CHAPTER 4: FIRST PAPER FEED SECTION

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Mechanism

1. Paper Feed Tray Mechanism

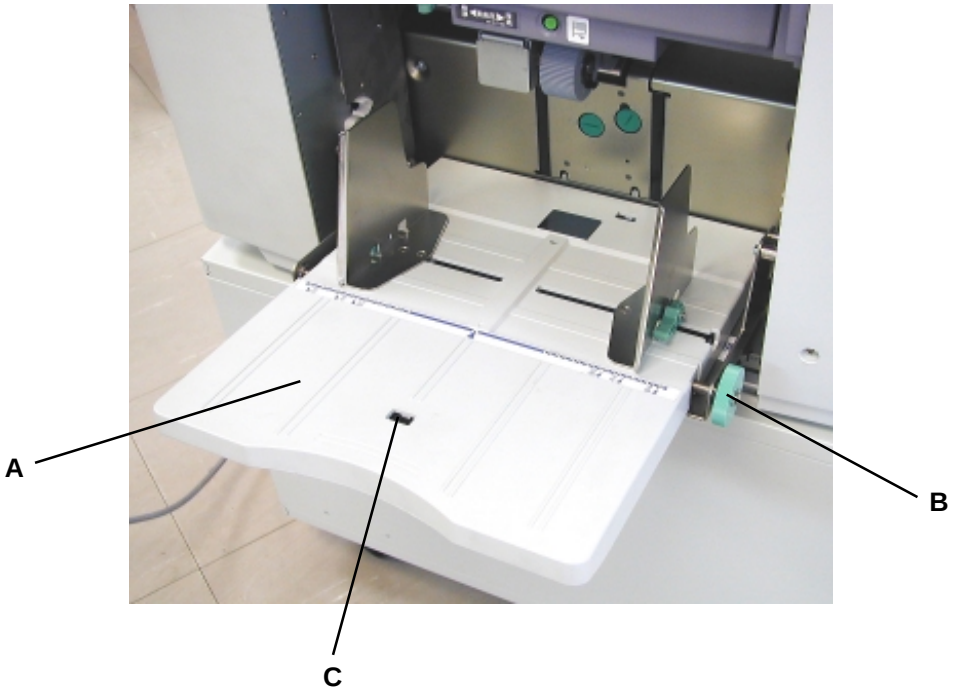
1) Horizontal positioning (horizontal print positioning) of the paper feed tray

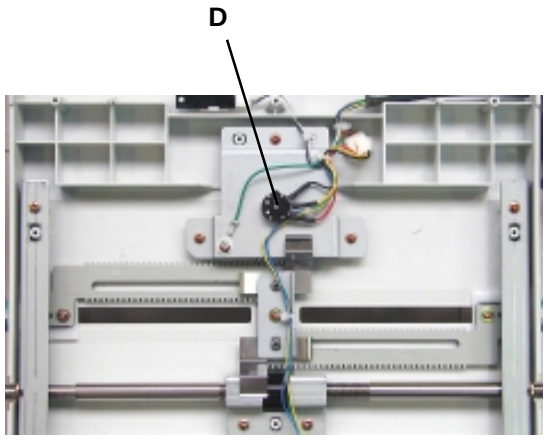
The Paper feed tray [A] can be moved ±10 mm left or right by turning the Adjustment dial [B] manually (for paper widths up to 274 mm, and ±5 mm for paper widths between 275 mm and 290 mm).

2) Print paper size detection

The Paper feed tray [A] uses the Paper width potentiometer [D] and Paper size detection sensor [C] to determine the size of the paper loaded in the Paper feed tray [A].

The Paper width potentiometer [D] checks the paper width, and the Paper size detection sensor [C] determines the paper length (portrait or landscape orientation).





A: Paper feed tray
B: Adjustment dial
C: Paper size detection sensor
D: Paper width potentiometer

View of underside of the paper feed tray with the cover off

2. Paper Feed Tray Elevation Mechanism

The presence of paper loaded in the Paper feed tray [A] is detected by the Paper detection sensor [B].

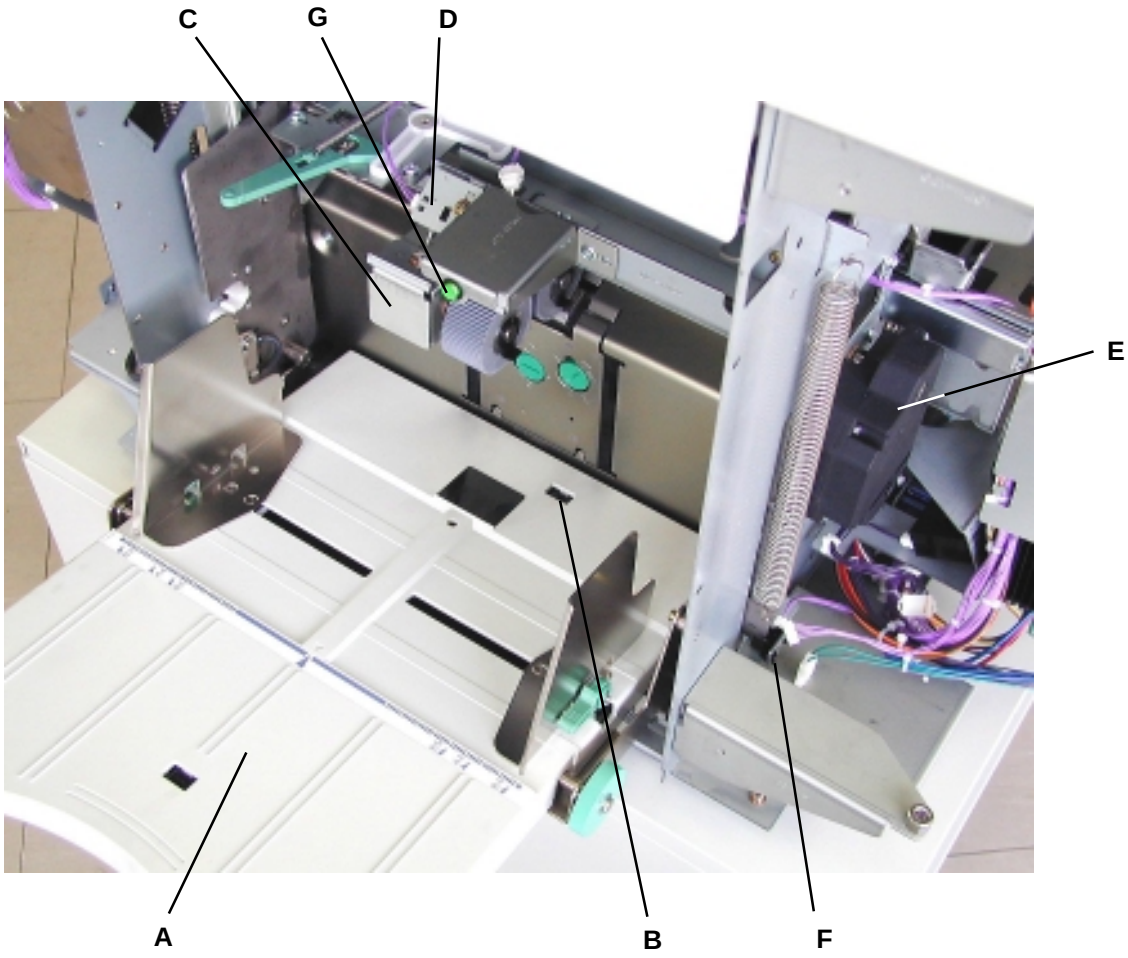
When light is received at the Paper detection sensor [B] (paper present), pressing the START key activates the Elevator motor [E] and raises the Paper feed tray [A] until the Scraper assembly [C] blocks the light beam of the Upper limit sensor [D].

During printing, the Elevator motor [E] is activated until the light to the upper limit sensor [D] is blocked.

When there is no longer paper in the Paper feed tray [A] and light is not received by the Paper detection sensor [B], the Elevator motor [E] activates and lowers the Paper feed tray [A] until the light beam of the Lower limit sensor [F] is blocked.

If the Feed tray descent button [G] is pressed while in print standby mode, the Elevator motor [E] activates and lowers the Paper feed tray [A] until either the light beam of the Lower limit sensor [F] is blocked or the Feed tray descent button [G] is pressed once again.

The Elevator motor [E] does not operate even if the Feed tray descent button [G] is pressed while the print drum is removed.

