

# Fatality Investigation Report

OR 2004-10-1

## Forklift crushes operator working underneath on starter

### SUMMARY

On June 4, 2004, a 47-year-old co-owner of a recycling business was run over and killed by a Gradall telescopic boom lift (rough-terrain forklift) while he was working underneath it. He had been operating the Gradall, and had shut it down when he momentarily exited the vehicle. When he returned to the machine, he found it would not restart. The Gradall had a safety interlock that prevented starting from the ignition switch while in gear. The contractor was apparently unaware of this safety feature. He checked the batteries, and then crawled underneath the cab area and reached up into the engine compartment with a screwdriver. The screwdriver made contact between the two terminals on the starter, effectively jump-starting the engine and bypassing the safety mechanism that prevented ignition while in gear. The Gradall started and moved forward. The parking brake was not set. The back left tire rolled over the contractor.



**CAUSE OF DEATH:** Severe head injury.

### RECOMMENDATIONS

- **Powered industrial forklifts should only be operated by knowledgeable and experienced individuals certified by the employer, with proficiency demonstrated through operator training.**
- **Before exiting any powered industrial truck, even briefly, completely shut down power, place controls in neutral and apply parking brake.**
- **Do not start equipment by overriding safety features.**

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## INTRODUCTION

On June 4, 2004, a 47-year-old co-owner of a recycling business, acting as a general contractor, was run over by a Gradall rough-terrain fork lift while he was working underneath it. The machine was in gear and the parking brake was not activated. The incident occurred at about 2 p.m. OR-FACE received notification of the incident from OR-OSHA on June 7. This report is based on the OR-OSHA investigation, and reports from the sheriff and medical examiner.

The recycling firm is primarily engaged in recycling wood (mill) waste materials into animal bedding. The victim had been co-owner of the company since 1993. Currently, the company has eight employees. Normal operations involve daily use of forklifts, front-end loaders, various trucks and other equipment. The co-owner regularly operated mobile machinery, but he was not a qualified operator for all pieces of construction equipment.

At the time of the incident, the co-owner was acting as a general contractor for the construction of a new facility at the company's production site, managing the financing, plans, permits, hiring, and scheduling of subcontractors. He was onsite to ensure that the concrete portion of the project was going well, and he was assisting wherever he could.

The forklift involved in the incident – a Gradall telescopic boom lift, model 534B8, with a weight of 19,500 lbs – belonged to the steel-erection subcontractor. Permission was granted to operate the equipment, without stipulations or requirements. The co-owner/contractor had not operated a Gradall prior to this incident.

## INVESTIGATION

On the day of the incident, the contractor and an employee were using the Gradall to move building materials, assisting the concrete crew in the preparation and pouring of concrete. The employee had been using the Gradall in the morning to move building materials all around the project. In the afternoon, the contractor was using the Gradall to assist the concrete crew by placing and removing the concrete finishing equipment on the poured concrete.

After moving concrete equipment with the Gradall, the contractor shut off the machine to go to his personal vehicle. Upon returning, the Gradall failed to start. When he shut it down, he had left the shift levers in the forward position and in second gear. The two levers must be placed in neutral before the starter will work using the ignition switch. When the contractor attempted to start the Gradall, it did not start. He exited the operator's seat again to check the batteries, and evidently left the key in the on position and failed to set the parking brake.

After checking the batteries, the contractor retrieved a screwdriver from his vehicle and returned to crawl under the Gradall cab area. He reached up into the motor compartment with the screwdriver and the tool made contact between the terminals on the starter. The contact effectively jump-started the engine and bypassed the safety mechanism that prevented ignition

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while in gear. Electrical burn marks found on the screwdriver after the incident correspond to the distance between the starter terminals, which also showed burn marks.

The Gradall started and moved immediately forward. The back left tire rolled up over the contractor. The Gradall traveled about 20 ft farther before being stopped by a cement slab. A coworker got into the cab of the Gradall and applied the foot brake, but this did not stop the machine. He turned off the key in the ignition, which stopped the engine. The victim was dead at the scene.

## **RECOMMENDATION/DISCUSSION**

**Recommendation #1. Powered industrial forklifts should only be operated by knowledgeable and experienced individuals certified by the employer, with proficiency demonstrated through operator training.**

The victim had operated several different types of mobile machinery, such as forklifts, front-end loaders, trucks, and other equipment at his own worksite, but he was not a qualified operator for all pieces of construction equipment. The victim had not previously operated a Gradall and was not familiar with the complete operations of the Gradall.

Effective refresher training should be provided to an operator if assigned to drive a different type of truck than originally qualified and certified to operate. Training topics should include proper operation, warnings, and precautions during use of the equipment.

The Gradall operator's manual gives directions that the "industrial truck operator is competent to operate a powered industrial truck safely as demonstrated by successful completion of the training evaluation." The direction corresponds to rules in OSHA 29 CFR 1910.178 and American National Standards Institute, ANSI B56.1-1993.

**Recommendation #2. Before exiting any powered industrial truck, even briefly, completely shut down power, place controls in neutral and apply parking brake.**

The Gradall was found with the key in the on position, in second gear and forward position, and the parking brake was not set. The Gradall operator's manual specifically states the following warning: "Always apply parking brake before leaving cab. Neither leaving the unit in gear nor applying the Mico Lock will prevent unit from rolling."

**Recommendation #3. Do not start equipment by overriding safety features.**

The victim unintentionally bypassed the operator's starter switch safety interlock designed to prevent starting while the machine was in gear. Any maintenance or repair activity that can circumvent or override an installed safety feature is hazardous. Therefore, all maintenance procedures should carefully follow the manufacturer's specifications. The Gradall operator's

manual states: “any procedure not specifically recommended by the Gradall Company must be thoroughly evaluated from the standpoint of safety before it is placed in practice.”

## REFERENCES

Center for Research on Occupational and Environmental Toxicology (n.d.). *Powered industrial trucks (forklifts)*. Online information resource: [www.croetweb.com/links.cfm?subtopicID=373](http://www.croetweb.com/links.cfm?subtopicID=373)

National Institute for Occupational Safety and Health (2001). *Preventing injuries and deaths of workers who operate or work near forklifts* [Pub 2001-109]. Available online: [www.cdc.gov/niosh/2001-109.html](http://www.cdc.gov/niosh/2001-109.html)

Occupational Safety and Health Administration. (n.d.). *Powered industrial trucks*. Online information resource: [www.osha.gov/SLTC/poweredinustrialtrucks/index.html](http://www.osha.gov/SLTC/poweredinustrialtrucks/index.html)

## For More Information

The Center for Research on Occupational and Environmental Toxicology at Oregon Health & Science University performs Fatality Assessment and Control Evaluation (FACE) investigations through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR). The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

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