

Hamilton County

Revised 2006

## Hamilton County 4-H 1/16 Model Tractor Pulling – Engineering and Design

### Grade Divisions:

Division 1	Beginner - Grades 3 – 5
Division 2	Intermediate – Grades 6 – 8
Division 3	Advanced – Grades 9 – 12

All members must complete the beginner and intermediate projects before moving to the advanced division. Example: All first-year members must exhibit as beginners. Second-year members in grades 6 -12 will exhibit as intermediates. The earliest you may exhibit in the advanced division is in your third year in the project **regardless of your grade in school.**

### **Projects will be judged as follows:**

1. 25% on static model (your completed model tractor on display at the 4-H Building)
2. 75% on the pull at the Hamilton County 4-H Fair

### **General Rules**

1. All judge's decisions are final. Misconduct will result in loss of all points in each class pulled at the judge's discretion.
2. All pit and track areas must contain only pullers and officials – no spectators.
3. Official 4-H classes include 4 lb. and 5 lb. pro-stock for Divisions 1 & 2, and 3 lb. and 5 lb. pro-stock and 5 lb. super-stock for Division 3.
4. Each vehicle may be entered in more than one class but only once in each class. A vehicle is defined as a driveline, body, tires, and engine. These components may not be interchanged in each class.
5. The first puller (test puller) of each class has the option to drop his first pull and pull again for his official pull pending his or her immediate decision. No test pulls (pull-overs) are allowed in a pull-off.
6. Contestants will be allowed two attempts to cross the 4' mark on a 16' track. However, in a pull-off, only one attempt will be allowed.
7. Pulling measurements are to be taken from the front center of the skid plate. Full pulls are 15' or 14' optional) on a standard 2' x 16' track. Track specifications are listed in the technical section.
8. The track will be cleaned between each puller in the class by the track judges only.
9. Any part of a vehicle tire or sled leaving the edge of the track during a pull will result in the pull being measured to that point. Anything (weights, nuts, etc.) that falls off the pulling unit during a pull will result in the pull being measured to that point. The pull will be stopped by the table judge

and measured if one drive wheel (or wheels on one side of the pulling unit) is raised off the track for a traveling distance of more than six inches. This decision is to be made at the judge's discretion.

10. All vehicles are to be guided with a clear plastic guiding device termed a "guidall", with the following requirements:

- A. The guidall must be kept flat on the track surface and parallel with the vehicle.
- B. A 7-inch (inside width) guidall must be furnished for use in the Pro-Stock and Super Stock classes.
- C. Must maintain a 1-inch minimum clearance between the front of the weight bracket, front end, tires, axle, etc. (any part in the front of the vehicle) and the guidall.
- D. The guidall must measure 6 inches minimum height and be square on all surfaces. The "arms" of the guidall must be 6 inches in length.
- E. Nothing can be used on the weight bracket, wide front end, or guidall to help in holding the vehicle on the track. Examples might be glue on the guidall or sharp objects or brads on the weight bracket.
- F. The object is to guide the vehicle in a straight line only. No zigzagging or s-ing will be allowed.
- G. The guidall must be assembled so that there are no protrusions on the inside surfaces to catch on weights or weight bracket.
- H. One hand must be on the guidall handle while in the act of pulling.

11. The type of fuel used in the Intermediate and Advanced Divisions is 35% Nitro/methane Glow Fuel. Each puller, as well as the spectators, is responsible for their own safety.

12. No radio-controlled vehicles will be allowed.

13. All pullers will be given a maximum time limit of three minutes to have their vehicle in operation from the previous pull of the class.

14. All pulling units must pass a "cotton ball test", wherein the tires will be touched to a cotton ball and removed. If the cotton ball is torn apart excessively, the puller is given zero points for the pull.

15. The weight added to the skid plate can not exceed 5% of the total weight of the sled.

16. All sleds used at a sanctioned 4-H pull must use a chain hitch on the skid plate or pan.

17. Starter batteries (used in the Intermediate and Advanced Levels) are to be maintained in a safe manner.

18. All vehicles must be inspected immediately after each pull. The hitch of the vehicle will be checked as pulled. No rotation of tires is permitted. Any vehicle not passing the inspection will receive zero points for the pull.

