

AGRICULTURAL and INDUSTRIAL ACCIDENTS

Types of Accidents

- Entanglements
- Crush Points
- Pinch Points
- Falling
- Roll Over/ Run Over

Entanglements

- Loose clothing and gloves are a lead cause of entanglements
- PTO (power take off) are used on a variety of farming and industrial applications
- PTO entanglements cause extensive damage to trapped limbs and sometimes requires limb amputation

Removal of the trapped limb

- Use caution when disengaging the PTO drive
- Ensure machinery is parked or neutral
- Minimize movement of both the patient and the PTO shaft until ready to disassemble the shaft

PTO Shaft



PTO Shafts

- Single-piece PTO shaft
- Telescopic PTO shafts

Single Shaft PTO

- Single shaft PTO's are use in fixed machinery, such as news paper printing presses
- If possible disengage the shaft at the ends and remove the shaft and entangled limb as a whole and transport to the nearest trauma center for surgical intervention

Single Shaft PTO

- If the shaft can not be disengaged at the ends, attempt to manually reverse the shaft to disentangle the limb
- Under no circumstance should mechanical power be used to reverse the PTO shaft

Single Shaft PTO

- If the shaft can not be reversed or removed, it may be necessary to cut the shaft above and below the entangled limb and transport the patient, with the PTO and limb still entangled, to the nearest trauma center
- If removal is not possible, call for a trauma surgeon for a field amputation

Telescopic PTO shaft

- Telescopic PTO shafts are made up of two shafts that can adjust to various lengths, such as a PTO shaft on a shedder that is connected to a tractor

Telescopic PTO shaft

- First stabilize the shaft to limit movement
- Remove the power supply, such as the tractor
- Telescope the two ends of the shaft apart to disentangle the limb
- Manually reverse the PTO shaft to remove the entangled limb

Types of injuries

- Crush injury
- Fractured bones
- Torn muscle, tendons, and ligaments
- Massive blood loss
- Amputation

Treatments

- ABC's
- Fluid replacement
- Tourniquets
- Pain management
- Rapid transport to the nearest trauma center

AUGERS

- Entanglements in augers is another leading cause of death and dismemberment
- Augers are used in silos, grinder/mixers, and portable transfer units

AUGERS



AUGERS



AUGERS



AUGERS

- Removal of entangled limbs can be a time consuming process
- Cooperation between EMS and Firefighters is a must
- The process is the same in removing entangled limbs and other body parts from a PTO or auger

