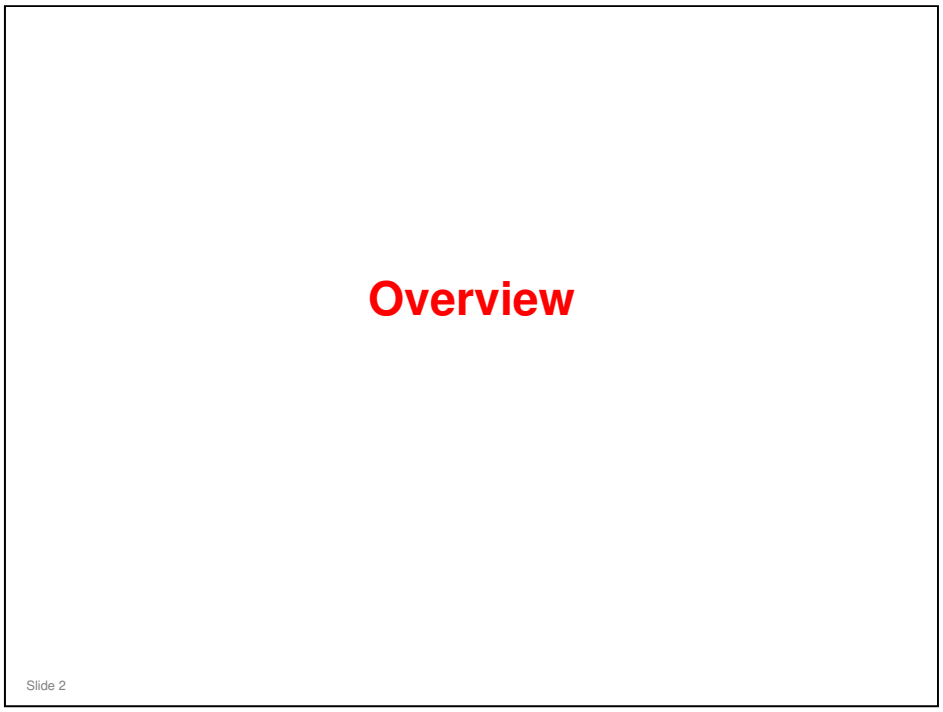
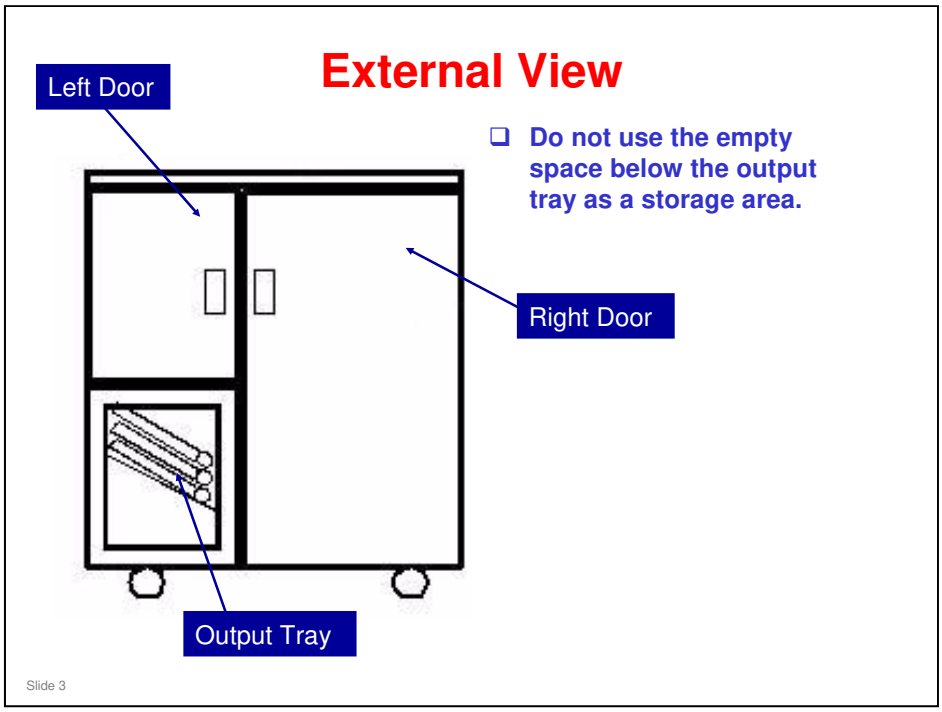
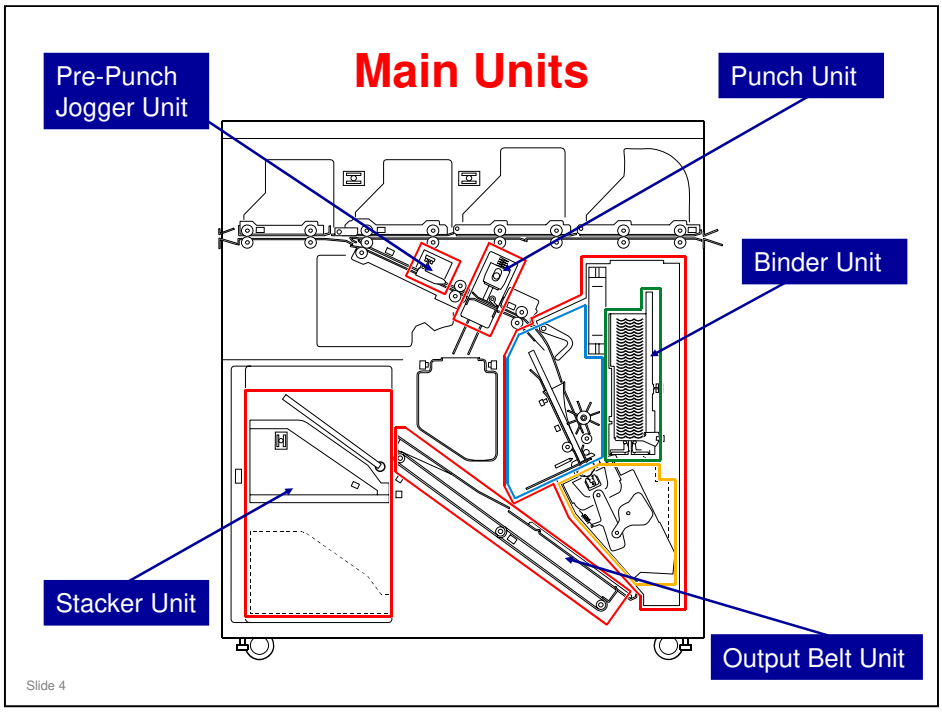
No additional notes



No additional notes

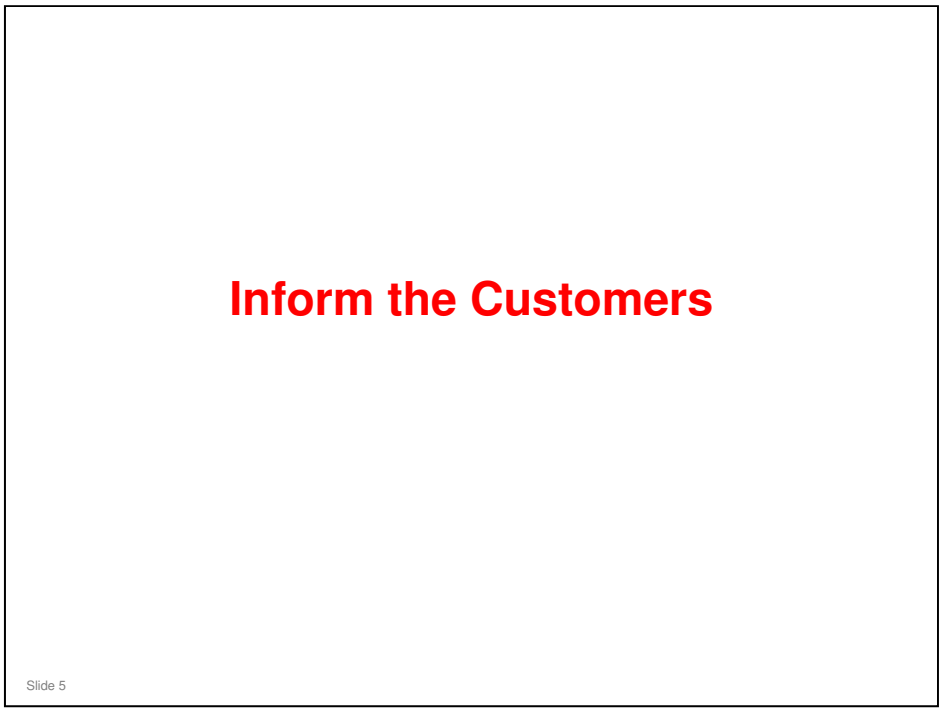


D392 service manual, Details, Overview, Important Parts



D392 service manual, Details, Overview, Important Parts

- The binder unit contains the pre-bind jogger unit, ring supply unit, and clamp unit. See the service manual for the locations of these within the binder unit.



- The next few slides contain points to tell the customers after you finish the installation.

Jams

- Decals attached to the machine that provide guidance for removing paper jams. Point out the decal locations.
- Detailed instructions on removing ring jams are provided in the operating instructions under "Removing Jammed Ring Combs".

Slide 6

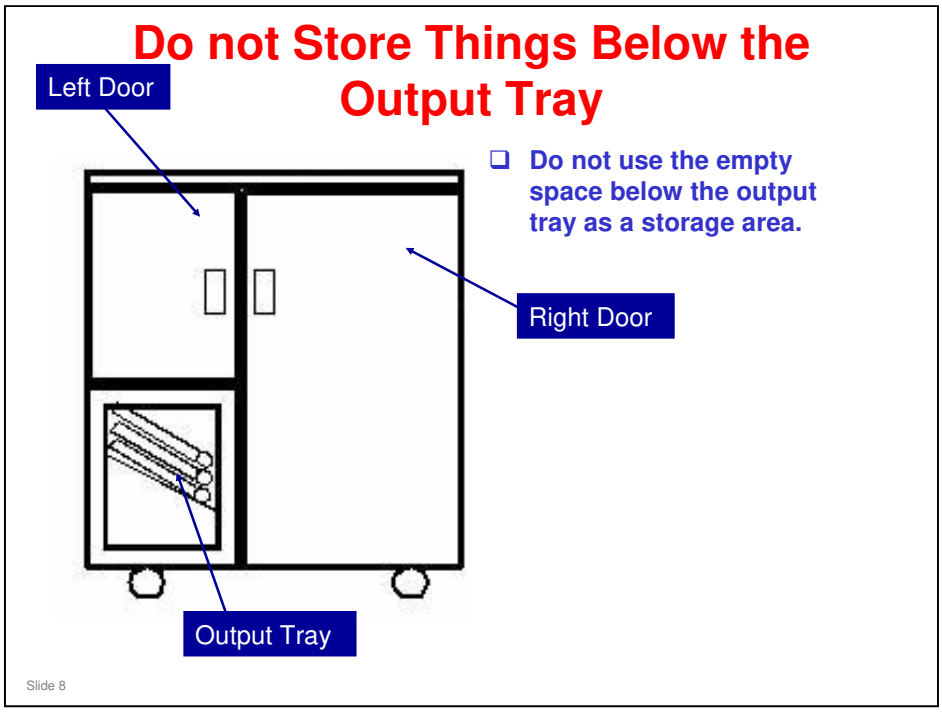
No additional notes

Pulling out/Pushing in the Binder Unit

- Always grip handle Mc8 when pulling out or pushing in the binder unit.
- Never touch any other surface of the binder unit when it is moving.
- To avoid injury the fingers, never push on the top of the binder unit to slide it back into the finisher.

Slide 7

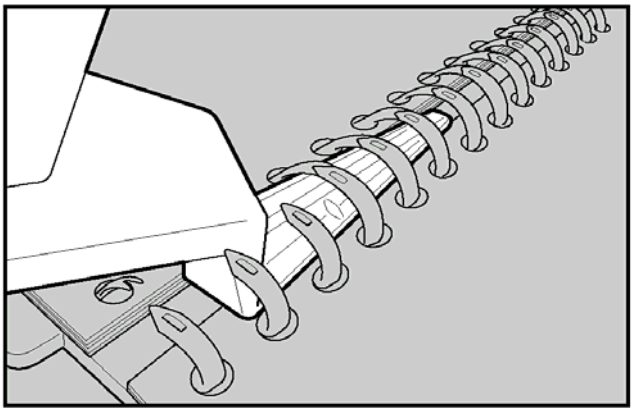
No additional notes



D392 service manual, Details, Overview, Important Parts

- Obstacles in this area (circled in the illustration) will interfere with the raising and lowering of the tray and cause an error.

Ring Opener



- The customer can use this to add pages to a document that is already bound.
- The additional pages must be printed with punching only (no ring binding).

Slide 9

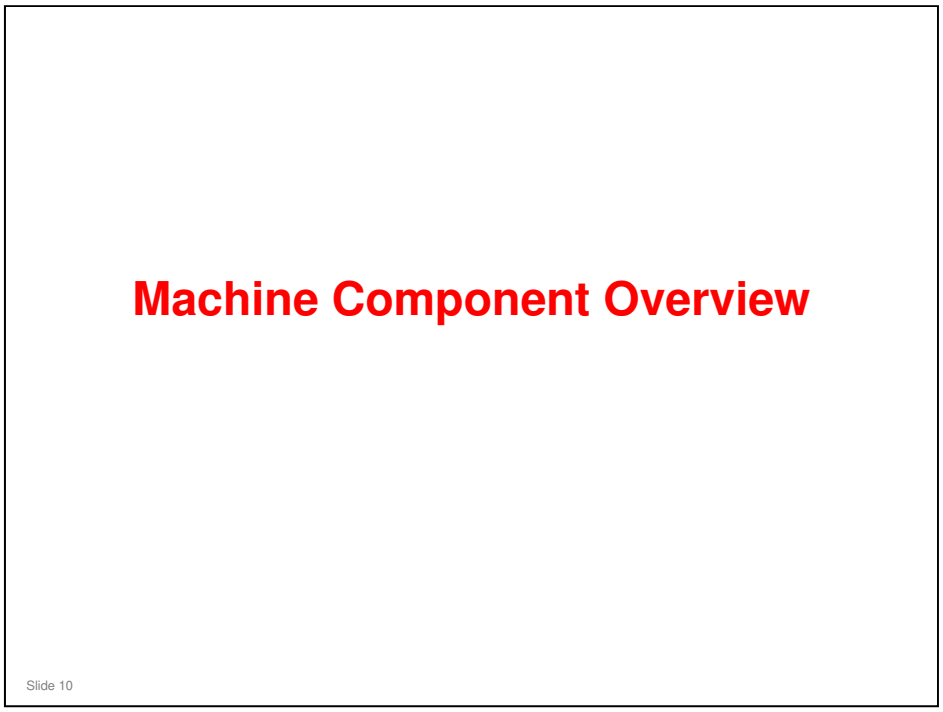
The ring binder is limited to 100 pages.

