500-SHEET FINISHER
(Machine Code: G314)

1. REPLACEMENT AND ADJUSTMENT

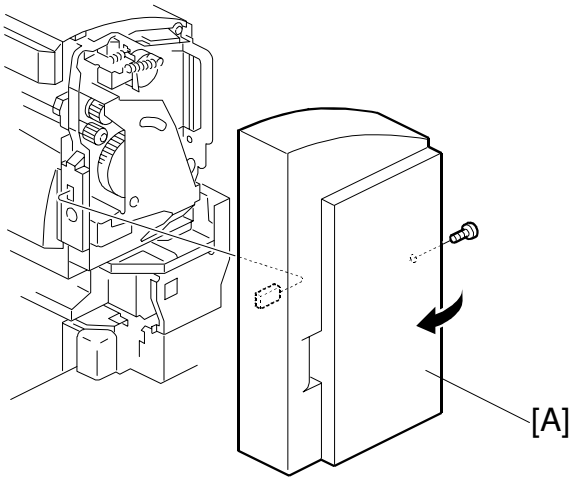
⚠CAUTION
Turn off the main power switch and unplug the machine before beginning any of the procedures in this section.

NOTE: This manual uses the following symbols.
☛ : See or Refer to : Screws : Connector : Clip ring

1.1 EXTERIOR COVERS

Front Cover

[A]: Front cover (x 1)



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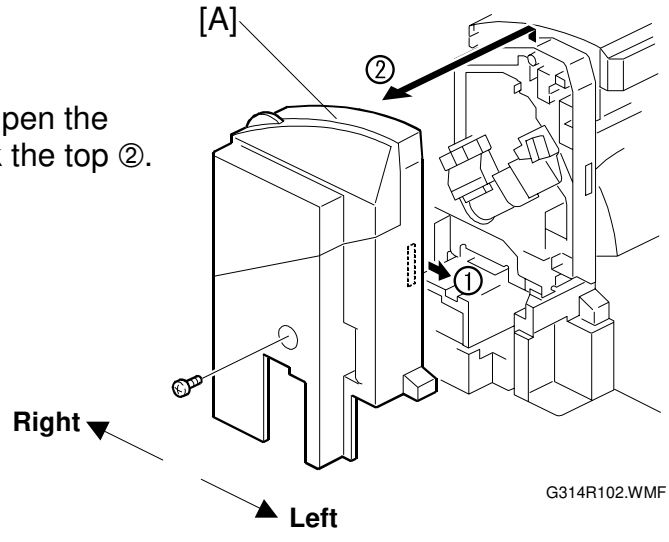
Rear Cover

[A]: Rear cover (x 1)

NOTE: Unhook the left side ①, open the upper cover, and unhook the top ②.



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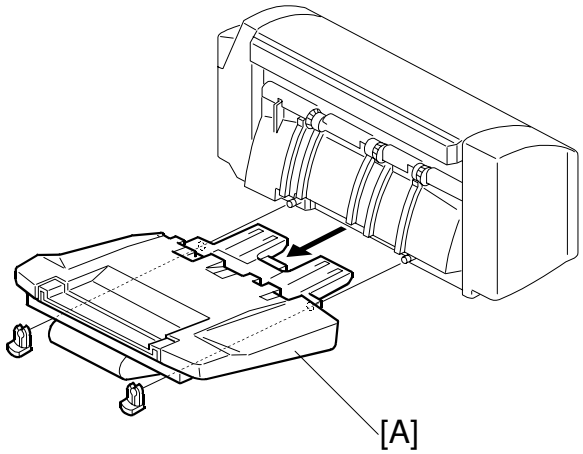
Peripherals

Lower Guide

[A]: Output tray (x 2)



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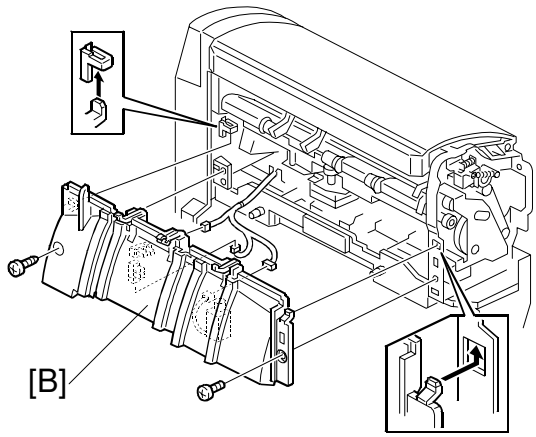
[B]: Lower guide (x 2, x 3)



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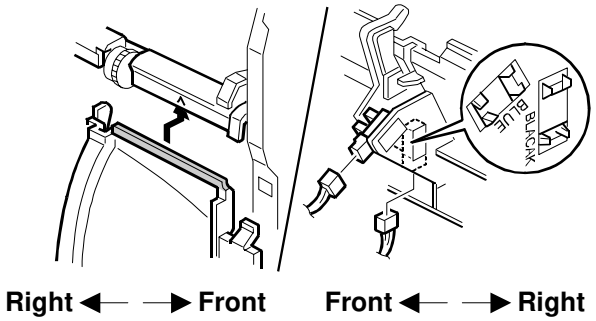
Reassembly

1. Check that the connectors are in the right places. (The wire colors are embossed on the rear side of the connector base.)
2. Insert the front-side hook.



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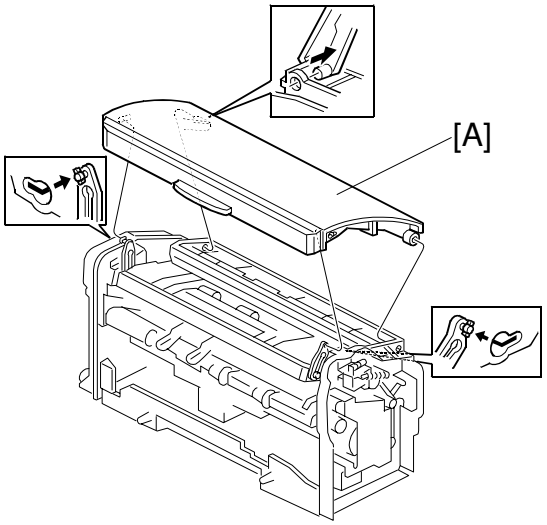
Upper Cover

[A]: Upper cover (2 hinges, 2 links)



