500-Sheet Finisher
Machine Code: D372

SERVICE MANUAL

September 2007
Subject to change

Safety, Conventions, Trademarks

Safety

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer and peripheral power cords are unplugged.
2. The power source should be near the printer and easily accessible.
3. Note that some components of the printer and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
6. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.
7. To prevent a fire or explosion, keep the machine away from flammable liquids, gases, and aerosols.

HEALTH SAFETY CONDITIONS

1. Never operate the copier without the ozone filters installed.
2. Always replace the ozone filters with the specified ones at the specified intervals.
3. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.

2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

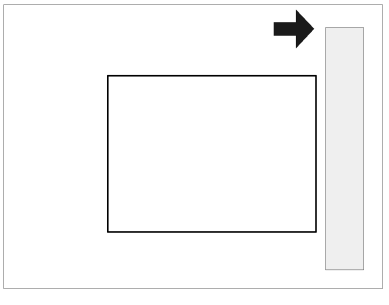
⚠CAUTION

- The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

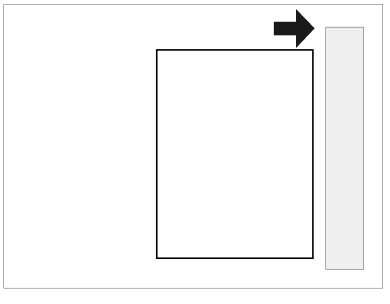
Conventions and Trademarks

Conventions

Symbol	What it means
CT	Core Tech Manual
	Screw
	Connector
	E-ring
	C-ring
	Clamp
FFC	Flexible Film Connector



SEF (Short Edge Feed)



LEF (Long Edge Feed)

The notations "SEF" and "LEF" describe the direction of paper feed. The arrows indicate the direction of paper feed.

Warnings, Cautions, Notes

In this manual, the following important symbols and notations are used.

⚠WARNING

- A Warning indicates a potentially hazardous situation. Failure to obey a Warning could result in death or serious injury.

⚠CAUTION

- A Caution indicates a potentially hazardous situation. Failure to obey a Caution could result in minor or moderate injury or damage to the machine or other property

Important

- **Obey these guidelines to avoid problems such as misfeeds, damage to originals, loss of valuable data and to prevent damage to the machine**

Note

- This information provides tips and advice about how to best service the machine.

Trademarks

- Microsoft®, Windows®, and MS-DOS® are registered trademarks of Microsoft Corporation in the United States and /or other countries.
- PostScript® is a registered trademark of Adobe Systems, Incorporated.
- PCL® is a registered trademark of Hewlett-Packard Company.
- Ethernet® is a registered trademark of Xerox Corporation.
- PowerPC® is a registered trademark of International Business Machines Corporation.
- Other product names used herein are for identification purposes only and may be trademarks of their respective companies. We disclaim any and all rights involved with those marks.

TABLE OF CONTENTS

3. Specifications

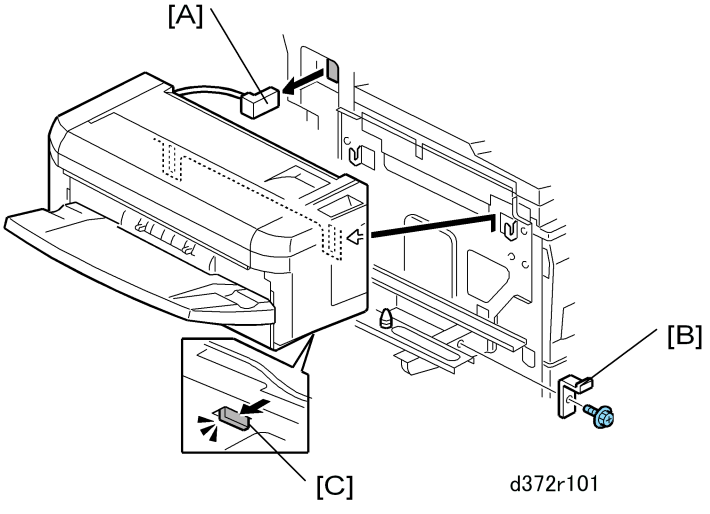
1. Replacement and Adjustment

Common Procedures

Disconnecting, Removing the Finisher

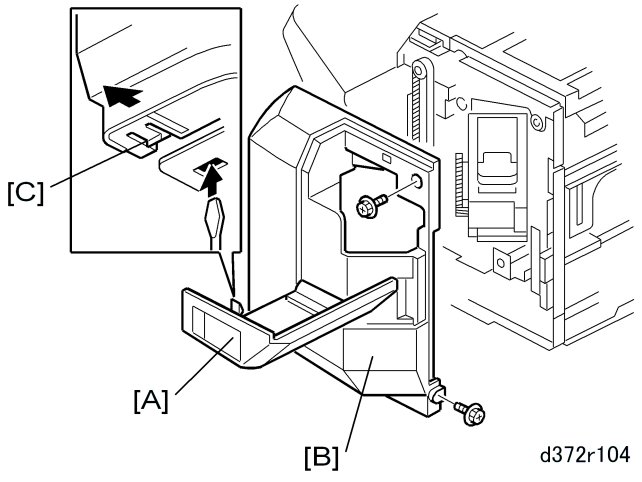
Important

- **The finisher must be removed from the machine for these procedures. The front and rear covers cannot be removed while the finisher is attached to the side of the machine.**



1. Disconnect the finisher I/F cable [A] on the left side of the machine.
2. Remove the lock plate [B] (x1).
3. Press the spring release [C] toward the rear of the finisher, then lift the finisher off its center post.

Front Cover



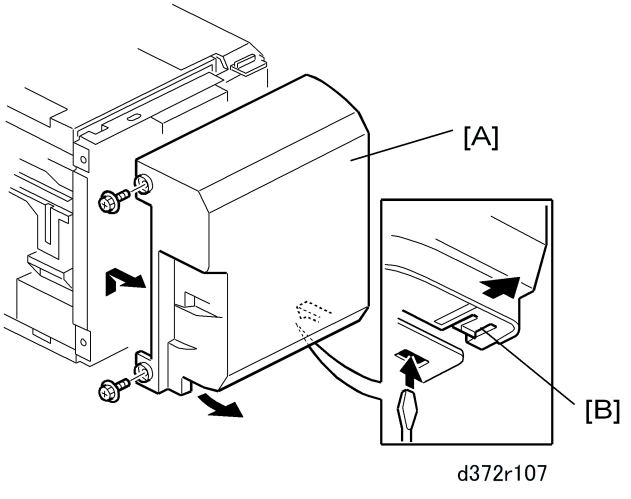
Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.

1. Open the stapler door [A].
2. Remove the front cover [B] (x2)

   Release tab [C] after removing the screws, then raise the bottom of the front cover to remove it.

Rear Cover



Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.

1. Remove the rear cover [A] (x2)

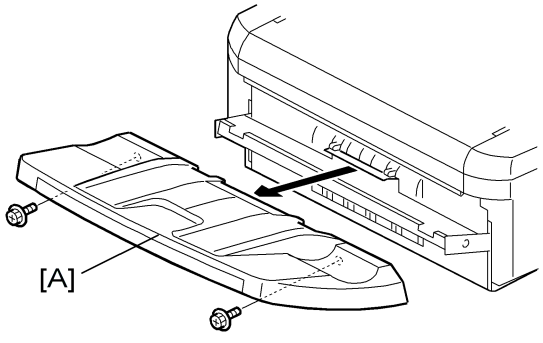
   Release tab [B] after removing the screws, then raise the bottom of the rear cover to remove it.

Transport Unit

Preparation

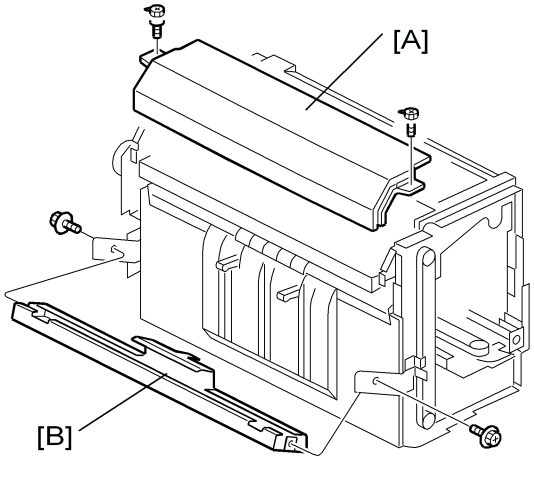
Remove:

- Front cover
- Rear cover



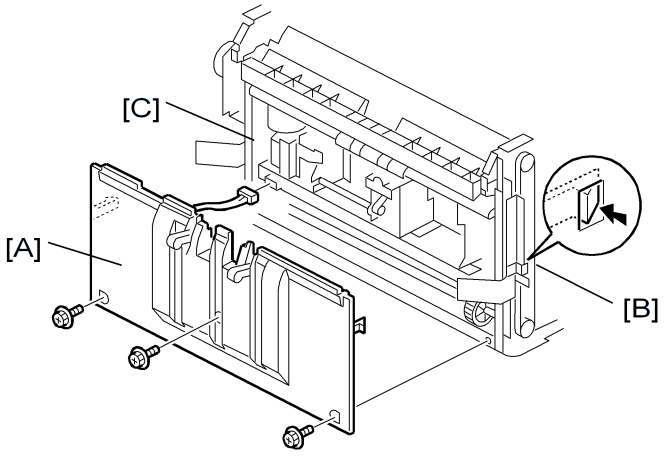
d372d102

1. Remove the paper output tray [A] (x2).



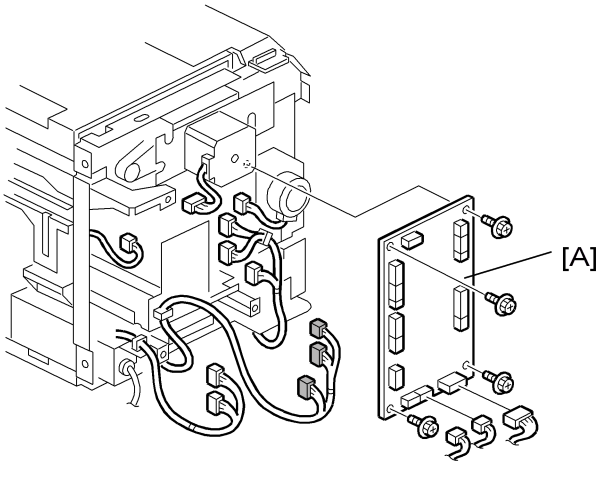
d372r114

2. Remove the left top cover [A] (x2).
3. Remove the tray support [B] (x2).



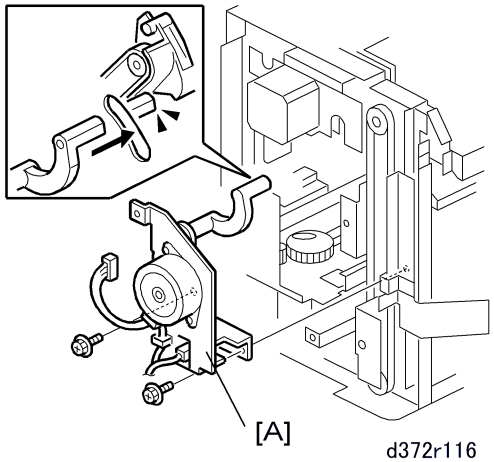
d372r115

4. Remove the screws of the end fence [A] (x3).
5. Release tabs [B] and [C].
6. Remove the end fence.



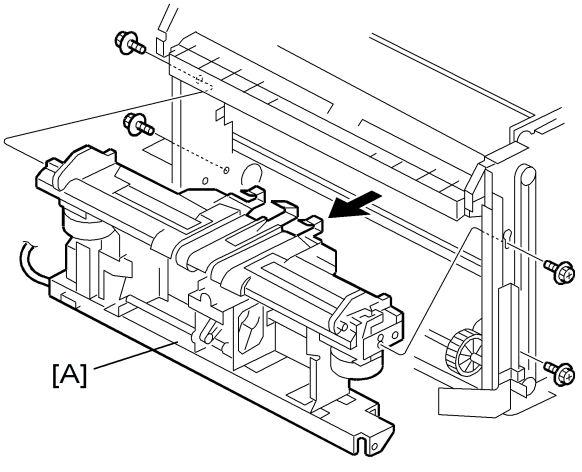
d372r108

7. Remove the main board [A] (x 14, x4)



d372r116

8. Remove the positioning roller arm motor bracket [A] (x2).



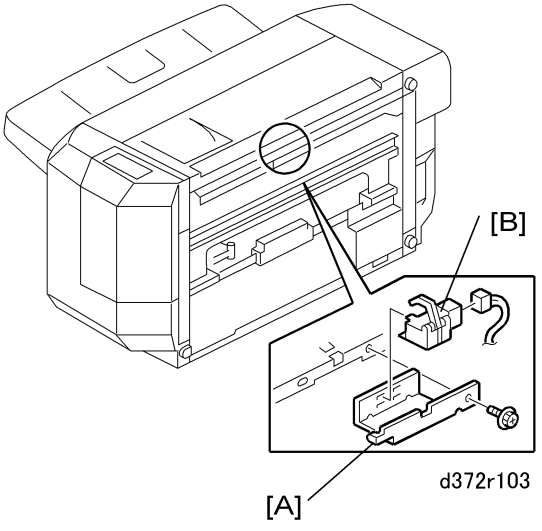
d372r117

9. Remove the transport unit [A] (x3 Rear, x2 Front).

Sensors

1

Entrance Sensor

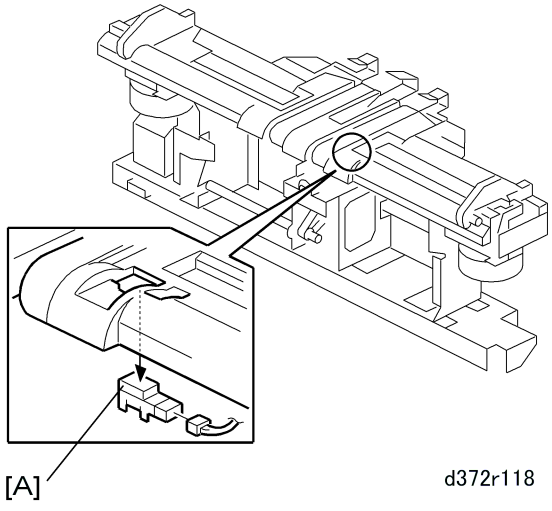


Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.