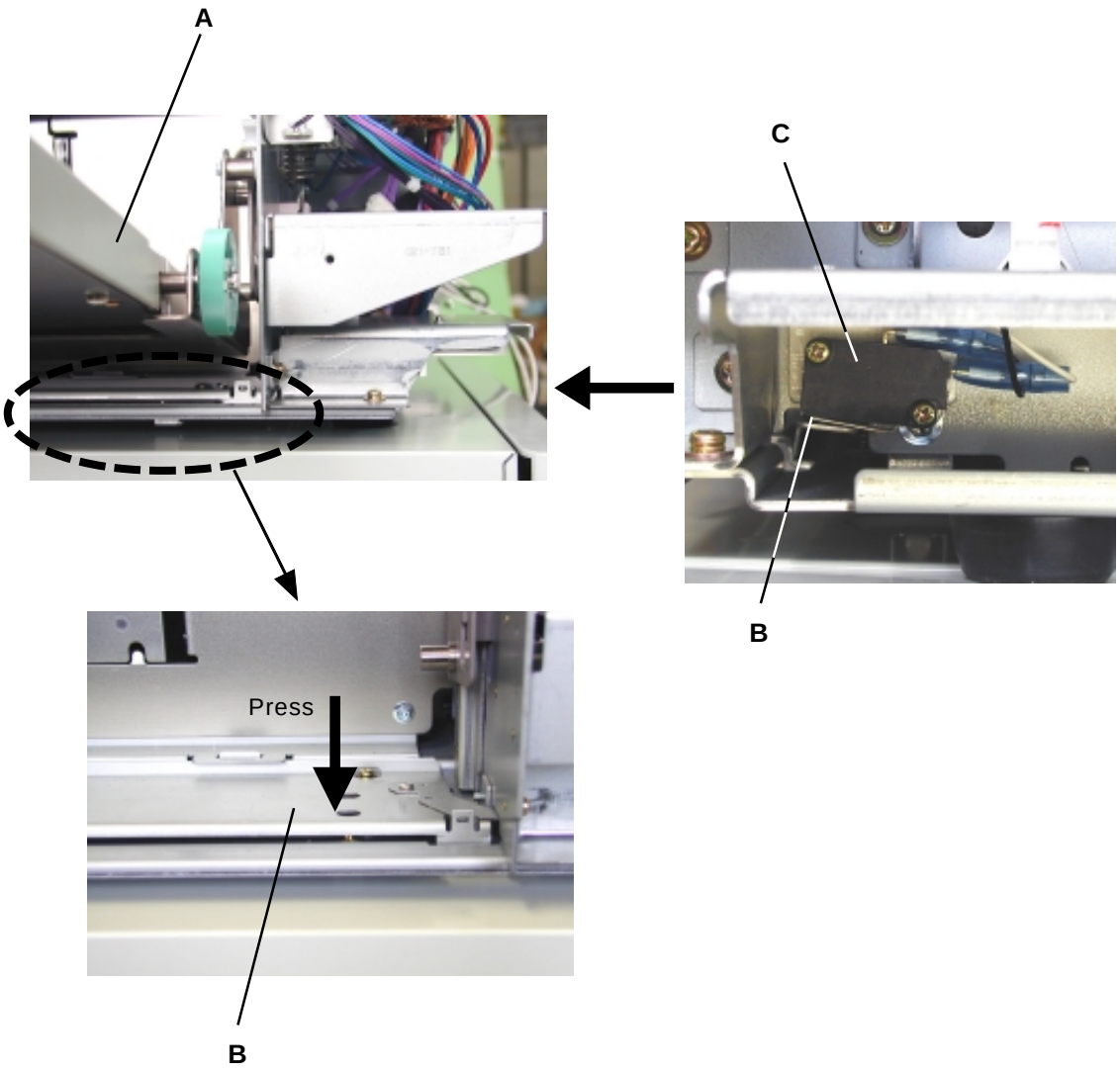


A: Paper feed tray
B: Paper detection sensor
C: Scraper assembly
D: Upper limit sensor
E: Elevator motor
F: Lower limit sensor
G: Feed tray descent button

3. Paper Feed Tray Safety Mechanism

The Paper feed tray lower safety switch [C] ensures safety while the paper feed tray is being raised or lowered or is stationary.

If the Safety switch actuator plate [B] is depressed, the Paper feed tray lower safety switch [C] trips. An error in the paper feed tray is then assumed, and the machine stops.



A: Paper feed tray

B: Safety switch actuator plate

C: Paper feed tray lower safety switch

4. First Paper Feed Drive Mechanism

When the printing operation commences, the Main motor [A] activates to rotate the print drum via the Main belt [C]. When the Main motor [A] is running, the Paper feed timing belt [D] continuously drives the pulley on the Paper feed clutch [E].

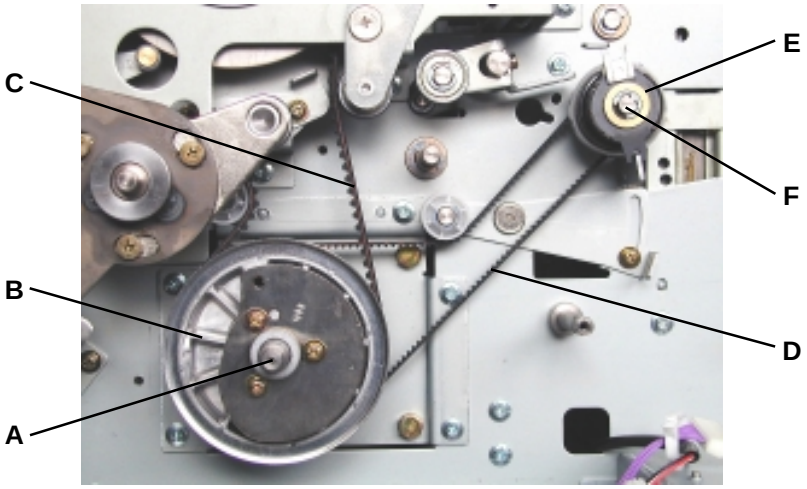
When the print drum rotates through a preset angle (the angle set for paper feed clutch activation by test mode No. 481) from position A, the Paper feed clutch [E] is activated. The Scraper roller [G] and Pickup roller [H] rotate to feed the paper inside the machine from the paper feed tray.

The paper fed inside the machine blocks the light beam between Paper sensors [I] and [L]. The print drum then rotates through a preset angle (the angle set for paper feed clutch deactivation angle adjustment by test mode Nos. 482 to 485), and the Paper feed clutch [E] is deactivated, completing the first stage paper feed.

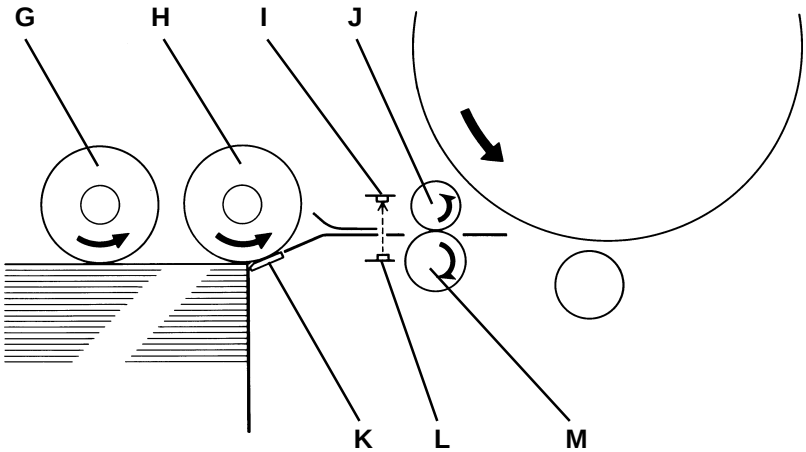
The leading edge of the paper rests against the Guide roller [J] and Timing roller [M] and stops with the paper bulging.

If the print drum rotates as far as the first paper feed jam detection angle after the Paper feed clutch [E] has been activated, Paper sensors [I] and [L] check to detect the presence or absence of paper.

After the paper has been fed to the second paper feed stage, a one-way clutch acts on the Scraper roller [G] and Pickup roller [H] so that they spin, to prevent the first paper feed area from applying brake on the paper.



A: Main motor
B: Main pulley
C: Main belt
D: Paper feed timing belt
E: Paper feed clutch
F: Pickup roller shaft
G: Scraper roller
H: Pickup roller
I: Paper sensor (receive)
J: Guide roller
K: Stripper pad
L: Paper sensor (send)
M: Timing roller

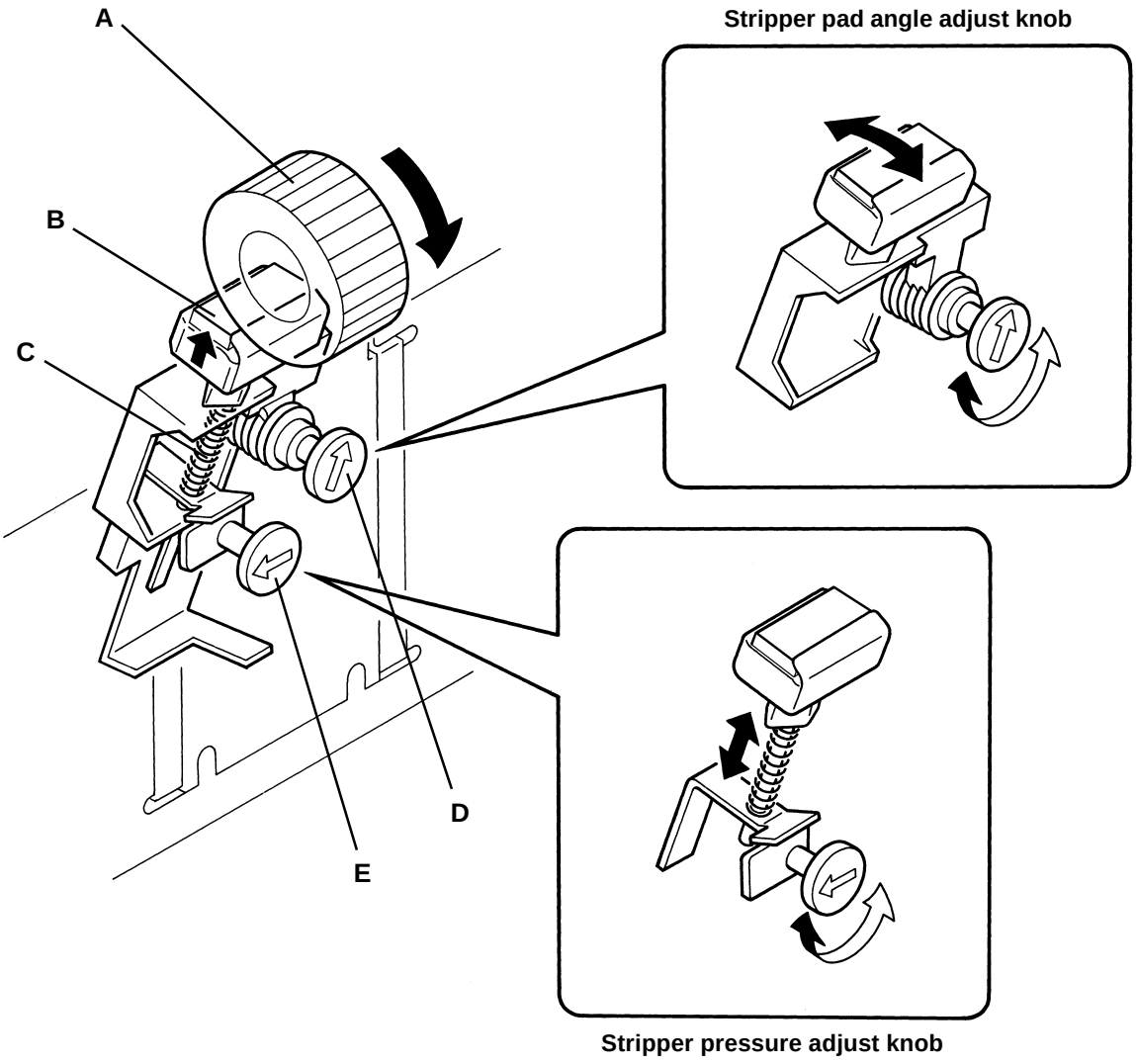


5. Paper Strip Mechanism

The paper loaded in the paper feed tray is fed in between the Pickup roller [A] and Stripper pad [B] by the rotating scraper roller. The paper is then separated by the Pickup roller [A] and Stripper pad [B] to ensure that only the uppermost sheet is sent into the machine.

