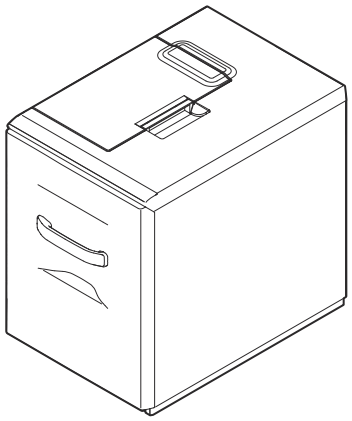
SERVICE MANUAL



DIGITAL
MULTIFUNCTIONAL SYSTEM OPTION
LARGE CAPACITY TRAY

MODEL MX-LC12

CONTENTS

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

CONTENTS

[1] PRODUCT OUTLINE

When using this unit, check for necessity of any other options referring to the configuration of the Service Manual of the main machine.

[2] SPECIFICATIONS

Model		Large capacity tray
Transport reference		Center reference
Heat reserving heater		Service parts
Paper capacity	Normal paper (80g/m^2, 21 lbs bond)	3500 sheets
Paper size/type/weight		Refer to Table 1
Paper size detection		Not provided (Manually setting from the control panel of the main unit)
Paper type setting		Refer to Table 2
Paper size change system	Changeover by user	No
	Changeover by service man (Adjustment of guide and entry of size)	Yes
Factory setting of paper size	Inch series	8.5x11
	AB series	A4
Remaining paper detection		Paper empty and 6 steps (100%, 83.3%, 66.7%, 50%, 33.3%, 16.7%, Paper empty)
Tray lift time	Up	max. 15 sec.
	Down	Fall of its own weight
Troubleshooting of paper jam		Can be corrected without separating the unit.
Reliability		MCBJ: Conforms to the main unit MCBF: Conforms to the main unit
Life		Conforms to the main unit
Power source		DC24V (supplied by the main body)
Power consumption		41.8w or less
Dimensions (WxDxH)		376 x 575 x 523 mm 14 4/5x22 41/64x20 19/32 inch
Occupying area (WxD)		370x550mm 14 9/16x21 21/32 inch
Weight		Approx. 28.5 kg 62.8 lbs
Installation/Maintenance		Implemented by service man
Maintenance parts		Paper feed roller
Optional detection		Automatic detection
Bundled item		Parts for installation

Table 1 : Paper size, type, weight

Paper size		A3W	No
		A3	No
		B4	No
		A4	Yes
		A4R	No
		B5	Yes*1
		B5R	No
		A5R	No
		12	No
		11x17	No
		8.5x14	No
		8.5x13	No
		8.5x11	Yes
		8.5x11R	No
		7.25x10.5R	No
		5.5x8.5R	No
		8K	No
		16K	No
		16KR	No
		Postcard	No
		Envelope	No
		Special	No
Kind/weight of applicable paper	Thin paper	55-59g/m^2 15-16- lbs bond	No
	Normal paper	60-105g/m^2 16-28 lbs bond	Yes
	Cardboard 1	106-176g/m^2 28-47 lbs bond	Yes
	Cardboard 2	177-220g/m^2 47-59 lbs bond	Yes
	Cardboard 3	221-256g/m^2 59-68 lbs bond	No
	Envelope	75-90g/m^2 20-24 lbs bond	No
	OHP paper		No
	Label paper		No
	Tab paper		No

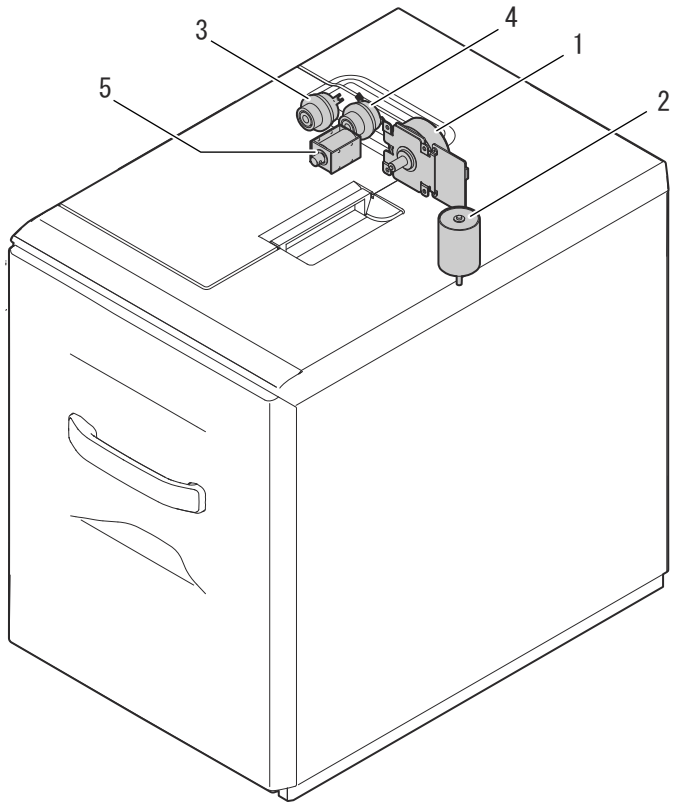
*1) Setting of paper in B5 size is enabled in only AB series size paper is available.

Table2 : Paper type setting

Paper type	Normal paper	Yes
	Printed paper	Yes
	Recycled paper	Yes
	Letter head	Yes
	Perforated paper	Yes
	Color paper	Yes
	Cardboard 1	Yes
	Cardboard 2	No
	Thin paper	No
	Label paper	No
	OHP	No
	Tab paper	No
	Envelope	No
	Use type 1 to 7	Yes

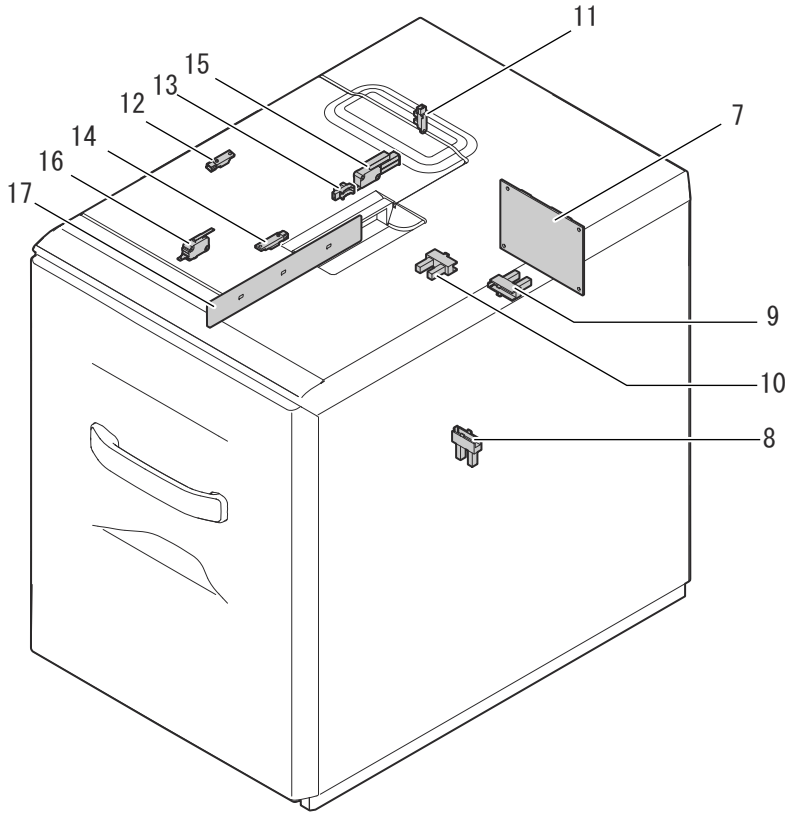
[3] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Motor, clutch, solenoid