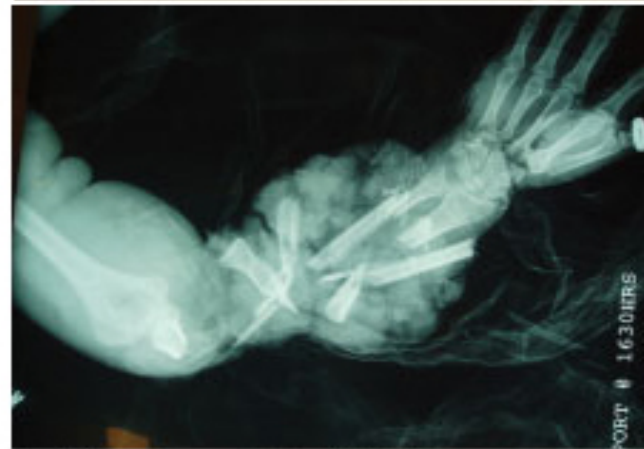
Augers



Augers



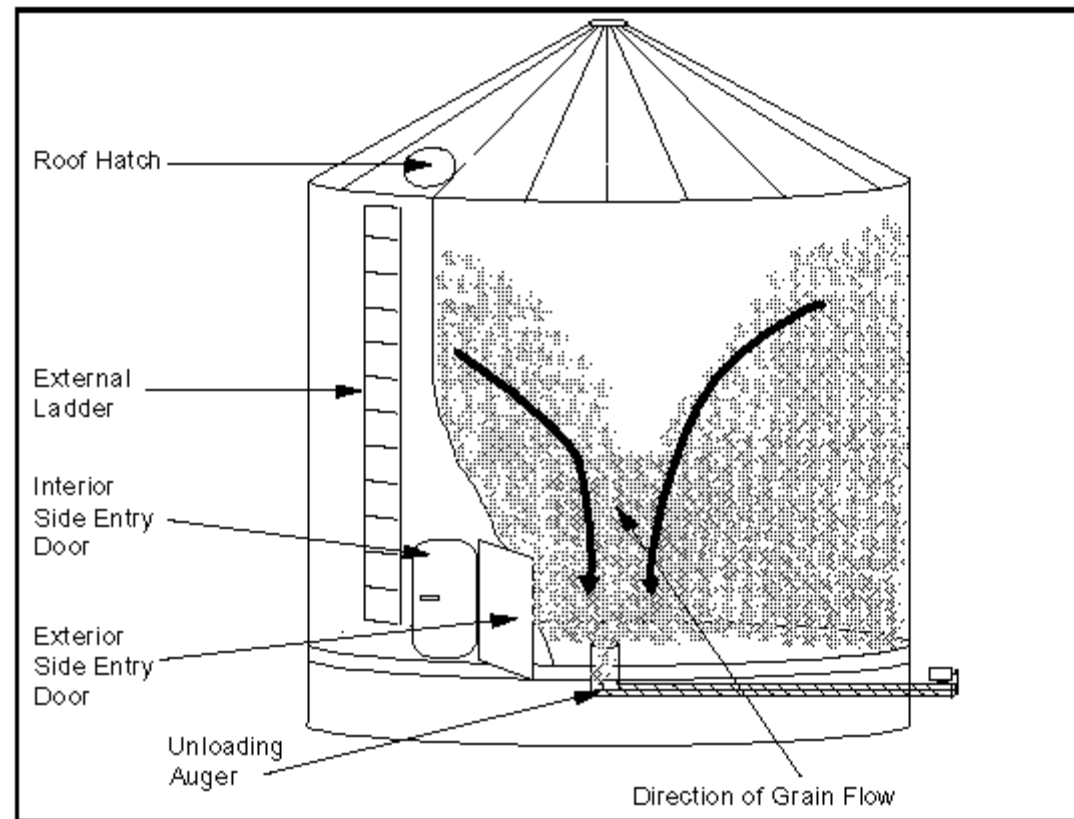
AUGERS



Grain Silo/Elevator

- Both augers and PTOs are utilized in grain silos or grain elevators
- With the popularity of grain ethanol or E85 growing as an alternative fuel source, more and more grain silos or elevators will appear on the South Plains

