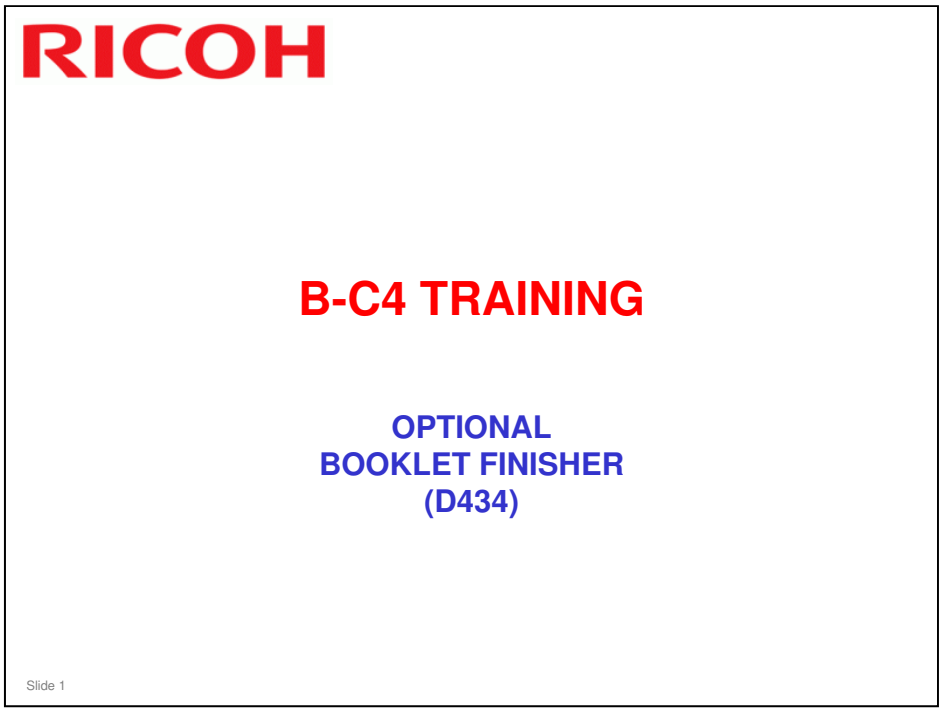


- This finisher is based on the B830 (Victoria) finisher, but there is a booklet folding mechanism that is similar to the D373 (Euphrates) finisher.
  - There are some differences. A top fence has been added, and the roller mechanism has changed.
- The punch unit is also similar to the Euphrates punch unit.
- The pre-stack mechanism is different from previous finishers.

Specifications

- **Capacity**
  - 2500 sheets
- **Paper Size, Weight**
  - Depends on selection of punch/staple modes
- **Capacity**
  - Depends on copy paper size, and number of pages per set if stapling or z-folding is done
- **Stapling: 64 – 90 g/m² (64-105 g/m² for z-folding)**
- **Stapler Stack Size**
  - Depends on paper size
- **Stapling Modes: 4**
- **Staple Replenishment**
  - Cartridge (5,000 staples/cartridge)

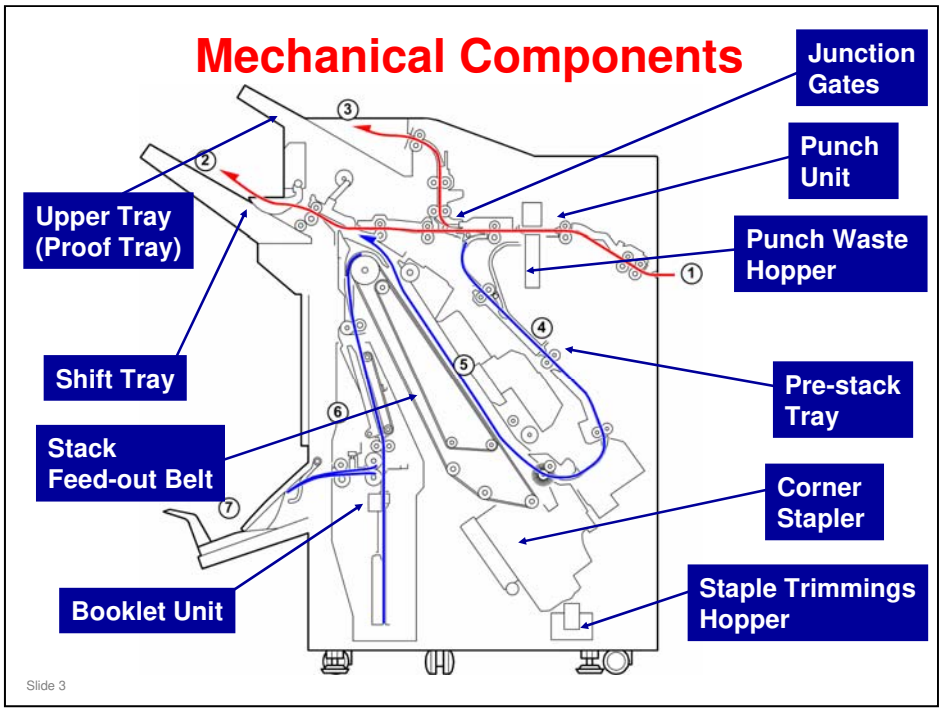
Slide 2

Stapler Stack Size

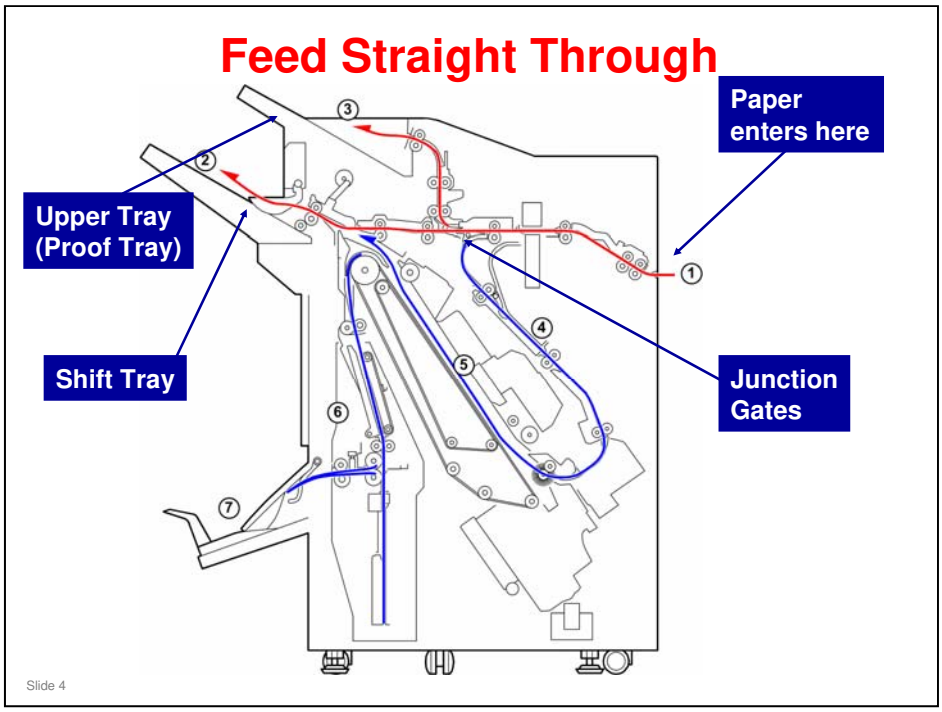
- This is less for larger paper, because the paper stack weighs more, and the motor may not be able to feed out a large stack of A3 paper.

Others

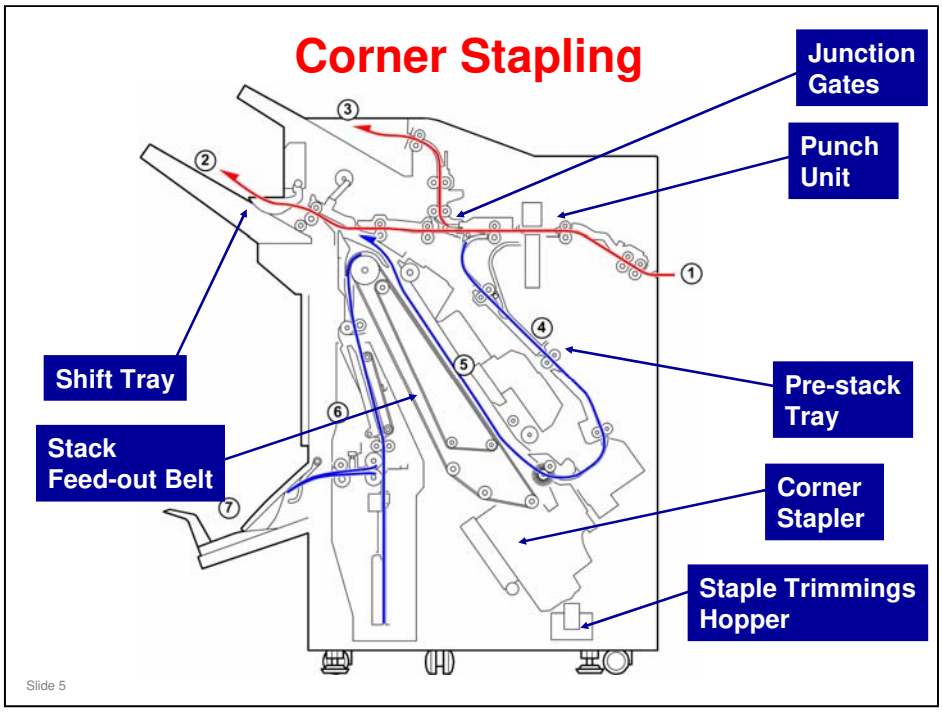
- There are three separate punch units: 4-hole, 2- or 3-hole, 2- or 4-hole.
  - The punch hole position up and down the page (sub scan direction) can be adjusted by a user or a 'super user', or by a technician in SP mode. The position across the page can only be adjusted by a technician (mechanical adjustment).
  - The user can adjust the number of punch holes, if the punch unit has more than one type of punching.
  - Note that small paper sizes cannot be punched. This is because these sizes are too narrow for all the holes to fit on the paper (some hole punches will miss the paper).
- Stapling is not done for feed-out to the upper tray.
- A5 and HLT cannot be stapled. This is a mechanical limitation of this machine.