The Stripper pad [B] is pressed against the Pickup roller [A] by the force of the Stripper spring [C], and the resistance applied to the paper fed in separates the sheet.

The stripper-pad angle and stripping pressure can be adjusted by the user using the Stripper pad angle adjust knob [D] and Stripper pressure adjust knob[E].

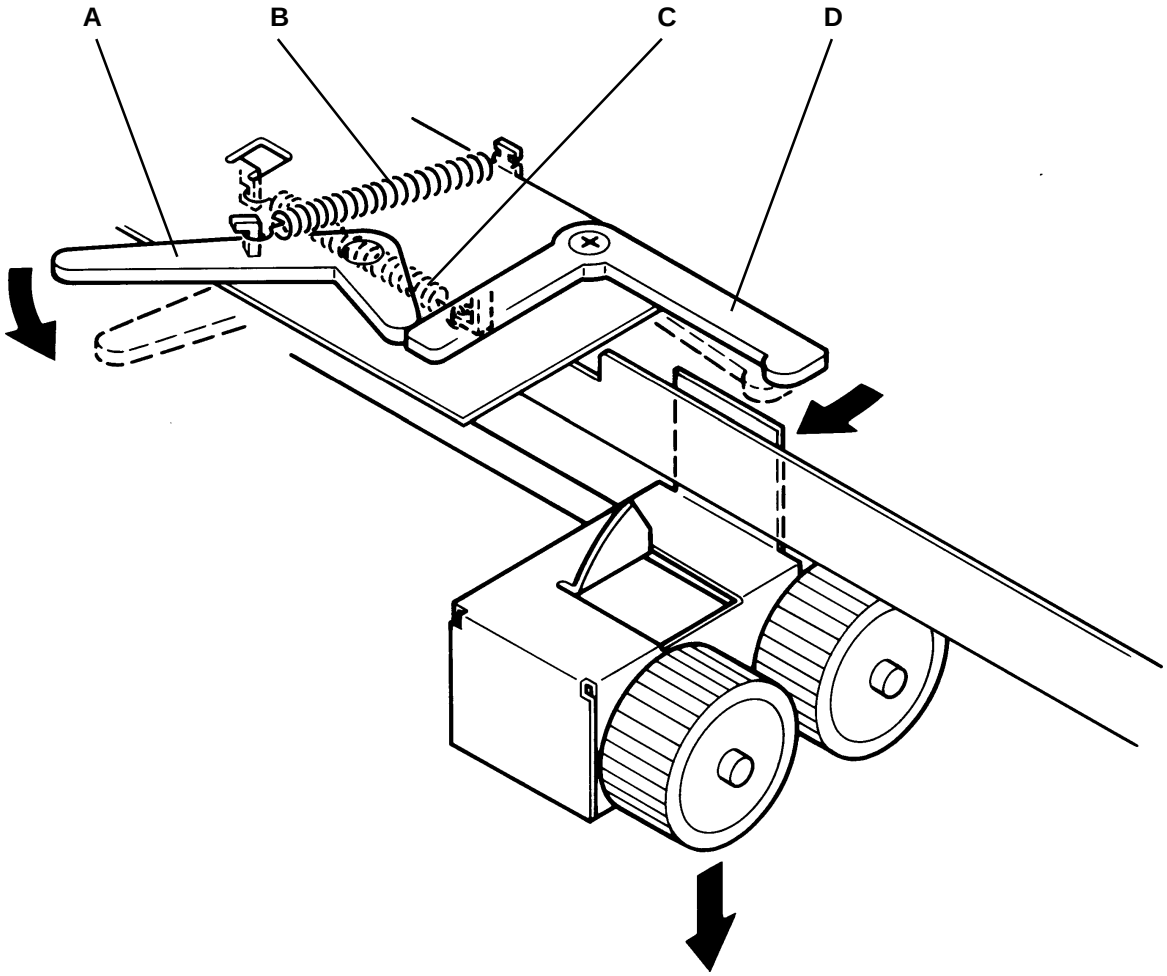


A: Pickup roller
B: Stripper pad
C: Stripper spring
D: Stripper pad angle adjust knob
E: Stripper pressure adjust knob

6. Paper Feed Pressure Adjust Lever

The Paper feed pressure adjust lever [A] is located on the left-hand side of the scraper unit, and moving this to the left or right switches the scraper-roller paper-feed pressure (scraper pressure) from NORMAL (weak) and CARD (strong).

Moving the pressure adjust lever to the right increases the paper-feed pressure (scraper pressure).



A: Pressure adjust lever
B: Pressure adjust lever spring
C: Pressure arm spring
D: Pressure arm

[Memo]

Removal and Assembly

1. Removing the Paper Feed Tray Unit

(1) Lower the Paper feed tray [F] fully.

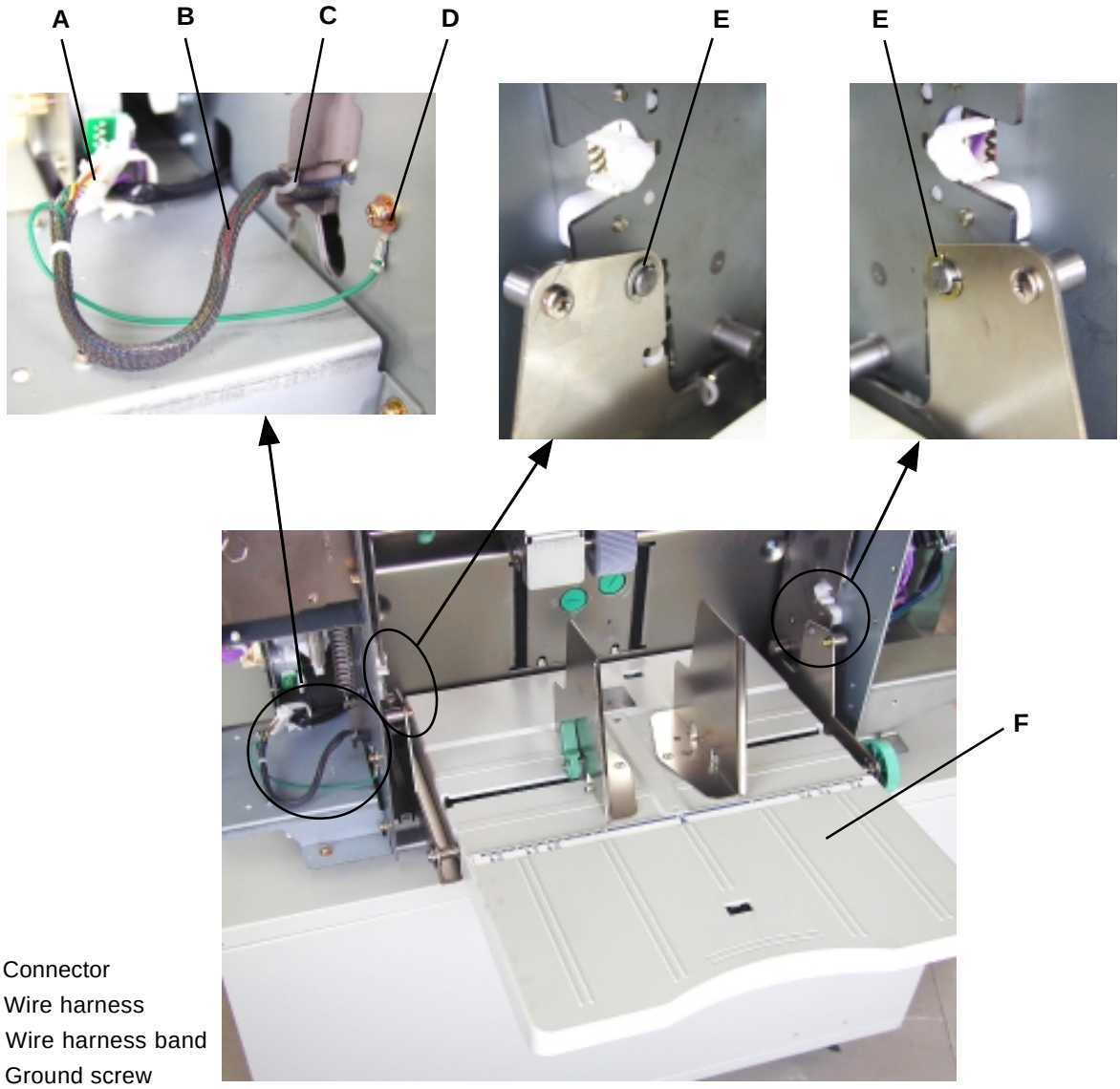
(2) Remove the rear cover.

(3) Unplug the connector [A] on the wire harness [B] from the Paper feed tray [F]. Remove the mounting screw (M4 x 6: 1 pc) and remove the ground screw [D]. Cut the wire harness band [C], and then pull the wire harness [B] towards the paper feed tray.

(4) Remove the E-rings [E] from the mountings on both sides of the paper feed tray, and remove the Paper feed tray [F].

[Precautions on Reassembly]

- The wire harness on the paper feed tray must be secured with the harness band as before.
- Do not forget to attach the ground wire.



