

MAILBOX UNIT FOR LASER PRINTER SERVICE MANUAL

MODEL:MX-2001 / MX-2002 / MX-2003

Note:

While the MX-2001 Mailbox unit is available in all countries, the MX-2003 is available in U.S. and Canada only, and the MX-2002 is available in the other countries than U.S. and Canada.

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PREFACE

This service manual contains basic information required for after-sales service of the optional Mailbox unit, MX-2001/MX-2002/MX-2003 for the HL-2060 laser printer (hereinafter referred to as "this unit" or "the Mailbox unit"). This information is vital to the service technician to maintain the high performance of the unit.

This service manual covers the MX-2001 / MX-2002 / MX-2003 Mailbox units.

The manual consists of the following chapters:

CHAPTER I: GENERAL

General view, specifications, etc.

CHAPTER II: THEORY OF OPERATION

Basic operation of the electrical system and the mechanical system

CHAPTER III: DISASSEMBLY

Procedures for disassembling the mechanical system.

CHAPTER IV: TROUBLESHOOTING

Reference values and adjustments, troubleshooting malfunctions, etc.

APPENDICES: PCB CIRCUIT DIAGRAMS, ETC.

Information in this manual is subject to change due to improvement or re-design of the product. All relevant information in such cases will be supplied in service information bulletins (Technical Information).

A thorough understanding of this unit, based on information in this service manual and service information bulletins, is required for maintaining its performance and for improving the practical ability to find the cause of problems.

CONTENTS

C	HAP1	TER I	GENERAL	I-1	
1.	INSTE	RUCTIO	ONS	I-1	
2.	OVER	RVIEW.		I-2	
3	SPEC	IFICAT	TIONS	1-3	
Ο.			5		
			and Mechanical		
C	HAP1	ER II	THEORY OF OPERATION	II-1	
1.	FI F	CTRON	IICS	II-1	
	1.1		al Block Diagram		
	1.2		PCB		
		1.2.1	CPU		
		1.2.2	Bin solenoid drive circuit		
		1.2.3	Entrance solenoid drive circuit	II-3	
		1.2.4	Bin capacity sensor	II-4	
		1.2.5	Infrared LED drive circuit	II-4	
		1.2.6	Power supply LED drive circuit		
	1.3	I/F PC	B		
		1.3.1	Regulator		
		1.3.2	Serial I/F circuit		
		1.3.3	Feeding motor drive circuit		
	1 1	1.3.4	Entrance sensor input		
	1.4 Sensor PCB				
		1.5 Power supply LED PCB			
_	1.6		nunication with the Printer		
2.	MECHANICSII-7				
	2.1 General Overview of Mechanism				
	2.2	2.2 Paper Feed SequenceII-8			
C	HAP1	ER III	DISASSEMBLY AND REASSEMBLY	III-1	
1.	SAF	ETY PR	RECAUTIONS	III-1	
2.	DISA	DISASSEMBLY FLOW			
3.	DISASSEMBLY PROCEDUREIII-				
	3.1	Extern	nal Covers	III-3	
		3.1.1	Cover UR (For MX-2001/2003 only)		
		3.1.2	Cover UL (For MX-2001/2003 only)		
		3.1.3	Cover R	III-4	
		3.1.4	Cover L		
		3.1.5	Rear Cover U ASSY (For MX-2001/2003 only)	III-5	
		3.1.6	Rear Cover A ASSY	III-7	

		3.1.7	PCB Cover A (MX-2001) / PCB Cover B (MX-2002) / PCB Cover D (MX-2003 Up Unit)				
		3.1.8	Bin				
	3.2		e the Main Frame Unit from the Under Frame Unit (For MX-2001/2003 only				
	3.3	Main Frame UnitIII-10					
	0.0	3.3.1	I/F PCB A ASSY (MX-2001) / I/F PCB B ASSY (MX-2002) / I/F PCB C ASSY (MX-2003) / I/F PCB D ASSY (MX-2003) Upper Unit)	X-2003			
		3.3.2	Feeding Motor ASSY				
		3.3.3	Main PCB A ASSY (MX-2001, MX-2003 Lower Unit) / Main PCB B ASSY (MX-2003 Upper Unit)	002,			
		3.3.4	Solenoid A/B & LED PCB ASSY (MX-2001/2003 only)				
		3.3.5	Sensor PCB ASSY				
		3.3.6	Actuator A/B				
		3.3.7	Eject Roller ASSY / Feed Rollers A/B ASSY	III-17			
		3.3.8	Eject Pinch Roller ASSY & Discharging Brush	III-19			
	3.4	Under F	Frame Unit (For MX-2001/2003 only)	III-20			
		3.4.1	Actuator U	III-20			
		3.4.2	Solenoid U	III-21			
		3.4.3	Photo Interrupter	III-21			
		3.4.4	Feed Roller U ASSY	III-22			
		3.4.5	Flap U	III-23			
	3.5	Remove	e the Upper Unit from the Lower Unit (For MX-2003 only)	III-24			
	3.6	Packing	g of MX-2003	III-28			
4.	APPL	.ICATIO	N OF GREASE	III-29			
	4.1	Rollers		III-29			
		4.1.1	Feed Roller A/B ASSY	III-29			
		4.1.2	Eject Roller ASSY	III-29			
		4.1.3	Feed Roller U ASSY	III-30			
		4.1.4	Pressure Roller / Pressure Roller U	III-30			
	4.2	Gears		III-31			
		4.2.1	Gears on the Main Frame R	III-31			
		4.2.2	Gears on the Main Frame L	III-31			
		4.2.3	Gears on the Frame UR	III-32			
	4.3	Others		III-32			
CI	HAPT	ER IV	TROUBLESHOOTING	IV-1			
1.	INITIA	AL CHE	CK	IV-1			
2.	. MTBF / MTTR						
3.	TROU	JBLESH	HOOTING	IV-3			
Δ.	DDEN	DICES					
				Λ 1			
	MAIN PCB CIRCUIT DIAGRAM (1/2)						
	MAIN PCB CIRCUIT DIAGRAM (2/2)						
კ.	I/F PCB CIRCUIT DIAGRAM						

CHAPTER I GENERAL

1. INSTRUCTIONS

The MX-2001/2002/2003 Mailbox units are optionally installed onto the HL-2060 printer. The MX-2001 Lower Mailbox unit consists of five bins. The MX-2002 Upper Mailbox unit is additionally installed onto the MX-2001, and also consists of five bins. The MX-2003 Mailbox unit consists of ten bins.

Note: While the MX-2001 Mailbox unit is available in all countries, the MX-2003 is available in U.S. and Canada only, and the MX-2002 is available in the other countries than U.S. and Canada.

The unit works as a **stacker**, **sorter** and **mailbox** for the printer. See the table below for each function.

Function	Description
Stacker	Printed paper is ejected into the multiple bins behaving as a single high-capacity tray.
Sorter	Printed paper is ejected as a set for a print job into a bin when multiple sets of documents are printed and collated.
Mailbox	Printed paper is ejected into the specific bin defined as your own mail box.

When you install the unit onto the printer, the printed paper is ejected to the output tray of the printer and/or the bin(s) of the Mailbox unit by selection commands sent from the printer.

2. OVERVIEW

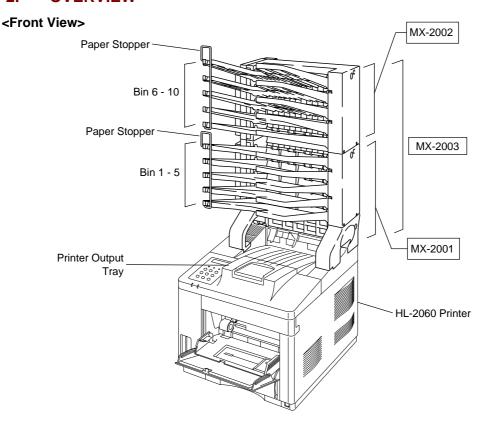


Fig. 1.1

<Rear View>

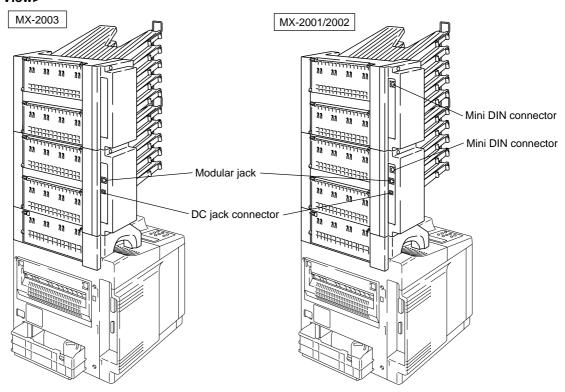


Fig. 1.2

3. SPECIFICATIONS

3.1 Function

(1) Stacking direction

Face down

(2) Feeding speed (when feeding A4 size paper)

Printer Mode	When the paper is ejected into multiple bins	When the paper is ejected continuously into a single bin
20ppm mode	18 ppm	20 ppm
10ppm mode	9 ppm	10 ppm

(3) Bin capacity

Normal mode: 100 sheet/bin Big stacker mode*: 300 sheet/bin

3.2 Electrical / Mechanical

(1) Power source

AC 100 to 240V, 50Hz/60Hz

(2) Power consumption

Printing: 25W or less (when MX-2001 is installed.)

45W or less (when both MX-2001 and MX-2002, or MX-2003 are

installed.)

Stand-by: 15W or less (when MX-2001 is installed.)

20W or less (when both MX-2001 and MX-2002, or MX-2003 are

installed.)

(3) Temperature

Operating: 10 to 32.5°C (50 to 90.5°F) Storage: 0 to 40°C (38 to 104°F)

(4) Humidity

Operating: 20 to 80% (non condensing) Storage: 10 to 85% (non condensing)

(5) Dimensions

MX-2001: 354 (W) x 356 (D) x 411 (H) mm MX-2002: 354 (W) x 356 (D) x 337 (H) mm MX-2003: 354 (W) x 356 (D) x 617 (H) mm

(6) Weight

MX-2001: Approx. 5.2 kg
MX-2002: Approx. 4.1 kg
MX-2003: Approx. 9.3 kg

^{*} When bins #2, #4, #7 and/or #9 are removed, bins #1, #3, #6 and/or #8 bin(s) as big stacker bins with a capacity of 300 sheets each.

3.3 Paper

(1) Paper type

Cut sheet

Normal paper / Specific recycled paper *Special paper is not included.

(2) Feedable paper weight $60 \sim 90 \text{ g/m}^2 (16 \sim 24 \text{lb.})$

(3) Feedable paper thickness $0.075 \sim 0.12 \text{ mm}$

(4) Paper size

A4, Letter, Executive, ISO B5

(5) Recommended paper

Xerox 4200 (For U.S.) / RANK Xerox 80 g/m² Premier paper (For Europe)

CHAPTER II THEORY OF OPERATION

1. ELECTRONICS

1.1 General Block Diagram

<MX-2001 & MX-2002>

The MX-2001 Mailbox unit is operated according to signals sent from the printer by serial communication. The MX-2001 and MX-2002 also communicate with each other by serial communication. Refer to Fig. 2.1 which shows the general block diagram of the MX-2001 and MX-2002.

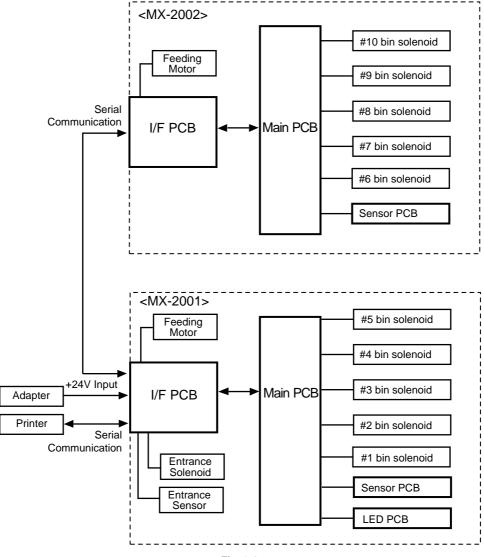


Fig. 2.1

Note:

The following parts and circuits are not fitted on the PCBs in the MX-2002. <Main PCB>

- Entrance solenoid circuit
- LED PCB circuit

<I/F PCB>

- Entrance sensor circuit
- DC jack connector for the adapter
- · Modular jack connection to the printer

<MX-2003>

The electronic system of the MX-2003 is basically the same with the one of MX-2001/2002. Refer to Fig. 2.2 which shows the general block diagram of the MX-2003.

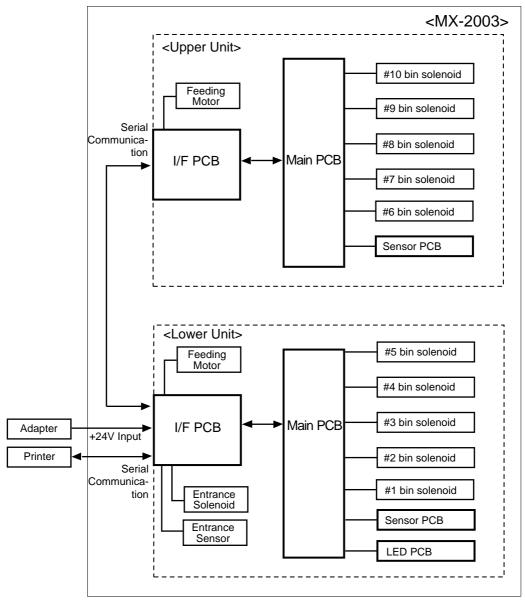


Fig. 2.2

1.2 Main PCB

Fig. 2.2 shows the block diagram of the main PCB.

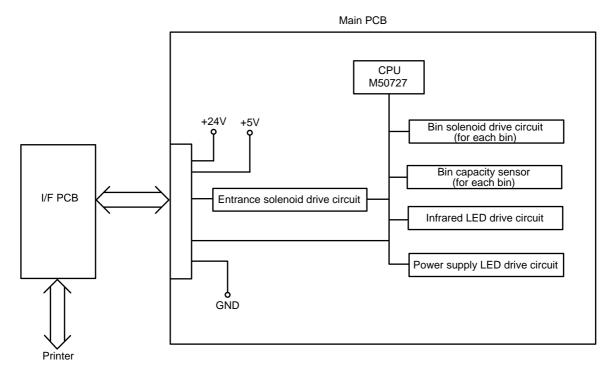


Fig. 2.2

1.2.1 CPU

The CPU M50727 is a 4 bit one-chip microcomputer which controls the Mailbox unit and communicates with the printer using serial communications. According to the commands from the printer, the CPU drives the feeding motor and the solenoid of each bin and then feeds the paper to the specified bin. If it detects paper full in the specified bin, the CPU sends the signal to the printer.

