SORTER STAPLER
(Machine Code: A377)

1. SPECIFICATIONS

Configuration: Console

Number of Bins: 20 + Proof Tray

Paper for Proof Tray:

Size: Maximum: A3, 11" x 17"
Minimum: A6 lengthwise, 5 1/2" x 8 1/2"

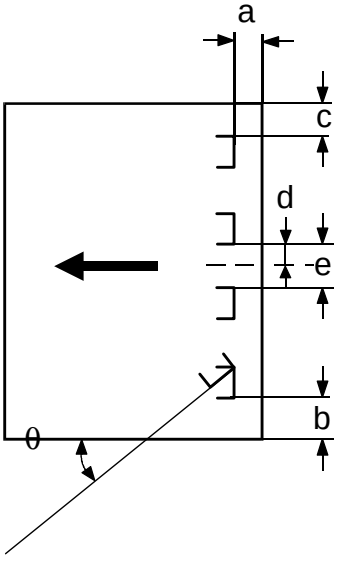
Weight: 52~157 g/m^2,14~42 lb

Capacity: 250 sheets (80 g/m^2, 20 lb)

Paper for Bins: See the table below.

	Sort	Stack	Staple
Maximum paper size	A3, 11" x 17"	A3, 11" x 17"	A3, 11" x 17"
Minimum paper size	A5, 5 1/2" x 8 1/2" lengthwise	Sideways: A4, 8 1/2" x 11" Lengthwise: A5, 5 1/2" x 8 1/2"	B5, 8 1/2" x 11"
Maximum paper weight	157 g/m^2, 42 lb	157 g/m^2, 42 lb	80 g/m^2, 20 lb
Minimum paper weight	52 g/m^2, 14 lb	52 g/m^2, 14 lb	64 g/m^2, 17 lb
Maximum capacity	all sizes: 50 sheets/bin 2 sided copies: 40 sheets/bin	all sizes: 40 sheets/bin 2 sided copies: 35 sheets/bin	all sizes: 50 sheets

Staple Position:

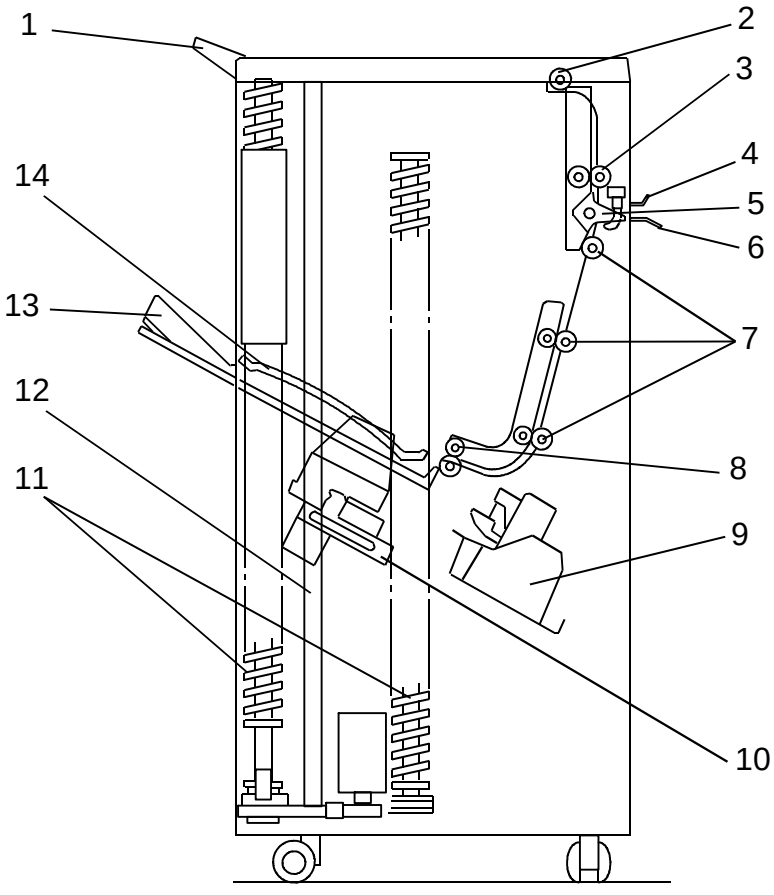


a = 6 ± 3 mm
b = 6 ± 3 mm
c = 6 ± 3 mm
d = 66 ± 3 mm
e = 132 ± 2 mm
θ = 45 ± 5°

Staple Replenishment:	Cartridge exchange (5,000 pieces/cartridge)
Power Source:	DC24V (from copier)
Power Consumption:	Average: less than 80W Maximum: in sort/stack mode: less than 100W in staple mode: less than 300W
Dimensions: (W x D x H)	566 x 583 x 978 mm
Weight:	Approximately 52 kg

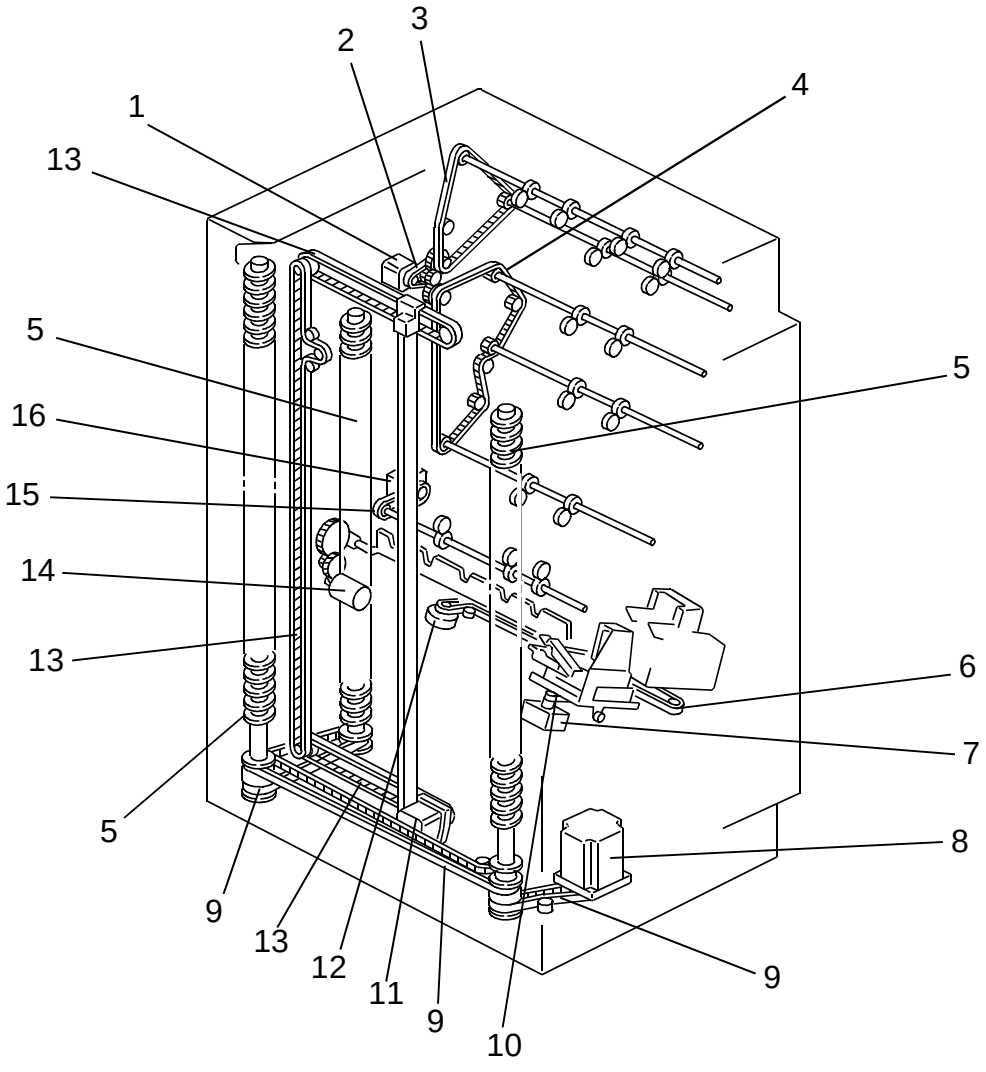
2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



1. Proof Tray
2. Proof Exit Rollers
3. Proof Transport Rollers
4. Upper Entrance Guide
5. Turn Gate
6. Lower Entrance Guide
7. Sorter Transport Rollers
8. Sorter Exit Rollers
9. Staple Unit
10. Grip Assembly
11. Helical Wheels
12. Jogger Plate
13. Bins
14. Upper Guide Plate

2.2 DRIVE LAYOUT



1. Main Motor
2. Main Drive Belt
3. Proof Drive Belt
4. Sorter Drive Belt
5. Helical Wheels
6. Staple Unit Drive Belt
7. Gripper Motor
8. Bin Drive Motor
9. Wheel Drive Belts
10. Grip Drive Belt
11. Jogger Motor
12. Staple Unit Drive Motor
13. Jogger Drive Belts
14. Bin Rear Plate Drive Motor
15. Sorter Exit Drive Belt
16. Sorter Exit Motor

3. ELECTRICAL COMPONENT DESCRIPTION

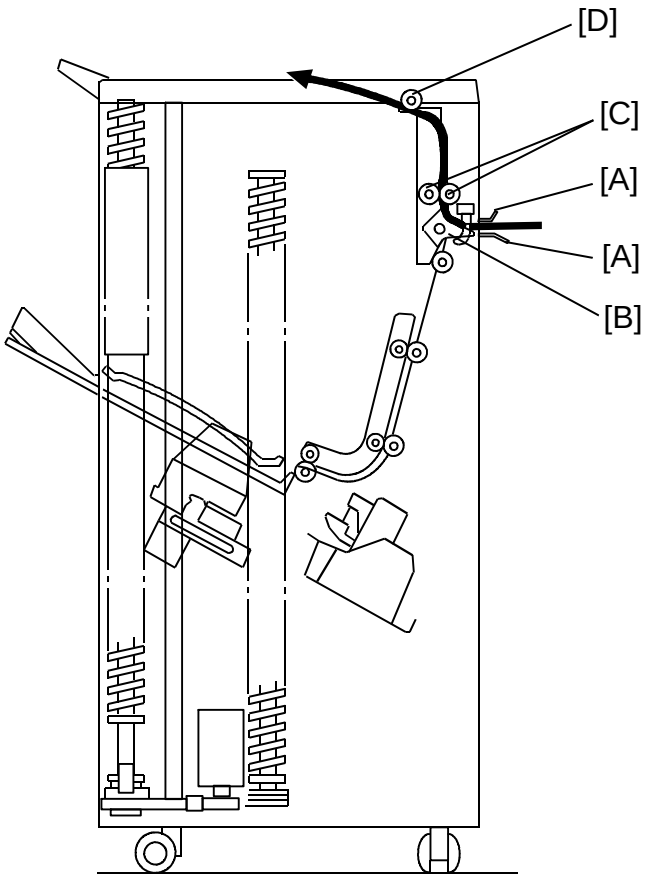
Please refer to the electrical component layout on the reverse side of the Point to Point (Water Proof Paper) for symbol and index number.

Symbol	Name	Function	Index No.
Motors			
M1	Main	Drives the paper transport rollers.	1
M2	Staple	Feeds the staples and drives the stapler hammer.	10
M3	Grip	Drives the grip assembly forward and backward into the bin to grip the copies and bring them to the stapling position.	16
M4	Bin Drive	Drives the bins upward and downward by rotating the three helical wheels.	18
M5	Jogger	Drives the jogger plate to jog the copies against the front side plate.	20
M6	Staple Unit Drive	Drives the staple unit according to the staple position and angle.	23
M7	Bin Rear Plate Drive	Drives the bin rear plate down and up.	24
M8	Sorter Exit	Delivers the paper into the bins.	27
Sensors			
S1	Bin Jam (LED)	Detects if there is paper jams at the distribution section and detects if there is paper in the bins (light emitting element).	3
S2	Proof Exit	Detects paper jams at the proof tray exit.	4
S3	Entrance	Detects paper jams at entrance guides.	5
S4	Staple HP	Detects if the staple hammer is in the home position.	8
S5	Staple End	Detects staple end.	9
S6	Paper	Detects whether copies are under the hammer.	11

Symbol	Name	Function	Index No.
S7	Staple Unit HP	Detects if the staple unit is in the home position.	13
S8	Grip HP	Detects if the grip assembly is in the home position.	15
S9	Bin Jam (Photo Tr.)	Detects paper jams at the distribution section and detects if there is paper in the bins (light receiving element).	17
S10	Wheel Sensor	Detects the bin position.	19
S11	Bin HP	Detects if the bins are in the home position.	21
S12	Jogger HP	Detects if the jogger plate is in the home position.	22
S13	Bin Rear Plate Open	Detects if the bin rear plate is in the open position.	25
S14	Bin Rear Plate HP.	Detects if the bin rear plate is in the home (closed) position.	26
Solenoids			
SOL1	Turn Gate	Opens and closes the turn gate to direct the copies into either the proof tray or the bins.	2
SOL2	Grip	Opens and closes the grip arms to grip copies on the bins.	12
SOL3	Grip Arm Positioning	Moves the grip ass'y to the rear and front to catch or release the paper to carry to the stapler.	14
PCBs			
PCB1	DC Supply	Provides DC power (Input: 24V DC, Output:24V/5V DC)	7
PCB2	Main Control	Controls all sorter stapler functions.	28
Switches			
SW1	Door Safety	Cuts the DC power when the front door is opened.	6

4. BASIC OPERATION

4.1 NORMAL (PROOF MODE) AND SORT/STACK MODE

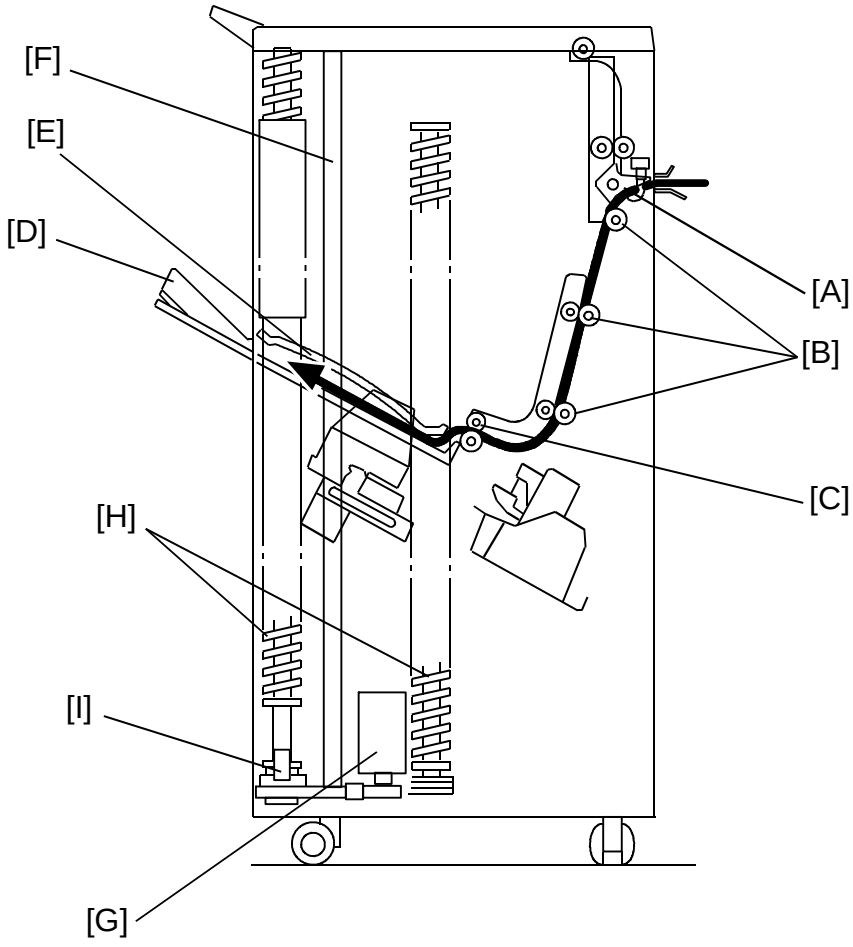


Copies exiting the copier pass through the entrance guide plates [A] to the turn gate section. The turn gate [B] will send copies either to the proof tray or to the bins, depending on the mode.

- Normal (proof) mode - (from the turn gate section to the proof tray)-

The turn gate solenoid energizes to turn the turn gate clockwise when the Start key is pressed. The main motor turns counterclockwise to rotates the vertical transport rollers [C] and proof exit roller [D]. The turn gate directs copies through the proof transport section to the proof tray.

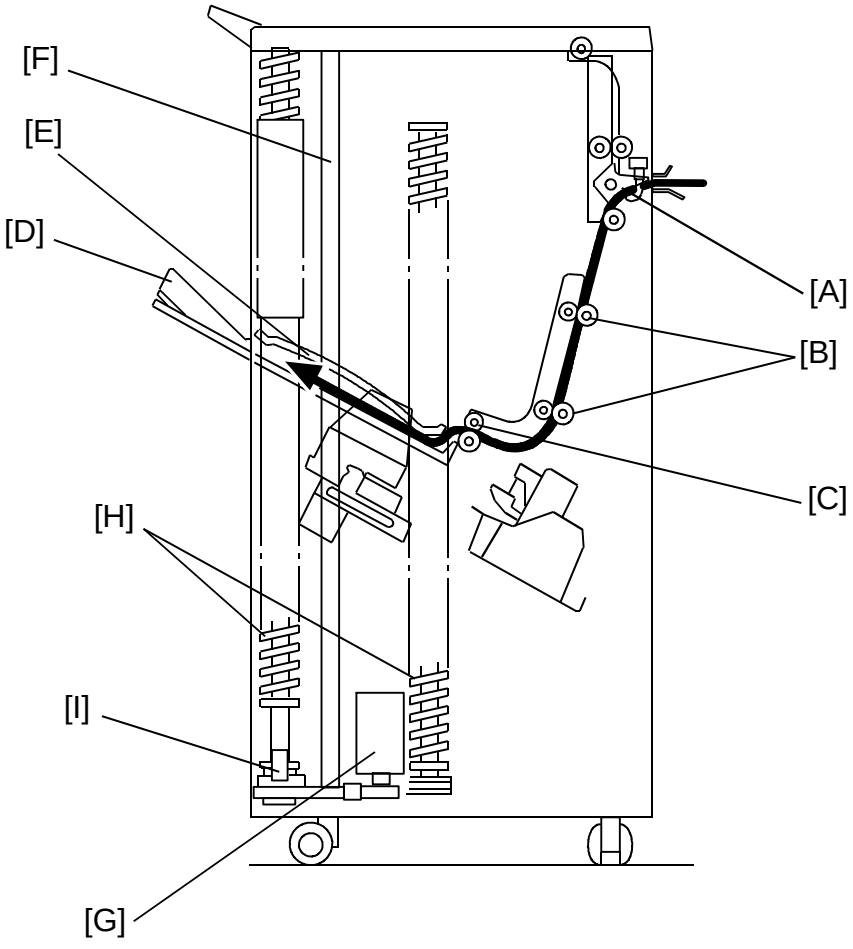
- Sort mode - (from the turn gate section to the bins)



In this mode, the turn gate solenoid stays off to keep the turn gate [A] at the upper position. The main motor turns clockwise to rotates the sorter transport rollers [B] and the exit motor rotates the exit rollers [C].

