



Lockout Tagout Lab

Program: Electrician Technician

Course: EL120 Introduction to Electrical Theory

Objectives: In this lab you will learn how to safely lockout and tagout an electrical circuit. After completing this lab, you will be able to:

- Lock out an electrical circuit.
- Tag out an electrical circuit.
- De-energize the proper circuit and complete a Lockout–tagout procedure.
- Verifying the absence of voltage on the circuit using a multimeter/voltmeter and or non-Contact Voltage Tester. Must be checked on a known energized circuit to make sure the meter is working properly before and during the verification.

Lab Equipment:

- Disconnect or Electrical panel.

Required Tools:

- Multimeter
- Non-Contact Voltage Tester
- Lockout Tag out kit.

Materials:

- N/A

Safety (PPE):

- Safety glasses/goggles

Resources:

[OSHA Standards 1910.147- The control of hazardous energy \(lockout/tagout\)](#)

[OSHA Standards-Appendix A- Typical Minimal Lockout Procedure](#)

[Are you compliant with the new NEC Lockout-Tagout Requirements?](#)

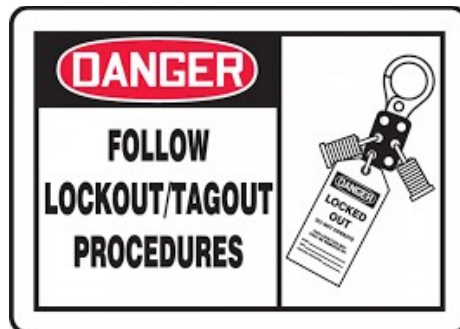


Required Time: 2 Hours

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility.

OSHA requires that a hazard assessment be performed before work is started. Once an electrical hazard assessment has been completed, proper lockout/tagout procedures must be applied in order to put a circuit, conductor, or electrical system in an electrically safe working condition. After lockout/tagout procedures have been completed, the circuit must be tested to verify the absence of voltage. In a simulated receptacle replacement, the electrical trainee will perform an electrical hazard assessment, apply lockout/tagout procedures, and witness testing for the absence of voltage on a branch circuit receptacle.



This performance project requires you to perform an electrical hazard.

Overview

It is policy that any individual engaging in the maintenance, repairing, cleaning, servicing, or adjusting of power-driven machinery and equipment will abide by the procedures outlined in this document.

Lockout is the first means of protection from people accidentally engaging the electrical circuit you are working on warning tags only supplement the use of locks.

The purpose of this procedure is to protect yourself from accidental or unexpected activation of mechanical and/or electrical equipment during maintenance, repairing, cleaning, servicing, or adjusting or prime movers, machinery, or equipment.



Lockout

This is the practice of using keyed or combination security devices (locks) to prevent unwanted activation of mechanical or electrical equipment.

Tagout

This is the practice of using tags in conjunction with locks to increase the visibility and awareness that equipment is not to be energized or activated until such devices are removed.



Responsibilities

- Ensure compliance with procedures set forth in this program.
- Inspect energy control procedures and practices at least annually to ensure that all Lockout–Tagout procedures are being followed.
- Certify that periodic inspections have been performed (see Record Keeping and Lockout–Tagout Inspection form).
- Maintain a file of the specific equipment and operations that require the use of Lockout–Tagout procedures. The file will include the location, description, power source, and primary hazards of equipment/machinery, a list of the primary operators/maintenance personnel, and a list of Lockout–Tagout equipment that is used and maintained on site.
- Provide and maintain necessary equipment and resources, including accident prevention signs, tags, padlocks, and seals.
- Notify the Instructor of any new or revised equipment, machinery, or operations that require the use of Lockout–Tagout devices during servicing, maintenance, or repair.



Procedures

Preparation for Lockout–Tagout

Make a survey to locate and identify all isolating devices to be certain which switch(es), valve(s), or other energy isolating devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical, stored energy) may be involved. Before lockout commences, job authorization should be obtained.