If the customer needs to bind a 120-page document:

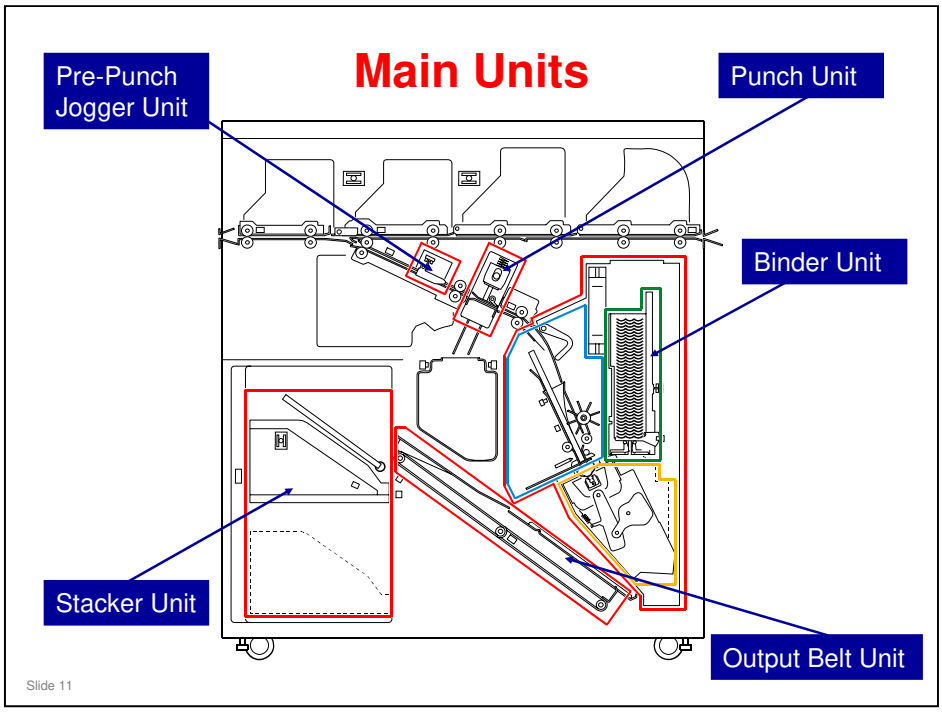
- First, do a run of 100 pages with ring binding enabled.
- Then, do a 20-page run for the remaining pages, with punching only (no ring binding).
- Then, use the ring opener to open the ring and add the remaining pages to the completed document.

For details about the ring opener, see the Operating Instructions for the ring binder.

Troubleshooting, Inserting Pages into an Existing Ring Bound Booklet

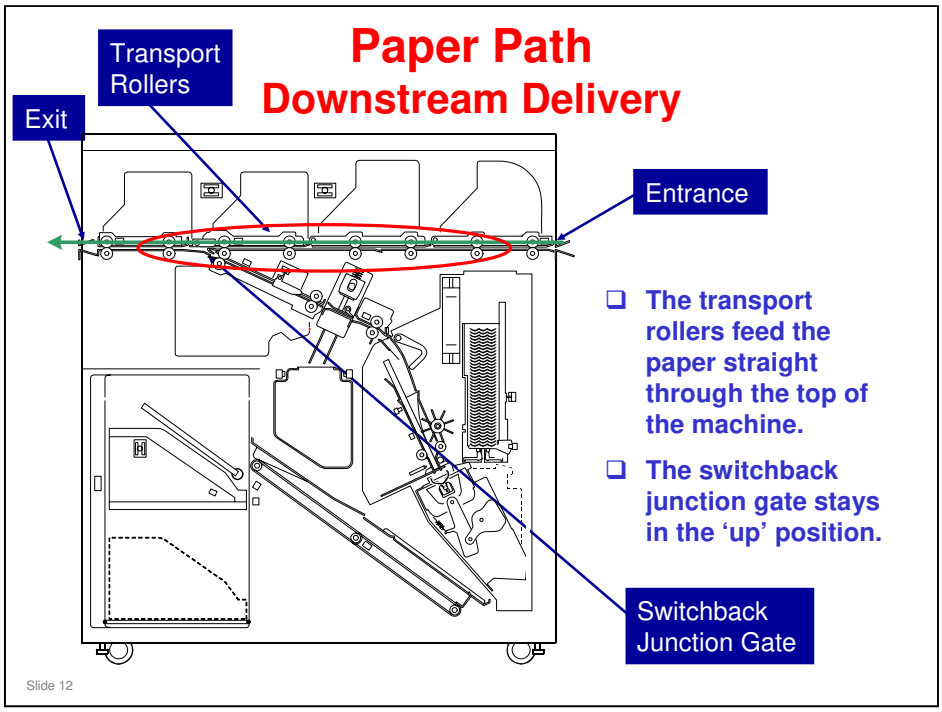


No additional notes



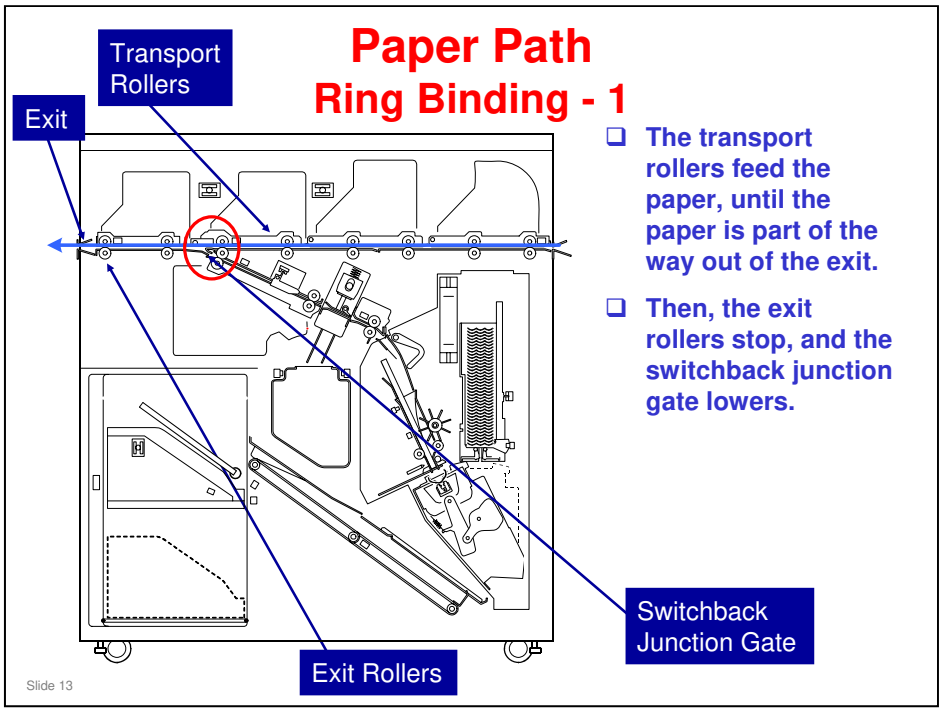
D392 service manual, Details, Overview, Important Parts

- This is a repeat of the slide that we saw at the start of the course, just to refresh your memory after that arduous installation procedure.
- The binder unit contains the pre-bind jogger unit, ring supply unit, and clamp unit. See the service manual for the locations of these within the binder unit.



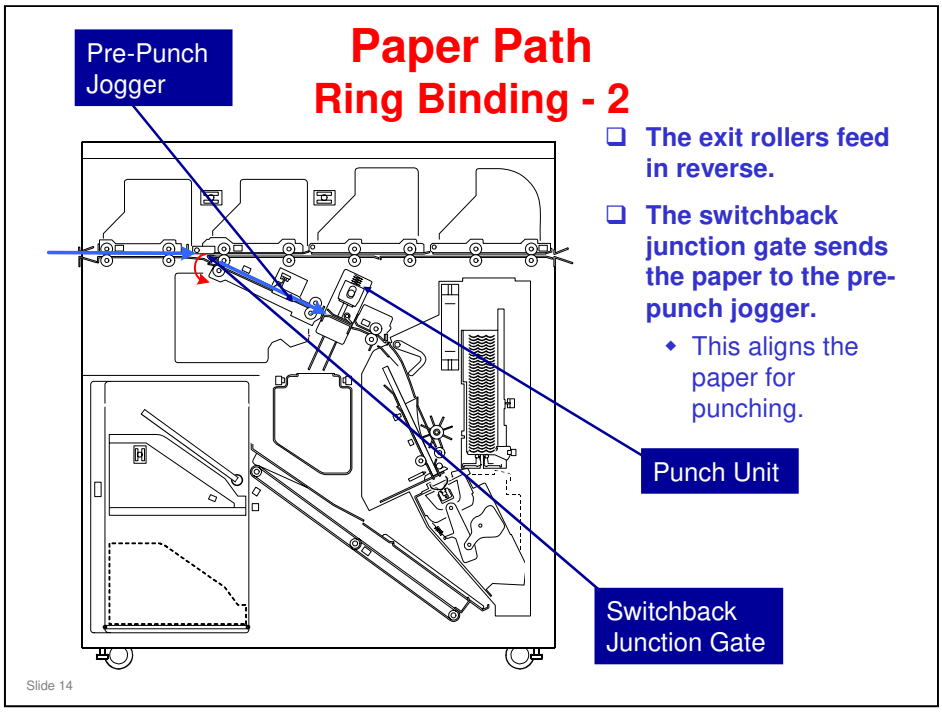
D392 service manual, Details, Overview, Paper Transport

- This is how paper feeds through the finisher if ring binding is not selected for the job.



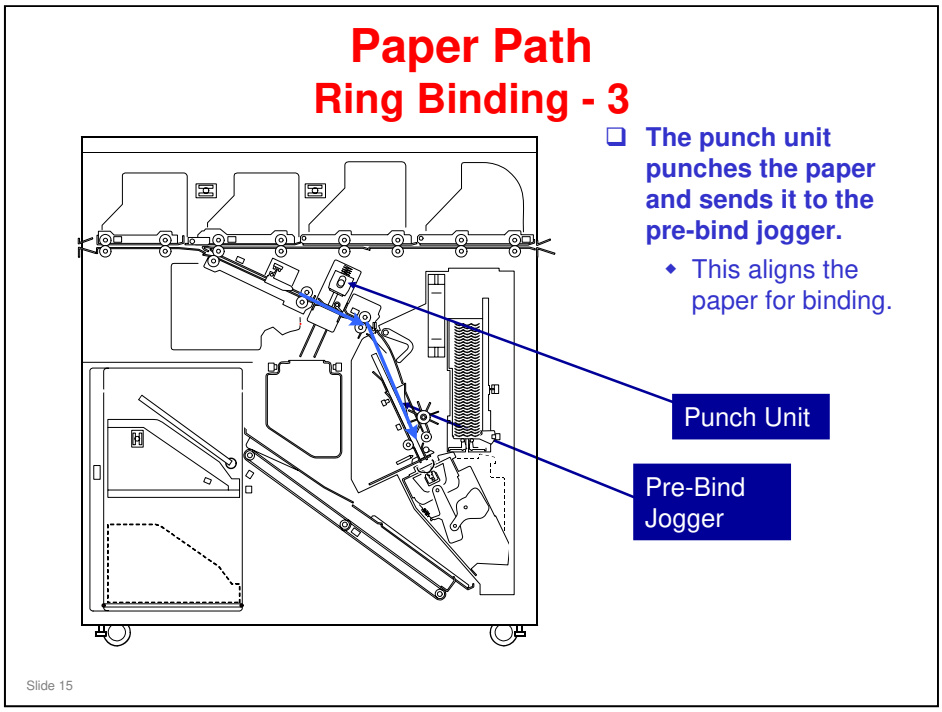
D392 service manual, Details, Overview, Paper Transport

- The first phase is similar to downstream delivery, until the paper stops after the leading portion of the paper is fed past the exit.



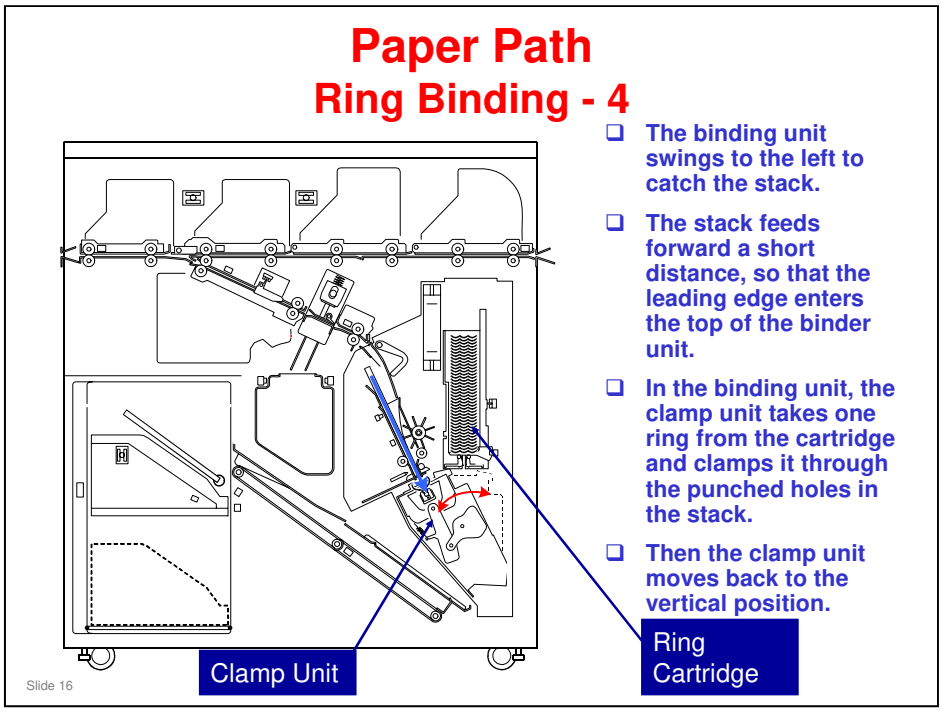
D392 service manual, Details, Overview, Paper Transport

