

# TOSHIBA MJ-1015 MJ-1016

## LET'S "FINISH" THE COPY/ PRINT JOB (part III)

By **VLADIMIR KAMENOV**

*Continuation from the November issue*

### FINISHER UNIT BASIC OPERATION

#### FEED/DRIVE SYSTEM

#### D. JOB OFFSET

##### **1. Outline**

In the job offset mode, sort jobs and entire copy groups are shifted to the front for delivery to the tray, and other copies are delivered to the tray without a shift.

The copies are shifted by the alignment guide. The alignment guide is checked by the alignment home position sensor (PI6) to find out whether it is at the home position.

The finisher controller PCB drives the alignment motor (M3) at power-on to return the alignment guide to its home position.

The finisher controller PCB stops the delivery motor (M2) when the trailing edge of the copy has moved past feed roller 2. Then the finisher controller PCB rotates the delivery motor counterclockwise and drives the swing motor (M7). As a result, the drive of the delivery motor is transmitted to the swing guide to move up the guide.

When the swing guide open sensor (PI18) detects the swing guide, the delivery motor stops, and the swing guide is held at the up position. When the swing guide has moved up, the knurled belts attached to feed roller 2 move the copy to the stapling tray. The presence of paper on the stapling tray is monitored by the stapling tray sensor (PI4). (The first sheet is fed to the stapling tray while the swing guide is moving up.)

The finisher controller PCB drives the alignment motor (M3) in advance, and keeps the alignment guide in wait at a point 10 mm behind the trailing edge of a sheet. Whenever one sheet is moved to the stapling tray, each sheet is aligned, and when the fifth or last sheet in a sort job/group is fed to the stapling tray, the escape solenoid (SL6) moves the guide plate away and under the stapling tray. From then on, the alignment motor shifts the sheets to the front by 30 mm.

When the copy has been shifted, the finisher controller PCB rotates the alignment motor counterclockwise to move the alignment guide to a point 7 mm behind the trailing edge of the sheet. This alignment operation is repeated until alignment of the fifth or last sheet in a sort job is completed. At this time, the swing guide is moved down and is closed, and the delivery motor rotates clockwise to deliver the sheet.

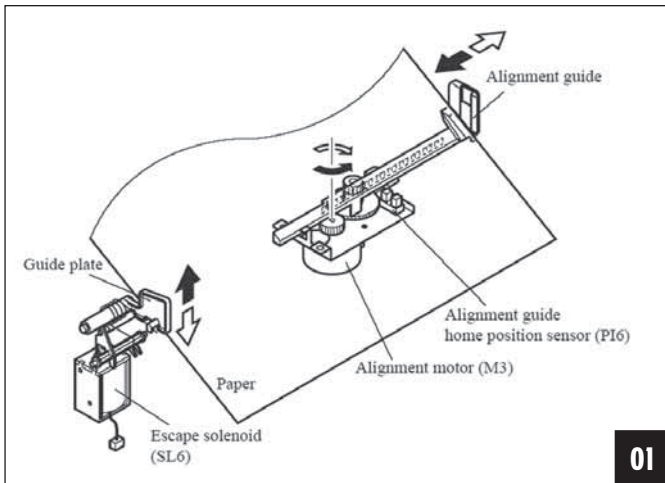


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#### **Contact:**

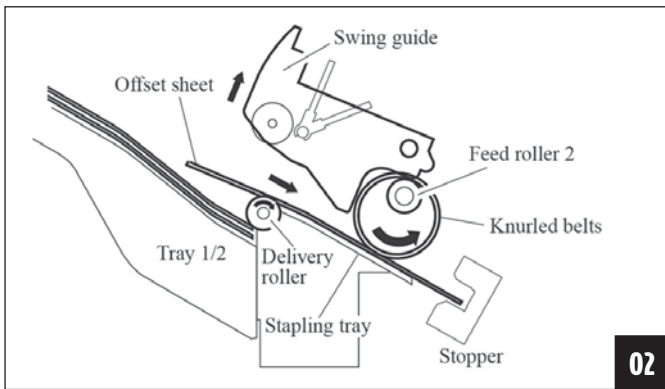
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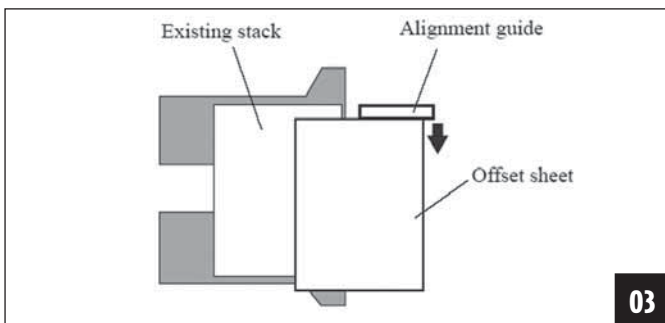
## 2. Flow of Job Offset Operations

