



## Drive Head Over Wheels

### Needed Materials:

- Incline Board (see second page)
- 1 Older Tricycle Tractor without Cab, No SMV
- 1 Wide Ended Tractor with Cab and SMV

The following are demonstrations that may be conducted with this display.

### 1. Demonstrate the difference between the two tractors.

- Allow the spectators to handle the model tractors in order to detect the differences in size, weight distribution and safety devices.
- "What are the difference between these two tractors? How could these differences influence how easily a tractor turns over?" The newer tractor has a cab which includes a ROPS (Roll Over Protective Structure), weights on the front end, and also wider wheel base on the front. The older tractor is lighter weight, does not have a ROPS, has a narrow front end and does not have weights on the front to help balance the weight of the tractor.

### 2. Demonstrate the improper way of driving up a steep slope.

- Position the model tractor so that the front end is pointing straight towards the steep incline on the display. Allow participants to drive with both tractors up the steep hill and notice the difference in weight distribution.
- "When driving up a steep slope forward, the amount of weight holding the front end down might be sufficient. The weight in the back of the tractor will make it more likely to roll over backwards. Additional weights in the front of the tractor could reduce the chance."
- Drive the model tractor STRAIGHT up the hill. Don't try to turn. (Remember, you want to tip the model tractor over. Stop after the tractor has rolled over.)

### 3. Demonstrate the proper way of driving up a steep slope.

"How can you redistribute the weight so the heaviest part of the tractor goes first? One way is to back up the slope."

- Position the model tractor so that the back end is pointing straight towards the steep part of the hill on the display.
- Back the model tractor STRAIGHT up the hill. Don't try to turn. You do NOT want to tip the tractor over. Stop after the model tractor climbs the hill.

### 4. Make comparison of the inclines.

Have participants compare the two inclines and discuss steepness in relation to safety.

"The more gradual incline allows a tractor to drive straight up it without the tractor losing traction or tipping."

### 5. Demonstrate the improper way of responding to the tractor wheel coming off the road.

Position the model tractor with a cab on the top level surface of the display so one front tractor tire is off the flat surface on the steep incline side.

- "When you are driving down the road and the front wheel comes off the pavement, your first response is to steer the tractor back onto the road. The tractor may overturn. 1) the tractor is traveling at a high rate of speed 2) making a sharp turn causes a larger overturning force on the tractor or 3) the wheel and part of the tractor can be on an incline surface of the shoulder which can flip a tractor over."



## Drive Head Over Wheels-cont.

### 6. Demonstrate the proper way of responding to the tractor wheel coming off the road.

Position the model tractor with cab on the level surface so that one front tractor tire is off the flat surface on the gradual incline side.

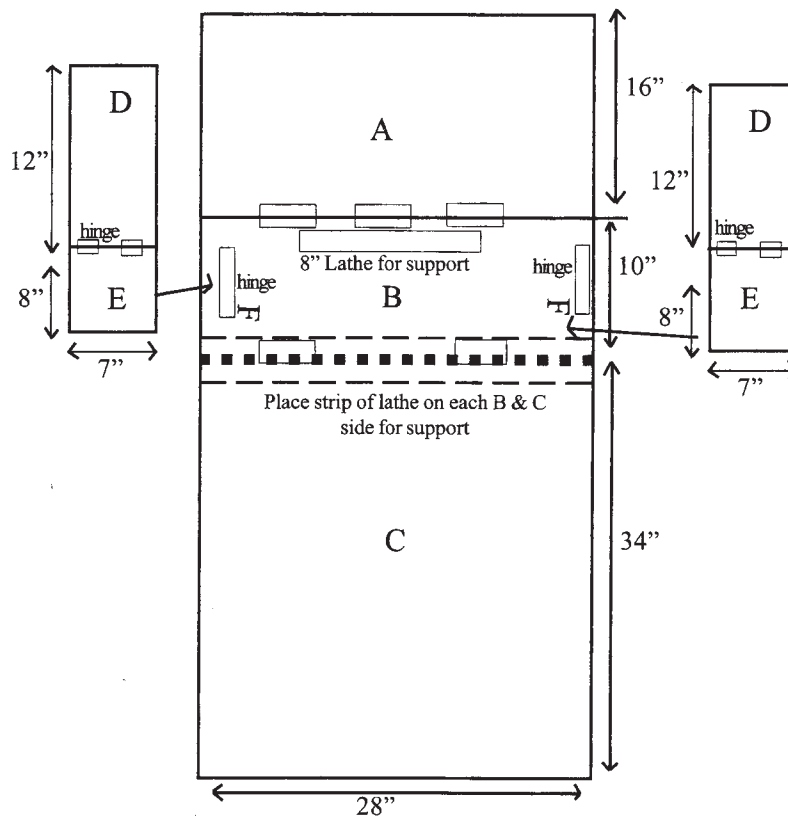
- "When you are driving down the road and the front wheel comes off the pavement, you should slow the tractor down and steer down into the ditch. Use common sense and do not drive into a steep ditch. Once in the ditch, you should attempt to get assistance.
- Once the front wheel is off the road, gradually turn the model tractor towards the bottom of the hill. Remember, you do NOT want to tip the model tractor over. Stop when the model tractor is at the flat ground at the bottom.