No.	Parts					
	Code	Signal name	Name	Type	Function/Operation	Active condition
1	LPFM	LPFM	Transport motor	Brushless motor	Drives the paper feed, and the paper transport section.	When paper feed is started, "H" level.
2	LLM	LLM	Lift motor	Brush motor	Lifts the paper feed table.	When the lower limit sensor is ON, "H" level. When the upper limit sensor is ON, "L" level.
3	LTRC	LTRC	Transport clutch		Controls ON/OFF of the transport roller.	
4	LPFC	LPFC	Paper feed clutch		Controls ON/OFF of the paper feed roller.	When paper feed is started, "H" level. After starring transport (pickup OFF), it is turned OFF by the timer.
5	LPFS	LPFS	Paper feed solenoid		Presses the paper pickup roller onto paper.	Turned OFF after starting transport. Turned ON by the timer. * Lift-up - When paper empty detection is made: ON

2. PWB, sensor, switch, heater



No.	Parts					
	Code	Signal name	Name	Type	Function/Operation	Active condition
7	MAIN PWB	-	LCC main PWB		Controls and drives the LCC.	
8	LDD	LDD	Lower limit sensor		The lower limit of the tray is detected.	When the tray is at the lower limit, "H" level.
9	LRE	LRE	Lift motor encoder		The lift motor rotation is detected.	Pulse signal
10	LCSW	LCSW	Cassette detection		The tray insertion is detected.	When inserted, "H" level.
11	LTOD	LTOD	The main unit connection sensor		Detects connection to the main unit.	When connected, "L" level.
12	LPFD	LPFD	Transport sensor		Detects paper transport.	L level at paper remaining detection.
13	LUD	LUD	Upper limit sensor		Detects the paper upper limit position.	When "H" level (ON), the lift-up motor stops.
14	LPED	LPED	Paper presence/ empty sensor		Detects paper presence/empty on the paper tray.	When paper is detected, "L". * When lifting up, if "L" with LRE 800 pulse, the paper feed solenoid is ON.
15	LLSW	LLSW	Upper limit switch		Protects the paper feed unit from breakage due to lifting the tray too high.	
16	LDSW	LDSW	Upper open/ close switch		Detects open/close of the upper door.	
17*	DH	DH	Thermal heater		Keeps temperature in the LCC tray.	

*Option

[4] OPERATIONAL DESCRIPTION

1. Lift operation

When the main unit is turned ON, if the tray is at the lower limit position (lower limit sensor: LDD ON position), the lift motor is turned ON to lift the tray.

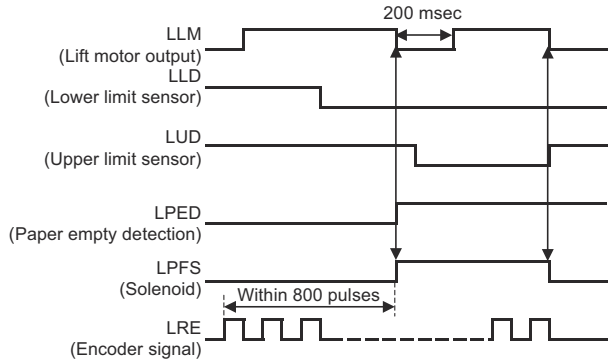
When the paper presence/empty sensor (LPED) is turned ON within 800 pulses of the encoder signal from start of lifting up the tray, the lift motor is turned OFF to stop the tray, and the paper feed solenoid is turned ON to move down the pickup roller. After that, the lift motor is turned ON to lift the tray. The tray is stopped when the upper limit sensor (LUD) is turned ON.

If the paper presence/empty sensor (LPED) is not turned on within 800 pulses, the paper feed solenoid is turned ON with the lift motor ON to move down the pickup roller. The lift motor is stopped at the upper limit sensor (LUD) ON position, and the paper feed solenoid is turned OFF.

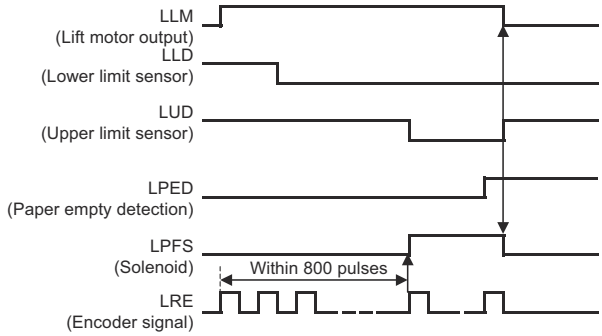
When the machine power is turned on, if the tray is on the paper feed position, lifting is not performed.

When the tray is pulled out, it moves down by its own weight.

Lifting up operation (When LPED is turned ON within 800 pulses of encoder.)



Lifting up operation (When LPED is not turned ON within 800 pulses of encoder.)



