

**COUNTY OF RIVERSIDE  
STANDARD SAFETY OPERATIONS MANUAL**

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<b>DOCUMENT NO:</b>	2009	<b>DATE ISSUED:</b>	03/01/97
<b>SUBJECT:</b>	LOCKOUT/BLOCKOUT PROGRAM GUIDELINES	<b>EFFECTIVE DATE:</b>	03/01/97
		<b>LAST REVISED:</b>	11/25/02

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**PURPOSE:** California Code of Regulations, Title 8, General Industry Safety Orders, Section 3314 requires all employers to comply with the Lockout/Blockout program when cleaning, repairing, servicing, and adjusting prime movers, machinery and equipment. This program establishes the Riverside County Lockout/Blockout Program in compliance with California statutes.

**POLICY:** County employees will be provided appropriate training and the necessary supplies such as signs, tags, padlocks, blocks, or seals as required when working on machinery or equipment capable of movement.

**OBJECTIVE:** Maintain employee safety and health, define the guidelines for the Lockout/Blockout program for all organizations, and assure compliance with regulatory requirements.

**SCOPE:** All County employees.

**REFERENCE:** CCR Title 8, GISO, Sections 3203, 3314, 6004 and Electrical Safety Orders Section 2320.

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**I. INTRODUCTION**

These lockout and blockout procedures describe how to protect you against unexpected energy releases. The procedures involve a system of switches, locks, tags and tests, mandated by Cal/OSHA, that will enable you to securely isolate machines, equipment, or confined spaces from hazardous energy sources.

**II. WHEN REQUIRED**

Machinery or equipment capable of movement shall be stopped and the power source de-energized or disengaged, and if necessary, the movable parts shall be mechanically blocked or locked to prevent inadvertent movement during cleaning, servicing, or adjusting operations unless the machinery or equipment must be capable of movement during this period in order to perform the specific task.

If the equipment must be capable of movement, the supervisor shall minimize the hazard of movement by providing and requiring the use of extension tools (e.g., extended swabs, brushes, scrapers) or other methods or means to protect employees from injury due to such movement.

**III. TRAINING**

A. Each County Department/Agency/District shall provide training for all employees who may use or be affected by the lockout procedure. Document the training and make sure the training is fully understood by every affected employee. Provide retraining annually or whenever there is a change in job assignment, a change in equipment or processes that present a new hazard, a change in the lockout procedure, or an inspection reveals a deviation from lockout procedure.

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**III. TRAINING** - Continued

- B. Training shall include the following:
  - 1. How to recognize energy sources;
  - 2. Types and magnitude of energy sources;
  - 3. Methods of energy isolation and control;
  - 4. How to shut down, isolate, and block or secure specific machines or equipment;
  - 5. How to place, remove and transfer lockout devices or tags;
  - 6. Testing a machine or equipment to determine the effectiveness of locks and other energy control devices; and
  - 7. Where the written lockout program is kept (it must be available for employee review).

**IV. IDENTIFYING HAZARDS**

- A. A variety of tasks in construction, facility maintenance, and equipment repair can involve an unexpected energy release. In general, you, the employee, are the best one to determine which tasks could place you at risk. By giving careful consideration to all potential energy sources, you should be able to work with your supervisor to identify energy release hazards specific to your job at the worksite.
- B. Examples of situations that require lockout, tagout, blockout and testing include:
  - 1. Adjusting or repairing power tools and equipment.
  - 2. Working on wiring.
  - 3. Working on pressurized pipes and tanks.
  - 4. Entering confined spaces.
  - 5. Working near compressed or expanded springs.
  - 6. Working in or near empty pipes, passages or tanks that might unexpectedly fill with liquid or gas.
  - 7. Maintaining or servicing any equipment that may release energy.
- C. Supervisors are to work with employees to develop a list of equipment and tasks that require lockout procedures. Make sure that each piece of equipment is permanently labeled with a message such as "**Lockout and Blockout required when working on this equipment**".

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**V. ROLES AND RESPONSIBILITIES**

A. Department/Agency/District Heads

1. Ensure the implementation of the lockout program in Department/Agency and District.
2. Allocate sufficient resources to supervisors to fully implement the lockout program.
3. Ensure that supervisors receive proper training.

B. Supervisors

1. Ensure that all new and existing employees required to operate, clean, service, adjust or repair machinery or equipment are trained in the use of locks, tags and blocks as follows:
  - a. For new employees before they use equipment;
  - b. Annually as a refresher for all employees; and
  - c. Whenever, work processes change.
2. Identify task(s), equipment and procedures that require locking, tagging or blocking-out.
3. Enforce lockout compliance.
4. Provide new and existing employees with approved lockout equipment such as locks, tags and blocking devices and ensure that they are identifiable as belonging to a specific employee.
5. Conduct periodic inspections on lockout activities and document inspections.
6. Maintain documentation of all training.

C. Employee will:

1. Maintain a thorough knowledge of the operating systems to be locked out.
2. Attend training on the lockout/blockout program.
3. Follow lockout procedures whenever necessary.
4. Inform his or her supervisor of concerns about lockout hazards.

