



ANN ARBOR FIRE DEPARTMENT

Standard Operating Procedures – 2.04 Power Lockout



POWER LOCKOUT

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Approved: Fire Chief Mike Kennedy

I. PURPOSE

All equipment shall be locked out during servicing and/or maintenance work to protect against accidental or inadvertent activation that could result in personal injury or equipment damage. In addition to disconnecting the power source, it is also required that all residual pressures be relieved and energizing lines closed (secured) prior to and during any such work

This procedure establishes the minimum requirements for the lockout of energy sources whenever maintenance or servicing work is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or maintenance work where the unexpected/unintended energization or start-up of the machine or equipment, or release of stored energy could cause injury.

This procedure is to ensure departmental compliance and adherence to the Michigan Occupational Safety and Health Administration (MIOSHA), Part 85, “The Control of Hazardous Energy Sources.”

II. EMPLOYER RESPONSIBILITY

- A. The department shall train all new employees and periodically instruct all employees regarding provisions and requirements of this procedure.
- B. The department shall effectively enforce compliance of this lockout procedure, including the use of corrective disciplinary action where necessary.
- C. The department shall assure that the locks and devices required for compliance with the lockout procedure are provided to all firefighters.
- D. Prior to setting up, adjusting, repairing, servicing, installing or performing maintenance work on equipment, machinery or processes management shall determine and instruct the employee of the steps to be taken to assure they are not exposed to injury due to unintended machine motion or release of energy.

III. EMPLOYEE RESPONSIBILITY

- A. All employees (authorized, affected, or others) are required to comply with the requirements of lockout.
- B. The authorized employees are required to perform the lockout following this procedure.
- C. All employees, upon observing a machine or piece of equipment is locked out for servicing or maintenance work, shall not attempt to start, energize or use that machine or equipment.
- D. Employees shall consult with management whenever there are any questions regarding energy control procedures or methods.
- E. Management shall enforce the energy control procedure including the use of corrective disciplinary action when necessary.



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IV. OBTAINING A LOCK AND IDENTIFICATION LABEL

Authorized employees shall obtain a lock from a lockout tag out tool box on a fire apparatus. One key will be in the possession of the employee using the safety lockout lock. The other key or a master key will be maintained by management.

V. WHAT TO LOCKOUT

During servicing or maintenance, a machine utilizing any mechanical power source such as electrical, pneumatic, steam, hydraulic, and/or air must be locked out when the unexpected energization or startup of the machine or equipment or release of stored energy could cause injury to employees. The lockout must render the machine inoperative and immovable.

VI. WHEN LOCKOUT METHODS ARE REQUIRED

Below are some examples of when lockout methods are required.

- A. Equipment cleaning or jam-clearing tasks - When a normally moving piece of equipment is stopped for cleaning, clearing, or adjustment during which a startup could cause injury, lockout is used.
- B. Equipment Repair - Whenever a repair is being performed on or near equipment where there is a possibility of injury as a result of starting the equipment, lockout is used. This includes any and all equipment from which a guard or other safety device has been removed.
- C. Installation Tasks - Frequently during installation, either part of all of the components making up the installation can be operated before the installation is complete. If needed for testing, precautions must be taken to prevent injuries to personnel during the test periods and the equipment again locked out when the test is complete or interrupted.
- D. Electrical Repair Tasks - Whenever any work other than testing is to be performed on an electrical circuit, the wiring involved must be deactivated and locked out so that it cannot be reactivated during this work.

VII. WHEN LOCKOUT METHODS ARE NOT REQUIRED

Below are some examples of when lockout methods are not required.

- A. Minor tool changes (for example, changing a drill bit) are not covered when a stop button is used to control unexpected motion during the tool change or minor adjustment and when the start button is both visible and under the employee's immediate control.
- B. Other minor servicing activities that take place during normal operations are not covered by this standard if they are routine, repetitive, and integral to the use of equipment and if work is performed using alternative protective measures that provide effective employee protection.
- C. Cord and plug connected equipment must be unplugged and under the exclusive control of the employee performing the service or maintenance work. The plug must physically be in the possession of the employee, or in arm's reach and in the line of sight of the employee. Lockout devices are available to lockout the plug when disconnected.