1.2.2 Bin solenoid drive circuit

The bin solenoid drive circuit drives the solenoid of each bin which controls the diverter flap to send the paper to each bin. The diverter flap is opened when the solenoid is energized and the flap is closed when the solenoid is de-energized. Each drive circuit for each of the five bins works independently.

This circuit provides a constant current drive to the solenoid. The solenoid is driven at 600mA for 200msec when it is first energized and then it is held by being driven at 150mA.

1.2.3 Entrance solenoid drive circuit

The entrance solenoid drive circuit drives the solenoid which controls the flap to switch the paper eject tray from the printer to the Mailbox unit. It is the same as the bin solenoid drive circuit and connected to the entrance solenoid through the I/F PCB.

1.2.4 Bin capacity sensor

The bin capacity sensors, which are five infrared LEDs, detect whether the bin is full or not.

The infrared sensor output generated from the sensor PCB is shut off when the bin is full of paper. The CPU recognizes that the bin is full when the infrared sensor output is shut off for 20 seconds.

These sensors also detect paper jams. When paper is ejected into the bin, the sensor is covered temporarily by the actuator. The CPU recognizes that a paper jam has occurred when the sensor has not cleared after a specified time has passed.

1.2.5 Infrared LED drive circuit

The infrared LED drive circuit drives the five infrared LEDs on the sensor PCB. This drive circuit is controlled by the CPU.

1.2.6 Power supply LED drive circuit

The power supply LED drive circuit drives the power supply LED when the regulated DC power, +24V, is supplied when the adapter is connected and plugged in.

1.3 I/F PCB

Fig. 2.3 shows the block diagram of the I/F PCB.

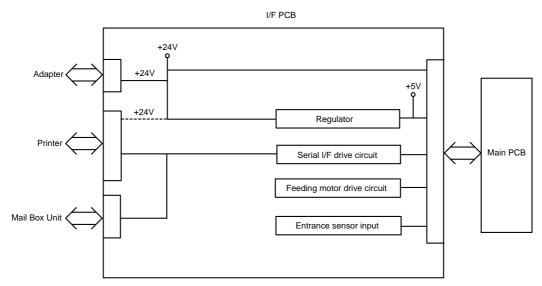


Fig. 2.3

1.3.1 Regulator

The regulator generates and supplies the +5V logic power supply from the +24V supplied by the adapter.

If the adapter is not connected, the regulator generates the +5V logic power supply from the +24V supplied by the printer. In this case, the +24V supplied by the printer is not connected with the +24V supply that should be provided to the Mailbox unit from the adapter.

1.3.2 Serial I/F circuit

The serial interface circuit transmits and receives data to and from the printer.

1.3.3 Feeding motor drive circuit

The feeding motor drive circuit drives the motor which feeds the paper in the Mailbox unit according to the signals from the CPU.

1.3.4 Entrance sensor input

The entrance sensor which is connected with the CPU detects whether the paper is fed into the Mailbox unit or not.

1.4 Sensor PCB

The five infrared LEDs are mounted on the sensor PCB to detect whether the bin is full or not. The sensor PCB is controlled according to signals from the CPU.

1.5 Power supply LED PCB

The LED which turns on when the +24V is supplied from the adapter is mounted on the power supply LED PCB.

1.6 Communication with the Printer

A 3-line clock synchronous serial interface is used for communication between the Mailbox unit and the printer.

The diagram below describes the timing of communications.

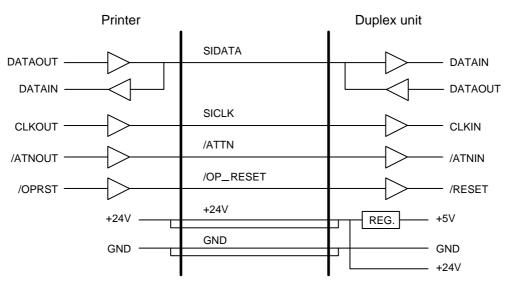
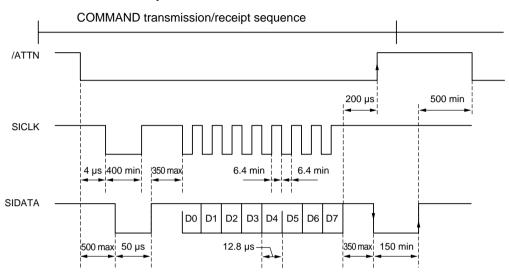
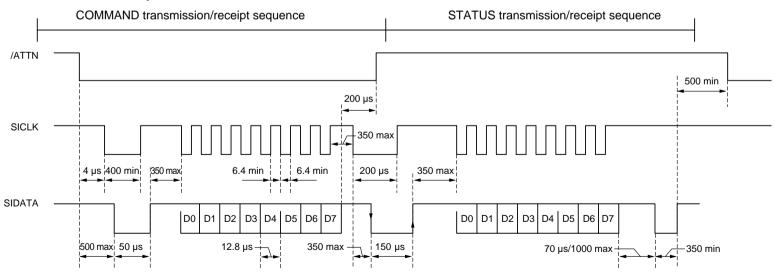


Fig. 2.4

• Without a STATUS request



• Within a STATUS request



2. MECHANICS

2.1 General Overview of Mechanism

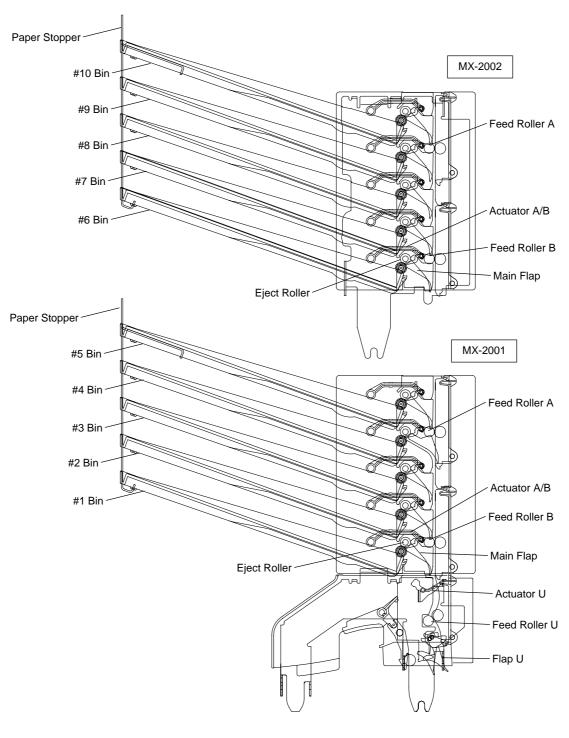


Fig. 2.5

Note:

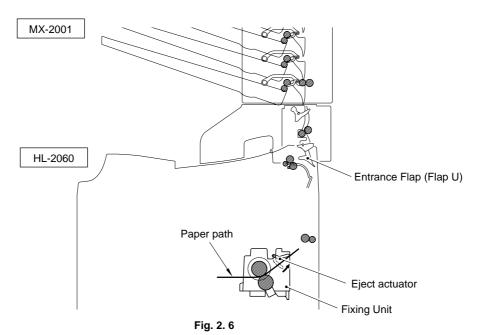
The mechanical system of the MX-2003 is the same with the one of MX-2001/2002.

2.2 Paper Feed Sequence

This section describes the sequence when paper is fed from the printer to #1 bin as an example.

(1) When the paper is sensed at the eject actuator in the fixing unit, the printer specifies which bin of the Mailbox unit the paper is to be ejected to and sends the command to start the operation of the Mailbox unit. (Refer to Fig. 2.6.)

When the Mailbox unit receives the command, it drives the feeding motor and starts the timer to open the entrance flap (flap U).



(2) While the paper is being fed towards the entrance flap, the Mailbox unit starts driving the entrance solenoid (solenoid U) and turns on the entrance flap so that the paper is fed to the Mailbox unit. (Refer to Fig. 2.7.)

If the entrance sensor has not turned on after a specified time has passed, it detects that a paper jam has occurred.

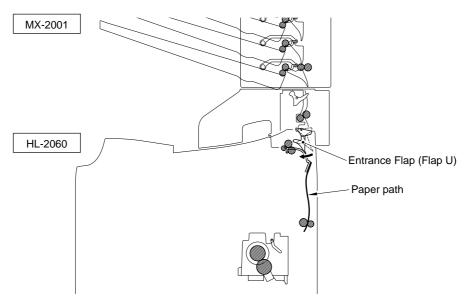


Fig. 2. 7

(3) The Mailbox unit drives the #1 bin solenoid (solenoid A) and sets the #1 bin flap (main flap) so that the paper is fed to #1 bin. (Refer to Fig. 2.8.)

If the eject sensor of #1 bin has not turned on after a specified time has passed, it detects that a paper jam has occurred.

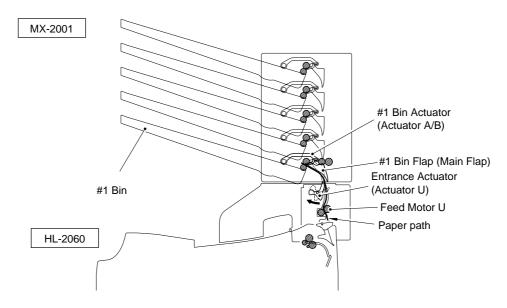


Fig. 2. 8

- (4) After the paper end is ejected from the printer to the Mailbox unit, the printer sends the command to stop the entrance solenoid to the unit. As soon as the Mailbox unit receives the command, it stops driving the entrance solenoid.
- (5) After the paper is correctly ejected into the #1 bin, the printer sends the command to stop the operation of the Mailbox unit. As soon as the Mailbox unit receives the command, it stops driving the feeding motor and the #1 bin solenoid.

Paper Feed Timing Chart

<Example: #1 Bin >

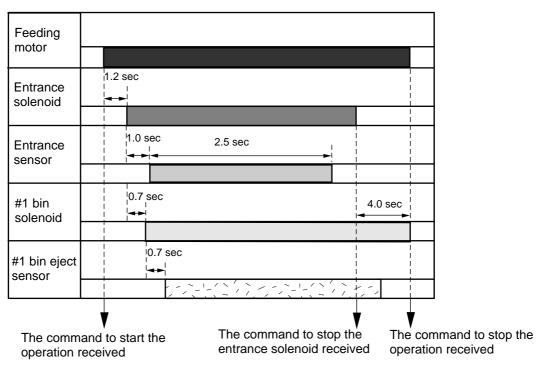


Fig. 2.9

Note:

- The above timing applies to the 20ppm mode. It takes twice as long when the printer is in the 10ppm (1200 dpi) mode.
- The timing delay to eject the paper into the next bin upwards is about 0.3 seconds later than the bin below because the distance between each bin is 39mm. Also, note that the distance between the #5 bin and the #6 bin is 55mm and the timing is 0.43 seconds later.

CHAPTER III DISASSEMBLY

1. SAFETY PRECAUTIONS

To avoid creating secondary problems by mishandling, be careful to follow the following precautions during maintenance work.

- (1) Always unplug the power cord from the power outlet of the Mailbox unit before accessing any parts inside the unit.
- (2) Be careful not to lose screws, washers, or other parts removed during servicing.
- (3) Be sure to apply grease to the gears and applicable positions specified in this chapter.
- (4) When using soldering irons or other heat-generating tools, take care not to accidentally damage parts such as wires, PCBs and covers.
- (5) Before handling any PCBs, touch a metal portion of the equipment to discharge any static electricity charge on your body, or the electronic parts or components may be damaged.
- (6) When transporting PCBs, be sure to wrap them in the correct protective packaging.
- (7) Be sure to replace self-tapping screws correctly, if removed. Unless otherwise specified, tighten screws to the following torque values.

TAPTITE, CUP B

M3: 7kgf • cm M4: 10kgf • cm

TAPTITE, CUP S

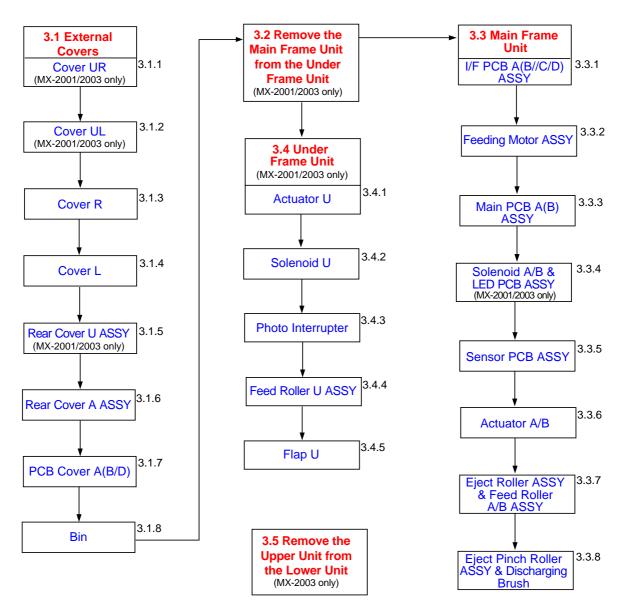
M3:8kgf • cm

SCREW

M3:8kgf • cm

- (8) When connecting or disconnecting cable connectors, hold the connector body, not the cables. If the connector has a lock, release the connector lock first to release it.
- (9) After a repair, check not only the repaired portion but also all connectors. Also check that other related portions are functioning properly before operational checks.

2. DISASSEMBLY FLOW



Note:

- 1) When disassembling the MX-2003, see Section 3.5 first to remove the upper unit from the lower unit.
- 2) Most of the parts are common or similar among the MX-2001, the MX-2002 and the MX-2003, and the procedures to disassemble them are also the same. Therefore;
 - MX-2001 is used for the figures in the following sections.
 - The parts name descriptions such as 'Main PCB A(B)' indicates 'Main PCB A' for MX-2001 and 'Main PCB B' for MX-2002 in this chapter.

3. DISASSEMBLY PROCEDURE

3.1 External Covers

3.1.1 Cover UR (For MX-2001/2003 only)

- (1) Remove the two screw cover sheets, then remove the two M3x6 Taptite screws.
- (2) Remove the cover UR from the frame UR.

