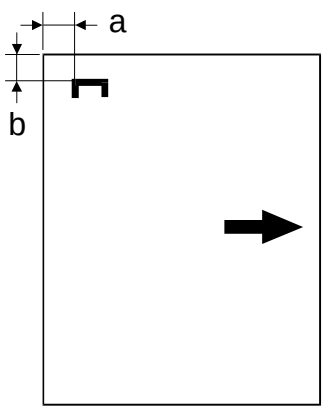
10-BIN
SORTER STAPLER

(Machine Code: A555)

1. SPECIFICATIONS

Paper Size for Bins:	Sort/Stack Modes: Maximum: A3, 11 x 17" Minimum: B5, 8 1/2 x 11"
Paper Weight for Bins:	Sorting: 52 ~ 157 g/m^2 (14 ~ 42 lb) Stacking: 52 ~ 157 g/m^2 (14 ~ 42 lb) Stapling: 52 ~ 80 g/m^2 (14 ~ 21 lb)
Bin Capacity:	Sorting: A4, 8 1/2 x 11" or smaller: 30 copies B4, 8 1/2 x 14" or larger: 25 copies Stacking: A4, 8 1/2 x 11" or smaller: 25 copies B4, 8 1/2 x 14" or larger: 20 copies
Stapler Capacity:	2 ~ 20 copies
Proof Tray Capacity:	100 copies (52 ~ 80 g/m^2 / 14 ~ 21 lb) 50 copies (81 ~ 128 g/m^2 / 22 ~ 34 lb) 30 copies (129 ~ 157 g/m^2 / 35 ~ 42 lb)
Number of Bins:	10 bins + proof tray
Stapling Position:	a = 6 ± 3 mm b = 6 ± 3 mm



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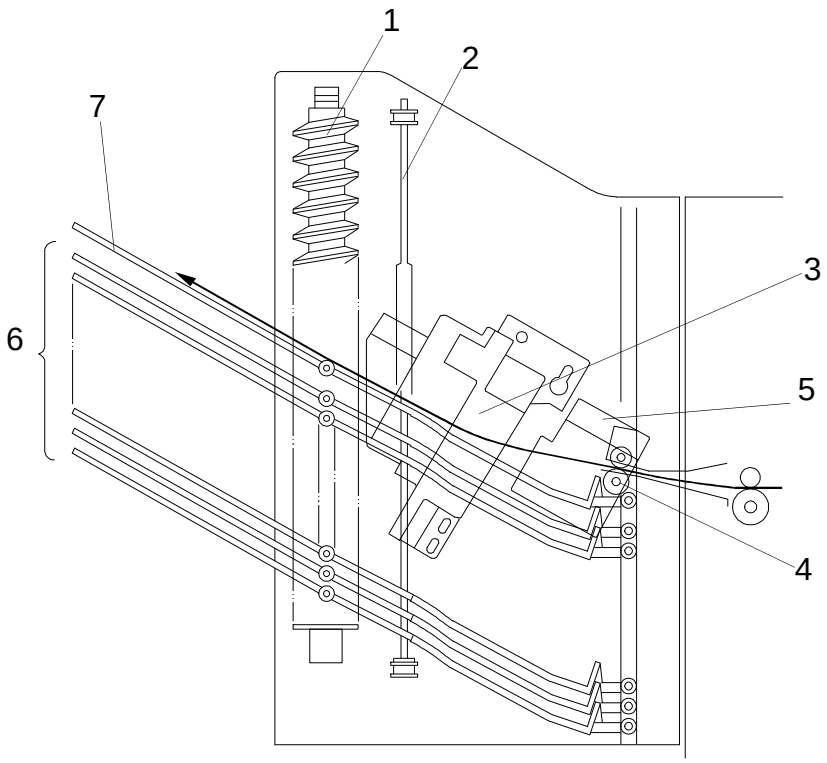
Staple Replenishment:	Cartridge exchange (2,000 staples/cartridge)
Power Source:	DC 24 V, 5 V (from the copier)
Power Consumption:	Average: less than 33 W Average for Sorting: less than 25 W Average for Stapling: less than 33 W
Weight:	12.4 kg (27.4 lb)
Dimensions (W x D x H):	381 x 548 x 443 mm (15.0" x 21.6" x 17.5")

2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



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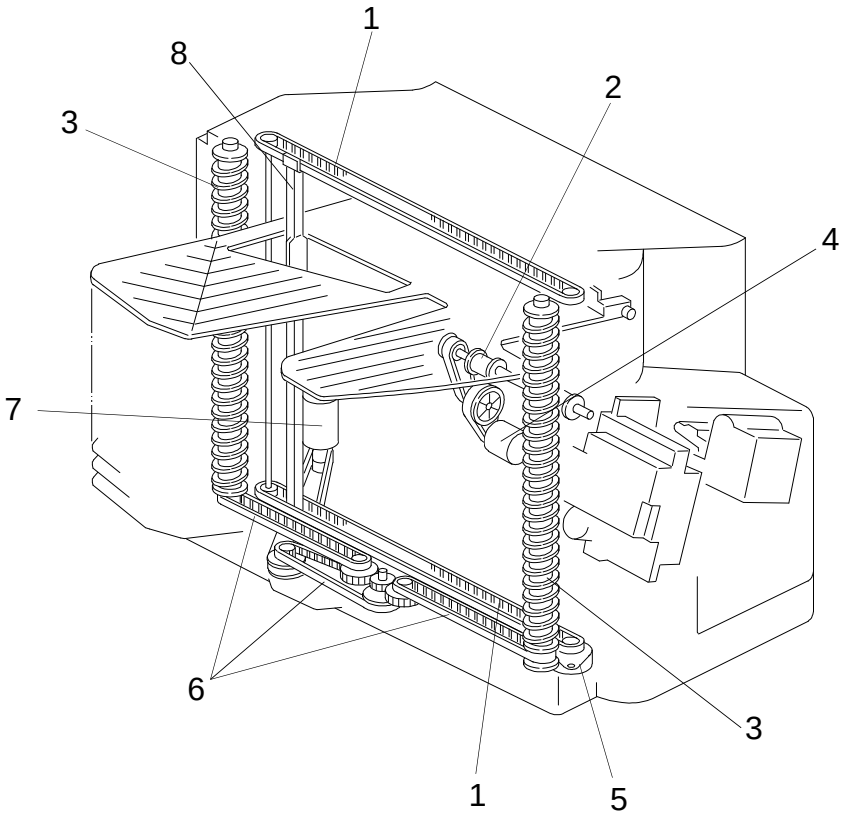
1. Helical Wheels
2. Jogger Plate
3. Grip Assembly
4. Transport Rollers
5. Staple Unit
6. Bins
7. Proof Tray

2.2 DRIVE LAYOUT



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1. Jogger Drive Belt
2. Transport Roller
3. Helical Wheels
4. Transport Motor
5. Jogger Motor
6. Wheel Drive Belts
7. Bin Drive Motor
8. Jogger Plate

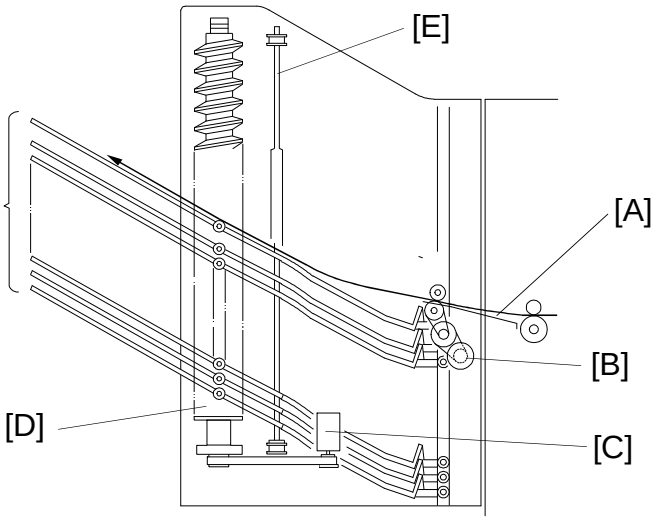
2.3 ELECTRICAL COMPONENT DESCRIPTION

Refer to the electrical component layout on the reverse side of the Point to Point Diagram (on waterproof paper).

Symbol	Index No.	Description	Note
Motors			
M1	14	Transport	Drives the transport roller
M2	9	Jogger	Drives the jogger plate to square the copies
M3	16	Bin Drive	Drives the bins
M4	6	Stapler	Drives the stapler hammer
M5	3	Grip	Drives the grippers forwards and back into the bin to grip the copies and bring them to the stapling position
Sensors			
S1	1	Bin (Phototransistor)	Detects whether there is any paper in the bins (light receiving element)
S2	2	Sorter Entrance	Detects paper jams
S3	15	Jogger H.P.	Detects whether the jogger plate is in its home position
S4	13	Timing	Provides pulses to the sorter stapler main board.
S5	4	Stapler Paper	Detects whether any copies are under the hammer.
S6	5	Grip H.P.	Detects when the grip assembly cam gear has rotated once
S7	11	Bin (LED)	Detects whether there is paper in the bins (light emitting element)
S8	10	Wheel	Detects the bin position.
S9	12	Bin H.P.	Detects whether the bins are at home position
S10	18	Staple H.P.	Detects whether the stapler hammer is at home position
S11	19	Staple End	Detects when the staples run out
Switches			
SW1	8	Door Safety	Cuts the dc +24V supply when either the unit or the stapler cover is opened.
SW2	7	Stapler	Cuts the signals to the stapler.
Circuit Board			
PCB1	17	Main	Controls all sorter/stapler functions

3. BASIC OPERATION

3.1 NORMAL MODE AND SORT/STACK MODE



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Copies exiting the copier pass through the entrance guide plate [A]. The transport roller will send copies either to the proof tray or to each bin, depending on the selected mode.

During copying, all rollers in the sorter stapler transport the paper at a speed which depends on the copier. When the trailing edge of the copy passes the fusing exit sensor, the speed of the rollers changes to 600 mm/s. This makes enough time for the jogger plate to square the stack of paper and to stack the paper smoothly into the bins.

- Normal (proof) mode -

When the Start key is pressed, the transport motor [B] energizes to rotate the transport roller. The transport roller sends copies to the proof tray directly.

- Sort mode -

When sort mode is selected, the bin drive motor [C] energizes to rotate the helical wheels. The helical wheels [D] rotate twice to move the top bin to the transport roller position, then the first copy is delivered to the top bin.

