PA FFA Small Gasoline Engines Career Development Event

Chairperson Information

CDE Chairpersons	Luke Kerstetter and Chloe Whitmoyer
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Best Contact Number	School Phone – (717) 872-9520 Cell Phone – (570) 541-5789
Contest Date/Times	**Tuesday** 2:00PM-4:30PM, **Wednesday** 8:00AM-3:00PM
Contest Location	**Tues**. – Ag Engineering Building, **Wed.** – Ag Engineering Building
CDE Review Time	**Wednesday** - Approximately 3:00PM
CDE Review Location	Ag Engineering Building

Basic CDE Guidelines

Event Type: Individual/Team	**# of Team Members:** 2
Individual Materials List • Briggs and Stratton Service Repair Manual **#381573EN** available for free download at the PowerPortal • Pencil • Calculator • Safety Glasses	Group Materials List • Briggs and Stratton Engine **Model 130G32-0022-F1** (See Engine Arrival pg. 5 for more information) • **ONE** Toolbox • Required Tools (Use Required Tools Checklist)
Attire • Tuesday – Official Dress • Wednesday – Work clothes, safety glasses, and leather boots	CDE At-A-Glance • On Tuesday, students will complete Parts I-III individually to test their small engine theory knowledge. Wednesday, students will complete Parts IV-IX to test their skills in engine repair.
Pre-State CDE Expectations • **(5 Teams per Region) -** Must have qualified at the regional level if the region holds SGE contest prior to the State Convention. If the region does not hold a SGE event, each area FFA in that region may send the top team from their competition to the State SGE CDE.	
CDE Changes from Previous Years? • Proposed changes written in red	

CDE Rules

CDE Component	Points (Team/Ind.)	Component Description
Part I: Written Exam	100pts./50pts.	At PA FFA Activities Week, contestants must be in official dress for Tuesday's activities. Missing or improper items of official dress will warrant a docking of points from the written exam score not to exceed 25 points per individual. The exam will cover selection, engine theory, and principles of operation, maintenance, repair, adjustment and service of the two-stroke and four-stroke cycle multi-fuel engines. The questions will be constructed from information supplied in the following resources. This is a "closed book" test. 1. Briggs & Stratton Small Engines Textbook: Part# CE8020 2. Briggs & Stratton Small Engine Care and Repair: Part# 274041 3. Briggs & Stratton Service and Repair Instructions: #381573EN available for free download at the PowerPortal 4. Equipment and Engine Training Council: Study Guides; 2 Stroke, 4 Stroke, and Compact Diesel. http://www.eetc.org/certification/forms.html
Part II: Using the Service Manual and Parts Manual	100pts./50pts.	Each contestant will supply their own (current as per *Required Tools Checklist* specifications) Briggs & Stratton Service and Repair Instructions manual. Contestants will use the service manual to determine measurements, adjustments, service, and maintenance procedures for designated engine models. The service manual, parts manual, and price lists will be the only references permitted for this section. *Parts manuals and price lists will be provided, if required, for this activity.* Students may be expected to use T-gauges, small-hole gauges, feeler gauges, and/or plug gauges and read inside- and outside micrometers and/or dial calipers. There will be a 10-point deduction per page or part thereof for any other papers, notes, etc. Contestants will be supplied with necessary engine model information prior to beginning this section. Students may be expected to obtain replacement parts numbers and prices for specified engines.
Part III: Tool and Part Identification	40pts./20pts.	Contestants will identify by correct name, from the list provided, various parts of small engines as well as various tools used to repair small engines. No reference material permitted.
Part IV: Tool Inventory	Deductions	Team toolboxes will be inventoried to verify that they have the required tools listed on the *Required Tools Checklist*.