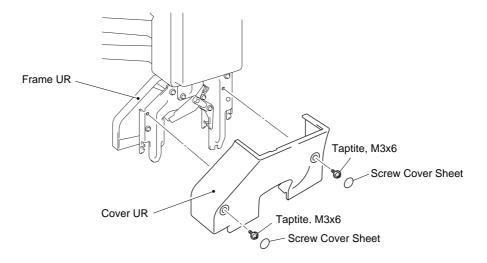


Fig. 3.1

3.1.2 Cover UL (For MX-2001/2003 only)

- (1) Remove the two screw cover sheets, then remove the two M3x6 Taptite screws.
- (2) Remove the cover UL from the frame UL.

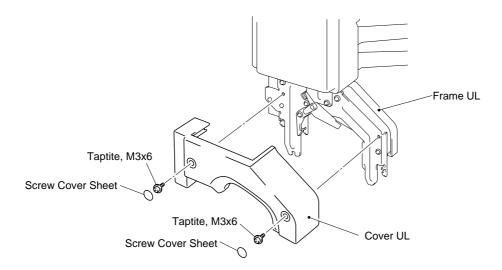
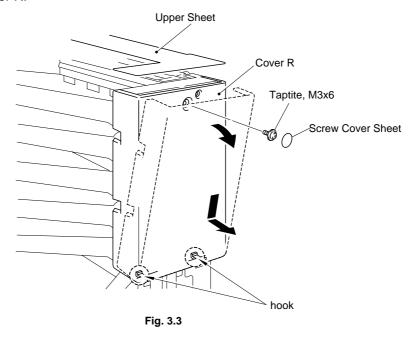


Fig. 3.2

3.1.3 Cover R

- (1) Unstick the upper sheet.
- (2) Remove the one screw cover sheet, then remove the one M3x6 Taptite screw.
- (3) Incline the cover R outwards using the two hooks as supporting points, then remove the cover R.



3.1.4 Cover L

- (1) Remove the one screw cover sheet L, then remove the one M3x6 Taptite screw.
- (2) Incline the cover L outwards using the two hooks as supporting points, then remove the cover L.

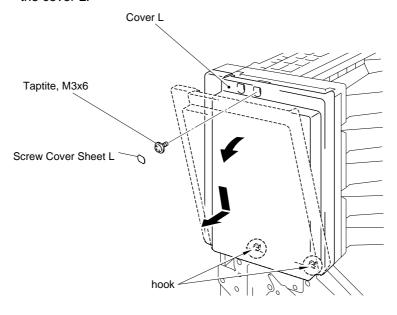


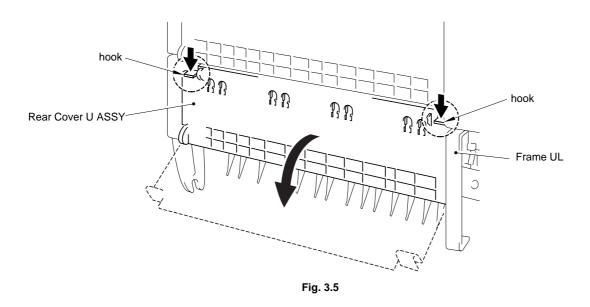
Fig. 3.4

Note:

When refitting cover L, ensure that the cover is lift fully upwards to reduce the gap on the upper side of the cover.

3.1.5 Rear Cover U ASSY (For MX-2001/2003 only)

(1) Release the two hooks to open the rear cover U ASSY.



(2) Release the left hand side of the cover by pulling the hinge of the frame UR outwards, then remove the cover from the right hand side.

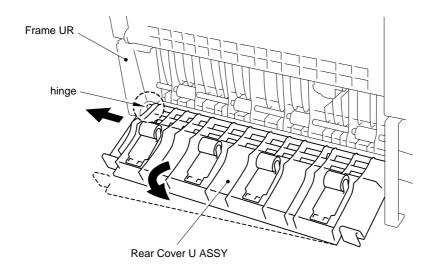


Fig. 3.6

- (3) Remove the four feed roller springs from the rear cover U by pressing the projection on the cover .
- (4) Remove the pressure roller U from each of the four feed roller springs .

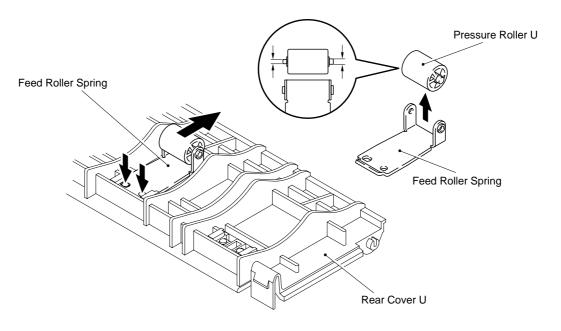


Fig. 3.7

Note:

When reassembling the pressure roller U into the feed roller spring, note that the axle size on each side is different as shown in the figure above.

3.1.6 Rear Cover A ASSY

- (1) Release the two hooks to open each of the two rear cover A ASSYs.
- (2) Release the left hand side of the cover by pulling the hinge of the frame R outwards, then remove the cover from the right hand side.

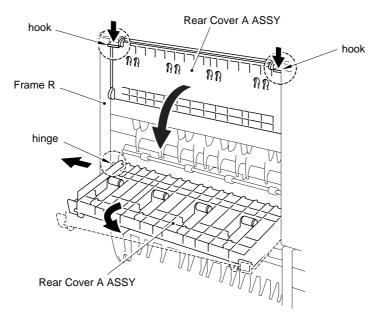
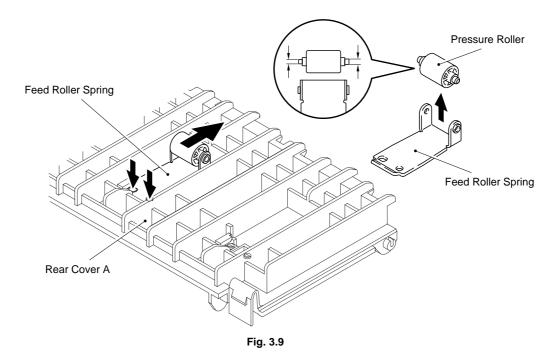


Fig. 3.8

- (3) Remove the four feed roller springs in each cover by pressing the projection of the cover.
- (4) Remove the pressure roller from each of the eight feed roller springs .



Note:

When reassembling the pressure roller into the feed roller spring, note that the axle size on each side is different as shown in the figure above.

3.1.7 PCB Cover A (MX-2001) / PCB Cover B (MX-2002) / PCB Cover D (MX-2003 Upper Unit)

- (1) Remove the four M3x6 Taptite screws.
- (2) Remove the PCB cover A(B/D).

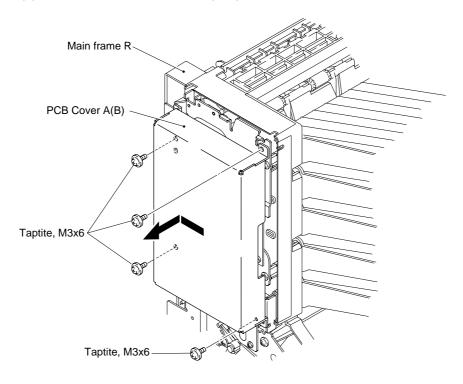


Fig. 3.10

Note:

For the PCB cover C (MX-2003 Lower unit), it is already removed when you remove the upper unit from the lower unit.

3.1.8 Bin

(1) Remove the paper stopper from the bins.

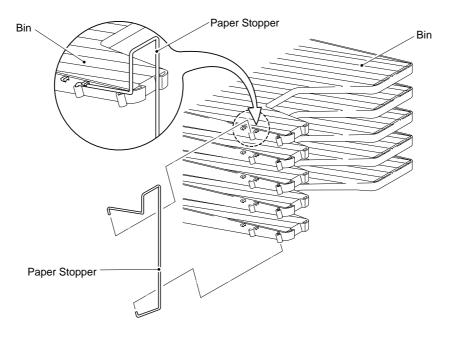


Fig. 3.11

(2) Slide bins #2 and #4 (MX-2001/2003 lower) or #7 and #9 (MX-2002/2003 upper) towards you.

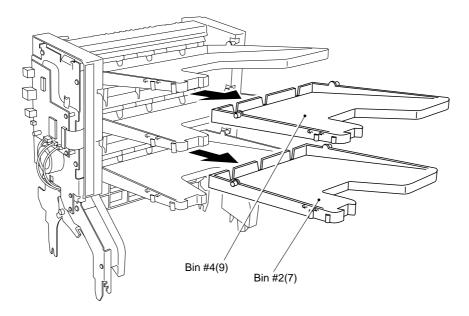


Fig. 3.12

- (3) For other bins, slightly release the right side of the bin by pulling it toward you, then incline the bin downward to remove it.
- (4) Remove the front sheet A(B).

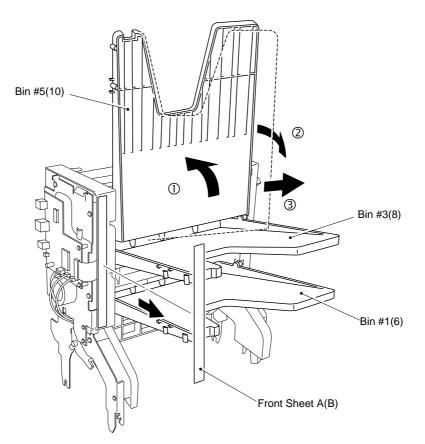


Fig. 3.13

3.2 Remove the Main Frame Unit from the Under Frame Unit (For MX-2001/2003 only)

- (1) Disconnect the harness connector of the solenoid U and the entrance sensor connector from the I/F PCB A(C) ASSY.
- (2) Remove the three M3x6 Taptite screws securing the arm AL and the arm UL. Remove the three M3x6 Taptite screws securing the arm AR and the arm UR.
- (3) Lift up the main frame unit .

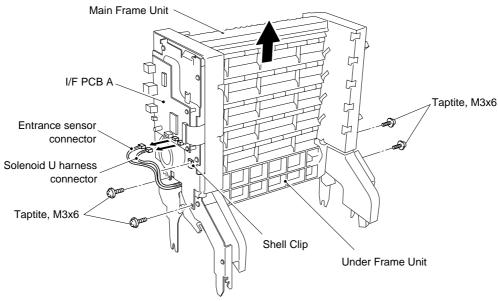


Fig. 3.14

Note:

When reconnecting the entrance sensor connector and the solenoid U harness connector, ensure the cables are hooked into the shell clip on the right hand side of the feeding motor.

3.3 Main Frame Unit

3.3.1 I/F PCB A ASSY (MX-2001) / I/F PCB B ASSY (MX-2002) / I/F PCB C ASSY (MX-2003 Lower Unit) / I/F PCB D ASSY (MX-2003 Upper Unit)

- (1) Disconnect the feeding motor harness connector.
- (2) Remove the four M3x16 Taptite screws from the I/F PCB.
- (3) Remove the flat cable from the I/F PCB, then remove the I/F PCB A(B/C/D) ASSY .

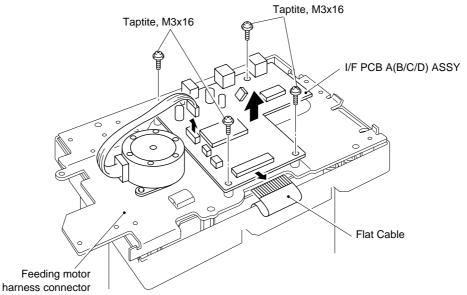


Fig. 3.15

3.3.2 Feeding Motor ASSY

- (1) Remove the ten M3x4 screws from the four solenoids A and one solenoid B.
- (2) Remove the M3x6 Taptite screw securing the MX ground wire.
- (3) Remove the four M4x12 Taptite screws from the arm AL(BL).

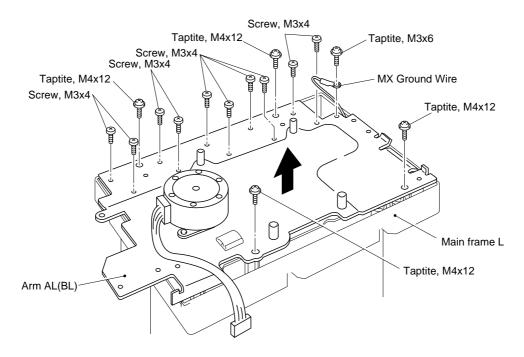


Fig. 3.16

- (4) Remove the four spacers and the insulation sheet from the arm AL(BL).
- (5) Remove the two M3x4 screws to remove the feeding motor ASSY.

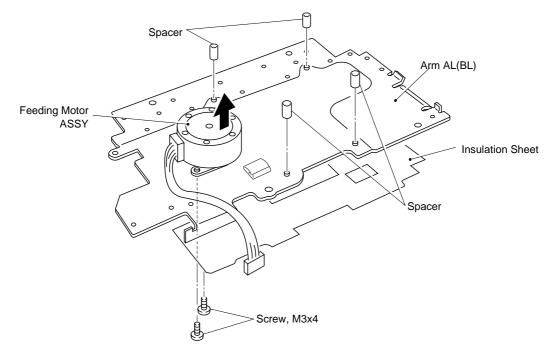


Fig. 3.17

3.3.3 Main PCB A ASSY (MX-2001, MX-2003 Lower Unit) / Main PCB B ASSY (MX-2002, MX-2003 Upper Unit)

- (1) Remove the four M3x10 Taptite screws from the main PCB A(B).
- (2) Disconnect the five solenoid A/B harness connectors and the infrared LED harness connector from the main PCB.
- (3) Disconnect the LED harness connector from the main PCB. (MX-2001/2003 only)
- (4) Remove the main PCB A(B) ASSY.

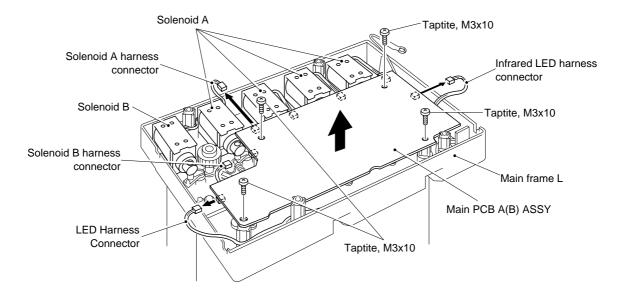


Fig. 3.18

(5) Remove the five sensor guides and the flat cable from the main PCB A(B).