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**V. ROLES AND RESPONSIBILITIES - continued**

- D. Department/Agency/District Safety Representative will:
  - 1. Help supervisors establish a lockout/blockout program.
  - 2. Coordinate basic lockout/blockout program training with the County Safety Office.
  - 3. Inform the County Safety office of any lockout/blockout hazard.
- E. County Safety Office will:
  - 1. Establish lockout program.
  - 2. Oversee the lockout program implementation, evaluation and modification per CAL/OSHA updates.
  - 3. Coordinate lockout training and information sharing among organizations.
  - 4. Assist supervisors and the purchasing department with the purchasing of protective and lockout equipment.
  - 5. Review Worker's Compensation reports or injury rates related to energy release and recommend corrective action.
- F. Purchasing will:
  - 1. Ensure that new or overhauled equipment can accommodate locks and tags.
  - 2. Work with the County Safety office to standardize locks, tags, and warning signs.
- G. County Construction Project manager will:
  - 1. Review outside contractor's lockout procedures to ensure CAL/OSHA compliance.
  - 2. Inform outside contractors of the County's lockout procedure.
  - 3. Insure that the contractor follows the prescribed lockout procedure for the appropriate tasks being performed.

**VI. GENERAL PROCEDURE**

This program utilizes the concept of Zero Mechanical Energy State (ZMES), which requires a source of energy, whether mechanical, electrical, active or stored, to be blocked out, de-energized, or otherwise shut down. ZMES is to be established on all equipment and machinery, work processes, or operating systems that require maintenance repair, adjustment, or servicing.

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**VI. GENERAL PROCEDURE** - continued

The procedures outlined in this program apply to all moveables, electrically energized, or pressurized equipment and systems during installation, repair, maintenance, servicing, cleaning or adjustment. They do not apply to routine operational adjustments or set-up procedures such as adjusting work in a lathe, drill press, etc., as long as the machine operator retains personal control over the machine or equipment.

When maintenance is required to "troubleshoot" equipment or systems while under a ZMES, locked out and tagged, the maintenance supervisor or responsible designee shall indicate "Troubleshooting" on the tag. Locks may then be removed and test instruments used.

When equipment is being balanced in place, a lock is not required. However, a "**DANGER - DO NOT OPERATE**" tag must be completed and placed on the starter before work begins and must remain on the starter during the balancing operation.

During the repair of steam traps, a completed, "**DANGER - DO NOT OPERATE**" tag may be signed by the maintenance employee and used in place of a safety lock and device.

Special procedures developed by installation engineers for securing new equipment during installation must meet this procedure's minimal requirements. Procedures developed for this purpose shall become a permanent addendum to this program after approval by department management.

In the event that it is not practical to lock out a piece of equipment, process or system, removal of power cords or fuses, disconnection of pressurized cylinders, or use of blocks to prevent movement may be used. Such alternative methods must be approved by the manager before adoption and listed in this program as an addendum. Management personnel are the only individuals authorized to permit work on energized, unlocked or unblocked machinery or equipment. All such authorization shall be written.

Where several employees are involved with working on a single piece of equipment, the maintenance supervisor will designate a single individual responsible for initial shut down, tagging out, and assuring ZMES of equipment. The safety lock and device of this designated individual will be the first applied and the last removed.

The Maintenance Supervisor shall verify that such designated individual is aware of the motor control center, all switches, valves and devices that need to be in a ZMES, locked. Blocked and tagged.

The designated individual will verify ZMES by trying to restart the equipment and checking its interlocks after it has been locked out or blocked out.

**VII. LOCKOUT/BLOCKOUT PROCEDURES**

A. "**DANGER - DO NOT OPERATE**", shall be the tag used to comply with the tagout portion of this program.

1. This tag shall be placed on the control points of machinery, processes, valves, equipment, or systems that are either under repair, defective, being serviced, cleaned, or newly installed but not yet fully operational.

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**VII. LOCKOUT/BLOCKOUT PROCEDURES - continued**

2. This tag shall be completed and placed at the control points only after ZMES has been assured.
3. The tag shall also be placed on obsolete equipment or machinery that is in a ZMES but not yet fully isolated from an operating system.
4. A properly completed tag shall contain a description of the equipment or system under service or repair, the purpose of the tag, the name of the individual placing the tag, time, date, and the name of the person authorizing the use of the tag. No other information is to be added to the tag.
5. Once placed, the tag is to remain on the switch system while work is being performed; however, this shall not exceed 30 days. If the work extends beyond 30 days, a supervisor shall review the status and issue a new tag, if necessary.

**B. Locks**

1. When work is being performed on machinery, equipment or processes, individual safety locks, and when necessary, multiple lock devices will be used to secure equipment or sources of energy. This is to assure ZMES and prevent accidental start-up. Applying locks at the start/stop button or switch is not considered safe, does not meet the standards of this program, and is therefore, prohibited.
2. Safety locks shall be one key series or pattern and be issued individually to employees along with a multiple lock device.
3. The tag of each lock must be clearly stamped or marked with the employee's name and the lock number.
4. Master keys for safety locks are prohibited.
5. In addition to distribution lists, an extra key for assigned locks shall be maintained by the supervisor in a secure manner.
6. Project engineers shall be assigned locks, keys, and devices for use in "remodel" or system upgrade construction. The project engineer shall apply and remove the lock and devices for the contractor. Contractors are solely responsible for lockout/blockout procedures on new construction.
7. Safety locks; devices, and tags shall remain in place as long as work is being performed by either maintenance or outside contractor employees.
8. If work on the equipment, process, or system has not been completed by the end of a shift, the individual assigned to such work shall not remove locks until employees of the oncoming shift have attached locks and are instructed about the scope of work.
9. Once a disconnected switch or circuit breaker is locked and tagged in ZMES, tampering with the locked element to circumvent ZMES is prohibited.