The turn gate directs copies to the sorter bins through the sorter transport section, then the first copy is delivered between the top bin [D] and the upper guide plate [E].
The jogger plate [F] then jogs to square the copies each time.
Before the next copy reaches the sorter exit roller, the bin drive motor [G] rotates and advances the bin one step (the helical wheels [H] rotate once).
When the cut out of the actuator reaches below the wheel sensor [I], the bin drive motor turns off.
Bins advances each time copies are delivered.

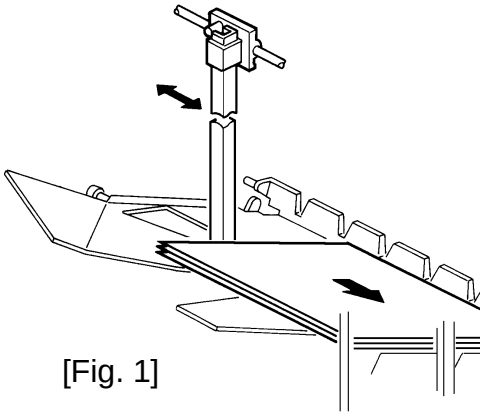
- Stack mode - (from the turn gate section to the bins)



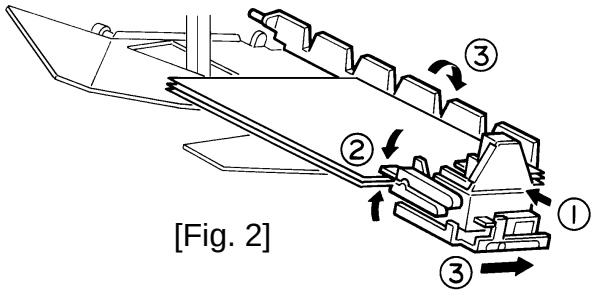
As with sort mode, the turn gate solenoid stays off and the turn gate [A] also stays up when the start key is pressed. The main motor turns clockwise to rotate the sorter transport rollers [B] and the exit motor rotates the exit rollers [C].

The turn gate directs copies to the sorter bins through the sorter transport section, then the copies are delivered between the top bin [D] and the upper guide plate [E].
The jogger plate [F] then jogs to square the copies each time.
All copies of the copy run are then fed to the first bin. When the final copy is delivered, the wheel drive motor [G] turns and advances the bin one step (the helical wheels [H] rotate once). When the cut out of the actuator reaches below the wheel sensor [I], the bin drive motor turns off.

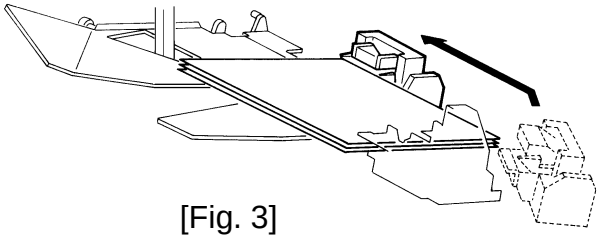
4.2 STAPLE MODE



[Fig. 1]

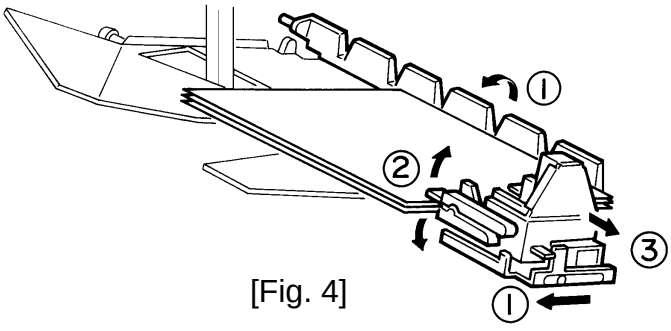


[Fig. 2]

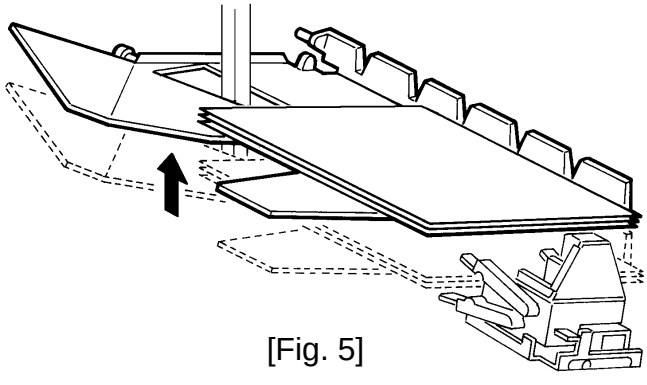


[Fig. 3]

When the final set of copies is jogged [Fig. 1], the staple unit staples the stacked copies as follows: The grip arms move inside the front side plate and catches the paper. The bin rear plate is turned so as to be flat with the sorter bin. The grip assembly brings the copies down underneath the stapler [Fig. 2]. The staple unit changes the position (the position varies depending on the copy size and staple mode) and the stapler staples the copies [Fig. 3].



[Fig. 4]



[Fig. 5]

The grip assembly brings the stapled copies back to the bin and the bin rear plate returns to the original position.

The grip assembly releases the copies and return to outside the front side plate so as not to disturb the bin movement [Fig. 4].

The bin advances one step [Fig. 5].

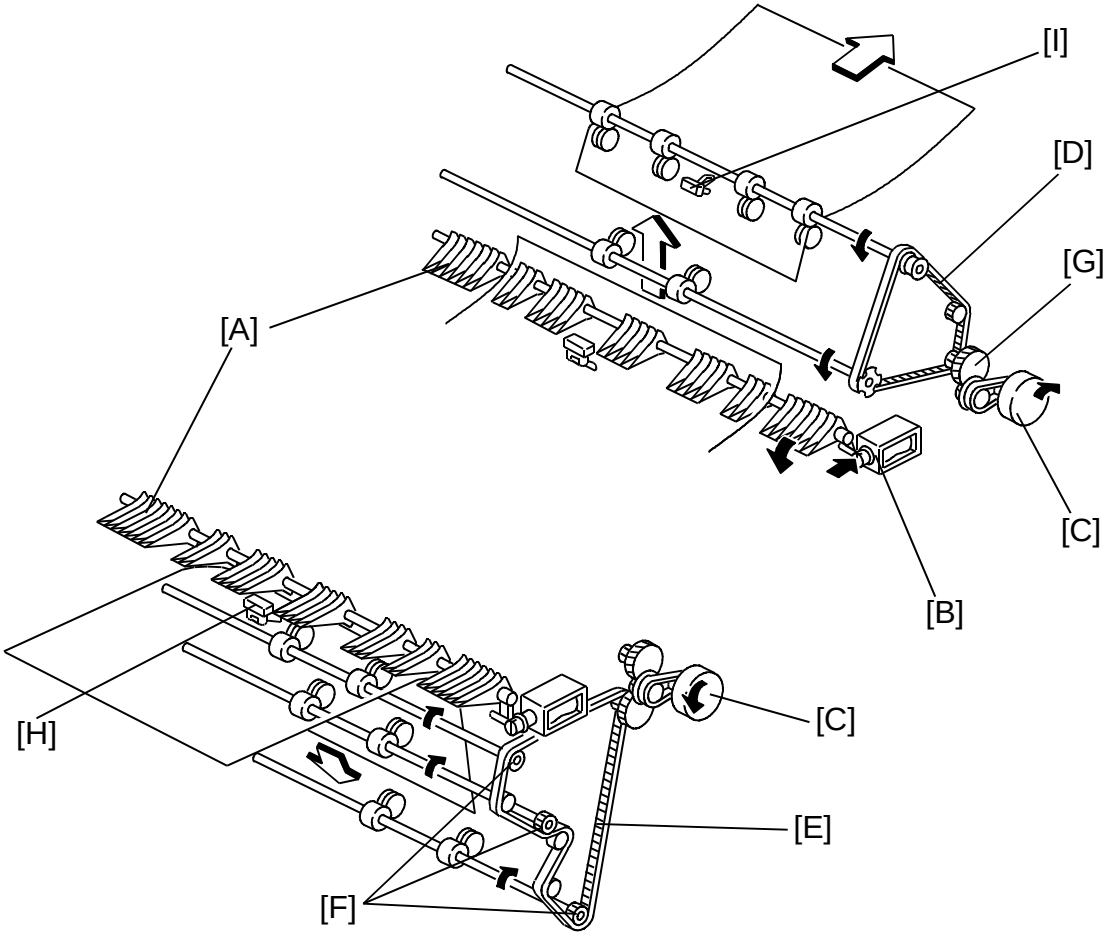
When the final set of copies is stapled, the staple unit is returned to the home position.

There are two staple modes.

1) Automatic stapling:
   In ADF mode, when the staple mode is selected before pressing the start key, copies will be delivered to each bin and stapled automatically.

2) Manual stapling:
   In sort mode, after copies are sorted in the bins, the copies will be stapled when the manual staple key is pressed then staple position is selected. In stack mode, manual stapling is impossible.

5. TURN GATE SECTION

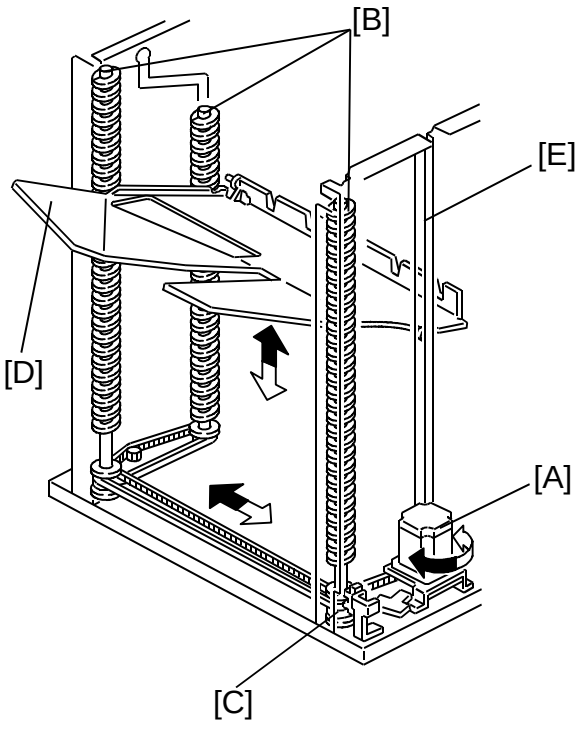


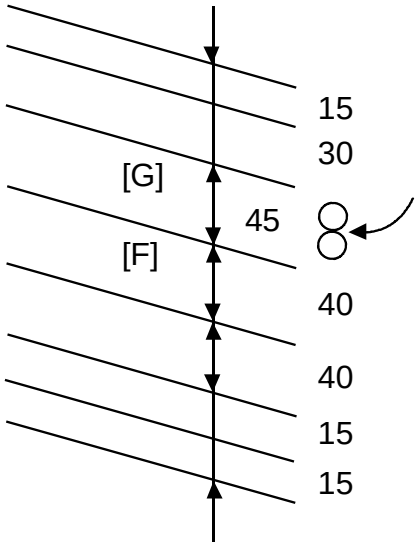
The turn gate [A] sends copies to the proof tray or the sorter bins depending on the mode. In the proof mode, the turn gate solenoid [B] turns on and the main motor [C] turns clockwise when the start key is pressed.
The turn gate [A], directs copies upward through the proof transport section to the proof tray. In this mode, the main motor drive is transmitted by both the proof drive belt [D] and sorter drive belt [E]. However the one way clutch in each sorter transport roller drive gear [F] does not transmit the drive to the sorter transport rollers.

In the sort, stack and staple modes, the turn gate solenoid stays off to direct copies downward to the sorter transport section. When the start key is pressed, the main motor [C] turns counterclockwise.
In this mode, the main motor drive is not transmitted to the proof drive belt [D] because of the one way clutch in the pulley [G].

The entrance [H] and the proof exit [I] sensors monitor the paper jam.

6. BIN DRIVE MECHANISM



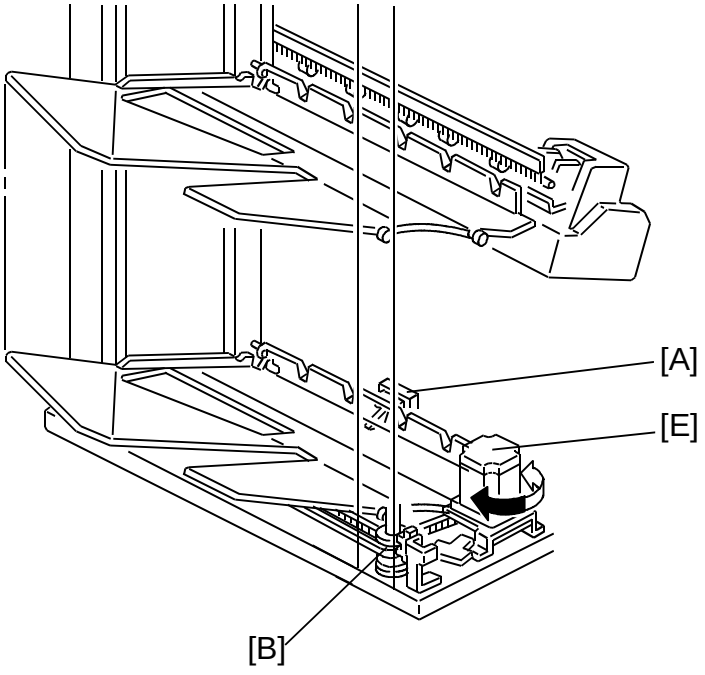


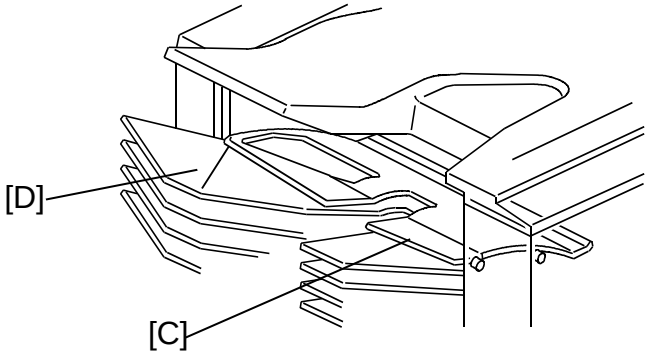
The bin drive mechanism moves the bins up and down to receive copies. The main components in this mechanism are the bin drive motor [A], the three helical wheels [B], the wheel sensor [C], and the bins [D] themselves. There are four pins on each bin. Three of them fit in the slot on the helical wheels. Another pin fits into the slot [E] of the front side frame.
The pins slide up and down in these slots.

Three timing belts transmit the drive from the bin drive motor to the three helical wheels. When it rotates clockwise, the bins lift (black arrow) and when it rotates counterclockwise, the bins lower (white arrow). There is a wheel sensor actuator on the front helical wheel, the actuator has a slot which detects when the helical wheel has rotated 360 degrees.

When the bins are advanced, the helical wheels rotate once (360 degrees) for each step.
As the pitch of the spiral on the helical wheel is greater when bins are at the staple and paper exit area than when bins are elsewhere, the amount of bin shift is greater when bins are at the staple and paper exit area. This leaves enough space to staple [F] and stack paper [G] and reduces the total machine height.

7. BIN HOME POSITION

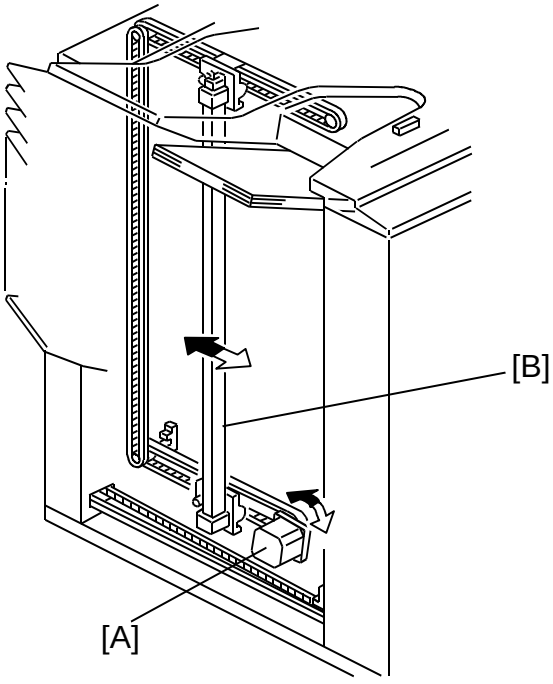


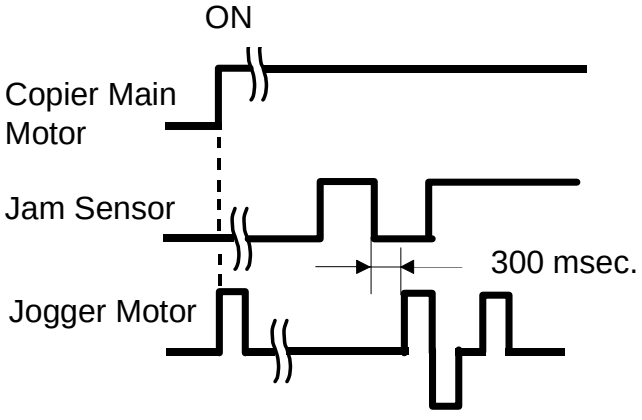


The bin home position sensor [A] and the wheel sensor [B] ensure that the sorter exit roller is between the upper guide plate [C] and the 1st bin [D] when all the bins are in the home position.

When the main switch is turned on, the bin lift motor [E] lowers the bins (turns counterclockwise) until the bottom bin actuates the bin home position sensor. Then, the bin lift motor raises the bins (turns clockwise) until the wheel sensor activates. Thus, the bins are in the home position.

8. JOGGER SECTION





When the Start key is pressed in the sort, staple and stack modes, the copier sends the paper size information to the sorter stapler. In accordance with this data, the jogger motor [A] drives the jogger plate [B] from the jogger home position to where the width is 10 mm wider than the selected paper.
300 ms after the trailing edge of the copy passes underneath the jam sensor, the jogger motor rotates forward and in reverse. This makes the jogger plate push all the copies against the front side plate to square the sheets. When the jogger plate pushes the paper, the plate shifts to a position 5 mm wider than the paper size when the bins lift. It shifts to a position 1 mm narrower than the paper size when the bins lowers.

The jogger plate returns to 10 mm away from the selected paper size for the next copy.
When the bin sensor detects that all copies are removed from the bins after jogging is finished, the jogger plate returns to its home position.

