

Tractor & Machinery Operations: Science of Stability



Photo Credit: Penn State Agricultural Safety and Health Team

Outline

- Review Safety
- Technology options
- Kids and tractors



Tractor and Machinery Hazards

Tractors account for 1/3 of farm fatalities

50% of tractor related fatalities are from roll-overs

Runovers

Entanglements



SaferFarm.org – Farm Hazard Analysis Tool

Tractors

ROPS

Least Protection

1. No ROPS installed on the tractor or tractor with weather cab only.
2. A modified or homemade ROPS.
3. Two-post ROPS.
4. ROPS cab with missing or improperly shutting door or missing window glass; a 4-post ROPS.
5. ROPS cab with all glass in place and a door that shuts properly.

Most Protection



Item:	Item:	Item:	Item:	Item:
<input type="radio"/> 01				
<input type="radio"/> 02				
<input type="radio"/> 03				
<input type="radio"/> 04				
<input type="radio"/> 05				

Farm: _____

Inspector: _____

Date: _____



PennState

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Drawbar Hazard Control

- Secure parking brake
 - Chock wheels of implement
 - Use a helper
 - Keep clear during backing of equipment
 - Maintain visual contact and use hand signals
 - Use a one-person drawbar hitching system
 - Examples:
 - <http://www.bergmanmfg.com/index.html>
 - <https://youtu.be/93EPQ5S8fMA>
 - Use slow speeds and lower gear when backing
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Three-point Hazard Control

- Proper ballasting of tires
- Use helper
 - Hand signals and visual contact
- Support stands to align implement
- Use one-person in-cab three point hitching system
- Slow speeds and lower gear during backing.



PTO Hazard Control

- Replace worn or damaged driveline components
- Use guarding in good condition



PTO Guarding

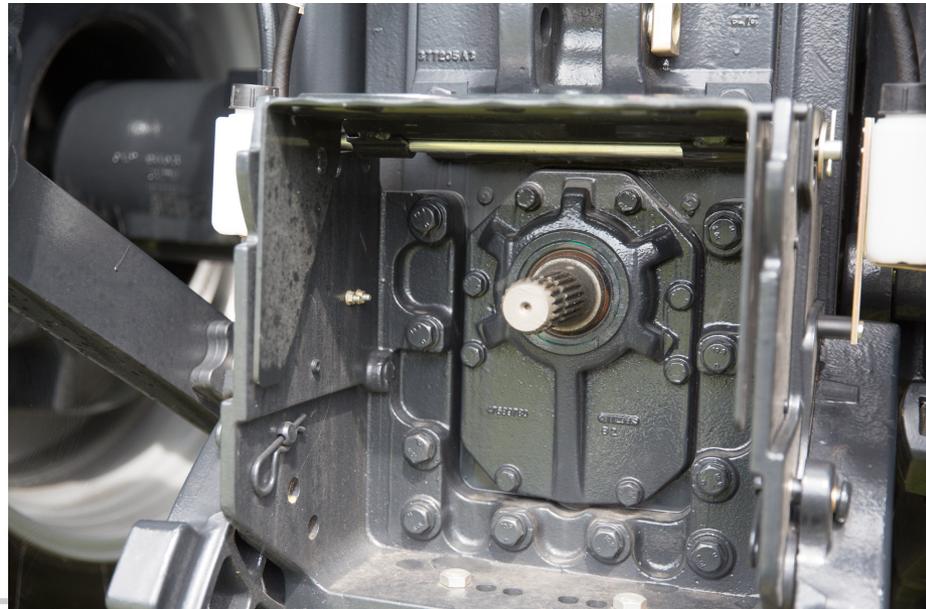
Stub cover

Master Shield



Bell Guard

Shaft Guard



Hydraulic Hazard Control

- PPE
- Use cardboard
- Relieve pressure in circuit
- Repair damaged equipment
- Maintain connections
- Use cylinder locks



Youth Rules

- Department of Labor
 - Wage and Hour
 - Hazardous occupations in agriculture
 - Age 16 or older
 - Exemptions
 - Tractor and Machinery 14-15 year old youth
 - Must be trained and certified by Agriculture teacher or Extension
 - Parent owned farm
 - Student-learner
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