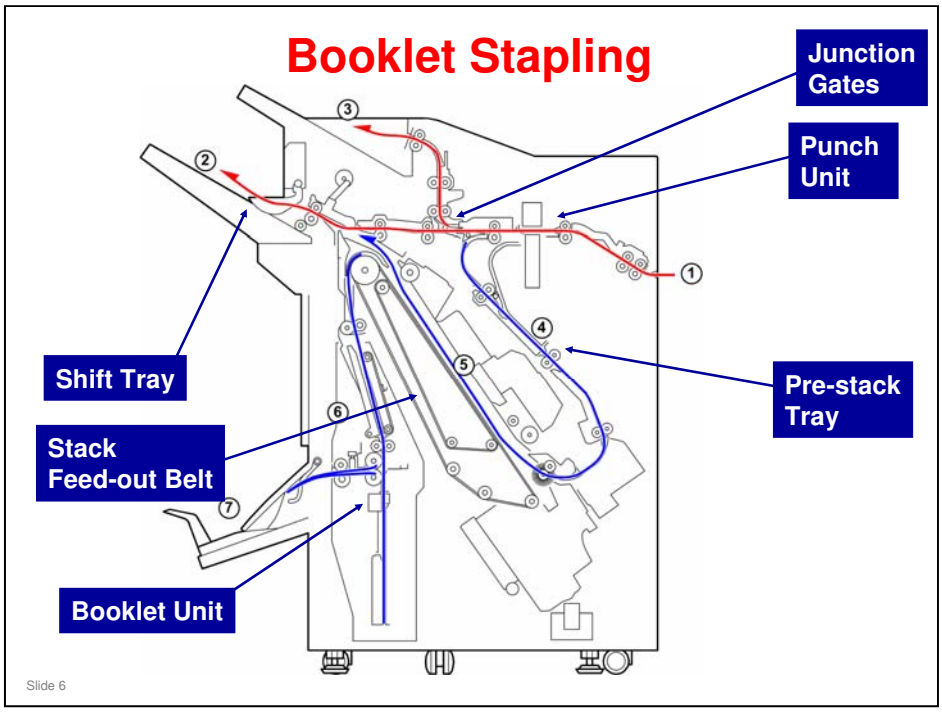
No additional notes



- Shift Tray: All junction gates remain closed
- Proof Tray: Proof tray junction gate opens



- The staple tray junction gate opens and guides the paper down to the pre-stacker.
- Paper (up to 5 sheets) is held in the pre-stacker long enough for the downstream stack to be stapled.
- The paper enters the corner stapling unit where it is aligned (by the top fence, bottom fence, and side fences) and then stapled.
- The feed-out belt raises the stack. The exit rollers feed the stack onto the shift tray.



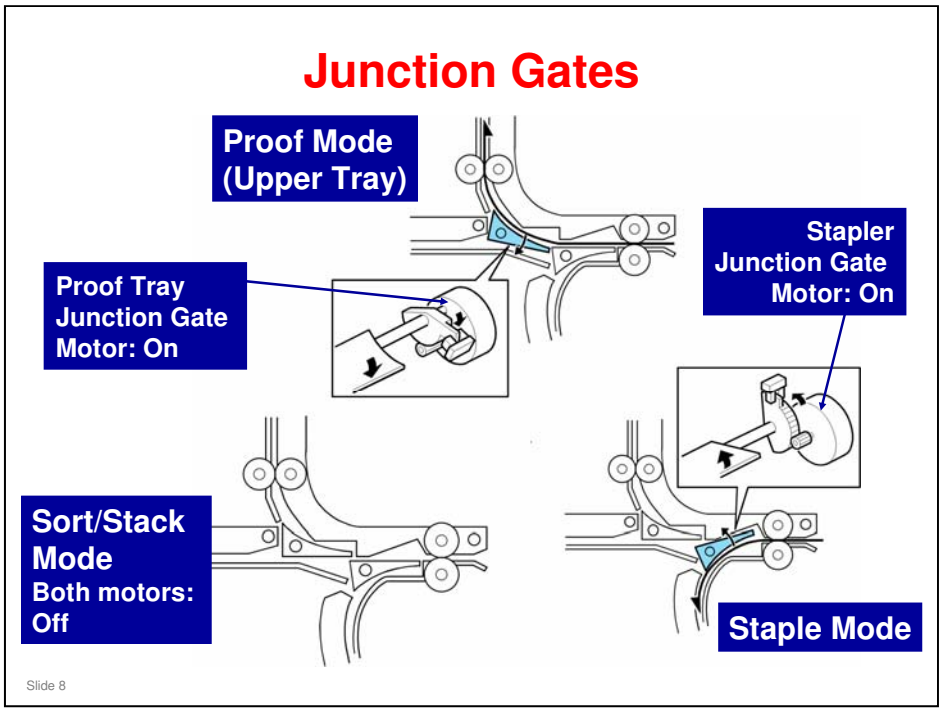
- The staple tray junction gate opens and guides the paper down to the pre-stacker.
- Paper (up to 5 sheets) is held in the pre-stacker long enough for the downstream stack to be stapled.
- The paper enters the corner stapling unit where it is aligned (by the top fence, bottom fence, and side fences), but not stapled.
- The feed-out belt raises the stack.
- The stack junction gate opens and guides to the stack to the booklet unit.
- The booklet unit staples and folds the paper in the center. The booklet unit exit rollers feed the paper onto the booklet tray.

Junction Gates

- **There are two junction gates.**
- **The junction gates send paper to three locations:**
  - Upper tray (proof tray)
  - Stapler
  - Shift Tray (Sort/Stack mode, no stapling)
- **Two motors control the junction gates.**
  - Motors are used because of the high speed of paper feed.

Slide 7

No additional notes



- Upper Tray (no sorting, stacking, or stapling): The stapler junction gate motor remains off and the proof tray junction gate motor turns on. The copies go up to the upper tray.
- Sort/Stack: The proof tray junction gate motor and the stapler junction gate motor remain off. The copies are sent to the shift tray directly.
- Staple: The stapler junction gate motor turns on. The copies go downwards to the jogger unit.

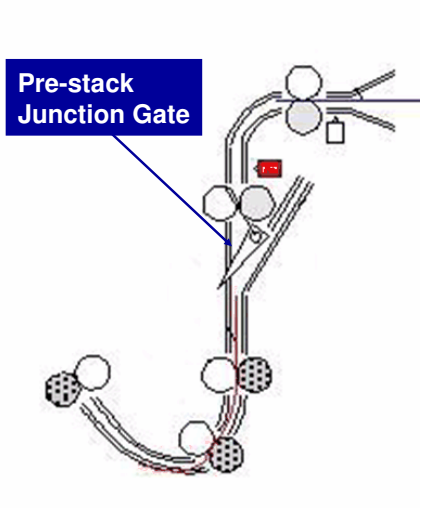
Pre-stack Tray

- This mechanism holds the first six sheets of a job while the previous set is being stapled.
- It is only needed during the second and subsequent sets of a multi-set copy job.
- Pre-stacking can be done for all paper sizes.
- There is an SP to disable pre-stacking.
  - SP6213: There are settings for every paper size.

Slide 9

No additional notes

Pre-stacking – A4 or Smaller (1)

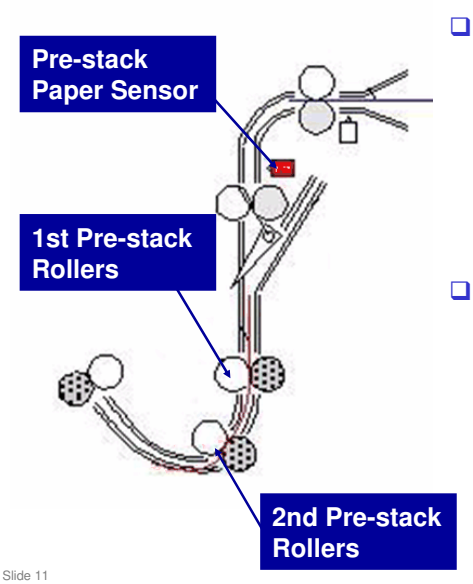


- **The first sheet (red line in the drawing) is directed into the pre-stack paper path by the staple junction gate (not shown here).**
- **The sheet brushes past the spring loaded pre-stack junction gate.**
  - The weight of the paper allows it to push past the junction gate, and then the spring attached to the gate pulls it closed.

Slide 10

No additional notes

Pre-stacking – A4 or Smaller (2)

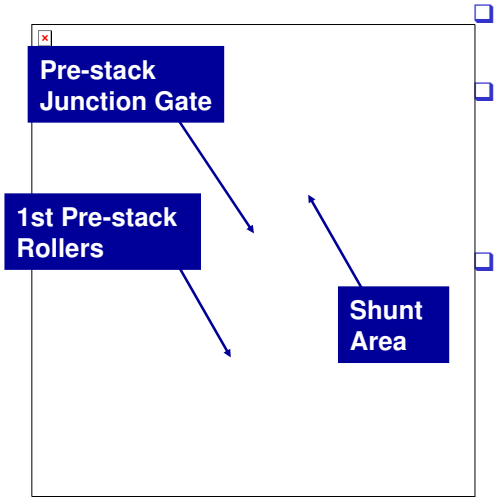


- **The pre-stack paper sensor detects each sheet of paper that enters the pre-stack paper path.**
  - This sensor controls the timing for forward and reverse feed during stacking.
- **The pre-stack motor turns the 1st and 2nd pre-stack rollers to feed the leading edge of the paper the correct distance.**

Slide 11

No additional notes

Pre-stacking – A4 or Smaller (3)

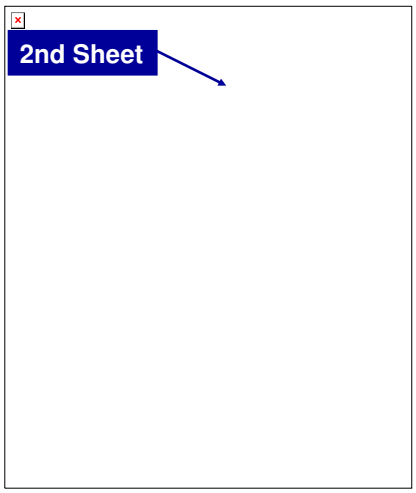


- The motor stops, then reverses.
- The rollers feed the paper under the pre-stacker junction gate and into the shunt of the pre-stacker unit
- The leading edge of the paper stops at the nip between the 1st pre-stack rollers

Slide 12

No additional notes

Pre-stacking – A4 or Smaller (4)

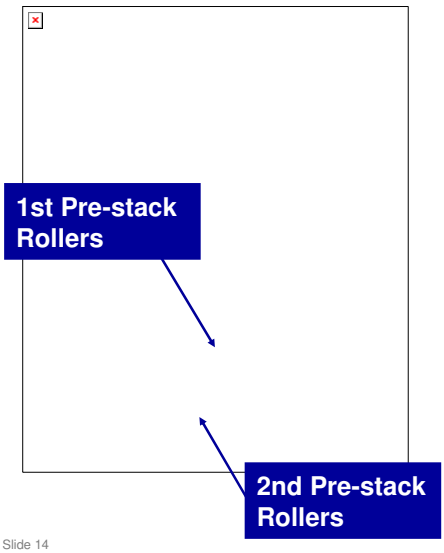


- Next, the 2nd sheet (blue line in the drawing) feeds.

Slide 13

No additional notes

Pre-stacking – A4 or Smaller (5)

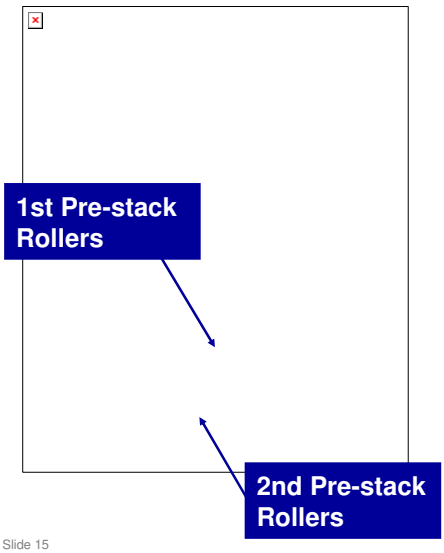


- When the 2nd sheet reaches the 1st pre-stack rollers, the pre-stack roller motor switches on and the 1st and 2nd sheets feed together.