❒ Now the paper is fed into the ring binder



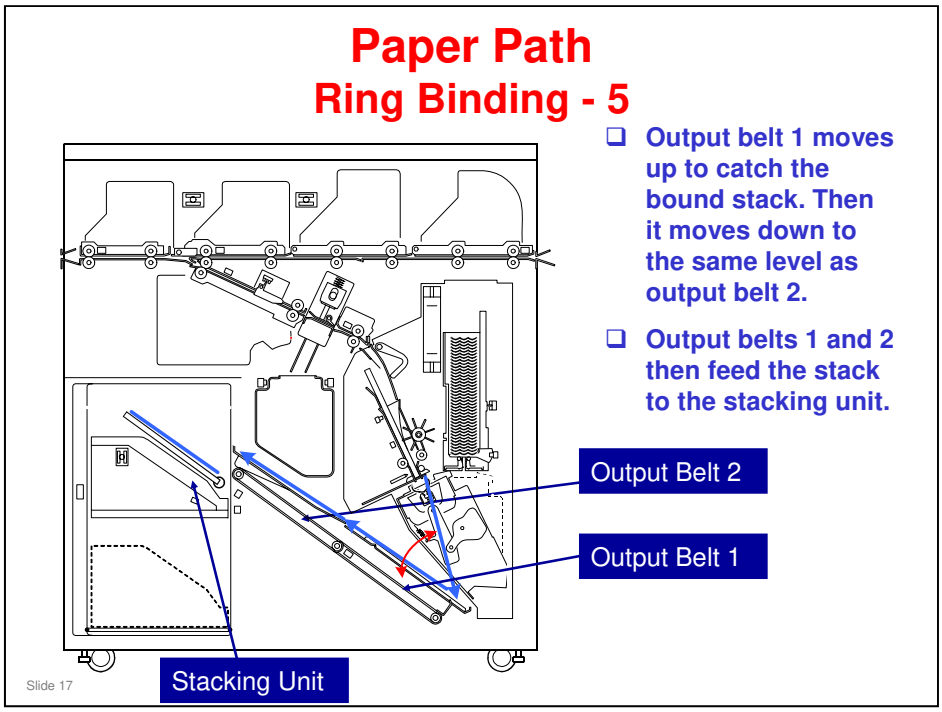
D392 service manual, Details, Overview, Paper Transport

❒ Now the paper is fed into the ring binder



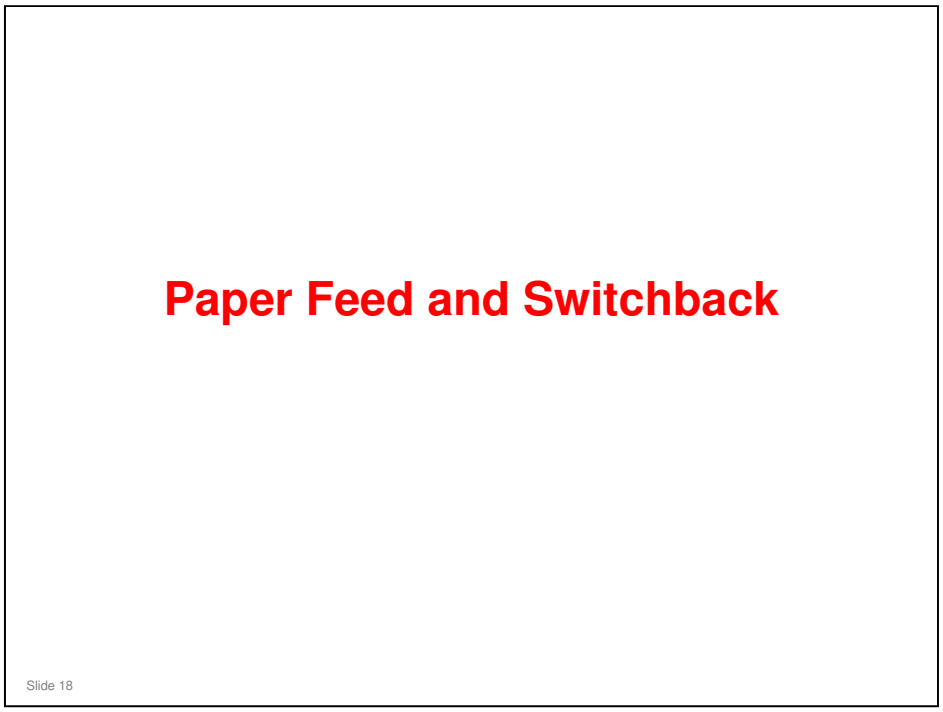
D392 service manual, Details, Overview, Paper Transport

- Now the paper is fed into the ring binder.
- The red arrow indicates the movement of the clamp unit in the binder unit.



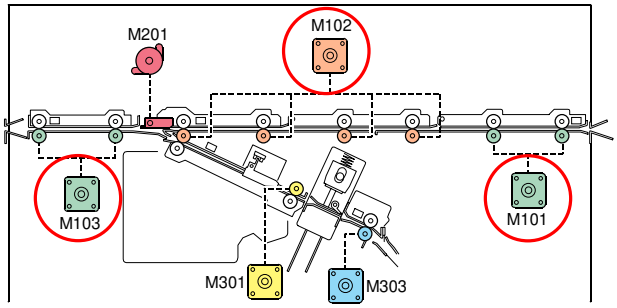
D392 service manual, Details, Overview, Paper Transport

❒ The red arrow indicates the movement of output belt 1 to catch the paper.



No additional notes

Paper Feed

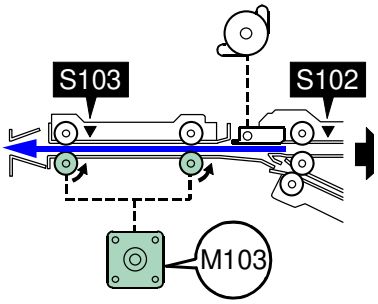


- **M101 (Entrance motor): Drives the entrance roller and the 1st transport roller**
- **M102 (Transport motor): Drives the 2nd, 3rd, 4th, and 5th transport rollers**
- **M103 (Exit motor): Drives the 6th transport roller and the exit roller.**
  - Feeds in reverse to feed the paper back into the machine for ring binding.

Slide 19

D392 service manual, Details, Overview, Paper Feed and Switchback

Sensors

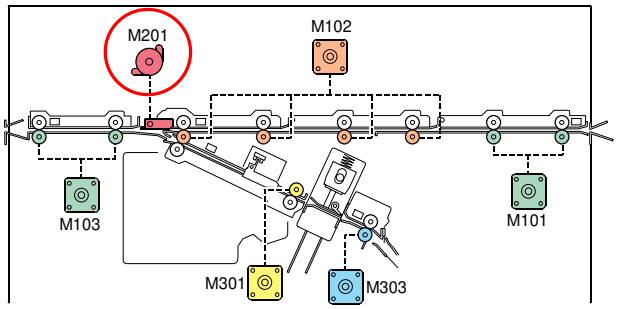


- S102 (Transport sensor) and S103 (Exit sensor) detect jams in the feed path

Slide 20

No additional notes

Switchback

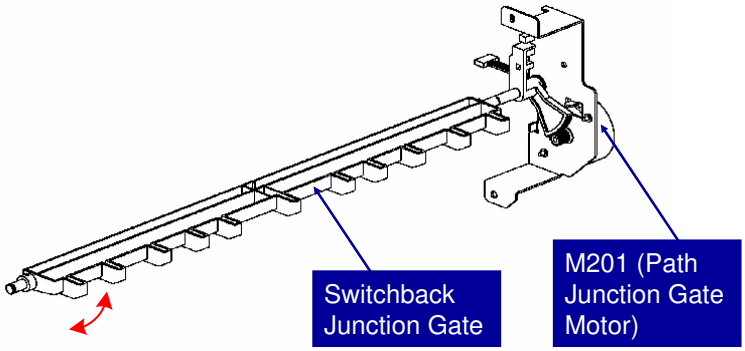


- **M201 (Path JG Motor): Controls the switchback junction gate.**
  - A spring normally keeps the gate open so that paper can feed through for downstream delivery.

Slide 21

D392 service manual, Details, Overview, Paper Feed and Switchback

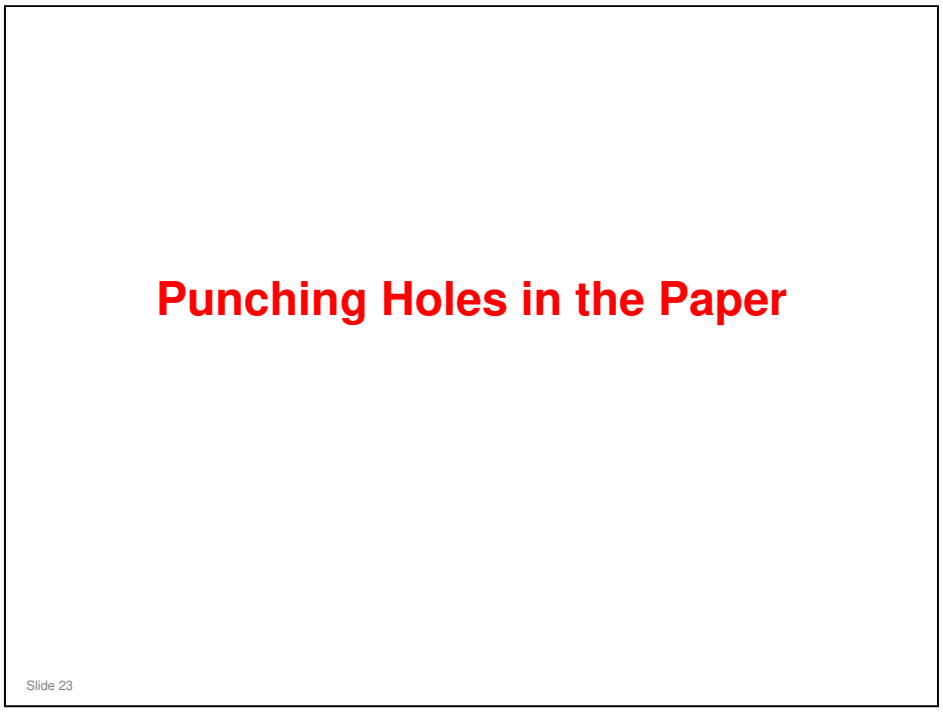
Switchback Junction Gate



- **M201 (Path JG Motor): Controls the switchback junction gate.**
  - A spring normally keeps the gate open so that paper can feed through for downstream delivery.

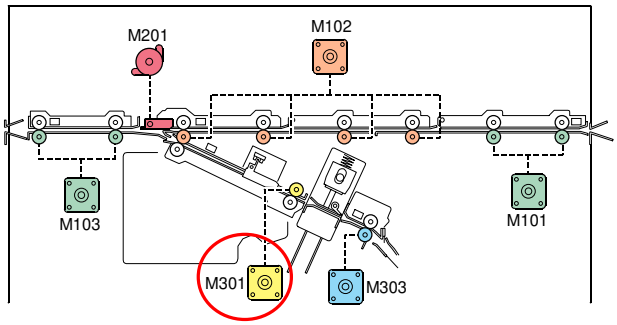
Slide 22

No additional notes



No additional notes

Pre-punch Jogging - 1

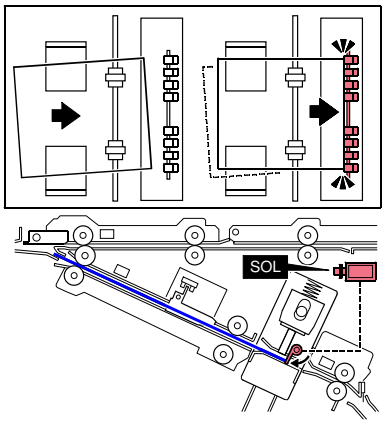


- **M301 (Jog Roller Motor): Controls the roller that feeds the paper into the pre-punch jogger.**

Slide 24

D392 service manual, Details, Overview, Paper Feed and Switchback

Pre-punch Jogging - 2

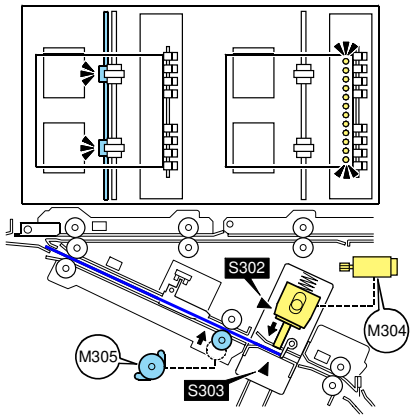


- **SOL302 (Top fence solenoid): Controls the stopper inside the punch unit.**
  - This stopper improves the accuracy of hole punching at the leading edge of each sheet.

Slide 25

No additional notes

Pre-punch Jogging - 3



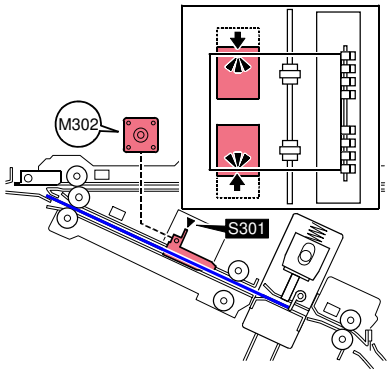
- M305 (Jog roller lift motor): Makes a gap between the two rollers to allow the paper to be moved from side to side during jogging.

Slide 26

No additional notes

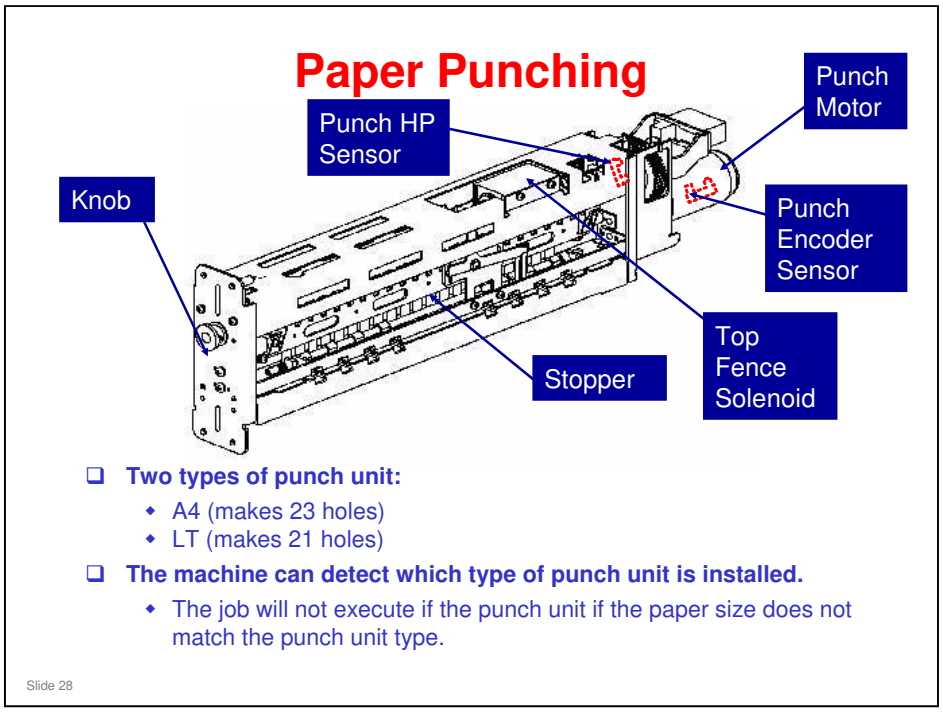
Pre-punch Jogging - 4

- M302 (Side jogger motor): Controls the jogger fences.
- S301 (Pre-punch jogger HP sensor): Detects when the jogger fences are at home position.