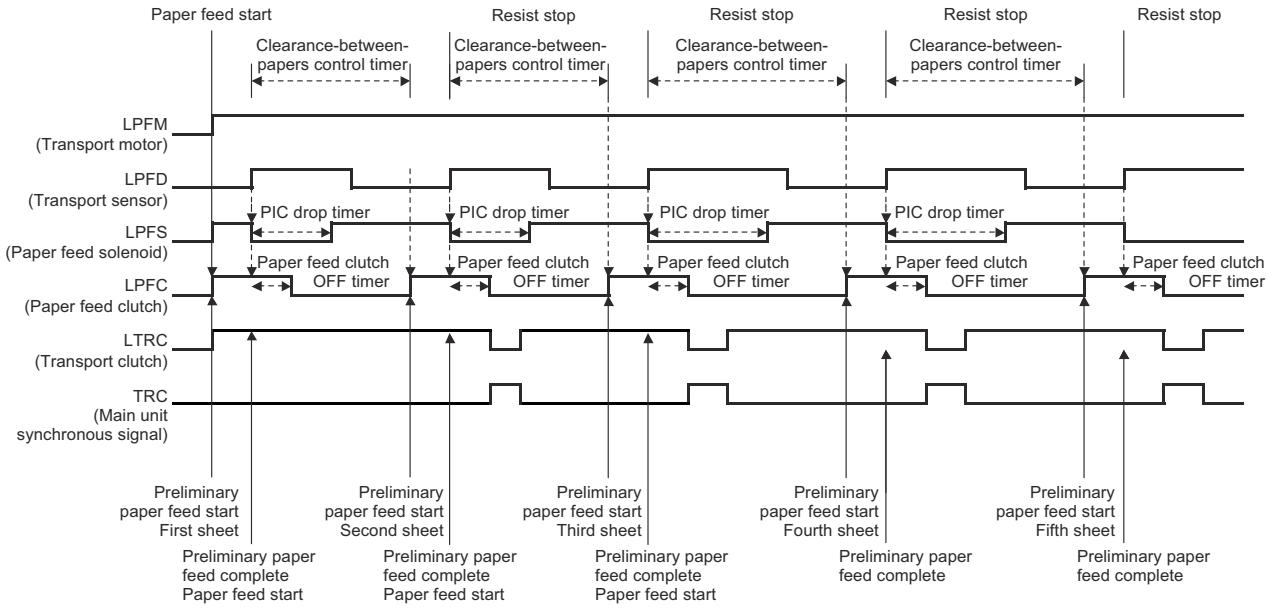
2. Paper feed operation

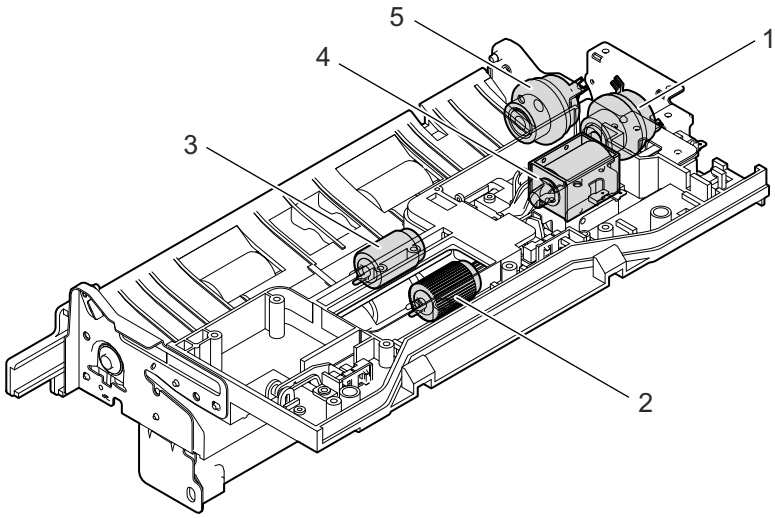
When the tray is stationary at the paper feed position (upper limit sensor: LUD ON position) and there is paper on the tray, paper feed operation can be performed.

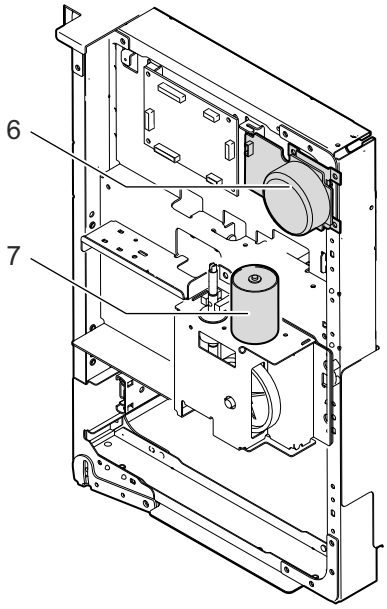
Paper feed operation is performed by the transport motor (LPFM), the transport clutch (LTRC), the paper feed clutch (LPFC), and the paper feed solenoid (LPFS) at the following timing.

When the transport clutch (LTRC) is turned ON with the transport motor (LRFM) ON (rotating), the transport roller rotates. When the paper feed clutch (LPFC) is turned on under this state, the paper feed roller and the take-up roller rotate. When the paper feed solenoid (LPFS) is turned ON, the take-up roller is pushed down to press paper.

LCC paper feed time chart







1	Paper feed roller clutch
2	Take-up roller
3	Paper feed roller
4	Paper feed solenoid
5	Transport clutch
6	Transport motor
7	Lift-up motor

3. Paper empty detection

When the tray lifts and stops at the paper feed position and during paper feed operation, paper presence/empty is detected by the paper presence/empty sensor (LPED).

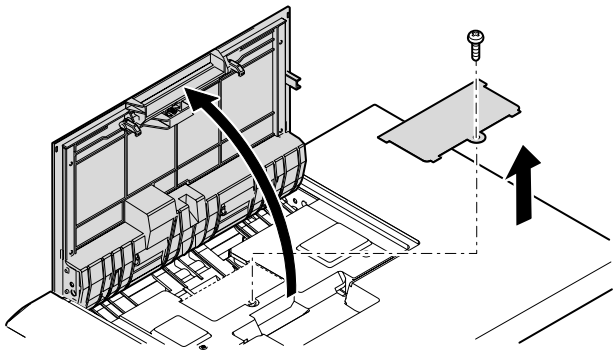
When paper empty is detected in the tray during paper feeding, paper feeding is stopped.

[5] DISASSEMBLY AND ASSEMBLY

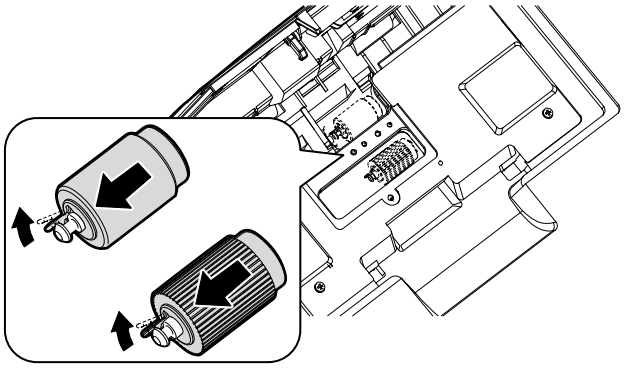
1. Maintenance parts replacement procedures

A. Paper feed roller

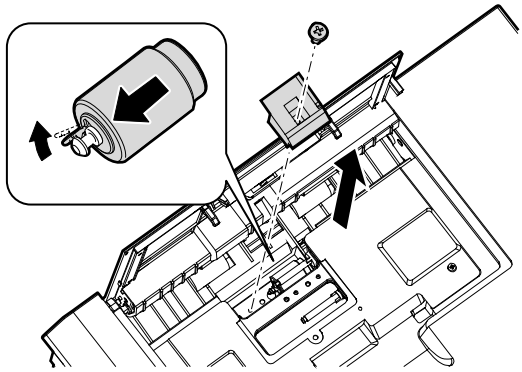
1) Pull the lever, and open the upper cover.
2) Remove the screw, and remove the sheet.



3) Remove the pawl, and remove the take-up roller and the paper feed roller.



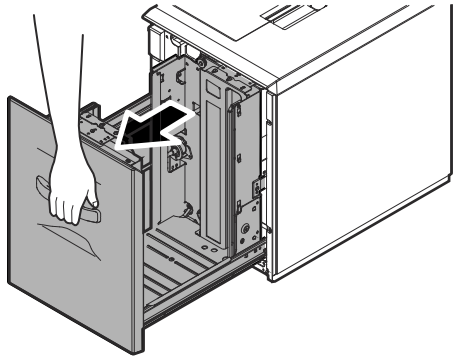
4) Remove the screw, and remove the paper guide block.
5) Remove the pawl, and remove the reverse roller.



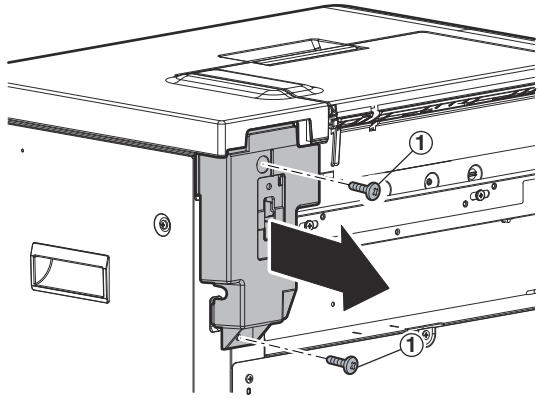
2. Each unit removal

A. Paper feed unit

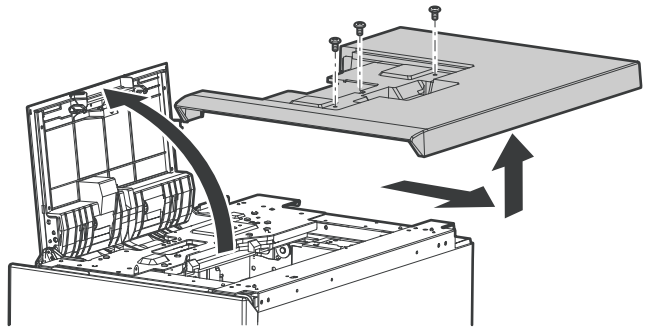
1) Pull out the tray.