A: Connector
B: Wire harness
C: Wire harness band
D: Ground screw
E: E-ring
F: Paper feed tray

2. Removing the Paper Width Potentiometer, Paper Detection Sensor, and Paper Size Detection Sensor

(1) Remove the paper feed tray unit.

(2) Remove the E-ring and remove the Adjustment dial [A].

(3) Remove the E-rings [C] and bearings from both sides of the Slide shaft [B].

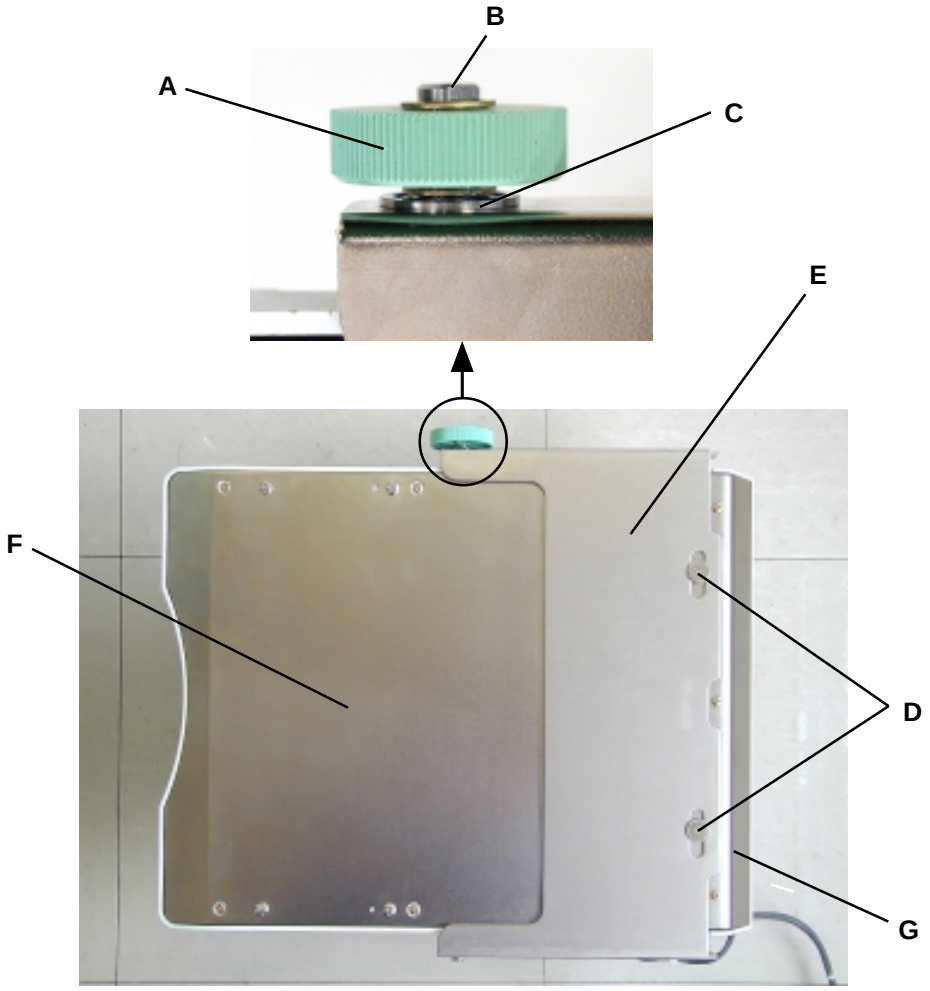
(4) Remove the shoulder screws (2 pcs) [D] and remove the paper-feed mounting plate [E].

(5) Remove the Paper-feed-tray bottom front cover [F] (mounting screws M4 x 6: 4 pcs) and Paper-feed-tray bottom rear cover [G] (mounting screws M3 x 8: 3 pcs).

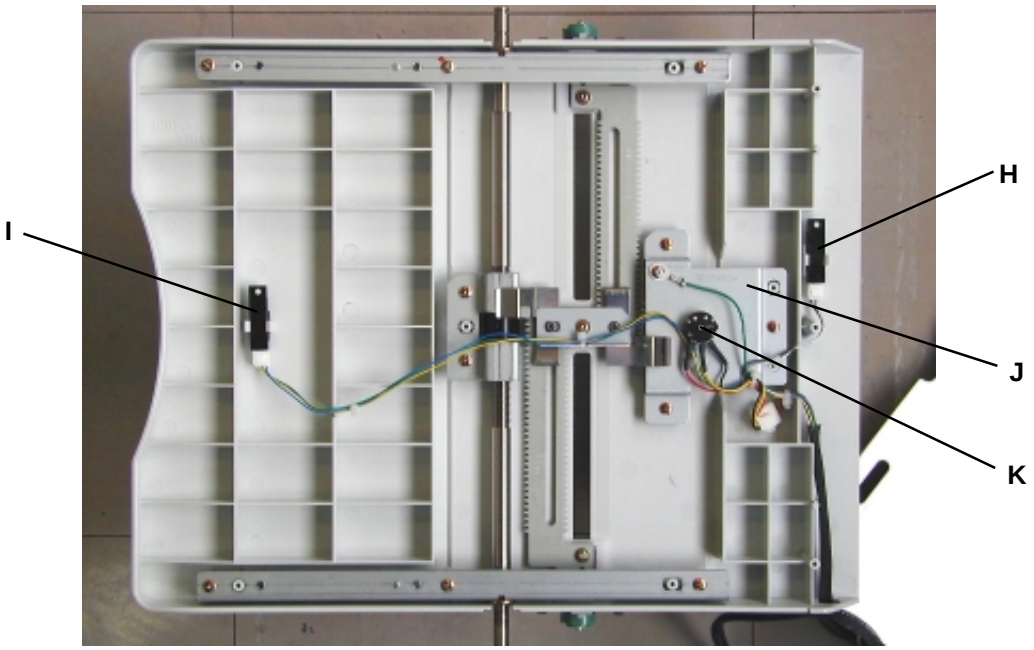
(6) Unplug the connector and remove the Paper detection sensor [H] while expanding the mounting clips.

(7) Unplug the connector and remove the Paper size detection sensor [I] while expanding the mounting clips.

(8) Remove the mounting screws (mounting screws M3 x 8: 3 pcs), unplug the connector, and then remove the Paper width potentiometer [K] together with the Potentiometer base [J].

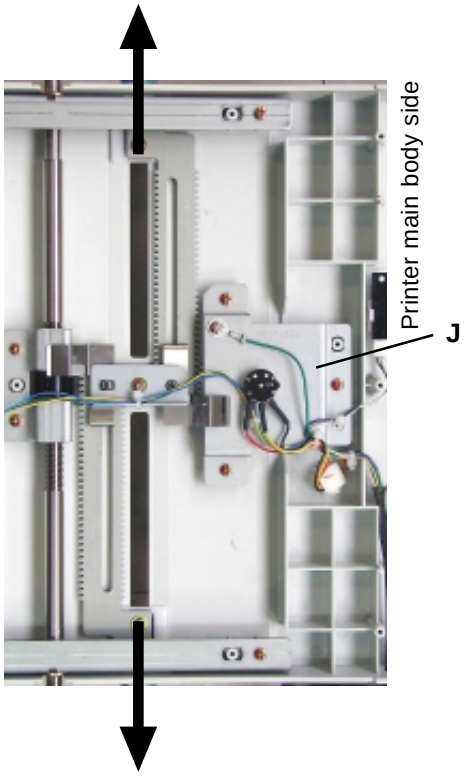


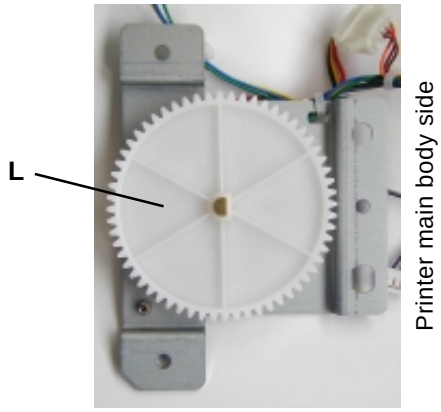
A: Adjustment dial
B: Slide shaft
C: Bearing
D: Shoulder screw
E: Paper-feed mounting plate
F: Paper-feed-tray bottom front cover
G: Paper-feed-tray bottom rear cover
H: Paper detection sensor
I: Paper size detection sensor
J: Potentiometer base
K: Paper width potentiometer
L: Spur gear
M: Potentiometer shaft

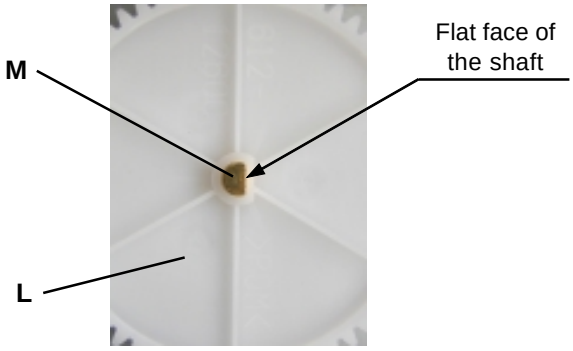


[Precautions on Reassembly]

- With the fence opened fully, mount the Spur gear [L] and the flat face of the potentiometer shaft [M] facing the printer body. (See photograph below.)
- Start test mode, and first set the fence position to 105 mm and activate test mode No. 450 (potentiometer adjustment 105 mm). Next, set the fence position to 210 mm and activate test mode No. 451 (potentiometer adjustment 210 mm).
- After adjusting the potentiometer, check that each paper size is correctly detected.







3. Removing the Pickup and Scraper Rollers

Removing the Scraper roller

(1) Lower the paper feed tray fully and switch off the power.

(2) Remove the Lock ring [E] on the Scraper roller shaft [C].

(3) Slide the Scraper roller [D] off the Scraper roller shaft [C].