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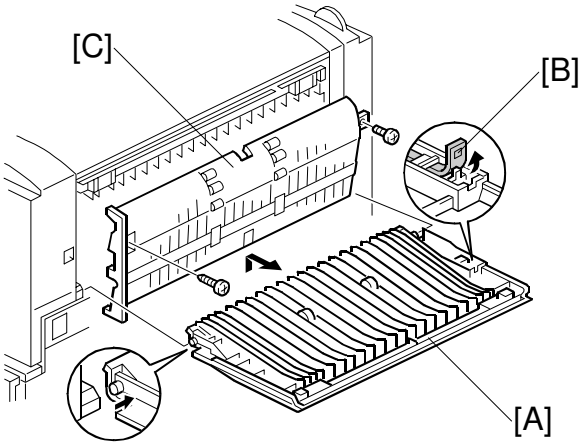
Right Cover

1. Right cover [A] (1 belt [B])
2. Inner cover [C] (🔩 x 2)



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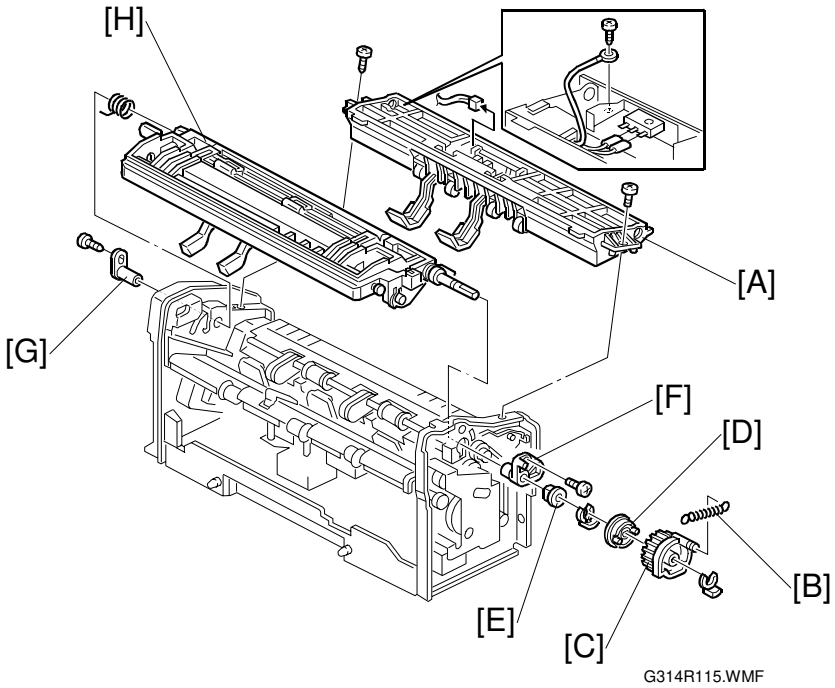
1.2 ENTRANCE UPPER GUIDE AND PAPER EXIT UNIT



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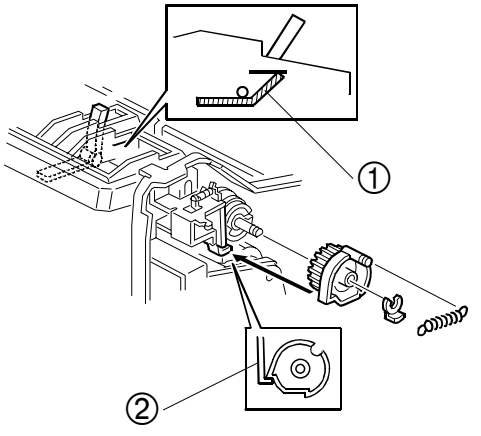
1. All exterior covers (☛ 1.1)
2. Entrance upper guide [A] (x 3, x 3)
3. Paddle gear spring [B]
4. Paddle gear [C] (x 1)
5. Paddle gear holder [D]
6. Bushing [E] (x 1)
7. Paper exit unit holder [F] (x 1)
8. Rear paper exit unit holder [G] (x 1)
9. Exit unit [H]

NOTE: When reassembling, put the paper exit unit stay in the uppermost position and the paddle roller stay in the ready position ①. Insert the paddle gear with the pawl resting on the clutch link ②.



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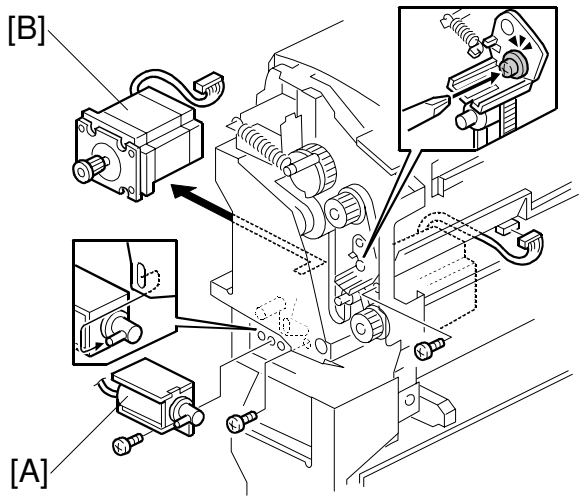
1.3 MOTORS

1.3.1 MAIN MOTOR

1. Front cover (☛ 1.1)
2. Solenoid [A] (☞ x 1)
3. Main motor [B] (✋ x 1, ☞ x 2)



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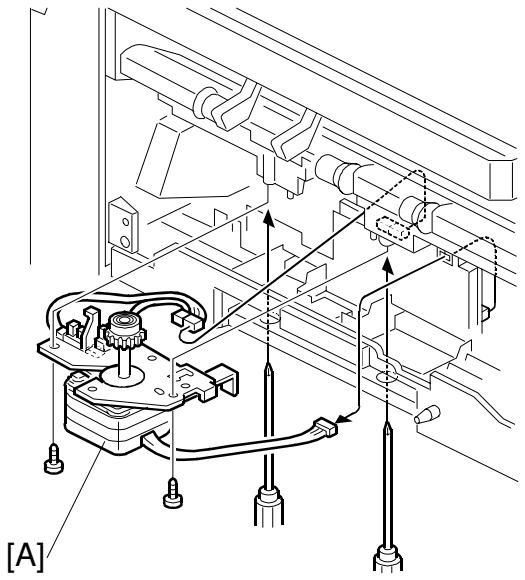
1.3.2 JOGGER MOTOR

1. Lower guide, right cover (☛ 1.1)
2. Remove the finisher from the main unit.
3. Jogger motor [A] (✋ x 3, ☞ x 2)

NOTE: When reassembling, connect the connectors first. (After the motor is installed, it is difficult to connect the connectors.)