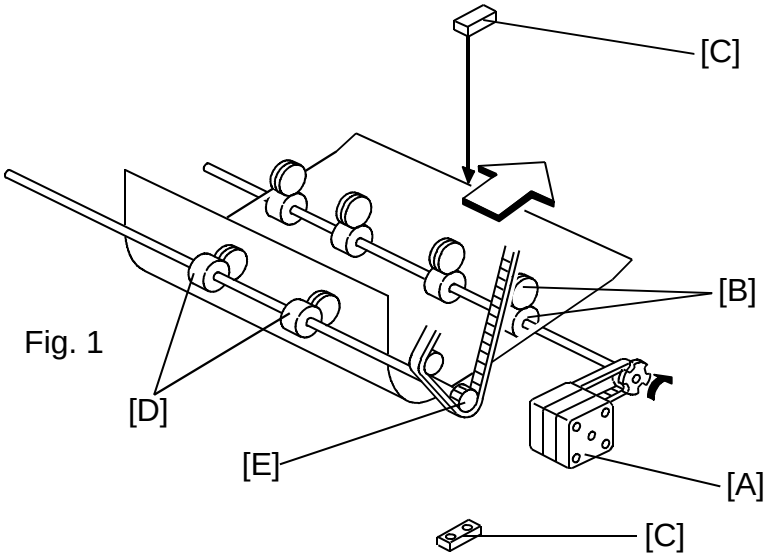


Fig. 1

Normally all rollers in the sorter stapler transport the paper at a speed of 360mm/sec.
To have enough paper jogging time, the sorter exit motor [A] rotation speed changes to transport the paper quickly and to stack the paper smoothly into the bins as follows:

360mm/sec: When the sorter exit roller [B] catches the leading edge of the paper

1,000mm/sec: After the jam sensors [C] detects the leading edge of the paper

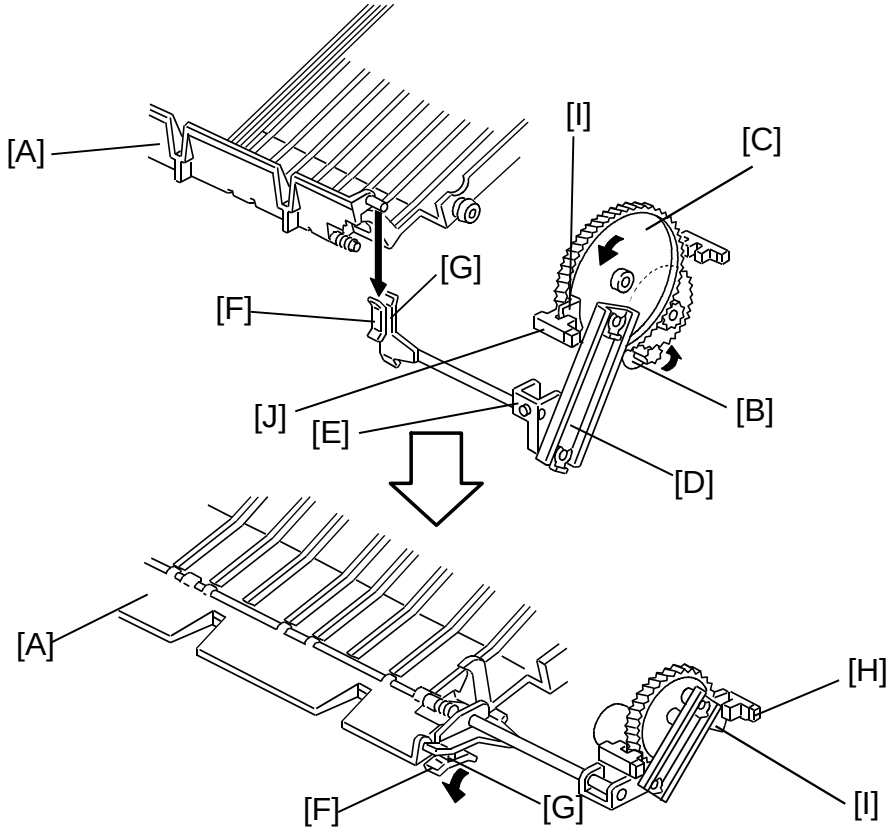
600mm/sec: When releasing the trailing edge of the paper

The transport roller [D] is driven at a speed of 360mm/sec constantly, however, when the sorter exit roller [B] rotates quickly, the transport rollers also rotate quickly with the pulled paper because of the one way clutch in the drive gear [E].

- Jogger Off Conditions -

1. Under the following conditions, the jogger plate does not jog after copies are delivered to the bins.
   - If paper is loaded in a bin by hand while the sort/stack or staple mode is selected.
   - If the selected paper size does not match stapling specifications.
   - If copy of smaller width is delivered in the bins later in the "Mixed sizes" mode.
2. If paper is in a bin before the main switch is turned on, the sort/stack mode is disabled when the sort key is touched.

9. BIN REAR PLATE DRIVE SECTION



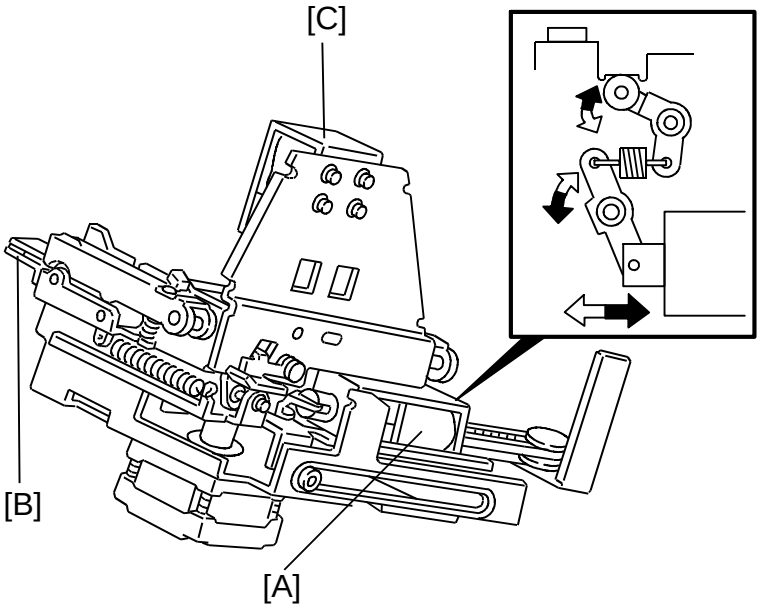
The bin rear plates [A] basically stand up as shown in Fig.1. They are lowered only during stapling as shown (Fig.2).
In the staple mode when all copies have been jogged by the jogger plate, the bin rear plate drive motor [B] rotates gear [C]. Gear [C] drives the piston rod [D] to push the lever [E] down.
The holder [F] engaging the pin [G] on the bin rear plate lowers in accordance with the lever [E] position. Thus, the bin rear plate becomes flat so as not to interfere with the copies being brought to the staple position by the grip assembly.
During stapling, the bin rear plate open sensor [H] is interrupted by the actuator [I] (Fig.2).

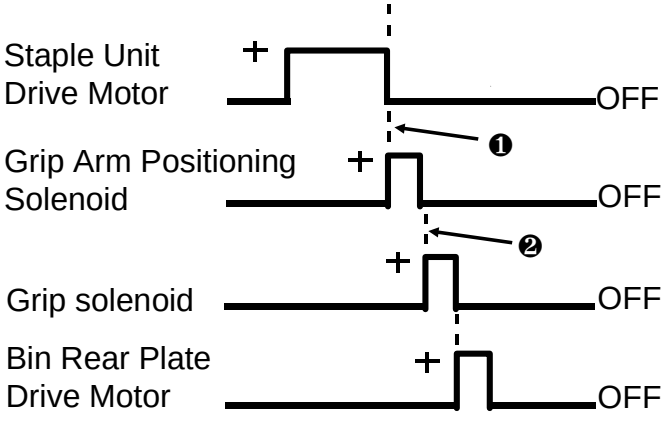
When the bin rear plates are in the home position, the bin rear plate HP sensor [J] is interrupted by the actuator [I](Fig. 1).

Under this condition, a pin [G] enters the holder [F] or passes through it.

After stapling is completed and stapled paper is returned to the bin, gear [C] rotates 180 degrees and the bin rear plate returns to its home position.

10. GRIP ASSEMBLY

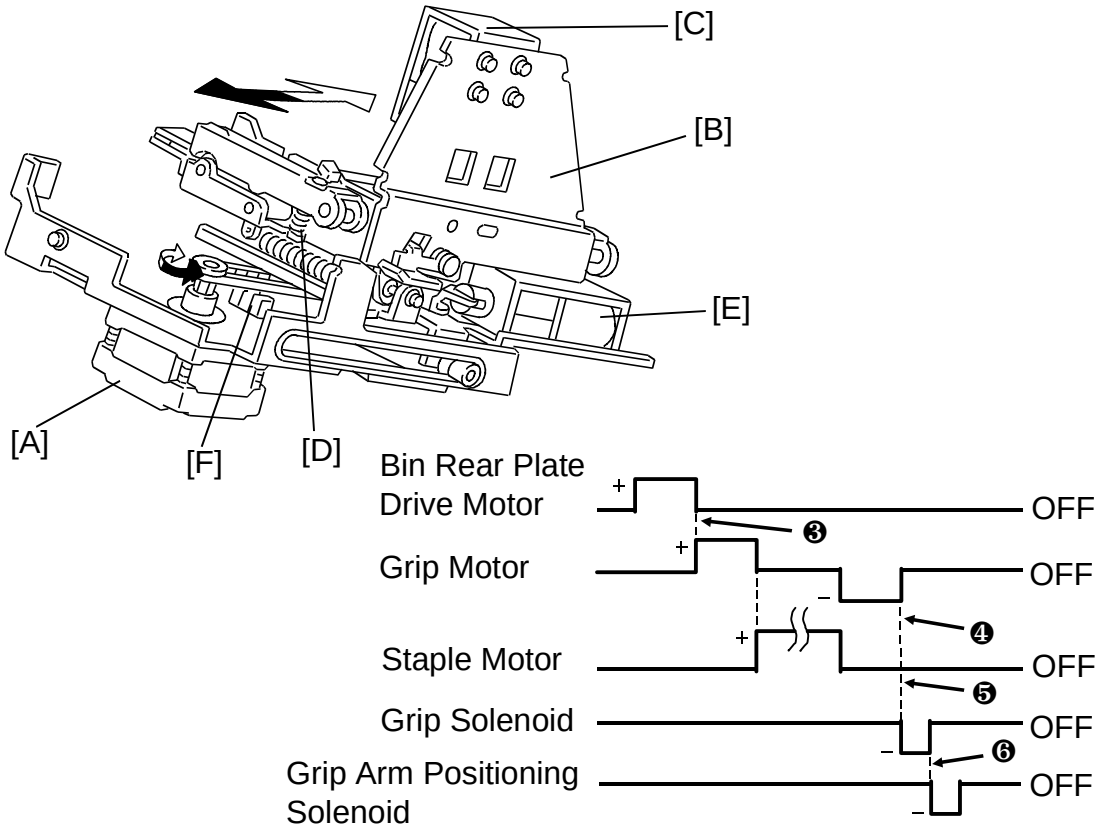




The grip assembly works as follows:

❶ When the staple unit reaches the staple position, the grip arm positioning solenoid [A] activates and the plunger is pulled in to move the grip arms [B] to the rear side of the machine. This is to access the paper on the bin. The grip arm positioning solenoid has a strong magnet inside, the plunger keeps this condition until the solenoid is energized by an opposite charge. The right upper part of the illustration (squared part) shows the mechanical linkage as seen from the top.

❷ The grip solenoid [C] activates to close the grip arms and the grip arms catch the papers.
As for the grip arm positioning solenoid, the plunger keeps the grip arms closed until the solenoid is energized by an opposite charge.



❸ After the bin rear plate drive motor lowers the bin rear plate, the grip motor [A] turns clockwise (white arrow) until the gripper [B] carries the paper to the staple position.

❹ After stapling is finished, the grip motor turns counterclockwise to move the stapled copies caught by the grip arms back to the bin.

❺ When the grip solenoid [C] activates in the opposite way (as when it activates to catch the paper), the return springs [D] opens the grip arms to release the papers which remains in the bin.

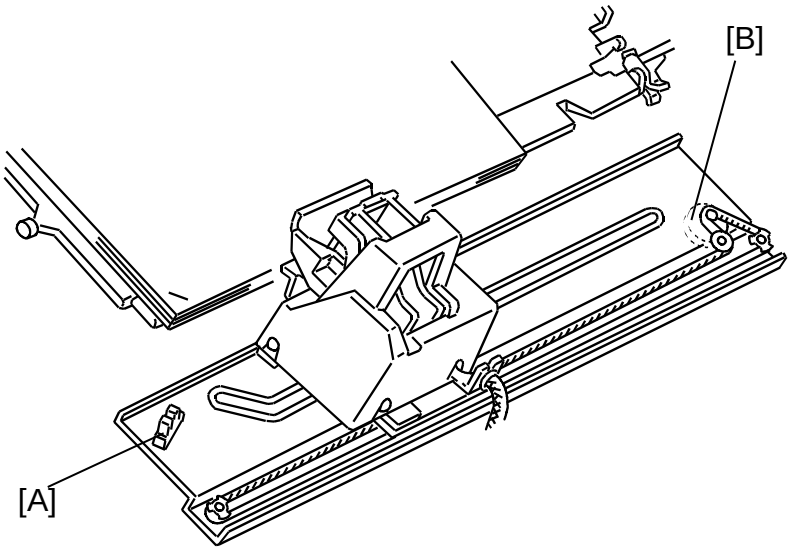
❻ The grip arm positioning solenoid [E] activates to return the grip arms to the home position to prepare for the next staple cycle.

The grip home position sensor [F] is actuated while the gripper is in the home (grip) position.
The sorter stapler main control board sends the appropriate pulses to the grip motor (stepping motor) [A] to determine the grip position and staple position.

Vertical staple positions are adjustable by changing the number of the stepping motor pulses from the home position (1 SP Adjustment - PAGE11).

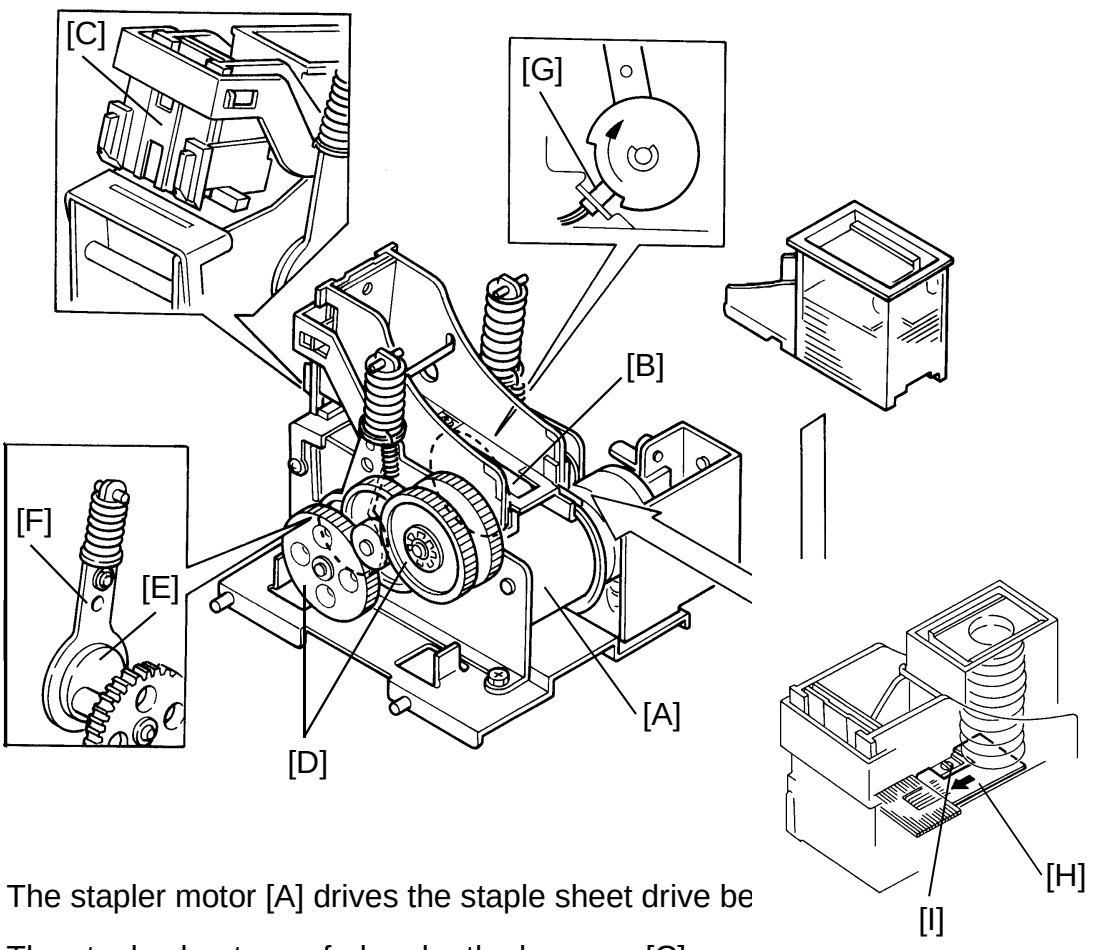
11. STAPLE UNIT

11.1 STAPLE UNIT DRIVE MECHANISM



The staple unit moves from the home position (top slant position) to the rear side of the machine in order to change the staple position. The staple HP sensor [A] activates when the staple unit is in the home position. In Top Slant mode, the stapler is only at the home position. In "Top" ("Bottom") single staple mode, the staple unit moves to the front (rear) single staple position and stays there until all stapling is completed. It then returns to the home position. In "2 Staples" mode or "Bottom" single staple mode, the staple positions differ according to the paper size. The staple unit drive motor [B] is a stepping motor, and the staple position is decided by the number of steps from the home position.
During stapling in the "2 Staples" mode, the staple unit goes back and forth to staple the two positions.
Horizontal staple positions are adjustable by changing the number of stepping motor pulses from the home position (1 SP Adjustment - PAGE11).

11.2 STAPLER



The stapler motor [A] drives the staple sheet drive be

The staple sheets are fed under the hammer [C].

The stapler motor drives the staple hammer via gears [D], two eccentric cams [E], and two links [F].

When the aligned copies are brought to the staple position by the grip, the stapler motor starts rotating. When the cams complete one rotation, the staple home position sensor [G] is de-actuated. The stapler motor then stops.

When the paper sensor in the grip assembly does not detect that the copies are under the hammer, the stapler motor does not rotate.

A paper sheet [H] with a notch cut-in is positioned at the bottom of the staple cartridge. This paper sheet is fed out after the last staple sheet. When the leading edge of the notch in the sheet is detected by the staple end sensor [I], the sorter stapler unit recognizes the staple near end condition. After the job is completed, the Add Staple indicator lights on the copier operation panel and the Start key turns to red whenever the staple mode is selected.