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- D. Repair, trouble-shooting and set-up adjustments must be performed on energized equipment only when it is absolutely necessary to leave the machine energized. For the purpose of this procedure, the trouble-shooting process will end and a lockout will be required when:
- i. Power is shut-off;
 - ii. A particular problem has been located and repairs start;
 - iii. Individual machine components are being replaced;
 - iv. Circuit changes are being made.

VIII. APPLICATION OF LOCKOUT CONTROL

The essential part of lockout of any equipment or lines is to ensure that the equipment cannot be started or source lines opened by unauthorized personnel during servicing and maintenance work. Employees having questions relating to the appropriate procedures to be followed, shall ask management prior to commencing work.

- A. Preparation for Shutdown - Locks and keys are kept on fire apparatus. Authorized employees shall review the written lockout procedure to have complete understanding of the type(s) and magnitude of the energy, the hazards of the energy to be controlled, and the methods or means to control the energy.
- B. Notification of Employees - Affected employees shall be notified by the authorized employees that the machine or equipment is going to be locked out.
- C. Machine or Equipment Shutdown - The machine or equipment shall be turned off or shut down using the energy control procedures established for the machine or equipment.
- D. Machine or Equipment Isolation - All energy isolating controls that are needed to control the energy of the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy sources (e.g., steam, pneumatic, hydraulic, and air). A Zero Energy State must be proven. If the valves do not permit the use of a standard lock out, another method such as a wire cable and lock can be used.
- E. Lockout Device Application - The multiple lock adapter and lock shall be affixed in such a manner as to hold the energy isolation devices in a safe or off position.
- F. Notification of Affected Personnel - Affected employees shall be notified by the authorized employees that the machine or equipment is locked out. In addition to verbal notification, a sign indicating a power lockout condition will be placed near the machine/equipment controls.
- G. Verification of Isolation - Prior to starting work on a machine or equipment that has been locked out, each authorized employee involved shall verify that the isolation and de-energization of the machine or equipment have been accomplished by testing the effectiveness of the lockout by attempting to cycle the machine or start the equipment at the motor control center panel or start/stop switch (key/lock system).

Each authorized employee will notify other authorized and affected personnel in the area that they are going to attempt to cycle the machine or equipment prior to doing so and shall ensure that personnel are free and clear of the machine or equipment prior to operating the controls.



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If the controls activate the machine or equipment or cause any machine or equipment movement, each authorized employee will begin again at Step A. Preparation for Shutdown.

If there is the possibility of re-accumulation of stored energy to a hazardous level, verification or isolation shall be continued until the servicing or maintenance is completed, or until the possibility of re accumulation no longer exists. Stored or potential energy will be relieved, restrained, or otherwise made safe.

Begin Work Activity - Work activity will begin once each authorized employee involved has verified that the current control of hazardous energy sources has been effective.

IX. TESTING/POSITIONING OF MACHINES/EQUIPMENT/COMPONENTS

In situations in which lockout devices must be removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component, the following sequence of actions shall be followed:

- A. Clear the machine or equipment of tools and materials.
- B. Remove employees from the machine or equipment area.
- C. Notify affected employees that the lockout devices are going to be removed.
- D. Each authorized employee who applied a safety lock will remove their own safety lock.
- E. Notify affected employees that the safety locks have been removed and that the machine or equipment is going to be energized.
- F. Energize and test the equipment.
- G. De-energize all systems and reapply energy control measures in accordance with established procedures.

X. LOCK REMOVAL

Each lockout lock shall be removed from each energy isolating device by the authorized employee who applied the device except for conditions specified in emergency lock removal. A lockout must never be broken (lock removed) by anyone other than the employee who performed that lockout.

XI. EMERGENCY LOCK REMOVAL

When an authorized employee is not available to remove their lock, management has the authority to request the removal of a lock in the absence of the employee. In those cases when a supervisor exercises that authority, the following procedure must be followed:

- A. The supervisor shall contact an authorized person and request assistance in this procedure.
- B. The supervisor and an authorized person must attempt to contact (at least verbally) the employee to whom the lock belongs and determine if the employee is on the premises.
- C. If the employee is on the premises, he/she alone has the authority to determine whether the lock can be removed based on the guidelines of the lockout procedure.
- D. If the employee is not on the premises, the supervisor or an authorized person will make a reasonable effort to contact the employee and will ask the employee whether the work is complete and the equipment is ready to be activated. The employee will be advised that his/her lock will be removed.