FIGURE 1. Grain bin structure and direction of grain flow during unloading



Grain Silo/Elevator

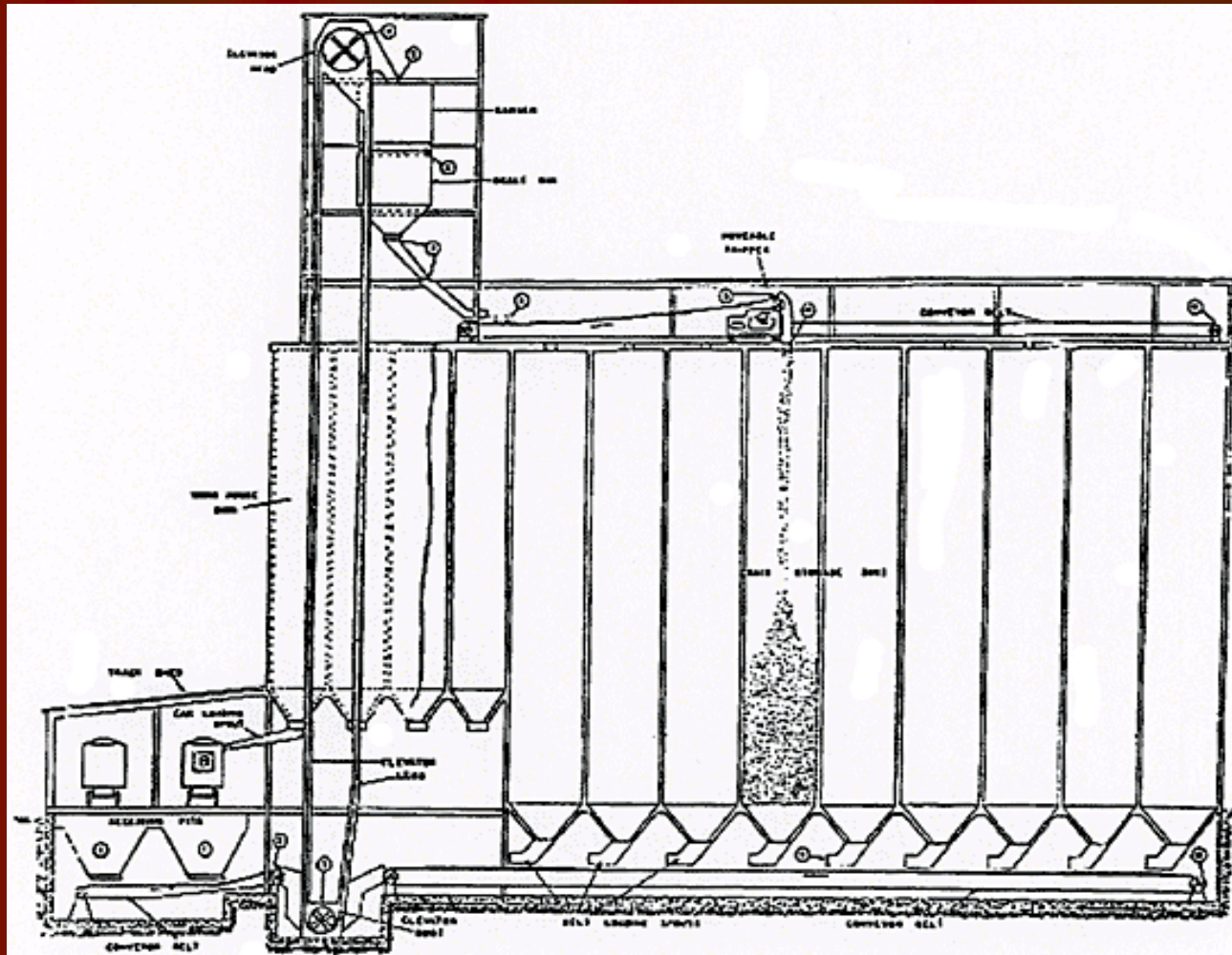
- Extraction from silo/elevator can be a time consuming task
- If the person is not extracted in a timely manner, the rescue often turns into a body recovery

Grain Silos/Elevators



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Grain Silos/Elevators



Grain Silos/Elevators



Grain Silo/Elevator

- Hazards include immersion in the grain causing suffocation
- Falling from the silo or elevator
- Entrapment in the auger or PTO systems that are used to transfer the grain

Grain Silo/Elevator

- Typical extractions start with identifying what depth the person is trapped in the grain.
- Top extraction
- Side extraction
- Base extraction

EXTRACTION

- Top extraction
- If the person is trapped in the top layers of the grain, extrication using a rope and pulley system can be used to extract the patient
- This type of extraction is usually the easiest for the patient and safest for the 1st responder

EXTRACTION

- Side extraction includes determining the depth of the patient
- Once the depth is determined, access is gained by either access panels in the side of the silo/elevator that extend the length of the structure or cutting a access hole in the side of the structure.

EXTRACTION

- It also has to be determined if the patient is on the surface of the grain or if they have been submerged in the grain
- If the person is trapped on the surface of the grain, access should be made above he/she to extricate

If the person is submerged then access should be made even or slightly below the patient

EXTRACTION

- Once access is made, grain that is above the access will spill through the access
- Ensure that the rescuer that enters the enclosed space is secured with ropes, he/she can be retrieved if needed
- After the patient is located, they should be secured in some kind of rescue stretcher or stokes basket

EXTRACTION



Extraction

- Resuscitation should be started immediately
- Along with airway, some kind of suction device is necessary to remove the grain from the patients airway

Extraction

- Base extraction is usually a recovery of some type
- All the grain above the patient has to be removed prior to extraction
- It has to be determined if the patient is trapped inside the grain or the grain and auger at the bottom of the silo/elevator

Injuries to Consider

- Suffocation
- Crush injuries
- Entrapment in the auger
- Multi-systems trauma

Rollover

- Agriculture tractor rollover
- Industrial tractor rollover

Rollover



Rollover