1. Remove the sensor bracket [A] (x1).
2. Disconnect the entrance sensor [B] (Pawls x4, x1).

Paper Sensor



Preparation

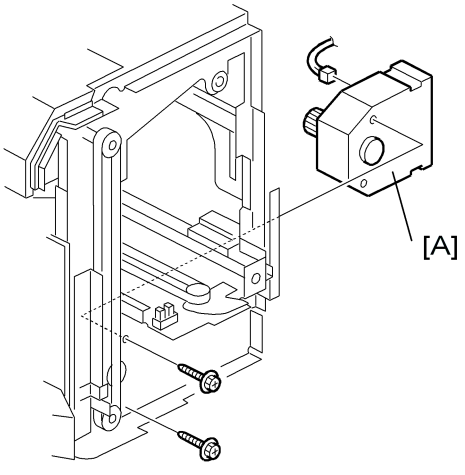
- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the transport unit

1. Disconnect the sensor [A] (x1, Pawls x3, x1)

Motors

1

Tray Lift Motor



d372r106

Preparation

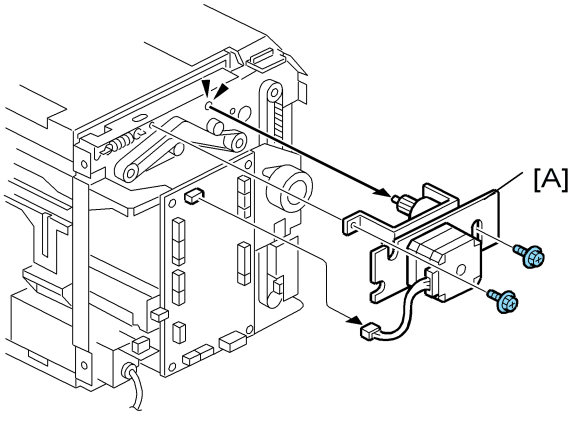
- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the front cover

1. Remove the tray lift motor [A] (x2, x1).

Transport Motor

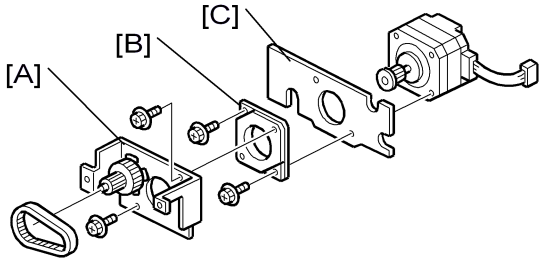
Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the rear cover.



d372r110

1. Remove the motor bracket [A] (x2, x1)



d372r111

2. Remove:

   [A] 1st bracket (Timing belt x1, x2)

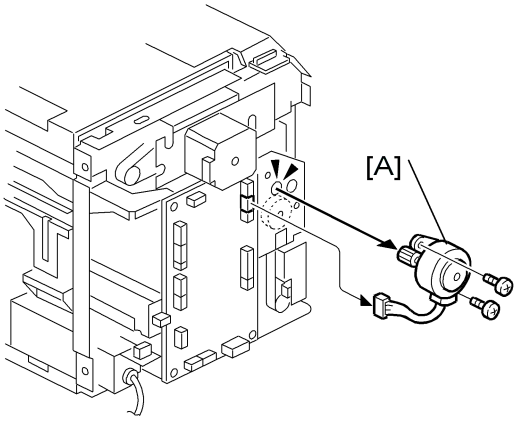
   [B] 2nd bracket (x2)

   [C] 3rd bracket

Reinstallation

- After reattaching the motor, rotate its drive gear and confirm that the timing belt is set correctly.
- Rotate the motor drive gear by hand and confirm that these rollers are turning: 1) entrance roller, 2) positioning roller, and 3) return rollers. (The return rollers are the two small sponge rollers below the positioning roller.)

Positioning Roller Arm Motor



d372r109

Preparation

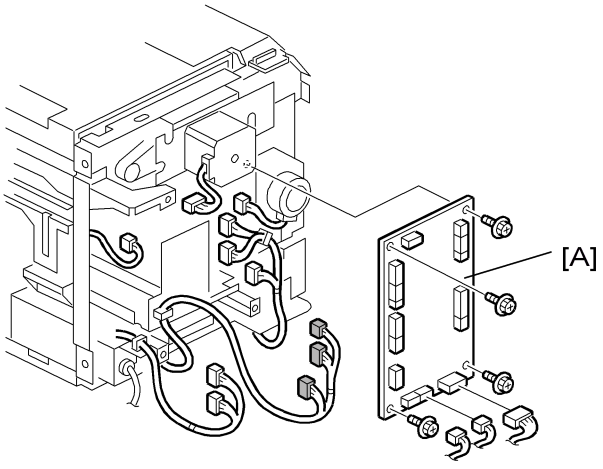
- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the rear cover.

1. Remove the positioning roller arm motor [A] (x2, x1).

Stapler Movement Motor

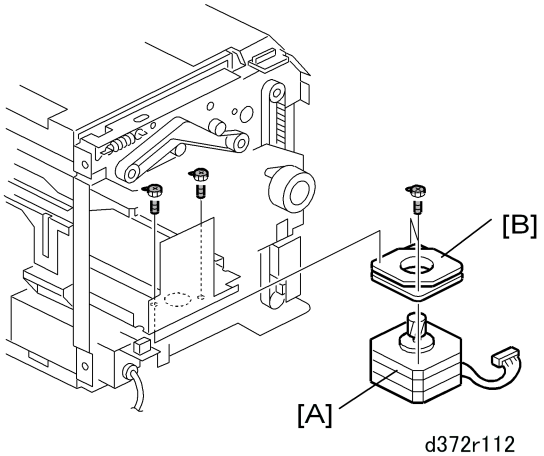
Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the rear cover.



d372r108

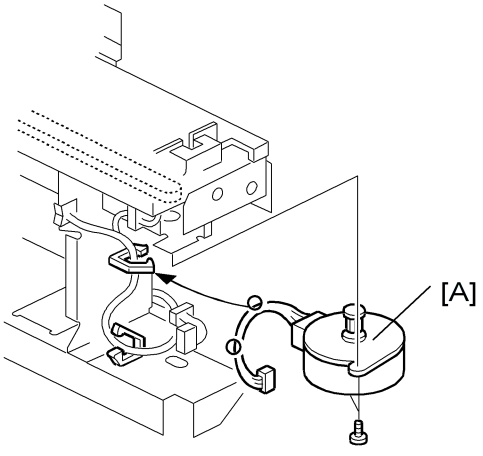
1. Remove the main board [A] (x 14, x4).



d372r112

2. Remove the stapler movement motor [A] (x2, x1).
3. Remove the bracket [B] (x2).

Front Fence Motor



d372r119

Preparation

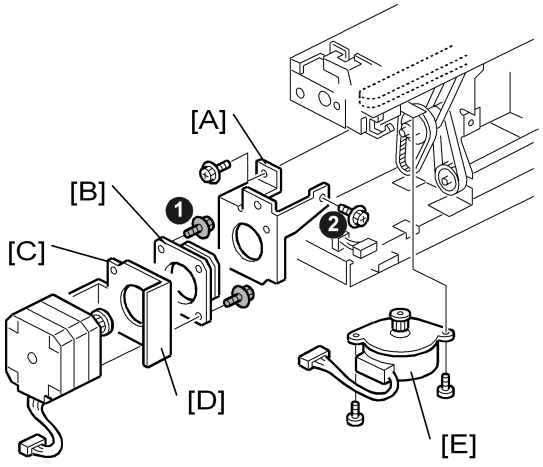
- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the transport unit

1. Remove the front fence motor [A] (x1, x2, x1).

Feed-Out Belt Motor, Rear Fence Motor

Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the transport unit



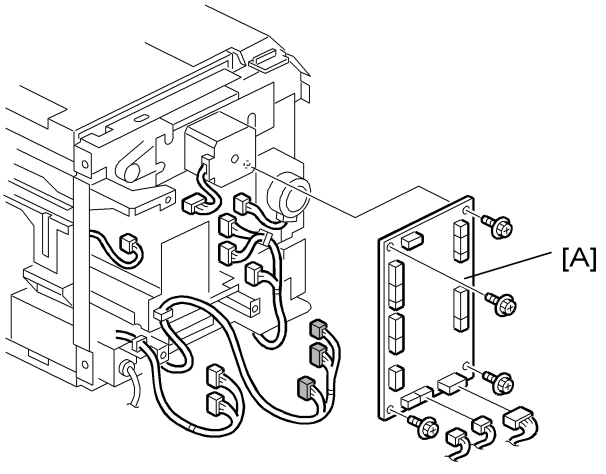
d372r120

1. Remove the feed-out belt motor mount [A] ①, ② (x2).
2. Remove:
   [B] 1st bracket (x2)
   [C] 2nd bracket (x2)
   [D] 3rd bracket
3. Remove the rear fence motor [E] (x2, x1)

Boards

1

Main Board



d372r108

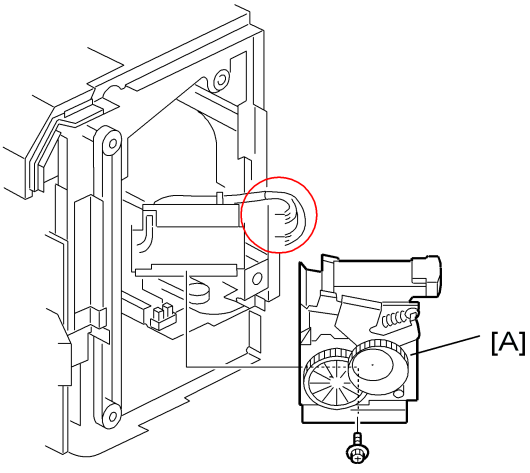
Preparation

- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the rear cover.

1. Remove the main board [A] (x14, x4)

Others

Stapler



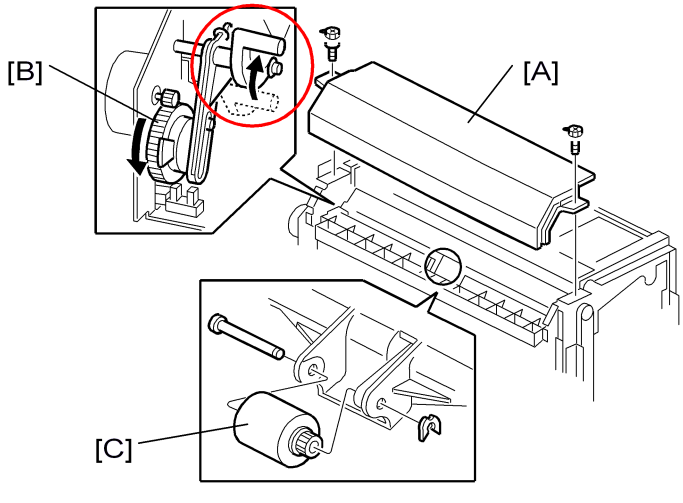
d372r105

Preparation

- Remove the front cover.

1. Remove the stapler [A] (x1, x2)

Positioning Roller



d372r113

Preparation

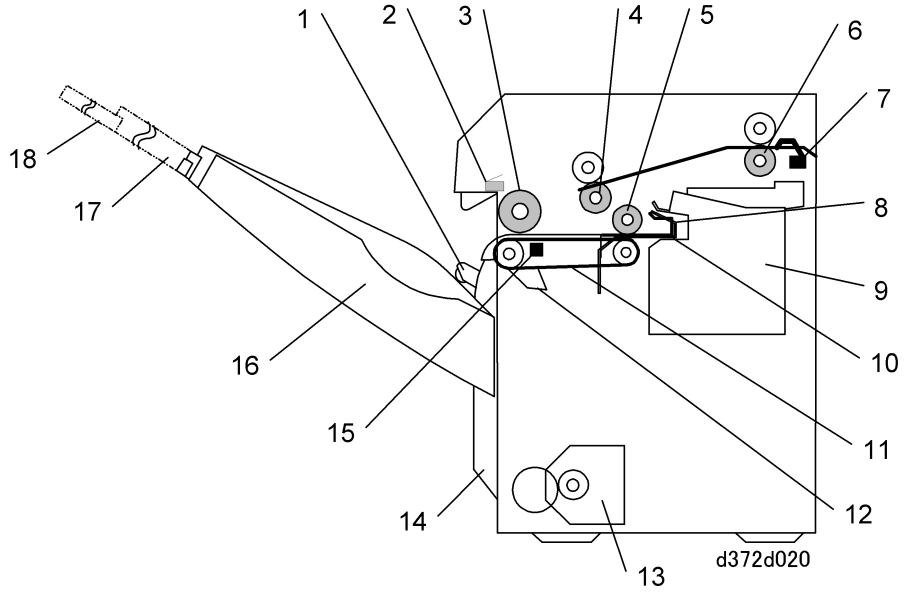
- Disconnect the finisher.
- Remove the finisher from the side of the machine.
- Remove the front cover.
- Remove the rear cover.

