Safety Precautions for Service Engineer

English

Lotem 800 Family

399Z3R623A

www.creo.com

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4456924	5247352	5412737	5600448	5802034	5996499	6136509
4500919	5249067	5420702	5608822	5813346	5998067	6147789
4558302	5283140	5420722	5615282	5818498	6003442	6158345
4743091	5291273	5459505	5625766	5854883	6014471	6159659
4992864	5296935	5473733	5636330	5861904	6016752	6164637
5049901	5313278	5481379	5649220	5861992	6031932	6180325
5079721	5323248	5488906	5650076	5864651	6043865	6181362
5103407	5325217	5497252	5652804	5875288	6060208	6181439
5111308	5331439	5508828	5691823	5894342	6063528	6186068
5113249	5333064	5509561	5691828	5900981	6063546	6189452
5122871	5339176	5517359	5696393	5934196	6072518	6191882
5124547	5343059	5519852	5699174	5942137	6090529	6204874
5132723	5355446	5526143	5699740	5946426	6096461	6208369
5150225	5359451	5532728	5708736	5947028	6098544	6252522
5153769	5359458	5561691	5713287	5958647	6107011	6260482
5155782	5367360	5568595	5739819	5966504	6112663	
5157516	5367388	5576754	5742743	5969872	6115056	
5208818	5384648	5579115	5764381	5973801	6121996	
5208888	5384899	5592309	5771794	5986819	6130702	
5247174	5412491	5594556	5785309	5995475	6134393	

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Introduction

Read the following safety chapter carefully before installing, operating, servicing or maintaining the Lotem 800 Family platesetter.



This chapter applies to the following Lotem 800 (Fiber, not Quantum) platesetters , namely thre Lotem 800 (with Omron interlocks), Lotem 800 (F-speed), Lotem 800 with Spectrum, and Lotem GTO. Throughout this document, the Lotem 800 is mentioned and applies to all platesetters in the Lotem 800 family, unless otherwise specified.

Read the user safety precautions for the Lotem 800 Family platesetter, an indispensable part of the service engineer's precautions. Please see *Lotem 800 Family Safety Precautions for User, cat # 399Z1R943A*.

This product is a **Class 1** laser product, according to IEC825-1 and USA 21 CFR 1040. This implies that there is no hazardous laser radiation, providing that the user and service safety precautions are followed.

Lotem 800 Family safety at a glance - how to avoid exposure hazards?



WARNING ! The laser beam and radiation are invisible to the eye.

1. Never operate or electrically connect the Laser system unless it is properly installed inside the platesetter.
2. Keep all external doors and internal protective barriers (including internal doors) of the platesetter complete, unharmed and intact !
3. Never defeat the Laser interlock switches ! Motor interlock switches may be defeated following safety instructions!
4. Never leave any object between the Laser head and the drum.
5. Do not operate the platesetter if there is any doubt regarding the above.

Extensive means were taken in the design and manufacturing of the platesetter to eliminate the hazards for user and service personnel.

Follow the instructions in this chapter to ensure your safety and the safety of others when installing and servicing the platesetter. These instructions are also required for the user's safety.

General Safety Precautions

1. Whenever servicing the platesetter, post the following sign close to the keyboard and close to the platesetter: **CAUTION**: machine in service – do not operate. This sign will caution people from operating the platesetter while it is being serviced.
2. Many service procedures can be performed when the entire platesetter or some of its assemblies are switched off. Service the platesetter when **off** whenever possible (see *Disconnection from Mains Supply* further on).
3. Never operate or electrically connect the Laser unless it is properly installed inside the platesetter.
4. **The service engineer is not allowed under any circumstances to defeat any Laser interlock** !
5. While taking appropriate precautions, the service engineer is allowed to defeat the Motor interlock switches. Do so **only** when no alternative service option is possible.
6. Three readily accessible yellow pushbuttons are provided for disconnecting power from the mechanical hazards existing in the platesetter. Two yellow On/Off pushbuttons are located on the external front side, on both sides of the platesetter; these disconnect power from certain parts of the platesetter, including the motors, Laser box, and the Electronic box.

   Another pushbutton is centrally located below the upper front door; it activates the motor interlocks, even if the interlock is defeated. When the pushbutton is pushed, power is disconnected from the motors, including the drum motor.

   WARNING ! Injury hazard! The drum will **not stop** immediately when the yellow on/off pushbutton is pressed or the main power circuit breaker is activated.

7. Prior to service, remove any piece of clothing or object that may get caught in the revolving drum or in any other moving part of the platesetter. For example, remove ties, roll up long sleeves, remove rings and bracelets, and gather long hair.

8. Remove jewelry, wristwatches and reflective objects from your hands, wrists and shirt, and use non-reflective tools. This measure reduces the chance of hazardous laser reflection if a failure occurs in the Laser interlock system or in a protective barrier.
9. If there is any doubt regarding the proper functioning of the Laser interlock system, or whenever you suspect that the platesetter protective cover or barrier is broken, cracked or otherwise damaged, you must turn the platesetter **off and not turn it on** again until it is checked and found to be **OK**.