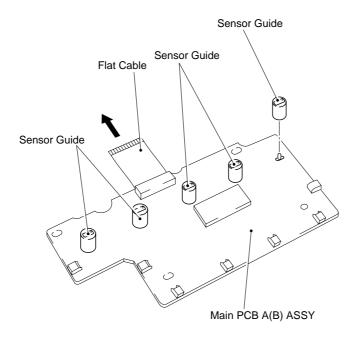


Fig. 3.19

3.3.4 Solenoid A/B & LED PCB ASSY (For MX-2001/2003 only)

- (1) Remove the four solenoids A and one solenoid B from the main frame L.
- (2) Remove the LED PCB ASSY and the LED harness from the main frame L. (MX-2001/2003 only)

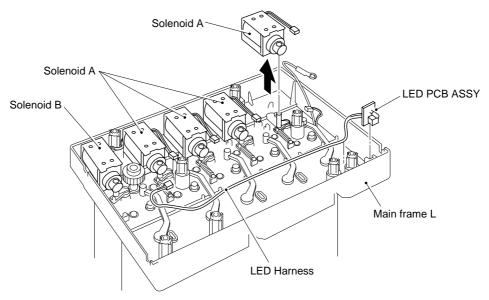


Fig. 3.20

Note:

- When replacing/reassembling the solenoid A/B ASSY, ensure that you reduce the gap at the left hand side as shown in the figure below.
- When replacing/reassembling the solenoid harnesses, the infrared LED harness and the LED harness on the main frame L, refer to the figure below;

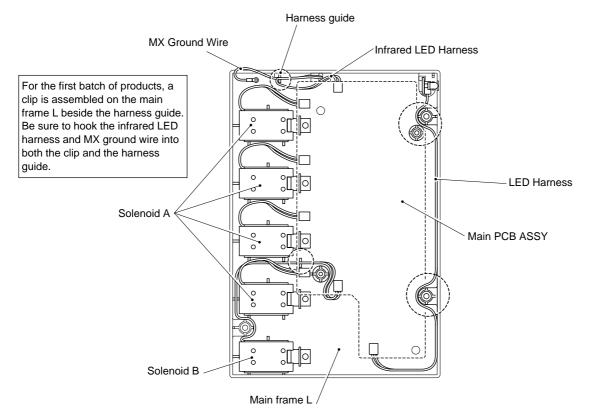
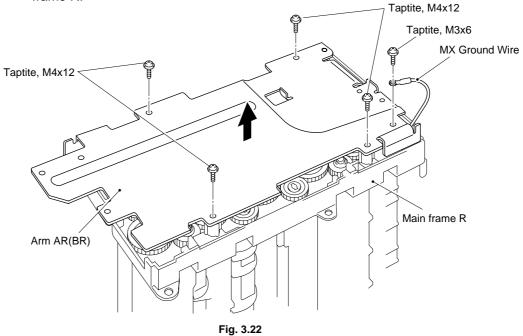


Fig. 3.21

3.3.5 Sensor PCB ASSY

- (1) Remove the one M3x6 Taptite screw securing the MX ground wire.
- (2) Remove the four M4x12 Taptite screws to remove the arm AR(BR) from the main frame R.



Caution:

After removing the arm AR (BR) from the main frame R, do not place the unit face downward. Failure to do so will cause damage to the discharging brush holder and this will cause misfeeding of the paper

- (3) Remove the two M3x10 Taptite screws to remove the sensor PCB ASSY.
- (4) Disconnect the infrared LED harness connector from the sensor PCB.

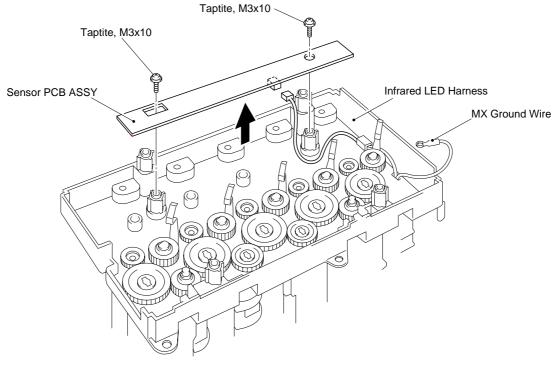


Fig. 3.23

Note:

When replacing/reassembling the infrared LED harness and MX ground wire, ensure that the cable length for the main frame R side as follows;

Infrared LED harness: 130 ± 5mm
 MX ground wire: 65 ± 5mm

3.3.6 Actuator A/B

(1) Release the hook on the right hand side on the rear cover B to remove it.

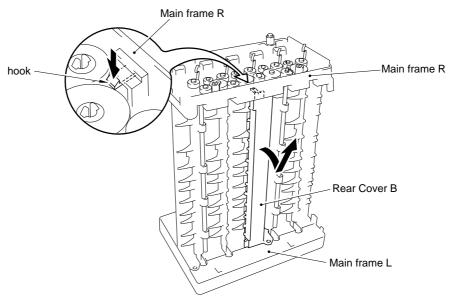
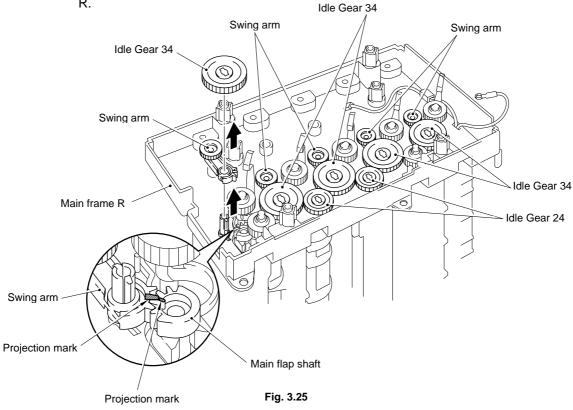


Fig. 3.24

(2) Remove the five idle gears 34, five swing arms and two gears 24 from the main frame R.



Note:

When reassembling the swing arm onto the main flap shaft, refer to the figure above.

(3) Remove the five springs from the main flaps and the main frame L.

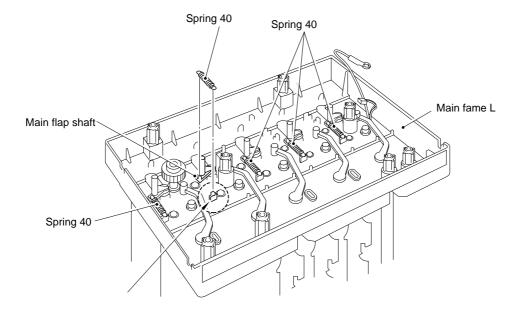


Fig. 3.26

(4) Release the left side of the five main flaps from the main frame R to remove them.

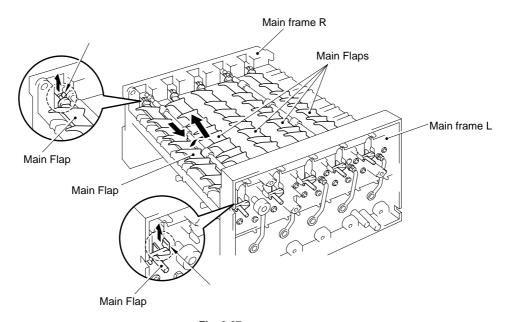


Fig. 3.27

- (5) Release the hook of the actuator B, then slightly slide the actuator A to the left hand side to remove the five actuators B from the main frame L.
- (6) Slide the five actuators A leftwards to remove them from the main frame A, B and C.

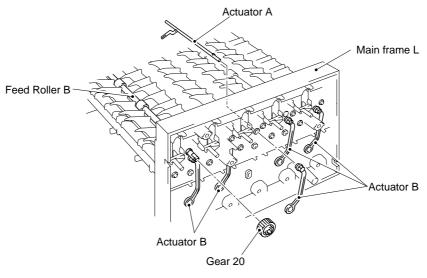


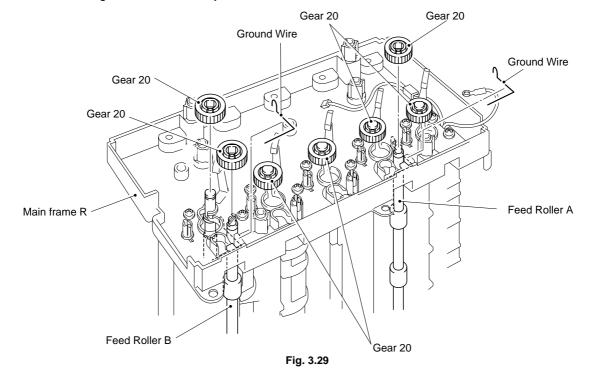
Fig. 3.28

Note:

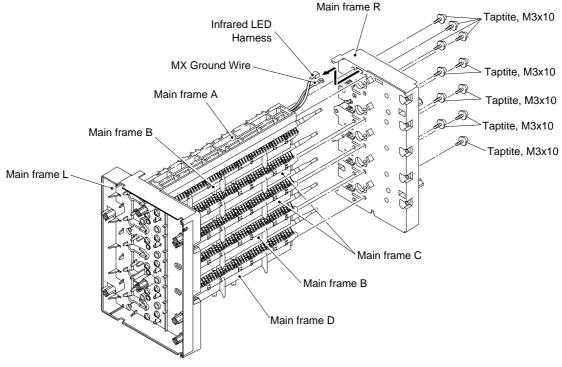
Before removing the actuator A/B from the main frame A, remove the gear 20 from the left side of the feed roller B. Refer to the figure above.

3.3.7 Eject Roller ASSY & Feed Rollers A/B ASSY

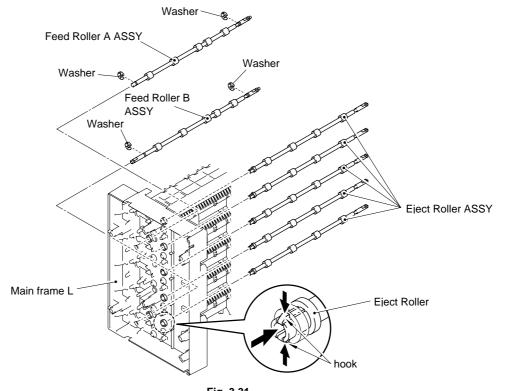
- (1) Remove the two ground wires from the main frame R.
- (2) Remove the two gears 20 from the right hand side of the feed rollers A/B and the five gears 20 from the eject rollers.



- (3) Remove the 11 (eleven) M3x10 Taptite screws from the main frame R.
- (4) Release the infrared LED harness from the hook of the main frame R.
- (5) Remove the main frame R from the main frames A, B, C, and D.



- Fig. 3.30
- (6) Remove the feed roller A ASSY and feed roller B ASSY from the main frame L.
- (7) Remove the two washers from each feed roller.
- (8) Push the hook from the left side of the main frame to remove the five eject roller ASSYs.



3.3.8 **Eject Pinch Roller ASSY & Discharging Brush**

- (1) Remove the 11 (eleven) M3x10 Taptite screws from the main frame L.
- Remove the main frame L from the main frames A, B, C, and D. (2)
- (3)Release the MX ground wire and infrared LED harness from the hook on the main frame L to remove them.

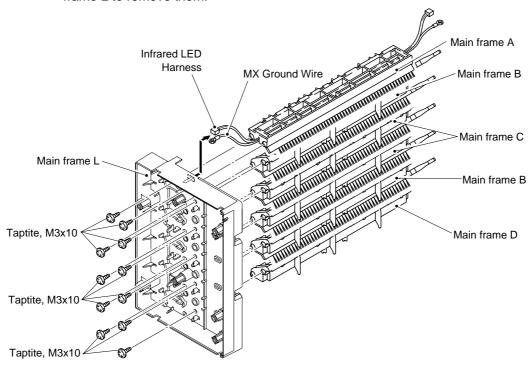


Fig. 3.32

- (4) Remove the 20 (twenty) eject pinch rollers and the 20 (twenty) pinch springs from the main frames A, B, and C.
- (5) Remove the five discharging brush ASSYs.

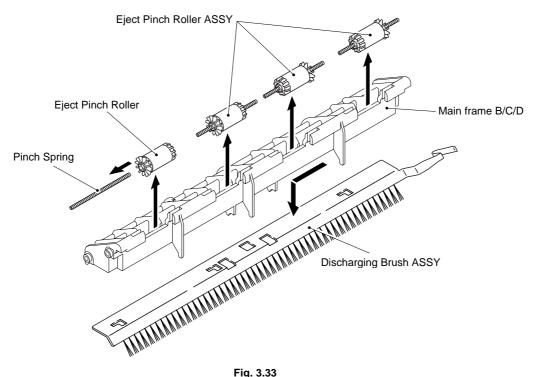


Fig. 3.33

Note:

When reassembling the main frame A, B, C and D, note that the shape and number of ribs on each frame are different as shown in the figure below;

Ensure to assemble each frame on to the correct position.

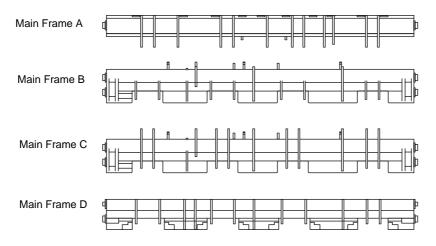


Fig. 3.34

3.4. Under Frame Unit (For MX-2001/2003 only)

3.4.1 Actuator U

(1) Remove the rib U from the right hand side of the actuator U, then remove the actuator U from the frame U.

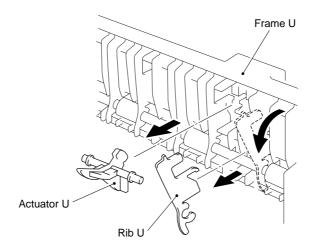
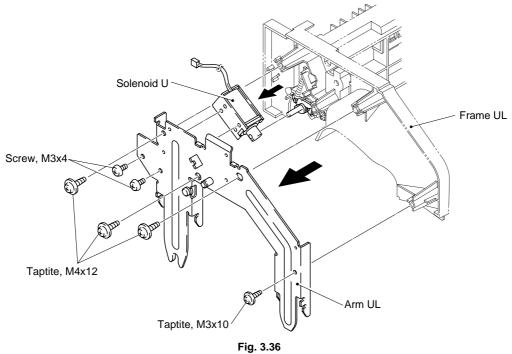


Fig. 3.35

3.4.2 Solenoid U

- (1) Remove the three M4x12 and one M3x10 Taptite screws from the arm UL.
- Remove the two M3x4 screws securing the solenoid U. (2)
- (3) Remove the arm UL, then remove the solenoid U from the frame UL.