1. Remove the left top cover [A] (x2)
2. Rotate drive gear [B] of the positioning roller arm motor to raise the positioning roller to its highest position.
3. Remove the positioning roller [C] (x1)

2. Detailed Section Descriptions

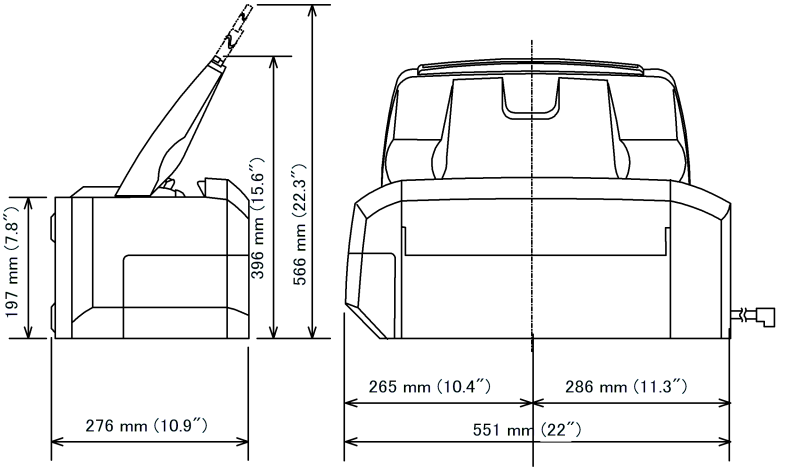
Overview

Important Parts

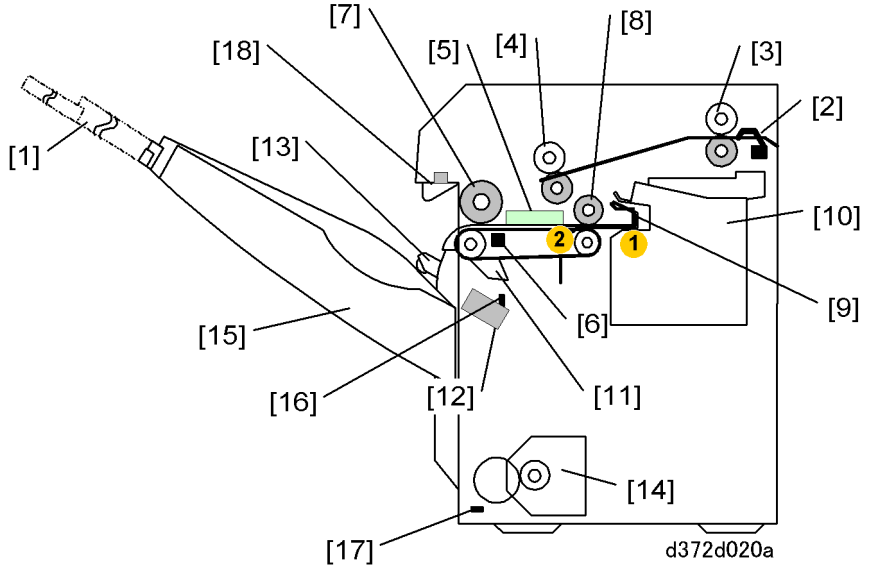


1.	Stack Edge Depressors (x2)	10.	Bottom Fences
2.	Tray Upper Limit Switch	11.	Feed-out Belt
3.	Positioning Roller	12.	Feed-out Belt Pawls (x2)
4.	Exit Roller	13.	Tray Lift Motor
5.	Return Roller	14.	End Fence
6.	Entrance Roller	15.	Paper Sensor
7.	Entrance Sensor	16.	Output Tray
8.	Mobile Fence (x1)	17.	Tray Extension (Middle)
9.	Stapler	18.	Tray Extension (End)

External Dimensions



General Operation



Here is a brief summary of what happens inside the finisher. For more details, see the other sections of this manual.

First, the operator pulls out the tray extension [1], and selects the paper size and operation mode for the job (Normal, Shift, or Stapling).

Paper Transport

The entrance sensor [2] detects the paper when it enters the finisher. The entrance rollers [3] feed the paper to the exit rollers [4]. The paper falls between the front and side fences [5].

Positioning

The paper sensor [6] detects the paper on the tray. The positioning roller [7] (mounted on a free-swinging arm) descends and touches the paper. The positioning roller (turning counterclockwise) and the return roller [8] push the trailing edge of the paper against the two bottom fences and the mobile fence at [9]. (The mobile fence is centered between the stationary bottom fences.)

Jogging

The front and side fences move in to align the sheets for stacking.

Stapling

The stapler [10] staples the stack with one or two staples.

Paper Output

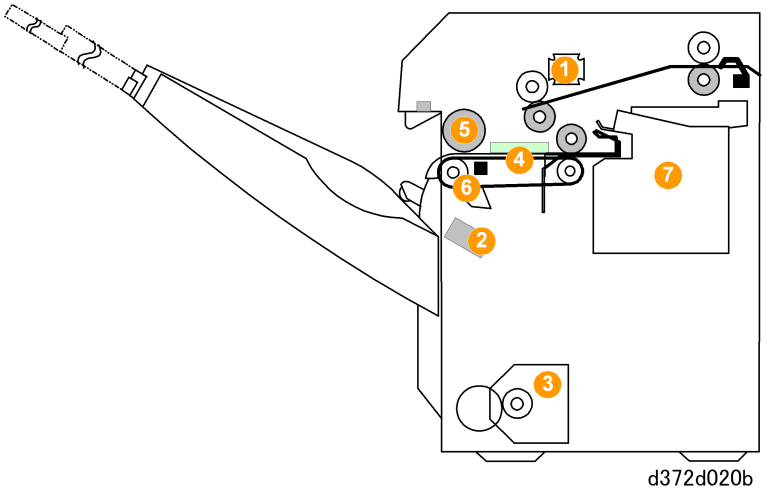
The feed-out belt motor switches on, moves the mobile fence forward and rotates the feed-out belt with the feed-out belt pawls [11]. The mobile fence pushes the stack from ① to , then the pawls come around and push the stack out of the finisher. Before the next stack exits, the edge depressor solenoid [12] switches on and retracts the edge depressors just before the feed-out belt pawls push the stack out. The two stack edge depressors [13] lightly push down on the trailing edge of the stack to keep it down against the end fence. The edge depressors are attached to the paper height sensor, so this action checks if it is necessary to move the tray up or down.

Tray Operation

The tray lift motor [14] raises and lowers the output tray [15] to keep the tray at the correct height. The readings of the paper height sensor [16] are used to control the raising and lowering of the tray with the tray lift motor.

The tray-full sensor [17] located at the bottom of the tray rail at the back of the finisher switches on after the tray descends to its lowest point. This signals that the tray is full. A spring-loaded bar [18] and its push-switch also signal tray full if the top of the paper load in the tray pushes this bar up and trips the switch. (This is a backup device to signal tray full if the tray-full sensor fails.)

Initialization: What Happens at Power On



Here is a summary of what happens during the initialization of the finisher after the system power is turned on.

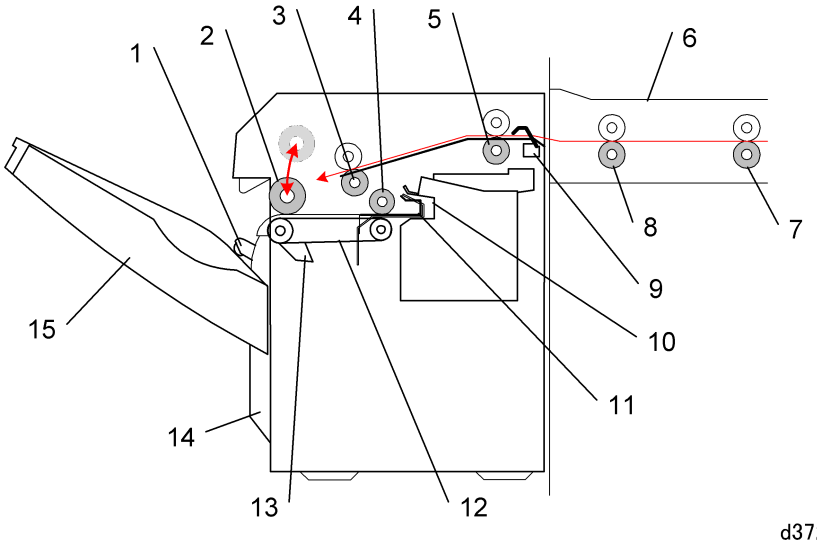
Note

- The initialization halts if the entrance sensor or paper sensor on the stapling tray detects paper inside the finisher.

No.	What Happens
1	The transport motor roller switches on and off.
2	The edge depressor solenoid switches on, retracts the edge depressors, and then switches off to allow the depressors to lower.
3	The tray lift motor switches on, lowers the tray slightly, raises it to the start position and switches off.
4	The front and side fence motors switch on and off to position both side fences at their home positions (both retracted).
5	The positioning roller arm motor switches on and off to bring the positioning roller to its home position (up).
6	The feed-out belt motor switches on and moves the belt pawls to their home positions below the paper sensor on the stapling tray.
7	The stapler movement motor switches on, reverses, and then switches off to make sure that the stapler is at its home position.

Paper Transport

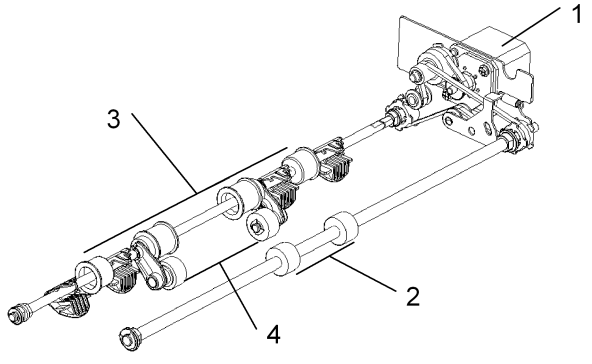
Overview



1.	Stack Edge Depressors	9.	Entrance Sensor
2.	Positioning Roller	10.	Mobile Fence
3.	Exit Roller	11.	Bottom Fences (x2)
4.	Return Rollers	12.	Feed-Out Belts (x2)
5.	Entrance Roller	13.	Feed-Out Belt Pawls (x2)
6.	Bridge Unit (Copier)	14.	End Fence
7.	Transport Roller (Main Machine)	15.	Output Tray
8.	Exit Roller (Main Machine)		

Transport Rollers

Paper Feed Rollers



d372d050

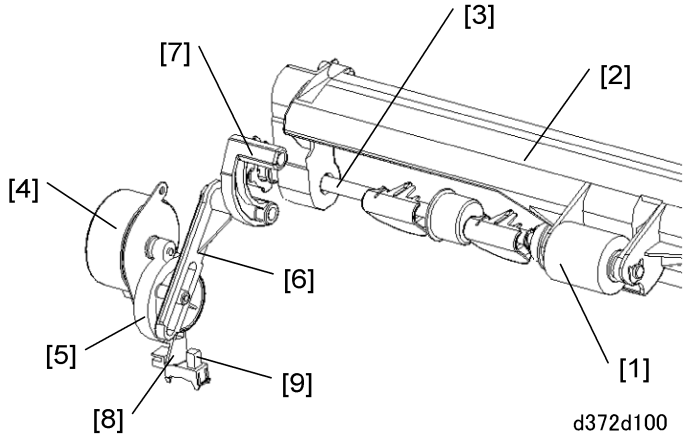
1.	Transport Motor
2.	Entrance Rollers
3.	Exit Rollers (Teflon)
4.	Return Rollers (Sponge)

The transport motor [1] uses timing belts to drive all the rollers in the unit.

The entrance rollers [2] take the paper from the copier and feed it to the exit rollers [3], where the paper drops onto the jogging and stapling tray. The return rollers [4] rotate in the opposite direction and feed each sheet against the bottom fences inside the finisher. The positioning roller (described in the next section) assists the return rollers in feeding each sheet against the end fences.

Positioning Roller

Positioning Roller Mechanism



The positioning roller [1] (driven by the transport motor) is mounted on the positioning roller arm [2] that swings freely on the shaft [3].

The positioning roller arm motor [4] drives a cam [5]. The eccentric rotation of this cam raises and lowers the coupler [6] that pushes against the positioning roller arm [7]. This motion raises and lowers the rotating positioning roller as the cam turns through one full rotation.

An actuator [8] attached to the cam wheel deactivates the positioning roller HP sensor [9] and stops the motor. This stops the positioning roller arm and positioning roller at the highest point (home position).

When the positioning roller is lowered:

- The transport motor slows down to match the speed of the main machine's exit roller.
- At the same time, the positioning roller motor accelerates briefly, lowers the positioning roller arm and then stops.

When the positioning roller touches the paper:

- The positioning roller (driven by the transport roller) continues to rotate.
- The positioning roller (and the smaller two sponge rollers), rotating against the direction of paper feed, touch the paper and send it back against the bottom fences.
- The number of sheets that stack on the staple tray while the positioning roller motor is stopped is different for each job.
- To meet the requirement for the increasing number of sheets, the length of prescribed time that the positioning roller is in contact with each sheet of paper is very short, regardless of the size of the stack.
- The positioning roller arm motor remains off just long enough for the positioning roller to send the sheet against the bottom fences.

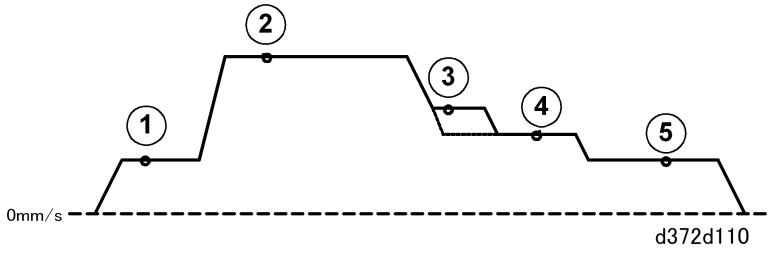
When the positioning roller is raised:

- The motor switches on again, raises the positioning roller arm, slows down slightly, and then the arm stops at the home position.
- The motor slows down slightly before reaching the home position to reduce the impact and noise of the arm returning to the home position.

This cycle of lowering the positioning roller, touching the paper with the positioning roller and return rollers, and then lifting them again and stopping at the home position, is done for each sheet of paper.

Transport Motor Control

The transport motor drives all the rollers inside the finisher and controls the line speed of the finisher.