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**VII. LOCKOUT/BLOCKOUT PROCEDURES - continued**

10. Upon completion of work, the maintenance worker, operating employee, or Project Engineer shall remove locks belonging only to themselves. When all locks have been removed, the operating employee may remove the tag.
11. In the event of an emergency or other absence of a lock's owner, a safety lock may be removed only by a supervisor. This removal must not expose employees to potential injury. The duplicate key held by the supervisor should be used for such removal.

**VIII. LOCKOUT CONTROL METHODS**

There are many different ways to lockout a piece of equipment. Commonly, the main disconnect switch has one opening where a lock can be placed. If more than one employee works on the equipment, a lockout adapter suitable for the installation of several locks must be used, enabling all workers to lockout the machine with individual locks.

If switches are in a metal box, the box itself must be locked out. If a fuse is removed to de-energize equipment or circuits, the fuse box must be locked.

If controls are in a metal covered box, a common hasp may be welded or riveted to the door, along with a lock staple. The switch can then be "opened", the door closed and padlocked. Fuse boxes can be locked in this manner.

Machines activated by compressed air or steam include valves that control the source of energy. These valves must be locked out and the system must be bled to release energy (in the form of pressure).

**A. Locks**

1. Each employee must have an individually assigned lock and maintain the only key to that lock. The lock should be substantial, durable, and must have the name of the employee on it. If necessary, locks can be color coded to indicate different shifts or types of craft. When more than one worker is servicing a piece of equipment locked out, a lockout adapter must be used which allows all workers to place locks on the disconnecting means. After all work is completed, individual locks are removed and the machine can be returned to service.

**B. Tags**

1. **DO NO USE TAGS ALONE.** Tags or signs are to be used in addition to locks. Tags must state:
  - a. The reason for the lockout;
  - b. The name of the employee who is working on the equipment and how that person may be reached; and
  - c. The date and time when the tag was put in place.

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**VIII. LOCKOUT CONTROL METHODS – continued**

C. Blocks

1. A suitable block is an important safety device to ensure that a piece of equipment is safe to be repaired or serviced. Appropriate blocks must be placed under raised dies, lifts, or any equipment that might inadvertently move by sliding, falling, or rolling.
2. Blocks, special brackets, or special stands, such as those which are commonly used under raised vehicles, must be made available and used by employees.

C. Blocks – continued

3. Another form of blocking is the placement of a blind. A blind is a disk of metal placed in a pipe to ensure that air, steam, or other substance will not pass through if the system is activated.
4. Before blinds or blocks are installed, steam, air, or hydraulic lines must be bled to reduce existing pressure. Coiled springs, spring-loaded devices, or suspended loads must be released so that stored energy will not result in inadvertent movement.

**IX. TESTING EQUIPMENT DURING LOCKOUT**

A. In maintenance and repair operations, machinery may need to be tested, and therefore energized, during the course of maintenance. Employees should be trained as follows relative to testing:

1. Clear all personnel to safety;
2. Clear away tools and materials from equipment;
3. Remove lockout devices and re-energize systems following established safe procedure;
4. Proceed with test; and
5. After test, neutralize all energy sources again, purge all systems and lockout prior to continuing work.

**X. ALTERNATIVES**

Equipment circuit design or performance limitations may dictate that alternative worker protection be provided when the established lockout/blockout procedure is not feasible. If machinery must be capable of movement or circuits energized in order to perform a maintenance task, supervisors must evaluate the circumstances. No employee shall be permitted to work on unlocked machinery or energized circuits unless sufficiently experienced, properly trained, provided with appropriate protective equipment/tools and specifically instructed on procedure.

**XI. RESTORING EQUIPMENT TO SERVICE**



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- A. After the work is completed and equipment is ready to be returned to normal operation, the procedure below must be followed:
  - 1. Remove all non-essential items;
  - 2. Ensure that all equipment components are operationally intact, including guards and safety devices.
  - 3. Repair or replace defective guards before removing lockouts or blockouts.
  - 4. Remove each lockout/blockout device using the correct removal sequence.
  - 5. Make a visual check before restoring energy to ensure that workers are physically clear of the equipment.

**XII. RECORD KEEPING**

- A. The following records will be retained as outlined in this policy and other Federal, State, and County policies.
  - 1. Training records. Include employee's name, title, dates of training, and subject matter covered.
  - 2. An inventory of locks and keys as they are assigned to employees.
  - 3. Inspection report records.
  - 4. Pre-job (task) safety meeting records. Include employee's name and what was discussed.