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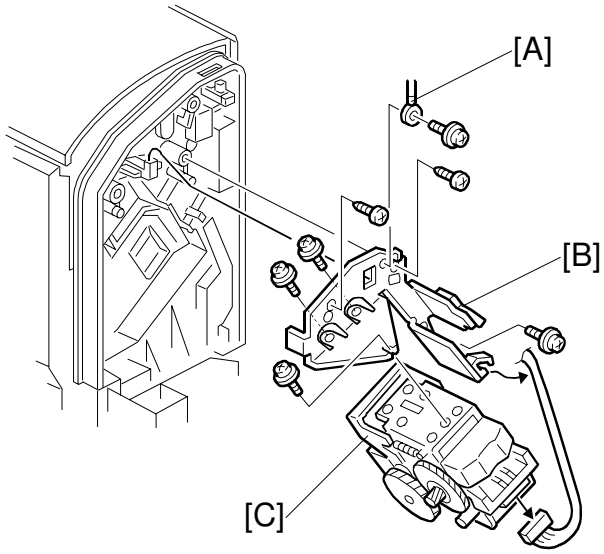
1.4 STAPLER

1. Rear cover (☛ 1.1)
2. Ground wire [A] (☞ x 1)
3. Bracket [B] (✍ x 2, ☞ x 3)
4. Stapler [C] (✍ x 1, ☞ x 3)



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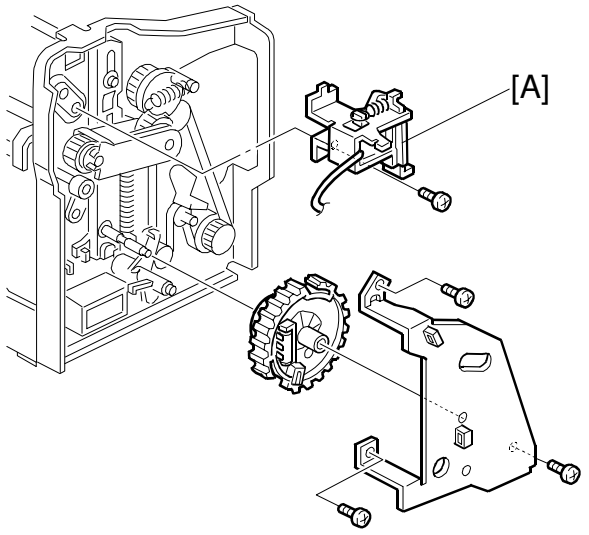
1.5 PADDLE ROLLER SOLENOID

1. Front cover (☛ 1.1)
2. Paddle roller solenoid [A] (1 spring, ☞ x 1)



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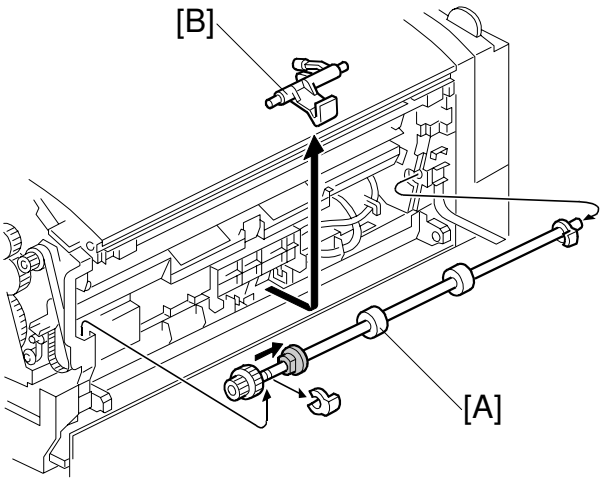
1.6 MAIN CONTROL PCB

1. Right cover, inner cover (☛ 1.1)
2. Transport roller [A] (⟲ x 1)
3. Feeler [B]



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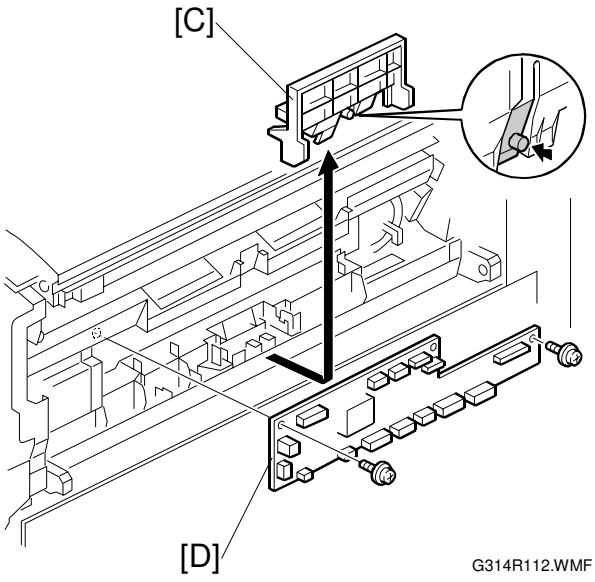
4. Protector [C]
5. Main control PCB [D] (🖐 x 15, 🔩 x 2, 1 projection)



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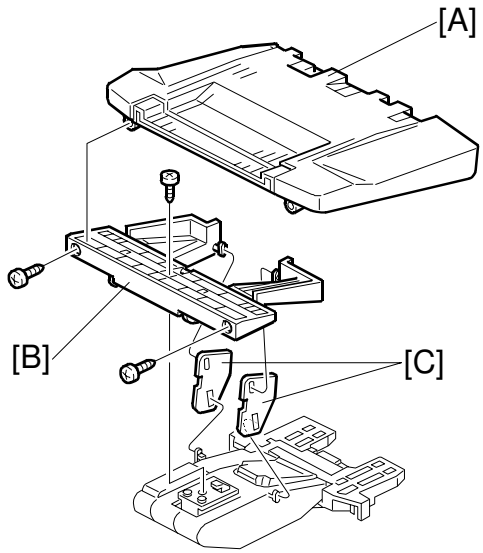
Peripherals

