



What is Lockout and Tagout?

These are measures to control hazardous energy, as anyone working on machinery may be exposed to injuries from energy surges, machine startup, or release of energy stored in the equipment.



What is hazardous energy?

- Energy that is not controlled can trigger hazards:
- **Electrical**
 - Voltage or current that is not intrinsically safe.
- **Pressurized**
 - High Pressure, Low pressure (escaping gas or motivating piping flanges etc. into motion during failure)
 - Gases which cause asphyxiation like Nitrogen even at room pressure



What is hazardous energy? (cont'd)

- **Explosive**

- Chemical, Dust (even substances only flammable normally)

- **Gravitational**

- Where weight can cause a hazard due to its force or motion such as free-fall



How to accomplish an effective Lockout and Tagout?

Your program must consist of :

- Energy control procedures
- Employee training
- Periodic inspections to ensure that before service and maintenance is performed machines are effectively locked and tagged to prevent their starting or recycling



Energy Control Procedures

Energy control procedures detail and document the specific information that an employee must know to accomplish effective lockout and tagout.

Documentation will include the scope, purpose, authorization rules and techniques to be utilized for the control of hazardous energy, including **energy isolating devices**.



Energy isolating devices are:

Mechanical devices that physically prevent the transmission or release of energy, including but not limited to:

- A manually operated electrical circuit breaker
- A disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently
- A line valve
- A block
- Any similar device used to block or isolate energy

The term does not include a push button, selector switch, and other control circuit type devices.



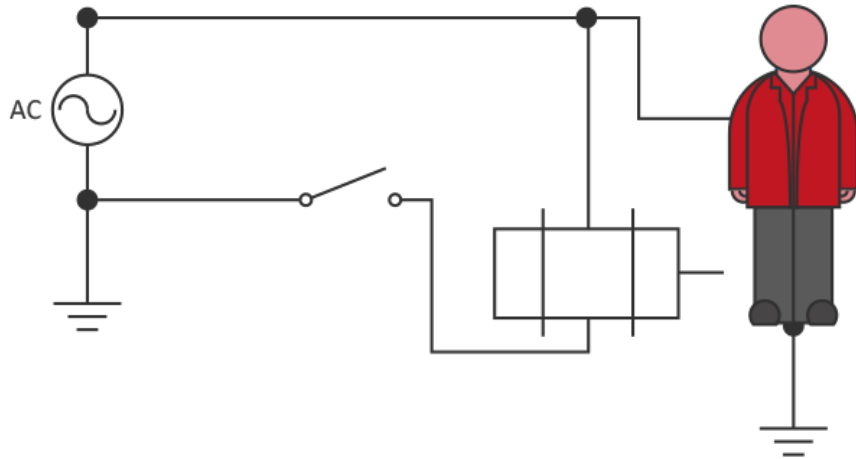
What is a Disconnect Switch?

- Manually operated switch disconnecting all the conductors of a circuit from all ungrounded supply conductors and no pole is operated independently;
- Simple switches are not allowed because it may be wired so that only a single conductor is removed in several circumstances this would be dangerous.
 - If the neutral has residual voltage or current
 - If the switch is switching the neutral and leaving the device with a “LIVE” powered conductor. In these circumstances the device runs when the GROUND or NEUTRAL is connected.
 - Controlling each phase of three phase with separate switches would allow one to stay on and provide a “LIVE” line with voltage



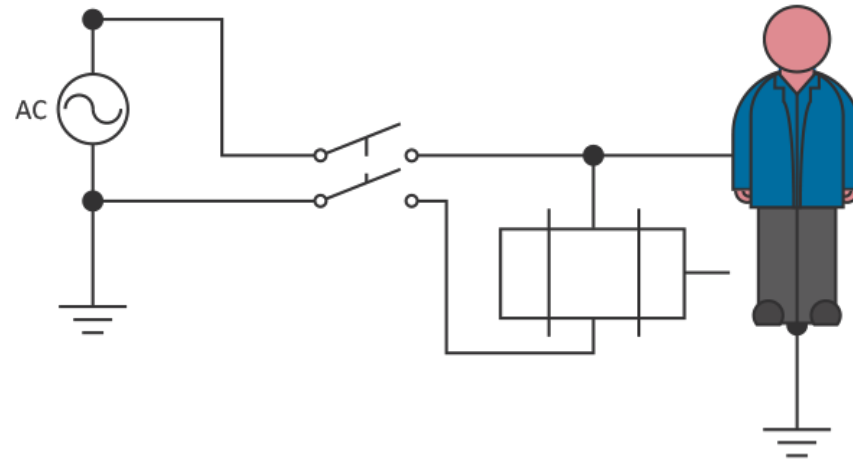
Diagram of Simple Switches and Disconnecting Means

Motor Doesn't Run with Single Conductor (Neutral)
Switched Person Electrocuted



If properly wired to switch the "Hot" conductor there are circumstances where the neutral can be charged

Motor Doesn't Run Both Conductors Switched
Person Safe





Periodic Inspections

Periodic inspections of energy control procedures ensure that the requirements of the standard are being followed:

- How often must the inspection take place?
- Who performs the periodic inspection?
- What does the periodic inspection entail?
- The inspection must identify any deficiencies or deviations and recommend corrective action.
- The employer is responsible for maintaining and implementing energy control procedures.



Training

Employee training ensures that the purpose and function of the energy control programs are understood

The standard requires different levels of training for the three categories of employees:

- Authorized, Affected, and Other

What are the differences in the training required for these three categories?

Is training required annually?



Training should take place when:

- There is a change in job assignments
- There is a change in machines, equipment or processes (which present a new hazard)
- There is a change in energy control procedures **overall or for specific machines**
- Periodic inspections reveal deviations
- An employer believes an employee's knowledge of energy control procedures is inadequate or wrong



Your Lockout and Tagout policy should state:

It is the policy of [**Company name**] that any individual engaging in the maintenance, repairing, cleaning, servicing, or adjusting of machinery, or equipment on [Company name] property will abide by the procedures outlined in this document and specific procedures outlined in LO and TO program.

These procedures are designed to meet or exceed applicable OSHA standards for safe work practices.

Lockout is a first means of protection; warning tags only supplement the use of locks.

Never Ignore a TAG!

Tags alone may be used only when the application of a lock is not practically feasible and with approval of the appropriate supervisor.



Safety Committees Work! Their functions are:

- Performing regular shop and machine inspections
- Training new employees about shop policies
- Performing job hazard analysis or risk analysis
- Providing and receiving input on decreasing workplace hazards from upper and lower level employees
- Transferring requirements and lessons learned to relevant purchasing, engineering, maintenance, operations or management groups as appropriate
- Regularly meeting to address new or ongoing issues
- Bringing concerns to owners/management and helping to define corrective actions
- Clearly defining roles and responsibilities of each member on the safety committee



Suggested Resource:

<http://www.osha.gov/dts/osta/lototraining/tutorial/p-inspec.htm>

This is a Federal OSHA training program and is free on the internet.