



Farm Safety Association
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Tailgate-PTO

Power-Take-Off Safety

Instructor: The following script can be used to deliver a 15-minute training session to employees. It would be a good idea to make the presentation while standing in front of a tractor with a PTO-driven piece of equipment attached. You can point out hazards and safety features on the machinery. (Make sure that all shielding is in place and in good condition!)

The text emphasizes the most important points related to PTO safety. It is suggested that you try to stay strictly on topic. Obviously, you will need to be prepared to answer questions.

POINTS TO EMPHASIZE:

- **All guards in shields must be in place and in good repair.**
- **Always shut down power before servicing or unplugging equipment.**
- **Wear close-fitting clothes and keep long hair covered when working with powered equipment.**

Recognize the hazard

A 540 PTO shaft travels more than two metres in less than a second. Anything caught by that spinning shaft—clothes, shoelaces, hair—will instantly be wrapped up. No wonder that PTO accidents nearly always result in devastating injury or death.

PTO entanglement most often occurs when people try to make repairs while equipment is operating. Other victims have been caught while stepping over or onto rotating shafts.

This leads to the cardinal rule of PTO safety—**Never attempt to repair, adjust, or unplug equipment with the PTO engaged!** You can't get caught by a shaft that isn't turning.

Proper shielding all-important

All PTO shielding must be correctly installed and properly maintained to prevent injury in the event of accidental contact. You should refuse to use a machine with damaged or missing PTO shields.

Let's start at the tractor, and work our way back to the driven machine.

1. The tractor's master shield prevents contact with the stub shaft and the front universal joint of the attached machine's driveline. Never operate a tractor with a missing or damaged master shield!
2. Tubular shields completely enclose the power shaft of a PTO-operated machine. This integral shield rotates on bearings, independently of the power shaft. Bearings must be in top condition to ensure that the shield will stop spinning if accidentally contacted.

3. Cones used to cover the universal joints at each end of the power shaft have been greatly improved in recent years. Their flexible nature makes hook-up easier, while providing greater protective cover than earlier, bell-shaped designs.

4. The stub shaft on the driven machine should also be covered by shielding. Just like the tractor's master shield, this prevents accidental U-joint contact.

5. **With the PTO disengaged and the tractor engine shut off**, check the condition of the entire PTO shielding system. Look for nicks, dents, or bent components. Test for free movement of the tubular shield on its bearings.

6. If any shielding component is damaged or missing, or if you feel it doesn't provide adequate protection, talk to your employer about replacing the defective items.

7. Before attaching PTO-powered equipment, confirm that the tractor drawbar is adjusted to the length specified in the driven machines manual. This ensures that the telescoping power shaft and shield will stay together when they lengthen. If a PTO shaft separates in operation, the tractor-driven end will swing violently, and could cause equipment damage and operator injury.

Your PTO safety checklist

As with all aspects of farm machinery operation, you must be constantly alert to prevent PTO accidents. Follow these steps to avoid PTO entanglement.

- ✓ **Most importantly, always disengage the PTO, shut off the tractor engine, and remove the keys before leaving the tractor seat. You can't**

be injured by the PTO or other machine parts if the driveline isn't rotating. Taking the keys prevents unexpected start-up by another person while you are making repairs or adjusting the machinery.

- ✓ Keep the tractor's master shield in place at all times. The PTO could be accidentally engaged when no driveline is attached. An exposed, rotating tractor stub shaft will aggressively grab and wrap anything it contacts.
- ✓ Check frequently to make sure that PTO shielding is in good condition (with power disengaged, of course). Damaged shields or bearings should be repaired or replaced *before* the equipment is operated again.
- ✓ Never step across a rotating PTO shaft! Some equipment must be operated in a stationary location, with you working nearby (for example, grain augers, forage blowers, generators, etc.) Always walk *around* such machinery. Safety devices are usually reliable, but could malfunction. Take extra care if the

ground is muddy or icy.

- ✓ **Dress for safety.** Wear close-fitting clothes and keep long hair covered. Raggy old coats and long boot laces can easily be grabbed by rotating parts.

Make shutdown a habit

Additional spinning shafts are often used to transfer power to machine components. Just like a PTO shaft, these can entangle you in an instant. The same principles apply when it comes to safety around any rotating shaft.

Again, it must be emphasized: Always disengage the PTO, shut off the tractor engine, and remove the keys before leaving the tractor seat!

Are there any questions?

Finally, let's take a moment to review some of the "Do's" and "Don'ts" of PTO safety.

DO:

Always shut down equipment before making repairs or adjustments.

Regularly check the condition of all PTO shielding components.

Wear close-fitting clothes and tie up long hair when working with power equipment.

Always walk *around* operating equipment.

DON'T:

Leave the keys in the tractor ignition while making repairs or adjustments.

Operate equipment with missing or damaged PTO shields.

Wear raggy old coats, loose laces, or anything else that could become entangled.

Never step onto or across a PTO shaft.

The information and recommendations contained in this publication are believed to be reliable and representative of contemporary expert opinion on the subject material. The farm safety Association Inc. does not guarantee absolute accuracy or sufficiency of subject material, nor can it accept responsibility for health and safety recommendations that may have been omitted due to particular and exceptional conditions and circumstances.

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