Installation and Service Personnel

Installation or service must be performed only by authorized service personnel.

The Lotem 800 platesetter is installed and serviced exclusively by specialized technicians. These technicians are trained, authorized and certified in the proper procedures for working with, and adjusting the laser system, and working with the mechanical, cooling, vacuum, and electrical systems of the platesetter.

WARNING ! Only certified service personnel are allowed to install or service the Lotem 800 platesetter.

Installation

Power Line and Safety Ground

Refer to the Lotem 800 Site Preparation Guidelines catalog number 399Z1P839A, also located in the TIC - Technical Information Center.

For platesetter - line voltage 208V/120V ±10%, 3 phase (Star) 20A, 50/60 Hz ±2%; for Brisque and PC Controller - 120V ±10% or 230V ±10%; frequency - 50/60HZ ±2%.

Only for customers with line power of 230V - a step-down transformer is used, from 346/200, 380/220, 400/230 or 415/240 to 208/120V (3 phase).



NOTE: To protect the transformer, a 4 pole (3 phase and neutral) circuit breaker must be provided in the power line that feeds the step-down transformer. The circuit breaker must be rated: 10KA IEC 947.2, 230/400 VAC, 16A, tripping curve D (such as, Cat no. 24688 by Merlin Gerin).



WARNING ! Hazard of fire and electric shock if circuit breaker is missing!



NOTE: The power line connection **MUST** include 5 pins: 3 Phases, Neutral and safety Ground. Where the step down transformer is used, the 3 phases, Neutral and Safety Ground are provided through the step-down transformer.



DANGER ! Hazard of fatal electric shock if safety ground path is interrupted!

Disconnection from Mains Supply

The Distribution box at the lower front panel of platesetter has three (3) circuit breakers - main power (in the center), drum power and drum vacuum pump circuit breakers. An Additional circuit breaker is on the Electronic box inner cover. Two yellow On/Off pushbuttons are located on both sides of the front panel.

- Before dismantling any board or power supply, shut down the **Main power circuit breaker** on the Distribution box or the Electronic box circuit breaker (if only the Electronic box is opened).

- Whenever adjusting or checking an electrical board/unit, verify that you are using the correct test point. Do not touch any unit with bare hands.



WARNING ! Total disconnection from the mains supply can only be achieved by deactivating the Main power circuit breaker (set to “0”), or by unplugging the 5 pin Main power cable from the 3 phase power supply.

Disconnection from Pneumatic Air Pressure

Disconnecting the air pressure is done by switching off the air supply. The Lotem 800 receives pneumatic air pressure from the filtration unit located on the wall. Turn the knob to switch the air pressure off.

Non-English Warning Labels

Where a language other than English is spoken, the service engineer must stick the translated warning labels (attached to the platesetter) according to the country of installation, in the designated locations. The translated labels have the letter ‘K’ in the catalog number.

Basic & Laser Safety Precautions

The basic and laser safety precautions section includes the following topics:

- Optical Fibers
- Laser Head
- Laser Box
- Enclosures
- Safety Interlocks
- Warning labels



CAUTION ! Use of controls or adjustments, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.



DANGER ! The above **CAUTION** note must be included in this manual according to USA 21CFR regulations. However, the hazards involved include not moderate, but **SERIOUS** bodily injury - especially to the eye!

The platesetter is equipped with a **highly hazardous laser system** that exposes the media. However, the platesetter as a whole is a **Class 1 laser product**, according to IEC825-1 and the USA 21 CFR 1040. This implies that the operator and service engineer cannot access hazardous laser radiation, providing that the user and service safety precautions are followed.



WARNING ! The laser beam and radiation of the platesetter contain invisible laser radiation that are hazardous to the eye and skin. **In the presence of flammable material, the laser beam is also a fire hazard! Even brief exposure of the eyes to the laser radiation or beam, or its reflections from shiny or matte objects may cause permanent loss or permanent degradation of eyesight !**



WARNING ! Whenever in doubt, the platesetter should never be operated until it is checked and approved for operation by an authorized service engineer

WARNING ! If you **must** enter the room where the platesetter is located when the platesetter is on, and you suspect that any of the following precautions was somehow violated, then you must **disconnect** the power supply to the platesetter before entering the room !

Optical Fibers

The laser energy is generated in the laser diodes, located in the Laser box and conducted to the Laser head through optical fibers. Up to several hundred milliwatts of invisible laser radiation at a wavelength of 810-860 nanometers may be conducted in each fiber. This laser radiation is hazardous to the eye and skin.

The service engineer must check and ensure that:

1. All the optical fibers are complete, not cut or broken and not abruptly bent.
2. No optical fiber extends from the outer platesetter enclosure or even from the Laser box enclosure.
3. The optical fibers guards are complete and unharmed.

