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Virginia 4H State Lawn Tractor Operators Safety Contest Guidelines

Developed 2015

The Virginia 4H Lawn Mower Safety Operator event is based on the National 4H Petroleum Power Operator contest. Purdue University Publication 4H 84-W

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

Agricultural and lawn and garden tractors are the most extensively used pieces of equipment on farm and home grounds today. The U.S Consumer products Safety Commission estimates more than 37,000 Americans suffer a power mower-related injury each year. The American Academy of Pediatrics (AAP) estimates that about 17,000 children require care in the emergency room each year because of lawn mower accidents. According to Technology Associates the leading cause of lawnmower accidents is contact with its moving blade. While the danger from this cause may seem obvious, it is an established fact that people will place their fingers near the blade, generally in an attempt to clear away a clump of grass or other undesired matter. Most of these accidents occur when the person reaches under the “skirt” of the mower, or reaches into the discharge chute. Another cause of accidents is throwing of objects, such as small stones, by the blade. The tip of the blade can be moving as fast as 200 miles per hour, and can project small, hard objects as far as 50 feet. These objects can travel in any direction, depending on the angle at which the blade encounters them, and can injure nearby persons including the operator himself. Burns may occur as a result of a person touching a hot surface of the exhaust system of the engine of the mower. In addition, fires can result when there is leakage of gasoline for any reason, and the gasoline vapor is ignited by a spark from the ignition system of the engine (including the battery) or by an abnormally hot surface of the exhaust system. Injury can also result from contact with and inadequately shielded part of the propulsion system, such as a sprocket wheel or gearing. The remaining causes of injury only apply to riding mowers. One of these causes is the potential instability of such a mower, which may cause it to overturn in certain conditions. The overturned mower can fall on the operator; to it may cause the rupture of the gasoline tank, with the consequent danger of fire: or it may lead to contact with the rotating blade with the operator. Because of the operator’s limited visibility to the rear, a riding mower may be subject to back-over accidents, in which the mower runs over a child or other person while going in reserve. The likelihood of back over accidents is increased by the fact that noise of the mower makes it harder for the operator to hear the warning cry of a person behind him.

The 4-H Petroleum Power Lawn and Garden Tractor Operator’s Contest provides Virginia 4-H members with an opportunity to actually put into practice, before their peers and a panel of judges, their ability to safely and effectively operate a lawn and garden tractor.

CONTEST GOALS

- Develop the skills, leadership, and citizenship of the 4-H members.
- Emphasize safety practices.
- Maintain and increase interest of 4-H members.
- Provide the members with an opportunity to demonstrate their skills and knowledge of agricultural tractor and/or lawn and garden tractor operation, maintenance, and safety.
- Stimulate the desire to complete the petroleum power program.
- Provide a premier event for the 4-H petroleum power program.
- Provide an opportunity to inform the public of the 4-H petroleum power program and what 4-H members are doing.
- Train 4-H members in the safe operation of lawn and garden tractors and equipment.

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VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

GENERAL RULES

- a) Contestants must be enrolled in Virginia 4-H.
- b) Contestants should be enrolled in the 4H petroleum power or small engine program.
- c) Contestants must be at least 13 and not more 18 years old on January 1st.
- d) Contestants must wear closed toed shoes during the event.
- e) Each county/unit may enter one contestant in the State Contest.
- f) Contestants participating in the state contest must have their project records completed before entering the contest.
- g) Contestants are judged on safety at all times while at the contest site: before, during, and after their contest operation. At the discretion of the judges, unsafe operation may disqualify a contestant.
- h) The driving order should be determined by allowing the contestants to draw numbers.
- i) The penalty scoring system is to be used. Unanswered or incorrectly answered questions and violations of rules draw penalty points for the contestant. In each division the contestant who completes the event with the lowest total score or number of penalty points is the contest winner.
- j) While at the contest, all participants are scored on Safety, Written Quiz, Parts Identification, Lawn and Garden Tractor operation on the course, and time.
- k) The driving event is timed and scored on the basis of one-penalty point for each second of operation. However, penalty points for safety violations, hit stakes, etc. are severe enough that the importance of speed is minimized.
- l) Failure to complete the course in eight minutes results in the driver being assessed a penalty of 100 points per minute.
 - a. **Note:** Officials, prior to the contest, may waive the eight-minute time limit.
- m) In case of a tie score for an award, the tie is broken using the contestants' scores in the specific scoring categories: written exam, parts identification, obstacle course score (lawn and garden tractor operation on course), and time on course. The order for breaking a tie is:
 - 1) written exam
 - 2) parts identification
 - 3) obstacle course score
 - 4) time

If comparing the contestants' scores in each of the above categories fails to break the tie, the contestants re-drive. (Safety, obstacle course score, and time are counted.)