- Staple Prohibit Conditions -

1. Under the following conditions, the staple mode is disabled when the staple key on the operation panel is pressed.

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

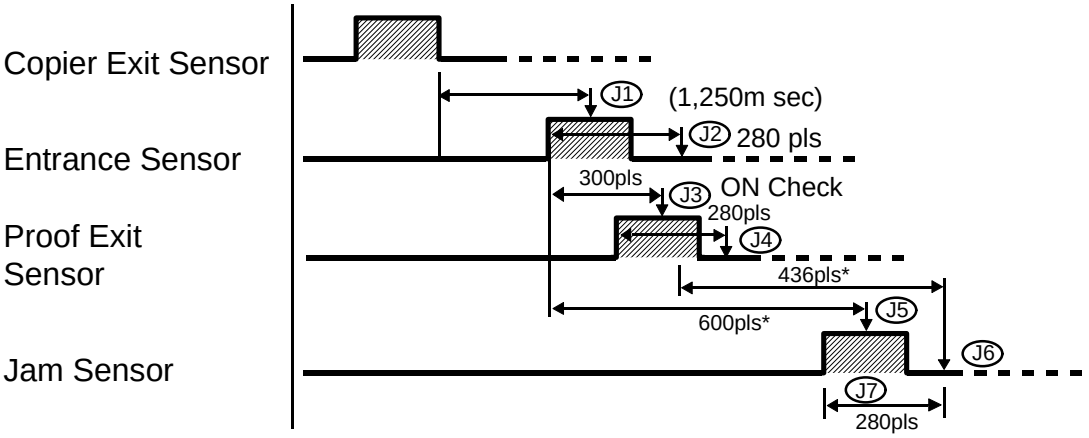
2. Under the following conditions, the staple mode is canceled.

   If paper is loaded in a bin by hand while the staple mode is selected.
   If only one sheet is delivered to the bin.
   If the stack, slip sheet or interrupt modes are selected.

3. Under the following conditions, the manual stapling mode in sort mode is prohibited.

   If paper is loaded in a bin by hand while the sort mode is selected.
   If the paper size in the bin does not match stapling specifications.
   If only one sheet is delivered to the bin.
   If smaller width paper is delivered on the bin later in "Mixed Sizes" mode.
   If copies already stapled are left in the bin.

12. JAM DETECTION



*This is the jam checking timing for the 1st bin. Timing depends on the bins.

1 pulse ≈ 3.61 ms

- Sorter Jams -

The sorter stapler main control board detects jams when the following conditions are detected. In these cases, a jam signal is sent to the copier, the copier stops the paper feed and indicates a sorter misfeed.

- Normal (Proof) mode -

J1: The entrance sensor has not turned on for the 1,250 ms after the copier exit sensor turns on.

J2: The entrance sensor stays on for the appropriate number of pulses (for example, 280 pulses for A4 sideways) or more.

J3: The proof exit sensor has not turned on for 300 pulses after the entrance sensor turns on.

J4: The proof exit sensor stays on for the appropriate number of pulses (for example, 280 pulses for A4 sideways) or more.

- In Sort/stack or Staple Mode -

J1 and J2: Same as the Normal mode.

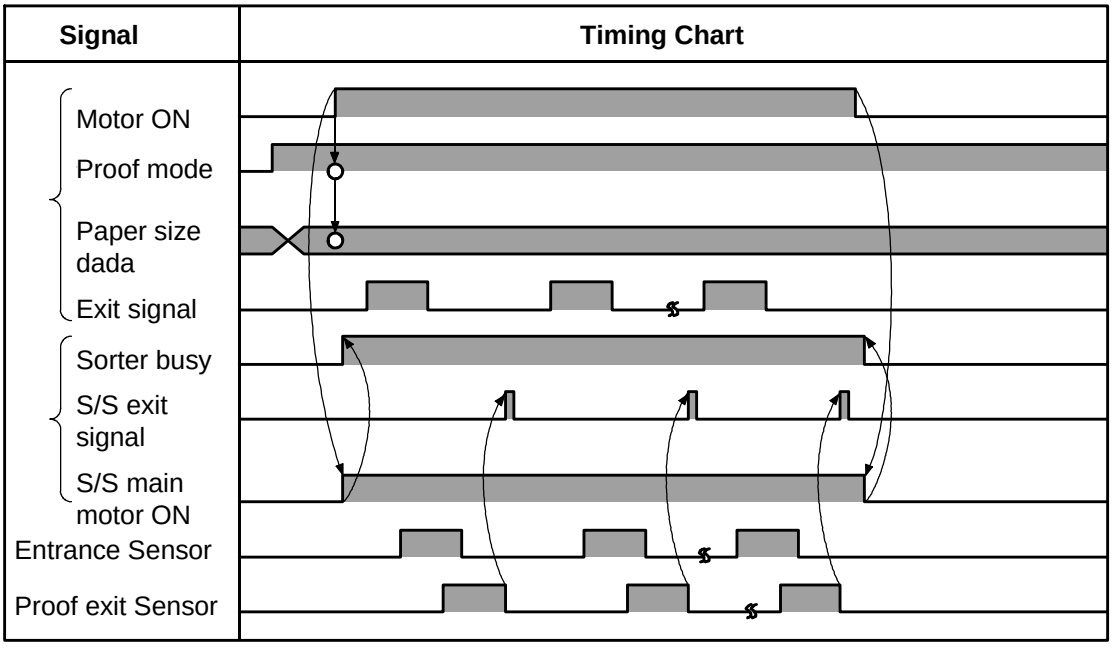
J5: The jam sensor has not turned on for 600 pulses after the entrance sensor turns on.

J6: The jam sensor stays on for the appropriate number of pulses (for example, 280 pulses for A4 sideways) or more.

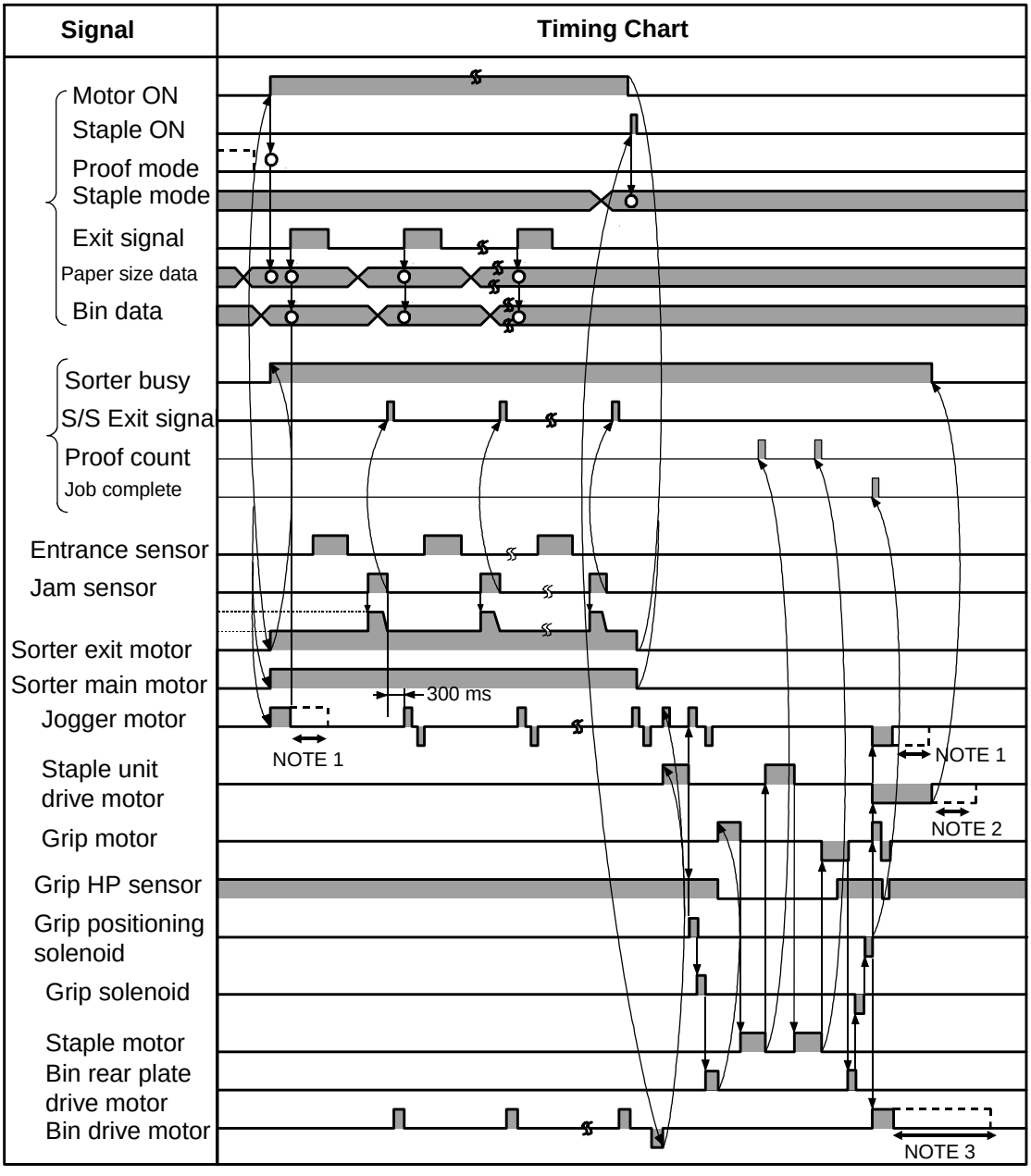
J7: The jam sensor turns on while the bin drive motor turns on.

13. TIMING CHART

13.1 A377 SORTER/STAPLER TIMING CHART (PROOF MODE)



13.2 A377 SORTER/STAPLER TIMING CHART (STAPLE MODE)



NOTE: 1. Jogger motor on time differs depending on the paper size.
2. Staple unit drive motor on time differs depending on the paper size.
3. Bin drive motor on time differs depending on the number of copy sets.

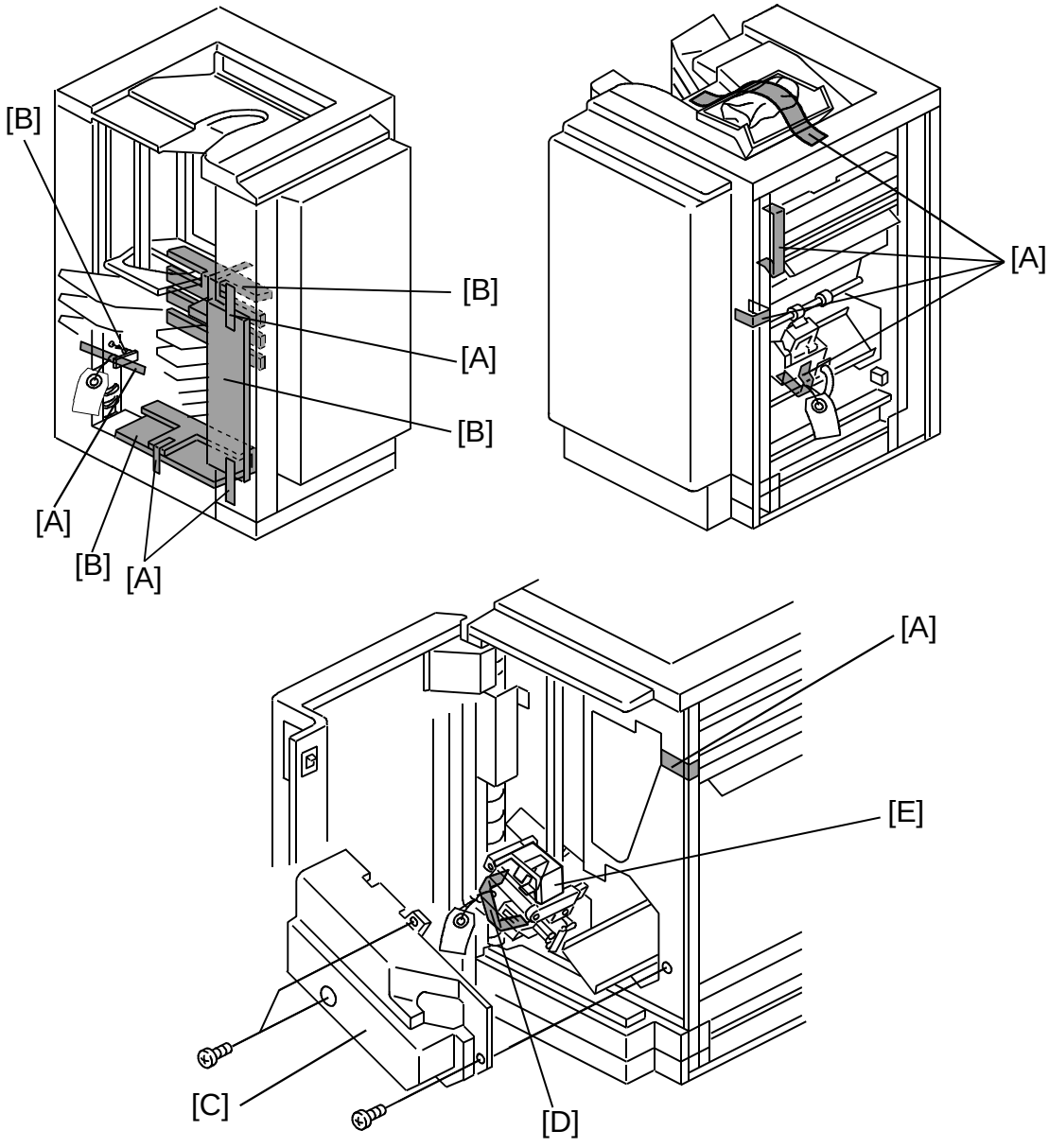
14. INSTALLATION

14.1 ACCESSORY CHECK

Check the contents of the box according to the following list.

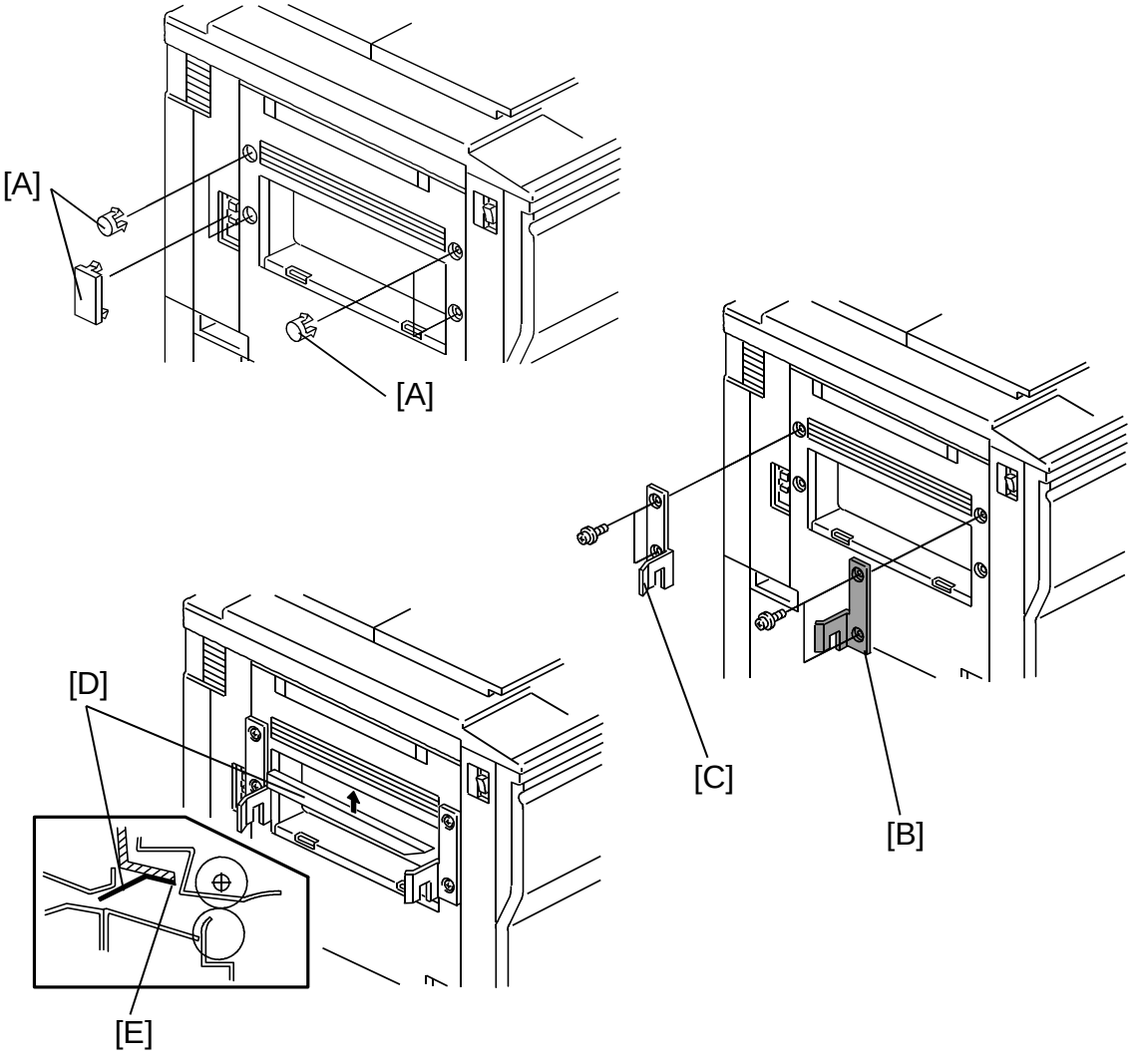
Description	Q'ty
1. Installation Procedure	1
2. Front Connecting Bracket	1
3. Rear Connecting Bracket	1
4. Staple Cartridge	1
5. Cushion	1
6. Entrance Guide Mylar	1
7. Proof Tray	1
8. Caster Stopper	2
9. Philips Pan Head Screw - M4x12	4
10. Philips Screw With Flat Washer - M4x6	1
11. New Equipment Condition Report (N.E.C.R.) (-17, -27 machines only)	1
12. Envelope for N.E.C.R (-17 machine only)	1

14.2 INSTALLATION PROCEDURE



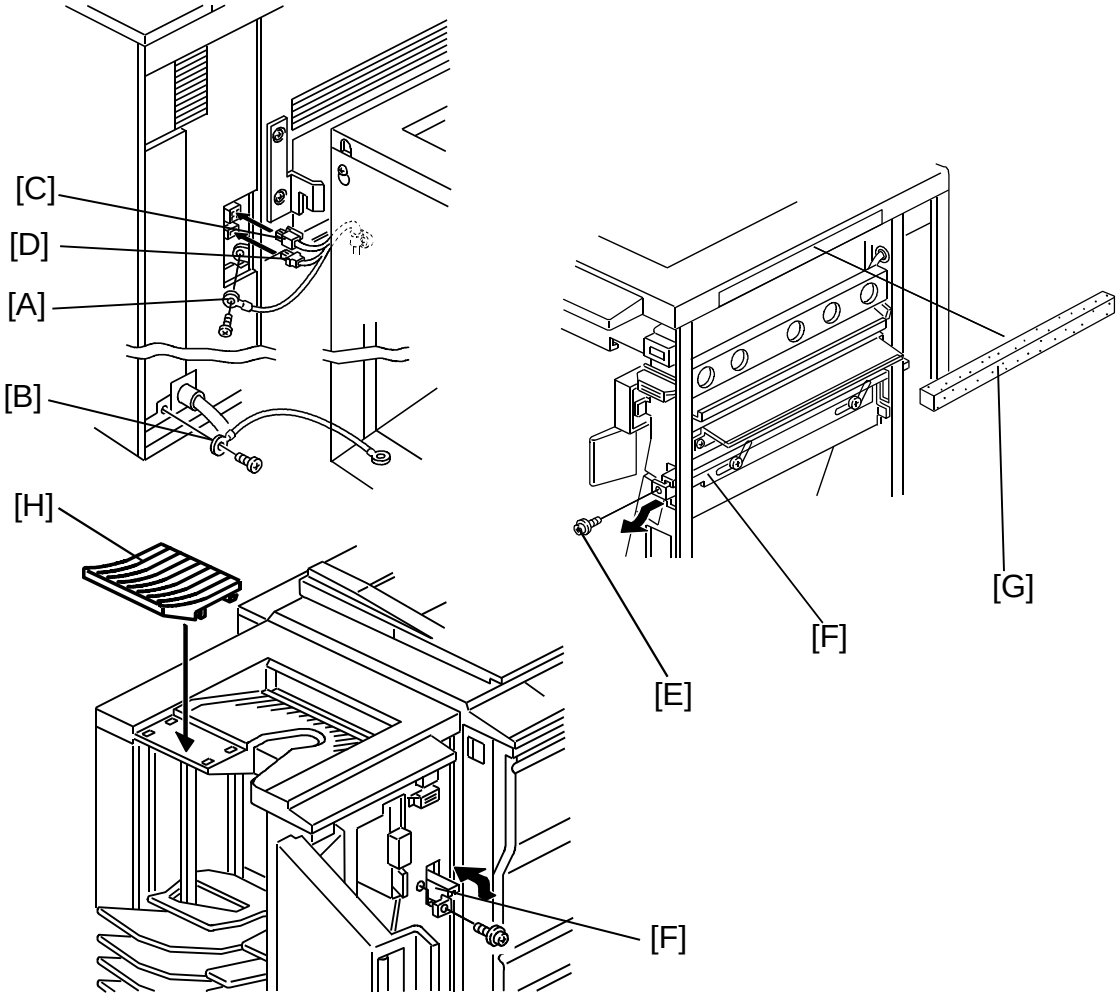
CAUTION: Unplug the copier power cord before starting the following procedure.