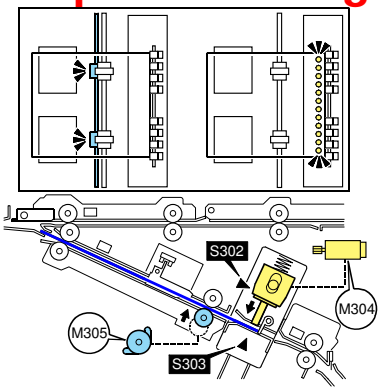
Slide 27

No additional notes



- The stopper and the top fence solenoid were discussed in a previous slide.
- Use the knob to pull the punch unit out of the machine.
- The machine comes with a punch unit for either A4 or LT, depending on the area. If the customer wants the other punch unit, they can order it. They also have to order ring cartridges for that paper size.

Paper Punching

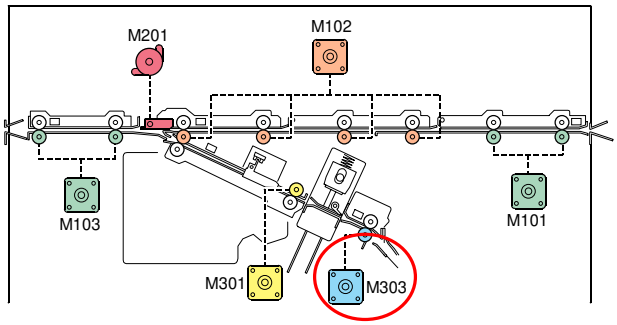


- **M304 (Punch motor): Punches the holes in the paper.**
  - Pages are punched one at a time
- **S303 (Punch HP sensor): Detects when the punch unit is at home position. Also detects if the punch unit is missing.**
- **S320 (Punch encoder sensor): Controls the start and stop timing, and the speed of the punch motor.**

Slide 29

- Punch motor speed is adjusted to match the thickness of the paper.

Feed-out from the Punch Unit



- **M303 (Punch Unit Runout Motor): Controls the roller that feeds the paper out of the punch unit, and towards the pre-bind jogger unit.**

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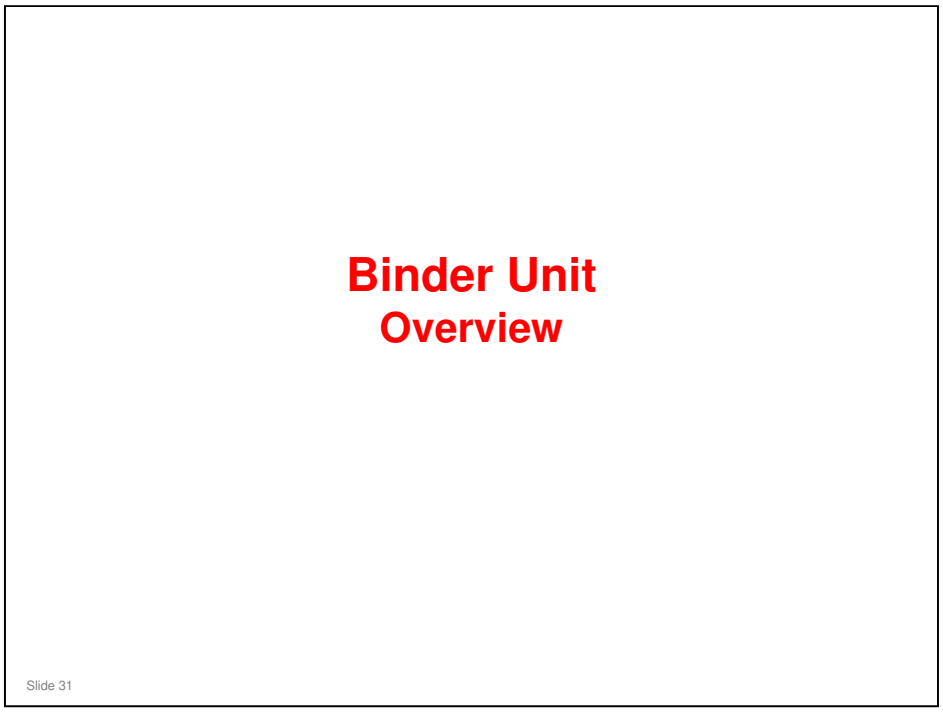
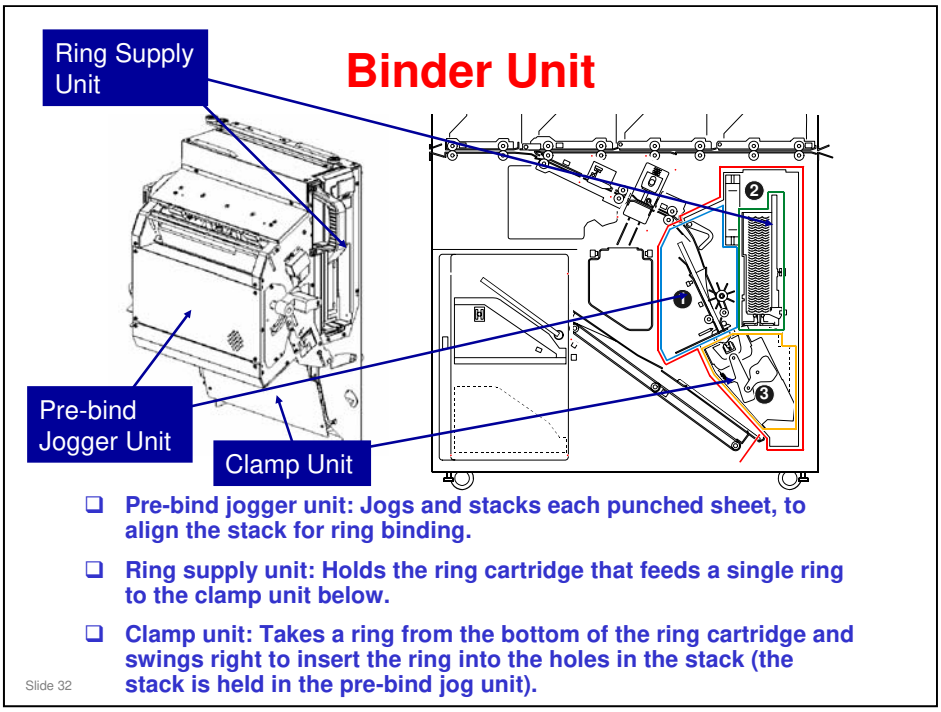
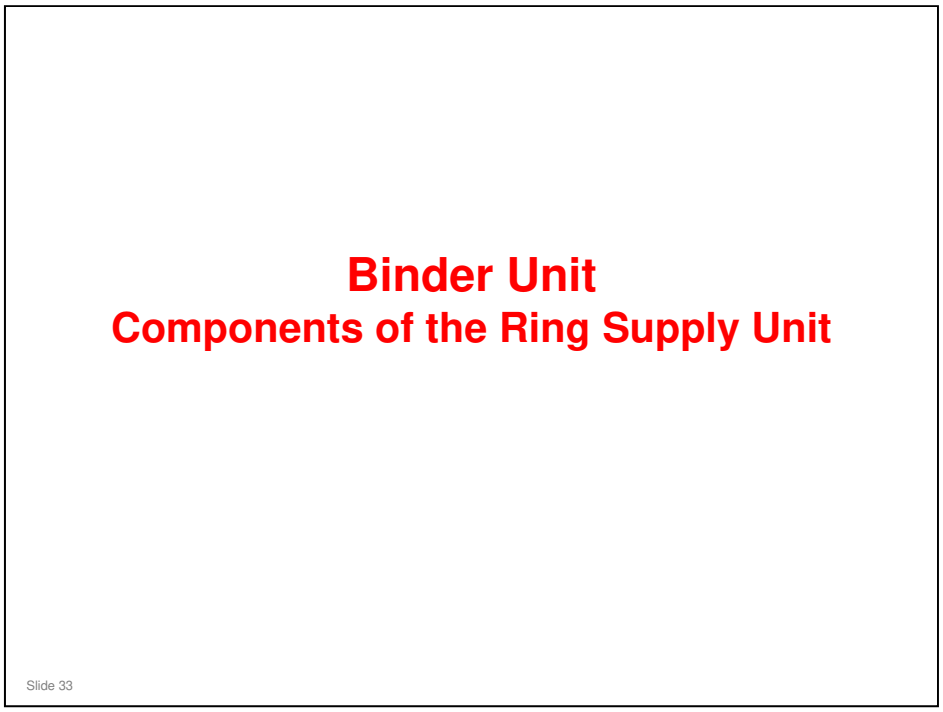
D392 service manual, Details, Overview, Paper Feed and Switchback



No additional notes

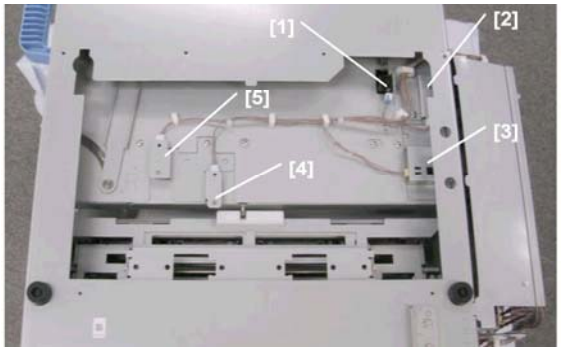


No additional notes



No additional notes

Locations of Components

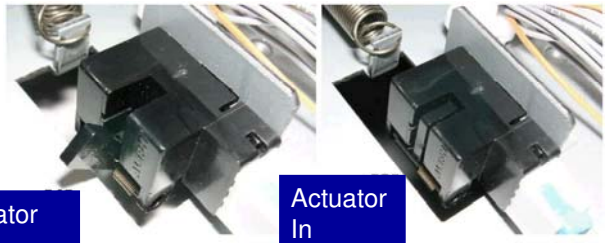


- [1]: Cartridge Detection Sensor (S801)
- [2]: Ring Cartridge Type Sensor (S805)
- [3]: Ring Near-End Sensor (S803)
- [4]: Rings Reversed Sensor (S802)
- [5]: 50/100 Ring Detection Sensor (S804)

Slide 34

- The functions of these components will be explained in the next few slides.

Ring Cartridge Detection

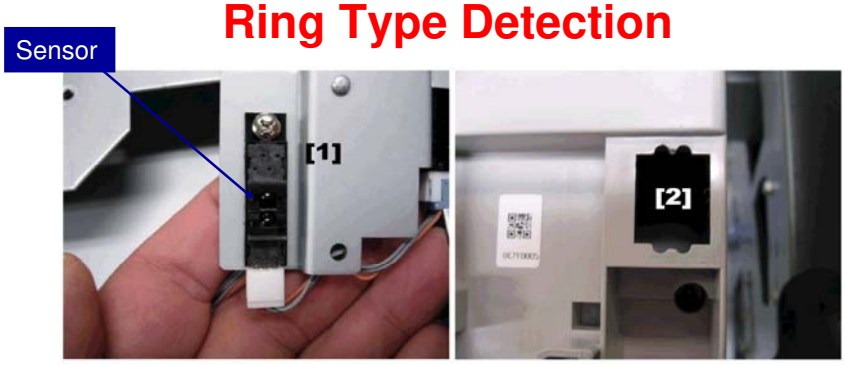


- **Cartridge Detection Sensor (S801): if the ring cartridge is missing or is not installed correctly.**
  - When the ring cartridge is pushed in, the actuator is pushed out of the sensor.
  - When the ring cartridge is pulled out, the actuator goes into the sensor.

Slide 35

No additional notes

Ring Type Detection

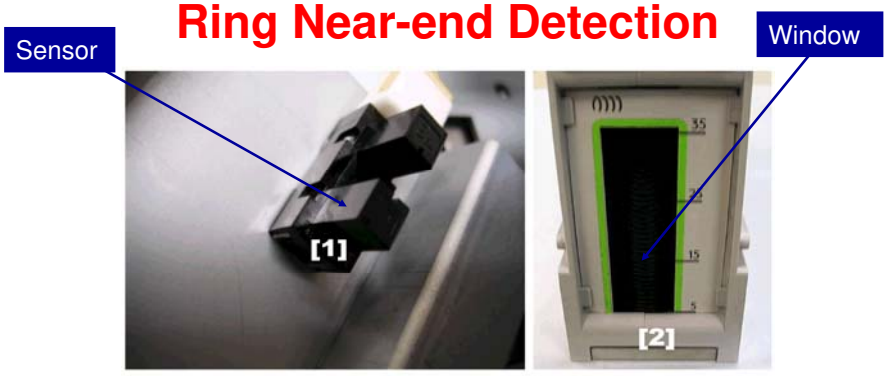


- **Ring Cartridge Type Sensor (S805): Detects which type of ring cartridge is installed (A4 or LT).**
  - The A4 cartridge has a cover. The LT cartridge does not.
  - The sensor checks if the cartridge has a cover or not.

Slide 36

- The photo on the right shows a cartridge without a cover [2]. This is detected as LT.

Ring Near-end Detection

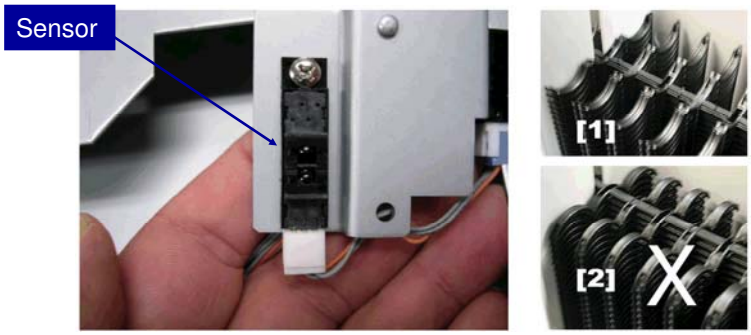


- **Ring Near-End Sensor (S803): Detects when approximately 5 rings remain in the ring cartridge.**
  - There is a weight on top of the stack of rings. The sensor actuator is attached to this weight.
  - The user can see how many rings remain, by looking through the window. There is also a scale, which is attached during the installation procedure.

Slide 37

No additional notes

Detecting Incorrect Ring Installation

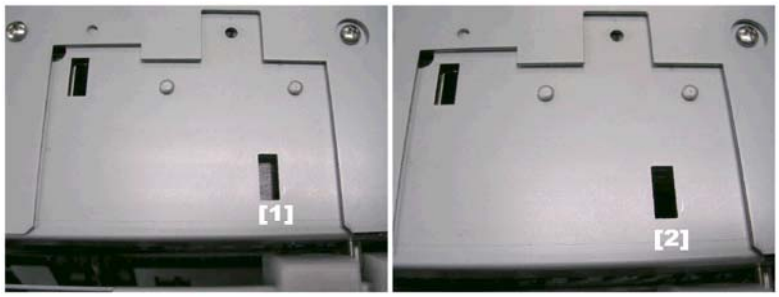


- **Rings Reversed Sensor (S802): Detects when rings have been loaded upside-down.**
  - Rings must be loaded in the cartridge with the open side facing up [1].