Any rule or interpretation not covered here is decided by the superintendent and assistants of the contest. Their decisions are final.

The State 4H office officials will be responsible for only the State Event. Individual counties and areas will be responsible for their events and must furnish all personnel, quizzes, score sheets, equipment, etc. for these events.

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

LAWN TRACTOR CONTEST OPERATING PROCEDURES

- a) The diagrams for the Senior Division Obstacle Course may be used at the county, area events. For the State Contest the course should be driven in the manner indicated in the diagrams unless the official judges indicate otherwise. Note: Obstacle 2 (semi-circle) should be set up such that the contestant is maneuvering the Lawn and Garden Tractor in a counter-clockwise direction (right to left) around the semi-circle.
- b) The contest course should always be driven by a non-contestant prior to the contest to identify any problems maneuvering the course.
- c) The contestant, with the safety judge present, performs a safety and maintenance check of the lawn and garden tractor.
- d) The contestant mounts the lawn and garden tractor and starts the engine.
- e) Time starts when the lawn and garden tractor's rear axle crosses the course "start line" (line across the rear of Obstacle 1 – serpentine).
- f) The contestant is to start through Obstacle 1 backing to the left side of the stake, then go forward through the serpentine using the opposite side to the left of the stake. The contestant then finishes the obstacle course as outlined in the Obstacle Course Diagram on page 32. Failure to do so is scored as "Failure to follow instructions."
- g) Scoring on Obstacle 2 "Semi-circle" is: - 10 points for every two-foot section of the semi-circle that the mower did not stay in the allowed 2 inches (maximum of 160 points). - If the mower is never within the allowed two inches, the contestant is penalized an additional 25 points for "Failure to follow instructions" (160 points + 25 points = 185 points).
- h) When the contestant comes upon the obstacle stick, he/she stops within two (2) feet of the stick, dismounts the lawn and garden tractor (engine left running, transmission in park, mower blade disengaged, etc.), and picks up the stick and hands it to an official judge.
- i) Stop-stake --- The contestant will signal the judge when they are ready for the measurement to be taken.
- j) When the contestant has the lawn and garden tractor positioned in Obstacle 4 (shed) to his/her satisfaction, the contestant signals (throws one hand and arm into the air) the official judge that he/she is done.
- k) The contestant dismounts the lawn and garden tractor (engine left running, transmission in park, check mower blade for disengagement, etc.).
- l) After the official judges have taken the measurements in Obstacle 4, the contestant mounts the lawn and garden tractor and returns it to the parking area.

Participant Limitation

The contestant must be physically large enough to operate the lawn tractor without the help from others or bypassing the lawn tractor safety interlock systems.

Practice Period

Each participant will be given a limited time (not more than 3 minutes) to study and get acquainted with the lawn tractor and its controls. The lawn tractor may be operated in the immediate area of the contest during the practice period but **not on or through the course.**

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

The Contest

Unit/County Event

Each unit/county is encouraged to conduct a county contest in order to determine the entry into the state contest.

The county contest should be organized by the local Extension Agent. In order to increase the awareness of and the importance of safety, the local contest coordinators are encouraged to invite the local FFA members to participate in the county contest.

Holding the county contest during the county fair could create a considerable amount of spectator interest and generate public support of the outreach program.

State Event

The state contest will be organized by an Extension Specialist in conjunction with the Virginia 4H Director.

The Virginia Lawn and Garden Tractor Operators Contest will be held during the Virginia State Fair.

