Power Take-Off (PTO) Safety

The High Plains Intermountain Center for Agricultural Health and Safety

The power take-off (PTO) is a rotating shaft that drives attached machinery. It is comprised of the PTO stub, telescoping driveline, and u-joints. The PTO can be very dangerous, therefore, safety must be exercised when working around the PTO.

Causes of PTO Accidents

Most PTO accidents occur when an operator's clothes become entangled in the PTO shaft. Most often these accidents can be avoided.

- Stay away from operating PTO
- Turn off PTO if in close proximity
- Clothing is more easily entangled in parts of a PTO with bolts, etc. protruding from it
- Removing guards makes entanglement more likely

Injuries Sustained

Being caught in the PTO can happen quickly. The PTO components spin at around 540 rpm or 1000 rpm. Once clothing, hair, shoelaces, etc. are caught in the PTO it is often too late to react and impossible to escape unscathed. Injuries can vary from:

- Minor lacerations and abrasions
- Severe lacerations and soft tissue damage
- Broken or amputated limbs
- Injuries resulting in disability or death

PTO Guards

PTO shields and guards are important safety features that can prevent serious injury and death. There are instances where the PTO guard must be removed, and though it is time consuming, the guards and shields should always be reinstalled before operating the machinery.

- Make sure that all components of the PTO are shielded and guarded
- If PTO is not equipped with shielding, shielding should be installed
- Keep PTO master shield in place
- PTO driveline should be completely enclosed by a guard
- Regularly check driveline guards to ensure that they have not become adhered to driveline

PTO Safety

While PTO guards can help to prevent injury and death from PTO accidents,
other safety guidelines can further ensure working safely around machinery equipped with a PTO.

- Stop engine; disengage PTO before servicing, adjusting, cleaning, or unclogging equipment
- Make sure that everyone is clear of machinery before engaging the PTO

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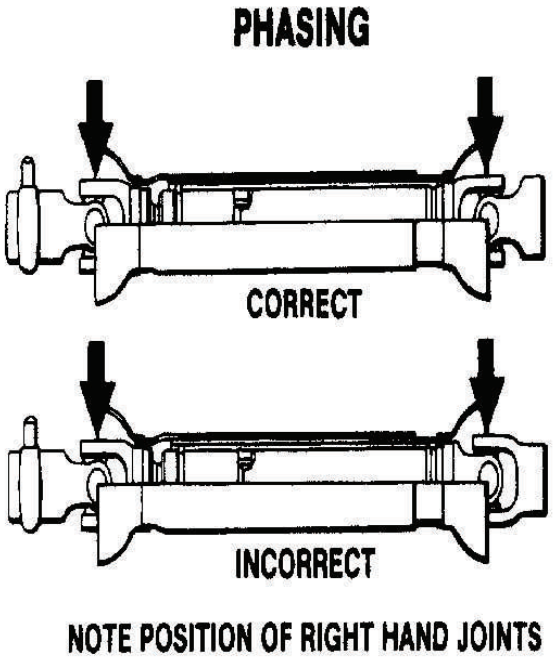
- Inspect PTO regularly for loose bolts or other malfunctions
- Walk around tractors and machinery rather than stepping over a rotating shaft
- Keep u-joints in phase (see graphic)
- Always use driveline recommended for your machinery
- Position the drawbar correctly and use the recommended drawbar height for the implement you are using
- Check connections regularly
- Do not abuse PTO shaft by avoiding sharp turns, driving in areas that will excessively telescope the shaft, or applying power to PTO too suddenly

An example of what can occur from just a few simple mistakes: "A farmer had a pull-type corn picker repaired, and in a hurry (error #1) to return to the field, used an excessively long bolt (Error #2) in a PTO shaft connection. The farmer thin neglected to replace the PTO shields (Error #3) and began picking corn, but soon plugged the snapping rolls with the damp, tough weeds and stopped the tractor without shutting off the PTO (Error #4). At that point, the farmer dismounted the tractor and stepped over the open PTO shaft (Error #5). At 9 o'clock that evening, the farmer's family was telephoned by neighbors, who found the farmer's body"

Phasing

U-joints must be timed or phased. When the u-joints are assembled incorrectly, it can cause excessive wear to the PTO shaft and the machine being driven. Some PTO shafts are made so they can not be assembled incorrectly. If there is any question on how the PTO u-joints should be assembled, then one should refer to the owner's manual or seek professional assistance.



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