Slide 38

No additional notes

Detecting Incorrect Ring Installation



- When the rings are loaded correctly, this pushes a cover into the window [1].
- When the rings are loaded incorrectly, the cover does not appear on the window [2].
- The sensor tries to detect the cover.

Slide 39

No additional notes

Ring Size Detection - 1

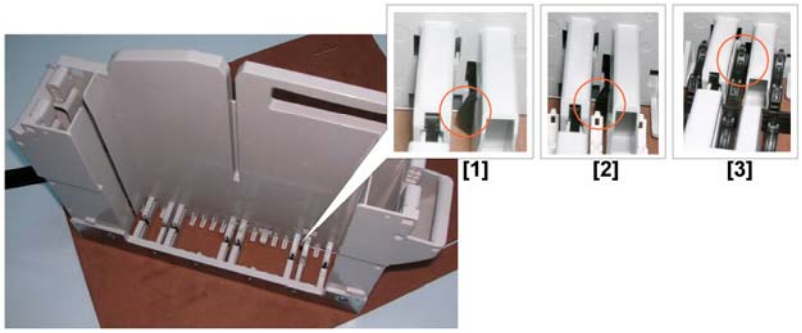
d392d906

- **50/100 Ring Detection Sensor (S804): Detects the ring size.**
  - There are only two ring sizes: 50-sheet, or 100-sheet.

Slide 40

No additional notes

Ring Size Detection - 2

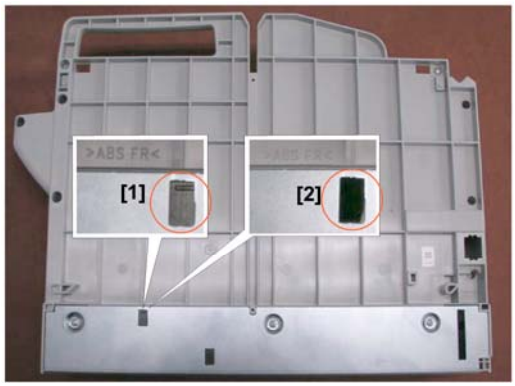


- An actuator opens and closes a window on the right side of the ring cartridge.
- The actuator [1] remains up when 50-sheet rings [2] are installed. The wider 100-sheet rings [3] push the actuator down.

Slide 41

No additional notes

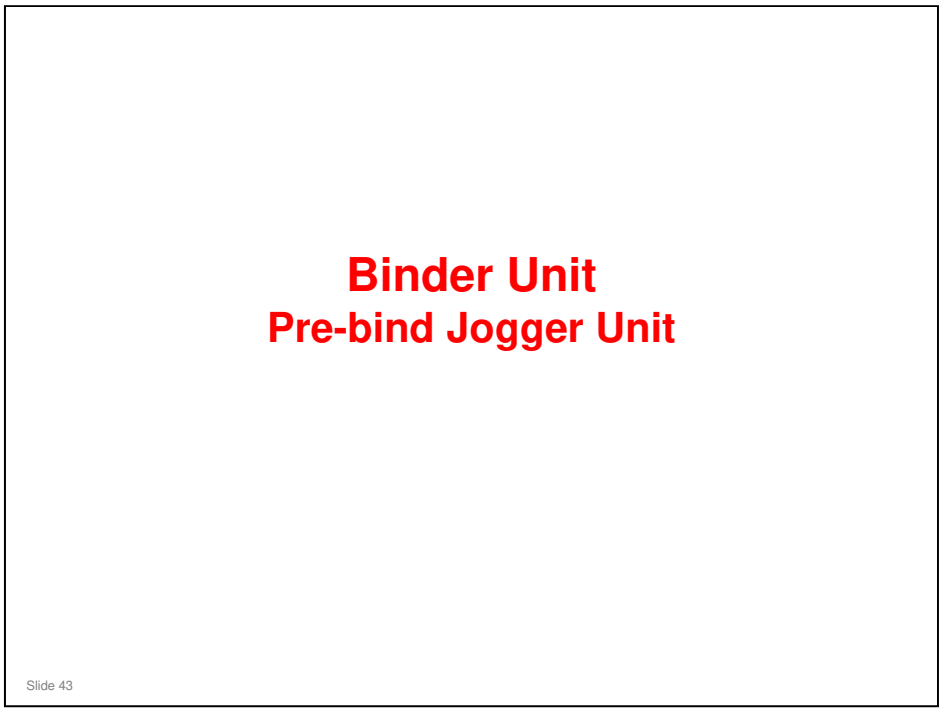
Ring Size Detection - 3



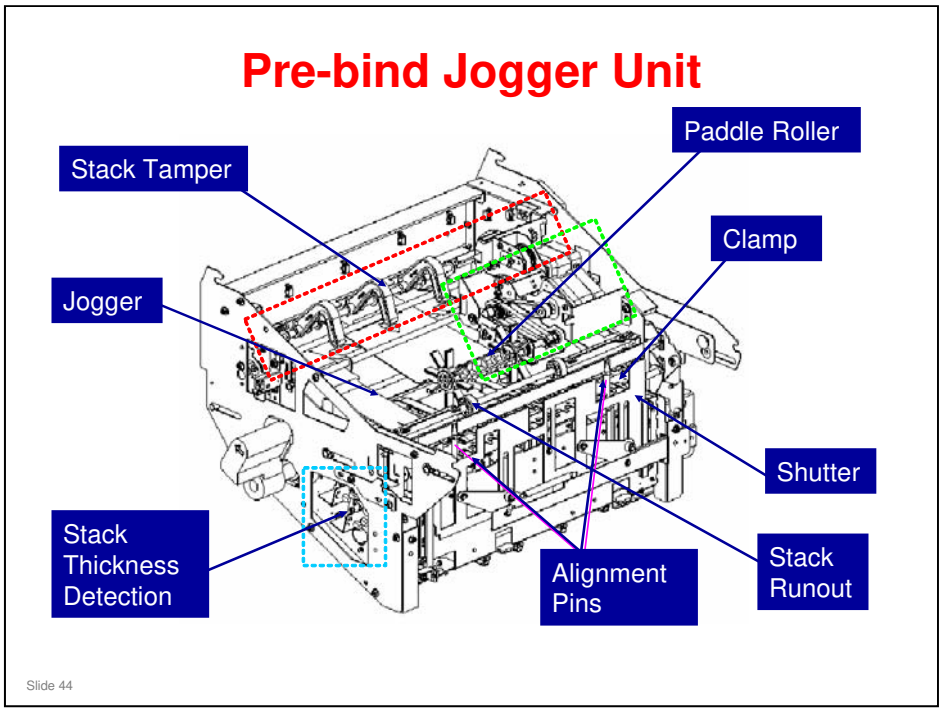
- The cover on the right side of the cartridge remains closed [1] when the 50-sheet size rings are installed.
- The cover opens [2] when the 100-sheet size rings depress the actuator.
- The sensor detects if the cover is open (50-sheet rings) or closed (100-sheet rings).

Slide 42

No additional notes

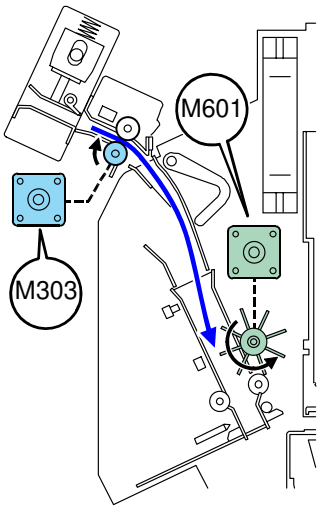


No additional notes



❒ The functions of these units will be explained on the next few slides.

Feed-in from the Punch Unit

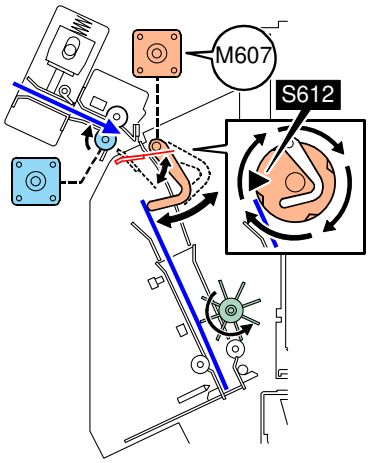


- **M303 (Punch Unit Runout Motor): Drives the punch runout roller.**
  - This feeds the punched sheet out of the punch unit to the pre-bind jogger.
- **M601 (Paddle Roller Motor): Drives the paddle roller.**
  - This pushes the leading edge of each sheet against the raised shutter to align the stack.
  - The motor drives the roller at a speed that is slightly faster than the line speed.

Slide 45

No additional notes

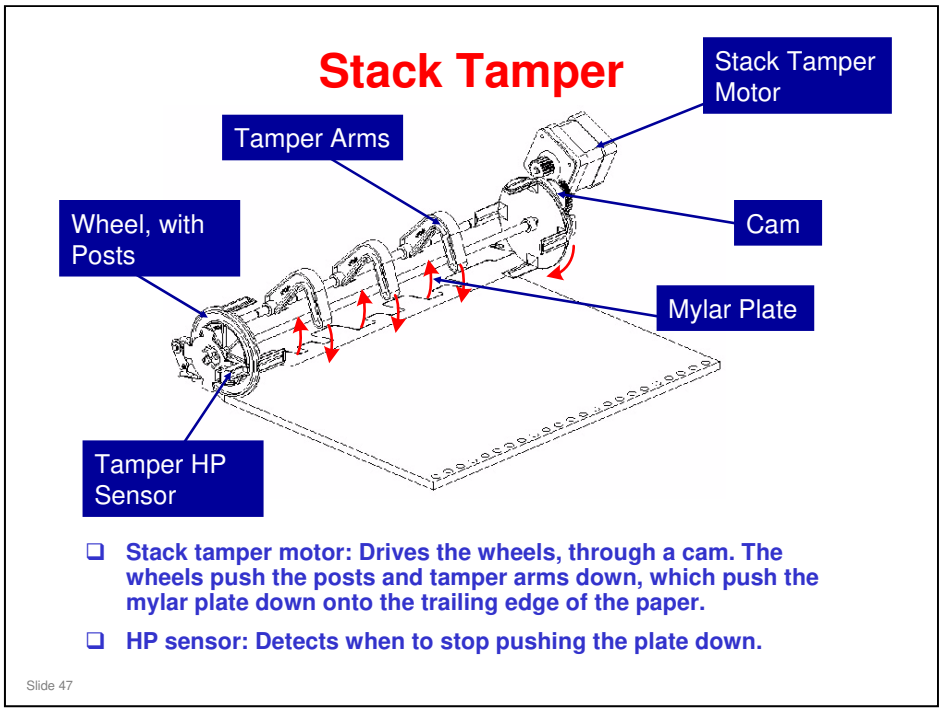
Stack Tamper



- **M607 (Stack Tamper Motor): Drives a cam that operates the tamper arms, posts, and mylar sheet.**
  - These press down the trailing edge of each sheet as it enters the pre-bind jogger unit.
  - This makes the path clear for the next sheet.
- **S612 (Stack Tamper HP Sensor): Detects the actuator on the tamper fence and stops the stack tamper motor (M607).**
  - The allowed arc of rotation is 90 degrees.

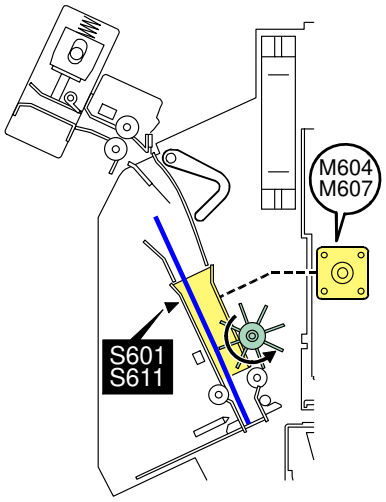
Slide 46

No additional notes



No additional notes

Pre-bind Jogger



- Each fence has a motor and a home position sensor.
- The front fence moves to a set position for the paper size.
- The rear fence jogs the paper against the front fence.

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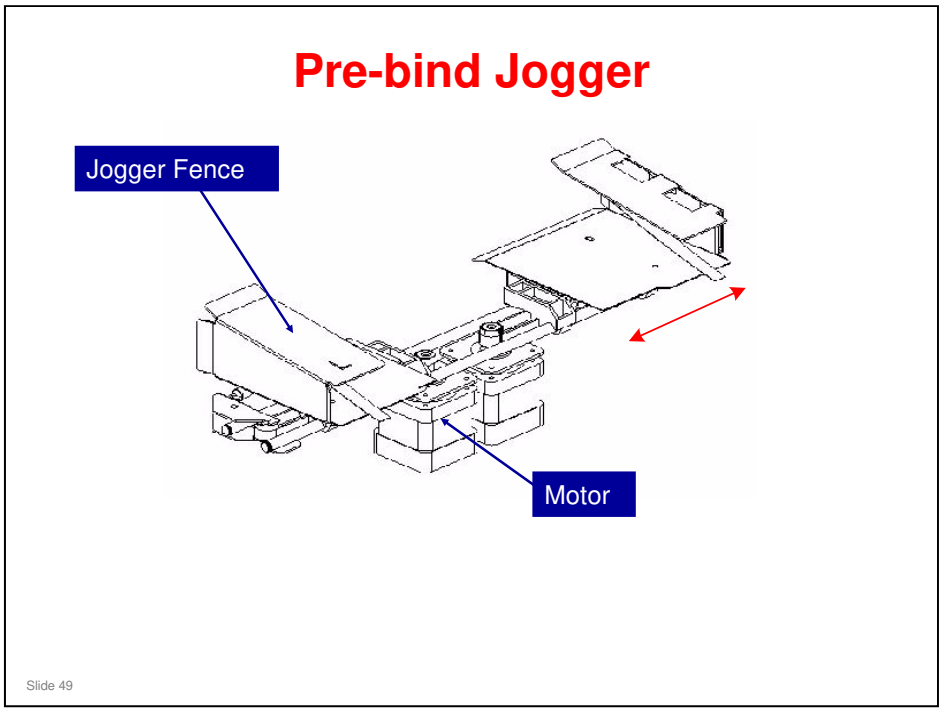
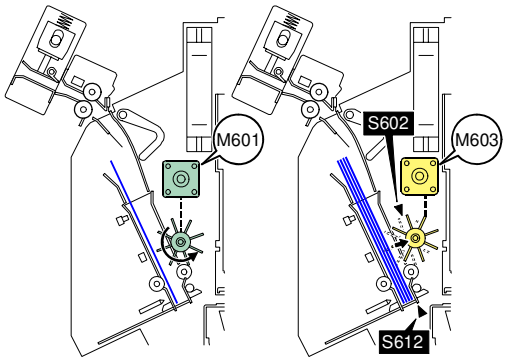
No additional notes