The state winner will have the opportunity to participate in the National 4H Lawn Tractor Safe Operator contest. The national contest is held the following September at Purdue University, West Lafayette IN. Ribbons will be awarded to the top ten individuals. If electric storms are present during the State Contest then the driving portion may be delayed up to one hour. If storms are still present and present a safety concern then the written scores will be used to determine the State placings. The driving portion of the event will not be rescheduled.

ORGANIZER(S) RESPONSIBILITIES

- a. Select the date for the contest.
- b. Reserve the contest site. The contest site should be a plot of level ground. Be sure to check contest size requirements for each course to ensure adequate space.
Note: Care must be taken to provide for the safety and comfort of the spectators.
- c. Contact local dealers in an effort to obtain equipment for the contest. Sponsoring dealers should be contacted several weeks before the contest. The dealers should be given the size and specifications of the equipment desired. It is a good idea to check again with the sponsoring dealers one week ahead of the contest to ensure that there are no problems and to provide final details on location and time of contest.
- d. Notify all participants and/or county extension offices of the time, date, and place for the contest.
- e. In the county contest the organizing person should obtain the judges. There should be a minimum of two (2) judges per course. Note: Parents of participating youth should not be judges of the division in which their child is a contestant. Prior contest participants make excellent judges. Dealers and personnel are another source of possible judges.
- f. In the area contest each county should be responsible for providing at least one judge. • Publicize the contest and its results in the news media (newspaper, radio, etc.).

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VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

LAWN AND GARDEN TRACTORS

Note: Safety devices will not be disabled for the contest.

- a) The lawn and garden tractor used in the contest should be from 12 to 24 horsepower in size.
- b) The lawn and garden tractor must contain a middle-mounted mower deck.
- c) The drive mechanism running the mower deck must be disconnected by a judge prior to the contest.
- d) It is strongly recommended that only one make and model of tractor be used on the driving course. Other sizes and makes of lawn and garden tractors may be used for the maintenance-safety and parts identification (if real parts are used instead of pictures) segments of the contest.
- e) The mower deck should extend out at least four (4) inches beyond the lawn and garden tractor's rear tire.
- f) The lawn and garden tractor should contain tractor-type front wheel steering.
- g) The lawn and garden tractor should contain a right-hand or rear discharge mower deck

EQUIPMENT (Required for contests)

- a) Stop watches (at least two for each course)
- b) Clipboards and pencils (one clipboard per judge plus enough pencils so the contestants may take the written examination)
- c) Lawn and garden tractors from local dealers (Specifications are listed in this manual)
- d) Stakes to mark courses for lawn and garden tractor and agricultural tractor events
- e) Ball of twine or lime to mark between stakes
- f) Steel tapes and yardsticks or rulers
- g) Steel drawbar pins (Safety hitch pins should be used.)
- h) Official scorecards for each contestant
- i) Written examinations (one copy per contestant) (Preparation of county exams is the responsibility of the petroleum power leader(s) and/or Extension agent.)
- j) A copy of the "Clarification of the Scorecard" for each judge (Should mail to the judges in advance along with a copy of the scorecard so they have a chance to look at it prior to the contest.)
- k) Sticky labels or masking tape to number and identify parts for identification
- l) Public address system (optional)
- m) Steel posts and rope to create barrier around the contest area (optional)
- n) Parts and/or parts pictures for the identification section.

WRITTEN EXAMINATION

- a) The written exam will consist of 25 multi choice questions pertaining to the Lawn Tractor program and the safe operation, maintenance of lawn tractors. References for the written exam are listed at the end of this document.
- b) Each question is worth 4 points. A total of 100 penalty points are possible.
- c) Each contestant is given a maximum of 20 minutes to complete the exam.

TIME

Time officially begins when the lawn and garden tractor's rear axle crosses the "start line" (line across the rear of Obstacle 1). Stop Time officially stops when the contestant, after backing the lawn and garden tractor into Obstacle 4 (shed), signals (throws one hand and arm into the air) the official judges that he/she is done.

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

PARTS IDENTIFICATION

- a) Note: Pictures may be used in place of actual parts.
- b) Twenty-five (25) items consisting of: lawn and garden tractor and equipment parts and supplies which are tagged with a number.
- c) Contestants identify the tagged items by writing the part's identification number next to the part's name on the scorecard. Parts Identification scorecard can be found at the end of this booklet.
- d) Each part incorrectly identified results in a 4-point penalty. A total of 100 penalty points are possible. (Only one penalty per tagged part.)
- e) A time limit of 20 minutes.