1) The swing guide moves up and, at the same time, the knurled belts move the sheet to the stapling tray:



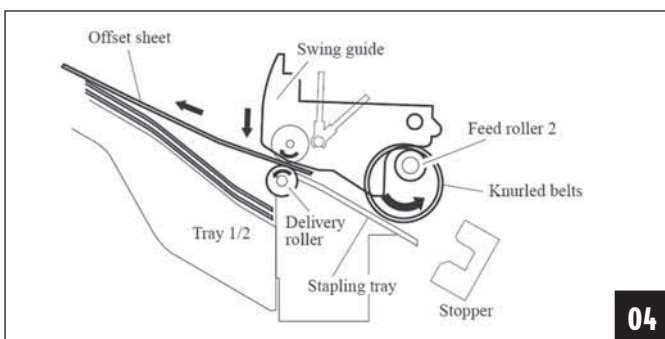
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2) The alignment guide shifts the sheet to the front:



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3) The swing guide moves down and, at the same time, the delivery roller delivers the sheet:

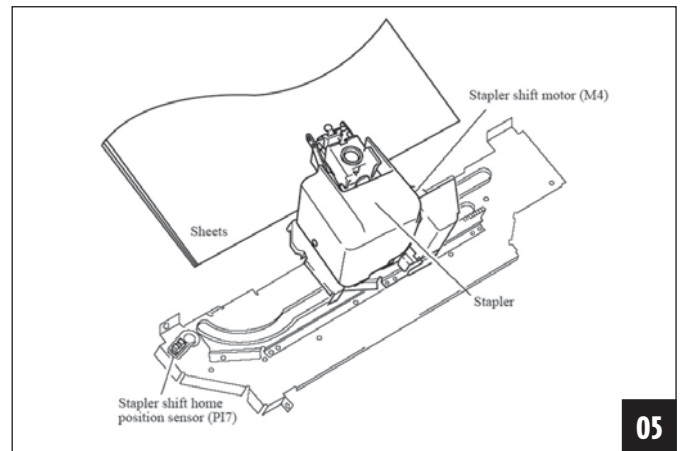


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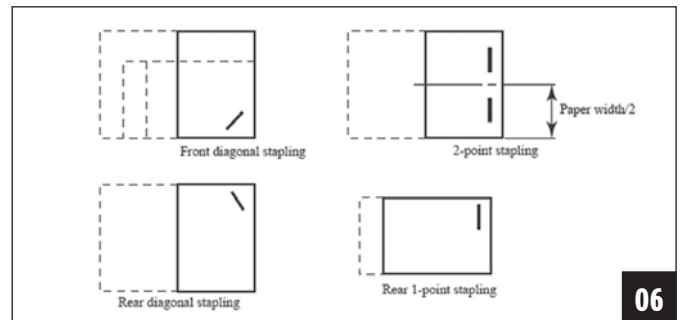
## E. STAPLING OPERATION

### 1. Outline

The stapler unit staples a stack of as many sheets as specified. The stapling position differs according to the selected staple mode and paper size. The stapler unit is checked by the stapler shift home position sensor (PI7) to find out whether it is at the home position. When starting operation after power-on, the finisher controller PCB drives the stapler shift motor (M4) to return the stapler unit to the home position. If the stapler is already at the home position, it is kept waiting as it is:



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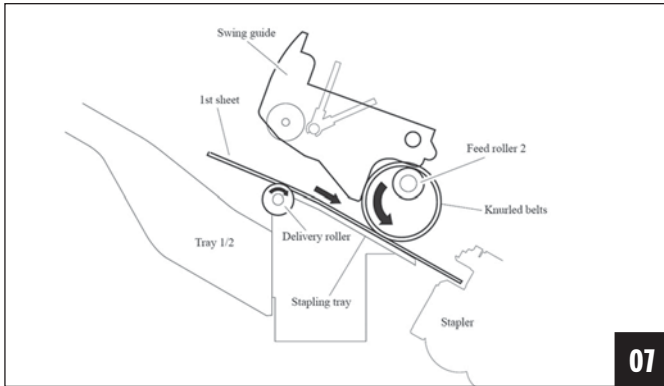
### 2. First Sheet

The finisher controller PCB stops the delivery motor (M2) as soon as the trailing edge of the first sheet has moved past feed roller 2. Then it rotates the delivery motor clockwise to switch the gear drive to the swing motor (M7), causing the swing guide to move up. When the swing guide open sensor (PI18) finds the swing guide at the up position, the swing motor stops, maintaining the swing guide at the up position.