No additional notes

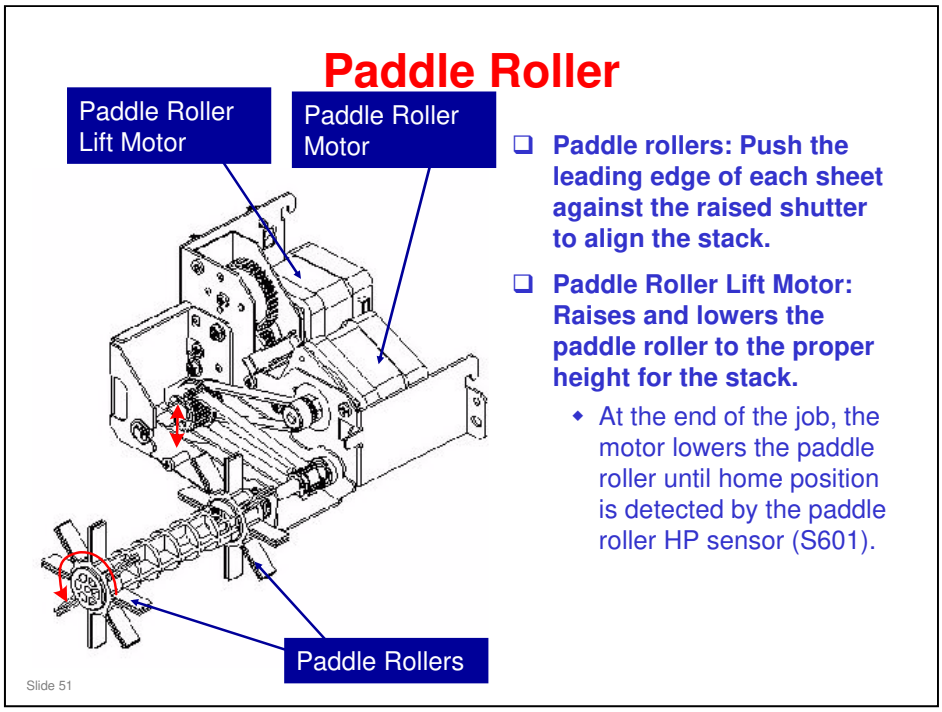
Paddle Roller



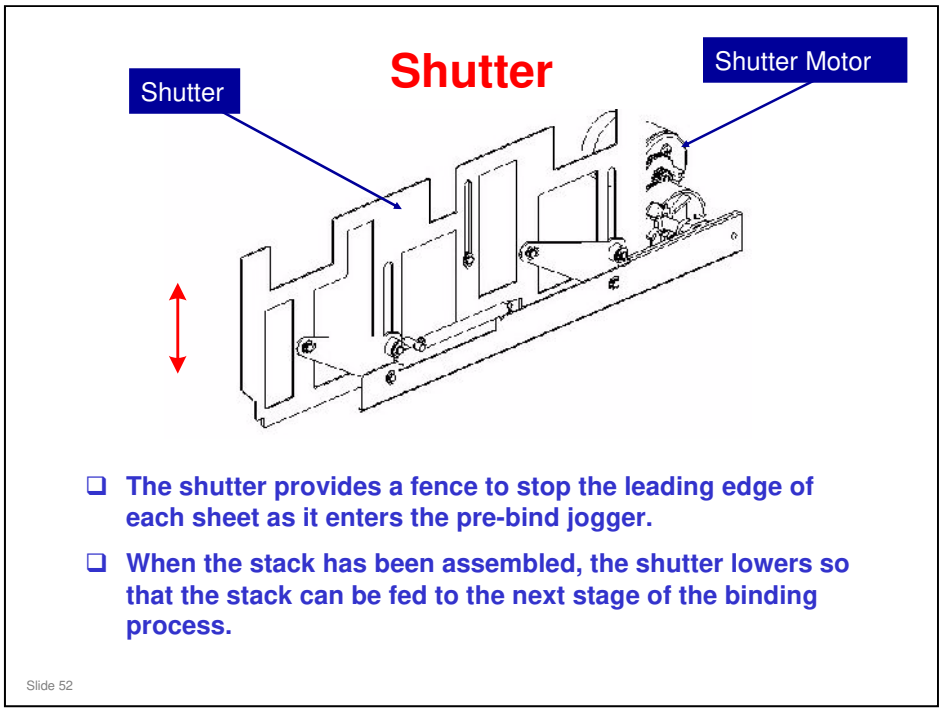
- M601 (Paddle Roller Motor): Drives the paddle roller.
- M603 (Paddle Roller Lift Motor): Raises and lowers the paddle roller to the proper height for the stack.
- S602 (Paddle Roller HP Sensor): Detects the descending paddle roller and switches off the paddle roller motor (M601) to stop the roller at its home position.

Slide 50

- S612 (Stack Tamper HP Sensor): Already described



- The paddle roller motor drives the roller at a speed that is slightly faster than the line speed.
- The readings of the stack thickness sensor (S607) determine how far the paddle roller is raised by the lift motor. The stack thickness sensor is discussed later in this section.

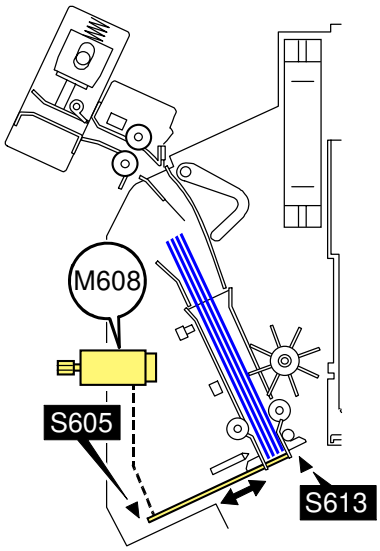


- The shutter provides a fence to stop the leading edge of each sheet as it enters the pre-bind jogger.
- When the stack has been assembled, the shutter lowers so that the stack can be fed to the next stage of the binding process.

Slide 52

No additional notes

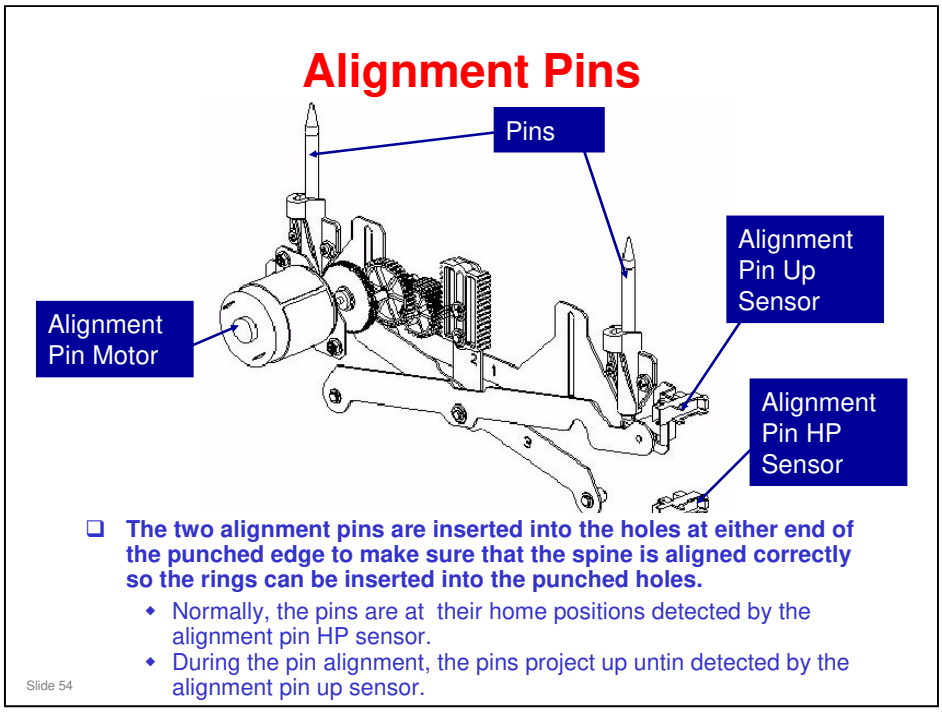
Shutter



- M608 (Shutter Motor): Raises and lowers the shutter.
- S613 (Shutter HP Sensor 2): Detects when the shutter is fully raised so that the leading edge of the stack can be aligned against the shutter.
- S605 (Shutter HP Sensor 1): Detects when the shutter is fully lowered, so that the stack can be fed out to the next stage of the binding process.

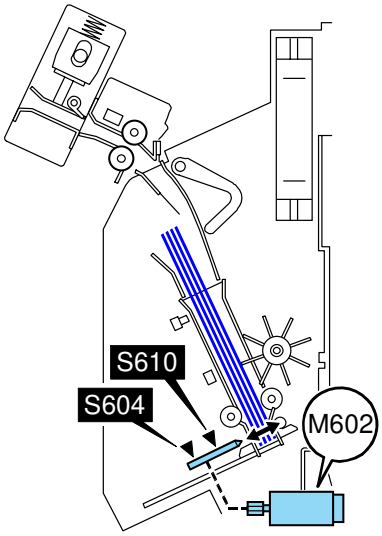
Slide 53

No additional notes



- The alignment pins are projected and retracted by a scissors lift (rack and pinion) driven by the alignment pin motor.
- This is the last alignment adjustment done before ring binding.

Alignment Pins



- **M602 (Alignment Pin Motor): Raises and lowers the alignment pins.**
- **S610 (Alignment Pin Up Sensor): Detects when the alignment pins are at the up position and inserted into the two holes in each end of the stack.**
- **S604 (Alignment Pin HP Sensor); Detects an actuator on the alignment pin linkage.**
  - This is the home position, when the pins have been moved away from the stack.

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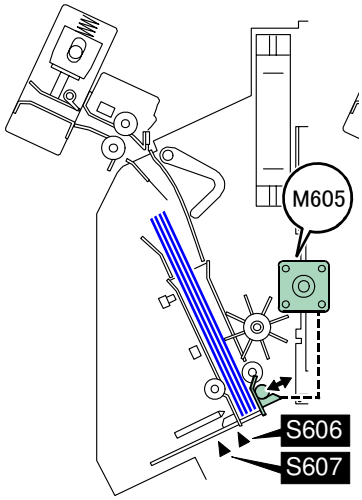
No additional notes

Detecting the Stack Thickness



- **S606 (50-Sheet Detection Sensor): Detects when the stack is thicker than 5.5 mm.**
  - When binding a 50-sheet document with the smaller 50-sheet rings, the job will stop if the sensor detects a stack that is thicker than 5.5 mm.
- **S607 (Stack Thickness Sensor): Measures the thickness of the stack through a cutout in the upper arm plate.**
  - This reading is used to adjust the height of the paddle roller when the stack is jogged.

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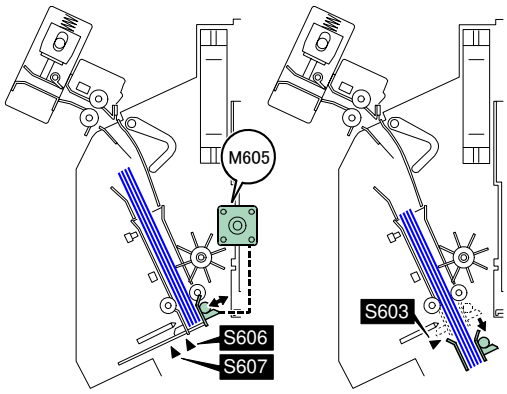
No additional notes

Clamping Before Binding



- **M605 (Clamp Motor): Rotates the cam which opens and closes the clamp that clinches the punched spine of the stack after it has been jogged.**
  - The spine remains clamped until the rings have been inserted and closed.
- **S603 (Clamp HP Sensor): Controls the operation of the clamp lift cam that opens the arms of the clamp.**

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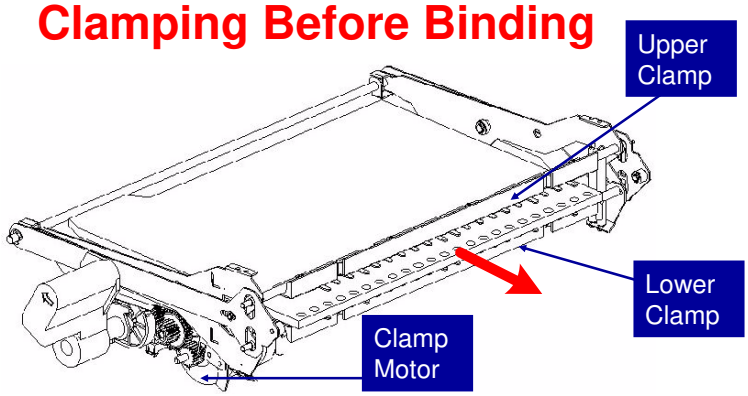
No additional notes

Clamping Before Binding



- The guide clamps hold the spine of the document before binding.
- The clamp motor moves the upper clamp guide through a cam.
- The rotation of the cam is controlled by the clamp HP sensor. The clamp upper guide normally remains away from the bearing of the clamp upper arm.
- During ring binding, the stack is held only at the spine.