Slide 14

No additional notes

Pre-stacking – A4 or Smaller (6)

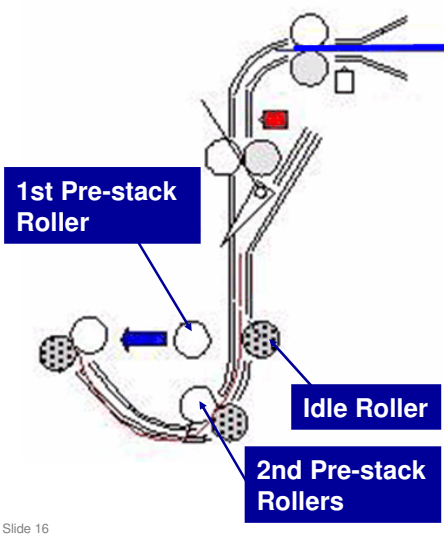


- **The pre-stack motor reverses again and both sheets are fed up into the shunt.**
- **This cycle can repeat up to 5 times until finally, after one additional sheet feeds, all 6 of the sheets are fed together to the corner stapler.**
  - Up to 4 sheets are held in the pre-stack unit for stapling at one corner.
  - Up to 5 sheets are held in the pre-stack unit for stapling at two places on the edge of the stack.

Slide 15

No additional notes

Pre-stacking – B4 or Larger (1)

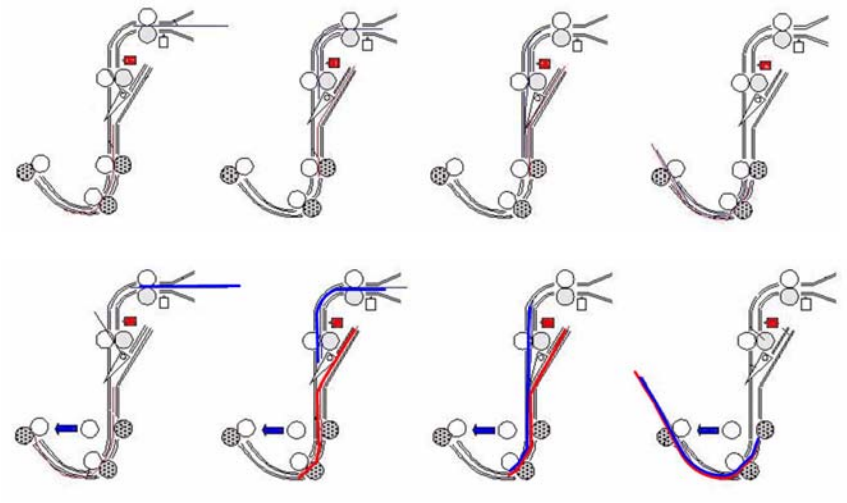


- Before large paper sizes are fed in staple mode, the pre-stack release motor switches on and pulls the drive roller of the 1st pre-stack roller pair away from its idle roller.
- During forward and reverse feeding, the pre-stack motor drives the 2nd pre-stack rollers, and feeds the paper only as far as the nip of the 2nd pre-stack rollers.
  - The nip of the 1st pre-stack rollers remains open.

Slide 16

- The sequence of events in the pre-stacker unit for large paper sizes is the same as that for A4 and smaller sizes, with one important exception, as explained above. Reverse feeding the leading edges only as far as the 2nd pre-stack rollers saves time.
  - Reverse and forward feeding the leading edges as far as the 1st pre-stack rollers would require more time.

Pre-stacking – Comparing the Two Methods



Slide 17

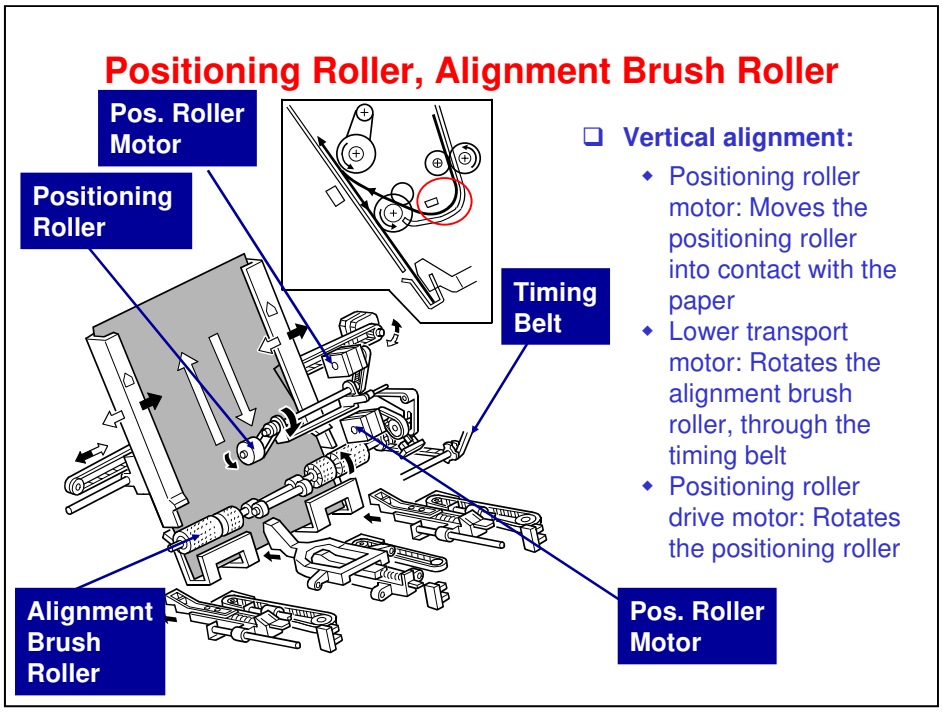
- The upper diagram shows pre-stack tray operation for A4 or smaller.
- The upper diagram shows pre-stack tray operation for B4 or larger. Note that the 1st pre-stack roller has moved away from its idle roller.

Aligning the Sheets Before Stapling

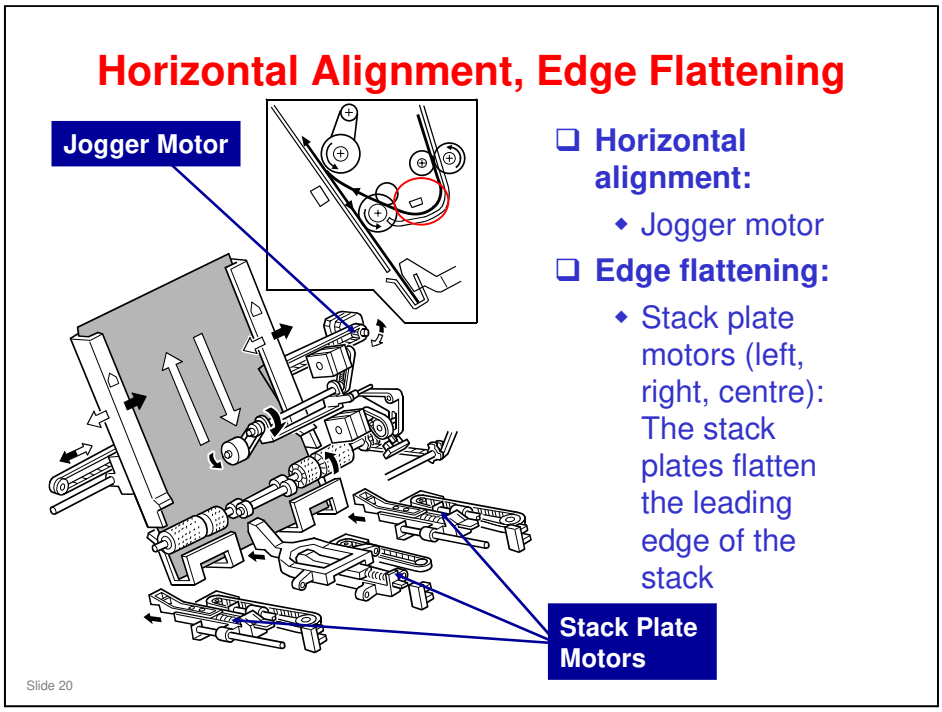
- **Vertical Alignment**
  - Positioning Roller, Alignment Brush Roller
  - Top Fence
  - Bottom Fence
- **Horizontal Alignment**
  - Jogger Fences
- **Edge Flattening (also called 'stack correction')**
  - Left, center, right stack plates

Slide 18

- These mechanisms align the edges of the paper and prepare the stack for stapling.



- After the trailing edge of the copy passes the staple tray entrance sensor (in the red circle), the positioning roller motor pushes the positioning roller into contact with the paper.
- The positioning roller and alignment brush roller rotate to push the paper back and align the trailing edge of the paper against the bottom fence.
- These procedures are done each time paper arrives in the stapler tray.



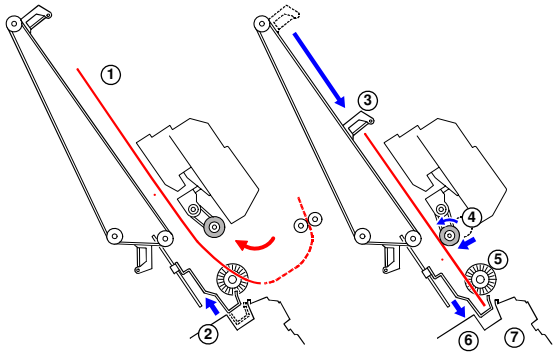
Horizontal Paper Alignment

- When jogging starts, the jogger motor turns on, and the jogger fences move to the wait position (slightly wider than the selected paper size) on both sides.
- When the trailing edge of the paper passes the staple tray entrance sensor (in the red circle), the jogger motor moves the jogger fences closer to the paper.
- Next, the jogger motor turns on, both jogger fences move against the sides of the stack to align it, then the side fences return to the wait position.

Edge Flattening

- After the paper is aligned in the stapler tray, the stack plate motors switch on briefly and drive the front stack, center stack, and rear stack plates against the edge of the stack to flatten the edge completely against the staple tray for stapling.
- When the next copy paper turns on the stapler entrance sensor, the stack plate motors turn on and return to their home positions. The home positions are detected by stack plate HP sensors.
- This procedure is done each time paper arrives in the stapler tray.

Stapling (1)



- 1. Z-folded B4 size only: The bottom fence rises to receive the sheets.
- 2. The top fence moves down to the horizontal position.
- 3. A sheet of paper goes into the stapler tray.
- 4. The positioning roller turns when each sheet is fed to the stapler tray.

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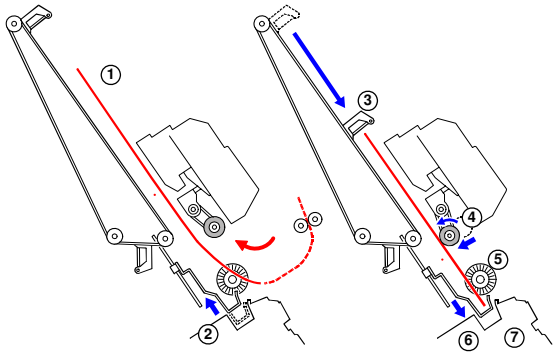
- The top fence operates when all sheets in the set have been fed to the stapler tray, just before stapling is done.
- It also operates each time paper arrives in the stapler tray.
- For z-folded B4 paper, the bottom fence also operates at these times.
- Below is the procedure for a job that includes Z-folded B4 paper.
  - When the first Z-folded B4 sheet comes to the staple tray, the bottom fence goes up to the pre-set position.
  - After all sheets have come to the staple tray, the bottom fence goes down to the stapling position.