DANGER! If one of the many optical fibers is damaged or cut inside or outside the platesetter, and even when the doors are closed, invisible laser radiation of up to several hundred milliwatts at a wavelength of 810-860 nanometer may radiate outside the platesetter through the side door openings or through other openings. This laser radiation is hazardous to the eye and skin. **Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!**

Laser Head

The Optical fibers direct the laser radiation in the platesetter from the Laser box to the plotting Optical head.

DANGER ! The laser head must never be activated if it is removed from its position on the guide beam. In addition, the optical head must never be activated when it is not in its proper position facing the drum, and with all the internal protective barriers assembled and all the doors closed.

WARNING ! Never place any object in the path of the laser beam between the laser head and the drum.



WARNING! Up to several watts of invisible laser radiation at a wavelength of 810-860 nanometer may be present at the output of the plotting head. This laser radiation is hazardous to the eye and skin. **Even brief exposure of the eye to this radiation or to its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight !**

Laser Box

The Laser diodes are located in the Laser box on the left side of the platesetter. The platesetter must never be activated when the Laser box is not in its proper location and the Laser box door closed and properly fastened.

Before servicing the Laser box, shut down the circuit breaker on the outer cover of the Laser box.



CAUTION ! Always use Static Electricity discharge before opening the Laser box door or working with the Laser diodes. The Static Electricity discharge is located inside the Laser box.



WARNING ! After servicing or checking the Laser box, make sure that all the laser fibers are properly connected and routed, and do not extend out of the Laser box. When closing the Laser box door, make sure you do not harm any of the fibers.



DANGER! If one of the many optical fibers is damaged or cut inside or outside the platesetter, and even when the doors are closed, invisible laser radiation of up to several hundred milliwatts at a wavelength of 810-860 nanometer may radiate outside the platesetter through the side door openings or through other openings. This laser radiation is hazardous to the eye and skin. **Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!**

Enclosures

Together with the Laser interlock system, the platesetter enclosure is designed to protect anyone in the platesetter vicinity from exposure to the laser radiation by enclosing the laser radiation within the platesetter. The enclosure includes the external doors and panels, and the internal protective barriers. The internal protective barriers prevent the laser radiation from escaping through the platesetter loading/ unloading openings and through the ventilation openings on the side doors or lower panels. This protection depends upon the completeness and correct assembly of the outer enclosure and the internal protective barriers.

CAUTION ! The opening of the two upper doors is controlled by a spring loaded mechanism. Make sure your head is **not near** the door when opening the door.

WARNING ! After performing any service activity and before switching the platesetter on, the service engineer must check and ensure that all external and internal enclosures are complete, not broken or cracked, and properly assembled to the platesetter.

DANGER ! If the platesetter is ON and the enclosure is damaged or incomplete, and even with the external doors closed, then visible or invisible laser radiation of up to several watts may be present. **This radiation is hazardous to the eye and skin. Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight !**

Safety Interlocks

Interlock switches are designed to disconnect power from **all** the Laser sources and from mechanically hazardous parts when one of the above doors is opened or one of the panels is removed. See the interlock table and figures that follow

WARNING ! The service engineer is forbidden under **any** circumstances to **defeat** any of the Laser interlock switches.

All doors (upper and side doors) and the upper rear panel have Omron interlock switches that disable the laser sources and the motors.

The upper doors have 2 interlock switches each. The side doors have one interlock switch each. The upper and lower rear panels also have only one interlock switch each. In order not to rely on the reliability of a single switch, **the serviceman is required to keep one of the upper doors open if a side door or a rear panel is open**.



WARNING ! If you must defeat the motor interlock switch, located below the upper rear door, you are **not allowed** to use any other means except the dedicated cheaters (Creo No. 290B8L064) that are supplied for the use of the Lotem 800 service. Use of any other interlock cheater is **unsafe** and **forbidden**.



CAUTION ! The service engineer is also allowed to defeat the cassette inlet opening magnetic interlock switch and the two paper door interlock switches, using the intended magnet or defeater respectively.

Interlock Functions and Locations

Interlock Location	Interlock Function	Number of interlock and defeater Switches	Serviceman only Defeat Allowances
Upper rear door (unloading)	Disable Lasers and Motors	2 interlock switches 1 defeat switch	Defeat switch only - to operate motors
Upper front door (loading)	Disable Lasers and Motors	2 interlock switches	None
Upper rear panel	Disable Lasers and Motors	1 interlock switch	None
Lower rear panel	Disable Lasers and Motors	1 interlock switch	none
Left door	Disable Lasers and Motors	1 interlock switch	None
Right door	Disable Lasers and Motors	1 interlock switch	None
Cassette inlet opening	Disable motors only	1 defeatable interlock magnetic switch	Interlock magnetic switch - to operate motors
Left and Right side paper doors	Disable paper disposal motor only	1 defeatable interlock switch at each paper door	Interlock switch - to operate paper disposal motor

NOTE: In the above table, Front Side refers to the Loading side of the platesetter. Rear Side refers to Unloading side of the platesetter. Upper doors may also be referred to as upper covers.

