

LOCKOUT/TAGOUT STUDENT'S TRAINING MANUAL



TABLE OF CONTENTS

Lockout/Tagout Student Guide

Section	1 Introduction
	2 What is Lockout/Tagout?
	3 What is Tagout?
	4 Lockout/Tagout Devices Requirements
	5 Key points about tags
	6 When do we apply Lockout/Tagout?
	7 Exceptions to LO/TO
	8 Inch-Safe Service Method
	9 When exceptions do not apply.
	10 Eight procedural steps to implement Lockout/Tagout
	11 Restoring normal operations
	12 Outside Contractors
	13 Group Lockout/Tagout
	14 Special Procedures
	15 Lockout/Tagout Assessment Form and Instructions

Sample Certificate

LOCKOUT/TAGOUT STUDENT GUIDE

Section 1: Introduction

- A. Lockout/Tagout (LO/TO) procedures are a set of safety procedures that the Occupational Safety and Health Administration (OSHA) wants employees to follow in order to repair or maintain equipment in a safe manner.
- B. The importance of performing LO/TO is primarily to prevent accidents involving machinery. LO/TO accidents result in nearly 120 deaths a year because employees failed to perform proper LO/TO procedures. Many more injuries occur causing the loss of more than 28,000 work hours to companies.
- C. The purpose of LO/TO is to prevent the unexpected startup or release of energy, which could cause serious injury or death to someone working on a piece of equipment.
- D. Hazardous Energy: Energy that could cause injury to an employee or equipment. There are two basic types:
 - 1. **KINETIC ENERGY**: Force caused by movement of an object...
 - 2. **POTENTIAL ENERGY**: Stored or residual energy i.e. spring action, pressure in a pneumatic line, electricity in a capacitor, etc. must be isolated and controlled!
- ENERGY EXISTS EVEN IF EQUIPMENT IS TURNED OFF!
- E. According to OSHA, you must place employees into three different categories based on their responsibilities if any, during maintenance. These three categories are **Authorized**, **Affected** or **Other personnel**.
 - 1. The **Authorized** person is the individual who is actually going to perform the maintenance on a given piece of equipment. For this individual to do this safely, they will lock or tag out the equipment to ensure that they are safe when performing work on a piece of equipment. Authorized personnel can also include supervisors, especially when there may be multiple individuals working on the same piece of equipment.

In this case, the supervisor will attach his/her lock or tag first and remove it last to ensure that everyone else is following all the required procedures. Your Authorized personnel may include (and will in many situations) an outside contractor. Since most involved maintenance or repair requires specialized knowledge, outside contractors are more often than not called upon to perform these functions. NOTE: When dealing with contractors, ensure that prior coordination takes place so that both your employees and the contractor understand each other's LO/TO procedures.

 - 2. The next category is the **Affected** employee. Though this individual may not perform maintenance on a given piece of equipment, they may have occasion to power up that piece of equipment. In some cases the Affected employee could be a machine operator,

especially if that machine operator does not perform involved maintenance or repair on their equipment.

3. The third category is the **Other** category, which may include helpers, temp workers, or even people in the general vicinity of the equipment being worked on.

Section Two: What is Lockout?

A. LOCKOUT:

1. Refers to placing a lock on the equipment part that controls energy.
2. It is applied to:
 - a. Circuit breakers, valves, disconnect switches, etc.
 - b. Its purpose is simply to prevent energization of a given piece of equipment.

B. LOCKOUT MUST BE USED IF THE EQUIPMENT IS DESIGNED TO ALLOW A LOCK TO BE ATTACHED!!!

C. A lock is not to be removed by anyone except for the person who put it there! That is the AUTHORIZED PERSON!

Section Three: What is Tagout?

A. When a device or piece of equipment cannot be locked out, then the only alternative is to TAGOUT!!

B. To tagout, you simply place the piece of equipment in the off position and place a tag on it, warning people not to turn it back on!

C. TAGOUT POINTS:

1. Place tag in such a way as to prevent its accidental removal.
2. In other words in such a way that if it is removed it was done so intentionally!!
3. Once the Tag is placed on the device only the AUTHORIZED PERSON can remove it!!

Section Four: The requirements for Lockout/Tagout attachment devices

WHAT SHOULD THESE LO/TO DEVICES BE MADE OF???

► FIRST OF ALL THEY MUST BE:

A. DURABLE:

1. That is they must be able to withstand the environmental conditions to which they are exposed.
2. Both locks and tags should not be susceptible to damage from wind, water, or chemicals.