Stapling (2)



- 5. Each sheet is fed down against the lower jogger fence to align the bottom edge.
- 6. Z-folded B4 only: The bottom fence motor lowers the aligned stack to the stapling position.
- 7. The corner stapler staples the stack.

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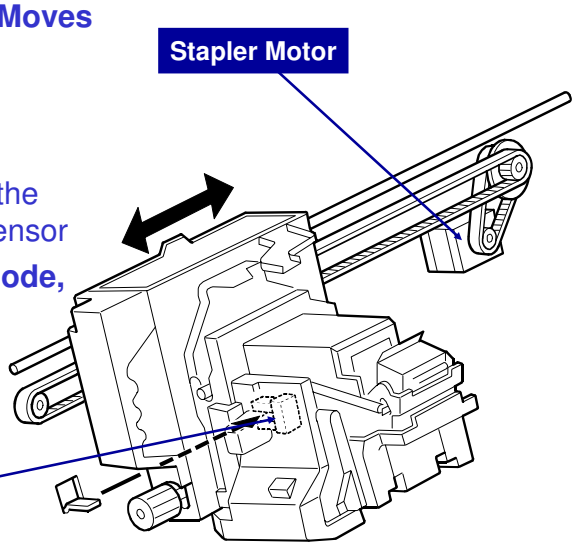
No additional notes

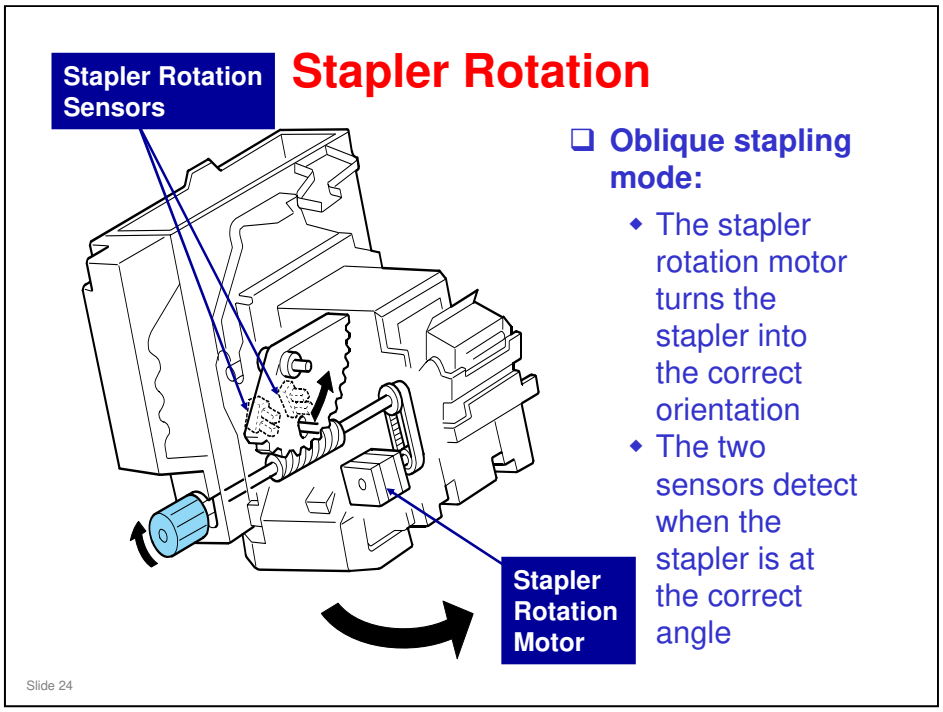
Stapler Side-to-side Movement

- Stapler motor: Moves the stapler
- Moves to home position first
  - Detected by the stapler HP sensor
- In two-staple mode, the rear staple is put in first.



Slide 23

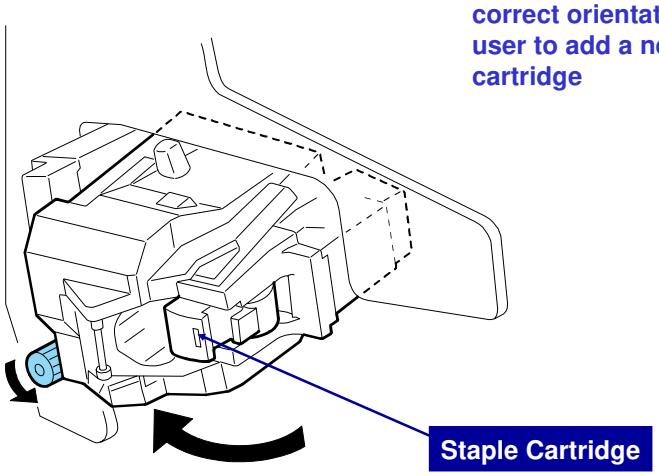
No additional notes



- There are 3 positions: Horizontal, 45 degrees, 75 degrees

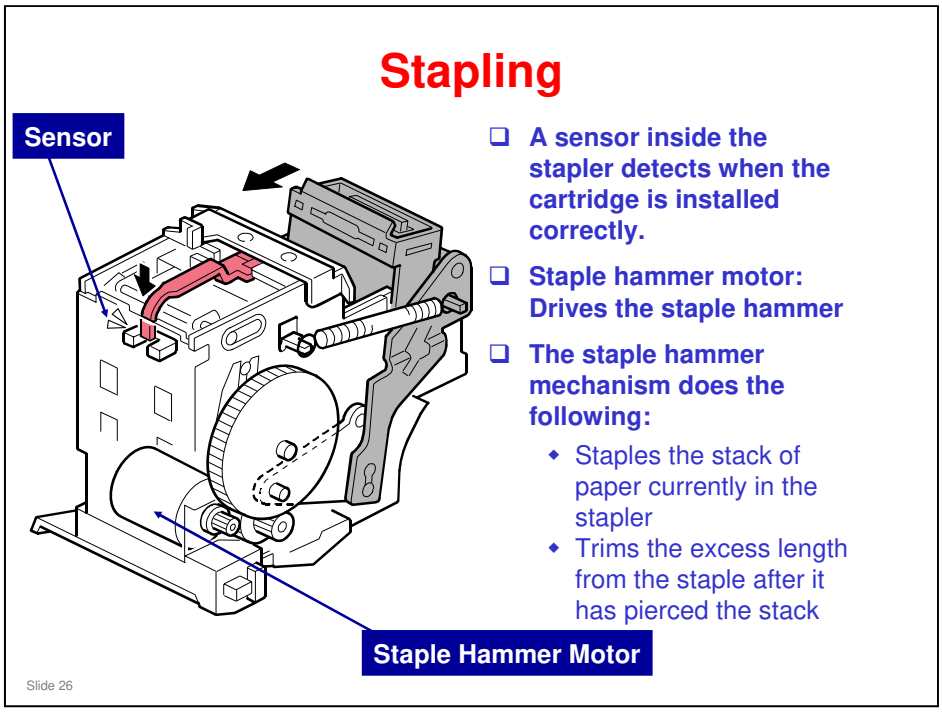
Staple End and Replenishment

- Stapler rotation motor: Turns the stapler into the correct orientation for the user to add a new staple cartridge

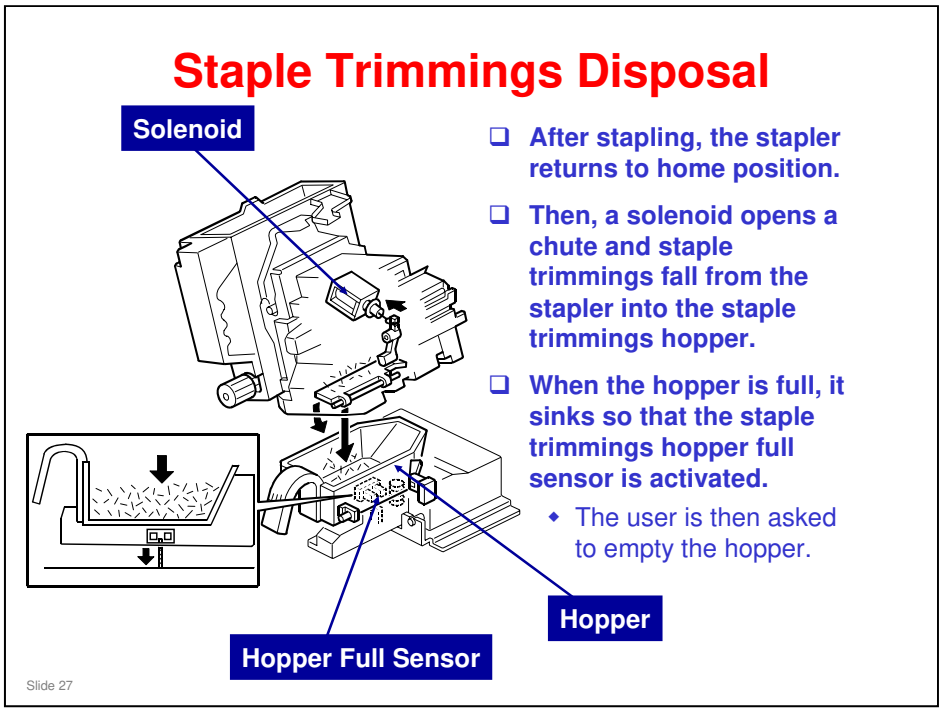


Slide 25

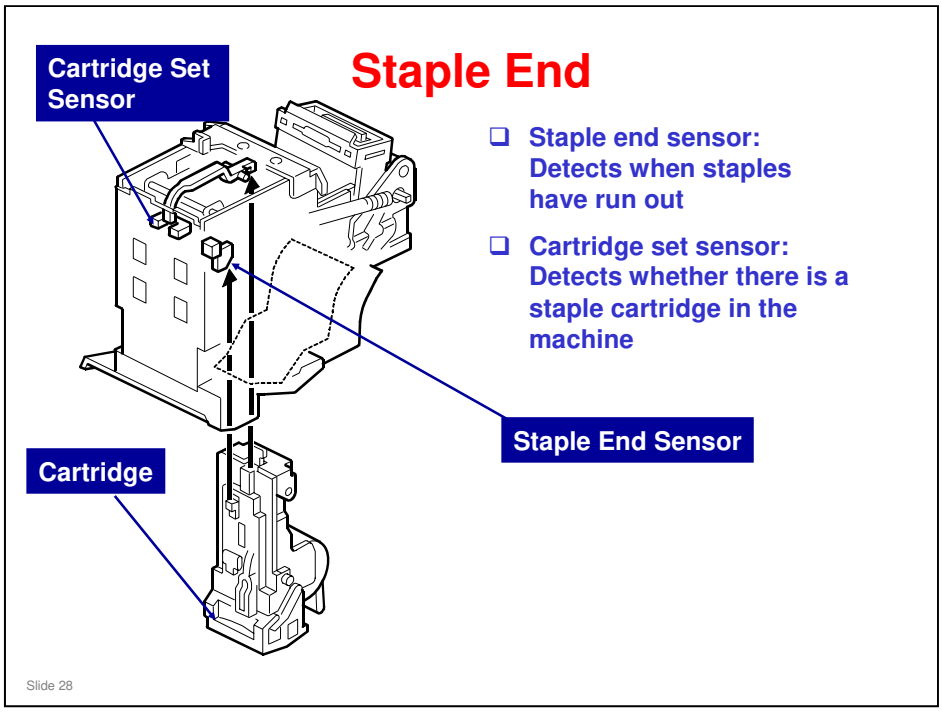
- The stapler does not return to the standby position unless new staples are added. It only returns if the staple end sensor detects new staples.