MAINTENANCE/PRE START SAFETY CHECK

- a) A maximum of five (5) missing or loose parts will be identified by senior contestants.
- b) Contestants will be told on contest day how many parts there are.
- c) The loose or missing parts must be the same for all contestants.
- d) The maintenance/safety check should be conducted in a secluded area out of sight of the other contestants.
- e) Only one contestant at a time should be administered the maintenance/safety check.

OBSTACLE STICK

- a) The purpose of the obstacle stick is to emphasize that lawn and garden tractor operators must constantly be alert for foreign objects in their pathway.
- b) An obstacle stick is placed, by one of the judges, at some point in Obstacle 3.
- c) The obstacle stick should be placed after the contestant has started through Obstacle 1 but before he/she has proceeded more than halfway through Obstacle 1.
- d) The obstacle stick used should be similar to a 2" by 4" board 1 to 2 feet in length.
- e) The contestant is expected to stop within two (2) feet of the obstacle stick, set the brakes or place the transmission in "PARK," disengage the mower's blade, dismount the lawn and garden tractor, and remove the obstacle stick and hand it to a judge. Failure to stop within two (2) feet results in a penalty as outlined in the score sheet.
- f) Hitting or running over the obstacle stick results in a 50-point penalty.

STOP-STAKE AND MEASUREMENT STAKE

- a) The stop-stake is a stake positioned distance "C" in front of Obstacle 4. (For dimension "C," see the Lawn and Garden Tractor Obstacle Course Diagram.)
- b) The stop-stake should be 1 1/2 times distance "A" from the inside wall of Obstacle 3. (For dimension "A," see the Lawn and Garden Tractor Obstacle Course Diagram.)
- c) The measurement stake is a stake located in the middle, rear of Obstacle 4. • The stop-stake and measurement stake should be at least six (6) inches taller than the tractor's front hood. (Suggestion: five (5) feet or taller)

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

LAWN AND GARDEN SAFETY INSPECTION Scoring Sheet

	NUMBER OF TIMES	PENALTY POINTS
PRESTART CHECK (Report each to safety judge 5 minute limit)		
a) Failure to check fuel level	_____ x 25	_____
b) Failure to check oil level	_____ x 25	_____
c) Failure to observe tire inflation	_____ x 25	_____
d) Failure to observe loose or missing parts (each part)	_____ x 25	_____
e) Failure to check mower blade for disengagement	_____ x 25	_____
STARTING SAFELY		
a) Failure to check neutral position	_____ X 25	_____
b) Failure to disengage clutch while starting engine	_____ X 50	_____
DRIVING SAFELY		
a) Failure to engage clutch gently	_____ X 25	_____
b) Failure to ride on seat	_____ X 100	_____
c) Skidding or spinning tractor wheels (scuffing of inside wheel on turning does not count as a skid) Skid of the front tractor wheel is not counted until the skid equals or is greater than the width of the tire.	_____ X 50	_____
MOUNTING AND DISMOUNTING SAFELY		
a) Failure to set brakes before dismounting (Transmission set in park or locked position counts as brakes locked)	_____ X 50	_____
b) Failure to bring tractor to complete stop before dismounting	_____ X 100	_____
c) Failure to mount/dismount on side opposite the discharge chute	_____ X 100	_____
OTHER SAFETY		
a) Extra Riders	_____ X 100	_____
b) Other unsafe practices (_____)	_____ X 100	_____

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VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

LAWN AND GARDEN TRACTOR PARTS IDENTIFICATION

Scoring Sheet

Parts to be identified have numbers attached to them. Select the correct part name from this list. Place the corresponding number on the beside the part name. This event will have a 20 minute time limit. Actual parts/photos of parts may be used in this event.