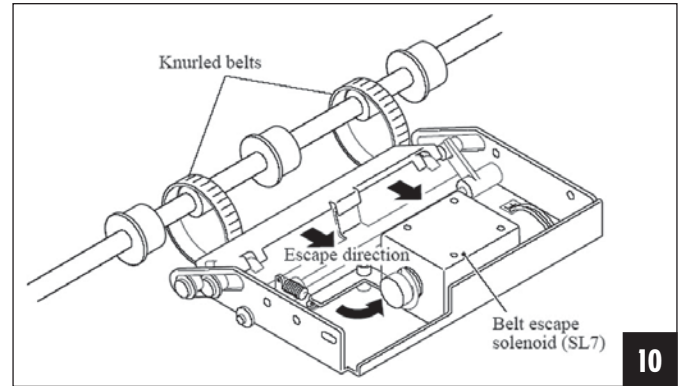
When the swing guide has moved up, the feed belts of feed roller 2 move the sheet to the stapling tray. (The first sheet is fed to the stapling tray while the swing guide is moving up.) The presence of paper on the stapling tray is detected by the stapling tray sensor (PI4).

The finisher controller PCB drives the alignment motor (M3) when the stapling tray sensor has detected paper to put sheets in order. The alignment plate is kept waiting in advance at a point 10 mm behind the trailing edge of the paper.

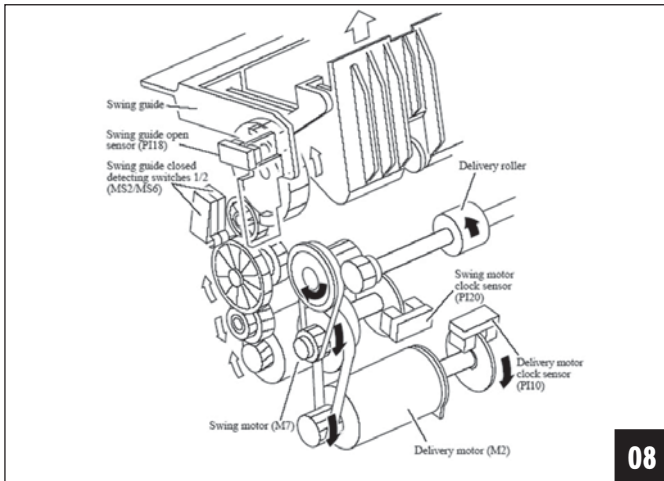
The swing guide is kept waiting at the up position until the last sheet is output onto the stapling tray:



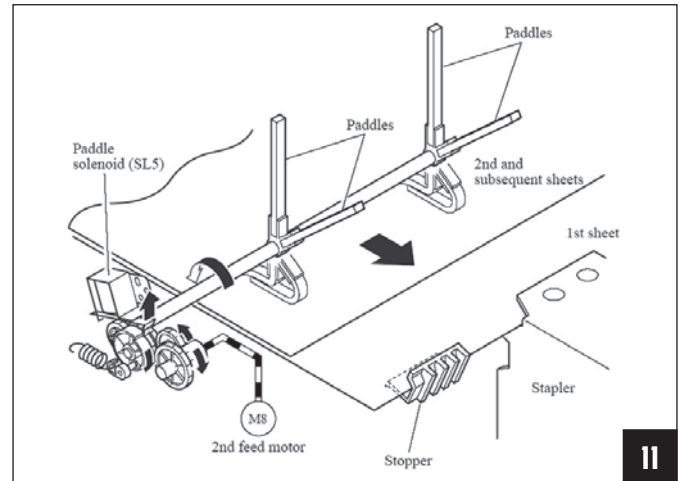
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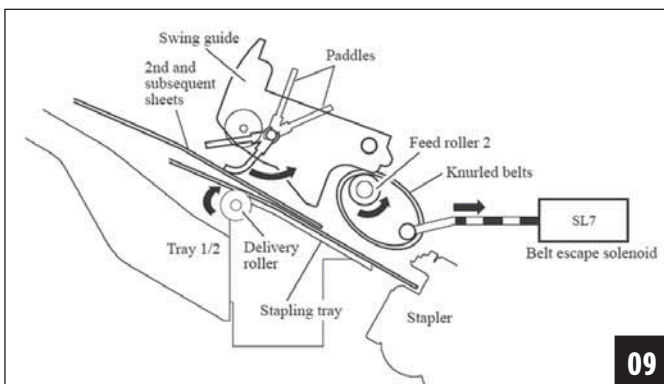
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### 3. 2nd and Subsequent Sheets