Removing the Pickup roller

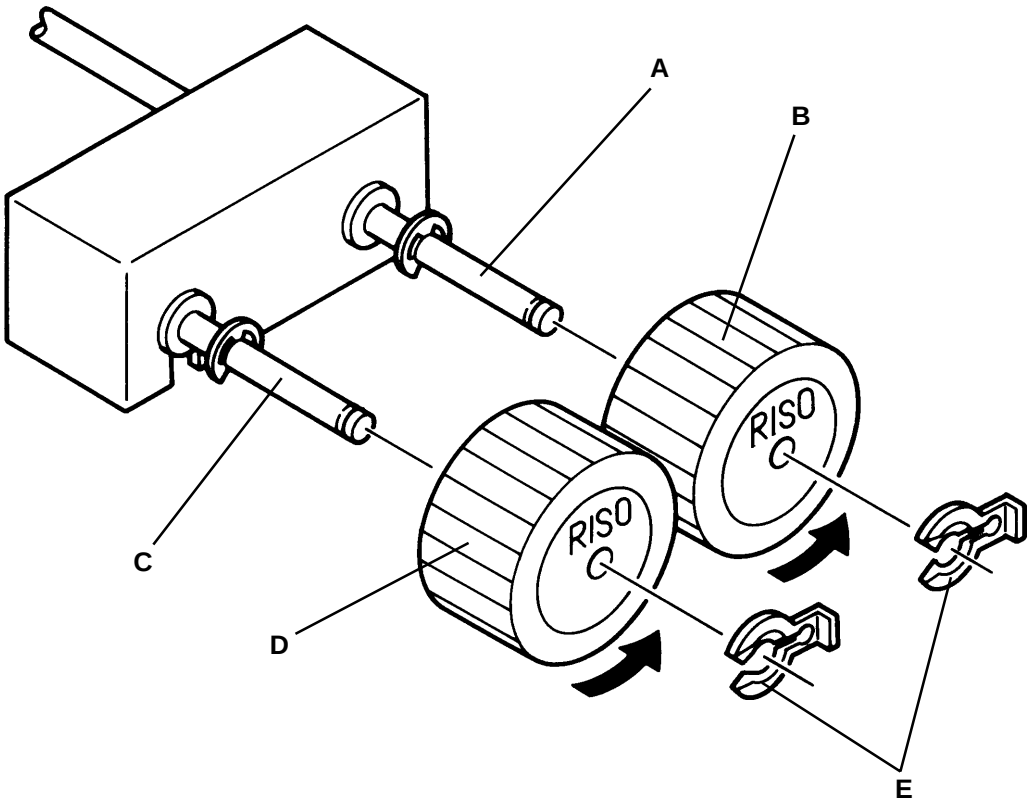
(1) Lower the paper feed tray fully and switch off the power.

(2) Remove the Lock ring [E] on the Pickup roller shaft [A].

(3) Slide the Pickup roller [B] off the Pickup roller shaft [A].

[Precautions on Reassembly]

- The scraper and pickup roller contain a one-way clutch. If mounted in the opposite direction, the rollers will not rotate even when the pickup roller shaft rotates. When mounted on the shafts correctly, the rollers spin freely in the direction shown on the diagram below when rotated manually.



A: Pickup roller shaft
B: Pickup roller
C: Scraper roller shaft
D: Scraper roller
E: Lock ring

4. Removing the Feed Tray Descent Button and Upper Limit Sensor

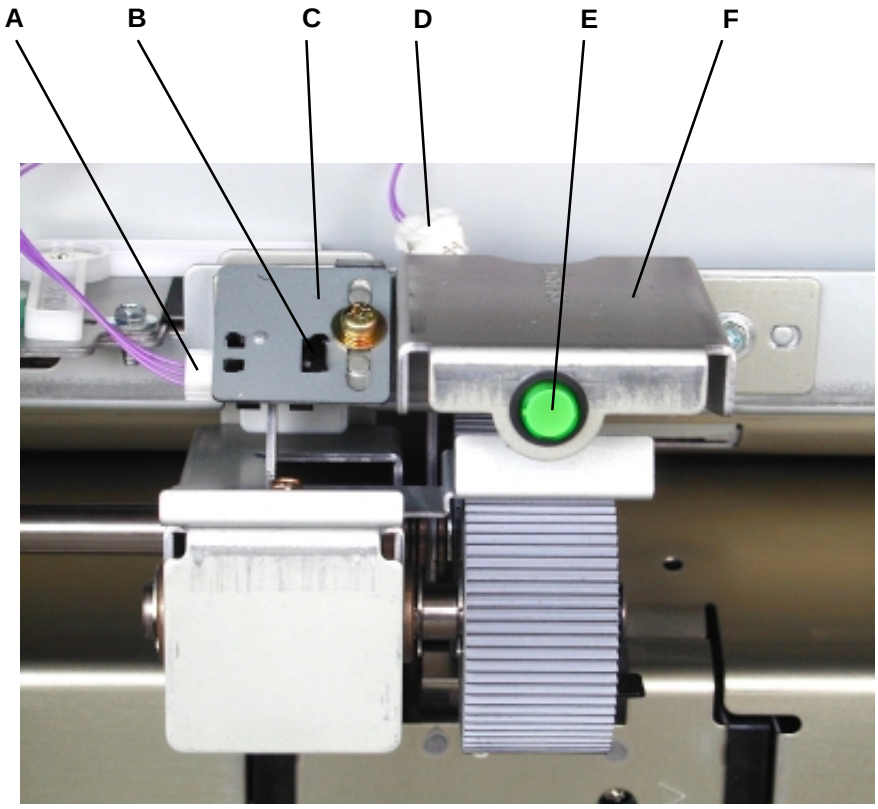
(1) Remove the Master-removal lower cover. (mounting screws M4 x 8: 4 pcs)

(2) Unplug connector [A], remove the mounting screw (M4 x 8: 1 pc), and then remove the Upper limit sensor [B] together with the Upper limit sensor bracket [C].

(3) Remove the mounting screws (M4 x 8: 2 pcs), unplug the connector [D], and then remove the Feed tray descent button [E] together with its mounting bracket [F].

[Precautions on Reassembly]

- Adjust the position of the upper limit sensor.



A: Upper limit sensor connector
B: Upper limit sensor
C: Upper limit sensor bracket
D: Feed tray descent button connector
E: Feed tray descent button
F: Mounting bracket

5. Removing the Paper Feed Clutch

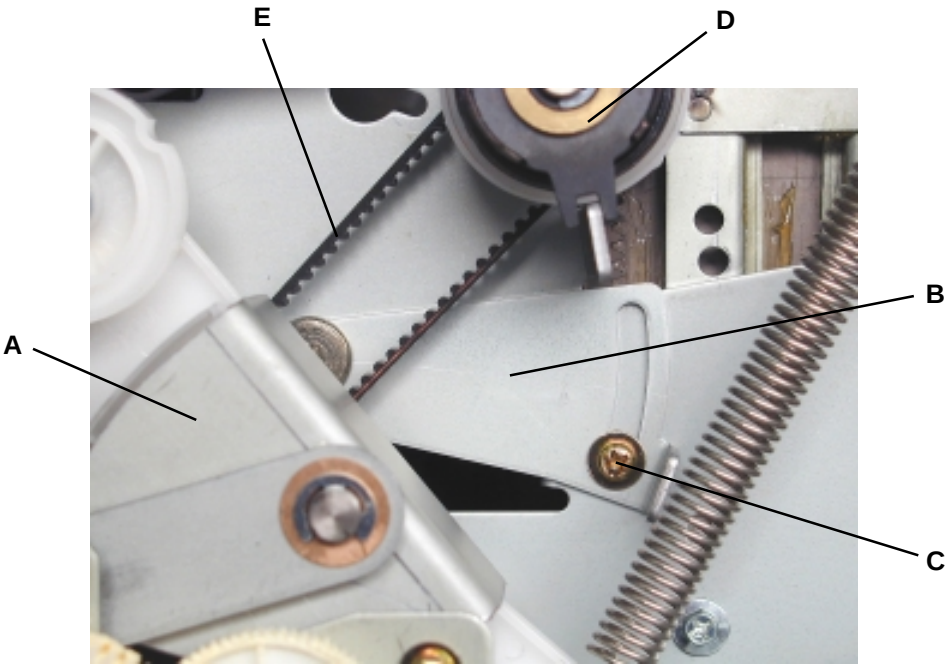
(1) Remove the rear cover.

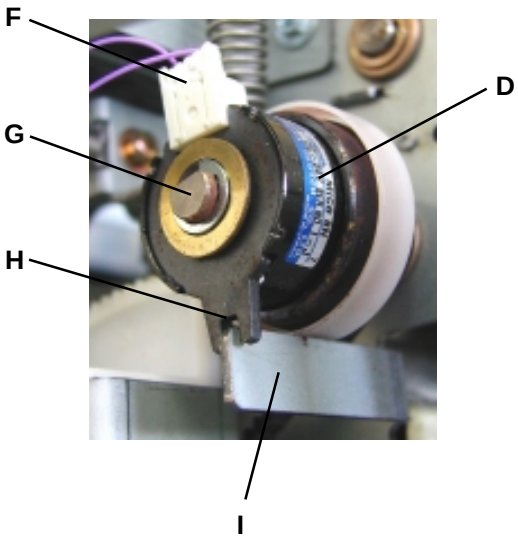
(2) Loosen the retaining screw [C] on the Paper timing belt tension bracket [B], and reduce the tension on the Paper feed timing belt [E].

(3) Unplug the connector [F], remove the E-ring, and remove the Paper feed clutch [D].

[Precautions on Reassembly]

- Align the flat face of the Pickup roller shaft [G] with that on the Paper feed clutch [D].
- Engage the slot [H] on the clutch with the clutch lock plate [I] on the machine to prevent the paper feed clutch unit from rotating.





A: Timing gear
B: Timing belt tension bracket
C: Retaining screw
D: Paper feed clutch
E: Paper feed timing belt
F: Connector
G: Pickup roller shaft
H: Paper feed clutch slot
I: Clutch lock plate

6. Removing the Pickup Roller Shaft Ass'y

(1) Remove the covers.
- Rear cover
- Master-removal lower cover

(2) Remove the pickup and scraper rollers.