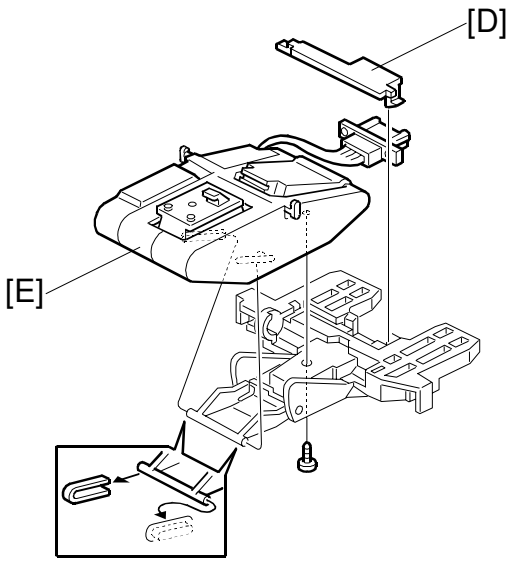
1.7 OUTPUT TRAY UNIT

[A]: Output tray cover (☞ x 2)
[B]: Tray holder (☞ x 1)
[C]: Links



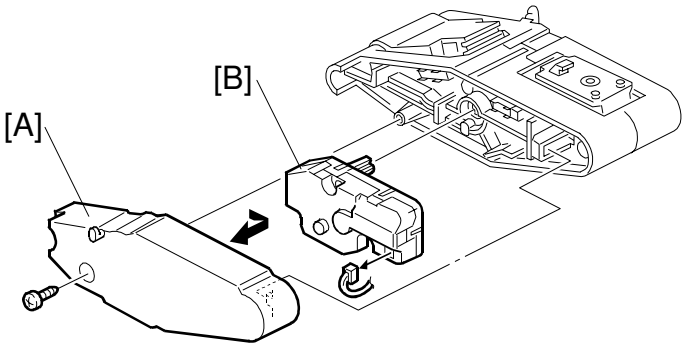
G314R117.WMF

[D]: Connector cover
[E]: Output tray motor link unit (☞ x 1)



G314R118.WMF

[A]: Rear cover (☞ x 1)
[B]: Output tray motor (☞ x 1)



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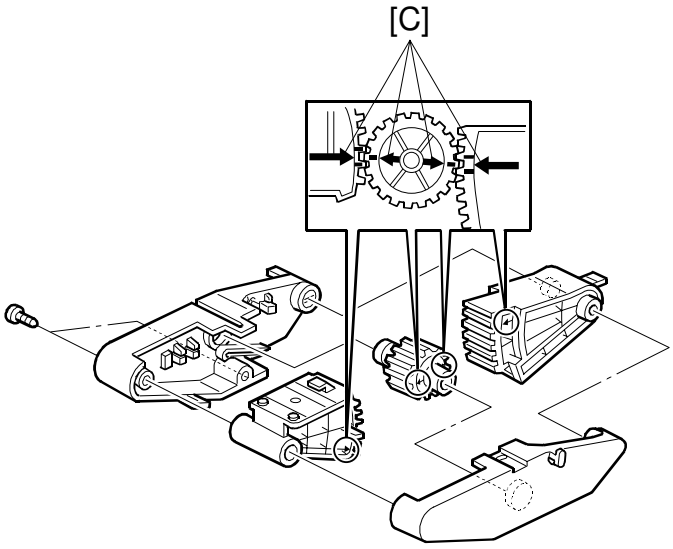
NOTE: When putting back the output tray motor, make sure that the arrows [C] indicated on the gears are aligned as shown.



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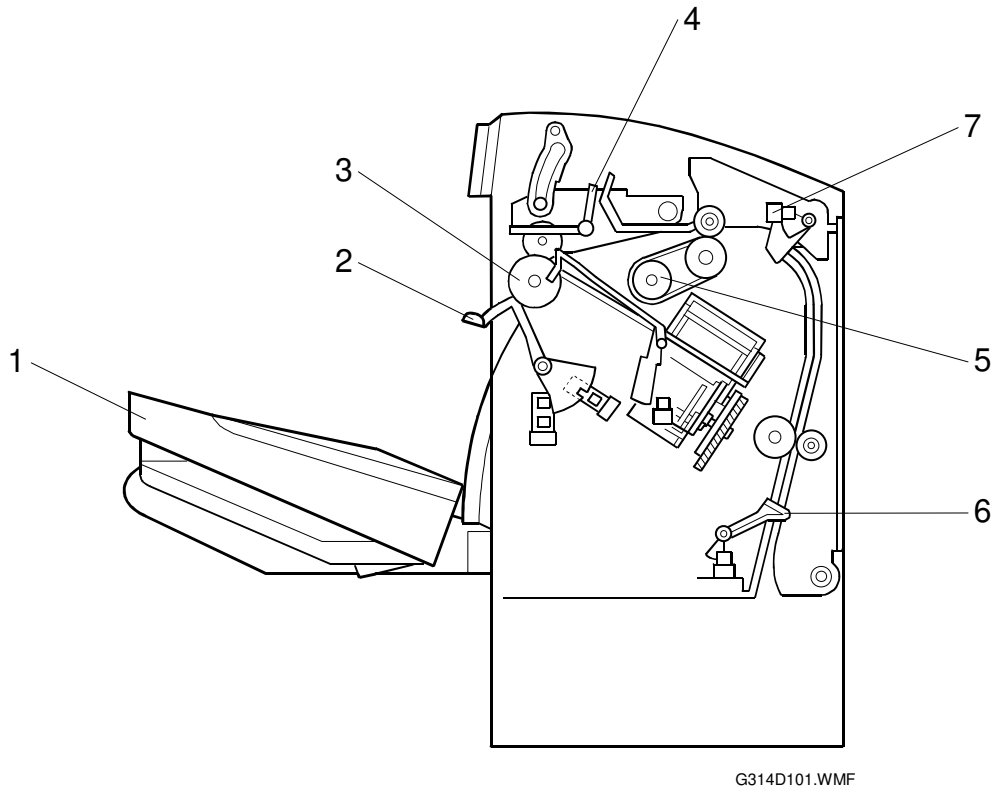
2. DETAILED DESCRIPTIONS