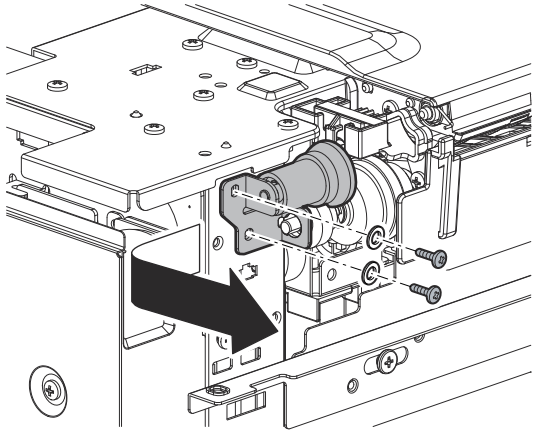
2) Remove two screws, and remove the left rear cabinet.



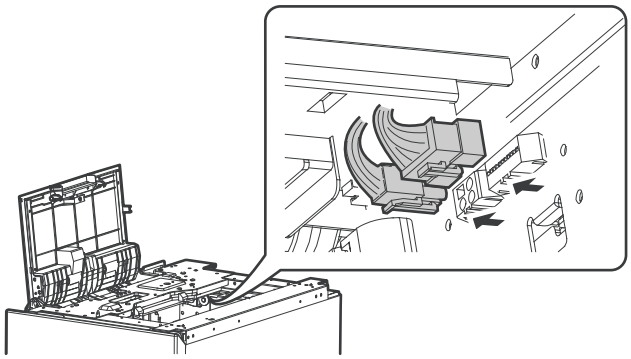
3) Open the upper cover, and remove three screws.
4) Remove the upper cabinet.



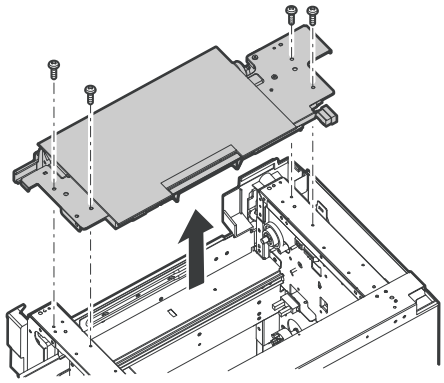
5) Remove two screws, and remove the torque limiter unit.



6) Disconnect the connectors (2 positions).

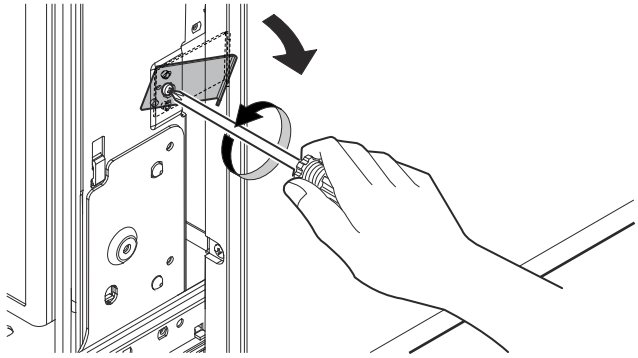


7) Remove the screw, and remove the paper feed unit.

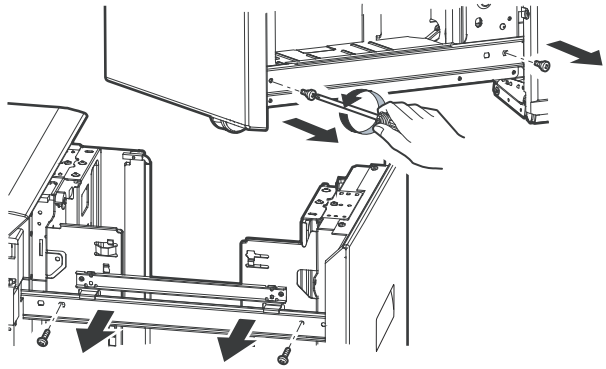


B. Paper feed tray

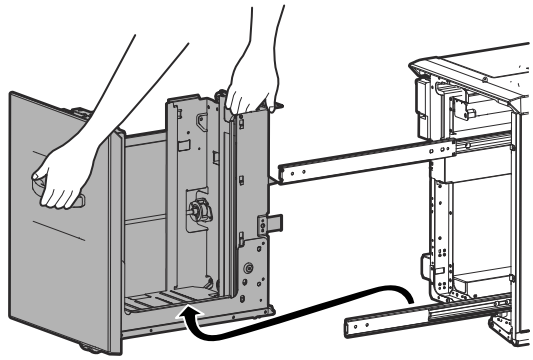
1) Pull out the tray.
2) Loosen the stopper fixing screw (1) on the lower right side of the paper tray and remove the stopper.



3) Remove the screws from the left and right rail sections.

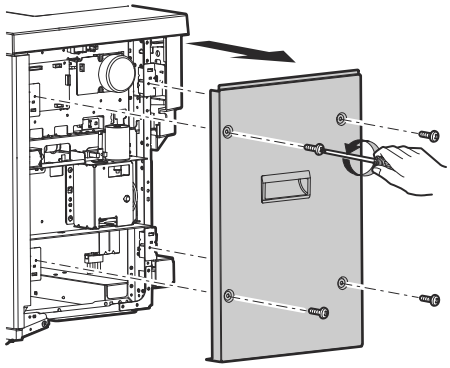


4) Remove the tray unit from the rail.

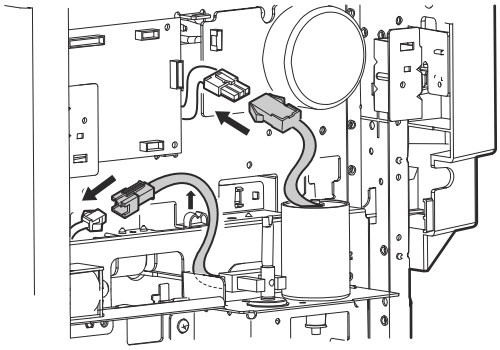


C. Drive unit

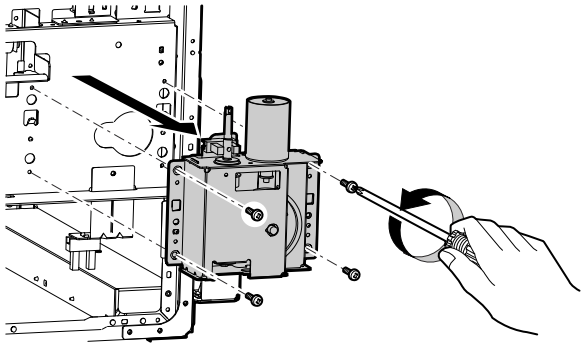
1) Remove the screw, and remove the rear cover.



2) Remove the connectors (2 positions).



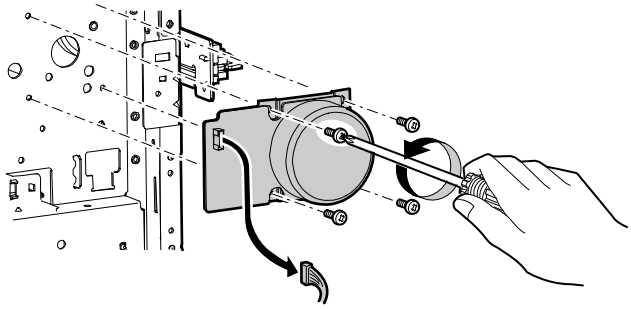
3) Remove the screw, and remove the drive unit.