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**APPENDIX A  
INDIVIDUAL EMPLOYEE TRAINING DOCUMENTATION**

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**INDIVIDUAL EMPLOYEE TRAINING DOCUMENTATION**

NAME OF TRAINER/INSTRUCTOR: \_\_\_\_\_

TRAINER SUBJECT: **Lockout/Tagout Program Guidelines**

TRAINING MATERIALS USED: \_\_\_\_\_

NAME OF EMPLOYEE: \_\_\_\_\_

DATE OF HIRE/ASSIGNMENT: \_\_\_\_\_

I, \_\_\_\_\_, hereby certify that I received training as described above in the following areas:

- Instruction on job objectives and equipment involved.
- Instruction on energy sources for each machine and lockout procedure.
- Instruction on steps for shutting down and securing machinery.
- Instruction on steps to verify lockout effectiveness.
- Instruction on procedural steps for applying lockout and tagout.
- Instructions on procedural steps for restarting.
- Instructions on authorized person duties to perform lockout.
- Instructions on affected person duties during lockout.

I fully understand this training, agree to comply with the instructions received, and the Lockout/Tagout Program and Procedures.

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Date

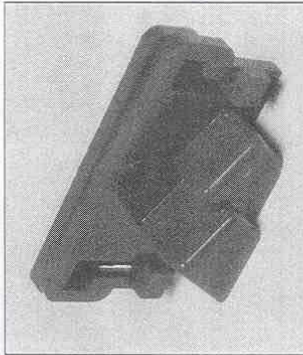
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**APPENDIX B**

**SAMPLES OF APPROVED  
LOCKOUT, TAGOUT, RESTRAINING AND BLOCKOUT  
PROCEDURES**

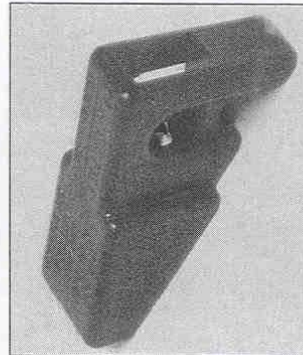
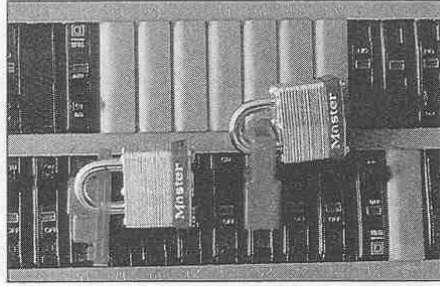
## ELECTRICAL LOCKOUT DEVICES

Constructed of rigid plastic, the circuit breaker lockouts are available for either single or double pole circuit breaker lockout applications. Breaker must be in the "off" position before installing.



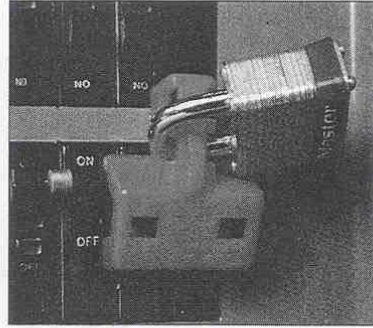
### CIRCUIT BREAKER LOCKOUT (Single Pole)

This is a single pole lockout which requires a switch breaker with a recessed hole in it. This model will accommodate breakers up to 9/16" (14mm) in width.



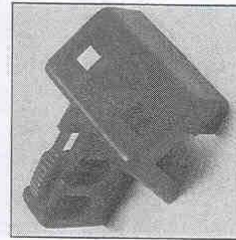
### CIRCUIT BREAKER LOCKOUT (Single Pole)

This is a single pole lockout which does not require a switch breaker with a recessed hole in it. This model will accommodate breakers up to 9/16" (14mm) in width.



### CIRCUIT BREAKER LOCKOUT (Double Pole)

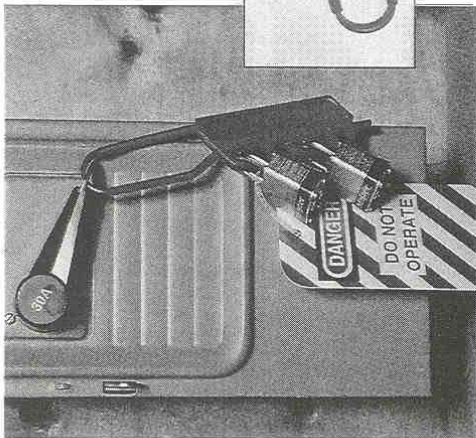
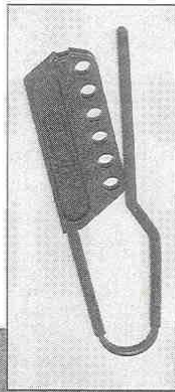
This double pole lockout requires that there be two toggles connected together with a cross bar. This model will accommodate double or triple breakers and will fit most major brands of electrical circuit breakers.



## SAFETY LOCKOUT HASP

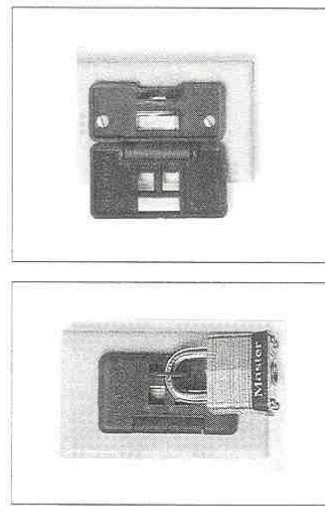
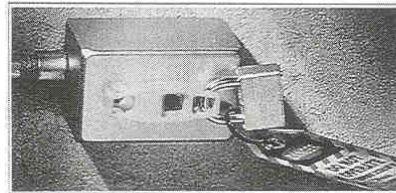
More than one worker can lock-out the same energy source for added safety with these versatile safety lockout hasps. Hasp will accept up to six padlocks with shackle diameters up to 3/8" with six lockout tags.