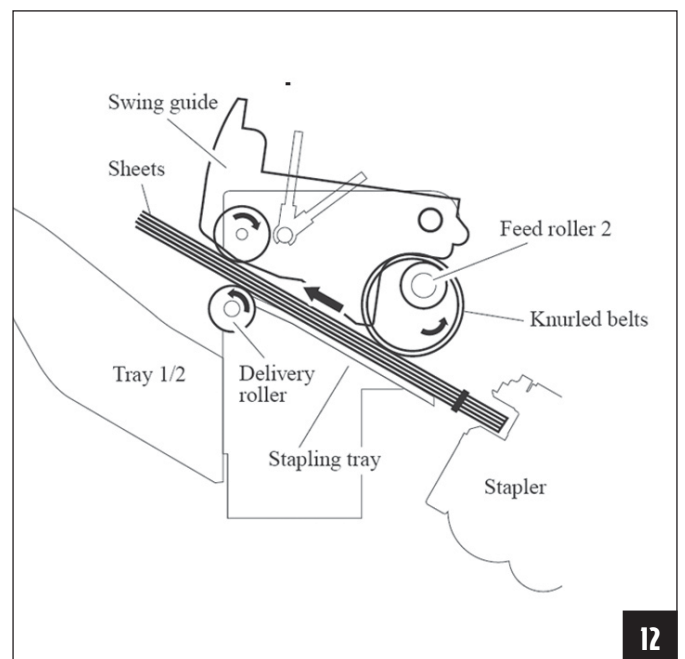
The finisher controller PCB turns on the belt escape solenoid (SL7) before the trailing edge of the second and subsequent sheets have moved past feed roller 2 to make the feed belt escape. This operation is performed to reduce the time it takes for the trailing edge of the paper to fall on the stapling tray, and to improve the product duty. The finisher controller PCB turns on the paddle solenoid (SL5) as soon as the trailing edge of the second and subsequent sheets have moved past feed roller 2, causing the drive of the second feed motor (M8) to rotate the paddle. The sheets are pushed by the paddle and moved to the stapling tray. Almost simultaneously with the trailing edge of the sheet falling into the stapling tray, the belt escape solenoid is turned off to return the feed belts that were in the escape position to their original position, and feed the sheet onto the stapling tray. When the sheet has been output onto the stapling tray, the finisher controller PCB rotates the alignment motor (M3) to put the sheets in order:

### 4. Last Sheet

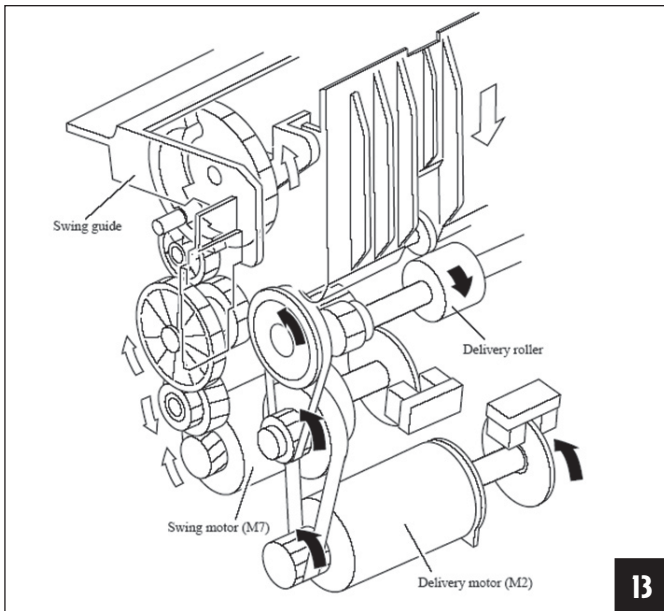
When the last sheet has been put in order, the finisher controller PCB turns on the alignment motor (M3) to move the alignment guide to the alignment position (to butt the guide against the stack). Then, the finisher controller PCB rotates the swing motor (M7) counterclockwise to move the swing guide downwards. The finisher controller PCB moves the stapler according to the staple mode for stapling. From then on, it rotates the delivery motor (M2) clockwise to deliver the stack to the tray:



