Lockout - Tagout

Control of Hazardous Energy
OSHA Standard 1910.147
You will learn...

- Purpose of Lockout-Tagout
- Requirements for LOTO
- Types of Hazardous Energy
- Procedures for LOTO
Types of Energy

- Electrical
- Mechanical
- Chemical
- Thermal
- Hydraulic
- Pneumatic
Electric shock can kill

✓ as low as 30 volts can carry enough current to kill
Use Safe Electrical Practices

- Use non-conducting tools
- Check circuits dead before working
- Lock & Tag source breakers not switches
- Ensure all control power is de-energized
- Discharge all capacitors after Lockout
Quiz Time!

Circle the correct answer below.

1. It takes at least 120 volts to carry enough current to kill you.
   a. True
   b. False

2. The two types of mechanical energy hazards are:
   a. thermo and hydraulic
   b. kinetic and potential
   c. hydraulic and kinetic
Mechanical Energy Hazards

2 Types

- Kinetic – in motion
- Potential - stored
Kinetic Energy Hazards

Energy of moving machinery can cause

- Amputations
- Lacerations
- Fractures
- Loss of life
Potential Energy Hazards

- Energy stored in machinery
- Weights & Springs
- Pistons under pressure
- Hydraulic controls

Stored potential energy can be released during work causing injury or death
Chemical Energy Hazards

Chemicals have energy that can

- start fires
- cause skin burns
- generate harmful gases or fumes

Before working – release, drain or vent chemicals safely
Thermal Energy Hazards

Energy of Heat (and cold)

- Hot equipment & fluids will burn you
- Cold fluids can cause injury also
- Quick release of compresses gases can freeze your skin
- Allow equipment to reach a safe temperature before starting work.
Hydraulic Energy

Energy of Liquids Under Pressure

- pressure can cause equipment to move
- rapid release can cause injury
- or ejection of system parts

Relieve pressure slowly into a proper container
Pneumatic Energy Hazards

Energy of Compressed Gases
- uncontrolled release can cause injury
- rapid de-pressurization creates extreme low temperature

Properly vent all systems before starting work
Quiz Time!

Circle the correct answer below.

1. Thermal Energy can start fires and may generate harmful gases or fumes.
   a. True
   b. False
   • When working with pneumatic energy:
     a. relieve pressure slowly into a proper container.
     b. properly vent all systems before starting work.
     c. allow equipment to reach a safe temperature before starting work.
First Step In LOTO

Know your equipment & systems
- hazards
- isolation points
- procedure for Lockout

Working on unfamiliar machinery is a hazard
Who Can Lockout Equipment?

Only Employees who have been trained and authorized by management.
Items needed for LOTO

- Written LOTO schedule
- Locks & Tags - identified to the worker
- Hasps - for placing locks & tags
- Breaker Clips - for electrical LOTO
- Blank Flanges (pancakes) - for fluid lines
- Valve Covers - for LOTO of Valves
- Plug Buckets - for electrical plugs
Use of Locks & Tags

- Use only those issued to you
- Never use another workers lock or tag
- Ask your supervisor if you need more LOTO equipment
1. The first step in lock LOTO is to remove all protective guards.
   a. True
   b. False

2. Only those employees who have been trained and authorized by management can lockout equipment.
   a. True
   b. False
6 Step LOTO Procedure

- Prepare for Shutdown
- Shutdown Equipment
- Isolate all energy sources
- Place Locks & Tags
- Release Stored Energy
- Verify Equipment Isolation
1. Prepare for Shutdown

Understand equipment hazards

Notify other workers of shutdown
2. Shutdown Equipment

Use normal shutdown procedure

Turn all switches to OFF

Shut all control valves

Disable all sources of energy
3. Isolate All Energy Sources

Shut valves
Open breakers & disconnects
4. Place Locks & Tags on

Valves

Breakers / electrical disconnects

Block or disconnect all lines

Lock and tag blank flanges
5. Release or Block all Stored Energy

- Discharge capacitors
- Block or release springs
- Block elevated parts
- Stop rotating flywheels
- Relieve system pressure
- Drain fluids
- Vent gases
- Allow system to cool
6. Verify Equipment Isolation

- Check all other workers are clear
- Check locking devices securely placed
- Check isolation
- Attempt normal startup
- Return Controls to OFF/Neutral
Release from LOTO

- Inspect Area and Equipment
- Ensure all Machine Guards in place
- Move tools away from equipment
- Inform others of startup
- Restore system connections
- Remove Locks & Tags
- Restore equipment to normal
- Conduct normal startup
1. You must notify other workers prior to a shutdown.
   a. True
   b. False

2. Locks and or tags must be placed only on block or disconnect lines.
   a. True
   b. False
Contractors

All contractor employees must follow Our LOTO procedures!
Who can remove Locks & Tags?

Only the employee who placed the tag or a supervisor, after obtaining permission from the worker who placed the tag.
A piece of equipment already has a lock and tag. Do I have to place my own locks & tags?

YES. Each person working on the equipment must place their own locks and tags to ensure their safety.
Lockout-Tagout Protects YOU!

USE Proper Lockout - Tagout Procedures

Please be careful when working on equipment
Quiz Time!

Circle the correct answer below.

1. Only the employee who places a lock and or tag may remove it.
   a. True
   b. False

2. In the event a piece of equipment already has a lock and tag; an additional lock and tag from a second worker is not necessary.
   a. True
   b. False