TOSHIBA MJ-1015 MJ-1016 FINISHERS – LET'S "FINISH" THE COPY/PRINT JOB (part IV)

By **VLADIMIR KAMENOV**

Continuation from the December issue

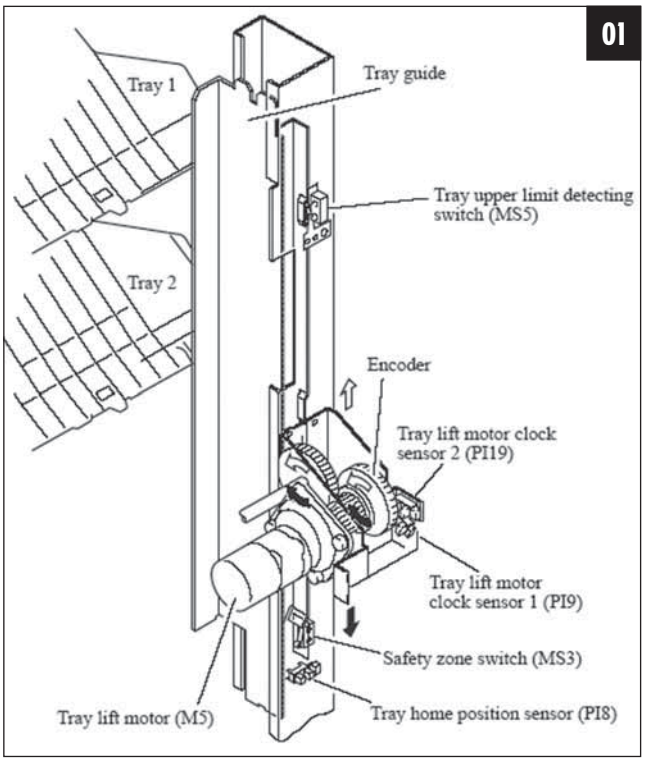
FINISHER UNIT BASIC OPERATION

FEED/DRIVE SYSTEM

G. TRAY OPERATION

The finisher has two delivery trays for normal delivery, each accepting sheets.

Each tray is moved up and down by the tray lift motor (M5). The position of tray is identified with reference to the number of clock pulses of the tray lift motor clock sensor 1/2 (PI9/PI19) coming from the tray home position sensor (PI8). The finisher controller PCB finds out in which direction (up or down) the tray is moving based on combinations of pulses from the two clock sensors. The finisher controller PCB drives the tray lift motor (M5) to return the tray to the home position at power-on. If the tray is already at the home position, it is kept waiting as it is. The finisher controller PCB moves up and down the tray selected by the host machine so that it is positioned at the delivery slot. The upper limit of the tray is detected by the tray upper limit detecting switch (MS5). The finisher controller PCB stops the drive (up) of the tray lift motor (M5) as soon as the tray upper limit detecting switch is turned on.



The height of the stack on the tray is identified by the height sensor (PS1), which measures its distance from the top of the stack. The tray is moved down when the distance between the top of the stack and the delivery assembly drops to a specific measurement.

The finisher controller PCB cuts off the +24V power of the tray lift motor (M5) as soon as the safety zone switch (MS3) is turned on while the shutter and the swing guide are open, stopping the operation of the finisher:

Eng. Vladimir Kamenov, PhD

Vladimir Kamenov, PhD, *is a specialist in maintenance of various models of Toshiba copiers. He holds a master's degree in Precision Mechanics and a PhD degree in Applied Mechanics. His work experience includes part-time and full-time jobs as service engineer. He also lectures at the Sofia Technical University, Precision Mechanics Department, Office Equipment Specialty.*

Contact:

Email:
vladokamenov@tu-sofia.bg
Tel.: +359887730384

H. DETECTING THE HEIGHT OF STACK ON THE TRAY

1. Outline

The number of sheets delivered to the tray and the number of sets (number of stapling operations) are stored in memory by the finisher controller PCB. The height of the stack is checked by the height sensor (PS1). See the table for the maximum loading capacity of each tray. The finisher controller PCB stops its operation when the conditions in the table occur, informing the host machine that the tray is full:

Stacking-mode	Non-staple sort			Staple sort		
Tray	Small-size	Large-size	Mixed sizes	Small-size	Large-size	Mixed sizes
Tray 1	147 mm high (1000 sheets)	74 mm high (500 sheets)	74 mm high (500 sheets)	110 mm high (750 sheets/ 50 sets)	74 mm high (500 sheets/ 50 sets)	74 mm high (500 sheets/ 50 sets)
Tray 2	147 mm high (1000 sheets)	74 mm high (500 sheets)	74 mm high (500 sheets)	110 mm high (750 sheets/ 50 sets)	74 mm high (500 sheets/ 50 sets)	74 mm high (500 sheets/ 50 sets)

Note 1:

1. The capacity for the non-staple sort mode is approximate and computed based on 80 g/m2 paper.
2. Alignment for stacks containing of 750 sheets or more is not guaranteed.
3. Stacking height precision is ±7 mm.

Note 2:

1. The term "small-size" stands for A4, A5-R, B5, LT, ST-R.
2. The term "large-size" stands for A3, B4, A4-R, B5-R, LD, LG, LT-R, FOLIO, COMPUTER.

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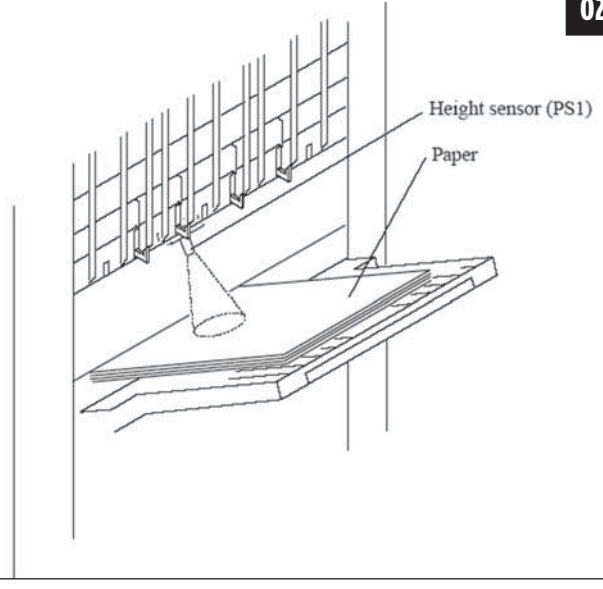

I. Shutter Operation

Before the tray on which sheets are output is shifted by the tray lift motor (M5) to another tray, the finisher controller PCB closes the shutter mounted on the delivery slot before moving the tray, protecting the existing stack on the tray from the delivery slot and intrusion of hands. The shutter moves up (to close) when the second feed motor (M8) rotates counterclockwise, and is held in position when the motor stops. When the second feed motor rotates counterclockwise once again, it moves down (to open) to enable delivery. When the shutter is held at the up position, claws slide out of the swing guide to engage the back of the shutter. This way, the existing slack and the swing guide engage while the tray is moved, preventing the guide from opening. The claws slide in when the shutter is moved down to release the engagement. The upward movement of the shutter is monitored by the shutter closed detecting switch (MS4), and the downward movement is monitored by the shutter open sensor (PI5).
See the following diagrams for how these operations take place:

1) The second feed motor rotates counterclockwise to move the shutter up:

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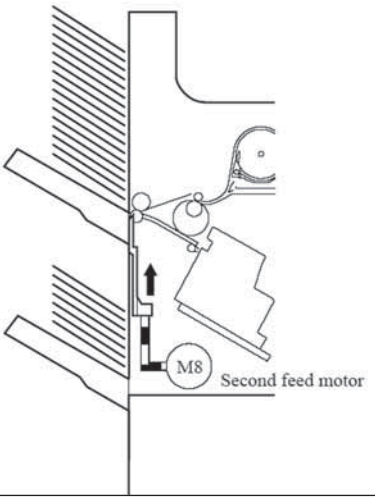

