TO: Director, National Institute for Occupational Safety and Health

FROM: Iowa FACE Program

SUBJECT: Auto salvage yard worker crushed while working under car-- Iowa

SUMMARY: A 27 year old mechanic working for an auto recycler was fatally injured while working under a wrecked car in an auto salvage lot. The man was removing a front wheel assembly while standing under the car which was supported by forks of a large 4-wheel drive rubber-tired forklift truck. The victim was assisted by a friend who was not employed by the salvage yard and was not adequately experienced with fork lift operation.

The victim had removed lug nuts and the axle nut of the right wheel assembly and was standing under the front end of the automobile. He grabbed the undercarriage and swung his feet up to kick off the wheel. At this point the car began to tilt to the front. The assistant yelled to the victim, but it was too late, for the car rapidly slid forward and fell pinning the victim to the ground causing fatal head injuries. The back end of the car remained supported by the left fork. The assistant mounted the forklift and lowered the rear of the car, then radioed to other employees for help. He stated in an interview that he noticed a gap between the car and the right fork of the forklift, but didn't think anything of it and didn't mention this to the victim.

The wrecked car was not secured by safety chains or other means to the forklift, and there was no supports to prevent the car from falling. The victim was killed instantly from head injuries. When emergency personnel arrived, they were instructed to immediately transport the body to the hospital in hopes of saving vital organs for donation.

RECOMMENDATIONS following our investigation were as follows:

1. Auto mechanics should not work under cars when they are elevated and supported only by a forklift.
2. Salvage yards should use safety chains or other means to secure autos when they are elevated and moved by forklifts.
3. Salvage yards should provide safe dismantling areas where cars are adequately supported.

INTRODUCTION

In September, 1995 a 27 year old male auto salvage yard mechanic died while working under a wrecked car in the salvage yard. The Iowa FACE program became aware of the incident after reading a newspaper article. After gathering information by telephone, a site visit was conducted on Oct. 4th by two investigators from the Iowa FACE program. Other sources of information for this case include the county sheriff, the county medical examiner, and an interview with the victim's father. Photographs were also taken during the site visit.

The business was a typical large auto salvage yard which dismantles and recycles wrecked automobiles, including auto crushing. It was a family owned business, consisting of the father and his two sons, and 5 other men who worked full-time. The salvage yard is a member of a network of 1500 computerized yards nationwide and a member of the Iowa Auto Recyclers.

The salvage yard provided safety training for employees by periodic visits by safety companies. No other formal safety meetings were conducted, however safety was a priority and each new employee was fully instructed for 2 weeks on use of heavy equipment. A safety improvement had recently been made which consisted of a solid support frame. Cars were placed on this stationary frame or "tear down rack" to avoid working under cars only supported by the forklift. The victim grew up working in the salvage yard and was entirely familiar with all the equipment and procedures. The company has had very few minor injuries over the years, and this was their first fatality.

INVESTIGATION

Autos are brought into this salvage yard on trailers or by tow trucks. They are sorted and transported around the yard using a large 4-wheel drive truck equipped with hydraulic loader and forks on the front end. This truck was purchased new 10 years ago and remains in good working condition. A single lever controls movements of the forklift: forward and backward movement causes raising and lowering of the forks, while left and right movement causes downward and upward tilting of the forks. Movement of the machine itself is controlled by foot pedals and a steering wheel.

The victim and his helper were performing a very routine job at the time of the accident. The ground in the middle of the salvage lot where they were working was level and dry. They had raised up a 1989 Renault Eagle with the forklift and the victim was standing underneath removing the right front wheel assembly. The helper stated seeing a space between the right fork and the car, but didn't recognize the significance of this and didn't tell the victim. No bracing was under the raised car, nor were any safety chains attached to it. The victim grabbed onto the undercarriage near the engine area and swung his feet up trying to kick off the wheel assembly. The car tilted to the left and slid off the left fork, falling on the victim. Warning shouts from the helper were too late, for the victim became entangled in the falling car, or could not escape fast enough, and the car fell on his head and one arm, killing him instantly from massive head injuries.

