



AGRICULTURAL TRACTORS

HOSTA Task Sheet 4.1

Core

NATIONAL SAFE TRACTOR AND MACHINERY OPERATION PROGRAM

Introduction

In 1892 a man named John Froelich developed a successful tractor to power a grain thresher. By 1918 a PTO shaft was used to power equipment drawn behind the tractor. Before these time periods, farm work was done by hand, by horse, or by huge stationary steam engines.

You will be operating a tractor designed to accomplish greater amounts of work than ever thought possible in the early 1900s. The speed, power, flexibility, adaptability, and handling ease of modern tractors is what makes them valuable and indispensable for modern day farming. This task sheet describes agricultural tractors, with an emphasis on what tractors are designed to do.

Tractor Types/Sizes

Tractors have both narrow and wide front ends, use both wheels and tracks, and can be two-wheel drive, four-wheel drive, or articulated. A narrow front end (“tricycle”) will be an older tractor, as they have not been produced this way since the 1960s. Articulated tractors are usually very large (at least 250 hp) and are usually operated only by very experienced farmers. Young and inexperienced tractor drivers usually operate tractors ranging from lawn and garden-size

(~ 20 hp) to large two- and four-wheeled drive tractors (around 150 hp). Many older and smaller tractors will not have a rollover protective structure (ROPS), while most new tractors will have a ROPS and seat belt.



Figure 4.1.a. Tractors come in all shapes and sizes.

Tractor Purposes

Farm tractors were designed for four primary purposes:

1. Load Mover (High Lift)
2. Remote Power Source (PTO)
3. Implement Carrier (3 Pt. Hitch)
4. Transport Unit (Drawbar Unit)

Understanding that ordinary farm tractors are not recreational vehicles is very important. Farm tractors are not to be used for fun, play, or for mud-bogging or racing, unless specifically modified for that purpose. You must use the tractor only for work purposes. Other uses can increase the chance of injury to you or others, or to the tractor, implements, and other property.



Figure 4.1.b. Tractors should be used for their designed purpose.

Tractors are
work horses,
not race
horses.

Learning Goals

- To describe how tractors vary in size, shape and age
- To describe how tractors are designed for work

Related Task Sheet:

Tractor Hazards

4.2

Tractor Characteristics

Here are some design elements of a tractor.

- Rear wheels adjustable for width
- “Turn-on-a-dime” steering
- High-powered engine with many gear ranges for relatively low speeds
- Great clearance beneath the tractor
- More weight over traction wheels
- Individual brakes for each rear wheel
- Adjustable drawbar hitch
- Power controls to increase pulling power
- Potential to add or subtract weights for ballast
- Hydraulic system for added power source
- PTO shaft to transfer power to towed machine
- Differential lock for added traction
- Adapted to carry or pull equipment
- Fitted with a Rollover Protective Structure (ROPS) or a Falling Object Protective Structure (FOPS)

A tractor is designed to do work. Use the tractor only for this purpose!

Safety Activities

1. Take photos or video camera footage of tractors being used for the four intended purposes. Make a display for your club or classroom or employee lunch room where you work.
2. Collect newspaper and magazine articles on farm tractor safety. Share the main points of the articles with classmates.
3. Locate a farmer in your community who has been injured with a tractor or farm machine and see if they will discuss the incident with you.
4. Use the Internet to find information on tractor safety. Find articles that describe people injured by a tractor because they were not using it for its designed purpose.
5. Do a survey of tractors at area farms or at an equipment dealer’s lot and record how many tractors: a) have a tricycle or wide front end; b) have a ROPS with seat belt; c) have wheels or a track; if it has wheels, is it a two-wheel, four-wheel, or an articulated tractor? Also record the engine horsepower and tractor age.

References

1. Farm and Ranch Safety Management, John Deere Publishing, 1994.

Contact Information

National Safe Tractor and Machinery Operation Program
The Pennsylvania State University
Agricultural and Biological Engineering Department
246 Agricultural Engineering Building
University Park, PA 16802
Phone: 814-865-7685
Fax: 814-863-1031
Email: NSTMOP@psu.edu

Credits

Developed, written and edited by WC Harshman, AM Yoder, JW Hilton and D J Murphy, The Pennsylvania State University. Reviewed by TL Bean and D Jepsen, The Ohio State University and S Steel, National Safety Council. Version 4/2004

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