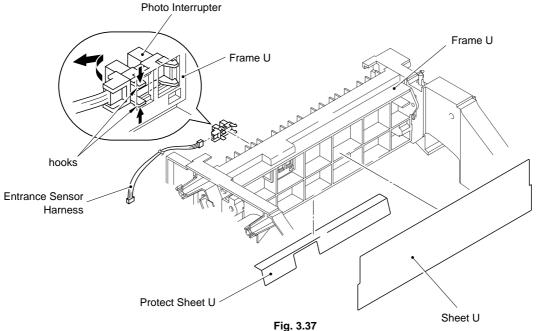


Note:

When replacing/reassembling the solenoid U ASSY, ensure that you reduce the gap at the rear side of the frame UL.

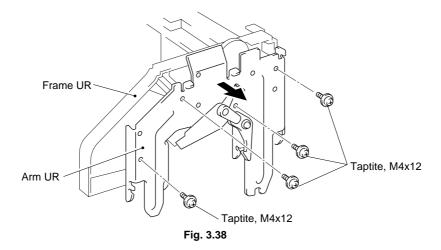
3.4.3 **Photo Interrupter**

- (1) Unstick the sheet U and the protect sheet U from the frame U.
- (2) Release the hooks from the frame U to remove the photo interrupter.
- (3)Disconnect the entrance sensor harness connector from the photo interrupter.



3.4.4 Feed Roller U ASSY

(1) Remove the four M4x12 Taptite screws to remove the arm UR from the frame UR.



(2) Remove the eight ribs from the frame U.

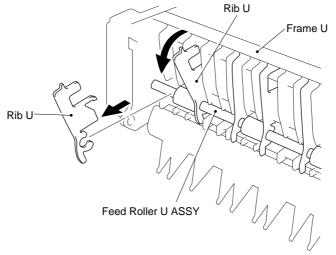


Fig. 3.39

- (3) Remove the ground wire U.
- (4) Release the hook to remove gear 20 from the feed roller U ASSY.

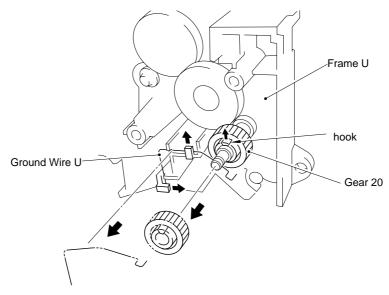
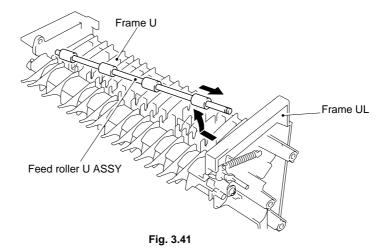


Fig. 3.40

(5) Slightly slide the feed roller U ASSY to the right hand side to release the left side of the roller, then remove the feed roller.



3.4.5 Flap U

- (1) Remove the spring 40 from the release link, then remove the release link.
- (2) Remove the spring 35 from the flap U.

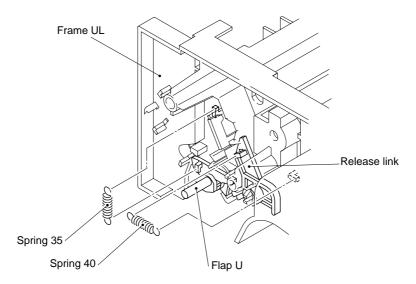


Fig. 3.42

(3) Remove the flap U from the frame UL.

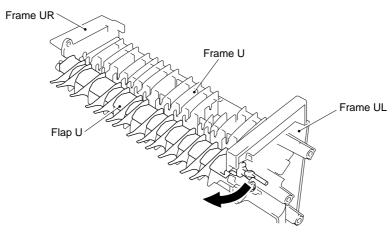
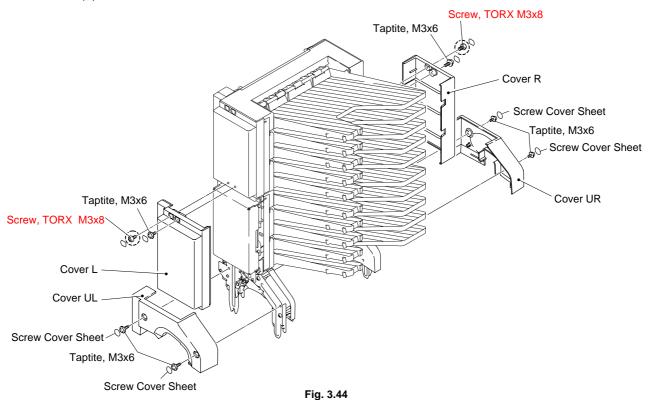


Fig. 3.43

3.5 Remove the Upper Unit from the Lower Unit (For MX-2003 only)

When you disassemble the MX-2003 Mailbox unit, you have to remove the upper unit from the lower unit first. Follow the steps below;

- (1) Remove the two screw cover sheets, then remove the two M3x6 Taptite screws from each of the cover UR and cover UL.
- (2) Remove the cover UR and cover UL from the frame.
- (3) Remove the two screw cover sheets, then remove the two screws from each of the cover R and cover L of the lower unit..
- (4) Remove the cover R and cover L.



Note:

1) One of the two screws securing the cover R/L is very special. (They are indicated RED in the figure above.) When disassembling/re-assembling the screw, you need a special screw driver. Refer to the figure below and the parts reference list;

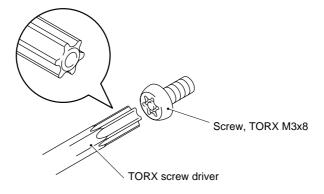


Fig. 3.45

2) Refer to Section 3.1.3 'Cover R' and 3.1.4 'Cover L' in this chapter for details on removing the cover R/L from the main frame.

(5) Remove the four M3x6 Taptite screws, then remove the PCB cover C.

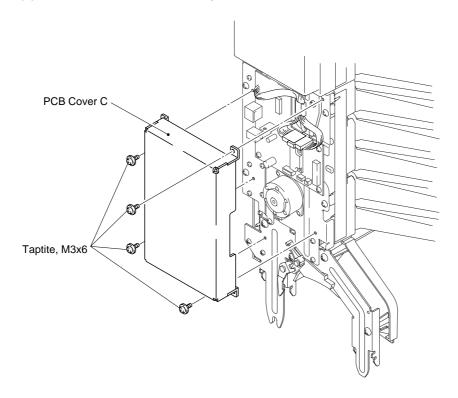


Fig. 3.46

(6) Remove the M3x4 screw securing the lower and upper units on the main frame R.

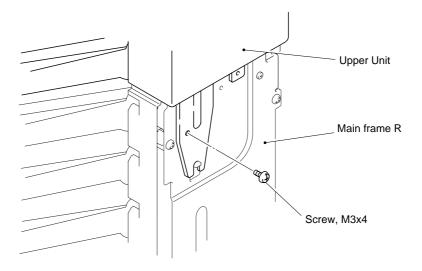


Fig. 3.47

- (7) Remove the M3x4 screw securing the lower and upper units on the main frame L.
- (8) Unhook the harness from the shell clip, then disconnect the harness connector from the I/F PCB C.

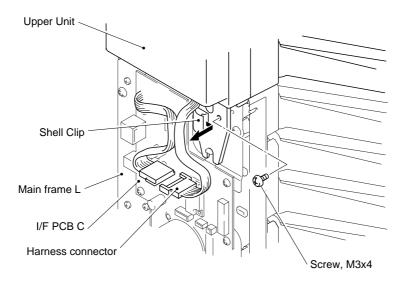


Fig. 3.48

Note:

When replacing/re-assembling the harness, refer to the figure below;

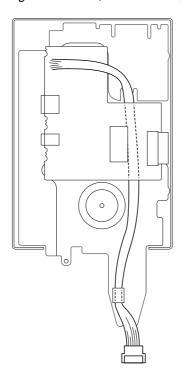


Fig. 3.49

(9) Lift up the upper unit from the lower unit.

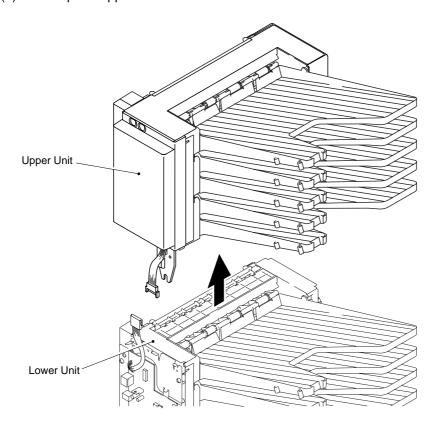


Fig. 3.50

Disassembling steps for other parts are the same with the MX-2001/2002. See the previous sections.

3.6 Packing of MX-2003

When unpacking/re-packing the MX-2003 mailbox unit, refer to the figure below;

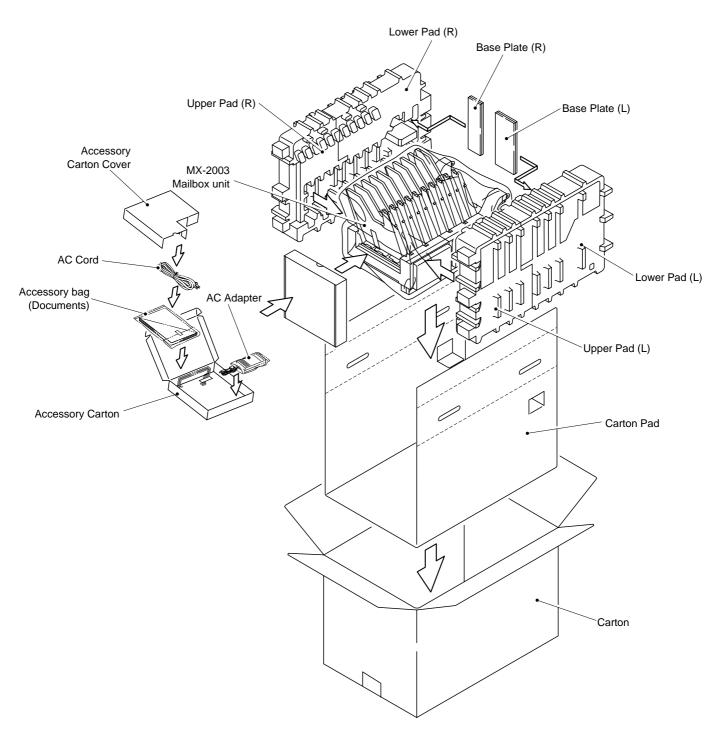


Fig. 3.51

4. APPLICATION OF GREASE

When replacing/reassembling the following parts, remove the old grease and apply a suitable amount of grease referring to each figure.

4.1 Rollers

4.1.1 Feed Roller A/B ASSY

Apply 1 rice-grain size of grease, SHINETSU SILICON KS-64F to the points (① \sim ④) and KANTO KASEI FLOIL GE-676 to the points (⑤ \sim ⑥), as shown below;

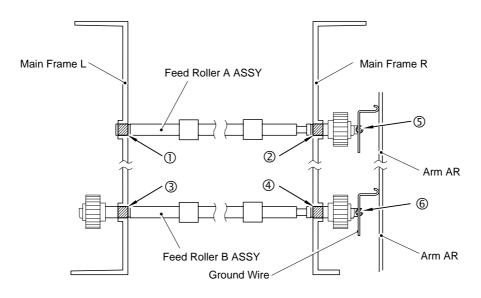


Fig. 3. 52

4.1.2 Eject Roller ASSY

Apply <u>1 rice-grain size</u> of grease, SHINETSU SILICON KS-64F to the points (\bigcirc ~ \bigcirc) as shown below;

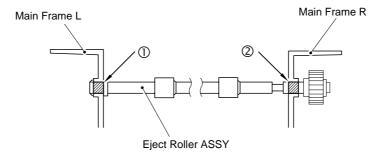


Fig. 3. 53

Apply <u>1 sesame-grain size</u> of grease, SHINETSU SILICON KS-64F to the points (①) as shown below;

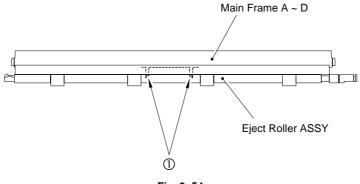


Fig. 3. 54

4.1.3 Feed Roller U ASSY

Apply <u>1 rice-grain size</u> of grease, SHINETSU SILICON KS-64F to the points (① \sim ③), and KANTO KASEI FLOIL GE-676 to the points (④ \sim ⑤), as shown below;

Apply <u>1 sesame-grain size</u> of grease, SHINETSU SILICON KS-64F to the points (⑥) as shown below;

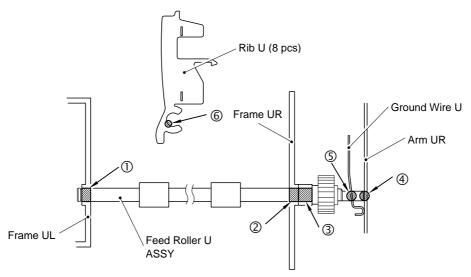


Fig. 3. 55

4.1.4 Pressure Roller / Pressure Roller U

Apply <u>1 sesame-grain size</u> of grease, SHINETSU SILICON KS-64F to the points (① \sim ②) as shown below;

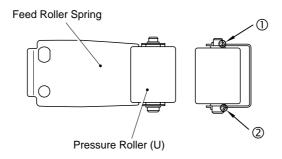


Fig. 3. 56

4.2 Gears PR99011

4.2.1 Gears on the Main Frame R

Apply 1 rice-grain size of grease, SHINETSU SILICON KS-64F to the points (\bigcirc ~ \bigcirc) as shown below;

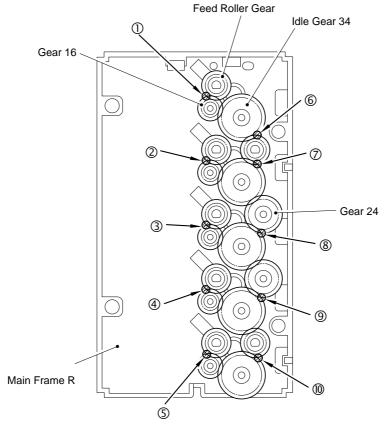


Fig. 3.57

4.2.2 Gears on the Main Frame L

Apply <u>1 rice-grain size</u> of grease, SHINETSU SILICON KS-64F to the points $(① \sim ②)$ as shown below;

