MAFES Dawg Tracks

March 30, 2009 *Safety Tips: Power Take Off*

We are all familiar with the adage that it's impossible to keep PTO guards and shields in place. We always have to buy and change them out. These two statements are too familiar, but little do we think that maintaining our equipment with adequate shields and guards is a small investment compared to the possible consequences of not replacing a bad one.

The Power Take-off (PTO) shaft is an efficient means of transferring mechanical power between farm tractors and implements. This is also one of the oldest and most persistent hazards associated with farm machinery.

Injuries from PTO accidents can be life threatening. Getting caught in an open shaft can result in lacerations, multiple fractures, broken arms, spinal and neck injuries, and even complete body destruction. A person can become entangled in a PTO shaft with a single strand of thread or even with strands of hair... All that is necessary is for the hair or a strand of thread or cloth to get caught in the shaft and it will pull the person in with it.

Below you will see a list of PTO parts that have been found to be hazardous:

- ***POWER TAKE-OFF (PTO) STUB*** – Most incidents involving PTO stubs are caused by clothing getting caught in an engaged, but unguarded stub. A stub left engaged may come from the operator forgetting or not aware of the stub being engaged; knowing that the stub is spinning and not realizing that it is turning fast enough to be dangerous; or the operator may be working in an activity requiring PTO operation. Pant legs, sweatshirts, coveralls, wind breakers or bootlaces can become caught and wrapped around a spinning shaft.
- ***THE PTO DRIVELINE HAZARD*** – This drive shaft is known as the implement input driveline (IID). This entire shaft is a wrapping point hazard if it is completely unshielded. The IID may be partially guarded. The shielding is usually the straight part of the shaft, leaving the universal joints, the front connector (PTO connection), and the Implement Input Connection (IIC, the rear connector) as the wrapping point hazards.
- ***THE MACHINE IID SHAFT*** – This is the part that is coupled to the tractor PTO stub. At slower and even the recommended speeds, the IID shaft is much quicker than a person can pull back, or it takes another evasive action.

  If the IID shaft is coupled to the tractor PTO stub and there is no other hitch between the tractor and the machine, the tractor may pull the IID shaft apart. If the PTO shaft is engaged, the shaft on the tractor will swing wildly around and can hit anyone in this range. Also, the swinging force of the shaft may break the locking pin. Then the shaft becomes an unguided missile.
- ***POTRUDING PINS AND BOLTS*** – When pins and bolts are used as connection locking devices, it is highly possible for them to snag clothing articles. If the clothing doesn't rip or tear, then a limb or even the body can wrap with the clothing. Even if the clothing doesn't wrap, the affected part can become compressed so tightly that the person may be trapped against the shaft.
- ***OTHER UNSAFE PRACTICES*** – Mounting, dismounting, reaching for control levers from the rear of the tractor, stepping across the shaft instead of walking around the machine all can result in a debilitating incident.
- ***SHIELDS AND GUARDS: 1)*** Master shield – The first shield in the PTO driveline is the master shield on the rear of the tractor. This shield prevents the operator from accidently coming into contact with the tractor stub shaft and the front universal joint of the driveline. The practice of replacing a bad PTO shaft guard should be enforced totally. It completely covers the tractor stub shaft when it is not in use. ***2)*** Full Shield Driveline – This type of driveline fully encases the shaft in a plastic or metal casing supported by bearings at each end of the shaft. The bearings allow the shield to stop spinning if someone or something comes into contact with the driveline, while the shaft inside continues to spin. The ends of the driveline are bell shaped to cover the universal joints of the shaft. As the joints are irregularly shaped and prone to grab objects, operators should never try to modify the bell shaped shield for ease of maintenance, greasing parts or connecting the shaft. ***3)*** Guards – Manufacturer installed guards must be replaced when removed for maintenance. They are designed to protect the operator and the equipment. They not only reduce the chance of injury, but help to keep dust and other foreign objects from damaging gears and other moving parts.

PTO SAFETY PRACTICES –

- Always disengage the PTO, shut off the engine and remove the key before dismounting the tractor.
- Keep the master shield in place at all times.
- Regular checks of the PTO driveline to assure that they are in good condition.
- Refrain from modifying driveline shields to make servicing easier.
- As mentioned above, don't step across a rotating driveline.
- Reduce PTO shaft abuse by avoiding tight turns that pinch rotating shafts between the tractor and the implement. Avoid over tightening the slip clutches on PTO driven machines and keep excessive telescoping to a minimum.

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(662) 566-2201 3/30/2009
Excerpts: Farm Service Association

IF IN DOUBT-CHECK IT OUT!

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STOP ACCIDENTS BEFORE THEY STOP YOU!!