❒ The staple hammer home position sensor is built into the stapler unit.

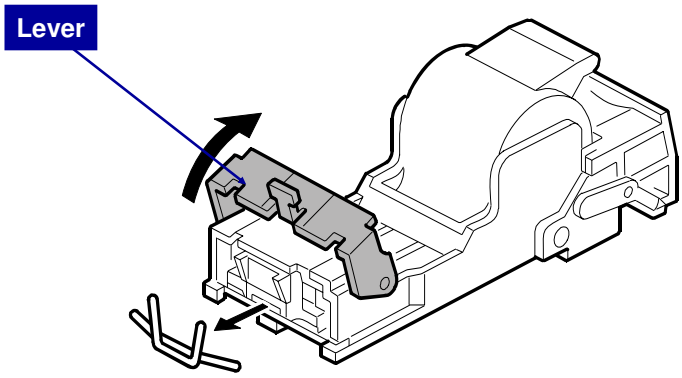


- The chute opens at these times:
  - At the end of each job (as described on the slide)
  - At initialization after start-up



- The staple end switch and cartridge set sensors are built into the stapler unit, so they are not on the component list.
- In a staple end condition, about 20 staples are left, but they can't be fed to the staple hammer.
  - Copying will stop if staples end in the middle of a job.

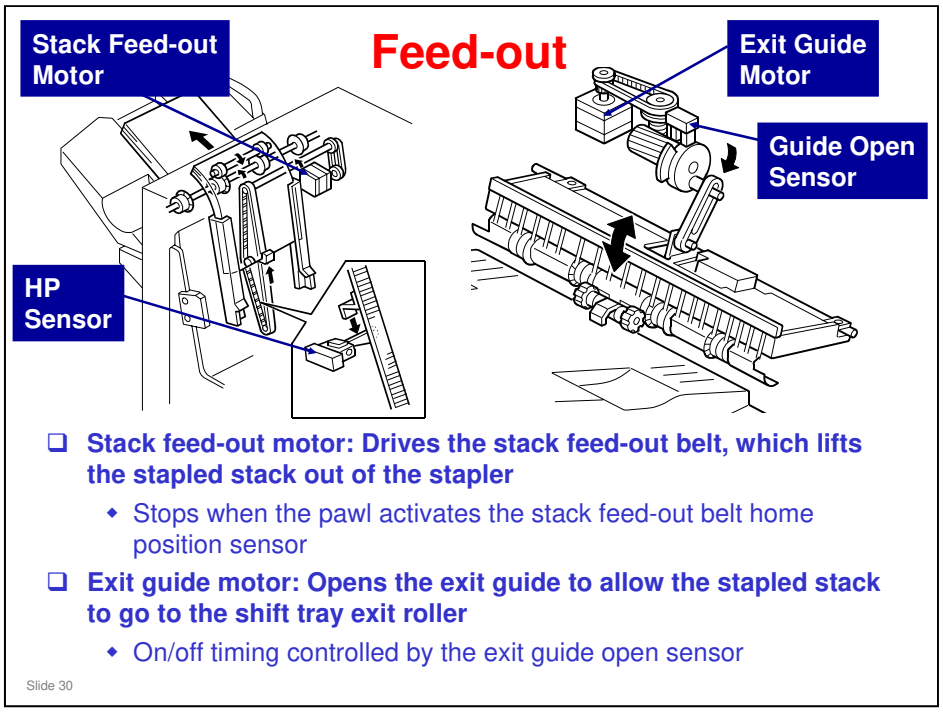
Removing Jammed Staples



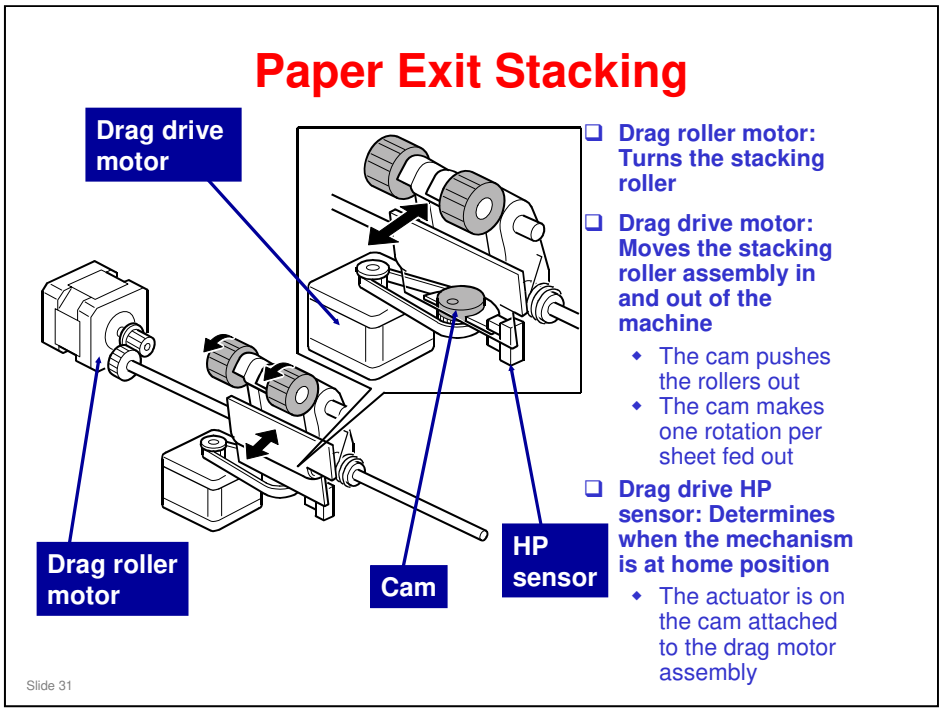
- Lift the lever to remove jammed staples

Slide 29

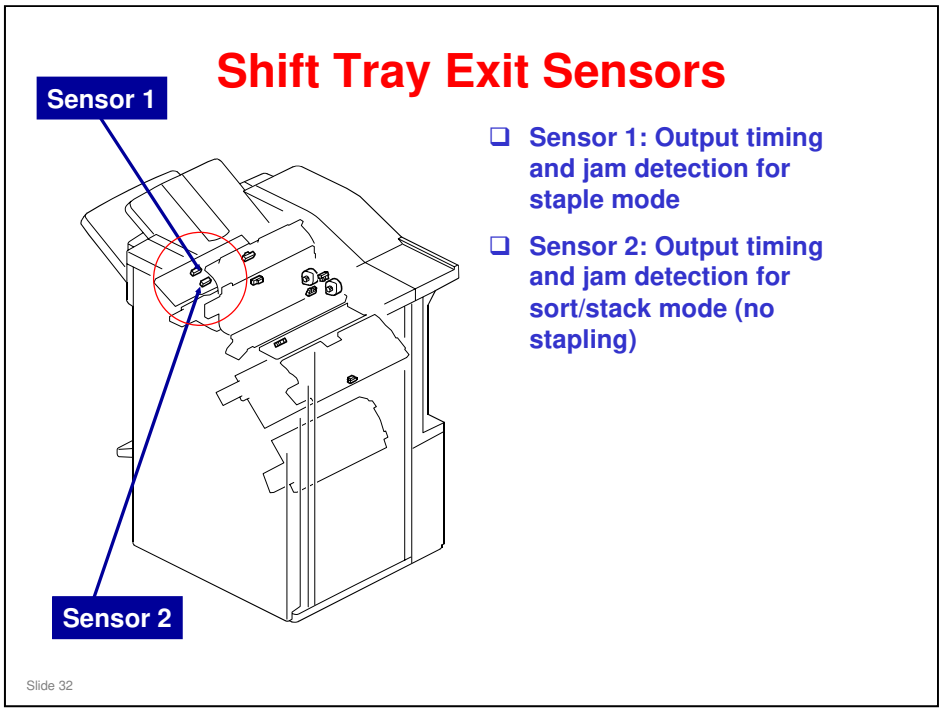
No additional notes



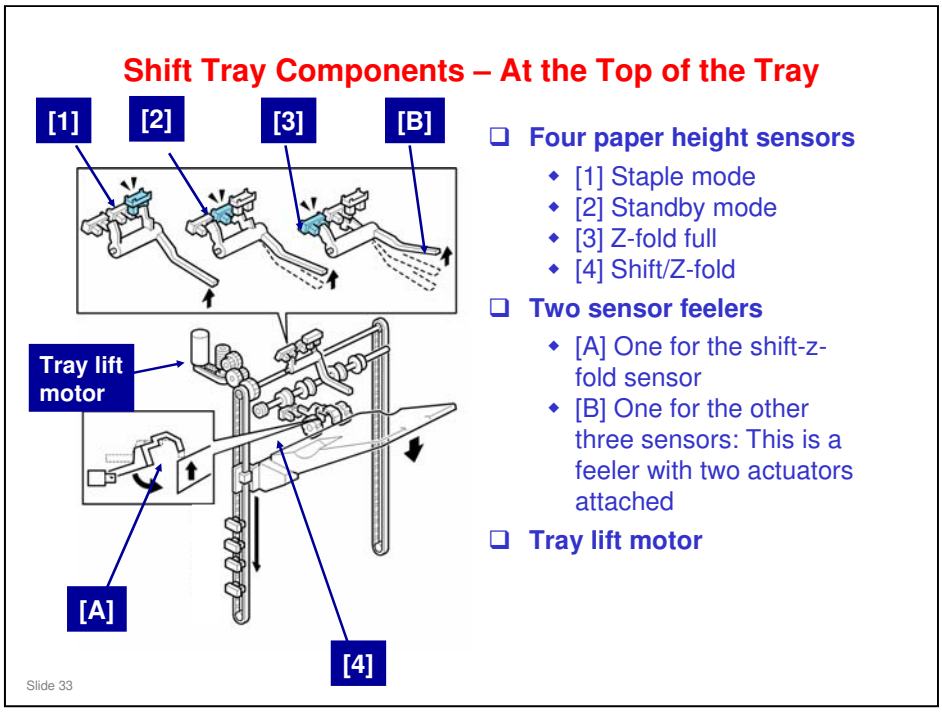
❒ The exit guide opens only for stacks of more than 15 sheets, regardless of paper thickness.



- The drag roller assembly is fastened to a plate on a shaft by a spring.
- The cam, in contact with the bottom of the plate, is connected to the drag drive motor via a timing belt.
- The drag drive motor and timing belt rotate the cam against the bottom of the plate to move the rollers forward and back with each sheet ejected onto the shift tray.
- The drag roller motor drives the shaft that rotates the drag rollers counter-clockwise as the rollers move back. The simultaneous rotation and backward movement of the roller assembly pulls each sheet back toward the copier to align the edges of the stack on the shift tray.
- The actuator is mounted on the cam and rotating with both rotating clockwise, and detects the roller assembly home position when the actuator leaves the drag drive HP sensor and signals the machine that the rollers are at the home position. The machine uses this information to control paper feed timing and confirm that the mechanism is operating correctly. The cam and actuator make one complete rotation for every sheet fed out of the machine onto the shift tray.



No additional notes



- This slide shows the components at the top of the tray that control the up/down movement of the shift tray. There are other components down the side of the tray. See the next slide.