		The checklist is provided to ensure that all teams will have the appropriate tools to conduct troubleshooting and repair operations. Deductions will be assessed as identified on the checklist. Additional tools not specifically identified on the checklist are permitted. The Briggs & Stratton OHV Service and Repair Instructions manual (as specified on the *Required Tools Checklist*) is the only reference that will be permitted during the engine repair portion of the C.D.E. Any other charts, papers, references, checklists, or other notes are prohibited. A 10-point deduction per page or any part thereof will be assessed. Spare parts are not permitted. A 25-point deduction will be assessed for each spare or marked part.
Part V: Engine Arrival Checklist	Deductions	Engines will be checked upon arrival to verify that they meet the specifications set forth in the Engine Arrival Checklist. Point deductions are identified on the checklist. ***Special note:*** *Fuel tank, fuel lines, and carburetor must be* ***ABSOLUTELY DRY*** *to avoid point deductions regarding fuel in the engine.*
Part VI: Troubleshooting Checklist	40pts./20pts.	Immediately following the scenario, contestants will complete a troubleshooting checklist indicating their strategy for repairing the engine. The contest committee will determine time allocation. At the end of this session, contestants will begin engine troubleshooting and repair.
Part VII: Engine Repair	200pts./100pts.	This section entails troubleshooting and repairing an engine. The engine will be "bugged" (defected) in some manner and may require that the contestants look up part numbers and order correct replacement parts. Engine "bugs" may require the removal of the crankcase cover assembly and thus will necessitate that students are knowledgeable in how to do so without draining the oil from the engine. If the bug is of a nature that oil must be temporarily drained, containers for doing so will be provided. Team members will work cooperatively and will be allotted an appropriate amount of time, to not be less than 30 minutes, in which to repair the engine. For scoring purposes, teams will be given a specific "flat-rate" time to be used when completing the job sheet, independent of the actual time allotted to fix the engine. The contestants will be provided a verbal scenario representing information given to the service manager by the "customer" when the engine was submitted for repair. Questions regarding the scenario are permitted with the understanding that all contestants will hear the question and answer. Top no-load governed speed will be announced at the beginning of this session Points for Part VII are as follows: **AWARDED POINTS** Engine Speed – 100 pts. /team Points in this section are

		awarded to teams that are able to start their engine. Speed will be measured using the team's digital tachometer as per the *Required Tools Checklist*. Engines must be able to run safely within **±50 RPM** of the designated idle speed and **±100 RPM** of the designated top no-load speed. If an engine is deemed by the judge(s) to be unsafe to run, no points will be awarded. The decision of the contest committee will be final. Engines that run but leak gas will be deemed unsafe. Points will be awarded in the following manner: Engine doesn't run or is deemed unsafe to be run: 0 points Engine runs but does not achieve either of the designated speeds: 20 points Engine runs but only achieves one of the two designated speeds: 50 points Engine runs properly and achieves both designated speeds: 100 points. Safety and Work Habits – 30 pts. /team Safety glasses meeting ANSI Z.87 specifications must be worn. Students **WILL NOT BE** permitted to work on the engine if they **DO NOT** have ANSI Z.87 safety glasses. Contestants must wear suitable work clothes and leather boots. Students not wearing proper footwear i.e., Sneakers, Tennis Shoes, Hey Dudes, Crocs, etc., **WILL NOT BE** permitted to work on the engine. Loose clothing and long hair must be tied back in a manner that it cannot become entangled with PTO. Nitrile gloves will be provided for students to use. Work habits will be observed, and deductions will be given for unsafe or improper practices. For scoring purposes, all questionable behaviors/practices will be noted by the judges during observation. Judges will determine point deductions per safety violation at their discretion based on the severity of the violation. If one team member is not permitted to work on an engine due to safety glasses or footwear violation, the maximum 30 points will be deducted in this category. Engine Safety – 10 pts. /team Engine **must** be secured while attempting to start or run the engine. Safe practices must be exhibited if the engine is not secure while it is not running. Fuel Safety – 30 pts. /team Engines will be fueled by the judges prior to the start of the troubleshooting portion of the event. Nitrile gloves will be provided for students to use Tool Use and Safety – 30 pts. /team Contestants will be observed for proper tool use and safe handling of tools. Scoring follows guidelines for that of *Safety and Work Habits*.
Part VIII: Job Sheet	100pts./50pts.	Contestants will be required to fill out the job sheet completely. Neatness of the final product is important since it is an indicator of attention to detail and pride in work completed. Pennsylvania Sales Tax must be calculated based on the subtotal of parts *and* labor. The flat rate time