Sequence of Lockout Procedure

1. Notify all affected individuals that a lockout is required and the reason, therefore.
2. If the equipment is operating, shut it down by the normal stopping procedure (such as: depress stop button, open toggle switch).
3. Operate the switch, valve, or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, and other) is disconnected or isolated from the equipment.
4. Lockout energy isolating devices with an assigned individual lock.
5. Stored energy, such as that in capacitors, springs, elevated machine members, rotating fly wheels, hydraulic systems, and air, gas, and steam or water pressure must also be dissipated or restrained by methods such as grounding, repositioning, blocking, and bleeding down.
6. After ensuring that no individuals are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating controls to neutral position after the test.
7. The equipment is now locked out.
8. Perform Lockout–tagout procedure on the various circuit breakers, switches, disconnect panels and/or potentially energized equipment/motors/appliances cords, valves, etc. 9. Ensure the lockout is secured



Restoring Equipment to Service

1. When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no individuals are exposed.



2. When the equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to equipment.

Rules for Using Lockout Procedure

All equipment shall be locked out to protect against accidental or inadvertent operations when such an operation could cause injury to individuals. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock.

Temporary Removal of Lockout–Tagout Devices

In situations where Lockout–Tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment, or component thereof, the following sequence of actions will be followed:

1. Remove non-essential items and ensure that machines or equipment components are operationally intact.
2. Notify affected individuals that Lockout–Tagout devices have been removed and ensure that all employees have been safely positioned from the area.
3. Have individuals who applied the Lockout–Tagout devices remove such devices.
4. Energize and proceed with testing or positioning.
5. De-energize all systems and reapply energy control measures in accordance with this document.



Lockout/Tagout Inspection Form Location

Inspected:

Student(s) Inspected (Print/Signature):

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Machine/equipment on which the energy control procedure was being utilized Yes

or No

1. Has the equipment been turned OFF at the power source? ☐ Yes ☐ No
2. Has the student tested the effectiveness of their Lockout–Tagout devices?
☐ Yes ☐ No
3. If the individual is an outside contractor, have they been informed of the IEC Locations Lockout–Tagout procedures? ☐ Yes ☐ No
4. Have all the energy sources to the equipment been turned off? ☐ Yes ☐ No
5. Were tag outs legible and clearly displayed? ☐ Yes ☐ No

Comments/Observations: _____



Lab Questions:

1. A Lockout Device (LOTO) is a device that positively prevents a machine from being:
 - a. Started up.
 - b. Becoming electrically energized
 - c. Turned on
 - d. All the above
2. “Lockout” means “the placement of a tagout device on an energy-isolating device to indicate that the device and the equipment being controlled may not be operated until the tagout device is removed”.
 - a. True
 - b. False
3. Which statement is true concerning tagout devices?
 - a. Tags are only warning devices.
 - b. Tagout devices can always be used in place of lockout devices.
 - c. Tags may be removed by affected employees once LOTO is complete.
 - d. Tags provide equivalent security to using a lock.
4. The OSHA Standard that covers “The control of Hazardous Energy” is:
 - a. 1910.120
 - b. 1910.147
 - c. 1910.1001
 - d. 1926.145
5. OSHA requires that employers establish a “written energy control program”.
 - a. True
 - b. False
6. Only trained, authorized, and qualified electrical workers may perform electrical testing with a voltmeter.
 - a. True
 - b. False



7. You should only remove the lock of another worker when he or she cannot be located. a. True
b. False
8. What is the first step in safely returning equipment to service after a lockout procedure has been completed?
 - a. replacing protective devices and machine guards
 - b. removing tools and materials from the immediate area around the machine
 - c. informing all affected employees, the equipment is going to be re-energized.
9. Both authorized and affected workers are allowed to perform lockout/tagout procedures. a. True
b. False
10. The first step in a lockout procedure is for the authorized worker to be familiar with the written energy control procedures for the equipment.
 - a. True
 - b. False