- | | | |
|----------------------------------|-----------------------------------|------------------------------|
| _____ 6 Point Socket | _____ Front Axle | _____ Radiator Cap |
| _____ 12 Point Socket | _____ Front Tire | _____ Rear Tire |
| _____ Air Cleaner Housing | _____ Fuel Fill Cap | _____ Reflector |
| _____ Air Pressure Gauge | _____ Fuel Filter | _____ Roller Chain |
| _____ Air Filter Precleaner | _____ Fuel Pump | _____ Rotary Blade Adapter |
| _____ Alternator | _____ Fuel Tank | _____ Rotary Mower Blade |
| _____ Amber Light | _____ Fuse | _____ Sleeve Bearing |
| _____ Anti-freeze/Coolant Tester | _____ Gear | _____ Slotted Screwdriver |
| _____ Ball Bearing | _____ Grass Clippers | _____ Spark Plug |
| _____ Ball Joint/Rod End | _____ Headlight | _____ Spark Plug Wire |
| _____ Brake Pedal | _____ Hose Nozzle | _____ Sprocket |
| _____ Camshaft | _____ Hydraulic Control Lever(s) | _____ Starter |
| _____ Carburetor (flow jet) | _____ Hydraulic Hose | _____ Starter Solenoid |
| _____ Carburetor (pulse jet) | _____ Idler Pulley | _____ Tail Light |
| _____ Choke Control Lever | _____ Ignition Switch | _____ Tapered Roller Bearing |
| _____ Coil | _____ Kill Switch | _____ Throttle Control Lever |
| _____ Combination Wrench | _____ Lawn Mower Wheel | _____ Tie Rod End |
| _____ Connecting Rod | _____ Lawn Sprinkler Head | _____ Tire Tube |
| _____ Crowfoot Wrench | _____ Mower Deck | _____ Torx Screwdriver |
| _____ Cruise Control Set Lever | _____ Mower Height Adjuster | _____ Transmission Filler |
| _____ Discharge Chute | _____ Muffler | _____ Universal Joint |
| _____ Distributor | _____ Needle Bearing | _____ Valve |
| _____ Drain Plug | _____ Oil Dipstick | _____ Valve Core |
| _____ Dump Valve Release | _____ Oil Filler Cap | _____ Valve Cover |
| _____ Edger Blade | _____ Parking Brake Control Lever | _____ Valve Spring |
| _____ Engine Oil Filter | _____ Personal Safety Device(s) | _____ Valve Stem |
| _____ Fire Extinguisher | _____ Phillips Screwdriver | _____ V-Belt |
| _____ Flat Belt | _____ Piston | _____ V-Belt Pulley |
| _____ Flywheel | _____ Piston Rings | _____ Warning Label |
| _____ Forward/Reverse Pedals | _____ PTO Control Lever | _____ Water Pump |
| | | _____ Wheel Lug Bolt |

Insects

- _____ Cut Worm
- _____ Sodweb worm
- _____ White grub

Plants/seeds

- _____ Clover Grass
- _____ Seed Legume
- _____ Fescue Seed
- _____ Kentucky Bluegrass

Weeds and Grasses

- _____ Annual Blue Grass
- _____ Carpetweed
- _____ Common chickweed
- _____ Common purslane
- _____ Crabgrass
- _____ Dandelion
- _____ Goosegrass
- _____ Ground Ivy
- _____ Knot weed
- _____ Plantain
- _____ Prostrate Spurge
- _____ Quackgrass
- _____ Shepherdspurse
- _____ White clover
- _____ Yellow nutsedge

Other

- _____ Filter, air dry element
- _____ Filter, air oil foam
- _____ Fertilizer, granular
- _____ Glasses, safety
- _____ Gauge, tire inflation
- _____ Limestone, ground
- _____ Spark tester
- _____ Valve Spring compressor

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VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

LAWN AND GARDEN TRACTOR PARTS IDENTIFICATION

Opscan Answer Sheet

Parts to be identified have numbers attached to them. Select the correct part name from this list. Place the corresponding number on the beside the part name. Each tagged part incorrectly identified results in a four point penalty. A total of 100 penalty points are possible. (Only one penalty per tagged part.) **Members competing in the Virginia State contest will use an opscan form to record their answers.** This event will have a 20 minute time limit. Actual parts/photos of parts may be used in this event.