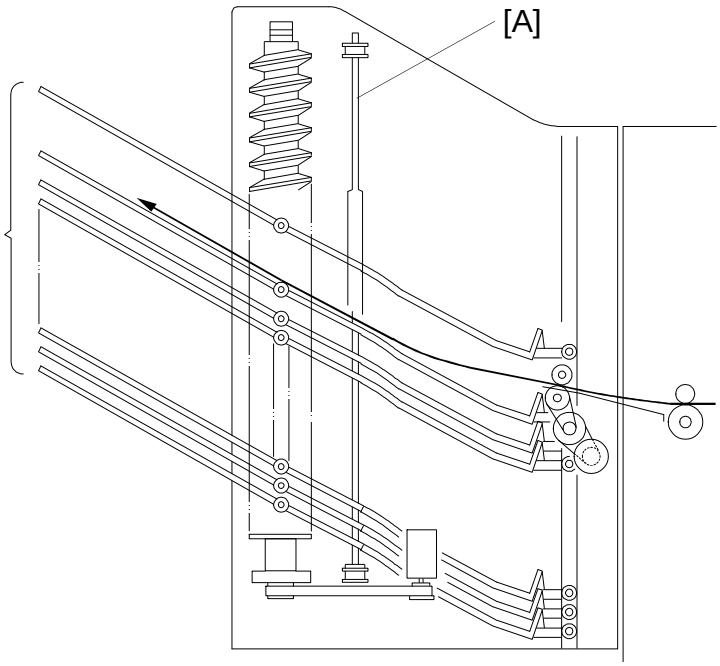
After the first copy of the first original has been fed to the top bin, the bin drive motor moves the bins up one step (the helical wheels rotate once) so that the second copy of the first original will be delivered to the next bin.

The jogger plate [E] squares the copies after each copy has been fed to a bin. After the copies of the first original have been delivered to each bin, the sorter stapler maintains its status (the bin drive motor does not rotate).

The first copy of the second original is delivered to the final bin that was used for the first original, then the final bin descends one step. The bins descend each time a copy of the second original is delivered.

The direction of motion of the bins alternates for each page of the original until the copy run is finished.

- Stack mode -



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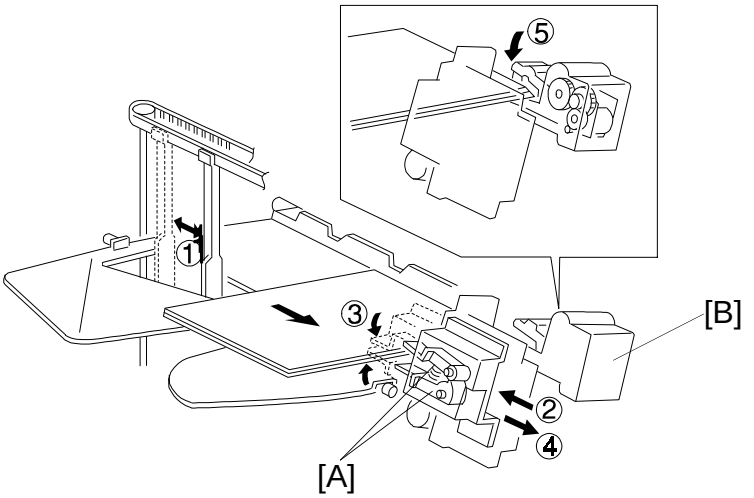
When stack mode is selected, the top bin advances to the transport roller position in the same way as in sort mode.

After the first copy is delivered to the top bin, the jogger plate [A] moves across to square the copy. The jogger plate squares the copies after each copy has been fed to a bin.

After one set of copies for the first original has been delivered to the top bin, the bin drive motor moves the bins up one step. Then, one set of copies of the second original will be delivered to the next bin.

3.2 STAPLE MODE



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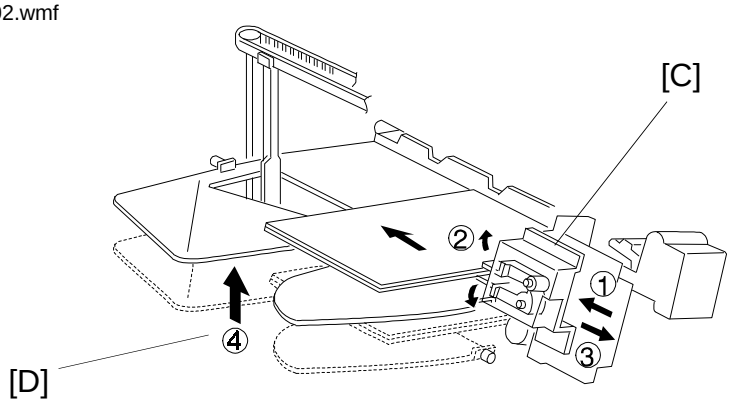

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The stapler is only available in sort mode.

When the jogger plate has squared the final set of copies, the grip arms [A] move inside the front side frame and catch the paper. The grip assembly brings the copies into the stapler [B], and the stapler staples the copies.

After stapling, the grip assembly [C] brings the stapled copies back to the bin and releases the copies. Then the grip assembly goes back to the normal position. The bin either advances or descends one step depending on whether the number of originals is odd or even [D].

When the final set of copies has been stapled, the bins go back to the standby position.

There are two staple modes.

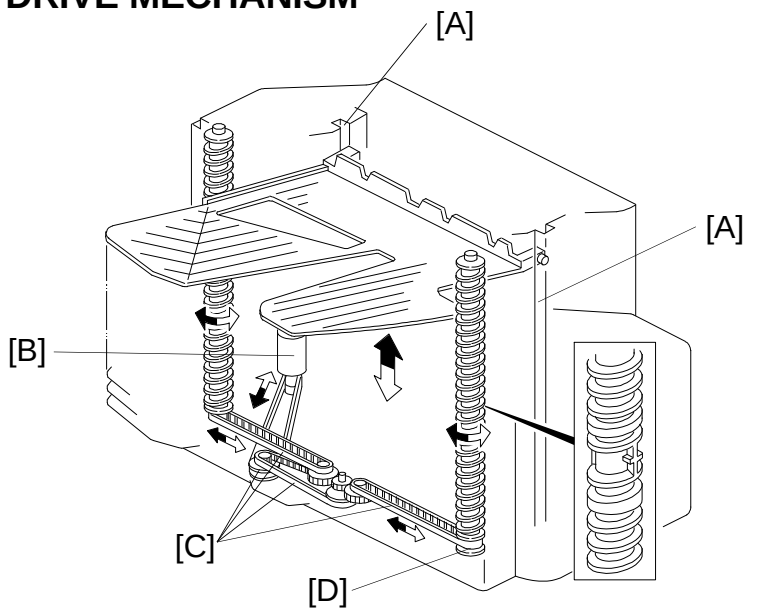
Automatic Stapling

In ADF mode, when staple mode is selected before pressing the Start key, copies will be delivered to each bin and stapled automatically.

Manual Stapling

In platen cover mode, after the copies have been sorted into the bins, the staple mode LED starts to blink. If the sort key is pressed while this LED is blinking, the copies will be stapled.

3.3 BIN DRIVE MECHANISM



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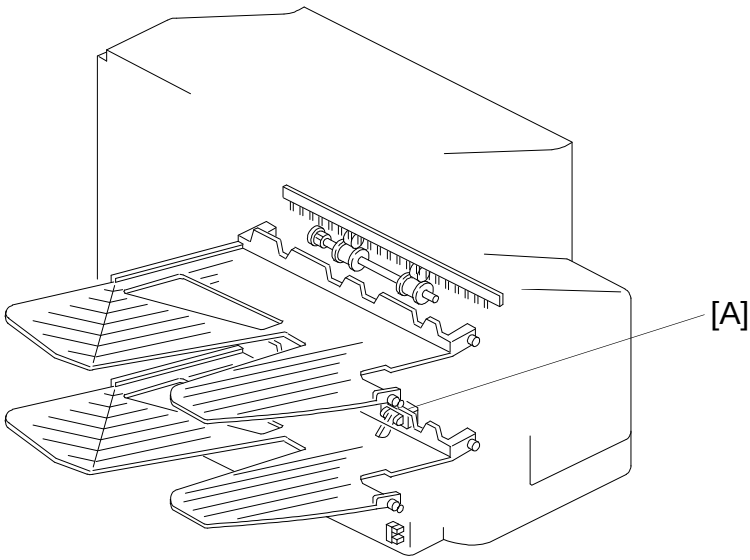
The bin drive mechanism moves the bins up and down to receive copies.

There are four pins on each bin. Two pins fit into the slots [A] in both the front and rear side frames; the pins slide up and down in these slots. The other two pins fit into the slot in the helical wheels; as the helical wheels turn, these pins move up and down, and the other pins move up and down in the slots at the other end of the bin.

The bin drive motor [B] drives the helical wheels through four timing belts [C]. When the motor rotates clockwise, the bins lift; when it rotates counterclockwise, the bins lower. There is a wheel sensor actuator [D] on the front helical wheel; the actuator has a slot which detects when the helical wheel has rotated once.

When the bins are advanced, the helical wheels rotate once for each step. As the pitch of the spiral on the helical wheel is greater when the bins are at the staple and paper exit area than when the bins are elsewhere, the amount of bin shift is greater when the bins are at the staple and paper exit area. This leaves enough space to staple and stack the copies. Also, this reduces the total machine height.

3.4 BIN HOME POSITION



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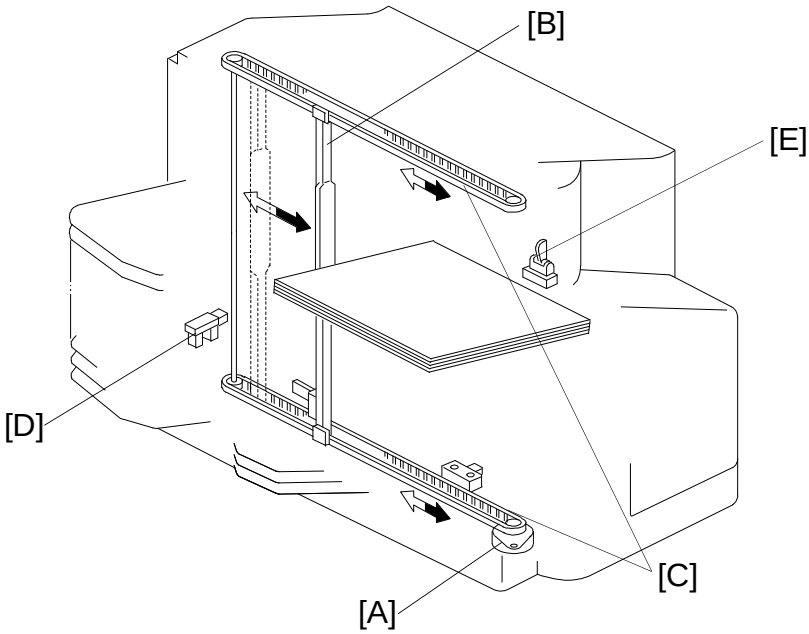
The bin home position sensor [A] ensures that the proof tray is lower than the transport roller when the bins are in the home position.