- Heavy duty nylon construction
- Bright red color for high visibility
- Unbreakable
- Heat and cold resistant
- Highly flexible



## TOGGLE SWITCH LOCKOUT

This yellow, thermoplastic toggle switch lockout accommodates single, double and three pole toggle switches. It will hold two padlocks with a maximum shackle diameter of 5/16" (7.9 mm). Two 1/2" (12.7 mm) stainless steel screws are supplied with each device.



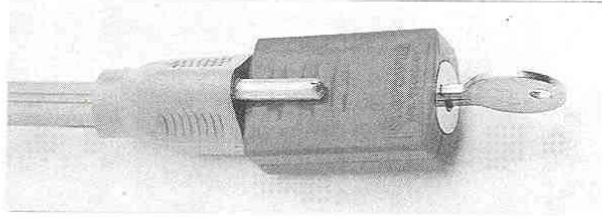
## ELECTRICAL SWITCH LOCKOUT

The "Lock-A-Switch" is easy to install and can be used with most mounted switches. It can be used to lock the switch in either the "on" or "off" position. Install using existing screws. Sold individually.

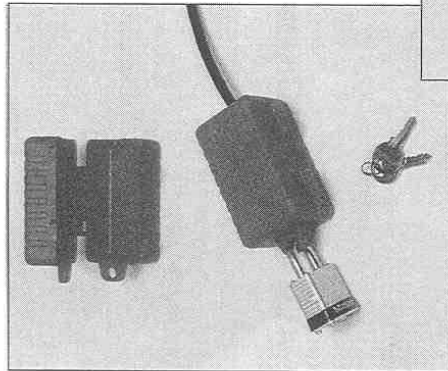
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## POWER-CORD SAFETY LOCK

Protect workers and visitors from serious injury. The power-cord safety lock connects solidly onto two or three-prong power-cords to prevent the activation of machinery. Suitable for industrial, office or home use.

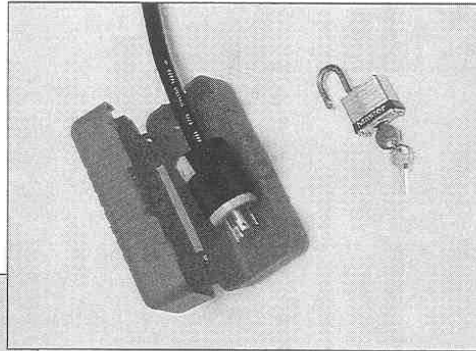


## ELECTRICAL PLUG LOCKOUTS



### ▲ SINGLE ENTRY ELECTRICAL PLUG LOCKOUT

Will accept 110 volt and certain models of the 220 volt plug up to 1.750" x 1.750" x 3.250" (44.5 mm x 44.5 mm x 82 mm) in size with a maximum cable diameter of .500" (12 mm).



### ▲ MULTIPLE ENTRY ELECTRICAL PLUG LOCKOUT

Will accept 220 volt and 550 volt plugs up to 3.000" x 3.000" x 6.750" (76 mm x 76 mm x 170 mm) in size with maximum cable diameter of 1.000" (25 mm).

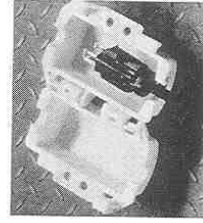
The "Lock-A-Plug" completely encloses the plug from any accidental reconnection. The electrical cable is inserted through the opening and then closed. The single entry or multiple entry locking avoids usage by unauthorized personnel during critical times.

Made out of polypro plastic and is totally dielectric. It resists cold or hot temperatures up to 300°F/149°C. It has a sliding closure and an integrated multiple lockout.

## ELECTRICAL PLUG LOCKOUTS



Plug lockout devices provide for the locking out of the plug for cord



connected electrical equipment. Use when performing maintenance or service, or when unauthorized use prevention is desirable. Constructed of UV stabilized polypropylene, these lockouts will withstand above average abuse and ambient temperature ranges.

## **VALVE LOCKOUTS**

### **VALVE LOCKOUTS**

Valve lockouts consist of two flattened half moons that completely cover valve wheels from 1" - 14" in diameter. Use diagram to ensure proper size when ordering.



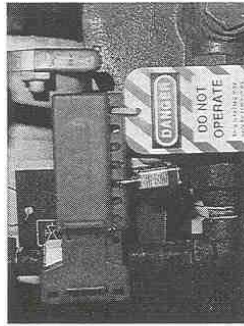
### **BUTTERFLY VALVE LOCKOUTS**

A universal lock-out for butterfly valves. It is the only way to secure your butterfly valve efficiently. Use diagram at right to ensure proper size when ordering.