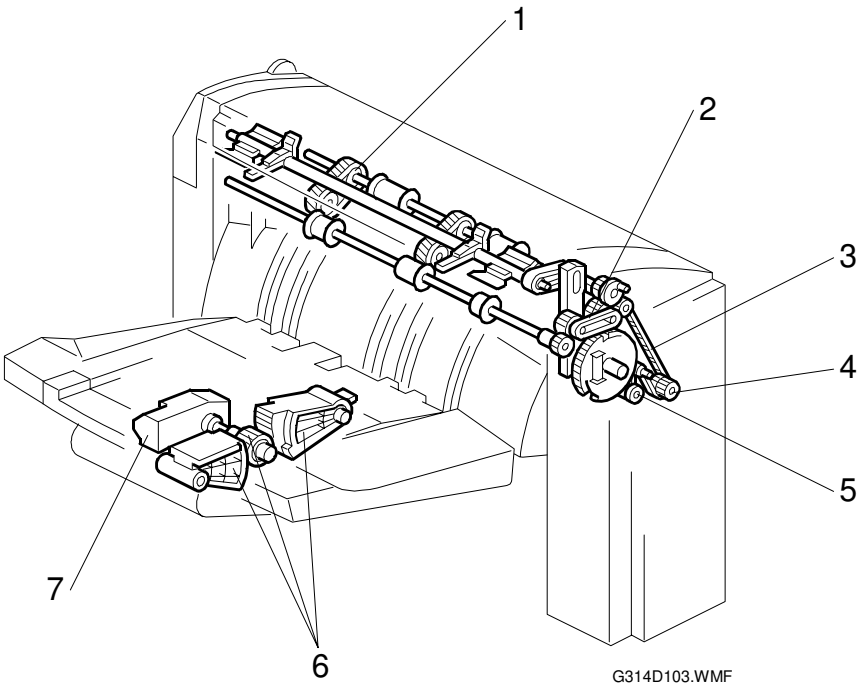
2.1 OVERALL MACHINE INFORMATION

2.1.1 COMPONENT LAYOUT



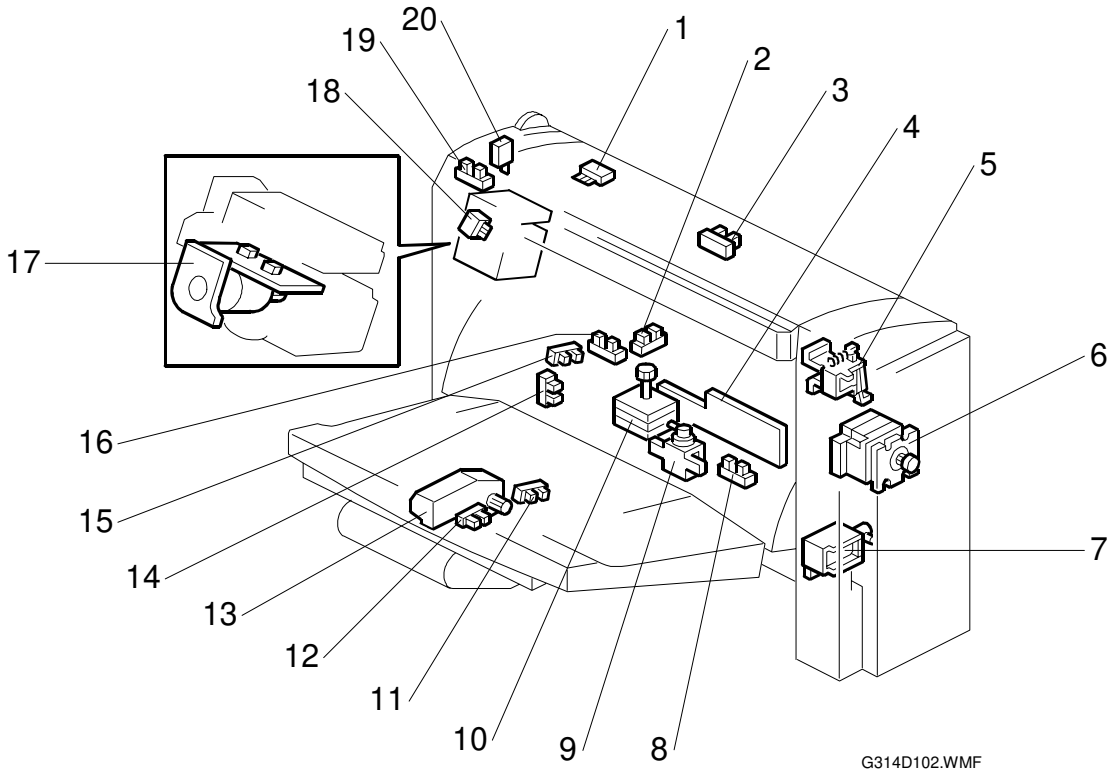
1. Output tray
2. Stack height detection lever
3. Paper exit roller
4. Paddle roller
5. Reverse roller
6. Base sensor
7. Entrance sensor

2.1.2 DRIVE LAYOUT



1. Reverse roller
2. Exit roller timing belt
3. Main motor timing belt
4. Main motor
5. Paper exit unit drive gear
6. Output tray link gears
7. Output tray motor

2.1.3 ELECTRICAL COMPONENTS



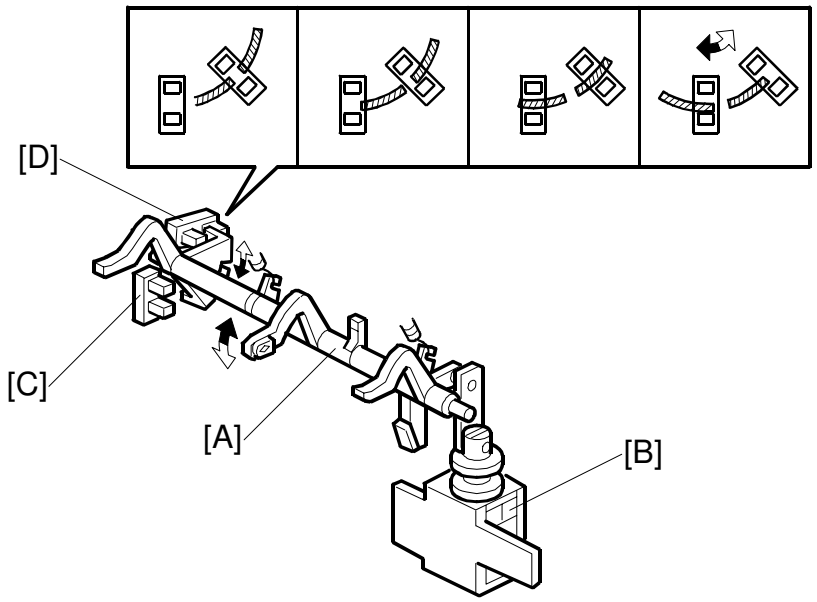
See the next page for the component description table.

