

# **Safety Hazardous Lockout Tagout System in Automobile Industry**

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**ABSTRACT:** Many workplace accidents are caused by machinery that accidentally becomes activated while being serviced or maintained. This accidental activation is called an “uncontrolled released hazardous energy.” Many of these accidents can be prevented if the energy sources are isolated, and locked or tagged out. The Occupational Safety and Health Administrations (OSHA) have a regulation on the control of hazardous energy (Lockout/Tagout). This regulation, (29CFR 1910.147) helps safeguard employees from hazardous energy while they are performing service or maintenance on machines and equipment. The OSHA regulation requires that the employer have documented clearance procedures to ensure that machinery does not start up while an employee is working on it.

**KEYWORDS:** Maintenance work, Lockout & Tagout (LOTO), Hazardous energy

## **I. INTRODUCTION**

Hazardous energy can found in the workplace in different forms. The most common form of energy is electrical, but mechanical, hydraulic, pneumatic, chemical, and thermal energy can also be dangerous. Whenever any part of the body is exposed to these types of energy while servicing or maintaining equipment, lockout/tagout procedures must be followed.

## **II. LOTO SYSTEM**

### **2.1. Definition and scope of LOTO**

LOTO refers to specific practices and procedures to safeguard employees from unexpected startup of machinery and equipment, or the release of hazardous energy during setup, service or maintenance activities. To lock out equipment, a lock is placed on the energy source, control, or isolating device. The LOTO system applies to the maintenance and commissioning in industry, such as the maintenance for power distribution system, maintenance for equipment. It can be used in different kinds of industry, such as manufacture, chemical and coal mine.

### **2.2. LOTO EQUIPMENT**

Types of isolation devices include Personal locks (red), Equipment locks, Group locks (Green), Identification Tags, Multi-lock Devices, Isolators, Group Isolation Board and Locking devices.

- Personal locks protect people when they are working on isolated equipment.
- Equipment locks are used to secure isolators in the safe (isolation) position, to prevent the accidental or inadvertent movement of the isolator.

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- Group locks are used by Isolation Coordinators and attached to Group Isolation Boards to lock the board in the active position and to secure all Equipment Lock keys used in a Group Isolation into the lockable compartment of the board.
- Identification tags are purple and white in color and are used to identify unlabelled locks.
- Multi-locks is a device that is used to attach more than one lock to an isolator, when a multi-lock is used an equipment lock attached.
- Isolator is a device which positively separates or blocks the energy sources to equipment, the device is not capable of remote operation whilst in the isolation position.
- Group Isolation Board is used exclusively for Group Isolation and considered identical to an isolator when used with these regulations.
- Locking device is a prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment controlled may not be operated until the tagout device is removed.

### III. STEPS INVOLVED IN LOTO

#### 3.1 Define when a lockout needs to occur

It's important that there is a clear distinction between normal production operations and instances when a lockout is needed.

#### 3.2 Identify all potential energy sources

A simple disconnect of the main power switches is not sufficient, as other types of energy may exist, such as hydraulic, electric, thermal, radioactive, pneumatic, gravity, and chemical energy. It's also important to drain, release, or lock any stored energy.

#### 3.3 Procedure preparation

The procedure documents the individual items of equipment to be isolated. The isolation planner should inspect the work site to determine which plant and equipment requires isolation and the boundary of isolation and hazards.

#### 3.3.4 Train employees

To provide technical training to employees who are authorized to apply locks and tags to equipment and awareness training to those who are affected by the equipment such as machine operators, workers in close proximity, and management contacts.

#### 3.5 Isolation steps

Inform all machine operators of the lockout. Locate energy isolating devices correctly. Attach locks along with a warning tag indicating the date, purpose, and length of the lockout and who installed the lock.

Use uniquely key locks that come with only one key to ensure that employees cannot remove each other's' locks. After the lockout procedures having been performed, test the operation of the machinery to ensure that all energy sources have been secured.

#### 3.6 Finish the work.

Remove the individual lock.

Remove all other lock-out equipments.

Inform all operators that the LOTO has been finished. Figure 1 shows the control processes of LOTO.

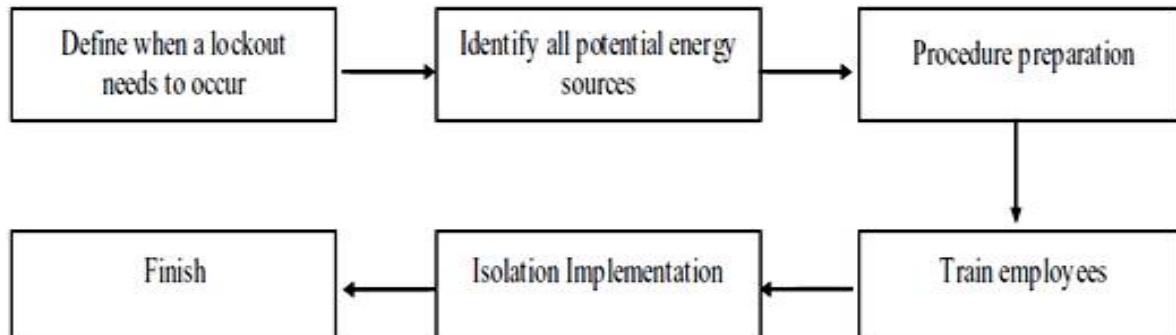


Figure 1: Steps involved in LOTO

#### IV. PERIODIC INSPECTIONS

Periodic inspections of the energy control procedures must be performed annually by an authorized employee. The inspections must review lockout and tagout procedures and correct any deficiencies.

#### V. TRAINING

As important as a lockout/tagout program is, it can only be effective if employees are aware of the program and are trained properly.

Three types of employees are covered by the standard: authorized, affected, and other. The amount and type of training that employees receive depends on their job in relation to the machine that is being locked out of tagged out.

**5.1 Authorized Employees:** Employees who are authorized to execute the lockout/tagout and perform the servicing or maintenance should receive training in the:

- recognition of all applicable hazardous energy sources (electrical, mechanical, hydraulic, pneumatic, chemical and thermal),
- details about the type and size of the hazardous energy sources present in the workplace, and
- methods necessary for controlling and isolating the energy source.

Authorized employees must possess the knowledge and skills necessary for the safe application, use and removal of energy controls.

**5.2 Affected/Other Employees:** Affected employees (usually the machine operators or users) and all other employees whose work operations may be in the area of the energy controls need to recognize when the control procedure is set in motion. They also need to understand the purpose of the procedure and the importance of not using or starting up any equipment or machines that are locked out or tagged out.

**5.3 Retraining:** Employees should be retrained whenever there is a change in their job assignment, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

The retraining should make sure that employees are still able to conduct lockout-tagout procedures and should include information about any changes in procedures. Employers must certify that training of employees has been accomplished and is being kept up to date. The certification should contain the employee's name and dates of the training.

## **VI. CONCLUSION**

In most developed countries, lockout procedures are required by local authorities when workers carry out maintenance, repairs and unjamming activities on equipment. It is clearly emphasized that standardized and effective operation of LOTO system will reinforce occupational safety management, enhance the establishment of persistent effect safety management mechanism.

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