①	The transport motor accelerates to match the line speed of the main machine (150 mm/s).
②	The transport motor speed accelerates to 600 mm/s after the leading edge of the sheet passes the entrance sensor and feeds 21.5 mm.
③	After the trailing edge goes 96 mm past the entrance sensor, the transport motor slows the line speed to 200 mm/s for paper shorter than 300 mm, or to 300 mm/s for paper longer than 300 mm.
④	After the paper sensor detects that the trailing has fed 45 mm past the exit roller, the transport motor slows the line speed to 200 mm/s so that the sheet can be positioned for jogging. At this time, the positioning roller arm motor switches on and starts to lower the positioning roller arm and positioning roller.
⑤	The transport motor slows the line speed in the finisher to match the line speed of the paper path in the main machine. The positioning roller reaches the end of its downward stroke and remains in that position long enough to feed the sheet back against the bottom fences. The positioning roller arm motor reverses and raises the positioning roller arm to the end of its upward stroke and stops at the home position. While the sheet is being jogged between the front and rear side fences, the cycle repeats from when the next sheet feeds.

Positioning Roller Initialization

The following sequence occurs when the system is switched on:

Paper in Paper Path (Jam)

If paper is detected in the paper path between the copier exit roller and finisher entrance roller, the transport motor switches on then immediately switches off.

Normal Startup

The transport motor switches on and rotates the positioning roller to home position. The positioning roller arm motor switches on, lowers the positioning roller arm, raises the positioning roller to the up position and then stops when the actuator of the positioning roller HP sensor switches off the sensor.

- If the HP sensor does not go OFF within the prescribed time, this indicates an error.
- If the HP sensor does not go ON after the motor has switched on, this also indicates an error.

In either case, the positioning roller arm motor is switched off. The first occurrence causes a jam error. An SC code is issued if the error occurs again.

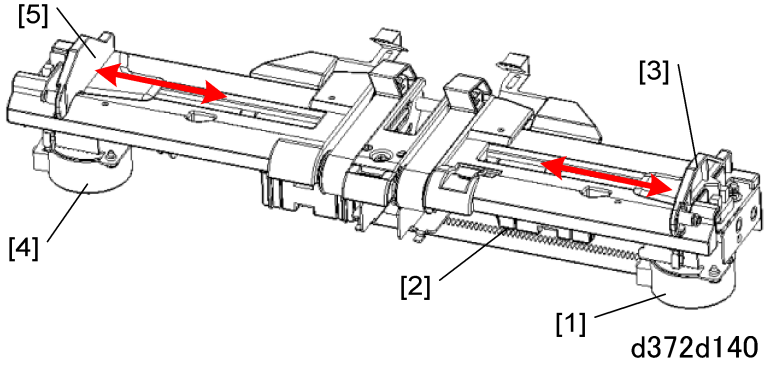
This initialization sequence is executed:

- When the copier is powered on
- When the stapler door is opened or closed
- When the top cover of the finisher is opened or closed to remove a jam

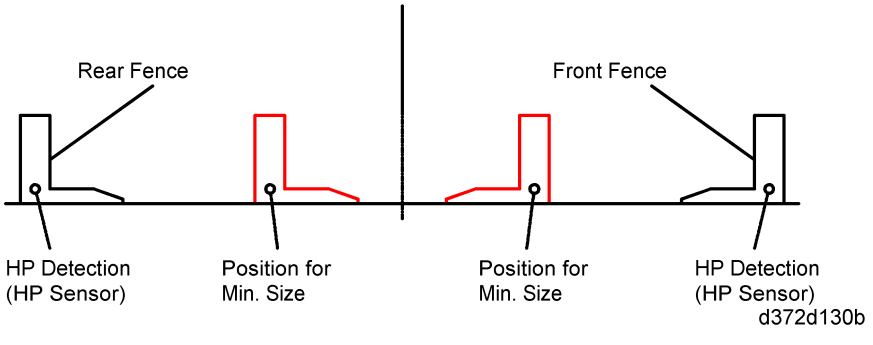
Jogging (Paper Alignment)

Overview

Two side fences, a rear fence and a front fence, move in and out to align the sides of the paper stack. Each fence is controlled by an independent timing belt and motor.



The front fence motor [1] and timing belt [2] move the front fence [3] backward and forward. The rear fence motor [4] and timing belt (not shown) move the rear fence [5] forward and backward.



The diagram above shows the positions of the side fences.

1. When the copier exit sensor signals that that a sheet of paper has been sent from the copier to the finisher, both fence motors switch on and move the side fences to the start position.

   The start position for each fence is set wider than the paper size selected for the job:

   - 15 mm wider than the paper for shift mode.
   - 7 mm wider than the paper for staple mode
   - 10 mm wider than 12-in. paper for oblique stapling
   - 12 mm wider than 12-in. paper for straight stapling

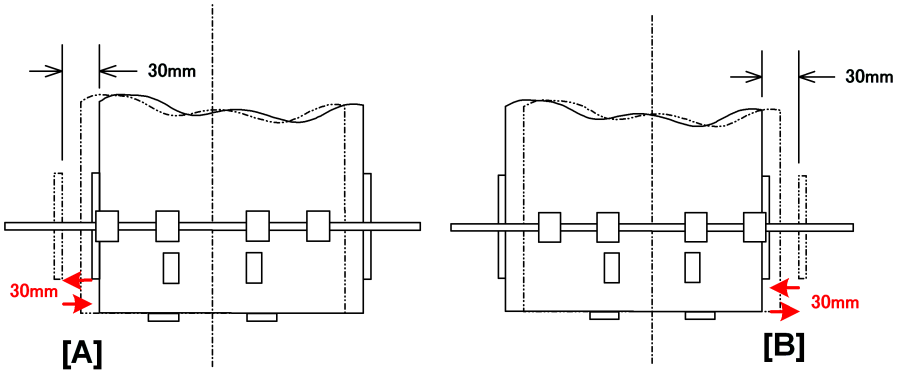
2. The paper is fed onto the output tray. The transport motor slows down the rotation of the positioning roller and return rollers. The positioning roller descends. The positioning roller and return rollers feed the trailing edge of the paper to the right against the bottom fences. The side fence motors switch on and jog the edges of the sheet so that the first sheet is properly aligned.
3. The side fences return to the start position after the next sheet has feed 50 mm past the entrance sensor.
4. Steps 2 and 3 are repeated for the next sheet.
5. In stapling mode: After the last page of the document has fed and been aligned on top of the stack by the rear and front fences, the side fences retract and advance two more times against the sides of the complete stack.
6. The stack is now ready to be output from the finisher. The side fences stop at the sides of the stack and wait for the stack to be output. After output, the side fence motors switch on and move the fences to the jog start position.
    - As soon as 10 sheets stack on the jogging tray in shift mode, the stack is output regardless of whether the document has finished printing or not.
    - In stapling mode, the side fence that jogs the side of the stack stops and waits for stapling to end. After stapling, the side fence motor switches on and retracts the side fence 0.5 mm. (If the stack is centered, both fences retract 0.25 mm).
    - After the stack is output by the feed-out belt, the side fence motors switch on and once again move the fences to the jog start position.
7. In the shift mode: The rear side fence does the jogging against the side of the stack, and the front fence does not move. For the next stack, the roles of the side fences are reversed: the front fence does the jogging and the rear fence does not move. The operation continues to alternate for the next stacks so that each stack is shifted to the front (or back) depending how it was jogged between the side fences. (Steps 2, 3, 6 repeat.)

    In the staple mode, the steps are done in sequence (2), (3), (5), (6).
8. After the last stack of the job has been output, the main machine sends a STOP signal to end the job, and the front and rear side fence motors switch on and the side fences retract to their home positions.

Side Fence Operation

Shift Mode

Side Fence Operation: Shift Mode



d372d170a

The diagram above illustrates the operation of the side fences in shift mode with no stapling.

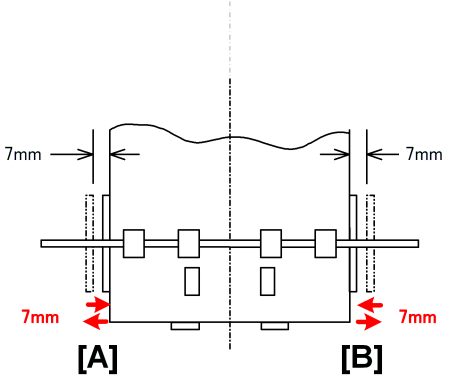
- Every sheet of the first set is pushed by the front fence [A] against the rear fence, which does not move.
- Every sheet of the second set is pushed by the rear fence [B] against the front fence, which does not move.
- The sequence alternates for every set in the print job. At the end of the job, every set is stacked on the output tray neatly offset by 30 mm, making them easy to separate.

Normal (Non-Shift) Mode

The diagram above illustrates the operation of the side fences in normal (non-shift) mode. The operation is slightly different, depending on the paper size. There are three cases:

- Standard paper sizes (other than "wide" or "small" paper
- Wide paper sizes (133 to 147 mm)
- Small paper sizes (up to 133 mm)

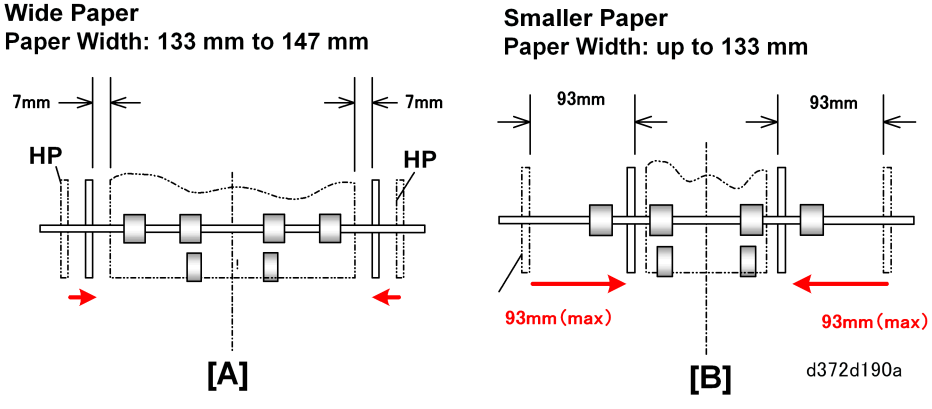
Standard Paper Sizes



d372d180a

Every time a sheet is fed the front fence [A] and rear fence [B] both push against the sides of the stack within the space of 7 mm on each side.

Wide and Small Paper Sizes



d372d190a

Every time a wide sheet [A] is fed, the front fence and rear fence both push against the sides of the stack within the space of 7 mm on each side.

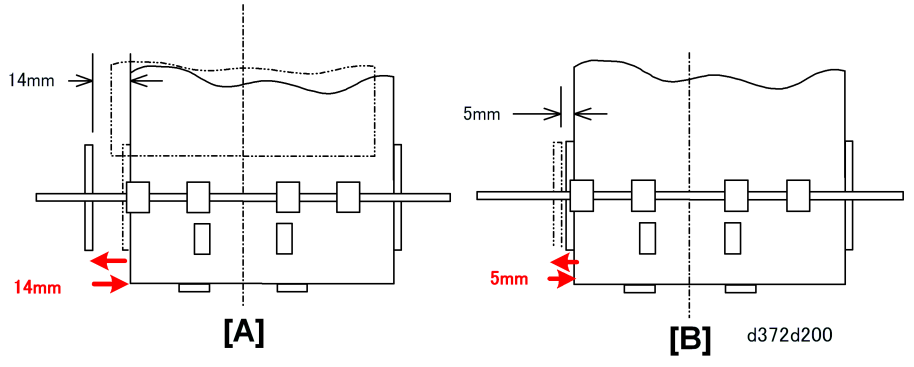
Every time a smaller sheet [B] is fed, the front fence and rear fence both push against the sides of the fence with the space of 93 mm on each side.

Staple Mode

The operation of the side fences is slightly different, depending on the type of stapling selected for the job:

- One staple (front/oblique, front/straight, rear/oblique, rear straight)
- Two staples at two positions

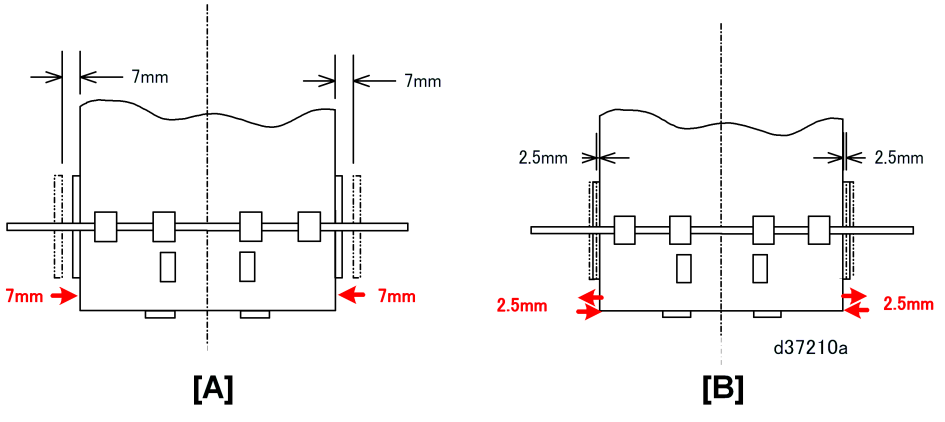
Staple Mode: 1 Staple



In the One-Staple Mode, one side fence jogs one side of the stack. The diagram above illustrates the operation of the side fences for stapling at one position (front/oblique, front/straight, rear/oblique, or rear/straight).

- Every time a sheet [A] is fed, the front fence pushes the sheet against the rear fence, which does not move.
- After the last sheet [B] is pushed against the rear fence, the front fence moves front to back twice (5 mm) to align the side of the stack for stapling.

Staple Mode: 2 Staples



In the Two-Staple Mode, both side fences jog the sides of the stack. The diagram above illustrates the operation of the side fences for stapling at two positions.

- Every time a sheet [A] is fed, the front and rear side fences push the sheet to center it.
- After the last sheet [B] is centered, the front and side fences push and retract twice (5 mm) to align the sides of the stack centered for stapling.

Side Fence Initialization

Initialization of the front and rear side fence positions at power on is determined by the states of the front fence HP sensor and rear fence HP sensor. The descriptions below apply to both HP sensors.

- Paper on Stapling Tray

  Initialization is not executed if the paper sensor on the stapling tray detects paper present.

- Fence HP Sensor OFF

  The fence motor switches on until the HP sensor goes ON, advances 0.25 mm, then switches OFF. This is the home position.