When the main switch is turned on, the sorter stapler initializes itself to check whether the component parts work or not. At this time, the bin drive motor raises the bins for a few moments, then it lowers the bins until the bottom bin actuates the bin home position sensor.

3.5 JOGGER MECHANISM



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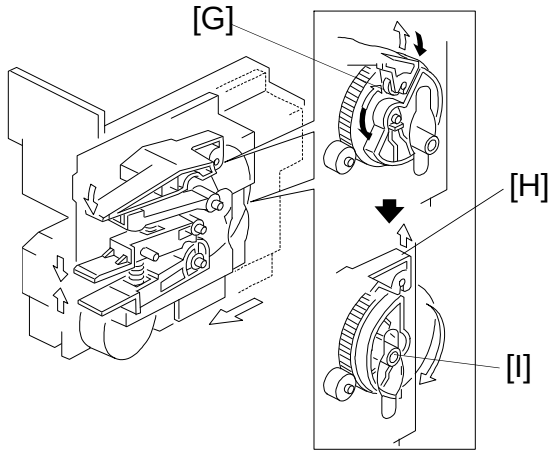
The jogger motor [A] drives the jogger plate [B] through the timing belts [C].

The jogger is at home position when the actuator on the jogger plate goes into the jogger home position sensor [D].

At standby, the jogger plate is at the home position. When the Start key is pressed, the copier sends the paper size information to the sorter stapler.

In sort, staple, and stack modes, the jogger moves three times to square the stack of paper. First, when the paper has been fed completely into the bin (at the proper time after the copy has passed through the entrance sensor [E], depending on the paper length), the jogger motor moves the jogger plate out of the jogger home position. Then, the jogger motor drives the jogger plate to the width of the copy. Finally, the jogger plate moves inward to push all the copies against the front side frame, which squares the sheets of paper. Then the jogger plate returns to the home position.

3.6 GRIP ASSEMBLY



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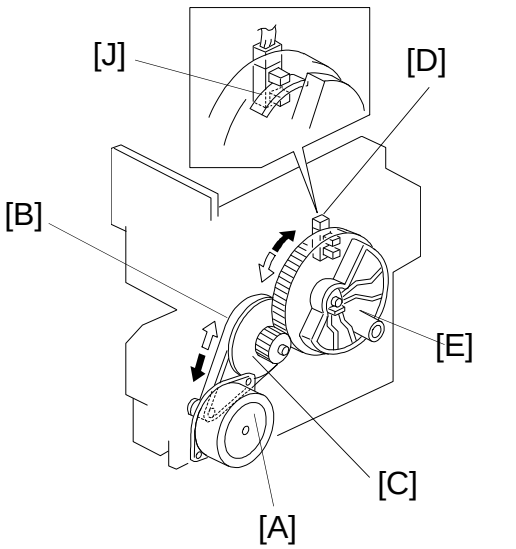

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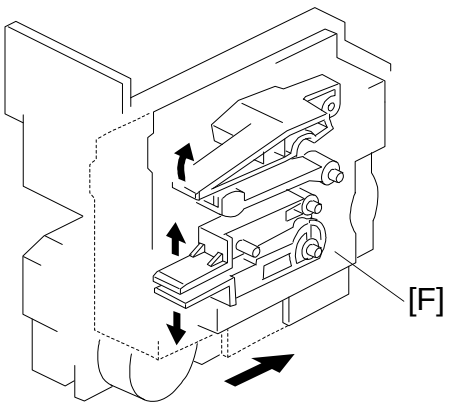

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The grip assembly consists of the grip motor [A], the timing belt [B], the drive gear [C], the grip home position sensor [D], and the cam gear [E].

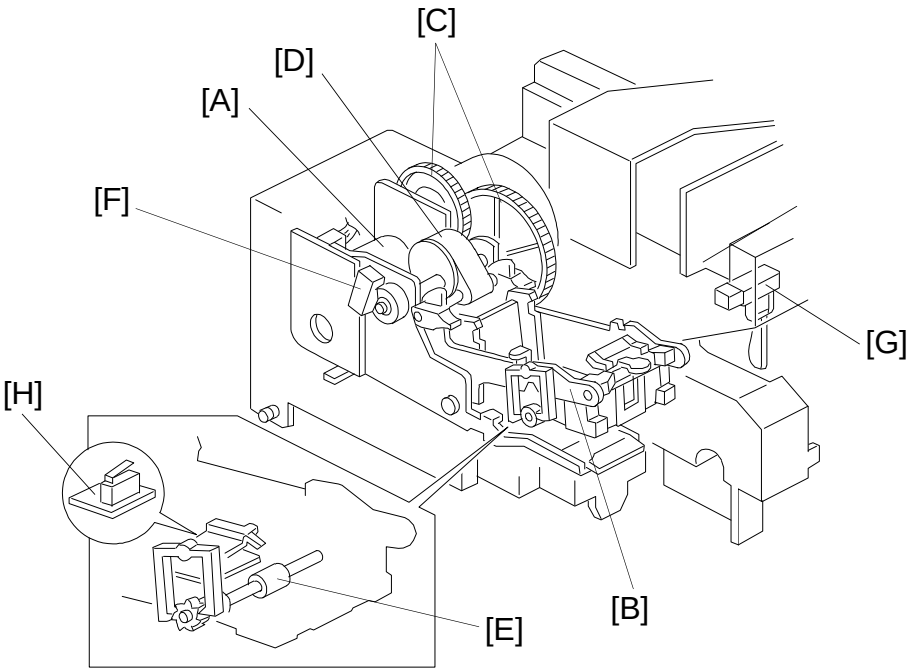
The grip motor drives the cam gear through the timing belt and drive gear. Cam gear rotation drives the mechanism that catches the copies and moves the grip arm unit [F]. When the cam gear rotates clockwise one full turn, the grip arm moves to catch the copies and returns to the home position to prepare for stapling. After stapling, the cam gear rotates counterclockwise once so that the stapled copies go back to the bin, and the cam gear returns to its home position.

When the cam pushes the roller [G] on the lever [H] and the lever pushes the grip arm, the grip arm can catch the copies.

A pin [I] on the cam gear fits into the slot in the grip arm unit. So, when the cam gear rotates, the slot moves the grip arm unit inward and outward.

The actuator [J] on the cam gear activates the grip home position sensor once every rotation of the cam gear. This allows the sorter stapler to determine that the cam gear has rotated once.

3.7 STAPLER UNIT



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The stapler motor [A] drives the staple hammer [B] using the gears [C] and the eccentric cam [D].

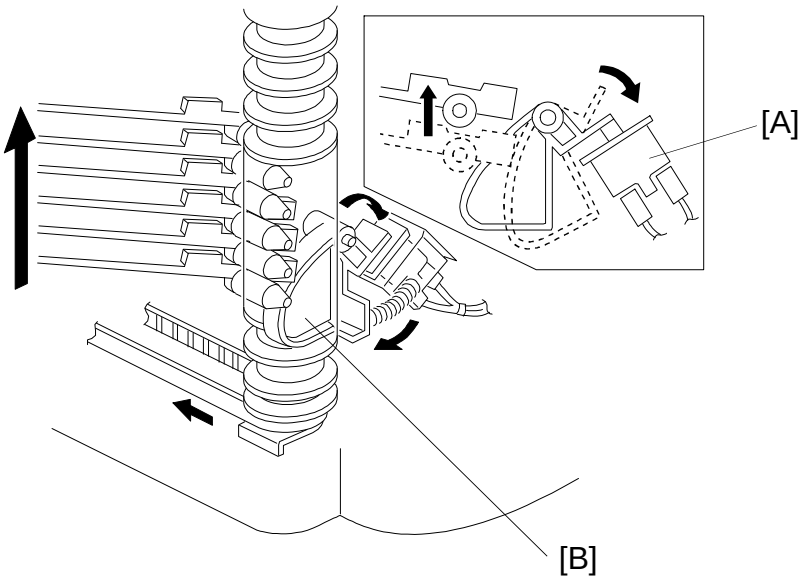
The roller [E] feeds the staple sheets under the hammer.

When the aligned copies are brought to the staple position by the grip unit, the stapler motor starts rotating and the copies are stapled. When the cam completes one rotation, the staple home position sensor [F] is deactuated and the stapler motor stops.

When the stapler paper sensor [G] in the grip assembly does not detect any copies under the hammer, the stapler motor does not rotate.

When the trailing edge of the last staple sheet pass through the staple end sensor [H], the sorter stapler enters the staple near end condition. After the current job is completed, the Add Staples indicator lights on the operation panel. Then the copier cannot be used whenever the staple mode is selected.

3.8 STAPLER SWITCH



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The stapler switch [A] below the grip assembly cuts the signal to the stapler. In proof mode, all bins lower and push the lever [B]. This opens the stapler switch so that the signal to the stapler is cut. In sort and staple modes, all bins are advanced and the switch is closed so that the signal can be supplied to the stapler.

- Staple Disabling Conditions -

1. Under the following conditions, staple mode is disabled.

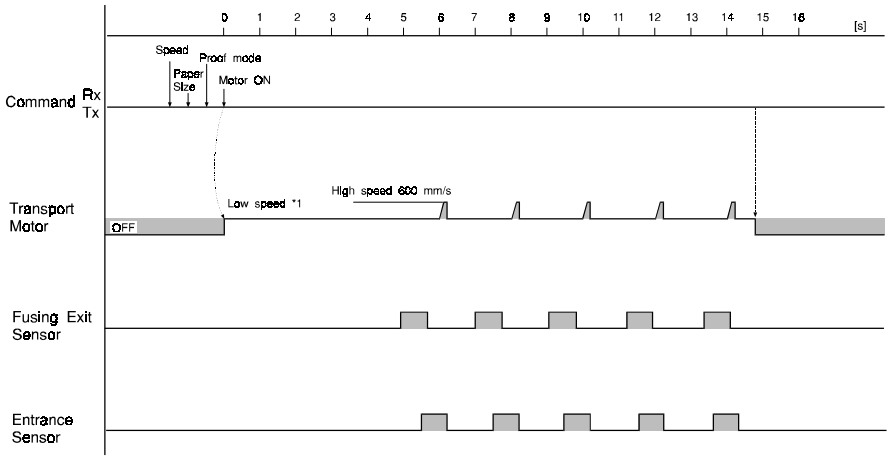
   If there is paper in a bin before the main switch is turned on.
   If the selected paper size does not match the stapling specifications.
   If the paper is fed from the by-pass feed table.
   If the stack or interrupt modes are selected.

2. Under the following conditions, staple mode is canceled if it had been selected.

   If paper is inserted into a bin by hand while the staple mode is selected.
   If only one sheet is delivered to the bin.
   If the number of sheets to be stapled exceeds the stapler capacity.