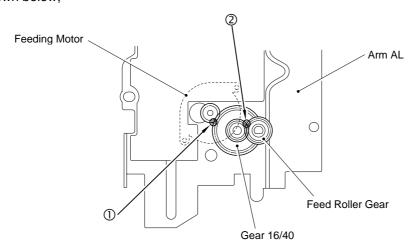
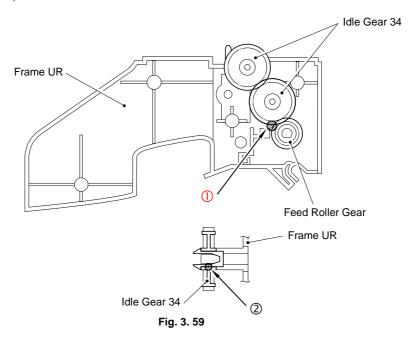


Fig. 3. 58

4.2.3 Gears on the Frame UR

Apply 1 rice-grain size of grease, SHINETSU SILICON KS-64F to the points (\bigcirc ~ \bigcirc) as shown below;



4.3 Others

Apply <u>1 rice-grain size</u> of grease, SHINETSU SILICON KS-64F to the points $(① \sim \textcircled{8})$ as shown below;

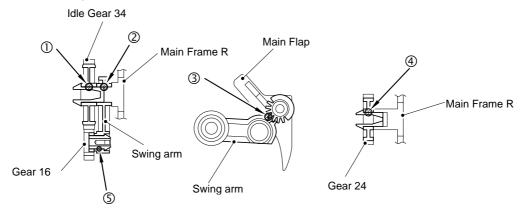


Fig. 3. 60

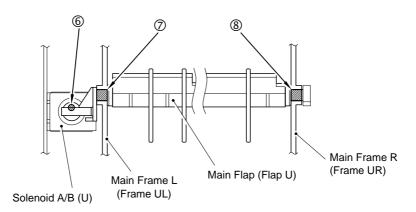


Fig. 3. 61

CHAPTER IV TROUBLESHOOTING

1. INITIAL CHECK

(1) Operating environment

Check if:

- The source voltage stays within ±10% of the rated voltage shown on the rating plate.
- The room temperature is maintained between 10°C and 32.5°C. The relative humidity is maintained between 20% and 80%.
- There is enough space around the unit so that the following operations are possible.
 - a) The power cord and modular jack connector can be connected
 - b) The rear cover can be opened to remove jammed paper.
 - c) Various maintenance work can be easily implemented.
- The unit is installed on a solid, level surface.
- The unit is not exposed to direct sunlight.
- The unit is not located in a dusty place.
- . The room is well-ventilated.
- The unit is not placed where the ventilation hole of the unit is blocked.
- The unit is not exposed to ammonia fumes or other harmful gases.
- The unit is not located in a hot or humid area (such as near water or a humidifier).

(2) Print paper

Check if:

- A recommended type of print paper is being used. [If the paper is too thick or too thin, or tends to curl, paper jams or paper feed problems may occur, or printed images may be blurred.]
- The print paper is damped. [If so, use fresh paper, and check whether the print quality improves or not.]
- The print paper is short-grained paper or acid paper. [If so, print quality problems may occur. For further information, refer to paper specifications in Chapter II.]

(3) Others

Condensation:

- When the unit is moved from a cold room into a warm room in cold weather, condensation may occur inside the unit.
- Condensation on the hopper gate and separation pad may cause paper feed problems.

If condensation has occurred, wipe the effected parts with a dry cloth and leave the printer for 2 hours to allow it to reach room temperature.

2. MTBF/MTTR

The meantime between failure (MTBF) and the meantime to repair (MTTR) for this printer are as follows;

MTBF: 4,000 hours

MTTR: Less than 30 minutes

3. TROUBLESHOOTING

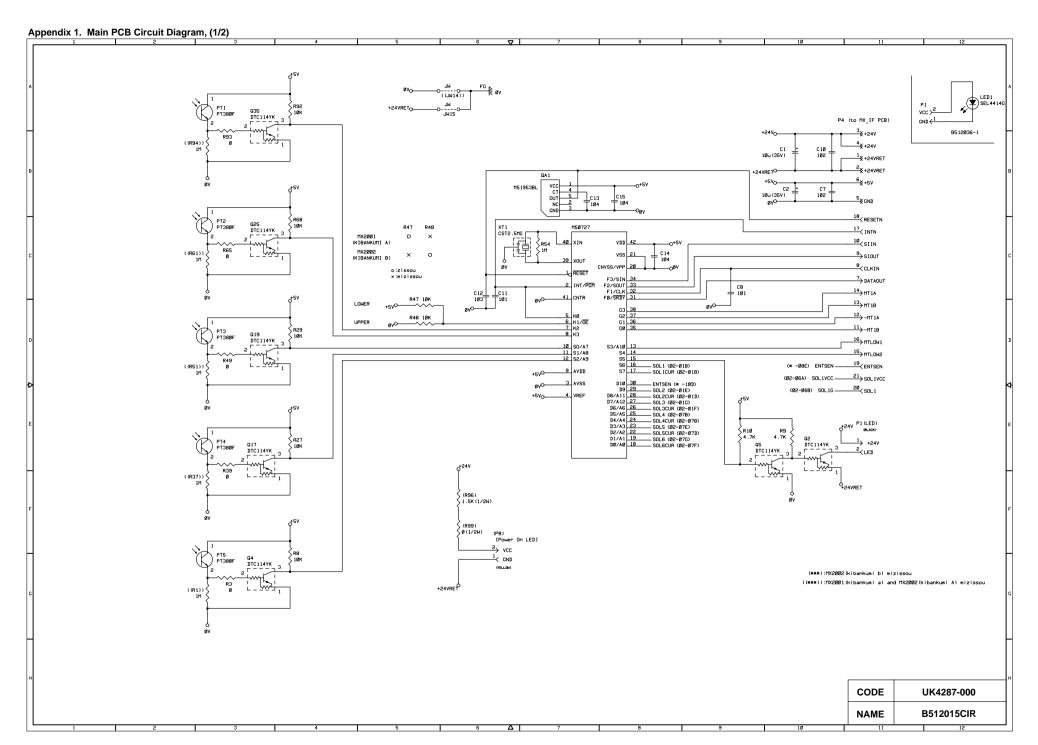
Problem	Cause	Check	Result	Remedy
The paper is not ejected to the Mailbox unit even though paper output is set to the Mailbox unit in the printer driver.	Installation error	Is the modular cable connected correctly?	No	Turn off the printer power switch and unplug the AC adapter cord of the Mailbox unit from the outlet. Connect the modular cable correctly, then plug in the AC adapter cord and turn on the printer power switch again.
	Modular cable	Is the timing of pins 2 and 4 of the P6 connector on the I/F PCB normal? (Refer to the figure on page II-6 of Chapter II.)	No	Replace the modular cable.
	I/F PCB	Is a voltage of +5V supplied to pin 16 of the P1 connector on the I/F PCB?	No.	Replace the I/F PCB.
	I/F PCB Main PCB	Is the timing of pins 5 and 6 of the P1 connector on the I/F PCB normal?	No	Replace the I/F PCB.
		(Refer to the figure on page II-6 of Chapter II.)	Yes	Replace the main PCB.
The 'STACK PAPER JAM' message appears when the printer is turned on even though no paper is ejected to the Mailbox unit.	Installation error	Is the AC adapter cord connected correctly? Is the AC adapter jack connected to the Mailbox unit correctly?	No	Turn off the printer power switch and connect the AC adapter cord or the AC adapter jack of the Mailbox unit correctly. Then, plug in the AC adapter cord and turn on the printer power switch again.
	Adapter I/F PCB	Is a voltage of +5V supplied to pin 1 of the P5 connector on the I/F PCB?	No	Replace the adapter.
			Yes	Replace the I/F PCB.
The 'STACK FULL' message appears even though no paper is ejected to the Mailbox unit.	Sensor PCB Main PCB	Does the error message appears for all bins?	Yes	Replace the sensor PCB.
			No	Replace the main PCB.

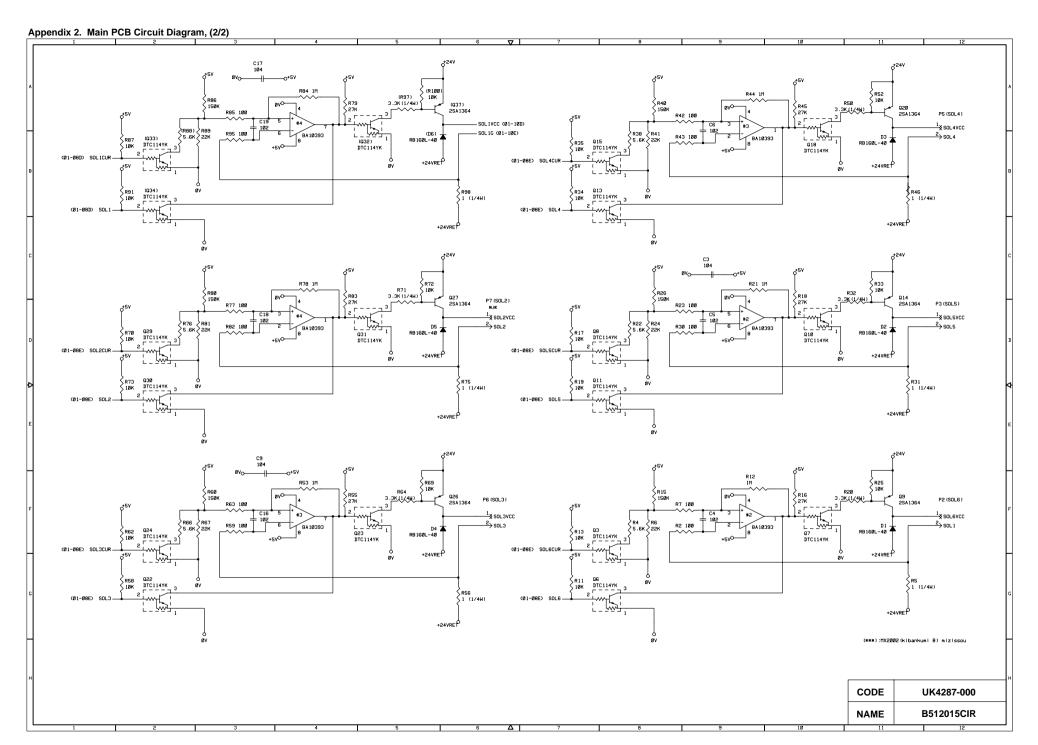
Problem	Cause	Check	Result	Remedy
The paper is ejected to the printer output tray and the 'STACK PAPER JAM' message appears, even though paper output is set to the Mailbox unit.	Flap U	Does the flap U work correctly?	No	Apply the grease to the specified points of the flap U. For details, refer to Section 4 of Chapter 3.
	Solenoid U Main PCB	Is a voltage of +24V supplied to pin 1 and a voltage of app. 1V supplied to pin 2 of	Yes	Replace the solenoid U.
		the P2 connector on the I/F PCB when the flap U operates?	No	Replace the main PCB.
The 'STACK PAPER JAM' message appears even though the paper is ejected to the Mailbox unit correctly.	Actuator U	Does the actuator U work correctly?	No	Check if there is any flash on the frame U or actuator U. If there is no flash, replace the actuator U.
	Main PCB Photo interrupter	Is the timing of pin 3 of the connector P3 on the I/F PCB normal when the actuator U operates?	Yes	Replace the main PCB.
		(Refer to the figure on page II-6 of Chapter II.)	No	Replace the photo interrupter.
The paper is not ejected to the specified bin but fed into the back of the unit.	Feeding motor	Does the feeding motor rotate?	No	Replace the feeding motor and the I/F PCB.
The 'STACK PAPER JAM' message also appears.	Main flap of each bin	Does the main flap of each bin work correctly?	No	Apply the grease to the specified point on the main flap of each bin. For details, refer to Section 4 of Chapter III.
	Solenoid A/B Main PCB	Is a voltage of +24V supplied to pin 1 and a voltage of app. 1V supplied to pin 2 of the connector on the main PCB when each flap operates?	Yes	Replace the solenoid A/B.
		<pre><connector bin="" each="" for="" no.=""> #1 Bin: P7 #2 Bin: P6 #3 Bin: P5 #4 Bin: P3 #5 Bin: P2</connector></pre>	No	Replace the main PCB.

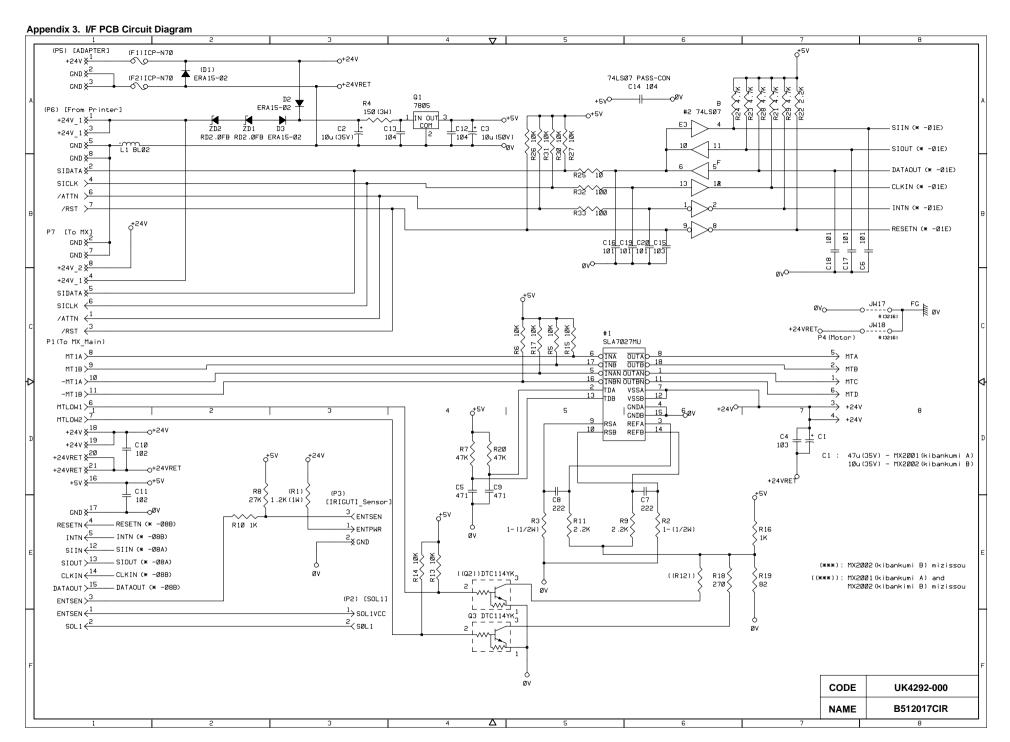
Problem	Cause	Check	Result	Remedy
The 'STACK PAPER JAM' message appears when 100mm of paper is ejected to the Mailbox unit.	Harness wiring	Does the infrared LED harness interfere with the actuator A/B?	Yes	Re-wire the infrared LED harness not to interfere with the actuator A/B.
	Actuator A/B of each bin	Does the actuator A/B of each bin work correctly?	No	Replace the actuator A/B of each bin.
	Main PCB		Yes	Replace the main PCB.