- Fence HP sensor ON

  The fence motor drives the fence toward the center until the HP sensor goes OFF, advances 15 mm, then switches off. The motor switches ON again, advances the fence 0.25 mm, then switches off. (This is the home position.)

Side Fence Motor Errors

A side fence motor error can occur in two cases:

- The HP sensor does not go OFF even after the side fence has run long enough to advance the fence 12.5 mm from the fence home position, far enough to deactivate the fence HP sensor.
- The HP sensor does not go ON even after the motor has run long enough for the side fence to retract 105.0 mm, far enough for the fence to reach the side fence HP sensor.

When an error occurs the finisher ceases to operate (all motors are switched off with the exception of the stapler movement motor).

Errors for the front fence and rear fence motors are counted separately.

- The first occurrence of an error issues a paper jam alert.
- The second occurrence of an error issues an SC code. SC721 is issued for the front fence motor and SC722 for the rear fence motor.

To recover from an error:

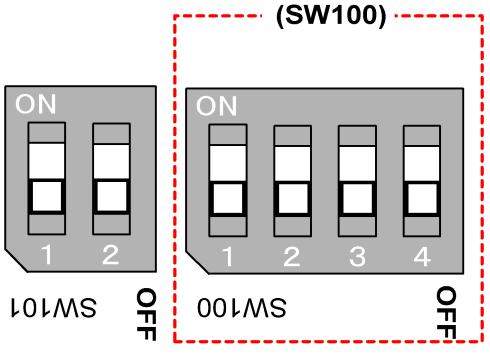
- At the first occurrence of the error after a paper jam error, opening and closing either the top cover or the stapler door triggers the initial check and restores normal operation if no problems are detected.
- At the second occurrence after an SC code is issued, cycling the main machine off/on may restore full operation if no problems are detected.

Side Fence Operation Adjustment

The distance between the front and rear side fences can be adjusted with DIP SW100. The DIP SW adjustment is done in increments of 0.5 mm (Max. Range: ±3.5 mm).

- The adjustment is halved for center jogging. If the adjustment is 0.5 mm, for example, this means the position adjustment 0.25 mm for each side fence.

The table below shows the adjustments done with DIP SW100 on the main board of the finisher.



DIP SW

1	2	3	4	Adjustment (mm)
ON	ON	ON	ON	-3.5
ON	ON	ON	OFF	-3.0
ON	ON	OFF	ON	-2.5
ON	ON	OFF	OFF	-2.0
ON	OFF	ON	ON	-1.5
ON	OFF	ON	OFF	-1.0
ON	OFF	OFF	ON	-0.5
ON	OFF	OFF	OFF	0.0
OFF	ON	ON	ON	3.5
OFF	ON	ON	OFF	3.0
OFF	ON	OFF	ON	2.5
OFF	ON	OFF	OFF	2.0
OFF	OFF	ON	ON	1.5
OFF	OFF	ON	OFF	1.0
OFF	OFF	OFF	ON	0.5

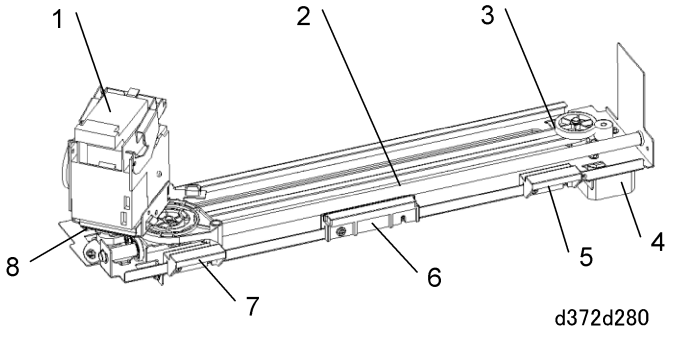
1	2	3	4	Adjustment (mm)
OFF	OFF	OFF	OFF	0.0

Stapling

Overview

2

Stapler Movement



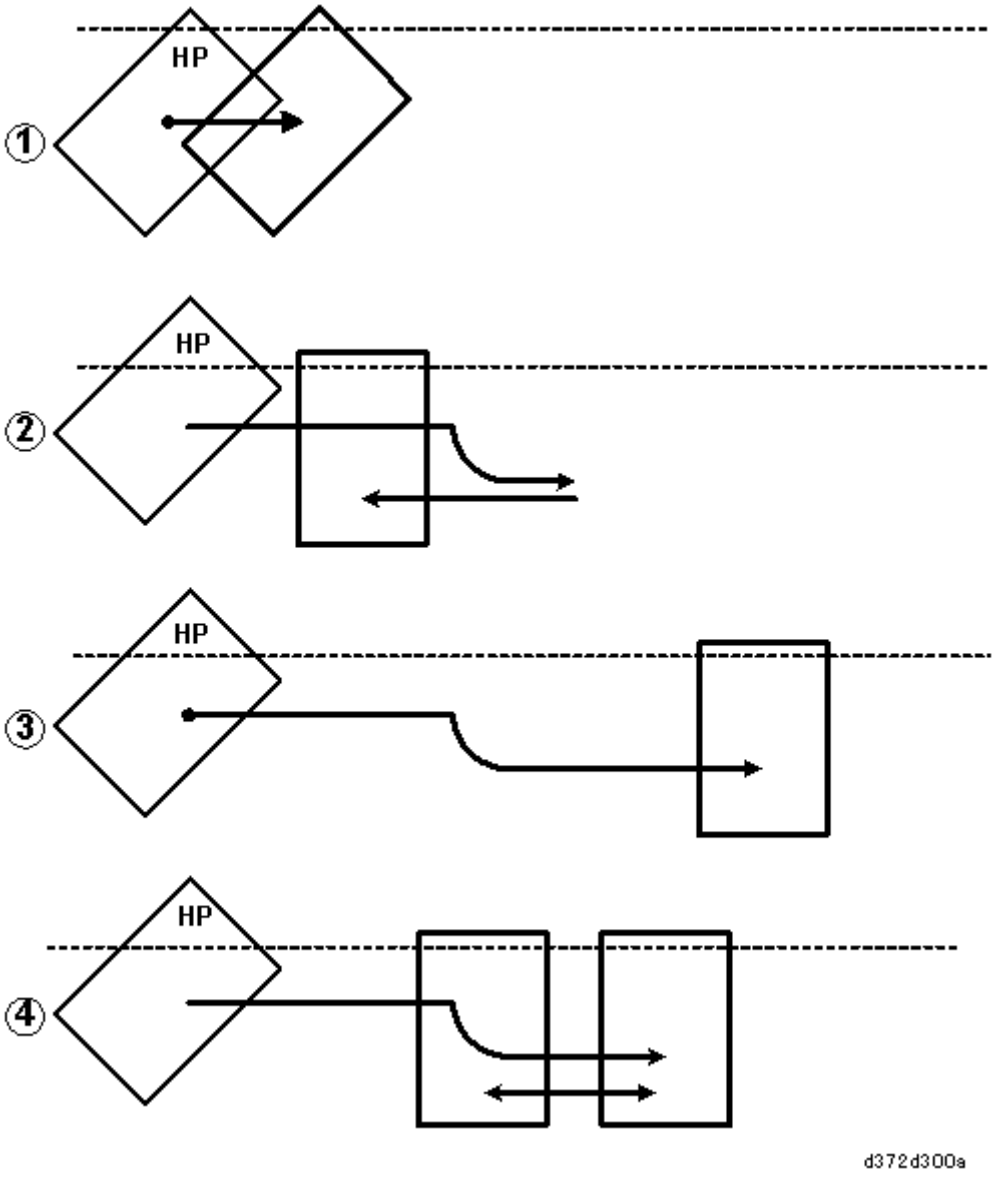
1.	Stapler Unit	5.	Trip Plate – Rear
2.	Guide Rail	6.	Trip Plate – Center
3.	Driver Gear, Timing Belt	7.	Trip Plate – Front
4.	Stapler Movement Motor	8.	Stapler HP Sensor

The illustration below shows how the stapler moves during each stapling mode.

Note

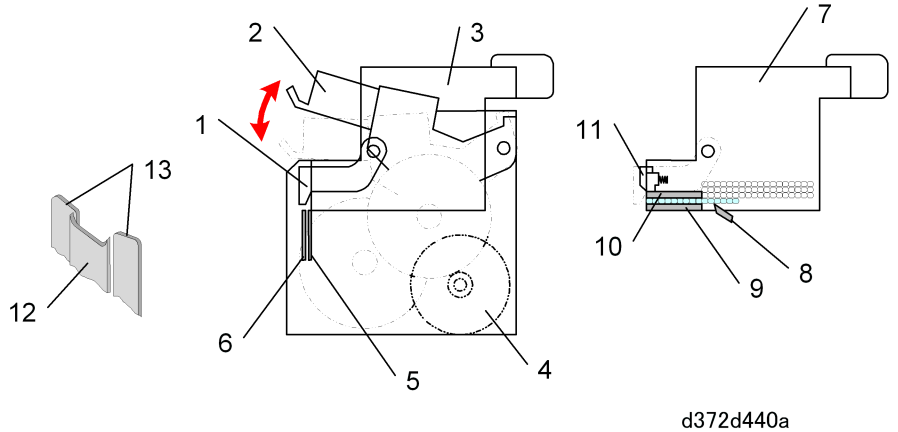
- When the plate on the bottom of the stapler unit strikes a trip plate, this swivels the stapler unit from straight to oblique or vice versa.

Staple Positions



①	Front Oblique Stapling: 1 Staple
②	Front Straight Stapling: 1 Staple
③	Rear Straight Stapling: 1 Staple
④	2 Staples (Rear then Front)

Stapler EH-530



d372d440a

1.	Faceplate	8.	Staple Supply Pawl
2.	Clincher	9.	Staple Sheet
3.	Cartridge	10.	Base
4.	Stapler Motor	11.	Plunger
5.	Homing Plates	12.	Driver Plate
6.	Driver Plate	13.	Homing Plates
7.	Cartridge		

The stapler motor (4) drives both the driver plate (12) and homing plates (13) toward the clincher. The driver plate and homing plates separate and feed the staples to the clincher (2) that performs the stapling.

The pressure of the plunger (11) feeds the next staple for firing. A staple supply pawl below the staple sheet moves to the front and back to assist in staple supply. The plunger feeds only one staple at a time, but the staple supply pawl can feed up to 10 staples.

Stapler Movement Motor Initialization

Initialization of the stapler unit position is determined by the state of the stapler HP sensor. One of the following sequences occurs at power on, depending on the state of the stapler HP sensor.

- Stapler HP sensor OFF

  The motor turns on and brings the stapler forward until the stapler HP sensor goes ON. Then the motor remains on to move the stapler an additional 1.2 mm, then stops. This is the home position.

- Stapler HP sensor ON

  The stapler movement motor turns on and moves the stapler to the rear until the stapler HP sensor goes OFF. The motor stays on to move the stapler 12 mm, then stops. Next, the motor turns on again and brings the stapler forward until the stapler HP sensor goes ON, the motor stays on to move the stapler 1.2 mm, then stops. This is the home position.

Stapler Errors

A stapler position error can occur in two cases:

- Stapler HP sensor does not go OFF.

  The stapler HP sensor does not go OFF even after the stapler movement motor has been on long enough to move the stapler away from the home position.

- Stapler HP sensor does not go ON

  While the stapler is out of the home position, the stapler HP sensor does not go ON even after the stapler movement motor has been on long enough to move the stapler into the home position.

- Stapler is out of staples.

  At power on, if staples are not detected in the stapler, the staple detection sequence executes up to 10 times until "staples present" is detected. If staples cannot be detected after 10 attempts, then the staples out alert is issued.

When one of these errors occurs, the exciter current to the stapler motor is switched off. Both of the HP sensor errors described above are counted as the same error. In either case, the first occurrence of the error is considered a jam, and the second occurrence issues SC742 (Stapler Movement Motor Error).

To recover from an error:

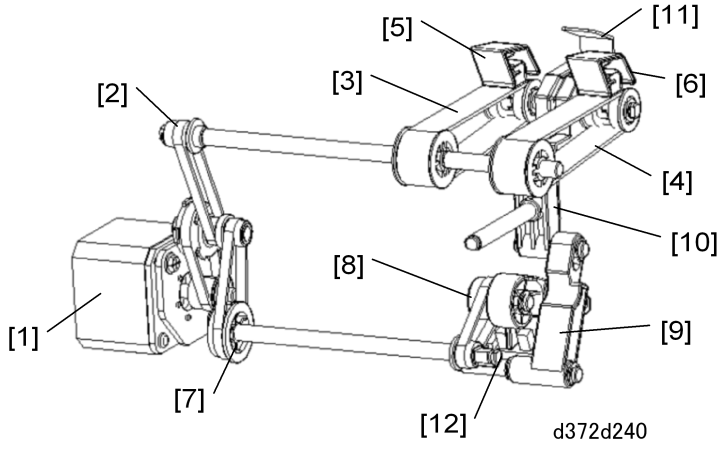
- At the first occurrence of a stapler HP sensor error, removing the jam then opening and closing either the top cover or the stapler door triggers the initial check and restores normal operation if no problems are detected.
- At the second occurrence after SC742 is issued, cycling the main machine power off/on may restore full operation if no problems are detected.