3.9 PAPER FEED AND MISFEED DETECTION TIMING

– Proof Mode – A4 sideways, 5 copies, 150 mm/s



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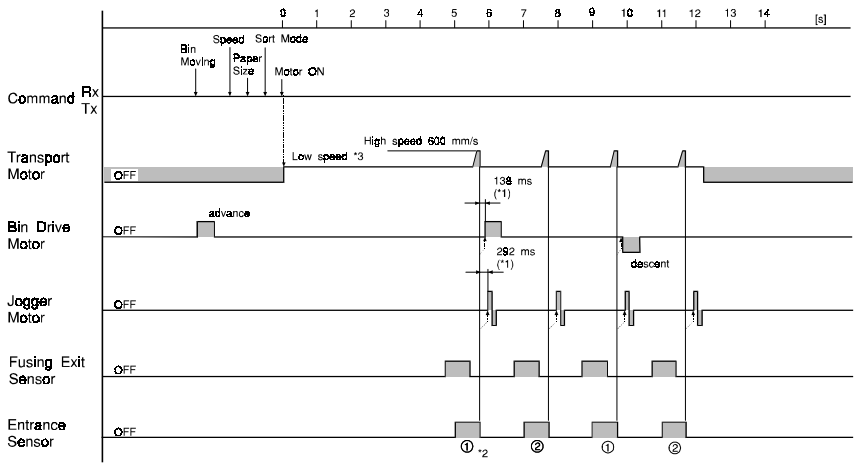
*1: The value of the low speed depends on the copier.

– Sorter Mode – A4 sideways, two copies a of two-page original, 150 mm/s



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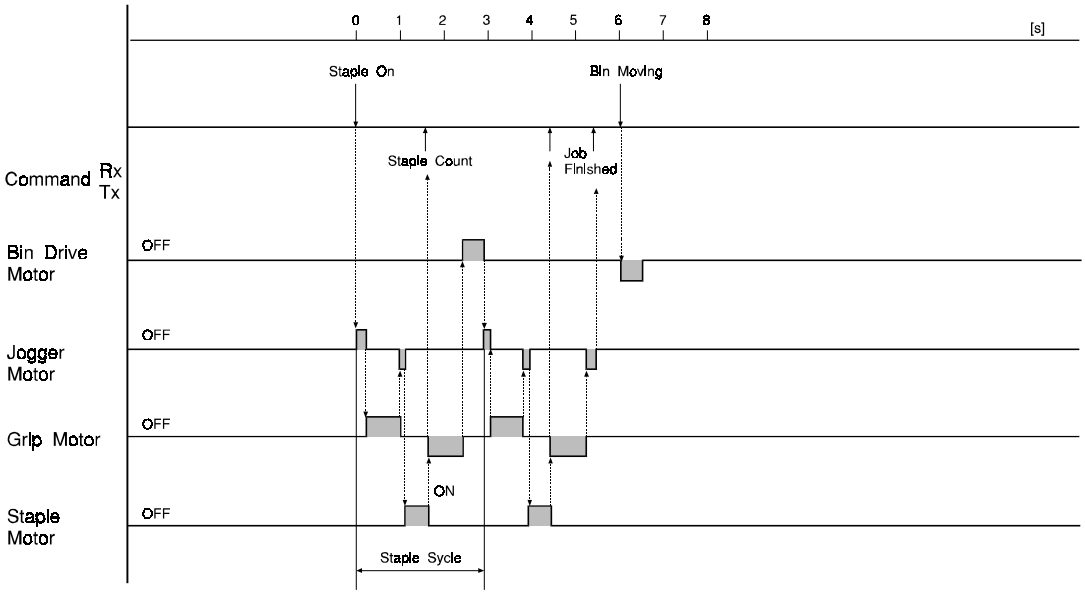
*1: The start timing of the bin drive and the jogger motors depend on the paper size as shown in the following table.

*2: Bin No.

Paper Size	Bin drive motor timing	Jogger motor timing	Paper Size	Bin drive motor timing	Jogger motor timing
A3/11"x17"	138 ms	292 ms	A4 lengthwise/ 8 1/2"x11"	312 ms	118 ms
B4	218 ms	212 ms	B5 sideways	218 ms	212 ms
A4 sideways/ 11"x8 1/2"	138 ms	292 ms	B5 lengthwise	368 ms	62 ms

– Staple Mode –

A4 sideways, two copies of a two-page original, after sorting, 150 mm/s



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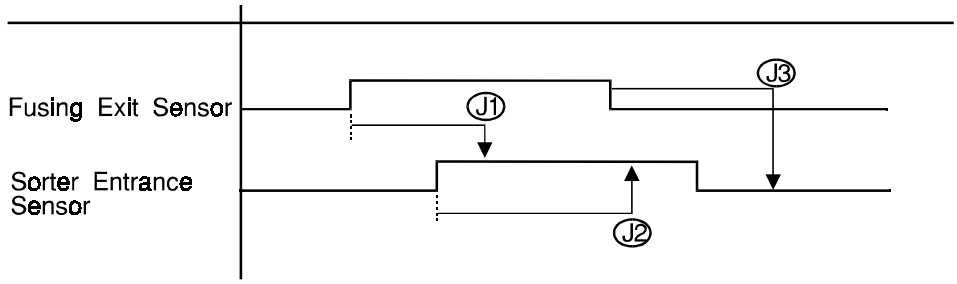
3.10 JAM DETECTION

– Paper Jam –



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J1: The sorter entrance sensor does not turn on within 2 s after the fusing exit sensor has turned on.

J2: The fusing exit sensor does not turn off within 11.4 s after the sorter entrance sensor has turned on.

J3: The sorter entrance sensor does not turn off within 1 s after the fusing exit sensor has turned off.

– Staple Jam –

In the following conditions, a staple jam will occur and the sorter jam indicator on the operation panel will light.

1. If the stapler paper sensor is on when the main switch turns on or just as the stapler cover is closed.
2. If the stapler paper sensor stays on after the stapling job has been finished.

6. 10-BIN SORTER (A555) INSTALLATION

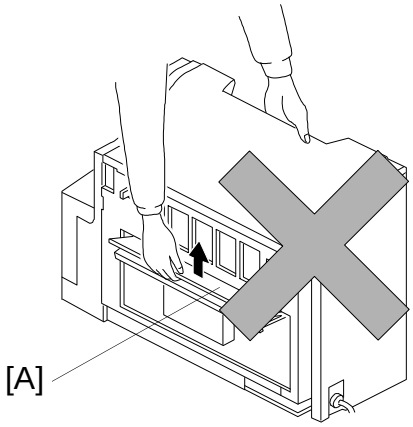
6.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box with the following list:

1. Misfeed Removal Decal..... 1
2. Staple Position Decal 1
3. Chain 1
4. Cap Remover 1
5. Philips Pan Head Screw 4 x 8 1
6. Philips Pan Head Screw 4 x 14 4
7. New Equipment Condition Report 1
8. Installation Procedure..... 1

6.2 INSTALLATION PROCEDURE

Incorrect Lifting Method



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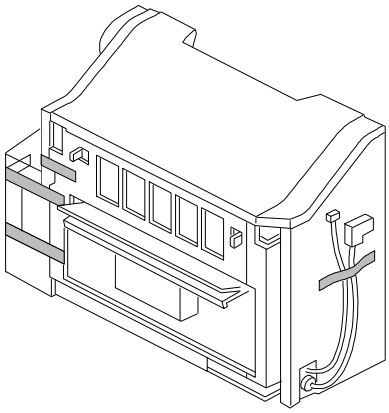

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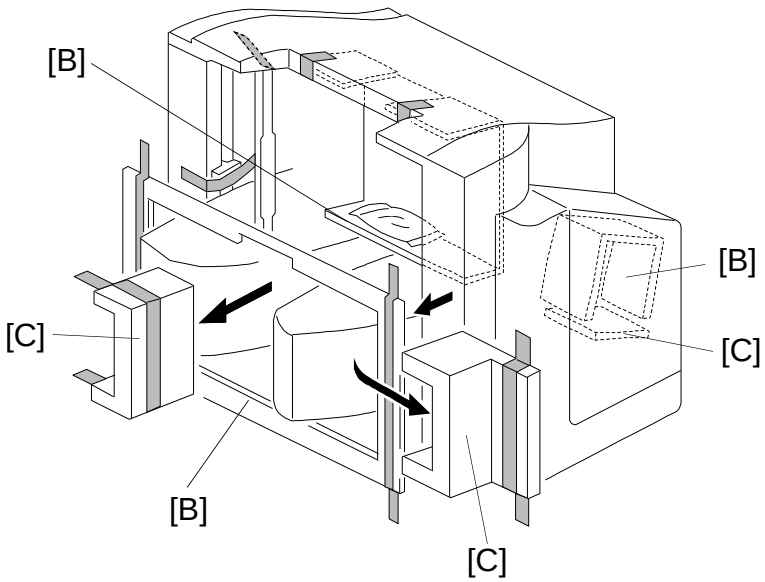

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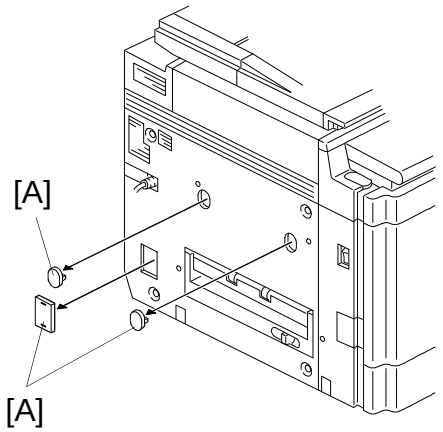
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.
Do not lift the sorter stapler by holding the entrance guide [A].
Otherwise, the resulting damage may cause paper jams to occur.

1. Remove the strips of tape.
2. Remove the cardboard pieces [B] and the foam blocks [C].



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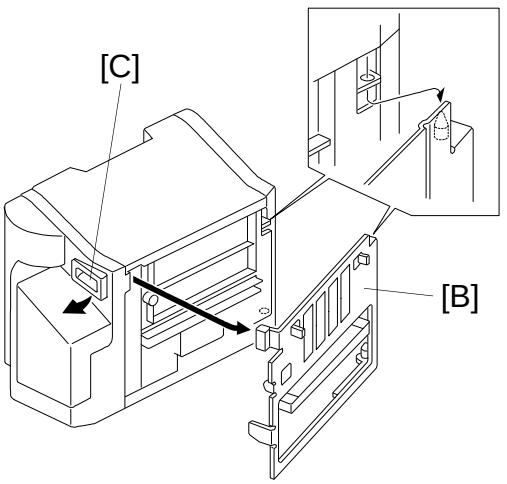

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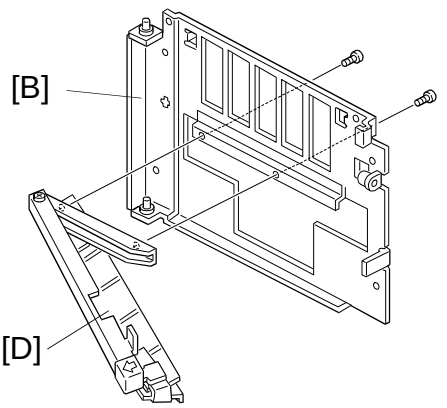

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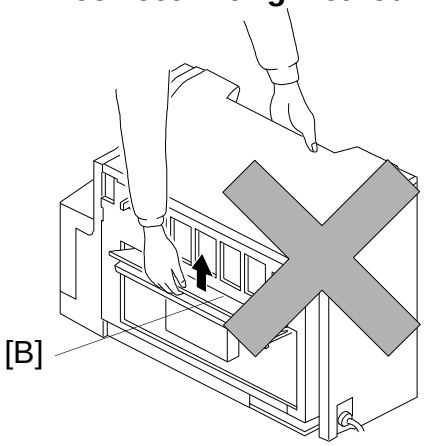
3. Remove the caps [A] with wire clippers.
4. Remove the mounting frame [B] from the sorter stapler by releasing the open lever [C].
5. Remove the exit paper guide [D] from the mounting frame [B].