3. Major parts removal

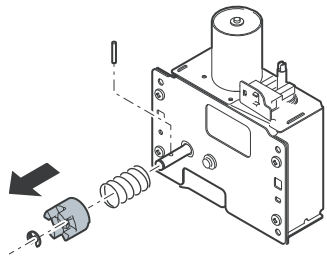
A. Motor (Main)

1) Remove the screw, and remove the rear cover.
2) Disconnect the connector.
3) Remove the screw, and remove the motor.

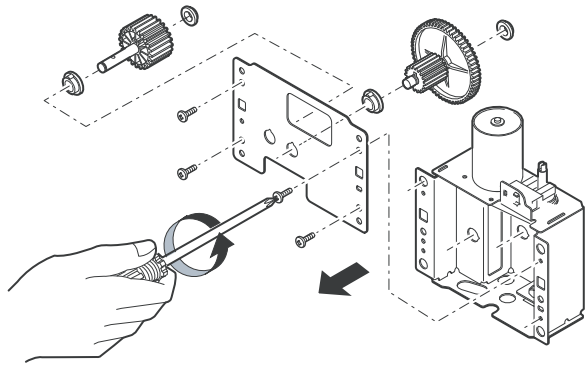


B. Lift motor

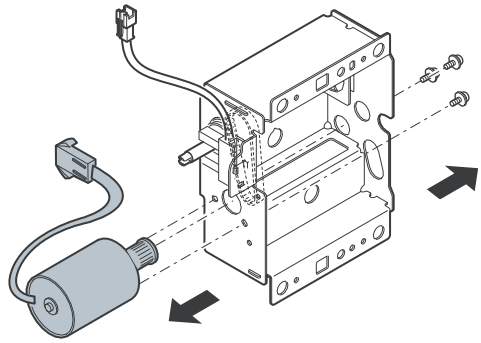
1) Remove the drive unit.
2) Remove the E-ring, and remove the parts.



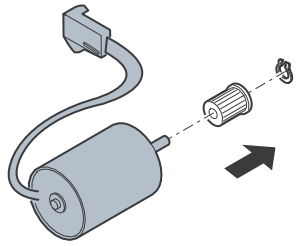
3) Remove the screw, and remove the cover.



4) Remove the screw, and remove the lift motor.

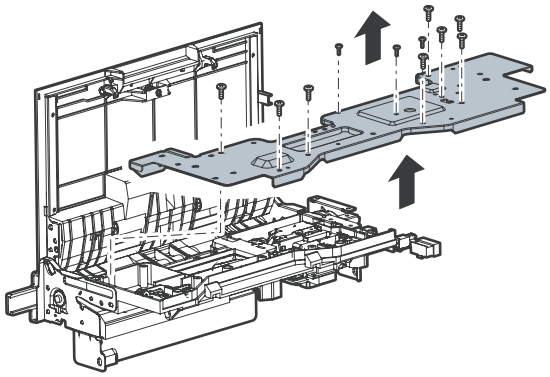


5) Remove the ring, and remove the pulley.

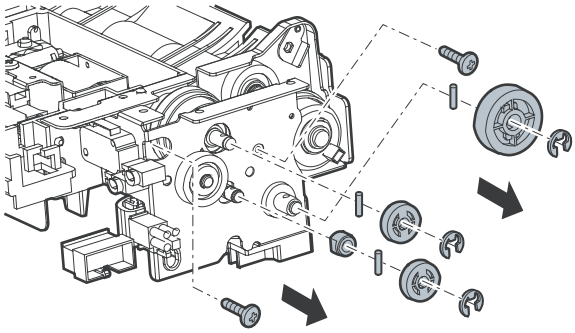


C. Clutch

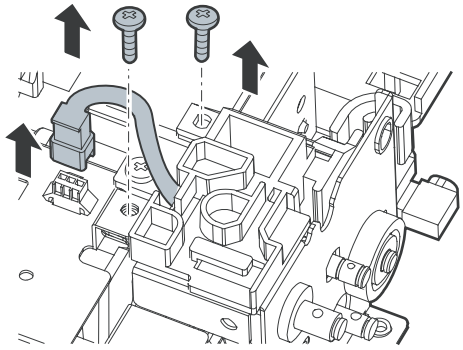
1) Remove the paper feed unit. (Refer to "3. Each unit removal.")
2) Remove the screw, and remove the cover.



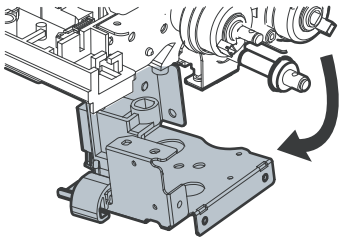
3) Remove the E-ring, and remove the parts.



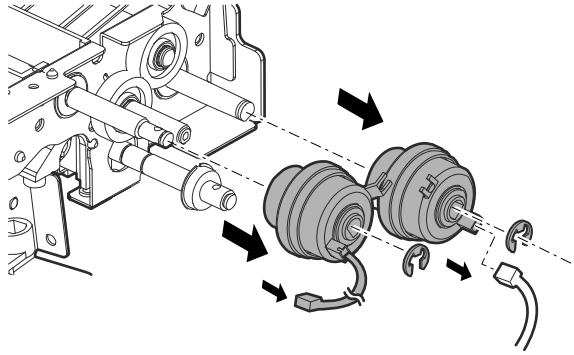
4) Disconnect the connector, and remove the screw.



5) Remove the frame.

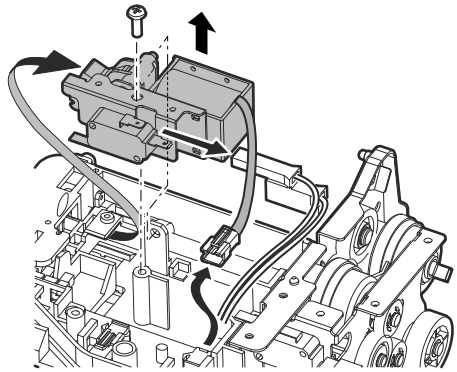


6) Remove the connector, and the E-ring, and remove the paper feed, transport clutch, respectively.

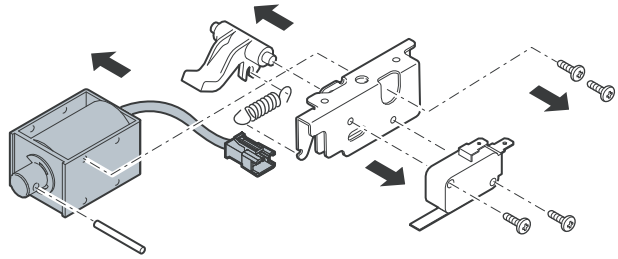


D. Paper feed solenoid

1) Remove the paper feed unit.
2) Remove the cover.
3) Remove the screw, and remove the unit.

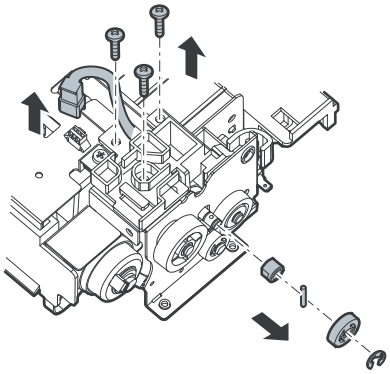


4) Disconnect the connector.
5) Remove the screw, and remove the solenoid.

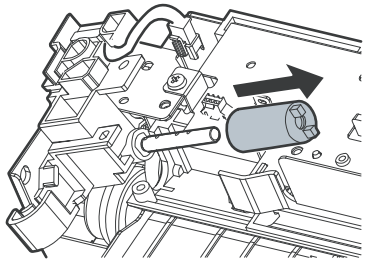


E. Torque limiter

1) Remove the paper feed unit.
2) Remove the cover.
3) Remove the E-ring and the screw, and remove the parts.