NOTE: The **laser** interlock system is equipped with a **buzzer**. If a failure is detected in the operation of the laser interlock system, the buzzer is activated and the laser is shut off. In any case, not every possible failure can be detected, especially failure of a single interlock switch.

DANGER ! If a door or panel is open and if the laser interlock switch is defeated, or if it failed, and the laser did not shutt off, invisible laser radiation of up to several hundred miliwatts may be present in each of the opticals fibers, and up to several watts at the output of the plotting head (between the plotting head and the drum). **This radiation is hazardous to the eye and skin. Even brief exposure of the eye to this laser radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight !**

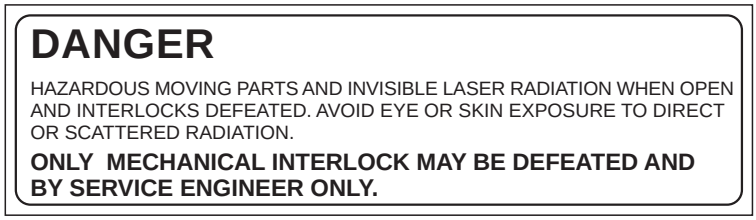
WARNING ! It may take up to two seconds for the Laser interlock system to shut off the laser sources. Therefore, when opening a door or a panel or stop defeating an interlock switch, do not rush to access inside the platesetter !

DANGER ! Never leave the platesetter while an interlock switch is defeated!

Warning Labels

The following pages show the laser and other warning labels, and their locations.

NOTE: The catalog numbers for English labels contain the letter A; all other languages contain the letter K instead. For example, cat. no. 374A8L697 is the English label; cat. no. 374K8L697 is for all other languages. The following labels show the English catalog numbers.
Some labels have the same text but the label shape or size is different. Therefore these labels have different catalog numbers.



K7B830



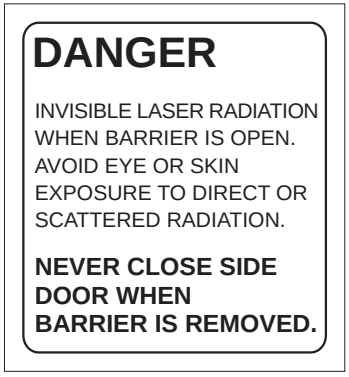
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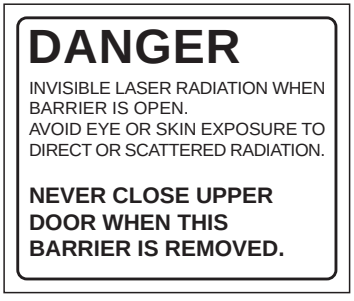
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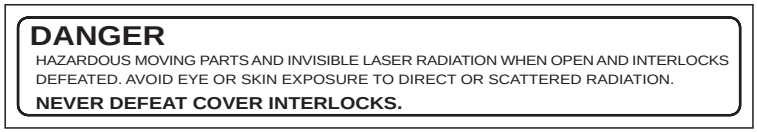
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KB834



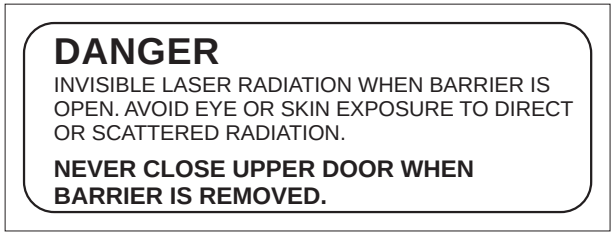
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KB836



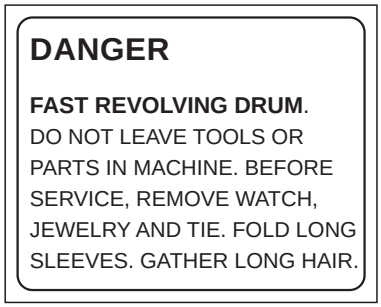
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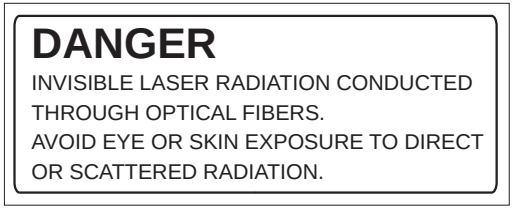
K7L408