100 - 6 Point Socket	131- Front Axle	162 - Rear Tire
101 – 12 Point Socket	132- Front Tire	163 - Reflector
102 - Air Cleaner Housing	133 - Fuel Fill Cap	164 - Roller Chain
103 - Air Pressure Guage	134 - Fuel Filter	165 - Rotary Blade Adapter
104 - Air Filter Precleaner	135 - Fuel Pump	166 - Rotary Mower Blade
105 - Alternator	136 - Fuel Tank	167 - Sleeve Bearing
106 - Amber Light	137 - Fuse	168 – Slotted/flat Screwdriver
107 - Anti-freeze/Coolant Tester	138 - Gear	169 - Spark Plug
108 - Ball Bearing	139 - Grass Clippers	170 - Spark Plug Wire
109 - Ball Joint/Rod End	140 - Headlight	171 - Sprocket
110 - Brake Pedal	141 - Hose Nozzle	172 - Starter
111 - Camshaft	142 - Hydraulic Control Lever(s)	173 - Starter Solenoid
112 – Carburetor (flow jet)	143 - Hydraulic Hose	174 - Tail Light
113 – Carburetor (pulse jet)	144 - Idler Pulley	175 - Tapered Roller Bearing
114 - Castor Gauge Wheel	145 - Ignition Switch	176 - Throttle Control Lever
115 - Choke Control Lever	146 - Kill Switch	177 - Tie Rod End
116 - Coil	147 - Lawn Mower Wheel	178 - Tire Tube
117 - Combination Wrench	148 - Lawn Sprinkler Head	179 - Torx Screwdriver
118 - Connecting Rod	149 - Mower Deck	180 - Transmission Filler
119 - Crowfoot Wrench	150 - Mower Height Adjuster	181 - Universal Joint
120 - Cruise Control Set Lever	151 - Muffler	182 - Valve
121 - Discharge Chute	152 - Needle Bearing	183 - Valve Core
122 - Distributor	153 - Oil Dipstick	184 - Valve Cover
123 - Drain Plug	154 - Oil Filler Cap	185 - Valve Spring
124 - Dump Valve Release	155 - Parking Brake Control Lever	186 - Valve Stem
125 - Edger Blade	156 - Personal Safety Device(s)	187 - V-Belt
126 - Engine Oil Filter	157 - Phillips Screwdriver	188 - V-Belt Pulley
127 - Fire Extinguisher	158 - Piston	189 - Warning Label
128 - Flat Belt	159 - Piston Rings	190 - Water Pump
129 - Flywheel	160 - PTO Control Lever	191 - Wheel Lug Bolt
130 - Forward/Reverse Pedals	161 - Radiator Cap	

Insects

- 201 – Cut Worm
- 202 – Sodweb worm
- 203 - White grub

Plants/seeds

- 300 -Clover Grass
- 301 -Seed Legume
- 302 - Fescue Seed
- 303 -Kentucky Bluegrass

Weeds and Grasses

- 401 - Annual Blue Grass
- 402- Carpetweed
- 403- Common chickweed
- 404 -Common purslane
- 405 -Crabgrass
- 406 - Dandelion
- 407 -Goosegrass
- 408 - Ground Ivy
- 409 - Knot weed
- 410 -Plantain
- 411 -Prostrate Spurge
- 412 -Quackgrass
- 413 -Shepherdspurse
- 414 -White clover
- 415 -Yellow nutsedge

Other

- 501 - Filter, air dry element
- 502 - Filter, air oil foam
- 503 – Fertilizer, slow release
- 504 - Fertilizer, granular
- 505 - Glasses, safety
- 506 - Glasses, reading
- 507 - Gauge, tire inflation
- 508 - Limestone, ground
- 509 - Spark tester
- 510 - Valve Spring compressor

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

Resources – Test Questions may come from the following sources.

National 4H Center – Small Engines (Crank It Up, Warm It Up, Tune It Up)

<http://www.4-hmall.org/Category/4-hcurriculum-small-engines.aspx?qa=1.159123578.17897973.1424960296>

Lawnmower Operators Manuals (the following list is only examples not intended to be comprehensive!)

