



**VIRGINIA**  
FFA ASSOCIATION



## Virginia FFA: Small Engines

State Fair of Virginia  
2024 Contest Letter

<p><b>State Fair Address:</b> Meadow Event Park 13111 Dawn Blvd Doswell, VA 23047 Caroline County</p>	<p><b>Contest Registration and Tickets:</b> Participants must have a \$6 Student Competition Ticket to enter the Fairgrounds unless they are already at the Fair for another competition. Agricultural Education instructors are responsible for ordering tickets: <a href="https://www.vaffa.org/state-fair-of-virginia">https://www.vaffa.org/state-fair-of-virginia</a></p>	<p><b>Event Location:</b> Best of Show Tent</p>	<p><b>Date:</b> September 27, 2024</p> <p><b>Times:</b> <i>Contest Meeting:</i> 10:15 AM  <i>Contest Begins:</i> 10:30 AM  <i>Awards:</i> Following the Event</p>
<p><b>Contest Superintendents:</b> Jeff Wilt Andy Seibel Stuart Byrd</p>	<p><b>Entry Deadline:</b> September 20, 2024 by 5:00 PM.</p>	<p><b>Questions? Contact us!</b> <i>Virginia FFA Association</i> Andy Seibel - <a href="mailto:gseibel@vt.edu">gseibel@vt.edu</a> Alison Jones - <a href="mailto:alisonks@vt.edu">alisonks@vt.edu</a> 540-231-3823</p>	

### Purpose:

This event provides FFA members an opportunity to demonstrate their knowledge of small engines by completing a written test and to display their practical skills by troubleshooting an engine malfunction.

### Procedures:

1. The state event is held during the State Fair of Virginia.
2. One participant from each area competes in the state event.
3. The event consists of two parts. Part I is a written test, and Part II is a practical test.

### **Part I: Written Test**

1. The written test contains:
  - a. 20 true-false and/or multiple-choice questions
  - b. One measurement
  - c. Five tool identifications
  - d. One part for which to determine the replacement part number
2. The time limit is 40 minutes.
3. The test has a maximum of 100 points.

### **Part II: Practical Test**

1. The practical test involves having the participant troubleshoot an engine to determine specific malfunctions and to adjust the engine so that it operates properly.
2. The maximum time limit is two hours. A shorter time limit may be set if appropriate. If unplanned malfunction occurs, time required to correct the malfunction is deducted from the participant's total time.
3. If possible, all engines are of the same make and model and have the same malfunctions.
4. Participants bring their own safety glasses, tools, and repair manuals.
5. Oil, fuel, rags, fire extinguishers and parts containers are provided.
6. No work is to be done outside the designated troubleshooting area.
7. If a mechanical failure over which no one has any control should occur, it is considered an act of nature, and participants are expected to accept this without claim or recourse.
8. Adjustments must be within tolerances specified in repair manuals.
9. Participants should consult with the event manager when in doubt.
10. Participants are not penalized for requesting parts if they can justify their requests to the events manager.
11. Participants may be disqualified for any of the following reasons:
  - a. Failure to follow rules and regulations of the event or the judges' instructions.
  - b. Conduct on the part of an instructor or participant unbecoming a gentleman or lady or inappropriate spirit of the event and of the school is represented.
  - c. Smoking in the event area.
  - d. Conversing with anyone other than the judges and the event manager.
  - e. Employing an unapproved practice (such as using starter fluid).
12. The event manager is allowed to request a participant's aid and to use participant's tools to determine if malfunctions have been corrected.
13. The point-addition system is used to score the event. The participant with the lowest total score is the winner. Each participant is scored on safety throughout the event. Each participant receives a Malfunction Check-off Sheet to complete

as he or she corrects a malfunction. This sheet is also used for scoring. (The Malfunction Checkoff Sheet and the Small Engines Troubleshooting Event Score Sheet follow this section).

14. Participants must notify the event manager when they have completed the event. At that point, no further adjustments to the engines are allowed.
15. Only members of the event committee and participants are allowed in the immediate troubleshooting area. Spectators are allowed to observe from a distance but may not converse with participants.
16. The event manager and judges' rule on any condition not covered herein. Their decision is final.

**Judging/Scoring Criteria:**

- Written Exam - 100 points
- Diagnosis (10 points per malfunction) - 100 points
- Repair (50 points per correction) - 100 points
- 10 point deduction for safety infraction

**Awards:**

*Cash Awards:*

<b>Place:</b>	<b>Award:</b>
1st	\$50
2nd	\$45
3rd	\$40
4th	\$35
5th	\$30

*Ribbons:*

- 1st-6th Place - Rosette Ribbons**
- 7th-10th Place - Flat Ribbons**

**State Fair Scholarship Program:**

Contestants will be eligible to participate in the State Fair Scholarship Program. Please see the State Fair website, [www.statefairva.org](http://www.statefairva.org) for more information regarding the State Fair of Virginia Scholarship Program and eligibility requirements for other available scholarships. The following scholarships will be awarded to the top four individuals:

- 1st Place - \$600**
- 2nd Place - \$400**
- 3rd Place - \$300**
- 4th Place - \$200**

**Event Sponsor:**



**JAMES RIVER**  

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**EQUIPMENT**

**Attachments:**

- Malfunction Check-Off Sheet
- Score Sheet
- Event Tool List

# Small Engines Troubleshooting

*MALFUNCTION CHECK-OFF SHEET*

Participant's Name \_\_\_\_\_

School \_\_\_\_\_

Engine Model \_\_\_\_\_

Engine Type \_\_\_\_\_

	GOOD	NEEDS WORK	DESCRIBE WORK DONE
<b>1. Ignition System</b>			
a. Spark Plug			
b. Breaker points			
c. Condenser			
d. Armature air gap			
e. Ignition wires			
f. Other			
<b>2. Fuel System</b>			
a. Air Cleaner			
b. Carburetor			
c. Fuel			
d. Idle adjustment			
e. Main Load adjustment			
f. Choke			
g. Stop Switch			
h. Governor			
i. Other			
<b>3. Cranking System</b>			
a. Compression			
b. Tappet clearance			
c. Rings			
d. Timing			
e. Gaskets			
f. Other			
<b>4. Lubrication</b>			
a. Oil Level			
b. Drain plug			
c. Breather			
d. Other			

NOTE: Notify event manager when you have completed the event

# Small Engines Troubleshooting

## SCORE SHEET

Participant \_\_\_\_\_ School \_\_\_\_\_

Engine Model Number \_\_\_\_\_ Engine Type \_\_\_\_\_

	SCORING AREA	POINTS
1.	Failure to start engine (+200 points)	
2.	Failure to correct present defects (_____ defects not corrected X 50 points)	
3.	Number of parts requested but not needed: _____ X 20	
4.	Carburetor idle mixture improperly adjusted (+20 points) (Engine must have a distinct high and low end idle)	
5.	Number of minutes or major fractions thereof (over 30 seconds) of troubleshooting: _____ Minutes X 2 points	
6.	Safety violations (ex. Goggles, carelessness): _____ safety violations X 20 points	
7.	Improper use and care of tools: _____ incidents X 20 points	
8.	Failure to reassemble the engine to factory/original condition + 100	
9.	Written Examination: _____ wrong X 5 points	
10.	Parts and Tool ID: _____ wrong X 10 points	
11.	Measurement: +5 points if incorrect	
12.	Part Lookup: +20 points if incorrect	
	TOTAL POINTS	

# Small Engines Troubleshooting

SCORE SHEET

*Measurement, Identification, Part Number*

*Participant* \_\_\_\_\_ *School* \_\_\_\_\_

## MEASUREMENT EXERCISE

1. \_\_\_\_\_

## PARTS AND TOOL ID

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

## DETERMINING PART NUMBER

1. \_\_\_\_\_

## Small Engines Event Tool List

Adapter—"to 3/8"  
Adjustable wrench  
Allen or hex wrench (SAE & metric)  
Ball peen hammer  
Box-end wrench  
Brass hammer  
Breaker bar\*  
Center punch  
Clutch type screwdriver  
Cold chisel  
Combination wrench  
Compression tester or gauge  
Crankshaft holder wrench  
Cylinder gauge  
Cylinder hone  
Cylinder ridge remover  
Deep socket or deep well socket\*#  
diagonal cutters  
Diagonal cutting pliers or  
Dial caliper  
Die  
Die stock  
Drift punch  
Extension\*  
Feeler gauge (SAE & metric)  
Flat file  
Flywheel holder  
Flywheel knocker  
Flywheel puller  
Gear or wheel puller  
Groove joint or channel lock pliers  
Half-round file  
Ignition or spark tester  
Impact socket\*  
Lever wrench pliers or vise grip pliers  
Metric socket  
Micrometer  
Needle nose or long nose pliers  
Nut driver \*  
Offset screwdriver  
Open-end wrench  
Phillips screwdriver  
Pin punch or prick punch  
Piston groove cleaner  
Piston ring expander  
Plastic hammer  
Ratchet or ratchet handle\*  
Ratchet starter remover  
Ring compressor or piston ring compressor  
Round file  
Rubber mallet  
Screw extractor  
Sliding "T" handle  
Slip-joint or combination pliers  
Snap ring pliers  
Spark plug gauge and adjusting tool  
Spark plug socket  
Speed handle\*  
Standard or regular socket\*#  
Standard screwdriver  
Starter clutch wrench  
Tap  
Tap wrench  
Telescoping gauge  
Torque wrench\* (in lbs.)  
Torx screwdriver  
Valve grinder (hand)  
Valve lapper (hand)  
Valve refacer  
Valve spring compressor  
Vernier caliper  
Vibration tachometer

\* size drive—3/8

# point