Paper Output

Overview

2

Feed-Out Mechanism



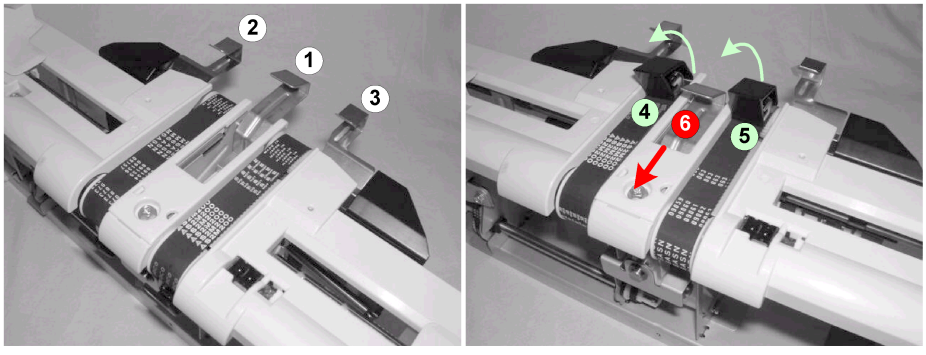
1.	Feed-Out Belt Motor	7.	Mobile Fence Drive Shaft
2.	Feed-Out Belt Drive Shaft	8.	Mobile Fence Cam
3.	Rear Feed-Out Belt	9.	Mobile Fence Follower
4.	Rear Feed-Out Belt Pawl	10.	Mobile Fence Link and Slider
5.	Front Feed-Out Belt	11.	Mobile Fence
6.	Front Feed-Out Belt Pawl	12.	Feed-Out Belt HP Sensor

The feed-out belt motor [1] drives the timing belt and shaft [2] that rotates the feed-out belts [3] and [4]. The rear pawl [5] and front pawl [6] attached to the rear and front belts push the stack out of the finisher after stapling.

The feed-out belt motor also drives the timing belt and shaft [7] that rotates the mobile fence cam [8]. The mobile fence follower [9] converts the rotary movement of the cam to rectilinear movement (left-to-right) and transmits this movement via the link/slider to the mobile fence [11]. The mobile fence is moved forward to start pushing the stack out of the finisher. The pawls on the rapidly moving feed-out belt complete pushing the stack out of the finisher. After the cam releases the follower, a spring pulls the mobile fence back to its home position.

When the actuator attached to the mobile fence cam switches the feed-out belt HP sensor [12] ON, this stops the feed-out belt motor with the pawls at their home positions.

Bottom Fences

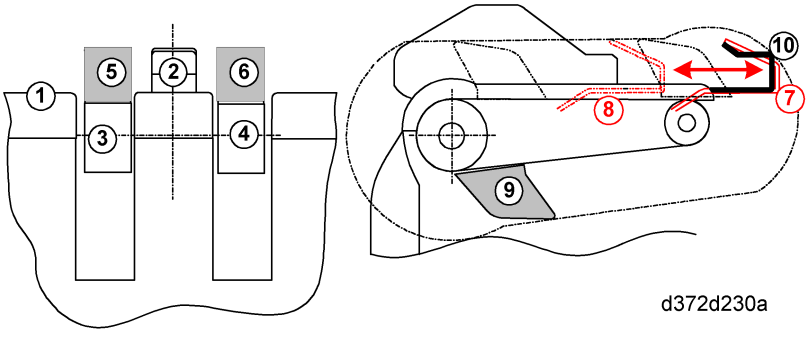


d372d901

There are three bottom fences. A mobile fence (1) resides between two stationary bottom fences (2) and (3). When the mobile fence (1) is at its home position, the positioning roller and return rollers feed the trailing edge of each sheet against these fences.

When the stack is ready to be moved to the output tray, the mobile fence (6) pushes the stack to the right. The rear pawl (4) and front pawl (5), mounted on the rear and front feed-out belts, swing up from below and push the stack onto the tray. The mobile fence (6) returns to its home position between the stationary bottom fences.

Feed-Out Mechanism: Right and Front View



d372d230a

1.	Stapling Tray	6.	Rear Feed-Out Belt Pawl
2.	Mobile Fence	7.	Mobile Fence HP
3.	Front Feed-Out Belt	8.	Mobile Fence (Forward Position)
4.	Rear Feed-Out Belt	9.	Feed-Out Pawls (HP)
5.	Front Feed-Out Belt Pawl	10.	Bottom Fences x2

In the left illustration, just before that stack is output:

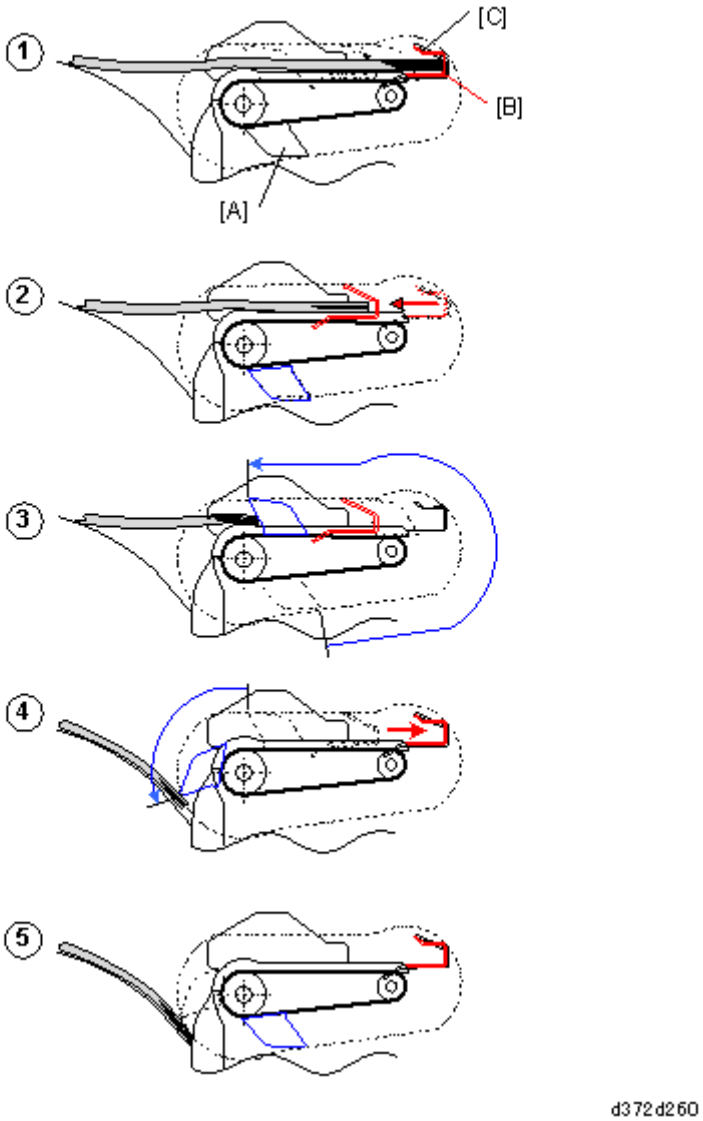
- The stack is on the stapling tray (1).
- The mobile fence (2) has pushed the stack forward to start moving it out of the finisher.
- The front and rear feed-out belts (3) and (4) have rotated the front and rear pawls (5) and (6) behind the stack so they can push the stack out of the finisher.

In the right illustration, after stack output:

- The mobile fence (driven by its cam, follower, and lever below) moved from its home position (7) to (8) to start pushing the stack out of the finisher.
- The feed-out belt pawls pushed the stack out of the finisher then stopped at their home positions (9).
- A long spring pulled the mobile fence back to its home position between the stationary bottom fences (10)

Feed-Out

The diagram below shows how the feed-out belt and mobile fence work together to push the stack to the output tray.



①	Document stacking has finished and the stack is ready to be output. The output belt pawls are at their home positions [A]. The mobile fence [B] is at its home position between the front and rear bottom fences [C].
②	The mobile fence pushes the stack to the right and stops.
③	The feed-out belt pawls rapidly swing up and push the stack toward the output tray.

④	The feed-out belt pawls push the stack onto the output tray. A spring (not shown) retracts the mobile fence.
⑤	The actuator on the mobile fence cam activates the feed-out belt pawl HP sensor. This switches the motor off and the pawls stop at the home position.

Feed-Out Belt Initialization

Initialization of the positions of the feed-out belt pawls at power on is determined by the state of the feed-out belt HP sensor. This operation does not affect the mobile fence because it is held in its home position by a spring.

One of the following sequences occurs at power on, depending on the state of the feed-out belt HP sensor.

- Feed-out belt HP sensor ON

  The feed-out belt motor switches on and rotates clockwise until the HP sensor goes OFF. The motor reverses for 50 ms until the HP sensor goes ON again and stops. This is the home position.

- Feed-out belt HP sensor OFF

  The feed-out belt motor rotates counter-clockwise until the HP goes ON and then stops. This is the home position.

Feed-Out Belt Errors

A feed-out belt error can occur in two cases:

- The feed-out belt HP sensor does not go OFF even after the motor has started.
- The feed-out belt does not go ON after the feed-out belt motor has started at power on and the finisher is ready to operate.
- Stapler out of staples

When an error occurs, the feed-out belt motor is switched off.

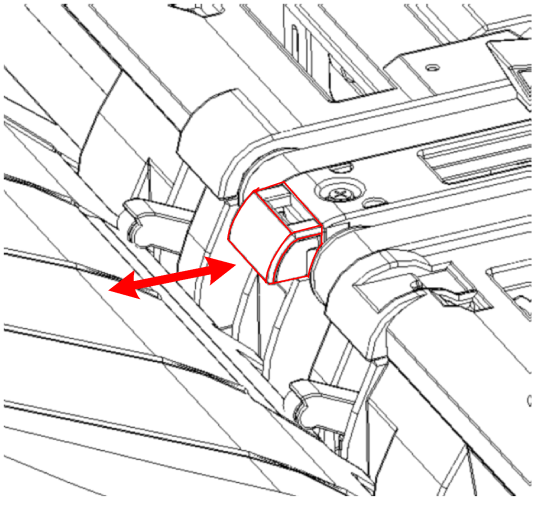
Either of the errors caused by the states of the feed-out belt HP sensor is counted as the same error.

- The first occurrence of an error issues a paper jam alert.
- The second occurrence of an error issues an SC723 (Feed-out Belt Motor Error).

To recover from an error:

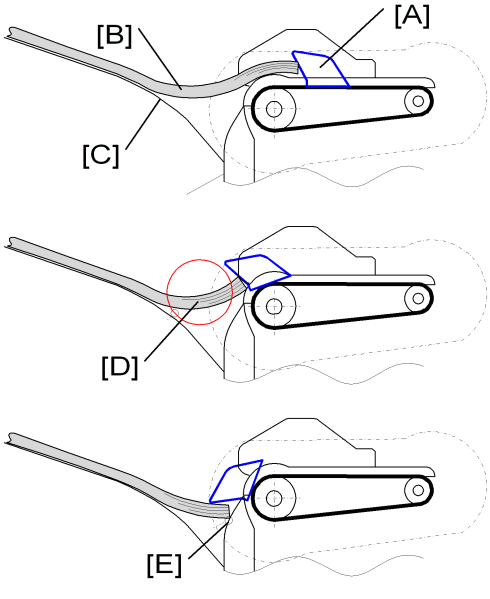
- At the first occurrence of the error after a paper jam error, opening and closing either the top cover or the stapler door triggers the initial check and restores normal operation if no problems are detected.
- At the second occurrence after SC723 is issued, cycling the main machine power off/on may restore full operation if no problems are detected.

Feed-Out Extension



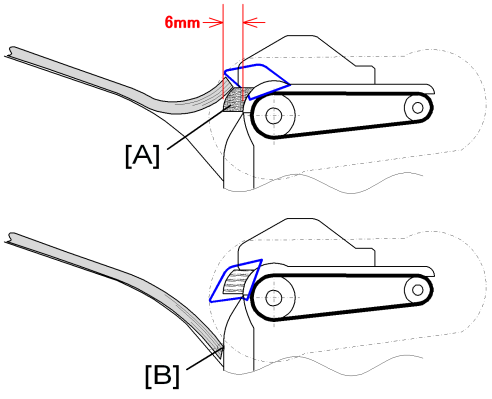
d372d380

A retractable extension is attached to the center of the stapling tray. The operator can pull it out manually if the trailing edges of the stacks are catching on the end fence and not falling straight down onto the tray.



d372d391

When the feed-out belt pawls [A] push a stack of paper [B] onto the tray [C], a bend [D] forms at the trailing edge. With some types of paper (especially larger paper such as A3), this bend can cause the edge of the stack to catch on the end fence [E] when it falls into the tray.

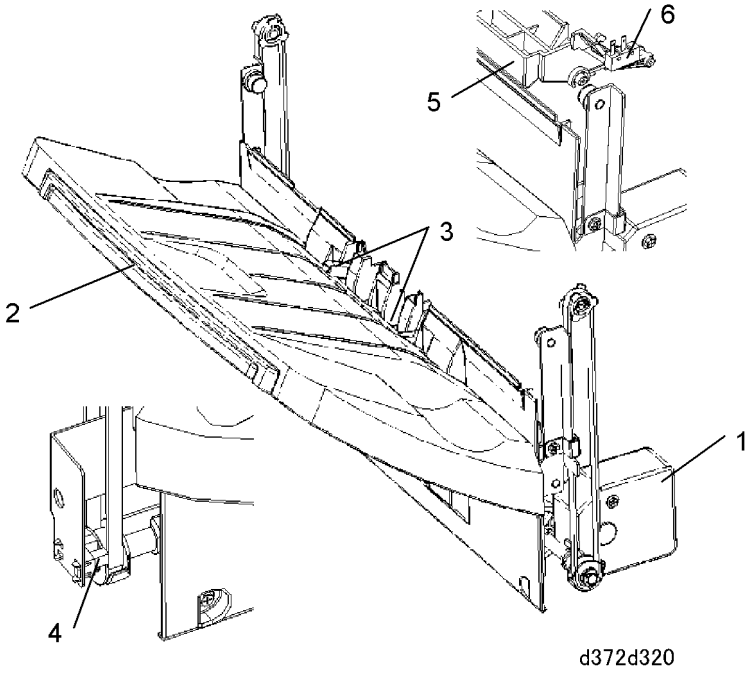


d372d392

Pulling the stapling tray extension [A] out by hand extends by 6 mm the distance that the pawls must push the trailing edge of the stack. The extra 6 mm forces the edge of the stack to bend more so it will snap down with more force and not catch on the end fence. This prevents the trailing edge of the stack [B] from catching on the end fence when it falls into the tray.