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03502.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03537.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03532.pdf>

<https://www.managemyhome.com/mmh/user-profile/CreateUserProfileDisplay.action> Sears Craftsman Manuals

http://www.usa.husqvarna.com/support_manual_search.aspx

<http://www.snapper.com/manuals/#>

<http://www.exmark.com/Manuals.htm>

http://www.usa.husqvarna.com/support_manual_search.aspx/landscapers.aspx

<http://www.snapper.com/manuals/#> Select Z Rider

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

<http://www.dixiechopper.com/support.php>

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

<http://www.toro.com/en-us/customer-support/Pages/educational-technical-references/Service%20Manuals/service-manuals.aspx>

Lawn Equipment Videos

http://www.deere.com/en_US/homeowners/safety/video.html?tm=ho&link=cnav

<http://www.dixiechopper.com/support.php>

<http://www.briggsandstratton.com/us/en/support/videos/other-engines/4-cycle-theory>

<http://www.briggsandstratton.com/us/en/support/videos/riding-mower-engines/how-to-store-your-tractor-for-winter>

<http://www.briggsandstratton.com/us/en/support/videos/riding-mower-engines/tune-up-your-briggs-and-stratton-riding-mower-engine>

<http://www.kohlerengines.com/difference/howengineswork.htm>

Safety/Maintenance Publications

http://www.deere.com/en_US/homeowners/safety/mowermaintenance.html?aid=

http://www.grounds-mag.com/news/mowers_052606/

<http://msucares.com/pubs/publications/p1097.pdf>

<http://www.toro.com/safety/index.html>

http://www.cdc.gov/nasd/menu/topic/machinery_mowers.html

<http://www.nsc.org/resources/issues/agrisafe.aspx>

Practice Questions

http://www.four-h.purdue.edu/Tractor/Tractor_questions/LGTOC_JrSr_Division.html

Supplemental Text Books (will not be used for the test)

Small Engines by R. Bruce Radcliff (Authorized by Briggs & Stratton), Second Edition, 2004, American Technical Publishers. ISBN 978-0-8269-0012-8

John Deere – Fundamentals of Compact Equipment Series

Compact Equipment: Safety Management for Landscapers, Grounds-Care Businesses and Golf Courses. A primer of safety procedures for compact or outdoor power equipment. Book © 2001

Compact Equipment: Engines. A primer of test and repair procedures for compact-equipment engines.

http://www.deere.com/en_US/compinfo/publications/john_deere_publishing/complete.html

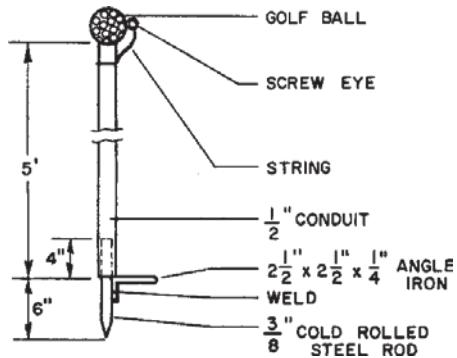
Turfgrass Science and Management by Robert Emmons, Second Edition, 1995, Delmar Publishers. Chapter 11. Mowing

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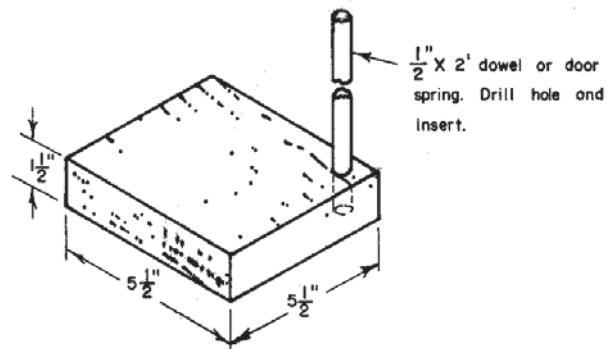
The Virginia 4H Lawn Mower Safety Operator event is based on the National 4H Petroleum Power Operator contest. Purdue University Publication 4H 84-W