B. STANDARDIZED:

1. LOCKS must be identified by:
 - * color
 - * shape
 - * size
2. TAGS must be identical and of same print style and format!

NEXT THEY MUST BE:

C. SUBSTANTIAL:

For example

1. LOCKS:
 - a. They must be strong enough to prevent their removal except by key or bolt cutters.

Why should they be so strong?

2. TAGS:
 - a. Again, they must be strong enough to prevent their accidental removal!
 - b. In fact they must meet the following criteria:
 1. Non-reusable (the cord)
 2. Attachable by hand (not needing some special tool!)
3. Self-locking
4. Non-releasable
5. Minimum strength of 50 lbs
 - a. Nylon tie is the preferred attachment!

Finally they must be:

D. IDENTIFIABLE:

For Example:

1. LOCKS must be identified to a particular individual.
Such as...Blue is Bob's, Red is Bill's, Green is Steve's, etc...

- a. This works well where you have a maintenance department with more than one service technician. So, you can permanently assign locks & tags.
- b. Or, like most of our accounts who don't have a maintenance department, you can simply have locks and tags available in a kit for checking out as needed.

2. TAGS:

- a. Should have the Authorized Individual's Name and the Date of placement. Also it should indicate the piece of equipment being tagged out (if not obvious)!
- b. Tags should also have warnings such as:
 - * DO NOT START
 - * DO NOT ENERGIZE
 - * DO NOT OPERATE
 - * DO NOT OPEN, etc.

Section Five: Key points about Tags!

Let's go over a few points about:

A. TAGS....

- 1. Tags are warning devices only!!.....They do not prevent the startup of equipment!!
- 2. This is because they provide little or no physical restraint.
 - Not understanding this could lead to a '***False Sense of Security***'!
- 3. Let's emphasize some key point about tags:
 - a. Must not be removed except by the authorized individual who placed it there!
 - b. As we have already mentioned, they must be able to withstand the environmental elements i.e. moisture, wind, etc. to which they are exposed.
 - c. Must not be easily detachable!
 - d. Be marked clearly and legibly by authorized person!
 - e. Used only when locks cannot!
 - f. And placed as close as possible to the energy providing device!
 - g. Must be of the same style and format.

Section Six: When do we apply Lockout/Tagout?

A. ANSWER: Basically whenever someone is performing service or maintenance on a piece of equipment which if started could cause injury or death.

...that is a release of stored energy..

B. INSTANCES...

1. If you need to remove a guard or other safety device.
2. If any part of a person's body is placed in an area where it could be injured by moving parts.
3. The above situation may exist if you are:
 - a. Repairing electrical circuits..
 - b. Clearing or oiling moving parts (we'll talk exceptions later).
 - c. Un-jamming in some cases.

Section Seven: Exceptions to Lockout/Tagout

A. EXCEPTIONS...

1. Minor tool changes
2. Adjustments
3. Minor servicing if:
 - a. They take place during normal production operations
 - b. They are -routine
-repetitive
-integral to use of equipment

AND...

4. Alternative measures provide effective worker protection.

B. OTHER EXCEPTIONS:

1. There are some exceptions, to this LO/TO regulation. The main exception is if the person performing the repair or maintenance can unplug the equipment and keeps that plug within arm's reach, then LO/TO does not have to be performed. This most likely applies to computers, copiers, and other direct plug-in machines. However, LO/TO would apply to these devices if they were disassembled and the repairperson left the immediate area.
2. For example, if the copier repairperson extensively disassembled your copier only to find that they had to return to their repair shop to retrieve a needed part, then LO/TO procedures would have to be observed! NOTE: In cases where items can be simply

plugged in, the repairperson can utilize a Lockout device that requires the end of the plug to be placed inside of a canister. This canister or tube opens up to allow the cord inside. When shut, the canister can be locked tight, therefore physically preventing the cord from being plugged in!

3. Other exceptions that would apply are; “**Minor servicing and maintenance**” and “**Set up**” activities. Minor servicing and maintenance is defined by OSHA as “those tasks involving operations which can be safely accomplished by employees and where extensive disassembly of equipment is not required”. “Set up” as defined by OSHA means “any work performed to prepare a machine or equipment to perform its normal operation”.
4. For presses, minor servicing and maintenance includes but is not limited to the following:
 - a. Clearing certain types of paper jams.
 - b. Minor cleaning (blanket washing, roller washing).
 - c. Lubricating and adjusting operations.
 - d. Certain plate and blanket changing tasks.
 - e. Paper webbing and paper roll changing.
5. For equipment setup procedures include the following:
 - a. Mounting a plate.
 - b. Setting bearer pressures.
 - c. Setting folder adjustments.
 - d. Setting rollers.