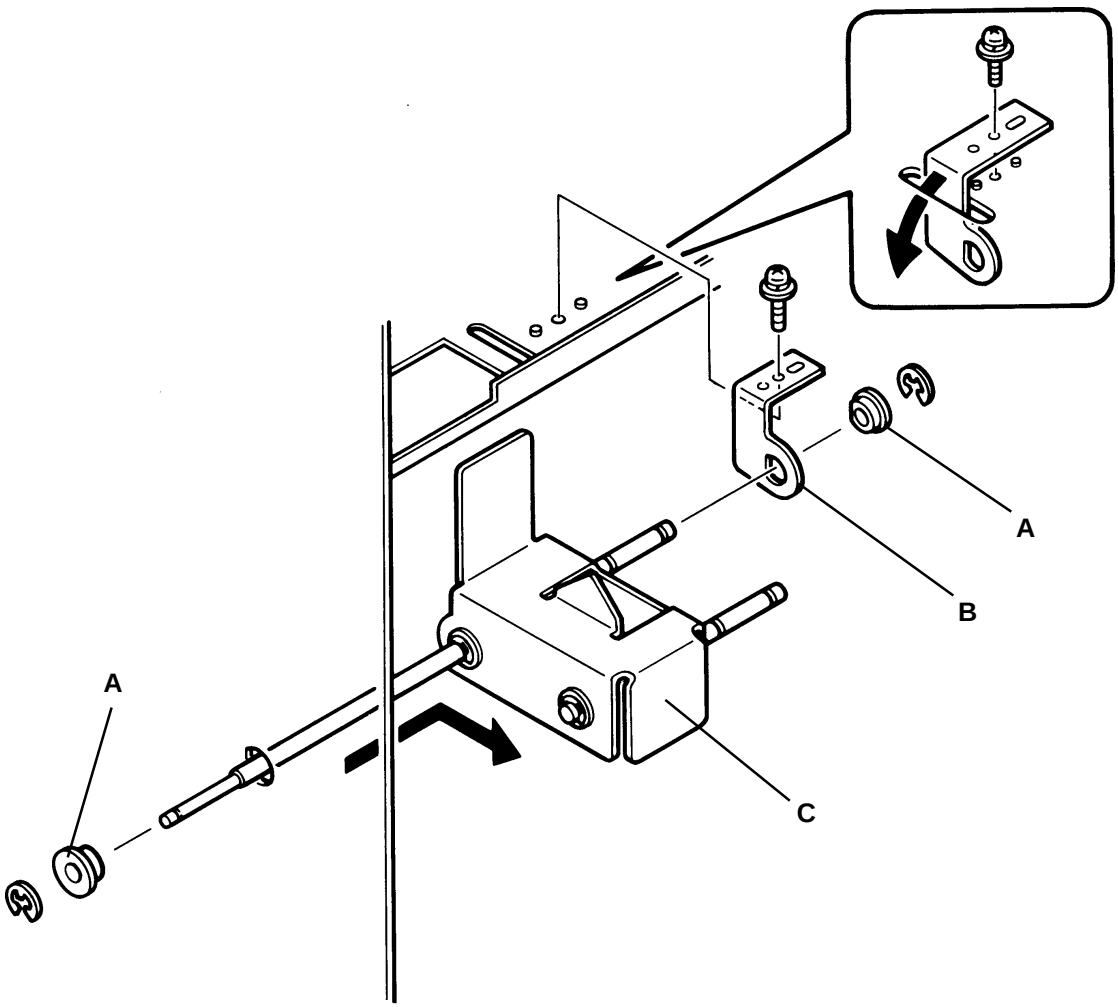
(3) Remove the upper limit sensor.

(4) Remove the paper feed clutch.

(5) Remove the E-rings and bearing bushes [A] on either end of the Pickup roller shaft.

(6) Remove the mounting screw (4 x 8: 1 pc) on the shaft bracket [B], remove the bracket, and then remove the Pickup roller shaft ass'y [C] towards you.

[Precautions on Reassembly]
- Adjust the position of the upper limit sensor.



A: Bearing bush
B: Shaft bracket
C: Pickup roller shaft ass'y

7. Removing the Elevator Motor

(1) Lower the paper feed tray fully, switch off the power, and pull out the print drum.

(2) Remove the covers.

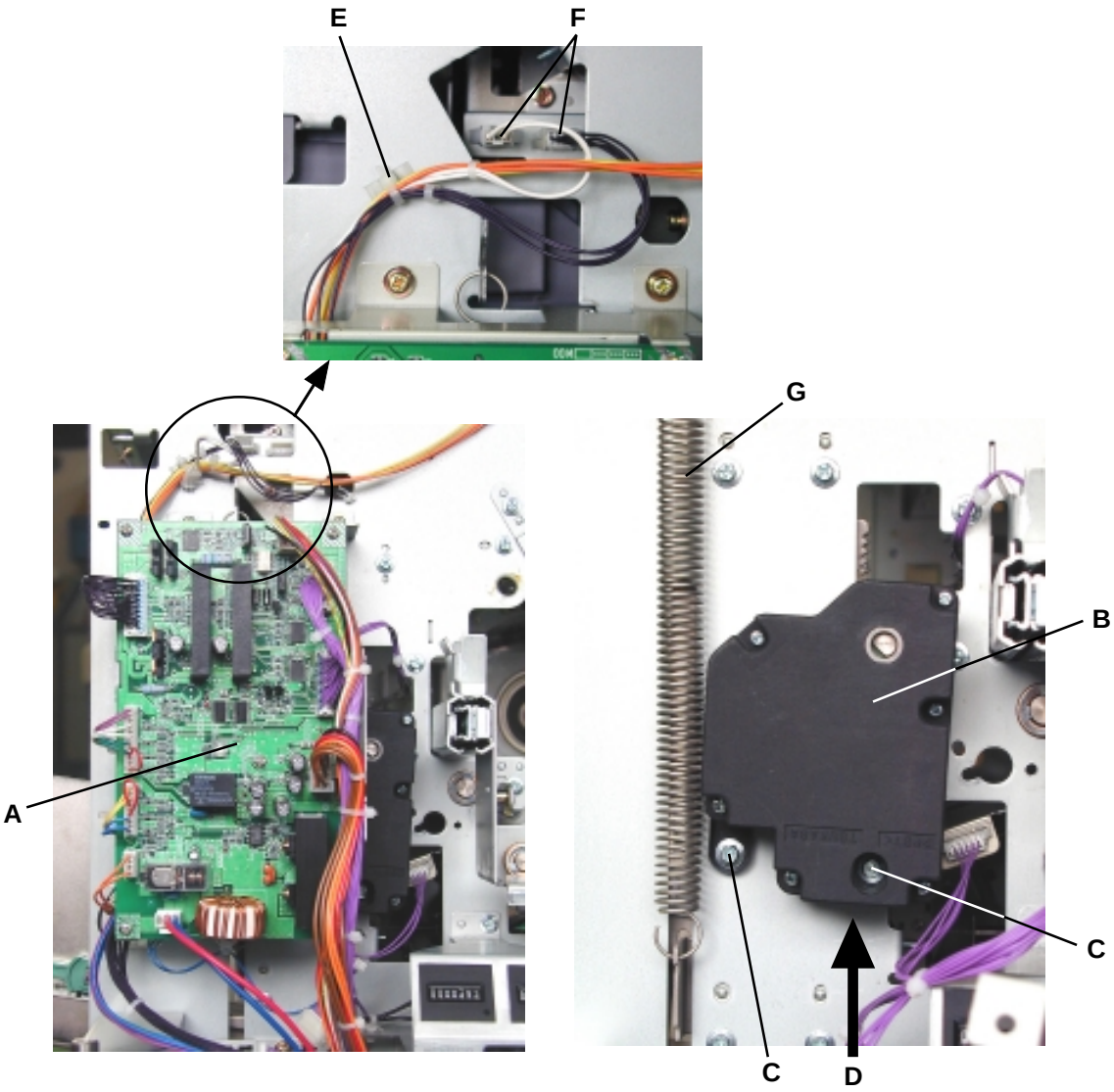
- Front door
- Front cover
- Master-removal lower cover

(3) Squeeze the wire harness band [E] from the inside, detach from the side frame, and then unplug the two connectors [F] of the Master removal unit.

(4) Remove the mounting screws (M4 x 6: 4 pcs), and hang free the Drive PCB [A] together with its mounting bracket.

(5) Remove the Elevator springs [G] from both sides of the Paper feed tray to prevent the tray from springing up.

(6) Remove the mounting screws (M4 x 8: 2 pcs), unplug the connector [D] of the Elevator motor [B], and remove the Elevator motor [B].



A: Drive PCB
B: Elevator motor
C: Mounting screw
D: Connector of elevator motor
E: Wire harness band
F: Connector of master removal unit
G: Elevator spring

8. Removing the Paper Feed Tray Lower Safety Switch

(1) Remove the screws (Shoulder screw, M4 x 30: 2 pcs), securing the printer to the Risograph stand.

(2) Remove the rear cover.

