



# LOCKOUT/TAGOUT SAFETY TRAINING



## Lockout Tagout Training

*This training is best viewed in Internet Explorer 6.0 or above.*

### Introduction

Lockout/Tagout training is required by Michigan OSHA and is part of KUKA-AT's Lockout/Tagout Program. The purpose of the program is to protect employees during machine or equipment service and maintenance where unexpected energization, start-up, or release of stored energy could cause injuries.

# Unexpected Release of Stored Energy Can Cause Injuries

There are many sources of energy to watch out for on the assembly floor, such as:

- Electrical
- Pneumatic
- Hydraulic
- Mechanical
- Thermal

In addition, stored or residual energy can remain after the primary energy source is shut down. This includes:

- Steam
- Air pressure
- Water pressure
- Compression of springs
- Gravity

Every time a machine is serviced, this creates a potentially dangerous situation. The leading causes of lockout/tagout injuries include:

- Failure to shut off equipment
- Failure to disconnect from power source
- Unexpected restart of equipment
- Failure to clear the work area before restart

*(by making sure no tools or spare parts can get caught in the machinery)*

## Definitions

### **ISOLATION DEVICE**

Guards against accidental machine startup or unexpected re-energization of equipment during servicing or maintenance.

### **LOCKOUT DEVICE**

A key or combination lock installed in such a way that the isolation device cannot be activated without first removing the lock. The lock must be labeled with the name of the person who placed the lock.

### **TAGOUT DEVICE**

A specially designed warning tag to identify the isolation device and equipment being controlled. The tag's information must include the name of the person who installed the tag and clear instructions that the equipment cannot be operated until the tag is removed. The tag could say, "DO NOT START" or another similar warning.

## Definitions (cont.)

### ***AFFECTED EMPLOYEE***

Someone whose job requires him/her either to operate the machine which is being serviced, or to work in an area where servicing is being performed under lockout/tagout.

### ***AUTHORIZED EMPLOYEE***

The person who locks out or tags out machines to perform servicing or maintenance on that machine. He/She is responsible for the maintenance or repairs, and must put his/her personally designated lock at each location. He/She is also responsible for telling Affected Employees that the equipment has been isolated.

If an Affected Employee must perform service or maintenance while exposed to potentially hazardous energy, then he/she becomes an Authorized Employee and must lockout or tagout the machine himself/herself.

### ***QUALIFIED EMPLOYEE***

Someone who has received training to avoid electrical hazards of working on or near exposed energized parts. He/She is familiar with the construction and operation of the equipment and hazards involved on the job. He/She is the only person authorized to work on, deactivate, or activate electrical circuits.

## Warning!

Any attempts to restart or re-energize equipment which is locked out or tagged out are ***STRICTLY PROHIBITED!***

# When to Lockout

When should lockout/tagout be implemented? Any one of these situations is enough to warrant lockout/tagout:

- ... when employees must remove or bypass machine guards or other safety devices, thereby exposing them to hazards at the point of operation
- ... when an employee's body must come in contact with the point of operation of the machine
- ... when an employee must place any part of his body into a danger zone associated with the machine operating cycle

In general, anytime someone could be injured by the power turning back on unexpectedly, the machine must be locked out or tagged out. This includes normal servicing tasks that are not done as part of normal production operations, such as setup or making big adjustments to the machine.

## Applying Lockout

To safely apply lockout/tagout, perform the following steps in order:

### **1. PREPARE FOR SHUTDOWN**

The Authorized Employee must know the type and magnitude of energy, the hazards of the energy to be controlled, and the best method to control the energy.

### **2. SHUT DOWN THE MACHINE**

... in an orderly fashion to reduce potential hazards to people.

### **3. ISOLATE THE MACHINE**

Locate and operate all the energy-isolating devices needed to control the energy so that the machine is no longer connected to the energy source.

## Applying Lockout (cont.)

### **4. APPLY LOCKOUT/TAGOUT DEVICE**

Authorized Employees are the only people who can apply lockout/tagout devices. Afterwards, they must keep the lockout keys with them at all times.

### **5. MAKE SAFE ALL STORED OR RESIDUAL ENERGY**

Relieve, disconnect, or restrain all possible hazardous stored or remaining energy. If there's a possibility of stored energy building up to a dangerous level, then isolation must be verified continually either until the servicing is complete or until the energy can no longer build up.

### **6. VERIFY THE MACHINE IS ISOLATED & DE-ENERGIZED**

Try the start switch or other activating device, then visually verify that the equipment is de-energized and non-functioning.

## Applying Lockout (cont.)

### **7. PRESS 'STOP' SWITCH**

... to ensure a zero-energy state.

### **8. READY TO PERFORM REPAIRS**

**\*Following each of these steps, in order, is critical to employee safety.**

Simply hitting a temporary energy device, like a STOP button, is not enough to prevent accidents. That's why it's so important to lockout the machine.