Moving the tray to the standby position

- Just after the machine is switched on, the tray lift motor moves the tray down until the actuator attached to feeler [B] leaves sensor [2].
- Then the motor moves the tray up until the actuator enters sensor [2]. This is the standby position.

Operation in shift mode (sorting and stacking, no stapling)

- When the thickness of the stack on the tray increases, feeler [A] pushes the actuator into sensor [4].
- The tray lift motor then moves the tray down until the actuator goes out of the sensor.

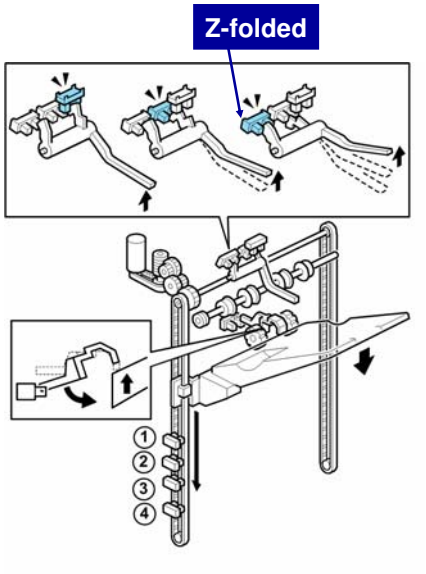
Operation in staple mode

- After a stapled stack is output to the tray, the tray lift motor lowers the tray by a prescribed amount.
- Then, the motor lifts the tray until the actuator leaves sensor [1].

Operation for z-folded outputs

- This is the same as for sort/stack mode. The only difference is that tray full is detected when the actuator enters sensor [3].
- For paper that is not z-folded, tray full and near-full detection is explained on the next slide.

Shift Tray Components – Side of the Tray



- **Four sensors**
  - (1) Tray full sensor for A5, HLT paper (500 sheets)
  - (2) Tray full sensor for SR_A3 (320 x 450 mm) paper (1000 sheets)
  - (3) Tray full sensor for A3, DLT paper (1500 sheets)
  - (4) Tray full sensor for A4, LT paper (2500 sheets).

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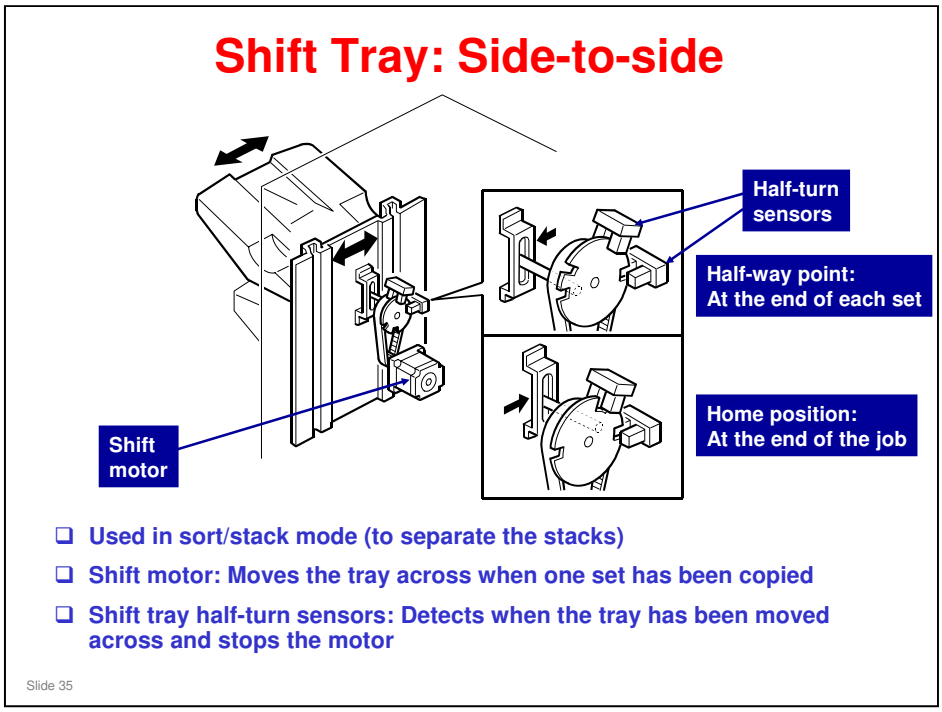
- These are for tray full detection for paper that is not z-folded.
  - Sensor [3] on the previous slide is used for tray full detection for z-folded outputs.



- After each set, the disk moves 180 degrees. The motor stops when one of the half-turn sensors is activated (the notch in the disk goes into the sensor). The diagram shows one of the half-way point positions. The other is 180 degrees rotated from that position (when only one of the two sensors is activated).
- At the end of the job (after all sets), the motor turns the disk until both sensors are activated.

Punch Unit - Overview

- **This punch unit moves to the front or back (along the leading edge of the paper) to make sure that the punch holes are in the correct position on the paper.**
  - The paper must be in the middle of the paper feed path, or the punch holes will be too high or too low along the edge of the paper.
  - The punch unit detects the distance that the paper is away from the ideal position.
  - Then it moves the punch unit across to put the holes in the correct position at the edge of the paper.

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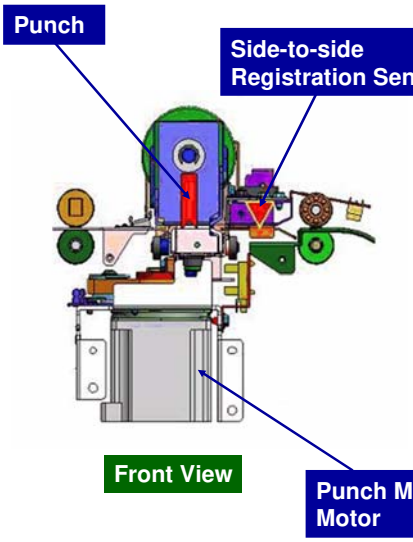
No additional notes

Punch Unit Mechanisms (1)

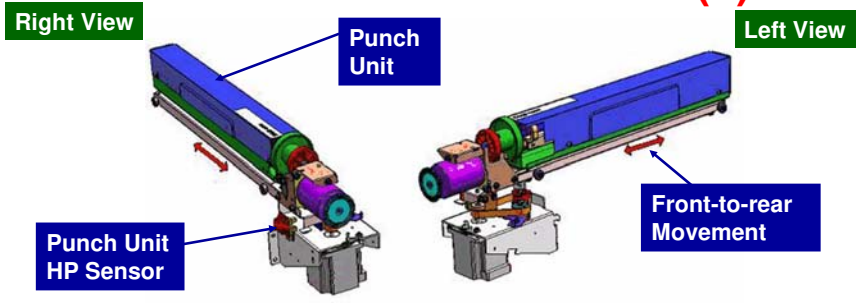


- The position of the paper is detected by the side-to-side registration sensor, which is above the paper path.
  - This sensor contains a CIS (Contact Image Sensor).
- The punch movement motor moves the punch unit to the front or rear, in response to the output from this sensor, to make sure that the punch holes are made in the correct position across the leading edge of the paper.

Slide 37

No additional notes

Punch Unit Mechanisms (2)



- This slide shows the front-to-rear movement, and the home position sensor.

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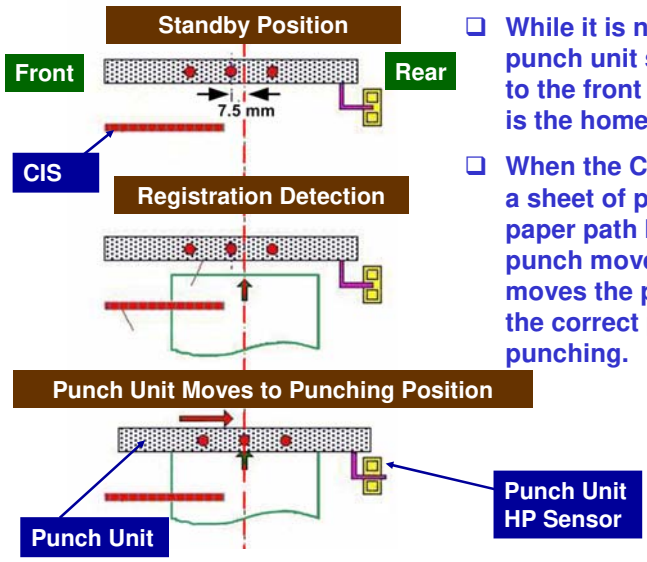
No additional notes

Punch Unit Mechanisms (3)



- While it is not in use, the punch unit stays 7.5 mm to the front of center. This is the home position.
- When the CIS unit detects a sheet of paper in the paper path below, the punch movement motor moves the punch unit to the correct position for punching.

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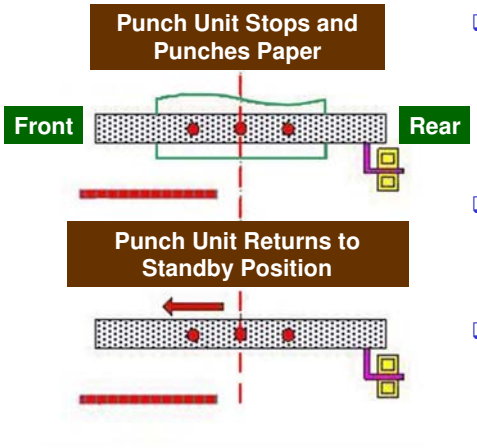
No additional notes

Punch Unit Mechanisms (4)



- Next, the punch unit, a straight punch (not a rotary punch) punches the paper.
  - The punch hammers are driven by the punch drive motor.
- After the paper is punched, the punch movement motor returns the punch unit to its home position.
- When the punch unit HP sensor detects the actuator on the side of the punch unit, the punch movement motor turns off. The punch unit is now at home position. The punch unit waits here for the next sheet.

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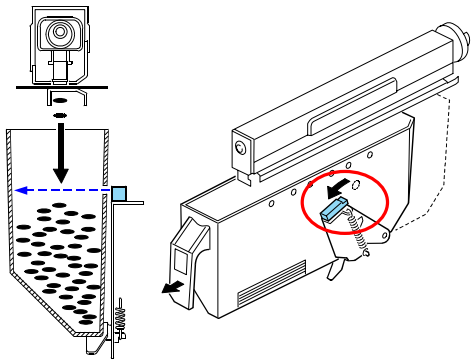
European models:

- Punch Switch Motor: Switches the punch mechanism for number of holes selected for punching.