1. Remove the strips of tape [A] and the cushions [B].
2. Open the front door and remove the inner cover [C] (3 screws).
3. Remove the strip of tape [D] securing the gripper unit and remove the cushion [E]. Then re-install the inner cover [C].



4. Remove five plastic caps [A] on the copier's left cover.
5. Install the front connecting bracket [B] (2 screws - M4 x 12) and the rear connecting bracket [C] (2 screws - M4 x 12) on the copier.
6. Stick the entrance guide mylar [D] on the copier exit area as shown.

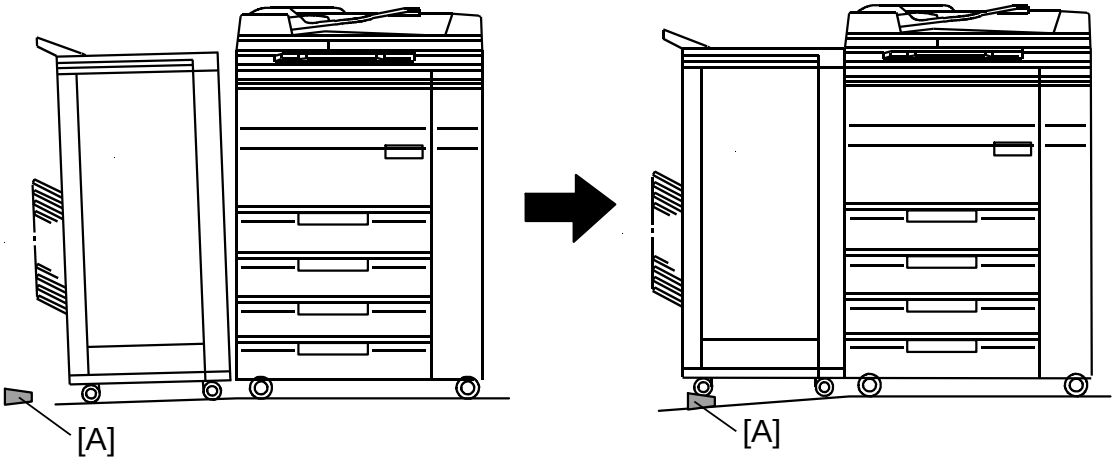
   NOTE: Align the edge [E] of the cover and the mylar.



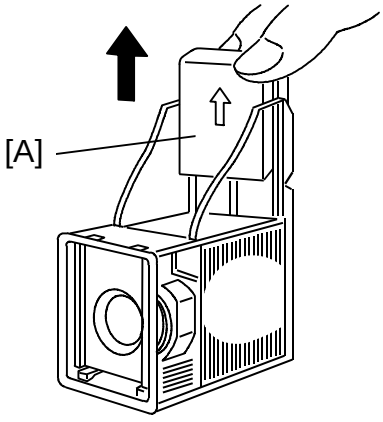
7. Secure the protective earth wire [A]* (1 screw with spring washer) and the wire [B] (1 screw with spring washer).

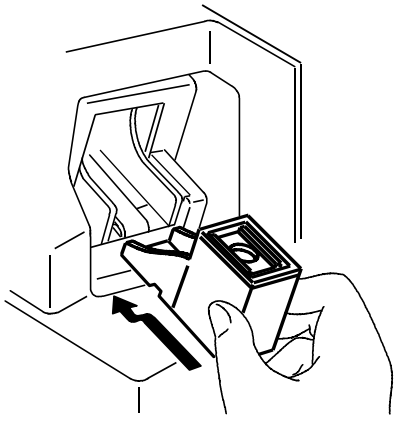
   NOTE*: For all models other than those intended for North America, the green wire is intended as a functional earth and should be connected as shown.

8. Connect the 4P connector [C] and the fiber optic connector [D].
9. Open the front door of the sorter stapler and remove the screw [E] fixing the locking lever [F], then lower the locking lever.
10. Stick the cushion [G] on the proof tray.
11. Align and press the sorter stapler against the copier and fix them by raising the locking lever [F].
12. Secure the locking lever (1 screw).
13. Install the proof tray [H].



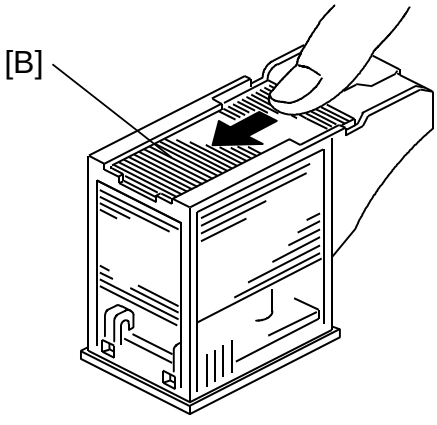
14. If the gap between the top of the sorter stapler and the copier is too great, adjust by placing caster stoppers [A].





15. Remove the green plastic clip [A] from the staple cartridge, and install the cartridge in the stapler.

    NOTE: When installing the staple cartridge, make sure that all the staple sheets [B] are in the initial position.



16. Plug in the copier.

17. Turn on the main switch of the copier and test the operation of the sorter stapler.

    NOTE: The copier automatically recognizes that the sorter stapler has been installed.

    The stapler will not staple for the first 10 or so copies until the first staple moves to the proper position from the cartridge.

15. SERVICE TABLES (MAIN CONTROL BOARD)

15.1 DIP SWITCHES

DIP SW100 0: OFF 1: ON

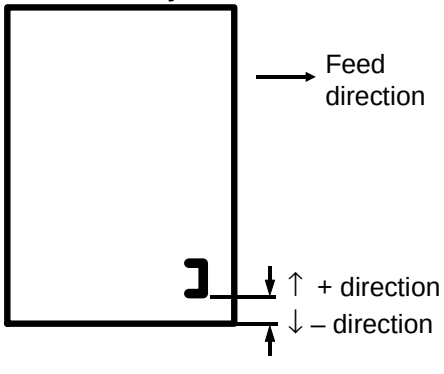
1	2	3	4	Function
0	0	0	0	Standard setting
1	0	0	0	Raises all bins to the top position.
0	1	0	0	Free run

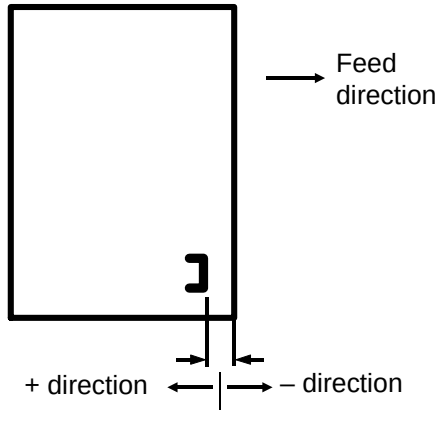
DIP SW101
Vertical Staple
Position Adjustment

DIP SW102
Horizontal Staple
Position Adjustment

Adjustment Value	1	2	3	4
Standard Position	0	0	0	–
0.5 mm	1	0	0	0/1
1.0 mm	0	1	0	0/1
1.5 mm	1	1	0	0/1
2.0 mm	0	0	1	0/1
2.5 mm	1	0	1	0/1
3.0 mm	0	1	1	0/1
3.5 mm	1	1	1	0/1
- direction (See the illustration below.)	–	–	–	0
+ direction (See the illustration below.)	–	–	–	1

NOTE: The adjustment value and the combination of the dip switch positions are exactly the same on DIP SW 101 and DIP SW 102.





15.2 TEST POINTS

Number	Function
TP100	GND
TP101	+ 5 V

15.3 FUSES

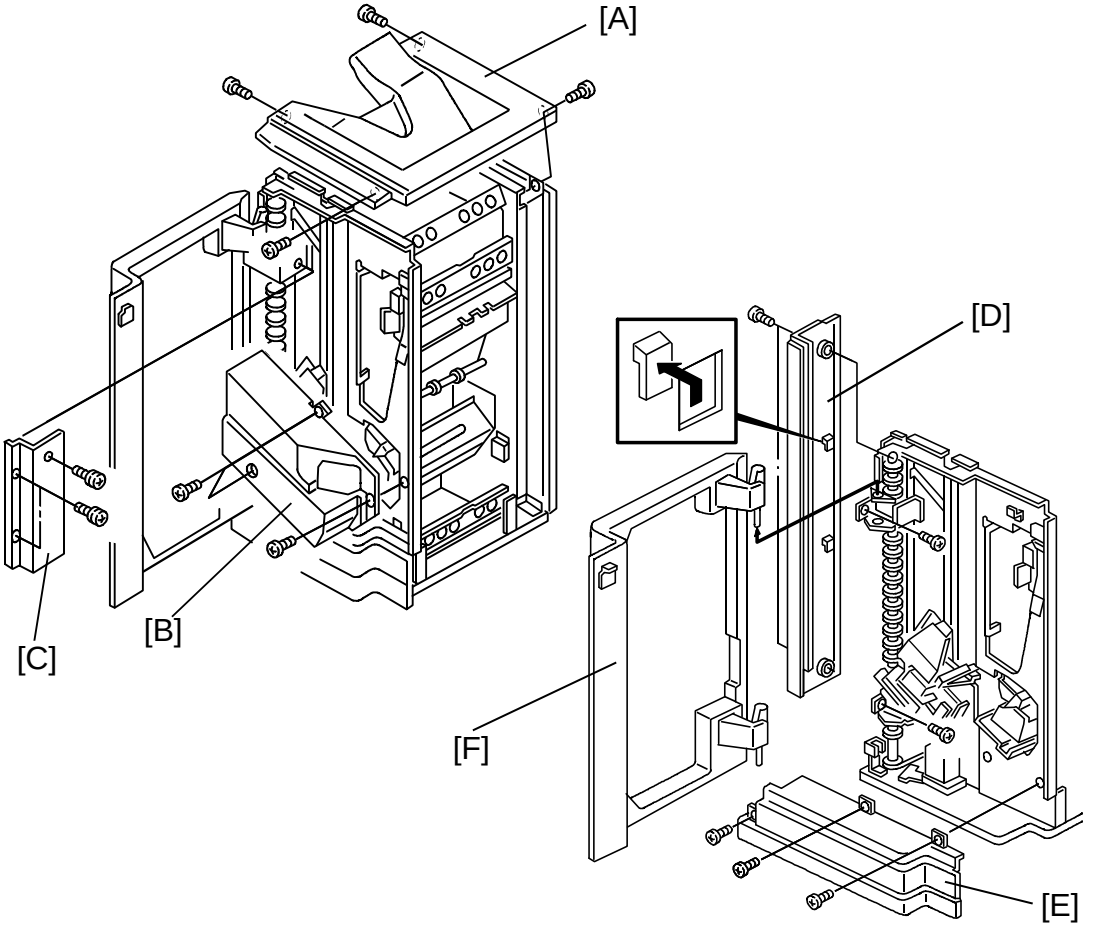
FUSES	Connected Point	Rated Current and Voltage
FUSE100	CN100-3 (+24 V)	250 V T5A
FUSE101	CN100-1 (+5 V)	250 V T2A

16. REPLACEMENTS AND ADJUSTMENTS

16.1 EXTERIOR COVER REMOVAL

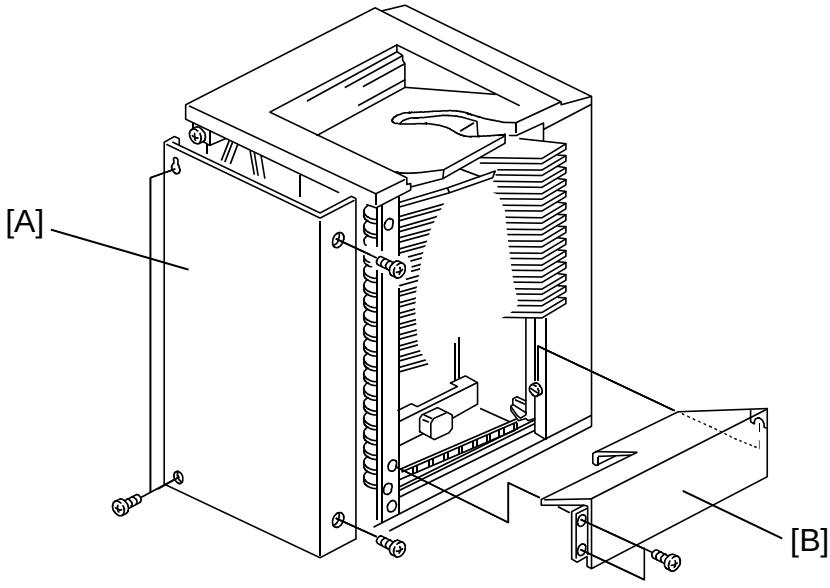
- Front side -

Remove the covers in the order as follows.



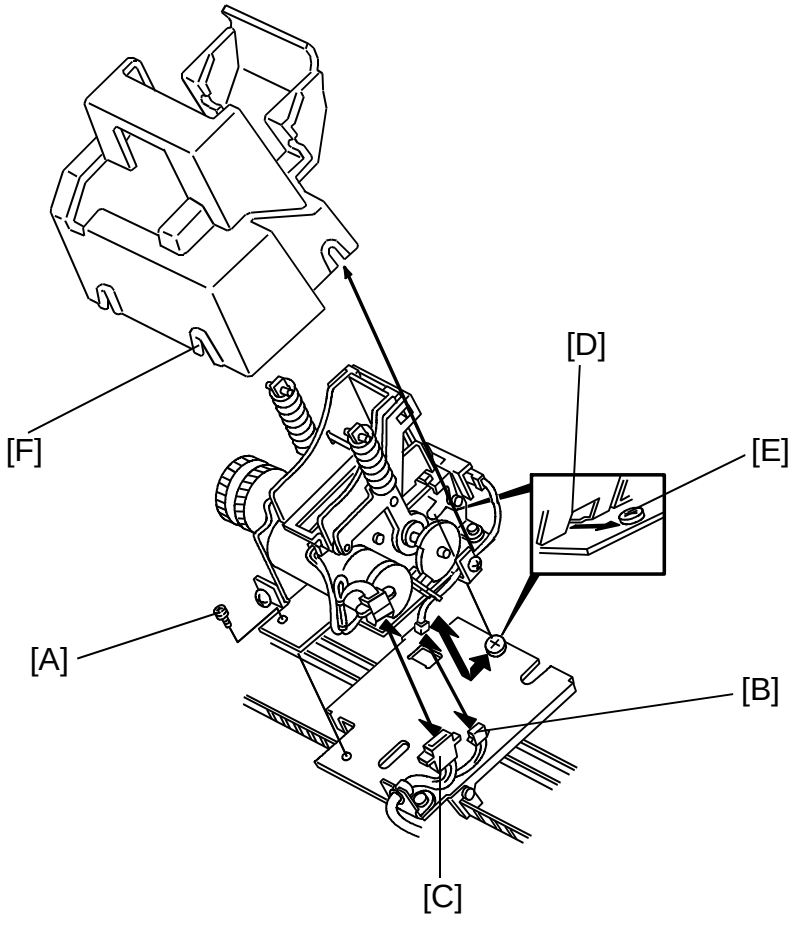
1. Remove the proof tray [A] (4 screws).
2. Open the front door.
3. Remove the front inner cover [B] (3 screws).
4. Remove the front wheel cover [C] (3 screws).
5. Remove the four screws fixing the front left cover [D] and remove the front left cover by shifting the cover up to release the two hooks.
6. Remove the front lower cover [E] (3 screws).
7. Remove the front door [F] (2 hinge pins).