2) The tray lift motor rotates and the new tray moves to the stacking lower limit. The distance of movement is detected by the tray lift motor clock sensor 1/2 (PI9/PI19):

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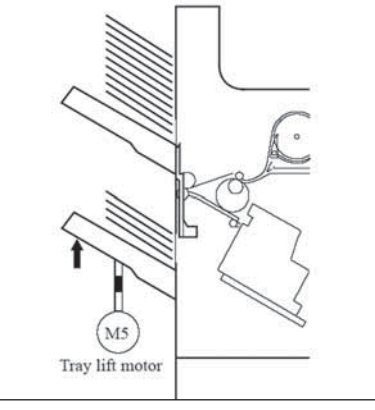
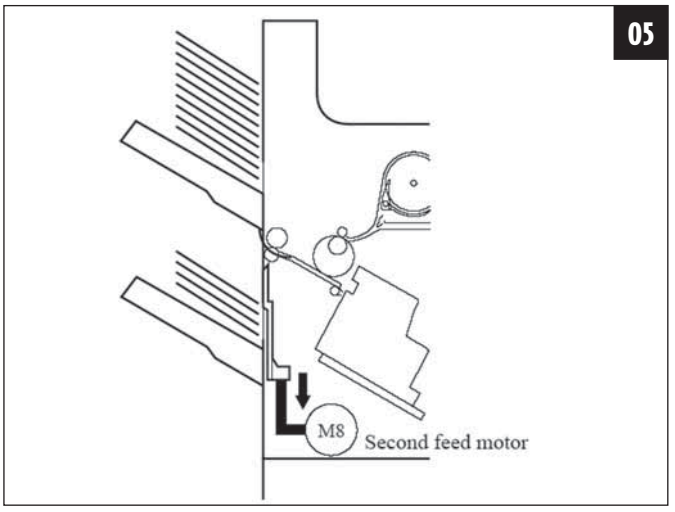
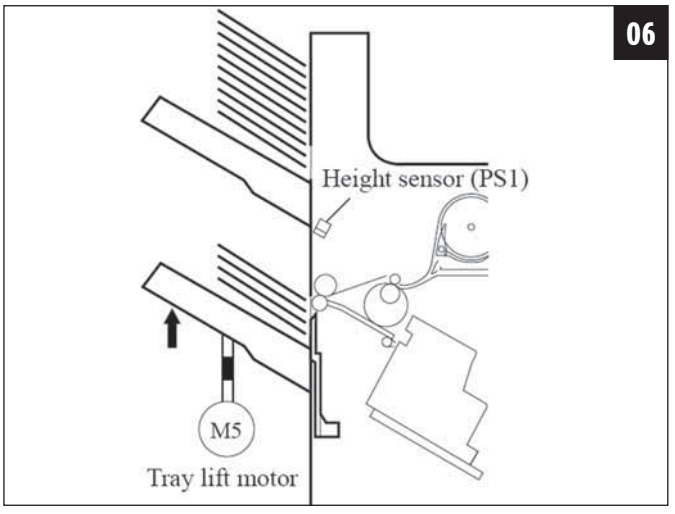
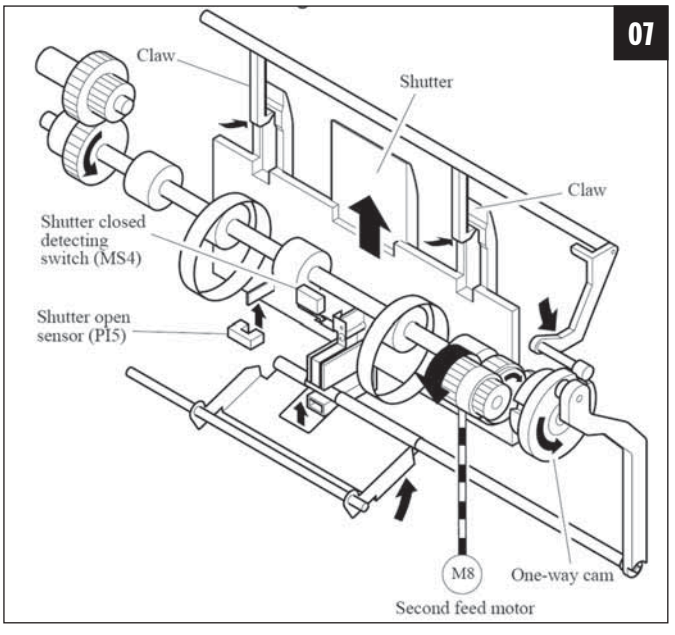