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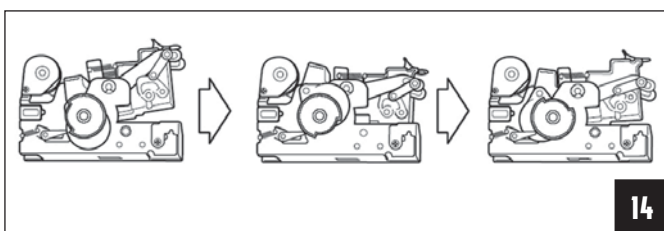


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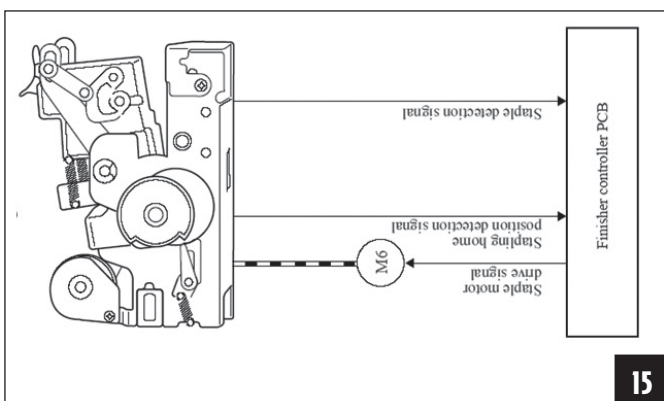
### F. Stapler Unit

Stapling is executed by the stapler motor (M6). A single rotation of the cam by the motor results in one stapling operation. The cam is checked by the stapling home position sensor (PI22) to find out whether it is at the home position.

The stapler motor is controlled by the microprocessor (Q1) on the finisher controller to enable it to be rotated clockwise or counterclockwise. When the stapling home position sensor is off, the finisher controller PCB rotates the stapler motor clockwise until the sensor is turned on so as to return the stapling cam to its initial state. The presence/absence of staples inside the staple cartridge is detected by the staple switch (MS8). The finisher controller PCB does not drive the stapler motor (M6) unless the swing guide closed detecting switch 2 (MS6) is on (i.e., the swing guide is closed). This is to guard against injuries that could occur when a finger is stuck inside the stapler:



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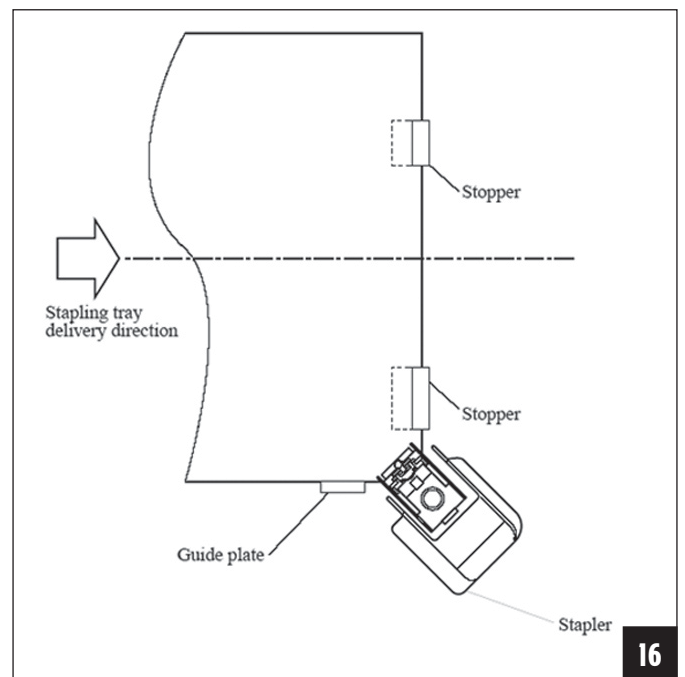


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### 5. Shifting the Stapler Unit