Tray Operation

Overview



1.	Tray Lift Motor
2.	Output Tray
3.	Edge Depressors
4.	Tray Full Sensor
5.	Upper Limit Push-bar
6.	Tray Upper Limit Switch

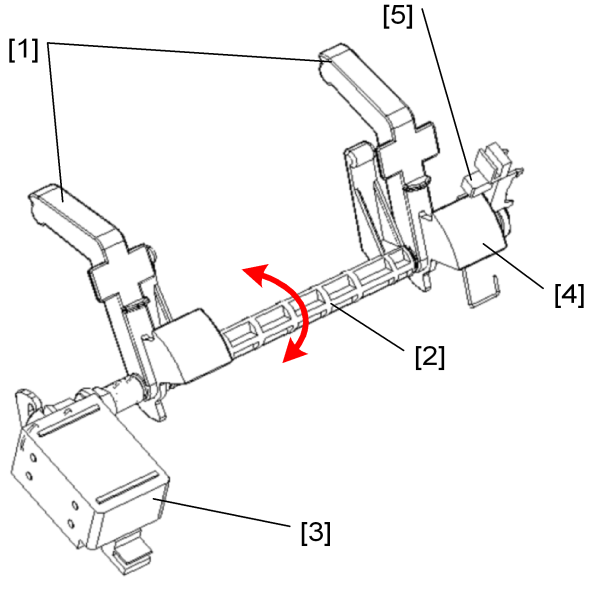
The tray lift motor (1) raises and lowers the output tray (2).

The edge depressors (3) lightly press down on the trailing edges of stacks already on the tray to keep them down against the end fence.

When the actuator on the bottom of the rear rail switches the tray full sensor (4) ON, this means that the tray is at its lowest point and the tray is full.

If the tray becomes overloaded, the top of the stack pushes up the spring-loaded push-bar (5). This will turn on the tray upper limit switch (6) and turn off the tray lift motor. This is a safety device to signal tray full in case the tray full sensor fails.

Tray Lift Control



d372d340

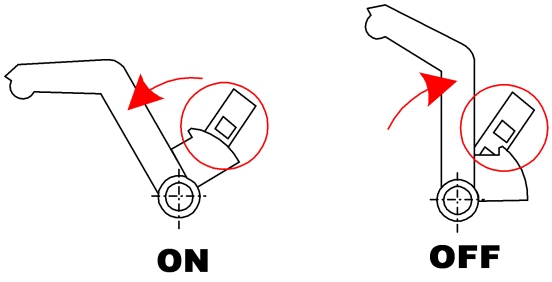
1.	Edge Depressors
2.	Rotating Shaft
3.	Edge Depressor Solenoid
4.	Actuator
5.	Paper Height Sensor

While the feed-out belt motor is running, the tray lift motor switches on (300 ms for shift mode, 500 ms for stapling mode), lowers the output tray, stops, then waits to receive the stack.

Just before a stack falls onto the output tray, the edge depressor solenoid (3) switches ON and retracts the edge depressors (1) away from the top of the stack already on the tray so that the next stack can fall freely.

The feed-out belt motor stops immediately after the stack has fallen between the side fences. The edge depressor solenoid switches OFF, and the edge depressors fall onto the trailing edge of the stack against the end fence.

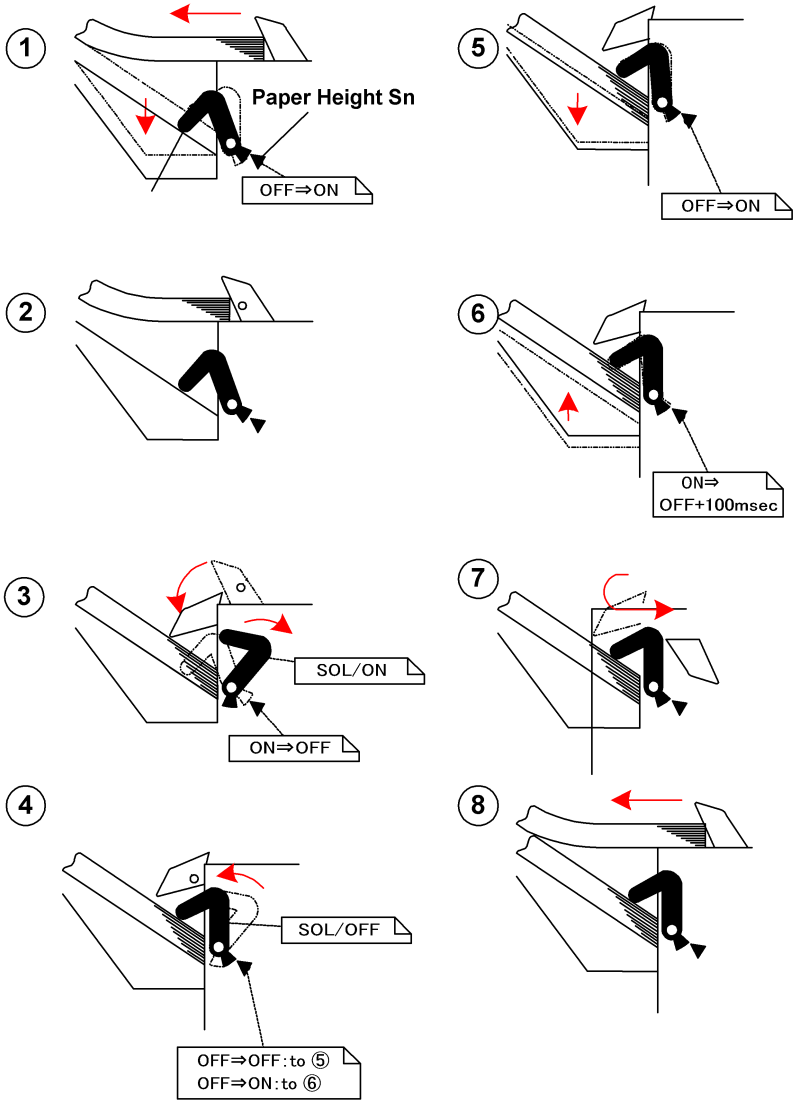
The edge depressors touch the top of the stack, and they are connected to the paper height sensor, so this action checks if it is necessary to move the tray up or down.



- After 200 ms if the paper height sensor is **ON**, the tray lift motor switches ON and raises the tray.
- If the paper height sensor is **OFF,** the tray lift motor lowers the tray until the paper height sensor switches ON, pauses for 100 ms, switches on again briefly to raise tray to the prescribed position to receive the next stack.

The diagram below shows how the feed-out belt pawls, output tray, and edge depressors operate together.

Stack Output to Tray



d372d360

①	The feed-out motor switches on and starts to move the feed-out belts and pawls, pushing the stack toward the output tray. The tray motor switches on and lowers the tray until the paper height sensor switches on.
②	The motor stops briefly to stop the pawls.

③	The motor starts, and just as the pawls start to push the stack onto the tray the edge depressor solenoid switches on and retracts the edge depressors
④	The stack is on the tray. The solenoid switches off, and the depressors move forward and press down lightly on the trailing edge of the stack. • If the paper height sensor is OFF, go to ⑤ • If the paper height sensor is ON, go to ⑥
⑤	The tray lift motor switches on, lowers the tray, and then stops when the paper height sensor goes ON.
⑥	The tray lift motor reverses for 100 ms to raise the tray to the start position.
⑦	The pawls move to their home positions and stop.
⑧	The sequence starts again with the next finished stack,.

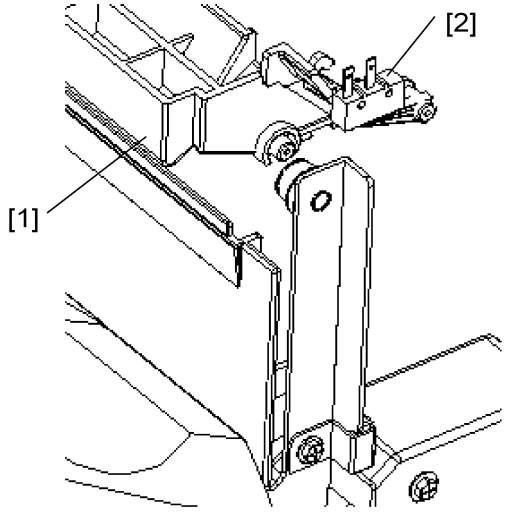
Tray Initialization

The following sequence occurs at power on depending on the states of the paper height sensor and tray full sensor:

①	The edge depressor solenoid switches from ON to OFF.
②	• If paper height sensor ON, then go to ③. • Paper height sensor OFF. If the tray full sensor is ON and the paper height sensor is OFF, this signals that the output tray is full. Removing the paper from the tray will switch the paper height sensor ON. The tray lift motor switches on, lowers the tray, reverses for briefly to raise the tray to the start position, then switches OFF.
③	The tray lift motor continues to lift the tray until the paper height sensor goes OFF, continues to run 100 ms, and stops.

Tray Lift Errors

Tray Lift Motor Error



If the tray becomes overloaded and the paper pushes and raises the push-bar [1], this will switch ON the upper limit switch [2] (a push-switch). Activating this switch switches off the tray lift motor. This is a backup device that will switch off the tray lift motor if the tray full sensor or paper height sensors fail.

The table below shows how the state of the two sensors and one switch signal an error.

Tray Upper Limit SW	Tray Full Sn	Paper Hgt Sn	What Happens
ON	OFF	OFF	Tray Full. One or both sensors has failed.
OFF	ON	OFF	Tray Full
OFF	ON	ON	Lift motor starts to raise tray
OFF	OFF	OFF	Lift motor starts to lower tray
OFF	OFF	ON	Lift motor starts to raise tray.

The machine issues a tray-full alert when the tray becomes full:

- Tray full sensor ON

  The tray has reached its lowest position.
- Paper height sensor OFF (full upright)

The paper on the tray has pushed the edge depressors to the full upright position.

Normally, removing the paper from the tray restores normal operation. The actuator falls and the paper height sensor switches ON. This signals the lift motor to raise the tray to the start position.

An error will occur if an abnormal condition exists:

- After the paper height sensor switches ON and the tray lift motor raises the tray, if paper height sensor does not go OFF after 20 sec., this signals an error and the tray lift motor will switch OFF.
- With the paper height sensor OFF and the tray full sensor OFF, the tray lift motor lowers the tray. The tray lift motor will switch off if the paper height sensor does not go ON within 3 sec.

These two errors are counted as the same error. The first occurrence of the error is considered a jam, and at the second occurrence SC750 (Tray Lift Motor Error) is issued.

To recover from an error:

- At the first occurrence of the error after a paper jam error, opening and closing either the top cover or the stapler door triggers the initial check and restores normal operation if no problems are detected.
- At the second occurrence after SC750 is issued, cycling the main machine off/on may restore full operation if no problems are detected.

Edge Depressor Solenoid Error

At power on, or while the stack starts being output to the tray (the solenoid starts to go OFF), if the paper height sensor remains OFF this indicates a solenoid error. When this error occurs:

- All motors switch off.
- The error is logged.

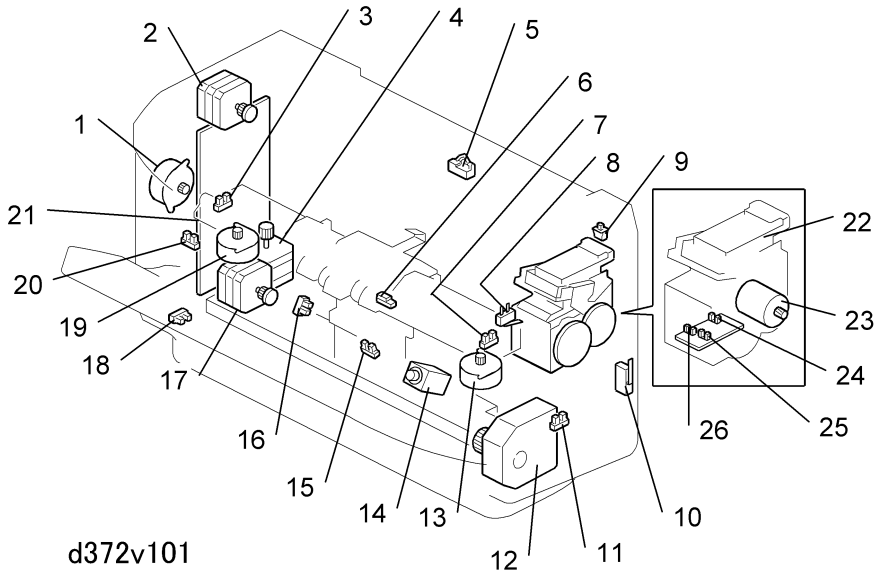
The first occurrence is considered a jam, and the second occurrence causes SC751 (Edge Depressor Solenoid).

To recover from an error:

- At the first occurrence of the error after a paper jam error, opening and closing either the top cover or the stapler door triggers the initial check and restores normal operation if no problems are detected.
- At the second occurrence after SC750 is issued, cycling the main machine off/on may restore full operation if no problems are detected.

Electrical Components

Component Layout



1.	Positioning Roller Motor	14.	Stack Depressor Solenoid
2.	Transport Motor	15.	Feed-Out Belt HP Sensor
3.	Rear Fence HP Sensor	16.	Paper Height Sensor
4.	Stapler Movement Motor	17.	Feed-Out Belt Motor
5.	Entrance Sensor	18.	Output Tray Full Sensor
6.	Stapling Tray Paper Sensor	19.	Rear Fence Motor
7.	Front Fence HP Sensor	20.	Positioning Roller HP Sensor
8.	Tray Upper Limit Switch	21.	Main Board
9.	Top Cover Switch	22.	Stapler
10.	Stapler Door Switch	23.	Stapler Motor
11.	Stapler HP Sensor	24.	Staple Cartridge Set Sensor
12.	Tray Lift Motor	25.	Stapler Hammer HP Sensor

13.	Front Fence Motor	26.	Staple End Sensor

Summary of Electrical Components

Motors		
M1	Feed-Out Belt Motor	Drives the two feed-out belts (1 pawl each). The pawls push the finished stack out of the finisher.
M2	Front Fence Motor	Moves the front fence to the back and front.
M3	Positioning Roller Arm Motor	Lowers and raises the positioning roller arm and positioning roller.
M4	Rear Fence Motor	Moves the rear fence to the front and back.
M5	Stapler Movement Motor	Moves the stapler to the front and back.
M6	Transport Motor	Drives all the rollers in the finisher: entrance roller, positioning roller, return rollers, exit roller
M7	Tray Lift Motor	Raises and lowers the output tray.
M8	Stapler Motor	The motor inside the stapler that drives staple supply and stapling.