K7L411



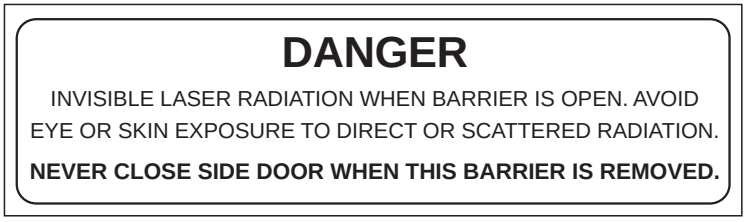
K7L413 (also K7L412A)



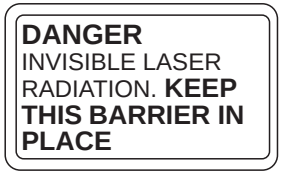
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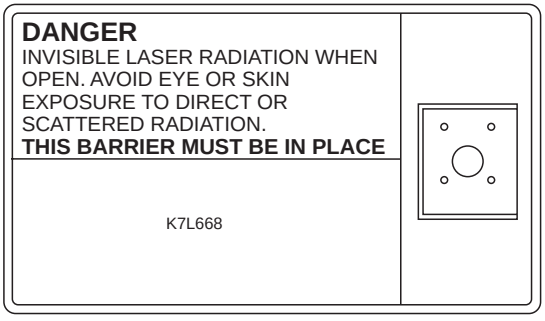
K7L405



K7L416



K7L667



K7L668



K8L535



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374A7B951 (374A30170)