Incorrect Lifting Method



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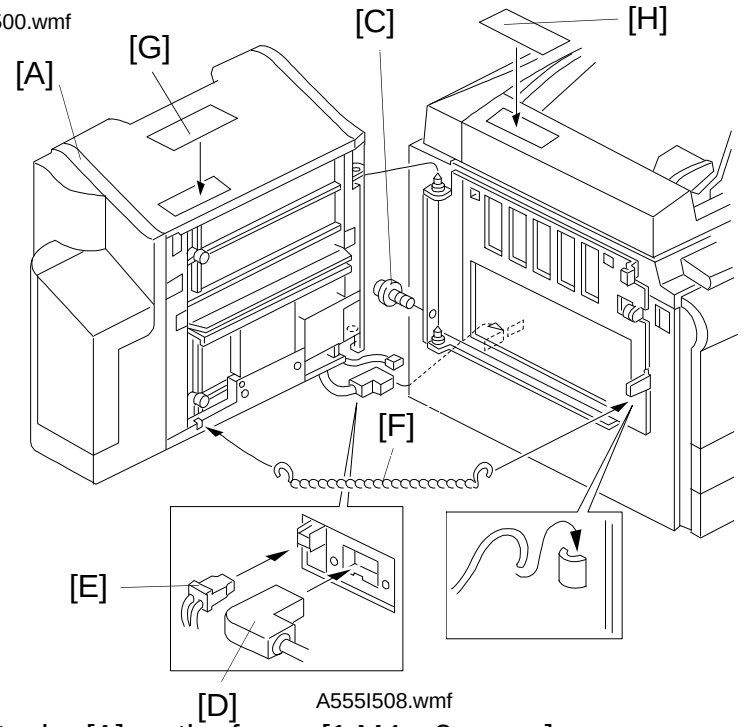

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6. Install the sorter stapler [A] on the frame [1 M4 x 8 screw].

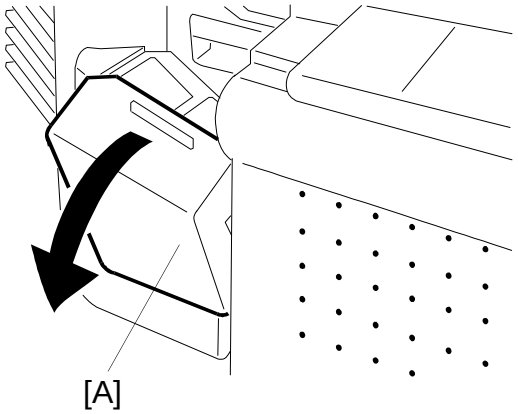
   NOTE: Do not lift the sorter stapler by holding the entrance guide [B] when installing it.

7. Tighten the M4 x 8 screw [C].

⚠ CAUTION

If you do not insert and tighten this screw, the sorter stapler may fall down.

8. Connect the cable [D] and the optic cable [E].
9. Install the chain [F] as shown.
10. Attach the misfeed removal decal [G] and the staple position decal [H] as shown above.



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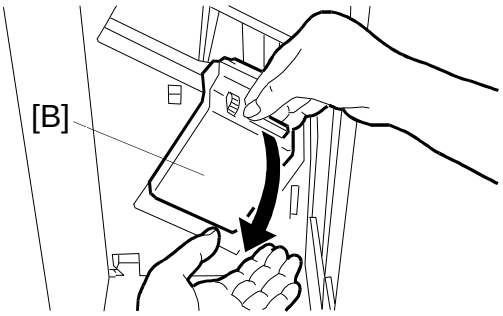

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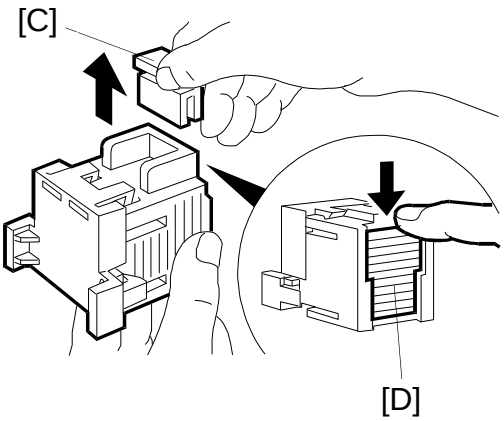

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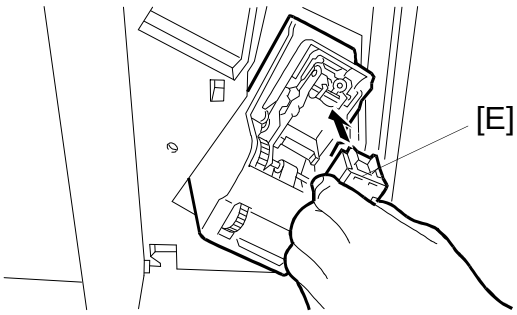

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11. Open the front door [A] of the sorter stapler and swing the staple unit [B] up.
12. Remove the green plastic clip [C] from the staple cartridge and correct the position of the staple sheet [D]. Make it flush with the other sheets in the cartridge.
13. Install the cartridge [E] in the stapler while holding the staple unit.
14. Put the staple unit back in the original position, close the sorter stapler front door, and plug in the copier.
15. Turn on the main switch, and test the operation of the sorter stapler.

    NOTE: The stapler will not staple for the first few copies. The first staple will be set at the proper position after about 5 copies.

4. INSTALLATION

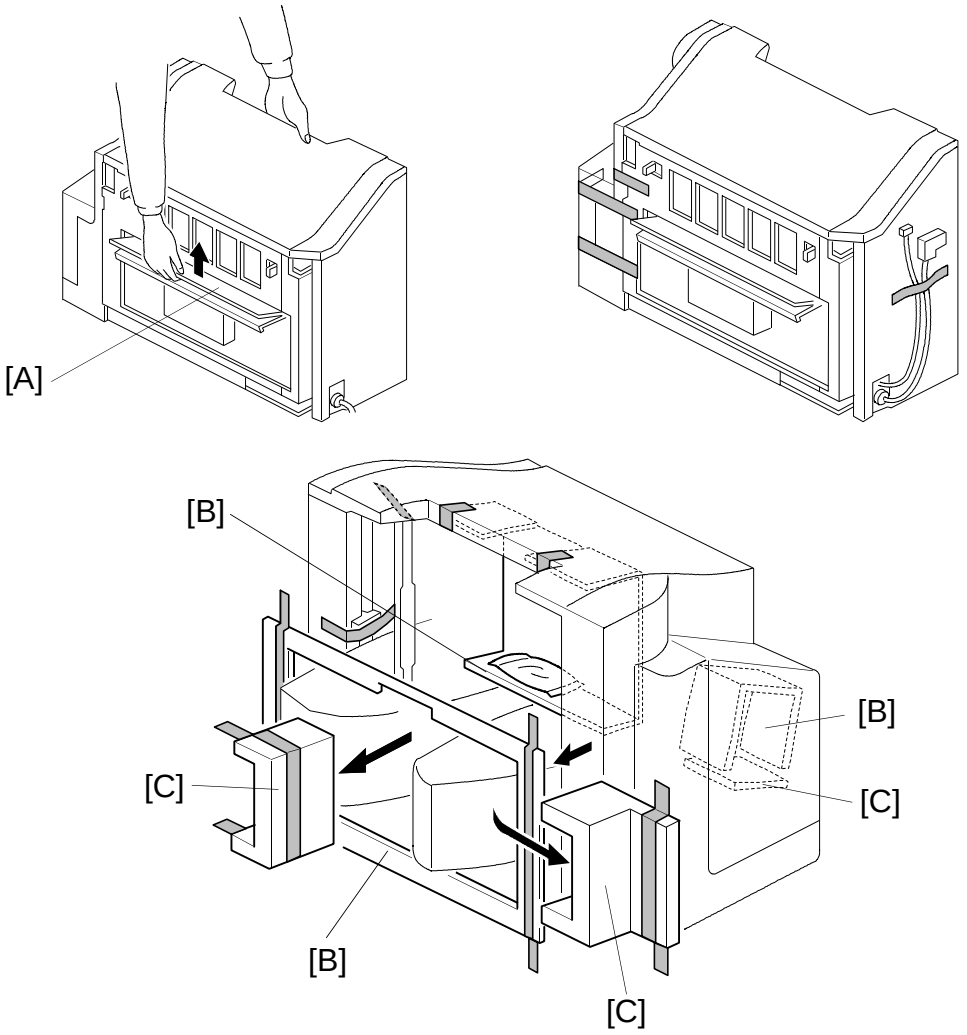
4.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

1. Misfeed Removal Decal..... 1
2. Staple Position Decal 1
3. Chain 1
4. Cap Remover 1
5. Philips Pan Head Screw 4 x 8 1
6. Philips Pan Head Screw 4 x 14 4
7. New Equipment Condition Report 1
8. Installation Procedure..... 1

4.2 INSTALLATION PROCEDURE

– Incorrect Lifting Method –

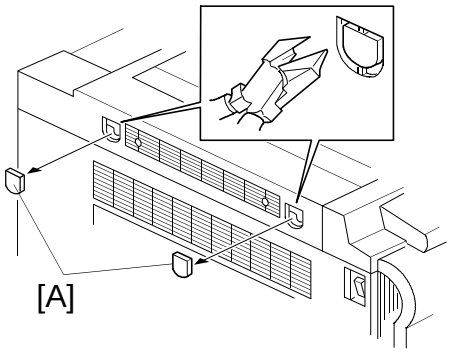


NOTE: When this unit is installed in the A157, A159, A160, A161, and A162 copiers, the sorter adapter (A568) should be installed before the sorter stapler.