Note:

- 'Main PCB' described in the above table is indicating 'Main PCB A' for MX-2001 or MX-2003 lower unit and 'Main PCB B' for MX-2002 or MX-2003 upper unit.
- 'I/F PCB' described in the above table is indicating 'I/F PCB A' for MX-2001, 'I/F PCB B' for MX-2002, 'I/F PCB C' for MX-2003 lower unit and 'I/F PCB D' for MX-2003 upper unit.







INDEX

	feeding motor drive circuit II-5
	feeding speedI-3
A	flap UII-7, II-8, III-23, III-32
actuator AII-7, III-17	flat cableIII-12
actuator BII-7, III-17	front sheet AIII-9
actuator UII-7, III-20	front sheet BIII-9
В	G
big stacker modeI-3	gearIII-31
binI-2, II-7, III-9	general block diagramII-1
bin capacityI-3	grease III-29
bin capacity sensorII-4	grodoo
bin solenoid drive circuitII-3	ī
<u>C</u>	I/F PCBII-4
	block diagramII-4
communicationII-5	circuit diagramA-3
condensation IV-1	I/F PCB AIII-10
cover LIII-4	I/F PCB BIII-10
cover RIII-4	I/F PCB CIII-10, III-26
cover ULIII-3	I/F PCB D III-10
cover URIII-3	infrared LED drive circuit II-4
CPUII-3	infrared LED harness III-14
	insulation sheetIII-11
D	
DC jack connectorI-2	L
dimensionsI-3	LED harness III-13
discharging brushIII-19	LED PCBIII-13
<u>E</u>	M
eject pinch rollerIII-19	mailboxl-1
eject roller II-7, III-18, III-29	main flapII-7, II-9, III-16, III-32
entrance flapII-8	main PCBII-3
entrance sensorII-5	block diagramII-3
entrance sensor harnessIII-21	circuit diagramA-1-2
entrance solenoidII-8	main PCB A III-12
entrance solenoid drive circuitII-3	main PCB BIII-12
environmentIV-1	mini DIN connector I-2
	modular jackl-2
F	MTBFIV-2
•	MTTRIV-2
feed roller AII-7, III-18, III-29	MX ground wireIII-11
feed roller BII-7, III-18, III-29	
feed roller U II-7, III-23, III-30	

feeding motor.....II-8, III-11

P	W
packingIII-28	weightI-3
paperI-4, IV-1	
paper sizeI-4	
paper typeI-4	
feedable thicknessI-4	
feedable weightI-4	
recommended paperI-4	
paper stopper I-2, II-7, III-8	
PCB cover AIII-8	
PCB cover BIII-8	
PCB Cover CIII-25	
PCB Cover DIII-8	
photo interrupterIII-21	
power consumptionI-3	
power supply LED drive circuitII-4	
power supply LED PCBII-5	
precautionIII-1	
pressure rollerIII-7, III-30	
pressure roller UIII-6, III-30	
printer output trayI-2	
pinch springIII-19	
protect sheet UIII-21	
R	
regulatorII-4	
rear cover AIII-7	
rear cover UIII-5	
<u>s</u>	
sensor guideIII-12	
sensor PCBII-5, III-14	
serial interface circuitII-5	
sheet UIII-21	
solenoid AII-9, III-13	
solenoid BIII-13	
solenoid UII-8, III-21	
sorterI-1	
spacerIII-11	
stackerI-1	
T	
torque valuesIII-1	
U	
upper sheet III 4	



MAILBOX UNIT FOR LASER PRINTER

PARTS REFERENCE LIST

MODEL:MX-2001/MX-2002/MX-2003

Note:

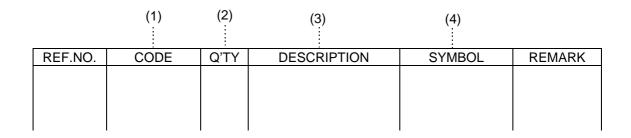
While the **MX-2001** Mailbox unit is available in all countries, the **MX-2003** is available in U.S. and Canada only, and the **MX-2002** is available in the other countries than U.S. and Canada.

NOTE FOR USING THIS PARTS REFERENCE LIST

- 1. In the case of ordering parts, it needs mentioning the following items:
 - (1) Code
 - (2) Q'ty
 - (3) Description
 - (4) Symbol (PCB No., Revision, and Parts location mounted on the PCB.)

Note: No orders without Parts Code or Tool No. can be accepted.

< Example >



Revision No.: marked on the main printed circuit board.



Revision No.: marked on the power supply printed circuit board.

Rev. <u>A</u>	1
1	Design change indication
-	(The first version has no sign)

2. Design-changed parts:

If the parts are changed, any one of the following symbols is indicated in the REMARKS column.

#A: compatible between old and new

#B: replaceable from old to new

#D: incompatible

: newly established

- 3. The original of this list was made based on the information available in October, 1998.
- 4. Parts are subject to change in design without prior notice.

CONTENTS

1.	UNDER FRAME UNIT	1
2.	UNDER UNIT COVERS	1
3.	MAIN FRAME UNIT	3
4.	COVERS	5
5.	PCBS	5
6.	PCB RELATED	7
7.	POWER SUPPLY	7
8.	AC CORD	9
9.	ACCESSORIES	9
10.	PACKING MATERIALS (MX-2001/2002)	.11
11.	PACKING MATERIALS (MX-2003)	.11
12.	ADJUSTING TOOL KIT	.13

1. UNDER FRAME UNIT

PR98306

DEE NO	0005		1. UNDER TRAME UNIT	F 1730200
REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4325000		PHOTO INTERRUPTER:1241	
2	UK4314001		ENTRANCE SENSOR HARNESS 3P	
3	UH3904001	1	SHEET U	
4	UH3990001	1	PROTECT SHEET U	
5	UH3907001	1	ACTUATOR U	
6	UH3908001	1	FEED ROLLER U ASSY	
7	UH3912001	1	GROUND WIRE U	
8	UH3913001	1	FLAP U	
9	UH3915001	1	SPRING 35	
10	UH3916001	1	SPRING 40	
11	UH3917001	1	SOLENOID U	
12	060300416	2	SCREW, BIND M3X4	
13	087411216	3	TAPTITE, CUP B M4X12	
14	087311016	1	TAPTITE, CUP B M3X10	
15	087411216	4	TAPTITE, CUP B M4X12	
16	087320616	4	TAPTITE, CUP S M3X6	

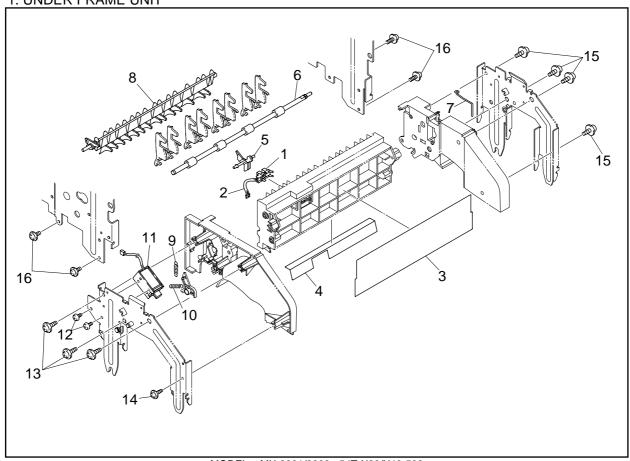
MODEL MX-2001/2003 54T-X20/X40-500

2. UNDER UNIT COVERS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UH3930001	1	COVER UL	
2	UH3931001	1	COVER UR	
2	087320616	4	TAPTITE, CUP S M3X6	
4	UH3932001		SCREW COVER SHEET	
5	UH3933001		REAR COVER U ASSY	
5-1	UH3935001		FEED ROLLER SPRING	
5-2	UH3936001	4	PRESSURE ROLLER U	
			MODEL MV 2004/2002 E4T V20/V40 E40	

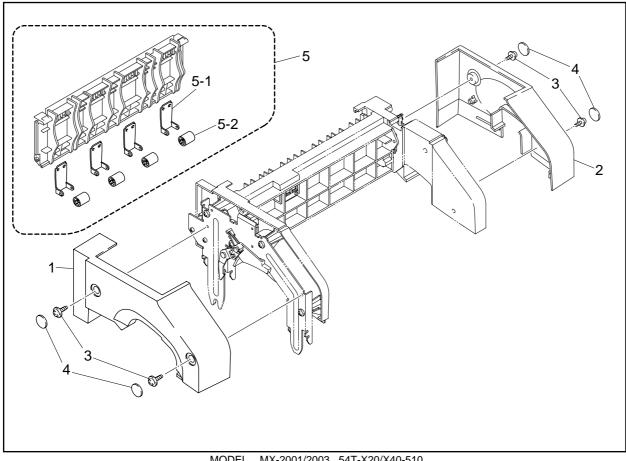
MODEL MX-2001/2003 54T-X20/X40-510

1. UNDER FRAME UNIT



MODEL MX-2001/2003 54T-X20/X40-500

2. UNDER UNIT COVERS



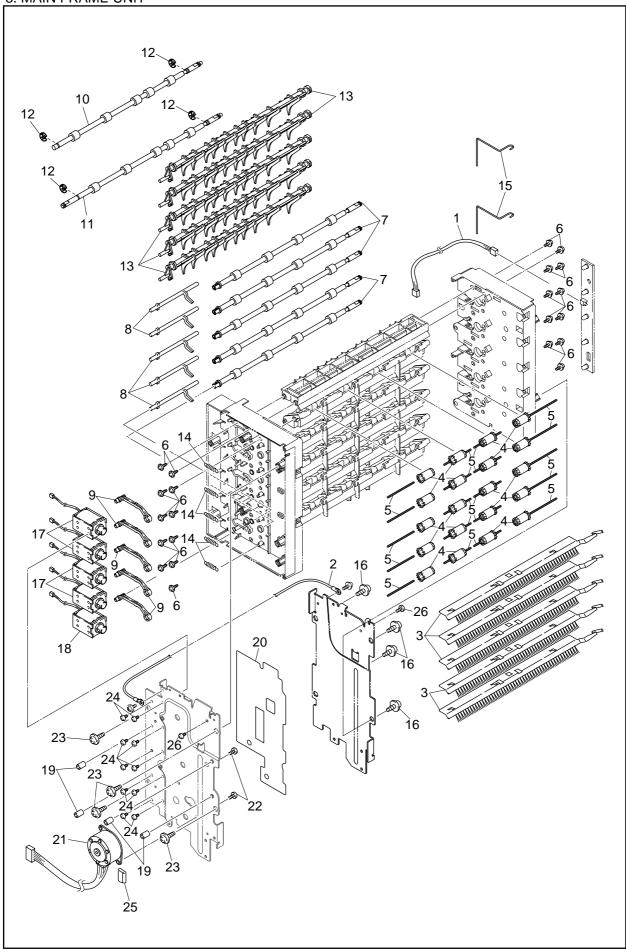
MODEL MX-2001/2003 54T-X20/X40-510

3. MAIN FRAME UNIT

DEE NO	CODE	O'TV	3. MAIN FRAME UNIT	DEMADIA
REF.NO.		Q'TY	DESCRIPTION	REMARK
1	UK4298001		INFRARED LED HARNESS 2P	
2	UK4319001		MX GROUND WIRE	
3	UH3939001		DISCHARGING BRUSH ASSY	
4	UH3323001		EJECT PINCH ROLLER ASSY	
5	UH3948001		PINCH SPRING	
6	087311016		TAPTITE, CUP B M3X10	
7	UH3951001	5	EJECT ROLLER ASSY	
8	UH3953001	5	ACTUATOR A	
9	UH3954001	5	ACTUATOR B	
10	UH3955001		FEED ROLLER A ASSY	
11	UH3957001		FEED ROLLER B ASSY	
12	048040346		WASHER E4	
13	UH3959001		MAIN FLAP	
14	UH3916001		SPRING 40	
15	UH3962001		GROUND WIRE	
16	087411216		TAPTITE, CUP B M4X12	
17	UH3964001		SOLENOID A	
18	UH3965001		SOLENOID B	
19	UH3970001		SPACER	
20	UH3971001	1	INSULATION SHEET	
21	UH1565001	1	FEEDING MOTOR ASSY	
22	060300416	2	SCREW, BIND M3X4	
23	087411216		TAPTITÉ, CUP B M4X12	
24	060300416		SCREW, BIND M3X4	
25	UH4001001		SHELL CLIP	
26	060300416		SCREW, BIND M3X4 (MX-2003 LOWER,	
20	000300410	_	FOR CONNECTION WITH UPPER UNIT)	
			FOR CONNECTION WITH OFFER UNIT)	
	MO	DEL M	X-2001/2002/2003 54T-X20/X30-600, 54T-X	40-600/601

T/I NO. PR98267 / PR98306

3. MAIN FRAME UNIT



MODEL MX-2001/2002/2003 54T-X20/X30-600, 54T-X40-600/601

T/I NO. PR98267 / PR98306

4. COVERS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UH4018001	5	BIN	
2	UH3974001	2	REAR COVER A ASSY	
2-1	UH3935001	8	FEED ROLLER SPRING	
2-2	UH2360000	8	PRESSURE ROLLER	
3	UH3977001	-	COVER L	
4	UH3978001	•	COVER R	
5	087320616		TAPTITE, CUP S M3X6	
6	UH3932001	1	SCREW COVER SHEET	
7	UH3993001		SCREW COVER SHEET L	
8	UH3979001		UPPER SHEET (MX-2001/2003 UPPER)	
9	UH3981001		FRONT SHEET A (MX-2001/2003 LOWER)	
9	UH3987001		FRONT SHEET B (MX-2002/2003 UPPER)	
10	UH3989001	-	PAPER STOPPER	
11	UH4019001		SCREW, BIND(TORX) M3X8 (MX-2003 LOWER)
12	UH3993001	2	SCREW COVER SHEET L (MX-2003)	