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- E. If the employee advises that the equipment is not ready to be activated, the supervisor must arrange to have another lock placed on the equipment as soon as the existing lock is removed.
- F. If the employee advises that the equipment is ready to be activated, the supervisor shall inspect the work area to verify that there is no danger in re-energizing the equipment, remove the lock, and inform the fire chief that the equipment is operational.
- G. If contact is not established, the supervisor will inspect the equipment for completeness of work and authorize the removal of the lock. The employee whose safety lock has been removed will be notified immediately upon return to work by a note being attached to his/her time card requiring that they come to supervisor's office for safety lock.
- H. If the equipment is ready to be activated, the supervisor will inform the department fire chief that the equipment is operational. At this point, the supervisor can authorize removal of the lock.

XII. LOCKOUT DEVICES

The following lockout devices are carried on fire apparatus.

- A. Electrical disconnect or breaker lockout device - the switch lever must be padlocked in the OFF position using a shackle and/or padlock with an identification label.
- B. Valve lockout device - can be locked out by using a padlock, a cable and lock, or a valve handle lockout devices. The method used is determined by the type of valve.
- C. Multiple locks (gang hasp) - when more than one person or group has to work on a machine, a lock adapter shall be used. Each person or group must place a lock on the adapter thus assuring each person a safe and complete lockout.

XIII. CATEGORIES OF EMPLOYEE TRAINING

- A. Authorized employees will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the work place, and the methods and means necessary for the energy isolation and control. An employee will not be considered authorized until training has been completed.
- B. Affected employees shall be instructed in the purpose and use of the energy control procedure.
- C. "Other" employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about their responsibility not to restart or re-energize machines or equipment which are locked out.

XIV. EMPLOYEE RETRAINING

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

Additional retraining shall also be conducted whenever periodic inspection reveals, or whenever there is reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

Retraining will re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary.



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XV. CERTIFYING TRAINING/RETRAINING

The fire chief shall certify that employee training/retraining has been accomplished and is being kept up to date. Certification shall include written documentation containing the employee's name, category status (authorized, affected, other), and dates of training as well as a signed statement by the instructor signifying that the training has been conducted.

XVI. EMERGENCY SCENES

- A. Lockout is required for all personnel who may have to operate at an emergency scene if any procedure could involve either patient or employee exposure to live electrical parts or exposure to a stored energy source on any machinery or equipment, or incidents relating to fire operations.
- B. Whenever a situation is encountered that meets the above criteria upon arrival at the scene, personnel shall check to see if building/plant personnel or company personnel have begun the lockout procedure. If they have begun the procedure then AAFD locks or tags shall be added to those already present.
- C. If lockout procedures have not been initiated, then AAFD personnel will initiate this procedure.
- D. Notify all affected personnel that a lockout procedure is required and the reason why this is necessary.
- E. With the assistance of the shut down the equipment using the normal shut-down procedure if you can assure that the person entangled, if applicable, will not be harmed further.
- F. Operate the disconnect switch, valve, circuit breaker or other energy isolating device(s) so that the equipment is isolated from its energy source. Toggle switches, push buttons and other types of control switches are not isolating devices.
- G. Dissipate and isolate all stored energy, if applicable, such as that found in springs, elevated machine components, rotating parts, hydraulic systems and air, gas, steam or water pressure. All stored energy must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
- H. Lock out the energy isolation devices with energy lockout device(s), located on fire apparatus. If one or more crews are working at the same incident, then each crew will put their individual lock(s) and or tag(s) on the energy lockout device.
- I. If it is impossible to use a secure a lock on a machine or equipment, another positive means of disconnecting the circuit or equipment must be used. Other positive means may include unplugging, disconnecting the conductors or removing fuses. In this case, the tag must be placed on the plug, conductor, fuse brackets, etc. If no positive means can be used placing a radio-equipped firefighter stationed at the controls to keep the machine/equipment from being activated.
- J. Upon conclusion of the incident, fire department locks shall be removed, but re-energization of the machine shall left with building/plant personnel