3) The second feed motor rotates counterclockwise and the shutter moves down:



4) The tray lift motor rotates and the tray moves to suit the height of the stack. The appropriate height in relation to the existing stack is checked by the height sensor (PS1):



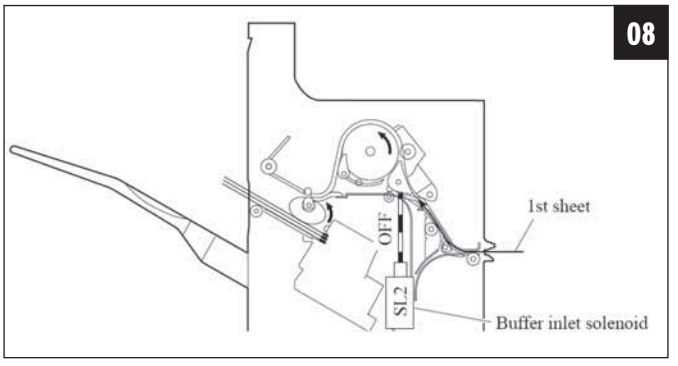


J. BUFFER PATH OPERATION

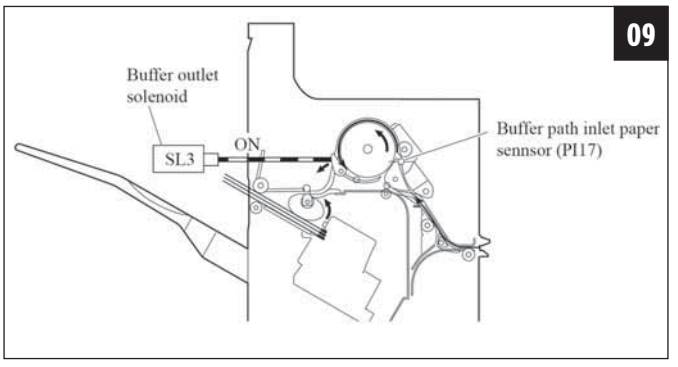
1. Outline

This machine is provided with a buffer paper path for continuously receiving paper from the host machine during stapling and job offset operation on the stapling tray. A maximum of three copies (three originals or more in the stapling mode) are wrapped around the buffer roller. During this time, job offset and stapling are performed on the stapling tray. The following shows operation on the buffer paper path:

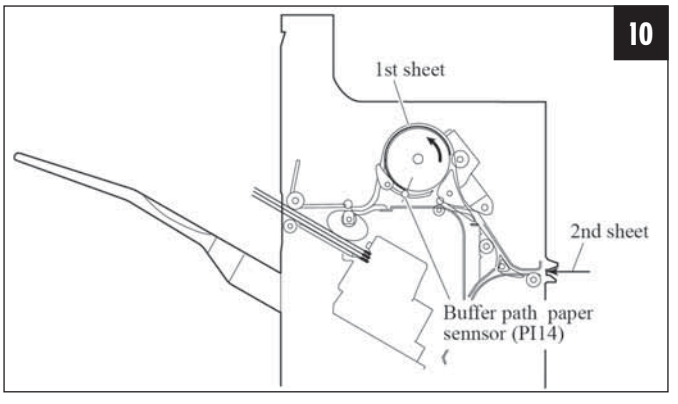
1) When the first sheet arrives, the buffer inlet solenoid (SL2) remains off. The first sheet enters the buffer path:



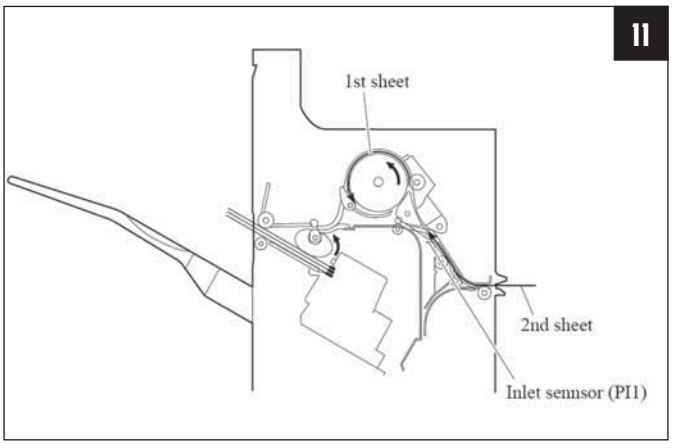
2) When the leading edge of the sheet has moved past the buffer path inlet paper sensor (PI17), the buffer outlet solenoid (SL3) is turned on so as to cause the sheet to wrap around the buffer roller:



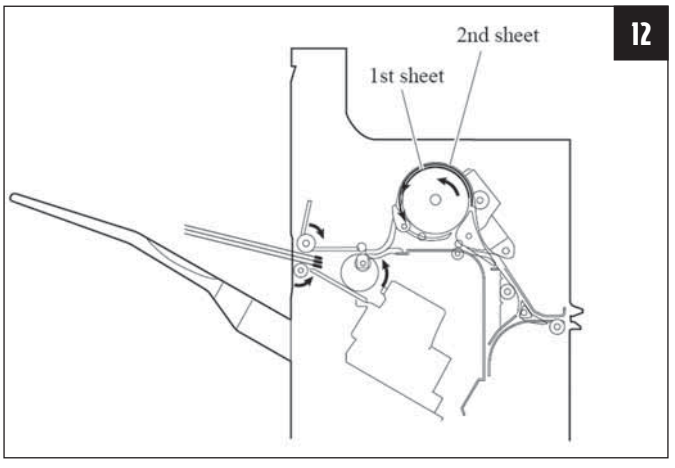
3) When the leading edge of the sheet has moved past the buffer path paper sensor (PI14), the buffer roller stops and waits for the second sheet:



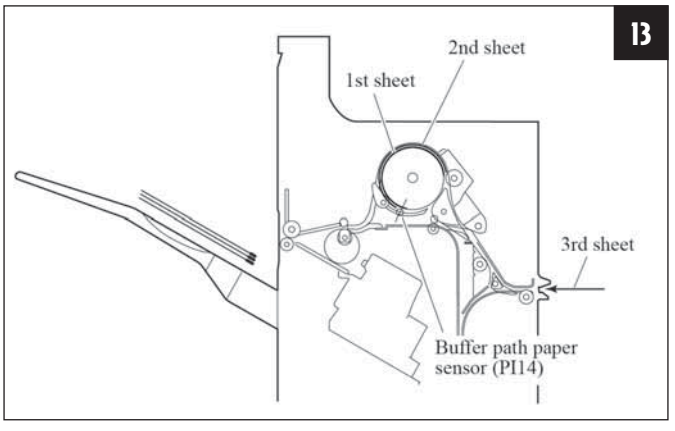
4) When the second sheet arrives and its leading edge reaches the inlet sensor (PI1), the buffer roller starts to operate once again:



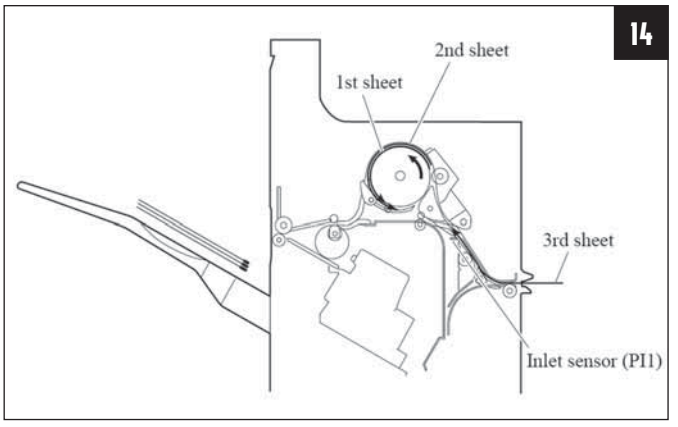
5) The buffer roller continues to rotate, and the second sheet overlaps the first sheet:



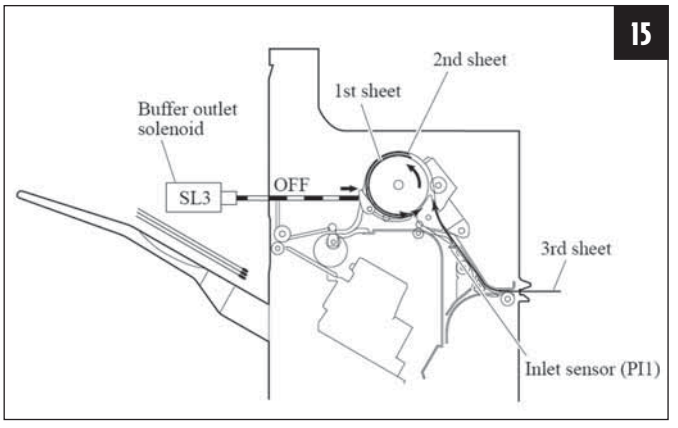
6) When the trailing edge of the second sheet has moved past the buffer path paper sensor (PI14), the buffer roller stops and waits for the third sheet:



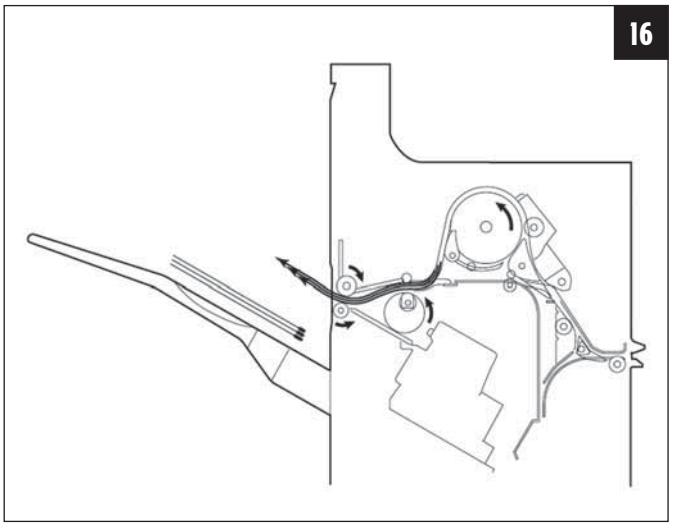
7) When the third sheet arrives and its leading edge reaches the inlet sensor (PI1), the buffer roller starts to operate once again:



8) When the leading edge of the third sheet reaches the inlet sensor (PI1), the buffer outlet solenoid (SL3) goes off so that the path is directed in the direction of delivery. (The actual switchover will occur after the trailing edge of the first sheet has moved past the flapper):



9) The buffer roller continues to rotate, the third sheet overlaps the first and second sheets, and the three sheets are fed together towards the delivery roller:



In our next articles you will find the continuation of the present series of articles. The new articles will be discussing the saddle stitch and punch units theory of operation and mechanical construction. RCE