Punch Waste Collection



- Punch waste goes to the punch waste hopper.
- When the waste covers the hole, the sensor detects that the hopper is full (disposed of by the user)
  - This sensor also detects if the hopper is installed correctly

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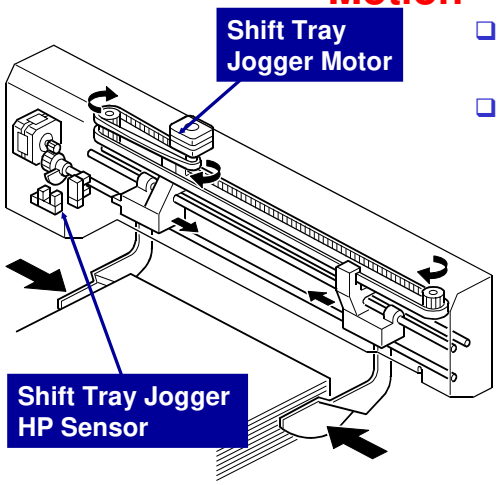
No additional notes

Shift Tray Jogger Unit: Side-to-side Motion



- **Tidies up the stack on the shift tray**
- **Side-to-side motion**
  - Every page
  - Shift tray jogger motor: Moves the joggers side to side
  - Shift tray jogger HP sensor: Jogger home position; turns the motor off at the end of the job

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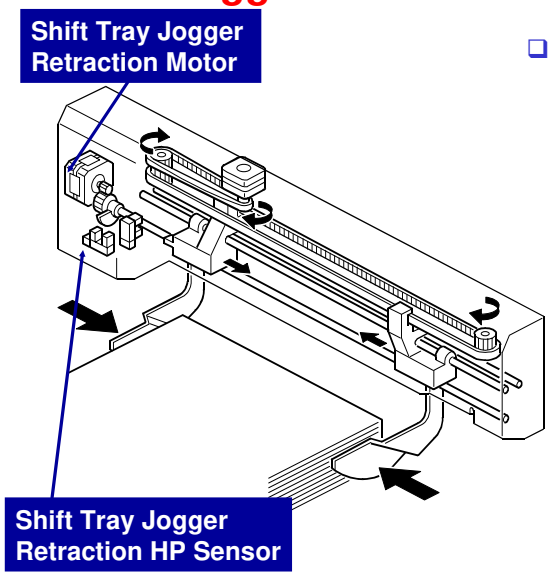
- This is installed above the shift tray.
- It tidies up the stack on the shift tray. If the stack on the tray is thick, it only tidies up the top few sheets.
  - Every page, the joggers move against the side of the stack to tidy up the edges.
  - At the end of the job, the joggers move away from the side of the stack, and then the shift tray jogger retraction motor turns on to move the joggers back to home position.
- The service manual explains the mechanism.
- This slide explains the side-to-side motion of the joggers. The next slide explains the vertical motion.

Jogger Unit: Vertical Motion



- **Vertical motion**
  - At the start and the end of the job only
  - Shift jogger retraction motor: Moves the joggers down at the start of the job and up at the end of the job
  - Shift jogger retraction HP sensor: Jogger home position; turns the retraction motor off at the end of the job

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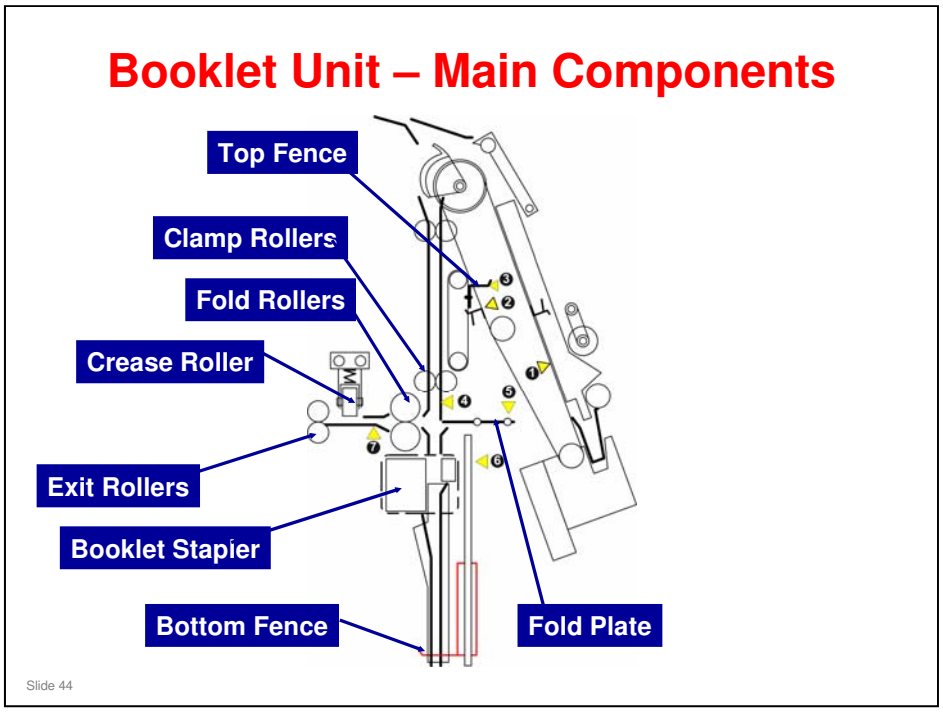
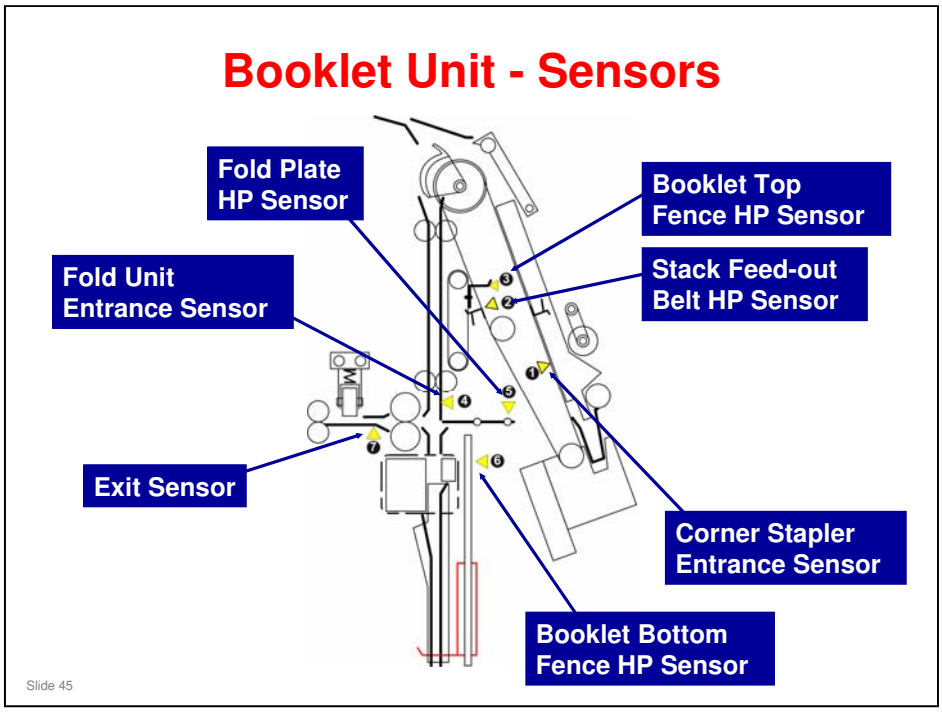
- If there is a lot of paper on the tray, the jogger cannot jog the sides of the top sheets on the stack. SP 6217 can be used to change the jogger position (it can be moved up or down by up to 10 degrees)
- But it stays at the new angle regardless of stack thickness.

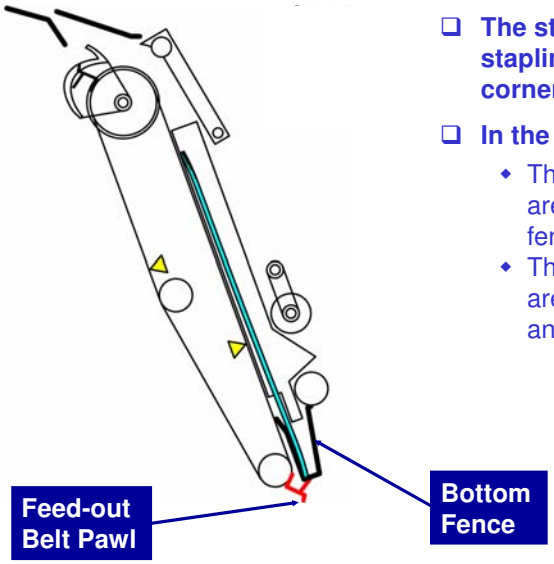


- Booklet top fence: Rotates up, descends, and tamps the top of the stack to align the stack vertically against the bottom fence.
- Booklet bottom fence: Bottom fence catches the stack. Aligns the stack vertically with the top fence. Also lowers and raises the stack to the stapling position and folding position after stapling.
- Clamp roller pair: Feed the stack into the booklet unit. After the stack is in the booklet unit, the clamp roller releases the booklet so that it can be positioned for stapling and folding.
- Booklet stapler unit: Staples the booklet with two staples at the center fold.
- Fold plate: Pushes the fold plate into the center of the stack toward the nip of the fold rollers.
- Fold rollers: Fold the stack along its spine after stapling.
- Crease roller: The crease roller runs rear to front, then front to rear to sharpen the crease in the fold created by the fold plate and fold rollers.
- Exit rollers: Feed the booklet out of the booklet unit onto the booklet tray.



- Sensors
  - Corner stapler entrance sensor: Detects the stack when it enters the corner stapling tray. This triggers positioning and top/bottom jogging on the corner stapling tray before the stack is sent to the booklet unit.
  - Stack feed-out belt HP sensor: Detects the home position of the stack feed-out belt that feeds the stack from the corner stapling tray into the booklet unit.
  - Booklet top fence HP sensor: Detects the home position of the booklet top fence.
  - Fold unit entrance sensor: Detects each stack as it enters the booklet unit.
  - Fold plate HP sensor: Detects when the fold plate is in and out of its home position.
  - Booklet bottom fence HP sensor: Detects when the bottom fence is in and out of its home position.
  - Exit sensor: Detects each folding and stapled booklet as it leaves the booklet unit.

Folding and Stapling Operation (1)



- **The stack is fed onto the stapling tray of the corner stapler unit.**
- **In the corner stapler unit:**
  - The sides of the stack are aligned by the side fences
  - The top and bottom are aligned by the top and bottom fence.

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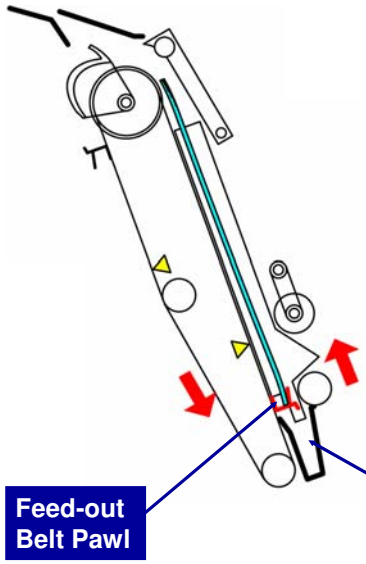
No additional notes

Folding and Stapling Operation (2)



- The stack feed-out belt motor turns on.
- The stack feed-out belt pawl moves up between the bottom fences, catches the edge of the stack, and raises it upward.

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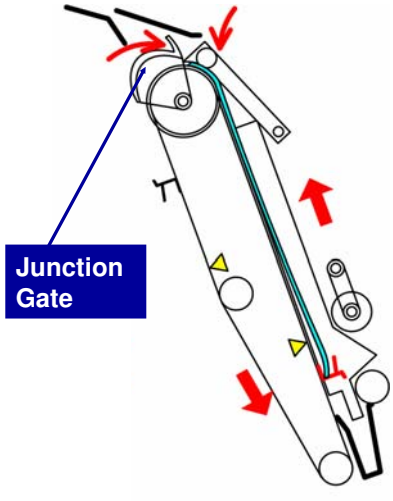
No additional notes

Folding and Stapling Operation (3)



- The stack junction gate motor switches on and closes the stack junction gate just before the top of the stack reaches the top of the stapling tray.
- This guides the stack into the vertical path of the booklet unit.