- Rear side -



1. Remove the rear cover [A] (4 screws).
2. Remove the bottom plate [B] (2 screws and 1 hook).

16.2 STAPLER REMOVAL AND REINSTALLATION



- Removal -

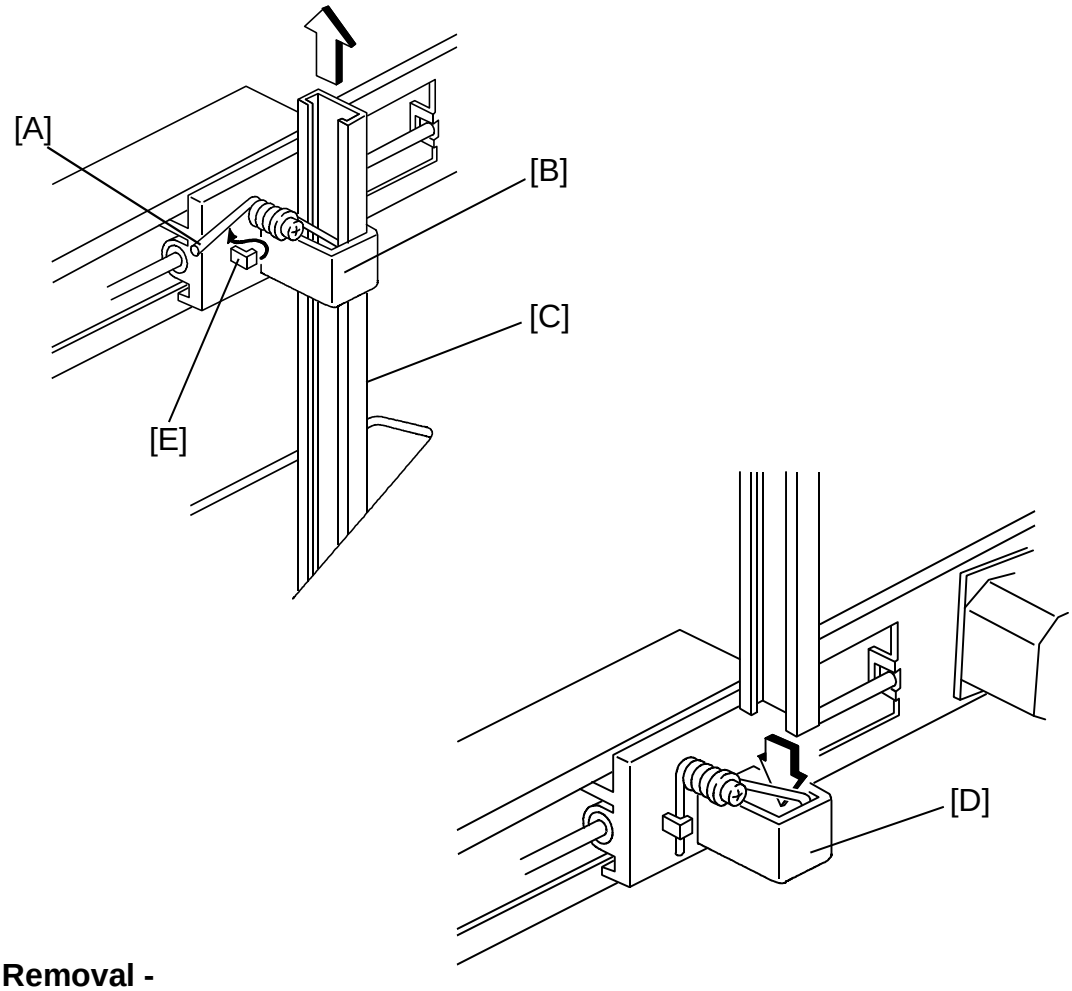
1. Remove the front inner cover. (Refer to Exterior Cover Removal.)
2. Remove the stapler unit (1 screw [A], 2 connectors).

- Installation -

1. Connect the two connectors [B] and [C].
2. Hook the cut out [D] on the stapler on the stepped screw [E].
3. Install the stapler unit(1 screw).

   NOTE: All harnesses should be wired through the cut-out [F] on the stapler cover. Do not pinch the harness between the cover and staple unit.
   The two connectors must be put inside the stapler cover.
4. Install the front inner cover (3 screws).

16.3 JOGGER PLATE REMOVAL AND INSTALLATION



- Removal -

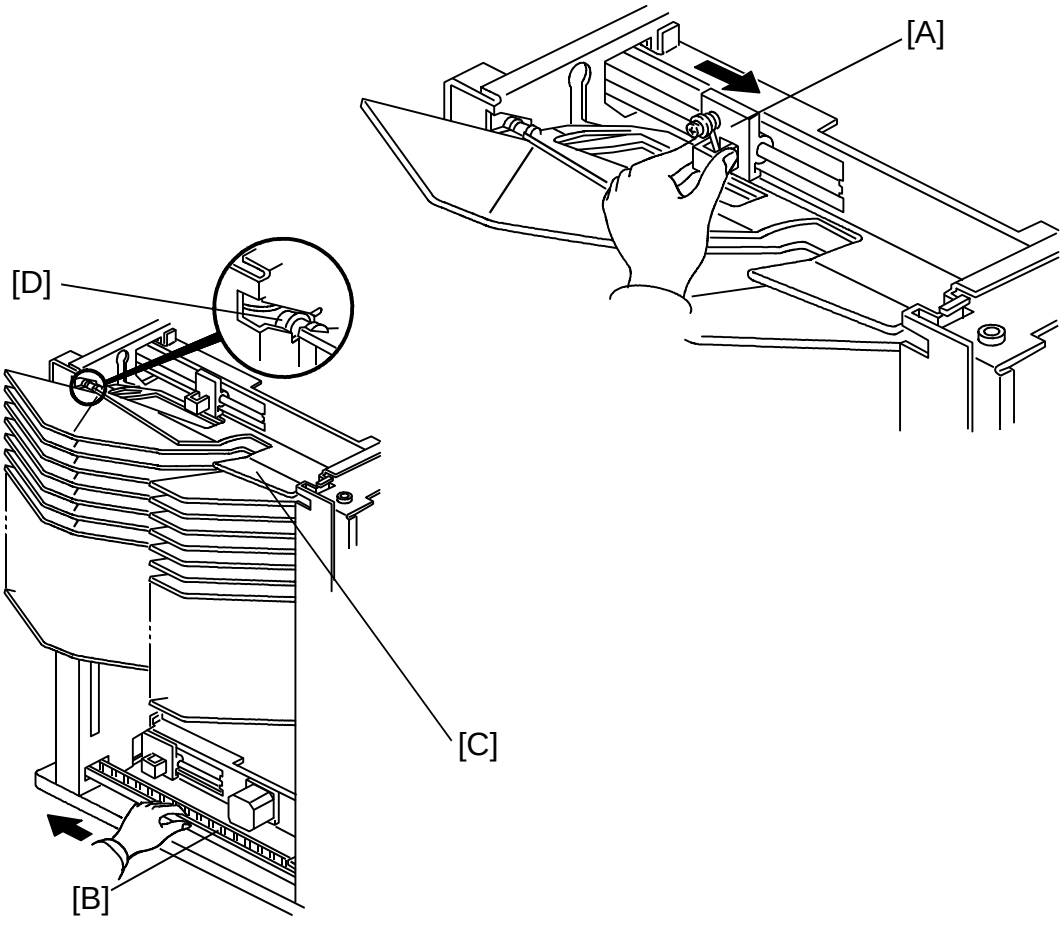
1. Remove the proof tray. (Refer to Exterior Cover Removal.)
2. Release the spring [A] of the upper jogger holder [B], then pull out the jogger plate [C].

- Installation -

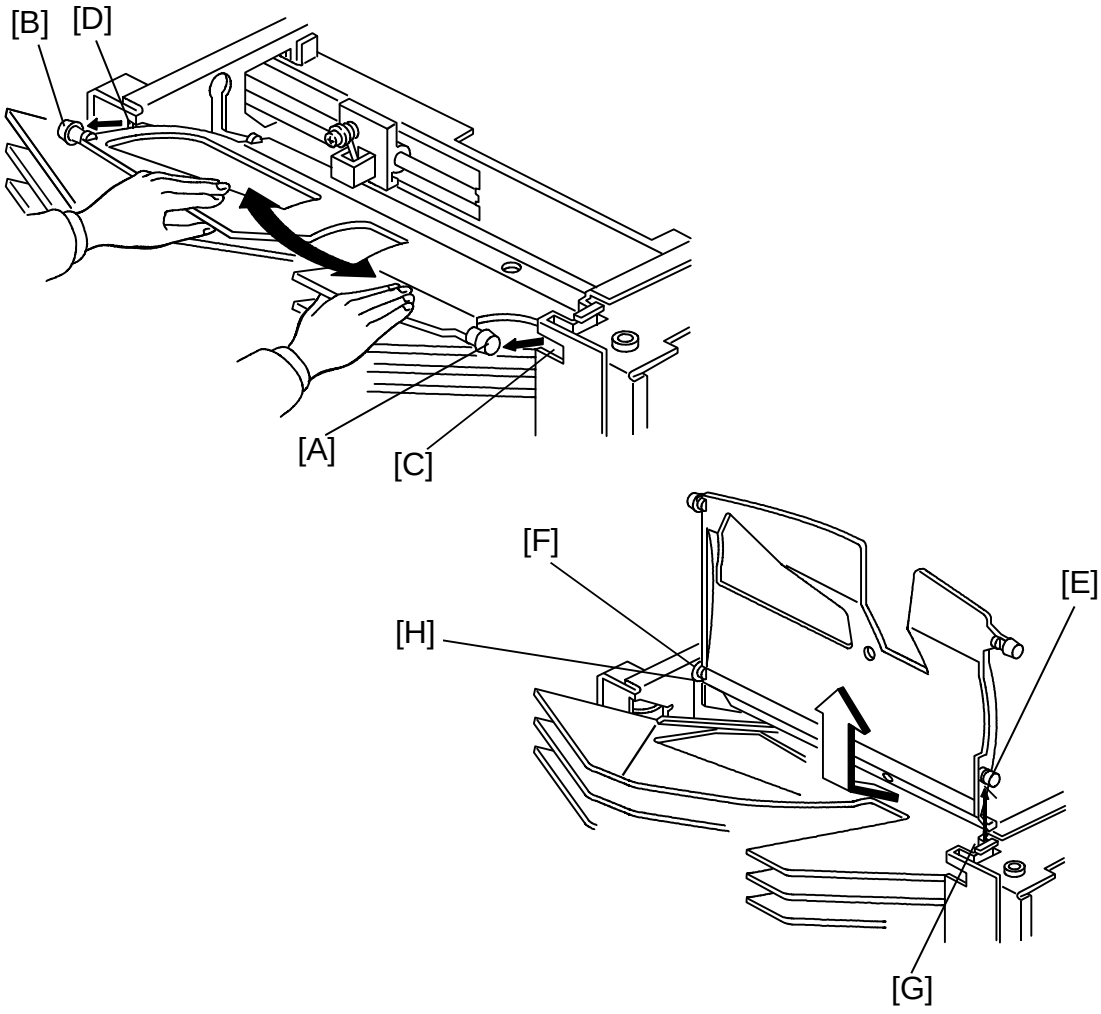
1. Insert the jogger plate through the upper holder [B].
2. Push down the jogger plate towards the lower holder [D].
3. Set the jogger plate in the lower holder [D].
4. Hook the spring [A] of the upper jogger holder to the stopper [E].

16.4 BINS

- Removal -



1. Remove the rear cover.
2. Raise all bins to the highest position by turning on DIP SW100-1 on the sorter main PCB then turn off the main switch of the copier.
3. Remove the jogger plate (refer to Jogger Plate Removal) then move the upper jogger holder [A] to the front side.
4. Remove the rear cover then remove the bottom plate to access the drive belt. (Refer to Exterior Cover Removal section.)
5. Manually rotate the helical wheel drive belt [B] and move up the top guide [C] until the three guide pins [D] reach the top of the helical wheel as shown.

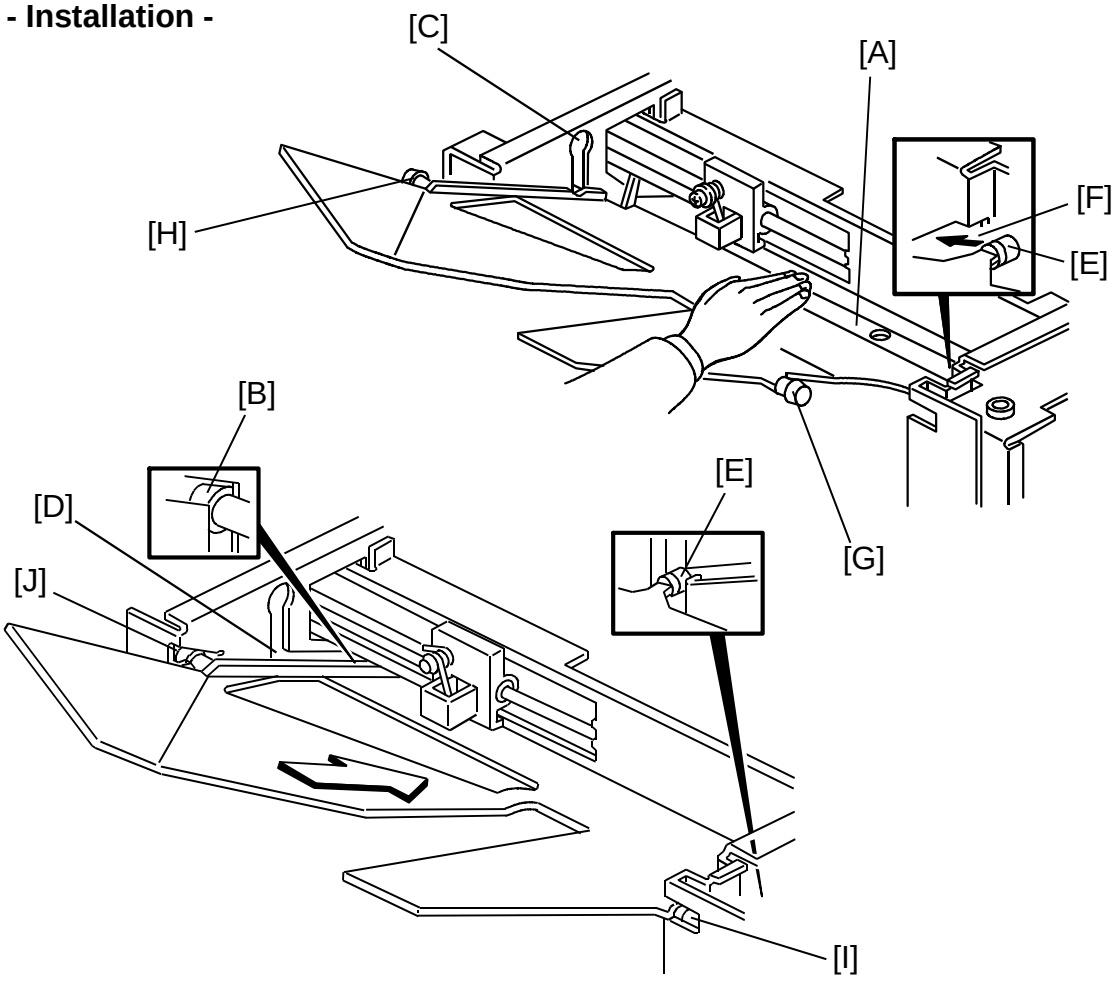


6. Remove the top guide by releasing the pins [A] and [B] from cut-outs [C] and [D] at the end of the bin guide slots. Then remove the pins [E] and [F] from cut-outs [G] and [H].

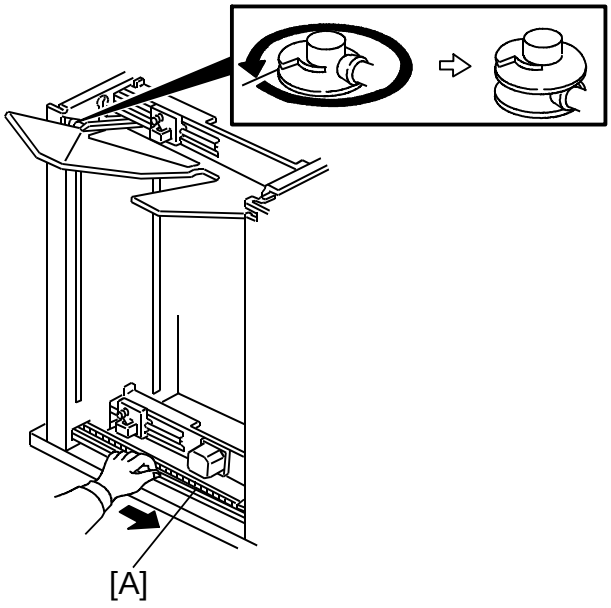
7. Move up the next bin to the top position by manually rotating the helical wheel drive belt and remove it as in the top guide removal procedure (step 5 and 6).

8. Remove the other nineteen bins by repeating step.7.

- Installation -

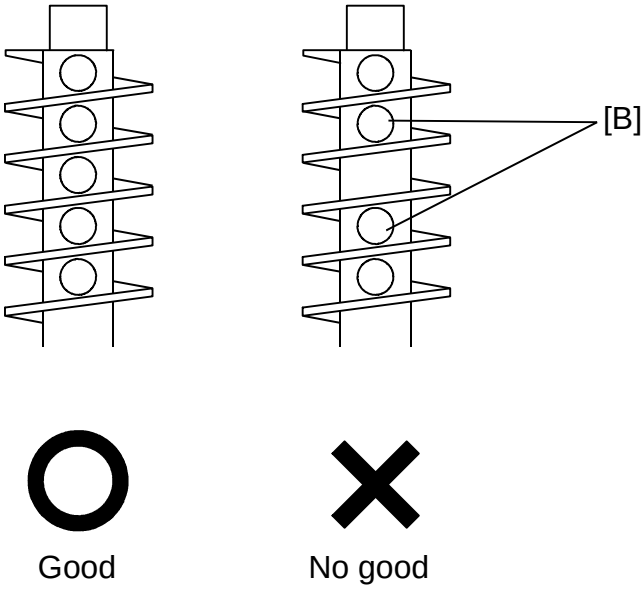


1. While holding the bin rear plate [A] straight, insert rear right guide pin [B] to the slot [C], then lower the rear guide pin to the corner [D].
2. While still holding the bin rear plate straight, insert the front right guide pin [E] to guide slot [F].
3. Insert the other guide pins [G] and [H] to the slots [I] and [J].