1. This diagram is the underneath view of board.

2. Hinged pieces D & E attach to hinges on spot F inside 1" on board B. These flaps fold in when using demonstration to elevate the board off the table.

3. Glue flat green carpeting on display boards.

Diagram





## Drive Head Over Wheels-cont.

### Rear Axle Torque...

Backward overturn when rear wheels are not free to move or spin. Improper hitching can result in backward overturn.

### Improper Weight Distribution...

Equipment mounted on a tractor can shift the center of gravity and decrease stability, resulting in tractor overturn.

### A Side Overturn...

Result when attempting to immediately turn back on to the road after a wheel slips off a road shoulder.

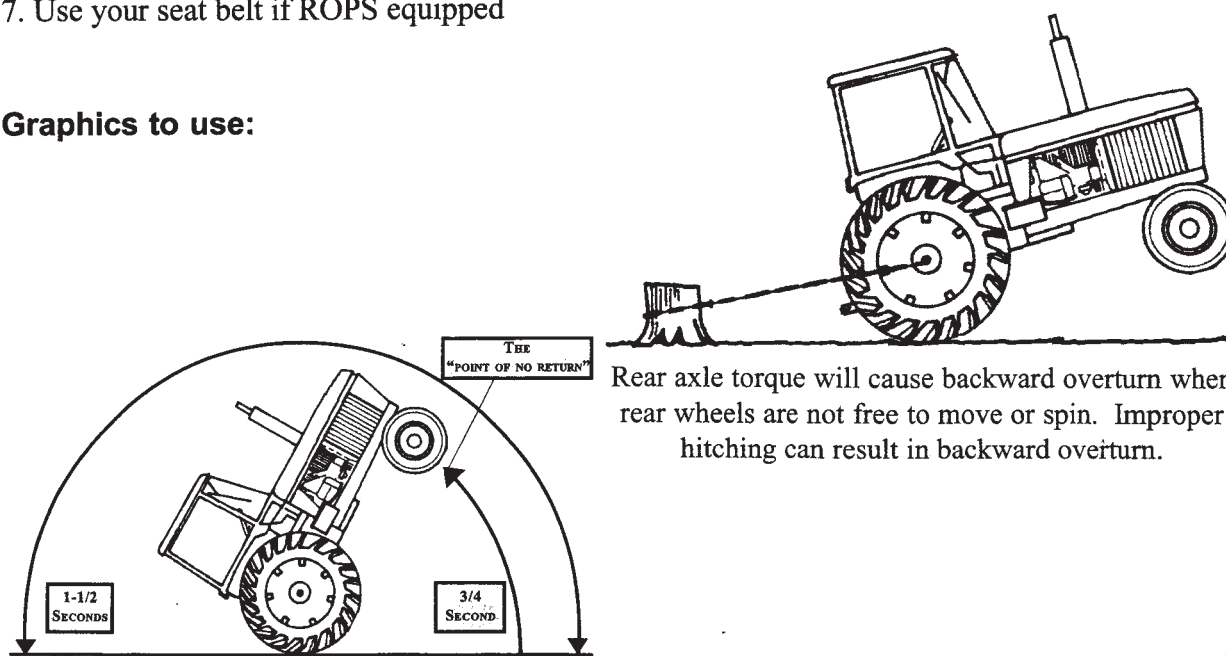
### The Critical Point...

“No return” point is reached in only 3/4 of a second during rear overturn.

### Avoid tractor overturns by following these rules of safe tractor operation:

1. Back up slopes
2. Drive down slopes
3. Stay off those slopes too steep for safe operation
4. If a tractor wheel slips off the road shoulder, drive down into the ditch if the path is clear and reduce speed before attempting to climb back onto the roadway
5. Hitch only to the drawbar or points recommended by the manufacturer
6. Use front end weights when needed for stability
7. Use your seat belt if ROPS equipped

### Graphics to use:



Rear axle torque will cause backward overturn when rear wheels are not free to move or spin. Improper hitching can result in backward overturn.