When co-workers arrived at the site they found the victim on the ground near the front of the automobile with his head and one arm crushed underneath the left wheel area. The car was flat on the ground approximately 6 inches in front of the forks which were level and also lying flat on the ground (see diagram). The assistant had lowered the rear of the car, but was afraid to move the car anymore for fear of further injuring the victim.

When emergency personnel arrived, it was obvious that the man was dead from head injuries. His father had already arrived at the scene and gave instructions to save his vital organs for donation. The forklift was used to lift the car off the victim and his body was quickly rushed to the hospital.

CAUSE OF DEATH

The official cause of death from the medical examiner's report was "cranial trauma due to accidental crush injury". An autopsy was performed in the process of procurring organs for donation. No other significant findings were obtained.

RECOMMENDATIONS / DISCUSSION

Recommendation #1 *Auto mechanics should not work under cars when they are elevated and supported only by a forklift.*

Discussion: Forklifts do not provide adequate safety when working under a raised car. Failure of the hydraulic system or external forces on the car can cause it to shift and/or fall down injuring workers underneath. This car was obviously picked up leaving the heavier front end inadequately supported. When the victim held on to the undercarriage, his additional weight was sufficient to tilt the car so it slid off the left fork of the forklift. According to CFR 1910.178(m)(2), workers should always stand clear of elevated loads when they are being adjusted.

•**Recommendation #2** *Salvage yards should use safety chains or other means to secure autos when they are elevated and moved by forklifts.*

Discussion: The forklift provides support for the car, but does not keep it from sliding around on the forks. Moving the forklift on an incline or uneven ground can easily shift the balance and cause the car to slide and fall off the forks. Parts of the auto may get caught in other autos or objects, or an operator may simply make a mistake. A safety chain or other means of securing the auto to the forklift can prevent the cars from falling off the forks and causing a hazard to the forklift operator or others in close proximity. Safety chains or other means, however, will not be adequate safety measures to work under elevated cars. Reliable bracing is needed.

•**Recommendation #3** *Salvage yards should provide safe dismantling areas where the cars are adequately supported.*

Discussion: The need for working under cars that are only supported by a forklift should be eliminated by providing racks or other means to support the car while dismantling parts from it. The owner of this salvage yard had lately built a metal rack to minimize risk to mechanics working underneath. Using the same forklift, cars are now lifted onto this frame prior to tearing down. This job is done at a central location, on level terrain, rather than out in the salvage yard. This will likely reduce the risk of injury from falling vehicles. Other similar racks could be added in other parts of the large yard to avoid moving cars far from their usual location.

References:

Referring to all powered industrial trucks, CFR 1910.178(m)(2) states: *"No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty."*

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Fatality Assessment
&
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(FACE)

The University of Iowa, in conjunction with Iowa Department of Public Health and National Institute for Occupational Safety and Health (NIOSH), is investigating the causes of work-related fatalities in the State of Iowa. FACE is a surveillance program that identifies all occupational fatalities, conducts in-depth, on-site investigations on specific types of fatalities, and makes recommendations for employers employees, farmers and others to help prevent similar fatal accidents in the future.

Iowa is a major farming state, and therefore the Iowa FACE Program deals with many occupational deaths on the farm. It is a very hazardous profession that claims hundreds of lives nationally every year. We publish detailed reports that are disseminated to agricultural leaders in Iowa to share our concern for the safety of farmers. To reach and effectively communicate with the agricultural community, which is at high risk of fatal injuries, is a worthy challenge in Iowa.

NIOSH funded state-based FACE Programs include: Alaska, California, Colorado, Georgia, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Wisconsin, and Wyoming.

Additional information regarding this report or the Iowa Face Program is available from:

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