		and billed hourly rate will be provided at the time the scenario is presented. All contestants will use the flat rate time provided to calculate the labor charge. Requesting improper parts will also result in a **2-point deduction per part requested; this** will be deducted from the Job Sheet score.
Part IX: Oral Report	60pts./30pts.	Upon completion of the job sheet, students will meet with the customer to present the bill, explain the services performed and answer customer questions. The score will be divided evenly between the contestants. Scoring premiums will be awarded to reports in which team members participated equitably during presentation.
Causes for Disqualification: Any device capable of wireless transmission including, but not limited to; cell phones, palm pilots, or personal digital assistants are prohibited. The use of any such device will result in disqualification from the event. Digital devices with calculator capabilities may be used at the time of completion of the Job Sheet, or other time specified by the judge(s).		
Tie-breaker: Top score(s) from Part I will be the tie-breaker for team or individual.		

Engine Arrival

Engines must be transported in a secure wooden, aluminum, or plastic/polymer box (with handles) of a size and weight that can be lifted and moved by an average individual.

All tools must fit in the **SINGLE** toolbox or the engine box. **NO** loose tools **OR** multiple toolboxes permitted.
The team is responsible for delivering their engine and toolbox to the designated location by 1:00 pm on Tuesday. Time and pick-up location will be posted in the registration area. Disqualification will result if the engine or toolbox is not present when judges begin the "bugging" process. ~~Normally, a U-Haul straight truck is typically parked visibly in the lot near the basketball court.~~ Team members should **REMOVE** their repair manuals and **TAKE** them to the written activity on Tuesday.

All engines must be mounted by four (4) 5/16" or 3/8" carriage bolts onto a piece of ***PLYWOOD*** measuring at least ½" thick and at least 10" X 10" in each dimension and be accompanied by two appropriately sized C-clamps with which to secure the engine to the table for starting. Mounting bolts must be cut and filed/ground to the top of the nut.

Toolboxes, engines, and service manuals must all be **CLEARLY** identified with the chapter or school name. Repair Manuals are to **REMAIN** with the contestants on Tuesday for use in Part II of the contest and are to be brought to the contest site by the contestant on Wednesday. **THE TOOLBOX MUST ACCOMPANY THE ENGINE. BOTH THE ENGINE BOX AND TOOLBOX MUST BE UNLOCKED.**
All engines are to arrive with NO spark plug. There is to be NO spark plug installed OR included in the engine box. A spark plug will be provided on the day of the contest.

The engine must be properly filled with oil prior to arrival.
See Part V: Engine Arrival for fuel-in-engine guidelines.
Engines **MUST** have been demonstrably previously disassembled.
Engine parts may not be marked in any way. Spare/Marked parts will receive a 25-point deduction per part with no maximum deduction.
If officials fault engines by installing non-functioning parts, teams must ask for replacements by bringing the part number and part name to the designated parts person. Requests for improper parts will be met with a "Not in Stock" response from the parts person. Requesting improper parts will also result in a **2-point deduction per part requested; this** will be deducted from the Job Sheet score. All faulty parts that are not found must be returned at the conclusion of the event and they will be replaced with the original parts.

Gasoline will be furnished for the competition. Initial fueling will be conducted by the students prior to the commencement of the troubleshooting and repair component of the event.

Engines will be evaluated for performance in the presence of the contestants. Team members will assist in the evaluation of their engines by following the instructions of officials in starting, idling, and removing engine parts as directed. The digital tachometer provided by the team will be used to evaluate engine speed for scoring purposes.

Upon completion of the event, it will be the team's responsibility to remove engines and tools from the contest site according to the designated time frame. C.D.E. officials, The Pennsylvania State University, and the hosting site will bear no responsibility for lost or stolen equipment and/or tools.