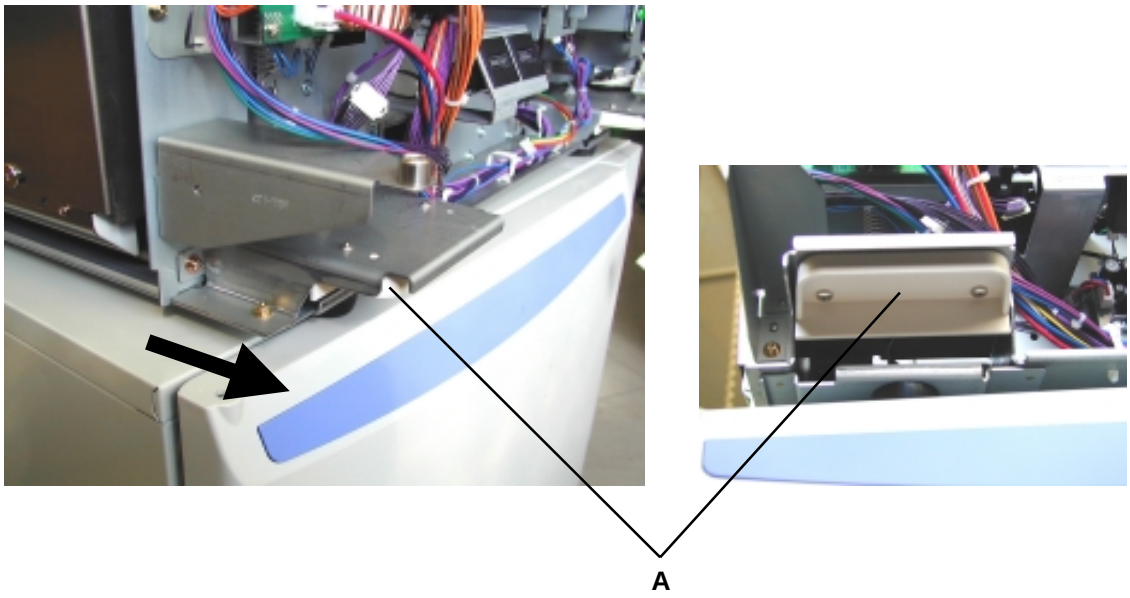
(3) Slide out the machine from the Risograph stand (in the direction shown by the arrow in the photograph) far enough to allow a screwdriver to be inserted in the mounting screws on the Grip handle [A]. Make sure that the rubber feet do not slip off the Risograph stand.

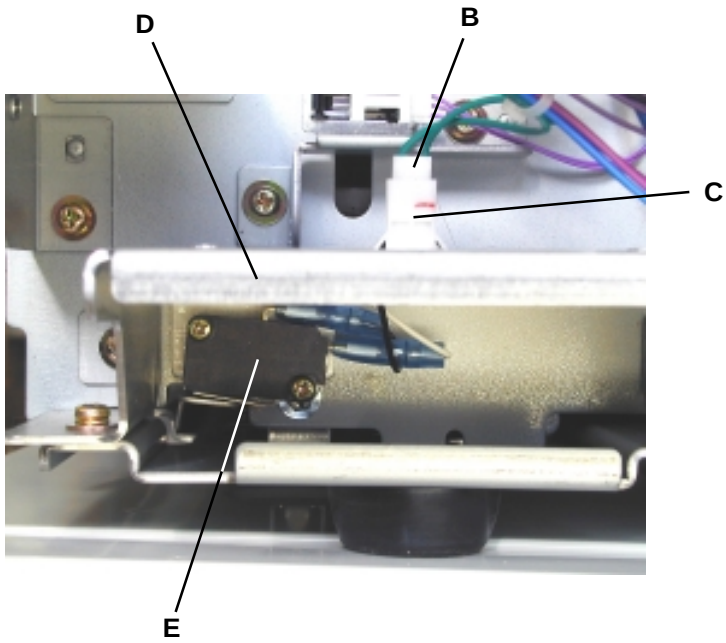
(4) From underneath the machine, remove the mounting screws (M4 x 8: 2 pcs), and remove the Grip handle [A].

(5) Unplug the top connector [B].

(6) Unplug the bottom connector [C] from the stay [D].

(7) Remove the mounting screws (M3 x 14: 2 pcs), and remove the Paper feed tray lower safety switch [E].





A: Grip andle
B: Top connector
C: Bottom connector
D: Stay
E: Paper feed tray lower safety switch

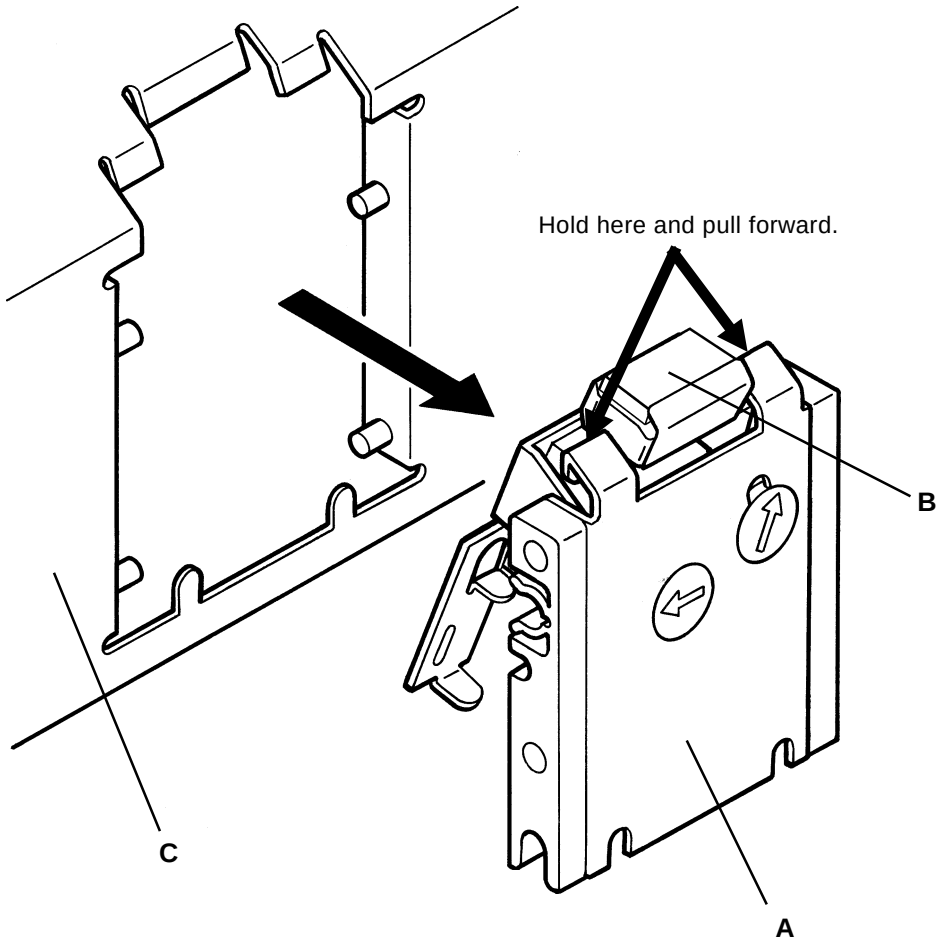
9. Removing the Stripper Unit

(1) Lower the paper feed tray fully.

(2) Place a finger on the top of the Stripper unit [A] and pull it forward to remove it.

[Precautions on Reassembly]

- Set the Stripper pad ass'y [B] in the Paper guide plate [C] while it is pushed down.
- Adjust the stripper pressure and stripper angle.



A: Stripper unit
B: Stripper pad ass'y
C: Paper guide plate

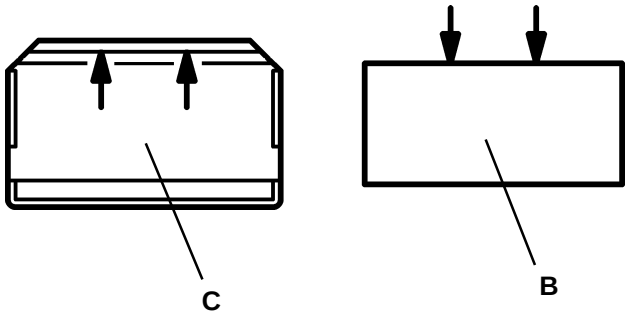
10. Removing the Stripper Pad Ass'y

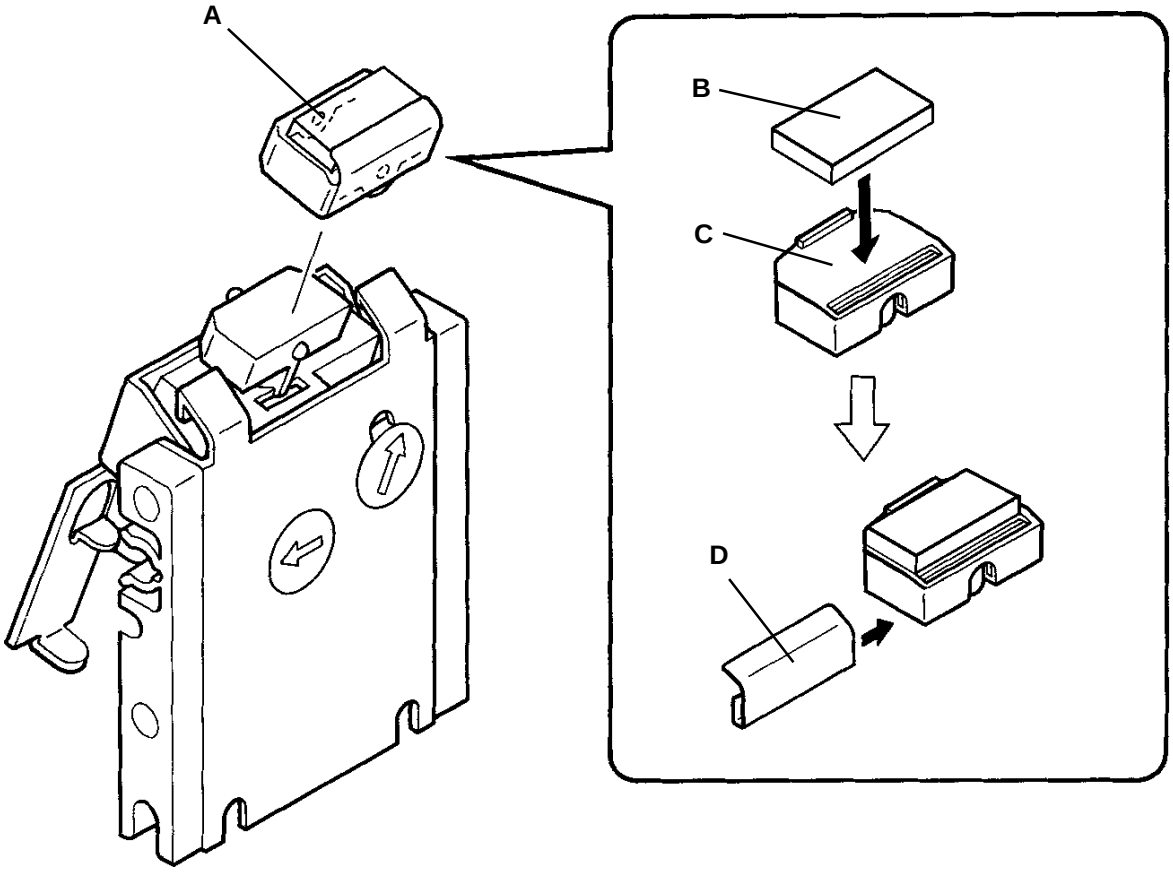
(1) Lower the paper feed tray fully, and remove the stripper unit.