Board		
PCB1	Main Board	Controls operation of the finisher. DIP switches can be changed to adjust the positions of the front and rear side fences.

Sensors		
S1	Entrance Sensor	Detects the leading edge of the paper when it enters the finisher. Readings of this sensor are used for timing of finisher operation. Also detects jams.
S	Feed Out Belt HP Sensor	Detects the HP of the feed-out belt pawls on the two feed-out belts (one pawl on each belt).
S2	Front Fence HP Sensor	Detects the HP of the front fence at the front of the finisher.

Sensors		
S3	Output Tray Full Sensor	Located at the bottom left corner of the finisher. When the actuator on the tray rail switches this sensor ON, this signals tray full.
S4	Paper Height Sensor	Used to monitor the positions of the edge depressors that press down on the trailing edge of the stack at the end fence. When the top of the stack pushes the depressors up, this switches the sensor OFF and signals the tray lift motor to lower the tray.
S5	Positioning Roller HP Sensor	Detects the HP of the positioning roller when it is up.
S6	Rear Fence HP Sensor	Detects the HP of the rear fence at the back of the finisher.
S7	Stapler HP Sensor	Detects HP of the stapler at the front of the finisher.
S8	Stapling Tray Paper Sensor	Detects paper on the stapling tray,

Solenoid		
SOL	Stack Depressor Solenoid	When a stack is output, the tray lift motor lowers the tray slightly. At this time, the stack depressor solenoid switches ON and retracts the edge depressors briefly so that the trailing edge of the stack can fall onto the tray. The solenoid then switches OFF and lowers the arms against the trailing edge of the stack to keep it down against the end fence.

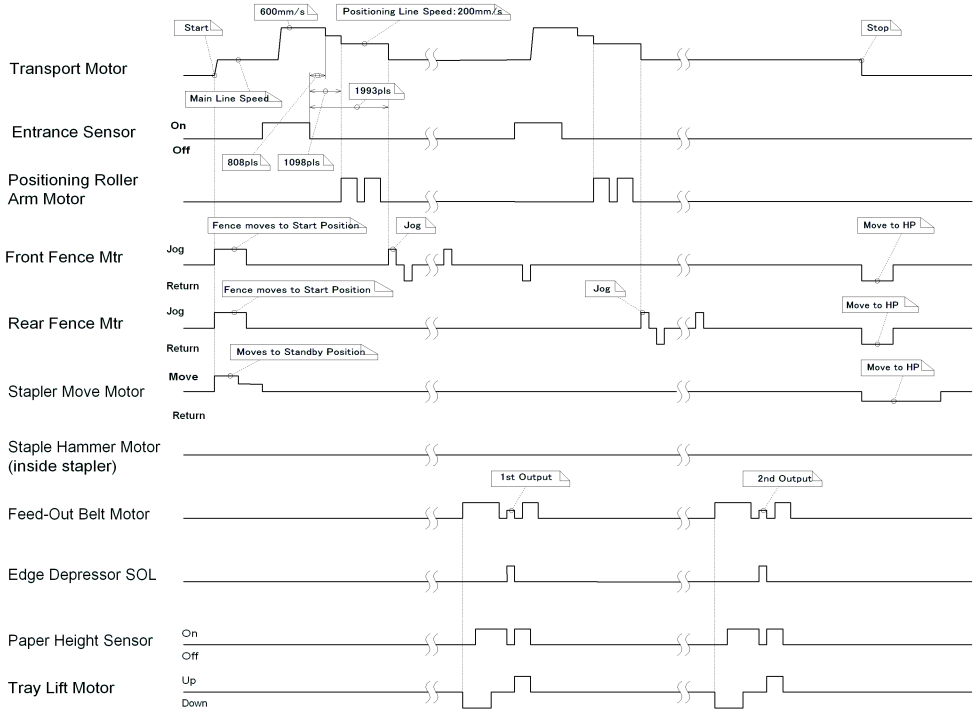
Switches		
SW1	Stapler Door Switch	Detects when the stapler top cover is open or closed.
SW2	Top Cover Switch	Detects when the top cover is opened or closed.
SW3	Tray Upper Limit Switch	If the tray becomes full, the top of the stack will push up a plate that activates this switch and switches off the finisher. This is a backup feature that will shut down operation if the tray full sensor or paper height sensor fails with the output tray full.

Other		
Stapler	Stapler Unit	Staples sheets stacked on the stapling tray.

Timing Charts

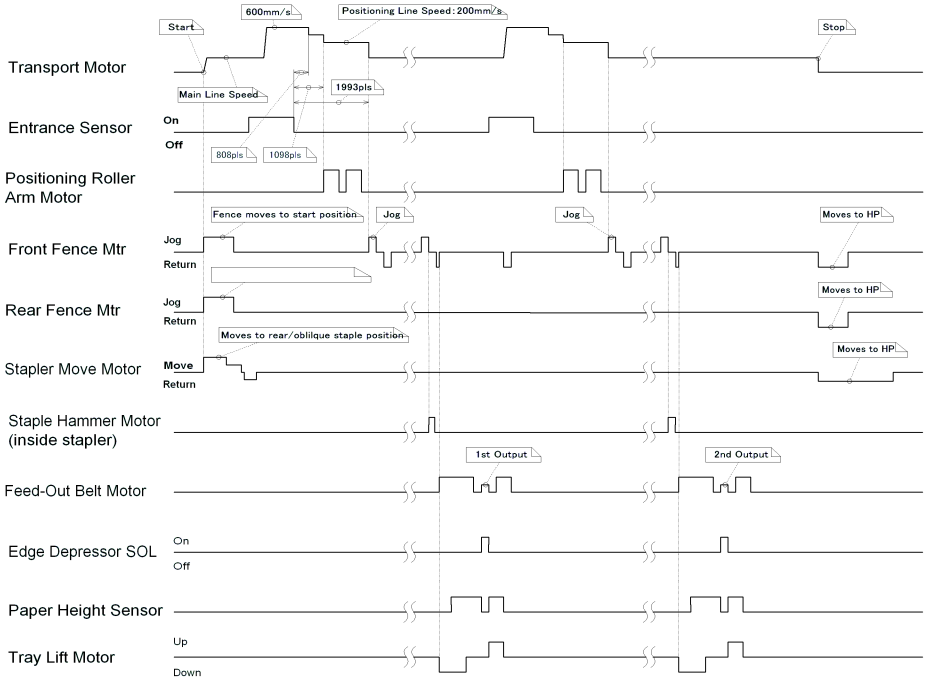
The first flowchart below is the operational timing chart for shift mode, the second chart is for stapling mode.

Shift Mode



d372d420

Staple Mode: Rear/Oblique



d372d430

Error List

Here is a comprehensive list of finisher errors.

Solution Key

Symbol	Solution
①	1. Open top cover (or stapler door). 2. Remove jammed paper (or staple). 3. Close the top cover (or stapler door).
②	**1st Occurrence (Jam Error):** 1. Open top cover (or stapler door). 2. Remove jammed paper (or staple). 3. Close the top cover (or stapler door). **2nd Occurrence (SC Code):** 1. Cycle the machine power off/on

Symbol	Solution
	2. If this does not solve the problem, refer to Section "4. Troubleshooting". 3. Look up the SC code in table and do the service procedure.

No.	Error	Problem/Solution
1	Entrance sensor	**Problem:** Lag errorOccurs during paper feed. A paper exit signal (ON) was received from the main machine, but the entrance sensor did not switch ON after the finisher transport motor ran long enough to feed paper 500 mm. **Solution:** ①
2	Entrance sensor	**Problem:** Late errorOccurs during paper feed. The entrance detected the paper, but the entrance sensor did not go OFF after the finisher transport motor ran long enough to feed 1.5 times the length of the paper size signaled by the main machine. **Solution:** ①
3	Paper in paper path	**Problem:** Occurs at power on, or after the top cover or stapler door has been closed. After the top or stapler cover switch is closed, the stapler cover switch goes OFF but the entrance sensor remains ON for longer than 50 ms. **Solution:** ①
4	No paper present	**Problem:** Occurs during stapling, stapling mode WAIT. The paper sensor on the stapling tray remains OFF for more than 50 ms. **Solution:** No action required.
5	Positioning roller motor error	**Problem:** Occurs during initialization or during operation of the positioning roller motor.

No.	Error	Problem/Solution
		• During initialization or while the positioning roller arm was being lowered, the HP sensor remained ON did not go OFF within the prescribed time. • During initialization, the positioning roller HP sensor remained OFF did not go ON within the prescribed time. • When the positioning roller arm is raised from the down position, the HP sensor does not go ON even after the positioning roller motor remained on for 450 pulses. **Solution:** ②
6	Front side fence motor error	**Problem:** Occurs at power on, when the paper moves to the start position in the finisher, or in standby mode. • The front side fence HP sensor did not switch from ON to OFF after the front side fence motor remained on for 50 pulses to move the fence toward the rear. • The front side fence HP sensor did not switch from OFF to ON after the front side fence motor remained on for 420 pulses. **Solution:** ②
7	Rear side fence motor error	**Problem:** Occurs at power on, when the paper moves to the start position in the finisher, or in standby mode. • The rear side fence HP sensor did not switch from ON to OFF after the rear side fence motor remained on for 50 pulses to move the fence forward. • The front side fence HP sensor did not switch from OFF to ON after the front side fence motor remained on for 420 pulses to move the fence toward the rear. **Solution:** ②
8	Feed-out belt motor	**Problem:** Occurs at initialization or during feed-out belt operation. • The feed-out belt HP sensor did not switch from ON to OFF after the feed-out belt motor ran for 100 pulses. • The feed-out belt HP sensor did not switch from OFF to ON after the feed-out belt motor ran for 1000 pulses. **Solution:** ②

No.	Error	Problem/Solution
9	Stapler movement motor error 1	**Problem:** Occurs at initialization or while the paper is being fed to the start position in the finisher. • The stapler HP sensor did not switch from ON to OFF after the stapler movement motor ran for 200 pulses. • The stapler HP sensor did not switch from OFF to ON after the stapler movement motor ran for 5600 pulses. **Solution:** ②
10	Stapler motor error	**Problem:** Occurs during staple supply to the stapler. The stapler operation (stapling) did not end after 600 ms. A staple jam can also cause this error.
11	Tray lift motor error	**Problem:** Occurs at initialization, after return to standby, or during feed-out belt operation. • The paper height sensor did not go OFF after the tray lift motor ran for 3 sec. to lower the tray. • The paper height sensor did not go OFF after the tray lift motor ran for 20 sec. to raise the tray. **Solution:** ②
12	Edge depressor solenoid	**Problem:** Occurs at initialization or during feed-out belt operation. • The paper height sensor remained ON after the solenoid went OFF. **Solution:** ②
13	Tray full sensor	**Problem:** The tray full sensor went ON with the edge depressor solenoid OFF and paper height sensor OFF. **Solution**: Tray full, remove paper.
14	Staple out	**Problem:** Occurs during standby or during stapling.

No.	Error	Problem/Solution
		• The staple near-end sensor went ON, or during staple supply the self-priming sensor did not go ON, even after 10 attempts to supply more staples to the stapler. **Solution:** Replace the empty staple cartridge.
15	Top cover open	**Problem:** The top cover remained open longer than 2 ms. **Solution:** Close the top cover.
16	Stapler cover open	**Problem:** The stapler cover remained open longer than 2 ms. **Solution:** Close the stapler cover.
17	Tray upper limit switch is ON	**Problem:** The tray upper limit switch remained on longer than 2 ms. **Solution**: Before determining that an error has occurred: • Lower the safety lever. • Cycle the machine power off/on
18	System error	**Problem:** An abnormal condition was detected and existed longer than 60 sec. **Solution: DFU**
19	Exceeded system limitation	**Problem:** Occurs when the number of command requests received has exceeded the limit. The entrance detected the paper, but the entrance sensor did not go OFF after the finisher transport motor ran long enough to feed 1.5 times the length of the paper size signaled by the main machine. **Solution: DFU**
20	Abnormal data transfer	**Problem:** A problem has been detected at ASAP during data transmission. **Solution:** ①

3. Specifications

Specifications

Target Line Speed	77 mm/sec. to 205 mm/sec		
Target CPM	35 cpm		
Face-down Output Size	12"x18", A3 SEF to A6 SEF, DLT to HLT SEF Shift sizes: A3 SEF to B5 SEF A5, B6, A6 SEF labels possible		
Paper Thickness	52 g/m^2 (45 K) to 157 g/m^2 (135 K) Up to 253 g/m^2 (220K) without shift		
Stapling			
Stack Height for Stapling	50 sheets: A4, LT and smaller 30 sheets: B4, LG and larger		
Size	A3 SEF to B5 SEF (can be mixed if same width)		
Stack Thickness	64g/m^2 (45 K) to 157 g/m (135 K)		
Stapling Positions	Front/Oblique: 1, Front/Parallel: 1 Rear/Oblique: 1, Rear/Parallel: 1, 2 locations		
Output Tray Capacity			
Non-staple Mode	500 sheets: A4, LT and smaller		
Staple Mode	250 sheets: B4, LG and larger Stack Size (Stapling)	Stacks	Size
	2 to 9 Sheets	55 to 46	A4, B5, LT LEF
	10 to 50 Sheets	45 to 10	
	2 to 9 Sheets	55 to 27	A4, B5, LT SEF
	10 to 50 Sheets	25 to 8	
	2 to 9 Sheets	55 to 27	A3, B4, DLT, LG

	10 to 30 Sheets	25 to 8	
Stacking	Non-Stapling Mode	Vertical: 15 mm or less	
		Horizontal: 15 mm or less	
Jogging Precision			
2 to 30 Sheets	2 mm		
31 to 50 Sheets	3 mm		
Dimensions (w x d x h)	396 x 551 x 276 mm (15.6 x 21.7 x 10.9 in.)		
Weight	12 kg (26.4 lb.)		