USING 3-POINT HITCH IMPLEMENTS

HOSTA Task Sheet 5.3 Core

NATIONAL SAFE TRACTOR AND MACHINERY OPERATION PROGRAM

Introduction

Once you can successfully connect an implement to a tractor's 3–point hitch, you are ready to start using the machine. Some machines are powered by the PTO, while others are ground-driven (the power comes from the wheels turning on the ground). A qualified operator should demonstrate how to safely use equipment before expecting you to use the machinery.

This task sheet discusses 3-point hitch equipment which is both ground- and PTO-driven. Later task sheets will provide information regarding hydraulic connections and electrical connections between the tractor and the implement.

Hitching Review

Follow these steps for connecting implements to a 3-point hitch.

1. Remove the drawbar, or move the drawbar forward or to the side for clearance.
2. Back the tractor so the pin holes of the tractor's draft arms are nearly aligned with the implement's lower hitch pins. See Figure 5.3.a.
3. From the tractor seat and using the hydraulic lift controls, raise or lower the draft arms to match the implements lower hitch pins. See Figure 5.3.a.

Figure 5.3.a. Back slowly to the implement to be attached. Using the hydraulic controls, raise or lower the draft arms to nearly match the implement's lower hitch pins.

4. Stop the engine, securely park the tractor, and set the brakes.
5. Attach each draft arm to the implement, and secure with the hitching pins and security clips. See page 2, Figure 5.3.c.
6. Remount and restart the tractor, and slowly raise the tractor's draft arms with the hydraulic lift controls to closely align the upper hitch points.
7. Stop the engine, securely park the tractor, and set the brakes.
8. Attach the tractor's upper hitching point of the 3-point hitch to the top hitch point of the implement with the proper size pin and securing clip. See page 2, Figure 5.3.d. The upper link may need to be lengthened or shortened to fit.

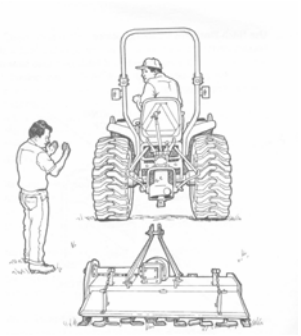

Figure 5.3.b. When connecting drawbar implements, never let a helper stand between the tractor and 3-point hitch implement. Crushing injuries and death can result. *Safety Management for Landscapers, Grounds-Care Businesses, and Golf Courses, John Deere Publishing, 2001. Illustrations reproduced by permission. All rights reserved.*

Do as many hitching operations as you can with the engine shut off and the tractor securely parked.

Learning Goals

- To safely connect a 3-point hitch implement
- To safely use a 3-point hitch implement
- To safely disconnect a 3-point hitch implement

Related Task Sheets:

Stopping and Dismounting the Tractor	4.9
Moving and Steering the Tractor	4.10
Using the Tractor Safely	4.13
Operating the Tractor on Public Roads	4.14
Connecting Implements to the Tractor	5.1
Making PTO Connections	5.4

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Figure 5.3.c. On both the left and right sides of the implement, insert the draft arm attachment pin of the tractor into the pin holes of the implement's lower hitch assembly. Secure the hitch with the proper size hitch pins and security clip.

Figure 5.3.d. After adjusting the upper link of the tractor's 3-point hitch to align with the upper hitch point of the implement, secure the equipment with the proper size hitch pin and security clip. The circled area indicates where the upper link may be adjusted for fit. The implement must be in a level position after the connection is made. See Task Sheet 5.2.

The 3-point hitch works because the three hitch pins secure the implement to the tractor. Do not use chains or other temporary pins to attach the implement.

Figure 5.3.e. A firm grip will be needed to press in on the detent lock of the PTO shaft. This lock engages the groove in the stub shaft to secure the PTO driveline shaft to the stub shaft. Other forms of locking the PTO shaft will be found in Task Sheet 5.4.

3-Point Hitches and PTOs

After connecting the implement to the tractor, power is needed to operate the machine if it is not ground-driven. A PTO driveline, hydraulic motors, and electrical devices are used. The PTO is the most common source of remote power. Three examples of PTO-driven implements that a young agricultural worker may use or assist in using include: rotary mowers (bush hogs), fertilizer spreaders (spin spreader), and post hole diggers.

To attach the PTO shaft of a 3-point hitch implement, follow these steps.

1. Connect the 3-point hitch of the implement using the approved steps to align the hitch and to park the tractor securely.
2. Attach the implement driveline shaft to the PTO stub shaft of the tractor.