## Warning!

Remember to check for **all types** of stored energy in the equipment!

One example of stored energy is fluids in pipes. Let's say that someone needs to do welding work at one end of a pipe. After closing the valve, he removes the bolts from a flange, puts a solid metal plate in place to block flow through the pipe, then puts the bolts back in. Now he can weld safely on the other side of that plate. If something occurs to cause liquid to flow through the plate despite the Lockout, the metal plate will stop the liquid from coming through the pipe, hitting the welding torch, and possibly exploding.

That's why it's important to use other physical means of blocking equipment whenever possible, in addition to lockout/tagout.

## Removing Lockout

To remove lockout/tagout, follow these steps, in order:

### **1. INSPECT THE WORK AREA**

... to ensure that unnecessary items have been removed, that all parts of the machine are intact, and that the machine is ready to operate.

### **2. CHECK THAT ALL PERSONS ARE CLEAR & SAFE**

### **3. ANNOUNCE CLEARLY THAT LOCKOUT IS BEING REMOVED**

## Removing Lockout (cont.)

### **4. REMOVE LOCKOUT/TAGOUT DEVICE**

The Authorized Employee who applied the device is the **only** person who can remove it. If that person is absolutely not available, then it may only be removed under the direction of the supervisor.

### **5. ANNOUNCE THAT THE EQUIPMENT IS BEING RE-STARTED**

**\*Following each of these steps is critical to employee safety.**

If someone makes a mistake and re-starts the machine before everyone is ready, then somebody could be seriously injured or killed.

## Facts: Locks & Tags

- Tags are warning devices only that accompany locks.
- Locks and tags can only be removed by the person who put them there.
- Never bypass, ignore or defeat a lock or tag.
- Tags must be securely attached and able to withstand the environment. They must be labeled legibly in a format that is understandable by all employees. Locks must be fairly heavy-duty to prevent removal.
- Locks and tags must be standardized according to color, shape or size. Tags must be standardized according to print and format. This way every employee can immediately recognize a lockout/tagout device.

## Group Lockout

When two or more people must service the machine, a group lockout is required. One employee has primary responsibility for the duration of the project. Each Authorized Employee must place his/her personal lockout/tagout device on the group device or lockbox when he/she begins work. Then he/she removes the device when his/her work is finished.

If the group lockout must cross over shift changes, then one employee should be designated as being responsible for making sure that lockout is maintained. He/She provides orderly transfer of lockout/tagout between out-going and incoming employees.

## KUKA-AT's Lockout Program

KUKA Assembly and Test has a Lockout/Tagout Program in place to protect people from unexpected energy release or startup during machine servicing. This program covers the points reviewed in this presentation and establishes the requirements for lockout of machine energy isolating devices.

[Click here to download and view the Lockout/Tagout Program.](#)

For employees, once you have completed KUKA-AT's Lockout/Tagout training, you will be issued three picture I.D. tags. If you need more, contact Sue Sharrow at ext. 252.

For contractors, your contact house is responsible for issuing you with three sets of picture I.D. tags and heavy duty locks.

**The I.D. tags must accompany the locks every time you apply lockout.**



# Summary

**Lockout/Tagout** is a necessary procedure to reduce the chances of injury from unexpected re-energization of equipment being serviced. An **isolation device** guards against accidental startup. A **lockout device** prevents the isolation device from being activated without first removing the lock.

Only **Authorized Employees** may apply or remove locks and tags. Any other attempts to defeat, bypass or remove lockout/tagout are strictly prohibited.

Lockout/Tagout must be applied when either:

- Safety devices must be removed or bypassed
- Employee body parts must enter the machine's point of operation or operating cycle danger zone

A **group lockout** is required when two or more people must service the machine. Each person must apply his/her personal lockout device, and one employee has primary responsibility for the duration of the work.

Make sure you follow the proper steps, in order, to apply or remove lockout/tagout.

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To apply lockout/tagout:

Prepare for shutdown.  
Shut down the machine.  
Isolate the machine.  
Apply the lockout/tagout device.  
Make safe all stored or residual energy.  
Verify that the machine is isolated and de-energized.  
Press the STOP switch to double-check.  
Now you are ready to perform repairs.

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To remove lockout/tagout:

Inspect the work area.  
Make sure everyone is clear and safe.  
Announce that lockout/tagout is being removed.  
Remove the lockout/tagout device.  
Announce that equipment is being returned to service.

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Remember to check for ALL types of stored energy in the machine! Use additional physical means of blocking equipment or fluids whenever possible.

## **Conclusion**

This concludes Lockout/Tagout Safety Training.

For more information, please consult either  
your supervisor or the Safety Director.

Be sure to read the handout detailing KUKA-AT's Lockout Program.

Don't forget to complete and submit the quiz to Human Resources!