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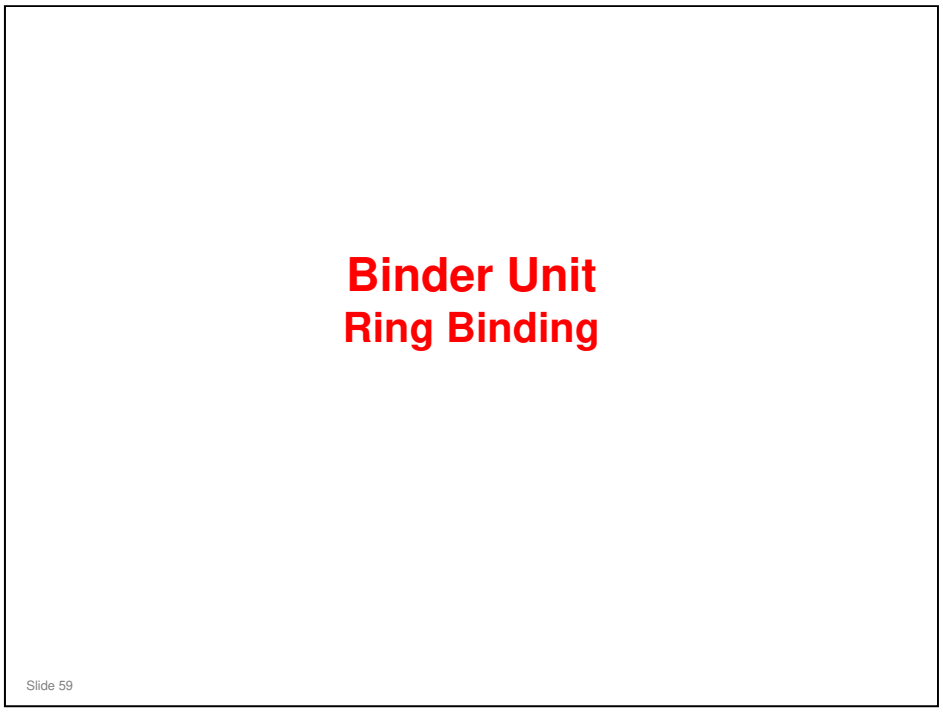
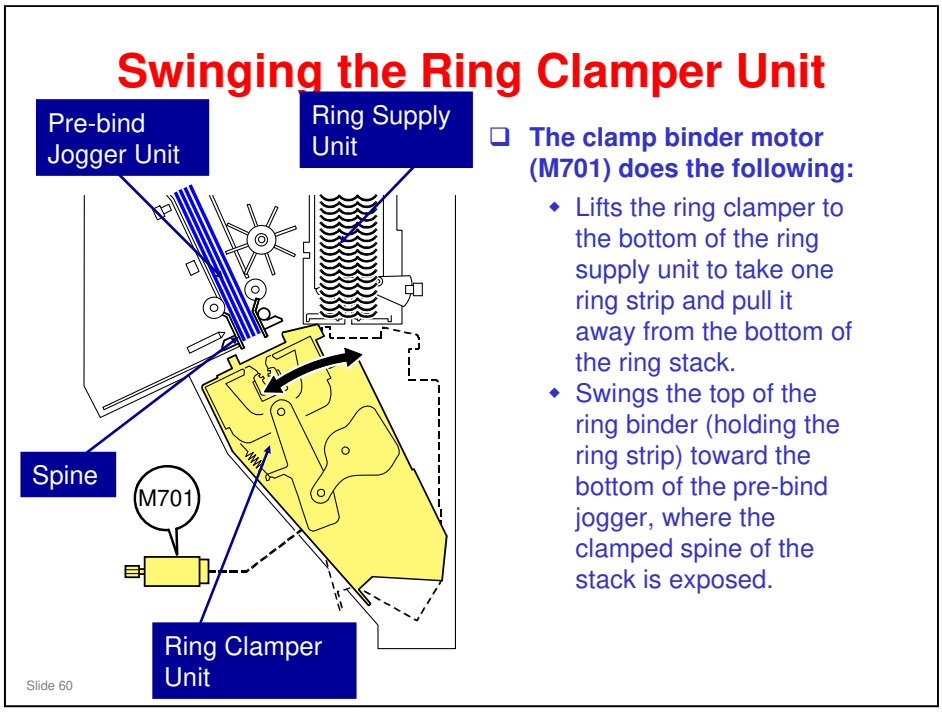
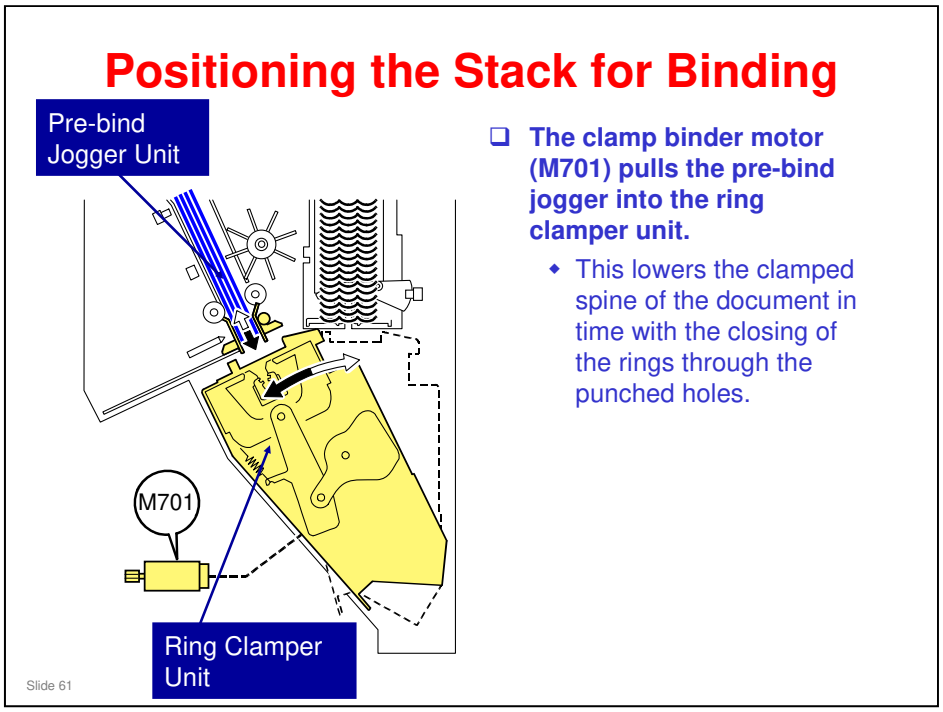
- During clamping, the upper and lower clamps are held closed by large springs.
- The clamp binder motor pulls the pre-bind jogger, with the clamped stack, into the ring binder. We will see this in the next section.



No additional notes

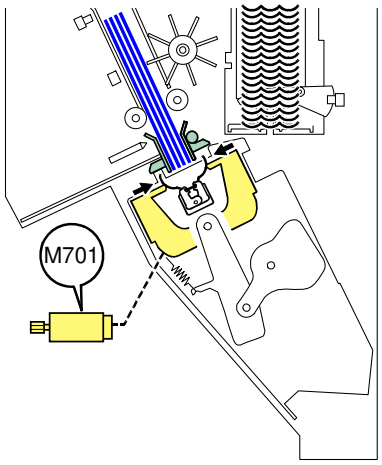


No additional notes



No additional notes

Binding



- The clamp binder motor (M701) closes the rings into the holes in the spine of the document.
- After inserting the rings, the clamp binder motor moves the ring binder unit back to the vertical position, to catch the next ring from the ring cartridge.

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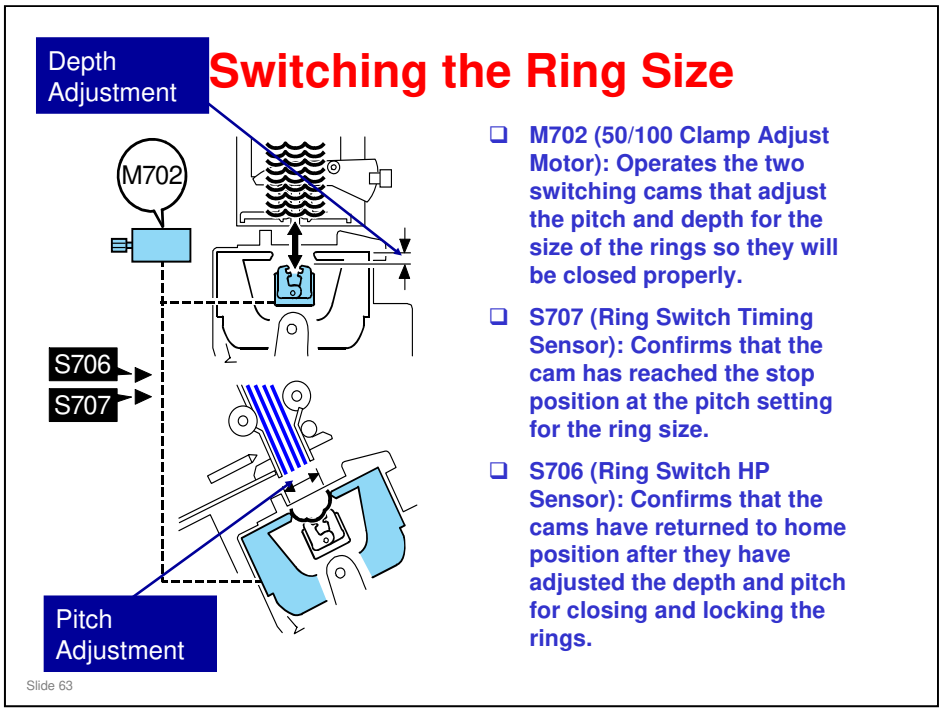
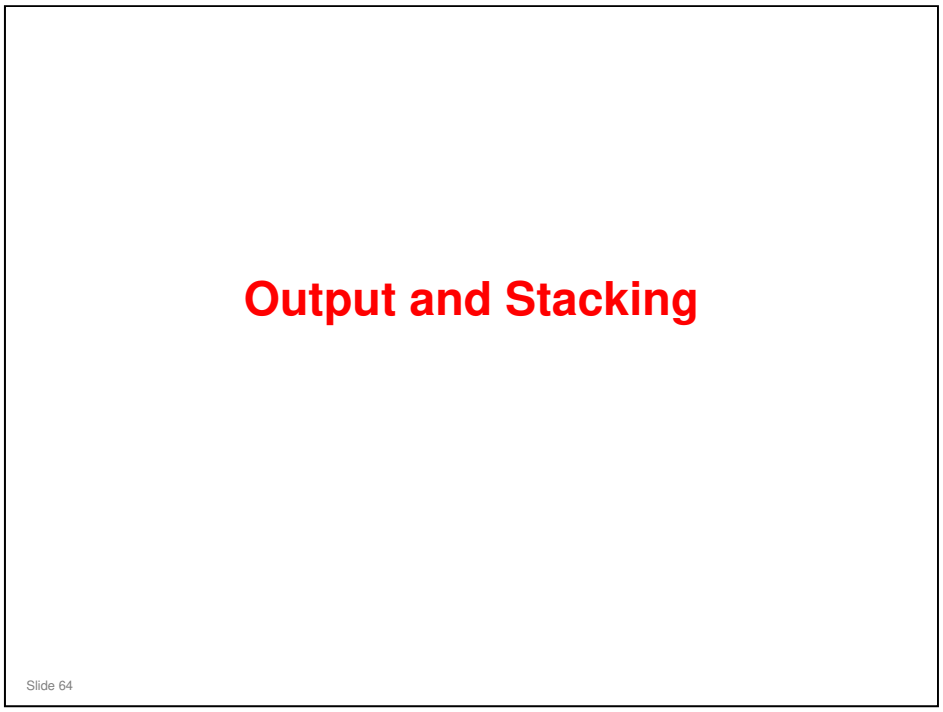
- There is a complex mechanism of cams and linkages.
- If possible, study this on a machine, while turning the shaft of the clamp binder motor.

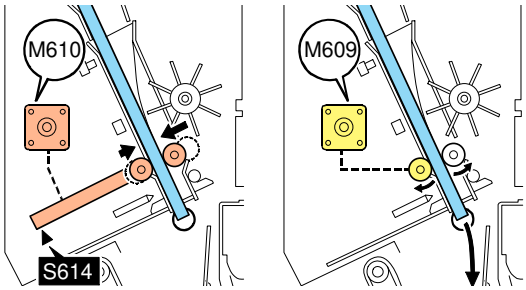


- The linkage depth and the binding pitch must be adjusted for the size of the ring (50 or 100-sheet size).
- The 50/100 clamp adjust motor (M702) drives a gear and switching cams 1 and 2 above the same shaft. Switching cam 1 switches the binding pitch and switching cam 2 switches the linkage depth.



No additional notes

Output from the Binder Unit



- **M610 (Runout Press Roller Motor): Raises and lowers the press roller to adjust it to the thickness of the book before the runout roller motor turns on.**
  - The roller must be moved to close the nip so that the bound stack can be fed out of the binder unit.
- **M609 (Runout Roller Motor): Rotates the runout press roller that feeds the bound book out of the binder unit.**
- **S614 (Runout Roller HP Sensor): Controls the runout press roller motor (M610). The home position is up (nip released).**

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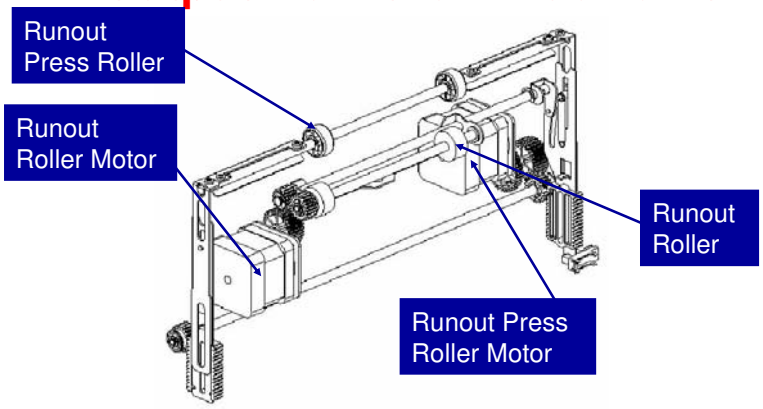
No additional notes

Output from the Binder Unit



- After the runout press roller has been moved against the stack, the runout roller feeds the stack out.

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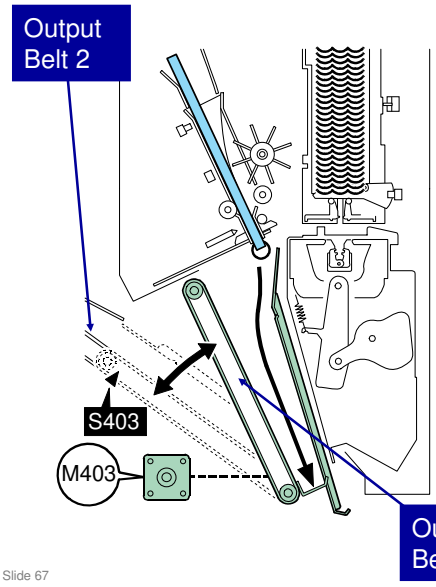
No additional notes

Catching the Stack with Output Belt 1



- **M403 (Output Belt Rotation Motor): Rotates the output belt 1 assembly.**
  - Rotates the assembly to the vertical so that it can receive the bound book from the binder unit
  - Rotates the assembly back to the left, to feed the book to output belt 2.
- **S403 (Output Belt Rotation HP Sensor): Detects when the belt reaches the correct position to feed the book on to output belt 2, and stops the output belt rotation motor (M403).**

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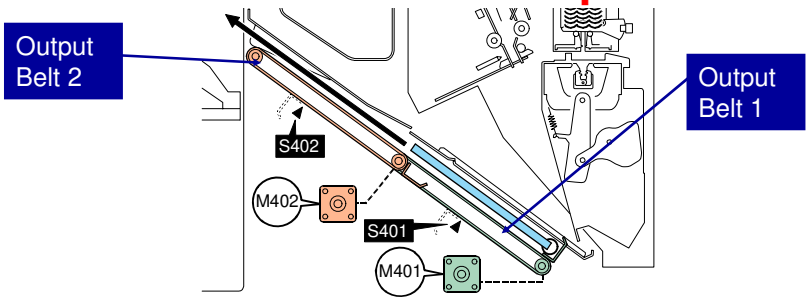
No additional notes

Feed-out with the Output Belts



- M401, M402 (Output Belt Motors): Drive output belts 1 and 2.
- S401 (Output Belt 1 HP Sensor): Detects the home position of the pawls mounted on output belt 1. The pawls push the book onto output belt 2.
- S402 (Output Belt 2 HP Sensor): Detects the home position of the pawls mounted on output belt 2. The pawls push the book onto the output stacking tray.