19. You must be a 4-H member in the 16<sup>th</sup> tractor project to enter and pull at a 4-H sanctioned pull.

20. The only points of contact with the track by the vehicle shall be the wheels. Weights, weight bracket, gears, and all parts of the vehicle must clear the track.
21. Sled hitch height at the skid plate shall not exceed 1 inch from the pulling surface. No minimum height is stated. No length is stated.
22. The number of entries is limited to 1 entry per person per class.
23. For the Intermediate and Advanced Divisions, exhaust stacks, mufflers if used, must point away from the track.
24. It is recommended that a fire extinguisher be present at all pulls.
25. For the Intermediate and Advanced Divisions, on machines that do not have a legal hand throttle cable, the engine fuel and throttle settings can not be manually adjusted after a vehicle is hooked to the sled and placed on the track.
26. For the Advanced Division, handheld throttle cables, if used, must be flexible so that they can not be used to stabilize the machine (at judge's discretion) and must not become tight.
27. A pulling attempt (or hook) is defined as when the vehicle's pulling tires touch the track with the engine running while the vehicle is hooked to the sled.

### **Pro-Stock Classes**

#### **For Beginner, Intermediate and Advanced Divisions**

1. All pro-stock tractors must originate from 1/16<sup>th</sup> scale two-wheel drive farm tractors. They must keep their tractor-like appearance, which includes seat, steering wheel, hood, etc. Each tractor must have the stock hood mounted plus or minus ¼ inch from the front-most part of the hood to the center of the rear axle. The maximum overall length from the center of the rear axle to the front-most part of the tractor, including the front weights and bracket, is 10.5 inches. Maximum wheelbase is 8 inches. The hood must be made of metal (in Div. I).
2. Engine to be no larger than .061 cubic inch displacement. May be reed valve or rotary valve. No dual engines or \*electric motors allowed. No handheld throttles are allowed.  
**\*EXCEPTION:** For the Beginner Division, electric motors will be supplied.
3. The tractor must pull by no more than two tires. No duals or track-type tractors are allowed. All tires are to be made of rubber (4 -1/4 x 1-5/8 inches maximum) with no additives, fillers or softeners of any kind. Tires may be turned down to puller's preference. Tires must be cleaned with alcohol only. Tires are subject to be checked by a durometer with a minimum reading of 35. If below 35 on first reading then it must read above 35 on two of three places on the tire. Tires must be made of black rubber. **NO PART OF THE TIRE MAY BE SILICONE-TYPE RUBBER.** Puller may use their choice or pro-stock rims.

### **Division 1 and 2 (Beginner and Intermediate)**

4. Class weights will be set at 4 and 5 pounds. Official may run any combination of classes.

### **Division 2 (Intermediate)**

5. Weight bracket or wide front can not exceed 6 inches in width.
6. Rear weights can not extend behind the rear wheels. Weights must be distributed equally on the rear axle.
7. Hitch height must be no higher than 1-1/4 inches to the top of the drawbar. Hitch can not be closer than 1-1/8 inches from the back of hitch hole to the center of the rear axle. Hitch must be mounted solid to the tractor. Pulling point (1/4 inch minimum diameter hole) may not be more than 1/4 inch from the back edge of the drawbar. Pulling point must be rigid and centered between the pulling surfaces (tires) within 1/4 inch. Hitch must be made from material with a minimum thickness of 1/16 inch and maximum thickness of 1/4 inch.
8. Excessive holes in the tractor body are not allowed (this does not include driveline).
9. Tractors without original toy tractor engine must have side panels in place of engine.
10. Tractor tires can not leave excessive black marks on the track.
11. Gear ratios for each Division are as follows:

Beginner: 251-300:1

Intermediate: 200-250:1

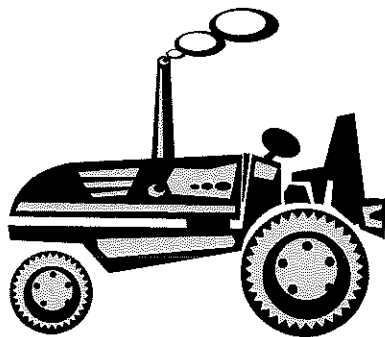
Advanced: Unrestricted



## Super Stock Class

### Advanced Division Only

1. All super stock tractors must originate from 1/16<sup>th</sup> scale two-wheel drive farm tractors. They must keep their tractor-like appearance, which includes seat, steering wheel, hood, etc. Each tractor must have the stock hood mounted plus or minus ¼ inch from the front-most part of the hood to the center of the rear axle. The maximum overall length from the center of the rear axle to the front-most part of the tractor, including the front weights and bracket, is 10.5 inches. Maximum wheelbase is 8 inches.
2. Engines no larger than .15 cubic inch displacement. No dual engines or electric motors allowed. Engine may not extend in front of the tractor's hood grill. Hand held throttles are allowed.
3. The tractor must pull by no more than two (2) rear wheels. Tires may be of puller's design, but no larger than 3 inches wide by 5 inches in diameter. No adhesive substances are permitted. Tires must be cleaned with alcohol only.
4. Class weight will be set at 5 pounds only.
5. Weight bracket or wide front can not exceed 6 inches in width.
6. Hitch height must be no higher than 1 – ¼ inches to the top of the drawbar. Hitch can not be closer than 1 – 1/8 inches from the back of hitch hole to the center of the rear axle. Hitch must be mounted solid to the tractor. Pulling point (1/4 inch minimum diameter hole) may not be more than ¼ inch from the back edge of the drawbar. Pulling point must be rigid and centered between the pulling surfaces (tires) within ¼ inch. Hitch must be made from material with a minimum thickness of 1/16 inch and maximum thickness of ¼ inch.
7. Excessive holes in the tractor body are not allowed (does not include driveline).
8. Tractors without original toy tractor engine must have side panels in place of engine.



## Appendix

### Measurements of Stock Hood locations (from center or rear axle to front-most point of the hood)

AC 7060, 7030, 45, 50, 60, 80 .....	8-13/16"
JD 5020 .....	8-5/16"
Case Agri-King .....	7-5/16"
IH 886, 1086, 1586 .....	7-1/2"
Case 2590 .....	8'
JD 4850, 4960 .....	8-7/8"
Oliver 1800, 1850, 1855 .....	7-1/16"
IH 5088, 5288 .....	8-5/8"
AC 8000 Series .....	8-3/4"
IH 966, 1066, 1466 .....	7-1/2"
JD 3020, 4020 .....	6-13/16"
MF 1150 .....	8-1/8"
JD 4430 .....	7-11/16"
White 2-135, 155, 180 .....	7-15/16"
MM G1000 .....	7-7/8"
Case/IH Magnum .....	8-13/16"
Ford 8730 .....	8-5/8"
Ford/New Holland Genesis .....	8-1/4"

### Quick Rule Reference Table

Rule	Division 1	Division 2	Division 3 Pro-stock	Division 3 Super Stock
<b>Maximum Weight (lbs)</b>	4 & 5	4 & 5	3 & 5	5
<b>Maximum Wheelbase (inches)</b>	8	8	8	8
<b>Length limit (inches) (center of rear axle to front of vehicle)</b>	10-1/2"	10-1/2"	10-1/2"	10-1/2"
<b>Maximum Number of Engines</b>	1	1	1	1
<b>Max. Engine Displacement (cubic inches)</b>	Electric 9V DC	.061	.061	.15
<b>Hand-held Throttle Cables Allowed?</b>	No	No	No	Yes
<b>Tire Design (Must Fit Ertl Type Wheel)</b>	Black Rubber	Black Rubber	Black Rubber	Open
<b>Max Tire Size (width X diameter)</b>	1-5/8' x 4-1/4"	1-5/8' x 4-1/4"	1-5/8' x 4-1/4"	3" x 5"
<b>Maximum Hitch Height (inches)</b>	1-1/4"	1-1/4"	1-1/4"	1-1/4"
<b>Minimum Hitch Length (center or rear axle to back of hitch hole)</b>	1-1/8"	1-1/8"	1-1/8"	1-1/8"
<b>Gear Ratio</b>	251-300.1	200-250.1	Open	Open

# MODEL TRACTOR PULLING ENGINEER & DESIGN

Name \_\_\_\_\_ Grade \_\_\_\_ Year \_\_\_\_

Year in Club Work \_\_\_\_\_ County \_\_\_\_\_

Date Project Started \_\_\_\_\_ Date Project Completed \_\_\_\_\_

I have reviewed this record and believe it to be correct:

Signature of Leader \_\_\_\_\_ Date \_\_\_\_\_

1. Origin of Tractor (sand pile, toy box, dealer, gift, etc.)

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2. Tell about what activities you did to complete your project. List any articles you made.

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**3. Tell about what you learned while you were working on this project.**

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**4. Time spent, cost, ect.**

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**5. How would you change your project for next year?**

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