### **BALL VALVE LOCKOUTS**

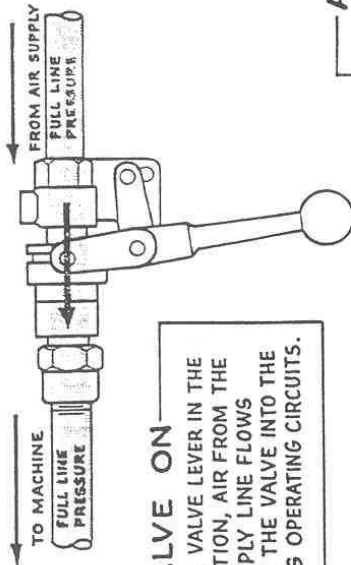
Available in 3 different sizes to lock your Ball Valves safely, efficiently and inexpensively.



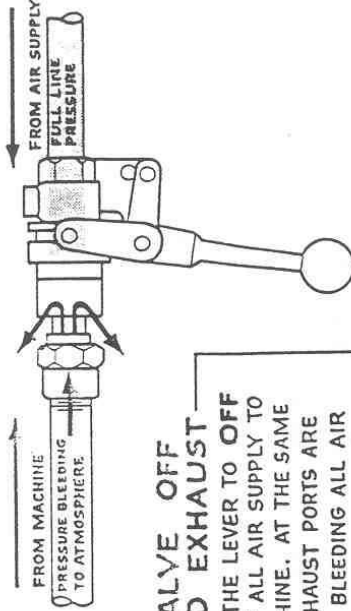


## LOCKOUT / TAGOUT APPLICATION AIR SUPPLY BLEED VALVES

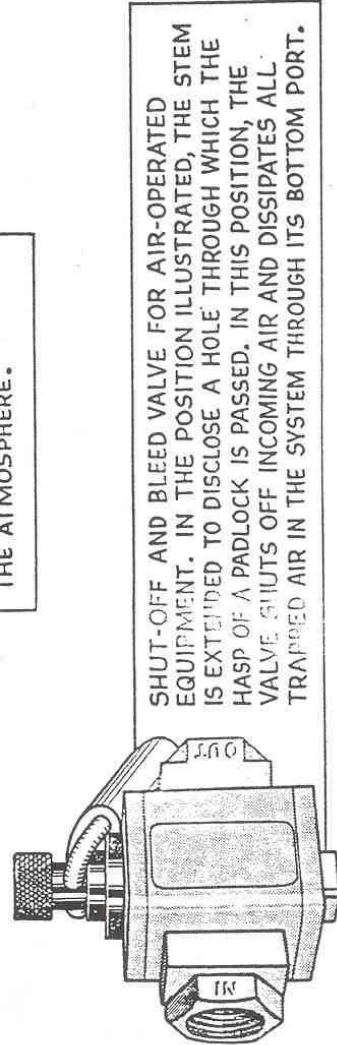
AUTOMATIC BLEEDER VALVE WITH  
BUILT-IN PROVISION FOR LOCKING IN  
EITHER "ON" OR "OFF" POSITION



**VALVE ON**  
WITH THE VALVE LEVER IN THE  
**ON** POSITION, AIR FROM THE  
MAIN SUPPLY LINE FLOWS  
THROUGH THE VALVE INTO THE  
MACHINE'S OPERATING CIRCUITS.



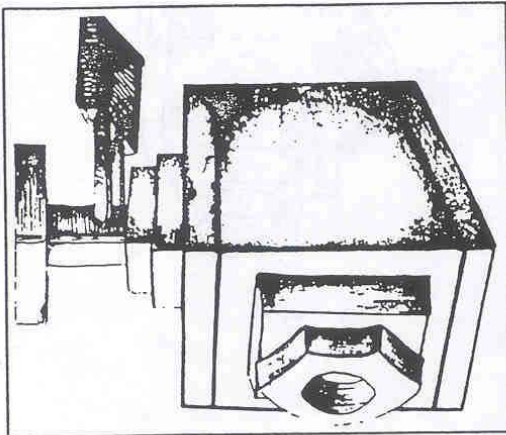
**VALVE OFF  
AND EXHAUST**  
MOVING THE LEVER TO **OFF**  
CUTS OFF ALL AIR SUPPLY TO  
THE MACHINE. AT THE SAME  
TIME, EXHAUST PORTS ARE  
OPENED, BLEEDING ALL AIR  
PRESSURE IN THE MACHINE TO  
THE ATMOSPHERE.



SHUT-OFF AND BLEED VALVE FOR AIR-OPERATED  
EQUIPMENT. IN THE POSITION ILLUSTRATED, THE STEM  
IS EXTENDED TO DISCLOSE A HOLE THROUGH WHICH THE  
HASP OF A PADLOCK IS PASSED. IN THIS POSITION, THE  
VALVE SHUTS OFF INCOMING AIR AND DISSIPATES ALL  
TRAPPED AIR IN THE SYSTEM THROUGH ITS BOTTOM PORT.

# LOCKOUT/BLOCKOUT PROGRAM GUIDELINES

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### BLOCKS

Suitable blocks are another important safety device to make a piece of equipment safe to be repaired or serviced. Blocks must be placed under raised dies, lifts, or any equipment that might inadvertently move by sliding, falling, or rolling. Blocks, special brackets, or special stands such as those which are commonly used under raised vehicles, must be available and always used. Another form of blocking is the placement of a blind. A blind is a disk of metal placed in a pipe to ensure that no air, steam, or other substance will pass through that point if the system is accidentally activated.