Section Eight: Inch Safe Service Method/OSHA-Acceptable Blanket Washing Procedures

A. Inch-Safe Service Method.

Another exception is when the use of the “**Inch Safe Service**” can be used. For this reason ‘Inch Safe Service’ is recognized as a ‘*Safe Alternative*’ to Locking Out or Tagging Out. This applies to presses, bindery and finishing equipment. Inch safe service consists of the following steps:

1. Servicing or maintenance must not be conducted when machine components are moving. Before performing any minor servicing, the machine must be **STOPPED** and its drive control must be in the **STOP/SAFE** position.
2. Consistent with the provisions contained in **1910.147(f)(1)**, procedures to **INCH** a machine must include a pre-startup check to assure the safe positioning of employees and to assure that all tools, etc. are positioned so that they do not create a hazard for employees.

3. **DE-ACTIVATE** the **SAFE** function immediately before safely inching the machine component for positioning purposes.
4. By use of the **INCH** control, the components of the machine are moved to their desired position. Immediately thereafter, the drive control is placed on **STOP/SAFE** by each employee working in a hazardous area before beginning or resuming the minor servicing work activity.
5. Steps (2) through (4) are repeated as necessary until minor servicing is completed.

B. NOTE ON INCH SAFE SERVICE METHOD:

1. Operators should be aware that failure to properly utilize the **STOP/SAFE-READY** button for their routine procedures may result in a serious injury. On some machines the **STOP/SAFE-READY** controls are used as a single button, a combination of **STOP/SAFE** and **READY** buttons, or three separate buttons.
2. When mounting or installing a piece of equipment, it is still acceptable to inch the machine (if applicable) repeatedly forward until the point where the operator is touching the moving part such as a nip point to complete the operation. At such time, the machine must be stopped and put on **SAFE**. When clearing jams in the machine or clearing any other type of equipment jam where the equipment needs to be disassembled, the “inch-safe-service method” must be used.
3. The bottom line from OSHA’s perspective is that an operator’s hand cannot be anywhere near a nip point, hazard area, or touching a moving part unless the equipment is either on **STOP/SAFE** or completely locked out.

C. OSHA Acceptable Blanket-Washing Procedures

Besides the ‘Inch-Safe’ Method OSHA allows for the first time, situations where the press **can actually be energized** such as during ‘*Blanket-Washing*’. In order for an operator to perform “**Blanket-Washing**” tasks while the press is ‘*energized*’, some other criteria must be met and these are that in some instances, employees in the printing industry must:

1. Perform blanket-cleaning operations on the **out-running side** of an offset printing press while the machine is operated in a “**slow-run**” mode.
2. The press operators use *folded towels* (containing solvent), which are held in the palm of a hand (so that no loose ends are available), to clean the moving cylinders.
3. That these slow moving cylinders have **smooth surfaces** (that is, without projection, gaps, notches or other surface features that may grab a towel or otherwise cause injury to workers) that pose no additional hazards during the hand cleaning task.

4. Additionally, if employees are exposed to ‘nip-points’ on the *in-running side* of the press, barrier guards that fully extend across the entire smooth surface of the rolls are used to provide employee protection from all ingoing nip hazards.
5. The **barrier guards** must meet the requirements of Subpart O and be adjusted to have no more than a one-quarter (0.25) inch opening at any point between the guard and the print rollers.

However, practices are prohibited such as reaching around guards, removing guards and reaching into unguarded danger areas (for instance, to remove a ‘hickey’). These practices defeat the protective value of machine guards, eliminate effective protection during servicing and maintenance activities, and they preclude the application of the minor servicing exception. (See 1910.147 (a)(2)(ii)(A) and (B)).

Likewise, the Lockout/Tagout standard applies if employees are exposed to other hazards created by rollers or blankets, such as uneven revolving surfaces or roller/blanket openings or projections. Under no circumstances is an employee ever permitted to place any part of his or her body within a hazardous area, such as a point of operation, in-going nip points or around power transmission apparatus, while the equipment or machine is running or energized.

