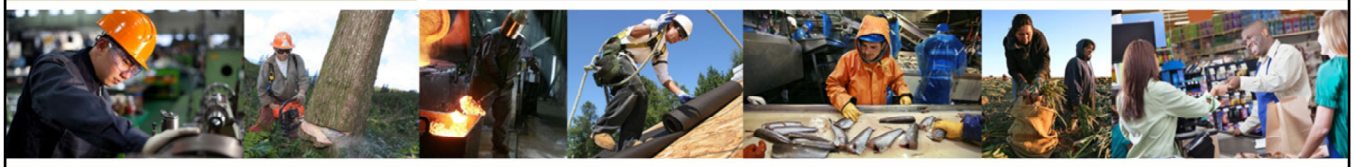
Washington State Department of
Labor & Industries

Lockout/Tagout (LOTO)

Control of Hazardous Energy



March, 2021

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What will be covered

What is hazardous energy?

How is hazardous energy controlled?

What is lockout/tagout?

Lockout/tagout procedures

Specific tagout requirements

Group lockout/tagout

What is hazardous energy?

Mechanical – machinery moving parts

Electrical – live or stored electrical energy

Hydraulic – compressed or moving liquids

Pneumatic – compressed air or gas

Gravitational – raised objects that can fall

Thermal – extremely hot liquids or cold gas

Radiation – lasers, microwave, ultraviolet, x-rays

All of these energy sources can either be stored or be active.

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As indicated, these energy sources can cause serious injuries if not controlled. Although not mentioned here, extremely hot surfaces can be considered a thermal hazardous energy.

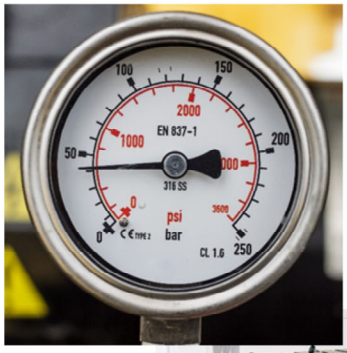
Stored energy

Can include the following:

Fluids or gases still in the equipment and under pressure,

electrical stored energy in batteries or capacitors,

parts of machinery that are affected by springs or gravity or could otherwise move.



How to control hazardous energy

Identify all energy sources – potential (stored) or kinetic (moving or existing).

De-energize equipment by isolating or blocking the energy source.

Dissipate or release stored energy.

Lock out the equipment's energy source, so it cannot be reactivated by anyone while equipment is being serviced.

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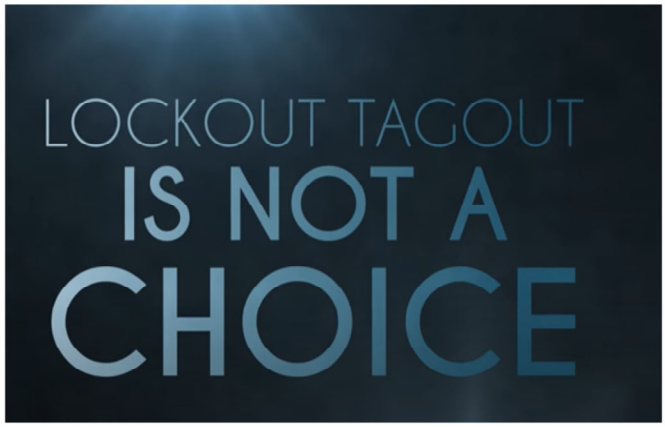
Shutting down machinery, closing valves or turning off electrical power to work on equipment is obvious to most people. Where injuries occur are when an employee not directly involved in the servicing inadvertently re-activate the equipment while it is still being worked on. This is why lockout is required.

What is lockout/tagout?

"Lockout/Tagout (LOTO)" is specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

Why lockout/tagout is needed



YouTube video – Lockout/Tagout - It would have saved his life

YouTube Video - LOTO is not a choice

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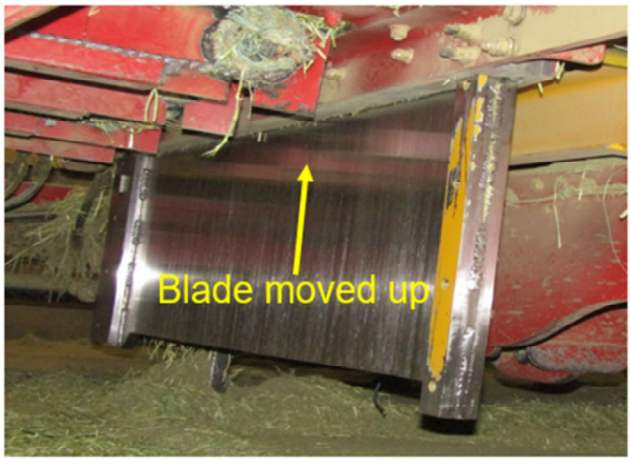
Injuries from a lack of lockout/tagout can include electrocution, severe burns, lacerations, amputations and body crushing. Many of these injuries are life-changing or fatal.