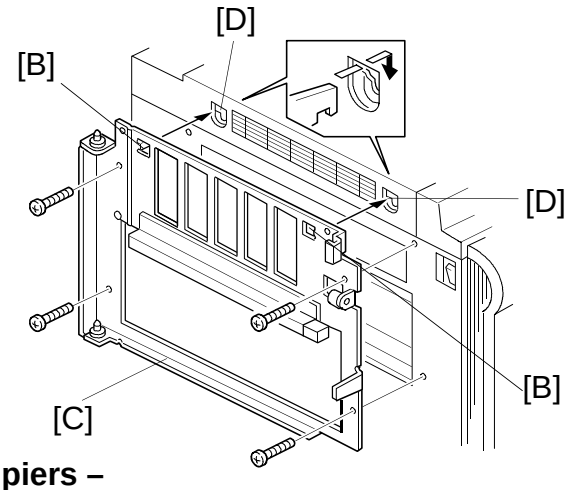
! CAUTION

Unplug the copier power cord before starting the following procedure. Do not lift the sorter stapler by holding the entrance guide [A]. Otherwise, the resulting damage may cause paper jams to occur at the entrance.

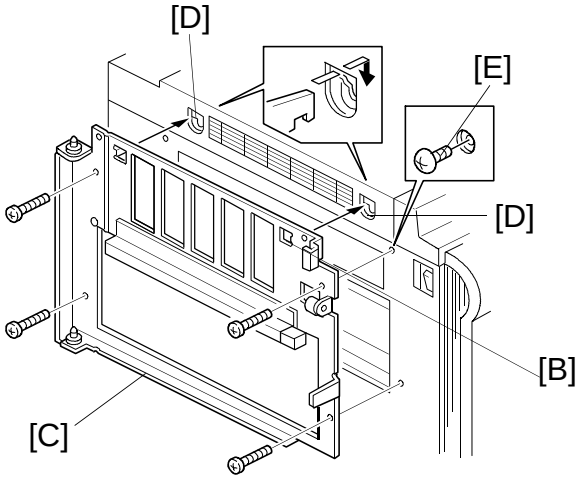
1. Remove the strips of tape.
2. Remove the cardboard pieces [B] and the foam blocks [C].



– A153/A155/A156 copiers –

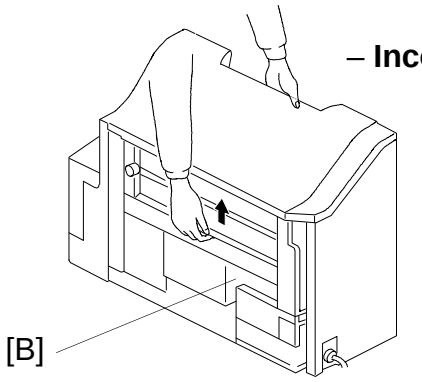


– A157/A159/A160/A161/A162 copiers –

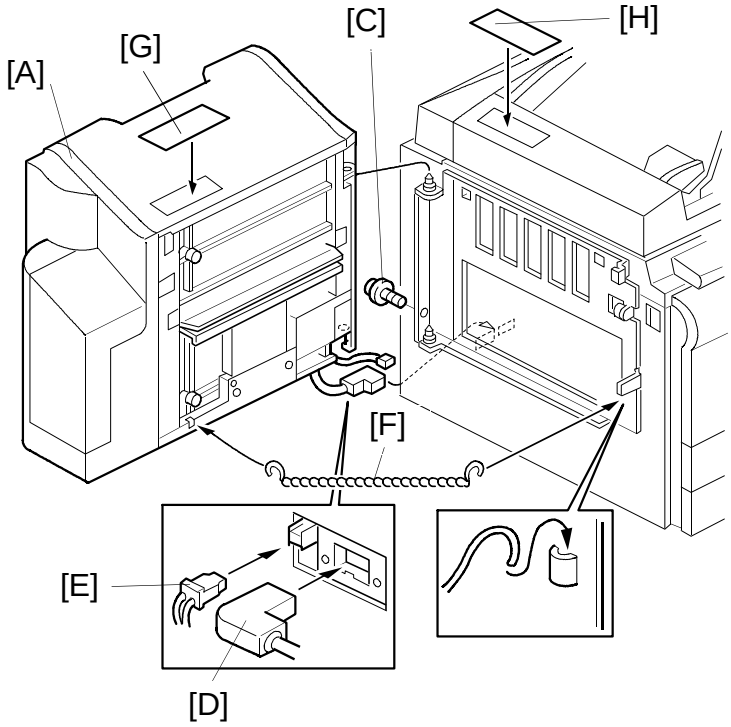


3. Remove the caps [A] with nippers.

4. **For A153, A155, and A156 copiers:**
   Fit the hooks [B] on the sorter stapler mounting frame [C] into the openings [D]. Then tighten four M4 x 14 screws.
   For A157, A159, A160, A161, and A162 copiers:
   First, remove the screw [E], and fit the hooks [B] on the sorter stapler mounting frame [C] into the openings [D]. Then tighten four M4 x 14 screws.



– Incorrect Lifting Method –



5. Install the sorter stapler [A] on the frame [1 M4 x 8 screw].

   NOTE: Do not lift the sorter stapler by holding the entrance guide [B] when installing it.

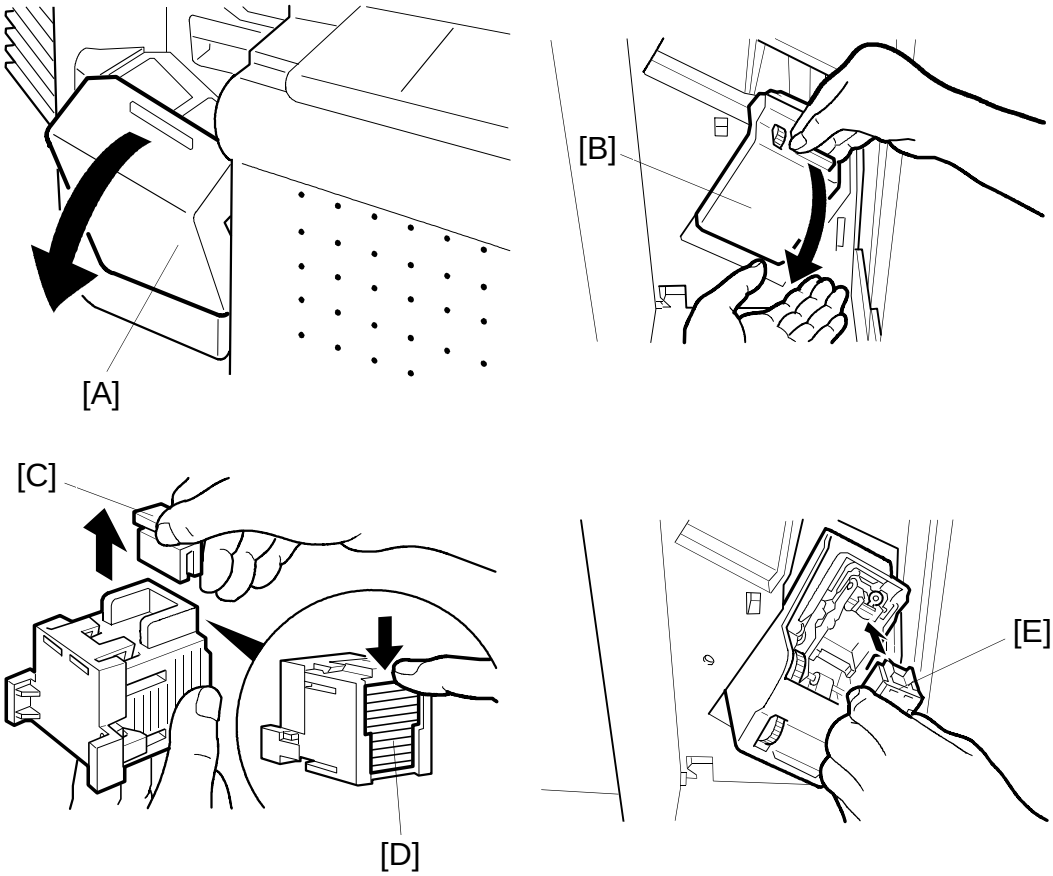
6. Tighten 1 M4 x 8 screw [C].

   NOTE: This screw prevents the sorter stapler from falling down.

7. Connect the cable [D] and the optic cable [E].

8. Install the chain [F] as shown.

9. Attach the misfeed removal decal [G] and the staple position decal [H] as shown above.



10. Open the front door [A] of the sorter stapler and swing the staple unit [B] up.

11. Remove the green plastic clip [C] from the staple cartridge and correct the position of the staple sheet [D] to make it flush with the other sheets in the cartridge.

12. Install the cartridge [E] in the stapler while holding the staple unit.

13. Put the staple unit back to the original position, close the sorter stapler front door, and plug in the copier.

14. Turn on the main switch, and test the operation of the sorter stapler.

    NOTE: The stapler will not be stapling for the first 5 or so copies after installation until the first staple comes to the proper position from the cartridge.

4. SERVICE TABLES

4.1 DIP SWITCHES

DIP SW100

Switch No.					Function
1	2	3	4	5	
Off	Off	Off	Off	Off	Normal Setting
On	On	Off	Off	Off	Sorter Free Run
On	Off	On	Off	Off	Staple Free Run
On	On	On	Off	Off	System Free Run
Off	Off	Off	Off	On	Bin Jam Sensor Adjustment (see section 6.6)

Using a Free Run Mode

1. Select the type of free run that you need using switches 2 and 3.
2. Set switch 1 to 1. The free run starts.
3. To stop the free run, set switch 1 to 0.
4. Return switches 2 and 3 to their factory settings.

Free Run Mode Types

- Sorter Free Run Mode -
This mode advances and lowers the bins, moves the jogger plate, and changes the roller rotation speed from low to high for each bin.

- Staple Free Run Mode -
This mode performs the jogger plate, grip assembly, and staple movements for each bin.

- System Free Run Mode -
This mode performs both sorter free run and staple free run modes.