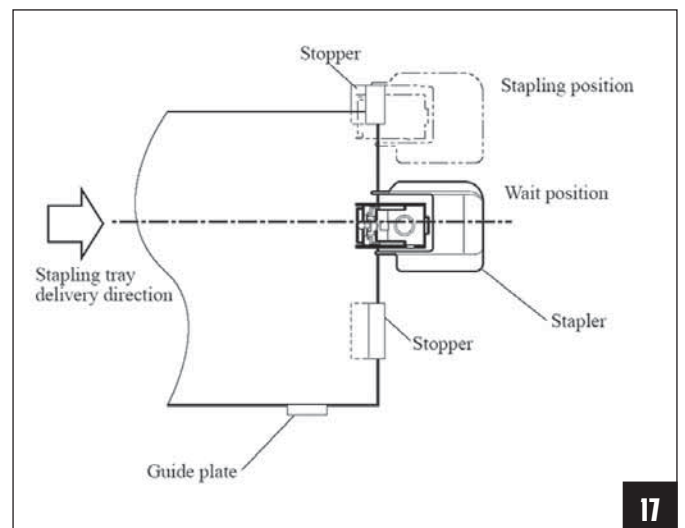
The stapler unit is moved by the stapler shift motor (M4). Its home position is detected by the stapler shift home position sensor (PI7). When the start signal arrives from the host machine, the stapler moves to the center of its movement range. This movement occurs regardless of the selected mode of delivery, as no specific mode is recognized at this point in time. When the command for stapling arrives from the host machine after the first sheet has reached the host machine pre registration sensor, the stapler moves to the staple wait position to suit the appropriate stapling position and paper size. See following figures for an idea of the waiting position according to the stapling mode:

A. Front Diagonal Stapling - the position is the same as the stapling position:



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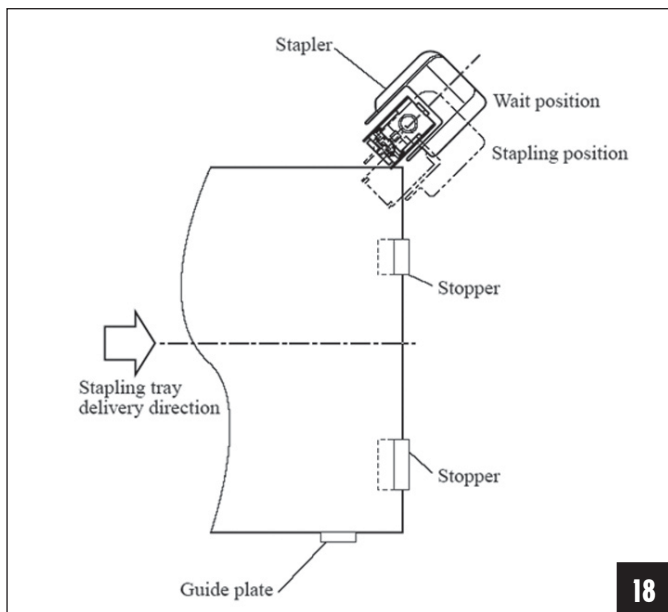
B. Rear 1-Point Stapling - the stapler is kept waiting at the center position. The stapler is moved to and from the stapling position for each stapling operation.



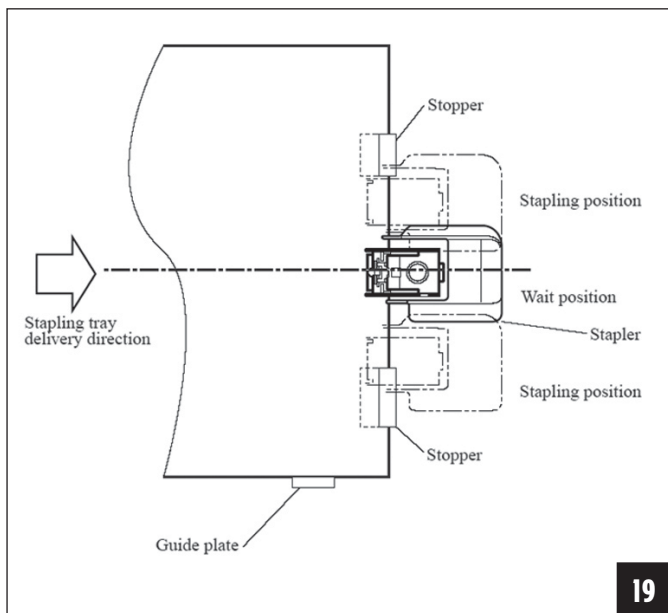
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**C.** Rear Diagonal Stapling - for LT and B5 sizes, the stapler is kept waiting toward the rear away from the stapling position. The stapler is moved to and from the stapling position for each stapling operation:



**D.** 2-Point Stapling -the stapler is kept waiting at the center of paper. Stapling occurs at two points, first at the rear and then at the front:



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