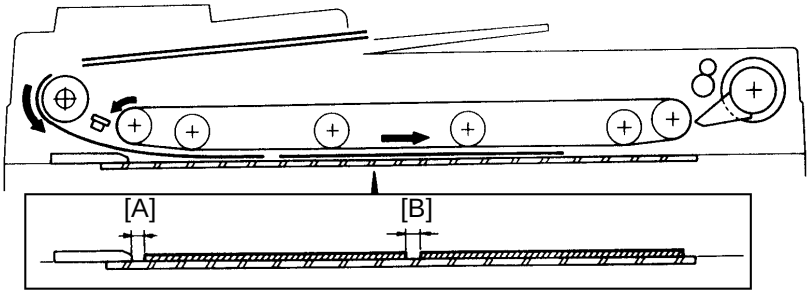
The DF operation in the combine 2 originals mode is as follows:

[Figure 1]
100 milliseconds after the registration sensor [A] detects the trailing edge of the first original, the feed-in clutch turns on again to feed the second original.

[Figure 2]
When the registration sensor detects the leading edge of the second original, the feed-in clutch turns off and the DF CPU starts counting the encoder pulses of the belt drive motor. At the proper timing, the belt drive motor turns off to place the leading edge of the second original 3 mm (0.12") away from the left scale edge.



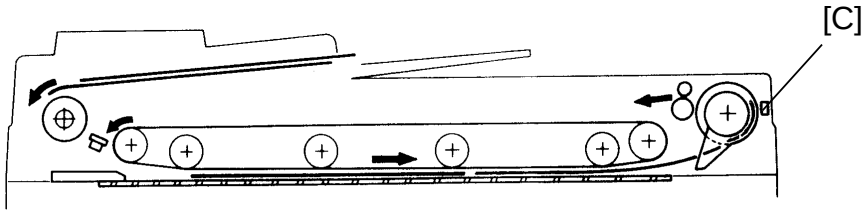
[Fig. 3]



[Fig. 4]

[Figure 3]
The belt drive motor starts the reverse rotation to aligne the first original against the left scale. Then the belt drive motor stops. As the feed-in clutch stays off during this operation and the pull-out rollers have one-way bearings, the second original stays where it is. Therefore, the distance between the first and second originals becomes 3mm.

[Figure 4]
The belt drive motor starts the normal rotation to transport both the first and second originals onto the exposure glass, keeping the same distance between them. At the proper timing after the trailing edge of the second original passes the registration sensor, the belt drive motor stops to place the first and second originals on the exposure glass, as shown.
There is no adjustment for the combine 2 original mode. However, when the lead edge registration is adjusted properly in the thin original mode, the lead edge registration [A] in the combine 2 originals mode should be 0±2.5 mm (0±0.1"). The distance [B] between the first and second originals is 3±3 mm (0.12"±0.12"). This is fixed by the software.



[Fig. 5]

[Figure 5]
After copying of these originals is finished, the belt drive motor and the feed-out motor turn on to feed out the originals. When the leading edge of the first original is detected by the feed-out sensor [C], the feed-in clutch turns on to start feeding the first original of the next cycle.