Symbol	Name	Function	Index No.
Motors			
M1	Main	Drives all the rollers.	6
M2	Jogger	Drives the jogger fence	10
M3	Output Tray	Drives the tray up and down	13
M4	Stapler	Drives the stapler	17
Sensors			
S1	Entrance	Detects paper at the entrance	3
S2	Exit	Detects paper at the exit	16
S3	Stack height	Detects the top of the paper stack	14
S4	Lever	Detects the position of stack height lever	15
S5	Jogger home position	Detects the position of the jogger fence	2
S6	Top cover	Detects if the top cover is open.	19
S7	Tray upper limit	Detects when the tray is lifted up to the upper limit.	12
S8	Stack near-limit	Detects when the tray is at its lowest limit (almost full).	11
S9	Base	Jam detector.	8
Switches			
SW1	Paper exit unit	Switches DC for the stapler unit on and off.	20
SW2	Staple unit cover	Cuts DC when the staple unit cover is open.	18
SW3	Right cover	Detect if the finisher right cover is open.	1
Solenoids			
SOL1	Exit unit gear	Moves the paper exit unit up and down	7
SOL2	Paddle roller	Switches paddle roller rotation on and off.	5
SOL3	Stack height lever	Moves the stack height lever into contact with the top of the stack.	9
PCBs			
PCB1	Main control	Controls all finisher functions	4

2.2 DETAILED SECTION DESCRIPTIONS

2.2.1 OUTPUT TRAY

Stack Height Detection



G314D104.WMF

Stack height detection lever [A]: Driven by stack height lever solenoid [B].

Two sensors detect the height of the stack in the output tray: the stack height [C] and lever [D] sensors.

Stack height sensor	Lever sensor	Status
Off	Off	The stack height is below the target. The output tray is lifted to the target position.
Off	On	Target position
On	On	The stack height is more than the target. The output tray is lowered to the target position.
On	Off	The stack height detection lever is at home position.

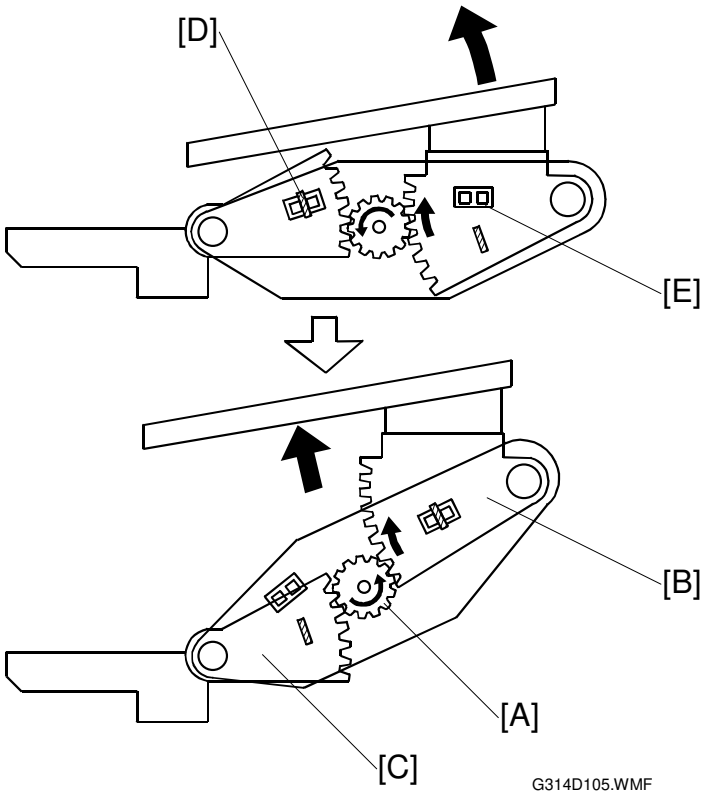
Off: Actuator not in sensor

At the start of a print job, the solenoid turns off. The stack height detection lever comes down, to detect the current stack level.

When a sheet of paper is being fed out, the solenoid turns on and the lever goes back up to home position (inside the unit).

After paper has been fed out, the solenoid turns on again, and the lever detects the level of the stack.

Output Tray Up/Down Mechanism



Overview

The output tray motor [A] lifts/lowers the tray if the stack height is not at the target position.

Gears [B] and [C] keep the angle of the tray constant at any tray position.

Output Tray Downward Movement

The top of the paper stack is checked after every page (or set of pages) has been fed out. If the top of the stack is higher than the target level, the output tray motor moves the tray down.

When the stack near-limit sensor [D] detects the actuator on gear [C], a stack near-limit signal is transferred to the main frame. The tray cannot move any lower. The next time the top of the stack height is above the target level, printing stops.

Output Tray Upward Movement

If paper is removed from the stack, the top of the stack will be lower than the target level, and the output tray motor moves the tray up.

When the tray upper limit sensor [E] detects the actuator on gear [B], the tray cannot be moved up any more, so the motor stops.

2.2.2 PAPER FEED

Overview

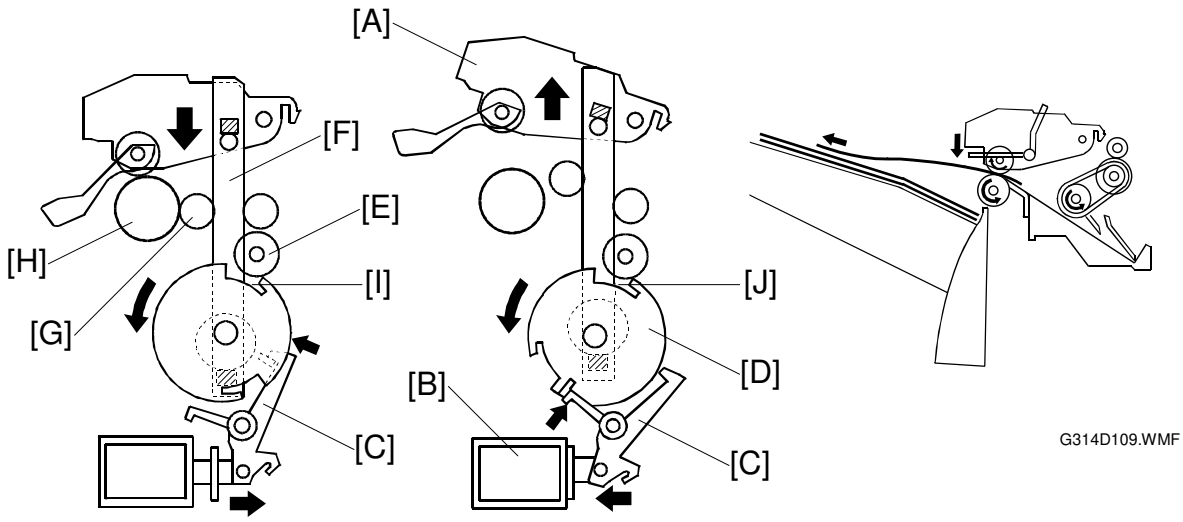
The following paper feed out modes can be selected at the printer driver.