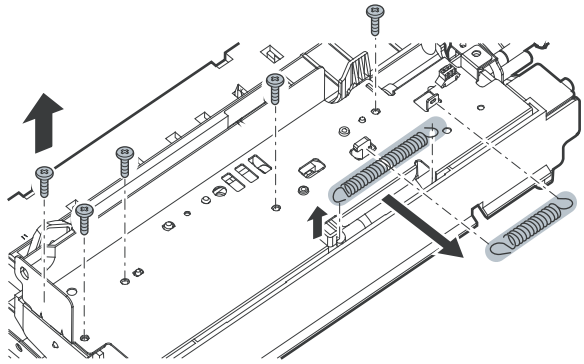


4) Lift the shaft, and remove the torque limiter.

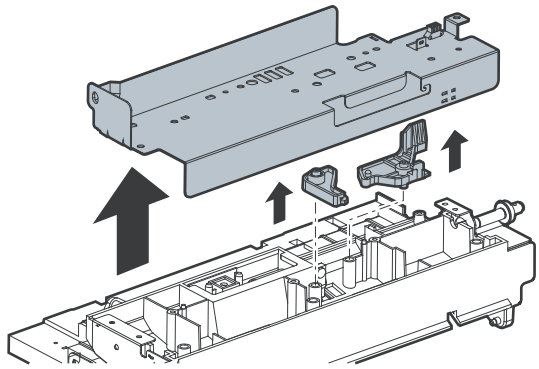


F. Transport roller

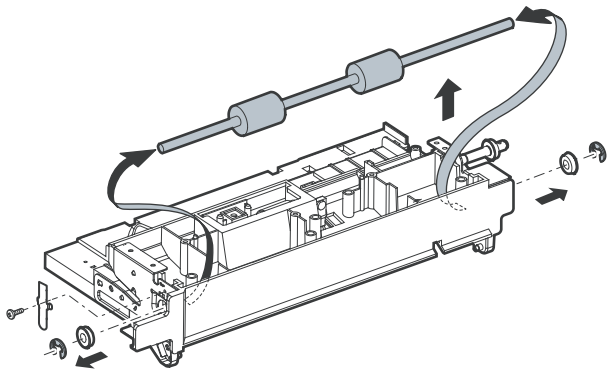
1) Remove the paper feed unit.
2) Remove the cover.
3) Remove the spring, and remove the screw.



4) Remove the plate cover, and remove the lever.



5) Remove the clutch.
6) Remove the screw and the E-ring, and remove the parts.
7) Remove the transport roller.



[6] MAINTENANCE

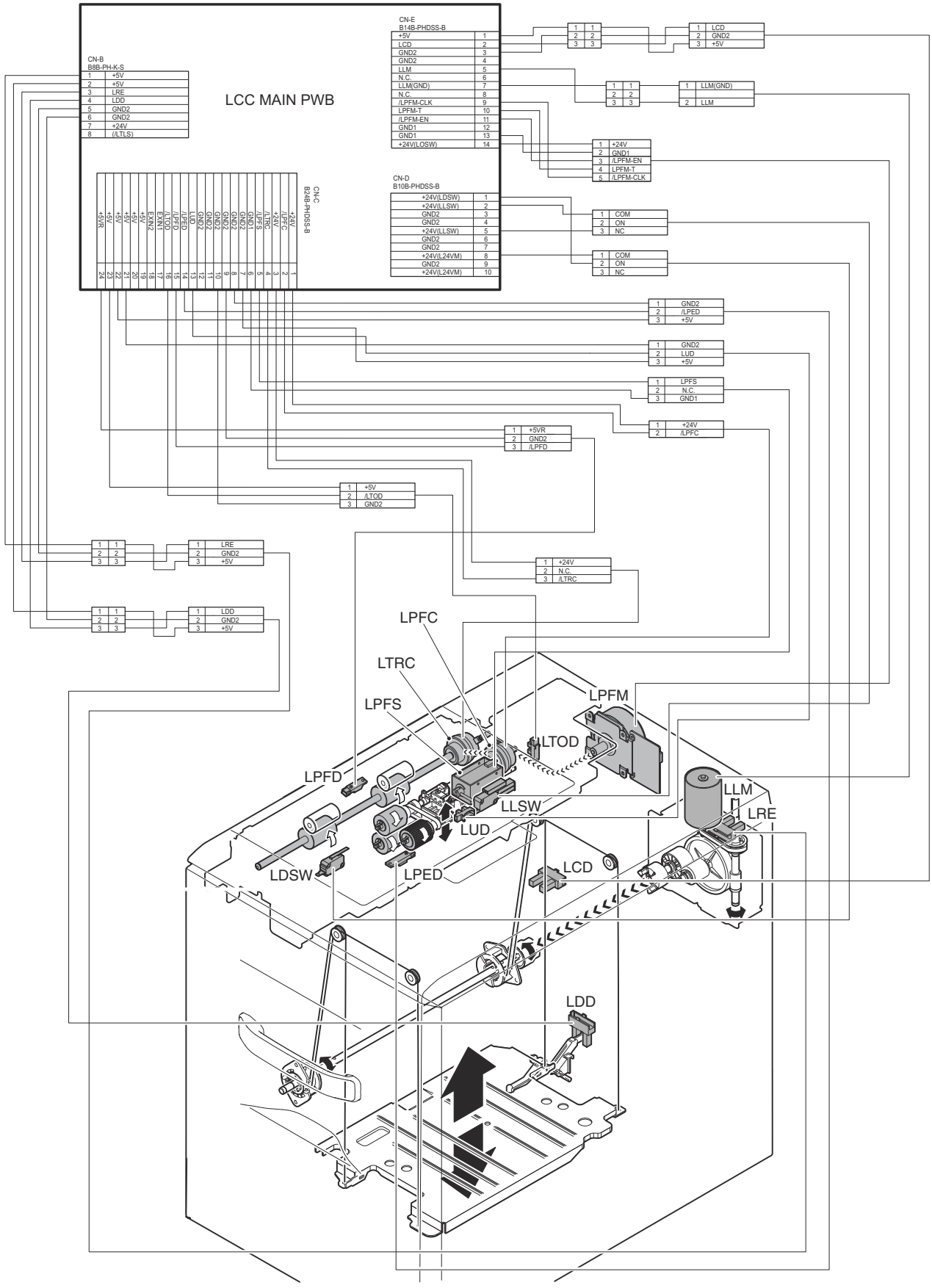
1. Maintenance system table

× : Checking (clean, replace or adjust as required)　○ : Cleaning　▲ : Replace　Δ : Adjust　☆ : Lubricate　□ : Position shift