4.2 TEST POINTS

Number	Function
TP100	+24 V
TP101	+5 V
TP102	GND

4.3 LED

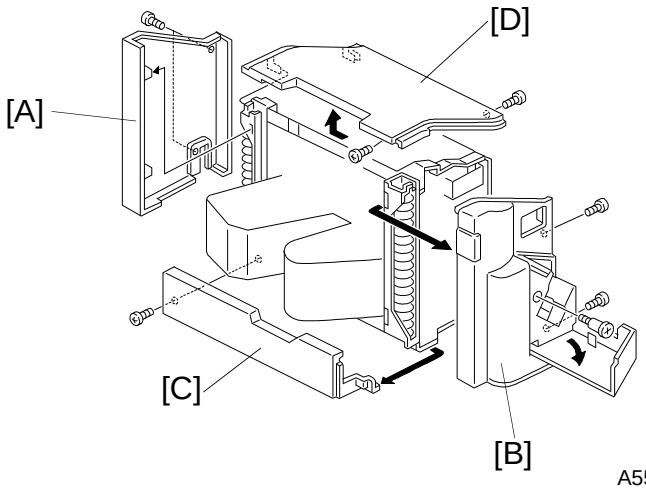
Number	Function
LED100	Bin jam sensor status

4.4 VARIABLE RESISTOR

Number	Function
VR100	Bin jam sensor (LED) adjustment (see Bin Jam Sensor Adjustment)

5. REPLACEMENT AND ADJUSTMENT

5.1 EXTERIOR COVER REMOVAL



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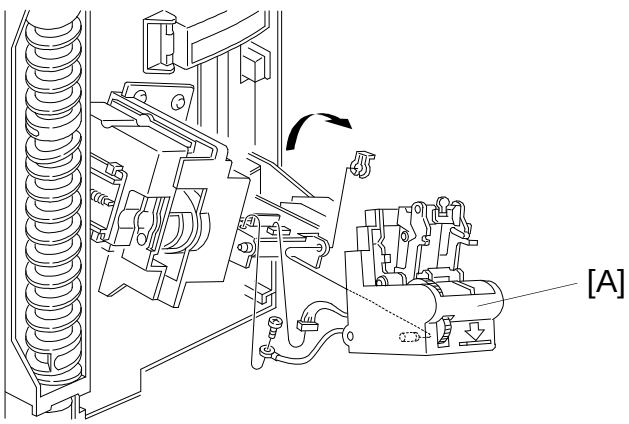
1. Rear Cover [A] (2 screws)
2. Front Cover [B] (3 screws)
3. Lower Cover [C] (1 screw)
4. Top Cover [D] (2 screws)

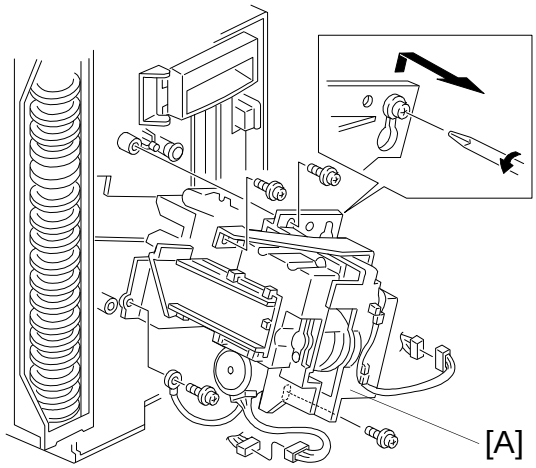
5.2 STAPLE UNIT REMOVAL



A555R501.wmf

1. Remove the front cover (see Exterior Cover Removal).
2. Swing up the staple unit [A].
3. Remove the staple unit (1 connector, 1 ground wire, 1 clip).

5.3 GRIP ARM REPLACEMENT



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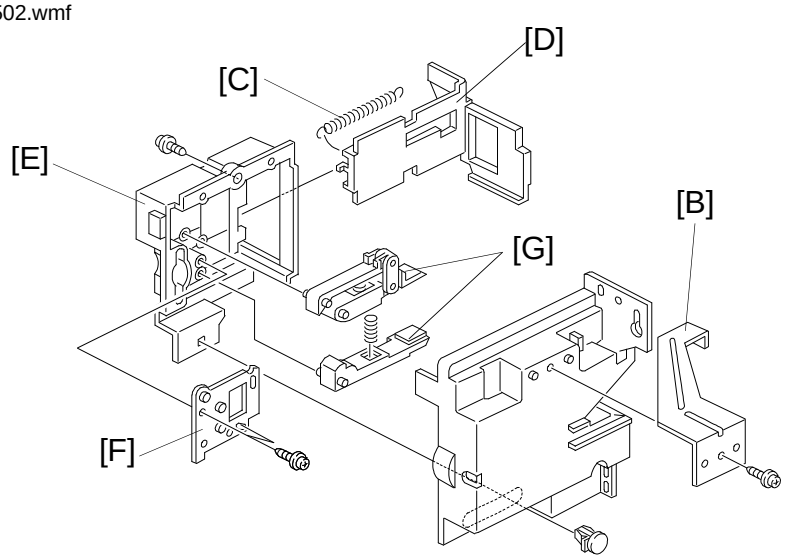

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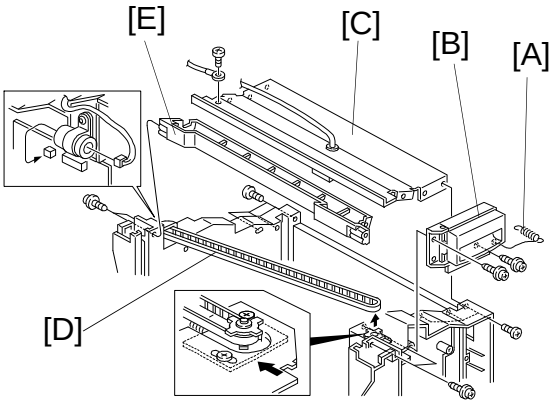
1. Remove the front cover (see Exterior Cover Removal).
2. Remove the grip assembly [A] (4 screws, 2 connectors, 1 grounding wire).
3. Remove the holder bracket [B] (1 screw).
4. Remove the spring [C] and remove the slider [D].
5. Remove the grip arm unit [E] (1 screw, 1 clip).
6. Remove the grip arm plate [F] (2 screws).
7. Replace the grip arms [G].

5.4 BIN REPLACEMENT



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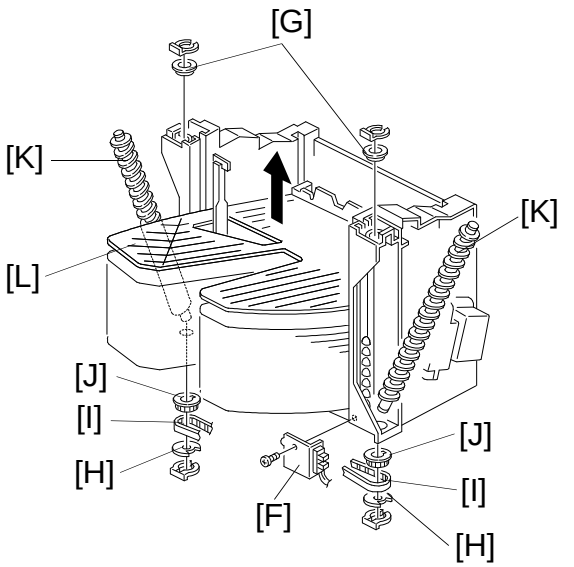

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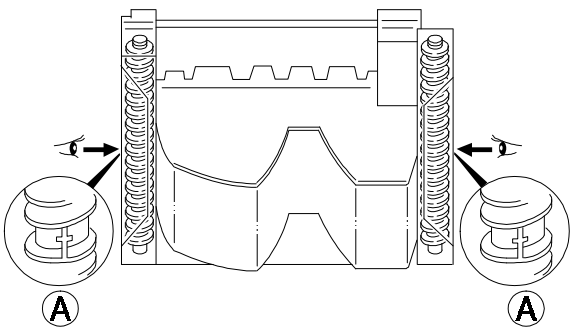
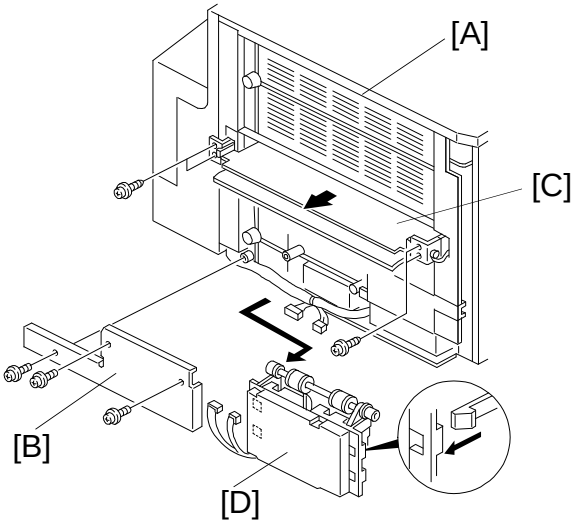


A555R506.wmf

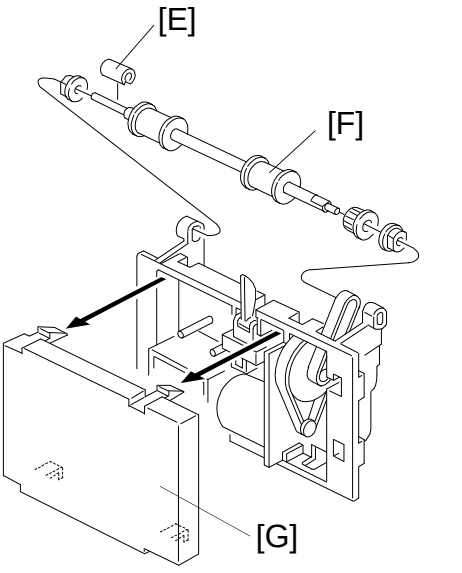
1. Remove the front, rear, and top covers (see Exterior Cover Removal).
2. Remove the spring [A] and the grip cover [B] (2 screws).
3. Remove the upper stay bracket [C] (6 screws, 1 grounding wire, 1 connector).
4. Remove the timing belt [D].
5. Remove the jogger guide plate [E] (4 screws).
6. Remove the wheel sensor bracket [F] (1 screw).
7. Remove the bushings [G] (1 clip each).
8. Remove the actuators [H], belts [I], and the gears [J] (1 clip on each side).
9. Remove the helical wheels [K].
10. Remove the bins [L].

NOTE: When putting back the helical wheels at both the front and rear of the machine, the parts labeled Ⓐ should be pointing directly away from the machine.