4. Manually rotate the helical wheel drive belt [A] and lower the bin.

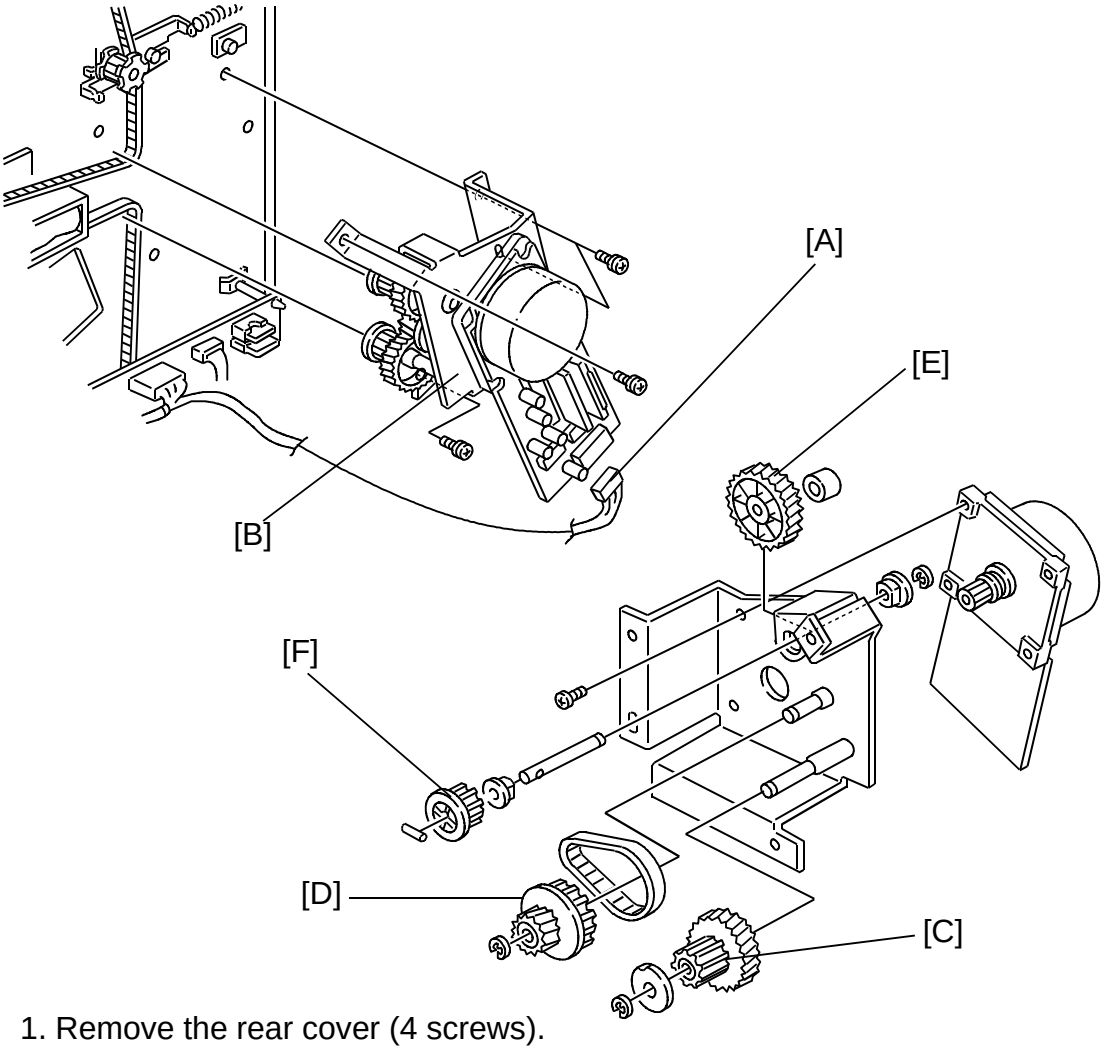
NOTE: Before installing the next bin, rotate the helical wheels only once. Otherwise, the distance between the guide pins [B] become uneven and the bin tilts



5. Set all bins and the top cover by repeating steps 1 to 4.

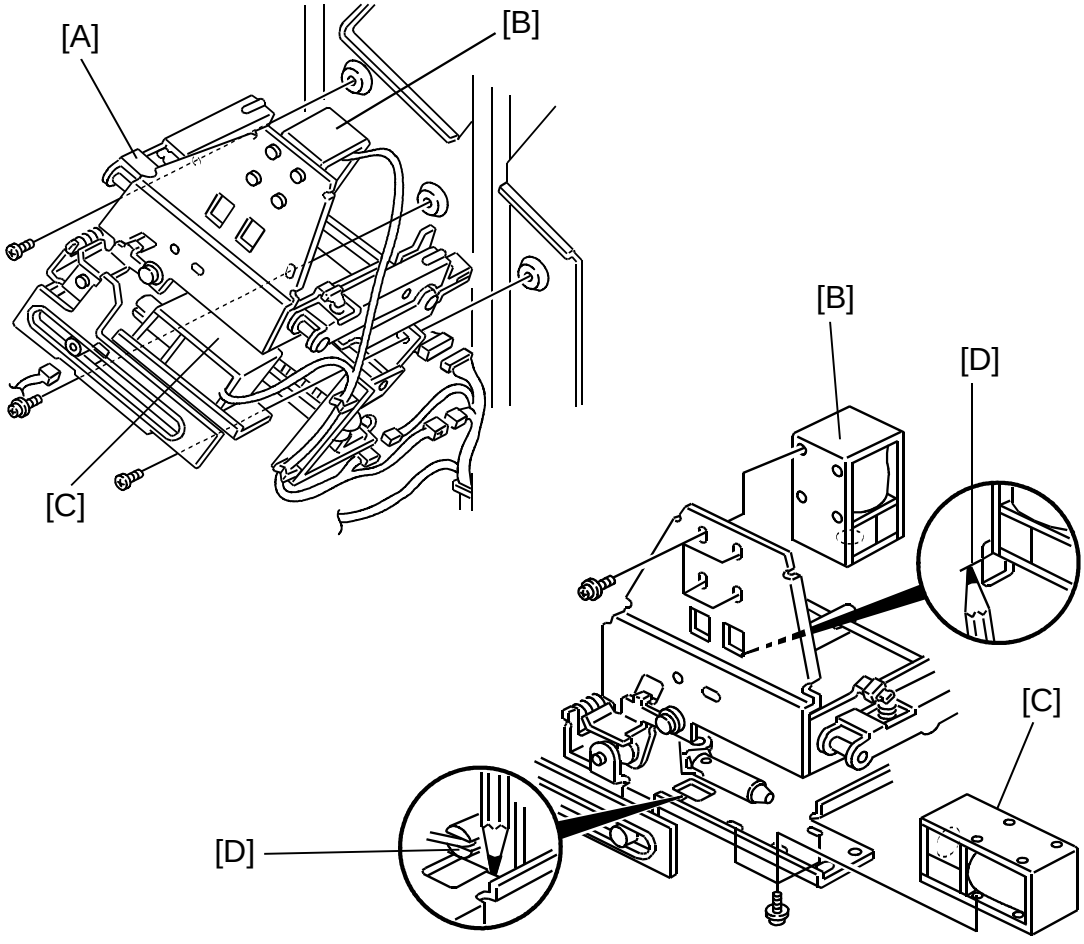
6. Re-install the jogger plate and all covers.

16.5 MAIN MOTOR REMOVAL



1. Remove the rear cover (4 screws).
2. Disconnect the connector [A].
3. Remove the main motor bracket [B] (4 screws) with the main motor.
4. Remove all gears and pulleys [C] [D] [E] [F] (3 E-rings).
5. Remove the main motor (4 screws).

16.6 GRIP ASSEMBLY REMOVAL, AND GRIP SOLENOID AND GRIP POSITIONING SOLENOID ADJUSTMENT



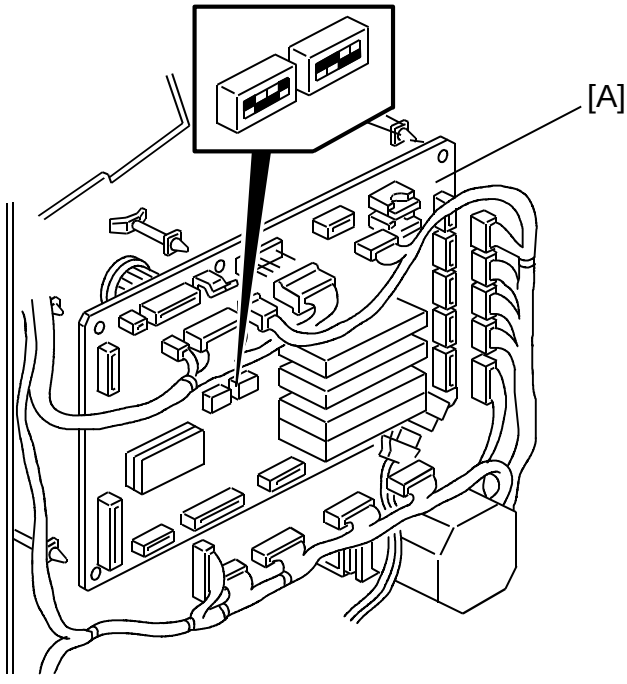
- Grip assembly removal -

1. Open the front cover then remove the front inner cover. (Refer to Exterior Cover Removal.)
2. Remove the grip assembly [A] (4 connectors, 3 screws).
3. Replace the grip solenoid [B] and the grip arm positioning solenoid [C].

- Grip solenoid [B] and the grip arm positioning solenoid [C] adjustments -

It is impossible to perform the fine positioning adjustments for both solenoids because magnets in both solenoids pull the plunger very strongly.
So, mark the original position of the solenoids and remove the solenoid. Then place the solenoid at the original position by referring to the mark you made [D] and tighten the screws (4 screws for the grip solenoid and 3 screws for the grip arm positioning solenoid).

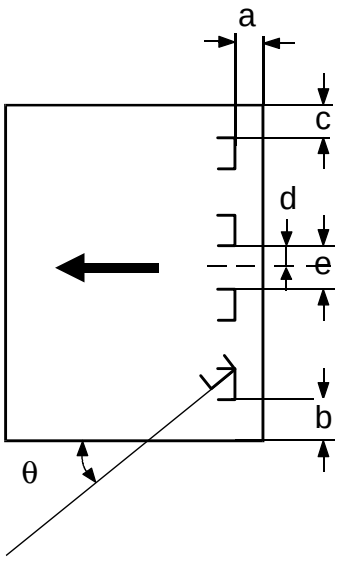
16.7 MAIN CONTROL BOARD REPLACEMENT



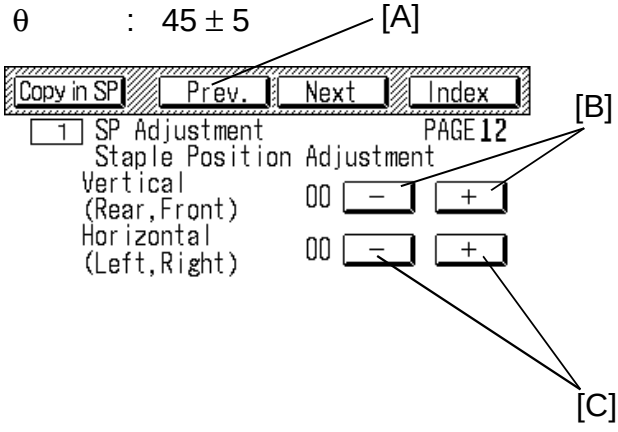
1. Remove the rear cover (refer to Exterior Cover Removal) then disconnect all connectors (15 connectors and 1 fiber optics connector).
2. Remove the main control board [A] (6 studs).
3. Install the new main control board and set all connectors.
4. Position DIP SW101 and 102 as on the original main control board (DIP SW 101 and 102 are for staple position adjustment).
5. Turn on the copier main switch then confirm the staple position. If incorrect, adjust the staple position. (Refer to the Staple Position Adjustment.)

16.8 STAPLE POSITION ADJUSTMENT

ADJUSTMENT STANDARD:



a ~ c	:	6 ± 3 mm
b	:	6 ± 3 mm
c	:	6 ± 3 mm
d	:	66 ± 3 mm
e	:	132 ± 2 mm
θ	:	45 ± 5



ADJUSTMENT

Both the vertical and the horizontal staple positions are adjustable as follows:

1. Enter SP mode as follows:
   a. Press the clear modes key.
   b. Enter 107.
   c. Press and hold the clear/stop key for three seconds.

2. Touch the "SP Adjustment" key.
3. Touch the Prev. key [A] four times to access page 12.
4. Adjust the vertical staple position by touching the [−], [+] keys [B] and the horizontal staple position by touching the [−], [+] keys [C].

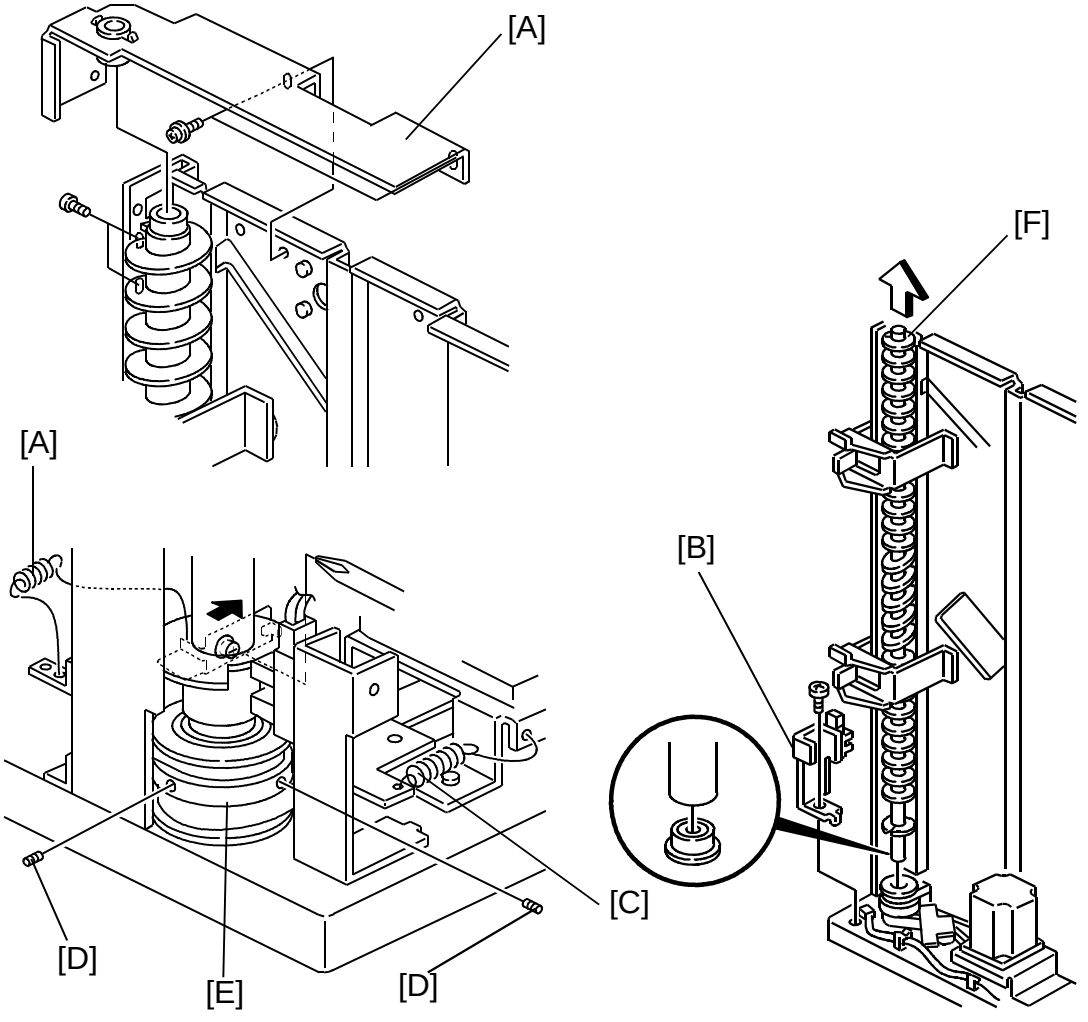
NOTE: 0.5mm/step

16.9 HELICAL WHEELS

- Removal -

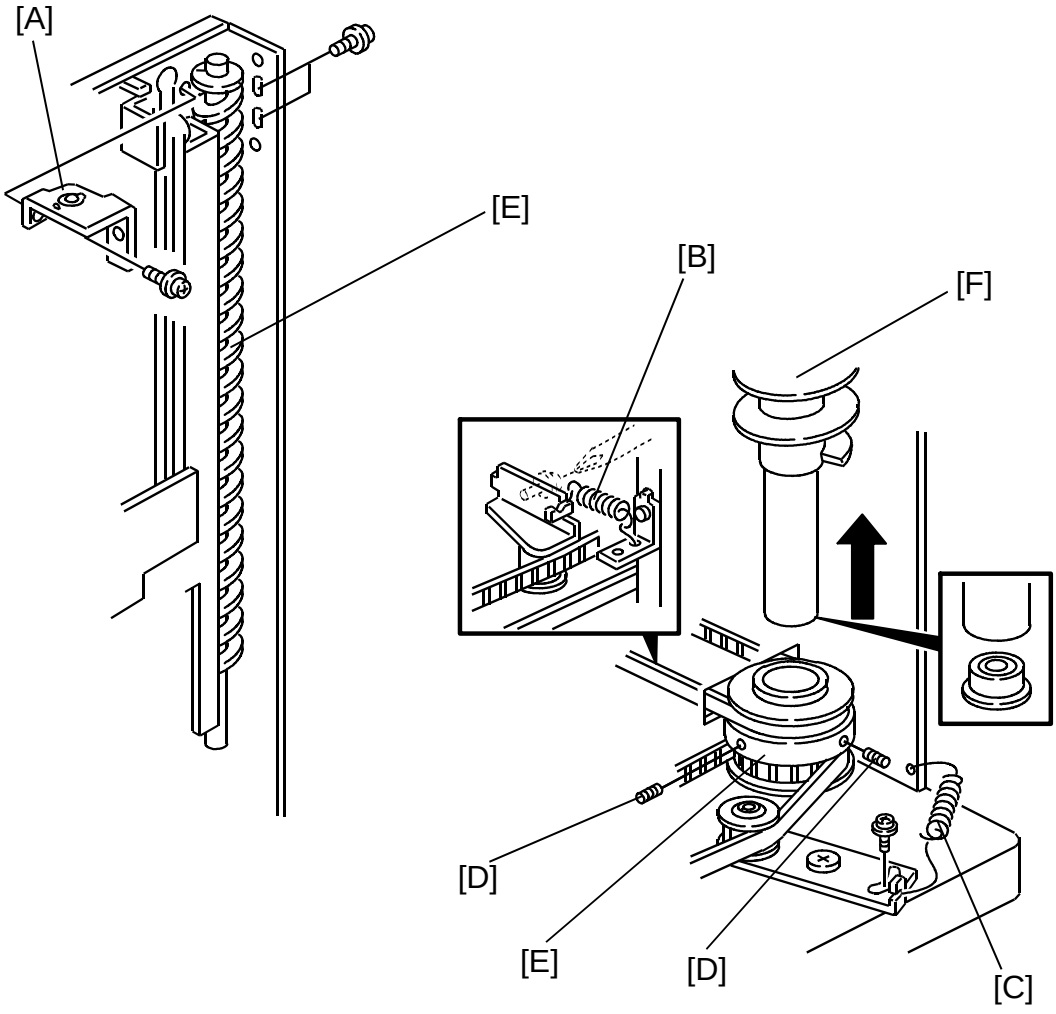
Before removing the helical wheels, remove all bins and all exterior covers. (Refer to Exterior Cover and Bins Removal.)