Before blinds or blocks are installed, bleed down steam, air, or hydraulic lines to get rid of any pressure. In addition, coiled springs, spring-loaded devices, or suspended loads must be released so that their stored energy will not result in inadvertent movement.

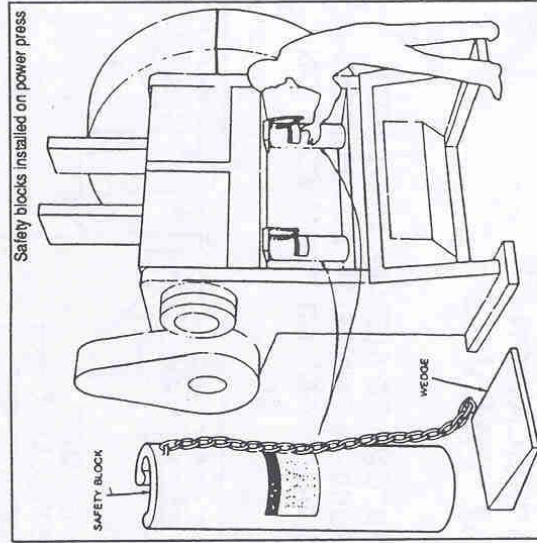
### A WRITTEN, STANDARD OPERATING PROCEDURE

A written, standardized operating procedure, followed by necessary training and responsible supervision is the best way to put into practice an effective lockout program. A lockout usually requires coordination between the production and maintenance departments. In addition, it frequently extends over two shifts, which adds to the number of employees involved and complicates portions of the lockout/blockout procedure.

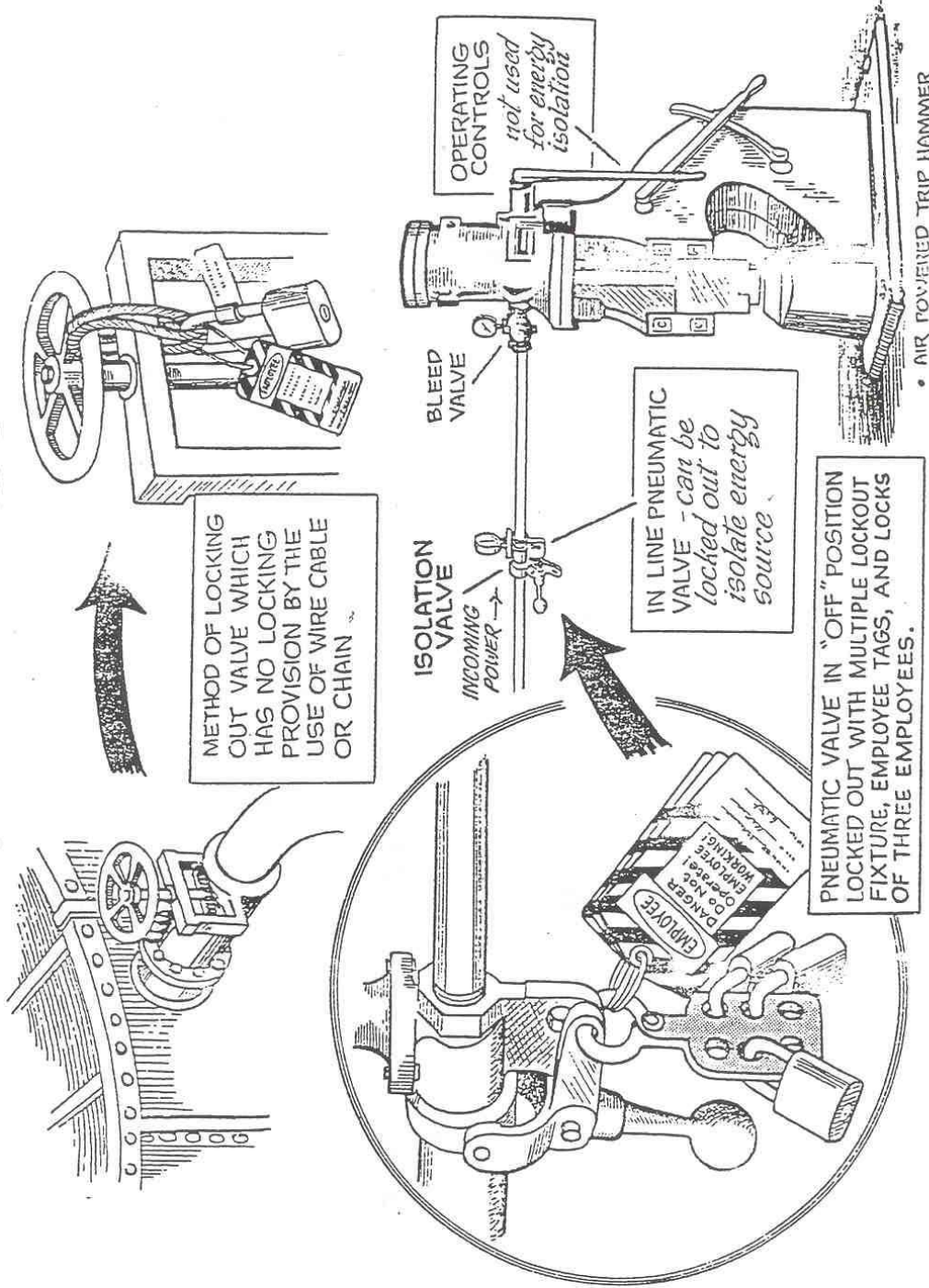
Prepare a written sequence in check list form for access, de-energizing, lockout, clearance, release, and start-up. Also consider stored energy. There are conditions that are not hazardous during normal operations, but become hazardous when guards are removed during maintenance and servicing.

