DATE: November 13, 1995

FROM: Minnesota Fatality Assessment and Control Evaluation (MN FACE) Program
Minnesota Department of Health

SUBJECT: MN FACE Investigation 95MN04601
Farmer Youth Dies After Being Struck By A Loader Bucket

SUMMARY

A 17-year-old farm youth (victim) died of injuries sustained when he was struck by a bucket that fell from a front-end loader. On the day of the incident, the operator of a farm drove a tractor equipped with a front end loader to a farm site to haul some items. Shortly before the incident, the bucket was connected to a quick-connect coupling mechanism on the loader, but it was not secured in place with locking pins. After attaching the bucket, the farm operator drove the tractor between two farm sites. The victim apparently rode along on the tractor between the farm sites. When they arrived at the second farm site, they stopped at a closed farm gate and the victim got off the tractor and opened the gate. The operator drove the tractor through the opened gate and the victim closed it. The victim climbed into the bucket and the tractor operator raised the loader to a height of approximately five feet. The operator drove the tractor down a gravel driveway toward the farm site. It was not known how fast the tractor was driven down the gravel driveway. Along the way, the front wheels struck a bump that caused the loader to bounce and the bucket to unhook from the quick-connect mechanism. The victim fell from the bucket to the ground and was struck by the bucket as it fell to the ground. The tractor operator stopped and manually lifted the bucket from the victim. The operator drove back to the first farm site and placed a call to emergency medical personnel. They arrived shortly after being notified and pronounced the victim dead at the scene. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- operators should never allow any passengers to ride along on equipment; and
- all equipment locking devices should be properly installed before the equipment is used.

INTRODUCTION

On August 19, 1995, MN FACE investigators were notified of a farm work-related fatality that occurred on August 17, 1995. The county sheriff's department was contacted and releasable information was obtained. Information obtained included a copy of their report of the incident and copies of their photos of the incident site. A copy of the county coroner's summary report, containing releasable information, was requested and obtained. A site investigation was not conducted by MN FACE investigators.

INVESTIGATION

On the day of the incident, the operator of the farm drove a tractor equipped with a front end loader to a farm site. The tractor was approximately 15 years old and was equipped with a wide front end. The front end loader was equipped with a quick-connect coupling mechanism as shown in Figure 1. The quick-connect coupling mechanism enabled an operator to quickly change from one loader attachment to another. Attached to the back of the bucket were two pairs (left and right of center) of bucket brackets. Near the top of each pair of brackets was a quick-connect pin that did not have to be removed to mount or dismount the bucket to/from the loader. Attachment of the bucket was accomplished by lowering the loader and driving the tractor forward until the quick-connect mechanism contacted the back of the bucket. When the loader was raised, the quick-connect yokes slid up and against the quick-connect pins in the bucket brackets and lifted the bucket. As the loader was raised, the weight of the bucket held the bucket in place against the quick-connect yokes and caused the locking pin holes to become aligned. Installation of a locking pin near the bottom of each pair of bucket brackets was necessary to securely lock the bucket or other attachment to the loader. On the morning of the incident, the bucket was attached to the loader, but the locking pins were not inserted to securely lock it to the loader.

After attaching the bucket, the farm operator drove the tractor between two farm sites. The victim apparently rode along on the tractor between the farm sites. When they arrived at the second farm site, they stopped at a closed farm gate, and the victim got off the tractor and opened the gate. The operator drove the tractor through the opened gate and the victim closed it. The victim then climbed into the bucket, and the tractor operator raised the loader to a height of approximately five feet. The operator drove the tractor down a gravel driveway toward the farm site. It is not known how fast the tractor was driven down the gravel driveway. Along the way, the front wheels struck a bump that caused the loader to bounce and the bucket to unhook from the quick-connect yokes. The victim fell from the bucket to the ground and was struck by the bucket as it fell to the ground. The tractor operator stopped and manually lifted the bucket from the victim who had suffered

severe head and neck injuries. The operator drove back to the first farm site and placed a call to emergency medical personnel. They arrived shortly after being notified and pronounced the victim dead at the scene.

CAUSE OF DEATH

The cause of death listed on the death certificate was skull fracture and massive fracture of cervical spine.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Operators should never allow any passengers to ride along on equipment.