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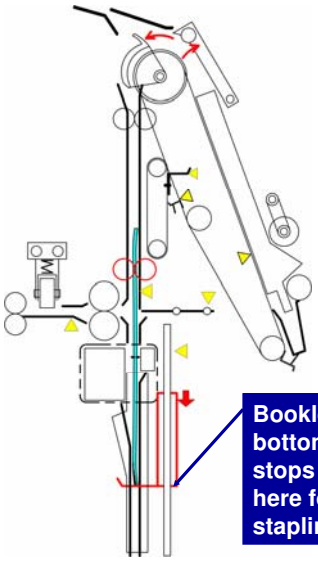
No additional notes

Folding and Stapling Operation (4)



- **When the booklet unit entrance sensor detects the stack in the booklet unit, the following sequence occurs.**
  - After the stack enters the booklet unit, the stack junction gate motor reverses and opens the stack junction gate.
  - The bottom fence motor switches on and lowers the bottom fence
    - » For a stack of 5 or fewer sheets: Lowers the fence to the stapling position.
    - » For a stack of more than 5 sheets: Lowers the fence to 10 mm lower than the stapling position. Then moves it up to the stapling position for stapling.
  - The stapling position depends on the paper size.
  - The clamp rollers feed the booklet down to the bottom fence. The stack transport motor stops and the clamp rollers stop.

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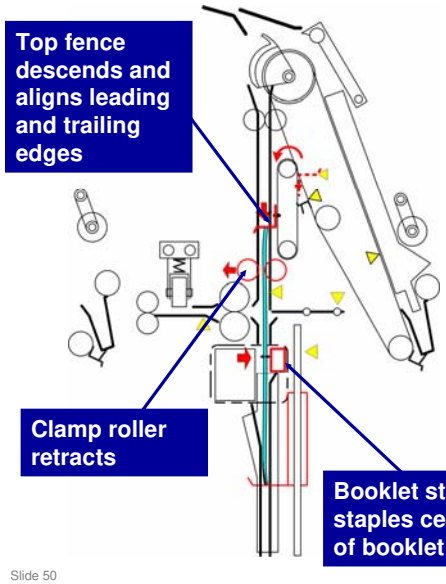
No additional notes

Folding and Stapling Operation (5)



- **Then:**
  - The clamp roller motor switches on and retracts the clamp roller to open the nip between the clamp rollers.
  - The booklet stapler side fence motor switches on and aligns the sides of the stack (not shown here).
  - The top fence motor switches on and the top fence rotates up, swings down, and tamps the top of the stack to align the top and bottom edge.
  - The booklet stapler staples the stack in the center at two locations.

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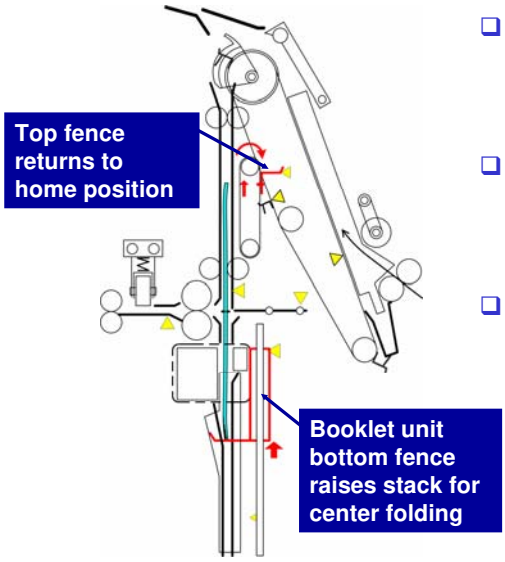
No additional notes

Folding and Stapling Operation (6)



- The top fence motor reverses and returns the top fence to its home position.
- The top fence HP sensor detects the top fence and switches off the top fence motor.
- The bottom fence motor switches on and raises the stapled stack to the folding position, centering the stack on the edge of the fold plate.
  - This position depends on the paper size.

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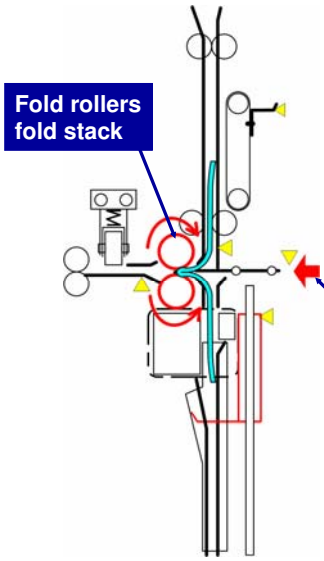
No additional notes

Folding and Stapling Operation (7)



- The fold plate motor and fold roller motors switch on.
- The fold plate motor pushes the center of the stack into the nip of the rotating folder rollers.

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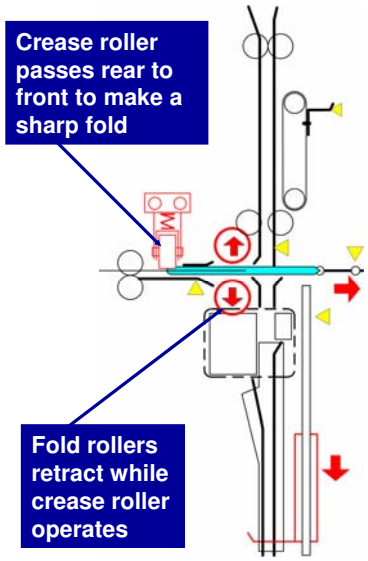
No additional notes

Folding and Stapling Operation (8)



- The fold roller motor and fold rollers (controlled by a cam) rotate long enough to feed the folded edge as far as the crease roller.
- The fold rollers retract slightly, to reduce the nip pressure. The fold plate returns to its home position, and the bottom plate returns to its home position.
- The crease roller motor switches on and drives the crease roller along the length of the fold from rear to front, reverses, then drives the roller front to rear. The motor switches off after the crease roller returns to its home position at the rear.

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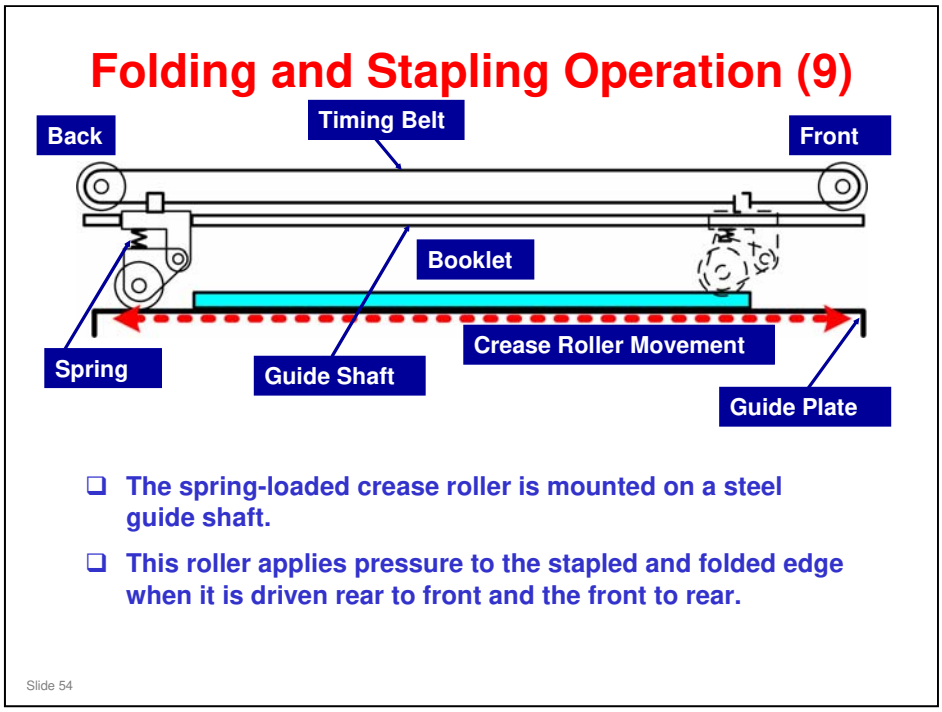
- The crease roller is a new mechanism. In previous models, the fold was made sharp by feeding the folded output backwards and forwards between the fold rollers a number of times.
- SP6727 adjusts the number of times the crease roller moves back and forth along the fold. This is also in the skilled operator adjustment mode.

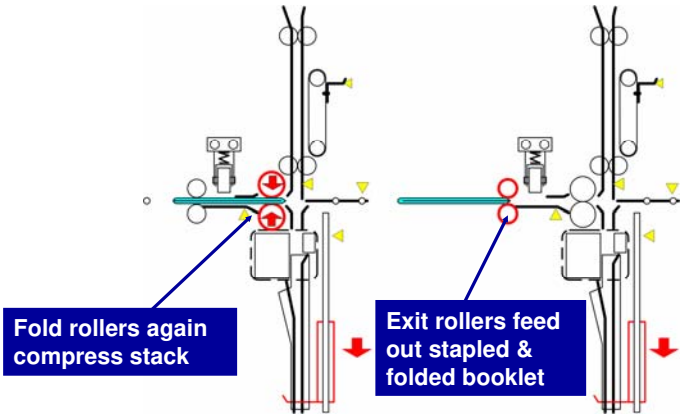
Fold roller retraction during creasing - details

- When folding 6 sheets or more: The fold roller decreases the nip pressure during creasing. When the paper stack goes to the exit after creasing, the fold roller returns to the original nip pressure.
- When folding 5 sheets or less: The fold roller nip pressure stays at the lower level during feed from creasing to exit.



- Here is a side view of the crease roller mechanism.
- The red dotted line shows the direction of motion of the crease roller.

Folding and Stapling Operation (10)



- Finally, the fold rollers once again clamp the booklet and together with the exit rollers they feed the booklet out of the booklet unit onto the booklet tray.

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No additional notes

Replacement and Adjustment

- **Study the replacement and adjustment procedures in the service manual.**
  - Side Fence Removal: This is a long procedure, but it is important for some other removal procedures (drag roller unit, shift tray unit)
  - Horizontal and Vertical Skew Adjustments: The booklet unit is adjusted for optimum performance before the finisher is shipped from the factory.
    - » Do these adjustments only if the edges of folded booklets are not even.

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No additional notes

Right Lower Panel

- The right lower panel covers the PSU, which retains residual voltage after the system is switched off.
- Before removing the right lower panel for any procedure, switch the machine off and wait 30 min. for the charge on the PSU to disappear.

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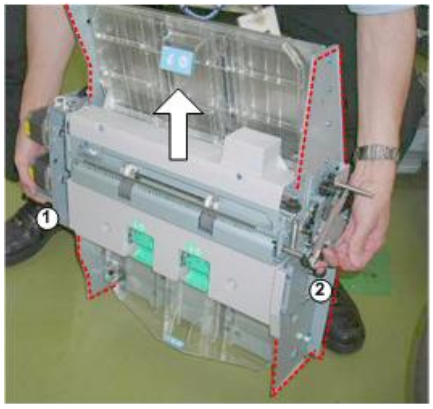
No additional notes

Handling the Booklet Unit



- The metal edges of the booklet unit are sharp and can easily cut your hands or fingers.
- Always handle the unit carefully.
- Always lift the booklet unit with your hands positioned at (1) and (2).
- Never attempt to lift the booklet unit by the edges (shown above by the red dotted lines).

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No additional notes