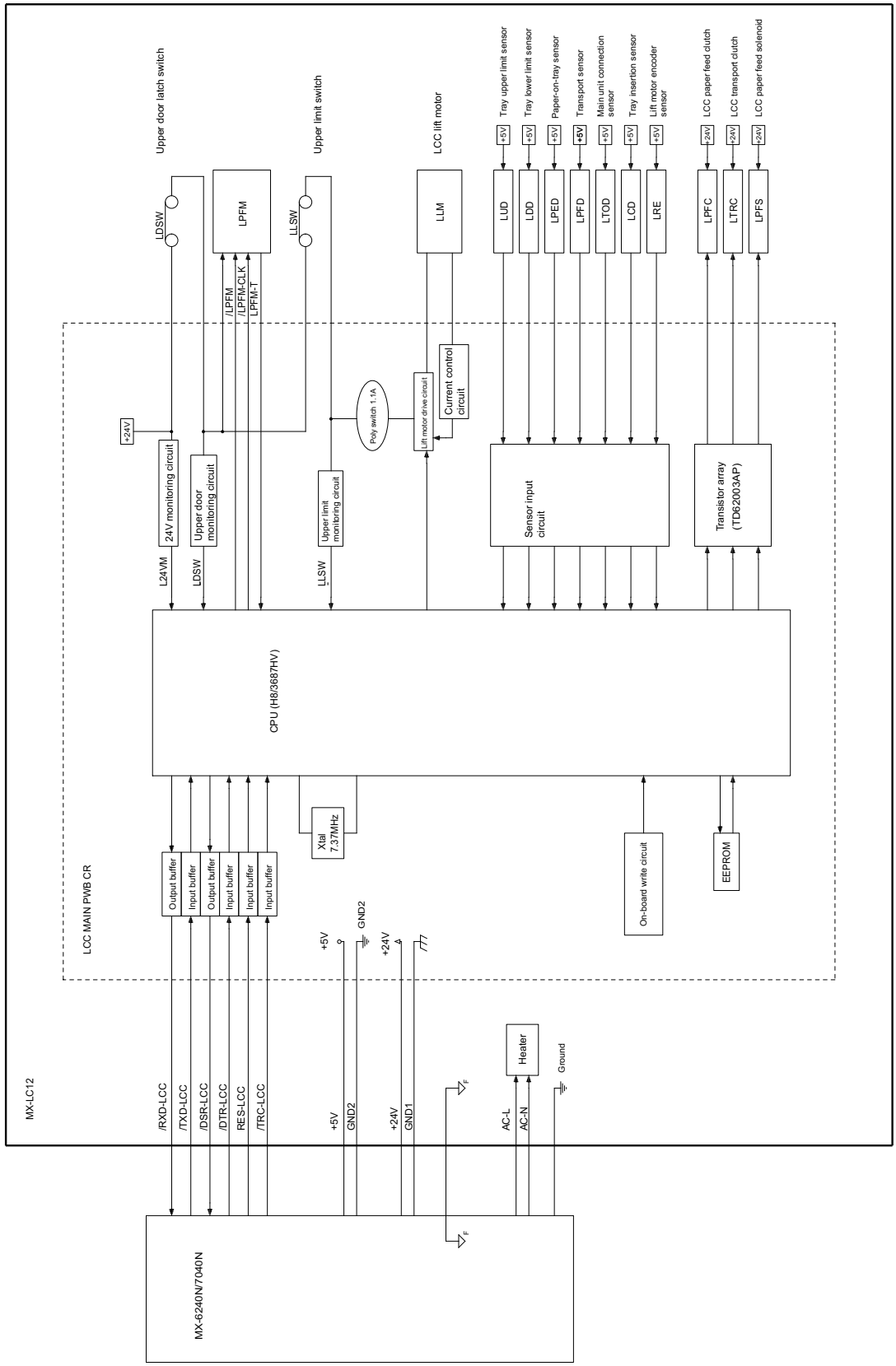
No.	Part name	When calling	Main unit maintenance cycle	Remarks
1	Pick-up roller/each paper feed roller	×	○	As a rough guide, these rollers should be replaced when the LCC paper feed counter reaches a value of 200K (Sim22-9) .
2	Torque limiter	×	×	As a rough guide, the torque limiter should be replaced when the LCC paper feed counter reaches a value of 800K (Sim22-9).
3	Each transport rollers	×	○	
4	Each transport paper guides	○	○	
5	Each gears	×	×	
6	Each belts		×	
7	Each sensors	×	×	

[7] ELECTRICAL SECTION

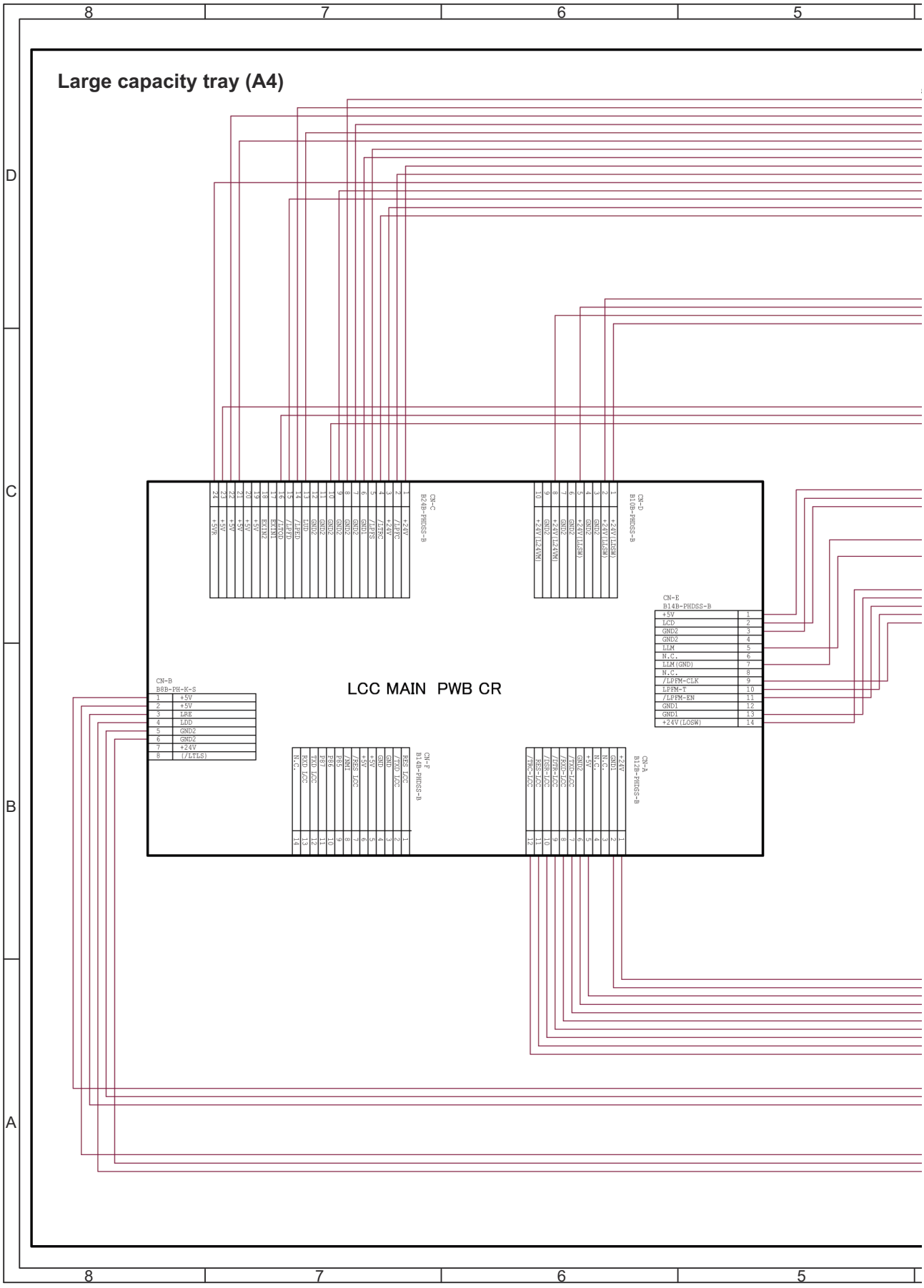
1. Electronic/mechanical parts relationship diagram