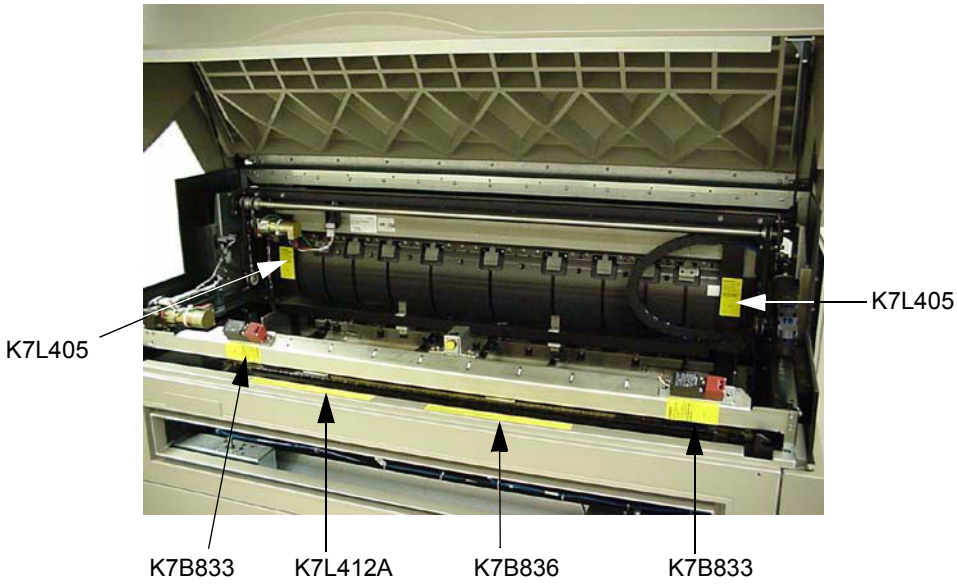


Figure 1. Front top cover open

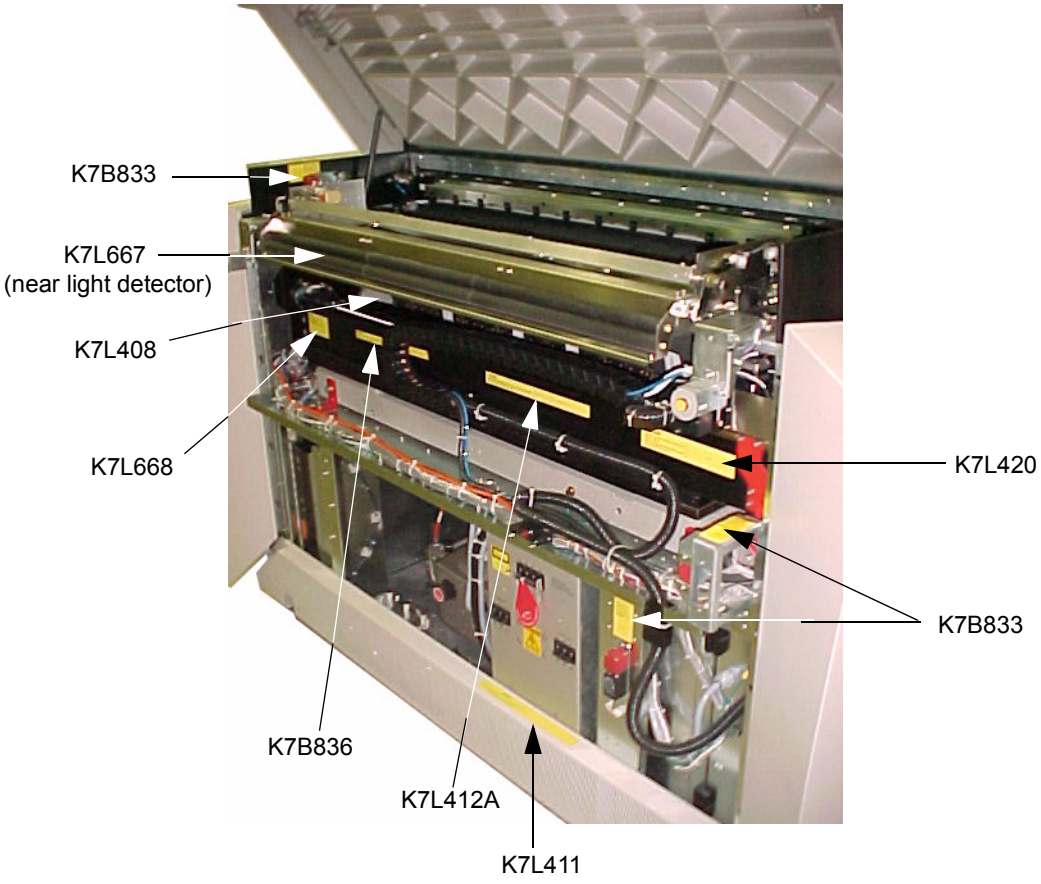


Figure 2. Rear top cover open, rear panel removed

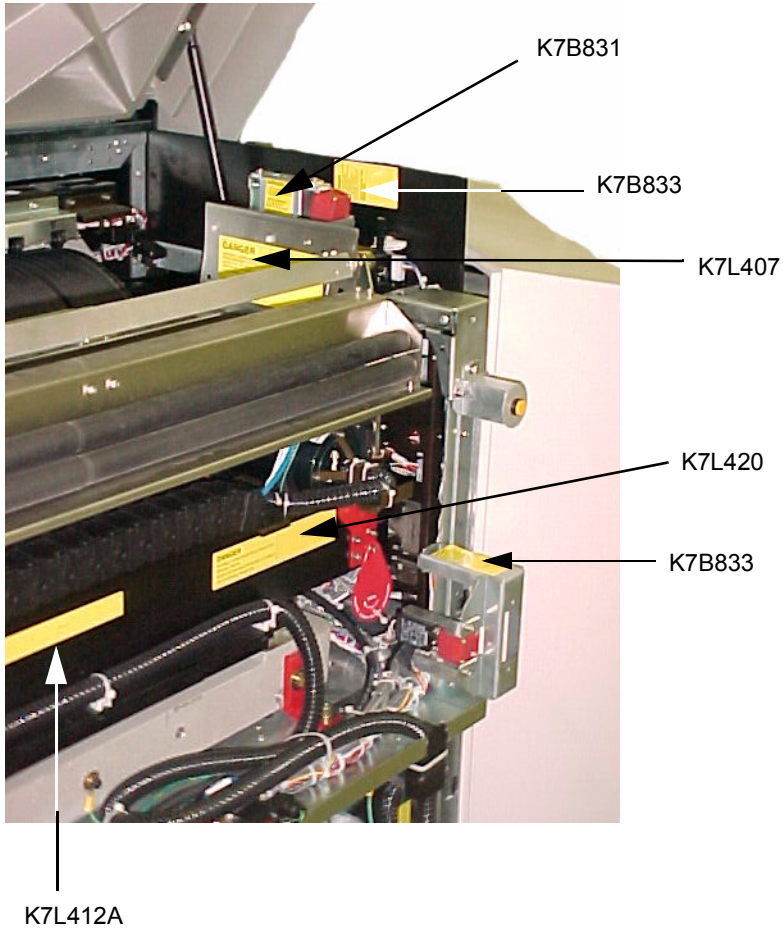


Figure 3. Rear top cover open, panel removed, right side

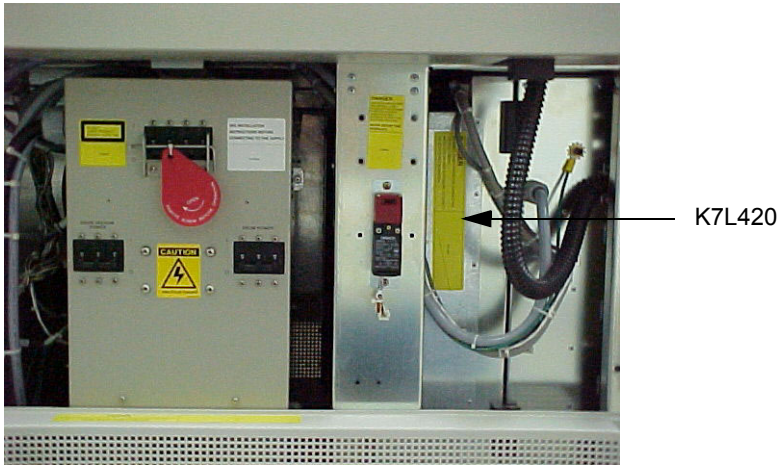


Figure 4. Rear lower panel removed, right side

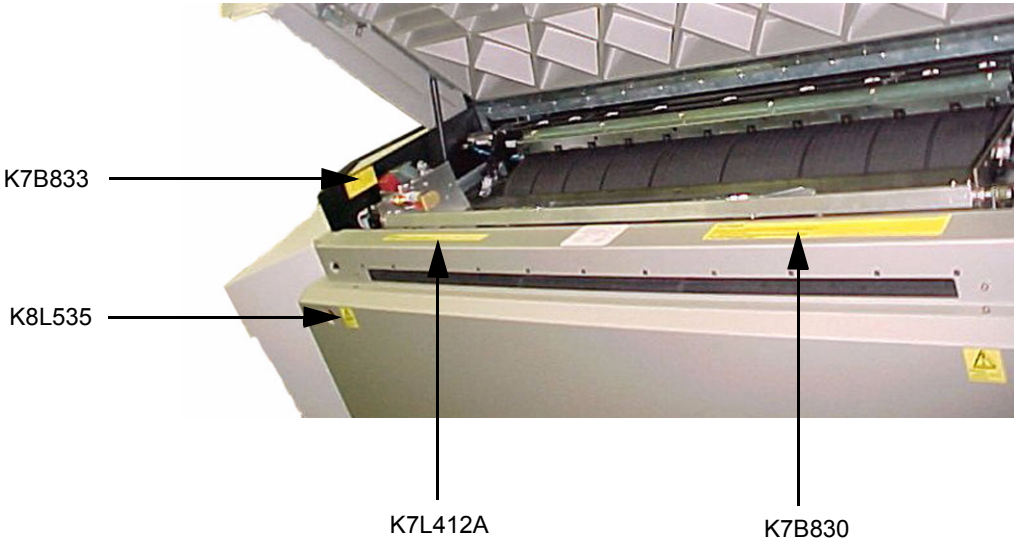


Figure 5. Rear top cover open, left side

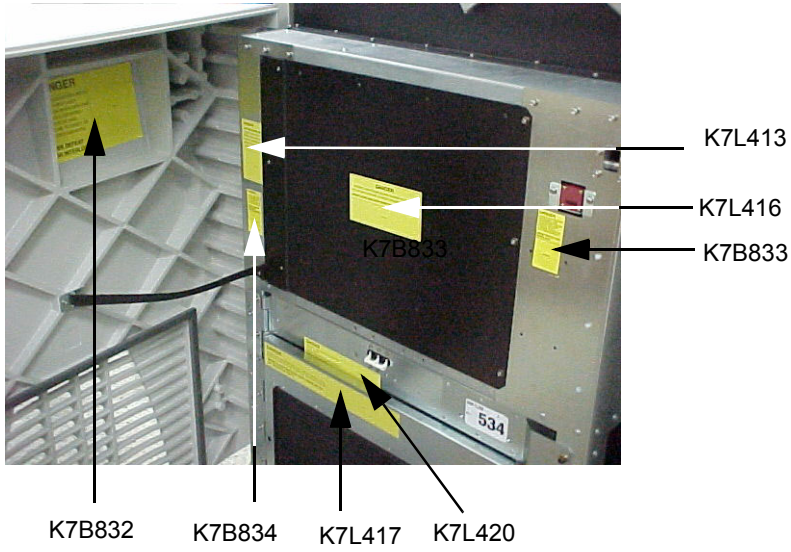


Figure 6. Left side door open

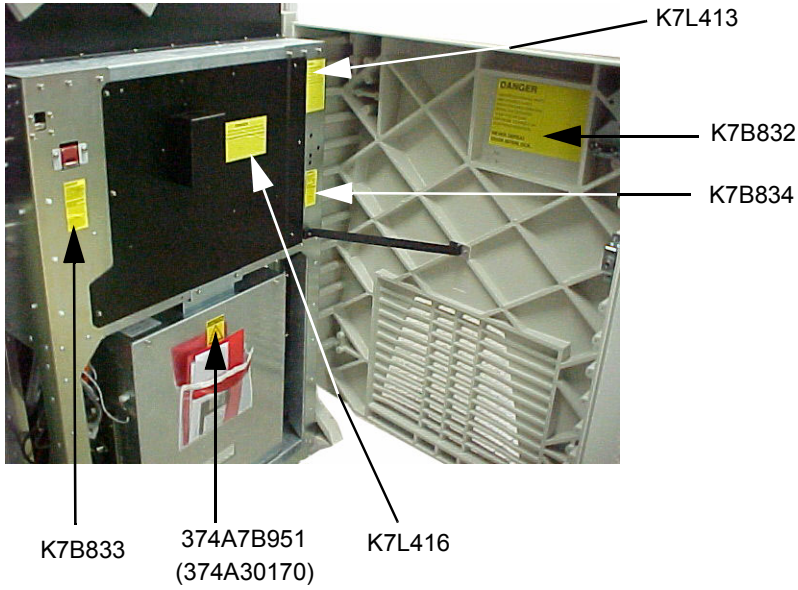


Figure 7. Right side door open

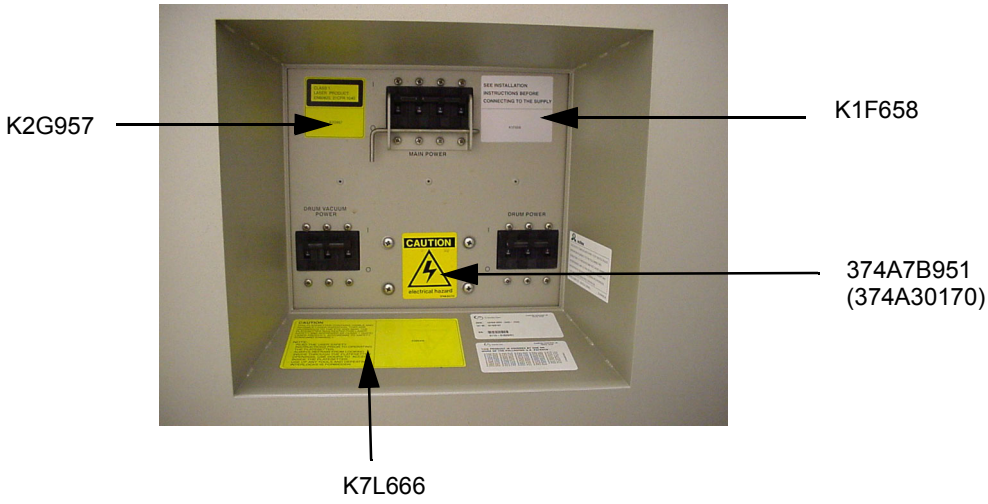


Figure 8. Distribution box

Drum Safety Precautions

The Lotem 800 platesetter contains a drum that revolves inside the platesetter. Special safety precautions that include solenoids and interlock system are implemented in order to prevent rotation of the drum while the user opens the upper doors.

The upper doors opening is initiated from the platesetter Controller. This activates the solenoids that release the upper door locks, thus enabling the user to open the door. By this time, the drum must be almost stationary.



WARNING ! Before servicing, remove any piece of clothing or object that may get caught in the revolving drum or other moving parts. Remove ties, roll up long sleeves, remove jewelry and gather long hair.



