

Technical Information Bulletin

U.S. Department of Labor
Occupational Safety and Health Administration



Key Switch Controlled Elevating and Rotating Aerial Lifts

TB020411

Purpose

The purpose of this Technical Information Bulletin is:

1. To inform users of subject aerial lifts that emergency rescue of employees on the lifts can be delayed if:
 - the upper and lower controls used to operate the lift are selected by key;
 - the key can be removed while set in the upper, off, or lower position; and
 - the key is removed from the switch and not immediately available to individuals on the ground;
2. To alert users that the subject lifts should only be operated when the operational mode switch key is inserted in the switch, unless the key is otherwise readily available and immediately accessible for use; and
3. To provide recommendations for employers that own the subject aerial lifts.

Background

The Hartford Area Office brought to the attention of the Directorate of Technical Support an accident that it investigated involving an elevated aerial lift with a keyed mode selector. The accident occurred when an employee was working on an electrical panel with the basket elevated about 20-25 feet off the ground. When an electric arc from the electrical panel ignited the employee's clothing, he was only able to lower the basket to a height about 12 feet above the ground before he became incapacitated. Co-workers tried to lower the aerial lift further, but could not operate the lower controls because the control key had been removed and was not available to them.

The Occupational Safety and Health Administration's (OSHA's) Directorate of Technical Support issues Technical Information Bulletins (TIBs) to provide information about occupational hazards and/or to provide information about noteworthy, innovative, or specialized procedures, practices, and research that relate to occupational safety and health. These bulletins are not standards or regulations and create no independent legal obligations. They are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace.

Further information about this bulletin may be obtained by contacting OSHA's Directorate of Technical Support at 202-693-2095.

Description of Hazard

The subject aerial lifts have two sets of controls that can be used to move the boom and the basket. One set of controls is located in the basket at the end of a telescopic boom. A second set of controls is located in a panel mounted on the lower superstructure of the lift, which is mounted on the chassis of the lift.

On the lift involved in the accident, the keyed switch controlling the lower and upper sets of controls works as follows: Prior to starting the engine, the emergency stop button must be pulled out, and the key turned to the right or left depending on the desired operating mode. One mode is for basket level operation (upper controls). The other mode is for ground level operation (lower controls). Once the control mode is set, a momentary contact switch is activated. The lift can then be operated from either the basket or ground level, depending upon the mode selected.

During the attempted rescue of the injured worker, the basket could not be lowered to the ground with the lower controls. The lower controls were inoperative because the switch was locked in the upper controls position, and the key for the operational mode switch was not in the switch. In that position, the lift can only be controlled from the upper controls in the aerial basket. The switching mechanism can not be switched to the lower controls without the key; thus, the lower controls could not be used to override the upper controls, and individuals on the ground were unable to readily assist the incapacitated employee.

Other Information

While many aerial lifts are equipped with a key mode switch that only allows the key to be removed from the switch panel when the key is in the “OFF” position and the lift is locked in a lowered position, some aerial lift models are manufactured such that the key may be removed from the key mode switch at any time. If an aerial lift’s design permits individuals to remove the key from the key mode switch at any time, and the aerial lift is not equipped with an alternative device to lower the basket from the ground in emergencies (e.g., an emergency-lowering-piston that can be operated independently of the mode switch, permitting the basket to be lowered in an emergency by a separate control lever)¹, employees working from the basket may be at risk unless the key remains in the key mode switch or the employer can assure that, at all times when the aerial lift is being used, the key or a duplicate key, is in the possession of a person who is readily available and immediately accessible to the aerial lift.

OSHA’s 29 *CFR* 1910.67 (c)(2)(ix) standard for general industry, and OSHA’s 29 *CFR* 1926.453 (b)(2)(ix) standard for construction, require aerial lifts to “have both platform (upper) and lower controls.

Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.”

The American National Standards Institute (ANSI) standard A 92.2-1990, *Vehicle-Mounted Elevating and Rotating Aerial Devices*, Section 4.3.3 contains the following requirements for the Lower Controls: “Lower controls shall be readily accessible and shall provide for over-riding the boom positioning upper controls provided the upper control system is intact. They shall be plainly identified as to their function and protected from damage and inadvertent actuation.”

A92.5-1992, *Boom - Supported Elevating Work Platforms*, Section 4.10.2 requires “Lower controls shall be readily accessible from ground level and shall: a) Override upper controls for powered functions. b) Be provided for all powered functions except drive and steering. c) Be of the type that automatically returns to the “off” or “neutral” position when released if used to control any movement of the aerial platform. d) Be protected against inadvertent operation. e) Be clearly marked.”

Conclusions

When the subject lifts are operated from the basket and the key required to switch operation to the lower controls is removed, potential rescuers may have difficulty reaching an injured or incapacitated employee who is unable to operate the basket controls, unless the rescuers can immediately locate the key and lower the injured or incapacitate employee using the lower controls.

The subject aerial lifts’ lower controls have the capability to override the upper controls only if the key is in the lower controls mode. In order for such lifts to meet the requirements of the OSHA and ANSI standards, it is essential that: (1) the key remains in the key switch, so that it can be set to activate the lower controls, and can provide a means to lower the platform, or (2) the key, or a duplicate key, is in the possession of a person who is readily available and immediately accessible to the aerial lift, so that in an emergency, the lower controls can be used to override the upper controls and lower the aerial lift.

¹ The European mobile elevating work platforms (MEWPs) standard, EN280, requires the MEWPs be fitted with an over-riding emergency system, e.g., a hand pump, secondary power unit, or an emergency-lowering-piston that can be operated independently of the mode switch, permitting the basket to be lowered in the event of an emergency by a separate control lever. The EN 280 standard also allows the lower controls be used as the emergency device. Section 4.10.4 of ANSI A 92.5-1992 standard requires that “All aerial platforms shall be provided with an auxiliary means of lowering, retracting, and rotating in the event of a power loss.”

Recommendations

Aerial lifts used in general industry or in construction activities must meet the requirements of 29 *CFR* 1910.67 or 29 *CFR* 1926.453 standards respectively. The lower controls of the subject lifts must be able to override the upper controls in an emergency. Thus, when employees are working from the basket on the subject lifts, the key must not be removed from the switch control panel when the setting is in the upper control position, unless the key or a duplicate key, is in the possession of a person who is readily available and immediately accessible to the aerial lift.

*