Obviously it is important to thoroughly understand **all** the key-on-going provisions of the LO/TO Standard, especially the recent new interpretations covered above in order to **avoid serious injury when washing up your press.**

Section Nine: When exceptions do not apply

(or in other words, situations in which LO/TO should be performed)

A. Situations where the exceptions do not apply, or in other words you would have to perform LO/TO would be:

1. Operations where auxiliary motors and pile motors are not disabled by the SAFE button and where the operator cannot maintain exclusive control of the machine or machine elements such as when:
 - a. Cleaning frames and braces.
 - b. Cleaning the feeder and delivery on sheet fed presses.
 - c. Cleaning the reel stand and other parts of the infeed on web presses.
 - d. Cleaning or replacing air filters used to supply ventilation for toxic or flammable materials or heat generating electrical equipment.
2. Operations that require the machine operator to remove major parts of the equipment such as:
 - a. Panels or other barriers that restrict access to moving mechanical parts or energized electrical equipment.

- b. To perform extensive work without removal of such components.
 - c. To perform work requiring the operator to leave the immediate area containing the operating controls where exclusive control by the operator is required.
3. Roller removal would require Lockout/Tagout when two people are required and/or there are no quick release sockets, which would permit safe roller removal by one person.
 4. Gripper bar repair/removal, gear replacement and electrical work.

Section Ten: Eight procedural steps to implement LO/TO

A. EIGHT PROCEDURAL STEPS:

1. Do an assessment of all possible energy sources and know how to isolate them, i.e. stored, hydraulic, electrical, pneumatic etc.
2. Identify and locate the exact disconnect switches for a given piece of equipment. Exactly which panel/or switch do I go to?
3. Notify all Authorized, Affected and Other employees that LO/TO is about to be performed. Then they will know not to touch or use the electricity.
4. **SHUT DOWN ALL EQUIPMENT!!**
Turn everything to the “OFF” or “NEUTRAL” position.
5. Isolate the equipment from its energy sources, i.e:
 - Turn off electricity
 - Bleed airlines
 - Block moving parts
6. **LOCKOUT or TAGOUT THE EQUIPMENT!!**
Actually place locks or tags on equipment or electrical panels/switches. Remember placing locks and tags on equipment in the correct places **will not** necessarily mean the equipment is thoroughly ‘de-energized’.
7. Attempt to turn on the equipment to ensure energy has indeed been isolated. For example: if at this point you attempt to turn equipment on, what should happen?..... **NOTHING!!!!**
8. If nothing happens, begin work! If something moves, repeat above procedure.

Section Eleven: Restoring Operations following LO/TO

A. RESTORING NORMAL OPERATIONS:

SOMEWHAT IN REVERSE...

1. Remove all tools and check area to ensure no one is exposed.
(So that tools are not inadvertently left in machine and cause an injury or damage.)
2. Inform all employees that LO/TO is to be removed.
3. Make sure everything is in “off” position.
4. At energy source remove LO/TO Devices (Remember only the Authorized individual can do this).
5. Test the equipment.
6. If good, then notify employees that equipment is functional.

IF NOT, REPEAT LO/TO PROCEDURES

Section Twelve: Outside Contractors

A. OUTSIDE CONTRACTORS:

1. Outside Contractors must know and understand your LO/TO procedures as well as their own. Therefore, exchange LO/TO information i.e. tags, locks, written procedures, etc. Also, must perform LO/TO if the situation and procedures require.
2. Ensure they use LO/TO and that your employees understand their procedures and recognize the contractor’s LO/TO devices.
3. You don’t have to change your procedures just know theirs!!
4. NOTE: The reason it is important is because if one of your employees accidentally starts or powers up a machine that a contractor is working on, and as a result they are injured, then the liability is on the company.

Also, if a contractor fails to implement LO/TO properly or at all and one of your employees is injured, don’t assume that the liability is entirely theirs.

Remember, as a manager you are responsible for all that goes on in your area/building.

Section Thirteen: Group Lockout/Tagout Procedures

A. GROUP LOCKOUT/TAGOUT:

1. Everyone involved must have their own LO/TO devices i.e. locks, tags, etc.
2. The supervisor should attach his devices first and remove his/hers last.
 - ▶ Show group LO/TO device.
3. Follow 8 procedural steps.
For example, if you have an electrician and two press repairmen working on a machine, then the supervisor should also attach his/her lock first and remove it last!

Section Fourteen: Special Procedures

A. SPECIAL PROCEDURES:

1. What to do if authorized person is not available or forgets to remove their LO/TO devices!
 - a. Verify that individual cannot be reached.
 - b. Notify everyone that you are about to remove LO/TO devices.
 - c. Ensure that authorized individual knows what you have done.

OTHER KEY POINTS...

2. If someone is careless then call him or her in.....
3. Retraining will be conducted to remedy lack of knowledge.
4. Come in on his or her own time to remove LO/TO devices.