WARNING ! If, after the door is unlocked, it takes **more than 5 seconds** for the drum to become completely stationary, the machine must be repaired.



WARNING ! If you switch on the upper rear door defeater, all motors, including the drum motor, can rotate. Removing the defeater or pushing one of the 3 yellow pushbuttons will **NOT** stop the drum within 5 seconds!



DANGER ! The drum will rotate at high speed for a few minutes after defeat is canceled or the yellow pushbutton is pressed!

The drum revolves at approximately **900** revolutions per minute.
If an object hits the rotating drum, the object may get dislodged inside the platesetter and cause damage (including damage to the safety system and laser head), or force the upper doors to open, or penetrate through the doors.

Since serious personal injury to the operator, service engineer or anyone in the vicinity may occur by the revolving **drum**, the following cautions must be observed.



WARNING ! Be sure not to leave any object, tool or part inside or on the platesetter enclosure. The object may get dislodged, get caught in the revolving drum or other moving parts, penetrate through the enclosure and injure a person standing nearby.

WARNING ! Because of the potential danger of loose parts inside the platesetter, be sure to replace, reconnect or adjust any drum component according to the exact correct procedure.

Vacuum Pump

Two vacuum pumps are contained in the platesetter. The vacuum pumps contains filtering devices that extracts dust, fumes, contaminants and solvent vapors that appear within the platesetter during normal operation and need to be removed.

WARNING ! The filtering device has been constructed according to recognized technical safety regulations. Nevertheless, danger to life of the user or third parties or damage property can occur if the filter is not handled and disposed of properly. The service engineer must follow the instructions in the Creo Technical Information Center (Tech Planet) when replacing and disposing the filter.

WARNING ! The interlock system does not disconnect the electricity supply to the vacuum pumps.

Lithium Battery

The platesetter contains a Lithium battery in the CPU board. The battery should be replaced only by qualified service personnel, and must **not** be replaced by the user.

WARNING ! Hazard of explosion if battery is incorrectly replaced

- Replace only with the same or equivalent type recommended by the manufacturer.
- Follow the manufacturer’s safety instructions provided with the battery.
- Dispose the used batteries according to the manufacturer's instructions.