(2) Lift up the Stripper pad ass'y [A] by hand and remove it.

[Precautions on Reassembly]

- Attach the Stripper pad [B] by pushing the face indicated by arrow against the face indicated by arrow on the Stripper pad base [C].





A: Stripper pad ass'y
B: Stripper pad
C: Stripper pad base
D: Stripper pad cover

Adjustment

1. Upper Limit Sensor Position Adjustment

Procedure

(1) Remove the paper on the paper feed tray.

(2) Start test mode No. 453 (elevator servo) and raise the paper feed tray and bringing it to a complete stop.

(3) Once it is stopped, check that the gap between the Pickup roller [C] and the Paper feed tray [E] is 1.0 mm ±0.3 mm.

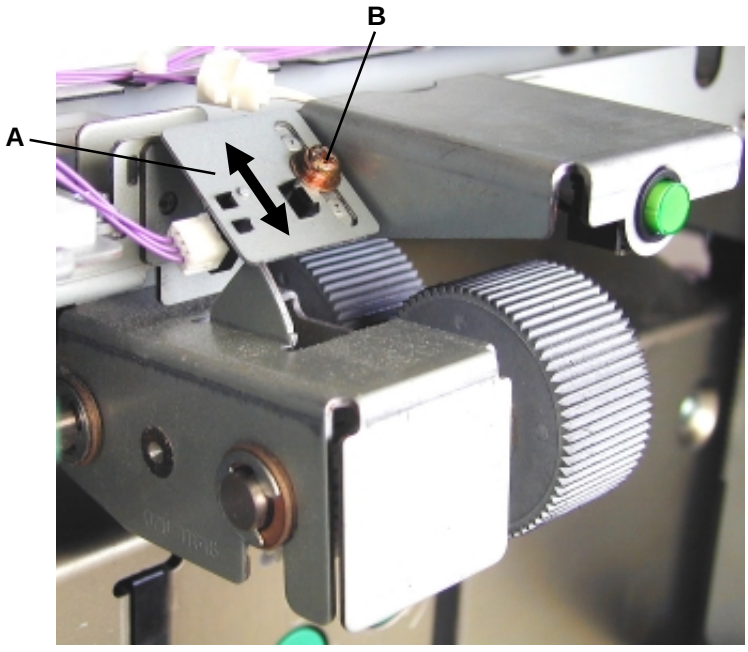
(4) If the gap is not within the specifications, detach the master removal box and remove the Master-removal lower cover.

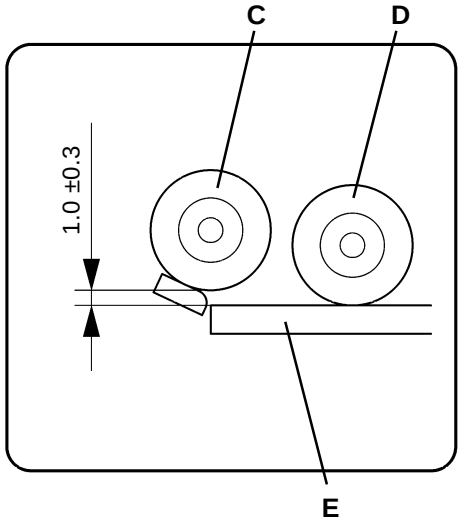
(5) Loosen the mounting screw [B] on the Upper limit sensor bracket [A], and adjust by sliding the upper limit sensor up or down.

Symptoms

If the upper limit sensor is positioned too high, the paper-feed pressure is increased and multiple sheet feeding is more likely to arise.

Conversely, if it is positioned too low, the paper-feed pressure is reduced and non-feeding is more likely to arise.





A: Upper limit sensor bracket
B: Upper limit sensor bracket mounting screw
C: Pickup roller
D: Scraper roller
E: Paper feed tray

2. Stripper Unit Adjustment

Procedure

(1) Slide the Paper feed pressure adjust lever to suit the paper type before printing.

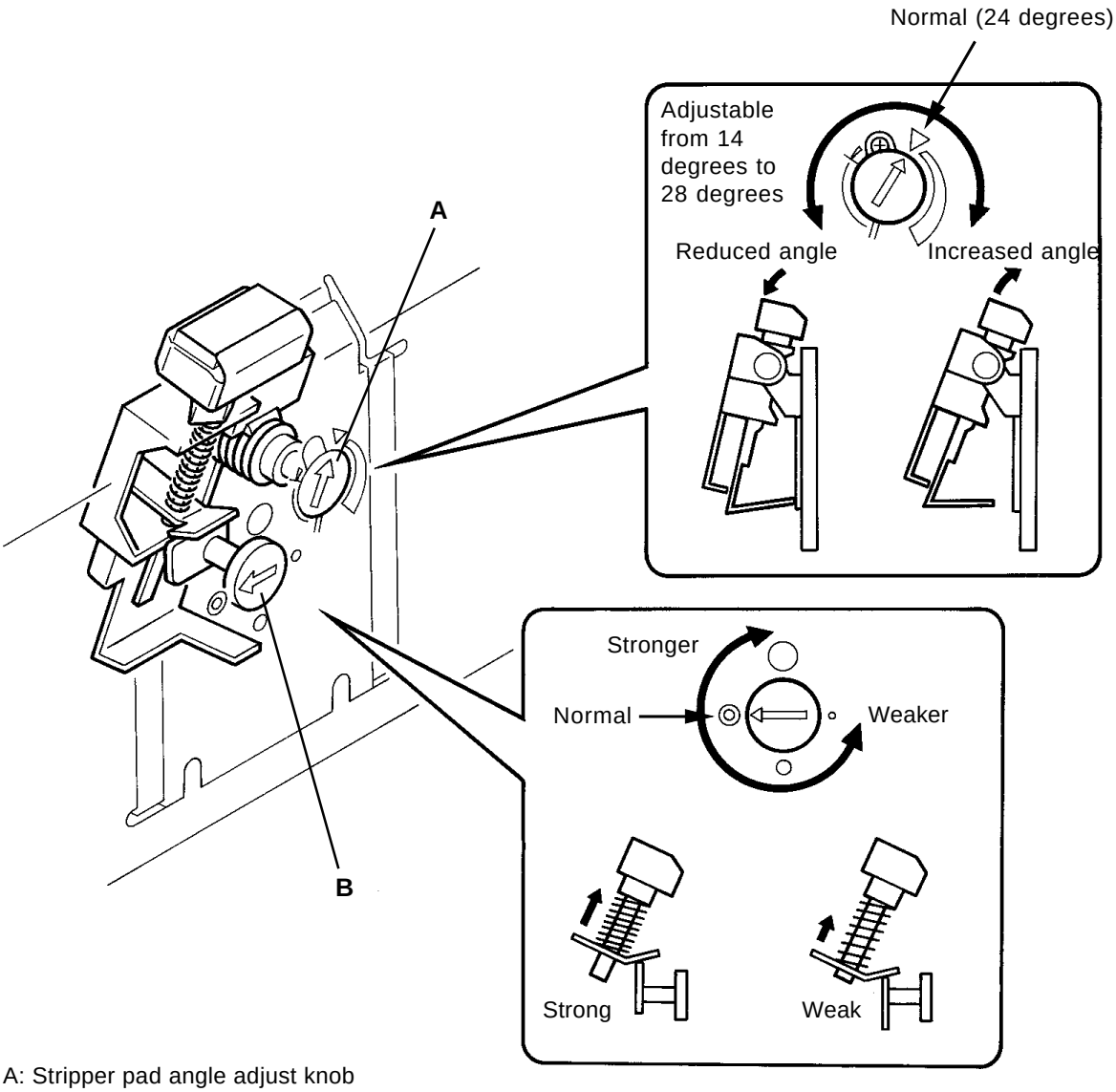
(2) If multiple feeding or non-feeding occurs, adjust the stripper-pad angle and pressure.

1) Multiple feeding

- Turn the Stripper pad angle adjust knob [A] clockwise to increase the stripper-pad angle (raise the pad more vertically).
- Turn the Stripper pressure adjust knob [B] clockwise to increase the stripper pressure.

2) Non-feeding

- Turn the Stripper pad angle adjust knob [A] counter-clockwise to reduce the stripper-pad angle (lower the pad more horizontally).
- Turn the Stripper pressure adjust knob [B] counter-clockwise to reduce the stripper pressure.



A: Stripper pad angle adjust knob

B: Stripper pressure adjust knob

3. Paper-Feed Clutch “ON” Timing Adjustment

Check and adjustment procedure

(1) Test print to check that paper is fed smoothly.

(2) If the first stage paper feed timing is not synchronized, adjust using test mode No. 481 (paper-feed-clutch activation drum angle adjustment). (For the setting procedure, refer to Chapter 16: Test Modes.)

(3) Repeat from step (1) until correct timing is achieved.

Symptoms

If the first stage paper feed timing is not synchronized, paper jamming or inconsistent print registration may occur.

4. Paper-Feed Clutch “OFF” Timing Adjustment

Check and adjustment procedure

(1) Test print to check that printing is performed smoothly.

(2) If the paper is excessively or insufficiently buckled and printing is not performed smoothly, run test modes No. 482–485 (paper-feed-clutch deactivation drum angle adjustment) according to the user’s paper selection setting. (For the setting procedure, refer to Chapter 16: Test Modes.)

(3) Repeat from step (1) until correct timing is achieved.

Symptoms

If the paper is excessively or insufficiently buckled, paper may not be fed to the second stage and paper jamming may occur.