In preparing a lockout procedure, consider the following items;

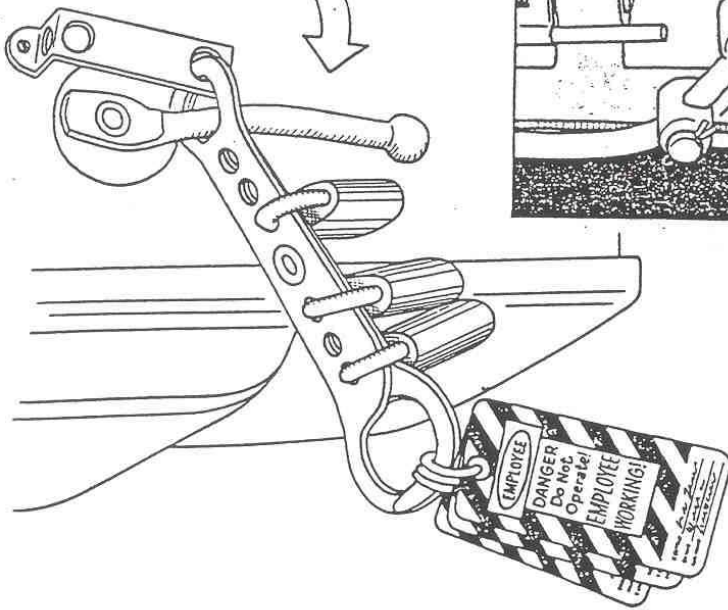
- a) *Job objectives and equipment involved.*
- b) *Estimated job duration.*
- c) *Personnel and skills involved.*
- d) *Personnel sign-on and -off positions.*
- e) *Type, number, and location of energy neutralization device requiring lockout.*
- f) *Responsible and knowledgeable persons' approvals.*
- g) *Start-up provisions.*



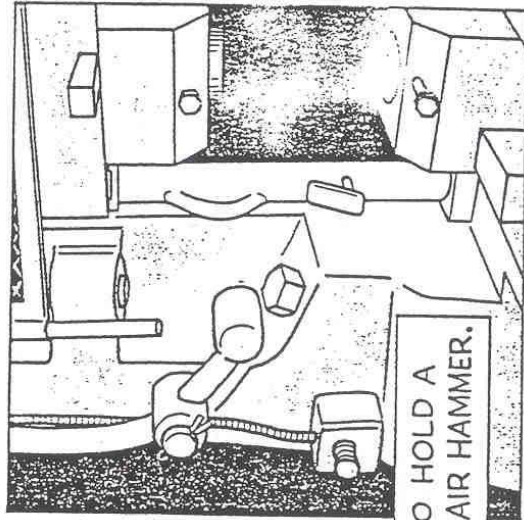
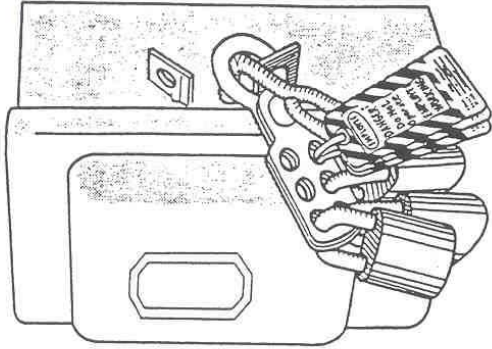
LOCKOUT / TAGOUT APPLICATION  
**HYDRAULIC - PNEUMATIC**



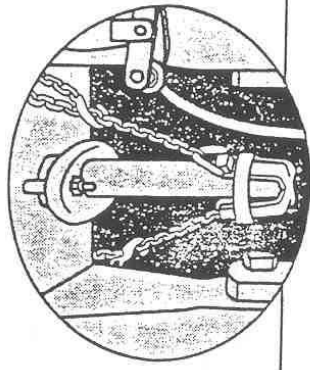
LOCKOUT / TAGOUT APPLICATION  
**LOCKOUT FIXTURES / RESTRAINING DEVICES**



MULTIPLE LOCKOUT FIXTURES WITH LOCKS APPLIED TO THE DISCONNECT SWITCHES (ENERGY ISOLATING DEVICES) ON ELECTRICAL CONTROL BOXES.



A SAFETY PROP USED TO HOLD A SUSPENDED RAM ON AN AIR HAMMER.



A RESTRAINING DEVICE USED TO HOLD A SUSPENDED PISTON ROD.

LOCKOUT/TAGOUT APPLICATION  
**ELECTRICAL**