5.5 TRANSPORT MOTOR REPLACEMENT



A555R507.wmf



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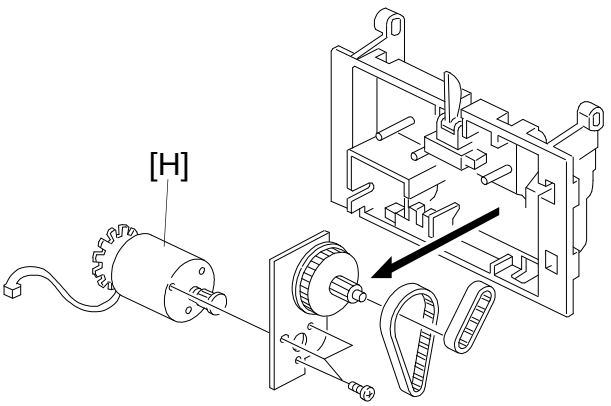

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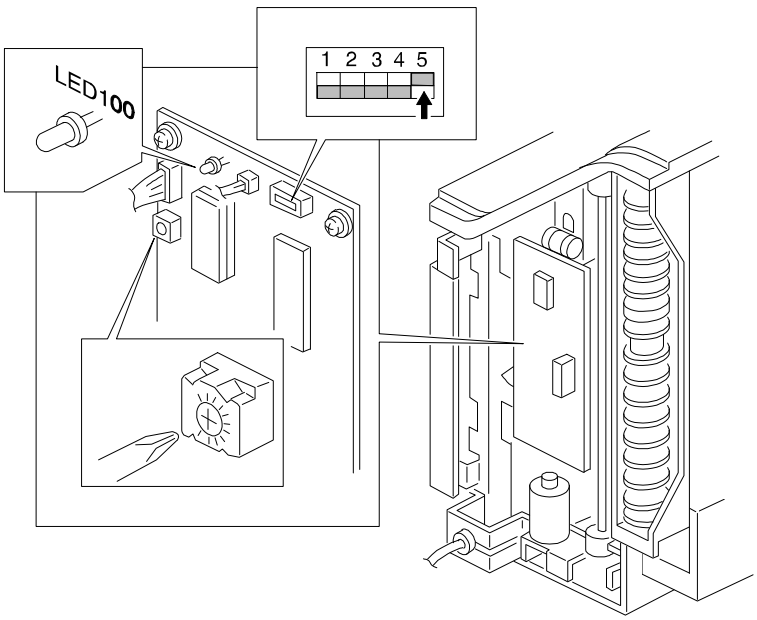
1. Remove the sorter stapler [A] (1 screw, 1 chain).
2. Remove the lower plate [B] (3 screws).
3. Remove the entrance guide [C] (4 screws).
4. Remove the transport motor unit [D].
5. Remove the collar [E].
6. Remove the transport roller [F] (2 bushings, 1 gear).
7. Remove the transport motor cover [G].
8. Remove the transport motor [H] (3 screws).

5.6 BIN JAM SENSOR ADJUSTMENT



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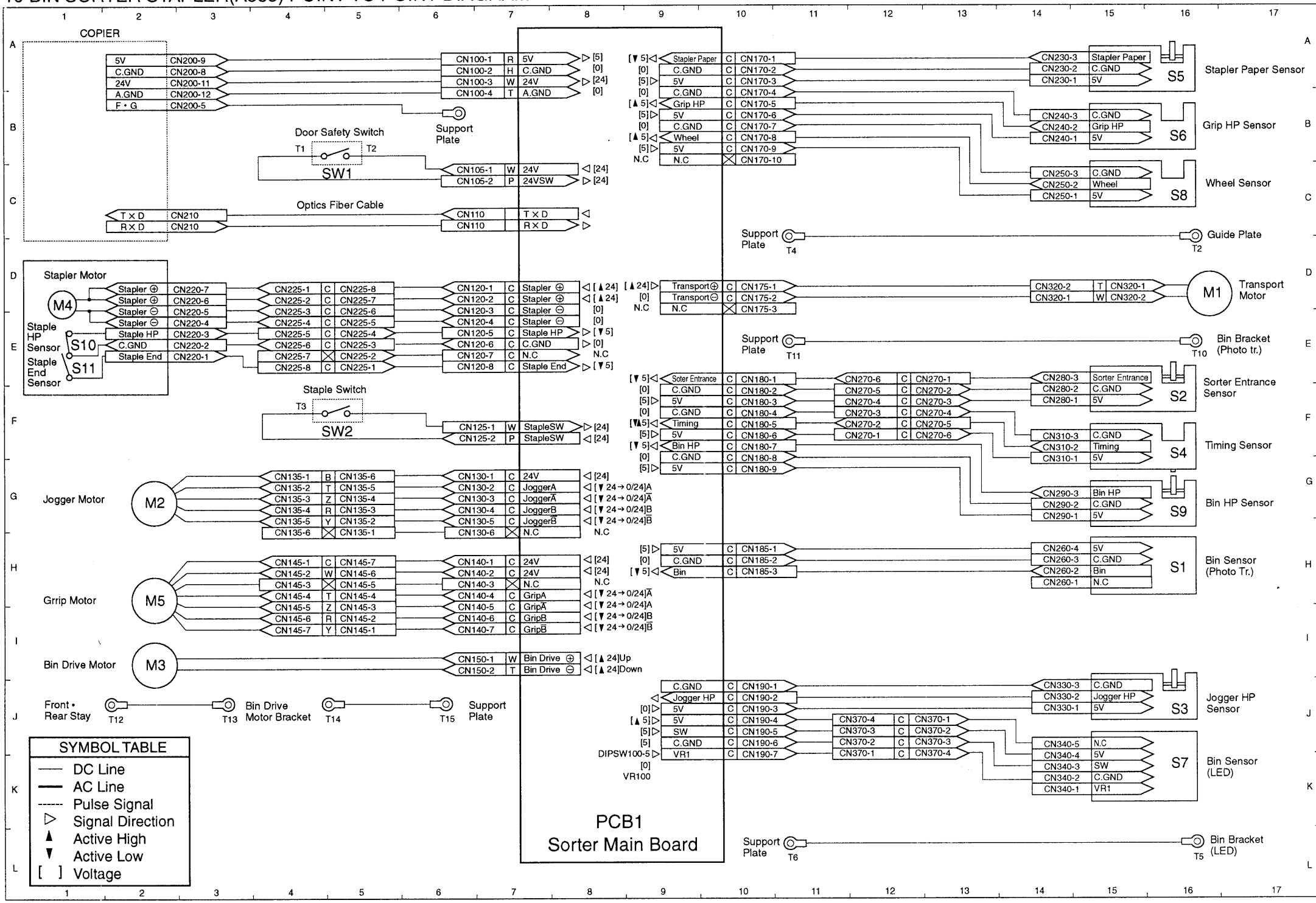
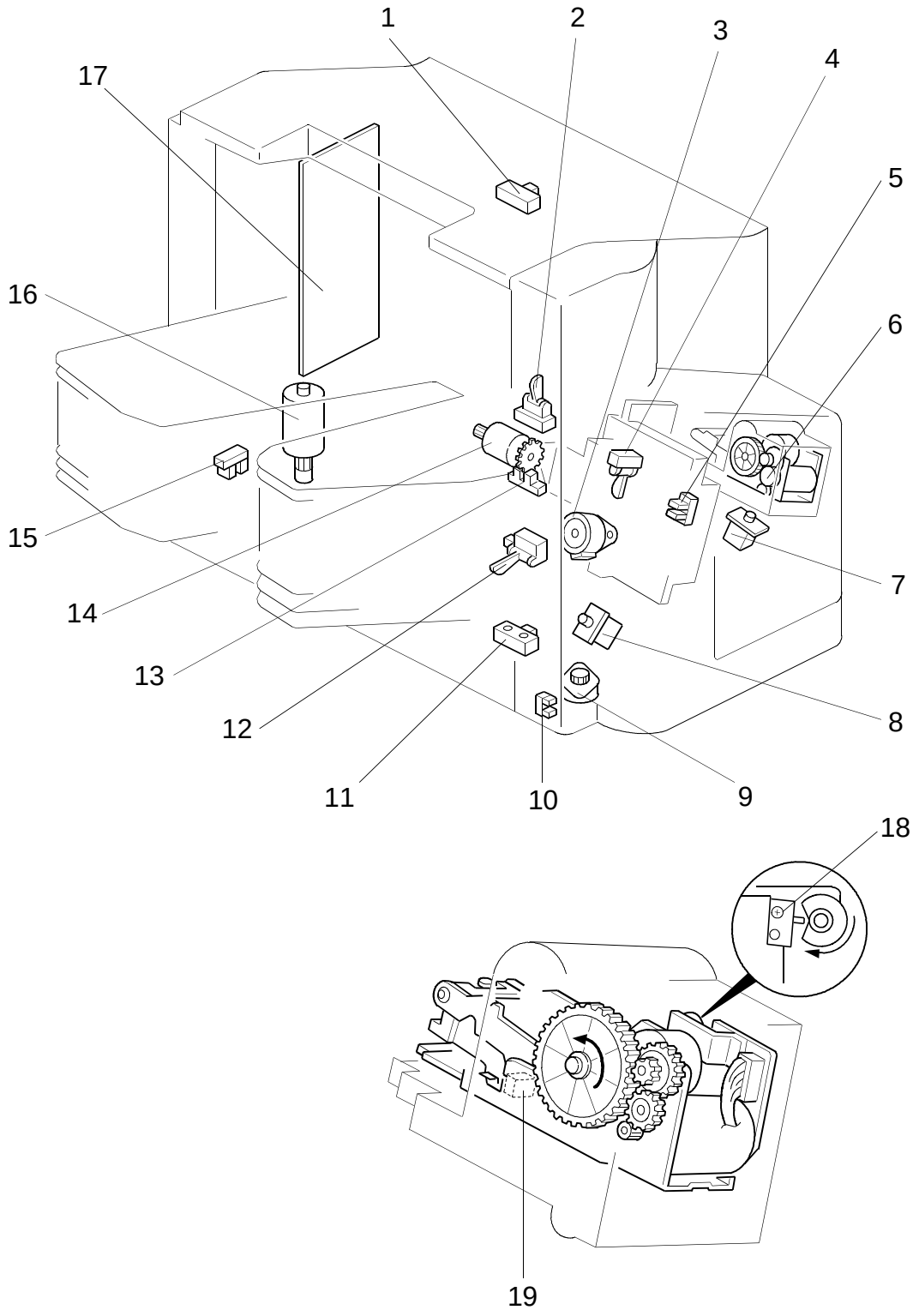
After replacing the sorter main board, perform the bin jam sensor adjustment as follows.

1. Turn on the main switch.
2. Remove any copies from the bins.
3. Set switch 5 of DIP SW 100 on the sorter main board to the ON position.
4. Turn VR 100 until LED 100 goes off.

10 BIN SORTER STAPLER(A555) POINT TO POINT DIAGRAM



10 BIN SORTER STAPLER (A555) ELECTRICAL COMPNENT LAYOUT



Description	Index No.	P to P Location
Bin Sensor (Photo tr.) (S1)	1	I15
Sorter Entrance Sensor (S2)	2	F15
Grip Motor (M5)	3	I2
Stapler Paper Sensor (S5)	4	A15
Grip H.P. Sensor (S6)	5	B15
Stapler Motor (M4)	6	E1
Stapler Switch (SW2)	7	F5
Door Safety Switch (SW1)	8	C5
Jogger Motor (M2)	9	H2
Wheel Sensor (S8)	10	C15
Bin Sensor (LED) (S7)	11	K15
Bin H.P. Sensor (S9)	12	H15
Timing Sensor (S4)	13	G15
Transport Motor (M1)	14	E16
Jogger H.P. Sensor (S3)	15	J15
Bin Drive Motor (M3)	16	K2
Main Board (PCB1)	17	F8
Staple H.P. Sensor (S10)	18	E1
Staple End Sensor (S11)	19	E1