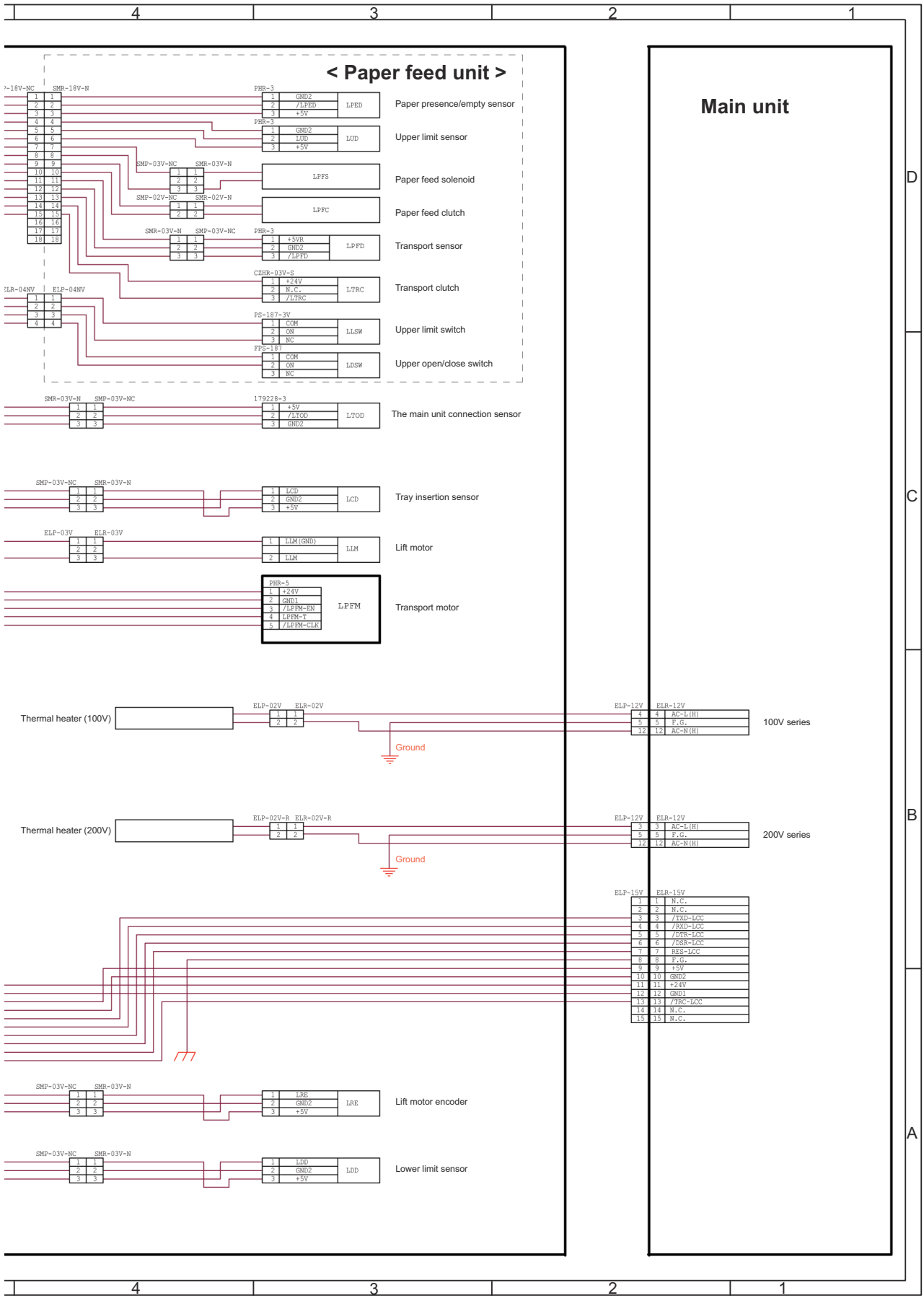


2. Block diagram



3. Wiring diagram

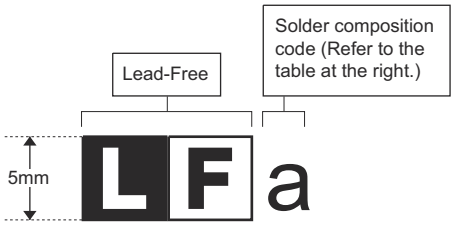



< Paper feed unit >
Main unit
Paper presence/empty sensor
Upper limit sensor
Paper feed solenoid
Paper feed clutch
Transport sensor
Transport clutch
Upper limit switch
Upper open/close switch
The main unit connection sensor
Tray insertion sensor
Lift motor
Transport motor
Thermal heater (100V)
Thermal heater (200V)
Ground
100V series
200V series
Lift motor encoder
Lower limit sensor

LEAD-FREE SOLDER

The PWB's of this model employs lead-free solder. The "LF" marks indicated on the PWB's and the Service Manual mean "Lead-Free" solder.
The alphabet following the LF mark shows the kind of lead-free solder.

Example:



<Solder composition code of lead-free solder>

Solder composition	Solder composition code
Sn-Ag-Cu	a
Sn-Ag-Bi Sn-Ag-Bi-Cu	b
Sn-Zn-Bi	z
Sn-In-Ag-Bi	i
Sn-Cu-Ni	n
Sn-Ag-Sb	s
Bi-Sn-Ag-P Bi-Sn-Ag	p

(1) NOTE FOR THE USE OF LEAD-FREE SOLDER THREAD

When repairing a lead-free solder PWB, use lead-free solder thread.

Never use conventional lead solder thread, which may cause a breakdown or an accident.

Since the melting point of lead-free solder thread is about 40°C higher than that of conventional lead solder thread, the use of the exclusive-use soldering iron is recommended.

(2) NOTE FOR SOLDERING WORK

Since the melting point of lead-free solder is about 220°C, which is about 40°C higher than that of conventional lead solder, and its soldering capacity is inferior to conventional one, it is apt to keep the soldering iron in contact with the PWB for longer time. This may cause land separation or may exceed the heat-resistive temperature of components. Use enough care to separate the soldering iron from the PWB when completion of soldering is confirmed.

Since lead-free solder includes a greater quantity of tin, the iron tip may corrode easily. Turn ON/OFF the soldering iron power frequently.

If different-kind solder remains on the soldering iron tip, it is melted together with lead-free solder. To avoid this, clean the soldering iron tip after completion of soldering work.

If the soldering iron tip is discolored black during soldering work, clean and file the tip with steel wool or a fine filer.

CAUTION FOR BATTERY REPLACEMENT

(Danish) ADVARSEL !

Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English) Caution !

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the manufacturer.
Dispose of used batteries according to manufacturer's instructions.

(Finnish) VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

(French) ATTENTION

Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type équivalent recommandé par
le constructeur.
Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.

(Swedish) VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

(German) Achtung

Explosionsgefahr bei Verwendung inkorrekter Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

* Applicable to battery-operated equipment

CAUTION FOR BATTERY DISPOSAL

(For USA, CANADA)

"BATTERY DISPOSAL"

THIS PRODUCT CONTAINS A LITHIUM PRIMARY (MANGANESS DIOXIDE) MEMORY BACK-UP BATTERY THAT MUST BE DISPOSED OF PROPERLY. REMOVE THE BATTERY FROM THE PRODUCT AND CONTACT YOUR LOCAL ENVIRONMENTAL AGENCIES FOR INFORMATION ON RECYCLING AND DISPOSAL OPTIONS.

"TRAITEMENT DES PILES USAGÉES"

CE PRODUIT CONTIENT UNE PILE DE SAUVEGARDE DE MÉMOIRE LITHIUM PRIMAIRE (DIOXYDE DE MANGANÈSE) QUI DOIT ÊTRE TRAITÉE CORRECTEMENT. ENLEVEZ LA PILE DU PRODUIT ET PRENEZ CONTACT AVEC VOTRE AGENCE ENVIRONNEMENTALE LOCALE POUR DES INFORMATIONS SUR LES MÉTHODES DE RECYCLAGE ET DE TRAITEMENT.

* Applicable to battery-operated equipment