Discussion: Self-propelled farm machines, including tractors, are designed to carry only one person, the operator. In addition, the proper place for the operator to ride is sitting in the operator's seat. Passengers may be thrown from machines as the result of unexpected movements such as bumps or turns. A passenger carried in a loader bucket is exposed not only to the risk of falling from the bucket but also to the risk of being immediately run over before the operator can stop or turn the tractor. Passengers can cause additional problems such as interfering with the operator's vision, interfering with the operation of

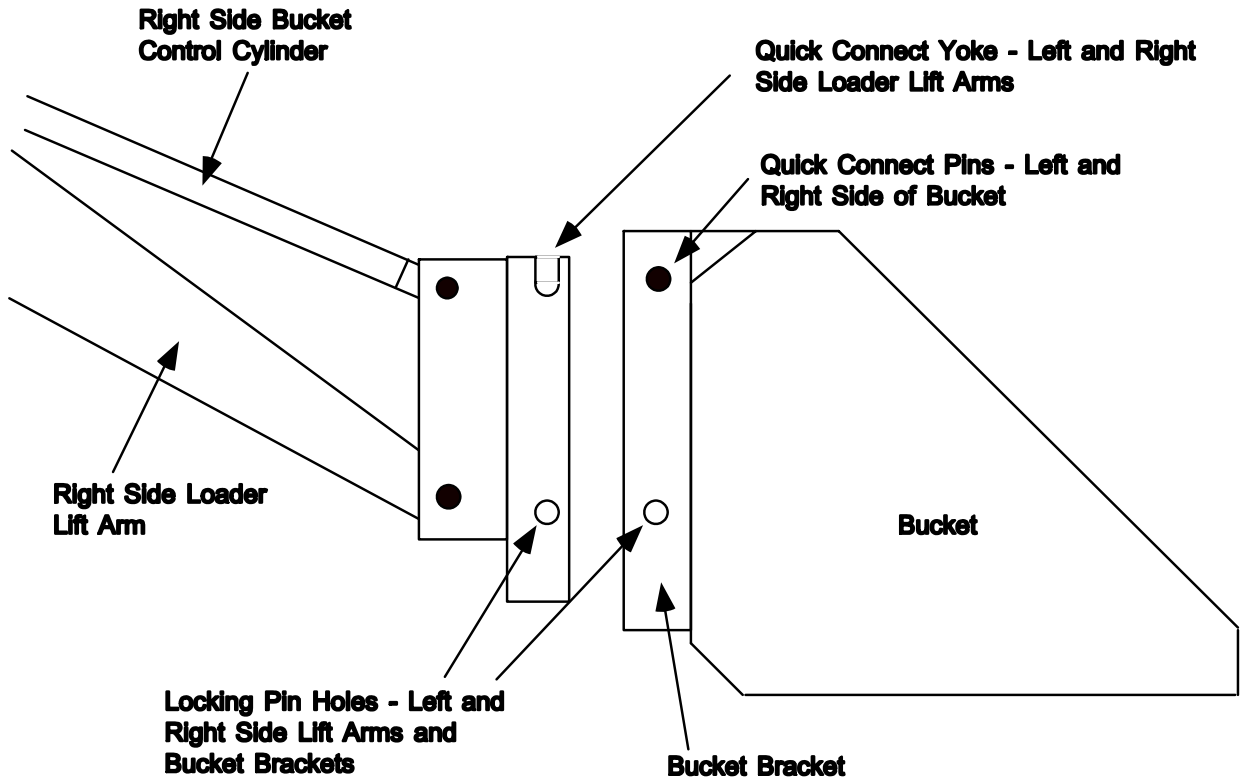

Figure 1. Loader Bucket and Bucket Coupling Mechanism
Side View - Not To Scale

machine controls, and distraction of the operator's attention from the tasks being performed. Whenever additional workers are needed at a work site, safe and appropriate transportation designed to carry passengers should be used.

Recommendation #2: All equipment locking devices should be properly installed before the equipment is used.

Discussion: Many types of farm machines and equipment are designed to allow an operator to quickly change the unit from one configuration to another. These changes range from the switching of attachments on a piece of equipment to the complete removal of equipment from a farm tractor. In most cases, these rapid changes are possible because of connection designs that include some type of quick-connect system in combination with one or more locking devices. The quick-connect system properly positions and connects the equipment or attachment. The locking devices provide a method of securing the equipment or attachment in it's proper and safe mounting position. Whenever locking devices are not installed, workers may be exposed to injury by

equipment that becomes unattached and falls. In this incident, the installation of two locking pins would have prevented the bucket from falling from the loader.

REFERENCES

1. Agriculture Safety, Fundamentals of Machine Operation, 1987, Deere & Company, Moline, Illinois, Third Edition.

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