Mode	Description
Straight feed out mode	Paper is fed directly to the output tray without shifting or stapling.
Shift sorting mode	Alternate sets are shifted before being fed to the output tray.
Stapling mode	All sets are shifted and stapled, then fed to the output tray.

Straight Feed-out Mode

Before the job, the exit unit [A] is up, and the exit unit gear solenoid [B] is on, pulling lever [C] away from the exit unit gear [D].

At the start of the job, the stack height detection lever detects the top of the stack. The tray moves up or down if the top of the stack is not at the correct level.



When the paper exit sensor in the main frame turns on, the finisher main motor starts. It drives the exit unit gear [D] through idle gear [E]. The gear pulls paper exit unit [A] down, using the paper exit link [F]. The link also moves the paper exit roller [H] up through the exit roller drive gear [G].

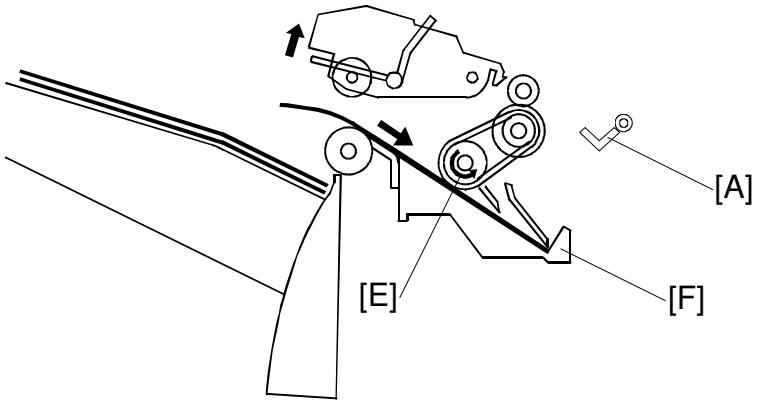
When the motor starts, the solenoid switches off and a spring pushes lever [C] into contact with the exit unit gear [D].

When a part of the exit unit gear without threads [I] faces the idle gear, the gear stops turning (see the left-hand diagram). The lever [C] catches a peg on the exit unit gear, to make sure that it stops at the correct position. The paper exit rollers [H] now contact each other and the main motor feeds out the paper.

When the last page has been fed out, the solenoid turns on to pull the lever away from the gear. The gear starts turning, to lift the exit unit to the standby position.

When the other part of the exit unit gear without threads [J] faces the idle gear, the exit unit gear stops. Then, the main motor stops and the solenoid turns off.

Shift Sorting Mode



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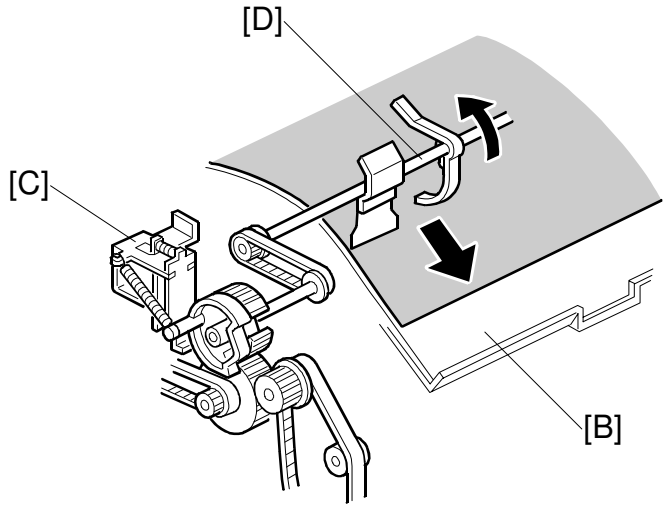

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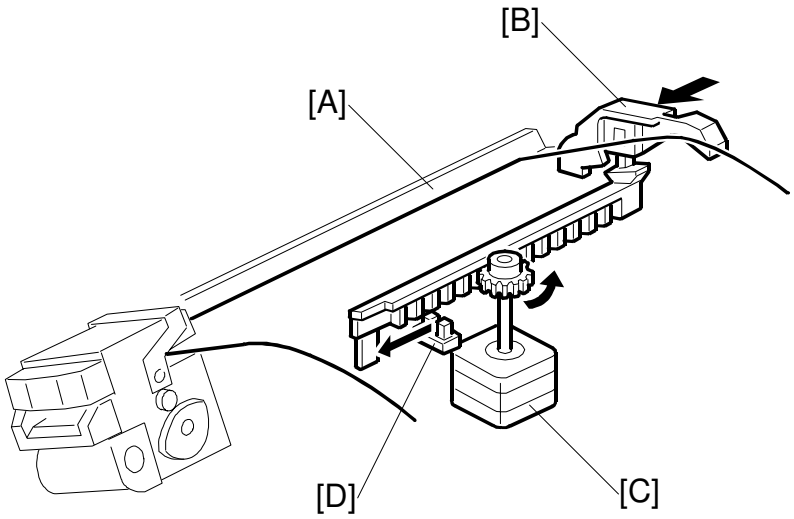
At the start of the job, and for odd numbered sets of copies, the mechanism is the same as the straight feed out mode. However, even numbered sets are fed back to the jogger tray, which shifts the sets to one side before feeding them out.

This section describes what happens for even-numbered sets (sets 2, 4, 6 etc) of the job.

A short time after the entrance sensor [A] detects the first page of the set, the paper exit unit solenoid turns on to restart the rotation of the paper exit unit gear, raising the paper exit unit to the standby position. It stays there until after the last page of the set.

The paper cannot feed out, so it drops into the jogger tray [B]. The paddle roller solenoid [C] turns on and the paddle roller [D] feeds the paper to the reverse roller [E]. The reverse roller feeds the paper to the end fence [F] of the jogger tray.