An example of a hay bale cutter LOTO fatality

L&I photos



A worker died when he crawled into this hay bale cutting machine to dislodge a hay bale without locking it out first. His weight activated the guillotine cutting blade which struck him.

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This incident occurred recently in Eastern Washington. The machinery had warning signs regarding lockout, but were ignored.

When are lockout/tagout procedures needed?

When employees do service or maintenance on or around any equipment that has hazardous energy,

When equipment or machinery is being installed or removed,

When a guard or other safety device is bypassed or removed.

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Service and maintenance means activities such as constructing, installing, setting-up, adjusting, inspecting, modifying, maintaining and servicing machines or equipment and includes lubricating, cleaning, unjamming and making tool changes.

When is lockout not required?

Service and maintenance during normal production operations:

- if an employee is not required to remove or bypass a guard or other safety device; or
- place any body part into the point of operation or any other hazardous area created by machine operation.

Minor tool changes, adjustments, and other minor service during normal production:

- If they are routine, repetitive, and integral to the use of the equipment for production; and
- the work is done using measures which provide effective protection from hazards.

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Lockout/tagout is not always required when working around operating machinery or equipment.

What is a lockout device?

It is a device that positively holds energy isolating devices or measures in a safe position to prevent the re-energizing of equipment.

It can be a key or combination lock, or blank flanges in piping.

It includes a tag or other notice that identifies the person authorized to remove the lock.

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Although tags are frequently used in lockout procedures, that are not absolutely required if there is another way that communicates that a machine or equipment is locked out and who the authorized person is that can remove the lockout device.

Authorized and affected employees

An “authorized employee” is a person who has been properly trained to lockout/tagout procedures on machinery or equipment that is to be serviced.

An “affected employee” is a person who operates the machinery or equipment, but does not perform the lockout procedures, or a person who works in the area where machine or equipment maintenance is being done.

L & I photos

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Six steps of lockout/tagout procedures

1. Preparation – get ready, inform all affected employees
2. Shutdown – turn off or shut down operating equipment
3. Isolation – install isolating devices or implement procedures to block hazardous energy
4. Lockout/Tagout – apply LOTO devices or procedures
5. Stored energy check – verify that stored energy is released or restrained
6. Isolation verification – test to make sure LOTO is working

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Only after all these steps are taken can the maintenance or repair work be done on the equipment. Isolating devices can include circuit breakers, disconnect switches, valves, chains, piping blank, or other devices that block the energy.

Once locked out – no unauthorized restart!

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It is obvious – but needs to be stated. No one is allowed to attempt to start up or re-energize equipment that has been locked out until after lockout and tagout devices are removed by the person authorized to do so

Starting up equipment again

Remove all tools, replace guards, and make sure the equipment is ready to re-energize.

Notify all affected employees and make sure they are clear of area.

The authorized person removes the lockout/tagout device.

Start-up or reactivate equipment.

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Affected employees are those employees that operate or work around the machinery or equipment that is being locked out. The only person who can remove the lockout/tagout device is the person who attached it.

Using tagout devices only

Tags are warning devices and do not provide the same level of physical restraint as a lock.

Tags may give a false sense of security.

Tags can't be removed without the approval of the person responsible for it.

Tags cannot be bypassed, ignored or otherwise defeated.

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There may be times or situations where tagout devices are the only way to prevent employee exposure to hazardous energy, when there is no way to lock out equipment. Tags can also used as a visual warning when lockout procedures or devices are used.

More tagout rules

Tags must be legible and understandable

Tags must be made of materials that will withstand the environmental conditions they are exposed to.

Tags must be securely attached to energy-isolating devices so they can't be accidently removed.

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Perhaps another way of saying this, is that tags can't be made of paper that would deteriorate in wet condtions

Group lockout/tagout

A primary authorized employee must be assigned who has overall responsibility.

Each authorized person puts a lockout/tagout device on equipment.

No lockout/tagout device can be removed until the work is done.

The primary is the last person to remove their lockout/tagout device.

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Sometimes equipment maintenance, serviceing or repair requires more than one perspn to be involved. Group work must be coordinated so everyone knows what others are doing.

LOTO is required on the following equipment

List machinery or equipment here

Our lockout/tagout procedures

Describe your procedures here

Link to Sample Lockout Procedure Template

Our lockout/tagout program

Describe your program here or pass out copies of written program

Link to Lockout/tagout Rule

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[If shift changes occur at the worksite, be sure to address the orderly transfer of lockout/tagout protection in the lockout/tagout program.]

Further training for authorized employees

Provide training on specific lockout/tagout procedures on specific machinery or equipment for authorized employees