VIRGINIA LAWN AND GARDEN TRACTOR OPERATORS CONTEST

1. Lawn and Garden Tractor Mower Suggested Stakes

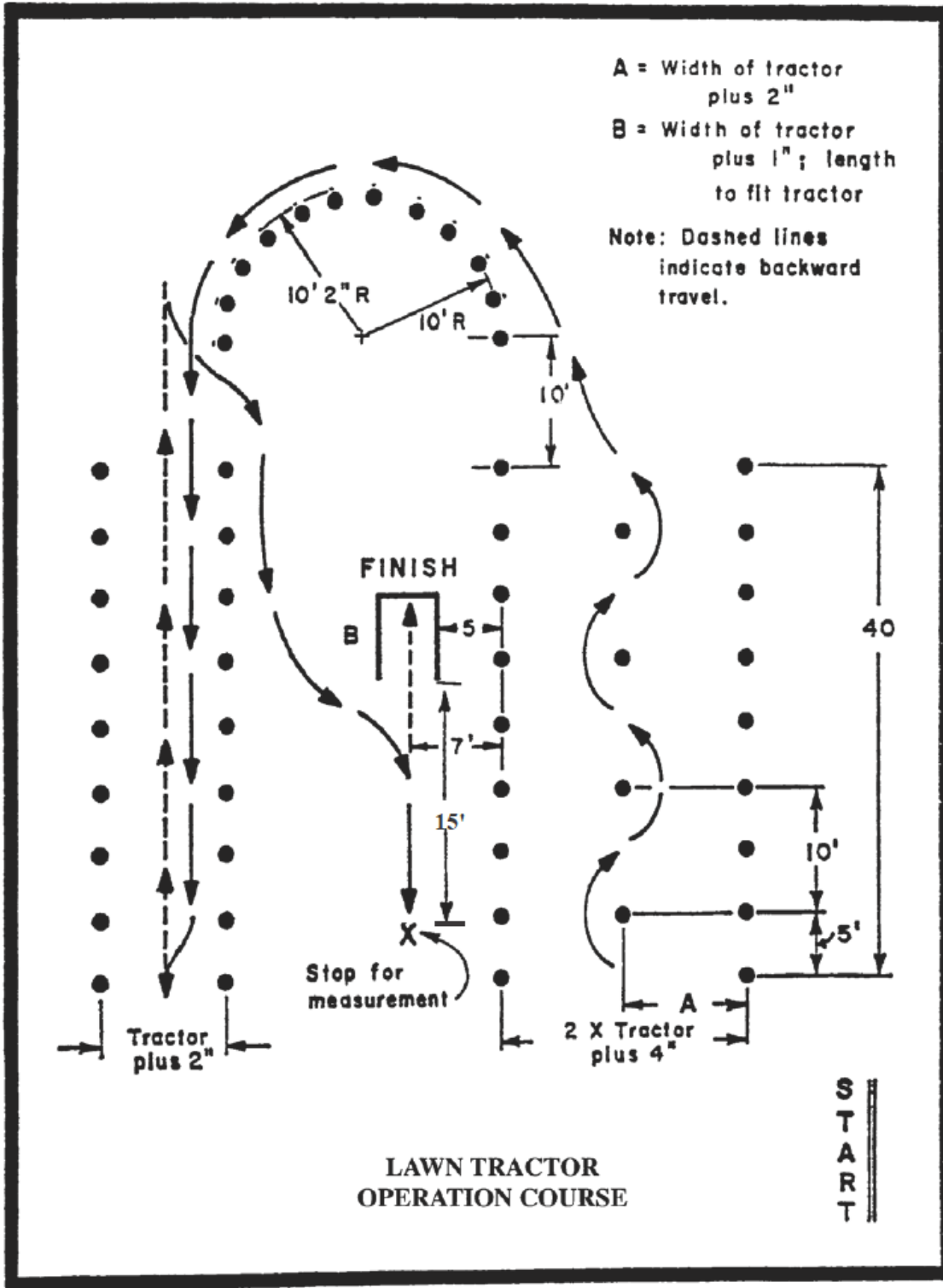


Suggested Boundary Lines for Obstacles 1, 3, and 4



- Obstacle 1
 - 2 Ropes 40' long
 - 6 Metal key rings clamped or taped on each rope at 5' and 10'
- Obstacle 3
 - 2 Ropes 40' long
 - 5 Metal key rings clamped or taped on each rope at 10' spacing
- Obstacle 4
 - 1 Rope 30' long
 - 4 Metal key rings clamped or taped, one at each end and 12' back from each end

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