- Front Helical wheel -



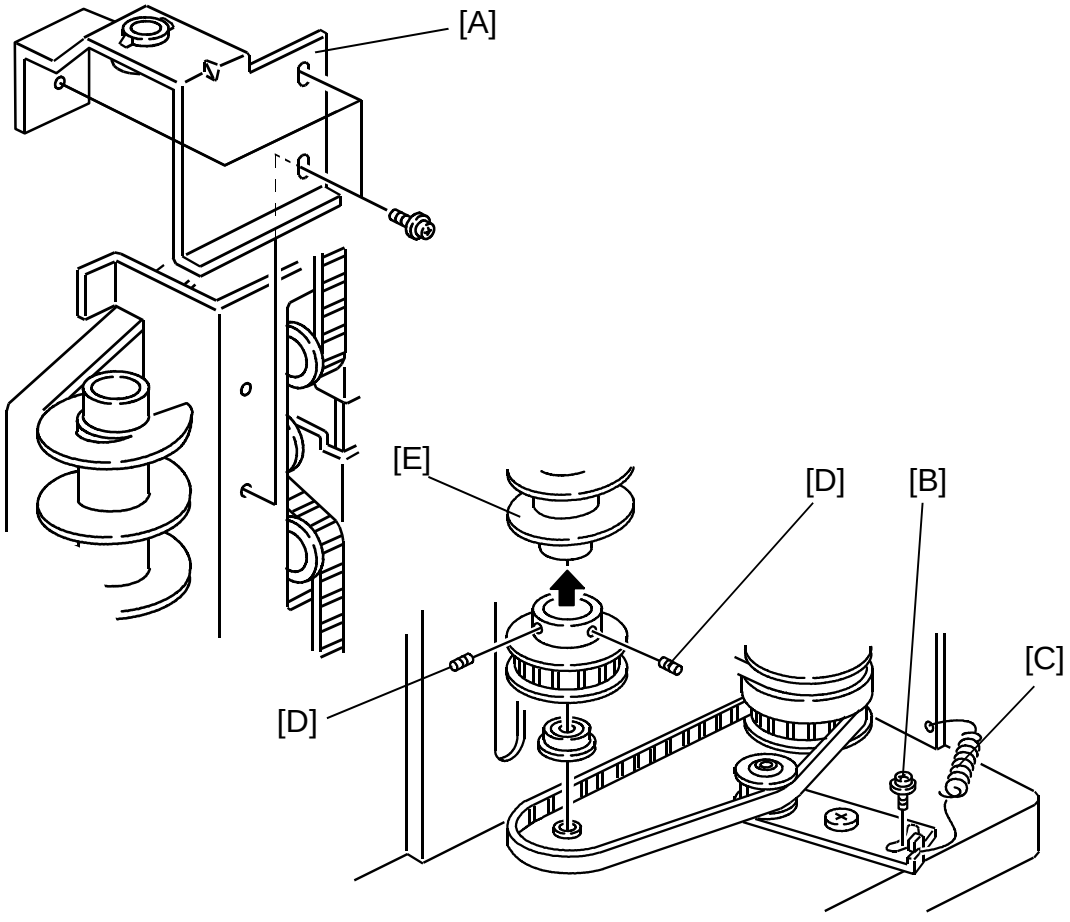
1. Remove the bracket [A] (4 screws).
2. Remove the wheel sensor bracket [B] (1 screw).
3. Unhook the two springs [C].
4. Loosen the two Allen screws [D].
5. While holding the pulley [E] to keep it in position, remove the helical wheel [F].

- Rear Long Helical Wheel -



1. Remove the bracket [A] (3 screws).
2. Unhook the spring [B] at the front side and the spring [C] at the rear side.
3. Loosen the two Allen screws [D] on the drive pulley.
4. While holding the pulley [E] to keep it in position, remove the helical wheel [F].

- Rear Short Helical Wheel -

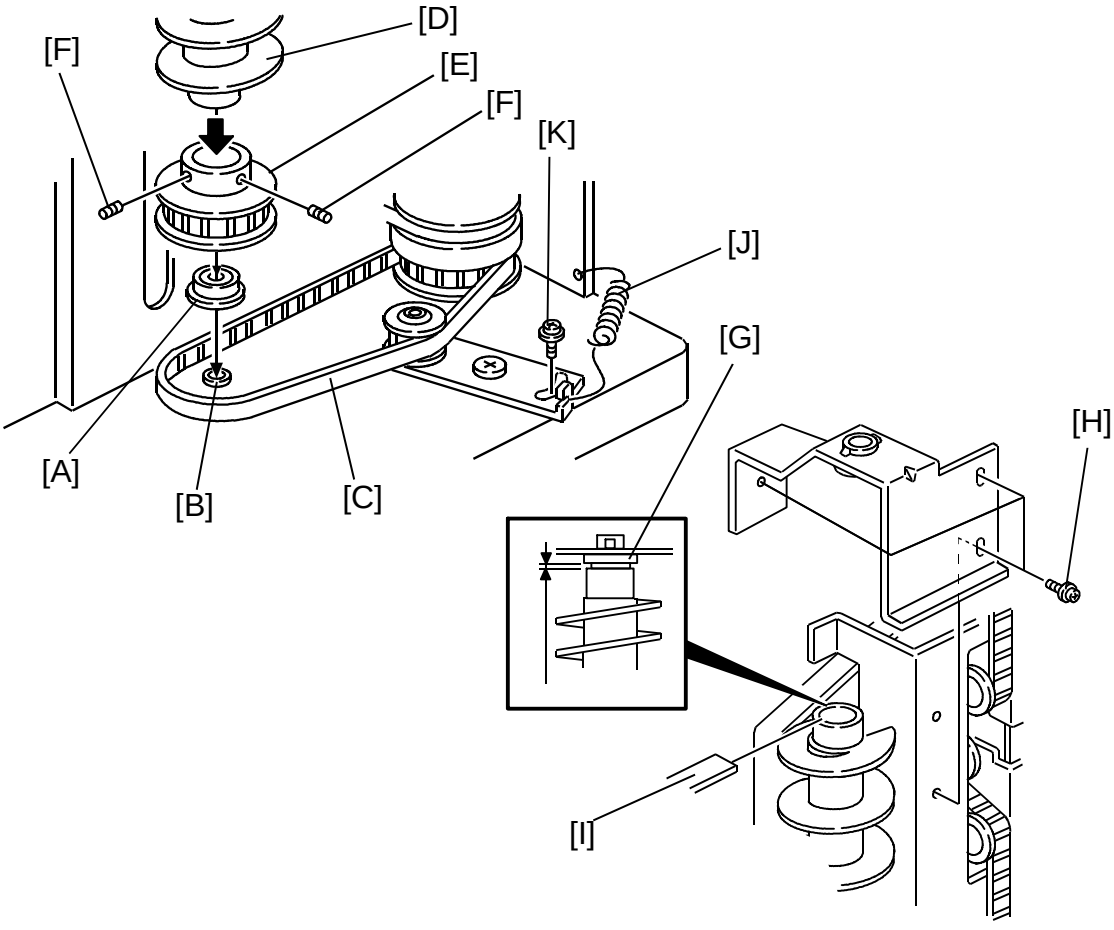


1. Remove the bracket [A] (3 screws).
2. Loosen the screw [B] then unhook the tension spring [C].
3. Loosen the two Allen screws [D] on the drive pulley.
4. Remove the helical wheel [E].

- Installation -

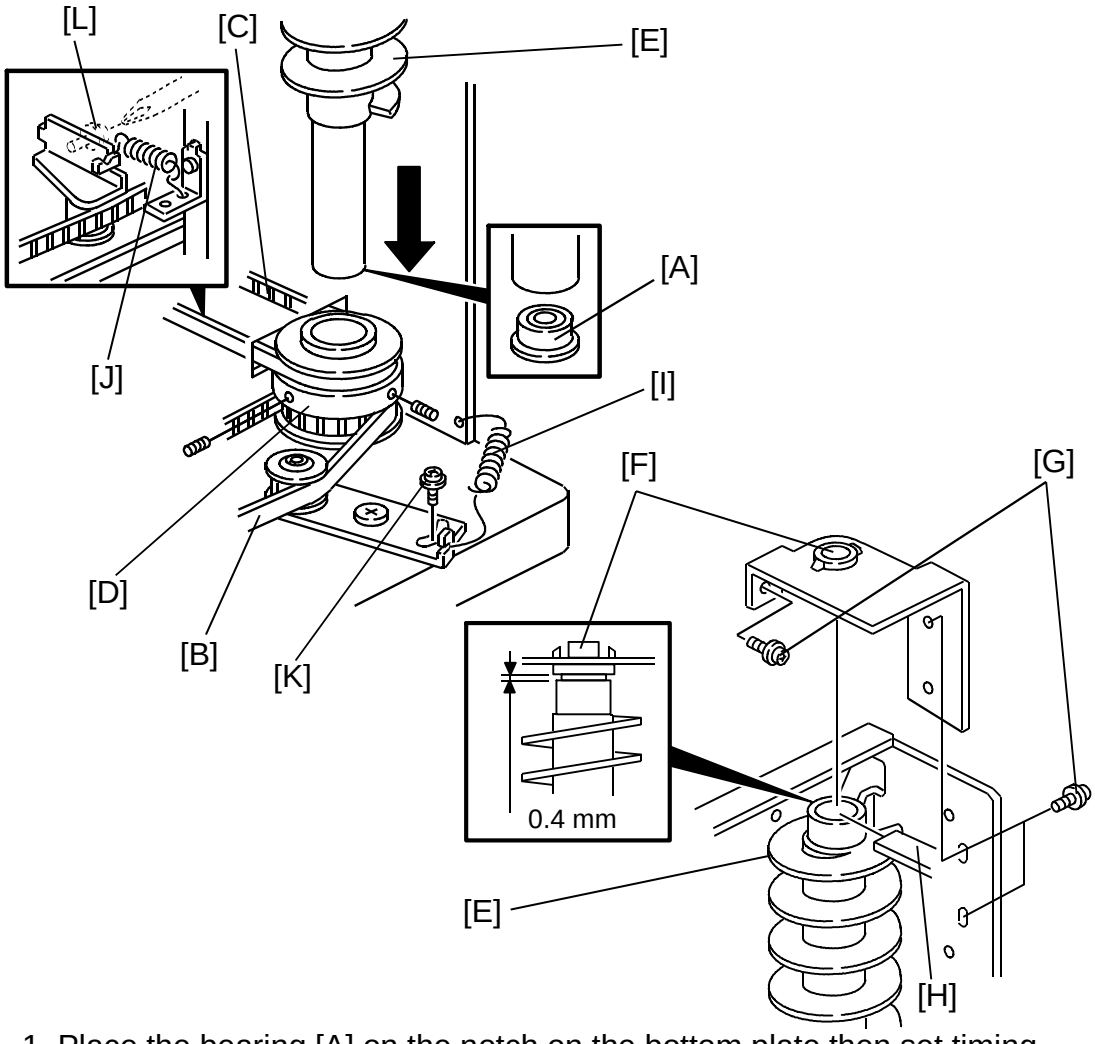
NOTE: After installing the helical wheels, perform the helical wheels alignment which is explained later.

- Rear Short Helical Wheel -



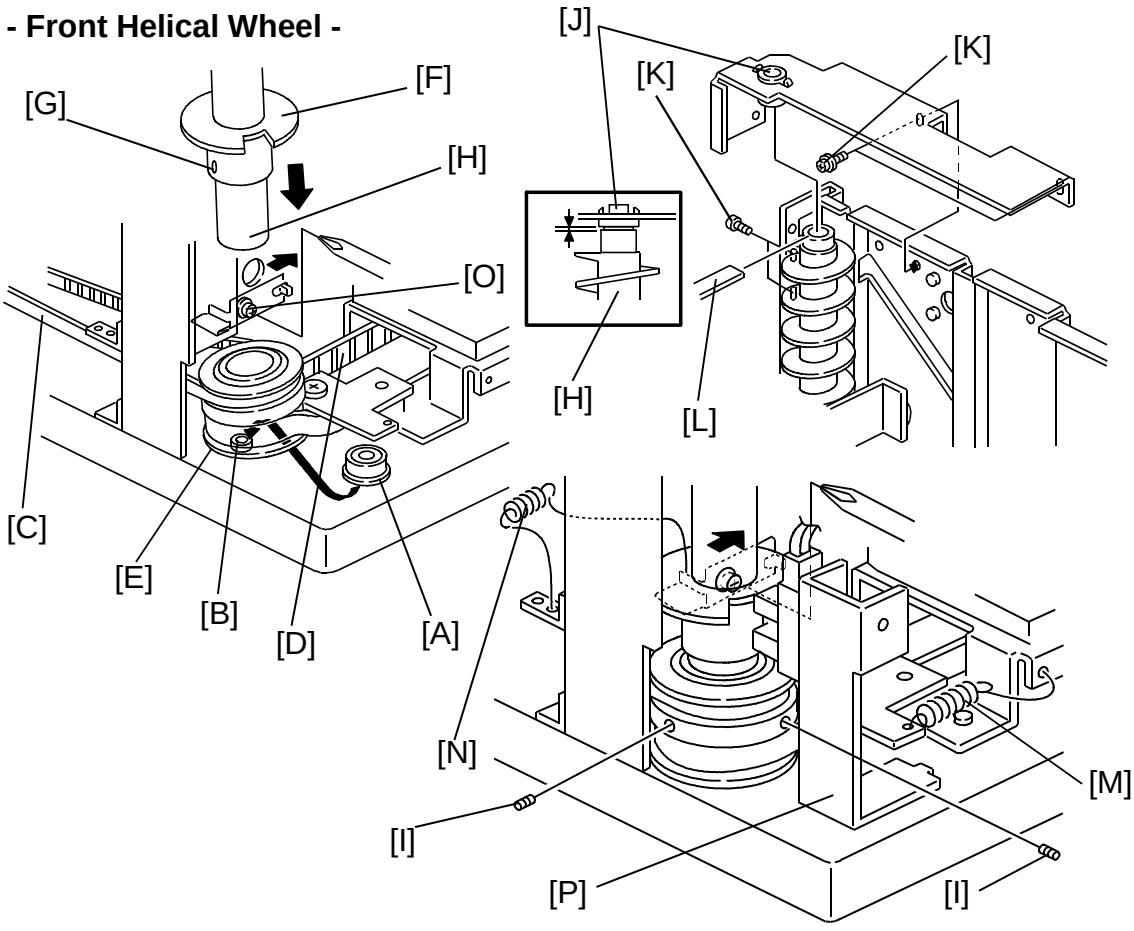
1. Place the bearing [A] on the notch [B] on the bottom plate then set the timing belt-426XL [C] around the pulley.
2. Set the helical wheel [D] into the pulley [E]. Leave the Allen screws [F] loosened.
3. Set the helical wheel [D] with the pulley [E] on the bearing [A].
4. Set the bracket with the bushing [G] on top of the helical wheel then install and slightly tighten the three screws [H].
5. Place a 0.4mm thickness gauge [I] between the helical wheel and the bushing [G] on the bracket. While holding the bushing down to the helical wheel, tighten the three screws [H].
6. Set the tension spring [J], then tighten screw [K].

- Rear Long Helical Wheel -



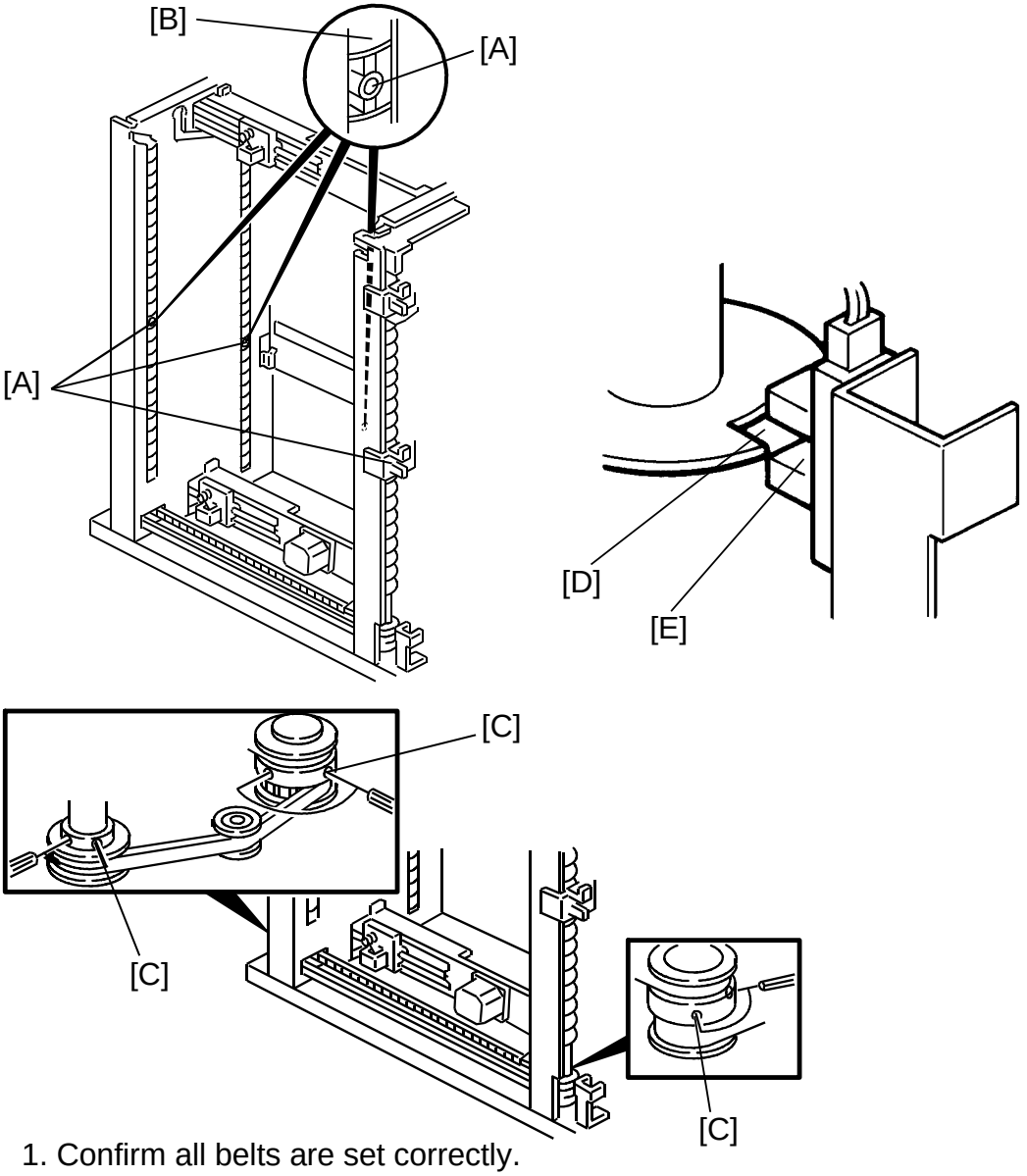
1. Place the bearing [A] on the notch on the bottom plate then set timing belt-426XL [B] and timing belt-918XL [C] around the pulley [D].
2. Set the helical wheel [E] into the pulley [D] then set the helical wheel on the bushing [A].
3. Set the bracket with the bushing [F] on top of the helical wheel then install and slightly tighten three screws [G].
4. Place a 0.4 mm thickness gauge [H] between the helical wheel [E] and the bushing [F] on the bracket. While holding the bushing down to the helical wheel, tighten the three screws [G].
5. Hook tension springs [I] and [J], then tighten screws [K] and [L].

- Front Helical Wheel -



1. Place the bearing [A] on the notch [B] on the bottom plate then set timing belt-918XL [C] and timing belt-300XL [D] around the pulley.
2. Set the pulley [E] on the bearing. The direction of the pulley should be as shown in the illustration.
3. Set the helical wheel in the wheel sensor actuator [F]. Leave the Allen screw [G] loosened.
4. Set the helical wheel [H] in the pulley [E]. Leave the Allen screws [I] loosened.
5. Set the bracket with a bushing [J] on top of the helical wheels then install and slightly tighten the four screws [K].
6. Place a 0.4 mm thickness gauge [L] between the helical wheel and the bushing on the bracket. While holding the bushing down to the helical wheel [H], tighten the four screws [K].
7. Hook tension springs [M] and [N] then tighten the screw [O].
8. Install the wheel sensor bracket [P].

- Alignment of the 3 Helical Wheels -



1. Confirm all belts are set correctly.
2. Align all holes [A] at the middle of the helical wheels at the center of the bin guide slots [B], as shown.
3. In this condition, tighten all Allen screws [C] on the helical wheel drive pulleys (2 Allen screws on each drive pulley).
4. In this condition, place the cut out [D] on the wheel sensor actuator under the wheel sensor [E] then tighten the Allen screw on the wheel sensor actuator.