B. SHIFT CHANGES:

1. If a shift change occurs and the new shift is going to continue repair, then the original shift working on equipment will remove their LO/TO device and the shift coming on will put theirs back on.

Section Fifteen: Lockout/Tagout Assessment Form and Instructions

The following two pages are assessments forms designed to help you produce your own written LO/TO procedures which are required by the LO/TO standard.

LOCKOUT/TAGOUT ASSESSMENT

NAME OF COMPANY: _____

DEPARTMENT NAME: _____

NAME OF EQUIPMENT: _____ DATE COMPLETED: _____

AUTHORIZED EMPLOYEE POSITION

- 1.
- 2.
- 3.

AFFECTED EMPLOYEE POSITION

- 1.
- 2.
- 3.

OTHER POSITION

- 1.
- 2.
- 3.

ASSESSMENT OF ENERGY SOURCE

ELECTRICAL	E
PNEUMATIC (AIR)	P
HYDRAULIC	H
GRAVITY	G
OTHER	O

LOCATION OF ISOLATION

MEANS OF LO/TO

PROCEDURES REQUIRING LO/TO

1. Extensive Disassembly
2. Guard Removal
3. Repairing Electrical Circuits
- 4.
- 5.
- 6.

DIAGRAM OF EQUIPMENT

-N-

LO/TO PROCEDURES

1. Notify everyone that LO/TO is to be performed
*Notify affected/others listed above
2. Shut down all equipment (turn to off)
3. Turn off or isolate power
* turn off electricity
* bleed air lines
* block
4. Apply locks/tags in areas indicated by diagram
5. Attempt to turn on equipment
(to ensure energy isolation)
6. Begin work

RESTORE OPERATIONS

1. Remove tools
2. Inform affected/other employees that
LO/TO is to be removed
3. Ensure everything is in *OFF* position
4. Authorized Individual to remove LO/TO devices
5. Test equipment if good notify everyone that
LO/TO is complete

Guidelines/Instructions for Assessment/Procedures Form

NAME OF COMPANY: Example ACME Machine Company

DEPARTMENT NAME: i.e. Machine shop, Deburring, Degreasing, Welding etc.

NAME OF EQUIPMENT: Example Challenge Drill Press, Milwaukee Mill etc.

DATE COMPLETED: The date the assessment is performed. NOTE: Since you are required to review your LO/TO program on a yearly basis (to verify its effectiveness) you can put this information in a computer and simply change the dates every year if no other changes are necessary.

AUTHORIZED, AFFECTED, and OTHER: Fill out appropriate names based on definitions of those types of employees mentioned previously in the article.

ASSESSMENT OF ENERGY SOURCE: Circle type of energy source i.e. is there electrical (normally a given!) if yes circle 'E'. Is there 'Pneumatic' again if yes circle 'P', etc.

LOCATION OF ISOLATION: Where do you actually lock or tag out the piece of equipment. Example: Panel A, or Control Box B etc.

MEANS OF LO/TO: Are you going to lock or tag, i.e. lock on power switch on machine and tag on Panel A etc.

PROCEDURES REQUIRING LO/TO: Procedures you know or instances you know that would require LO/TO. NOTE: A good way to come up with procedures are for example using the "Operators Manual" or simply imagine doing that particular procedure and wondering what would happen if all of a sudden the equipment were to start up! Would you be injured? If that scenario could happen then that might be a situation where utilizing LO/TO procedures would be necessary.

LO/TO PROCEDURES: These would be essentially the eight LO/TO procedural steps minus the first two steps. (The first two steps should not have to be repeated obviously unless something has changed!)

RESTORE OPERATIONS: Essentially the same six steps mentioned in the manual!

DIAGRAM OF EQUIPMENT (NOT REQUIRED!) Though not required, this is maybe an excellent way to graphically display disconnect points and their relation to the equipment. NOTE: (N) simply indicates NORTH

Notes

Lockout/Tagout Training Certification (*SAMPLE*)

I John Doe, hereby certify that on Jan.1, 2004, the company provided me with training as prescribed by the OSHA Lockout/Tagout Standard 29 CFR 1910.147.

I fully understand the material and instructions provided, and the procedures required to de-energize the machinery and/or equipment in my job assignment.

**EMPLOYEE
NAME**

**DATE
EMPLOYED**

DEPT.

John Doe Jan. 1, 1990-Jan 1, 2000 Pressroom

John Doe
Employee Signature

Jane Doe
Program Coordinator

James G. Harris
ACS Representative Signature
(Only applies if training conducted by ACS)