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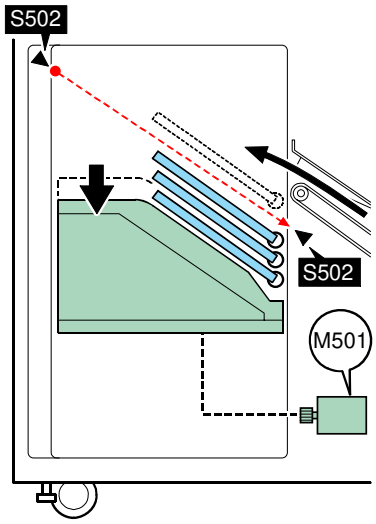
- HP sensors: With the pawls at their home positions, the belt is ready to move the next book received from the binder unit (in the case of S401), or from output belt 1 (in the case of S402).

Stacking the Output - 1



- M501 (Stacker Motor): Raises and lowers the stacking tray, where the bound books are output from output belt 2.
- S502 (Stack Height Sensor): Detects the top of the document stack on the stacker tray and signals when the stacker tray is full.

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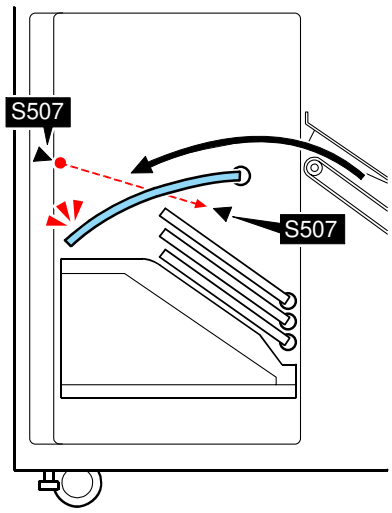
No additional notes

Stacking the Output - 2



- S507 (Book Position Sensor): Checks the position of the bound book to detect book skew or falling.

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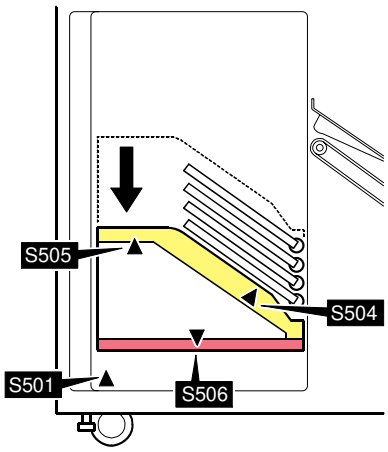
No additional notes

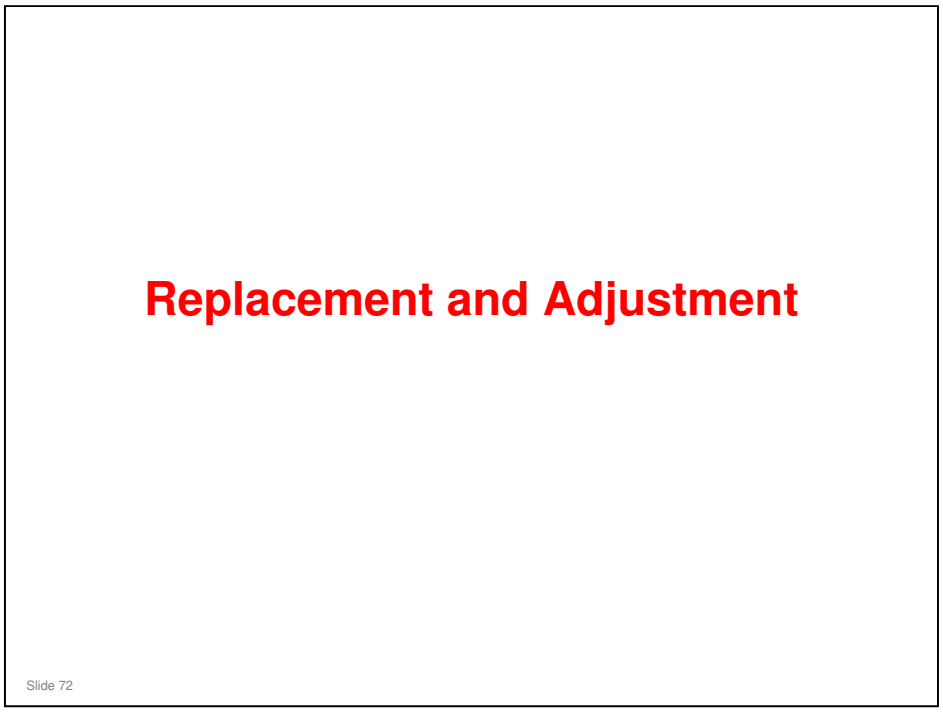
Stacking the Output - 3



- **S505 (Tray Detection Sensor): Detects whether the stacker tray is pulled out or pushed in.**
- **S504 (Stacker Detection Sensor): Detects a document on the stacker tray at power on.**
- **S501 (Stacker HP Sensor): Detects the home position of the stacker tray and stops the stacker motor (M501).**
  - The stacker tray is at its home position when it is completely down.
- **S506 (Obstacle Detection Microswitch): The open space on the left side of the finisher must always remain open. If something is placed under the tray, the tray will trigger this switch and the tray will stop.**

Slide 71

No additional notes



❒ The next few slides contain important points for replacement and adjustment.

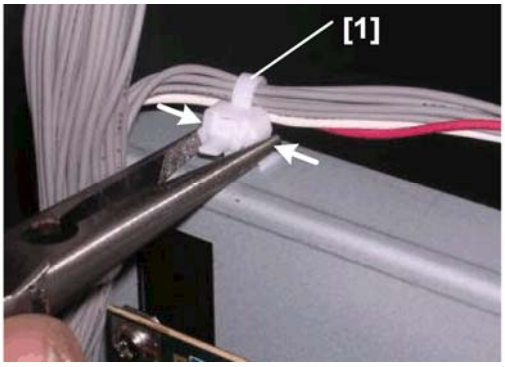
Pulling out/Pushing in the Binder Unit

- Always grip handle Mc8 when pulling out or pushing in the binder unit.
- Never touch any other surface of the binder unit when it is moving.
- To avoid injury the fingers, never push on the top of the binder unit to slide it back into the finisher.

Slide 73

No additional notes

Standoffs on Harnesses - 1



- Some harnesses are permanently locked by plastic bands [1] to plastic standoffs that are attached to the frame.
- Do not try to remove this band.
- Use a pair of needle-nose pliers to press in the base of the stand off and lift it out of its hole.

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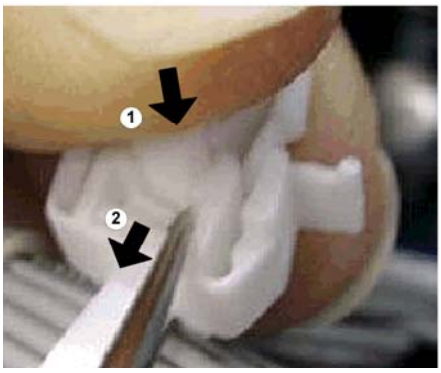
- The base of a removed standoff can be quickly re-inserted into its hole.

Standoffs on Harnesses - 2



- **If you must remove the band:**
  - Press the end of the band loop.
  - Use a sharp tool to press down the lock band below (or above) the looped band to separate the serrations of the bands and release the loop.
- **This must be done for the two motors of the clamp unit, or the band must be cut, which is not good.**

Slide 75

No additional notes

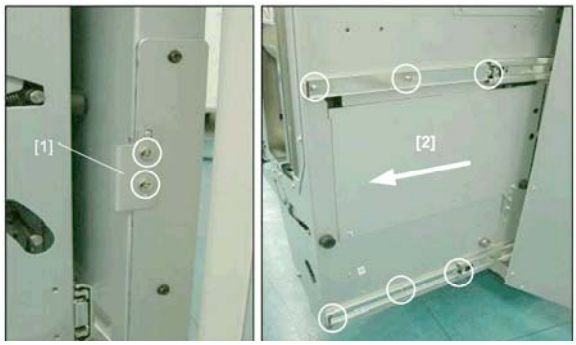
Ring Cartridge

- Always remove the ring cartridge before removing the binder unit for servicing.

Slide 76

No additional notes

Working on the Binder Unit

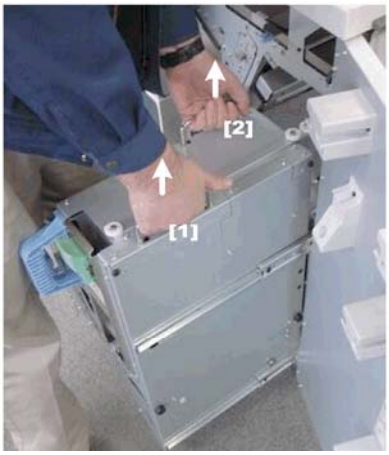


- It is recommended that the binder unit be removed for all servicing and maintenance.
- The binder unit wobbles on the rails and moves back into the machine. So, it does not provide a stable platform for removing sensors or motors.

Slide 77

No additional notes

Lifting the Binder Unit - 1



- Lift the binder unit by its handles [1] and [2], pull it straight up and then slightly to the left to disengage the right side of the unit from the machine.
- The binder unit is heavy and weighs about 22 kg (50 lb).

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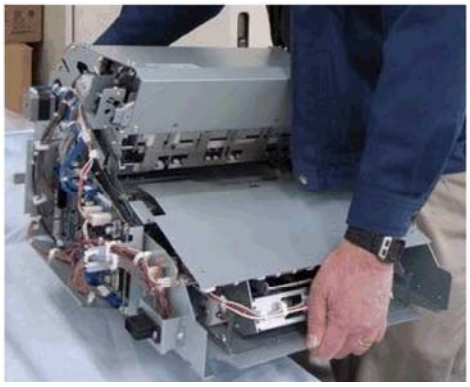
No additional notes

Lifting the Binder Unit - 2



- Hold the binder unit from the rear with a firm grip under the top and bottom of the unit.

Slide 79

No additional notes

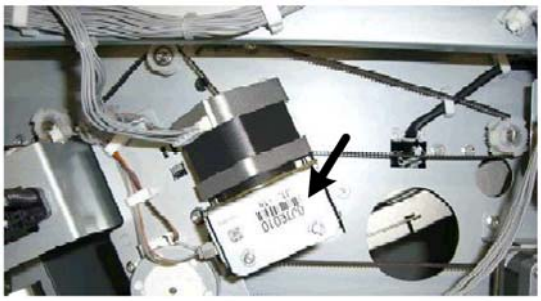
Lifting the Binder Unit - 3

- Lay the binder on its right side with its rubber stoppers down.

Slide 80

No additional notes

SP6504



- **Adjust this SP after you replace one or more of the following items:**
  - Binder unit control board
  - Ring binder main board
  - Pre-punch jogger unit
  - Pre-punch jogger HP sensor (S301)
- **Multiply the value on the decal by "0.1". For example, if the value is "-19" then input –1.9.**
- **Do a run with the ring binder in the punch only mode (no ring binding). Use paper in the weight range 70 to 90 g/m^2.**

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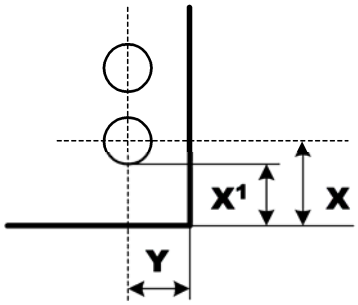
❒ SP6504-1 (A4 LEF) or SP6504-2 (LT LEF)

Adjusting SP6504 if the Hole Position is Incorrect - 1



- Check the position of the last punched hole.
- Standard Values (mm)
  - X: 8.8 (A4), 12.7 (LT)
  - Y: 6 (A4), 6 (LT)
  - X1: 5.625 (A4), 9.52 (LT)
- If Y is incorrect, replace the punch unit.
- If X is incorrect, change the value of SP6504 as shown on the following slide.

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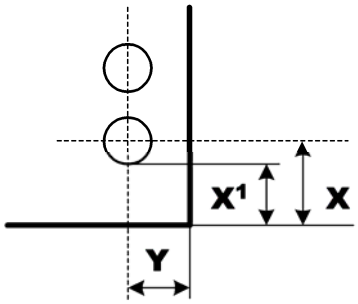
No additional notes

Adjusting SP6504 if the Hole Position is Incorrect - 2

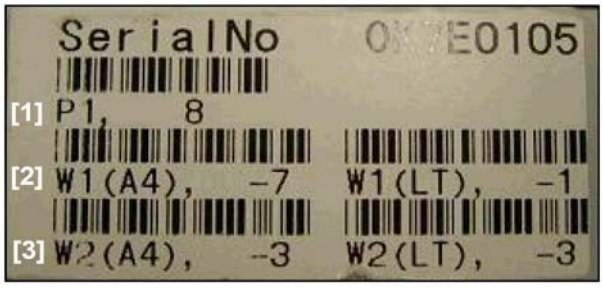


- For example, if X1 is measured at "9.65“, this does not match the standard for LT (X1 = 9.525). The hole is too high up the page.
- Subtract the measured value (9.65) from the standard value (9.525) and multiply it by "2".
  - 9.525 - 9.65 = -0.125 x 2 = -0.250
- Add "-0.250" to the setting of SP6504

Slide 83

- The actual adjustment is done by adjusting the movement of the pre-punch jogger fences so that the hole-punch position is lowered "-0.125".
- The firmware does this automatically by dividing the entered value (-0.25) by 2 (-0.125), so 9.65 – 0.125 = 9.525 mm.
- In our example above, the measured distance is more than the standard value.
  - If the measured distance is less than the standard value, then the adjustment must raise the hole-punch position. The setting of SP6504 must be made larger in order to raise the hole position.

SP 6505, 6506, 6507



- **Adjust this SP after you replace one or more of the following items:**
  - Ring binder main board
  - Binder unit control board
  - Pre-bind jogger unit
- **Input the following values on the decal into the SPs:**
  - [1]: SP6505
  - [2]: SP6506-1 (for A4), 6506-2 (for LT)
  - [3]: SP6507-1 (for A4), 6507-2 (for LT)

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- This label is attached to the front cover of the pre-bind jogger unit.