Here are some suggestions to make connecting the PTO easier.

A. Align the implement PTO shaft splines with the splines of the stub shaft of the tractor. See Task Sheet 5.4.

B. Press the detent lock (Figure 5.3.e) inward as you slide the implement shaft onto the tractor PTO stub shaft.

C. Slide the implement shaft forward far enough to make sure the detent lock has snapped into the lock position.

Figure 5.3.f. To attach the PTO shaft, you will be operating in a crowded space. Be sure the tractor engine is shut off and is securely parked.

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Hitching Precautions for 3-Point Hitch Drawbars

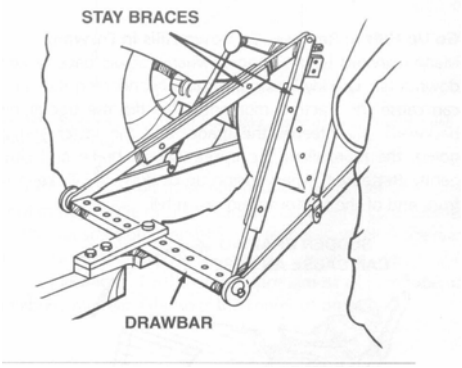

Figure 5.3.g. Stay braces prevent the 3-point hitch drawbar from being lifted too high. *Safety Management for Landscapers, Grounds-Care Businesses, and Golf Courses, John Deere Publishing, 2001. Illustrations reproduced by permission. All rights reserved.*

Never pull a load with the 3-point hitch drawbar more than 13-17 inches above the ground or the pulling forces will be higher than the tractor's center of gravity. A rear overturn hazard may develop as the tractor moves forward.

Using the 3-Point Hitch Implement

Ground-driven 3-point hitch implements are often assigned to the beginning tractor operator. A few ideas are presented here to help you safely operate these implements.

- Make sure you know how wide the machine is compared to the tractor.
- Be sure the machine is in "transport," or "up" position for travel on public roadways.
- Lower the machine to the "field" position when you are ready to use it. This keeps the load pulling below the center of gravity.
- Engage the machine operation mechanism (levers, pins, etc) for the wheels to power the machine if you are using a ground-driven machine. A qualified operator should demonstrate this procedure for each machine.
- Begin field operation of the machine by paying attention to field boundary fences and obstacles.
- Allow space at ends of rows or fields to lift the equipment with the 3-point hydraulic lift.
- Do not make turns with a 3-point hitch implement in or on the ground. This places undue force on the 3-point hitch draft and lift arms which can damage the machine.
- Backing a 3-point hitch implement, such as a small planter, while it is lowered onto the ground can plug the seed drops of the planter. Lift the implement before reversing the direction you are going to prevent possible damage to the implement or 3-point hitch draft and lift arms.
- Lift the implement to the transport position before using public roads or passing through narrow farm gates. Ground-driven implements operated on roadways can damage the road surface.

Figure 5.3.h. If the 3-point hitch is equipped with an extension to the lower draft arm, release the lock and pull or extend the draft arm extension to the rear before nearing the implement to be attached.

Lift the 3-point hitch implement from contact with the ground before turning, backing or transporting.

Figure 5.3.i. The telescopic extension to the draft arm is fully extended. In some cases, this must be done to align with the lower lift points of the 3-point hitch implement. Be sure the extension is pushed back into the draft arm until locked into place when you are finished attaching the implement.

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Safety Activities

1. Practice spotting the tractor 3-point hitch draft arms to the 3-point hitch attachment points of the implement for quick and safe hitching.
2. Demonstrate the rules you will use when backing a tractor to connect to a 3-point hitch implement by showing your helpers where to stand to safely assist you in spotting the 3-point hitch to the implement.
3. Inspect the ground-driven machines you may use to learn:
    a. how are they moved from transport to field position and vice versa, if applicable?
    b. what mechanism is used to engage the ground wheels with the turning parts of the machine?
4. Inspect all hitch pins and security clips on 3-point hitch attachments. Did you find any problems or missing hitch pins?

5. Inspect a 3-point hitch quick attaching coupler for cracks or damage to upper and lower lift hooks. Report any problems to your employer, mentor, leader or instructor.

References

1. Safety Management for Landscapers, Grounds-Care Businesses and Golf Courses, 2001, 1st Edition, John Deere Publishing, Moline, Illinois.
2. www.nagcat.org/Click on Guidelines/Select item T4 from Tractor Fundamentals, 3-Point Implements (hitch/unhitch), December, 2002.
3. Operators' Manuals for specific tractors and equipment.

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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