MODEL MX-2001/2002/2003 54T-X20/X30-610, 54T-X40-610/611

T/I NO. PR98306 / PR98307

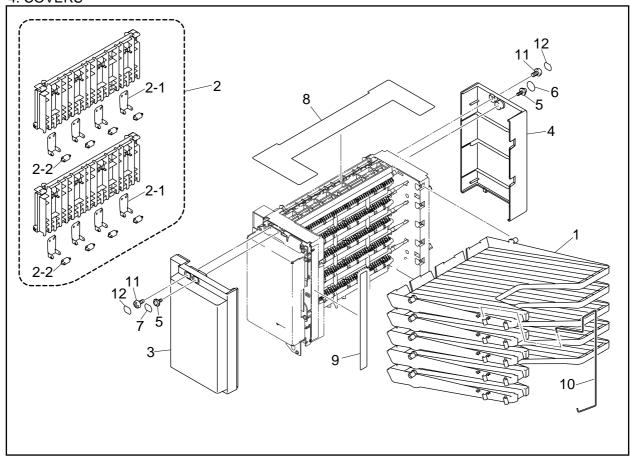
5. PCBS

			J. 1 ODO		
REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK4283001		MAIN PCB ASSY A (MX-2001/2003 LOWER		
1	UK4284001	1	MAIN PCB ASSY B (MX-2002/2003 UPPER)B512015-201D	
2	UH3901001	5	SENSOR GUIDE		
3	087311016		TAPTITE, CUP B M3X10		
4	UK4288001	1	I/F PCB ASSY A (MX-2001)	B512017-200B	
4	UK4289001	1	I/F PCB ASSY B (MX-2002)	B512017-201B	
4	UK4382001	1	I/F PCB ASSY C (MX-2003 LOWER)	B512017-202	
4	UK4383001	1	I/F PCB ASSY D (MX-2003 UPPER)	B512017-203	
5	087321616	4	TAPTITE, CUP S M3X16		
6	UK4293001	1	SENSOR PCB ASSY	B512016	
7	087311016	2	TAPTITE, CUP B M3X10		
8	UK4317001	1	LED PCB ASSY (MX-2001/2003 LOWER)	B512036	
			,		

MODEL MX-2001/2002/2003 54T-X20/X30-100, 54T-X40-100/101

T/I NO. PR98306, PR99026

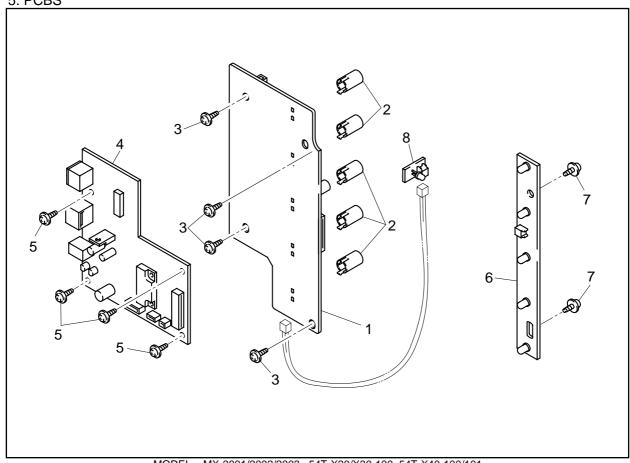
4. COVERS



T/I NO. PR98306

MODEL MX-2001/2002/2003 54T-X20/X30-610, 54T-X40-610/611

5. PCBS



MODEL MX-2001/2002/2003 54T-X20/X30-100, 54T-X40-100/101

6. PCB RELATED

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4297000		FLAT CABLE	
2	UK4299001	1	LED HARNESS 2P (MX-2001/2003 LOWER))
3	087320616		TAPTITE, CUP S M3X6	
4	UH3992001	1	PCB COVER A (MX-2001)	
4	UH3982001	1	PCB COVER B (MX-2002)	
4	UH4016001		PCB COVER C (MX-2003 LOWER)	
4	UH4017001		PCB COVER D (MX-2003 UPPER)	
5	087320616	4	TAPTITE, CUP S M3X6	

MODEL MX-2001/2002/2003 54T-X20/X30-110, 54T-X40-110/111

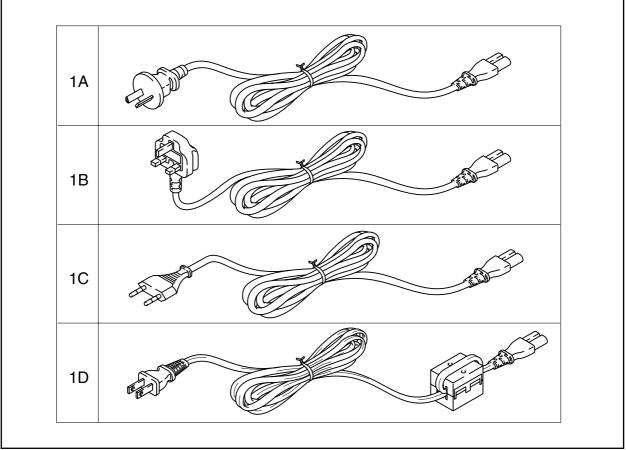
T/I NO. PR98306

7. POWER SUPPLY

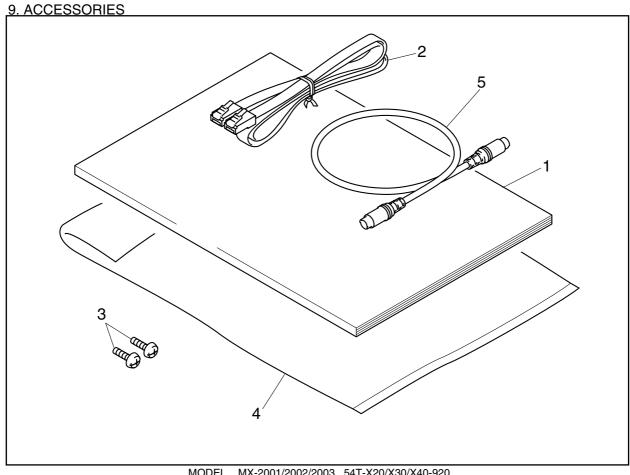
REF.NO.		Q'TY	DESCRIPTION	REMARK
1	UK4300001	1	MX AC ADAPTER	
			MODEL MV 2001/2002 5/T V20/V40 200	

MODEL MX-2001/2003 54T-X20/X40-200

8. AC CORD



MODEL MX-2001/2003 54T-X20/X40-230



MODEL MX-2001/2002/2003 54T-X20/X30/X40-920

8. AC CORD

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
				KEWAKK
1A	UK4302001		AC CORD, SAA	
1B	UK4303001		AC CORD, BS	
1C	UK4301001	1	AC CORD, EUR	
1D	UK4332001	1	AC CORD UL/CSA ASSY	

MODEL MX-2001/2003 54T-X20/X40-230

T/I NO. PR99191

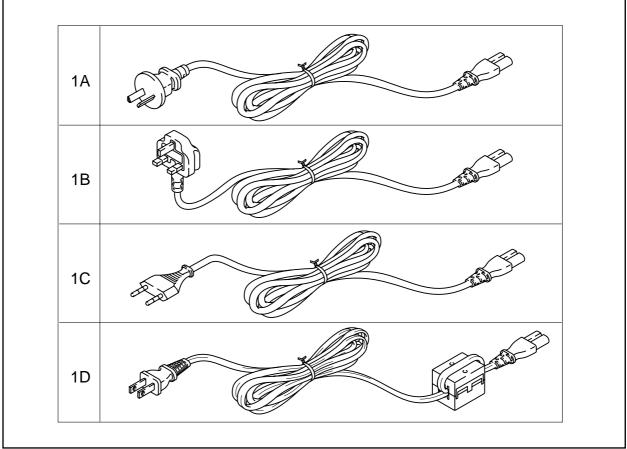
9. ACCESSORIES

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UH3995001	1	USER'S GUIDE, EUR	
1	UH3747001	1	USER'S GUIDE, US/CAN	
2	UK4305001	1	MODULAR CORD 8P (MX-2001/2003)	
3	060300814		SCREW, BIND M3X8 (MX-2002)	
4	UE0331001		BAG, 215X350H	
5	UK4306001	1	MINI DIN CORD 8P (MX-2002)	

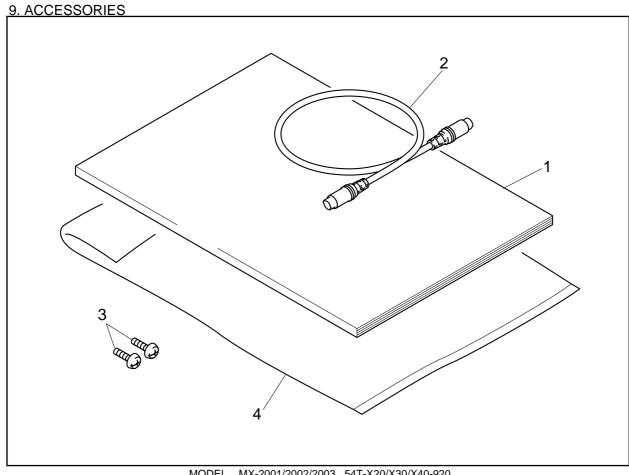
MODEL MX-2001/2002/2003 54T-X20/X30/X40-920

T/I NO. PR98306, PR99196

8. AC CORD



MODEL MX-2001/2003 54T-X20/X40-230



MODEL MX-2001/2002/2003 54T-X20/X30/X40-920

10. PACKING MATERIALS (MX-2001/2002)

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE0782001	1	CARTON, MX-2001	
1	UE0783001	1	CARTON, MX-2002	
2	UE0784001		STYROFOAM PAD (R), MX-2001	
2	UE0786001		STYROFOAM PAD (R), MX-2002	
3	UE0785001		STYROFOAM PAD (L), MX-2001	
3	UE0787001		STYROFOAM PAD (L), MX-2002	
4	UE0790001		CARTON, ACCESSORIES	
5	UE0798001		BASE PLATE R, MX-2001	
5	UE0800001		BASE PLATE R, MX-2002	
6	UE0799001		BASE PLATE L, MX-2001	
6	UE0801001		BASE PLATE L, MX-2002	
7	UE0696001		BAG, 700X800H (BODY)	
8	UE0823001	1	STYROFOAM PAD (F)	

MODEL MX-2001/2002 54T-X20/X30-930

T/I NO. PR98268 / PR99039

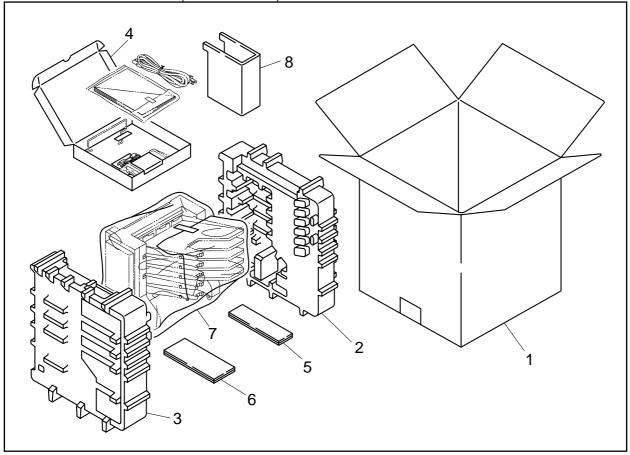
11. PACKING MATERIALS (MX-2003)

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE0809001	1	CARTON, MX-2003	
2	UE0810001		CARTON PAD, MX-2003	
3	UE0811001	1	STYROFOAM PAD LOWER (R), MX-2003	
4	UE0812001	1	STYROFOAM PAD LOWER (L), MX-2003	
5	UE0813001		STYROFOAM PAD UPPER (R), MX-2003	
6	UE0814001		STYROFOAM PAD UPPER (L), MX-2003	
7	UE0790001		CARTON, ACCESSORIES	
8	UE0798001		BASE PLATE R, MX-2001	
9	UE0799001		BASE PLATE L, MX-2001	
10	UE0816001	1	BAG, 800X1100H (BODY)	
			MODEL MV 2002 54T V40 020	

MODEL MX-2003 54T-X40-930

T/I NO. PR98306 / PR99039

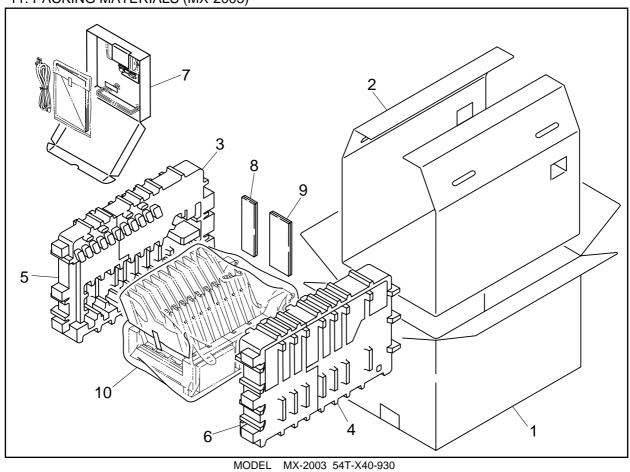
10. PACKING MATERIALS (MX-2001/2002)



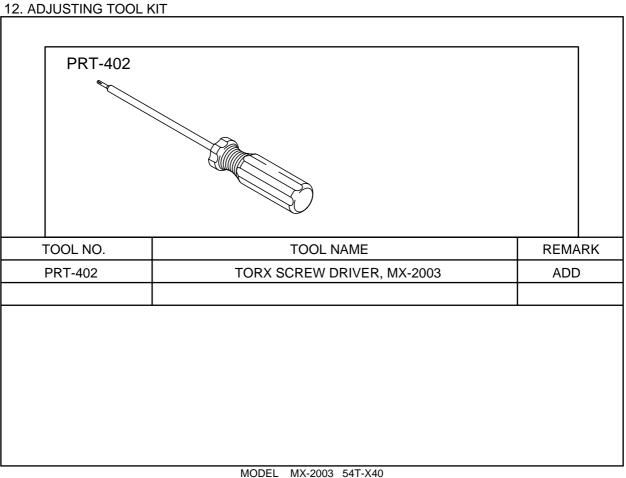
MODEL MX-2001/2002 54T-X20/X30-930

T/I NO. PR98268 / PR99039

11. PACKING MATERIALS (MX-2003)



T/I NO. PR98306 / PR99039



T/I NO. PR98306