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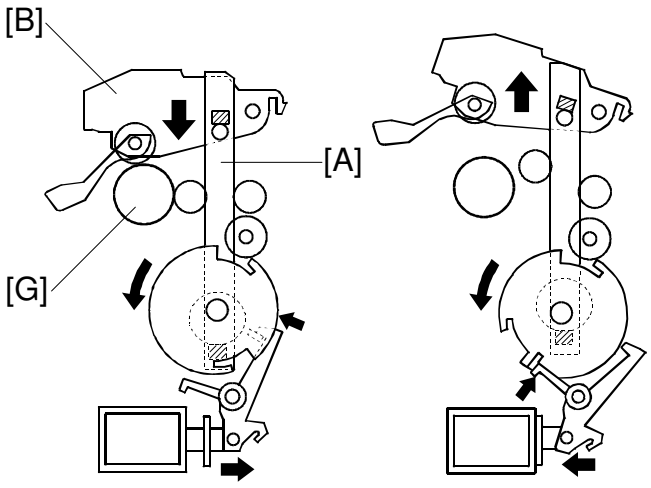
After the paper reaches the end fence [A], the jogger fence [B] shifts the paper across. The jogger motor [C] drives the jogger fence. The home position sensor [D] detects when the jogger fence has returned to home position.

When the next set begins, the paper exit unit moves down, and the machine operates the same way as straight feed out mode. At this time, the entire set in the jogger tray is fed out at the same time as the first page of the next set. However, the set coming from the jogger tray has been shifted to one side.

If the last set is an even-numbered set, the paper exit unit must be pulled down to feed the final set out of the jogger tray. Then the exit unit moves back up to the standby position.

The capacity of the jogger tray is 30 sheets. If the set contains more than 30 sheets, the machine feeds out the first 30 from the jogger tray, then continues with the rest of the set, using the jogger tray.

Stapling Mode



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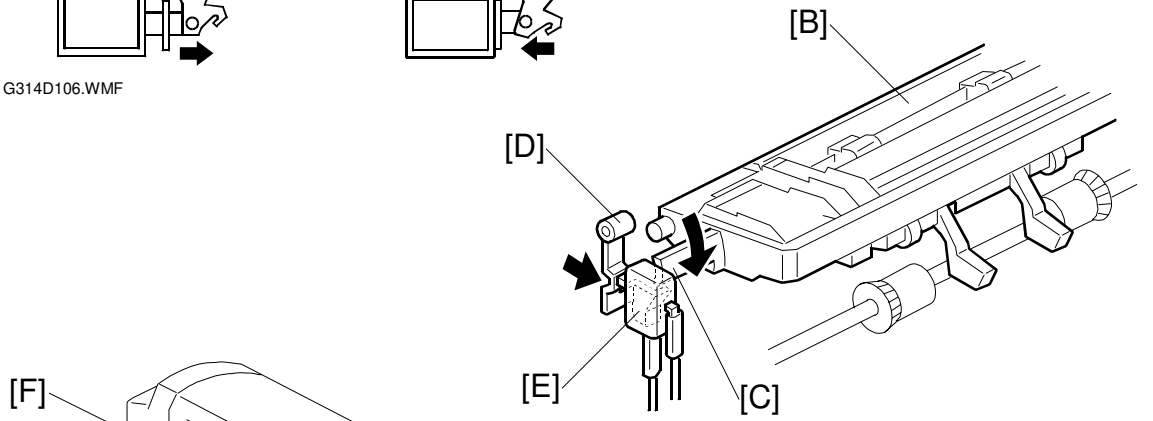

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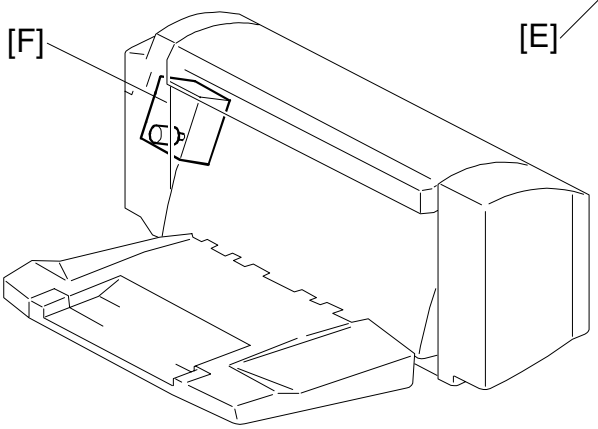

G314D114.WMF

The stapler is attached to the jogger tray, so all sets go to the jogger tray.

After all pages of a set have entered the jogger tray and been shifted across, the paper exit link [A] pulls the paper exit unit [B] down until knob [C] on the exit unit pushes the link lever [D] for the exit unit switch [E]. This turns on the exit unit switch. When this switch is on, dc is supplied to the stapler unit [F] and the main motor is turned off.

The exit unit switch is activated when the exit unit is pulled part-way down. After stapling the set of prints, the paper exit unit is pulled down again until the unit comes in contact with the paper exit roller [G], and the stapled set is fed out.

2.2.3 JAM CONDITIONS

	Sensors	Conditions
Remaining paper detection	Entrance Exit	Either the entrance or exit sensor detects paper just after the unit is initialized.
Non-feed at the entrance	Entrance	The entrance sensor is not activated within a certain period after the paper exit sensor detects paper.
Jamming at the entrance	Entrance	The entrance sensor is not de-activated after paper is fed 1.3 times the length of the paper.
Non-feed inside the unit (Straight feed out mode only)	Exit	The exit sensor is not activated within a certain period after the entrance sensor detects paper.
Jamming at the exit	Exit	The exit sensor is not de-activated after paper is fed for a certain period.
Jogger tray	Exit	The exit sensor is de-activated during paper shifting or stapling.

2.2.4 ERROR DETECTION

	Conditions
Jogger motor error	Jogger home position sensor does not shut off after jogger motor starts.
Jogger motor home position detection error	Jogger home position sensor does not turn on after paper shifting.
Stapler error	Stapler home position sensor (inside stapler unit) does not turn on after stapling.
Output tray upper limit error	Tray upper limit sensor is activated.
Output tray motor error	The output tray is away from the target position for more than 10 seconds.
Stack height detection error	The stack height detection lever does not return to its home position before going to detect the stack height.

NOTE: The above errors are indicated as “Finisher jam” at the first occurrence. If the same error happens again in the next job, “finisher error” is indicated.